

Abstraction of Groundwater from the Millstream Aquifer

Proposed Amendment During
Referral under s.38C of the
Environmental Protection Act 1986

Rev 1

24 July 2025





Executive Summary

Water Corporation (the Corporation) is an integrated water utility and the principal supplier of water services across Western Australia (WA) and supplies the towns Karratha, Wickham, Dampier, Roebourne, Point Samson, and industrial areas including Cape Lambert and the Burrup Peninsula through the West Pilbara Water Supply Scheme (WPWSS or the Scheme). The Scheme is partly comprised of water from the Millstream Water Reserve (Millstream aquifer).

YAC submitted a third-party referral on the 11 November 2024 under section 38 of the *Environmental Protection Act 1986 (EP Act)* for the Abstraction of Groundwater from the Millstream Water Reserve (hereafter referred to as the **referral**). The proposal content as described in the referral was:

Proposal by the Water Corporation to renew groundwater licence GWL158011 for the abstraction of 6GL/a from the Millstream Water Reserve until May 2027, combined with the existing temporary groundwater licence to abstract 3GL/a until February 2027 (GWL205069), enabling abstraction of up to 9GL/a.

The Corporation submitted a response to the referral on the 4 April 2025 (hereafter referred to as **s38F response**). The proposal content as described in the s38F response was:

Groundwater abstraction of up to 6 gegalitres per annum (GL/a) until 2032, with a contingency of 3GL/a until 2027.

The Corporation submits this Proposed Amendment During Referral under s.38C of the EP Act (hereafter referred to as the **proposed amendment**) following further consultation with the Environmental Protection Authority (EPA), Yindjibarndi Aboriginal Corporation (YAC) and investigation into alternative options. The proposed content of this proposed amendment is a reduction from the referral and is:

Groundwater abstraction of up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.

The environmental factors for the proposed amendment are:

- Inland waters;
- Social surroundings;
- Flora and vegetation;
- Terrestrial fauna; and
- Subterranean fauna.

Inland Waters is the primary key environmental factor for the proposed amendment with the Millstream Wetlands (including pools) being the primary environmental value may be potentially impacted by the proposed amendment. The potential impacts to the Millstream Wetlands may subsequently potentially impact riparian and groundwater dependent vegetation (**GDV**), and fauna habitat associated with riparian and GDVs. Potential impacts to the Millstream Wetlands will also be assessed under the social surroundings key environmental factor, with the Millstream Wetlands and associated surrounding lands identified as cultural significant to Aboriginal people and aesthetic (tourism) values from the Millstream Chichester National Park. The subterranean fauna



environmental factor has been assessed due to groundwater abstraction within subterranean fauna habitat.

The proposed amendment did not result in new or additional environmental factors. There is no change to the environmental factors as presented in the s38F response.

The proposed amendment has resulted in a decrease in the environmental effects relevant to environmental factors. The sustainable yield and allocation planning studies and real-life monitoring data for the proposal has predicted and shown that:

- Abstraction up to 6GL/a with a contingency of 3GL/a does not adversely affect pool water levels; antecedent hydroclimatic conditions are the primary driver.
- Pool water levels have recovered following periods of groundwater abstraction greater than 9GL/a.
- Pool water levels and groundwater levels are not significantly impacted at 6GL/a or lower.

Consequently, the proposal is not expected to result in long-term, permanent observable change, any observable changes are likely to be attributable to climatic events and the proposal is not likely to result in significant impacts. The EPA objectives for the environmental factors for the proposed amendment can be met.

The character of the proposed amended will be substantially the same character as the referral and s38F document. The proposed amendment comprises the same activity, but of lower abstraction volumes and durations which are likely to be less significant.

The proposed amendment can be regulated under the *Rights in Water and Irrigation Act 1914* (RiWI Act) and the 5C licence can be used to mitigate impacts for the proposal. The RiWI Act associated policy documents provides repeated references to the need to consider sustainable use of water resources, protection of the ecosystems and environment, and public interest considerations in decision-making. This will enable any impacts to be considered under RiWI Act, via issuing of a 5C licence.

Regulation of the proposed amendment under the RiWI Act can be undertaken via clauses 7 and 22 of Schedule 2 of the RiWI Act, where the Minister has a broad discretion to consider anything. The assessment of impacts from the proposal can therefore be included under clauses 7 and 22 of Schedule 2 of the RiWI Act, via issuing of a 5C licence. The Minister's powers in clause 15 of Schedule 1 to impose terms, conditions and restrictions on a s5C licence are broad, including concerning the matters set out in the Appendix to Schedule 1 to the Act (e.g. use, management, protection and enhancement of any water resources and its ecosystem or the environment and monitoring) or any other matter relevant to the clause 7(2) matters. The Corporation's existing and expired licences include common conditions requiring an operating strategy (**WRMOS**), monitoring and reporting, so additional conditions can also be added to the 5C licence to enable regulation under the RiWI Act rather than a formal Part IV (of the EP Act) assessment. Regulation of potential impacts can be a standalone condition or changes added to the WRMOS.



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PART A: PROPOSAL INFORMATION AND PROPOSAL DESCRIPTION

1. Proponent Information

Proponent: Water Corporation

ABN: 28 003 434 917

Please see *Form – Request to amend a referred proposal under s.38C of the EP Act* (Appendix A).

Water Corporation (**The Corporation**) is an integrated water utility and the principal supplier of water services across Western Australia (**WA**). The Corporation is owned by the State Government and is accountable to the Minister for Water for the delivery of water, wastewater and drainage services across 2.6 million square kilometres (**km²**). The Corporation's purpose is 'to manage water services sustainably to make WA a great place to live and invest.' Its services enable economic growth and prosperity for the community as well as protecting public health and the environment.

The Corporation is a well-established water service provider that maintains high levels of community and regulatory trust. The Corporation is also an experienced asset manager to ensure the delivery of safe, sustainable, reliable, compliant and cost-effective water services. The Corporation concurrently manages the State's water infrastructure to support population and economic growth.

The West Pilbara Water Supply Scheme (**WPWSS or the Scheme**) supplies the towns of Karratha, Wickham, Dampier, Roebourne, Point Samson and the industrial areas of Cape Lambert and the Burrup Peninsula.

2. Pre-request Discussions

The Corporation submits this Proposed Amendment During Referral under s.38C of the *Environmental Protection Act 1986 (EP Act)* (hereafter referred to as the **proposed amendment**) following further consultation with the Environmental Protection Authority (**EPA**), Yindjibarndi Aboriginal Corporation (**YAC**) and investigation into alternative options after submission of the s.38F response date 4 April 2025.

In 2022 the approved allocation for Millstream Borefield groundwater licence (GWL 105696) issued under the *Rights in Water and Irrigation Act 1914 (RiWI Act)* was reduced from 15GL/a to the current 6GL/a in accordance with the Department of Water and Environment Regulation's (**DWER's**) sustainable yield and long-term reliable allocation assessment (DoW, 2010). A separate temporary groundwater licence (GWL 205069) for 3GL/a was also issued in 2022 for a five-year period until 2027, to enable a staged reduction in groundwater abstraction while still meeting demand until the delivery of a new, alternative water source for the WPWSS.

The Corporation submitted a 5C licence renewal (GWL 105696) under the RiWI Act to DWER on 26 April 2024 for the same volume previously licenced; 6GL/a from the Ashburton-Hamersley-Millstream resource. The renewal application is currently under assessment and in accordance with section 22 of Schedule 1 of the RiWI Act, the Corporation is operating the WPWSS under the current licence until the DWER assessment has been completed and new licence issued.



The EPA issued the Corporation a Notice Requiring Further Information (29 May 2025) to be included in this document. The information requested in this Notice and the Corporation's response is outlined below.

Investigation of the expansion or reconfiguration of the Millstream borefield across the Millstream aquifer, including resampling and assessing bores 7 to 12 for recommissioning.

The Corporation has undertaken a desktop study to investigate the re-use of groundwater abstraction bores 7 -12 (previously decommissioned due to elevated salinity) and engaged a consultant to undertake water quality sampling to assess suitability of the groundwater for use. Based on the results (due around September 2025) and the outcomes of the sustainable yield study, the bores and associated infrastructure will be assessed for integrity, evaluated for the repairs and maintenance required to enable ongoing use of these abstraction bores, and assessed on cost/benefit of repairing these bores for use versus other more viable options.

Yindjibarndi Water has submitted a proposal to the Corporation to assess potential new locations for production wells within the Millstream aquifer extent. The Corporation has engaged Yindjibarndi Water to execute that proposal.

Yindjibarndi Water is proposing to develop a northern borefield as an alternative groundwater water supply to the Millstream aquifer. The development of the borefield is being undertaken in collaboration with DWER.

Progress of upgrades to infrastructure at Harding Dam water treatment plant and distribution system.

The Corporation has identified the engineering improvements to Harding Dam to improve daily production capacity and to improve the ability to treat water at low dam levels, and maintenance activities within the conveyance network to reduce water loss. The Corporation is currently preparing a business case to State Treasury for these works and pending approval from State Treasury, engineering design works will commence. The Corporation has recently undertaken a non-visible leak detection survey on transfer mains between Millstream, Bungaroo and Harding Dam, through to main town supplies and is now prioritizing repairs.

Commissioning of an independent review to reassess the sustainable yield of the Millstream aquifer, the scope of which is to be developed in collaboration between the Water Corporation, the Department of Water and Environmental Regulation (DWER) and the Yindjibarndi Aboriginal Corporation.

The Corporation is currently scoping the "Sustainable yield review on Millstream Aquifer" study. Once the scope has been drafted, it will be sent to DWER and YAC for their comments and input.



3. Proposal Information

Proposal Title: Abstraction of groundwater from the Millstream aquifer (**the proposal**)

Description of the proposed amendment: Water Corporation proposes to continue abstracting groundwater from the Millstream aquifer to supply the West Pilbara Water Supply Scheme.

The proposal is to continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.

Proposal content document: Refer to Appendix B.

Spatial Data Spatial data of the Millstream Borefield is attached to this proposed amendment.

Water for the WPWSS is sourced from Harding Dam and Millstream Borefield. The two sources operate in conjunction, with Harding Dam the primary source. The proposal is to continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032. This s38C request is applicable to the current groundwater abstraction up to 2032. Should groundwater abstraction be required after 2032, and the abstraction be potentially significant, Water Corporation will assess whether an additional referral is required closer to this time.

Further information on the history of water licensing under the RiWI Act, including the WPWSS and Harding Dam is presented in the s38F response (Section 1.2 of the Supporting Document).

The local and regional context including the need for water to supply the WPWSS is presented in the s38F response (Section 1.2 of the Supporting Document).

The Millstream Borefield is located near the old Millstream Homestead, adjacent to the Fortescue River, about 130 km south of Roebourne. The borefield was established for public water-supply purposes in 1969. The borefield consists of six production bores, that draw water from an unconfined aquifer within the Millstream aquifer. Figure 2 shows a locality plan of the Millstream Borefield, within the Shire of Ashburton and located on the reserves:

- Crown Reserve 36991, Lot 55 Millstream (Bores PB1, PB2, PB3, PB4, PB5, PB6 Millstream Borefield).
- Crown Reserve 36991, Lot 58 Millstream (Bores PB7, PB8, PB9, PB10, PB11, PB12 Millstream Borefield).

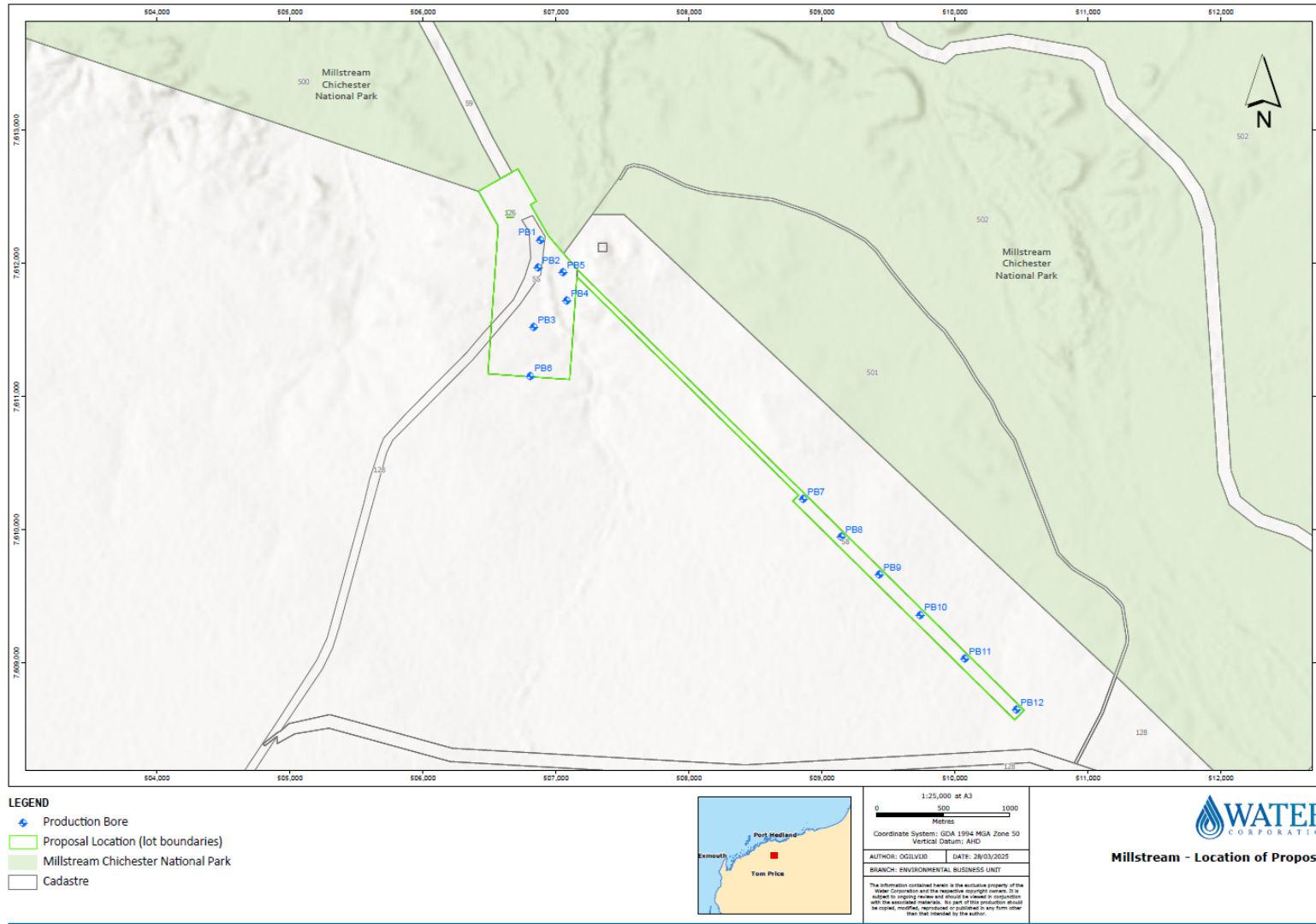


Figure 1: Millstream Borefield.



PART B ASSESSMENT OF AMENDMENTS

4. Reason For and Content of Proposed Amendment

4.1 Reason for the Proposed Amendment

Continued drinking water supply to the WPWSS is critical to the people of Karratha, Wickham, Dampier, Roebourne, Point Samson and the industrial areas of Cape Lambert and the Burrup Peninsula. WPWSS supplies a population of approximately 22,000 in these areas, which is forecast to increase to 22,700 in 2025 financial year. The reduction of the groundwater abstraction volume to 6GL/a from February 2027 and subsequent reduction in impacts as presented in this proposed amendment has been proposed to result in a “not assessed” level of assessment and allow continued drinking water supply.

4.2 Content of the Proposed Amendment

YAC submitted a third-party referral on the 11 November 2024 under section 38 of EP Act for the Abstraction of Groundwater from the Millstream Water Reserve (hereafter referred to as the **referral**). The proposal content as described in the referral was:

Proposal by the Water Corporation to renew groundwater licence GWL158011 for the abstraction of 6GL/a from the Millstream Water Reserve until May 2027, combined with the existing temporary groundwater licence to abstract 3GL/a until February 2027 (GWL205069), enabling abstraction of up to 9GL/a.

The Corporation submitted a response to the referral on the 4 April 2025 (hereafter referred to as **s38F response**). The proposal content as described in the s38F response was:

Groundwater abstraction of up to 6 gegalitres per annum (GL/a) until 2032, with a contingency of 3GL/a until 2027.

The proposed content of this proposed amendment is:

Groundwater abstraction of up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.

The proposed amendments to the general proposal content description and proposal content elements in the proposal content document are presented in Table 1 and Table 2.

The proposed amendment comprises a reduction in the duration of groundwater abstraction at up to 6GL/a with a contingency of 3GL/a from end 2027 to February 2027, a reduction in the duration of groundwater abstraction at 6GL/a from 2032 to 2028, and a reduction of the groundwater abstraction rate from 6GL/a to 5.5GL/a from 2028 to 2032. The proposed amendment is applicable to current abstraction up to 2032. Should groundwater abstraction be required after 2032, and the abstraction be potentially significant, Water Corporation will assess whether an additional referral is required closer to this time. Importantly the allocation allows a temporary-stepwise reduction for ongoing abstraction to 2032 and is below the volumes discussed with DWER when the current allocation plan was developed.



Table 1: Proposed Amendment to the General Proposal Content Description

	Referral	s38F response	Change from s38F response to s38C amendment	s38C amendment (this document)
Proposal title	Abstraction of Groundwater from the Millstream Water Reserve	Abstraction of Groundwater from the Millstream Aquifer	No change	Abstraction of Groundwater from the Millstream Aquifer
Referral Date	11 November 2024	4 April 2025	-	24 July 2025
Proponent name	Water Corporation	Water Corporation	No change	Water Corporation
Referrer name	Yindjibarndi Aboriginal Corporation RNTBC	Water Corporation	No change	Water Corporation
Short description	<p>The Water Corporation proposes to increase groundwater abstraction from the Millstream aquifer to 9 gegalitres per annum (GL/a), significantly exceeding the Department of Water and Environmental Regulation’s (DWER) sustainable limit of 6GL/a, set in 2013.</p> <p>The referral relates specifically to:</p> <ol style="list-style-type: none"> the existing groundwater licence to extract 3GL/a (GWL 205069); and a proposal to renew water licence GWL158011 (previously GWL105696), under section 5C of the Rights in Water and Irrigation (RiWI) Act 1914. <p>The two licences jointly would enable abstraction of water from the Millstream aquifer up to 9GL/a, 50% greater than the DWER’s publicly stated sustainable abstraction limit. This abstraction is expected to occur until at least 2032, or until the Water Corporation makes adequate investment in the West Pilbara Water Supply Scheme (WPWSS) to improve existing water management, or to develop alternative sustainable water supply sources for the WPWSS.</p> <p>The 6GL/a limit is currently under review based on the Millstream Groundwater Study (Supporting Document 4) recently completed by Yindjibarndi Water which recommends a maximum draw of 4GL/a. This Study has reviewed the past 50 years of data from Millstream abstraction supplied by the Water Corporation and the Department of Water and Environmental Regulation (DWER) and information from Yindjibarndi Aboriginal Corporation which is the Registered Native Title Body Corporate (RNTBC) for the Yindjibarndi People in the Ngarluma/Yindjibarndi Native Title Determination (Tribunal File No. WCD2005/001). The Millstream Groundwater Study has been reviewed by an independent hydrogeologist (Supporting Document 5).</p>	<p>Water Corporation proposes to continue abstracting groundwater from the Millstream aquifer to supply West Pilbara Water Supply Scheme (WPWSS).</p> <p>The proposal is to continue groundwater abstraction from the Millstream aquifer up to 6GL/a until 2032 with a contingency of up to 3GL/a until 2027.</p> <p>The proposal allows for groundwater abstraction from Millstream Borefield as a secondary water source for the WPWSS.</p>	<p>Reduction of the 3GL/a contingency from end 2027 to February 2027.</p> <p>Reduction of the 6GL/a rate from 2032 to 2028.</p> <p>Reduction of the 6GL/a rate to 5.5GL/a from 2028 to 2032.</p> <p>Removal of the Millstream Borefield as a secondary water source for the WPWSS.</p>	<p>Water Corporation proposes to continue abstracting groundwater from the Millstream aquifer to supply West Pilbara Water Supply Scheme (WPWSS).</p> <p>The proposal is to continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.</p>

Table 2: Proposed Amendment to the Proposal content elements

Proposal element	Referral		s38F response		Change from s38F response to s38C amendment		s38C amendment (this document)	
	Location / description	Maximum extent, capacity or range	Location / description	Maximum extent, capacity or range	Location / description	Maximum extent, capacity or range	Location / description	Maximum extent, capacity or range
Physical elements	Groundwater abstraction from the Millstream Water Reserve		Millstream Borefield		No change		Millstream Borefield	
	West Pilbara Water Supply Scheme	Combined abstraction from the Millstream	Figure 2 of the Supporting Document	Production Bores PB1, PB2, PB3, PB4, PB5, PB6 - Crown Reserve	No change		Figure 1 of the proposed amendment	Production Bores PB1, PB2, PB3, PB4, PB5, PB6 - Crown Reserve



Referral		s38F response	Change from s38F response to s38C amendment	s38C amendment (this document)
	Millstream borefield Refer Attachment 1	Water Reserve of up to 9GL/a	36991, Lot 55 Millstream Production Bores (unequipped) PB7, PB8, PB9, PB10, PB11, PB12 - Crown Reserve 36991, Lot 58 Millstream.	36991, Lot 55 Millstream Production Bores (unequipped) PB7, PB8, PB9, PB10, PB11, PB12 - Crown Reserve 36991, Lot 58 Millstream.
Construction elements		Not applicable	Not applicable – groundwater abstraction is currently occurring with established assets.	No change
Operational elements		Not applicable	Groundwater abstraction from the Millstream aquifer	No change
		Figure 2 of the Supporting Document	Continue groundwater abstraction up to 6GL/a until 2032 with an additional contingency up to 3GL/a to 2027	Removal of the 3GL/a contingency until 2027. Volume of 5.5GL/a from 2028 to 2032.
				Figure 1 of the proposed amendment
				To continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.
Proposal elements with greenhouse gas emissions		Not applicable	-	No change
Rehabilitation		Not applicable	Not applicable – assets are in operation	No change
Commissioning		Not applicable	Not applicable – assets are in operation	No change
Decommissioning		Not applicable	The need and timing of the decommissioning of groundwater bores and associated infrastructure will be confirmed as and when the long-term operation of the Millstream aquifer as a source for the WPWSS is defined.	Change to allow for the bores to be used and decommissioned after the project life of this proposal.
				The need and timing of the decommissioning of groundwater bores and associated infrastructure will be confirmed when the long-term operation of the Millstream borefield is finished. The decommissioning would be considered under the RiWI Act.
Other elements which affect extent of effects on the environment				
Proposal time	Maximum project life	Not confirmed by the Water Corporation	Abstraction up to 6GL/a until 2032, and up to 3GL/a contingency to 2027	Maximum project life to 2032.
	Construction phase	Not applicable	Not applicable	No change
	Operations phase	Not applicable	See maximum project life	No change
	Decommissioning phase	Not applicable	Not defined	No change
				To continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.
				Not applicable
				2032
				Not defined



4.3 Consolidated Updated Proposal Content Document

The proposal content document as a result of this proposed amendment, is presented as Appendix B.

4.3.1 Spatial Data, Maps and Figures

The location of the Millstream Borefield is shown in Figure 1. Spatial data of the Millstream Borefield is attached to this proposed amendment.

4.4 Proposal Alternatives

The initiatives and proposed alternatives identified to enable a staged reduction in groundwater abstraction to 2032, are outlined in Table 3.

Further detail is provided thereafter addressing the five actions recommended in the referral to be implemented as alternatives; these recommendations are also discussed in Section 1.3 of the s38F response.

Table 3: Potential alternatives and estimated staged reduction from Millstream borefield

Time frame	Water supply initiatives and alternatives to reduce abstraction and minimise impacts	Investigative initiatives to reduce abstraction volumes	Estimated Millstream abstraction
2025	<ul style="list-style-type: none"> • Minimise abstraction from Millstream Borefield (beyond sustainable yield) by prioritising water sources from Harding Dam in line with the requirements of the RiWI licence. • Minimise abstraction from Millstream Borefield through ongoing implementation of Waterwise Towns program and end-use demand management initiatives, including (residential and non-residential customers): <ul style="list-style-type: none"> ○ Providing ‘Showerhead Swap’ in the City of Karratha. ○ Sprinkler roster compliance. ○ Leak detection and repair. ○ Customer water efficiency communications (i.e. water use behaviour change letters to residents). ○ Engagement with high water users under the Water Efficiency Management Plan, offering audits if needed. ○ Plumbing services (leak repair, swapping fittings/features). ○ Customer meter replacement upgrade to Smart Meters. • Minimise abstraction from Millstream Borefield through water demand 	<ul style="list-style-type: none"> • Inform mitigation of impacts under the 5C licence to groundwater by commissioning an independent review to reassess the sustainable yield of the Millstream aquifer in collaboration with DWER and YAC by 2027. • Inform mitigation action by investigating the re-distribution of abstraction at the Millstream borefield, including resampling and assessing of bores 7 to 12, supported by Yindjibarndi Water. • Develop options for temporary desalination to minimise abstraction at Millstream Borefield in the near-term (2027-2032) prior to completion of long-term desalination plant planned for 2032. • Inform reduction measures by modelling impacts to residential gardens from water restrictions. • Commence increased ecohydrological monitoring at Millstream to better 	Continue up to 6GL/a with up to an additional 3GL/a contingency to February 2027.



Time frame	Water supply initiatives and alternatives to reduce abstraction and minimise impacts	Investigative initiatives to reduce abstraction volumes	Estimated Millstream abstraction
	management services, supported by Yindjibarndi Water.	assess the response of the aquifer system to climate and abstraction. <ul style="list-style-type: none"> Yindjibarndi Water undertaking assessment of northern borefield option as an alternative groundwater source. 	
2026	<ul style="list-style-type: none"> Minimise abstraction of Millstream Borefield by upgrading the Harding Dam water treatment plant and distribution system, including: <ul style="list-style-type: none"> A treatment membrane upgrade to increase the daily production rate. Aeration at Karratha tanks to better manage disinfection by-products. Non-visible leak repair. Asset condition assessment of networks and storages. Asset renewals (prevent future leaks). Identify opportunities for increased water recycling across the WPWSS. 		Continue up to 6GL/a with up to an additional 3GL/a contingency to February 2027.
2027	Minimise abstraction of Millstream Borefield by establishing an interim alternative water source of up to 4GL/a. Supply options currently under assessment include a Rio Tinto Iron Ore (RTIO) supply agreement, the Corporation Desalination supply or outcomes from a soft market sounding.	Independent sustainable yield review on Millstream Aquifer (in collaboration with DWER and YAC).	Up to 6GL/a after February 2027 until 2028.
2028			Up to 5.5GL/a from 2028 until 2032.

Implementation of water restrictions

The implementation of customer water restrictions is a management response available for all public supply schemes in WA and the decision to do so rests with the State Minister for Water, following recommendation from the Corporation.

The Corporation is modelling vegetation response for increased water restriction scenarios in the WPWSS to assess the level of risk and determine if further restrictions could be implemented with specific timing to maximise water savings and minimise the negative consequences.

Investment in existing water supply infrastructure

The Corporation has identified the engineering improvements to Harding Dam to enable treatment of low-quality dam water and maintenance areas within the conveyance network to remedy water loss. The Corporation is currently preparing a business case to State Treasury and pending approval the works are planned to commence in 2026. Improvement to water treatment process at



Harding Dam is planned to improve the daily production capacity and increase the volume of available water that can be extracted and treated from Harding Dam.

The Corporation has recently undertaken a non-visible leak detection survey on transfer mains between Millstream, Bungaroo and Harding Dam, through to main town supplies and it currently prioritizing repairs.

Distribution of bores extracting water from Millstream

The Corporation has undertaken a desktop study to investigate the re-use of groundwater abstraction bores 7 - 12 (previously decommissioned due to elevated salinity) and engaged a consultant to undertake water quality sampling to assess suitability of the groundwater for use. Based on the results (due around September 2025) and the outcomes of the sustainable yield study, the bores and associated infrastructure will be assessed for integrity, evaluated for the repairs and maintenance required to enable ongoing use of these abstraction bores, and assessed for cost/benefit of repairing these bores for use versus other more viable options.

Yindjibarndi Water has submitted a proposal to the Corporation to assess potential new locations for production wells within the Millstream aquifer extent. The Corporation has engaged Yindjibarndi Water to execute that proposal.

Development of alternative short-medium term options and collaboration with industry

The Corporation is investigating options for an interim water source (2027- 2032) to minimise abstraction from Millstream Borefield until delivery of long-term solution. Interim supply options currently under assessment, and described below, include a Rio Tinto Iron Ore (**RTIO**) supply agreement, the Corporation desalination supply and outcomes from a soft market sounding (**SMS**).

In February 2025, the State Government announced that the Corporation would engage with RTIO on the feasibility of Stage 2 of RTIO's Dampier seawater desalination plant (**SDP**) being made available for an interim supply of 4GL/a to help meet demand requirements. The forecast delivery date for Stage 2 is 2027, however the timeframe for the associated integration works is still being defined.

The Corporation is also investigating a temporary Corporation desalination supply of up to 3GL/a, including the potential to integrate a temporary desalination plant into the West Pilbara Water Supply Scheme to fast-track delivery and alleviate pressure on Millstream.

In addition, as of May 2025, SMS for third party water supply is with the market. The SMS process provides a transparent and equal opportunity for market participants to respond to the Corporation's need for third party water supply, consistent with the Corporation's requirement to act commercially. Yindjibarndi Water has been invited to partake in the SMS and the Corporation is keen to partner on suitable opportunities to build a genuine long-term partnership.

