Carlton Plain – Stage 1

3,086 ha Agricultural Development

REFERRAL TO EPA

Project Description

and

Environmental Factors

July 2017

Referral to the Western Australian Environmental Protection Authority

under Part IV of the Environmental Protection Act 1986.

EPA Reference CMS17140

Prepared for Kimberley Agricultural Investment Pty Ltd by

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Mapping (unless otherwise stated):

Rich River Irrigation Developments, 2017.

Woodman Environmental Consulting, 2017.

Kimberley Boab Consulting, 2017.

Disclaimer and Limitation

DOCUMENT CONTROL

Date	Version	Reviewed / endorsed by
3 July 2017	Draft Rev A	KAI – J Engelke
4 July 2017	Rev A	Submitted to EPA for initial review and comment
19 July 2017	Rev B	Submitted to EPA
21 July 2017	Rev O	Submitted to EPA with minor mapping amendments

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Carlton Plain Stage 1 Development Area shapefiles

Carlton Plain Development Envelope shapefiles

Electronic version of Figure 4: Carlton Plain Stage 1 Concept Plan

Electronic version of Figure 5: Carlton Plain Overall Concept Plan

Woodman Environmental Consulting – *Mantinea and Carlton Plain Project Level 1 Flora, Vegetation and Fauna Assessment*.

Soil Management Designs – *Soil and Groundwater Risk Assessment: Carlton Plain.*

Sustainable Soils Management – *Groundwater levels beneath Mantinea and Carlton Plain and implications for irrigation development.*

Acronyms and abbreviations

ADP	Aboriginal Development Package
AEM	Airborne Electromagnetic
ANZECC	Australian and New Zealand Environment and Conservation Council
BAM Act	Biosecurity and Agricultural Management Act 2007
DAFWA	Department of Agriculture and Food Western Australia
DEC	Department of Environment and Conservation
DER	Department of Environmental Regulation
DoEE	Department of Environment and Energy
DoL	Department of
DoW	Department of Water
DPaW	Department of Parks and Wildlife
ECD	Ecological Character Description
EMP	Environmental Management Program/Plan
EPA	Environmental Protection Authority
EP Act	Environmental Protection Act (1986)
EPBC Act	Environment Protection and Biodiversity Conservation Act (1999) (Cwth)
ESA	Environmentally Sensitive Area
EWR	Ecological Water Requirement
ha	Hectare(s)
ILUA	Indigenous Land Use Agreement
KAI	Kimberley Agricultural Investment Pty Ltd
km	Kilometre(s)
LAA Act	Lands Administration Act (1997)
MNES	Matter(s) of National Environmental Significance
MG	Miriuwung and Gajerrong (peoples)
MG Corporation	Yawoorroong Miriuwung Gajerrong Yirrgeb Noong Dawang Aboriginal Corporation
NACRA	Northern Australia Crop Research Alliance
NR	Nature Reserve
NT	Northern Territory
OIC	Ord Irrigation Cooperative
OEPA	Office of the Environmental Protection Authority
OFA	Ord Final Agreement
ORDCO	Ord River District Cooperative
ORIA	Ord River Irrigation Area
ORFRS	Ord River Floodplain Ramsar Site
PEC	Priority Ecological Community
PLB	Pastoral Lands Board
R&D	Research and development
RiWI Act	Rights in Water and Irrigation Act 1914
SWEK	Shire of Wyndham East Kimberley
TEC	Threatened Ecological Community
VT	Vegetation Type
WA	Western Australia
WoNS	Weeds of National Significance
WRM	Wetland Research and Management

Part A – Proposal Description and Key Proposal Characteristics

1.0 Overview

This document supplements a referral to the Western Australian Environmental Protection Authority (EPA) in relation to the *first stage* of the proposed clearing and development of Carlton Plain. The Carlton Plain Stage 1 development envelope comprises 3,086 hectares (ha) of land between House Roof Hill and the Ord River, located approximately 40 kilometres (km) north-west of Kununurra, in the Shire of Wyndham-East Kimberley. Figure 1 indicates the location within Western Australia.

Kimberley Agricultural Investment Pty Ltd (KAI) is the freehold owner of the 16,117ha Carlton Plain. Carlton Plain was formerly included within the boundaries of the Carlton Hill Station pastoral lease (also owned by KAI), but was excised following the endorsement of the *Ord Final Agreement* (an Indigenous Land Use Agreement) by Traditional Owners and the Western Australian government in 2006.

The proposal forms the *initial component of the staged development of four larger parcels of land designated for future irrigated agriculture, within the overall Carlton Plain freehold area*. A regional agricultural development strategy has been developed by the proponent, Kimberley Agricultural Investment Pty Ltd (KAI) as described in Section 3.0. (Figure 10 and Table 8 in Section 3.0 outline KAI's broader development plans and scale). Separate referrals to the Western Australian Environmental Protection Authority (EPA) for the remaining areas will be prepared in the future. This *current* referral is submitted following consultation with the EPA, which indicated that separate consideration may be given to the component of the broader proposal which exhibits the least environmental impact.

It is proposed that the broader development will be staged over a period of eight years, commencing in April 2018 with Carlton Plain Stage 1, or earlier if relevant approvals are secured. This current application seeks approval to commence development of the stage of the development program which exhibits the least environmental risk.

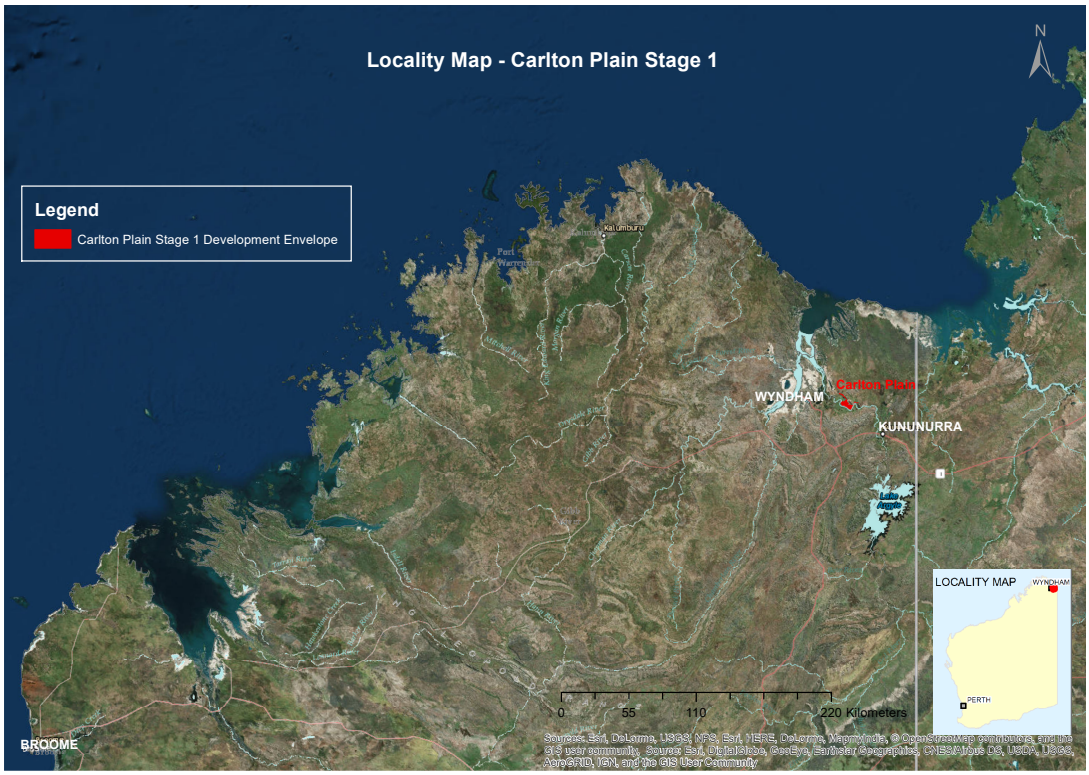
The development of the land parcel is to be undertaken for the purposes of perennial and annual cropping, including grains, cotton and horticulture (which may include citrus and/or mango trees or other tree crops).

Stage 1 of Carlton Plain will comprise a combination of surface and pressurised irrigation technologies, for the purpose of growing food and fibre crops. This includes perennial (tree) crops which may incorporate horticulture and/or forestry options.

Table 1 - Summary of the Proposal

Proposal title	**Carlton Plain Stage 1**
Proponent Name	Kimberley Agricultural Investment Pty Ltd
Short description	Clearing and development of 3,086ha between House Roof Hill and the Ord River, for the purpose of surface and pressurised irrigated agricultural cropping which may include grains, cotton, perennial horticulture and other crops.

Figure 1 - Locality Map



The proposed development of the Carlton Plain Stage 1 area includes the following activities:

- Clearing and laser leveling of the land and any other works which may be required in order to enable flood-irrigated agriculture to occur;
- Construction of hillside drains to divert runoff from surrounding ranges and protect both irrigation land and new channel infrastructure from inundation;
- Construction of water supply infrastructure, including pumping infrastructure (unlikely to be visible from the lower Ord River) and tailwater recycling facilities;
- Construction of smaller distribution channels off the main supply infrastructure to service agricultural land;
- Construction of levee banks, as required, around the perimeter of the farming land to prevent inundation;
- Enhancing the existing internal drainage system to divert excess stormwater runoff from the developed area and protect irrigated land, channels and farm infrastructure from long term inundation;
- Construction of on-farm capital works required for the planting and farming of crops.
- Construction and operation of groundwater management and disposal infrastructure, including sub-surface drains, groundwater bores and pipelines;
- Construction of suitable internal farm roads;
- Construction of farm sheds and houses, product and input storage facilities;
- Retention of vegetation in areas not required or not considered suitable for irrigated agriculture; and
- Utilisation of water released from Lake Argyle, via the Ord River and Lake Kununurra, to irrigate crops.

