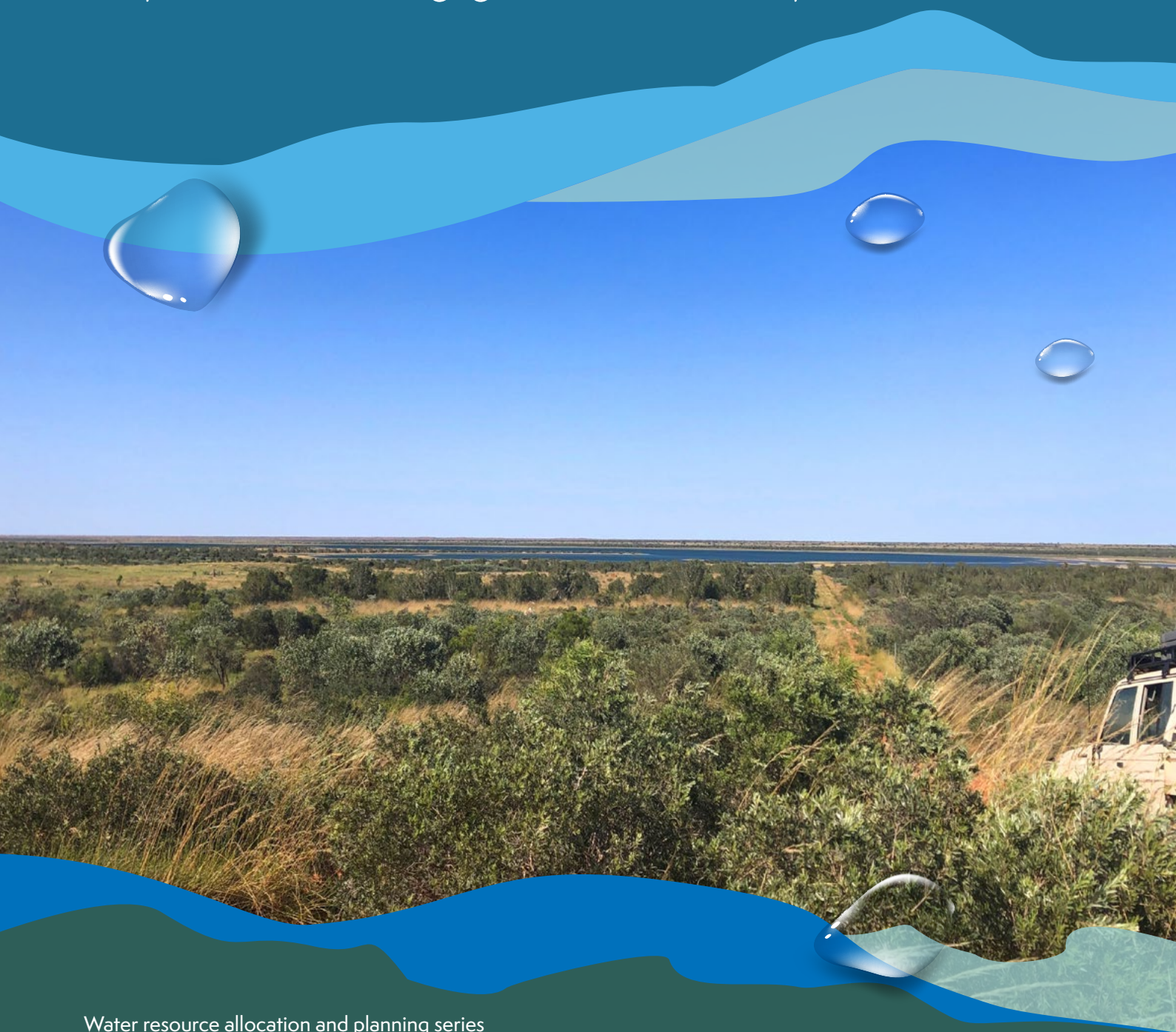




Department of Water and
Environmental Regulation

La Grange groundwater allocation statement

An update of the La Grange groundwater allocation plan



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Cover photograph: Sand-dunes of the pindan plains in the *La Grange groundwater allocation plan* area. Photo taken by Michelle Antao in May 2022.

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Acknowledgement of Country

The Department of Water and Environmental Regulation acknowledges the Nyangumarta, Karajarri, Yawuru and Nyikina-Mangala people as the Traditional Owners and custodians covered by the *La Grange groundwater allocation plan* area.

We pay our respects to Elders past and present, and to all members of the Aboriginal communities in the La Grange plan area and their cultures. We acknowledge that Traditional Owners have been custodians of Country for countless generations and that water is integral to life.

We recognise that Aboriginal people and their culture across the La Grange plan area are diverse and that continued custodianship of the land and water is fundamental to their health, spirit, culture and community.

Permission has been given to use images, language or traditional place names and traditional knowledge in this document. We welcome the opportunity to further collaborate with Traditional Owners in the future.

In this report we have used dual language, from the Karajarri and Yawuru people, for important water-based terms. Several of these terms may be shared by the Nyangumarta people. For more information about language terms and meaning, see the Glossary.

“The big water, the mother of water, kurtany, keeps the water level. It keeps it [the water] alive. Same like the mother of a human being. That’s the mother of the water level. The water is from the Pukarikarra – its underneath. The water underneath doesn’t live free – it travels underneath, from the high country to the sea.”

John ‘Dudu’ Nangkiriny – Karajarri Elder

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1 Purpose

The Department of Water and Environmental Regulation (the department) has prepared the *La Grange groundwater allocation statement* (the statement) to update what we know about the Broome sandstone aquifer and update local licensing policies. It adds to and replaces parts of the *La Grange groundwater allocation plan* (the La Grange plan; DoW 2010).

Groundwater use in the La Grange plan area has increased to support sustainable agricultural development and other economic opportunities. The department has implemented a comprehensive licence assessment and water management approach to ensure sustainable water use, and the plan's principles and objectives continue to be achieved (as detailed in Chapter 4 of the La Grange plan). This statement responds to the department's ongoing discussions with water users, Traditional Owners and other stakeholders and reflects our improved understanding of the aquifer in the La Grange plan area and the economic, cultural and ecological values it supports. This statement does not review nor change the allocation limits.

1.1 La Grange plan update

This statement replaces the La Grange plan's water licence assessment approach and details our current understanding of the aquifer and its dependent values (Table 1). This statement:

- updates policies to guide applicants during the licence assessment process
- describes how we will consider Native Title rights and interests, and Aboriginal heritage and cultural values during the licence assessment process
- updated information on ecological and cultural values supported by groundwater and how these values should be considered during the licence assessment process
- outlines ongoing and future investigations and planning.

Table 1 Sections of the La Grange groundwater allocation plan 2010 that this statement replaces or updates

La Grange groundwater allocation plan 2010		La Grange groundwater allocation statement 2025	
<i>Page</i>	<i>Original plan content being updated</i>	<i>Page</i>	<i>Updated plan content in the statement</i>
5–13	Chapter 3.1–3.3 Considerations for water management in La Grange	8–16	Additional information in Chapter 3
22–25	Chapter 6.1, Table 3: General licensing policies	21–26	Replaced by Section 4.3, Table 2: Updated local water licensing policies specific to the La Grange plan area
26–27	Chapter 6.2, Table 4: Licensing rules specific to the Coastal Management Zone Chapter 6.2, Table 5: Licensing rules specific to the Mandora Management Zone	27	Replaced by Section 4.4, Table 3: Updated local licensing policies for water management zones in the La Grange plan area – Policy group A7
28	Chapter 6.3: Regional Monitoring Program	34–36	Replaced by Chapter 5: Updates to monitoring
34–35	Appendix A, Table 8: Decision matrix for determining the level of hydrogeological assessments for water licence applications	21–22	Replaced by Section 4.3, Table 2: Updated local water licensing policies specific to the La Grange plan area – Policy group A2

2 Status of water availability and use

The La Grange plan area covers the Broome Sandstone aquifer, south of Broome. It is the sole source of fresh water in the plan area for community water supply, pastoral stations, irrigation developments, tourism and mineral exploration. It is divided into the La Grange north and south subareas (Figure 1), both of which have allocation limits set for the Broome Sandstone aquifer.¹

There is now very limited groundwater available for further water licensing from the Broome Sandstone aquifer in the La Grange north and south subareas. Licence requests have been submitted for almost all of the remaining balance of the allocation limit in each subarea (Figure 1).

Since the plan was last evaluated (DWER 2018), the volume of groundwater licensed for pastoral and horticultural irrigation has increased significantly. This increase has prompted Traditional Owners and stakeholders to request more transparency around how the department assesses and manages risks to ecological and cultural values, and more information about the position of the seawater (coastal) and saltwater (inland) interfaces.

While groundwater allocations are high, actual water use is low compared with the allocation limits (Figure 1), given the pastoral and horticultural licensees are still developing their operations. Estimated groundwater use is about 10 per cent of the allocation limit in the south and 11 per cent in the north, with these amounts expected to increase incrementally in the coming five years.

¹ The plan also includes a portion of the Canning-Pardoo subarea covered by the Mandora Marsh management zone. The allocation limit for this subarea is included in the *Pilbara groundwater allocation plan* (2013).

