

Sustainable Water in Mining? The Importance of Traditional Owner Involvement in Commercial Water Use and Management in the Pilbara Region of Western Australia

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ABSTRACT

The mining industry is a significant water user, an issue that gains a particular prominence in arid zone mining regions, such as the Pilbara region in Western Australia (WA). Mining companies extract vast amounts of water from the groundwater aquifers to access orebodies and to dewater the mine pits. Much of this water is dumped in creeks, injected back into the aquifer downstream or used in mining processing. There is increased awareness from community members for sustainable water use in mining beyond life of mine, and the emergence of Environmental, Social and Governance (ESG) principles in the mining and metals sector signals a shift towards recognizing the importance of water stewardship. Much of the land subject to dewatering in the Pilbara is also subject to native title determinations. For Traditional Owners, important cultural values are associated with water. However, water is not adequately covered in native title, especially in relation to commercial use. We argue that Traditional Owner involvement in design and management of the use of excess water from a mining proponent's water licence (dewatering) can assist in sustainable use of groundwater, as well as provide opportunities in social and economic enterprises. As a provocation style piece, this paper is based on secondary literature, rather than ethnographic data. It explores the political and regulatory landscape of mine dewatering and outlines the limitations that have existed historically and currently and which inhibit Traditional Owners to participate in water management or commercial water interests. We also provide a high-level analysis of several mining proponents' public policy commitments to water stewardship to assess the sustainable use of water which involves stakeholders such as Traditional Owners in water decision-making. Finally, we identify possible opportunities and provide some recommendations, for water futures in this dry region where iron ore mining and gas extraction, already massive, are expanding further.

Keywords: Indigenous Australian water rights, water justice, Pilbara mining region, mine dewatering, commercial value of water.

INTRODUCTION

The current period is a time of transition in water governance for Indigenous peoples, both in Australia and internationally (Jackson and Langton 2012; Marshall 2017;

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Pahl-Wostl 2017). Indeed, it has been an active space. Over the last fifteen years in Australia a raft of Declarations, Indigenous specific stakeholder forums, legislative reform and targeted research initiatives have been established to address the deficit in the Indigenous water rights and interests. Many of these initiatives were driven from the east coast, led by the Murray-Darling Basin region, including the National Cultural Flows Research Project (NCFRP) hosted by the National Native Title Council (NNTC).

The Declarations on Indigenous water rights include the Echuca Declaration (Victoria) in 2007 that defines the concept of 'cultural flows', followed by the Garma International Indigenous Water Declaration in 2008, which subsequently led to the Mary River statement (NT) in 2009. Though these statements are undoubtedly important, they are being inserted into a regulatory context of a 'mature water economy' (Jackson 2017:2), and present only a small level of intervention. Jackson (*ibid.*:121) has found that Indigenous specific water entitlements are estimated at less than one hundredth of 1% of Australian water allocations. Likewise, it wasn't until 2004, with the revision of the National Water Initiative, that Indigenous rights to water were formally recognised in national water policy (National Native Title Council 2014:4).

Coming off this very low base, it is clear that Indigenous peoples have struggled for recognition of *any* water entitlements. When there has been specific recognition and provision, the focus has been on the cultural values of water, its sacred nature as the source of life and as embodied in the concept of cultural flows. Water for Indigenous economic or commercial benefit has rarely figured. Indeed, Jackson and Langton (2012:117) argue that the concept of cultural flows fails as a conceptual tool, as it essentializes Indigenous water use as exceptional, and that furthermore the concept does not translate into the language of the water entitlement framework. The question of how Aboriginal people can insert their traditional rights and interests in water in the absence of adequate native title rights to water is a pressing one in the Pilbara region, the focus of this article. What makes this Pilbara region a special case within the Australian context is the intensity of the overlapping interests, which include the triptych of mining, pastoralism and native title determinations. Despite the attempted dispossession and alienation of Aboriginal people in this region, beginning with pastoral incursion from 1864 to industrial scale mining from the 1960s, customary land tenure has been extraordinarily resilient with the majority of the Pilbara region now recognized as native title lands. Most language groups in this region now have at least some areas of their Country, if not substantial tracts, recognized as native title (National Native Title Tribunal 2023). All groups also hold or are negotiating Indigenous Land Use Agreements (ILUAs) with mining companies on their lands (Fig. 1).

Over a decade ago, Barber and Jackson (2011:47) found that 'in general, the Pilbara has received far less research effort and advocacy attention than many other areas of Aboriginal Australia'. This paper goes some way to addressing this neglect. Much of the research that has been undertaken in this mining region, perhaps unsurprisingly, has been funded by the mining industry. Nevertheless, the Juukan Gorge caves site desecration in May 2020 by Rio Tinto (2020; McIntyre 2011) catalysed an unprecedented focus on the region and a shift in public awareness about the on-going intensity of mining development on the Indigenous estate and the very limited protections that Indigenous peoples hold, including within Indigenous Land Use Agreements (ILUAs) (Australian Government 2021).

This paper is intended as a provocation style piece based on secondary literature, rather than ethnographic data. Our aim is to explore the issue of commercial Indigenous rights and interests in water at the interface of the mining industry's water use in this region. We problematise earlier concepts, such as the 'Indigenous economic water fund' from 2012, and follow some of the leads provided in the Pilbara focused papers, including Barber and Jackson (2011) from over a decade ago. This includes the involvement of native title

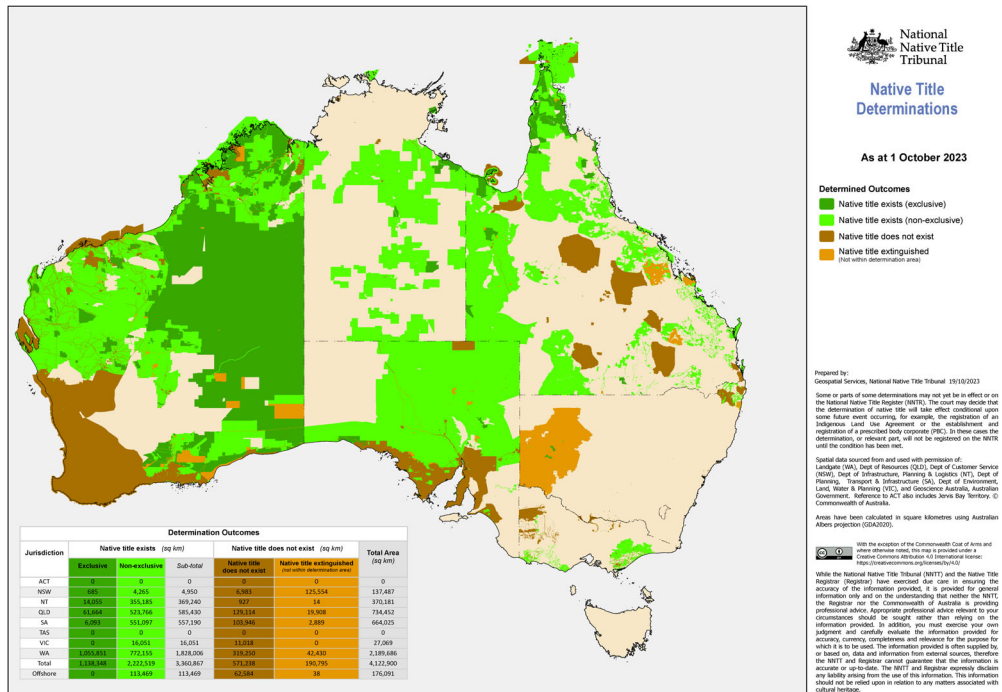


Figure 1: Map of native title determinations. Source: National Native Title Tribunal (2023).