Table 2provides further description and location detail for specific project elements.

Following Table 2, Figure 2 provides a regional context map. An illustration of the freehold area and

Stage 1 development envelope is provided in Figure 3, with the indicative development layout [concept plan] for Carlton Plain Stage 1 in Figure 4.

Note - The attached (electronic / PDF) Carlton Plain Stage 1 Concept Plan incorporates a functional ability to zoom and add or remove map layers for ease of viewing. It is recommended that the reader utilises the electronic map through a PDF viewer where possible.

Table 2 - Location and proposed extent of physical and operational elements

Element	Location	Proposed extent
Physical elements		
Surface irrigation of annual crops	Refer to attached shapefiles for precise locations.	1,742ha
Pressurised irrigation of perennial crops	Refer to attached shapefiles for precise location. Pressurised irrigation infrastructure to be constructed where soils do not allow for surface (flood) irrigation.	510ha
Infrastructure	Within Stage 1 development envelope	834ha
Easement for river access	Outside of Carlton Plain freehold area	12ha
Pump infrastructure corridor	Through vegetated zone within the freehold boundary	51ha
Operational elements		
Water supply – Pump location	Approximate site (TBC with legal easement and Bed and Banks permit): 15.56232S 128.51327E	80m wide infrastructure corridor allowed for in clearing area calculations
Annual irrigation water usage	1,742ha surface irrigation, partially double-cropped; and 510ha pressurised perennial irrigation. Average 12ML/ha usage including distribution losses and partial double-cropping.	27.6GL
Tailwater recycling	Approximate centre: 15.55506S 128.46000E	60ha
Access track (on-farm road)	To follow an existing track known as 'Movie Road' through Carlton Plain, per attached shapefile.	40m wide infrastructure corridor allowed for in clearing area calculations
Stormwater drainage	East to west, from approximate location 15.516744S 128.468380E	80m wide infrastructure corridor allowed for in clearing area calculations
Farm outbuildings and worker accommodation	To be located in infrastructure areas at approximately a) 15.541929S 128.472860E b) 15.556913S 128.490382E These locations are predominantly cleared and include limited existing infrastructure.	

Table 3 - Carlton Plain Stage 1 development calculation inclusions

Description	Inclusions	Area (ha)
Farming areas	Surface and sub-surface irrigation (fields); internal supply channels and pipes; internal drains; internal roads.	2,252
Infrastructure areas	Sheds; yards; storage dam; hillside drains; levees; main roads; pump site and pipeline.	834
	TOTAL DEVELOPMENT ENVELOPE	**3,086**