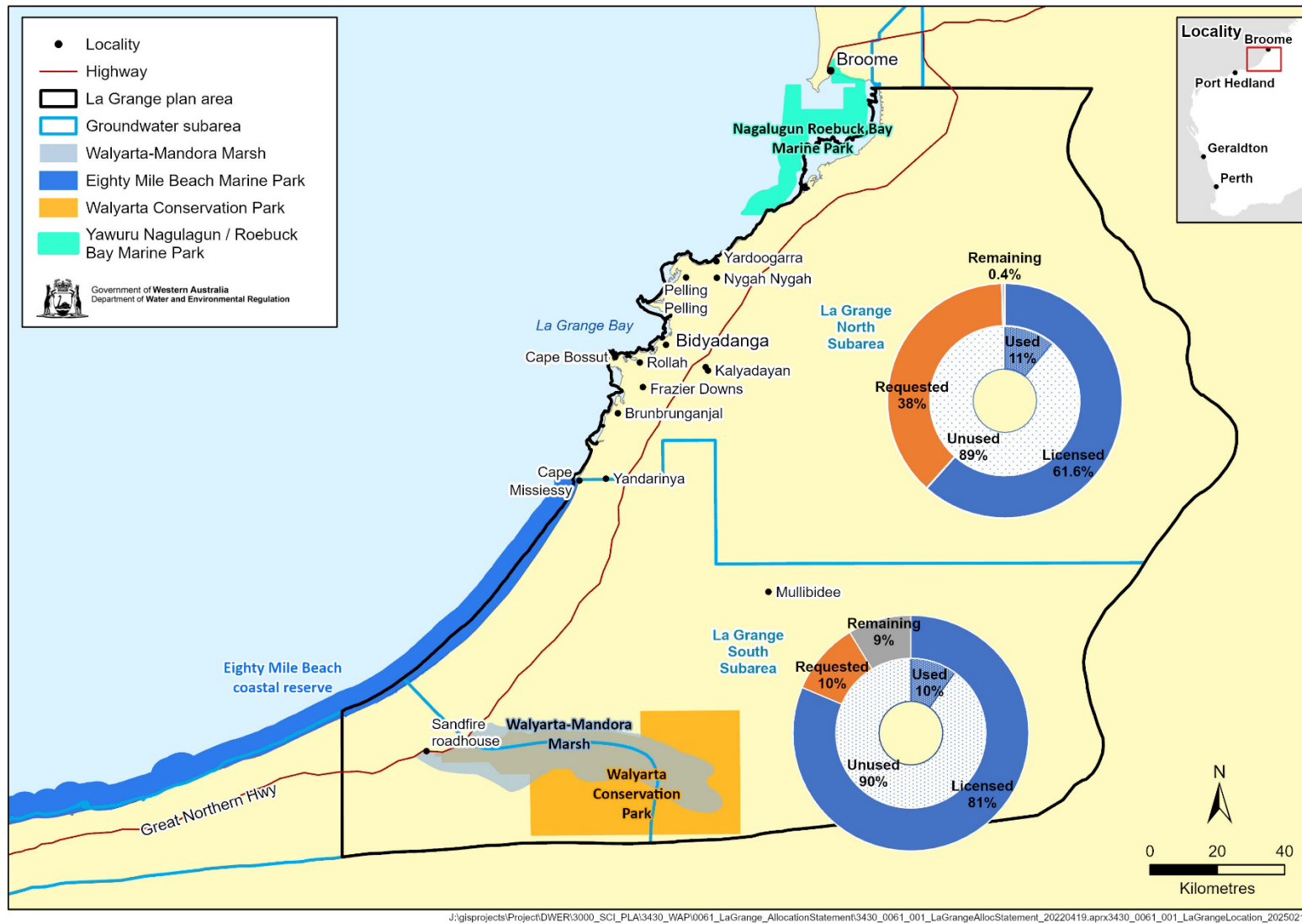


Figure 1 The La Grange plan area, subareas and water availability status as at February 2025.

3 Updated knowledge of the La Grange plan area

The department has built its knowledge of the La Grange plan area's groundwater resources, and the significant ecological and cultural values they support, on a large body of work at the regional scale. Since the La Grange plan's release, we have continued to engage and consult with stakeholders as economic opportunities develop. Our learnings from investigations, consultation with stakeholders and analysis of monitoring data, is shown in this section, along with future projects that seek to improve our knowledge.

3.1 Hydrogeology

Since our last plan evaluation (DWER 2018), ongoing programs have increased our understanding of the Broome Sandstone aquifer in the La Grange plan area. We have gained new information through the investigations of the Department of Primary Industries and Regional Development (DPIRD), as well as our own regional monitoring and bore audit programs.

La Grange agriculture opportunities project

DPIRD conducted hydrogeological investigations during the four-year La Grange agriculture opportunities project from 2014 to 2018. The project's findings (Paul et al. 2019) informs our understanding of the Broome Sandstone aquifer, as detailed below.

The Broome Sandstone aquifer is an extensive formation up to 240 m thick; in places near the coast it has a saturated thickness of more than 200 m. The main production zone occurs from about 70 to 150 metres below ground level where it contains fresh groundwater with salinities below 600 mg/L total dissolved solids.

The Broome Sandstone aquifer underlies surface deposits including Pindan sandplain and coastal marine plain sediments. The coastal marine plain is mostly supratidal mud flats (coastal clays) which are about 5 metres thick and locally confine the Broome Sandstone aquifer.

Groundwater levels in the Broome Sandstone aquifer are shallowest along the coast or in association with palaeovalleys, and generally increase in depth with distance inland. The depth to groundwater affects the groundwater system's response to recharge events – rainfall recharges the aquifer more rapidly and causes larger water-level rises where the watertable is shallower. Recharge to the aquifer is driven by episodic tropical rainfall events rather than the average rainfall each year (Paul et.al 2019).

A coastal seawater interface occurs naturally where sea water meets fresh water in the aquifer. The Broome Sandstone aquifer's seawater interface occurs about 7 km to up to 40 km inland from the coast. Groundwater throughflow maintains the position of the interface, with water flowing from east to west (from inland to the coast). Annetts et al. (2017) estimated the position of the interface based on an airborne

electromagnetic survey (2017). See the DPIRD website for further information: www.agric.wa.gov.au/r4r/la-grange-agriculture-opportunities.

La Grange seawater interface project

The department is developing a La Grange seawater interface monitoring (SWIM) project, as part of the State Groundwater Investigation Program (SGIP). Through this project we will:

- install specially designed SWIM bores in specific locations
- improve our knowledge of the inland extent of the seawater interface at key locations
- monitor any changes in the inland extent of the seawater interface over time
- design a site-specific seawater interface risk management approach.

Supporting this project will be data collected at two SWIM bores that DPIRD installed in 2021 and 2022 (which we are monitoring at present).

3.2 Groundwater-dependent ecosystems

The department has identified and mapped potentially groundwater-dependent wetlands, vegetation and nearshore marine areas at the regional scale using desktop review, spatial analysis and available georeferenced datasets (Figure 2).

The distribution of both potential groundwater-dependent wetlands and vegetation across the La Grange plan area aligns closely with areas where shallow coastal clay layers occur. These areas are generally located along the coast and Roebuck Bay, mapped as the Anna and Mannerie land systems by DPIRD (2018). Through our La Grange groundwater-dependent ecosystem project (La Grange GDE project), we have confirmed that these coastal clays play an important role in both the distribution and groundwater-dependency of wetlands and vegetation.

While the coastal clay layers locally confine the Broome Sandstone aquifer, water chemistry analysis indicates that shallow wetlands and associated wetland vegetation are supported by the aquifer through spring discharge. This introduces some complexity and uncertainty around how the Broome Sandstone aquifer supports these ecosystems and how they might respond to changes in groundwater levels. See the following section for more information.

The La Grange GDE project is also looking into the importance of groundwater discharging into the nearshore marine environment and how it might support the seagrass habitats that turtles and dugongs depend on.

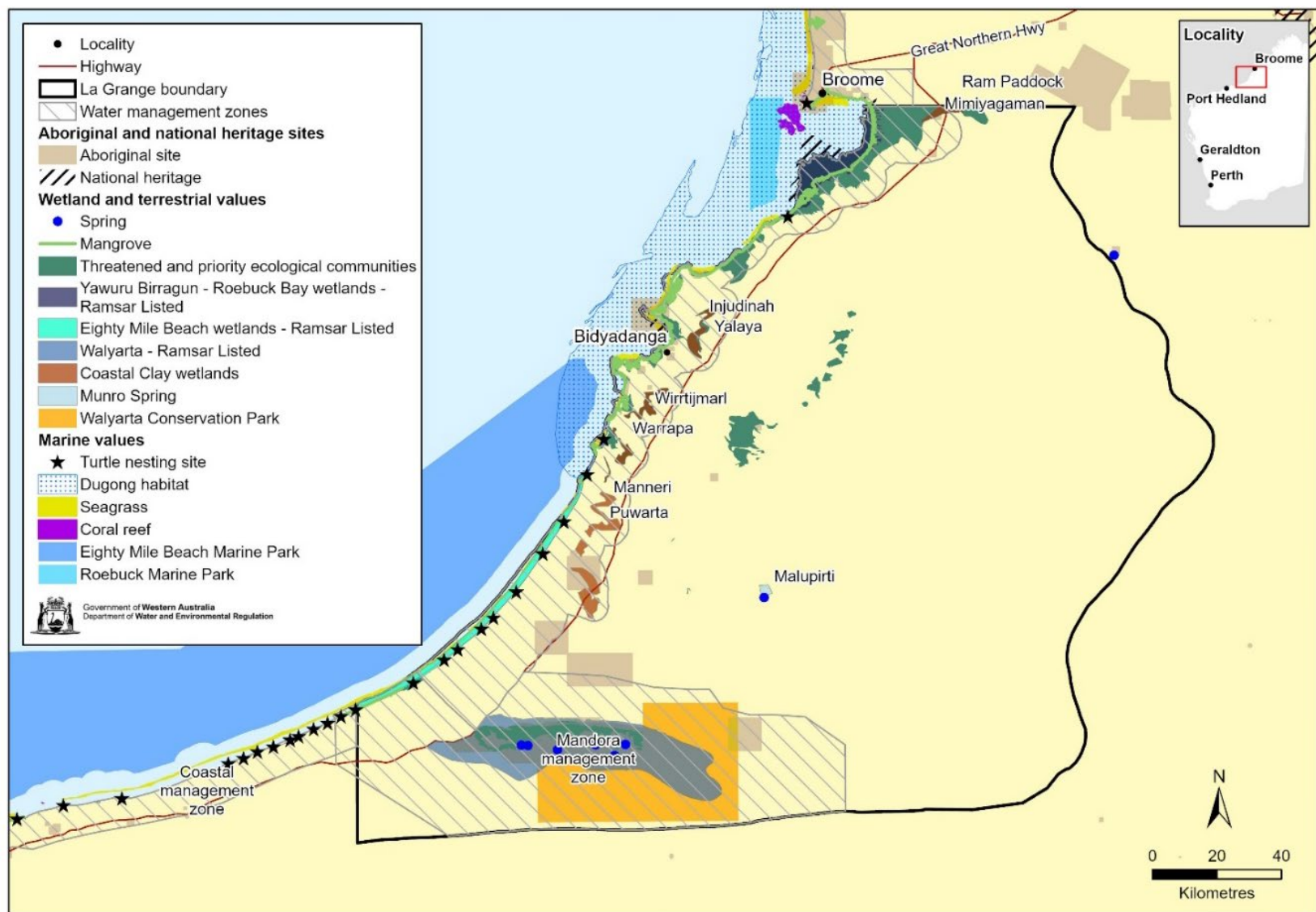


Figure 2 Ecological values mapped for the La Grange groundwater-dependent ecosystem project

La Grange groundwater-dependent ecosystems project

The La Grange GDE project, funded by the department's SGIP, began in 2020 and is being delivered in collaboration with Yawuru and Karajarri Traditional Owners (Figure 3). The project aims to understand how the Broome Sandstone aquifer supports groundwater-dependent values.