holders in commercial initiatives about how best to discharge and potentially commercially utilise the mine dewater, a term we explain below. We also explore whether ILUAs offer a lever for these groups to assert their interests in water management. We recognise that ‘water justice is embedded and specific to historical and socio-cultural contexts’ (Zwarteveen and Boelens 2014:143) and see water justice to be of crucial importance in the Pilbara mining region, and we hope to raise the profile of the issue in the absence of sustained ethnographic inquiry, at this stage. In this mature water market, the mining industry is a phenomenal water user. Figures from 2011 show Rio Tinto ‘managed 100 gigalitres of freshwater across its operations in 2010, a volume equating to approximately 25% of the water supply of Perth ... and it is likely to increase to 160 GL plus in the next 10 years’ (Barber and Jackson 2011:56). In 2022, Rio Tinto’s (2023a) water risk profiles for the Pilbara region show their commitment to completing six managed aquifer recharge investigations by the end of 2023. Further, in 2022, company data for water usage at Rio Tinto across all operations where water was discharged, reused or consumed was 199 gigalitres of groundwater and 359 gigalitres of surface water (Rio Tinto 2023b). Thus, since 2011, water usage has doubled across Rio Tinto’s operations in the Pilbara. As the demand for minerals for the renewable energy transition grows, so will the water usage at mining operations.

Barber and Jackson (2011:7) produced their report for Rio Tinto to ‘improve [the company’s] understanding of the importance of water ... and ... mitigate the impact of the mining operation(s) of places of significance to Traditional Owners and avoid the mistakes of the past ...’.¹ Drawing on the Rio Tinto water stewardship standards and publicly available audits and policies, including for Cultural Heritage Management, we briefly consider whether these findings have been implemented. Despite high water use, the company appears to be committed to their public water stewardship statement. In the first quarter of

2023, Rio Tinto became the first major mining company to publish their site-by-site water usage (Rio Tinto 2023c). However, a significant challenge for the industry as a whole is the lack of a strategic approach to assessing and managing for cumulative impacts, and thus disaggregating the effects of a mine on the drying out of Aboriginal water sites (see Sommer 2012:78). This is also compounded by the complex hydrogeology of the region, said to be a network of (predominantly cyclone recharged) aquifers (CSIRO Land and water 2015), with water table fluctuations necessitating dewatering in mining pits.

METHOD, DATA AND AUTHOR POSITIONALITY

This is a desktop study where the authors reviewed legislation, grey literature and published sources focusing on the intersections of Indigenous rights and interest holders with water in its various land-based forms. We also bring regional contextual knowledge. Garlett is from WA and has experience working in the mining industry and Holcombe has undertaken periods of field research in the Pilbara region for a range of applied and academic projects.

Garlett is a Nyungar-Nyiyaparli-Yamatji woman, with legal and mining experience. She is an Industry Fellow at the Centre for Social Responsibility in Mining (University of Queensland), an Adjunct Professor at Federation University, and a sessional legal academic at Curtin Law School. She seeks to provide Indigenous people with avenues for advancing their legal rights in the context of water decisions, which disproportionately affect native title holders. Holcombe is a non-Indigenous social anthropologist, with several decades of experience in both applied and academic contexts. Her current research on the anthropology of the extractive industries is focused on the chinks and levers where Indigenous peoples can assert their rights and interests.

This paper provides a critical analysis on water use, management, and governance in the Pilbara region of WA, and explores the current legal framework, limitations in the law and potential options to include Traditional Owners in the commercialisation of their water resources with excess dewater. We have chosen to focus on the mine dewater issue due to the limited attention on the topic. This is also an intercultural complex area, because this water activity space reveals competing value systems, but also economic opportunities. How can such opportunities maintain respect for this 'living water' (Nyiyaparli Karlka Aboriginal Corporation 2023:29)? The idea that water is merely a by-product 'surplus' to requirements (Western Australian Government 2017) or 'waste-water', does not sit easily within Traditional Owner value systems.

We first discuss the significance of mine dewatering and provide some socio-economic context to this mining region. We outline the cultural significance of water for Traditional Owners in the Pilbara region, as this frames the challenges to Traditional Owner engagement in water management in an industrial scale mining context. We then explore the political and regulatory landscape, outline the limitations and levers which have existed historically and currently that may inhibit Traditional Owners to participate in water management or commercial water interests. Finally, we provide some recommendations for water futures in this region. The recommendations outline the potential we see for Indigenous participation in water governance and associated economic opportunities. We argue for this approach as one way to address the inequitable distribution of water entitlements in this region. In doing so, we build on the work of Barber and Jackson (2011), Jackson and Langton (2012) and Jackson (2017).

WHY DO MINES NEED SO MUCH WATER? AND WHAT IS MINE DEWATERING?

Water availability for future development in the Pilbara is problematic (WA Government 2010:iii).

When mining below the water table, accessing the orebody is highly dependent on the ability to 'dewater'. This industry term dewatering refers to a process where groundwater that seeps into a mine pit is removed by pumping it out using wells or sumps. This lowers the groundwater level to allow excavation of the ore body in dry conditions. The dewater is commonly pumped into surface water areas, a process which can have negative long-term effects on the local environment. Mining operations have also begun to reinject excess dewater into the downstream aquifer. Dewater is generally not polluted. However, the type, depth and duration of this process of dewatering can have long term effects on the groundwater table, and subsequently on the environmental values of the area.

There are many uses for excess dewater in mining. These include dust suppression, washing of equipment and minerals processing, and the potable water required for the thousands of, usually, fly in fly out (FIFO) mining staff. However, on the whole, mine management fails to include options for Traditional Owners to be involved in the governance of the excess.