Figure 2 - Development area: Regional context

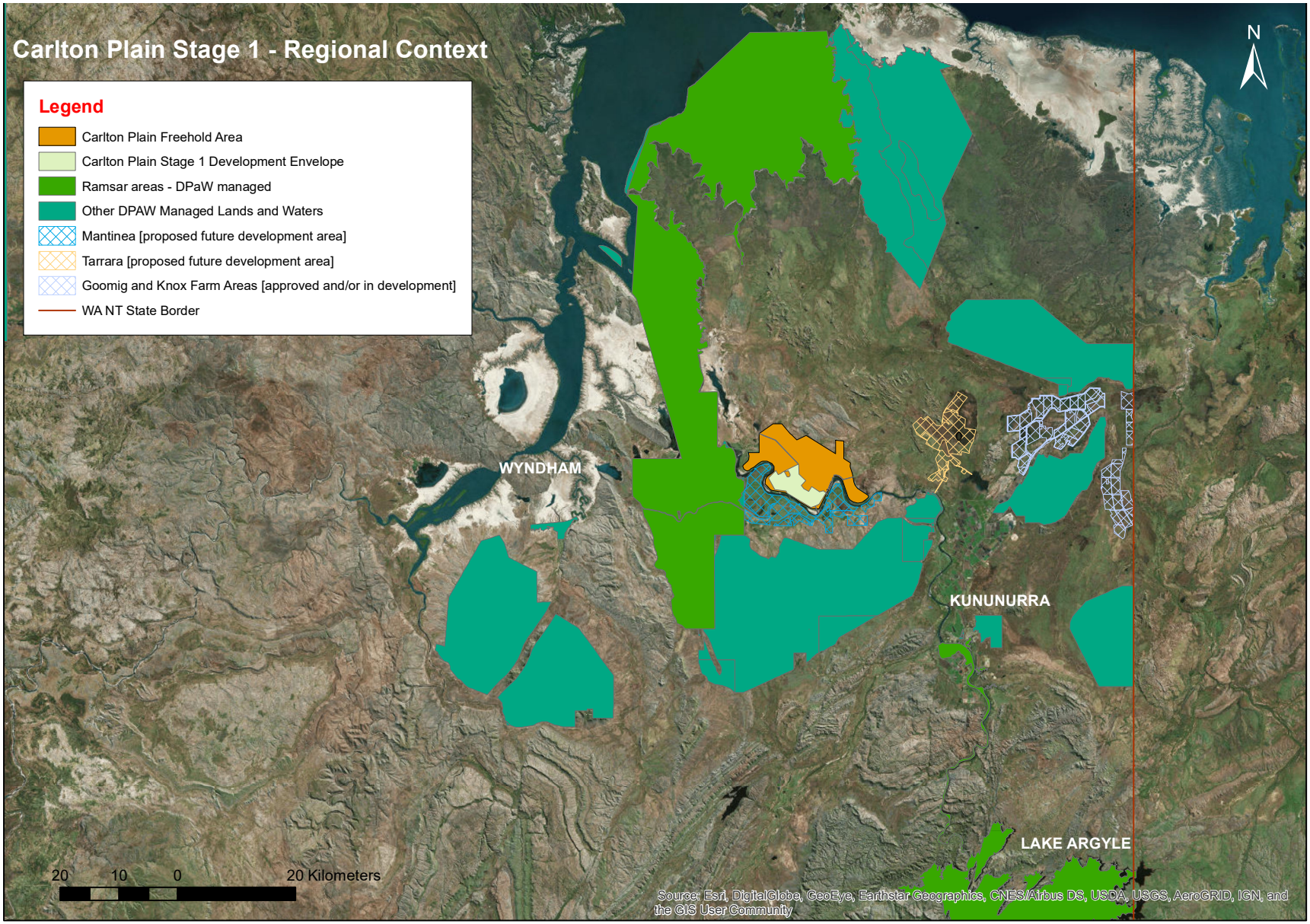


Figure 3 - Local area

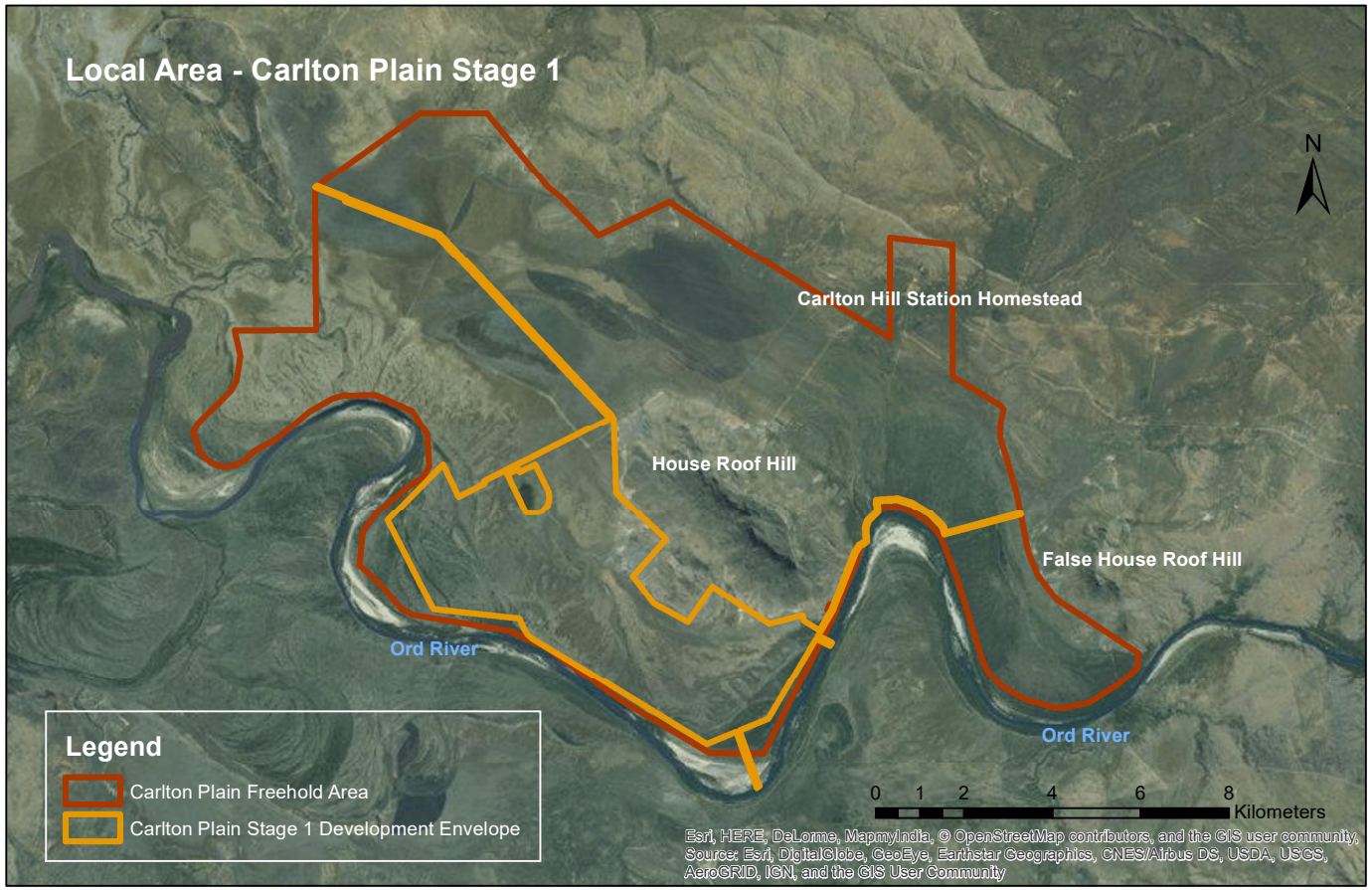
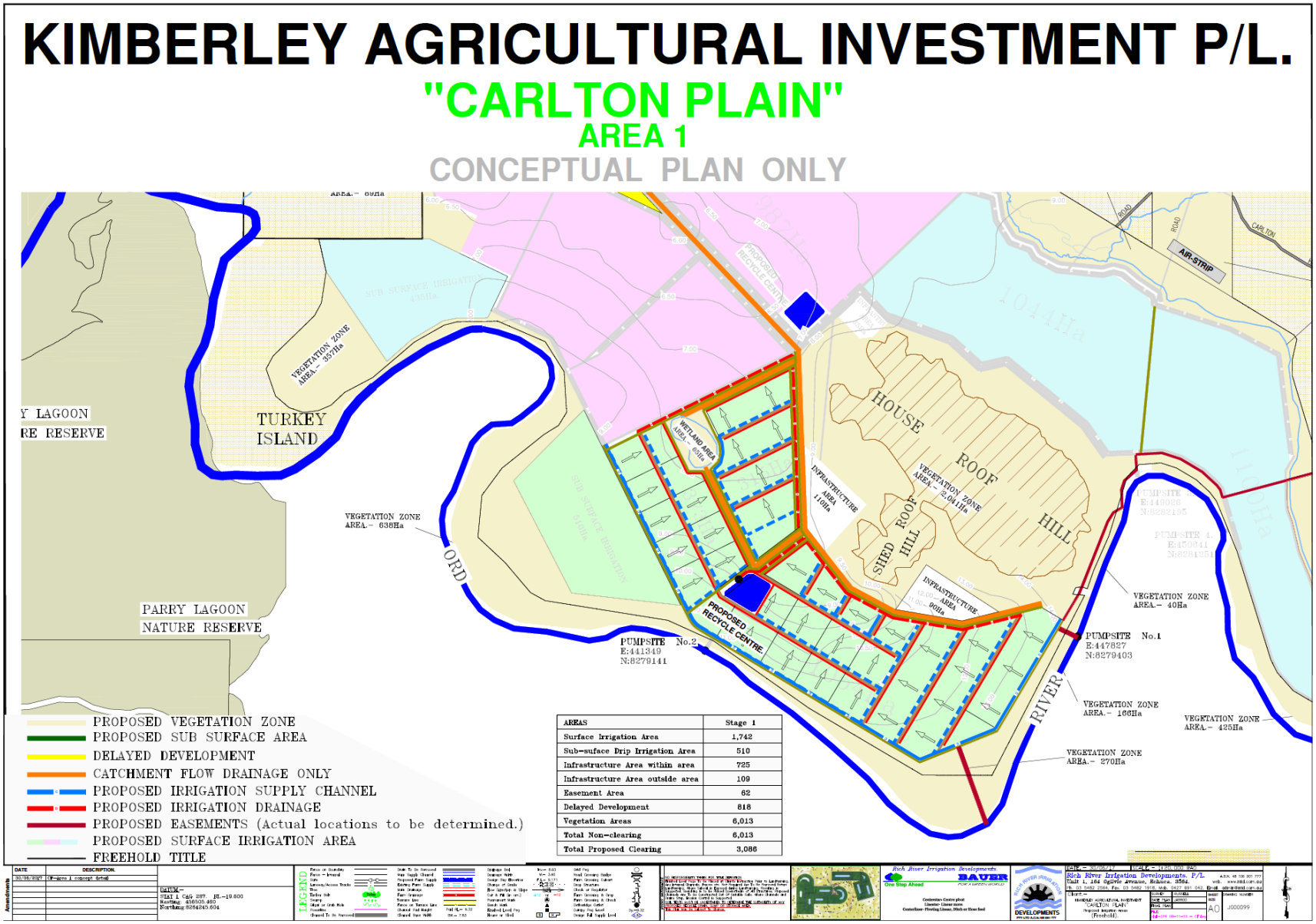


Figure 4 - Carlton Plain Stage 1: Indicative layout [concept plan]



AREAS	Stage 1
Surface Irrigation Area	1,742
Sub-suface Drip Irrigation Area	510
Infrastructure Area within area	725
Infrastructure Area outside area	109
Easement Area	62
Delayed Development	818
Vegetation Areas	6,013
Total Non-clearing	6,013
Total Proposed Clearing	3,086

1.1 Referral history

Clearing permit applications for the [broader] Carlton Plain and Mantinea developments were submitted to the Department of Environmental Regulation (DER) in December 2016. A subsequent application to clear the nearby Tarrara area was submitted to the DER in February 2017, with a concurrent diversification permit application submitted to the Pastoral Lands Board (PLB) via the Department of Lands (DoL).

Clearing permit application numbers were assigned by the DER as follows:

Table 4 - Clearing permit application references

Site	Clearing Permit Reference
Carlton Plain	CPS 7399/1
Mantinea Freehold	CPS 7400/1
Mantinea Leasehold	CPS 7401/1
Tarrara	CPS 7475/1

In June 2017, KAI was provided with a DER *Preliminary Assessment Report,* advice that the four applications were being assessed in unison, and that referral to the EPA was required. KAI subsequently commenced engagement with the EPA. Advice from the EPA indicated an initial referral for the Carlton Plain Stage 1 area could be submitted, given that environmental surveys and preliminary assessment work undertaken to date had not identified substantial risk for the Stage 1 area. Further referral of the broader program will occur in the near future.

KAI accepts that EPA acceptance of this referral separate to broader application does not imply that either or both approvals will be given.

The content of submissions received by the DER during the 21-day public comment periods relating to the clearing permits listed above are addressed in Table 16.

1.2 Purpose and scope

The purpose of this document is to meet the requirements of the EPA in relation to the referral of the *3,086ha Carlton Plain Stage 1* development proposal under Section 38 of the *Environmental Protection Act 1986* (EP Act 1986).

2.0 Overview of Carlton Plain – Stage 1

2.1 Overall development plans

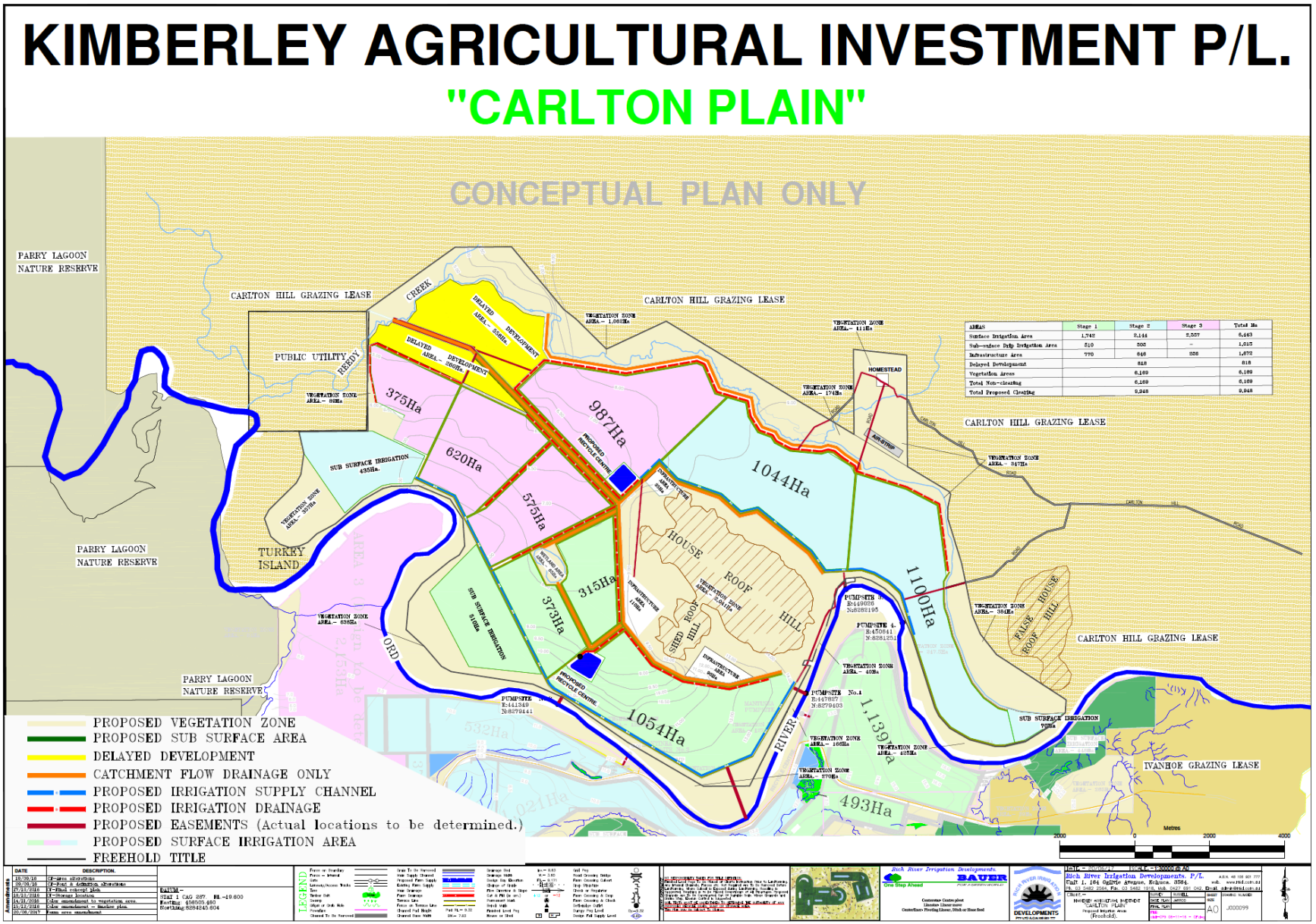
KAI is the freehold owner of the 16,117ha Carlton Plain land parcel (Lot 5000 on DP56715). Carlton Plain was excised from the Carlton Hill pastoral lease under the OFA which was executed by the State of Western Australia, the then-owners of Carlton Hill and Ivanhoe Station pastoral leases, and the Miriuwung and Gajerrong (MG) peoples, in 2005. As current owner of the Carlton Hill (and Ivanhoe) pastoral leases, and thus has tenure to the country surrounding the proposed development area.