Figure 3 Department staff and Karajarri rangers working together to collect groundwater level and water quality data, May 2022

Photo: Robyn Loomes

The La Grange GDE project aims to:

- improve our understanding of how the Broome Sandstone aquifer supports groundwater-dependent values, including wetland and nearshore marine habitat
- explore how the distribution and health of these values may change due to changes in groundwater levels
- collect baseline ecological and hydrogeological data and establish monitoring to support future management, including installation of monitoring bores at several key wetlands
- provide capacity-building opportunities for rangers and Country managers through on-ground training, science co-design and development of a TAFE program to support ranger training.

The La Grange GDE project is scheduled to be completed in 2026. Until then, the project's results and outcomes will continue to progressively build our knowledge and underpin our management considerations (such as assessing risks of water abstraction through the water licensing process).

Groundwater supporting wetlands and wetland vegetation

Initial interpretation of hydrochemistry data suggests that wetlands and associated vegetation communities are supported by locally confined sections of the Broome Sandstone aquifer (water under the clay layer), rather than the perched watertable (water on top of the clay layer).

The dissolution of sediments, and sediments with higher permeability, allow fresh groundwater from the Broome Sandstone aquifer to move to the surface. This has been identified adjacent to where the coastal clays and Pindan sandplain meet. The coastal clay sediments are saline and, although they have low permeability, contain saline groundwater. A natural saline groundwater plume has developed in the Broome Sandstone immediately below the coastal clays because of high evapotranspiration rates.

A separate seawater interface also extends inland from the ocean, with the fresh groundwater of the Broome Sandstone aquifer moving between these saltwater interfaces to express at the surface as wetlands or discharge to the coast.

In partnership with Karajarri rangers and Yawuru Country managers, we have developed various conceptual diagrams to communicate how we think groundwater is moving, to guide further investigations as part of the La Grange GDE project (Figure 4). These conceptual ideas will be tested through drilling, water source sampling and ecological monitoring.

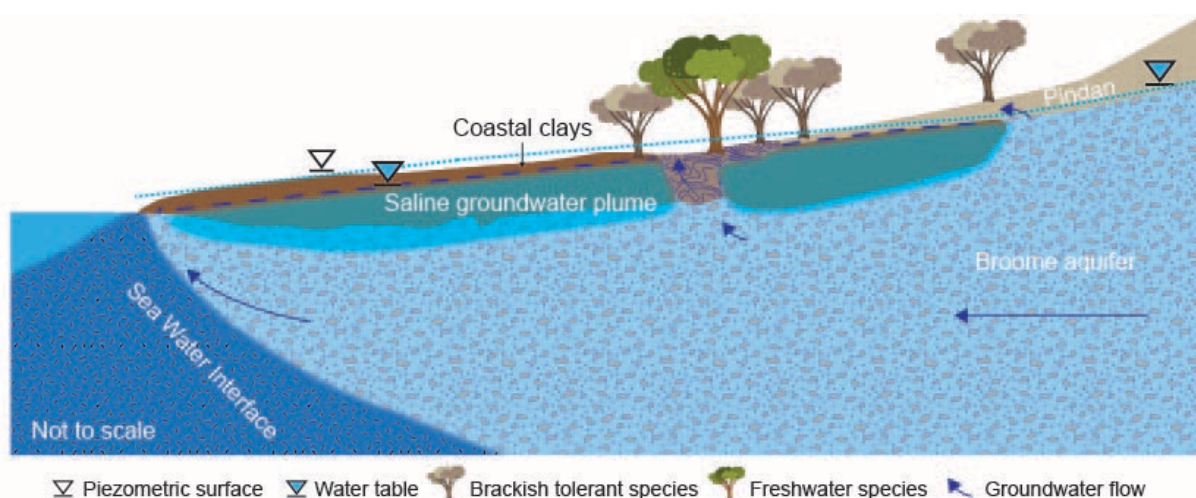


Figure 4 Working conceptual diagram of groundwater movement, wetlands and associated clay layers being tested through the La Grange GDE project

Groundwater supporting nearshore marine ecosystems

Through the La Grange GDE project we are also investigating how groundwater from the Broome Sandstone aquifer might support nearshore marine ecosystems. Specifically, we want to understand whether groundwater discharge supports seagrass habitat, which in turn supports nationally significant species in the area such as dugongs and turtles, protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). We are undertaking this work with Yawuru

Country managers and Karajarri rangers, with support from the Department of Biodiversity, Conservation and Attractions (DBCA).

Research into how groundwater may support seagrass habitat is ongoing. To date the scientific literature has very limited information on the role of submarine groundwater discharge in shaping seagrass communities. However, it is thought that the nutrients being transferred through groundwater into marine coastal waters (which are low in nutrients) may contribute to seagrass productivity in some areas.

Our early results have confirmed the presence of groundwater in marine coastal waters. To better understand the coincidence of seagrass and groundwater discharge, we have completed mapping of more than 17,200 hectares of subtidal benthic habitat in the nearshore marine area, including 3,860 hectares of seagrass habitat.

Applying our understanding of groundwater-dependent ecosystems in water licensing

Through the La Grange GDE project we have improved our understanding of the mechanisms that enable groundwater to support wetlands, vegetation and the nearshore marine environment. Our hydrogeologists and licensing officers will take into account this new knowledge when they assess groundwater licences and risks to ecological values.

For the purposes of assessing a water licence, our position is that all wetlands and wetland vegetation associated with the coastal clays, or any persistent wetlands across the study area, depend on the Broome Sandstone aquifer – unless an applicant can demonstrate otherwise. See sections 4.2 and 4.5 for more information on how we assess potential impacts to groundwater-dependent ecosystems.

3.3 Cultural water places

We recognise that Traditional Owners have strong connections to and custodial responsibilities for the land and waters of the La Grange plan area. The Nyangumarta, Karajarri, Yawuru and Nyikina-Mangala peoples are the Traditional Owners and have Native Title rights across the plan area (National Native Title Tribunal 2024; Yu 1999).

The Traditional Owners have a strong and active role in land and water management and in protecting Country, including as water users, cultural managers, science project co-leaders, monitoring program participants, and rangers. Some of these activities are described in Healthy Country management plans (KTLA 2014) and Indigenous Protection Area management plans (NBY 2016; NWAC & YMAC 2022), which enable the government to strategically align its work in this area.

Traditional Owners also have joint management partnerships with DBCA to manage conservation reserves in the La Grange plan area. Several new conservation reserves have been gazetted since the La Grange plan was published in 2010.

Understanding groundwater-dependent cultural water places

We have collaborated extensively with Karajarri and Yawuru people for many years on various projects and plans, but most recently through the La Grange GDE project. In working together, the department has gained a better understanding of how Karajarri and Yawuru people value and use water places. We respect their knowledge and connection to Country, and we are adapting the way we define and consider cultural values in response to these collaborations. For further insight into the Aboriginal language and terminology we refer to in this statement, see the Glossary.

Water places are reflected in traditional stories as a link between the spiritual and physical worlds. Permanent waterbodies are inhabited by *pulany* or *jurru* / powerful water snakes, which have the power to bring rain and control the weather.

“Water is the life for us all. It’s the main part. If we are gonna lose that I don’t know where we are gonna stand. If that water go away, everything will die. That’s the power of water. He connect with the land. Pukarikarra (the dreaming) put ‘em all together. One life.”

John ‘Dudu’ Nangkiriny – Karajarri Elder

Water places within the La Grange plan area have strong spiritual and cultural values which are difficult to qualify in scientific terms or compare with ecological values. The spiritual value of water places is revealed through their presence in language, songlines and stories, being sacred places and spiritual habitat for the *pulany* or *jurru* / powerful water snakes who reside in the permanent waters. The cultural value relates to the past and future ability of these places to sustain life, culture and traditional practices (Yu 2000).

We will continue to work closely with the Traditional Owners, Country managers and rangers to build a better knowledge base and continually improve how we achieve culturally appropriate water management in the La Grange plan area (Figure 5).



Figure 5 Department staff and Yawuru Country managers working together on Yawuru Country, May 2022

Photo: Michelle Antao

Applying our understanding of cultural water places in water licensing

To enable the department to better protect the cultural values of water places, when we assess a water licence application, we will consider the traditional knowledge that the Traditional Owners have shared with us.

The department's position is that the Broome Sandstone aquifer is likely to support all *lirri* / soaks, *jila* / permanent water places, *pajalpi* / springs or spring country or ecosystems surrounding a spring (Figure 6) and *wawajangka* / freshwater seepage in the intertidal zone, including places identified in Yu (1999). This means that these features are considered groundwater-dependent cultural values (see Section 4.2). This supports the view of Karajarri people that all *jila*, *pajalpi* and *wawajangka* are fed by the Broome Sandstone aquifer (see Yu 1999).