Separately, Yindjibarndi Water is proposing to develop a northern borefield as an alternative groundwater water supply to the Millstream aquifer. If the borefield is determined to be feasible, the Corporation will work with Yindjibarndi Water on this option.

Long-term Scheme source planning

To maintain water supply reliability for the Scheme and meet future demand, the Corporation has evaluated a number of source options and is currently undertaking investigations for a SDP as the preferred long-term solution to supplement supply from the current sources. Early planning works identified potential SDP locations within the Burrup area, and engagement with the Murujuga



Aboriginal Corporation (**MAC**) and other stakeholders is ongoing to confirm possible plant locations. The Corporation has also explored locations off the Burrup Peninsula however these options were not considered viable. The forecast delivery date for the proposed Corporation SDP is 2032. The ultimate and staged sizing of the plant is yet to be determined.



5. Regulatory Information

5.1 Proposal Referral Date

Yindjibarndi Aboriginal Corporation (**YAC**) submitted a third-party referral on the 11 November 2024 under section 38 of EP Act for the Abstraction of Groundwater from the Millstream Water Reserve (hereafter referred to as the **referral**).

5.2 Status of the Referral

The seven-day public comment period for the referral was from Thursday, 14 November 2024 to Wednesday 20 November 2024.

The EPA submitted a notice requiring further information under s. 38F of the EP Act (**s38F Notice**) to the Corporation on the 24 December 2024 and an additional 38F Notice 4 March 2025 (reference: APP-0026350).

The Corporation submitted a response to the s. 38F Notice on the 4 April 2025, clarifying the proposal description and expected environmental impacts in the format of a:

- Form: Referral of a proposal under s. 38 of the EP Act; and
- Abstraction of Groundwater from the Millstream Supporting Document. A Proposal Content Document (**PCD**) was presented as Appendix A to the Supporting Document.

(hereafter referred to a **s38F response**).

The Corporation submits this proposed amendment in response to consultation with the EPA to amend the proposal as previously presented in the s. 38F response.

5.3 Changes to Decision-making Authorities or Processes

The proposed amendment does not result in new or removal of decision-making authorities (**DMAs**). Table 4 presents the DMAs relevant for the proposed amendment, the approvals proposed to be obtained, and how these approvals can mitigate the potential impacts from the proposed amendment. The EPA (2021) *Taking decision making processes into account in EIA Interim Guidance* outlines that under section 38G(4) of the EP Act, the EPA may take into account other statutory decision-making processes that can mitigate the potential impacts of the proposal on the environment, when making its decision whether to assess a referred proposal. The main impact from the proposal is groundwater abstraction and the RiWI Act can mitigate the potential impacts of the proposed amendment. As a result, the proposed amendment can be determined a “not assessed” level of assessment with impacts managed through the 5C licensing process.

The decision-making process for the grant of a section 5C licence renewal under the RiWI Act provides a comprehensive framework for considering all of the potential impacts for the proposed amendment, also raised in the referral and relevant to an EPA Part IV assessment, including both environmental and Aboriginal cultural heritage (**ACH**) impacts. Table 4 demonstrates the impacts from proposed amendment that could otherwise be considered by the EPA in a Part IV assessment are considered by the 5C licensing framework under the RiWI Act.



Table 4: DMAs and Approvals to Mitigate Potential Impacts from the proposed amendment

Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
Minister for Water (via DWER)	<i>Rights in Water and Irrigation Act 1914</i> (RiWI Act).	5C Licence to Take Groundwater.	<p>The 5C licence can be used to mitigate impacts to:</p> <ul style="list-style-type: none"> • Inland waters; • Social surroundings; • Flora and vegetation; • Terrestrial fauna; and • Subterranean fauna. <p><i>1. The ability of the DMA to consider the impact of the proposal.</i></p> <p><i>Are there any restrictions on the DMA’s consideration of a proposal’s activities?</i></p> <p>When considering an application for renewal of a section 5C licence, the Minister has a broad discretion to consider anything that is relevant under clauses 7 and 22 of Schedule 2 of the RiWI Act. There are no relevant restrictions, in terms of impacts or generally. The only limitations on the Minister’s discretion are clause 8 (mandatory refusal if a person won’t comply with conditions).</p> <p><i>Is the decision-making process constrained to particular geographical locations?</i></p> <p>There are no relevant restrictions, geographically. The assessment of impacts from the proposal can therefore be included under clauses 7 and 22 of Schedule 2 of the RiWI Act, via issuing of a 5C licence.</p> <p><i>Does the decision-making process only consider a particular type of impact?</i></p> <p>The RiWI Act associated policy documents provides repeated references to the need to consider sustainable use of water resources, protection of the ecosystems and environment, and public interest considerations in decision-making. This will enable any environmental and social (heritage) impacts of the proposed renewal of GWL 105696 and the associated water abstraction from Millstream aquifer to be considered under RiWI Act, via issuing of a 5C licence.</p> <p><i>2. The process that the DMA uses to assess the potential impacts of the activity on the environment, including:</i></p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p><i>Is the assessment on a case by case, or activity category, basis?</i></p> <p>Licence applications are considered on a case-by-case basis, in particular with respect to the additional information that may be required of applicants.</p> <p>A hydrogeological assessment, as stated in 'Operational Policy no. 5.12 – Hydrogeological reporting associated with a groundwater well licence', can be used to support the 5C licence, which assessed the potential impacts of the activity on the environment including on groundwater levels, quality, the environment and the aquifer.</p> <p><i>What opportunity does the public have to comment in/about the decision-making process?</i></p> <p>Licence renewals are advertised and the public has an opportunity to make submissions, which must be considered by the Minister in the decision-making process.</p> <p><i>What appeal rights are there about the decision-making process?</i></p> <p>There are no merits appeal rights but judicial review is available. In addition, Water Corporation is consulting YAC on the revised operating strategy (WRMOS) that has been prepared for the 5C licence renewal (GWL 105696). Operating strategies like the WRMOS are guided by DWER's policy 'Use of operating strategies in the water licensing process' (October 2020) and must be approved by DWER through the licence renewal process.</p> <p><i>What effect do the DMA's policies and procedures have on its statutory decision-making process?</i></p> <p>Licensing decisions relating to the Millstream aquifer will also be guided by the Pilbara Water Allocation Plan (October 2013), which addresses impacts for the environmental factors for the proposed amendment.</p> <p>The assessment of cumulative impacts is an inherent part of the RiWI Act licensing framework by virtue of the fact that the Act is, at its heart, a water allocation regime. Sustainable water management is the primary goal. In addition, there are no other water users in this area, so there are no cumulative impacts outside of those considered for the 5C licence.</p> <p><i>3. The relevant considerations which the DMA can take into account in decision making.</i></p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p><i>Can and does the DMA take the EPA’s factor objectives (or related objectives and principles) into account in decision making? And What elements of the environment are relevant to the decision-making?</i></p> <p>The referral concerns the potential impacts arising from the proposed abstraction, in particular matters like declining ground and surface water levels, seasonal availability of water, erosion, salinity, water temperature changes and water quality, and the implications those direct impacts could have on flora, stygofauna, terrestrial fauna, inland waters, landforms and ACH values in the area. All of these potential impacts can be considered as part of a section 5C licence renewal decision-making process.</p> <p>Whilst the EPA's factor objectives are not expressly referred to in the RiWI Act or guidance, all of the key environmental factors and objectives (for flora and vegetation, subterranean fauna, landforms, terrestrial fauna, inland waters and social surroundings) can and must be taken into account in the section 5C decision-making process, to the extent that the factors are:</p> <ul style="list-style-type: none"> • part of the Millstream aquifer ecosystem and environment; • potentially impacted by the ecologically unsustainable use of the aquifer; • a matter of public (including social) interest; and/or • considered by the Minister to be relevant. <p>The Minister must have regard to the objects of Part III of the Act (s4), the matters listed in clause 7 of Schedule 1 and the content of any submissions. The Minister is to have regard to whether the proposed taking and use of water are:</p> <ul style="list-style-type: none"> • in the public interest (defined by reference to economic, social or recreational benefits to the public); • ecologically sustainable; environmentally acceptable; • prejudicial to other current and future needs for water; • detrimental to another person (in the opinion of the Minister); • in keeping with local practices; or



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<ul style="list-style-type: none"> • consistent with the requirements and policies of other government agencies and intergovernmental agreements. <p><i>Are there any potential environmental impacts outside the scope of the DMA's decision making?</i> Direct impacts to heritage places. No direct impacts to heritage places are proposed or expected and these could be regulated through the <i>Aboriginal Heritage Act 1972</i> as outlined below.</p> <p><i>4. The conditions that may be applied as a result of the decision-making process.</i></p> <p><i>Are there standard conditions relating to the environment that are imposed in all cases?</i> The Minister's powers in clause 15 of Schedule 1 to impose terms, conditions and restrictions on a s5C licence are broad, including concerning the matters set out in the Appendix to Schedule 1 to the Act (e.g. use, management, protection and enhancement of any water resources and its ecosystem or the environment and monitoring) or any other matter relevant to the clause 7(2) matters. The Corporation's existing and expired licences include common conditions requiring an operating strategy (West Pilbara Water Resource Management Strategy, August 2014 (WRMOS) (presented as Appendix B to the s38F document)) and monitoring and reporting. Operating strategies like the WRMOS are guided by DWER's policy 'Use of operating strategies in the water licensing process' (October 2020).</p> <p><i>What special conditions relating to the environment can the DMA authority impose? In what circumstances? Does the DMA have sufficiently broad powers to impose conditions, including those provided for in section 45A of the EP Act?</i> Conditions referred to in s45A of the EP Act can be imposed within the RiWI Act framework and listed on a 5C licence (refer to "enhancement" in item 2 of the Appendix to Schedule 1 of the RiWI Act). The Minister's has powers in clause 15 of Schedule 1 to impose conditions relating to management, protection, monitoring, reporting and auditing.</p> <p><i>What compliance monitoring of environmental conditions is carried out?</i> Annual compliance reporting against the conditions of the 5C licence is undertaken annually.</p> <p><i>What review of whether the environmental conditions achieve environmental outcomes is carried out?</i> A change to conditions requires an amendment to the 5C licence.</p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p>Enforcement action can be taken for breach of conditions, evidenced by required monitoring and reporting. The Minister has broad powers to amend, suspend and cancel licences if an environmental concern arises or it is otherwise in the public interest. The details in the approved WRMOS outline further operational, management, monitoring and reporting obligations, and allow for further compliance monitoring. As do the Millstream Harding Consultative Committee (MHCC) and Millstream Harding Technical Working Group (MHTWG) set up under the allocation plan and WRMOS. The MHTWG is focussed on implementing strategies to manage and overcome some of the impacts mentioned, such as erosion. These groups also allow for ongoing engagement with YAC regarding impacts, monitoring and compliance.</p> <p><i>5. Likely outcomes</i></p> <p><i>Are the EPA's objectives for environmental factors likely to be met through the other decision-making process?</i></p> <p>The framework for section 5C licences under the RiWI Act (including the renewal application process and ongoing consultation/engagement, management, monitoring and reporting obligations) allows for the assessment, protection and management of all of the environmental factor objectives including:</p> <ul style="list-style-type: none"> • protect flora and vegetation so that biological diversity and ecological integrity are maintained; • protect subterranean fauna so that biological diversity and ecological integrity are maintained; • protect terrestrial fauna so that biological diversity and ecological integrity are maintained; • maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected; and • to protect social surroundings from significant harm. <p><i>6. Overall conclusion</i></p> <p><i>Is there a statutory decision-making process which can mitigate the potential impacts of the proposal on the environment?</i></p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p>As part of the 5C licence decision-making processes, in accordance with Part III, section 4 of the RiWI Act, the Minister must:</p> <ul style="list-style-type: none"> • provide for the management of water resources, and in particular: <ul style="list-style-type: none"> ▪ sustainable use and development to meet the needs of current and future users; and ▪ protection of their ecosystems and the environment in which water resources are situated, including by the regulation of activities detrimental to them; • promote the orderly, equitable and efficient use of water resources; • foster consultation with members of local communities in the local administration, and to enable them to participate in that administration; and • assist the integration of the management of water resources with the management of other natural resources. <p>The assessment and decision-making process for a 5C licence must consider Part III, section 4 of the RiWI Act, and therefore meets the requirements for other statutory decision-making processes "that can mitigate the potential impacts of the proposal on the environment" stated under section 38G(4) of the EP Act.</p>
Minister for Aboriginal Affairs	<i>Aboriginal Heritage Act 1972 (AH Act).</i>	Section 18 approval for consent to use the land for a purpose which would be likely to damage, destroy or in any way alter an Aboriginal site (s18 consent).	<p>The s18 consent can be used to mitigate impacts to the following if applicable:</p> <ul style="list-style-type: none"> • Social surroundings. <p><i>1. The ability of the DMA to consider the impact of the proposal.</i></p> <p><i>Are there any restrictions on the DMA's consideration of a proposal's activities?</i></p> <p>The s18 consent does not restrict any Aboriginal heritage site, and includes both ethnographic and archaeological sites; and both direct and indirect impacts, and also any offsite impacts, as stated in s17:</p> <p><i>Excavates, destroys, damages, conceals or in any way alters any Aboriginal site; or In any way alters, damages, removes, destroys, conceals, or who deals with in a manner not sanctioned by relevant custom, or assumes the possession, custody or control of, any object on or under an Aboriginal site.</i></p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p>The Corporation has not applied for s18 consent under the AH Act as implementation of the proposal will not destroy, damage, conceal or alter an Aboriginal site.</p> <p>Should additional Aboriginal heritage sites be identified, potential impacts can be managed under the AH Act as described below. Indirect impacts from groundwater abstraction would be considered via the RiWI Act as outlined above.</p> <p><i>Is the decision-making process constrained to particular geographical locations?</i></p> <p>The 18 consent is not constrained geographically and can include offsite impacts to any Aboriginal heritage site and includes both ethnographic and archaeological sites; and can include direct and indirect impacts, as stated in s17.</p> <p><i>Does the decision-making process only consider a particular type of impact?</i></p> <p>The 18 consent does not restrict any Aboriginal heritage site, and includes both ethnographic and archaeological sites; and direct and indirect impacts, also any offsite impacts as stated in s17:</p> <p><i>Excavates, destroys, damages, conceals or in any way alters any Aboriginal site; or In any way alters, damages, removes, destroys, conceals, or who deals with in a manner not sanctioned by relevant custom, or assumes the possession, custody or control of, any object on or under an Aboriginal site.</i></p> <p>2. The process that the DMA uses to assess the potential impacts of the activity on the environment, including:</p> <p><i>Is the assessment on a case by case, or activity category, basis?</i></p> <p>s18 consent applications are considered on a case-by-case basis, but also impacts to an ACH place can be assessed outside of a permit application if there is new information about an ACH place.</p> <p><i>What opportunity does the public have to comment in/about the decision-making process?</i></p> <p>A s18 consent application must include supporting evidence of consultation. Consultation must be undertaken in accordance with the DLPH (2023) Consultation Policy which states consultation may occur with the native title party for the application area; and other Aboriginal people who have knowledge and rights in relation to the Aboriginal sites within the application area, who are not members of the native title party (sometimes known as knowledge holders). Evidence of</p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p>consultation may include copies of correspondence between the parties; any presentations given; minutes of any meetings held between the parties; and relevant Aboriginal heritage survey reports.</p> <p>The Aboriginal Cultural Heritage Committee, comprising Aboriginal people and those with extensive knowledge in the preservation of ACH provides recommendations whether to approve s18 consent applications, including any conditions.</p> <p>As soon as practicable after grant of a s18 Consent, the decision is published on the Aboriginal Cultural Heritage Committee webpage.</p> <p><i>What appeal rights are there about the decision-making process?</i></p> <p>The s18 consent is subject to a Right of Review of Decision. Where a consent holder is aggrieved by a decision of the Minister made under section 18(3) of the AH Act, including the conditions to which the consent is subject, application may be made to the State Administrative Tribunal for a review.</p> <p>Under the AH Act, the public does not have a direct right to appeal a s18 consent approval. However, there are consultation processes in place where Aboriginal people and other stakeholders can provide input before a decision is made.</p> <p><i>What effect do the DMA's policies and procedures have on its statutory decision-making process?</i></p> <p>The DLPH (2023) Consultation Policy must be followed for all s18 consent applications, which states consultation may occur with the native title party for the application area; and other Aboriginal people who have knowledge and rights in relation to the Aboriginal sites within the application area, who are not members of the native title party (sometimes known as knowledge holders). Evidence of consultation may include copies of correspondence between the parties; any presentations given; minutes of any meetings held between the parties; and relevant Aboriginal heritage survey reports. A s18 consent application must include supporting evidence of consultation.</p> <p><i>3. The relevant considerations which the DMA can take into account in decision making.</i></p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p><i>Can and does the DMA take the EPA’s factor objectives (or related objectives and principles) into account in decision making? And what elements of the environment are relevant to the decision-making?</i></p> <p>The Corporation has not applied for s18 consent as implementation of the proposed amendment will not destroy, damage, conceal or alter an Aboriginal site. The AHA s18 process can regulate potential ACH impacts within the social surroundings factor if additional aboriginal sites were identified. All elements of ACH can be included in the s18 consent, including both ethnographic and archaeological sites; and both direct and indirect impacts, also any offsite impacts as stated in s17:</p> <p><i>Excavates, destroys, damages, conceals or in any way alters any Aboriginal site; or In any way alters, damages, removes, destroys, conceals, or who deals with in a manner not sanctioned by relevant custom, or assumes the possession, custody or control of, any object on or under an Aboriginal site.</i></p> <p><i>Are there any potential environmental impacts outside the scope of the DMA's decision making?</i></p> <p>Should additional Aboriginal sites be identified, the AHA can assess the potential impacts from the proposal on ACH. Indirect impacts from groundwater abstraction would be considered via the RiWI Act as outlined above.</p> <p><i>4. The conditions that may be applied as a result of the decision-making process.</i></p> <p><i>Are there standard conditions relating to the environment that are imposed in all cases?</i></p> <p>The s18 consents are granted subject to conditions. Conditions relate the reporting the extent of sites impacted, results of any confirmation of ground works and consultation with the native title holders. The Minister is also able to amend the s18 consent by amending the conditions to which it is subject, imposing new conditions or changing the specification of the land to which it relates.</p> <p><i>What special conditions relating to the environment can the DMA authority impose? In what circumstances? Does the DMA have sufficiently broad powers to impose conditions, including those provided for in section 45A of the EP Act?</i></p> <p>An ACH management plan may be a condition of the s18 consent, which can include broad powers to impose conditions, including those provided for in section 45A of the EP Act.</p>



Decision-making authority	Legislation or Agreement regulating the activity	Approval required	Whether and how statutory decision-making process can mitigate impacts on the environment.
			<p>Failure to comply with the conditions of the s18 consent including the ACH management plan may constitute an offence under section 55 of the AH Act.</p> <p><i>What compliance monitoring of environmental conditions is carried out?</i></p> <p>A written report to the Registrar of Aboriginal Sites is required within 60 days of the completion works outlining the extent of impact to ACH. The Department of Planning, Lands and Heritage (DPLH) carries out routine audits on compliance with the conditions of the s18 consent.</p> <p><i>What review of whether the environmental conditions achieve environmental outcomes is carried out?</i></p> <p>The Minister may amend, revoke or give a new consent if new information about an Aboriginal site becomes available.</p> <p>The ACH management plan can also be updated with any additional monitoring or mitigation measures outside of the s18 consent approval process.</p> <p>5. Likely outcomes</p> <p><i>Are the EPA’s objectives for environmental factors likely to be met through the other decision-making process?</i></p> <p>The EPA objective for ACH within the social surroundings factor, being “to protect social surroundings from significant harm” can be managed through a s18 consent approval and supporting ACH management plan if additional Aboriginal sites were identified and likely to be impacted by the proposal.</p> <p>6. Overall conclusion</p> <p><i>Is there a statutory decision-making process which can mitigate the potential impacts of the proposal on the environment?</i></p> <p>The Corporation has not applied for s18 consent under the AH Act as implementation of the proposal will not destroy, damage, conceal or alter an Aboriginal site.</p> <p>Should additional Aboriginal heritage sites be identified, the assessment of ACH within the social surroundings environmental factor can be undertaken via a s18 consent under the AH Act.</p>



6. Object and Principles of the EP Act

The object of the EP Act is “to protect the environment of the State, having regard to the following principles”. Table 5 presents the how the proposal has considered the principles of the EP Act and addresses the consideration of principles as presented in the referral.

Table 5: Principles of the EP Act

Principle	Consideration of Principles as presented in the Referral	Consideration of Principles as presented in the s38C amendment (this document)
<p>1. The precautionary principle.</p> <p>Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</p> <p>In application of this precautionary principle, decisions should be guided by:</p> <ul style="list-style-type: none"> careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and assessment of the risk-weighted consequences of various options. 	<p>It is the view of YAC, that the Corporation has not undertaken any careful evaluation of the impacts or alternatives.</p> <p>The proponent has not provided any detailed scientific evaluation of the potentially practically avoidable or irreversible impacts that the over abstraction rate at 9GL/a may cause. It has not provided:</p> <ul style="list-style-type: none"> An evaluation of the potential impacts by this rate of abstraction for at least 8-years (through to 2032) and practical management measures to manage or avoid such impacts. any detailed weighted risk assessment of various alternative options. any definitive measures or investment to provide confidence the proposed abstraction at increase levels will only be temporary. <p>The Millstream Water Allocation Statement established a sustainable abstraction limit for the Millstream aquifer of 5.2GL/a and 100% reliability and 6GL/a at 80% reliability. The allocation statement was supported by key stakeholders including YAC and informed by comprehensive scientific evaluation and modelling of the aquifer.</p> <p>The YAC submitted with its referral that the Millstream Water Study (2024) demonstrates, through a comprehensive analysis of the last 50 years of groundwater level data and abstraction</p>	<p>The proposal to abstract groundwater from the Millstream aquifer has previously been subject to an environmental assessment by then Department of Water (DoW) as part of its core accountability for the management of the State’s groundwater aquifers assets and issuing groundwater licences based on the outcomes of these assessments. The EIA undertaken has been comprehensive, scientifically robust and meets the requirements for the EPA to determine whether the proposal may have a significant effect on the environment.</p> <p>The borefield has been in operation since 1969. During this time, the then DoW (now DWER) and the Corporation has developed an understanding on how the groundwater abstraction affects the Millstream aquifer and Wetlands, and the management measures required for any mitigation responses. This has led to the refinement of trigger values and management responses which are outlined in the WRMOS. These measures provide certainty with the regulation and management of impacts under the RiWI Act.</p> <p>The temporary allocation until February 2027 has been determined with DWER and is short term in nature. As a result, it would not result in</p>



Principle	Consideration of Principles as presented in the Referral	Consideration of Principles as presented in the s38C amendment (this document)
	<p>rates, that continuous abstraction above 4GL/a is likely to lead to serious and irreversible damage to the environment.</p> <p>The statistical analysis, primarily focused on monitoring bores (1C and 1E) adjacent to both production bores, and within the zone of environmental receptor and heritage sites, has confirmed that abstraction rates exceeding 4GL/a result in breaching the annual trigger level.</p> <p>The sustainable abstraction limit for the Millstream aquifer as stated in the Millstream Water Allocation Statement should be preferred to DWER's determination in 2013, that the long-term sustainable yield of the Millstream bore field is 6GL/a, as this determination appears to have relied on rainfall recharge measured from a 1985 study (Draft Water Resource Management Operation Strategy dated May 2024, section 3.2.2). That is, the current sustainable abstraction rate is based on 40-year-old research. The study recently completed by Yindjibarndi Water relies on data from the past 50 years, to support its conclusion that the sustainable abstraction rate is now 4GL/a.</p>	<p>irreversible impacts or ongoing serious impacts. The Corporation has considered how it would optimally reduce its abstraction within a few years. Importantly the Corporation has prepared a number of mitigation options to reduce its abstraction which are not weather dependent and would result in climate independent water sources and demand management.</p> <p>The Corporation will be working with YAC on a review on the sustainable abstraction volume on the Millstream Aquifer. This would be important to understand and assess potential impacts from any future proposal for long term abstraction.</p> <p>In summary the above measures have been developed to meet the precautionary principle by relying on long term data from operation of the borefield to inform management responses, provides for a stepwise reduction to ensure no serious or irreversible impacts and allows for an assessment on proposals for future abstraction as new scientific information becomes available.</p>
<p>2. The principle of intergenerational equity.</p> <p>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</p>	<p>The development of the Harding Dam in 1985 led to serious and irreversible damage to the environment and aboriginal cultural heritage values. The intended benefit of such destruction was the avoidance of irreversible damage to the Millstream aquifer and the surface and groundwater biodiversity and cultural values it sustains. In other words, construction of the Harding Dam was intended to achieve intergenerational equity by protecting Millstream from excessive abstraction.</p> <p>Millstream has been pumped for public water supply since 1968 and nearly 40 years on from the Harding Dam, the</p>	<p>The Millstream aquifer is currently being managed sustainability to ensure its continued use for water supply. The Corporation is actively planning and working towards other water supply options to minimise the reliance on Millstream as a major source to the WPWSS.</p> <p>The Corporation has amended the proposal to achieve a staged reduction in abstraction:</p> <ul style="list-style-type: none"> Continue up to 6GL/a with up to an additional 3GL/a to February 2027, then



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	<p>Corporation is again seeking permission to extract water at rates which exceed any recognised sustainable limit for the Millstream aquifer, with no scientific assessment of the longer-term multi-generational damage such rates of abstraction could cause. What one Yindjibarndi and Ngarluma generation sacrificed for future generations; the protection of Millstream, may have been a failed endeavour.</p> <p>The Yindjibarndi leaders, including direct descendants of those who sought to protect their country from the Harding Dam proposal, have now expressed great distress at the longer-term impacts of abstraction at unsustainable rates and the consequences to the generations that now follow them.</p> <p>Stanley Warrie, senior elder and lead claimant of the Yindjibarndi#1 claim has directly articulated this view:</p> <p style="padding-left: 40px;">“Got that same feeling again. Need to sit with the Government people, but will they listen? It’s just like Harding Dam again. They want to take all our sites and give us nothing again. I was standing with the old people [at Harding Dam], now it’s my turn.”</p> <p>It is an inherent responsibility that the generation of elders and leaders of Yindjibarndi must ensure the ongoing effective management of the Millstream eco-system, and the deeply significant cultural values intertwined with this physical environment. It is an obligation not just to those future generations, but to the generations past who sacrificed so much to protect it.</p> <p>In addition to the multi-generational risks to the Yindjibarndi people’s culture and values, the broader impacts that may be caused through over abstraction to the broader public have not been quantified. The Millstream Pools and wetland system has been incorporated into the National Parks estate. The</p>	<ul style="list-style-type: none"> • Up to 6GL/a thereafter until 2028, then • Up to 5.5GL/a until 2032. <p>The Corporation recognises the need for climate independent water sources and demand management to maintain and enhance the environment for future generations. These measures would ensure a staged reduction in water abstraction.</p> <p>The Corporation recognises the importance of YAC and has outlined a number of joint projects and YAC lead projects to ensure the water resources and the environment is maintained and enhanced for the benefit of future generations.</p> <p>In summary, the Corporation has developed its mitigation approach to ensure the environment is maintained and enhanced through a stepwise reduction in impacts, the development of climate independent water sources and future management under the RiWI Act to be informed by a joint study with YAC. As a result, the principal of intergenerational equity would be met.</p>



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	<p>National Park Management Plan outlines that it is visited by more than 20,000 visitors annually and holds special interest for Indigenous people, conservation and recreation groups, the tourism industry and water supply interest groups.</p> <p>Finally, in future climate projections, indicating a potential decrease in tropical cyclone frequency, rising temperatures, and reduced recharge, further underscore the growing water resource challenges in the Millstream region and the risk of serious or irreversible damage to the environment.</p>	
<p>3. The principle of the conservation of biological diversity and ecological integrity.</p> <p>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	<p>The Millstream Chichester National Park and the Mungaroona Range Nature Reserve Management Plan, 2011 has a stated Vision to achieve key outcomes by 2021. It includes the following statement:</p> <p><i>The significant wetland ecosystem and other natural values of the planning area will be in better condition than at present and the subterranean aquifer will remain in its current healthy condition. This will have been achieved through efforts focused on effective weed control, restoring the resilience of the natural ecosystems and improved management of water abstraction from the aquifer, through monitoring, research and adaptive management. In particular, those values that are not found or are uncommon elsewhere will have been conserved, and their special conservation significance will be recognised by the local and broader community and visitors.</i></p> <p>The Millstream Chichester National Park and the Mungaroona Range Nature Reserve Management Plan also states:</p> <p><i>The Environmental Protection Act 1986 (Environmental Protection Act) provides for protection of the environment across the State. The Act provides for the development of</i></p>	<p>The Corporation has considered biological diversity and ecological integrity as a fundamental matter for water abstraction. The monitoring requirements, trigger values and management measures outlined in the WRMOS are targeted to minimise and abate impacts to the Millstream Wetlands, its vegetation and associated fauna habitat. These measures have been developed over a long period of time and are robust and fit for purpose.</p> <p>The WRMOS is designed to ensure biological diversity and ecological integrity is maintained, and along with the stepwise reduction in abstraction, would ensure the principle of biological diversity and ecological integrity is met.</p> <p>The measures to minimise and mitigate impacts have been prepared using a range of verifiable independent studies such as:</p> <ul style="list-style-type: none"> • Antao, M. 2013, Pilbara monitoring program to support the Pilbara groundwater allocation plan, Department of Water, Government of Western Australia.



