

<b>Proposal name:</b>	<b>Gogo Station Irrigated Agricultural Development</b>
<b>Proponent:</b>	<b>Gogo Station Pty Ltd</b>
<b>Assessment number:</b>	<b>2134</b>
<b>Location:</b>	<b>Approximately 10 km east of Fitzroy Crossing</b>
<b>Local Government Area:</b>	<b>Shire of Derby - West Kimberley</b>
<b>Public review period:</b>	<b>Environmental Review Document - 8 weeks</b>
<b>EPBC reference no:</b>	<b>2018/8143</b>

### 1. Introduction

The Environmental Protection Authority (EPA) has determined that the above proposal is to be assessed under Part IV of the *Environmental Protection Act 1986* (EP Act).

The purpose of the Environmental Scoping Document (ESD) is to define the form, content, timing and procedure of the environmental review, required by s. 40(3) of the EP Act. This draft ESD has been prepared by the EPA in consultation with the proponent, Commonwealth Department of the Environment and Energy, decision-making authorities and interested agencies consistent with the EPA's *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual 2016*.

#### **Form**

The EPA requires that the form of the report on the environmental review required under s. 40 (Environmental Review Document) is according to the Environmental Review Document template (refer to the EPA's *Instructions on how to prepare an Environmental Review Document*).

#### **Content**

The EPA requires that the environmental review includes the content outlined in sections 2 to 6 of this ESD and addresses the matters in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (Appendix A).

#### **Timing**

Table 1 sets out the timeline for the assessment of the proposal agreed between the EPA and the proponent.

**Table 1 Assessment timeline**

Key assessment milestones	Completion Date
EPA approves Environmental Scoping Document	6 September 2018
Proponent submits first draft Environmental Review Document	1 March 2019
EPA provides comment on first draft Environmental Review Document <i>(6 weeks from receipt of ERD)</i>	12 April 2019
Proponent submits revised draft Environmental Review Document	17 May 2019
EPA authorises release of Environmental Review Document for public review <i>(2 weeks from EPA approval of ERD)</i>	31 May 2019
Proponent releases Environmental Review Document for public review for 8 weeks	14 June 2019
Close of public review period	9 August 2019
EPA provides Summary of Submissions <i>(3 weeks from close of public review period)</i>	30 August 2019
Proponent provides Response to Submissions	27 September 2019
EPA reviews the Response to Submissions <i>(4 weeks from receipt of Response to Submissions)</i>	25 October 2019
EPA prepares draft assessment report and completes assessment <i>(7 weeks from EPA accepting Response to Submissions)</i>	13 December 2019
EPA finalises assessment report (including two weeks consultation on draft conditions) and gives report to Minister <i>(6 weeks from completion of assessment)</i>	7 February 2020 (+2 weeks to allow for Xmas)

**Procedure**

The EPA requires the proponent to undertake the environmental review according to the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* and the *Procedures Manual*, including requirements for public review.

The ESD will be available on the EPA website ([www.epa.wa.gov.au](http://www.epa.wa.gov.au)) upon endorsement and must be appended to the Environmental Review Document.

**Assessment as an accredited assessment**

The proposal was referred to the Department of Environment and Energy on 28 February 2018. A controlled action decision was made 2 May 2018 under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The controlling provisions relevant to the proposed action are:

- Listed threatened species and communities (sections 18 & 18A);
- Listed migratory species (sections 20 & 20A); and
- The heritage values of a National Heritage place (sections 15B & 15C).

## 2. The proposal

The subject of this ESD is the proposal by Gogo Station Pty Ltd to develop up to 8,355 hectares of land for irrigated cropland and associated infrastructure on Gogo Station. The proposal is located near the Margaret River (a tributary of the Fitzroy River), approximately 10 kilometres east of Fitzroy Crossing, in the Kimberley Region. The proposal also includes the abstraction of up to 50 Gigalitres per annum (GL/a) of surface water via an offtake channel from the Margaret Rive, and the abstraction of up to 2500 ML of groundwater. The regional location of the proposal is shown in Figure 1 and the development envelope encompassing the physical elements of the proposal is delineated in Figure 2. The indicative footprint of the proposal shown in Figure 3.