Over the next decade, KAI will seek to clear and develop a total of 9,948ha or 62% of the Carlton Plain freehold area, in order to develop an initial 6,443ha of irrigated farmland, 1,015ha of perennial tree crops (horticulture or forestry), and associated infrastructure areas (for example, on-farm water recycling facilities). ***An additional 6,169ha of Carlton Plain will be retained in its current state (native vegetation and pastoral weeds), continue to be grazed as required under the pastoral lease, and not cleared for irrigated agriculture***. Figure 5 provides a concept plan for all stages of the proposed Carlton development.

This current application, Carlton Plain Stage 1, accounts for a 3,086ha of portion of Carton Plain exhibiting the lowest environmental risk. The 3,086ha incorporates construction corridors for entry road from the eastern boundary of Carlton Plain and drainage through the western area of the freehold location, as well as easements and construction corridors for pump sites on the Ord River, which will be located outside of the freehold boundary. Minor variations (<1ha) to track locations may also occur where natural environmental conditions (eg washouts after the wet season) necessitate.

Note – The attached (electronic / PDF) Carlton Plain Overall Concept Plan [Figure 5] incorporates a functional ability to zoom and add or remove map layers for ease of viewing. It is recommended that the reader utilises the electronic map through a PDF viewer where possible.

Figure 5 - Carlton Plain Concept Plan: All stages



2.1.1 Current condition

Carlton Plain has been continuously grazed for over 100 years. The location can be described as sparsely vegetated and largely degraded due to substantial grazing (cattle and wallabies). Plate 1 depicts an east to west view across the Stage 1 development area, including the Ord River in the foreground, and adjacent riparian reserve which is not included in the freehold title and falls outside of the proposed development area (with the exception of easements for pump sites). Plate 2, Plate 3 and Plate 4 indicate typical condition across the proposed clearing area of Carlton Plain Stage 1. Weed presence and overall vegetation condition is described in Section 4.0.

Plate 1 - Carlton Plain Stage 1 [February 2017] View west. Ord River in foreground.

Plate 2 - Carlton Plain (June 2017) View north-east to House Roof Hill / Shed Roof Hill

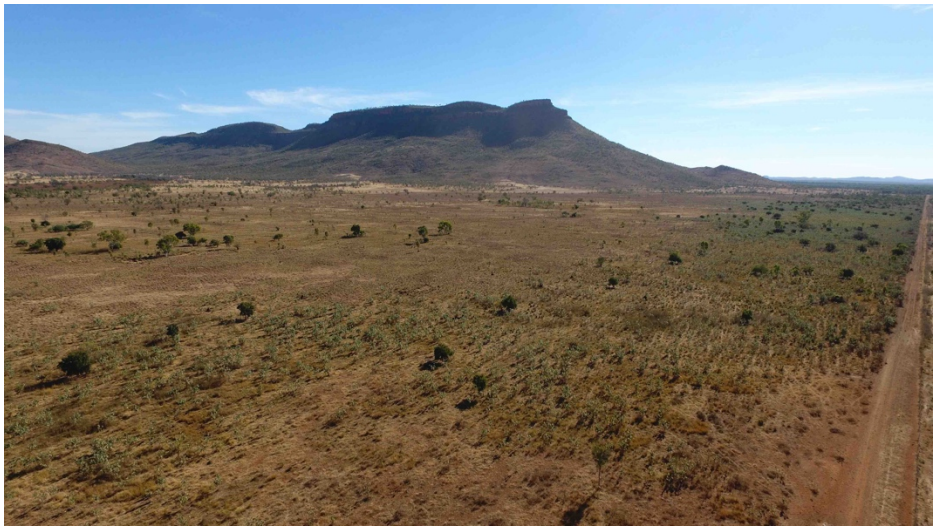


Plate 3 - Carlton Plain (June 2017) View east to House Roof Hill

Plate 4 - Calotropis procera *on Carlton Plain Stage 1, July 2016*

Plate 5 indicates mid-dry season (2016) condition of the wetland located to the west of the Carlton Plain Stage 1 area (approximate location 15.52996S 128.44963E). This wetland will be protected from clearing under the proposal, with tailwater drainage diverted around the wetland in the dry season, while allowing for stormwater inflow in the wet season.

Plate 5 - Carlton Plain Wetland (August 2016)

Plate 6 - Carlton Plain wetland (June 2017)

There are areas which can not and should not be developed (e.g. the wetland area depicted above). These areas will remain as important habitat for native species. Of the 16,117ha freehold Carlton Plain area, 38%, or 6,169ha, will be retained in its current condition under full development. Exclusion of cattle from farm areas will assist in the maintenance and protection of adjacent wetland values.

2.1.2 Other permits and licence requirements

Annual Water Entitlement

KAI will apply to the Department of Water (DoW) for an annual water entitlement under the *Ord Surface Water Allocation Plan* (2013). As depicted in Table 5, a nominal allocation of 115GL has been indicated for the Carlton Plain and Mantinea agricultural areas. KAI has engaged in preliminary discussions with the DoW relating to securing an annual water entitlement, location of pumping stations, and compliance with Ord River water quality requirements. These discussions will continue throughout 2017 and 2018 as appropriate water licences are sought.

Table 5 - Ord Surface Water Allocation Plan: Allocation limits

Allocation limits for the *Ord surface water allocation plan* area

Subarea	Allocation limit (total entitlements) (GL/yr)	Allocation limit components (GL/yr)		Annual reliability of supply	Water available for licensing in WA (GL/yr) (at January 2013)
		General licensing	Northern Territory		
Upper Ord	15	15	0	variable	6
Main Ord	750	590	160*	95%	242
Tarrara-Carlton	0	0	0	N/A	0
Carlton-Mantinea	115	115	0	95%	115
Dunham River	25	25	0	variable	5
Total	**905**	**745**	**160**		**368**

(Source: DoW 2013)

The impact of the abstraction of water for irrigated agriculture on the lower Ord River has been assessed in full by the DoW, under its statutory obligations arising from the *Rights in Water and Irrigation Act 1914*. As such, the abstraction of up to 115GL of water from the Ord River system is considered to be within the assessed ecologically sustainable limits and allocation determined by the State with input from the Commonwealth government. This includes consideration of the impact of this water extraction upon the downstream Lower Ord Floodplain Ramsar Site and Parry Lagoons wetland areas.

KAI will apply for an annual water entitlement of up to 27.6GL for the Carlton Plain Stage 1 area, calculated as follows:

Table 6 - Crop water use: Carlton Plain Stage 1

Crop type and usage consideration	Total usage (megalitres - ML)
Annual cropping under surface irrigation:	
1,742ha @ 8 ML/ha (cotton)	13,936
40% double cropping = 696.8ha @ 6 ML/ha	4,181
Distribution losses @ 10%	1,812
Perennial cropping under pressure irrigation:	
510ha @ 15 ML/ha (mangoes / citrus)	7,650
TOTAL WATER REQUIREMENT CARLTON PLAIN STAGE 1	**27,579ML**
	~ *27.6GL*
AVERAGE WATER REQUIREMENT PER HECTARE	**12.25ML/ha**