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	<p><i>Environmental Protection Policies and the assessment of development proposals and planning schemes for potential environmental impacts. Significant development proposals within the planning area (e.g. mining, significant water abstraction and utilities/services development proposals) may be referred to the EPA.</i></p> <p>It is unclear how approval for the Water Corporation to abstract 9GL/a from the Millstream aquifer will contribute to achieving the principle of biological diversity and ecological integrity and meet the Vision of the Millstream Chichester National Park. The current management, monitoring and reporting framework does not provide a robust and comprehensive suite of information on which to assess impact.</p>	<ul style="list-style-type: none"> • Department of Water 2013, Pilbara Groundwater Allocation Plan 2013, Water resource allocation and planning report series Report no 55. • Haig, T 2009, The Pilbara coast water study, Department of Water, Hydrogeological record series, Report HG34, 183 p.
<p>4. Principles relating to improved valuation, pricing, and incentive mechanisms.</p> <ul style="list-style-type: none"> • Environmental factors should be included in the valuation of assets and services. • The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement. • The users of goods and services should pay prices based on 	<p>The proponent has not quantified the potential environmental impacts associated with the impacts of increased abstraction and consequential damage to the environment has not been factored into a revision of the costs charged by the Corporation to its users.</p> <p>It would be reasonable and appropriate in applying this value, if the abstraction value was granted to consider:</p> <ul style="list-style-type: none"> • the required management measures needed to avoid, mitigate or manage impacts caused from the over abstraction at Millstream; • the relevant costs to properly implement these measures; and • revise the fees and charges to residents and industry for the supply of water to offset these additional costs of management and ensure funds are available to implement the impacts. <p>The alternative options discussed could also be used to determine the best public interest outcome. For example, the</p>	<p>The Corporation supplies the public with the State’s supply of drinking water. The Corporation operates under the <i>Water Corporation Act 1996</i>, with the function of providing water services, and with functions necessary for and related to that purpose, and for connected purposes. The Corporation connects people to water, building an appreciation for our valuable resource.</p> <p>The Corporation has considered using the Millstream aquifer as a resource commodity and asset for providing drinking and other water supply options and the valuation of ongoing use of this asset against the environmental factors. The Corporation considers that the Millstream aquifer is an asset that cannot continue to be used without other options, with alternative water supply options to be developed to reduce reliance on the asset.</p> <p>The options considered for a stepwise reduction in abstraction have considered valuation, pricing and</p>



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<p>the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.</p> <ul style="list-style-type: none"> Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems 	<p>proponent could investigate whether the cost to the public might be more or less with respect to:</p> <ul style="list-style-type: none"> implementation of water restrictions on the public and industry; investment to improve water efficiency or savings to Water Corporation infrastructure; development of short-term alternative bore fields to supplement demand; or immediate investment in development of desalination at the Burrup associated with the Dampier Seawater Desalination project. 	<p>incentive mechanisms, and include measures for both climate independent sources and demand management. These measures factor in the environment goals and cost-effective ways to supply water to the public.</p> <p>The WPSS does not produce significant quantities of pollution and is for the supply of water. The Scheme is currently regulated under the RiWI Act which provides a framework for managing impacts to the environment and allows for consideration of environmental factors.</p> <p>In summary, the approach proposed by the Corporation has considered the principles relating to improved valuation, pricing, and incentive mechanisms and would meet these principles.</p>
<p>5. The principle of waste minimisation.</p> <p>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</p>	<p>No information is offered by the proponent to indicate how efforts are being made to minimise the loss or wastage of water either by end users or through improve operations and maintenance of Water Corporation infrastructure within the WPWSS.</p> <p>The proposal, to the knowledge of the YAC does not include heightened promotion and awareness of the conditions the WPWSS is facing; specific water restrictions, or investment in better leak detection and repairs.</p>	<p>The proposal will take all reasonable and practical measures to minimise the generation of waste. No significant quantities of waste are expected to be produced by the proposal, as the proposal is for abstraction of water.</p> <p>Whilst water loss is unlikely to be considered under this principal, and not the generation of waste, the Corporation considers water loss to be an important matter and provides the following for</p>



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		<p>transparency. The Corporation is currently minimising the water loss and increasing efficiency of the scheme by the ongoing implementation of the Waterwise Towns program including:</p> <ul style="list-style-type: none"> • Providing ‘Showerhead Swap’ in the City of Karratha. • Water use behaviour change letters to residents in West Pilbara. • Engagement with high water users under the Water Efficiency Management Plan, offering audits if needed. • Customer meter replacement upgrade to Smart Meters. • Sprinkler roster compliance. • Plumbing services (leak repair, swapping fittings/features). • Leak detection and repair. <p>The Corporation is proposing in 2026 to minimise water loss and increasing efficiency of the scheme by upgrading the Harding Dam water treatment plant and distribution system, including:</p> <ul style="list-style-type: none"> • A treatment membrane upgrade to increase the daily production rate. • Aeration at Karratha tanks to better manage disinfection by-products. • Asset condition assessment of networks and storages. • Asset renewals (prevent future leaks). <p>The Corporation has recently undertaken a non-visible leak detection survey on transfer mains between Millstream, Bungaroo and Harding Dam,</p>



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		<p>through to main town supplies and it currently prioritising repairs.</p> <p>In summary, the proposal will not produce significant quantities of waste and has measures in place to minimise water loss. As a result, the principal of waste minimisation would be met.</p>



7. Identification of Environmental Factors and Environmental Effects

7.1 Environmental Factors

The environmental factors for the proposed amendment are:

- Inland waters;
- Social surroundings;
- Flora and vegetation;
- Terrestrial fauna; and
- Subterranean fauna.

Inland Waters is the primary key environmental factor for the proposed amendment with the Millstream Wetlands (including pools) being the primary environmental value may be potentially impacted by the proposed amendment. The potential impacts to the Millstream Wetlands may subsequently potentially impact riparian and groundwater dependent vegetation (**GDV**), and fauna habitat associated with riparian and GDVs. Potential impacts to the Millstream Wetlands can be considered under the social surroundings environmental factor, with the Millstream Wetlands and associated surrounding lands identified as cultural significant to Aboriginal people and aesthetic (tourism) values from the Millstream National Park. The subterranean fauna environmental factor has been assessed due to groundwater abstraction within subterranean fauna habitat.

The proposed amendment did not result in new or additional environmental factors. There is no change to the environmental factors as presented in the s38F response.

The proposed amendment has resulted in a decrease in the environmental effects relevant to environmental factors. This decrease is both temporal and spatial.

7.2 Inland Waters

The objective for the EPA (2016) Environmental Factor Guideline for Inland Waters is:

To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.

Sections 5.2 Relevant Legislation, Policy and Guidance, 5.3 Receiving Environment and 5.4 Studies and investigations as presented in the s38F response have not changed as a result of the proposed amendment and therefore have not been duplicated in this s38C amendment (this document).

7.2.1 Environmental Effects

The environmental values of the proposed amendment have not changed from the s38F document and therefore have not been duplicated in this document.

No clearing is proposed and no direct impacts are expected as a result of implementation of the proposal.

The Millstream Wetlands may be indirectly impacted by groundwater abstraction altering the volume of the springflow from the aquifer entering Millstream Wetlands pools and rivers.



The Millstream Borefield is located south of the Millstream Chichester National Park, which contains the Millstream Wetlands which are a series of rivers, pools and wetlands and listed in the Directory of Important Wetlands (Figure 2) (Environment Australia, 2001). The Millstream area, most of which is within the Millstream Chichester National Park, is of environmental, social and cultural importance. The National Park was established to protect and maintain areas of significant value. The natural pools and surrounding riverine ecosystems at Millstream Wetlands rely on groundwater discharge from the Millstream aquifer and intermittent seasonal flow from the Fortescue River from climatic events. The system occupies a broad ancestral valley between the Hamersley Range in the south and the Chichester Range in the north and is crossed by the Fortescue River.

The Millstream Wetlands include permanent and semi-permanent riverine pools and flowing streams, including:

- Pools along the Fortescue River including Deep Reach, Crossing, Palm and Livistona pools.
- Off-channel pools and wetlands including Chinderwarriner pool, the Millstream Delta, Woodley, Peters and Palm Creeks.

Groundwater abstraction in the Millstream aquifer has the potential to contribute to the lowering the water levels in the Millstream Wetlands and permanent pools by reducing the volume of the springflow from the aquifer entering the pools. The pools in the Millstream Wetlands are not solely fed by groundwater, and there is not a direct connection between the pool levels and groundwater abstraction (refer to Figure 3, Figure 4 and Figure 5). There is a direct connection between pool water levels and surface water flow inputs, being the Fortescue River (roughly 80-90% by volume comes from the Fortescue) and influences such as evaporative losses. Any impacts observed in the pools may not be solely attributed to the proposal, and also, any breaches in trigger values may also not be directly attributable to the proposal.

Springflow, represented by the observed outflow from the pools and groundwater level monitoring in the Millstream aquifer monitoring is undertaken for Deep Reach and Chinderwarriner pools. These pools represent the greatest, by volume, springflow contribution from the Millstream aquifer and therefore the most suitable locations to determine impacts attributed from the proposal.

The monitoring at Deep Reach and Chinderwarriner pools assumes that conditions at these pools reflect the same conditions at downstream pools, such as Livistonia pool (refer to Figure 3, Figure 4 and Figure 5). Springflow and local groundwater level are also monitored to determine the additional contributions at Woodley, Peters and Palm Creeks into the system.

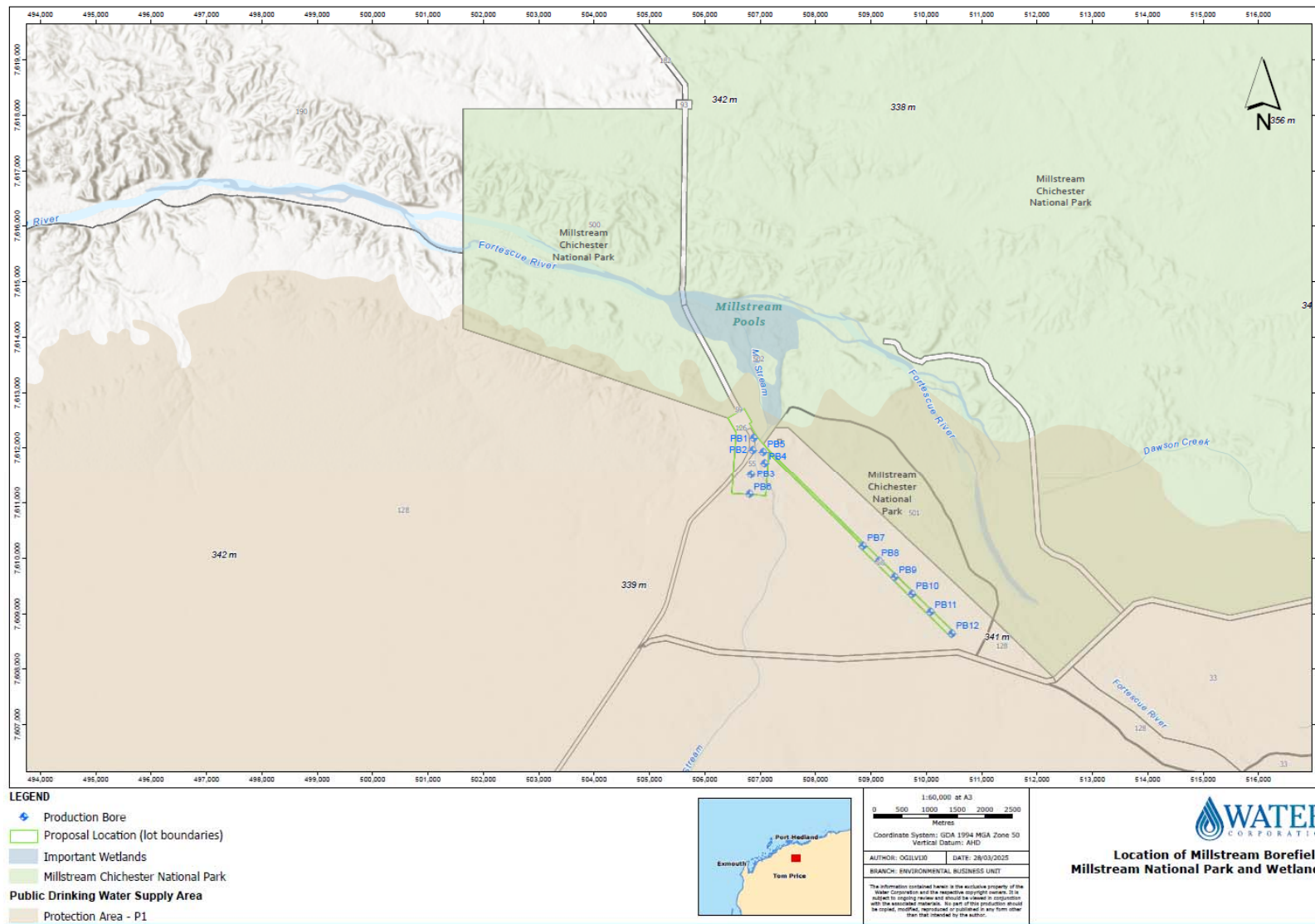


Figure 2: Location of Millstream Borefield, Millstream National Park and Wetlands

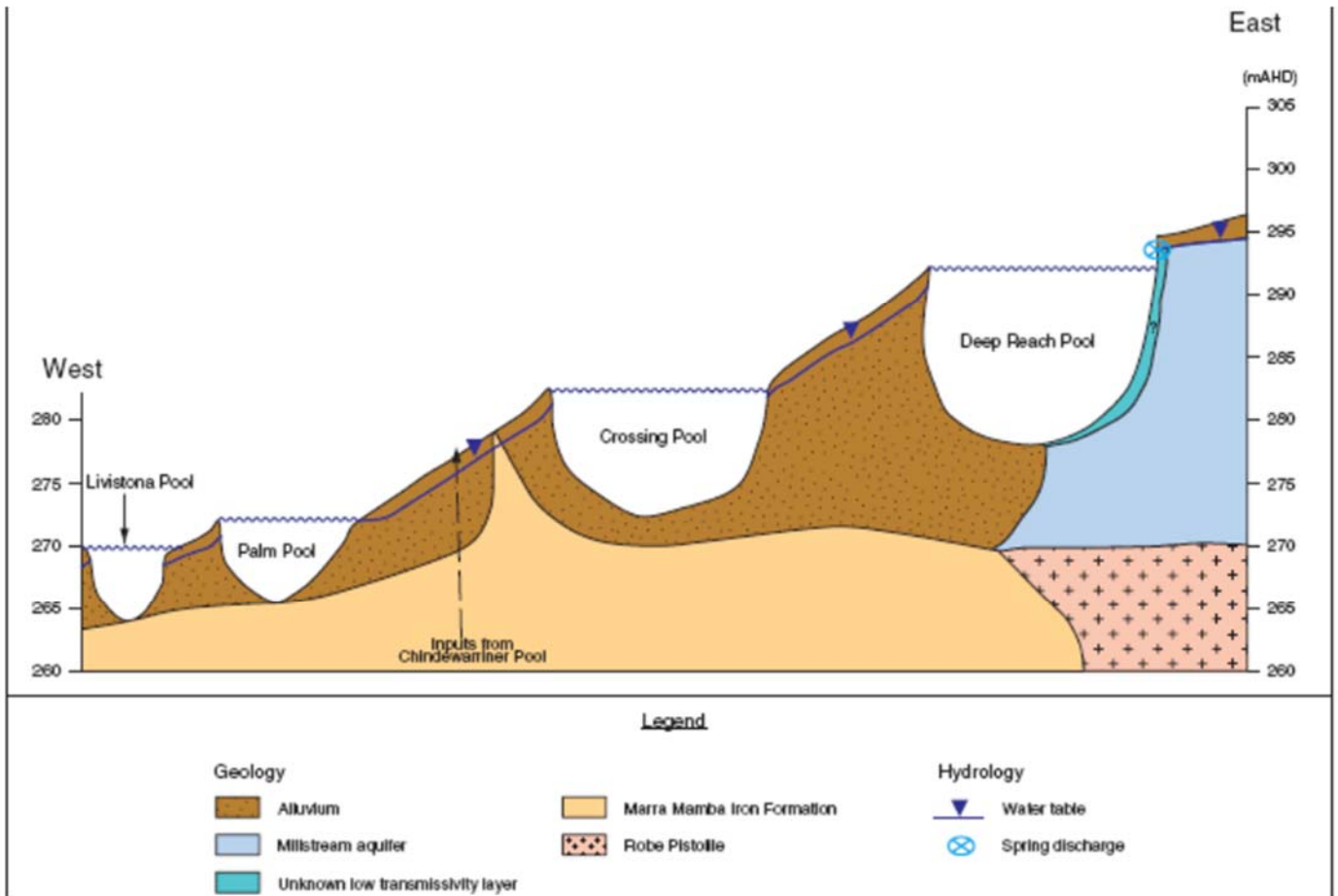


Figure 3: Longitudinal cross-section along the Fortescue River (revised from DEC 2007) (DoW, 2010)

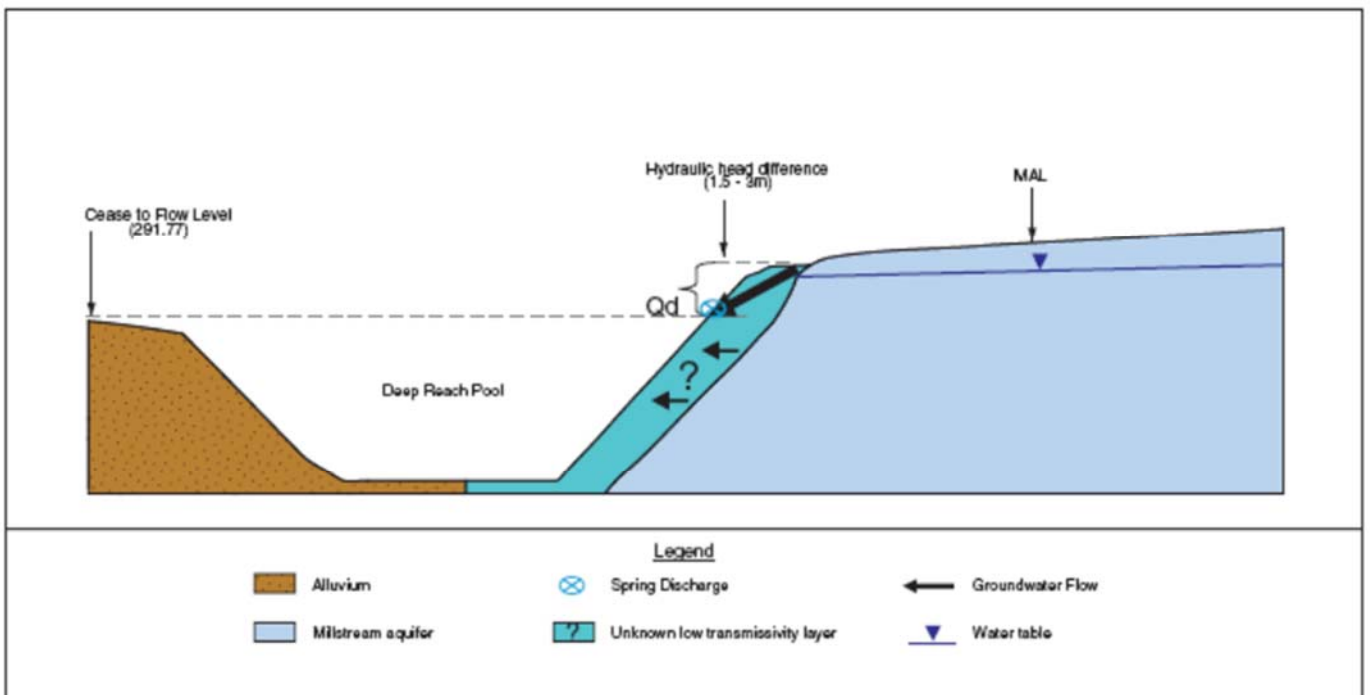


Figure 4: Conceptual diagram showing factors affecting springflow discharge into Deep Reach pool (DoW, 2010)

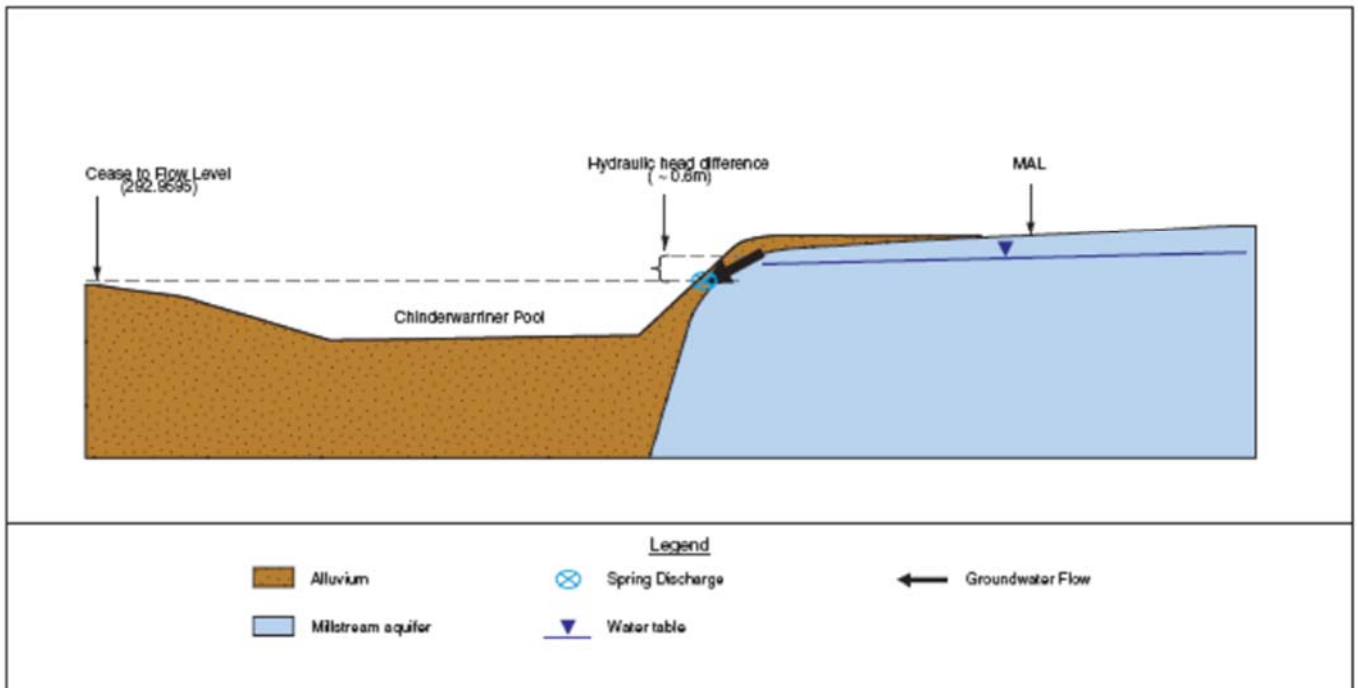


Figure 5: Conceptual diagram showing factors affecting springflow discharge into Chinderwarriner pool (DoW, 2010)

Monitoring at Deep Reach pool indicates the primary source of water is from the Fortescue River. Figure 7 shows pool levels in the Deep Reach pool and the MAL and Figure 9 shows pool levels and the springflow from Deep Reach pool, both showing that pool water is not correlated with the watertable levels or springflow and the pool water level fluctuation is around 1.0m. Figure 11 shows that peaks in pool levels in the Deep Reach pool are directly correlated with the peaks in Fortescue River flows. These graphs support that the primary source of water for Deep Reach pool is the Fortescue River, any impacts to Deep Reach pool are likely due to climatic conditions that affect water supply to the Fortescue River, such as the frequency of tropical cyclones and lows.

Monitoring at Chinderwarriner pool indicates pool water levels remain generally constant and are fed by both springflow and rainfall-runoff. Figure 8 shows pool levels in Chinderwarriner pool and the MAL, Figure 10 shows pool levels and the springflow from Chinderwarriner pool, Figure 12 shows pool levels in the Chinderwarriner pool with Fortescue River flows. The pool water level fluctuation is around 0.2m. These graphs show:

- Poor correlation with the resting watertable indicating pool water supply is maintained despite changes to the watertable;
- Correlation of pool water levels with springflow from 1995-2007, which occurs during a known wetter period of 1997 to 2013; and
- Peaks in the Fortescue River flows coincide with higher pool levels, this correlation is not as strong as for Deep Reach pool because the Chinderwarriner pool is a tributary to the Fortescue, supplied by springflow and surface runoff from across Millstream.

Historically the level in Chinderwarriner pool, which is up to 8m deep, varies in level by 0.2m. This small variation and poor correlation between pool water levels, aquifer monitoring bore 1E and the MAL suggests that Chinderwarriner pool is strongly and directly influenced by the local hydroclimate and (not significantly) indirectly influenced by abstraction from the aquifer.

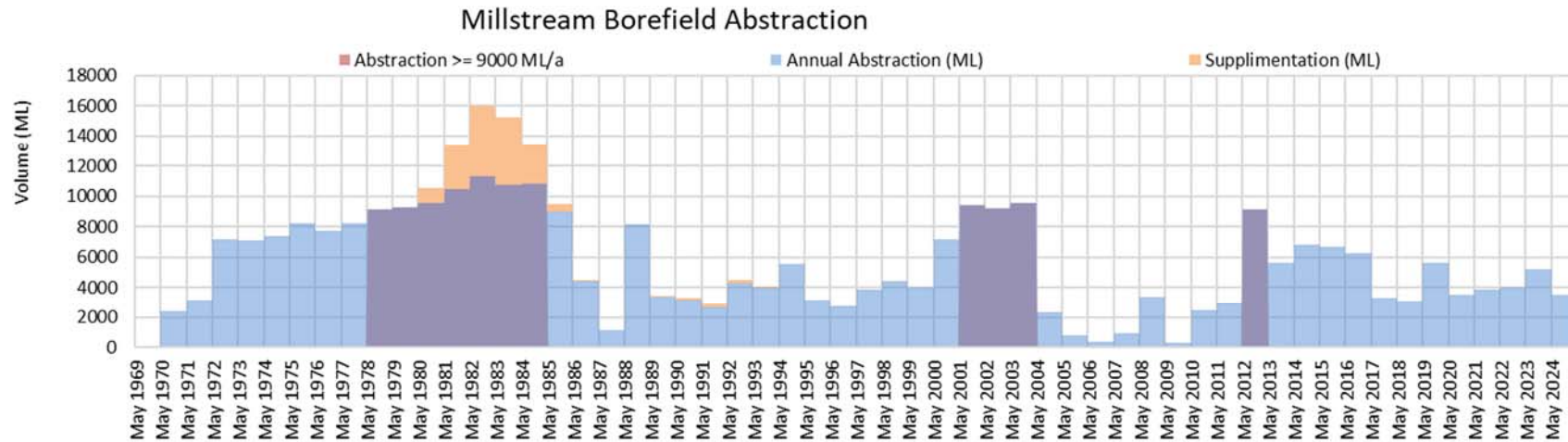


Figure 6: Historical groundwater abstraction volumes (based on May-April Water Year, 2024 values are YTD as of 1 April 2025).