Dewatering is one of several inter-related water management issues that are of concern to Traditional Owners, particularly when it may be perceived as wasted water. According to Barber and Jackson (2011:8), in general terms Traditional Owners' water management concerns include 'the long-term drying of country, obstruction of water flow [dams], over-extraction, inappropriate discharge from dewatering, and access restrictions'. Though our focus is on mine dewatering, we readily acknowledge that these are compounding and inter-related issues. However, as the 2011 (*ibid.*:57) report noted, '[W]ater-based enterprise development and how they [*sic*] can best be managed [was] of significant interest to [Aboriginal] people consulted'. Barber and Jackson documented Aboriginal people's perception that mines use and waste too much water: 'Pumping [mine dewater] down the creek is wasting it. And the problem is the water quality. The water being pumped might be different from the creek water' (statement by Cyril Locker quoted in *ibid.*:50).

THE PILBARA MINING REGION: LANDSCAPES OF INDUSTRIAL ALIENATION

It is difficult to imagine the scale of the iron ore and gas operations in the Pilbara region. Within this arid, remote and ecologically delicate environment, vast areas have been transformed over the last 50 years into a heavily industrialised landscape. The more than 25 industrial-scale iron ore mines in the Pilbara are linked to the largest privately owned (1,700 kilometre) railway globally, as part of an integrated network to transport iron ore out of the region, *via* four independent port terminals and other related infrastructure. The state is the largest iron ore supplier in the world accounting for 38% of global supply in 2021 and contributing to 25% of gross WA state product in 2019–20, while \$10 billion of major iron ore projects are under construction or committed (WA Government 2022). Nevertheless, the current footprint of mining is a mere 1% of the planned expansion over the next century (Macdonald 2020).

Industrial scale mining in the Pilbara began in the late 1960s and continues to expand, to the effect that the private sector now accounts for more than 90% of Aboriginal employment (up from 49.8% in 2001). However, perception of this employment is polarised among

the Aboriginal population (Taylor 2018). Taylor's report, commissioned by Rio Tinto Iron Ore, did not specifically analyse which groups were benefiting, but several issues from Taylor's socio-demographic profiling stand out. For instance, 'a third of [Indigenous] people are better off, and two-thirds are not', and while 'more [Indigenous] people are on higher incomes, poverty rates are increasing [and] gaps within the Indigenous population are widening, especially in regard to income and opportunity' (*ibid.*:139). Furthermore, the type of work has shifted. Taylor (*ibid.*:44) found that since 2006 there was a 40% decline of Indigenous employment in state and local government, and by contrast, private sector employment doubled over the same period. There has also been a decline in social services, in a concomitant withdrawal of the state.

The state has always played a secondary role to industry in the governance of the Pilbara region, initially in pastoralism, followed by mining. This was most powerfully illustrated in relation to mining by the nine closed company towns that were established here by the early 1970s (including Tom Price and Paraburdoo) where local Aboriginal people, who were not employed in the industry at that time, were not welcome. As Edmunds (1994:49) notes, these towns were 'perhaps the most visible demonstration of the extent to which control over social as well as economic development was ceded by the state government to the mining companies in the interests of rapid and large-scale resource exploitation'.

The more than 170 submissions to the Parliamentary Inquiry into the Destruction of Juukan Gorge (2020 and 2021) revealed the extent of the intensity of mining interests on the customary estates of Pilbara Aboriginal groups. A submission from the Wintawari Guruma Aboriginal Corporation stated that more than 93% of their Country is covered by mining tenements (Wintawari Guruma Aboriginal Corporation 2021). They have seven mines on their Country, including six owned by Rio Tinto, and this group is not an outlier. The neighbouring Yinhawangka have four Rio Tinto mines, as well as those from other companies, including FMG and multiple proposed mine expansions on their Country.

The development of the Harding dam on the Fortescue River in the late 1970s and early 1980s offers insight into the centrality of water in the growth of the mine worker population, and the subsequent consolidation of the region's industrialisation (Edmunds 1994; Rijavec 1993). According to Palmer (1977, in Rumley and Barber 2004:31), Aboriginal people at major meetings at the time made it very clear that they were strongly opposed to building a dam that would lead to the destruction and inundation of culturally significant sites, including rain-making sites – a perspective that is also articulated in public reports. As one Traditional Owner succinctly stated, 'We never gave permission to the government or water agencies to build dams and pipelines' (Rumley and Barber 2004:37). The construction of this dam speaks to the irony that 'contemporary water policies and legislative measures to address problems of water scarcity risk further widening the gap between the water "haves" and "have nots"' (Zwarteveen and Boelens 2014:143). Rumley and Barber indicate that this episode represented the first time that the Traditional Owners in the Pilbara registered objection to the loss of their land and the destruction of sites. That it was in relation to water is telling. Water use through licenses has increased in WA, predominantly through mining. In 2019–20 4,058 gigalitres of water were licensed for use. This increased to 4,237 gigalitres the following year in 2020–21 (DWER 2019, 2020).

CULTURAL LANDSCAPES, WATERSCAPES AND ENVIRONMENTAL PROTECTION

The archaeological and ethnographic record for the Pilbara region documents a great temporal depth of continued cultural activity, exemplified by the largest constellation of

petroglyphs worldwide, the Murujuga rock art at Burrup Peninsula. The Peninsula and surrounding Dampier Archipelago are home to an estimated one million petroglyphs dating back to at least 40,000 years. Burrup Peninsula (Murujuga) has been on the Australian National Heritage list since 2007 and is currently on the tentative list for UNESCO World Heritage Listing. This archaeological history is replicated, though less intensively, throughout the Pilbara region. Such tangible heritage also, of course, holds deep intangible significance to the Traditional Owners.

According to Rumley and Barber (2004:16) there are more than 12 different language groups in the Pilbara, most of whom have been successful in their native title determinations. These successful determinations show that, notwithstanding the region's cruel colonial history (Gregory and Paterson 2015) and the extensive movement of peoples away from their traditional estates (from the late 1960s, after award wages had to be paid to the Aboriginal stockmen), cultural knowledge has been retained and is part of a living tradition. Much of the ethnographic research in the Pilbara has been for native title and cultural heritage reports and cannot be fully accessed (but see Bagshaw 2003). Due to legal constraints none of the Connection reports are publicly available (only the findings at a high-level such as *Daniel v Western Australia [2003] FCA* 2003). Likewise, cultural heritage surveys are also rarely publicly available, though there are exceptions (Day 2004). Other applied anthropology has been undertaken for the WA government (Rumley and Barber 2004), for industry (Barber and Jackson 2011), and in response to the iron ore industry's growing footprint and impact on the Indigenous peoples of the region, though without a water focus (Holcombe 2009; Scambary 2013).

