CENTRAL LAND COUNCIL

Submission to the NT Government on

Draft Western Davenport Water Allocation Plan 2023-2033

Draft Western Davenport Background Report 2023-2033

Draft Western Davenport Water Implementation Actions 2023-2033

12 May 2023

Contents

About the CLC

- The Central Land Council (**CLC**) is a Commonwealth Statutory Authority established under the *Aboriginal Land Rights (Northern Territory) Act (Cth) 1976* (***Land Rights Act***). The CLC has statutory responsibilities for approximately 780,000 square kilometres of land in the southern half of the Northern Territory (**NT**). Our functions include:

  a) ascertaining and expressing the wishes and opinion of Aboriginal people living in the area of the CLC as to the management of Aboriginal land in the area;

  b) protecting the interests of traditional Aboriginal owners of Aboriginal land;

  c) assisting Aboriginal people to take measures likely to assist in the protection of sacred sites on land (whether or not Aboriginal land); and

  d) consulting with traditional Aboriginal owners of Aboriginal land about any proposals relating to the use of that land.

- CLC also administers a range of programs for the benefit of its constituents in relation to environmental management, community development, governance, economic participation, cultural heritage, and customary practices.

- CLC is also a native title representative body under the *Native Title Act 1993* (Cth). We prepare native title applications, respond to development proposals with the potential to impact on native title rights and interests ('future acts'),[1] negotiate indigenous land use agreements and support many corporations representing native title holders known as prescribed bodies corporate.

[1] See generally *Native Title Act 1993* (Cth) Part 2 Division 3.

Introduction

- CLC provides this submission on the following documents for the water allocation process for the Western Davenport Water Control District (**Western Davenport District**):

  a) Draft Western Davenport Water Allocation Plan 2023-2033 **(Draft Plan)**

  b) Draft Western Davenport Background Report 2023-2033 **(Draft Background Report)**

  c) Draft Western Davenport Water Implementation Actions 2023-2033 **(Draft Implementation Actions)**

  (together, the **Draft Water Allocation Documents**).

- This submission must be read with the advice set out at Annexure A (**Vogwill Advice**). CLC engaged expert hydrogeologist Mr Ryan Vogwill to analyse the Draft Water Allocation Documents and underpinning modelling. CLC adopts the Vogwill Advice, and it forms part of this submission.

- CLC strongly objects to the content and structure of the Draft Water Allocation Documents and in particular, the minimisation of the contents of the Draft Plan. These documents are completely out of step with national policy standards. They also demonstrate a complete disregard for Aboriginal peoples' perspectives, Aboriginal cultural values, environmental health and evidence-based decision making.

- The Northern Territory Government's (**NTG**) strong desire to expedite water extraction at all costs informs the Draft Plan. Under the Draft Plan, water has been allocated before the collection of sound baseline data, before the development of stakeholder informed objectives and before an effective risk assessment process could inform any decisions made.

- Water plans must be informed by best-practice science and be subject to stakeholder advice and public scrutiny.[2] The NTG fails to adequately implement these fundamental elements and, in doing so, falls far short of national water policy set by the National Water Initiative (**NWI**). The Draft Plan is a massive step backward for water allocation and planning in the NT.

- This submission contains CLC's comments on the Draft Plan and its supporting documents. However, it should not be taken to reflect CLC's acquiescence in the proposed format, which we maintain is unacceptable. Our comments on the Draft Background Report and Draft Implementation Actions further demonstrate the severe inadequacy of the Draft Water Allocation Documents.

[2] Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory, 2004, Intergovernmental Agreement on a National Water Initiative (NWI), p. 3.

CLC's key concerns and positions on the Draft Water Allocation Documents

1. **CLC strongly objects to the minimisation of the contents of the Draft Plan, including the newly proposed structure of the Water Allocation Documents.**

CLC's position: The water allocation plan for the Western Davenport District, which is currently limited to the Draft Plan, must include all of the Draft Water Allocation Documents. The NTG must rectify the content of the Draft Water Allocation Documents to match best-practice water planning under the NWI and in other jurisdictions. The Draft Water Allocation Documents fall far short of these standards.

2. **The NTG appears to have minimised the information in the Draft Plan to protect its own interests with no regard for the negative impact this would have on the quality of decision making about water allocation in the Western Davenport District**

3. **In developing the Draft Water Allocation Documents, the NTG disregarded the views of traditional owners, CLC and the Western Davenports Water Allocation Committee (WDWAC).**

CLC's position: The NTG must re-write and release the Draft Plan for public comment in a form endorsed by the WDWAC. The NTG must release the minutes of the final WDWAC meeting on 24 January 2023.

4. **The Draft Plan fails to protect Aboriginal sacred sites and other cultural values.**

CLC's position: Any proposed water allocation plan must clearly state that one of its objectives is the *protection* of Aboriginal cultural values. The type of cultural values to be identified and managed for protection should not be in any way limited or diminished by qualifiers such as 'key' or 'significant'. All sacred sites require protection in accordance with NT law.

5. **Establishing an Aboriginal Reference Group will not result in the protection of Aboriginal cultural values.**

CLC's position: Any water allocation plan must clearly set out the mechanism for the protection of cultural values. This must involve assessments of Aboriginal cultural values with CLC and traditional owners for the drawdown area of each licence before licence approval. The Water Controller must take into account such assessments before making a Water Licence Decision.

6. **Traditional owners do not want to form a separate, non-statutory Aboriginal Reference Group. The NTG must establish a water advisory committee (WAC) for the entire term of the Plan. Traditional owners must make up the majority of members of the WAC.**

CLC's position: The WAC must continue for the entire term of the Plan. The WAC should be made up of majority traditional owners. These must be male and female representatives from all estate groups in the Western Davenport District, chosen by traditional owners in consultation with CLC. Traditional owners do not want to form a separate, non-statutory Aboriginal Reference Group.

7. **The Draft Plan fails to protect the environment.**

CLC's position: We do not accept that the preservation of environmental values needs to be balanced with economic and social benefits. The NTG must protect Groundwater Dependent Ecosystems (GDEs) and environmental values in their own right. All detrimental impacts to water dependent ecosystems as a consequence of consumptive water use must be avoided as far as

possible. Any water allocation plan for the Western Davenport District must cover all water resources in the Western Davenport District including the Hanson River paleovalley aquifer.

8. **The Estimated Sustainable Yield (ESY) contained in the Draft Water Allocation Documents is inherently unsustainable.**

CLC's position: The NTG must recalculate the ESY for the Central Plains water management zone by adopting a precautionary approach to a sustainable figure within *net* recharge of the aquifer.

9. **The NTG has not provided any substantive or satisfactory updates from previous modelling deficiencies for the Western Davenport District and has limited baseline data for a reliable groundwater model.**

CLC's position: The deficiencies in the groundwater model underpinning the Draft Water Allocation Documents identified by CLC must be addressed. This includes NTG undertaking the necessary action identified in this submission.

10. **The NTG has failed to provide, or not provided in a timely manner critical information requested from CLC.**

CLC's position: The NTG must make critical documents underpinning the Draft Plan available to the public for review and assessment. These documents include the Tickell and Zaar Report and Groves Note.

11. **CLC rejects the Draft Plan's inclusion of the Guideline in the Draft Plan.**

CLC's Position: CLC rejects the use of the Guideline to manage the impacts of GDEs. The Draft Plan must clearly set out the applicable limits of acceptable change to GDEs, and drawdown criteria (environmental water requirements) for GDEs, which have been considered and approved by WDWAC.

12. **The Draft Plan must classify the risk of irreversible damage to sacred sites and fragile ecosystems as high.**

CLC's position: The Draft Plan must include the risk assessment element. This must reflect a realistic and evidence-based assessment of risks, rather than an assessment which seeks to minimise risk levels. Some of the risks should be assessed as 'high' to 'extreme' due to: a) the lack of knowledge underpinning the Draft Plan, and b) the importance of ecological and cultural values.

13. **The Draft Implementation Actions are deficient. These deficiencies will not mitigate risks to the environment, GDEs, cultural values and groundwater resources.**

CLC's position: The Draft Implementation Actions need to be part of any water allocation plan for the Western Davenport District. The Draft Implementation Actions need to be carefully reviewed to ensure deficiencies are addressed.

14. **The Draft Plan does not comply with national standards set by the NWI.**

CLC's position: In light of the NTG's stated commitments to comply with the NWI, the Draft Plan must be re-drafted to comply with NWI.

The current structure of Draft Water Allocation Documents, including the limited contents of the Draft Plan, is highly problematic. In its current form, the Draft Water Allocation Documents will likely result in the substantial diminishment of a public resource and the destruction of Aboriginal

cultural values and GDEs. The NTG must amend the structure and content of the Draft Water Allocation Documents to reflect the advice and recommendations of the WDWAC and address CLC's and traditional owners' concerns. The WDWAC must approve any water allocation plan for the Western Davenport District prior to its release. Until such a plan is gazetted, there must be a moratorium to the grant of the water licences in the Western Davenport District. The CLC strongly opposes any reliance by the NTG on the Northern Territory Water Allocation Planning Framework in relation to the water allocation in the Western Davenport District. The framework is more than 20 years old (it was published on 6 May 2020). Reliance on that framework would result in the destruction of GDEs and cultural values.

1. CLC strongly objects to the minimisation of the contents of the Draft Plan, including the newly proposed structure of the Water Allocation Documents.

- The water allocation plan is the key statutory document for a water control district. The *Water Act 1992* (NT) (***Water Act***) makes this clear by establishing that:

  a) resource management in a water control district is to be in accordance with the water allocation plan;[3] and

  b) the Water Controller must consider any water allocation plan for the relevant water control district when making a decision about a water licence[4] (**Water Licence Decision**).

- When making a Water Licence Decision under the *Water Act*, the Water Controller does not have to consider all of the Draft Water Allocation Documents. Instead, the Water Controller only needs to consider the Draft Plan. The Water Controller is not required to consider the Draft Background Report and Draft Implementation Actions and the Draft Plan recognises this by stating:

  > ***"The Western Davenport 2023-2033 Background Report and Implementation Actions and other factors may be taken into account where relevant to the decision."***[5]

- It is disingenuous for the NTG to state that the Draft Background Report and Draft Implementation Actions are '*core documents*'. In actual fact, the documents have no statutory grounding in the *Water Act*, and as such the Water Controller can **completely disregard** them when making a Water Licence Decision. The NTG's description of the Draft Background Report and Draft Implementation Actions has no legal basis and is highly likely to mislead the public.

- The *Water Act* does not limit the contents of a water allocation plan in any way. In contrast, the NTG has deliberately diminished the value of the water allocation plan for the Western Davenport District. The Draft Plan severely limits the matters which the Water Controller must consider in making a Water Licence Decision. In its current form, the Draft Plan does not require the Water Controller to ensure the protection of cultural values, environmental values and **GDEs** when making Water Licence Decisions.