Figure 6 *Pajalpi (spring-fed wetland) on Karajarri Country, May 2022*

Photo: Michelle Antao

We have mapped the general location of known groundwater-dependent cultural values for the La Grange plan area so they are considered during water licence assessments. To protect these sites, we will not provide their exact locations to others without consent from the Traditional Owners.

While most wetlands have both ecological and cultural values, we are aware that the specific water requirements may differ for each type of value that needs protection. Some cultural water requirements have been identified through our collaboration with Karajarri rangers (Figure 7), Yawuru Country managers and Elders.

These cultural water requirements should be considered during water licence assessments and include the following:

- that *jila* / permanent water places are synonymous with *pulany* or *jurru* / powerful water snakes: these are of the highest cultural value and must remain permanent to continue to provide this habitat
- that water levels in *jila* / permanent water places indicate the health of Country and its people (Yu 2000) and must be maintained to help support *mabu ngarlu* or *mabu liyan*.

“Health of Country is intrinsically connected to the social emotional wellbeing of Yawuru people, Mabu Buru / healthy country, Mabu Ngarngunil / healthy people and community and Mabu Liyan / good spirit and wellbeing”. Dean Mathews – Yawuru

- that connectivity between *jila* / permanent water places, *pajalpi* / springs or spring country or ecosystems surrounding a spring and groundwater must be maintained to support living water and the movement of *pulany* or *jurru* / powerful water snakes

- that water quality in *jila* / permanent water places should not be adversely affected so it may continue support the traditional practice of *kuwaiyinpijala* or water blowing
- that groundwater levels below *lirri* / soaks may need to be maintained to support the traditional practice of digging to the watertable to access fresh water
- that the location of seawater and saltwater interfaces are of particular concern and must be maintained to ensure groundwater discharge is protected and freshwater places remain fresh
- that ecological condition cannot be assumed as synonymous with cultural health (as discussed in the previous section – see page 13).

This list is not exhaustive. Hence engaging with Traditional Owner groups early will help to identify the differences between the cultural and ecological water values that water licence applicants will need to consider.

See sections 4.2 and 4.6 for more information on how we assess potential impacts on cultural values.



Figure 7 *Department staff and Karajarri rangers working together on Karajarri Country, February 2022*

Photo: Ryan Bacich

4 Updated local licensing policies and rules

This statement outlines policy to inform decision-making under Western Australia's *Rights in Water and Irrigation Act 1914* (WA) and *Water Agencies (Powers) Act 1984* (WAP Act) in the La Grange plan area.

In this chapter, we set out the updated local licensing policies and rules for water licence applications in the La Grange plan area, including how they will be assessed. Note we are already applying many of these local licensing policies in response to increased demand for water licensing.

Under the WAP Act, the Minister for Water has the general functions and powers to conserve, protect and manage the state's water resources by assessing and planning for their use.

Under the RIWI Act, the Minister, and department officers under delegation, have the discretion to determine the outcome of a licence application. When exercising that discretion, the Minister and the department will consider the matters set out in clause 7(2) of Schedule 1 of the RIWI Act, this statement and the *La Grange groundwater allocation plan* (DoW 2010), and consider other relevant matters in carrying out their duties.

The regulatory instruments under the RIWI Act are :

- a licence to take water (the licensed entitlement) from a water resource in accordance with the specified terms, conditions and restrictions (section 5C RIWI Act)
- a licence to construct or alter a well (bore), subject to the licence conditions (section 26D).

4.1 Policy on intersecting legislative requirements and referrals

Under section 4(1)(d) of the RIWI Act, the use and regulation of water resources needs to be integrated with the regulation of other natural resources. To apply this object to water licence assessments, the department:

- refers a significant proposal to the Environmental Protection Authority (EPA) when the applicant or third parties have not previously done so
- requests advice from other government agencies in relation to assessing licence applications
- has regard to other regulatory approval processes² under other written laws.

² Other regulatory approvals may include land tenure change (diversification), environmental (state and federal) and Aboriginal heritage approval processes.

We have used information from other regulatory approval processes to assess water licence applications under Schedule 1, Division 2, clause 7(2) considerations in the RIWI Act.

We will continue to consider other regulatory processes when assessing new licence applications or applications to amend, trade or transfer an existing licence.

Approvals granted under other regulatory legislation do not guarantee that a water licence will be issued, but the department generally provides early advice into other approvals (e.g. tenure or clearing approvals) that would flag any significant issues with water availability or impact.

Meeting obligations under the *Native Title Act 1993* (Cth)

The department will comply with its obligations under the *Native Title Act 1993* (Cth) (NT Act). When required, we will notify the relevant Native Title party in writing about a water licence application in the La Grange area.

When we assess a water licence application, we may consider all relevant information that Native Title holders, Traditional Owners, applicants, interested parties and other government agencies submit to us.

Advice or comments may be submitted to the department in the following ways:

- From Native Title holders or claimants in response to a notification under the NT Act.
- From an applicant in response to a request for further information associated with a water licence application.
- During the period of public advertising of a water licence as required under water legislation.
- Directly to the department by writing or talking to us.

A water licence applicant may enter into an Indigenous Land Use Agreement with a Native Title party as part of their proposed activity.

We may have regard to this agreement when:

- assessing a water licence or permit application
- making a decision on an application
- setting licence or permit conditions.

We will continue to apply this policy to new licence applications or when an application is made to amend, renew, trade or transfer a licence. When this occurs, we may wait until advice is received or the other regulatory approvals are completed to a point where our process can continue.

Regulatory approvals under Western Australia's Aboriginal heritage laws and considering heritage advice

We consider the impact of abstraction on sites of cultural significance when we assess a water licence application, as part of our considerations under Schedule 1,

Division 2, clause 7(2) of the RIWI Act and in setting any associated conditions on a water licence.

We may request information about the relevant potential impact of an applicant's proposed activities on sites of cultural significance. We may ask how the impacts will be managed or for evidence of an exemption or approval to cause harm under the *Aboriginal Heritage Act 1972* (WA). The outcome of a due diligence assessment can be submitted as evidence. See the [aboriginal-heritage-due-diligence-guidelines](#) for more information.

Water licence applicants should refer to the La Grange area supplementary guidance in Section 4.6 for more information on this matter. We present our current understanding of groundwater-dependant cultural values and how they should be considered in Section 3.3.

We will continue to apply the above policy to new licence applications or when an application is made to amend, renew, trade or transfer a licence.

4.2 Policy on sites of ecological and cultural significance

Sites of ecological significance

The department considers that all wetlands and wetland vegetation associated with the coastal clays or any persistent wetlands or vegetation across the La Grange plan area are supported by the Broome Sandstone aquifer (see Section 3.2).

For the purpose of assessing a water licence, we consider that these features are groundwater-dependent ecosystems unless an applicant can demonstrate otherwise. Applicants can use the Australian groundwater-dependent ecosystems toolbox to assist with identifying these features (Richardson et al. 2011a and 2011b).

In assessing a water licence application, we will consider that all mapped groundwater-dependent ecosystems are sites of ecological significance (see Section 4.5).

Sites of cultural significance

The department considers that all *lirri* / soaks, *jila* / permanent water places, *pajalpi* / springs or spring country or ecosystems surrounding a spring, and *wawajangka* / freshwater seepage in the intertidal zone, are supported by the Broome Sandstone aquifer (see Section 3.3).

For the purpose of assessing a water licence, we consider that these features are sites of cultural significance regardless of their current ecological condition, unless we are specifically advised otherwise by Traditional Owners (see Section 4.6).

4.3 Updated local water licensing policies

The local policies below build on the policy framework that the La Grange plan has already established. Table 2 of this statement replaces Tables 3 and 8 of the La Grange plan (see Table 1 of this statement for all replacement details).

References to other departmental policies or guidelines in Table 2 are current at the time of publishing. Any updated version should be used if the document is revised. If a local policy in this plan differs from a statewide one, the local licensing policy in this plan prevails.

We have numbered the new policies in order and added an 'A' to the policy number to denote that they are updates to the La Grange plan. Those local water licensing policies that are unchanged from Tables 3 and 8 of the La Grange plan are numbered as per that table.

Table 2 Updated local water licensing policies specific to the La Grange plan area

No.	Policy detail
A1. Administration	
A1.1	Before applying for more water, licensees should demonstrate compliance with current licence conditions and the associated operating strategy, and full use of their current licensed entitlement volume.
A1.2	Applications for ≤50,000 kL/year of water in a fully allocated subarea may be granted if it is to supply or maintain public assets, including regular and temporary road maintenance or tourism amenities, or public water supply servicing Aboriginal communities. Assessments of sustainability and impact are still required and monitoring or conditions still applied.
6.1	Groundwater should be used efficiently and in accordance with best management practices and irrigation methods. The department may refer the licence application to the Department of Primary Industries and Regional Development for advice.
A2. Additional information	
A2.1	<p>Applicants may be asked to undertake a hydrogeological assessment to support their water licence application. The department will set the level of hydrogeological assessment considering:</p> <ol style="list-style-type: none"> 1. The complexity of the application. 2. The potential that the take and use of water will impact on: <ol style="list-style-type: none"> a. the condition, value or extent of environmental assets (water-dependent ecosystem, an ecosystem service and/or a site with ecological, social or cultural significance) b. water quality or location of the seawater or saltwater interface/s c. local water levels (increase or decrease) d. discharge of groundwater to the surface or nearshore marine environment e. the water resource, or f. other water users' ability to take or use water. <p>The level of assessment set by the department is likely to be either:</p>