As Holcombe has not undertaken ethnography specifically for this paper, the data drawn on is secondary and provided to frame the cultural significance of water in general terms for the Indigenous groups across the region. In providing this cultural context, we recognize the sensitivity and preciousness that Indigenous customary landowners attach to water, such that any commercial decisions about using water have to be weighed against this spiritual, social and moral milieu.

As elsewhere across Australia, the Aboriginal English concept of the 'Dreaming' refers to the cosmological period 'when the world was soft'. In this region, during this period creative beings such as *Barrimirdi* the water snake created key features of the local landscape, including the permanent and ephemeral water sources. Barber and Jackson (2011:22; Palmer 1977; see also Toussaint 2008:52–3) describe these as the most important features in the Pilbara cultural landscape. As people, places and these ancestral beings are intimately connected, the ancestral beings – such as the snake – react to events in the world, particularly events involving people directly associated with the Country in which it resides. For instance, as one Traditional Owner stated (in Barber and Jackson 2011:23), 'When they take too much water, then the rainbow serpent gets upset and leaves. Once the rainbow serpent goes, then the water goes with him ... And Aboriginal people are the ones who get punished. We are supposed to be looking after him. They can take water, as long as he's satisfied that he's not being dried out'. This interconnection between water bodies, the reactive power of the Dreaming, and the social responsibilities that customary landowners have to care for and maintain these eco-cultural waterscapes, suggests that any respectful commercial use of water will take into account this dynamic (see also Riveroflife *et al.* 2020).

The engagement of Traditional Owners in work on Country as land managers by the industry has been limited and has predominately only focused on legal compliance for project approvals, such as cultural heritage approvals. This separation of cultural heritage from environmental management is a major gap, as the two areas are co-constitutive for Traditional Owners. One might anticipate that the routine participation of Traditional Owners in cultural heritage clearance work for mining companies would provide some potential to

raise the issue of water management. However, as these 'clearances' are routinely led by archaeologists and corralled by the limitations of the WA Aboriginal Cultural Heritage Act (1972, 2021), it is fair to say that intangible and environmental values are often overlooked.

Over two decades ago a local applied anthropologist, Day (2004:5), stated that heritage work for mining companies played a significant role in continuing Traditional Owners connection to land, as it enabled visits to Country. At that stage, almost 20 years ago, the scale of the heritage or site clearances was relatively limited and frankly incomparable to the cumulative impacts of mining today (Holcombe and Fredericks 2021). It is a cruel irony that Traditional Owners are provided the opportunity to access Country for site surveys and 'clearances', only for so many of these places and sites to be subsequently destroyed (Southalan 2020; Vaughan 2016).²

There have long been calls to reform the *Aboriginal Heritage Act 1972* (WA) (Chapple 2014; Kwaymullina and Butterly 2015), which seemed to finally occur with the passing of the *Aboriginal Cultural Heritage Act 2021* (WA) (ACH). The revised Act was an improvement in that it included the 'cultural landscape' concept, while the Protected Areas section of the revised Act had potential pathways to protecting more than a singular sacred site. However, after only a matter of weeks, the new Act was repealed, and the previous Act reinstated with amendments (Shea 2023). Either way, there was and is no mention of the cultural values of water in the Act, or in fact any mention of water.³ This new legislation, and subsequent return to the old, was a missed opportunity to change that (Dortch *et al.* 2021). On the other hand, one WA cultural heritage consultancy company indicates that, 'since 2020 [post-Juukan Gorge], a higher focus has been placed on assessing the impact of proposed developments on the surrounding cultural and environmental landscapes', which forms part of the approvals process under the EPA (Environmental Protection Act) in WA. Under this Act, what are termed 'Social Surroundings' are inclusive of the cultural, aesthetic, social and economic values of an environment. For Traditional Owner groups across WA this could also include the preservation of culturally significant flora and fauna, water sources and rivers, as well as maintaining access to Country and cultural knowledge transmission (Terra Rosa Consulting 2022). Of note, the Environmental Protection Authority submission to the WA government's Heritage Act review in 2020 stated that they have a 'legislative mandate to ensure that the indirect or 'off-site' impacts of any proposal under assessment (*e.g.*, groundwater drawdown impacts on significant waterholes outside of a development footprint area) are appropriately managed' (Western Australian Government 2020). The Environmental Protection Act is thus emerging as a lever for Traditional Owners to protect cultural values of water.

Healthy Country plans (aka Caring for Country Plans) offer insight into the priorities of native title holding groups in this region in relation to 'what makes Country healthy', with associated targets and management plans. The Yinhawangka Plan states that:

for yinda (water) we considered the water quality, the condition of the vegetation around it and whether the native plants and animals we expected to find there were all present. When we tried to do this across all of Yinhawangka Country and came up with an overall health rating for Country, we found that the health of our targets varied a lot depending on where they were and what sort of land uses and management were happening there. (Yinhawangka Aboriginal Corporation (2016:4).⁴

This plan has six management zones that are being tracked with targets rated as 'good', 'fair' or 'poor'. In relation to the water category, Rocklea cattle station and towns and mine sites management zones are rated as 'poor'. One non-Indigenous land management expert commented that '[these plans] can lead to disappointment, as they can't be fully implemented in heavily mined regions' (pers com. 2022). Another significant issue in this region is access to

Country both in relation to pastoral stations and mining leases. The ability of Traditional Owners to access Country in order to care for it, maintain their obligations to it, monitor the effects of mining operations and ensure inter-generational knowledge transfer is a sensitive issue. One Traditional Owner (in Barber and Jackson 2011:49; see also Holcombe and Fredericks 2021) explained that, 'When they mine, they leave a big hole in the ground and water comes up and sits there. No one has access to it. Even after they have finished'. In relation to water management, the recent Nyiyiparli People and Country Plan for the Fortescue Marsh (west Pilbara) has identified the following goals: for the rangers to be trained and equipped to undertake water monitoring activities on Country; for the cultural values of *yindas* (water sites) across the greater Fortescue Marsh area to be mapped by senior Nyiyiparli; and for a regular water monitoring program to be established (Rio Tinto 2023c:67).⁵ The importance of water monitoring was clearly stated by one Traditional Owner (in Barber and Jackson 2011:23) who observed, 'They have to do [water] monitoring so that everything else survives'. Like heritage surveys, the future will increasingly entail Traditional Owners undertaking water monitoring as a standard practice.