- This is a significant and deeply concerning departure from previous water allocation plans in the NT. With such sparse information, the Draft Plan cannot effectively be used to manage water resources in the Western Davenport District.[6] Additionally, the Draft Plan does not meet the statutory objectives of water allocation plans: these include the identification of the ESY, allocation of the ESY amongst beneficial uses, and ensuring total water use is less than the sum of each beneficial use.[7]

- The water allocation process is uncertain – it involves making difficult choices. If the Water Controller does not have adequate information to assist the making of a Water Licence Decision, there is a significant risk of detrimental consequences to cultural values, the environment, users of the resource, and the resource itself. These consequences, considered

[3] *Water Act 1992* (NT) (*Water Act*) s 22B(4).
[4] *Water Act* s 90(1)(ab).
[5] Draft Plan p.5.
[6] See *Water Act* s 22B(4).
[7] *Water Act* s 22B(5).

in light of the objectives of the *Water Act*, mean that the water allocation plan declared by the Minister must include detailed information underpinning:

- water management decisions;
- implementation activities;
- monitoring and evaluation components; and
- risk assessments.

- The NTG included all of these elements in the *Western Davenport Water Allocation Plan 2018-2021* (**2018 Plan**). They are key components of best-practice water planning under the National Water Initiative (**NWI**) and are standard in other jurisdictions.[8]

CLC's Position: The water allocation plan for the Western Davenport District, which is currently limited to the Draft Plan, must include all of the Draft Water Allocation Documents. The NTG must rectify the content of the Draft Water Allocation Documents to match best-practice water planning under the NWI and in other jurisdictions. The Draft Water Allocation Documents fall far short of these standards.

2. The NTG appears to have minimised the information in the Draft Plan to protect its own interests with no regard for the negative impact this would have on the quality of decision making about water allocation in the Western Davenport District.

- The NTG has attempted to justify its minimalist approach to the Draft Plan on the basis that it is 'easy to read'. Simultaneously, CLC does not believe that:
  - the Draft Plan is easy to read; or
  - the NTG is concerned about the Draft Plan's accessibility.
- CLC strongly suspects that the true intent behind the NTG's minimalist approach to the Draft Plan is to avoid litigation. During a meeting of the WDWAC on 3 October 2022, a NTG representative said:

> ***"The current format majority of committee do not endorse and do not want their name against it saying they endorse it as a committee, although noting structure is not for endorsement as it is a result of legislative responsibilities and to prevent future opportunity for litigation."***[9]

- The NTG has not communicated either the reason or the implications of this change to the public or traditional owners. By minimising the information contained in the Draft Plan, the NTG appears to be attempting to limit its accountability for Water License Decisions.
- CLC holds grave concerns about the NTG's purpose in formulating the Draft Plan. The NTG must listen carefully to the WDWAC, traditional owners, CLC and environmental groups in order to improve the water allocation plan for the Western Davenport District.

[8] NWI 2004; Environmental Defenders Office, 2022, 'October 2022 Update: Deficiencies in the existing water law and governance framework in the Northern Territory'.
[9] Western Davenport Ti Tree Water Advisory Committee Minutes - Meeting 6, 3 Oct 2022, p. 6.

3. In developing the Draft Water Allocation Documents, the NTG disregarded the views of traditional owners, CLC and the Western Davenports Water Allocation Committee (WDWAC).

a) The NTG disregarded the views of traditional owners when drafting the Draft Water Allocation Documents.

- At the request of the NTG, in September 2022 CLC invested significant time and resources to facilitate a meeting with a large group of traditional owners of the Western Davenport District.
- During these consultations, the NTG stated that one of the objectives of the new plan is to *'protect regional Aboriginal and other cultural values associated with water'.*
- During that meeting, traditional owners expressed the importance of protecting Aboriginal cultural values. For example, Derek Walker, a resident of Alekarenge, made it clear that *'This is for everyone to say. Everyone has to agree. Need to check with us every time. Every time. When it comes to water, when it comes to land. We got to keep our cultural values for our homeland for our future generations.'*
- The NTG's statements at that meeting were highly misleading. Instead of listening to traditional owners like Mr Walker, the NTG has removed the objective of protecting Aboriginal cultural values from the Draft Plan. The Water Controller, in issuing water licences, only needs to '***consider*** *Aboriginal and other cultural values dependent on water*'.[10]
- Traditional owners are deeply angry about this change. They expressed their anger and disappointment during a meeting held in late April 2023:

  > Alekarenge resident Graham Beasley said: '*they are wasting our time… we worked so hard. The government is cheap… they are just satisfying themselves. We are saying the same things as our elders told the government.*'
  >
  > Mr Beasley stated that the failure to protect cultural values: '*will stop everyone going into their lands. This is big trouble. It will cause fights – we don't want any big problems. They have already taken everything already. What more do they want? … They have already taken everything away from us.*'
  >
  > Kelantyerrang woman Sandra Morrison, said**:** '*Traditional owners of the country will get sick. They are destroying something important*.'
  >
  > Alakerenge resident Peter Corbett, said**:** '*government mob aren't listening… they replaced our input with their input… like taking our power, putting their power in… why can't the Minister listen to us, she's changing our plan… The government doesn't understand our values.*'
  >
  > Arrawajin man Michael Wilson said: '*they want to steal our culture*.'

a) The WDWAC did not endorse the Draft Plan.

- Water Advisory Committees are the primary statutory opportunity for stakeholder engagement in the water allocation process. The other avenue is the public comment process.

[10] Draft Plan, p 9.

- The role of the WDWAC was to:
    a. identify issues relevant to the implementation, review and preparation of water allocation plans;
    b. critically evaluate information;
    c. offer suggestions for approaches to water management that support the beneficial uses of water resource; and
    d. provide advice on opportunities for sustainable water resource development in the region.[11]
- CLC representative Mr Nick Ashburner joined a majority of the members of the WDWAC in explicitly not endorsing the Draft Plan. This was due to concerns with its development and its failure to protect cultural and environmental values. A majority of WDWAC members rejected 3 versions of the Draft Plan, most recently in its current form. Consequently, the NTG released the Draft Plan for public comment because it could not reach an agreement with the WDWAC as to its content and structure.
- On 24 January 2023, the WDWAC met for the final time prior to the release of the Draft Water Allocation Documents. A majority of WDWAC members:
    - noted that the Draft Plan demonstrates a significant departure from the comprehensive 2018 Plan to one of limited effect;
    - expressed a significant level of frustration with the NTG's consultation process; and
    - stated the ESY contained in the Draft Plan is unsustainable and far too high.
- During that meeting the NTG also assured the WDWAC that it would record a resolution that a majority of members did not endorse the structure and contents of the Draft Water Allocation Documents.
- The NTG media release accompanying the public release of the Draft Plan (**Media Release**) fails to accurately reflect the WDWAC's views. The Media Release only states that:
    - '*the draft plan was informed by robust debate and comments through the Western Davenport and Ti Tree Water Advisory Committee*';
    - '*…other key comments and concerns raised through the Committee have been addressed in the draft plan. The objectives of water sharing have been strengthened'*; and
    - *'…the plan describes the sustainable volume of water that can be taken for different beneficial uses.'* [12]
- The NTG did not satisfactorily address the WDWAC's concerns and as set out below, the Draft Plan's objectives have been substantively weakened.

[11] See Terms of Reference of WDWAC.
[12] DEWPS, Media Release: *Have Your Say on the new draft Ten-Year Western Davenport Water Allocation Plan*, 24 March 2023.

- As at the time of writing, the NTG has not published the minutes of the final WDWAC meeting on 24 January 2023. CLC is extremely concerned about this because it:
    - has curtailed stakeholder engagement;
    - misrepresents the advice that WDWAC provided and WDWAC's position; and
    - limits the information available to the public.

  In the interests of transparency, CLC strongly urges the NTG to release the minutes as a matter of urgency.

- In summary, the Draft Water Allocation Documents do not refer to the WDWAC's refusal to approve the Draft Water Allocation Documents and in particular, the Draft Plan. The Draft Background Report's assertion that the Draft Plan has been developed with input from the WDWAC[13] is highly likely to mislead the public. The Media Release does not accurately reflect the views of the WDWAC.

CLC's position: The NTG must re-write and release the Draft Plan for public comment in a form endorsed by the WDWAC. The NTG must release the minutes of the final WDWAC meeting on 24 January 2023.

4. The Draft Plan fails to protect Aboriginal sacred sites and other cultural values.

- Despite claiming to "*recognise the intrinsic connection of Traditional Owners to Country and value their ongoing contribution to managing the lands and waters",*[14] the Draft Plan does not protect Aboriginal cultural values at all.

- The 2018 Plan recognised that Aboriginal people from the Western Davenport District have a strong connection to country. One of its central objectives was to '*protect Aboriginal cultural values associated with water and provide access to water resources to support local Aboriginal economic development'.*[15]

- The Draft Plan states that the Water Controller need only **consider** '*Aboriginal cultural values and other cultural values dependent on water*'.[16] It also states that one of the associated outcomes should be that '*key Aboriginal cultural sites that rely on water are monitored and potential impacts of such sites are appropriately accounted for in water planning and licensing*'.[17]

- It is not enough to only 'monitor' 'key' cultural sites and 'account for' the potential impacts of such sites. CLC strongly disagrees with any suggestion that the protection of cultural assets associated with water should be balanced with the overall benefits provided by water resources.[18]

[13] Draft Background Report, p.7.
[14] Draft Plan, p. 2.
[15] 2018 Plan, p. 6.
[16] Draft Plan, p. 9.
[17] Draft Plan, p. 9.
[18] Draft Plan, p. 10.

- Damaging Aboriginal sacred sites is unlawful under the *Northern Territory Aboriginal Sacred Sites Act 1989* (NT)[19] (***Sacred Sites Act***). It follows that **all** water-related sacred sites in the Western Davenport District must be protected**.**

- Section 5.2 of the Draft Background Report purports to address *'considerations for protection of cultural uses*'.[20] In fact, that section contains no specific actions on how the Draft Plan will protect Aboriginal cultural values and sacred sites. This lack of specific actions is unacceptable to traditional owners because:

    - the Draft Water Allocation Documents represent the 4th iteration of Western Davenport water allocation plans declared under the *Water Act*; and

    - CLC has repeatedly suggested appropriate mechanisms for protecting cultural values in the context of water resource management (as below).

  Consequently, traditional owners are shocked that the NTG has not included a plan for how cultural values in the Western Davenport District will be protected. At a minimum, CLC asserts that protection of cultural values must take place in consultation with CLC.