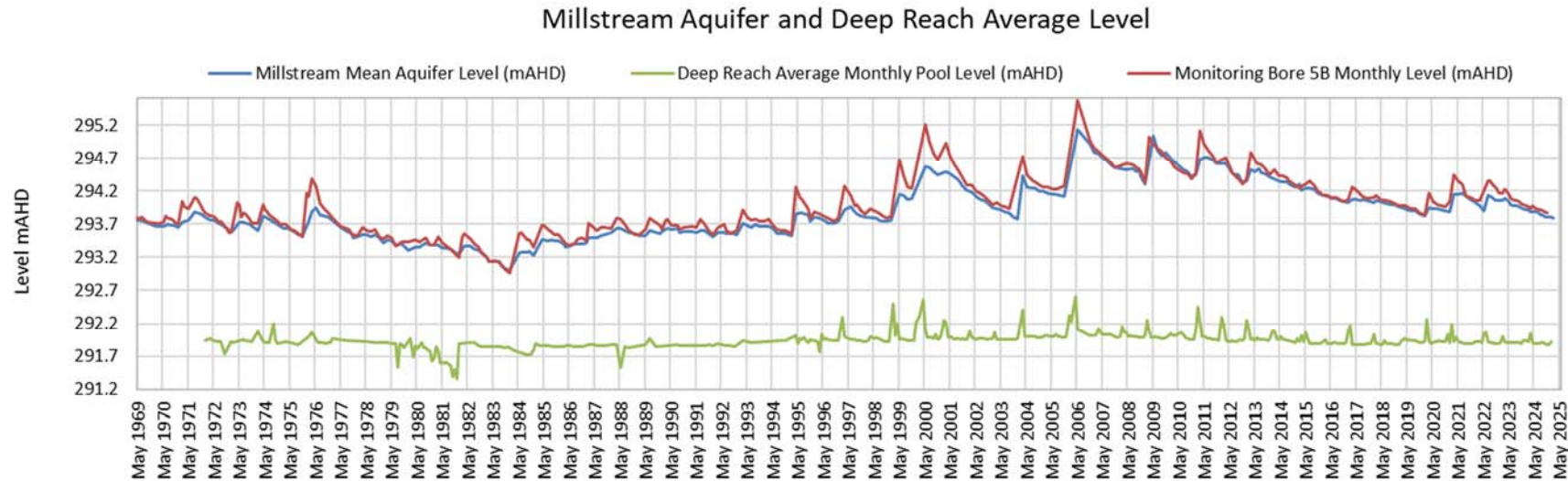


Figure 7: Millstream MAL, Bore 5 B levels and the Deep Reach pool levels



Millstream Aquifer and Chinderwarriner Average Level

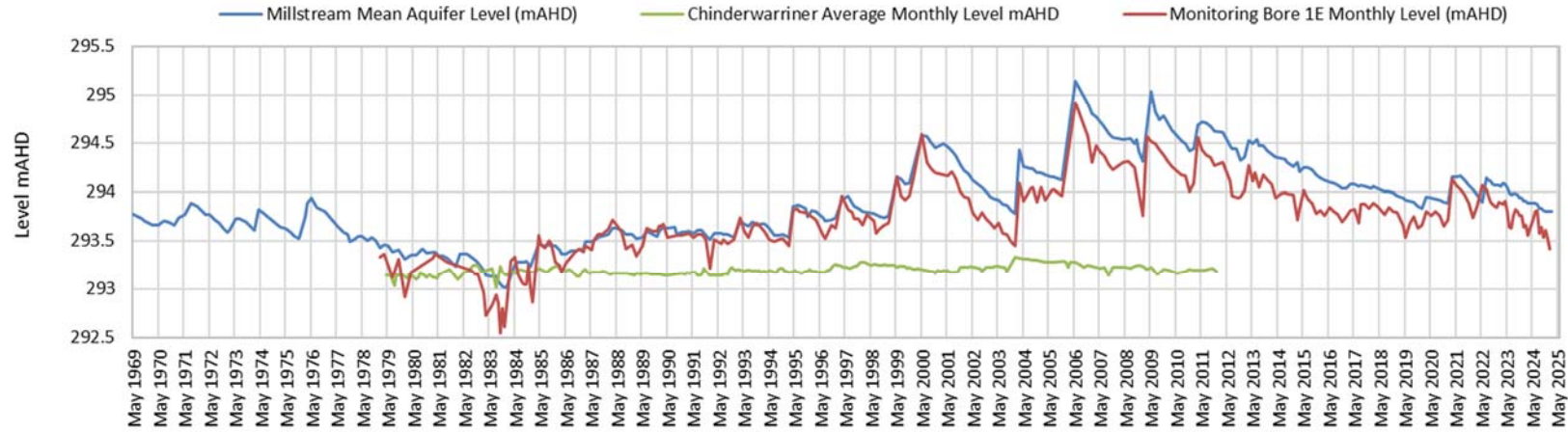


Figure 8: Millstream MAL, Chinderwarriner pool and Monitoring Bore 1E levels

Deep Reach Average Total Monthly Springflow Volume, Monthly Pool Level and Groundwater Level at 5B

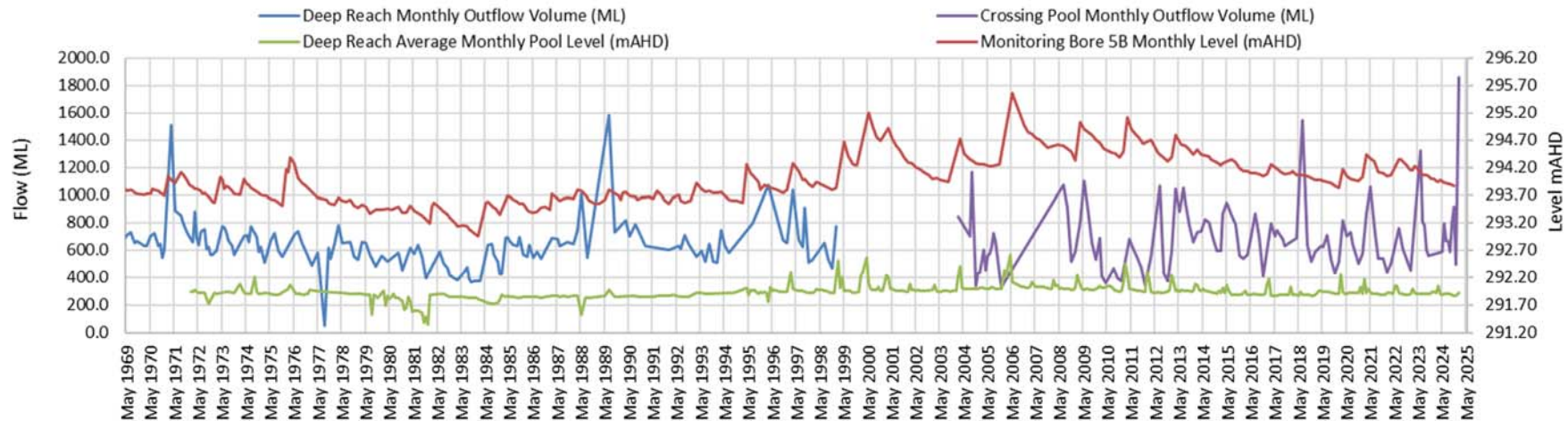


Figure 9: Deep Reach springflow and pool levels.



Chinderwarriner Average Total Springflow, Monthly Pool Level and Groundwater Level at 1E

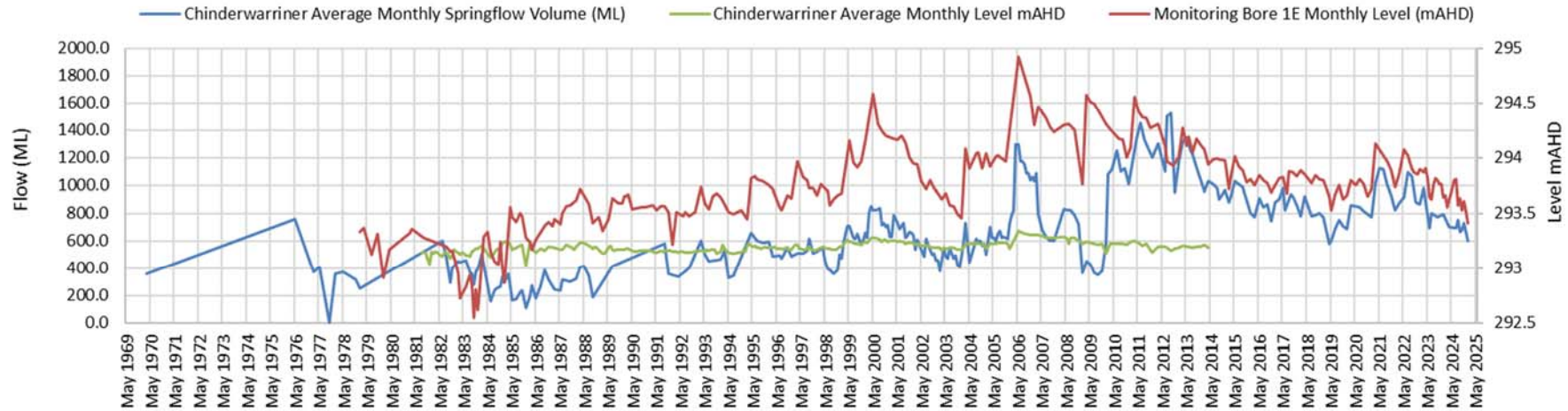


Figure 10: Chinderwarriner springflow and pool levels.

Fortescue River Monthly Flow Volume and Deep Reach Average Pool Level

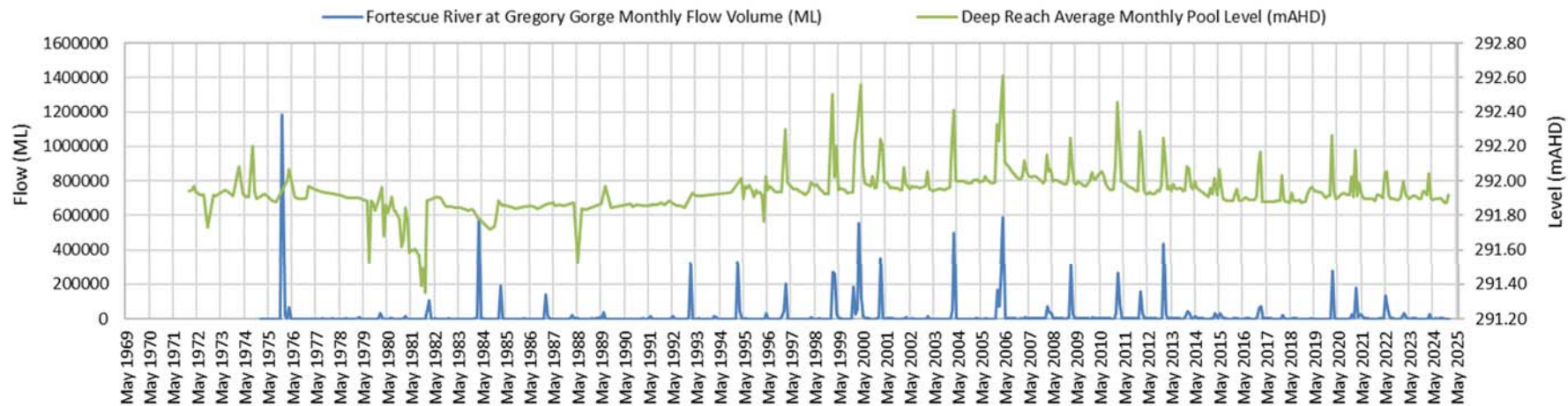


Figure 11: Fortescue River flow volumes and Deep Reach pool levels



Fortescue River Monthly Flow Volume, Chinderwarriner Monthly Pool Level and Groundwater Level at 1E

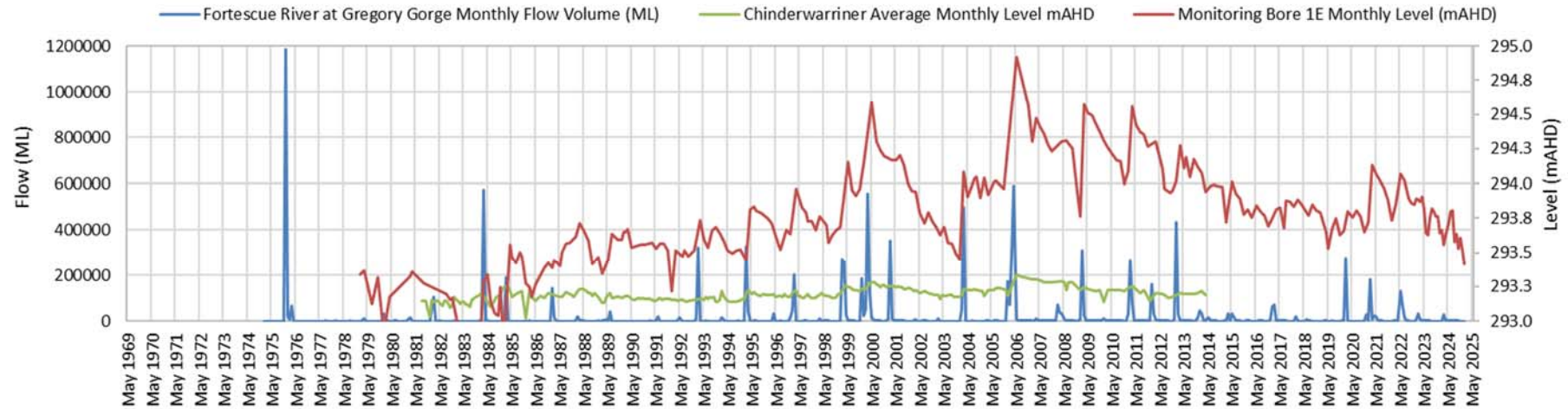


Figure 12: Fortescue River flow volumes, Chinderwarriner pool levels and level at Monitoring Bore 1E



Crossing pool is directly fed by water from the Deep Reach pool whilst Palm and Livistona pools are fed by flows from Crossing pool and Chinderwarriner pool, via the Delta. Any water level decline in these pools cannot be solely attributed to the proposal. Other factors influencing these pools include evaporation and evapotranspiration loss across the river system and flows down the Fortescue River.

Additional discharge from the Millstream aquifer occurs through the Woodley, Peters and Palm Creeks. These three creeks, when flowing, maintain additional supply of water to Palm pool (via Woodley), Livistona pool (via Peters) and downstream of Livistona (via Palm). Monitoring at Woodley, Peters, and Palm Creeks indicates the volume of springflow feeding the creeks is historically very low, and regularly supplemented by rainfall-runoff following significant and smaller acute localised climate events. This is illustrated by three distinct peaks in springflow (L/sec) in 1999, 2006 and 2009 (Figure 13 to Figure 15), which coincide with tropical cyclones (TC) in 1999 and 2006 and a significant tropical low in 2009:

- 1999: TC Tiffany (January), TC John (December).
- 2006: TC ClareC3 (January) followed by TC Emma C1 (February), TC Glenda C2 (March) (largest recorded recharge event).
- 2009: Tropical low floods large portion of Pilbara (second largest recharge, and localised 1/50 - 1/100-year rainfall event).

Monitoring at Woodley, Peters, and Palm Creeks (Figure 13 to Figure 15) demonstrates the low background springflow volumes to these pools and low correlation with changes to groundwater abstraction volumes.

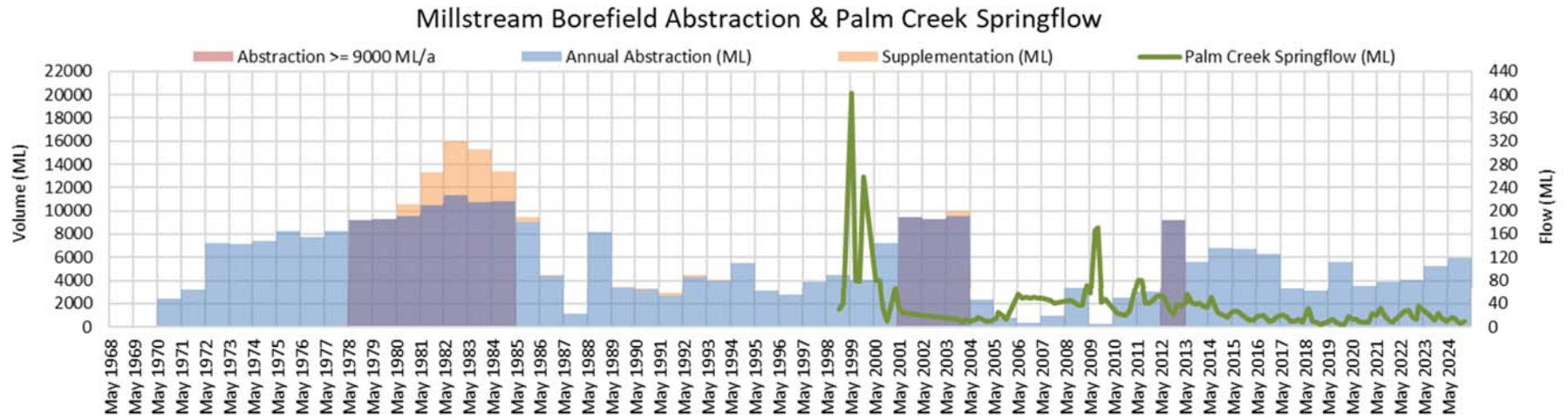


Figure 13: Springflow at Palm Creek

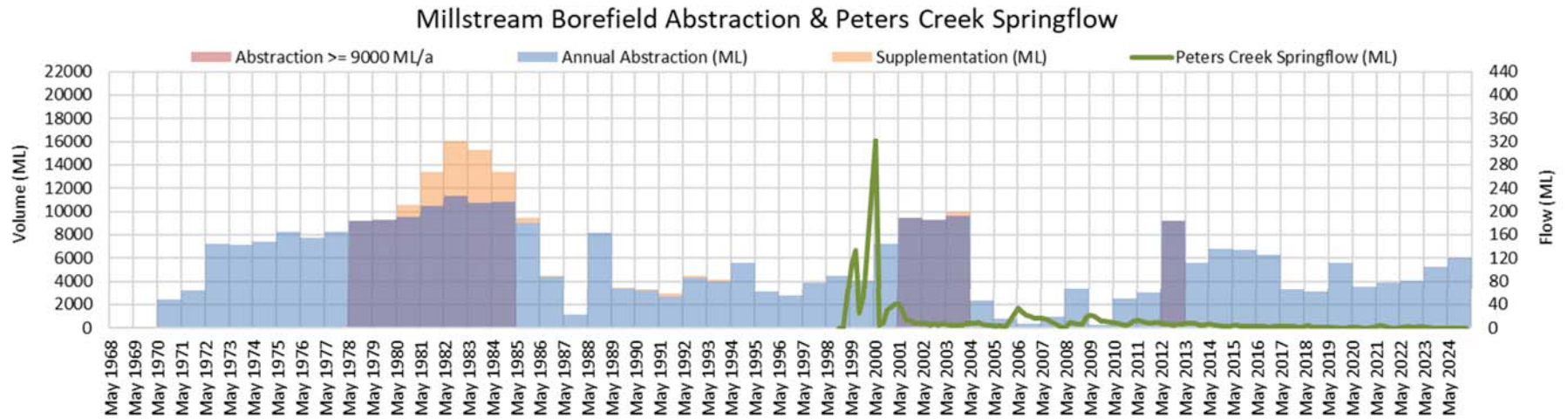


Figure 14: Springflow at Peters Creek

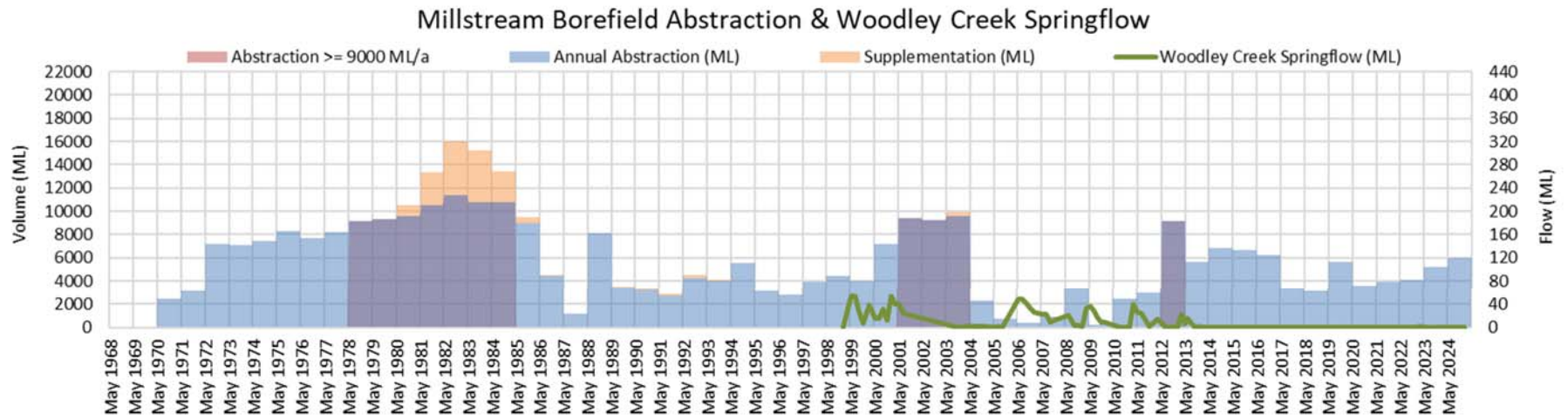


Figure 15: Springflow at Woodley Creek



Impact Assessment of up to 6GL/a with a contingency of 3GL/a

This environmental impact assessment (EIA) of the proposal of up to 6GL/a abstraction with a contingency of 3GL/a is based on historical abstraction volumes from the Millstream aquifer when it was 9GL/a or greater, being 1978 to 1985, 2001-2003, and 2012 (Figure 6). This EIA will review the impacts observed during these periods to evaluate likely impacts of groundwater abstraction up to 6GL/a abstraction with a contingency of 3GL/a, totalling 9GL/a, for this proposal amendment, being from 2025 to February 2027 (2 years). The 9GL/a represents a worst-case scenario of no rainfall during this time period. Previous monitoring data has been used to determine the potential environmental impacts of groundwater abstraction at the proposed amendment abstraction volume up to 6GL/a with a contingency of 3GL/a for less than 2 years. Figure 16 and Figure 17 show the correlation between groundwater abstraction volumes and the pool levels at Deep Reach and Chinderwarriner pools. There have been three periods where groundwater abstraction has been at or above 9GL/a; 1978 to 1985, 2001-2003, and 2012 (Figure 6).

- During 1978-1985, groundwater abstraction was up to 11GL/a plus an additional abstraction for supplementation, totalling 16GL/a. During this period, below average flows through the Fortescue River were observed between 1976 and 1983, including a three-year hydrological drought between 1976-1978. The MAL and levels in Chinderwarriner and Deep Reach pools dropped to their lowest recorded level in 1981. The Deep Reach pool levels started to show decline after three years, declining from 291.90 mAHD to 291.35 mAHD (0.55 m decline), and recovered following supplementation. No long-term impacts to pool water levels from abstraction were observed, as pool water levels recovered. At Chinderwarriner pool, flow from the pool ceased in one major outflow channel and decreased in the remaining channels. As a consequence, areas within the western side of the Millstream Delta, downstream of Chinderwarriner pool, which were normally damp, dried out resulting in a decline in the condition of the vegetation (Welker, 1995 and 1998). Flow also ceased in one major channel and decreased in the remaining channels resulting in a fall in local alluvial groundwater levels (Welker, 1995).

Supplementation of the Chinderwarriner and Deep reach systems commenced in 1980 and ran until 1986. In 1985 and 1986 rates of supplementation dropping and likely resulted in the observed short term drop in observed springflow and pool water levels.

- During 2001-2003, groundwater abstraction was up to 9.6GL/a with no supplementation. Between 2002 and 2003 below average flows were also observed in the Fortescue River. The pool levels were generally constant during this time at Deep Reach pool with no significant reduction in pool water levels. Pool levels showed a decline after the first year at Chinderwarriner pool. Pool water levels recovered in 2004 following almost 545GL of flow through the Fortescue River during the 2003-2004 wet season.
- During 2012, groundwater abstraction was up to 9.2GL/a with no supplementation. The pool levels were generally constant during this time with no significant reduction in pool water levels.

Previous monitoring data and abstraction volumes (2001-2003 and 2012) has shown short term abstraction of up to 9GL/a does not result in significant long-term impacts to the pool water levels of the Millstream Wetland. The duration of groundwater abstraction for the proposal amendment, up to 6GL/a with a contingency of 3GL/a, for a 2-year duration is more similar to the 2001-2003 and 2012 periods rather than the 1978-1985. For 2001-2003 and the 2012, monitoring indicates that the pool levels were generally constant with no significant reduction in pool water levels in the first year, followed by a decline in the second year, and recovery in the third year when abstraction reduced to less than 6GL/a. The proposed amendment of up to 6GL/a with a contingency of 3GL/a



for a 2-year duration, is likely to result in no decline in pool levels in the first year, a decline in pool water levels in the second year and is likely to recover once the abstraction is less than 6GL/a in the third year. As such the proposed amendment is not expected to result in long-term significant impacts to pool water levels.

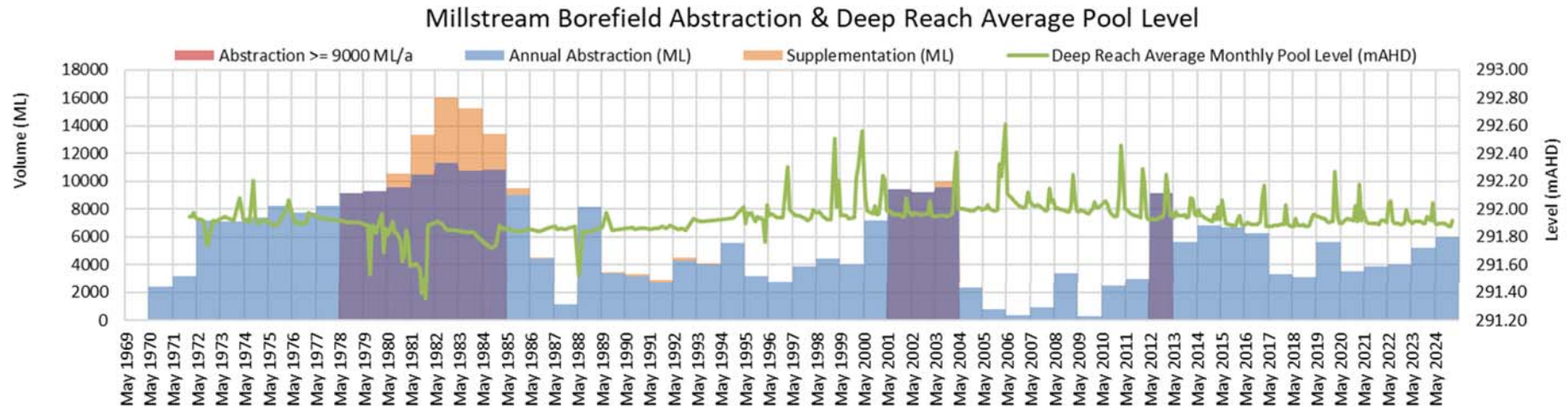


Figure 16: Groundwater abstraction volumes and Deep Reach pool levels

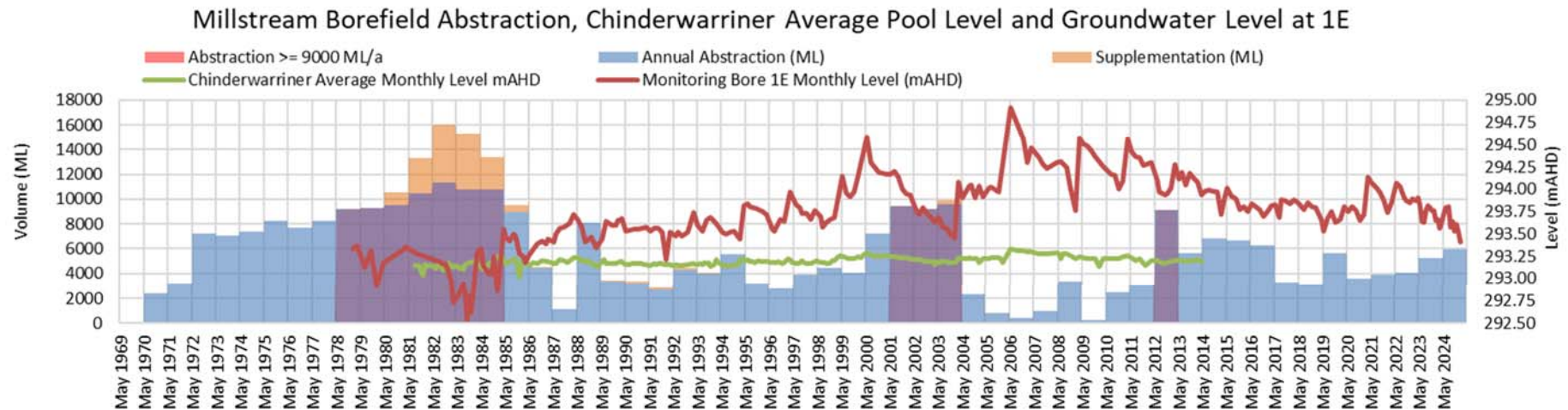


Figure 17: Groundwater abstraction volumes, Chinderwarriner pool level and groundwater level at Bore 1E



Extrapolating from the graphs in Braimbridge (2010), a 9GL/a abstraction volume is expected to exceed:

- The Chinderwarriner pool trigger around 67% of the time (note, the criteria was modelled at breaching 5% of the time at 0.0 GL/yr abstraction, indicating that the pool trigger are not solely related to groundwater abstraction).
- The Deep Reach pool trigger around 40% of the time.
- The MAL around 8% of the time.

Impact Assessment at 6GL/a

Impacts observed during periods where the historical abstraction volumes from the Millstream aquifer was 6GL/a has been used to evaluate likely impacts of groundwater abstraction at 6GL/a for this proposal amendment, being from March 2027 to 2028 (20 months). Figure 16 and Figure 17 show the correlation between groundwater abstraction volumes and the pool levels at Deep Reach and Chinderwarriner pools. There have been three periods where groundwater abstraction has been at or above 6GL/a, being 1972-1985, 1988, 2000-2003, 2012, 2014-2016 (Figure 6). However, the periods where abstraction was greater than 6GL/a but less than 9GL/a, were 1988, and 2014-2016 only, so the assessment of impacts at 6GL/a includes these periods only.

- In 1988 the groundwater abstraction was 8.13GL/a resulting in Deep Reach pool levels declining to 291.5 mAHD and the Chinderwarriner pool level declining to 293.13 mAHD. Both pool water level recovered the year after in 1989. There was no change to the MAL.
- During 2014 to 2016, the Deep Reach pool water level remained constant (no change), there was an overall decline in MAL, the Deep Reach springflow volume fluctuated during this time. The springflow volume at Chinderwarriner pool declined from 1,005 ML to 846 ML in 2016. The MAL continued to decline since 2016.

There was an absence of tropical cyclones during these times.

Historical observations indicate groundwater abstraction at 6GL/a may show a slight reduction in pool water levels, but no change to MAL. The observed changes to MAL in 2024-2016 was not due to groundwater abstraction and likely due to dry climatic conditions.

Braimbridge (2010) determined the sustainable yield at 6GL/a abstraction volume. A long-term reliable allocation of 6.0GL/yr allows for discharge to the river pools within and downstream of the Millstream Chichester National Park to be met with approximately 80% reliability. Using the modelling in Braimbridge (2010), at 6GL/a, triggers are expected to exceed:

- The Chinderwarriner pool trigger 50% of the time.
- The Deep Reach pool trigger around 27% of the time.
- No exceedance for MAL.

The historical observations align with the Braimbridge (2010) determination of 6GL/a abstraction volume as the sustainable yield. Monitoring shows that pool water levels and groundwater levels are not significantly impacted at 6GL/a.