There is a nod in this direction through a voluntary initiative of Rio Tinto's in the audit of their cultural heritage management (CHM), which they have made publicly available. All major mining companies, with significant variation, have internal standards, procedures and policies for CHM and Rio Tinto have sought to 'reset their approach'. Part of this 'reset' is the global audit of 37 mine sites, including 11 in the Pilbara. This independent CHM audit found, amongst other shortcomings, that the processes that exist around land disturbance had not been reflected in other 'key risk areas, in particular water management'. They recommended that water be managed as a cultural resource:

Impacting water resources presents a risk to cultural heritage and recommend that each asset's cultural heritage management system explicitly consider the potential impacts to cultural heritage resources due to changing water regimes. In addition, cultural heritage values should be captured in site water management planning processes (Rio Tinto 2023c:20).

INDIGENOUS COMMERCIAL WATER USES AND DEWATERING OPTIONS

Our country is being destroyed and we get nothing out of it (Rumley and Barber 2004:40).

Attempts to create opportunities for Indigenous people to use water resources for economic opportunities are not new. Various proposed frameworks and project ideas have been advanced at the national and state levels, including the Indigenous Economic Water Fund (IEWF), specific Indigenous water allocations (in NSW for instance), and re-use of dewater or excess dewater. Over a decade ago, the First Peoples' Water Engagement Council (FPWEC) proposed the creation of an Indigenous Economic Water Fund in their advice to the National Water Commission (FPWEC 2012b). The IEWF options paper (FPWEC 2012a) outlines the rationale and strategies to progress: (1) the establishment of an IEWF through the acquisition of water entitlements in fully allocated systems, (2) possible governance structures, and (3) recommendations for Indigenous peoples to pursue such opportunities (Australian Government 2017:24). According to the IEWF options paper:

[T]he key purpose of the IEWF is economic development as distinct from Indigenous cultural and environmental water that should be set out in a planning

process. The IEWF is not an alternative to addressing access to cultural and customary water, but an additional policy to improve the economic lives of Indigenous people...[via] the purchase of water entitlements. (FPWEC 2012a:6)

In instances where water is fully allocated, there is limited scope for Traditional Owners to obtain water entitlements, yet there could be opportunity for commercial agreements between mining companies and Traditional Owners to use excess dewater through mining companies providing a portion of excess water allocation prior to reinjection or disposal of water. In their Pilbara-based research over a decade ago Barber and Jackson (2011:56–7) indicated that the mining industry and the WA government were engaged in discussions about how best to re-use the discharged mine water from the mine pits that are below the water table. At the time, the Department of Regional Development and Lands called an open tender for proposals to utilize such water, and seeding grants were awarded to a number of successful applicants, including Indigenous organisations. One grant supported a bio-diesel project by the Ashburton Aboriginal Corporation (AAC), based at Tom Price, which involved using the mine dewater to grow *Moringa oleifera*, an oil-rich plant which is then harvested for biodiesel (*ibid.*:61, see also ORIC⁶). The trial was not successful, though the AAC trialed another crop (ABC Rural 2014).⁷ Since 2010 Rio Tinto has been using mine dewater for fodder production (hay) to feed cattle on their many pastoral leases in the region. Early comments by Traditional Owners reflect that this was negatively regarded as ‘Rio deriving benefit from a resource that rightly belongs to local people’ (Barber and Jackson 2011:61). Today, the company has consolidated the use of mine dewater for irrigated agriculture at their Hamersley and Nammuldi Agricultural Projects (Western Australian government 2017:30).

Non-Indigenous interests have established that economic possibilities exist for the use of mine dewater, notably in agriculture. In a WA Government report (2017:59) on the feasibility of irrigated agriculture for the Pilbara region, the only inclusion of Indigenous interests appeared in relation to cultural heritage protection, *via* the then *Aboriginal Heritage Act 1972*. Nonetheless, several Aboriginal ‘stakeholders’ surveyed for the report attempted to expand the remit of their interests, and emphasised ‘the economic, employment and social benefits of irrigation enterprises’ (2017:17). However, the report actively undermined Indigenous rights and interests by exclusion from water management plans. As we discuss in the following section, the *Native Title Act 1993* provides for very few levers to support such local inclusion.

RIGHTS UNDER NATIVE TITLE AND INDIGENOUS LAND USE AGREEMENTS (ILUAS)

The *Native Title Act 1993* (Cth) (NTA 1993) is an inadequate tool when considering water futures for Indigenous people, as Marshall has shown in detail (2017; see also National Native Title Council 2014). For our purposes we reiterate that water rights under the regime are very limited, difficult to establish and an impediment to sustainable Indigenous water development. Any water rights under the NTA can only be established if they can be traced to the traditional laws and customs at the time of British sovereignty and have a continued connection to today (*Members of the Yorta Yorta Aboriginal Community v Victoria* [2002] HCA 58 2002). This test to prove water (and land) rights under native title is set at a high bar and is often difficult to prove as many Indigenous groups have faced historical dispossession from their traditional lands, resulting in a lack of requisite evidence to establish and prove their continued connection to and exercise of their water rights. Thus, in most native

title determinations, no right to onshore water is established. Another failure in the NTA is that native title rights to water only include water for domestic, personal, customary or non-communal purposes (NTA 1993, s 24HA; Australian Government 2017:19). Additionally, the NTA does not provide a right to negotiate over water (NTA 1993 sub-div P ss25-44).

Against such odds, a native title group from the Torres Strait Islands in Queensland has been successful in securing commercial water rights. In the case of *Akiba* (No 2) (2010:515–40) FCA 643, a native title right to take resources ‘for any purpose’ was established, which includes commercial purposes, thus laying the foundation for further water rights to develop for native title claimants.⁸ Traditional Owners have long called for greater water rights on their land and advocated for broader inclusion in water decisions outside of native title. In the Pilbara, one Traditional Owner stated, ‘Native title is daylight robbery. Taking away water rights and mineral rights. There must be agreements and royalties for water’ (Brenden Cook, in Barber and Jackson 2011:32). Despite the continued calls from Traditional Owners for water justice, the government has failed to act on any substantial reform in native title legislation that would enable broader rights over commercial use of water (or bushfoods) or any standalone water agreement, and which could result in royalties paid for the take and use of water. Another significant failure from a Traditional Owner perspective is the future act regime under the NTA as the (future) management of water does not attract a right to negotiate (NTA 1993, s 24HA); only the right to comment is afforded to native title parties (NTA 1993, sub-divs G, H, I and J). Again, these narrow legal rights exclude native title holders from commercial water opportunities.