CLC's position: Any proposed water allocation plan must clearly state that one of its objectives is the protection of Aboriginal cultural values. The type of cultural values to be identified and managed for protection should not be in any way limited or diminished by qualifiers such as 'key' or 'significant'. All sacred sites require protection in accordance with NT law.

5. Establishing an Aboriginal Reference Group will not result in the protection of Aboriginal cultural values.

- The NTG proposes to form an Aboriginal Reference Group '*to seek to document cultural water values and to balance the protection of key cultural assets associated with water with the overall benefits provided by the water resources*'.[21]

- The NTG has not provided CLC with the terms of reference for establishing this Aboriginal Reference Group. Traditional owners have also expressed a strong preference to be members of the water advisory committee (**WAC**) for the Western Davenport District and not a separate reference group.

- The Draft Implementation Actions do not contain any outcomes or actions for the protection of Aboriginal cultural sites.[22] It is concerned only with 'identifying', 'documenting', 'monitoring' and 'assessing'. The only mention of 'protection' comes under the indicator for 'other cultural values', not Aboriginal cultural values.[23]

- CLC does not consider that the establishment of an Aboriginal Reference Group, which would merely 'document cultural water values', is the appropriate mechanism to **protect** Aboriginal cultural values.

- The appropriate mechanism for protection of Aboriginal cultural values is undertaking an assessment of Aboriginal cultural values and sacred sites before licence approval. These

[19] s 35.
[20] Draft Background Report, p. 37.
[21] Draft Plan, p. 10.
[22] See Draft Implementation Actions section 4.2.
[23] Draft Western Davenport Water Implementation Actions 2023-2033, p. 11.

assessments must involve CLC and traditional owners for the drawdown area of the licence, in accordance with CLC's approach to other land use proposals. The Water Controller must take into account such assessments before making a Water Licence Decision. This is also in line with the Draft Territory Water Plan, which states that new water legislation will need to consider '*a framework for allocation decisions that sets in legislation the protections for … cultural values*'.[24]

CLC's position: Any water allocation plan must clearly set out the mechanism for the protection of cultural values. This must involve assessments of Aboriginal cultural values with CLC and traditional owners for the drawdown area of each licence before licence approval. The Water Controller must take into account such assessments before making a Water Licence Decision.

6. Traditional owners do not want to form a separate, non-statutory Aboriginal Reference Group. The NTG must establish a water advisory committee (WAC) for the entire term of the Plan. Traditional owners must make up the majority of members of the WAC.

- The Draft Plan states that WAC will be established '*where appropriate*'.[25]
- Given the importance of managing water resources in the Western Davenport District, it is absolutely necessary and 'appropriate' for a WAC to be established for the **entire term** of any water allocation plan.
- Traditional owners have made it clear that they want the WAC to continue for the duration of the plan. Traditional owners do not want to form a separate, non-statutory Aboriginal Reference Group. They want majority representation on the WAC. They want male and female representatives from all estate groups in the Western Davenport District. Traditional owners must be able to choose their representatives, and be assisted by CLC to do so.

CLC's position: The WAC must continue for the entire term of the Plan. The WAC should be made up of majority traditional owners. These must be male and female representatives from all estate groups in the Western Davenport District, chosen by traditional owners in consultation with CLC. Traditional owners do not want to form a separate, non-statutory Aboriginal Reference Group.

7. The Draft Plan fails to protect the environment.

- The NTG has substantively weakened the objective for environmental protection in the Draft Plan.
- The 2018 Plan's environmental objective was to '*meet the environmental water requirements of water dependent ecosystems*'.[26] In contrast, the only objective regarding environmental values in the Draft Plan is Objective 1, which now reads: '*Balancing the retention and preservation of key environmental values dependent on water with the overall benefits provided by the water resources*'.[27] The economic, cultural, and social aspects of water planning already have specific objectives under the Draft Plan and should not be included here.

[24] Draft Territory Water Plan, p. 30.
[25] Draft Plan, p. 15.
[26] 2018 Plan, p.6.
[27] Draft Plan, p.9.

- Furthermore, the Draft Plan contains no specific protections for ecosystem health or GDEs. The Draft Plan states that only '*key*' environmental values must be '*accounted for*'.[28] There is no clear requirement for protection. This is far weaker than the 2018 Plan which clearly stated that:

    a) '*Detrimental impacts to water dependent ecosystems as a consequence of consumption water use will be avoided as far as possible.*'[29]

    b) *'Any licensed use of water should include conditions to safeguard GDEs, monitoring commitments and contingency commitments'.*[30]

- The Draft Plan does not require economic development to be ecologically sustainable, in contrast to the 2018 Plan. The Draft Plan now states it must only be '*sustainable*'.[31] It is not clear what this means.

- These weakened environmental objectives and protections are coupled with lack of substantive action under the Draft Implementation Actions.[32] None of the listed actions or relevant indicators will contribute to '*balancing the retention and preservation of key environmental values with the overall benefits'*.[33] The actions will only result in identification, documentation, monitoring and assessment of environmental values. The 'indicators' for environmental health similarly only relate to monitoring.

- In order to be effective, the indicators must include substantive indicators of ecosystem health, including water quality, GDE health, and health of sacred sites. The actions must include appropriate triggers and responses if specified limits to change are exceeded.

- Furthermore, the NTG's application of the *Water Act*'s broad definition of 'environment' is inconsistent with the discrete role of the water allocation plan in Water Licence Decisions.

- The *Water* Act defines 'environment' to mean 'the physical, biological, economic, cultural and social aspects of humans'.[34] This is an extremely broad definition. Such a definition does not account for the intricacies of water planning, which involves the unique risks identified in this submission.

- CLC's view is that, in light of the NTG's reference to the NWI in the Draft Plan,[35] the Draft Plan must instead adopt the NWI's dual term of 'environmental and other public benefit outcomes'.[36] This has two interrelated aspects, being:

    - 'environmental outcomes': maintaining ecosystem function (e.g. through periodic inundation of floodplain wetlands); biodiversity, water quality; river health targets; and

[28] Draft Plan, p.9.
[29] 2018 Plan, p. 16.
[30] 2018 Plan, p. 11.
[31] Draft Plan, p. 10.
[32] See Draft Implementation Actions section 4.1.
[33] Draft Implementation Actions, p. 5.
[34] *Water Act* s 4(1).
[35] Draft Plan, p. 8.
[36] NWI 2004, p. 29.

- ‘other public benefits’: mitigating pollution, public health (e.g. limiting noxious algal blooms), indigenous and cultural values, recreation, fisheries, tourism, navigation and amenity values.

- The NWI’s definition recognises the unique context of water planning, and the risks and benefits that must be balanced. As such, the NWI definition accords with the both the intent of the Water Licence Decision making process, and the purpose of the water allocation plan in the *Water Act*.

- In order for the Draft Plan to be an effective tool in the Water Licence Decision-making process, the Water Controller must take account of identifiable environmental characteristics, rather than broad-brush definitions.

- CLC considers it unacceptable that the NTG decided that:

  - water from the Hanson River paleovalley aquifer was not considered in calculating the ESY; and

  - the take of water from that aquifer is not considered within the cap on water use defined under the ESY.[37]

  Any water allocation plan must cover all water resources in the Western Davenport District including the Hanson River paleovalley aquifer.

CLC’s position: We do not accept that the preservation of environmental values needs to be balanced with economic and social benefits. The NTG must protect Groundwater Dependent Ecosystems (GDEs) and environmental values in their own right. All detrimental impacts to water dependent ecosystems as a consequence of consumptive water use must be avoided as far as possible. Any water allocation plan for the Western Davenport District must cover all water resources in the Western Davenport District including the Hanson River paleovalley aquifer.

8. The Estimated Sustainable Yield (ESY) contained in the Draft Water Allocation Documents is inherently unsustainable.

- During the WDWAC meeting on 24 January 2023, the WDWAC members unanimously advised the NTG that the ESY in the Draft Plan is too large and is unsustainable.

- CLC’s key concerns for the ESY are as follows:

a) The ESY for the Central Plains water management zone is based on twice the annual net recharge.

  - The NTG has calculated the ESY using average annual recharge without factoring in the natural outflows from the groundwater system.

  - A sustainable ESY would be based on **average *net* recharge,** which takes into account the inflows and outflows. This is standard practice in other jurisdictions.

  - The average annual net recharge for the Central Plains water management zone is 46.9 GL per year, however the ESY in the Draft Plan for the Central Plains water

[37] Draft Plan, p11.

management zone is 81.5 GL per year. This is nearly twice the average annual net recharge of the aquifer.

- The ESY are not derived consistently for the various management areas:
    i. For the Davenport Ranges water management zone, the average annual net recharge is 13.5 GL per year and the ESY is 4.4 GL per year.
    ii. For the Southern Ranges water management zone, the average annual net recharge is 34.7 GL per year and the ESY is 1.8 GL per year.
    iii. For the Central Plains water management zone, the average annual net recharge is 46.9 GL per year and the ESY is 81.5 GL per year.
- A comparison between the 2018 Plan and the Draft Plan shows that the ESY is very similar for the Central Plains water management zone (87.7 GL per year to 81.5 GL per year). In contrast, the ESYs in the Davenport Ranges (11 GL per year to 4.4 GL per year) and Southern Ranges (39.6 GL per year to 1.8 GL per year) water management zones have been considerably reduced reflecting a precautionary approach. The ESYs are considerably less than the annual net recharge. Conversely, it is not clear why the NTG has not applied this precautionary approach to the Central Plains water management zone.
- The ESY for the Central Plains water management zone is not sustainable. Abstraction proposed at almost twice net recharge is not sustainable – it is managed depletion of the aquifer that will not ensure water is available for future generations. It will lead to widespread declining groundwater levels. Any drop in this water table risks the health of GDEs.
- The Central Plains water management zone is the most vulnerable to impacts as it contains the most groundwater dependent biodiversity and cultural assets. It also has the largest groundwater licences, both granted and pending, of the 3 water management zones in the Western Davenport District.
- When invited to present to the WDWAC, Mr Vogwill recommended that a standard precautionary approach to water resource management in other jurisdictions was to allocate 70% of annual net recharge. This will result in an ESY of no more than 32.83GL per year. Mr Vogwill's recommendations are far lower than the ESY contained in the Draft Water Allocation Documents. This is deeply concerning as 51.4GL per year of water licences a year have already been allocated from the Central Plains water management zone and there are a number of water licence applications for consideration by the Water Controller.

b) The NTG incorrectly uses the entire storage of the aquifer to calculate the ESY.

- Throughout the Draft Water Allocation Documents, the NTG incorrectly uses the full volume of available groundwater to assert that *'the majority of the water is retained in the environment to maintain important ecological functions and for cultural purposes and values of water in the region.'*[38]

[38] Draft Background Report, p. 39.