No.	Policy detail
	<ol style="list-style-type: none"> 1. Desktop hydrogeological assessment. 2. Basic hydrogeological assessment. 3. Detailed hydrogeological assessment, including an appropriate analytical or numerical groundwater model. <p>Applicants should seek further advice from the department for models in data-poor areas.</p>
A2.2	<p>Applicants may be asked to undertake baseline monitoring and submit this to the department, before a licence decision is made, if we consider it necessary to inform our water licence assessment. This may include:</p> <ol style="list-style-type: none"> 1. Monitoring of water levels and sampling of water quality at designated bores or environmental assets for up to two years. 2. Surveys to determine the ecological significance of environmental assets, which may include condition, presence or absence of taxa, population structure and species richness of environmental assets. 3. Monitoring of ecological condition for one to three years, or more. 4. Information that determines: <ol style="list-style-type: none"> a. surface water and groundwater connectivity (including duration and timing of connectivity) b. water dependence of mapped environmental assets (using the department's mapping and/or that of the applicant) c. the location of the seawater or saltwater interface/s in relation to the proposed take and use of water.
A2.3	<p>Applicants should design their proposed activity to achieve a zero or low risk of impact to environmental assets and other water users. Applicants may be able to achieve this by reducing the volume of water being requested or reconfiguring a borefield design. Applicants should demonstrate the following:</p> <ol style="list-style-type: none"> 1. Proposed production bores are located away from environmental assets and other water users. 2. Monitoring bores are suitably located and baseline water level and water quality monitoring is implemented as soon as practical to support the assessment of a water licence application. 3. Monitoring is implemented before abstraction begins to gather baseline information about impacts to environmental assets and other water users. 4. Production bores are configured to spread abstraction across a larger area to minimise drawdown, and pumping rates are managed at production bores to limit drawdown impacts to environmental assets. <p>See Section 4.5 for the interim risk thresholds for preliminary impacts assessment for sites of ecological significance.</p>
A2.4	<p>Applicants may be requested to install new monitoring bores at locations the department designates to:</p> <ol style="list-style-type: none"> 1. Confirm and monitor the position of the seawater and saltwater interface (including under the Roebuck Plains area) in the Broome Sandstone aquifer. 2. Collect baseline data and monitor impacts between water users. 3. Collect baseline data and monitor impacts to environmental assets.

No.	Policy detail
A2.5	<p>Applicants may be asked to submit records and the outcomes of engagement with Traditional Owners to identify and assesses the risk of impacts from the proposed take and use of water on cultural values and sites of cultural significance.</p> <p>See Section 4.6 for guidance on what level of engagement with Traditional Owners the department expects from applicants.</p>
A3. Construction of bores/wells	
A3.1	<p>Applicants must submit a Form 2 or Form 2a or a certified driller's borehole construction report within 30 days of bore construction and include a description of the lithology and surveyed level of the bore. The department may also require, as a condition of bore construction, detailed geophysical logs, sampling for palynology or pump test results.</p>
A3.2	<p>Construction rules for groundwater production or monitoring bores may be applied as a licence condition specific to the La Grange plan area. Previous rules have aligned with a current version of <i>Minimum construction requirements for water bores in Australia</i> (National Uniform Drillers Licensing Committee 2020).</p>
A3.3	<p>Applicants should locate new or replacement production bores as far as practical from environmental assets and existing production bores to lower the potential risk of impact. This includes groundwater bores used for watering stock.</p>
A4. Operating strategies	
A4.1	<p>In an operating strategy for a water licence or licence application, applicants may be asked to include triggers and threshold criteria, including 'no allowable impact', as determined by the department, for:</p> <ol style="list-style-type: none"> 1. Water levels, water quality or rates of discharge. 2. Vegetation condition from in-field monitoring or percentage foliage cover from remote sensing. 3. Other indicators which may be provided by Native Title holders or to protect cultural values. <p>See Section 4.5 for examples of site-specific triggers and how they are included in management.</p>
A4.2	<p>Applicants may be required to include a specific monitoring and reporting schedule in an operating strategy. Some examples of previous requirements we have set include:</p> <ol style="list-style-type: none"> 1. Monitor water levels and sample water quality at designated bores (e.g. every three months). 2. Monitor ecological condition and trends (e.g. annually) including, but not limited to, water quality and levels in persistent pools or use piezometers targeting the local fresh watertable (e.g. every three months). 3. Analyse percentage vegetation foliage cover using publicly available remote sensing datasets with a method approved by the department. 4. Report non-compliance (within seven days of a threshold being reached). 5. Report on compliance with water-level and ecological criteria and any management actions implemented within the timeframe detailed.

No.	Policy detail
A4.3	<p>Applicants may be asked to include management responses to triggers or threshold criteria in an operating strategy or as conditions on the licence to minimise or mitigate observed impacts. Previous examples include, but are not limited to, the following:</p> <ol style="list-style-type: none"> 1. Commence or change the frequency of monitoring and reporting on water levels, water quality or ecological monitoring. 2. Install additional monitoring bores. 3. Alter the volume or rate of abstraction. 4. Reduce, modify or cease abstraction for a specified time or until a specified water level, water quality or ecological measure is achieved. 5. Implement an enhanced water quality monitoring program until the specified water quality is reached or stabilises. 6. Begin annual monitoring of ecological condition and trends. <p>In future, the operating strategy may also include relocating production bores.</p> <p>See Section 4.5 for more information on management responses and how they should be implemented.</p>
A4.4	<p>Applicants may be asked to prepare a nutrient and irrigation management plan, in addition to an operating strategy, where the application of nutrients and fertilisers has the potential to contaminate water sources. Previous examples of conditions include:</p> <ol style="list-style-type: none"> 1. Collect a minimum of 12 months or up to two years' baseline water quality data to inform the setting of triggers and thresholds. 2. Set water quality triggers and thresholds using baseline data in the operating strategy. 3. Report against department-approved water quality triggers and thresholds listed in the operating strategy in annual reporting. <p>A condition on the water licence is likely to involve taking a water sample at the end of the irrigation season (October to November) and sending it to an accredited laboratory for a comprehensive analysis, as per Appendix C4 of <i>Operational Policy 5.12 – Hydrogeological reporting associated with a water licence</i> (DoW 2009).</p> <p>See Water quality protection note 33 – Nutrient and irrigation management plans for assistance to develop a comprehensive and effective plan.</p> <p>See the Australian and New Zealand guidelines for fresh and marine water quality (ANZG 2018) for further information on how to set site-specific water quality triggers.</p>
A4.5	<p>Licensees must comply with the operating strategy and licence conditions and demonstrate they have been sustainably pumping the full entitlement in that stage before progressing to the next stage. The department will review and analyse the data against the model predictions to ensure the development can progress sustainably.</p> <p>Groundwater models prepared for subsequent development stages must include observed monitoring data, pump test data and any observed or modelled impacts from the current operation at full pumping.</p>
A4.6	<p>Licensees may be required to review and update their operating strategy as knowledge improves through monitoring and management. The department may amend the licence conditions to reflect this.</p>

No.	Policy detail
A4.7	<p>Applicants are required to provide evidence of legal access to the land on which the production and monitoring bores or other ongoing monitoring is to be located, for the duration of the proposed licence term. This includes legal access to properties outside the applicant's land tenure, where they may need to monitor impacts (because drawdown may extend that far), as detailed in the operating strategy.</p> <p>Landgate can identify the owner or management body for parcels of land: www.landgate.wa.gov.au or www.maps.slip.wa.gov.au/landgate/locate/. Once identified, applicants must follow the relevant process:</p> <ul style="list-style-type: none"> • Crown land is managed by the Department of Planning, Lands and Heritage (DPLH). Applicants can submit a Crown land enquiry form to gain legal access. • Land under a pastoral lease also requires the pastoral lease holder's permission. DPLH can advise of relevant contact details for that person/s. • Land under an exclusive Native Title determination also requires approval from the relevant Indigenous Corporation (Office of the Registrar of Indigenous Corporations) to access land. <p>If the land is under another tenure type, or the applicant is unsure, they should contact the department for further information.</p>

A5. Monitoring	
A5.1	<p>The licensee may be required to monitor, measure and report on:</p> <ol style="list-style-type: none"> 1. Salinity 2. Other specified water quality criteria and trends 3. Ecological condition and trends 4. The position of the seawater (coastline) or saltwater (inland) interface/s 5. Water levels and trends in water levels 6. Other criteria related to cultural values <p>This may be part of the licence conditions or operating strategy (see policy A4.2). The data can be used as evidence to support a licence application for an increased entitlement volume.</p>
A5.2	<p>Continuity in monitoring data is necessary to inform ongoing adaptive management. Where a monitoring bore needs to be replaced or redrilled, the licensee should, where possible, undertake 12 months of conjunctive monitoring or a minimum of four conjunctive monitoring occurrences before a site is decommissioned. This will maintain the long-term integrity of the monitoring dataset.</p>
A5.3	<p>Before pumping or abstraction begins, the licensee should measure and monitor groundwater for a minimum of 12 months, with salinity measurements taken at least every six months (twice) during this period.</p>
A5.4	<p>The department will specify monitoring requirements (including measurement frequency) in a licence condition or request that the licensee includes a specific monitoring schedule in an operating strategy (see policy A4.2). The preference is for licensees to equip bores with data loggers and regularly validate the data with three-monthly monitoring or sampling checks.</p>
A6. Reporting	

A6.1	The water year in the La Grange plan area is the calendar year (1 January to 31 December).
9.2	It is the licensee's responsibility to submit monitoring and aquifer review reports to the department, and meet other reporting requirements, by the date specified in their licence conditions or operating strategy. It is also the licensee's responsibility to contact the department if the reporting conditions cannot be fulfilled due to extenuating circumstances.

4.4 Updates to local licensing policies for management zones in the La Grange plan

This statement updates the local licensing policies for the two management zones in the La Grange plan area: the Coastal management zone and Mandora management zone (Figure 2) (see Table 3 below). The management zones are detailed in the La Grange plan (see Section 6.2).

In addition to the local licensing policies above (Section 4.3), these specific local policies apply to groundwater licences within the management zones. The specific monitoring requirements identified in Table 3 are minimum starting points and may need to be modified if declining water levels or quality are detected.