As the NTA has not to date been a mechanism to insert native title holder interests in either commercial or cultural water rights, what other legal or voluntary levers exist in WA to assert Indigenous water rights? Contractual levers include Indigenous Land Use Agreements (ILUAs), while Indigenous driven initiatives include Healthy Country Plans. ILUAs, negotiated under the NTA, are potentially one avenue for native title holders to include their rights and interests in water. The majority of ILUAs are commercial in-confidence. Yet, we understand anecdotally and also *via* our research that there is very limited inclusion of water rights through allocation in ILUAs, despite the potential scope for inclusion. This gap could be due to the State’s or the proponent’s unwillingness to negotiate, in addition to the NTA law failing to accommodate for adequate water rights. However, an exception is the Yamatji Nation ILUA, west of the Pilbara. This ILUA included water allocation as a part of their agreement and a Strategic Aboriginal Water Reserve will be established under it to reserve 25 gigalitre per year of water not already allocated, with the water being drawn from 17 aquifers within the agreement area (Yamatji Nation 2021).⁹ This ILUA is an example of opportunities for negotiating water rights insofar as actors, including the State and mining companies, are genuine about their commitments to Indigenous communities, the sustainable use of water and water justice.

A potentially positive outcome from the Australian Government (2021) into the Juukan Gorge cave site desecration was a major industry-wide social performance review of internal systems, part of which has led to ILUAs being ‘modernized’ by Rio Tinto (2022a) and other major companies. This juncture is clearly an opportunity to revisit the water allocation issue within agreements, including for engagement in water governance and especially oversight and water monitoring.¹⁰ We also note an example from the Northern Territory (NT) where at least one water license has been granted to Indigenous landowners to develop horticultural enterprises as part of an ILUA (Tan and Jackson 2013), illustrating that commercial initiatives are possible under the NTA. In NSW, though not under the NTA, the Nari Nari Tribal Council owns and manages irrigated farmland, under the regenerative agriculture philosophy, using a negotiated water entitlements allocation (Nari Nari Tribal Council *n.d.*; see also Jackson and Langton 2012).

TRADITIONAL OWNER RIGHTS V MINING RIGHTS TO WATER: WA WATER LAW AND MINING LAW

When it comes to water decisions, Traditional Owners and miners are treated as starkly different actors in the legal and regulatory framework. *The Rights in Water and Irrigation Act 1914* (WA, n.d.) (RIWI Act) is the primary statute that governs the take and use of water in WA. The RIWI Act was created at a time when water demands were low, climate change impacts were not considered, and Indigenous people did not have native title. As such, the law is outdated, convoluted and requires reform.

Although the water legislation that governs and approves licenses to access and use water resources applies to all actors, mining companies have broader scope and increased weight in their ability to access licenses to dewater for their projects. Statutes such as the *Mining Act 1978* (WA), mining leases,¹¹ miscellaneous leases¹² or general-purpose leases all support mining or subsequent mining operations in access to water. However, rights to water in the Mining Act are subject to license requirements in the RIWI Act and there is a legal hiatus in the State Agreements as they do not confer rights to abstract or dispose of excess mine dewater. In addition, agreements between the State and a miner (ratified by Parliament) give mining companies multiple avenues and levers to gain access to freshwater to ensure they can deliver their projects (Brown 2018). Such State agreements provide miners with a guaranteed water license which would normally require RIWI approval (Hillman 2006:293).

On the other hand, native title holders in WA have no specific water rights in the RIWI Act, do not have any rights to water under the Mining Act, and are not party to State Agreements. They are therefore deprived of commercial rights to mine water on their land. This contrasts with parts of northern Australia where ‘Indigenous advocates have lobbied vigorously for secure and tradable entitlements [so that] there is an emerging consensus concerning the need to establish an Indigenous specific allocation from the consumptive pool’ (Jackson and Langton 2012:121). These authors also note that ‘Western Australia’s legal framework does not support the concept of Indigenous reserves’ (2012:121).

NATIONAL LEVERS: ARE THEY BEING APPLIED IN THE PILBARA?

The National Water Initiative (NWI) states that the:

Parties [proponents and the state] will provide for Indigenous access to water resources, in accordance with relevant Commonwealth, State and Territory legislation, through planning processes that ensure: i) inclusion of Indigenous representation in water planning wherever possible; and ii) water plans will incorporate Indigenous social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed. Water planning processes will take account of the possible existence of native title rights to water in the catchment or aquifer area (Australian Government 2017:7).

The NWI has also developed a 36-page ‘module’ to support industry engagement of Indigenous peoples in water planning and management as a supporting resource for the (NWI) Policy Guidelines for Water Planning and Management (Australian Government 2017).¹³ The module indicates that ‘new and revised water plans should reflect Indigenous social, spiritual and customary objectives and include strategies for ongoing implementation, management and monitoring of these objectives throughout the life of the

water plan'. The module also includes a section on water for economic purposes, which states that although the range of Indigenous values related to water may be difficult to quantify, they are likely to cover both cultural and economic uses of water, and that these uses may overlap (*ibid.*:23).

As we have begun to illustrate, there is little evidence of water planning for inclusion of Indigenous interests occurring in the Pilbara, either through government departments, such as WA DPIRD or within ILUAs, which is a limitation of the federal system. Others too have observed that the NWI does not provide sufficient guidance for the resolution of competing claims to water, and regional differences need to be taken into account in the national dialogue over Indigenous water access (Jackson et al. 2009).

LEGAL LEVERS FOR GREATER INDIGENOUS SPECIFIC WATER RIGHTS

Recent federal reports and government reviews have highlighted that Traditional Owners must be included in water and environmental management on land (Samuel Review 2022; State of the Environment Report 2021). Traditional Owners should also have access to procedural fairness in water licensing decisions and the ability to appeal these where a decision would impact or displace their native title rights (Garlett 2022). Other protective avenues include legal personhood or 'nature rights'. In Victoria, the Yarra River has been recognised as a living entity by way of the *Yarra River Protection (Wilip-gin Birrarung murron) Act 2017* (Vic). Aotearoa New Zealand recognised the Wanganui River as a living ancestral being through the *Te Awa Tupua Act 2017* (see Strang, this issue). These rights to the river as a living system have also been called for by Traditional Owners in the Kimberly region of WA for the Fitzroy River (RiverOfLife et al. 2020). Recognition of the below ground inland aquifers as a living system could be a legal avenue to provide further protection of Indigenous rights to water.

The Department of Water and Environmental Regulation (DWER) is the agency that manages and regulates the extraction and use of water in WA. DWER has taken action to include Indigenous perspectives in water policy through the formation of the Aboriginal Water and Environment Advisory Group. The advisory group provides input and advice to ensure Aboriginal knowledge, values and needs are met within DWER policy, programs, planning, management and regulation of Western Australia's water and environmental resources (DWER 2020). In 2010, the DWER developed a regional water plan for the Pilbara (Government of Western Australia 2023; Department of Water 2010; Barber and Jackson 2011). The plan's vision for 2030 under Objective 2 is to 'ensure water use is balanced to meet environmental, social, cultural and economic values', be supportive of Indigenous participation, and commit to working with Traditional Owners to develop water allocation plans. Additionally, Objective 3 provides for cumulative impacts to be managed in collaboration with Traditional Owners (Department of Water 2010). However, they do not provide pathways to achieve this important objective.