- This contradicts its own statements. The NTG's regional data in the Draft Background Report indicates that '*overall lower yields are associated with depths greater than 150mBGL in the Central Plains area. These lower yields may suggest that practical extraction depth in this part of the area is around 150mBGL*'.[39]
- If it is unlikely that there are productive aquifers below this point, then this depth should be the baseline for the quantitative aspects. This would substantially reduce storage estimates and the ESY.

- These issues with the ESY not only represent an unacceptable risk to the protection of GDEs and cultural values. The NTG's present methodology also:
  - exposes the NTG to expensive future water buybacks; and
  - creates doubt and uncertainty for investors in the Northern Territory.

CLC's position: The NTG must recalculate the ESY for the Central Plains water management zone by adopting a precautionary approach to a sustainable figure within net recharge of the aquifer.

9. The NTG has not provided any substantive or satisfactory updates from previous modelling deficiencies for the Western Davenport District and has limited baseline data for a reliable groundwater model.

- The NTG stated that it has completed predictive uncertainty and sensitivity analysis.[40] However, the Draft Water Allocation Documents contain no detail or prediction ranges from these critical modelling outputs.
- More importantly, neither the drawdown predictions nor the model predictions of pre-impact groundwater level utilise predictive uncertainty and sensitivity analysis (i.e. <15m depth their criteria for the limits of groundwater dependence). **It is likely that the predictive uncertainty will indicate that drawdown impacts are possible over a greater area and at a greater magnitude than currently proposed**.
- The NTG must present sensitivity and predictive uncertainty analysis to put predictions in a context of their uncertainty. Failing to do so is out of step with Australian Groundwater Modelling Guidelines, and is inconsistent with the statement of the NTG's own hydrogeologist at the September 2022 meeting in Tennant Creek: '*We should rate our uncertainty… In some places the model is out by a metre. In other areas it can be out by several metres…The size of the area makes it very hard to get an accurate model across the whole area*'.
- In regards to the reliability and sophistication of its groundwater modelling, the NTG states that its methodology has been graded in accordance with the Australian Groundwater Modelling Guidelines 2012. Classifications for reliability and sophistication range from Class 1 (lowest) to Class 3 (highest)[41]. The NTG states that:

> *"While many characteristics of groundwater model were graded Class 3, the model was ultimately graded Class 2 owing to the limited availability of information to the south east and north west of the main (Central Plains) aquifer system."*

[39] Draft Background Report, p.21.
[40] Draft Background Report, p. 29.
[41] Draft Background Report, p. 28.

- In response to this, Mr Vogwill expressed concern that the NTG model contains some elements closer to Class 1 (lowest reliability and sophistication). Mr Vogwill's analysis further revealed that, irrespective of reliability and sophistication, all models must incorporate sensitivity and predictive uncertainty, as detailed in this submission.

- CLC cannot accept anything less than Class 3 modelling, and nor should the NTG. This is so particularly in light of the lack of known information about the water source, which inherently reduces the reliability and sophistication of the NTG's modelling. The NTG itself acknowledges this fact.[42] In a system incorporating 3 tiers, the NTG's failure to provide Class 3 groundwater modelling is seriously concerning.

- To reiterate from previous CLC submissions and expert reports, remaining modelling gaps include:

    - a lack of spatially distributed data on aquifer geometry, lithology, hydraulic properties, water levels and water quality;

    - a lack of water level data and associated time series for much of the model domain; and

    - sparse, short duration single bore hole tests for aquifer testing which cannot determine storage properties.[43]

CLC's position: The deficiencies in the groundwater model underpinning the Draft Water Allocation Documents identified by CLC must be addressed. This includes NTG undertaking the necessary action identified in this submission.

10. The NTG has failed to provide, or not provided in a timely manner critical information requested from CLC.

- The NTG has not provided, or failed to provide in a timely manner, critical information which underpins the Draft Water Allocation Documents (particularly in the case of the background document and hydrogeological modelling) to the CLC when requested.

- These documents include:

    a) Tickell, S.J. and Zaar, U., (2022 (in-press)). *Groundwater resources of the Western Davenport area*. Northern Territory Department of Environment, Parks and Water Security. Water Resources Branch, Technical Report 7/2022 (**Tickell and Zaar Report**); and

    b) Groves, H. (2022). *Western Davenport Water Allocation Plan Water Resource Status - Technical Note: Summary Update 2022*. (**Groves Note**)

- For example, the Tickell and Zaar Report apparently *'provides a comprehensive hydrogeological conceptualisation of the Western Davenport area based on the most recent data collected from the region. The report also includes a groundwater resource risk map which categorises the Central Plains aquifer into risk categories associated with development of irrigated agriculture. The risks are based on aquifer properties including the capability of the aquifer to supply water, the depth of the water table and groundwater salinity*'.[44]

[42] Draft Background Report, p. 28.
[43] CLC Submission to NTEPA on Singleton Horticulture Project, 2022, section 2.2.
[44] Draft Background Report, p. 20.

- Given that the Tickell and Zaar Report underpins all of the recent hydrogeological setting and conceptualisation work, the NTG should have made this document available for review and assessment for the public concurrently with the Draft Plan. CLC was only provided with the draft Tickell and Zaar Report on 12 May 2023, the last business day before the due date for the submissions on Sunday, 14 May 2024. At a minimum, the Draft Plan should contain more detail from the Tickell and Zaar Report. The NTG's failure to provide such an important report has substantially limited the ability of CLC and the public to assess any potential new research underpinning the groundwater model.

CLC's position: The NTG must make critical documents underpinning the Draft Plan available to the public for review and assessment. These documents include the Tickell and Zaar Report and Groves Note.

11. CLC rejects the Draft Plan's inclusion of the Guideline in the Draft Plan.

- CLC rejects the NTG's inclusion of its 'Guideline: *Limits of acceptable change to groundwater dependent vegetation in the Western Davenport Water Control District*' (**Guideline**) in the Draft Plan to manage impacts on GDEs. The Guideline operates on the assumption that 30% of GDEs in the Western Davenport District can be destroyed.

- CLC has repeatedly reiterated the serious deficiencies of the Guideline. In summary:

  a) The threshold figure has no discernible scientific basis and according to the references provided is based entirely on incorrect interpretations from unrelated research with no relevance to the arid zone.[45]

  b) The Guideline does not take into account the relative value of GDEs, which means that 30% of the most ecologically and culturally significant GDEs could in theory be degraded or destroyed.

  c) GDEs are frequently associated with discrete sacred sites and broader cultural values.[46] Under the *Sacred Sites Act* all sacred sites must be protected. No sacred sites can be damaged. [47]

  d) The NTG did not consult traditional owners or CLC at any stage during its development of the Guideline. Instead, it was developed in consultation with Fortune Agribusiness, the holder of the Singleton Station pastoral lease, who sought such a guideline to allow its horticulture project to proceed. This alone is highly concerning.

- The Draft Plan states that applicable limits of acceptable change will be identified in '*guidelines published by the Department from time to time*'.[48] It leaves the limits completely within the discretion of the NTG without any need to consult CLC and the WDWAC.

- The NTG must require any water allocation plan to clearly set out the applicable limits of acceptable change to GDEs. The water allocation plan must clearly set out drawdown criteria

[45] Central Land Council Submission to the Northern Territory Environmental Protection Agency SINGLETON HORTICULTURE PROJECT Jan 2022; Central Land Council Critique of the evidence used for the guideline Limits of Acceptable Change for the Western Davenport Water Allocation Plan

[46] Donaldson, Susan Dale. 2021. SINGLETON WATER LICENCE ABORIGINAL CULTURAL VALUES ASSESSMENT – PUBLIC REPORT.

[47] s 35.

[48] Draft Plan, p. 13.

(environmental water requirements) for all GDEs, including aquatic and subterranean GDEs, to ensure their protection. The WDWAC must consider and approve these limits and drawdown criteria.

CLC's Position: CLC rejects the use of the Guideline to manage the impacts of GDEs. The Draft Plan must clearly set out the applicable limits of acceptable change to GDEs, and drawdown criteria (environmental water requirements) for GDEs, which have been considered and approved by WDWAC.

12. The Draft Plan must classify the risk of irreversible damage to sacred sites and fragile ecosystems as high.

- The Draft Plan fails to identify and address the risks of irreversible environmental damage due to deficiencies in modelling and uncertainty.
- The Draft Plan mentions the 'associated risks' of water extraction **only once** in the entire document (when discussing considerations of the WAC).[49] It does not elaborate on these risks or provide a risk assessment that must be considered by the Water Controller when making Water Licence Decisions.
- In contrast, the 2018 Plan contained an entire section on risk due to the limitations and assumptions in modelling of climate change, groundwater and GDEs.[50] Due to this uncertainty, the 2018 Plan described some of the risks to:

  a) overestimating the ESY;

  b) damaging GDEs, cultural values and water quality;

  c) insufficient water for Aboriginal Water Reserves;

  d) ineffective implementation of adaptive management; and

  e) uncertainty potentially impeding and/or damaging investment,

  as 'high' to 'extreme'. [51]

- Risk assessment is a critical element of water planning, however the previous iteration of the Draft Water Allocation Documents did not include any risk assessment. After strong objections from the WDWAC, the NTG added an element of risk assessment to the Draft Implementation Actions.[52] For the following reasons, CLC's view is that this is patently insufficient.
- The Draft Implementation Actions are not included in the Draft Plan. The Water Controller does not have to consider the risk assessment and risk management processes when making a Water Licence Decision. The task of allocating water requires, but is not limited to, consideration of the following risks:
  - How much of the ESY should be allocated to consumptive uses? Is there a risk of over-allocation?

[49] Draft Plan, p. 15.
[50] 2018 Plan, pp. 59-64.
[51] 2018 Plan, pp. 59-64.
[52] Draft Implementation Actions, p. 25-29.

- If so, what the consequences and how will that be managed?
- Is there a risk allocations to the environment are insufficient to protect the resource and dependent ecosystems and if so, how is that to be managed?

Accordingly, the NTG must include risk assessments and risk management processes in the Draft Plan. The NTG's failure to include any consideration of risk is out of step with the NWI.

- By developing and adding risk assessment **at the end** of the planning process and **after** water has already been allocated to beneficial uses, the NTG defies best-practice water management. In doing so, the NTG negates the principal aim of a risk assessment. Viewed in this light, CLC is strongly concerned by the NTG's problematic approach to water planning that underpins the Draft Plan.
- According to Mr Vogwill, the risk assessment presented in the Draft Implementation Actions is highly subjective and should have higher residual risk ratings after completing the proposed management activities. The risk assessment itself describes most of the current residual risk as being 'Low' or 'Very Low'.[53] NTG staff developed these risk assessments without any input from the WDWAC. These risk ratings are inconsistent with the views of the WDWAC's members, who were united in expressing that the lack of knowledge of the Western Davenport District, together with the importance and sensitivity of the GDES, means that the risk level is high.
- Mr Vogwill also notes that the adaptive management framework is generic and not specific enough. CLC is deeply concerned about the adaptive capacity of the Draft Plan to address significant risks, particularly given the likelihood of exponential increases in extraction during the period of the Draft Plan.