Table 3 below replaces tables 4 and 5 in the La Grange plan (see Table 1 of this statement for all replacement details). We have numbered the new policies in order and added an 'A' to the policy number to denote that they are updates to the La Grange plan.

Table 3 *Updated local licensing policies for water management zones in the La Grange plan area*

A7. Water management zones	
A7.1	<p>A licence application that proposes to take water inside of a water management zone boundary, or from an area outside the management zone with a predicted drawdown at the management zone boundary, may be subject to the licensing rules for that management zone.</p> <p>See Section 4.5 for more information.</p>
A7.2	<p>Licensees taking water within a water management zone should include salinity and nutrient measurements as part of their monitoring and reporting (submitted annually), and in accordance with their operating strategy. This could include the following requirements based on the licence entitlement amount:</p> <ol style="list-style-type: none"> 2,000 kL/year up to 5,000 kL/year: one water sample analysed each reporting year, taken in October. 5,001 kL/year up to 20,000 kL/year: two water samples analysed each reporting year, taken in March and October. More than 20,000 kL/year: as a minimum, establish quarterly monitoring and analysis of salinity data and include this in an annual report. (Additional monitoring may be required with a preference for continuous logging.)
A7.3	<p>New bores must not be drilled within the Mandora management zone boundary unless these are:</p> <ol style="list-style-type: none"> For the purposes of monitoring or investigation. Outside the Ramsar boundary. In keeping with supplementary guidance on assessing impacts to sites of cultural significance (see Section 4.6).

4.5 Supplementary guidance for assessing impacts to sites of ecological significance

This section provides guidance on best-practice assessment and management of sites of ecological significance that may be considered during the department's assessment of licence applications and renewals. This guidance is to assist the department, licensees and applicants in providing information and advice in relation to environmental assessments.

The department developed the local licensing policies and management zone rules in this statement (Table 2 and Table 3) with the aim to avoid or minimise the impact of groundwater abstraction on sites of ecological significance. A site of ecological significance is a groundwater-dependent ecosystem (as identified in Section 3.2) which:

- is protected under environmental legislation or by international agreements
- supports species or communities protected under environmental legislation or by international agreements
- is listed in government policy and guidance as significant
- is regionally or locally important
- provides vital habitat
- is natural, rare or unique
- supports significant biodiversity.

Under the *Environmental factor guidelines – inland waters* (EPA 2018), for the purposes of environmental impact assessment, mapped groundwater-dependent ecosystems located across the La Grange plan area are likely to be considered sites of ecological significance (Section 4.2), because these ecosystems are either:

- wetland types which may be poorly represented in the conservation reserves system
- springs and pools, particularly in arid areas
- ecosystems which support significant flora, vegetation and fauna species or communities, including migratory waterbirds, bats and subterranean fauna, or
- ecosystems which support significant amenity, recreation and cultural values.

We will assess the risk of impact to sites of ecological significance by applying the risk thresholds in Table 4 associated with the predicted groundwater drawdown at the site. This risk assessment approach is adapted from Froend and Loomes (2004) and Green et al. (2013) and accounts for the shallow, often spring-supported wetlands located across the plan area. This approach may be updated as more local data becomes available on how wetlands, groundwater-dependent vegetation and ecosystems respond to changes in groundwater regimes.

Water licence applicants should aim to design their proposed activity to achieve a *low risk of impact* from their abstraction on sites of ecological significance (see Table 4).

Table 4 *Interim risk thresholds for preliminary risk assessment for sites of ecological significance*

Risk of impact ¹	Interim risk thresholds: predicted drawdown from the average minimum level in mAHD ²		Risk decision
	Ecosystem supported by watertable ³	Ecosystem supported by piezometric surface	
Low	<10 cm	<10% of available heads	Acceptable with monitoring to demonstrate that the impact occurs as predicted.
Moderate	<20 cm	<20% of available heads	Acceptable with monitoring and management actions that minimise or mitigate the impact.
High	<30 cm	<30% of available heads	Unacceptable unless the licensee agrees to conditions that require high-level management action (see Table 5) to minimise or mitigate the impacts.
Severe	≥30 cm	≥30% of available heads	Unacceptable and the application may be referred ⁴ or refused.

1 We will request advice from DBCA with regard to defining the risk of impact related to drawdown within, or that may intersect, the Mandora management zone or marine parks.

2 Against the baseline, which can be based on either an adequate period of historical groundwater monitoring or a modelled 0 GL scenario for 10 years with the current climate (using a fit-for-purpose model). We recognise that groundwater levels have remained high since the 2017–18 wet season and recommend using data collected before 2018 if available.

3 Use if piezometric data is not available or the ecosystem is not supported by a piezometric surface. We note that some models may not be able to predict within 10 cm drawdown and will work with proponents on a practicable approach to applying the triggers.

4 Licence applications may be referred to the EPA for assessment under Part IV of the EP Act or to the Commonwealth under the Environment Protection and Biodiversity Conservation Act 1999 (Cth: EPBC Act).

In cases where the department considers a water licence application has a moderate or high risk of impact on sites of ecological significance, the applicant is required to show they have considered feasible ways to reduce the risk of impact to 'low', as outlined in policy A2.3.

Where a low level of risk or higher remains, it is the applicant's responsibility to design and commit to an adaptive management approach that monitors and minimises impacts on any site of ecological significance.

Table 5 shows the level of monitoring and adaptive management that an operating strategy may require. Specific and timebound monitoring schedules from the operating strategy may be included as conditions on the water licence, as well as conditions that may require the licensee to reduce, modify or cease abstraction (policy A4.3).

Table 5 *Guidance on adaptive management for licence assessments and operating strategy development to demonstrate intent to avoid or minimise impacts on sites of ecological significance*

Monitoring tiers	Trigger criteria	Trigger actions, if the trigger is reached	Threshold criteria	Threshold actions, if threshold criteria are reached or impacts observed
Low risk of impact identified – see criteria in Table 4				
Monitor groundwater level at appropriately located (policy A2.4) and constructed (policy A3.2) bore/s against predicted drawdown.	Set at modelled drawdown	<ul style="list-style-type: none"> Remodel using recent monitoring data. Reassess risk of impact (Table 4) using updated model predictions. Report to the department. 	10 cm drawdown or 10% reduction in heads	Implement trigger actions for a moderate risk of impact.
Moderate risk of impact identified – see criteria in Table 4				
<p>Considerations for low risk, plus:</p> <ul style="list-style-type: none"> Collect baseline and ongoing ecological and hydrogeological data (policy A2.2) at a frequency specified by the department. Monitor level, electrical conductivity and pH of persistent pools and designated bores at a frequency specified by the department (policy A4.2). 	10 cm or 10% of available heads and other triggers deemed necessary (policy A4.1)	<ul style="list-style-type: none"> Report trigger exceedance to department within seven days. Analyse rainfall, groundwater and abstraction data to determine the likely driver for the trigger being reached. Start tree condition or percentage foliage cover assessment, or other flora and fauna monitoring. Analyse historical remote sensing data. Increase frequency of water-level and/or quality monitoring in persistent pools and designated bores. Report results of analysis and interpretation to the department within 90 days of exceedance or within an agreed timeframe. Take threshold criteria actions if abstraction is the likely driver of change. 	Modelled drawdown (which will be <20 cm or <20% of available head) and other criteria deemed necessary (policy A4.1)	<ul style="list-style-type: none"> Report criteria exceedance to the department within seven days. Reduce, modify or cease abstraction as required to stop any further decline if review identifies abstraction is the likely cause of impacts to the supporting water regime. Reduce, modify or cease abstraction as required to allow recovery of groundwater levels if the review identifies abstraction is the likely cause of impacts on sites of ecological significance. (Other actions as detailed in policy A4.3 may also be considered.)

Monitoring tiers	Trigger criteria	Trigger actions, if the trigger is reached	Threshold criteria	Threshold actions, if threshold criteria are reached or impacts observed
High risk of impact identified – see criteria in Table 4				
<p>Considerations for low risk and moderate risk, plus:</p> <ul style="list-style-type: none"> • Monitor tree and site condition annually (policy A4.2). • Analyse remote-sensing data on vegetation percentage foliage cover annually (policy A4.2). • Monitor local water levels and electrical conductivity using fit-for-purpose piezometer/s (policy A4.2). 	<p>20 cm or 20% of available heads and other triggers deemed necessary (policy A4.1)</p>	<ul style="list-style-type: none"> • Report trigger exceedance to the department within seven days. • Analyse rainfall, groundwater and abstraction data to determine the reason for the trigger being reached. • Undertake additional tree condition and percentage foliage cover monitoring. • Analyse historical remote-sensing data. • Increase frequency of water-level and/or quality monitoring in persistent pools and designated bores. • Report results of analysis and interpretation to the department within 90 days of exceedance or within an agreed timeframe. • Take threshold criteria actions if abstraction is the likely driver of change. 	<p>Modelled drawdown (which will be < 30 cm or < 30% of available head) and other criteria deemed necessary (policy A4.1)</p>	<ul style="list-style-type: none"> • Report criteria exceedance to the department within seven days. • Reduce, modify or cease abstraction as required to stop any further decline if review identifies abstraction is the likely cause of impacts to the supporting hydrogeology. • Reduce, modify or cease abstraction as required to allow recovery of groundwater levels if review identifies abstraction is the likely cause of impacts on sites of ecological significance. (Other actions as detailed in policy A4.3 may also be considered.)

4.6 Supplementary guidance for assessing impacts to sites of cultural significance

This section provides guidance on best-practice assessment and management of sites of cultural significance that may be considered during the department's assessment of licence applications and renewals. This guidance is to assist the department, licensees and applicants in providing information and advice in relation to environmental assessments.

The department consider the impact of the take and use of water on sites of cultural significance in our assessment of a water licence application as part of our considerations under Schedule 1, Division 2, clause 7(2) of the RIWI Act.