The key characteristics of the proposal are set out in Tables 2 and 3. The key proposal characteristics may change as a result of the findings of studies and investigations conducted and the application of the mitigation hierarchy by the proponent.

**Table 2 Summary of the proposal**

<b>Proposal title</b>	Gogo Station Irrigated Agricultural Development
<b>Proponent name</b>	Gogo Station Pty Ltd
<b>Short description</b>	The proposal is to develop land for irrigated crop production and associated infrastructure (including water storages, water supply channels, levees and roads). The proposal also includes the abstraction of surface water via an offtake channel.

**Table 3 Location and proposed extent of physical and operational elements**

Element	Location	Proposed extent
<b><i>Physical elements</i></b>		
Irrigated cropland and associated infrastructure	Figure 2 Figure 3	Clearing of up to 8,335 ha of native vegetation within a development envelope (to be defined by the proponent).
<b><i>Operational elements</i></b>		
Offtake Channel		Abstraction of up to 50 GL/a of surface water from the Margaret River floodplain from a gravity offtake channel, to take water only when the height of flow in Margaret River is approximately 3 m or above base flow level.
Offtake channel		Development of an offtake channel with a design capacity of 3 GL/Day sourcing water from flood events in the Margaret River
Groundwater abstraction		Up to 2,500 ML per year
Water storages		Construction of 40.35 GL water storage for capture of floodwater from the Margaret River and Mount Pierre Creek covering up to 807 Ha in area and construction of 7.2 GL Water storage covering 144 Ha.
Levee bank		Construct a levee.
Internal runoff capture		Exemption to permit capture of an estimated 2.5ML/ha of water from developed land as a base volume for stormwater/tailwater capture

### 3. Preliminary key environmental factors and required work

The preliminary key environmental factors for the environmental review are:

1. Inland Waters
2. Landforms

3. Terrestrial Environmental Quality
4. Flora and Vegetation
5. Terrestrial Fauna
6. Subterranean Fauna
7. Social Surroundings

Table 3 outlines the work required for each preliminary key environmental factor and contains the following elements for each factor:

- **EPA factor** and **EPA objective** for that factor.
- **Relevant activities** – the proposal activities that may have a significant impact on that factor.
- **Potential impacts and risks** to that factor.
- **Required work** for that factor.
- **Relevant policy and guidance** – EPA (and other) guidance and policy relevant to the assessment of the factor.

The following EPA guidance applies to all factors:

- *Statement of Environmental Principles, Factors and Objectives* (EPA, 2016).
- *Instructions and Template: Part IV Environmental Management Plans* (EPA, 2016).

Work requirements relating to offsets are specified for the relevant biodiversity factors (Flora and Vegetation, Terrestrial Fauna and Subterranean Fauna). As the consideration of offsets can link to multiple factors, the following government policy applies to other factors, where relevant:

- *WA Environmental Offsets Policy* (Government of Western Australia, 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia, 2014) – particularly the Residual Impact Significance Model (Figure 3, p11).

**Table 4 Regional Context and Integrating Issues**

<b>Regional Context and Integrating Issues</b>	
<b>Regional Context</b>	The proposal is located near the intersection of the Fitzroy and Margaret Rivers in the West Kimberley, with its implementation having the potential to impact on these rivers through the taking of water and values of the proposed Fitzroy River National Park.
<b>Required Work</b>	<p>The EPA has identified the following issues which cut across multiple preliminary key factors that need to be addressed in the PER document.</p> <ol style="list-style-type: none"> <li>1. Discuss the regional and cumulative impacts of other existing or reasonably foreseeable development in the catchment upstream of the proposal with the potential to impact the same receptors and environmental values.</li> <li>2. Provide details of proposed care and maintenance, and decommissioning and closure of the proposal. Provide details of the potential risks and impacts to environmental values, and details of mitigation and management measures to ensure that the impacts are not greater than predicted.</li> <li>3. The work to be carried out for all studies should be undertaken with consultation with Traditional Owners.</li> </ol>