CLC's position: The Draft Plan must include the risk assessment element. This must reflect a realistic and evidence-based assessment of risks, rather than an assessment which seeks to minimise risk levels. Some of the risks should be assessed as 'high' to 'extreme' due to: a) the lack of knowledge underpinning the Draft Plan, and b) the importance of ecological and cultural values.

13. The Draft Implementation Actions are deficient. These deficiencies will not mitigate risks to the environment, GDEs, cultural values and groundwater resources.

- CLC is gravely concerned about the Draft Implementation Actions. The Draft Implementation Actions are not part of the Draft Plan, and consequently the Water Controller does not need to consider any failure to complete these Draft Implementation Actions before making a Water Licence Decision.
- Furthermore, CLC has identified several deficiencies relating to the Draft Implementation Actions noting that it is not an exhaustive list:
- A monitoring program should contain details of exact locations, the frequency of water levels and water quality monitoring. Some of this information is missing (for example, measurements in discrete sites or the planned network expansion for GDE protection). Mr Vogwill considers that the coverage of sites in Figure 3 in the Draft Implementation Actions is sparse, and noted that '*it is unclear how this will provide sufficient information on all 3 types*

[53] Draft Implementation Actions, Schedule G, pp. 25-29.

of GDEs that are current poorly understood in terms of groundwater dependence and environmental water requirements (EWRs)'.[54]

- The NTG has set out actions related to key environmental issues.[55] However, the proposed timing of a number of actions are problematic. For example:
    - *Define regional scale map of key environmental values associated with water including surface water springs:*[56] this is proposed to be completed in 2033, however, this needs to be completed now to ensure the protection of key environmental values.
    - *Releasing GDE health and monitoring guidelines for use by the department and licence holders to enable the GDE condition to be assessed*:[57] this is proposed to be completed in 2023 to 2024. However, a lot of the studies required to produce these guidelines are proposed to be completed after 2024.[58]

CLC's position: The Draft Implementation Actions need to be part of any water allocation plan for the Western Davenport District. The Draft Implementation Actions need to be carefully reviewed to ensure deficiencies are addressed.

14. The Draft Plan does not comply with national standards set by the National Water Initiative

- Despite claiming that the NTG is 'committed to the Intergovernmental Agreement on a National Water Initiative (NWI)',[59] the Draft Plan does not meet the key elements of the NWI. This is because the NTG has:
    a) Failed to consult effectively with traditional owners and failed to ensure '*inclusion of indigenous representation in water planning wherever possible'*.[60] In developing the Draft Plan, the NTG has curtailed Indigenous participation by presenting information that is highly likely to mislead, and by disregarding traditional owners' perspectives;
    b) Failed to maintain the key NWI objective of '*transparent, statutory-based water planning*'[61] by unacceptably limiting the contents of a statutory water allocation plan. This is despite the WDWAC, CLC and other stakeholders repeatedly rejecting this approach;
    c) Removed protections for environmental values from the Draft Plan, contravening NWI objective iii: '***statutory*** *provision for environmental and other public benefit outcomes, and* ***improved*** *environmental management practices'*.[62] In contrast, the Draft Plan contains weaker protections for the environment than the 2018 Plan.

[54] Vogwill Advice, p.15.
[55] Draft Implementation Actions, section 4.1.
[56] Draft Implementation Actions, p.10.
[57] Draft Implementation Actions, p.10.
[58] Draft Implementation Actions, p.10.
[59] Northern Territory Government (2023) Draft Western Davenport Water Allocation Plan 2023 - 2033. Department of Environment, Parks and Water Security: Northern Territory, Australia, p 8.
[60] Commonwealth of Australia and the Governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Northern Territory, 2004, Intergovernmental Agreement on a National Water Initiative (NWI), p 9.
[61] NWI 2004 p 3.
[62] NWI 2004 p 4.

d) Removed protections for cultural values from the statutory water allocation plan. Under the NWI ii): '*water plans **will** incorporate indigenous social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed*'.[63] Indigenous objectives, as traditional owners made clear to the NTG in September 2022, prioritise **protection** of cultural values and sacred sites.

e) Removed considerations of risk and uncertainty from the statutory water allocation plan, contravening NWI objective vi): *'clarity around the assignment of risk arising from future changes in the availability of water for the consumptive pool'*.[64] CLC is extremely concerned that the NTG has not included these elements in the Draft Plan. Instead it has included them within the non-statutory Draft Implementation Actions, and at the end of the development process.

f) Failed to describe **the risks of climate change** on the water resources[65] in the Western Davenport District in the Draft Water Allocation Documents.

g) Removed the implementation and monitoring plans (including performance monitoring) from the statutory water allocation plan.

h) Removed the adaptive management framework from the statutory water allocation plan.[66]

- The NWI *defines* water plans as '*developed in consultation with all relevant stakeholders on the basis of best scientific and socio-economic assessment, to provide secure ecological outcomes and resource security for users.'*[67]
- The Draft Plan fails to provide secure ecological outcomes and resource security for users and does not meet the definition of a Plan under the NWI.
- CLC cannot support a water allocation plan that does not meet the minimum standards established under the NWI and is not precautionary in nature.

CLC's position: In light of the NTG's stated commitments to comply with the NWI, the Draft Plan must be re-drafted to comply with NWI.

[63] NWI 2004 p 9.
[64] NWI 2004 p. 4.
[65] NWI 2004, p. 35.
[66] NWI 2004, p. 5.
[67] NWI 2004, p. 3.

Annexure A: Memorandum - Western Davenport Water Allocation Plan (2023-2033) and Supporting Documents Review (Vogwill Advice)

MEMORANDUM - WESTERN DAVENPORT WATER ALLOCATION PLAN (2023-2033) AND SUPPORTING DOCUMENTS REVIEW

PREPARED FOR | Central Land Council - Norther Territory

PREPARED BY | Hydro Geo Enviro Pty Ltd, Dr Ryan Vogwill, Director

DATE | 2/05/2023

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Introduction

In response to the request from the Central Land Council (CLC) the following documents have been reviewed by Hydro Geo Enviro:

- Draft WDWAP BACKGROUND Mar 2023.pdf;
- NEW Draft WAP Mar 2023.pdf; and
- DRAFT Implementation Actions MAR WAP.pdf.

This review will take the form of a summary, covering all the documents, followed by individual points identified during the review of each document. Also note that where pages numbers are referred to, these are the PDF file page numbers not those in the header/footer of the document.

Summary

The Water Allocation Plan (WAP) and associated documents (the background and implementation documents) have been reviewed in the context of the CLCs interests in the Western Davenport area. As an overall opening comment, The WAP has become more generic compared to previous versions. In many ways the WAP and associated documents contain less scientific detail than previous versions. In other jurisdictions in my experience these documents typically become more detailed and robust in progressive iterations. The risk assessment presented is highly subjective, I would have assigned higher residual risk ratings post the proposed management activities. The adaptive management framework is generic and often not specific enough.

With respect to comments and issues raised in my previous reviews, where these issues have now been included in the revised WAP and associated documents, they have not been substantively addressed. For example, predictive uncertainty and sensitivity analysis have been completed according to the background document for the WAP. But no detail or prediction ranges from these critical modelling outputs are presented or included in the depth to groundwater predictions, the assessment of drawdown and potential for groundwater dependant ecosystem (GDE) impacts.

In the context of predictive uncertainty, some of the relevant guiding principles from the Australian Groundwater Modelling Guidelines (Barnett et al., 2012) are as follows, with Guiding Principal 7.6 of particular relevance:

- Guiding Principle 6.1: All model predictions are uncertain. The modelling process should acknowledge and address uncertainty through an appropriate uncertainty analysis (refer to Chapter 7).
- Guiding Principle 7.1: Because a single ‘true’ model cannot be constructed, modelling results presented to decision-makers should include estimates of uncertainty.
- Guiding Principle 7.6: Uncertainty should be presented to decision-makers with visual depictions that closely conform to the decision of interest.

Another issue that has now been included in the revised WAP but not substantively addressed relates to aquatic and subterranean GDEs. Although they are included in the revised plan text no drawdown criteria (environmental water requirements) are presented to protect them. Aquatic GDE mapping is also from a 2009 source, so likely not up to date and is not exhaustive.

Critical documents that underpin the WAP (particularly in the case of the background document) have not been made available to the CLC when requested. The two main documents in this context are:

- Tickell, S.J. and Zaar, U., (2022 (in-press)). Groundwater resources of the Western Davenport area. Northern Territory Department of Environment, Parks and Water Security. Water Resources Branch, Technical Report 7/2022; and
- Groves, H. (2022). Western Davenport Water Allocation Plan Water Resource Status - Technical Note: Summary Update 2022.

In my opinion the reduced detail in this WAP even further calls into question allocation limits that are nearly twice the average annual net recharge in the Central Plains management area. The allocation limits/estimated sustainable yield (ESY) do not appear to be derived consistently for the various management areas. To be specific:

- For the Davenport Ranges management area, the net recharge is 13.5 GL and the allocation limit is 4.4 GL;
- For the Southern Ranges management area, the net recharge is 34.7 GL and the allocation limit is 1.8 GL; and
- in the Central Plains management area, the net recharge is 46.9 GL and the allocation limit is stated as 81.5 GL.

A comparison between the previous WAP version (2018-2021) and this version (2023-2033) shows that the allocation limit/ESY is very similar for the Central Plains management area (87.7 GL/yr to 81.5 GL/yr). In contrast in the Davenport Ranges (11 GL/yr to 4.4 GL.yr) and Southern Ranges (39.6 GL/yr to 1.8 GL/yr) management areas allocation limits have been considerably reduced.

For the Davenport and Southern Ranges management areas in my opinion the ESYs are consistent with a precautionary approach with ESYs considerably less than average annual recharge. This is however in contradiction to the ESY being nearly double average annual net recharge in the Central Plains management area. The Central Plains management area is the most vulnerable to impacts as it contains the most groundwater dependent biodiversity and cultural assets. It is also the area with the largest groundwater allocations licenses both granted and pending.

Climate in the groundwater model utilises the observed post 1970 data, which is a wetter period than the long-term average. The wetter period occurs primarily as an increased frequency of high rainfall years but periods of low rainfall also occur. It is important to better understand the sensitivity of groundwater levels in the area to this observed climate variability. I would recommend a groundwater model scenario-based analysis, which would assess the variability of groundwater levels under a range of climate scenarios. This scenario analysis would take the form of a series of years representing a dry period, a series of years representing an average period and a series of years representing a wet period. This would be a robust approach to look at the implications of the proposed ESY on groundwater levels and GDEs under a range of future climates. This should have been completed as part of the sensitivity analysis, which according to the WAP background document, has been completed but is not presented.