A decade ago, Sommer (2012) indicated that WA was proposing to amend the Rights in Water and Irrigation Act (RIWI Act) to enable compliance with the National Water Initiative, and to respond to community and Traditional Owner calls for its amendment. However, this has still not occurred, and even at that time 'it appears that it intends to exclude mine dewatering from the application of the Water Allocation Plans (WAPs) that it is preparing for the west Pilbara' (*ibid.*:81). There is no mention of Indigenous rights and interest holders in the WA water policy on the use of mine dewatering surplus (Western Australian Government 2020). There is an increasing concern about the cumulative impacts of water extraction by the mining industry, yet there appears to be a failure in accounting for

cumulative impacts on the environment and Traditional Owner groups. However, almost 20 years ago Rumley and Barber (2004) were tasked to advise the government on Indigenous water priorities. Though the exclusive focus was on cultural values, there is no indication that their recommendations were ever implemented by the then Water and Rivers Commission (*ibid*:56–8).

In other states, such as NSW, Aboriginal Specific Purpose Licenses (SPALs), have been established which also include Aboriginal Community Development Licenses for economic purposes – such as irrigated cropping, aquaculture or manufacturing (Australian Government 2017:22).¹⁴ In Victoria, the Aboriginal Water Program aims to reconnect communities to water for cultural, economic, customary and spiritual purposes due to the failure in native title to provide adequate water rights (Victorian State Government, n.d.). Victoria provides a meaningful pathway for Traditional Owners to participate in water management through *Water is Life: Traditional Owner Access to Water Roadmap*, a framework that can be applied to establish meaningful connections, use of water and cultural economies for Traditional Owners (Victorian State Government, n.d.).

We also see pursuing Jackson's and Langton's (2012:20) idea of establishing a series of regional Indigenous trusts that could 'hold water for both consumptive commercial and non-consumptive environmental uses' to be of significant merit for the Pilbara. Such trusts would operate '... in the same manner that environmental agencies are entering water markets to purchase water rights for environmental use, [and] governments could purchase entitlements for Indigenous use' (*ibid*:.20).

VOLUNTARY INITIATIVES: COMPANY WATER STEWARDSHIP STANDARDS, POLICIES AND INTERNAL AUDITS

Water management is a high environmental risk in mining operations as water extraction can generate long-term monitoring and mitigation obligations, which in the Pilbara includes post-closure pit lakes and of course the fundamental issue of water as a scarce resource. Internationally, the importance of 'water stewardship' is highlighted in multiple standards and voluntary initiatives undertaken by industry, for example, the International Council on Mining and Metals (ICMM) Water Stewardship Framework (2017). Water use is also a key component integrated in the ICMM mining principles, specifically in risk management (ICMM 2023a, Principal 4) and environmental performance (ICMM 2023b, Principal 6). Industry water use has increased, which is demonstrated through the adoption and use of water accounting tools such as the Minerals Council of Australia's Water Accounting Framework (2022).

The top five ASX listed mining companies operating in Australia each publicly disclose their commitment to water through water stewardship statements. However, four of the five companies fail to explicitly include Indigenous peoples in the use and development of water resources and none of the companies include Traditional Owners in the development of water resources in line with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP, particularly articles 26 and 32). Out of these five companies only Rio Tinto has publicly stated they are working with Traditional Owners in the management of their water resources (Rio Tinto 2023c). BHP (2022) publicly discloses a commitment to water stewardship and states that they make community collaboration a priority, as demonstrated in a case study about South Australia's Olympic Dam (BHP 2019). However, BHP fails to explicitly list Traditional Owners as interested parties within the Stewardship Statement and in relation to water management decisions. In their Water Stewardship Statements, Newcrest and South32 both mention 'community stakeholders' with whom they engage, but do not explicitly mention Indigenous people (Newcrest 2019; South32 2023).

Unless backed up by regulations, such voluntary initiatives can be very weak, and junior and medium tier miners are unlikely to have any water stewardship policies. WA government has no authority holding the mining companies to account on their water stewardship policies. Industry water stewardship statements appear to be a precautionary measure by mining companies to prevent regulation by the State government, an attempt to preempt government regulation in demonstrating that they are using or trying to use water sustainably. The increase in mining company public disclosures of environmental commitments suggests that the industry has an appetite for engaging in better water governance. However, if there is to be any value in water stewardship standards, they must be publicly available and include transparent processes of disclosure and details of implementation.

CONCLUSIONS AND RECOMMENDATIONS

Many Indigenous voices are calling for water justice (RiverOfLife 2020; National Native Title Council 2014; Garlett 2022), which increasingly includes the aspiration of native title groups in WA to use water for sustainable economic development or commercial purposes. An important element of this aspiration is the assertion of oversight over *how* the very significant amount of mine dewater is used by industry. This is yet another ‘basis for contemporary claims for water over recognition of diverse and evolving interests in water, including opportunities for livelihoods’ (Jackson and Langton 2012:117). However, the industry is compliance focused and so Indigenous expertise and interests are routinely corralled by government and industry into cultural heritage management (CHM), which continues to exclude water. Meanwhile, CHM with its focus on tangible sites as ‘heritage’ does not account for the inextricable relationship between sites and the environment they are embedded within.

We have found that important principles of Indigenous inclusion in water governance developed by the National Water Initiative (Australian Government 2017) have not been implemented or engaged with by relevant WA Government departments. There is an urgent need for a WA water reform, as WA is the laggard behind other states and territories. The incorporation of Indigenous water governance in all water management processes is vital. Mining companies should have to account for the collective and inter-relational value system of Indigenous attachments to water, whereby the underground network of aquifers would have to be mirrored in the terrestrial governance system.

Industry is increasingly gaining advantage from mine dewater beyond the standard uses, notably for agriculture as they diversify their economic base. However, Traditional Owners are not only peripheral to these opportunities, they also have no voice in whether they agree with such a water re-use on their native title lands. We recognize that there are opportunities with the ‘modernisation’ of both ILUAs and cultural heritage agreements that is underway, largely as a result of the Juukan Gorge site desecration. Nonetheless, despite the recognition of native title rights and cultural heritage rights in Australia, there is still a large gap in Indigenous rights relating to water. Therefore, structural and substantive reform is needed to enable Traditional Owners to have access to water decisions on their traditional land subject to a native title determination. Crucially, engagement in the commercial use of water also offers another mechanism for Traditional Owner oversight and control of their water. We agree with Jackson and Langton (2012:117) and suggest that introducing the concept of an ‘Indigenous reserve’, which Indigenous advocates have used as the language of the water entitlement framework, would be fruitful. Such a ‘concept is understood by water

managers, amenable to quantification and able to be managed by Indigenous corporations and the state water agencies' (*ibid.*).