**Table 5 Preliminary key environmental factors and required work**

<b>Inland Waters</b>	
<b>EPA objective</b>	To maintain the hydrological regimes and the quality of groundwater and surface water so that environmental values are protected.
<b>Relevant activities</b>	<ul style="list-style-type: none"> <li>• Construction and operation of water infrastructure</li> <li>• Surface water abstraction</li> <li>• Earthworks and clearing of vegetation</li> <li>• Diversion of surface water flows</li> <li>• Flood irrigation</li> <li>• Application of fertilisers, pesticides and chemicals, and use of hydrocarbons.</li> </ul>
<b>Potential impacts and risks</b>	<ul style="list-style-type: none"> <li>• Changes to river and/or floodplain water levels surface water flows.</li> <li>• Changes to groundwater levels and flows.</li> <li>• Reduced floodplain inundation early in the wet season (extension of dry season conditions) and resulting impacts on vegetation recruitment and persistence due to the extended dry periods.</li> <li>• Changes to groundwater-dependent and riparian vegetation and dependent fauna.</li> </ul>

Inland Waters	
	<ul style="list-style-type: none"> <li>• Changes to National Heritage listed cultural flows of the Fitzroy River, its tributaries, floodplains and dry season water pool (<i>jila</i>) sites.</li> <li>• Increased sediment loads to surface water resources.</li> <li>• Increased nutrient loads to surface water resources, from fertiliser applications and mobilised sediment.</li> <li>• Decrease in surface and groundwater quality from fertiliser, pesticide, chemical and hydrocarbon runoff and/or seepage.</li> <li>• Increase in salinity from farm practices.</li> <li>• Groundwater and/or surface water contamination from the former Pillara mine (a known contaminated site), located approximately 4 km south of the proposal.</li> <li>• Impacts on the National Heritage listed aesthetic values of the Fitzroy River and permanent water holes, including Geikie Gorge.</li> </ul>
<b>Required work</b>	<ol style="list-style-type: none"> <li>1. Provide a description of the design and location of the parts of the proposal with the potential to impact surface water and groundwater, including the location of all proposed water infrastructure. Describe where water will be taken directly from the river and where water will be taken via floodplain offtake channels.</li> <li>2. Characterise the existing hydrological system within and surrounding the development envelope. Develop a conceptual model of the hydrological system including surface water and groundwater interaction. Provide a water balance of the existing hydrological system.</li> <li>3. Characterise the existing surface and groundwater quality within and surrounding the development envelope, including the former Pillara mine area.</li> <li>4. Model the changes to the hydrological system from the construction and operation of proposed water infrastructure and from farm practices (e.g. floodplain harvesting, flood irrigation, tailwater discharge), considering historic climate variability and future climate change. Provide a water balance of the hydrological system with the predicted changes.</li> <li>5. Investigate and provide a description of the connectivity between the floodplain and off-stream wetlands and dry season water pools (<i>jila</i> values).</li> <li>6. Investigate and describe the inundation requirements of floodplain vegetation.</li> <li>7. Investigate and describe how groundwater and surface interaction and recharge mechanisms may impact groundwater-dependent floodplain and riparian vegetation, the habitat and survival of water-dependent fauna and dry season water stores (<i>jila</i> values).</li> </ol>

### Inland Waters

8. Apply the mitigation hierarchy to demonstrate how the proposal has been designed to avoid and minimise impacts to surface and groundwater quantity (including the potential impacts identified above), through the location and operation of infrastructure and crop areas.
9. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to surface and groundwater at a local level including the habitat and survival of water-dependent fauna, recharge of dry season water stores and offsite impacts on Fitzroy River flows downstream and *jila* sites. Include an analysis of the nature, magnitude and duration of the impacts. Discuss cumulative impacts including the impacts from other existing and foreseeable user or projects.
10. Discuss proposed management, monitoring, and mitigation methods, including the identification of water quality trigger levels, to be implemented during construction and operation to ensure that the EPA's objective for this factor is met.
11. Commission an independent peer review of the floodplain offtake channel approach (see detail in Peer Review below) and include a report on the peer review as an appendix to the Environmental review document).