In order to exercise our decision-making functions under the RIWI Act, we may request an applicant to provide information about the impact of their proposed activities on water-related cultural values and sites of cultural significance.

We recognise that Traditional Owners are the custodians of their culture and cultural values and that their views are critical to understanding relevant impacts. Traditional Owners have knowledge about cultural values and sites of cultural significance which can inform our assessment of the risk of impact associated with a water licence or permit application. For this reason, applicants should engage with Traditional Owners to identify any relevant potential impacts.

When engaging with Traditional Owners (evidence of which we may request under policy A2.5), water licence applicants should follow this guidance:

- Do not rely on available published information as a definitive list of all Aboriginal heritage that may be impacted by the proposed activity. This is because not all Aboriginal heritage is recorded publicly.
- Engage early with the Traditional Owners on the water licence application. Proponents are advised to engage with Traditional Owners at the same time as contacting the department to allow for the necessary cultural studies to be identified and conducted, along with the ecological and hydrogeological studies.
- Ensure the appropriate people within the Native Title holder group are contacted via the prescribed body corporation (chairperson and chief-executive officer).
- Share appropriate information with Traditional Owners to enable them to make informed comment on your project.
- Give adequate time for Traditional Owners to consider information about your project and provide feedback. Discuss with Traditional Owners early in the process to determine how much time they may need. This may depend on the project's complexity and current capacity of the prescribed body corporation.
- Contact Native Title holders before visiting sites to determine if access is restricted, adhere to cultural protocols, and ensure that cultural monitors are provided, if required.
- Undertake an initial cultural heritage assessment if requested by Native Title holders (as per the Aboriginal Heritage Act) and submit this to the department.

The time required to engage with relevant Traditional Owners is factored into the licence assessment timeframe.

Traditional Owners may provide information to applicants or the department including, but not limited to, the following:

- Risk thresholds for sites of cultural significance that may differ to those listed in Table 4 and include a threshold for no allowable risk.
- Adaptive management guidance for sites of cultural significance including monitoring, thresholds and management actions. These may differ to those listed in Table 5 and include culturally appropriate monitoring methods.

If comments received from Traditional Owners or our risk assessment indicates there is a moderate or higher risk of impact to water-dependent cultural values and sites of cultural significance, then the applicant may need to show they have applied feasible ways to reduce the outcome to a zero or low risk of impact, as outlined in policy A2.3.

It is the applicant's responsibility to demonstrate that they can avoid impacts, or minimise the risk of impacts, on water-dependent cultural values and sites of cultural significance. When an applicant or Traditional Owners do not provide relevant information on how the proposal may impact water-dependent cultural values and sites of cultural significance, the department may apply the interim risk thresholds (Table 4) for sites of ecological significance. In this case, applicants should also use the considerations for adaptive management in Table 5 for sites of ecological significance.

Applicants must ensure that any monitoring or management actions are culturally appropriate.

5 Updates to monitoring

5.1 Updates to the department's regional monitoring program

The department commenced a regional monitoring program in 2015. The La Grange monitoring program consists of 69 bores installed by DPIRD and select pastoral bores across the La Grange plan area.

The La Grange regional monitoring program (Figure 8) is designed to monitor groundwater levels at a regional scale, as well as water quality and salinity profiles in selected bores. Most bores are equipped with loggers that record hourly data.

At present the program collects important baseline information on water level and water quality. As abstraction increases, we will be able to use this baseline and new data to assess how the Broome Sandstone aquifer changes in response to abstraction and rainfall (including the seawater and saltwater interfaces). This will help us to verify modelled predictions of how the aquifer and its dependent values are likely to respond to abstraction. Licensee monitoring and triggers set in operating strategies ensure that any impacts are detected early and in time to alter pumping regimes.

Applicants and licensees can access all the monitoring data we collect to support groundwater management, as well as use it for local scale numerical water models. Our publicly accessible database of water information is available at <https://www.wa.gov.au/service/natural-resources/water-resources/water-information-reporting>. Data from more specific project monitoring infrastructure may also be available on request.

We may require land access for monitoring purposes. In this case, we will give land holders and Native Title holders (where a collaboration agreement has not been established) three weeks' notice by email, with a follow-up phone call one week before access to the site.

Interested parties can request individual arrangements to access land, including those required to meet cultural protocols, by emailing our regional office in Kununurra. Our measurement staff will make reasonable efforts to meet such requests.

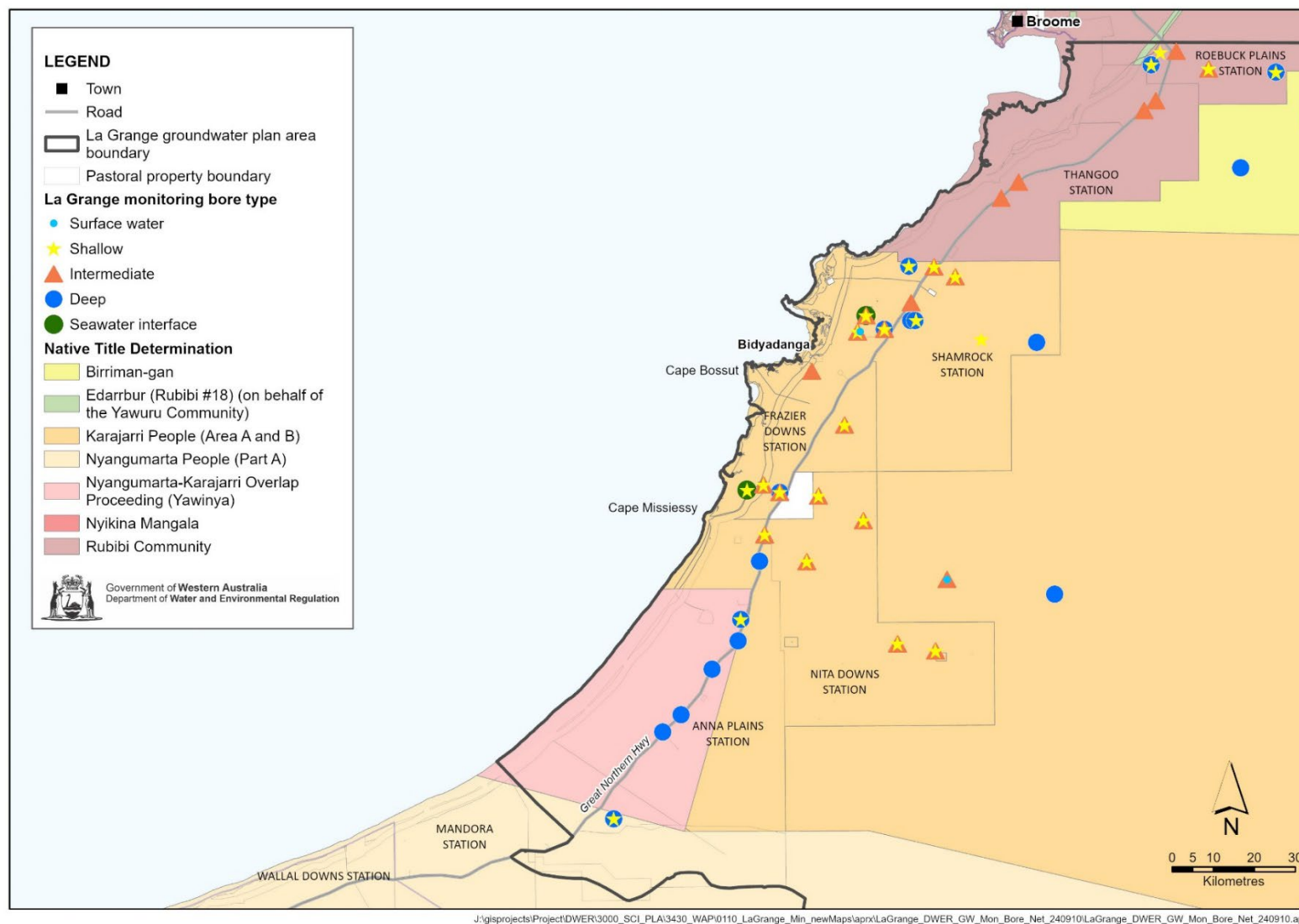


Figure 8 The location of bores included in the La Grange regional groundwater monitoring program

5.2 Updates to licensee monitoring

As detailed in the local water licensing policies (Section 4.3), the department may require that licensees carry out local area monitoring to detect and manage any impacts to the local environment from abstraction associated with licensed water use activities.

Consistent with regulation 41C of the Rights in Water and Irrigation Regulations 2000 (WA), monitoring includes installing meters for licences for 10,000 kL/year or more, unless we approve an alternative measurement method or exemption. Licensees must record meter readings monthly and report these to us every year, within 30 days of the end of the water year, through our Water Online portal.

The monitoring requirements for licensees is established in their operating strategies, which are developed during the licence assessment process.

Licensees must send their measurement data to us in accordance with their operating strategy. In some instances, licensees may also be required to monitor vegetation condition, and surface water levels and quality.

6 Next steps for water management in La Grange

The department remains committed to ensuring the Broome Sandstone aquifer is managed sustainably to protect the ecological, cultural and social values it supports. This statement reflects our commitment to transparency around how groundwater is being managed and provides guidance on accessing groundwater.

At present, most licensees in the plan area are still establishing their production bores and required infrastructure such that water use remains relatively low compared with the licensed entitlements. We will continue to assess monitoring data against modelled predictions to determine if the aquifer is responding as predicted and confirm whether allocation limit volumes are appropriate and sustainable.

Water licensing rules and agreed operating strategies may need to be amended should unforeseen impacts become apparent at the highly valued groundwater-dependent ecological and cultural heritage sites in the plan area.

Some of the issues raised by Traditional Owners and stakeholders around water licensing in the La Grange plan area have not been addressed in this statement; for example, some interested parties have asked for a formal review of the groundwater allocation limits, a climate change policy, and – for Traditional Owners – water for future economic development. These issues are best addressed through a new allocation plan.