Bed and Banks permit

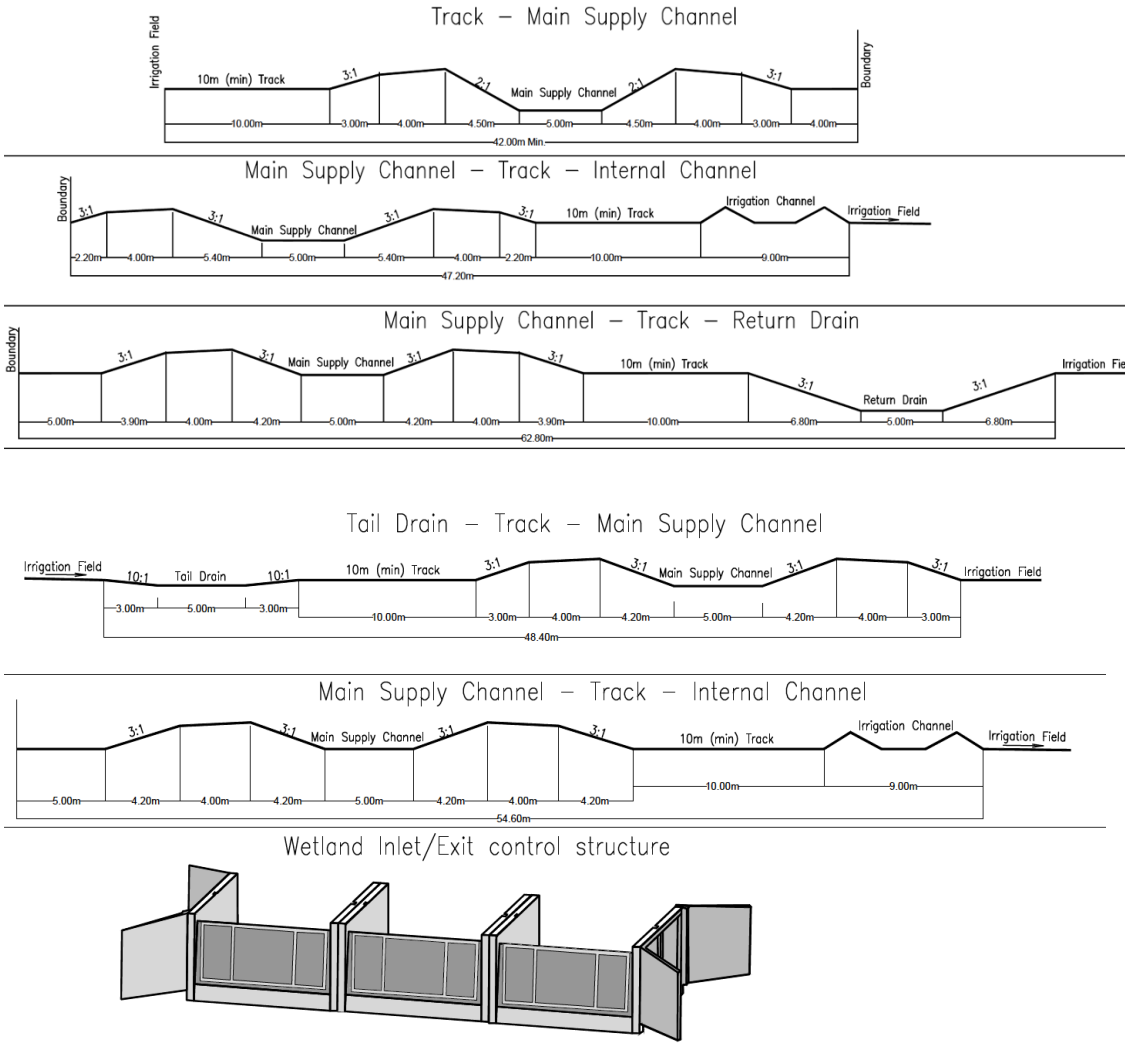
Bed and Banks permits under the RiWI Act 1914 will be obtained as required for pump sites identified for water supply to Carlton Plain. Required easements will also be secured.

2.2 Farm design

Farm design has been optimised to accommodate topography, drainage, soils, existing infrastructure (for example, tracks) and natural features suited to pump locations. Staging has been determined based on environmental risk, ease of access, and clearing/development difficulty.

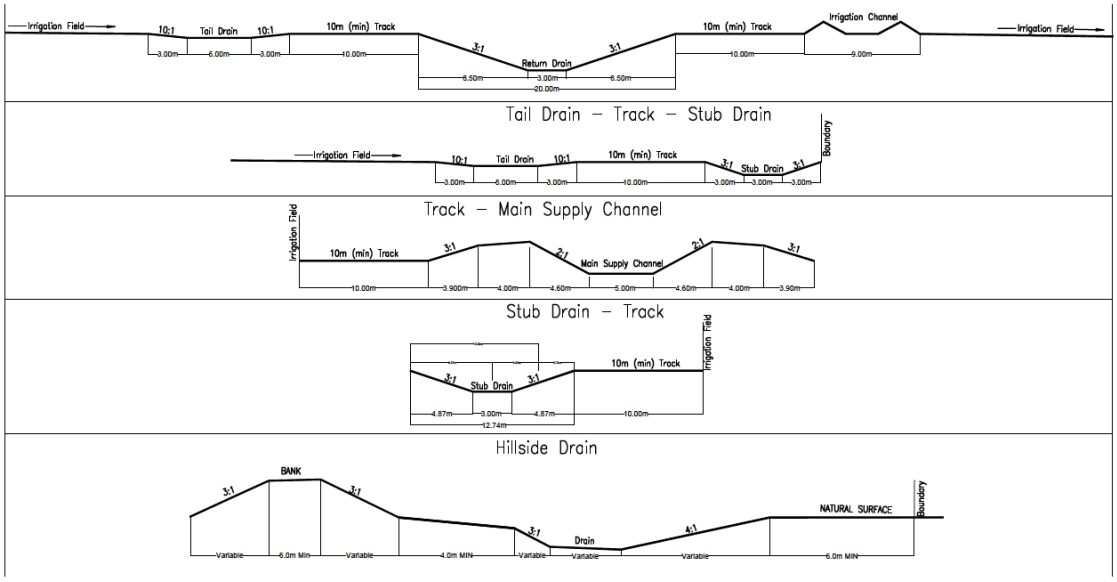
Typical farm infrastructure cross-sections are depicted in Figures 6, 7 and 8.

Figure 6 - Typical channel and return drain cross-sections



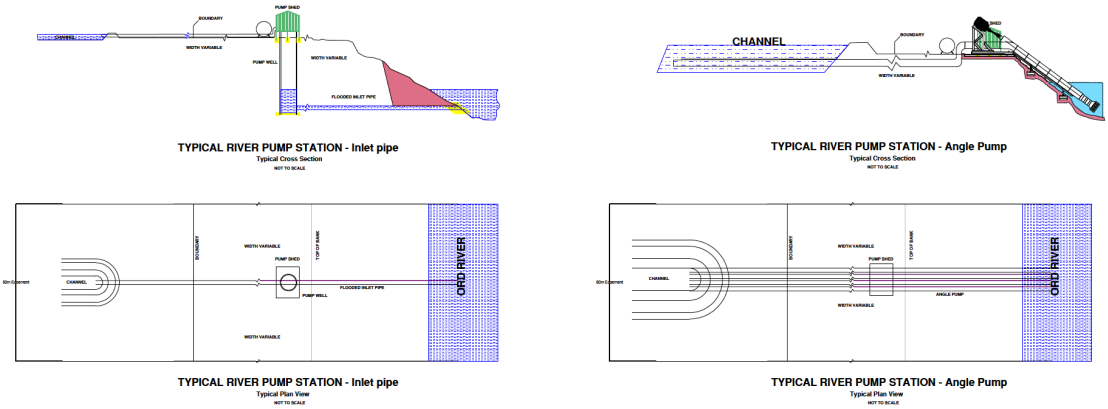
(Source: Rich River Irrigation Developments P/L, 2017)

Figure 7 - Typical track design cross-sections



(Source: Rich River Irrigation Developments P/L, 2017)

Figure 8 - Conceptual pump site design



(Source: Rich River Irrigation Developments P/L, 2017)

Final design and construction requirements will be determined upon further survey.

2.3 Local and regional environmental context

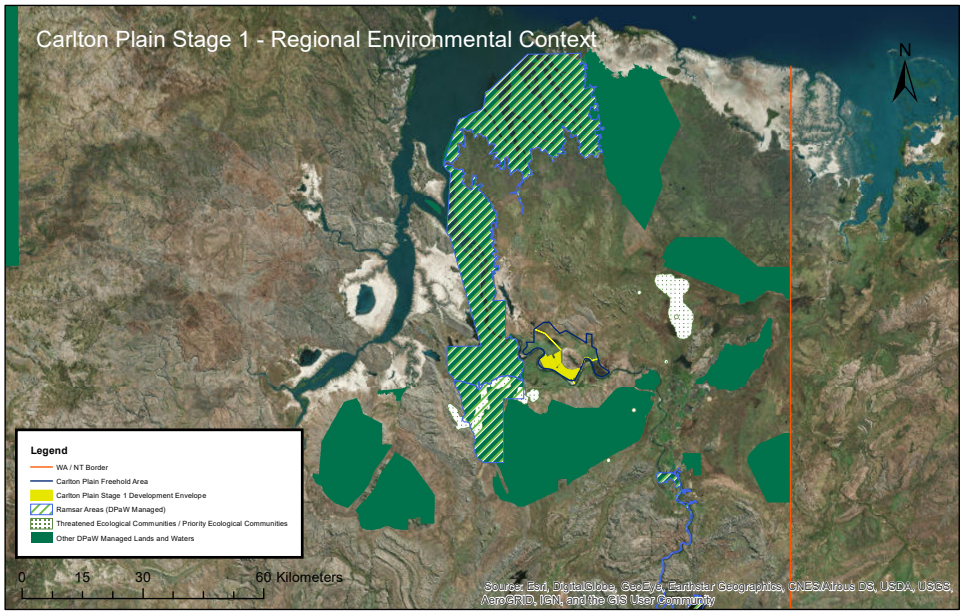
The Carlton Plain Stage 1 area forms part of the broader Carlton and Mantinea developments identified during the Ord Final Agreement process and subsequently allowed for in land and water planning by the WA Government.