#### **Groundwater**

12. Provide a hydrogeological conceptualisation of the site, supported by groundwater monitoring and geological mapping. The hydrogeological conceptualisation should:
  - a. include bore logs, depth to groundwater (from the surface and mAHD) and identify the aquifers proposed to be used for groundwater extraction.
  - b. describe the geological conditions within the project area (e.g. depth of alluvium, areas of outcrop and rock types) using bore logs and any other available information.
  - c. clearly show and state areas where groundwater and surface water interactions are likely to occur (both spatially and temporally) – supported by monitoring data.
  - d. include a water balance showing the fluxes between aquifers, groundwater flow directions, watercourses and the surface including areas of recharge and discharge.
  - e. be used to identify where potential impacts to MNES, their habitat and/or values may arise (for example, identify where groundwater is shallow enough to support groundwater dependent ecosystems (GDEs) that provide habitat for MNES).
  - f. be presented in a visual/graphical format with appropriate descriptions of the key processes depicted.



**Inland Waters**

13. Quantify the likely groundwater requirements for the project: assess the proposed project's groundwater requirements with reference to the potential changes to groundwater availability for GDEs that provide MNES habitat and baseflows in the Fitzroy River or tributaries near the project area. Quantification of groundwater requirements should be presented at a range of time scales (e.g. annually, seasonally and monthly).
14. Provide a risk assessment for groundwater quality – particularly in relation to changes due to irrigation enhanced recharge to shallow aquifers, run-off contaminants and changes to water quality during different seasons and climatic events. Include potential risks associated with nutrient changes, chemicals/fertilisers, metals, salinity and other potential contaminants.

**Surface Water**

15. Undertake a flood assessment that considers changes to flood height, duration and extent before and after the project. That is, assess the changes to the above flooding parameters with and without the proposed project's infrastructure and water extraction requirements.
16. Provide a risk assessment for surface water quality. The surface water risk assessment should contain details in-line with the groundwater quality risk assessment identified in point 14;
  - a. the surface water quality risk assessment should be supported by monitoring data collected from monitoring location upstream and downstream of the proposed project area that are representative of existing conditions; and
  - b. monitoring data should be collected at a range of temporal scales – depending on the water quality parameters being monitored (i.e. flow, volume and water levels can be collected automatically and continuously, while contaminants and nutrients would require regular manual collection).
17. Assess the risks associated with the realignment of the stock route. Moving the reserve directly adjacent to the Margaret River channel may result in bank instability, increased erosion and sedimentation, adverse water quality impacts and the spread of weeds if stock transport along the reserve recommenced in the future.

18. Consideration and requirements for closure and decommissioning.

**Water Quality**

19. Describe what fertilisers, pesticides, chemicals and hydrocarbons will be used for the proposal, and how and where they will be used and stored. Include likely volumes and application rates, as well as potential for loss to surface water and groundwater.