To inform water allocation planning, we need data and results from the La Grange GDE project, the seawater interface project, licensee monitoring (as groundwater use increases) and climate modelling. When these projects are completed, we will review whether we need to replace the *La Grange groundwater allocation plan* (2010) and, if so, begin developing the next plan. We will continue our water allocation planning and licensing in consultation with Traditional Owners and all stakeholders.

Further information

For water licensing information, please contact our North West regional office on (08) 9166 4100 or kununurra@dwer.wa.gov.au.

You can also view the latest water allocation and availability information through our online water register at WA.gov.au: www.wa.gov.au/service/natural-resources/water-resources/water-register

Glossary

This glossary lists new or updated terms in relation to water resource management in the La Grange plan area. Users can cross-reference the bold terms in the Meaning column.

Term	Meaning
Aboriginal heritage	The definition of Aboriginal heritage used in this plan relates to section 5 through to section 9 of the <i>Aboriginal Heritage Act 1972</i> (WA) in relation to places, objects, traditional use, and traditional custodians.
Country (when used in connection to Aboriginal people)	Country means the lands, waterways, seas and skies to which Aboriginal peoples are intrinsically linked. Wellbeing, law, place, custom, language, spiritual belief, cultural practice, material sustenance, family and identity are all interwoven as one.
(sites of) Cultural significance	<p>The department considers the following are sites of cultural significance:</p> <ul style="list-style-type: none"> • Aboriginal heritage listed under Western Australia's Aboriginal heritage laws • cultural heritage significance under section 5 of the <i>Heritage Act 2018</i> (WA), and/or • world or national heritage significance under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth), such as the West Kimberley National Heritage place. <p>In the La Grange plan area this definition has been extended to all <i>lirri</i> / soaks, <i>jila</i> / permanent water places, <i>pajalpi</i> / springs or spring country or ecosystems surrounding a spring, and <i>wawajangka</i> / freshwater seepage in the intertidal zone</p>
Cultural value	Cultural values are the core principles and value systems that underpin a community, a society or, in the case of Traditional Owners , a nation, clan or language group. They may be associated with a site of cultural significance or associated with the living, historical and traditional observances, practices, customs, beliefs, values, knowledge, relationships and skills of Aboriginal people. Cultural values of Traditional Owners can only be determined by them and are expressed in many ways such as narratives, songlines, art and maps.
(site of) Ecological significance	<p>A site of ecological significance is a water-dependent ecosystem that:</p> <ul style="list-style-type: none"> • is protected under environmental legislation or international agreements • supports species or communities that are protected under environmental legislation or international agreements • is listed in government policy and guidance • is regionally or locally important • provides vital habitat • is natural, rare or unique • supports significant biodiversity.
Ecological values	Ecological values are the natural ecological processes occurring within water-dependent ecosystems and the biodiversity of these systems.

Term	Meaning
Environment	Living things, their physical, biological, cultural and social surroundings, and interactions between all of these as defined in section 3, <i>Environmental Protection Act 1986</i> (WA).
Environmental assets	For the purposes of this statement environmental assets include a water-dependent ecosystem, an ecosystem service and/or a site with ecological, social or cultural significance.
Exempt use	Subject to the requirements of the <i>Rights in Water and Irrigation Act 1914</i> (WA) a person can take water without a licence for: <ul style="list-style-type: none"> • normal household consumption and watering of a domestic garden that is not larger than 2.0 ha for surface water and not larger than 0.2 ha for groundwater • watering stock other than those being raised under intensive conditions • emergency firefighting purposes.
Groundwater-dependent ecosystem	Natural ecosystems that require access to groundwater to meet all or some of their water requirements on a permanent or intermittent basis, to maintain their communities of plants and animals, ecosystem processes they support and ecosystem services they provide (Richardson et al. 2011a, p.1).
Metering	Measurement of water that is taken from a water resource using a water meter.
Native Title party	In relation to an area of land where a water licence or permit is applied for, the relevant Native Title party has the meaning given in section 24HA(7)(a) of the <i>Native Title Act 1993</i> (WA), including: <ul style="list-style-type: none"> • a representative Aboriginal/Torres Strait Islander body • a registered Native Title body corporate, or • a registered Native Title claimant.
Nearshore marine	The area that extends from the beach to the part of the ocean that is close to the shore.
Palaeovalley	The remnant of an inactive river or stream channel that has been filled or buried by younger sediment.
Recharge	Water that infiltrates into the soil to replenish an aquifer.
Risk of impact	The department uses the following definitions for risk of impact associated with a water licence application for the take and use of groundwater in the La Grange plan area: <ul style="list-style-type: none"> • Low risk of impact: low probability of measurable impact from change of groundwater regime. • Moderate risk of impact: moderate probability of noticeable impact from changes of groundwater regime. • High risk of impact: high probability of noticeable impact from changes to groundwater regime.
Saltwater interface	The saltwater interface is a zone where dense saline groundwater associated with on-land sources of salinity (e.g. hypersaline lakes, coastal clays) meets the fresh groundwater.

Term	Meaning
Saturated thickness	The vertical thickness of an aquifer which is saturated (completely filled) with water.
Seawater interface	The seawater interface is a zone where dense saline groundwater from the ocean meets the fresh groundwater flowing out to sea below the surface of the land along our coastlines.
(site of) Social significance	A site of social significance is a place of relative importance to people where they rely on water to practise their recreational, tourism, education and scientific pursuits and enjoy the landscape and aesthetic aspects of a place.
Spring	The <i>Rights in Water and Irrigation Act 1914</i> defines a spring as water naturally rising to and flowing over the surface of land, but does not include the discharge of underground water directly to a watercourse, wetland , reservoir or other body of water.
Threshold criteria	A defined water level, discharge rate, flow rate, water quality parameter, or other measure intended to represent the limit of acceptable change, beyond which a defined site of ecological significance is likely to be impacted by the licensee's abstraction. Actions need to be implemented to mitigate the observed impact.
Throughflow	The horizontal movement of groundwater through the aquifer generally from areas of high elevation to low elevation.
Traditional Owner	An Aboriginal person/s is a Traditional Owner if they are: <ul style="list-style-type: none"> • a Native Title holder • a registered Native Title claimant or claim group • a member of a regional aboriginal corporation established under a settlement agreement with the government, or • a person who is recognised as having the cultural authority to speak for a place.
Trigger criteria	A defined water level, discharge rate, flow rate, water quality parameter, or measure intended to forewarn of the possibility that threshold criteria may be reached and therefore prompt trigger actions by licensees and the department. Trigger criteria are set at a conservative level and actions are initiated to avoid reaching the threshold criteria.
Water resource	Water resources include – <ul style="list-style-type: none"> • watercourses and wetlands together with their beds and banks • other surface waters • aquifers and underground water.
Wetland	As defined by the <i>Rights in Water and Irrigation Act 1914</i> , a wetland is a natural collection of water, whether permanent or temporary, on the surface of any land and includes – <ul style="list-style-type: none"> • any lake, lagoon, swamp or marsh; and • a natural collection of water that has been artificially altered but does not include a watercourse.

Traditional Owner language terms and meaning

Term	Meaning	Language group
Bugarrigarra / Pukarikarra	The Dreaming era where all Law was passed on Karajarri people.	Yawuru / Karajarri
Kurtany	Literally 'mother' but used to refer to the unseen water that comes from the ground (groundwater). Groundwater/the watertable is understood as the 'balance of water' and Karajarri culture dictates that it is their responsibility to maintain the balance.	Karajarri
Kuwaiyinjijala	The practice of taking a mouthful of water and spraying it out around you. This serves to introduce the strangers to the <i>jurru/pulany</i> that live at <i>jila</i> and <i>pajalpi</i> .	Karajarri
Jila	A water site where a <i>jurru/pulany</i> (mythical water serpent) lives and is connected to Bugarrigarra / Pukarikarra. Often, but not exclusively, a site that has permanent surface water. Some <i>jila</i> need to be dug out to reach the water. <i>Jila</i> describes more of the cultural/spiritual characteristics of a water place rather than physical.	Yawuru / Karajarri
Jurru / pulany	Mythical water serpents who reside in, and/or have made the significant water sources, called <i>jila</i> . All <i>jurru/pulany</i> have the capacity to smell strangers; that is, people who do not come from that particular country. They also have distinctive personalities. Some are very 'cheeky' – dangerous and unpredictable. Others are docile. Active <i>pulany</i> are believed to be able to move around under the ground. <i>Jurru/pulany</i> are powerful beings who must be respected and approached in prescribed ways. Culture dictates that strangers should not approach a <i>jila</i> without being introduced by a Traditional Owner for that area so as to not disturb or anger the <i>jurru/pulany</i> .	Yawuru / Karajarri
Lirri	A soak where water can be dug up or held. Some soaks are permanent; others are seasonal. Some <i>lirri</i> may also be a <i>jila</i> .	Karajarri
Mabu buru	healthy country	Yawuru
Mabu liyan / Mabu ngarlu	good feeling, spirit or wellbeing especially pertaining to spiritual matters or intuition	Yawuru / Karajarri
Mabu ngarngunil	healthy people and community	Yawuru
Ngapa kunangkul	living water	Karajarri
Pajalpi	Spring, most often used to describe a wetland complex with a spring/springs. Generally an area with permanent or near permanent surface water.	Karajarri
Wawajangka	freshwater seepage in the intertidal zone	Karajarri

Shortened forms

AEM	Airborne Electromagnetic
AHD	Australian height datum
Cth	Commonwealth
DBCA	Department of Biodiversity, Conservation and Attractions
DoW	Former Department of Water (now DWER)
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
GDE	Groundwater-dependent ecosystem
EPA	Environmental Protection Authority
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
NT Act	<i>Native Title Act 1993 (Cth)</i>
RIWI Act	<i>Rights in Water and Irrigation Act 1914 (WA)</i>
SGIP	State Groundwater Investigation Program
WAP Act	<i>Water Agencies (Powers) Act 1984 (WA)</i>

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