While more detail is provided in the specific 'factor' sections of this document, the general geophysical and environmental management context is shown in Figure 9.

The Ord River flows to the east and south of the Carlton Plain Stage 1 area. To the west is the Ord River Floodplain Ramsar Site, managed by the Department of Parks and Wildlife (DPaW), as is the Ord

River and Parry Lagoons Nature Reserve and the Ngamoowalem Conservation Park (to the south).

Figure 9 - Regional environmental context



2.4 Proponent details

Table 7 - Proponent details

Registered Business Name: Kimberley Agricultural Investment Pty Ltd
ACN: 154 270 194
ABN: 60 154 270 194
Placed and Date of Incorporation: Registered by Australian Securities and Investments Commission 15/11/2011.
Address of Registered Office: Suite G01, Queens Riverside, 8 Adelaide Terrace, East Perth, WA, 6004.
Address for notices: PO Box 2531, Kununurra, WA, 6743.
Telephone No: (08) 9169 3113
Facsimile No: (08) 9169 1332
Email Address: jengelke@kai-australia.com.au
Email Address for notices: Copy to dliu@kai-australia.com.au and kimberleyboab@gmail.com
Website: www.kai-australia.com.au

Proponent representatives:

Name #1: Mr Jim Engelke
Position: General Manager
Phone Number: (08) 9169 3113
Facsimile Number: (08) 9169 1332
Mobile Telephone:0407 991 734
E-mail address: jengelke@kai-australia.com.au

Name #2: Mr Yin Jianzhong
Position: Chief Executive Officer
Phone No: (08) 9169 3113
Facsimile Number:(08) 9169 1332
Mobile Telephone: N/A
E-mail address: dliu@kai-australia.com.au

2.5 Legislative and policy context

This document is submitted to supplement the referral documentation provided to the EPA under Section 38 of the EP Act 1986, and the associated guidelines, policies and Administrative Procedures.

2.6 Environmental principles

Environmental principles established under Section 4A of the EP Act 1986, guiding the environmental assessment process, are stipulated as follows:

1. The precautionary principle

   Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

   In the application of the precautionary principle, decision should be guided by:

   (a) Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and
   (b) An assessment of risk-weighted consequences of various options.

2. The principle of intergenerational equity

   The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

3. The principle of the conservation of biological diversity and ecological integrity

   Conservation of biological diversity and ecological integrity should be a fundamental consideration.

4. Principles relating to improved valuation, pricing and incentive mechanisms
   (a) Environmental factors should be included in the valuation of assets and services.
   (b) The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement.
   (c) The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes.
   (d) Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.

5. The principle of waste minimisation

   All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.

(EPA, 2016a)

This document considers and where relevant addresses the environmental principles guiding the EPA in its decision-making.

2.7 Structure of document

Sections 1-3 provide a detailed project description relating to this development proposal, with broader contextual documentation of KAI's regional program.

The remainder of the document addresses the *environmental factors* associated with the proposed Carlton Plain Stage 1 development.

3.0 Regional context

3.1 Background to the proposal

Kimberley Agricultural Investment Pty Ltd (KAI) is developing farmland in the Ord Valley, within the Shire of Wyndham-East Kimberley. In 2012, the State of Western Australia entered into a Development Agreement with KAI for the Ord Stage II area. KAI has subsequently completed clearing and commenced farming in 2015 on an area known as the Goomig farmland. This has been done in line with the requirements of an *Environmental Management Plan* (EMP) approved under the requirements of Ministerial Statement 938 issued under the Environmental Protection Act 1986. Ongoing monitoring and annual audits have shown no material adverse environmental impacts.

In 2015, KAI secured Commonwealth environmental approval under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999) for the part of Ord Stage II known as the Knox Creek Plain. A Final Project Design Plan for the Knox area was approved by the Western Australian Office of the Environmental Protection Authority (OEPA) in late 2015.

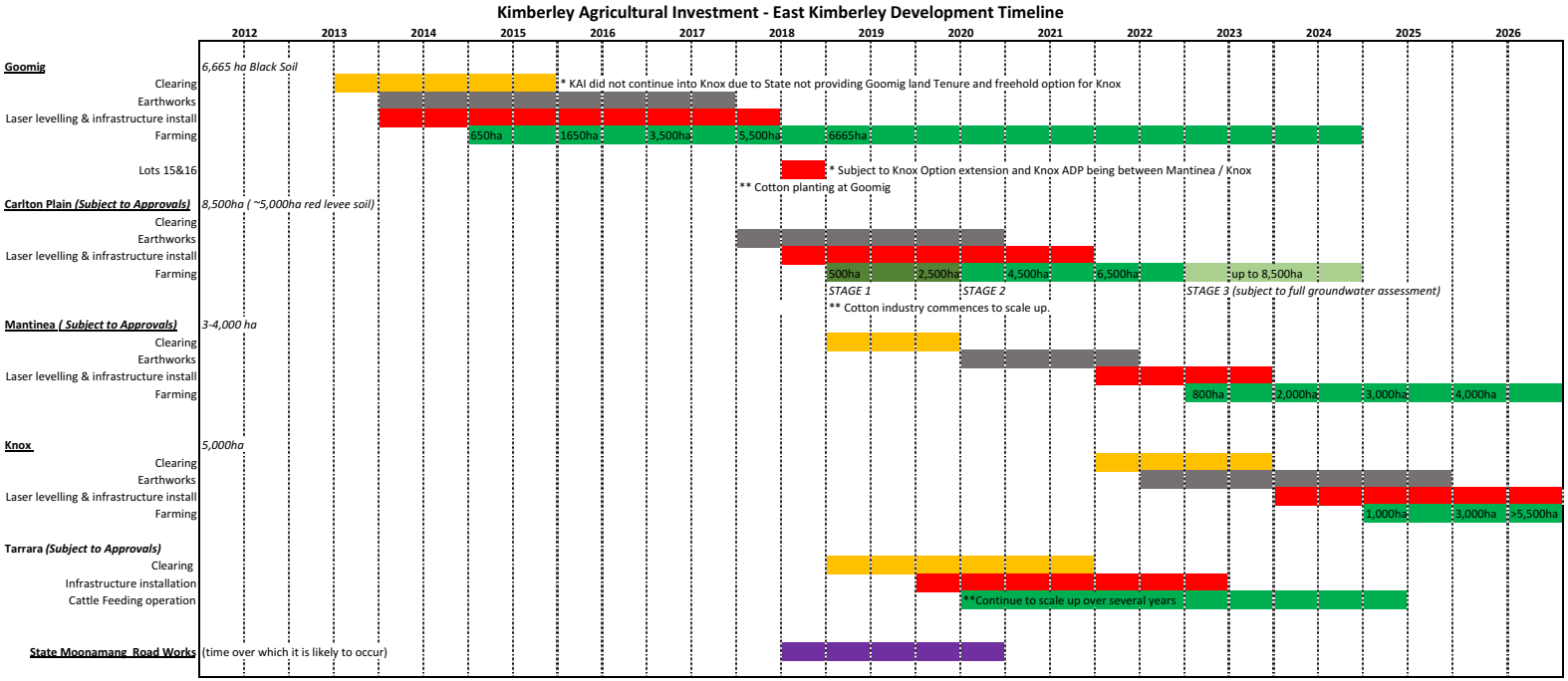
The State program to progress the development of the Ord Stage II lands was undertaken in line with the Ord Final Agreement (an Indigenous Land Use Agreement [ILUA]) signed in 2005. The Ord Final Agreement (OFA) also includes provisions relating to Carlton Plain and the Mantinea lands which are the subject of the major portion of this development proposal.

KAI is obligated under the Development Agreement signed with the State of Western Australia to develop at least another 10,000ha of irrigated farm land beyond the Ord Stage II lands. This has been incorporated due to a clear objective to increase the economic base of the East Kimberley region through irrigated agriculture. Scale of irrigated farm land is important in this respect to build the volume of agricultural product necessary to warrant downstream processing within the region. This is fundamental to State and National objectives to increase economic productivity and to achieve social development (including Indigenous employment) outcomes in Northern Australia.

KAI is applying to the EPA for approval under Section V of the Environmental Protection Act 1986 (EP Act), relating to the broader proposals for the Carlton Plain, Mantinea and Tarrara areas. The intention is to develop these lands for irrigated agriculture consistent with the intent of the Ord Final Agreement, and actions by the State to advance that. Referrals of the land parcels to the Department of Environmental Regulation (DER) in late 2016 and early 2017 were recommended for consideration by the EPA. Consultation with EPA staff in June 2017 indicated that consideration of the low-risk Stage 1 Carlton Plain development could occur through a differentiated referral process. KAI's experience indicates it can develop 1500-2000ha per year. Approval of Carlton Plain Stage 1 will enable KAI to continue its East Kimberley development program concurrent with the completion of further required studies and the negotiation of environmental management requirements for the broader areas.

Figure 10 illustrates the development program which KAI has established is essential to retain momentum, staffing, efficiencies and build the agricultural productivity necessary to underpin the food and fibre production scale in the region. Table 8 provides overall scale detail.