Impact Assessment at 5.5GL/a

Impacts observed during periods where the historical abstraction volumes from the Millstream aquifer was 5.5GL/a has been used to evaluate likely impacts of groundwater abstraction at



5.5GL/a for this proposal amendment, being from 2028 to 2032 (4 years). Figure 16 and Figure 17 show the correlation between groundwater abstraction volumes and the pool levels at Deep Reach and Chinderwarriner pools. There have been three periods where groundwater abstraction has been at or above 5.5GL/a, being 1972-1985, 1988, 1994, 2000-2003, 2012 to 2017, 2019 (Figure 6). However, the periods where abstraction was greater than 5.5GL/a but less than 6GL/a, were 1994 and 2019 only, so the assessment of impacts at 5.5GL/a includes these periods only.

- In 1994, there was no change to the Deep Reach or Chinderwarriner pool levels and no change to MAL.
- In 2019, there was no change to the Deep Reach or Chinderwarriner pool levels and no change to MAL.

Extrapolating from the graphs in Braimbridge (2010), a 5.5L/a abstraction volume is expected to exceed:

- The Chinderwarriner pool trigger around 48% of the time.
- The Deep Reach pool trigger around 25% of the time.
- No exceedance for MAL.

The historical observations align with the Braimbridge (2010) determination that 5.5GL/a abstraction volume as less than the sustainable yield. Monitoring shows that pool water levels and groundwater levels are not significantly impacted at 5.5GL/a.

Holistic Impact Assessment

The proposal has the potential to indirectly impact the Millstream Wetlands by altering the volume of the springflow from the aquifer entering Millstream Wetlands pools and rivers. The lowering of the watertable also has the potential to impact stygofauna through habitat loss.

Potential impacts to pool and river levels within the Millstream Wetlands are not solely directly related to groundwater abstraction as a result of implementation of the proposal with any observed impacts most likely to be caused by dry climatic conditions and a period without a significant recharge event from a tropical cyclone. The pool water levels in Millstream Wetlands are directly correlated to the Fortescue River flows with springflow from the Millstream aquifer being approximately 16.3% of water source into the pools.

Cumulative Impact Assessment

The Millstream aquifer is fully allocated with no further groundwater available for general licensing. The Corporation is the major licensee for the Millstream aquifer, with a total allocation of 9GL/a for public water supply purposes. The five other groundwater licences registered for Millstream aquifer have a combined allocation of 0.573GL/a. As other groundwater users are 6.37% of total allocation, abstraction from the Millstream Borefield is the key consideration in assessing cumulative impacts on groundwater and groundwater dependent values, while taking into consideration external pressures (such as climate change) and the dependence of potable water supply on the existing borefield.

The Corporation considers the RiWI Act licencing process provides a comprehensive framework for accessing cumulative impacts. RiWI Act licensing decisions relating to the Millstream aquifer are guided by the Pilbara Groundwater Allocation Plan (2013), which considers cumulative impacts. Specifically, page 34 of the Plan (2013) acknowledges the importance of considering cumulative impacts of hydrological changes on water resources and dependent ecosystems as part of individual



assessment of proposals. In addition, the assessment of cumulative impacts is an inherent part of the RiWI Act licensing framework as it is a water allocation regime and sustainable water management is the primary goal. Any RiWI Act assessment of sustainability will take into account the impacts from other threatening processes and activities, such as climate change on recharge.

7.2.2 Mitigation by DMAs

To minimise the impacts on the ecosystems, the Corporation currently operates and monitors the Scheme in accordance with DWER approved WRMOS, which describes specific operation, monitoring and reporting requirements to be followed as a condition of the water allocation licences. The WRMOS aligns with the Pilbara Groundwater Allocation Plan (2013) which outlines water abstraction rules that have been developed to minimise the impacts on the ecosystem. The plan sets out Millstream aquifer environmental water requirements, variable criteria (that account for a range of water availability conditions) and the steps that need to be taken each year by the Corporation to determine management responses including the level of monitoring. The requirements are reflected in the WRMOS and adherence is a licence condition for both the Harding Dam and Millstream licences.

The requirements of the WRMOS can be summarised as:

- DWER determines the recharge class for the current year based on previous wet season flow data.
- Trigger and criteria values corresponding to recharge class are specified for:
 - Deep Reach pool, Chinderwarriner pool outflows and groundwater levels at bores 1E and 5B to maintain Millstream Wetlands.
 - Mean Aquifer Level (MAL) to maintain aquifer groundwater levels and support riparian vegetation.
 - Deep Reach pool and Chinderwarriner pool outflows and groundwater levels to support riverine and delta vegetation.
- The implementation of a monitoring program and management responses are required if trigger or criteria levels are reached in the pools and monitoring bores.

The minimisation and management measures to minimise and mitigate impacts are presented in the WRMOS, which has been prepared using the:

- Antao, M. 2013, Pilbara monitoring program to support the Pilbara groundwater allocation plan, Department of Water, Government of Western Australia.
- Department of Water 2013, Pilbara Groundwater Allocation Plan 2013, Water resource allocation and planning report series Report no 55.
- Haig, T 2009, The Pilbara coast water study, Department of Water, Hydrogeological record series, Report HG34, 183 p.

The WRMOS outlines the responses when criteria are breached for the Millstream aquifer, these are outlined below.

- Level 1 monitoring and reporting
 - Increase frequency of groundwater and flow monitoring to fortnightly as soon as practicable.



- Increase reporting to DWER and TWG on monitoring results and implementation of Level 1 and 2 responses to monthly.
- Undertake remote sensing monitoring and budget for end of dry season in-situ vegetation monitoring.
- Increase downstream flow monitoring.
- Level 2 Supplementation Plan
 - Trigger supplementation plan.
- Level 3 Scheme response
 - Commence negotiations with RTIO to take additional water from Bungaroo and consider other contingencies.
- Level 4 Critical response
 - Supplementation to proceed with consideration of targets set in Table 12 and in discussion with TWG.
 - Use contingency sources.
- Reduce take

When triggers have been reached, the appropriate responses have been implemented in accordance with the WRMOS and as agreed by the TWG. Implementation of the management measures have mitigated significant long-term impacts to the environment.

It is noted that currently the level 3 scheme response and supplementation (level 4) are not possible, and the WRMOS is currently being revised to remove these management measures.

In accordance with the WRMOS, summaries of compliance against the licence conditions are prepared annually and every fifth year requires a Water Monitoring Review (examining longer term impacts and compliance) to be provided to DWER.

In addition, the staged reduction of groundwater abstraction in the proposed amendment (up to 6GL/a with a contingency of 3GL/a to February 2027, up to 6GL/a to 2028, then up to 5.5GL/a to 2032) will further minimise potential impacts to inland waters and the Millstream ecosystem.

7.2.3 Residual Impacts

Previous abstraction volumes and monitoring data has shown groundwater abstraction volumes greater than 9GL/a (up to 16GL/a) showed impact at year 3 at Deep Reach and after year 1 at Chinderwarriner pools. All pool water levels recovered. These impacts are not expected for the proposed amendment given the proposed amendment is for a lower ongoing abstraction volume and for a 18 month to 2-year duration. No long-term significant impacts to pool water levels are expected given the proposed amendment is for a lesser abstraction volume and shorter duration, and any observed impacts are expected to recover. From February 2027, no impacts are expected given the groundwater abstraction volumes align with, or lower than the sustainable yield determination.

Potential impact and observations on pool levels within the Millstream Wetlands are primarily due to climatic conditions and not directly related to groundwater abstraction. Groundwater abstraction from the proposal is not expected to impact the pool and river levels within the Millstream Wetlands with any observed impacts likely to be caused by climatic conditions which are not attributable to the proposal.



No clearing is proposed and no direct impacts to the Millstream Wetlands are expected as a result of implementation of the proposal.

The proposal is not expected to result in significant impacts to the Millstream Wetlands and implementation of the proposal is expected to meet the EPA objectives.

7.2.4 Discussion of Significance

Observations indicate that pool level trends within the Millstream Wetlands are primarily due to the influence of antecedent hydroclimatic conditions and not directly related to groundwater abstraction.

The proposal has the potential to indirectly contribute to impacts to the Millstream Wetlands by reducing the volume of the springflow entering Millstream pools at prolonged high abstraction volumes. Any observable changes to Millstream pools at sustainable abstraction volumes, are primarily due to reduction in runoff from the upstream Fortescue River catchment. This reduction in runoff is the consequence of a recent decline in the number and intensity of tropical cyclones and lows which are outside the influence of the proposal. The reaching of trigger values in Deep Reach and Chinderwarriner pools, were due to failed wet seasons, with the exception of the 1980's which was due to periods of extended over abstraction in excess of 10GL.

Baseflow into the Woodley, Peters and Palm Creek is supplied in the form of springflow from the aquifer during high water level periods and is supplemented by rainfall-runoff from Millstream during significant climatic events. Any reduction in springflow attributed by the proposal is not likely to impact the water levels in the pools, baseflow volumes through the creeks are naturally low and supplemented by runoff from the Millstream system during significant climatic events.

Previous monitoring showing prolonged (7 consecutive years) groundwater abstraction in excess of 9.5GL/a, and peaking at just below 16GL/a, illustrates the potential impacts to the Millstream Wetland system. In 1981 pool levels in both Deep Reach and Chinderwarriner dropping significantly and resulting in a decline in flow exiting Chinderwarriner pool. However, both springflow and pool level data also indicate how the levels in the systems recovered, within a year, when following recharge to the aquifer and a decrease in abstraction volumes back to sustainable volumes. This demonstrates that abstraction well in excess of the proposed 6GL/a with a contingency of 3GL/a did not result in significant long-term impacts to the pool water levels.

The potential impacts of the proposed amendment compared to the referral and s38F document are expected to be less significant due to the reduction in the duration of groundwater abstraction of up to 6GL/a with a contingency of 3GL/a from end 2027 to February 2027 and a reduction in groundwater abstraction volume from 6GL/a volume to 5.5GL/a from 2028 to 2032, due to groundwater abstraction from February 2027 being lower than the allocation in the current groundwater allocation plan for the region.

7.2.5 Regulation

The proposed amendment can be regulated under the RiWI Act and the 5C licence can be used to mitigate impacts to inland waters (refer to Table 4). The RiWI Act associated policy documents provides repeated references to the need to consider sustainable use of water resources, protection of the ecosystems and environment, and public interest considerations in decision-making. This will enable any inland waters impacts to be considered under RiWI Act, via issuing of a 5C licence.



Regulation of the proposed amendment under the RiWI Act can be undertaken via clauses 7 and 22 of Schedule 2 of the RiWI Act, where the Minister has a broad discretion to consider anything. The assessment of impacts from the proposal can therefore be included under clauses 7 and 22 of Schedule 2 of the RiWI Act, via issuing of a 5C licence. The Minister's powers in clause 15 of Schedule 1 to impose terms, conditions and restrictions on a s5C licence are broad, including concerning the matters set out in the Appendix to Schedule 1 to the Act (e.g. use, management, protection and enhancement of any water resources and its ecosystem or the environment and monitoring) or any other matter relevant to the clause 7(2) matters. The Corporation's existing and expired licences include common conditions requiring an operating strategy (WRMOS), monitoring and reporting, so additional conditions can also be added to the 5C licence to enable regulation under the RiWI Act rather than a formal Part IV (of the EP Act) assessment. Regulation of potential impacts to inland waters can be a standalone condition or changes added to the WRMOS.

7.2.6 Environmental Outcomes

The sustainable yield and allocation planning studies and real-life monitoring data for the proposal has predicted and shown that:

- Abstraction up to 6GL/a with a contingency of 3GL/a does not adversely affect pool water levels; antecedent hydroclimatic conditions are the primary driver.
- Pool water levels have recovered following periods of groundwater abstraction greater than 9GL/a.
- Pool water levels and groundwater levels are not reasonably impacted at 6GL/a or lower.

Consequently, the proposal is not expected to result in long-term, permanent observable change, any observable changes are likely to be attributable to climatic events and the proposal is not likely to result in significant impacts to inland waters. As a result, the environmental outcomes for the EPA's objective for this factor "*To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected*" would be met.

7.2.7 Character of the proposed amendment

The character of the proposed amended will be substantially the same character as the referral and s38F document. The proposed amendment comprises the same activity of groundwater abstraction from the Millstream aquifer, but of lower abstraction volumes and durations which reduces any potential impacts further.

7.3 Social Surroundings

The objective of the EPA (2023) Environmental Factor Guideline for social surroundings is:

To protect social surroundings from significant harm.

Sections 5.2 Relevant Legislation, Policy and Guidance and 5.3 Receiving Environment as presented in the s38F response have not changed as a result of the proposed amendment and therefore have not been duplicated in this s38C amendment (this document).

7.3.1 Environmental Effects

The environmental values including the places of ACH value, of the proposed amendment have not changed from the s38F document and therefore have not been duplicated in this document (refer to Table 12 and Table 13 and Figure 24 of the s38F document).



No clearing is proposed and no direct impacts to the Millstream Chichester National Park, Millstream Wetlands and ACH cultural places are expected as a result of implementation of the proposal as the proposal activities are limited to groundwater abstraction.

The cultural values of the Millstream Wetlands may be indirectly impacted by groundwater abstraction altering the volume of the springflow from the aquifer entering Millstream Wetlands pools and rivers.

The YAC (2024) referral states that pool water levels are in decline and presents graphs showing a percentage of mean frequency and a monitoring period from 2013 to 2023. Figure 18 and Figure 19 presents the Corporation data showing a longer timeframe of monitoring with recorded water level readings (presented as mAHD).

The change to pool water levels at Deep Reach pool has been within approximately a 1m range, with levels recorded at 292.61 mAHD in 2006 to 291.53 mAHD in 1988, with the exception of the period of 1979 to 1982 when abstraction reached 16GL/a. The pool water levels are erratic, characterised by 0.5m peaks associated with tropical cyclones and lows feeding the Fortescue River during the wet season. Figure 18 shows that in recent years, the peaks are not as variable, reflecting a more median trend in rainfall, but the overall trend is consistent with pools levels since 1990. The most recent reading of 291.92 mAHD in January 2025 is consistent with the pool levels since 1990 (291.86 mAHD in 1990).

The change in pool water levels at Chinderwarriner pool have ranged by around 0.2m from 293.13 mAHD in 1989 to 293.32 mAHD in 2006, with the exception of the period of 1981 to 1985 when abstraction reached 16GL/a. Monitoring at Chinderwarriner pool ceased in 2014 and was replaced with monitoring from bore 1E (Figure 19). Groundwater levels peaked in 2000 due to tropical cyclone Steve and 2006 due to tropical cyclone Clare followed by tropical cyclone Emma C1 (largest recorded recharge event). The pool levels as measured at bore 1E have since receded to levels observed prior to these events.

The historical pool water levels indicate that groundwater abstraction up to 6GL/a with a contingency of 3GL/a to February 2027, a reduction in the duration of groundwater abstraction at 6GL/a from 2032 to 2028, and a reduction of the groundwater abstraction rate from 6GL/a to 5.5GL/a from 2028 to 2032 are not likely to result in significant impacts to the pools. The impacts observed in the 1980s are not expected to be observed for the proposed amendment as the volumes in the 1980s were much higher and for a longer duration.

The average discharge volumes from the Millstream aquifer to Deep Reach pool observed at Crossing pool between 2014 to 2024 is 7.9GL/a, Chinderwarriner pool is 10.2GL/a, and small springs west of Chinderwarriner pool including Woodley, Peters, and Palm Creeks is estimated discharge 0.23GL/a (Water Corporation, 2024). Given the average annual flow into the Millstream Wetland pools from the Fortescue River (recorded at DWERs downstream Gregory Gorge gauging station) for the 2014 – 2024 period was on average 115.5GL/a, springflow from the Millstream aquifer therefore presents almost 16% of total flow recorded at Gregory Gorge with water sourced from the Fortescue River presenting just over 84%.

Any lowering of the watertable due to the proposal is not likely to impact water levels in Deep Reach and Chinderwarriner pools as the main water source for these pools is flow through the Fortescue River which is a system reliant on rainfall generated runoff from tropical cyclones and lows during the wet season.

Livistona, Palm and Crossing pools are fed by surface water moving through the Fortescue as well as springflow generated overflow from Deep Reach pool and tributaries such as Chinderwarriner.



Any water level decline in these pools cannot be solely attributed to the proposal and may be attributed to other factors, such as local hydroclimatic conditions.

The pools at Woodley, Peters and Palm Creek are fed from low background volumes of springflow from the aquifer and from runoff generated by significant climatic inputs. Any reduction in springflow attributed by the proposal is not likely to impact the water levels in the pools, as background volumes are low and pools levels are likely to be supplemented by catchment runoff.



Millstream Aquifer Bore 5B Groundwater Level, Deep Reach Monthly Pool Level and Pool Outflows

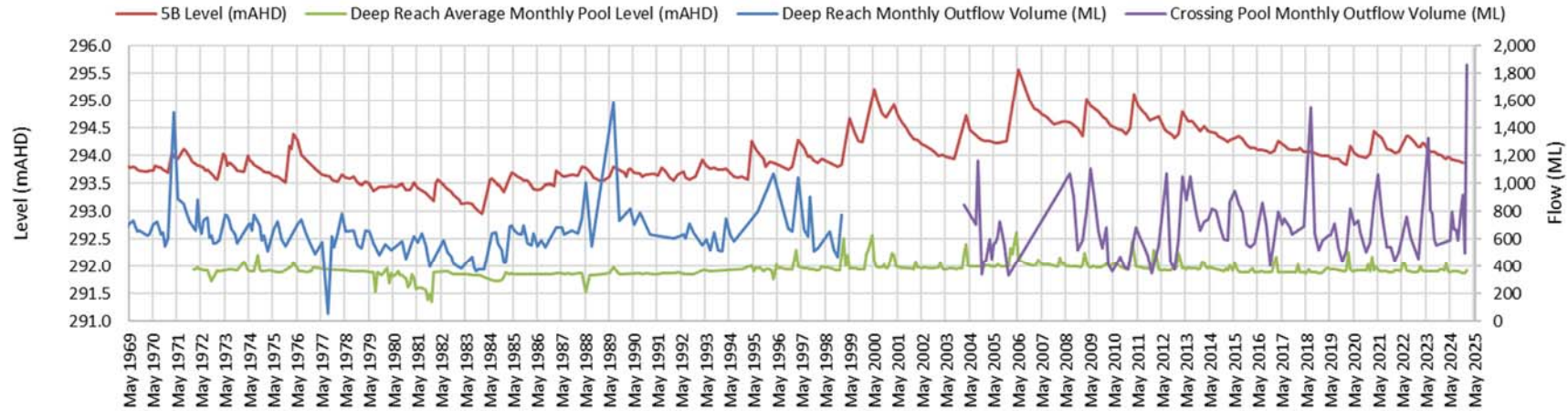


Figure 18: Deep Reach pool levels

Chinderwarriner Monthly Pool Level and Springflow, Groundwater Level at 1E

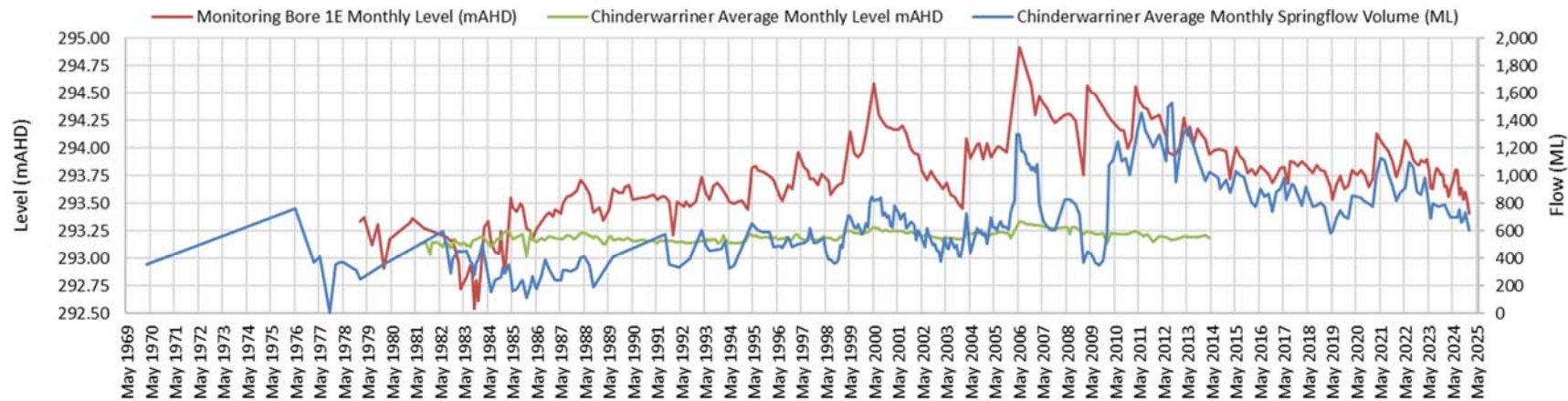


Figure 19: Chinderwarriner pool levels



Erosion

YAC (2024) discussed the impacts from erosion on the Millstream Wetlands, including the pools. In response to the ongoing focus on erosion by the MHCC and TWG, the Corporation commissioned a fluvial geomorphology study for the section between Deep Reach and Crossing pools (4DGeotechnics, 2025).

The development of erosion channels between the various pools (downstream of Deep Reach, Crossing and Chinderwarriner pools), forming relatively steep stream bed intervals, that continue to erode upstream, have been an ongoing issue since the mid-1970s. The erosion occurs in stages, commencing with sheetwash, initial channel development and entrenched upper channels within the alluvium soils until channels form where calcrete (Millstream aquifer) is exposed at the base of the channels.

The cause of channel development and erosion at the overflow point at Deep Reach pool is due to erosion of the alluvial soils. The underlying Millstream aquifer calcrete and Marra Mamba formation are less permeable, causing the runoff to erode the softer alluvium, resulting in exposure of the underlying watertable Figure 20. This is considered a natural process, exacerbated by fire and hydroclimatic conditions and not attributed to the proposal. The AQ2 hydrological report (2024) concludes current groundwater abstraction does not influence erosion, erosion is an ongoing natural process, and ongoing abstraction will not significantly impact water levels or rates of erosion.

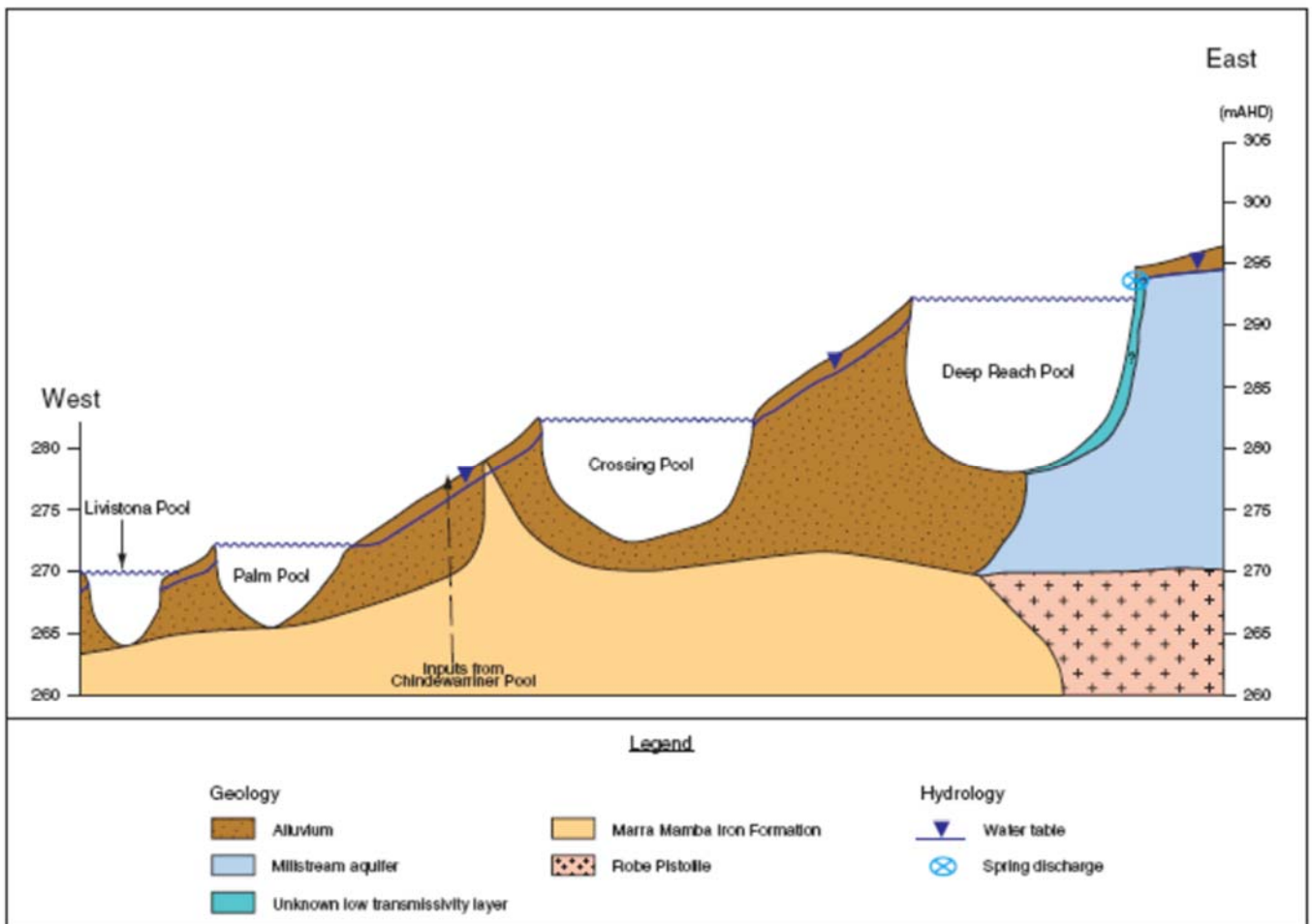


Figure 20: Cross section of the pools along the Fortescue River



The Aboriginal cultural values of the Millstream area may be indirectly impacted by noise from the groundwater abstraction pumps.

Noise levels will not change as a result of the proposal as no additional infrastructure or change to pumping schedules of the existing bores is proposed.

7.3.2 Mitigation by DMAs

The management measures to minimise and mitigate impacts to the Millstream Chichester National Park, Millstream Wetlands and the associated ACH cultural places are presented in the WRMOS. The adaptive management measures and response mitigation measures are outlined in the WRMOS are discussed in the Inland Waters chapter and presented in the s38F document.

The staged reduction for groundwater abstraction proposed will further minimise potential impacts to Millstream Chichester National Park, Millstream Wetlands and associated ACH cultural places.

7.3.3 Residual Impacts

Potential impacts and observations to pool and river levels within the Millstream Wetlands are not solely directly related to groundwater abstraction as a result of implementation of the proposal. Any observed impacts are likely to be caused by drying hydroclimatic conditions including periods without significant rainfall-runoff and recharge. The pool water levels in Millstream aquifer directly correlate to the Fortescue River flows, supplemented by springflow from the Millstream aquifer during the dry season and failed wet seasons. Overall annual springflow representing around 16.3% of water source into the pools over a median climate period (the last 10 years).

Erosion observed at Deep Reach pool is an ongoing natural process, impacted by flood events, and not attributable to the proposal.

Noise levels will not change as result of implementation of the proposal as no additional infrastructure or change to pumping schedules of the existing bores is proposed. Should, changes to noise levels occur in the future, such as through additional borefields, potential impacts can be minimised and mitigated through engineering solutions and in accordance with the *Environmental Protection (Noise) Regulations 1997*.

7.3.4 Discussion of Significance

For social surroundings to be considered significant, there must be significant impacts to pool water levels, vegetation health and soil erosion; and for these impacts to directly and significantly effect heritage values, being the aesthetic, historical, social, spiritual or scientific values of the site. The historical pool water levels indicate that groundwater abstraction at the proposed abstraction rates is not likely to result in significant reduction in pool levels, as such impacts to vegetation and fauna habitat are not expected. The erosion observed at Deep Reach pool is an ongoing natural process, impacted by flood events and not attributable to the proposal. The observed changes to pool water levels, vegetation health and soil erosion are not considered significant impacts attributed to the proposal.

7.3.5 Regulation

The assessment of social surroundings as a key environmental factor under the EP Act considers the extent to which cultural heritage or social values are directly affected or are affected by physical or biological surroundings and where there must be a clear direct link between a proposal's impact on the physical or biological surroundings and the subsequent impact on a person's aesthetic, cultural, economic or other social surroundings (EPA, 2023). For social



surroundings to be assessed as a key environmental factor, the effect on social surroundings must be significant, whereby a direct effect on the physical or biological environment, must be significant.

Table 6: Assessment of the Proposal against the EPA (2023) Technical Guidance - Environmental impact assessment of Social Surroundings – Aboriginal cultural heritage

3.1 Aboriginal Cultural Heritage (ACH) impacts where harm is avoided or minimised by the AH Act 1972

Are AH Act 1972 processes likely to mitigate the potential impacts to ACH values and meet the EPA's objective for the social surroundings environmental factor?

Within EPA's (2023) Technical Guidance on social surroundings, in relation to the EP Act, it's stated "for social surroundings to be considered in EIA, there must be a clear link between a proposal[s]...impact on the physical or biological surroundings and the subsequent impact on a person's aesthetic, cultural, economic or social surroundings". The focus of the AH Act is on the potential for damage to be caused to heritage and how that damage can be avoided, mitigated or managed.

The proposal's activities are limited to groundwater abstraction and do not include ground disturbance or clearing, as such no direct impacts to the Millstream Wetlands, Millstream Homestead, burial grounds, archaeological sites or other cultural places are expected as a result of implementation.