There is also an ongoing issue (in all of WAP versions) with the use of model derived highly uncertain groundwater levels to estimate the area of GDE impact risk. For example, the WAP background document correctly identifies that Thring Swamp is a high value biodiversity and cultural asset that

has a depth to groundwater of 5m or less. Available groundwater data from one of the bores near Thring Swamp (see figure below) show that the depth to groundwater at that location is consistently below 5m, has been 0m in 2011 (i.e. at the surface) and is generally about 1.5m. This area is predicted to impacted by drawdown but the lack of predictive uncertainty analysis of the groundwater modelling makes it difficult to assess the timing and magnitude of drawdown. The groundwater model does not accurately (see figure below) represent this important biodiversity asset/high cultural value site, which urgently needs a detailed assessment of aquifer connectivity and groundwater dependence. Showing all depth to groundwater contours <15m at 1m interval would be preferable to facilitate comparison with measured groundwater data.

As a final note, although it is outside the scope of this review, it may be prudent to assess how many of the previous WAP's implementation activities (see section 8.4.1 WAP implementation activities in the 2018-2021 WAP) have been completed and how many are being rolled into the current WAP version.

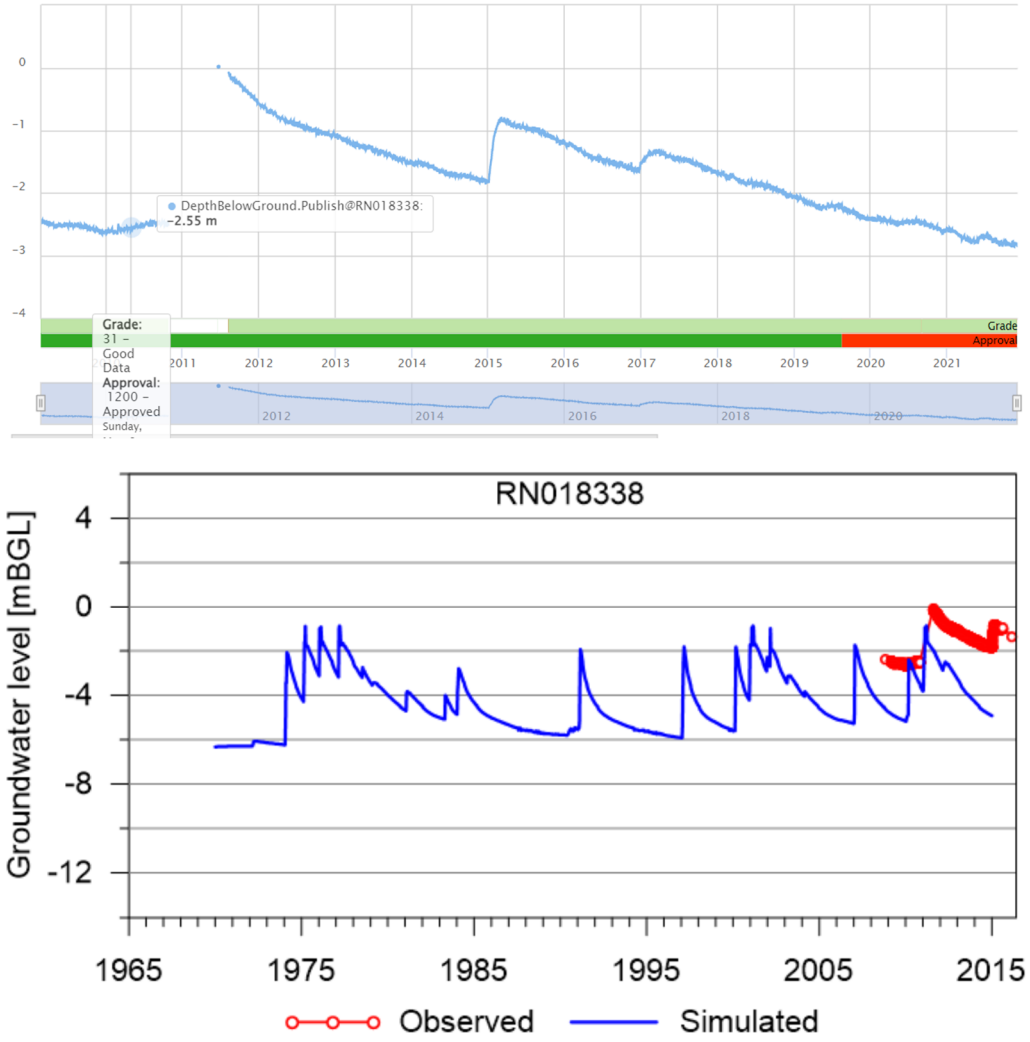

Figure - (Upper) Thring Swamp bore RN018338 (Lower) model calibration hydrograph from Knapton, (2017). Note the difference with the model prediction showing the bore fluctuating from ~2-6m below the surface instead of ~0-2m.

Review of Draft WDWAP BACKGROUND Mar 2023.pdf

Page 7 - "An updated water allocation plan for the period 2023 - 2033 (the draft plan) has been developed with input from the Western Davenport and Ti Tree Water Advisory Committee (the Committee)."

> Comment - Based on the comments from the committee I've read (Update on WDWAP - WAC meeting 24 Jan 2023.docx) all bar one committee member rejected this document and have major concerns with this WAP version and the revision process. The public consolation was posed as way to resolve this impasse. This statement suggests (indirectly) that the committee has approved this plan. I'd suggest that this is removed this until the committee has endorsed this plan.

Page 7 - "The result is a streamlined water allocation plan that meets the legislative requirements and is easy to read." and "As part of the department's commitment to the National Water Initiative".

> Comment - Although not core to my area of expertise I suspect that there are some issues with how well this meets many aspects of the NT and federal governments legislation especially the National Water Initiative (NWI). Clause 69 for example and note this NWI definition:
>
> > ***environmentally sustainable level of extraction*** – the level of water extraction from a particular system which, if exceeded would compromise key environmental assets, or ecosystem functions and the productive base of the resource.
>
> Proposed abstraction in the Central Plains is in excess of net recharge by some margin so will impact the productive base of the resource, impact to 30% of their definition of GDEs (which might be an underestimate and has no prioritisation or ranking od GDEs) may compromise key environmental assets.

Page 8 - "A detailed report on community engagement including the role and activities of the Committee, will be issued once consultation on the draft water allocation plan is complete, and the new plan is declared by the Minister."

> Comment - Given the Committee's comments on the plan this seem disingenuous. Their comments should be made public in this context?

Page 10 - "Central Plains - a large regional aquifer that is **high yielding**"

> Comment - High yielding hasn't been proven for the majority of the area.

Page 10 - "The understanding of the resources was improved through a number of key investigations conducted during 2018-2022 by the department, Geoscience Australia (GA), the National Water Grid Authority (NWGA) and other private companies. Data acquisition for these investigations included:"

> Comment - There is insufficient detail on these activities and limitations therein. For example, there is insufficient water monitoring data to provide a robust transient calibration for much of the model's domain. How much actual acquisition of data has occurred? Has all of this been incorporated in the model? It appears that the model and modelling report haven't been updated since the 2017 version that is cited in the WAP.

Page 10 - 3.2. Climate and rainfall

Comment - it is important to note that potential evaporation is higher than rainfall every month, this will limit the amount recharge that occurs to only during periods of intense rainfall. Average rainfall is less important than the frequency of high (>~50mm) rainfall events. SILO data is the best available so there is no issue with the use of that dataset. I also note that the assessment of rainfall events sufficient to cause recharge has occurred later in the document.

Page 13 - "Both charts provide evidence of an increasing trend in rainfall across the district since approximately 1972."

Comment - The data isn't that simple. An annotated version of the climate graph from the WAP background document is shown below. There is a period of average to less than average rainfall that spans 1980 to 2000 (see yellow arrows). The series of 4 significant rainfall years in the late 70's accounts for about half of the "increasing rainfall trend" at Ali Curung. This effect is even more pronounced in the Barrow Creek dataset with rising trend in the 4 late 1970's years, 2001, 2002, 2009 and 2010 accounting for this increasing trend.

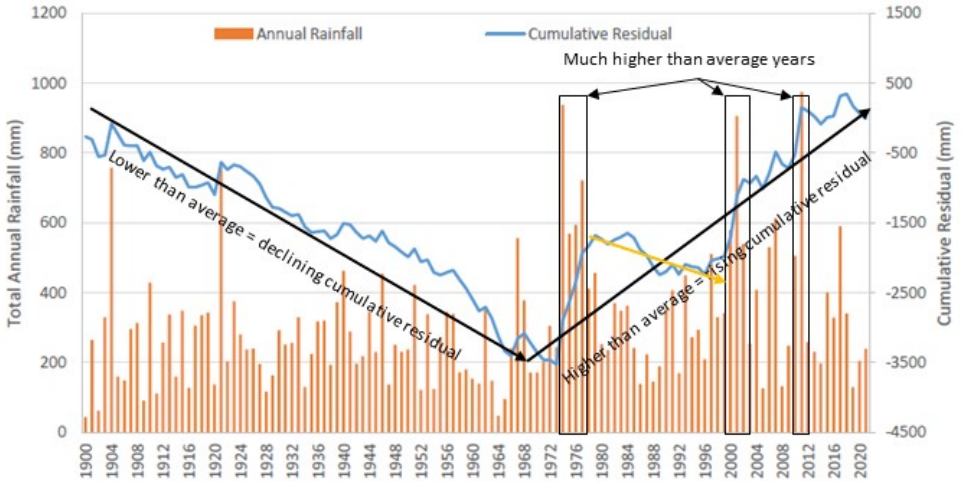

Figure 6. Cumulative residual rainfall (mm) measured at Ali Curung (BoM Station ID 015502)

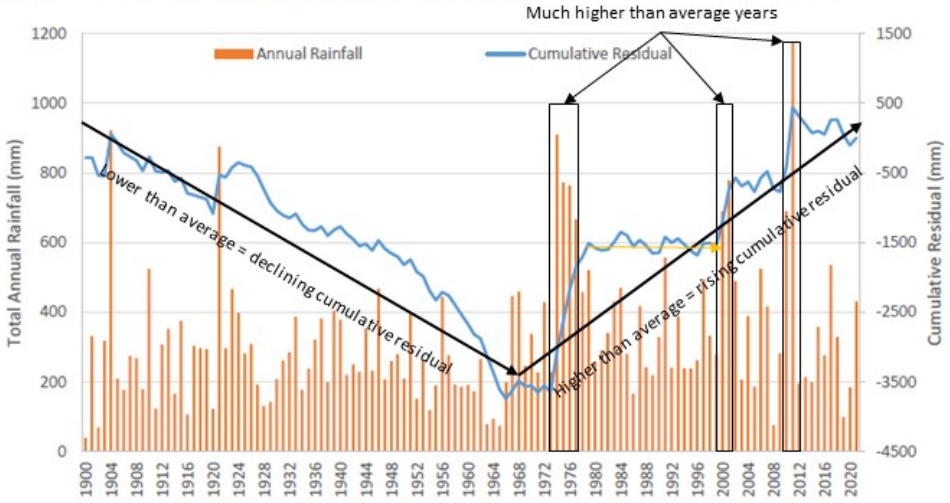

Figure 7. Cumulative residual rainfall (mm) measured at Barrow Creek (BoM Station ID 015525)

Page 15 - “Crosbie et al. (2013) states that results from such models should be presented using a risk analysis framework, which “incorporates the uncertainty associated with differences between Global Climate Models, thus [acknowledging] this inherent and possibly irreducible uncertainty””.