Industry initiatives such as the 2019 Pilbara Cultural Land Management Project (PCLMP) are to be commended. The PCLMP was established to enable 12 participating Pilbara Traditional Owner groups to come together as a collective 'to preserve their Country and culture and keep their people strong, across their native title determinations' (Rio Tinto 2022b). The PCLMP is supported by the Pilbara Development Commission and Rio Tinto as a response to the Pilbara Creative and Cultural Strategy, which highlights cultural land management and access as a priority. As the representative of one participating group stated, 'The PCLMP is removing the silo mentality in the Pilbara and supporting cultural connection across Pilbara Traditional Owner groups'. PCLMP members are also supported to engage in training programs to help develop tools that support cultural, heritage and environmental mapping, monitoring and management (Rio Tinto 2022b).

As a provocation piece, this paper has only been able to touch on the complexity of Indigenous water justice issues in this region of intensive water competition and a mature water market. A next step would be to undertake ethnographic research on the complex relationship and tensions between the commercial use of water and cultural/environmental uses, notably in relation to Indigenous notions of sustainable development. As Toussaint (2008:47) has observed, 'conflicts and disputes over scarce or abundant water sources are major points of inquiry in current water studies'. We conclude this piece with a short list of recommendations that seek to transform water inquiries into points for action.

Recommendations

What Traditional Owners can do, and should be enabled to do

- Draw on the WA Environmental Protection Act – the social surrounds assessment seems to be a far stronger potential mechanism for addressing water values and cumulative impacts than the WA Cultural Heritage Act.
- Take the opportunity to ensure that water governance is part of any modernized Indigenous Land Use Agreement and Cultural Heritage Management Plan.
- Traditional Owners should have access to direct knowledge concerning water governance within companies *via* a digital central information hub to serve as a direct communication channel and be a conduit for information regarding water stewardship.
- Traditional Owners need to be enabled to conduct site visits to audit the take, use and management of water on their native title lands.
- While the extent of Indigenous representation may vary depending on the scale and nature of the water planning task, water planners should work with Indigenous peoples to determine Indigenous representation at a scale that both parties deem appropriate (Australian Government 2017:11).
- Introduce the concept of an 'Indigenous reserve' in negotiations (and learn from other jurisdictions and notably NSW – the Nari Nari Tribal Council example).

What companies can do

- The failure to reform water law means that voluntary standards become even more important. Mining companies need to both strengthen their water stewardship statements to include Traditional Owner interests and ensure transparent audits are undertaken.
- Appoint an internal water governance principal with the role to act as a conduit between the relevant Traditional Owner groups and the mining company to communicate,

develop and implement water plans, also ensuring accountability and transparency and should report to an executive role such as the Vice President of Operations.

- Public disclosure of water stewardship statements like these of ASX listed companies must be acted upon and include the community, as they have stated, and it should be implied that this includes Traditional Owners who are major stakeholder to land access for mining.
- Enable Traditional Owners to undertake water monitoring as a standard practice.

Government

- In consultation and negotiation with regional native title groups and industry establish a series of regional Indigenous trusts that could hold water for both consumptive commercial and non-consumptive environmental uses.

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ENDNOTES

1. The term Traditional Owner is derived from the *Aboriginal Land Rights Act (NT) 1976* – referring to an Aboriginal person with a range of customary responsibilities – including ‘primary spiritual responsibility’ for sites on their estate. It has become widely used by Aboriginal people beyond the NT – and shortened to TO as an Aboriginal term denoting local customary landowner with the associated rights and responsibilities to act as both a guardian for Country, and also have the right to gain economic benefit from that land.
2. It is now well understood that the WA Aboriginal Cultural Heritage Act 1972 was enabling legislation for site destruction, referred to as managed destruction (Vaughan 2016). Under Section 18 of the Act a proponent can seek consent to damage a site. By 2020, there had been more than 3,300 S.18 applications, only a handful of which were rejected (Southalan 2020; see also Vaughan 2016).
3. There were also many other limitations and criticisms of the revised Act. See many of the 159 published submissions to the review of the Act: https://consultation.dplh.wa.gov.au/aboriginal-heritage/aboriginal-heritage-bill-2020/consultation/published_select_respondent
4. See also the Ngangumarta Warran Caring for Country Plan in the eastern Pilbara bordering the Kimberley region. Note that the YHC Plan is publicly available, and they state that ‘all traditional and cultural knowledge in this plan is the cultural and intellectual property of Yinhawangka Traditional Owners’. We quoted only very general aspects of the plan – not traditional or cultural knowledge – and sent several emails over the course of 2023 seeking permission to quote from the YHC plan.
5. This region is also listed as a wetland of national significance and the Nyiyaparli are seeking Ramsar wetland status for the marsh. Note that we gained permission from the Karlka Nyiyaparli Aboriginal Corporation to quote from their plan.
6. See ORIC: <https://www.oric.gov.au/publications/spotlight/tackling-big-issues>
7. See ABC rural: <https://www.abc.net.au/news/rural/2014-08-26/pilbara-biodiesel-company-looks-for-new-oilseed-crop/5695296>
8. Similarly, the Kurtjar decision, also in Queensland, offers a precedent for other native title decisions to enable the commercial use of bush resources, in the case of *Rainbow on behalf of the Kurtjar People v State of Queensland* [2019] FC.
9. Editor’s note: see Jackson, O’Donnell, Godden and Langton, this issue.
10. There are also many major gaps that need to be addressed in these ILUAs, such as Indigenous input into mine closure (see O’Fairchalleigh and Lawrence 2019), and issues that were raised in the Australian Government (2021).
11. Subject to the RIWI Act, a mining lease holder has the right to take and divert freshwater from any natural spring, lake, pool or stream in or flowing through land for mining purposes (Mining Act 1978 (WA) s 85(1)(c)).
12. Miners can apply for miscellaneous license to engage in activities related to mining, which includes dewatering (Mining Act 1978 (WA) s 91).
13. The confusing mix of terminologies for the resource may work against facilitating uptake.

14. The NSW government's water management policies provide clear and legal access entitlements to enable Aboriginal communities to gain an increased share of the benefits of the water economy, particularly the market in water. When Jackson and Langton were writing in 2012, there was one Aboriginal group in NSW – the Nari Nari Tribal Council (NNTC) – who have a mix of cultural and market water allocations. As Jackson and Langton (2012:117) state '[NNTC] watering activities contribute to biodiversity and cultural heritage management on their properties and, through annual water trading with a neighbouring farmer, contribute to the local agricultural sector'.

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