Figure 10 - KAI East Kimberley Development Program 2016-2026



ASSUMES:

Approvals are received in a manner that allows smooth transistion between land parcels
Approvals are received for Carlton / Mantinea - otherwise NO cotton industry
Approvals are received for Cartlon / Mantinea and Tarrara - otherwise NO cattle feeding
Until Moonamang Road extension complete no development at Knox Plain (unless State funds two main channel cross overs)
Assumes no increase in KAI development capability (earthworks and laser levelling)
Development of (MG Corporation) Lots 15&16, KAI is able to mitigate risk through ADP over Knox and Mantinea (i.e if Knox Option not extended or withdrawn by the State of WA)

Table 8 - Summary of proposed development areas

	Location Details	Tenure	Current Use	Proposed Use	Area proposed for clearing (ha)	Area to be retained (ha)	Total Area (ha)	% to be cleared	% to be retained
Carlton Plain	Lot 5000 on DP56715, Vol 2708 Folio 493	Freehold (KAI)	Pastoral grazing – Carlton Hill Station	Irrigated cropping – grains, cotton, perennial horticultural crops	9,948 (including 3,086ha Carlton Plain Stage 1)	6,169	16,117	62%	38%
Mantinea – Lease	Lot 371 on DP54529, Vol 3157 Folio 329; Lot 372 on DP54529, Vol 3157 Folio 330; Lot 376 on DP54529, Vol 3157 Folio 334; Lot 377 on DP54529, Vol 3157 Folio 335.	Department of Lands Licence (under Section 91, Lands Administration Act 1997) 50654/2006_A5648969	Grazing lease – associated with Ivanhoe Station pastoral lease	Irrigated cropping – grains, cotton, perennial horticultural crops	7,918	2,068	9,986	79%	21%
Mantinea – Freehold	Lot 5001 on DP56582, Vol 2708 Folio 491	Freehold (KAI)	Pastoral grazing – Carlton Hill Station	Irrigated cropping – grains, cotton, perennial horticultural crops	933	67	1,000	93%	7%
Tarrara	Lot 3550 on DP63533; Lot 1503 on DP76745 Lot 353 on DP211675; Lot 700 on DP215959.	Predominantly pastoral grazing lease. Easements to be secured.	Pastoral grazing – Carlton Hill and Ivanhoe Stations	Irrigated crops and pastures for supplementary cattle feeding	6,357	451,971	458,328	1.4%	98.6%
TOTAL AREA					**25,156**	**460,275**	**485,431**	**5.2%**	**94.8%**

3.2 Proposal context – *the big picture*

Kimberley Agricultural Investment proposes to expand agricultural production within proximity of the town of Kununurra and the port of Wyndham, utilising the floodplain soils and water of the Ord River (stored in Lake Argyle). KAI's project is based on building a scale, integrated agricultural development. Irrigated agriculture has occurred in the Ord valley for over 50 years. Ord Stage 1, an area of approximately 15,000 hectares, has been functioning successfully since the 1960s. Since that time there has been substantial scientific study and research into how to best manage the agriculture, water and environment of the region.

KAI's project as described in the 'Building the Ord' vision document focuses on developing four key industries:

1. Cotton production and processing
2. Grain production and processing
3. Sorghum production and processing
4. Cattle feeding and production with option to process within Australia

Each of these industries is dependent on one another to optimise farm production and performance and to allow best practice management.

3.2.1 Why is this proposal needed?

The productive capacity of the Ord Valley, despite ample land and water supplies, has faced numerous obstacles over the past five decades. Remoteness indicates that to become and remain viable, an industry must have appropriate scale. While technologies, such as crop R&D and water use efficiencies, have advanced, the growth of intensive agriculture in the region has been largely impeded by the lack of suitable tenure to secure the investment needed to grow the region's productivity.

Carlton Plain was made freehold following the ILUA negotiations which resulted in the endorsement of the *Ord Final Agreement* (OFA) in 2005. This Agreement paved the way for a number of agricultural lands to be developed, with (amongst other things) compensation for Traditional Owners, and environmental offsets via the establishment of six Conservation Parks in the East Kimberley. These deliverables were agreed between the State of Western Australia, the then-owners of Carlton Hill Station, and the Miriuwung and Gajerrong peoples.

KAI, as current owner of Carlton Plain, and preferred developer (as nominated by the State) for other OFA deliverables, has the investment backing to ensure timely conversion of former pastoral lease into higher value irrigated agriculture, while maintaining the environmental obligations required to ensure minimised ecological risk. Our company has the ability to proceed with this development. Furthermore, KAI is embedded strongly within the Kununurra community, it seeks to expand its agricultural production activity *with the support of existing producers and the broader East Kimberley community*, which recognise that there have been, and will be, very few opportunities for the Ord Valley to reach the scale of agricultural production required to reach its potential.

3.2.2 Scale

The scale of the KAI's overall program is critical. For cotton processing to be economically viable, and to commission the construction of a new cotton gin in the region, the minimum area required to planted is 10,000 hectares. This area can be both within Ord Stage 1 and new development areas. KAI has already committed to the establishment of a grain grading and packing facility in the region

(subject to the State of WA providing access to a parcel of land north of the old sugar mill in Kununurra). The intention with this facility is to conduct all grading and packing within the region for crops such as chia, sorghum, mung beans, chickpeas, maize and quinoa. Currently, grain must be freighted 3-4,000km south to have this work performed. Eliminating this freight requirement from the supply chain is an environmental and financial positive for producers and consumers.

The enterprises allow for good farm crop rotation and greatly enhance the capacity to manage the farms. KAI works closely with other landholders in the region, and is a partner in the Northern Australian Crop Research Alliance (NACRA) established between the Ord River District Cooperative (ORDCO) – representing Ord Stage 1 growers – and The Chia Company. NACRA has recently submitted an $11m crop research and development (R&D) proposal to the Cooperative Research Centre for Developing Northern Australia. Of this $11m, Ord growers (via ORDCO) and KAI (independently) are contributing in excess of $1m in cash contributions over three years. This indicates not only the recognition of the importance of and commitment to crop R&D, but the integration of KAI into the regional community. This is a fundamental aspect of KAI's approach to its agricultural operations – that it, like other growers, must be embedded into regional development and social processes.

Furthermore, it must be noted that non-achievement of KAI's development aspirations will have greater implications than solely for the company. The achievement of the scale proposed will substantiate investment in processing facilities (which will be used by other growers from across the Ord Valley) and improve logistics. This investment which will create local jobs and will impact positively on the broader agricultural industry. KAI is embedded in the agricultural community and production systems in the region, both of which are at risk if scale cannot be achieved. Smaller farming operations do not have access to the capital to invest at the scale required for industry to expand. Other growers are relying on KAI to achieve its scale and processing facility goals.

Sorghum processing is still being assessed for feasibility. While the technology and capacity to process sorghum is known, KAI is still trying to establish if the enterprise is viable.

By-products from all the processes and in particular cotton seed are critical to the establishment of KAI's cattle feeding operations.

Conservatively, the expected output of the four enterprises, based on KAI's production, is as follows:

1. Cotton 105,000 bales plus 28,000 tonnes cotton seed
2. 30,000 tonnes grain
3. 70,000 head of cattle through feeding operation
4. 48,000 tonnes sorghum syrup

These production figures do not include the increased production that is expected from Ord Stage 1 and the surrounding cattle station (Carlton Hill and Ivanhoe – both owned by KAI but managed by others) once the stations have access to cotton seed and grain by-products.

These figures could increase by 30-50% if the contribution of Ord Stage 1 is factored in.

3.2.3 Downstream processing

The project will take a staged approach to processing, which are dependent on KAI reaching the production indicated above. There are three key facilities required for the processing of raw products to be grown on the proposed development areas:

1. Grain grading and packing plant
2. Cotton gin

3. Sorghum syrup plant

Grain grading plant

KAI's proposed grain grading plant consists of silos to house grain and adjacent sheds containing the grading and packing equipment. The process of grading grain utilises compressed air and gravity to separate foreign material. The site selected is immediately adjacent to the 'old sugar mill'. Plans for constructing a grain grading plant at this site are well advanced.

Cotton Gin

The purpose of a cotton gin is to separate the fibre (lint) from the cotton seed. The process utilises compressed air to keep harvested cotton aloft, with a series of 'saws' grabbing the cotton and pulling it through a screen fine enough to separate cotton seed.

Sorghum Syrup

The existing 'old sugar mill' has been appraised for use as a crushing plant, in the same manner it was used as a sugar mill. Until the market for sorghum syrup has been verified and the farming viability confirmed there will not be any further work performed on the 'old sugar mill'.

Specific environmental, planning and food safety approvals and permits for each of these facilities will be obtained separately at appropriate times.

3.2.4 Project staging

Prior to commencing its work on Goomig, KAI considered carefully how to best undertake the development. Two decisions were made early in 2012:

1. KAI would purchase and run all of its own equipment with assistance from specialist contractors; and
2. To stage the development and grow employment numbers steadily.

At commencement, KAI established five operational teams:

1. Clearing
2. Earthworks
3. Laser Levelling
4. Infrastructure installation (pipes, pumps, gates)
5. Farming

Mechanical, farm design and administrative support is also provided within KAI's Kununurra base operations.

Staging the development was seen as a critical component for several different reasons.

People

The most significant reason was people.

KAI made a decision to use **only locally based people in our teams, with no FIFO** – leaving the need to train people to build the necessary skills. This was only possible if KAI was to commence works gradually. This was important for both Indigenous and non-Indigenous employees.

One of the biggest challenges in the Kimberley region, given the strong seasonality between wet and dry, is providing enough work to keep employees engaged for a full year. Staging and gradually growing has allowed KAI to address both the skills and training needs as well as the provision of full time employment.

It needs to be noted that in many ways it may have been easier to simply employ contractors from the East Coast of Australia to carry out works on a seasonal basis. This would not have been a good result for the local community. **Farming is about building community, whereas mining is about jobs.**

Flexibility

KAI has purchased construction machinery capable of to allowing the various teams to complete approximately 1,500-2,000 hectares of farming land per year. This development is not however, simultaneous.