> Comment - I agree, as previously stated the NTG has not presented any uncertainty for their groundwater modelling used to underpin this plan.

Page 15 - “***This data inherently allows for other trends*** as noted in the State of the Climate 2020 Report, such as ***a decrease in the number of tropical cyclones*** in the Australian region since 1982, high variability of rainfall in northern Australia, and a continuing trend of more frequent compound extreme events (BoM & CSIRO, 2020).”

> Comment - It is unclear how the chosen groundwater modelling climate scenario ensures this (bolded italics text above) is the case. I would recommend that they do some scenario analysis on climate sensitivity (low, medium and high) with their models focussing on the frequency of extreme events, compound events and potential evaporation.

Page 15 - “These figures clearly highlight the difference between artificially simulated potential evaporation for the period 1900-1970 and observed or derived potential evaporation for the period 1970 to 2021.”

> Comment - The pre 1970’s data is not particularly useful or relevant as the groundwater model doesn’t cover this period. I also think that annual total potential evaporation would be a better way to look at the recent (post 70’s) data.

Page 16 - “The study concluded that new AEM data suggests the Cambrian units of the Wiso Basin and Georgina Basin are connected, and act as an equivalent hydrostratigraphic unit. However, it was reported that a more detailed interpretation and data infill in the area where the Wiso Basin and Georgina Basin meet would improve this conceptualisation.”

> Comment - It is not definitive in my experience to conclude this based on AEM data alone, you need some geology data (cores/drill logs) and some aquifer testing data which spans the hydrostratigraphic boundary.

Page 16 - “Hydrochemistry data also revealed that the Central Plains of the district is characterised by good quality groundwater, suggesting irrigated agriculture could be supported in this area.”

> Comment - This is a simplistic endorsement of irrigated agriculture in the area as it doesn’t include salinity risk etc.

Page 17 - “3.2.2.2. Mapping the Future”

> Comment - No references are included so we don’t know the exact source of these comments from the Mapping the Future (MtF) project.

Page 17 - 3.2.2.3. National Water Grid Authority

> Comment - This section is non-specific, has no references and no substantive results presented. This adds little apart from concluding “we don’t have enough data to make an informed decision of secondary salinisation risk.”

Page 18 - 3.3. Surface water resources

> Comment - This section talks more about surface water features than surface water resources. Misleading section name but not a substantive issue.

Page 18 - “However, these systems are highly important and interconnected with groundwater resources in the district.”

> Comment - I agree so why are these connections not shown in depth to groundwater maps or in assessments of these system as potential GDEs?

Page 18 - “Given that regional surface water resources are not permanent, baseflow contributions to watercourses sourced from groundwater are likely negligible.”

> Comment - This is an option as opposed to a proven scientific fact. The connection and contributions to surface water features will likely be site specific and should be investigated with detailed water balance studies for: (1) representative sites; (2) high biodiversity value GDEs (but ranking/priority for GDEs is unknown); and (3) high cultural value sites (such as Thring Swamp) regardless of their biodiversity values. Just because the surface water isn’t permanent that doesn’t mean there isn’t any groundwater inflow. There are many examples of ephemeral wetlands with a significant groundwater inflow component and high degrees of groundwater dependence.

Page 18 - “Smaller wetlands, such as swamps and claypans that are not connected by flood ways or channels, are generally filled intermittently via local rainfall, runoff from nearby rocky ranges, or from sheet-flow across the surrounding landscape”

> Comment - No relevant references cited, with only Duguid, A. (2009) cited. How has this been determined? Duguid, A. (2009) does not present anything that can confirm this statement. Figure 10 is from 2009 and I would think a more robust (and up to date) investigation of wetlands is required. Page 18 contains critically important statements regarding wetlands but there are no substantive studies to back these statements up.

Page 19 - The Hanson River Palaeochannel runs along the western side of the District from the Southern Ranges into the Central Plains, it hasn’t been assessed.

> Comment - The Nolan’s bore field exploration studies for the Ammaroo mine have investigated this area. They have used actual depth to groundwater data (not just model outputs) to define GDEs and have done some predictive uncertainty analysis. In my opinion their analysis of that area is more robust than the WD WAP.

Page 20 - Tickell and Zaar (2022) and “The report provides a comprehensive hydrogeological conceptualisation of the Western Davenport area based on the most recent data collected from the region. The report also includes a groundwater resource risk map, which categorises the Central Plains aquifer into risk categories associated with development of irrigated agriculture. The risks are based on aquifer properties including the capability of the aquifer to supply water, the depth of the water table and groundwater salinity.”

> Comment - Although this recent report is cited it is not available to review. If it underpins all of the recent hydrogeological setting and conceptualisation work, then this should be available at the same time as the Draft WAP so it can be assessed. The 3 WAP documents

(particularly the background document) need more of the detail contained in Tickell and Zaar (2022) if that document is not available for public review.

Page 21 - However, regional data indicates that overall lower yields are associated with depths greater than 150 mBGL in the Central Plains area. These lower yields may suggest that the practical extraction depth in this part of the area is around 150 mBGL.

Comment - If this is the case then the basement for the quantitative aspects of the WAP should be this depth if it is unlikely that there are productive aquifers below this point. This would substantially reduce storage estimates.

Page 22 - Tickell and Zaar (2022) provide further explanation of recharge processes as part of the Western Davenport MtF study.

Comment - See previous comments. Tickell and Zaar (2022) need to be available for review during the public comment period of the WD WAP.

Page 23 - The water table is a dynamic feature, which can rise and fall depending on available recharge or lack thereof (Tickell and Zaar, 2022).

Comment - The water table respond to more than recharge, this is simplistic. Transpiration and abstraction for example but also lateral charges in hydraulic aquifer properties (hydraulic conductivity, thickness etc).

Page 23 - "Additionally, there is limited evidence regarding constraint of regional groundwater flow due to the aquitards or structural features (Tickell, 2014; Knapton, 2017)."

Comment - These are relatively old references and the status of faults as barriers or conduits needs to be verified with aquifer testing. The predominantly steady state regional groundwater modelling generally won't identify these more subtle nuances of a flow system as steady state modelling doesn't incorporate a time component. A steady state model is run until it is in "steady state" so there are no changes over time, but when you introduce transient stresses (such as pumping) hydraulic barriers or conduits may become apparent.

Page 24 - Low salinity groundwater is common across the central portion of the district, with total dissolved solids (TDS) concentrations generally less than 3,000 mg/L.

Comment - 3000 mg/L isn't low salinity groundwater it's brackish. The salinity categories of the United States Geological Survey (USGS) for example would classify this as slightly (1,000 mg/L to 3,000 mg/L) to moderately saline water (3,000 mg/L to 10,000 mg/L).

Page 27 - "In 2016, the department engaged CloudGMS to develop a hydrogeological conceptualisation and numerical groundwater model (the model) for the district (Knapton, 2017)."

Comment - No update from previous modelling reports.

Page 28 - "The groundwater model was calibrated using history matching, a method commonly used to check that a computer model satisfactorily predicts past conditions. Because no suitable evaporation data was available for the Western Davenport area from the BoM prior to 1970, the 45 year period from 1970 to 2015 was chosen to calibrate the model and to estimate key model parameters. Modelled groundwater levels were compared with approximately 20,000 recorded groundwater level measurements available for the calibration period."

Comment - The majority of these 20,000 recorded measurements come from a very limited number of bores according to Knapton (2017).

Page 28 - “The model was also graded for reliability and sophistication using a classification system developed under the Australian Groundwater Modelling Guidelines 2012 (Barnett et al., 2012). The classifications range from Class 1 (lowest) to Class 3 (highest). While many characteristics of groundwater model were graded Class 3, the model was ultimately graded Class 2 owing to the limited availability of information to the south east and north west of the main (Central Plains) aquifer system.”

Comment - I think there are some elements closer to Class 1. Regardless, models of all classes (as per Barnett et al., 2012) need sensitivity and predictive uncertainty analysis to be presented to help put the predictions in a context of their uncertainty. See my previous review for more detail on this topic.

Page 29 - “Sensitivity and uncertainty analyses (extended in 2021) were also performed to quantify the response of the model’s output to incremental variations in model parameters, stresses and boundary conditions.”

Comment - We haven’t ever seen these and have repeatedly asked for their analysis in this context. I believe we were told that predictive uncertainty analysis was not possible but it has been previously completed and is now “extended” in 2021?

Page 30 - Figure 17. Natural water balance for the Western Davenport water management zones

Comment - Regarding the Central Plains Management Zone, assuming the aquifer inflows and outflows roughly balance (even though outflows are bigger than inflows) the average net recharge (recharge minus evapotranspiration) is 46.9 GL/yr. Referring forward to Table 3 the estimated sustainable yield is stated at 81.5 GL/yr which is twice annual net recharge. Under no reasonable definition of sustainable yield is this appropriate. It is managed depletion of the aquifer.

Page 30 - “The maximum aquifer thickness in the Central Plains water management zone is estimated to be greater than 1,200 mBGL while the average thickness is around 300 m.”

and

“The full volume of storage for these zones is deemed a reasonable estimate for productive use due to the relatively small aquifer thicknesses.”

Comment - Previously they have stated that the effective depth of recoverable groundwater was 150mBGL (page 21) this is contradictory.

Page 30 - “3.5.3. Modelling scenarios”

Comment - Where are these fully detailed (source)? What is the uncertainty on these predictions?

Page 31 - “3.6. Interconnectivity of groundwater and surface water”

Comment - This section presents no specific findings or citations and is of critical importance. It’s more about mapping surface water features and runoff.