Consideration is therefore given to whether the aboriginal cultural heritage (ACH) values of the Millstream Wetlands may be indirectly impacted by groundwater abstraction altering the volume of the springflow from the aquifer entering Millstream Wetlands pools and rivers. Monitoring data demonstrates the potential impacts on pool and river levels are primarily due to hydroclimatic conditions and not directly related to groundwater abstraction as a result of implementation of the proposal.

Where there is no direct impact, it's not necessary to rely on the AH Act to ensure that potential impacts can be appropriately considered and, if necessary, mitigated, because the RiWI Act licensing decision-making process provides a comprehensive framework for considering potential impacts, including those related to ACH. The references within the RiWI Act, and associated policy documents, for the need to consider sustainable use of water resources, protection of their ecosystems and environment, and public interest considerations in decision-making ensures that environmental and social (heritage) impacts of the proposal will be considered and assessed.

3.2 ACH impacts not considered by AH Act 1972

- i. Outside the area likely to be subject to the AH Act 1972 processes, are there places where the proposal is likely to have a physical or biological impact which is likely to cause significant harm to ACH values?*
- ii. Inside the area likely to be subject to the AH Act 1972 processes, are there physical or biological impacts which may cause significant harm to ACH values which the AH Act 1972 will not apply to?*

The proposal's activities of groundwater abstraction do not include ground disturbance or clearing, as such no direct impacts to ACH are expected. Regarding the potential for groundwater abstraction to indirectly impact cultural values of Millstream Wetlands by altering pool and river levels; monitoring data demonstrates potential impacts on pool and river levels, and duration of impacts are primarily due to hydroclimatic conditions.

Measures to minimise and mitigate impacts to springflow into the Millstream Wetlands and pools are presented in the WRMOS. The Corporation is committed to ongoing consultation with YAC on management of the Millstream source. As such, it's not considered likely that ACH values will be significantly impacted as result of groundwater abstraction from implementation of the proposal, and no residual impacts are expected.



3.3 Reasonable steps to consult

Were reasonable steps taken to consult with relevant people about physical or biological impacts likely to cause significant harm to ACH values?

Millstream is a significant cultural landscape to the Yindjibarndi people. YAC is the Prescribed Body Corporate with responsibility for the management of Yindjibarndi country on behalf of Yindjibarndi people. Both the MHCC and TWG include representatives from YAC, who are involved in the joint management of the WPWSS sources to ensure that water dependant values are protected.

MHCC meets annually and was established to provide strategic advice to the DWER on management issues associated with WPWSS sources, while the TWG meets quarterly on the day-to-day operation, monitoring and management of Harding Dam and Millstream Borefield. The MHCC and TWG provide an opportunity to discuss monitoring and abstraction, collaborate on mitigation and maintenance activities and for the stakeholders to have input on the management of the WPWSS sources.

The WRMOS sets out the adaptative management process for Millstream in accordance with the Pilbara Groundwater Allocation Plan. The adaptative environmental assessment and management, through improved knowledge obtained from monitoring data that refines interim EWPs, is to incorporate improvements into the management guidelines as early as practicable. DWER manages revisions of EWPs (on behalf EPA) through consultation with the MHCC and TWG, of which YAC is a member. This process provides YAC the opportunity to jointly manage the Millstream source and thereby protect ACH values.

Outside the MHCC and TWG, the Corporation engages with YAC on project related matters in the Millstream area, and the Corporation CEO has met with YAC's CEO on several occasions to discuss the WPWSS. Monthly meetings between the Corporation, YAC and DWER were also established in December 2024, due to heightened interest in Millstream, to regularly discuss issues and progress on actions.

The established consultation processes ensure the provision of sufficient information to key stakeholders on monitoring and abstraction, and for collaboration on the management of WPWSS sources to avoid harm to ACH values.

Aboriginal Heritage Act 1972 (AH Act).

The Corporation does not consider the AH Act to solely regulate potential impacts to cultural values. The RiWI Act is given the scope to consider a broad range of issues under the RiWI Act decision making process and ongoing consultation with Traditional Owners is undertaken as part of the RiWI management framework. However, to the extent that there could be Aboriginal heritage concerns that are not directly related to the abstraction of the water, the protections in the AH Act apply.

The AH Act is part of the broader compliance landscape that protects Aboriginal cultural heritage. The AH Act prohibits a person from destroying, damaging, concealing or altering an Aboriginal site or object without consent.

The Corporation has not applied for section 18 consent under the AH Act as implementation of the proposal does not destroy, damage, conceal or alter an Aboriginal site.

Rights in Water and Irrigation Act 1914 (RiWI Act).

When deciding whether or not to assess a proposal, the EPA can take into account other statutory decision-making processes "that can mitigate the potential impacts of the proposal on the environment" (section 38G(4) of the EP Act). The Corporation considers that the RiWI Act can appropriately assess and regulate the potential impacts of the proposal on the environment. The decision-making process for the grant of a section 5C licence renewal under the RiWI Act provides



a comprehensive framework for considering all of the potential impacts that are raised in the YAC referral and relevant to an EPA Part IV assessment, including both environmental and ACH impacts. When considering an application for renewal of a section 5C licence, the Minister has a broad discretion to consider anything that is relevant under clauses 7 and 22 of Schedule 2 of the RiWI Act and the assessment of impacts from the proposal can be assessed through the 5C licencing process.

Whilst the EPA's factor objectives are not expressly referred to in the RiWI Act or guidance, the relevant key environmental factors and objectives (for flora and vegetation, subterranean fauna, landforms, terrestrial fauna, inland waters and social surroundings) can and must be taken into account in the section 5C decision-making process, to the extent that the factors are:

- part of the Millstream aquifer ecosystem and environment.
- potentially impacted by the ecologically unsustainable use of the aquifer.
- a matter of public (including social) interest; and/or
- considered by the Minister to be relevant.

The YAC referral concerns the potential impacts arising from the proposed abstraction, in particular matters like declining ground and surface water levels, seasonal availability of water, erosion, salinity, water temperature changes and water quality, and the implications those direct impacts could have on flora, stygofauna, terrestrial fauna, inland waters, landforms and ACH values in the area. All of these potential impacts are considered as part of a section 5C licence renewal decision-making process.

As part of the 5C licence decision-making processes, in accordance with Part III, section 4 of the RiWI Act, the Minister must:

- a provide for the management of water resources, and in particular:
 - (i) sustainable use and development to meet the needs of current and future users; and
 - (ii) protection of their ecosystems and the environment in which water resources are situated, including by the regulation of activities detrimental to them;
- b promote the orderly, equitable and efficient use of water resources;
- c foster consultation with members of local communities in the local administration, and to enable them to participate in that administration; and
- d assist the integration of the management of water resources with the management of other natural resources.

The framework for section 5C licences under the RiWI Act (including the renewal application process and ongoing consultation/engagement, management, monitoring and reporting obligations) allows for the assessment, protection and management of all of the environmental factor objectives including:

- protect flora and vegetation so that biological diversity and ecological integrity are maintained.
- protect subterranean fauna so that biological diversity and ecological integrity are maintained.
- protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
- maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected; and
- to protect social surroundings from significant harm.



The assessment and decision-making process for a 5C licence, meets the requirements for other statutory decision-making processes "that can mitigate the potential impacts of the proposal on the environment" stated under section 38G(4) of the EP Act.

Licensing decisions relating to the Millstream aquifer will also be guided by the Pilbara Groundwater Allocation Plan (2013). The assessment of cumulative impacts is an inherent part of the RiWI Act licensing framework by virtue of the fact that the Act is, a water allocation regime.

7.3.6 Environmental Outcomes

The observed and future potential changes to culturally important pools within the Millstream Wetlands are primarily due to antecedent hydroclimatic conditions and are not significant, nor directly related to groundwater abstraction. Groundwater abstraction is not a clear direct link to observations to pool and river levels, or erosion within the Millstream Wetlands and these observations are not considered significant affects. As a result the proposal is likely to meet the environmental outcomes for this factors objective and not be inconsistent with the EPA's objective for social surroundings: "*To protect social surroundings from significant harm*".

7.3.7 Character of the proposed amendment

The character of the proposed amended will be substantially the same character as the referral and s38F document. The activity comprising the proposal, being groundwater abstraction from the Millstream Borefield has not changed from the referral and s38F document

7.4 Flora and Vegetation

The objective of the EPA (2016) Environmental Factor Guideline Flora and Vegetation is:

To protect flora and vegetation so that biological diversity and ecological integrity are maintained.

Sections 5.2 Relevant Legislation, Policy and Guidance, 5.3 Receiving Environment and 5.4 Studies and investigations as presented in the s38F response have not changed as a result of the proposed amendment and therefore have not been duplicated in this s38C amendment (this document).

7.4.1 Environmental Effects

The environmental values of the proposed amendment have not changed from the s38F document and therefore have not been duplicated in this document.

The proposal comprises groundwater abstraction from existing production bores. No clearing of vegetation is required for this proposed amendment and no direct impacts to flora and vegetation are proposed.

Clearing of land and installation of additional groundwater bores as alternative water supply options, and for maintenance of the Scheme infrastructure are outside of the scope of this proposed amendment and excluded from the scope of the proposal. Works to install groundwater abstraction bores and maintenance infrastructure will be undertaken on already cleared land as a priority, followed by degraded land, where possible and will avoid any priority and threatened flora and ecological communities, places of ACH and significant habitat for priority and threatened fauna species.



The riparian, riverine and delta vegetation, and priority flora associated with the Millstream Wetlands, may be indirectly impacted by groundwater abstraction altering the volume of the springflow from the aquifer entering Millstream Wetlands pools and rivers.

Discharge from the aquifer via springflow into the Millstream Wetlands pools, and subsequent overflow into the Fortescue River and delta channels respectively, sustains riparian and wetland vegetation. The water requirements for riverine and delta vegetation are sourced from springflow from Deep Reach pool and other water sources and water requirements for delta riparian vegetation are sourced from both springflow volumes from Chinderwarriner pool and other water sources. These other courses are direct rainfall and surface runoff from Millstream and via the Fortescue River during significant climatic events. The primary target levels for riverine, delta and riparian vegetation have been set (and outlined in the WRMOS) and discussed further in the s38F document.

Historical monitoring at Deep Reach pool has outlined spring discharge fluctuates and has historically recorded values well below the current thresholds. Any impacts to riverine and delta vegetation from a reduction to the springflow from Deep Reach pool cannot be solely attributed to the proposal and the health of the riverine vegetation is demonstrably influenced by a range of influences including direct rainfall and surface runoff (Figure 21).

The requirement for riparian vegetation is greater than the springs discharge volumes for Chinderwarriner pool, indicating the criteria account for the provision of additional water, such as surface runoff from Millstream during significant climatic events (Figure 22) (DWER, 2019). With discharge from Chinderwarriner occurring, at levels much higher than historically observed, and vegetation condition assessments indicating no tangible long-term impacts directly attributable to the fluctuations in discharge, this suggests the vegetation is accessing sufficient water. This suggests that the current combination of springflow, direct rainfall and surface water runoff from the Millstream and Fortescue systems has been sufficient to maintain vegetation health. Any impacts to delta riparian vegetation due to a reduction to the springflow from Chinderwarriner pool cannot be solely attributed to the proposal. The health of the delta riparian vegetation has been demonstrated to be influenced by a range of other influences including access to direct rainfall and surface runoff from Millstream.

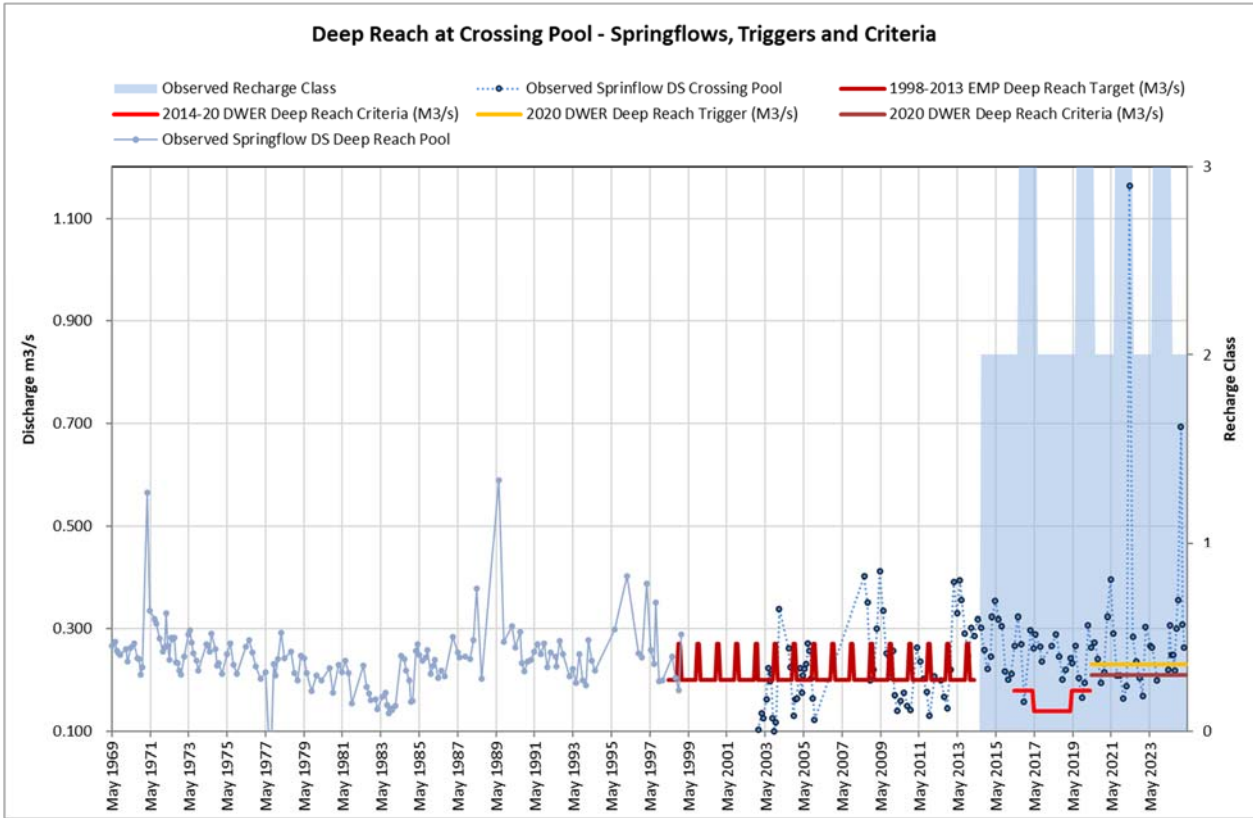


Figure 21: Springflow, Measured as Outflow from Deep Reach pool 1969-1999 and Crossing pool 2003 - 2025

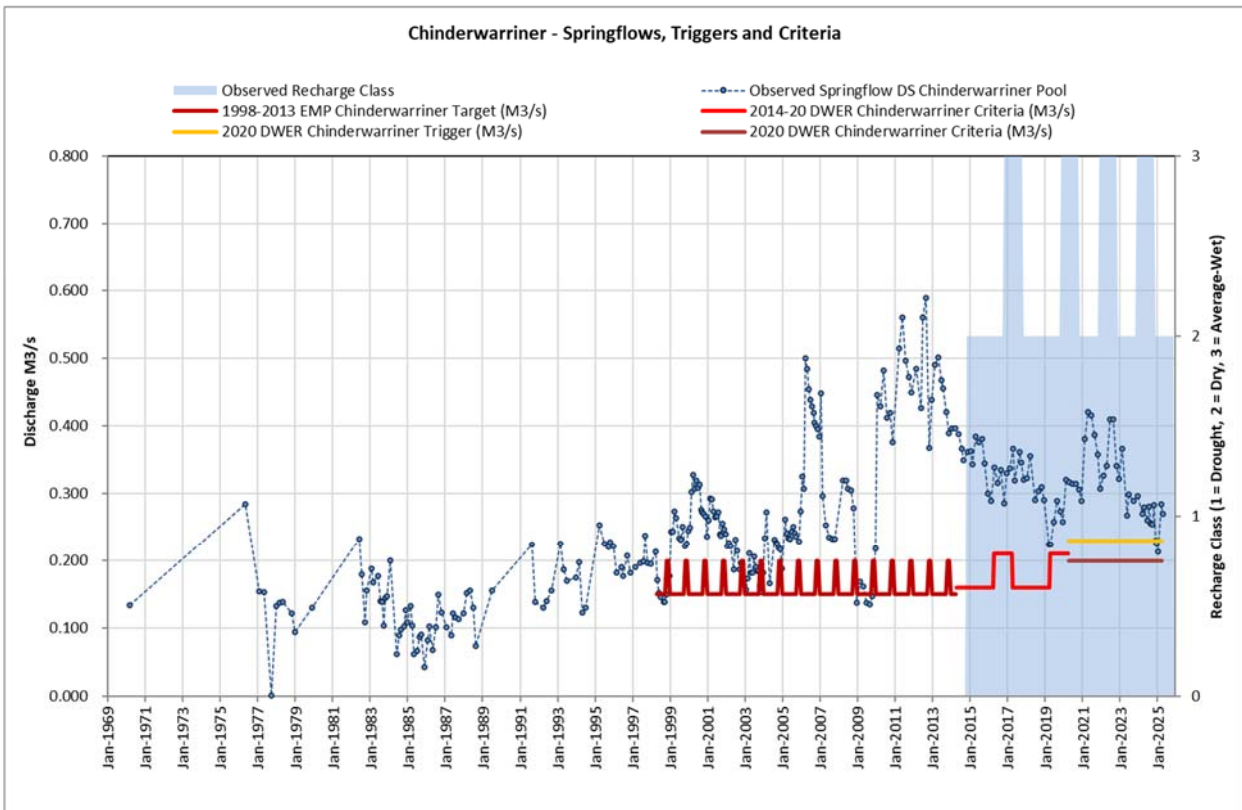


Figure 22: Springflow, Measured as Outflow from Chinderwarriner pool.



Impact Assessment of up to 6GL/a with a contingency of 3GL/a

Historical abstraction volumes from the Millstream aquifer was 9GL/a or greater from 1978 to 1985, 2001-2003, and 2012 (Figure 6). During the mid-1980s, flow from the Chinderwarriner pool ceased in one major outflow channel and decreased significantly in the remaining channels resulting in areas within the western side of the Millstream Delta, downstream of Chinderwarriner pool, to dry out resulting in a decline in the condition of the vegetation (Welker, 1995 and 1998). This vegetation health decline was due to eight years of below average riverflow through the Fortescue River (between 1976 and 1983), a three-year hydrological drought between 1976-1978 and subsequent high abstraction (abstraction was in excess of 9.5GL/a for a seven-year period, peaking at just below 16GL in 1983).

The proposed amendment of up to up to 6GL/a with a contingency of 3GL/a for a 2-year duration, is not likely to result in the decline in pool levels in the first year, a decline in pool water levels in the second year and is likely to recover once the abstraction is less than 6GL/a in the third year. The vegetation is not expected to decline significantly as the pools are not expected to dry out. Any observed impacts to vegetation health at the pools is likely to be caused by climatic events and not attributable to the proposal.

Vegetation conditions assessments in 2017, 2019 and 2021 indicate no tangible long-term impacts directly attributable to the fluctuations in discharge, this indicates that downstream vegetation is accessing sufficient water. This suggests that the current combination of springflow, direct rainfall and surface water runoff from the Millstream and Fortescue systems is sufficient to maintain vegetation health.

Impact Assessment at 6GL/a

Vegetation health monitoring was undertaken in 2017 (GHD, 2018), following a period of groundwater abstraction greater than 6GL/a from 2014 to 2016. The monitoring indicated the vegetation in the pools were in good to very good condition, with intact vegetation structure, with some areas had poor to moderate canopy condition scores, but these were often associated with a previous recent fire history, and presence of weeds.

Impact Assessment at 5.5GL/a

Vegetation health monitoring was undertaken in 2019 (360 Environmental, 2020) during groundwater abstraction of 5.6GL/a in 2019 and in 2021 when groundwater abstraction was 3.8GL/a. The assessment indicated that canopy condition score and insect score did not significantly differ from the 2017 assessment, all transects showed species regeneration, with the exception of transect A, where a total of 10 individuals had deceased between 2017 and 2019. The 2019 survey identified impacts from a recent fire.

The 2021 survey (GHD, 2022) found the condition of transects has either remained consistent or increased between 2017 and 2021, with the exception of Transect A in the Woodley Delta which had declined from good to poor condition. In 2019, 360 Environmental noted that the community structure within this transect had “significantly changed compared to 2017 due to a recent fire event”. In 2021 GHD noted that “vegetation the community structure was similar to that reported in 2017” indicating that it is slowly returning to its pre-fire state, with the exception of seven *Melaleuca glomerata* which were likely to have been burnt in the fire.



7.4.2 Mitigation by DMAs

The minimisation and management measures to minimise and mitigate impacts to riparian vegetation and GDVs from springflow into the Millstream Wetlands and pools are presented in the WRMOS. The adaptive management measures and response mitigation measures are outlined in the WRMOS are discussed in the Inland Waters chapter and presented in the s38F document.

The staged reduction for groundwater abstraction of up to 6GL/a with a contingency of 3GL/a to February 2027, up to 6GL/a to 2028, then up to 5.5GL/a to 2032 will also further minimise potential impacts to Millstream flora and vegetation values.

7.4.3 Residual Impacts

Previous abstraction volumes and monitoring data has shown the water requirements for riverine, delta vegetation and riparian vegetation are sourced from springflow from Deep Reach pool and Chinderwarriner pool and other water sources, being direct rainfall and surface runoff via the Fortescue River during significant climatic events. Any observed vegetation health impacts observed at Deep Reach pool cannot be solely attributed to the proposal and the health of the riverine vegetation is demonstrably influenced by a range of influences including direct rainfall and surface runoff. Any observed vegetation health impacts to riparian vegetation is due to a reduction in direct rainfall and surface runoff from Millstream and via the Fortescue River during significant climatic events given that the requirements for riparian vegetation is greater than the springs discharge volumes for Chinderwarriner pool.

The proposal is not expected to result in significant impacts to the flora and vegetation of the Millstream Wetlands and implementation of the proposal is expected to meet the EPA objectives.

7.4.4 Discussion of Significance

The change would reduce any potential impacts on vegetation although it is unlikely the proposal would have resulted solely on impacts to vegetation health. The proposed amendment is not expected to solely account for any observed vegetation health impact to riverine, delta vegetation and riparian vegetation as the source for these vegetation is not only springflow from Deep Reach pool and Chinderwarriner pool but other water sources, being direct rainfall and surface runoff from Millstream and via the Fortescue River during significant climatic events. Vegetation health monitoring at the groundwater abstractions volumes of the proposed amendment have not indicated impacts from groundwater abstraction and results in generally good to very good condition vegetation.

7.4.5 Regulation

The proposed amendment can be regulated under the RiWI Act and the 5C licence can be used to mitigate impacts to flora and vegetation (refer to Table 4). The RiWI Act associated policy documents provides repeated references to the need to consider sustainable use of water resources, protection of the ecosystems and environment, and public interest considerations in decision-making. This will enable any flora and vegetation impacts to be considered under RiWI Act, via issuing of a 5C licence.

Regulation of the proposed amendment under the RiWI Act can be undertaken via clauses 7 and 22 of Schedule 2 of the RiWI Act, where the Minister has a broad discretion to consider anything. The assessment of impacts from the proposal can therefore be included under clauses 7 and 22 of Schedule 2 of the RiWI Act, via issuing of a 5C licence. The Minister's powers in clause 15 of Schedule 1 to impose terms, conditions and restrictions on a s5C licence are broad, including



concerning the matters set out in the Appendix to Schedule 1 to the Act (e.g. use, management, protection and enhancement of any water resources and its ecosystem or the environment and monitoring) or any other matter relevant to the clause 7(2) matters. The Corporation's existing and expired licences include common conditions requiring an operating strategy (WRMOS), monitoring and reporting, so additional conditions can also be added to the 5C licence to enable regulation under the RiWI Act rather than a formal Part IV (of the EP Act) assessment. Regulation of potential impacts to flora and vegetation can be a standalone condition or changes added to the WRMOS.

7.4.6 Environmental Outcomes

There is no change to the environmental outcomes as a result of the proposed amendment. The observed and future potential impacts on riverine and delta vegetation within the Millstream Wetlands are primarily due to local water availability as well as the acute impacts from fire and floods. The local water availability is strongly correlated with antecedent hydroclimate including direct rainfall, surface water runoff and springflow from the aquifer. Groundwater abstraction from the proposal is not expected to significantly impact the riparian, riverine and delta vegetation within the Millstream Wetlands given the riverine and delta vegetation requires a combination of sources to meet demand. Impacts to riverine and delta vegetation from a reduction to the springflow cannot be solely attributed to the proposal. Implementation of the proposal is not expected to result in significant impacts to flora and vegetation, and it is expected that the environmental outcomes and EPA's objective for flora and vegetation "*To protect flora and vegetation so that biological diversity and ecological integrity are maintained*" would be met.

7.4.7 Character of the proposed amendment

The character of the proposed amended will be substantially the same character as the referral and s38F document. The proposed amendment comprises the same activity of groundwater abstraction from the Millstream aquifer, but of lower abstraction volumes and durations which are likely to be less significant.

7.5 Terrestrial Fauna

The objective of the EPA (2016) Environmental Factor Guideline for Terrestrial Fauna is:

To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

Sections 5.2 Relevant Legislation, Policy and Guidance, 5.3 Receiving Environment and 5.4 Studies and investigations as presented in the s38F response have not changed as a result of the proposed amendment and therefore have not been duplicated in this s38C amendment (this document).

7.5.1 Environmental Effects

The environmental values of the proposed amendment have not changed from the s38F document and therefore have not been duplicated in this document.

There is no change to the direct and indirect potential impacts as a result of the proposed amendment.

The proposal comprises the abstraction from existing production bores. No clearing of vegetation is required for this proposal and no direct impacts to terrestrial fauna and habitat are proposed.



Terrestrial fauna may be indirectly impacted by potential impacts to habitat associated with the Millstream Wetlands, caused by groundwater abstraction altering the volume of the springflow from the aquifer entering Millstream pools and river.

Potential impacts to terrestrial fauna and habitat may include:

- Changes to the connectivity of pools may impact aquatic fauna habitat availability.
- Impacts to deep permanent pools as habitat for large bodied, long-lived fish species and water birds.
- Potential impacts to shallow macrophyte habitat inundated and available for macroinvertebrates, small-bodied fish and juveniles of large-bodied fish.
- Changes in salinity have the potential to impact fish and macroinvertebrates directly through physiological stress and indirectly through loss of macrophyte habitat.

Changes to the connectivity of pools may impact aquatic fauna habitat availability.

Maintenance of pool connectivity is important to ensure habitat availability and quality allow fauna movement and nutrient transfer for aquatic fauna. This includes the requirement for:

- Permanent connectivity between wetlands from Deep Reach pool to Livistona pool.
- Persistence of flow down from Livistona pool to Gregory Gorge.

Discharge from the Millstream aquifer (through the Deep Reach pool to Livistona pool) maintains river ecosystems downstream to Gregory Gorge between river flow events. When flow to Gregory Gorge ceases, the river contracts to a series of large pools with intermittent pools drying out as the duration of no flow extends. Changes in the flow regime and the impact on the duration of no flow periods has the potential to impact these pools.

Pool stage height data has been used to assess the connectivity between the pools where, the pool stage height in the most downstream pool (Livistona pool) is above the pool cease to flow (**CTF**), then outflow and inflow is assumed to be occurring, and upstream connectivity maintained. This assumption is valid given the record period flow from Deep Reach pool and stage height in Livistona pool are strongly correlated ($R^2= 0.7781$: 1996 - 2003) (Figure 23).

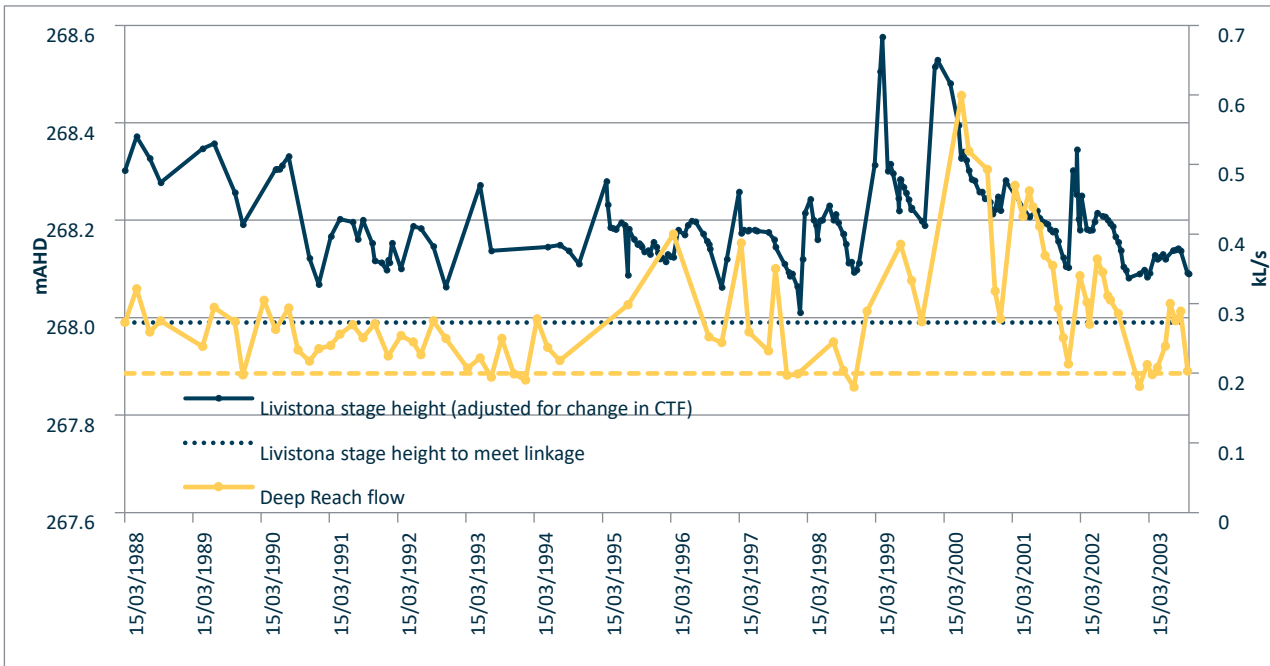


Figure 23: Record period flow from Deep Reach pool and stage height in Livistona pool

Analysis of available data from 1988 to 2003 for Livistona pool shows that connectivity between pools was maintained for the period of record (Figure 24). This is supported by anecdotal evidence that the Fortescue River from Deep Reach pool to Livistona pool is permanently connected. Livistona pool stage data remained above the CTF during the reporting period, indicating Deep Reach pool has been sufficient to maintain the connectivity of surface water downstream to Livistona pool. These outcomes are not expected to change as a result of the proposed amendment. Fortescue River from Deep Reach pool to Livistona pool will remain permanently connected.