<b>Inland Waters</b>	
	<p>20. Using relevant information obtained for Hydrological Processes and any additional relevant information, model the changes to surface and groundwater quality from the proposal and the former Pillara mine. Predict whether there are likely to be any impacts within the development envelope and downstream/downgradient of the development from the former Pillara mine.</p> <p>21. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to surface and groundwater quality at a local and regional level, including the habitat and survival of water-dependent fauna (including sawfish migration), recharge of dry season water stores, and offsite impacts on National Heritage listed Fitzroy River flows downstream and <i>jila</i> sites. Include an analysis of the nature, magnitude and duration of the impacts. Discuss cumulative impacts including the impacts from the former Pillara mine.</p> <p>22. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to surface and groundwater quality, and flow on impacts to local fauna, through the location of infrastructure and proposed farm practices.</p> <p>23. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts</p> <p>24. Consideration and requirements for closure and decommissioning.</p>
<b>Peer Review</b>	<p>Commission an independent peer review (see Requirement 11 above) by a suitably qualified and experienced expert (agreed to by the EPA prior to commissioning) to review the following:</p> <ul style="list-style-type: none"> <li>• Whether the floodplain offtake channel system is technically feasible.</li> <li>• How the design of the floodplain offtake channel system compares to best practice in Australia and internationally for systems in similar climates/river systems.</li> <li>• Whether the modelling and predictions of impacts from using the floodplain offtake channel are reasonable.</li> <li>• Whether proposed monitoring, management and mitigation measures are feasible and are best practice.</li> <li>• Whether there are likely to be potential impacts on the structure and geomorphology of the floodplain and local river system?</li> </ul>
<b>Relevant policy and guidance</b>	<p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Environmental Factor Guideline: Inland Waters (EPA, 2018)</i></p> <p><b><i>Other policy and guidance</i></b></p>

<b>Inland Waters</b>	
	<p><i>Operational policy 5.08 – Use of operating strategies in the water licensing process</i> (Department of Water, 2011)</p> <p><i>Selection of future climate predictions for Western Australia</i> (Department of Water, 2015)</p> <p><i>Australian Water Quality Guidelines for Fresh and Marine Water Quality</i> (ANZECC and ARMCANZ, 2000)</p> <p><i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i></p> <p>Contaminated Sites Guidelines (Department of Water and Environmental Regulation) <a href="https://www.der.wa.gov.au/your-environment/contaminated-sites/61-contaminated-sites-guidelines">https://www.der.wa.gov.au/your-environment/contaminated-sites/61-contaminated-sites-guidelines</a></p>

<b>Landforms</b>	
<b>EPA objective</b>	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.
<b>Relevant activities</b>	<ul style="list-style-type: none"> <li>• Earthworks</li> <li>• Construction and operation of water infrastructure</li> <li>• Diversion of surface water flows</li> </ul>
<b>Potential impacts and risks</b>	<ul style="list-style-type: none"> <li>• Structural alteration of the Fitzroy River, including the Margaret River and any other tributaries (temporarily or permanently).</li> <li>• Impacts to the ecological function of the Fitzroy River, including the Margaret River and any other tributaries (temporarily or permanently).</li> <li>• Impacts to the environmental values of the Fitzroy River including the Margaret River and any other tributaries (temporarily or permanently).</li> <li>• Impacts to the environmental values of the West Kimberley National Heritage Place (e.g. Devonian Reef) (temporarily or permanently).</li> <li>• Impacts on the National Heritage listed Devonian Reef formations and associated Gogo fossil sites (temporarily or permanently).</li> </ul>
<b>Required work</b>	<p>25. Characterise the Fitzroy River (including the Margaret River and any other tributaries) in terms of variety, integrity, ecological importance, scientific importance, rarity, social and cultural importance.</p> <p>26. From 14., identify the environmental and cultural values of the affected landforms and note which of these environmental and cultural values will be addressed through other preliminary key environmental factors identified in this ESD. Identify and discuss any</p>