There is a need for the operations to be separated over three to four years (or dry seasons, when access is available):

Year 1: Clearing, survey and detailed farm design
Year 2: Earthworks followed by laser levelling and infrastructure installation (this work can take two dry seasons depending on farm size pushing farming commencement to year 4).
Year 3: Commencement of farming

Staging the development allows KAI to balance the relative speeds of the operations and move staff between them. It has taken KAI three years to grow and stabilise the land development team.

All operations are limited by the Kimberley wet/dry season conditions, given all of KAI's current work is conducted on clay based soils. This is particularly the case for the earthworks and laser-levelling teams. Earthworks and laser-levelling teams assist each year in getting the farming operations started, adding 6-8 weeks to the working year. This is critical to enabling KAI to be able to provide enough work to employees.

Farming

The capacity to farm new land has to be developed at the same speed as the development occurs. This requires teams, and an understanding of the farming systems to be learned and communicated. Again, staging the development is critical in allowing this 'knowledge' to be accumulated over time and to avoid mistakes.

Development and the subsequent operation of farms is most logically done in a staged manner. To date KAI believe it has conducted this part of the process in a professional, competent manner. Staging is critical in enabling KAI to continue developing skills and capacity in people and providing 'full time' work in a seasonal business.

However, being able to continue staging for future development is also critical. Without staging and a smooth transition from development to farming, KAI would need to engage outside contractors to handle the seasonal 'glut' of work. Without smooth, staged transitions into the proposed new development areas, many of the current teams would lose their jobs and are would likely be replaced be contractors if certainty (by way of development approvals) was not available.

3.2.5 Transitioning from current to new areas

KAI will complete earthworks on the Goomig land by November 2017. Laser levelling will continue and be completed in mid-2018.

Knox Creek Plain

KAI is not prepared to proceed with the development of the Knox Creek Plain lands, despite having both Commonwealth and State environmental approvals in place, for multiple reasons:

- KAI does not have any form of tenure of the Knox area (or Goomig), and experience to date has shown that the timely confirmation of tenure, by the State, has not occurred;
- The WA government, through LandCorp, is re-aligning Moonamang Road, from the existing eastern end of the sealed section, to the WA/NT border. This creates logistical and cost difficulties for KAI, as it requires expensive modification of the original channel extension design. KAI estimates the cost of the changes arising directly as a result of the road realignment will be $2-3m if construction commenced prior to road completion.
- KAI holds a three-year option period of over the Knox Creek Plain, which commenced in October 2016. There is a chance that the road and tenure issues will not be resolved prior to the end of the option. If KAI commences the clearing and development of this land prior to the expiry of the option, and the option is not renewed, KAI will have invested heavily without possibility of return (noting the approximate cost of $12,000 per hectare to develop the land).
- KAI has an Aboriginal Development Package (ADP) with MG Corporation, established under the terms of the Ord Final Agreement ILUA. Commencement of land development on Knox will trigger ADP obligations, with or without tenure.
- KAI is not prepared to take the financial risk on commencing clearing until road construction is completed and tenure is secured, in order that financial obligations associated with the ADP are not triggered without guarantee of Knox tenure.
- Under the Development Agreement, once KAI commences work on the Knox Plain, milestones dictate that development needs to be completed within four years.

Development of the Knox Creek Plain is thus still surrounded by issues to be resolved and decisions to be made by State. The financial risk is such that KAI cannot warrant commencement of works until resolution of these issues occurs. (Note that KAI is liaising with MG Corporation to transfer the financial triggers from the Knox ADP to a similar ADP associated with the proposed Mantinea development, such that MG Corporation is not adversely affected by the delayed commencement of Knox).

KAI's preferred plan is to move progressively onto Carlton Plain (for which it has freehold and no development restrictions and/or third party obligations), commencing with the current proposal for the Carlton Plain Stage 1 area, and then onto Mantinea and Tarrara. This allows for the retention of existing staff (currently approximately 60 people) and to continue growing the farming operations. Without a smooth transition, KAI will be required to park equipment and lay off a large part of our local workforce.

Figure 5 outlines the staged areas and how the development would be implemented over a number of years. The rationale for staging the Carlton Plain development is exactly the process adopted for the development of Goomig. A staged approach will allow for a steady considered development in terms of all aspects of the project:

1. Managing People
2. Managing Environmental impacts
3. Managing machinery requirements
4. Managing the scaling up of the processing requirements

From all perspectives, staging makes strong pragmatic sense.

KAI, in its consideration of how to approach the development of Carlton Plain, Mantinea and Tarrara has utilised the considerable existing available knowledge relating to these land parcels. The logic of the staging proposed for Carlton Plain, as depicted in Figure 5, will be applied to the Mantinea and

Tarrara land parcels, in line with the schedule proposed in Figure 10.

3.2.6 Cropping

Establishing cotton is key to the long term viability and sustainability of the complementary grain, cattle and sorghum enterprises. The key to establishing cotton is the availability of a range of soil types, in particular red levee soils as are present on Carlton Plain and the lighter soils of Mantinea.

The preferred window for cotton planting is February/March, which coincides with the wettest months of the year. Soils that allow for all year access will form the core of the cotton industry and provide the justification for a local cotton gin construction. This area can be relied upon for production. The black soils more generally associated with Ord Stage 1 and Ord Stage 2 do not provide year round access. In most years, access during the months of February and March can be achieved for short time periods, sufficient to plant crops, although it is noted that in some wet seasons such as 2016/17, access is simply not possible and no cotton could be planted. It is estimated that in two out of ten years, black soil will not be able to be planted to cotton.

Part B – Environmental Factors

Environmental factors considered in relation to the proposed development are summarised as follows:

Table 9 - Summary of environmental factors and objectives

Theme	Factor	Objective	Where addressed
Land	Flora and Vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	Section 4.0
Land	Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.	Section 5.0
Land	Terrestrial Environmental Quality	To maintain the quality of land and soils so that environmental value are protected.	Section 6.0
Land	Terrestrial Fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Section 7.0
Water	Hydrological Processes	To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.	Section 8.0
Water	Inland Waters Environmental Quality	To maintain the quality of groundwater and surface water so that environmental values are protected.	Section 9.0
People	Social Surroundings	To protect social surroundings from significant harm.	Section 10.0

(EPA 2016a)

4.0 Key Environmental Factor 1 – Flora and Vegetation

4.1 EPA objective

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

4.2 Policy and guidance

The EPA (2016a) advises that considerations for Environmental Impact Assessment (EIA) for the factor *Flora and Vegetation* include, but are not necessarily limited to:

- application of the mitigation hierarchy to avoid and minimise impacts to flora and vegetation, where possible;
- the flora and vegetation affected by the proposal;
- the potential impacts and the activities that will cause them, including direct and indirect impacts;
- the implications of cumulative impacts;
- whether surveys and analyses have been undertaken to a standard consistent with guidance;
- the scale at which impacts to flora and vegetation are considered;
- the significance of the flora and vegetation, and the risk to the flora and vegetation;
- the current state of knowledge of flora and vegetation and the level of confidence underpinning the predicted residual impacts;
- whether proposed management and mitigation approaches are technically and practically feasible;
- whether the proposal area will be revegetated in a manner that promotes biological diversity and ecological integrity.

4.3 Receiving environment

Terrestrial flora and vegetation condition in the Carlton Plain Stage 1 area have been assessed by Woodman Environmental Consulting (2016a and 2016b).

The Woodman flora and vegetation assessment was undertaken at a Level 1 standard as defined by the Environmental Protection Authority's (EPA) Guidance Statement No. 51 (EPA 2004a), and Position Statement No. 3 (EPA 2002). This level of survey was determined to be appropriate given the proponents requested timing of the survey in conjunction with Table 2 of Guidance Statement No. 51, where the Bioregion Group is defined as Group 3 and at project commencement the scale and nature of impact was considered overall Moderate (EPA 2004a).

The survey was conducted according to the guidelines presented in the following documents:

- GS 51 (Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia) (EPA 2004a)
- Technical guide on Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (EPA and DEC 2015)
- EPA PS 2 (Environmental Protection of Native Vegetation in Western Australia) (EPA 2000)
- EPA PS 3 (Terrestrial Biological Surveys as an Element of Biodiversity Protection) (EPA 2002)
- EPB 20 (Protection of Naturally Vegetated Areas through Planning and Development).

In the vegetation and flora surveys undertaken in the 2016 dry season, Woodman identified the following significant vegetation factors within the Carlton Plain Stage 1 project area:

Vegetation

- *No Threatened Ecological Communities (TECs) are known from the Study Area.*
- *One Priority Ecological Community (PEC) is known from the Study Area: Priority 3 PEC Ivanhoe Land System.*
- *Eight vegetation types (VTs) were recorded during dry season surveys.*

Flora

- *No Threatened flora taxa are known to occur in the Study Area;*
- *Total of 83 Conservation Significant flora taxa are known to occur within 20km of the proposed development area; 32 of which have the potential to occur across Carlton Plain and the adjacent Mantinea lands; 14 of which are ranked Threatened, P1 or P2 and occur on substrates suitable for agriculture (excluding habitats on sandstone or rocky substrates).*

(Source: Woodman 2016b, p18).

Figure 11 illustrates the vegetation communities present on the Stage 1 Carlton Plain area, supported by Table 10 which provides detailed vegetation descriptions in relation to the colour-coding contained in Figure 11. Priority taxa locations, based on published data and surveys conducted by Woodman in 2016 are incorporated into Figure 11.

The local extent of each vegetation type is calculated and presented in Table 11.