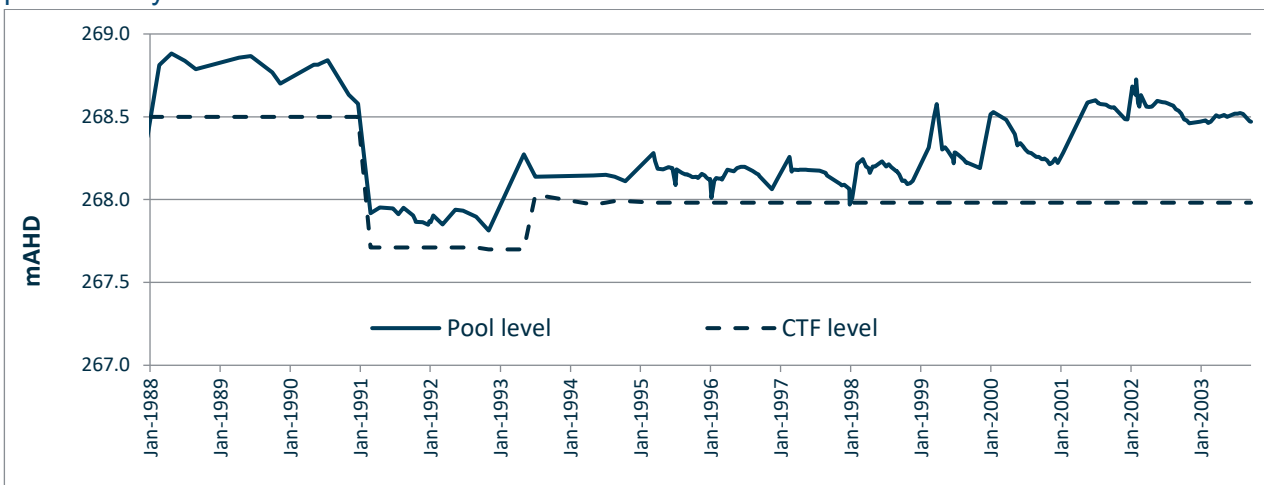


Figure 24: Livistona pool stage height and associated pool cease to flow.

There is no statistical relationship between Deep Reach spring discharge and the occurrence and duration of no flow at Gregory Gorge. This is presumably due to the distance between the two sites, inputs from the Millstream Delta and other factors influencing flow between Deep Reach pool and Gregory Gorge. Pool size when compared to Gregory Gorge flow rates indicates that permanent pools reduce in size as flow rates decline and intermittent pools will generally dry out when Gregory Gorge is receiving low or no flow (Figure 25).



Figure 26 shows the number of months, per year, of no flow in the Fortescue River at the Gregory George gauging station. Periods of no flow from Deep Reach and the occurrence and duration of no flow at Gregory Gorge is not statistically related. This indicates that the dominate source of flow through Gregory Gorge are rainfall-runoff events across the almost 14,000 km² Fortescue River catchment. The proposed amendment is not expected to impact surface water flows to Gregory George, as the springflow from Deep Reach has not historically shown correlation with pool levels.

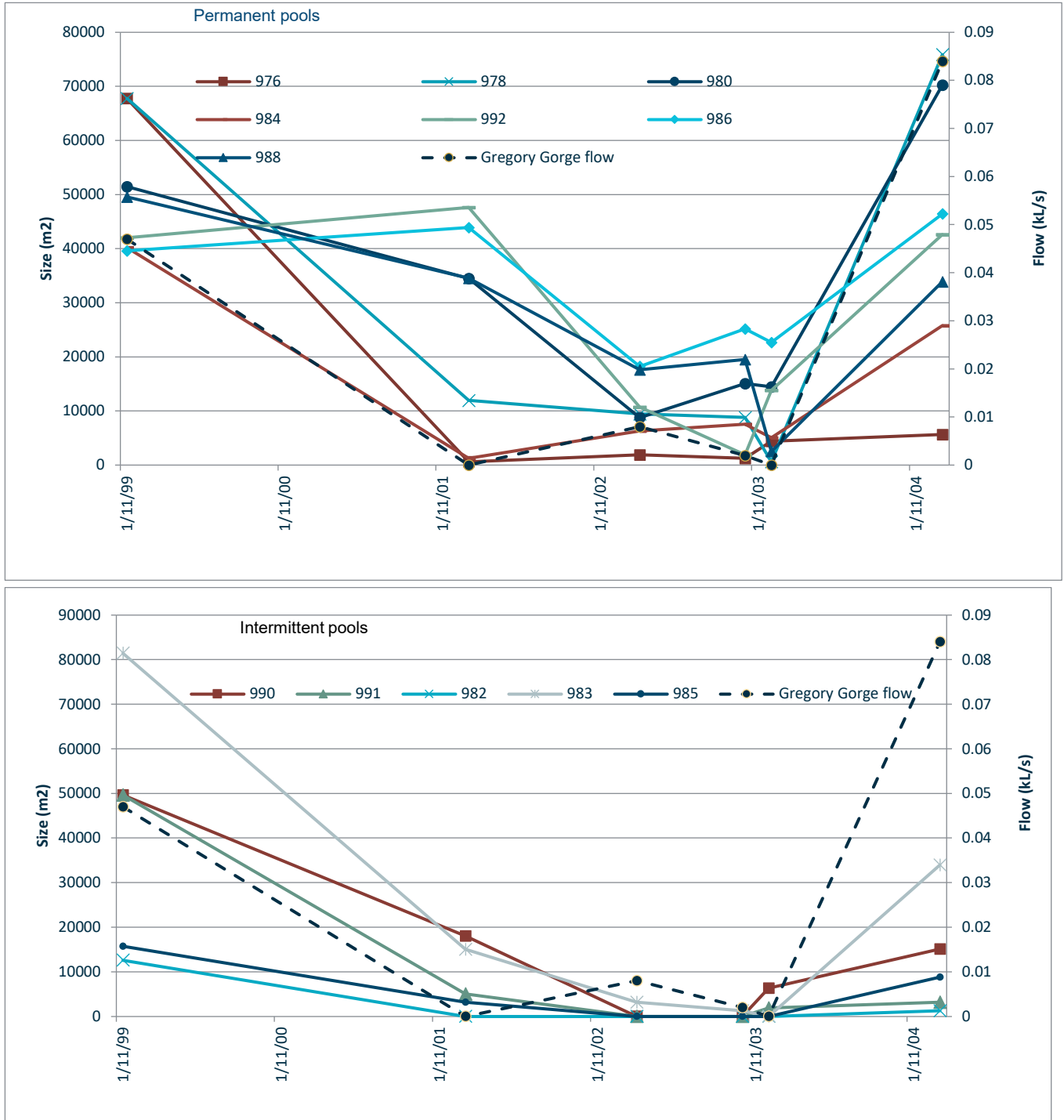


Figure 25: Pool size between Livistona and Gregory Gorge (top) Permanent pools and (bottom) semi-permanent/intermittent pools

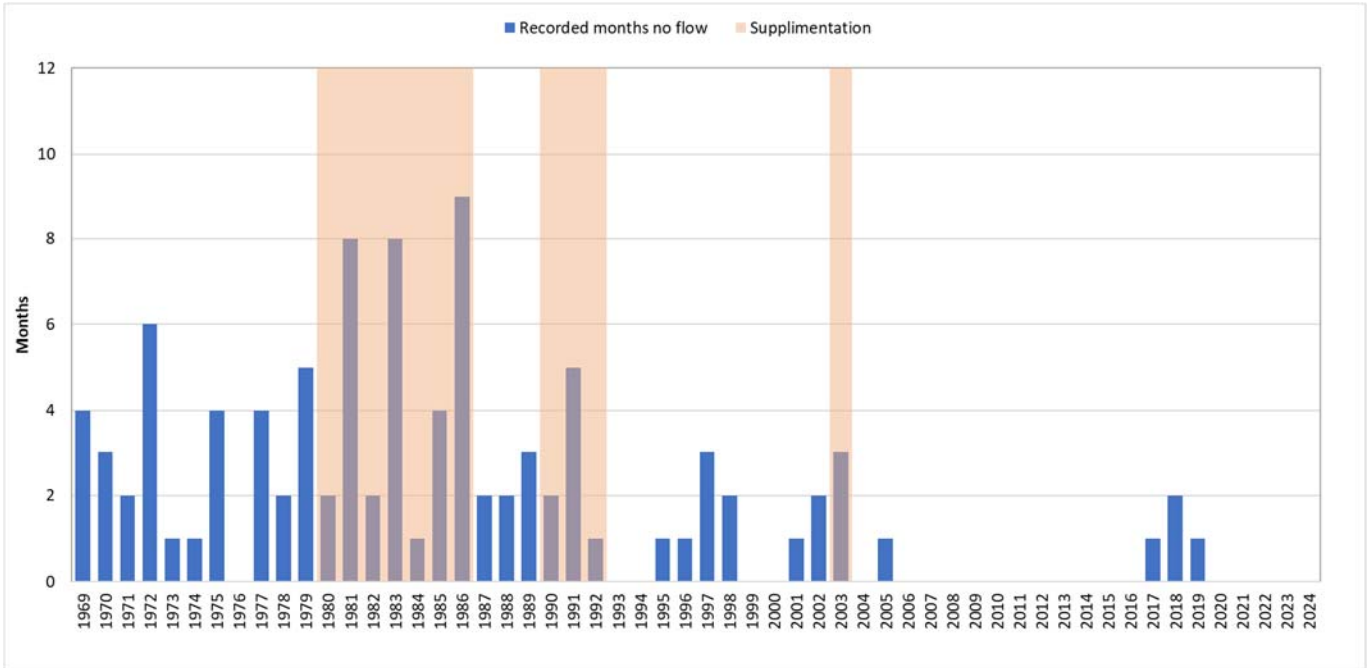


Figure 26: Fortescue River at Gregory Gorge recorded months of no flow

Impacts to deep permanent pools as habitat for large bodied, long-lived fish species and water birds.

Pool depth and stability are important drivers of fish community structure in Pilbara rivers with deep pools supporting greater species richness, abundance and diversity of fish, as such DoW applied 2.7 m as the threshold for maintaining deep pool habitat (refer to s38F document for more background). Pool bathymetry (Ramsey and Gibbs, 2014) shows that the pools all provide deep pool habitat (depths >2.7m) (Table 7). Similarly continuous discharge from Crossing and Palm pools indicates that water levels have been maintained above the pool cease to flow level and deep pool habitat has also been maintained in these pools. The proposed amendment is not expected to result in pool water levels dropping to <2.7 m given that abstraction of up to 6GL/a with a contingency of 3GL/a is short-term and abstraction volumes thereafter are significantly less.

Table 7: Pool bathymetry data collection June 2014 (DWER, 2019 unpublished)

Pool	CTF (date)	Max depth	Max width	Max length
Deep Reach	291.64m AHD (07/1995)	14.1m	100m	2600m
Crossing	280.51m AHD (11/1995)	6.0m	95m	2000m
Palm	271.87m AHD (01/1996)	6.8m	100m	3000m
Livistona	267.99m AHD (04/1995)	5.7m	50m	600m
Chinderwarriner	292.97m AHD (1995)	7.8m	30m	260m

Potential impacts to shallow macrophyte habitat inundated and available for macroinvertebrates, small-bodied fish and juveniles of large-bodied fish.

Potential impacts to macroinvertebrates are likely where pool depths are less than 1.5m (refer to s38F for more background). Water levels in Deep Reach, Crossing, Palm and Livistona pools have historically been maintained at or above their cease to flow point, maintained pool depth of greater than 1.5m. The proposed amendment is not expected to result in pool water levels



dropping to <1.5 m given that abstraction up to 6GL/a with a contingency of 3GL/a is short-term and abstraction volumes significantly below this occur until 2032. .

Changes in salinity have the potential to impact fish and macroinvertebrates directly through physiological stress and indirectly through loss of macrophyte habitat.

Changes in salinity have the potential to impact fish and macroinvertebrates directly through physiological stress and indirectly through loss of macrophyte habitat. DWER set a 1400 mg/l TDS target at Deep Reach pool and 1086 mg/L at Chinderwarriner pool to maintain fauna health (refer to s38F for more background).

Historical abstraction volumes greater than 9GL/a has been used to determine the potential impact of the proposed amendment. Historical TDS concentrations at Deep Reach pool typically ranged between 220mg/l to just over 1400mg/L (Figure 27) and Chinderwarriner pool salinity complied with trigger of 1086 mg/L with the exception of one monitoring event (1,392mg/L in December 2015) (Figure 28). The TDS at Deep Reach pool spiked in 1977 to 1979 which relates to historical abstraction volumes > 9GL/a but recovered in 1980. The TDS at Chinderwarriner pool salinity target was passed twice in January 2023 and January 2024 due to an initial flush of TDS from the upstream Fortescue River catchments and Millstream tributaries during the initiation of wet season flows. These levels are still well below salinities known to impact on fish and macroinvertebrates (DWER, 2019).

The proposed amendment is not expected to result in TDS concentrations to impact fish and macroinvertebrates as the groundwater abstraction volume of the proposed amendment is much lower than 1977-1979. Some flushing of TDS in the pools may be observed at the next tropical cyclone, due to the observed drying of the pools and the potential for TDS build up due to drying pools. This is considered primarily related to climate and weather patters and not due to abstraction.

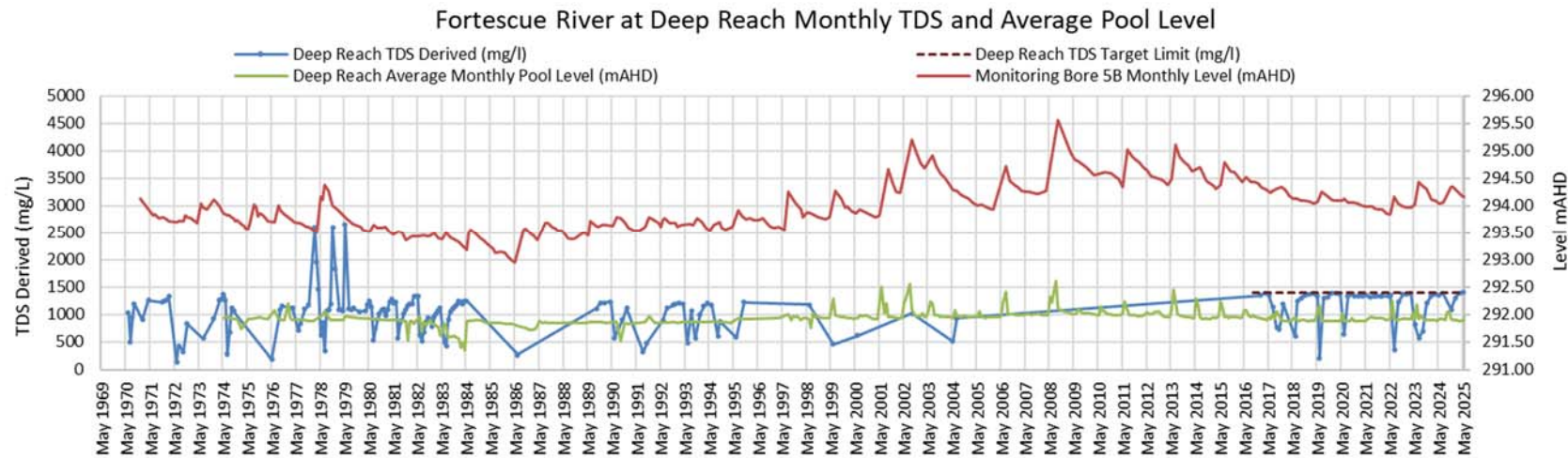


Figure 27: Fortescue River at Deep Reach pool observed TDS, TDS Target Limit, Pool Level and Groundwater Level at 5B

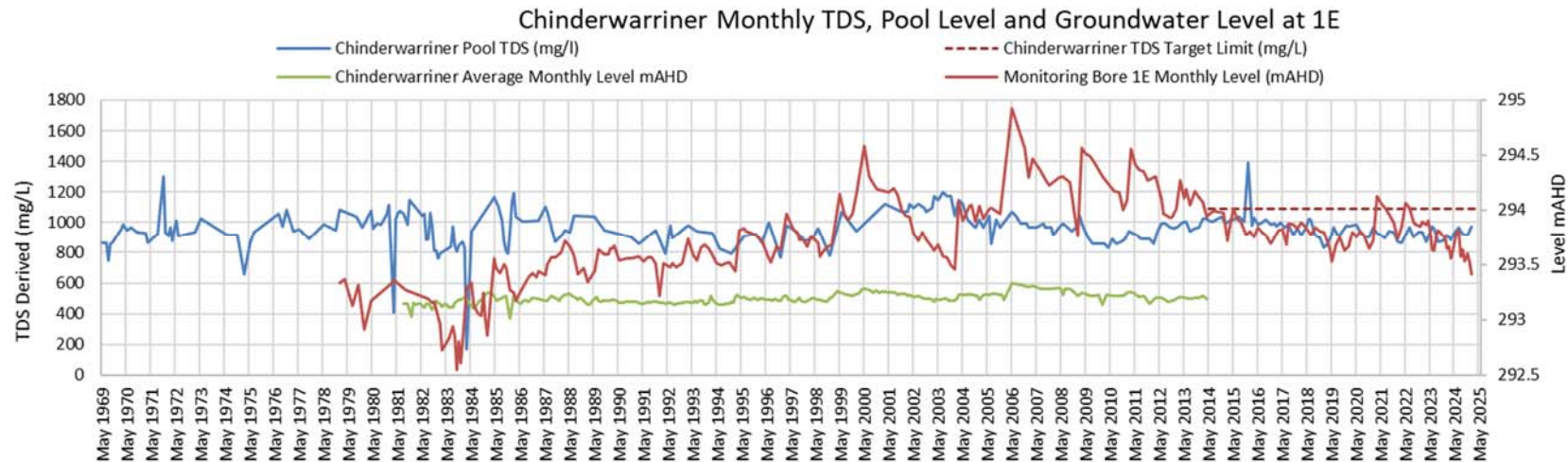


Figure 28: Chinderwarriner pool observed TDS, TDS Target Limit and Pool Level



7.5.2 Mitigation by DMAs

The staged reduction for groundwater abstraction within this proposed amendment (up to 6GL/a with a contingency of 3GL/a to February 2027, up to 6GL/a to 2028, then up to 5.5GL/a to 2032) will minimise potential impacts to fauna habitat of Millstream.

There is no change to the management measures to minimise and mitigate impacts to fauna habitat of the Millstream Wetlands and pools as a result of the proposed amendment. The adaptive management measures and response mitigation measures are outlined in the WRMOS are discussed further the Inland Waters chapter and s38F document.

7.5.3 Residual Impacts

Previous abstraction volumes and monitoring data has shown groundwater abstraction volumes greater than 9GL/a (up to 16GL/a) showed elevated TDS at Deep Reach. These impacts are not expected given the proposed amendment is for a lower ongoing abstraction volume and a short-term duration.

The proposed amendment is not expected to impact connectivity of pools, presence of deep permanent pools or shallow macrophyte habitat resulting in no expected impacts to aquatic fauna habitat availability. Pool water levels have remained above the CTF. Groundwater abstraction from the proposed amendment is not expected to impact the pool and river levels within the Millstream Wetlands with any observed impacts likely to be caused by climatic conditions which are not attributable to the proposal.

The proposal is not expected to result in significant impacts to the terrestrial fauna of the Millstream Wetlands and implementation of the proposal is expected to meet the EPA objectives.

7.5.4 Discussion of Significance

There is no change to the significance of the proposal as a result of the proposed amendment. As discussed in the Inland Waters section and s38F document, pool levels within the Millstream Wetlands are not solely directly related to groundwater abstraction with over 84% of water being fed by the Fortescue River. Groundwater abstraction from the proposal is not expected to impact the pool water levels and associated vegetation and fauna habitat within the Millstream Wetlands. Historical monitoring was shown that the Deep Reach water levels remained above the CTF during the reporting period, indicating connectivity has been maintained with downstream pools to Livistona pool. It has also been demonstrated that there is poor correlation between Deep Reach spring discharge and the occurrence and duration of no flow at Gregory Gorge, indicating any observed impacts at Gregory Gorge are not attributable to the proposal and likely to be caused by the decline in rainfall generated runoff as a consequence of tropical cyclones, and lows. Salinity concentrations have also generally remained within monitoring criteria outlined in the 2014 WRMOS.

7.5.5 Regulation

The proposed amendment can be regulated under the RiWI Act and the 5C licence can be used to mitigate impacts to terrestrial fauna (refer to Table 4). The RiWI Act associated policy documents provides repeated references to the need to consider sustainable use of water resources, protection of the ecosystems and environment, and public interest considerations in decision-making. This will enable any impacts to terrestrial fauna to be considered under RiWI Act, via issuing of a 5C licence.



Regulation of the proposed amendment under the RiWI Act can be undertaken via clauses 7 and 22 of Schedule 2 of the RiWI Act, where the Minister has a broad discretion to consider anything. The assessment of impacts from the proposal can therefore be included under clauses 7 and 22 of Schedule 2 of the RiWI Act, via issuing of a 5C licence. The Minister's powers in clause 15 of Schedule 1 to impose terms, conditions and restrictions on a s5C licence are broad, including concerning the matters set out in the Appendix to Schedule 1 to the Act (e.g. use, management, protection and enhancement of any water resources and its ecosystem or the environment and monitoring) or any other matter relevant to the clause 7(2) matters. The Corporation's existing and expired licences include common conditions requiring an operating strategy (WRMOS), monitoring and reporting, so additional conditions can also be added to the 5C licence to enable regulation under the RiWI Act rather than a formal Part IV (of the EP Act) assessment. Regulation of potential impacts to terrestrial fauna can be a standalone condition or changes added to the WRMOS.

7.5.6 Environmental Outcomes

It is not expected groundwater abstraction would significantly impact pool water levels and associated wetlands, and fauna habitat as water supply to the pools is predominately sourced during the wet season as a result of tropical cyclones and lows. As such no significant impacts to habitat and terrestrial fauna associated with the pools and wetlands are expected as a result of implementation of the proposal. Due to this, it is expected that the environmental outcome and EPA objective for this factor "*To protect terrestrial fauna so that biological diversity and ecological integrity are maintained*" can be met.

7.5.7 Character of the proposed amendment

The character of the proposed amended will be substantially the same character as the referral and s38F document. The proposed amendment comprises the same activity of groundwater abstraction from the Millstream aquifer, but of lower abstraction volumes and durations which are likely to be less significant.

7.6 Subterranean Fauna

The objective of the EPA (2016) Environmental Factor Guideline for Subterranean Fauna is:

To protect subterranean fauna so that biological diversity and ecological integrity are maintained.

Sections 5.2 Relevant Legislation, Policy and Guidance, 5.3 Receiving Environment and 5.4 Studies and investigations as presented in the s38F response have not changed as a result of the proposed amendment and therefore have not been duplicated in this s38C amendment (this document).

7.6.1 Environmental Effects

The environmental values of the proposed amendment have not changed from the s38F document and therefore have not been duplicated in this document.

There is likely to be a minor reduction to the direct potential impact as a result of the proposed amendment due to a reduction in the abstraction rate.

Subterranean fauna habitat may be directly impacted by a reduction in habitat as a result of the groundwater abstraction from the Millstream aquifer.



During the early to mid-1980's the MAL fell dramatically in response to abstraction at levels above 9.5GL/a for a 7-year period (peaking at just below 16GL in 1983) this was exacerbated by extremely low riverflow and recharge and a 3-year hydrological drought. As a consequence, in 1984 the MAL reached a minimum observed level of 293.02 mAHD. This drawdown of the watertable, was assessed by DoW in 2009 to be 0.23 m below the average natural MAL around Millstream and representing a storage depletion of approximately 23GL (DoW, 2009). The watertable recovered in May 1984 to 293.27 mAHD.

Since the commencement of operations in 1969 the maximum range in level change is 2.2 m which was limited to a period of 6 months during 1984. With a saturated thickness of up to 33m, this range represents a maximum observed change in available habitat of 6.7%. The proposal is not expected to reduce the watertable to levels observed in 1984.

The proposed amendment may result in a small reduction in subterranean fauna habitat due to groundwater abstraction. The volume of abstraction is significantly less than the volume of abstraction in 1984, as such the loss of subterranean fauna is not expected to significantly reduce the available habitat and will be limited to 5%. As previous monitoring results have shown, the water table recovered, and therefore reinstating the availability of stygofauna habitat. The extent of stygofauna habitat of 950 km² is not expected to change as a result of the proposal. The saturated thickness of the stygofauna habitat is not expected to reduce to less 30m as a result of the proposal. The extent and availability of stygofauna habitat is considered suitable to support the presence and diversity of stygofauna within the Millstream dolomite fauna habitat and no significant impacts to the presence and diversity of stygofauna species are expected as a result of implementation of the proposal.

Groundwater abstraction from the proposed amendment has not resulted in a change to the lateral availability of subterranean fauna habitat. The extent of habitat is consistent with no distinct pockets of specialist or localised habitat and the habitat is well-connected. As a result, groundwater abstraction from the proposed amendment is not expected to result in a significant impact to stygofauna due to the availability of remaining habitat present.

7.6.2 Mitigation by DMAs

Mitigation management measures for the protection of saturated stygofauna habitat are presented in the WRMOS. To develop ecological water requirements and management criteria for this system, DWER focused on the key hydrological processes and relationships that need to be maintained. Aquifer ecosystems were defined as "Ecosystems that have direct access to the Millstream aquifer, including minor springs, stygofauna and groundwater-dependent vegetation present across the aquifer".

For the aquifer ecosystems DWER determined they could be monitored via the MAL of eight bores across the aquifer (MAL8) using the groundwater level criteria presented in the s38F document. In 2014, to protect the stygofauna, DoW specified a Drought MAL8 criteria of 293.5 mAHD as a condition of the Corporation's licence to abstract. This criterion represents the maximum allowed reduction of habitat, as a condition of the Corporation's licence to abstract. It equates to a less than 5% allowable reduction in habitat. In February 2025 the observed MAL was at 293.797 mAHD and has been maintained above 293.5 since levels recovered in 1988.

In addition, the staged reduction for groundwater abstraction of the proposed amendment (up to 6GL/a with a contingency of 3GL/a to February 2027, up to 6GL/a to 2028, then up to 5.5GL/a to 2032) will further minimise the potential for impacts to stygofauna habitat.



7.6.3 Residual Impacts

There is no change to the residual impacts as a result of the proposed amendment compared to the s38F document.

Since the commencement of operations in 1969 the maximum observed reduction of the available habitat for subterranean fauna is 2.2m (6.7% change) which was limited to a period of 6 months during 1984. A 2.2m change represents a change from the maximum stygofauna habitat thickness of 33m to 30.8m which is not considered a significant impact due to over 90% of stygofauna habitat thickness available. This reduction in stygofauna habitat observed in 1984 is not expected to occur as a result of implementation of the proposal given the current proposal has lower abstraction volumes and the habitat remaining would likely be 95% or more.

As a result, the maximum allowable reduction in stygofauna habitat, which represents a less than 5% reduction, is not considered significant given the extent of remaining suitable habitat.

7.6.4 Discussion of Significance

Implementation of the proposal may result in a 5% change to subterranean fauna habitat. Since 2014 a maximum allowed reduction of habitat was set by DWER as a condition of the Corporation's licence to abstract, the criteria represent a less than 5% allowable reduction in habitat. A 5% change in watertable is not considered a significant impact given there is extensive fauna habitat remaining; 950 km² range extent and around 30m of saturated thickness remaining. This is not considered a significant impact to subterranean fauna, due to the maximum allowable change representing less than 5% of the available habitat and the ability for subterranean fauna to migrate to lower in the aquifer. The proposal is not likely to have a significant impact on subterranean fauna due to the availability of substantial suitable habitat remaining.

7.6.5 Regulation

The proposed amendment can be regulated under the RiWI Act and the 5C licence can be used to mitigate impacts to inland waters (refer to Table 4). The RiWI Act associated policy documents provides repeated references to the need to consider sustainable use of water resources, protection of the ecosystems and environment, and public interest considerations in decision-making. This will enable any subterranean fauna impacts to be considered under RiWI Act, via issuing of a 5C licence.

Regulation of the proposed amendment under the RiWI Act can be undertaken via clauses 7 and 22 of Schedule 2 of the RiWI Act, where the Minister has a broad discretion to consider anything. The assessment of impacts from the proposal can therefore be included under clauses 7 and 22 of Schedule 2 of the RiWI Act, via issuing of a 5C licence. The Minister's powers in clause 15 of Schedule 1 to impose terms, conditions and restrictions on a s5C licence are broad, including concerning the matters set out in the Appendix to Schedule 1 to the Act (e.g. use, management, protection and enhancement of any water resources and its ecosystem or the environment and monitoring) or any other matter relevant to the clause 7(2) matters. The Corporation's existing and expired licences include common conditions requiring an operating strategy (WRMOS), monitoring and reporting, so additional conditions can also be added to the 5C licence to enable regulation under the RiWI Act rather than a formal Part IV (of the EP Act) assessment. Regulation of potential impacts to subterranean fauna can be a standalone condition or changes added to the WRMOS.