<b>Landforms</b>	
	<p>environmental values that cannot be addressed under the other preliminary key environmental factors.</p> <p>27. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to the Fitzroy River (including the Margaret River and any other tributaries) at a local and regional level. Include an analysis of the nature, magnitude and duration of the impacts (temporary and permanent). Discuss cumulative impacts including the impacts from other existing and potential users and on the holders of cultural knowledge and traditions about the National Heritage listed cultural heritage values of the Fitzroy River and its tributaries, floodplains and <i>jila</i> sites.</p> <p>28. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to the geomorphology and structure of the Fitzroy River (including the Margaret River and any other tributaries) through the design and location of infrastructure.</p> <p>29. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts to the geomorphology and structure of the Fitzroy River (including the Margaret River and any other tributaries floodplains and <i>jila</i> sites).</p> <p>30. Consideration and requirements for closure and decommissioning.</p>
<b>Relevant policy and guidance</b>	<p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Environmental Factor Guideline: Landforms (EPA, 2016)</i></p>

<b>Terrestrial Environmental Quality</b>	
<b>EPA objective</b>	To maintain the quality of land and soils so that environmental values are protected.
<b>Relevant activities</b>	<ul style="list-style-type: none"> <li>• Earthworks and clearing of vegetation</li> <li>• Construction and operation of water infrastructure</li> <li>• Diversion of surface water flows</li> <li>• Irrigation and cultivation of crops</li> <li>• Application of fertilisers, pesticides and chemicals, and use of hydrocarbons</li> <li>• Grazing of cattle</li> </ul>
<b>Potential impacts and risks</b>	<ul style="list-style-type: none"> <li>• Soil erosion.</li> <li>• Potential contamination of soils</li> <li>• Salinisation of soils.</li> <li>• Changes to soil structure from sodic soils.</li> </ul>

<b>Terrestrial Environmental Quality</b>	
	<ul style="list-style-type: none"> <li>• Impacts on National Heritage listed Devonian Reef formations and associated fossil sites (temporarily or permanently).</li> </ul>
<b>Required work</b>	<p>31. Characterise the existing soil quality within and surrounding the development envelope.</p> <p>32. Undertake water and soil studies to determine the suitability of the surface water and groundwater quality at and near the mine site for pastoral activities.</p> <p>33. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to soil quality, Devonian reef and fossil sites. Include an analysis of the nature, magnitude and duration of the impacts. Discuss cumulative impacts including the impacts from the former Pillara mine.</p> <p>34. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to soil quality, Devonian reef and fossil sites through the location of infrastructure and proposed farm practices.</p> <p>35. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts in an Environmental Management Plan/s. Summarise measures in the Environmental Review Document.</p> <p>36. Undertake a geological study in the development envelope and in surrounding areas that are likely to be directly or indirectly impacted by the proposal to map the occurrence of Devonian reef formations and fossil sites.</p> <p>37. Consideration and requirements for closure and decommissioning.</p>
<b>Relevant policy and guidance</b>	<p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Environmental Factor Guideline: Terrestrial environmental quality</i> (EPA, 2016)</p> <p><b><i>Other policy and guidance</i></b></p> <p>The Department of Water and Environmental Regulation's <i>Contaminated Sites Guidelines</i></p> <p><i>The National Environmental Protection (Assessment of Site Contamination) Measure 1999</i></p>