Page 32 - “All three categories of GDEs are known to occur or are likely to occur within the district.”

and

“The type of GDE is strongly influenced by depth to groundwater”

> Comment - It is a positive step that this is included as previously subterranean and aquatic ecosystems were barely mentioned. However, no specific impact criteria have been presented or proposed for these types of GDE. Subterranean GDEs are not strongly influenced in all cases by depth to groundwater, it’s more about what type of subterranean habitat they can occur in and how proposed drawdown will impact that habitat. For subterranean fauna restricted to alluvium this could be a thin layer of alluvial sediments in the river/creek hyporheic zone.

Page 33 - “To map the probable occurrence of GDEs, Brim Box et al. (2022) applied singular value decomposition to a time-series of vegetation indices derived from Landsat-8 data. In-situ field data from 442 sites were used to validate the logistic regression and neural network models, to determine whether sites could be correctly classified as GDEs.”

and

“The 50% GDE probability map at Schedule F provides a reliable baseline for this water allocation plan and will be used to guide further targeted ground surveys during plan implementation.”

> Comment - This is a verification of the preliminary assessment but more on ground detailed investigations (particularly at high value GDEs and cultural assets) are urgently required prior to the plan being implemented for 10 years. Lots of the depth to groundwater mapping is based on model output and we don’t have the uncertainty for these depth to groundwater estimates. How much larger could the area of <15m depth to groundwater be under the predictive uncertainty analysis? Same question in this context as always.

Page 34 - “Stygofauna are likely to be present in alluvial, karstic and some fractured rock aquifers at depths of less than 100 mbgl (Hose et al. 2015).”

and

“Desaturation of suitable habitat is the biggest threat to stygofauna communities. Changes in water quality could also impact stygofauna. Where depth to groundwater is less than 50 metres there is increased probability of stygofauna occurring.”

> Comment - I agree with these statements so how do GDE impact criteria reflect this?

Page 34 - “Several springs occur in areas underlain by Dulcie Sandstone in the south-east part of the Central Plains water management zone. These spring sites are likely to have significant ecological values. More detailed assessment is needed to confirm the location of these springs and their potential connectivity with the regional groundwater resource.”

and

Page 35 - “The most significant is the Thring Swamp site associated with the Wycliffe Creek system, which supports an extensive area of GDEs and other wetlands and suitable habitat for several uncommon or highly restricted plant species as reported above.”

Comment - Given the obviously high biodiversity and cultural values of Thring Swamp it needs dedicated investigation asap. With such high ecological and cultural values this investigation should have happened in my opinion. Can the drawdown from the major projects reach this site under the range of uncertainty in model prediction? In what time frame in a worst-case scenario? Sensitivity and uncertainty analyses were extended in 2021 as previously noted but have never been made available to the CLC or used in the WAPs assessment of impact risk.

Page 35 - "Further work has been undertaken to extend the current methodology for GDE identification to the entire district, however it will take a number of years to complete thorough on-ground verification.

During the water extraction licensing assessment process the department identified that more explicit and updated guidance was required on how to assess the potential impact on GDEs"

Comment - This is the 4th iteration of the plan yet the on-ground investigations still aren't underway. Where are the GDE impact criteria for all 3 types of GDEs? I've only ever seen terrestrial presented, as previously noted I believe there are some issues therein. These should be presented in the allocation plan and supporting documents not left to the license application process.

Page 37 - 5.2. Considerations for protection of cultural uses

Comment - This section contains nothing specific on how the plan will do this. Given this is the 4th iteration of the WAP this should have already happened and there should be a timeline for how this is proposed to be addressed.

Page 38 - “Over 100 years the ESY represents a reduction of less than three percent of the natural water balance.”

> Comments - this is wrong it is close to 3% of storage which is very different, see comment at Page 30 - Figure 17 and table below. According to their water balance average annual net recharge is 58% of the ESY in the Central Plains Management Zone. A water balance is defined as “The flow of water in and out and changes in storage of a surface water system, groundwater system, catchment or specified area over a defined period of time.” according to the Australian Water Information Dictionary from the Australian Bureau of Meteorology.

Water Balance Verses ESY Table.

Area	ESY	ESY x 100	Recharge	EVT	Net Recharge	GW storage	ESY x 100 /Storage (%)	Net Recharge/ESY (%)
Davenport Ranges	4.4	440	16.1	2.6	13.5	7084	6.2	306.8
Central Plains	81.5	8150	96	49.1	46.9	137986	5.9	57.5
Southern Ranges	1.8	180	40.3	5.6	34.7	8651	2.1	1927.8
Total	87.7	8770	152.4	57.3	95.1	153721	5.7	108.4

Note this table was derived from:

1) Figure 17 (page 30) in the WAP background document, the water balance for recharge, evapotranspiration (EVT) and GW storage figures.

2) ESY is taken from Table 1 (page 11) in the draft WAP.

Blue columns are calculated with the calculation method shown in the table except for net recharge. net recharge = recharge - EVT.

Page 38 - “The ESY establishes the proportion of water from a water resource within the district that can be sustainably allocated for drinking water and for a range of commercial uses and reserved for future Aboriginal economic development.”

and

“The **estimated sustainable yield** means the amount of water that can be allocated from the water resource to support declared beneficial uses that is sustainable.”

> Comment - abstraction at twice average annual net recharge is by definition not sustainable.

Page 39 - “the Territory’s commitment to the Intergovernmental Agreement on a National Water Initiative 2014, which defines ‘environmentally sustainable level of extraction’ to mean ‘the level of water extraction from a particular system which, if exceeded would compromise key environmental assets, or ecosystem functions and the productive base of the resource’”

> Comment - I don’t think there is a high degree of confidence in the assessment that this level of allocation in the Central Plains management area will not “compromise key environmental assets, or ecosystem functions and the productive base of the resource”.

Page 39 - “That is, the majority of the water is retained in the environment to maintain important ecological functions and for cultural purposes and values of water in the region.”

> Comment - Only when compared to storage, abstraction proposed at almost twice net recharge will lead to widespread declining groundwater levels.

Page 40 - “The Western Davenport Ti Tree Water Advisory Committee advised that the recharge should be also be considered when determining the ESY.”

> Comment - It is unclear how recharge has been considered, storage is all this is quoted as the justification for ESY determination.

Page 40 - “Schedule G shows the modelled impact of 87,000 ML/year after continuous extraction of the ESY after 10 years and 50 years respectively.”

> Comment - What is the uncertainty in these predictions? If uncertainty analysis has been completed it needs to be presented.

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Overall

From a scientific perspective most of what this document contains is a repeat of the background document.

Page 9 - “The **estimated sustainable yield** means the amount of water that can be allocated from the water resource to support declared beneficial uses that are sustainable.”

> Comment - note previous comment on this in the Background Document.

Page 9 - 3.2 Objectives of water sharing

> Comment - I would suggest that the following objectives are not being met in the context of the CLC’s interests: 3.2.1 (b), 3.2.1 (c), 3.2.2 (b) and 3.2.2 (c).

Page 13 - “**Limits of acceptable change** define measures of acceptable and appropriate water resource conditions that maintain desired outcomes for groundwater dependent ecosystems in the district.”

> Comment - Given the lack of uncertainty presented on drawdown predictions/depth to water table estimates from the modelling (critical controls on GDE impacts) and GDEs prioritised based on biological and cultural values it is unclear how the arbitrary 30% of GDE protection threshold meets limits of acceptable change.

DRAFT Implementation Actions MAR WAP.pdf

Overall

The risk assessment is highly subjective, I would have assigned higher residual risk ratings post the proposed management activities. The adaptive management frameworks are generic and, in many places, not specific enough. How were the risk assessments ratings determined? Internal DENR staff only? The WAP advisory committee? How will the huge amount of work proposed be funded? There are also issues with how the proposed actions are staged in terms of their order and completion dates.

Page 5 - "The risk assessment process ensures that water resources are allocated in a sustainable and resilient manner."

> Comment - A risk assessment is only as good as the understanding it is based on. Just because you have undertaken a qualitative risk assessment doesn't provide any surety that water resources are allocated in a sustainable and resilient manner.

Page 5 - "ensuring that water resources are available for future generations"

> Comment - Allowing nearly twice net recharge for allocation in the Central Plains Area will not ensure that water resources are available for future generations, this will deplete the resources.

Page 6 - "Combining risk management with adaptive management enables a proactive approach to managing risks"

> Comment - This is more of a retrospective approach and generally management/mitigation will only occur when and where problems occur. See my previous reviews and the Thommann et al. (2022) Paper. *Thomann, J.A., Werner, A.D. and Irvine, D.J., 2022. Developing adaptive management guidance for groundwater planning and development. Journal of Environmental Management, 322, p.116052.*

Page 6 - "The water monitoring program is critical to adaptive management and an overview of this program is provided in section 3."

and

Page 7 - 3. Water monitoring program

> Comment - I agree that a water monitoring program is critical to adaptive management. A monitoring plan should contain the exact locations, the frequency of water level and water quality monitoring. Some of this information is missing (how many measurements in discrete sites or the planned network expansion for GDE protection for example). I think the coverage of sites in Figure 3 is sparse and it is unclear how this will provide sufficient information on all 3 types of GDEs that are current poorly understood in terms of groundwater dependence and environmental water requirements (EWRs).

Page 7 - “monitor groundwater level trends and recharge”

and

“biannual site visits”

> Comment - Does this mean that the discrete monitoring sites will only be visited twice per year? It is nearly impossible to estimate recharge from 2 data points per year.

Page 7 - “Planned expansion of the monitoring network includes”

> Comment - The plan needs a commitment to what, where and when will be monitored. This is stated for some sites but not the areas proposed for the additional investigations to fill critical knowledge gaps.

Page 10+ - 4.1. Actions related to water requirements of key environmental values

> Comment - There are lots of management strategies and actions in these lists. I would question how feasible all of these are in the timeframes proposed and how much will all this cost? Does the DEPW have the staff and financial resources in place for this? Some of my biggest concerns are with items: 4.1.2, 4.1.3, 4.1.4, 4.1.5 which are expensive complicated projects in many cases in my experience that require long term (10+ years minimum) datasets that don’t exist and will not exist in their timeframes. Also, there are major issues with the timing of the projects as proposed, I’ll give some examples.

- 4.1.6 Define regional scale map of key environmental values associated with water including surface water springs.
    - Comment - This is proposed to be complete by 2033 but this is needed now otherwise how can they be protected/managed?
- 4.1.7 Releasing GDE health and monitoring guideline for use by both the department and licence holders to enable GDE condition to be assessed
    - Comment - This is proposed to be completed in 2023-2024 but lots of the studies required to produce this are proposed to be completed after this date.

Page 11 - 4.2. Actions related to water requirements of key Aboriginal and other cultural values

> Comment - These should have been completed for this plan, especially for critical sites like Thring Swamp. Also, baselines need to be obtained for some years prior to significant impacts occurring (there is substantial impact potential from Stage 1 of the Singleton project alone, hence why it has gone into an EPA EIS process) not in 2027.