7.6.6 Environmental Outcomes

Implementation of the proposed amendment is not expected to result in significant impact to stygofauna as the maximum allowable reduction in habitat is limited to 5%, with abundant remaining habitat available for stygofauna.

Implementation of the proposed amendment is not expected to significantly impact subterranean fauna and it is expected that the environmental out and EPA objective for this factor “*To protect subterranean fauna so that biological diversity and ecological integrity are maintained*” would be met.

7.6.7 Character of the proposed amendment

The character of the proposed amended will be substantially the same character as the referral and s38F document. The proposed amendment comprises the same activity of groundwater abstraction from the Millstream aquifer, but of lower abstraction volumes and durations which are likely to be less significant and resulting in lower (aquifer) habitat loss.

7.7 Mitigation Hierarchy

The mitigation hierarchy, as defined in the Statement of environmental principles, factors objectives and aims of EIA (EPA, 2023) has been applied for the proposal.

7.7.1 Avoid

The proposed amendment has avoided potential environmental impacts through the alternative water supply options, such as seawater desalination (either Water Corporation or third-party supplied), Harding Dam upgrades and alternative borefields.

Complete avoidance of groundwater abstraction is not feasible due to the critical need to maintain public water supply for the Scheme.

7.7.2 Minimise

The proposed amendment has minimised potential environmental impacts through the reduction in the duration, intensity, and extent of unavoidable impacts. The proposal includes staged reduction in abstraction volumes: up to 6GL/a with a contingency of 3GL/a until February 2027, reduced to 6GL/a until 2028, then further reduced to 5.5GL/a until 2032.

Implementation of the WRMOS minimizes impacts through the monitoring of pool levels, springflow, and groundwater levels, with trigger-based responses to environmental thresholds.

To further minimise reliance on the Millstream aquifer, the Corporation is actively developing a suite of alternative water supply options:

- Northern Borefield Development: In collaboration with Yindjibarndi Water and with seed funding from the DWER, a new borefield is being investigated north of the current Millstream Borefield. This initiative aims to diversify groundwater abstraction points and reduce pressure on the existing aquifer.
- Harding Dam Upgrades: Engineering improvements are planned to enhance the Harding Dam water treatment plant’s capacity to treat lower-quality water. These upgrades include membrane filtration enhancements, aeration systems, and leak detection across the distribution network. Consideration of a business case by State Treasury is underway, with works expected to commence following Treasury approval.



- Desalination Options:
 - Short-term: A temporary desalination plant is being considered, potentially integrated into the existing Burrup seawater supply scheme. This would provide up to 3GL/a of water and reduce abstraction from Millstream during the interim period (2027–2032).
 - Long-term: A permanent SDP is planned for delivery by 2032. Site selection and stakeholder engagement, including with MAC, are ongoing.
- Third-Party Supply Agreements: The Corporation is exploring a potential supply agreement with RTIO, which could provide up to 4GL/a from Stage 2 of RTIO’s Dampier SDP.
- Soft Market Sounding process has been launched to identify third-party suppliers capable of delivering water to the West Pilbara Water Supply Scheme. Yindjibarndi Water has been invited to participate, with the aim of fostering long-term partnerships.

These initiatives are complemented by demand-side measures, including the Waterwise Towns program, smart meter rollouts, leak detection, and public education campaigns. Together, these efforts form a comprehensive strategy to minimise environmental impacts while ensuring water security for the region.

7.7.3 Rehabilitate

No clearing of native vegetation is proposed and the proposed amendment is not expected to result in significant impacts that require rehabilitation. However, Water Corporation is working with the key stakeholders, MHCC and TWG to remedy erosion, by:

- Commissioning a fluvial geomorphology study (4DGeotechnics, 2024).
- Monitoring erosion and its impacts as part of the WRMOS.
- Collaborating with stakeholders YAC, DWER, and Department of Biodiversity, Conservation and Attractions (**DBCA**) through the MHCC and TWG to guide erosion management.
- Evaluating engineering solutions based on the fluvial geomorphology study, which may include stabilisation works, vegetation restoration, and flow control structures.
- Ongoing consultation with Traditional Owners to ensure that ACH values are respected in erosion remedy works.

It is noted that the fluvial geomorphology study concluded that this erosion is not directly caused by groundwater abstraction.

7.7.4 Offset

Offsetting is not required for the proposal as the residual impacts are not considered significant. The proposed abstraction up to 6GL/a with a contingency of 3GL/a until 2027 is not expected to result in significant impacts due to its short duration, followed by abstraction volumes within sustainable volumes.



8. Consultation

8.1 Consultation Undertaken

Since submission of the s38F response on 4 April 2025, the Corporation has undertaken targeted consultation with YAC, Yindjibarndi Water, EPA, DWER and third parties to investigate alternative water supply options and initiatives in an effort to manage groundwater abstraction from Millstream aquifer. The purpose of the consultation was to:

- Consult on the proposed initiatives to minimise abstraction from Millstream and seek support for the implementation of these, such as Yindjibarndi Water providing water demand management services and submitting the business case to State Treasury for upgrade works at Harding Dam water treatment plant and distribution system.
- Identify the investigations to be undertaken on alternatives groundwater source options to minimise potential impacts at Millstream, including distribution/drawdown of production bores and resampling and assessing of bores 7 to 12 supported by Yindjibarndi Water.
- Re-assessing the sustainable yield of the Millstream aquifer and undertaking the assessment in collaboration between the Corporation, DWER and YAC.
- Engage with third parties on the feasibility of supplying desalinated water as an interim water source or partnering on the provision of land for a temporary Water Corporation desalination plant.

8.2 Outcomes of Consultation

The outcomes of the consultation has provided a pathway towards staged reduction from Millstream, as detailed within Section 4.3. The key outcomes are summarised below:

- EPA – The Corporation has briefed EPA on the source replacement strategy, investigative initiatives, environmental factors, potential impacts and mitigation methods.
- YAC and Yindjibarndi Water – The Corporation has consulted YAC/Yindjibarndi Water on the potential to collaborate on a number of initiatives, including a new sustainable yield assessment at Millstream, distribution/drawdown on the Millstream production bores, and provision of water demand management services. Water Corporation is keen to partner on suitable opportunities to build a genuine long-term partnership.
- DWER Water – Consultation between the Corporation and DWER Water focused on the RiWI Act licence renewal, likely licenced volumes and timeframes, and the collaboration between YAC, DWER and Water Corporation on a sustainable yield assessment.
- Third-party suppliers (i.e. RTIO) – The Corporation has commenced engagement with a number of third parties on potential partnerships to either provide desalinated water or access to land for a temporary Water Corporation operated desalination plant. In addition, as of May 2025, SMS for third party water supply is on the market, which provides a transparent and equal opportunity for market participants to respond to the Corporation's need for third party water supply.

8.3 WPWSS Stakeholder Engagement Process

Management of the Scheme is a collaborative undertaking, with the following key stakeholders involved in the joint management of the two sources via the MHCC and TWG:



- The Corporation – water services provider that operates and maintains infrastructure to ensure water supply reliability to the Scheme.
- DWER - regulatory agency that manages WA water resources for the benefit of present and future generations, in partnership with the community.
- DBCA – agency that manages Millstream Chichester National Park, conserving native plants and animals and managing their sustainable use.
- YAC - Traditional Owner group representing Yindjibarndi people that develops, maintains and improves traditional connection with the surrounding land.
- Ngarluma Aboriginal Corporation (NAC) - Traditional Owner group representing Ngarluma people that develops, maintains and improves traditional connection with the surrounding land.

The MHCC and TWG were established to jointly manage the Scheme sources to ensure that water dependant values are protected. As noted above, both MHCC and the TWG include representatives from the Corporation, DWER, DBCA and YAC.

MHCC meets annually and was established to provide strategic advice to DWER on management issues associated with Harding Dam and Millstream Borefield.

The TWG comprises of operational and regional staff, involved in the day-to-day operation, monitoring and management of Harding Dam and Millstream Borefield. YAC has been represented by employees of Yindjibarndi Water, Right Water Co. and RFF Australia.

Monthly meetings with representatives from the Corporation, YAC and DWER were also established in December 2024 due to heightened interest in the performance of Millstream, Harding Dam and the WPWSS.

Outside the MHCC and TWG, the Corporation engages with DBCA and YAC on project related matters in the Millstream area. The Corporation has met with YAC’s CEO on several occasions to discuss the WPWSS. In addition, the Corporation has engaged DWER Water regarding the RiWi Act licence renewals.

8.4 Consultation Summary

A summary of key stakeholder engagement activities with the Aboriginal Corporations and government departments from 2020, is provided in Table 8.

Table 8: Stakeholder consultation on activities related to Millstream Borefield

Stakeholder	Date	Issues/topics raised
TWG. Apologies YAC and NAC.	22 Jan 2020	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, erosion works, National Park updates and catchment and land management issues including dam catchment issues.
TWG. Apologies YAC and NAC.	20 May 2020	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, National Park updates and catchment and land management Issues including dam catchment issues.
TWG and Millstream Site	15 Jul 2020	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction



Stakeholder	Date	Issues/topics raised
Visit. Apologies YAC and NAC.		and monitoring reporting, the Corporation Supply Planning, National Park updates and establishment of cross agency communication protocols prior to visiting Millstream Park. Visit to erosion works and flow sites at Millstream.
TWG. Apologies NAC.	9 Sep 2020	WG meeting with DWER, DBCA, YAC and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, National Park updates and catchment and land management issues including dam catchment issues.
YAC.	22 Sep 2020	Ethnographic Report for Millstream Supplementation Bores and Millstream Redrill project.
MHCC. Apologies YAC and NAC.	4 Nov 2020	Annual MHCC meeting with DWER, DBCA and the Corporation. Discussion on outstanding action items, TWG Report, annual monitoring, WPWSS updates, Millstream aquifer model update, discussion on supplementation bore condition assessment, erosion mitigation works and National Park management.
TWG. Apologies YAC and NAC.	20 Jan 2021	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, National Park updates and catchment and land management issues including dam catchment issues.
TWG. Apologies YAC and NAC.	17 Mar 2021	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, Millstream supplementation bore update, investigations into loggers on MAL bores and National Park updates.
TWG and Millstream Site Visit. Apologies NAC.	19 May 2021	TWG meeting with DWER, DBCA, YAC and the Corporation. Welcome to Country by YAC, discussed outstanding actions, the Corporation abstraction and monitoring reporting, the Corporation Supply Planning, National Park updates, YAC updates and erosion mitigation works. Visit to supplementation bores and erosion mitigation worksite.
TWG. Apologies YAC and NAC.	21 Jul 2021	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, the Corporation Harding WTP Reliability Investigation and National Park updates
YAC.	29 Jul 2021	Meeting with YAC Board and Elders to discuss options regarding erosion to Deep Reach pool. Included discussion on groundwater abstraction from the Millstream aquifer in relation to climate change.
TWG. Apologies YAC and NAC.	22 Sep 2021	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting and National Park updates.
MHCC. Apologies YAC and NAC.	17 Nov 2021	Annual MHCC meeting with DWER, DBCA and the Corporation. Discussion on outstanding action items, TWG Report, annual monitoring, WPWSS updates, WPWSS



Stakeholder	Date	Issues/topics raised
		Conjunctive Yield Modelling, Demand Prediction and Source Planning, erosion mitigation and National Park management.
TWG. Apologies YAC and NAC.	25 Jan 2022	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, Millstream 20 Series Bore Comparisons, Environmental Trigger and Criteria Projections and National Park updates.
TWG. Apologies YAC and NAC.	24 Mar 2022	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, Trigger and Criteria Projections and National Park updates.
TWG. Apologies YAC and NAC.	2 Jun 2022	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, the Corporation project approvals update, update on installation of loggers on MAL bores and National Park updates
TWG Millstream Site Visit, Apologies from NAC.	5 Aug 2022	Visit to Deep Reach erosion mitigation site, WC Deep Reach erosion mitigation long term concept proposal presentation and discussion, the Corporation reporting, abstraction from Millstream, Harding Dam, monitoring compliance and Millstream aquifer modelling update.
TWG. Apologies YAC and NAC.	21 Sep 2022	TWG meeting with DWER, DBCA and the Corporation. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, Millstream aquifer modelling, progress on securing desalination site, GHD report on erosion mitigation options, Livistona monitoring options, the Corporation project approvals and National Park updates.
YAC.	9 Nov 2022	Traditional Owner Meeting at YAC Centre Roebourne to discuss access to Harding Dam catchment area. YAC requested information on Millstream allocation and abstraction figures.
MHCC. Apologies YAC and NAC.	14 Feb 2023	Annual MHCC meeting with DWER, DBCA and the Corporation. Discussion on outstanding action items, TWG Report, annual monitoring, WPWSS updates, discussion on erosion mitigation and National Park management.
TWG. Yindjibarndi Water represented YAC. RTIO. Apologies from NAC.	7 Jun 2023	TWG meeting with DWER, DBCA, YAC and the Corporation. RTIO also attended. Discussed outstanding actions, the Corporation abstraction and monitoring reporting, National Park and YAC updates, and RTIO's Livistona Palm study.
TWG. Yindjibarndi Water represented YAC. Apologies from NAC.	14 Sep 2023	TWG meeting with DWER, DBCA, YAC and the Corporation. Discussion on outstanding action items, abstraction and monitoring update, supplementation project approvals and National Park management updates.
YAC.	9 Nov 2023	Meeting in which YAC requested information on Millstream allocation and abstraction figures.
TWG. Yindjibarndi Water represented	5 Dec 2023	TWG meeting with DWER, DBCA, YAC and the Corporation. Discussion on outstanding action items,



Stakeholder	Date	Issues/topics raised
YAC. Apologies from NAC.		abstraction and monitoring update, supplementation project approvals and National Park and YAC management updates.
YAC CEO.	19 Dec 2023	Meeting on YAC's preference to cease abstraction from Millstream due to the cultural significance and to discuss access to country.
Yindjibarndi Water representing YAC.	11 Mar 2024	Provision of last 20 years of compliance monitoring datasets: <ul style="list-style-type: none"> Water levels of all monitoring bores within the Millstream region. Abstraction data for the Millstream Borefield and Harding Dam. Harding Dam level.
MHCC. Yindjibarndi Water represented YAC. Apologies from NAC.	25 Mar 2024	Annual MHCC Meeting with DWER, DBCA, YAC and the Corporation. Meeting covered previous action items, TWG summary, annual monitoring review, decline projections, future source planning, YAC/NAC activities, park management and action response to Deep Reach triggers.
Yindjibarndi Water representing YAC.	04 Apr 2024	Provision of trigger and criteria modelling results March 2024 as presented to MHCC.
Yindjibarndi Water representing YAC.	23 April 2024	Provision of site co-ordinates for monitoring locations on Millstream aquifer on request from Yindjibarndi Water.
Yindjibarndi Water representing YAC.	1 May 2024	Provision of hydrogeological investigation and modelling reports for Millstream on request from Yindjibarndi Water.
Yindjibarndi Water representing YAC.	6 Jun 2024	Provision of historical monitoring results on request from Yindjibarndi Water.
YAC CEO.	Jun 2024	Meeting on finding a cost effective, reliable, and timely supply of water from the date of implementation of a reduction in groundwater allocation at Millstream Borefield and into the long-term.
Yindjibarndi Water representing YAC.	10-18 Jun 2024	Various email/phone requests for data. The Corporation proved range of historical data and information to assist Yindjibarndi Water Yield Assessment. <ul style="list-style-type: none"> Annual abstraction volumes for Millstream Borefield back to 1969. Corporate reports on investigations into alternative sources. Historical water quality data Millstream aquifer monitoring and production bores.
TWG. Yindjibarndi Water represented YAC. Apologies from NAC.	18 Jul 2024	TWG site meeting. Undertook cultural immersion at Juluwarlu, followed by a visit to Millstream to view Deep Reach and other local pools. The meeting allowed for a knowledge share and increased understanding between parties.
TWG. Yindjibarndi Water represented YAC. Apologies from NAC.	19 Jul 2024	TWG meeting with DBCA, DWER, YAC and the Corporation. Discussed monitoring, erosion remediation works, future vegetation surveys and increased reporting frequency.



Stakeholder	Date	Issues/topics raised
Yindjibarndi Water representing YAC.	1-13 Aug 2024	Various email/phone requests for data. The Corporation proved range of historical data and information to assist Yindjibarndi Water Yield Assessment. <ul style="list-style-type: none"> • Climate projection summaries. • Harding Dam abstraction and dam level since 1985. • Monitoring data from 1970 onwards. • Millstream aquifer bore construction logs.
YAC CEO.	11 Aug 2024	Meeting on the Corporation's commitment towards finding a cost effective, reliable, and timely supply of water for the Scheme into the long-term.
DWER Water.	21 Oct 2024	Meeting to discuss licence renewal. DWER provided feedback on the draft WRMOS and advised they are reviewing Yindjibarndi Water's Millstream Groundwater Study September 2024 report. DWER planned to provide feedback in writing.
TWG. Yindjibarndi Water represented YAC. Apologies from NAC.	11 Nov 2024	TWG meeting with DBCA, DWER, YAC and the Corporation. Discussed abstraction, monitoring, maintenance and remediation works and future vegetation surveys.
DWER Water.	29 Nov 2024	Meeting with DWER Director General and Water Corp CEO on interpretation of WPWSS licence triggers and criteria for supplementation.
DWER Water.	2 Dec 2024	Meeting to clarify aspects of DWER's request for information to support the renewal applications.
Yindjibarndi Water representing YAC.	5 Dec 2024	Provision of digital Millstream lithological and bore construction details in CSV format on request from Yindjibarndi Water.
Yindjibarndi Water representing YAC.	6 Dec 2024	Provision of November 2024 monitoring results in advance of monthly YAC, DWER and the Corporation meeting.
Yindjibarndi Water representing YAC and DWER.	10 Dec 2024	Monthly YAC, DWER and Water Corporation meeting: Discussed operating performance, environmental conditions and response activities to address impacts from operations.
Yindjibarndi Water representing YAC.	11 Dec 2024	Provision of Trigger and Criteria projection presentation to DWER and the Corporation meeting held on the 10 December 2024.
EPA.	16 Dec 2024	Acknowledgement of Millstream third-party referral during the Corporation and EPA chair engagement meeting.
Yindjibarndi Water representing YAC.	6 Jan 2025	Field visit and discussion on monitoring being undertaken. Recommendations provided by Yindjibarndi Water, which the Corporation currently reviewing.
Yindjibarndi Water representing YAC and DWER.	23 Jan 2025	Monthly YAC, DWER and Water Corporation meeting: Discussed operating performance, environmental conditions, groundwater modelling and response activities to address impacts from operations.
DWER Water.	29 Jan 2025	Meeting to discuss DWER's request for information to support the renewal applications.



Stakeholder	Date	Issues/topics raised
Yindjibarndi Water representing YAC.	11 Feb 2025	Provision of January 2025 monitoring results.
EPA.	19 Feb 2025	The Corporation provided update to EPA on the response to the third-party referral of abstraction of groundwater from Millstream. Discussed key environmental factors, RiWI Act process, climate change impacts, future abstraction and long-term source planning.
TWG. Apologies from NAC.	5 Mar 2025	TWG meeting with DBCA, DWER, YAC and the Corporation. Discussed abstraction, monitoring, maintenance, and remediation works and future vegetation surveys.
Yindjibarndi Water representing YAC and DWER.	11 Mar 2025	Field visit and discussion on monitoring being undertaken. Visit to production bores, monitoring bores 1E, 5B, Peters Creek and Woodley Creek.
EPA.	17 Mar 2025	Meeting between Water Corporation CEO and EPA Chair to brief EPA on Millstream groundwater abstraction referral, including status of response, groundwater abstraction volumes, alternative water source options and short-term source replacement strategy, and environmental factors.
DWER Water	28 Mar 2025	Letter providing an update on Water Corporation's actions to fulfil the request for further information to support the renewal of GWL105696 (application 063806) and SWL105715 (application 063804).
EPA	4 Apr 2025	Water Corporation submitted s38F response.
Yindjibarndi Water representing YAC and DWER.	9 Apr 2025	Provision of March 2025 monitoring results in advance of monthly YAC, DWER and the Corporation meeting.
Yindjibarndi Water representing YAC and DWER.	15 Apr 2025	Monthly YAC, DWER and Water Corporation meeting: Discussed operating performance, environmental conditions, groundwater modelling and response activities to address impacts from operations.
EPA.	17 Apr 2025	Notice requiring further information received from EPA requesting that, if applicable, a proposed amendment be submitted by way of s38C.
Yindjibarndi Water representing YAC and DWER.	2 May 2025	Discussion of carryover items from 15 April 2025 meeting: Licensing and new operating strategy (WRMOS) and Sustainable Yield Assessment draft.
DWER Approvals.	12 May 2025	Meeting between Water Corporation and DWER Deputy Director-General, Executive Directors and Director to provide a briefing on the Scheme, Millstream referral and s38F response. Discussions covered demand forecast, interim and long-term source options, potential approval requirements, Water Corporations consultation activities and demand management/water efficiency initiatives.
EPA.	14 May 2025	Water Corporation requested extension until 20 June 2025 to prepare proposed amendment by way of s38C.
Yindjibarndi Water.	15 May 2025	Discussion regarding the Yindjibarndi Water Proposal to undertake desktop assessment of options to spread the abstraction load in Millstream.



Stakeholder	Date	Issues/topics raised
TWG. Yindjibarndi Water represented YAC. Apologies from NAC.	20 May 2025	TWG meeting with DBCA, DWER, YAC and the Corporation. Discussed abstraction, monitoring, maintenance and remediation works and Millstream National Park management.
DWER Water	21 May 2025	Letter from DWER RE: Renewal GWL105696 AND SWL105715 – Request for additional Information. Letter in response to Water Corporation letter 28 March 2025.
YAC and Yindjibarndi Water.	22 May 2025	Water Corporation CEO and team met with YAC and Yindjibarndi Water on country to discuss alternative water source options, opportunities to partner on projects/services and working together on the Millstream sustainable yield study.
EPA.	29 May 2025	EPA granted extension to 20 June 2025 for submission of the proposed amendment.
DWER Water	04 Jun 2025	DWER request to WC to review their draft tri-annual report to the EPA on the West Pilbara Water Supply Scheme against the requirements outlined in EPA Bulletin 115. Feedback requested by the 20 June 2025.
Yindjibarndi Water.	09 June 2025	Discussed opportunities for the Corporation and Yindjibarndi Water to partner on remedial activities to support demand management, Harding improvements and Millstream activities.
EPA	20 June 2025	Water Corporation submitted (Rev 0) s38C Proposed Amendment to Referral (which has since been revised by this (Rev 1) document).



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Appendix A: Form – Request to amend a referred proposal under s.38C of the EP Act

Form

Request to amend a referred proposal under s.38C of the EP Act

Part A: Proponent information and proposal description			
1. Proponent information			
Name of the proponent/s (including Trading Name if relevant)		Water Corporation	
Australian Company Number(s) <input type="checkbox"/> OR Australian Business Number(s) <input checked="" type="checkbox"/>		28003434917	
Who is requesting to amend a proposal?		<input checked="" type="checkbox"/> Proponent <input type="checkbox"/> Authorised representative (an authorisation from the proponent should be provided).	
Name (print) Digby Short		Signature 	
Position	Head of Environment	Organisation	Water Corporation
Email	digby.short@watercorporation.com.au	Phone	(08) 9420 2038
Address	629 Newcastle Street		
	Leederville	WA	6007
Date	24 July 2025		
Does the referrer request that the EPA treat any part of the proposal information in the referral as confidential? <i>Provide confidential information in a separate attachment.</i>		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Does the referrer confirm that they consent to receive correspondence electronically?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Referral declaration for proponent and Authorised representative: I, Digby Short, of Water Corporation declare that I am authorised to refer this request on behalf of the proponent, and further declare that the information contained in this form is true and not misleading. Date: 24 July 2025			
Provide contact details for purposes of the assessment, if different from the above. <i>Include: name, physical address, phone, email.</i>		Elizabeth Hodges elizabeth.hodges@watercorporation.com.au (08) 6300 6694	

2. Pre-request discussions	
<p>Have you had pre-referral discussions with the EPA (including the EPA Services of DWER)?</p> <p><i>If so, provide name, date, and overview of discussions.</i></p>	<p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Water Corporation met with the EPA Chair and EPA Services in February 2025 to discuss the proposal and response to the third party referral.</p> <p>An initial response to the third party referral was provided to the EPA on 4 April 2025.</p> <p>Water Corporation met with the EPA Chair and EPA Services in late May 2025 to discuss the additional mitigation measures being undertaken for the s. 38C amendment to referral and consultation undertaken with key stakeholders.</p> <p>An initial s. 38C amendment request was submitted to the EPA on 20 June 2025.</p> <p>Water Corporation received correspondence from the EPA Chair on 9 July 2025 to consider revising the s. 38C application, given the volume and duration beyond 2032 was not specified.</p>
3. Proposal information	
Title of the proposal	Abstraction of Groundwater from the Millstream Aquifer
Description of the proposed amendment/s	<p>Water Corporation proposes to continue abstracting groundwater from the Millstream aquifer to supply West Pilbara Water Supply Scheme (WPWSS).</p> <p>The proposal is to continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.</p>
Proposal content document	Refer to Appendix B of the attached proposed amendment.
Have you provided electronic spatial data, maps, and figures in the appropriate format of the referred proposal before any change request?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Part B: Assessment of amendments	
1. Reasons and content for the proposed amendment	
Reasons for the proposed amendment/s	Refer to Section 4.1 of the attached proposed amendment.
Describe the content of the proposed amendment/s to the proposal	Refer to Section 4.2 of the attached proposed amendment.

Provide a consolidated updated Proposal content document	Refer to Section 4.3 of the attached proposed amendment.
Alternatives to the proposed amendment/s	Refer to Section 4.4 of the attached proposed amendment.
2. Regulatory information	
Proposal referral date	11 November 2024 (referral made by Yindjibarndi Aboriginal Corporation (YAC) third party)
Status of the referral	Refer to Section 5.2 of the attached proposed amendment.
Changes to decision making authorities or processes (if required)	Refer to Section 5.3 of the attached proposed amendment. The proposed amendment does not result in new or removal of decision-making authorities.
3. Identification of environmental factors and environmental effects	
Environmental factors	Refer to Section 7 of the attached proposed amendment.
Environmental effects	Refer to Section 7 of the attached proposed amendment.
Mitigation hierarchy	Refer to Section 7.7 of the attached proposed amendment.
Residual Impacts	Refer to Sections 7.2.3, 7.3.3, 7.4.3, 7.5.3, and 7.6.3 of the attached proposed amendment.
Specify if additional information is required	N/A
4. Consultation	
Consultation undertaken	Refer to Section 8.1 of the attached proposed amendment.
Outcomes of consultation	Refer to Section 8.2 of the attached proposed amendment.
Part C: Additional information (provide if required)	
1. Additional surveys, investigations and other information	
Discuss and provide additional information that has been obtained	N/A
2. Discussion of significance	
Change to the significance of the residual impact/s	The proposed amendment has resulted in a decrease in the environmental effects relevant to environmental factors.
Significant effect on the environment	The proposed amendment does not result in a significant effect on the environment.

Environmental outcomes	There is no change to the environmental outcomes as a result of the proposed amendment.
Character of the proposed amendment/s	The character of the proposed amended will be substantially the same character as the referral, s. 38F document.

Table: Other approvals

Decision-making authority. If DMA's are changing from the original referred proposal, please provide detail.	Legislation or Agreement regulating the activity	Approval required (and specify which proposal element the approval is related to)	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons)
Refer to Table 4 of the attached proposed amendment.			



Appendix B: Proposal Content Document

Proposal Content Document

Table 1: General proposal content description

Proposal title	Abstraction of Groundwater from the Millstream Aquifer
Proponent name	Water Corporation
Referrer name	Water Corporation
Short description	<p>Water Corporation proposes to continue abstracting groundwater from the Millstream aquifer to supply West Pilbara Water Supply Scheme (WPWSS).</p> <p>The proposal is to continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.</p>

Table 2: Proposal content elements

Proposal element	Location / description	Maximum extent, capacity or range
Physical elements		
Millstream Borefield	Figure 1 of the proposed amendment	<p>Production Bores PB1, PB2, PB3, PB4, PB5, PB6 - Crown Reserve 36991, Lot 55 Millstream</p> <p>Production Bores (unequipped) PB7, PB8, PB9, PB10, PB11, PB12 - Crown Reserve 36991, Lot 58 Millstream.</p>
Construction elements		
<i>Not applicable – groundwater abstraction is currently occurring with established assets.</i>		
Operational elements		
Groundwater abstraction from the Millstream aquifer	Figure 1 of the proposed amendment	To continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.
Rehabilitation		
<i>Not applicable – assets are in operation</i>		
Commissioning		

Not applicable – assets are in operation

Decommissioning

The proposal is for continued supply of water to the public. Bores will be decommissioned on a needs basis and in accordance with the 5C operating licence.

Other elements which affect extent of effects on the environment

Proposal time	Maximum project life	To continue groundwater abstraction from the Millstream aquifer up to 6GL/a with a contingency of 3GL/a to February 2027, then up to 6GL/a to 2028, then up to 5.5GL/a to 2032.
	Construction phase	Not applicable
	Operations phase	See maximum project life
	Decommissioning phase	Not defined