<b>Flora and Vegetation</b>	
<b>EPA objective</b>	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
<b>Relevant activities</b>	<ul style="list-style-type: none"> <li>• Clearing of native vegetation</li> <li>• Surface water abstraction</li> <li>• Diversion of surface water flows and flood irrigation.</li> </ul>
<b>Potential impacts and risks</b>	<ul style="list-style-type: none"> <li>• Loss of and disturbance to conservation significant flora and vegetation, including riparian vegetation and flora</li> <li>• Loss of and disturbance to flora and vegetation that has Aboriginal heritage and cultural value, including for bush tucker and bush medicine (see also Social Surroundings factor).</li> <li>• Introduction and/or spread of weeds.</li> <li>• Indirect impacts to flora and vegetation from changed hydrology (quantity and quality of surface and groundwater).</li> <li>• Fragmentation of intact native vegetation.</li> <li>• Loss and/or disturbance of endemic and rare flora associated with National Heritage listed Devonian reef formations.</li> </ul>
<b>Required work</b>	<p>38. Identify and characterise flora and vegetation in the proposal area in accordance with EPA guidance. Undertake surveys in the Development Envelope and in surrounding areas that are likely to be directly or indirectly impacted by the proposal, including off-channel springs and wetlands associated with the Fitzroy River floodplain and Devonian reef formations that provide refugia.</p> <p>39. Provide maps showing the recorded locations of significant flora and vegetation in the survey area. Provide maps showing weed species occurrence in the survey area, including rare and endemic flora associated with National Heritage listed Devonian reefs.</p> <p>40. Provide tables and maps of the proposed direct impacts and predicted indirect impacts to significant flora species and significant vegetation including threatened/priority flora and threatened/priority ecological communities, endemic flora associated with National Heritage listed Devonian reefs, as defined by EPA guidance and Commonwealth guidance for MNES.</p> <p>41. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to significant flora and vegetation at a local and regional and national level. Discuss cumulative impacts including the impacts from historic and current grazing.</p> <p>42. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to significant flora and vegetation through the location of infrastructure and crop areas.</p>

Flora and Vegetation	
	<p>Discuss how the proposal has been designed to minimise the disturbance footprint and the development envelope.</p> <p>43. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts in an Environmental Management Plan/s. Summarise measures in the Environmental Review Document.</p> <p>44. Describe the proposed rehabilitation methodology for areas of temporary clearing and in the event that the project ceases.</p> <p>45. Determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Offset Template (Appendix 1) in the WA Environmental Offsets Guidelines (2014) and include reference to the Commonwealth Assessment Guide for any MNES.</p> <p>46. Where significant residual impacts remain, propose an appropriate offsets package that is consistent with the WA Environmental Offsets Policy and Guidelines. Provide spatial data defining the area of significant residual impacts.</p> <p>47. Consideration and requirements for closure and decommissioning.</p>
<b>Relevant policy and guidance</b>	<p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Environmental Factor Guideline - Flora and vegetation (EPA, 2016)</i></p> <p><i>Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)</i></p> <p><b><i>Other policy and guidance</i></b></p> <p><i>WA Environmental Offsets Policy (Government of Western Australia, 2011)</i></p> <p><i>WA Environmental Offsets Guidelines (Government of Western Australia, 2014)</i></p> <p><i>Western Australian Environmental Offsets Template, 2014</i></p>

Terrestrial Fauna	
<b>EPA objective</b>	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
<b>Relevant activities</b>	<ul style="list-style-type: none"> <li>• Clearing of native vegetation</li> <li>• Movement of machinery during construction</li> <li>• Construction and operation of water infrastructure</li> <li>• Surface water abstraction</li> <li>• Diversion of surface water flows</li> </ul>

	<ul style="list-style-type: none"> <li>• Groundwater abstraction</li> <li>• Flood irrigation.</li> </ul>
<b>Potential impacts and risks</b>	<ul style="list-style-type: none"> <li>• Loss of and disturbance to terrestrial fauna and habitat due to clearing.</li> <li>• Loss of and disturbance to terrestrial fauna that has Aboriginal heritage and cultural value, including for bush tucker (see also Social Surroundings factor).</li> <li>• Fauna deaths from vehicles.</li> <li>• Indirect impacts from changed hydrology (quantity and quality of surface and groundwater) and water infrastructure, including, but not limited to: <ul style="list-style-type: none"> <li>- reduction in persistence and/or connectivity of water pools/springs.</li> <li>- changes to river depth</li> <li>- changes to riparian habitat</li> <li>- changes stormwater runoff, including sediment, nutrients and chemicals.</li> </ul> </li> <li>• Fragmentation of fauna habitat.</li> <li>• Degradation of habitat due to weeds.</li> <li>• Loss and/or disturbance of endemic and rare fauna species associated with National Heritage listed Devonian reef formations.</li> </ul>
<b>Required work</b>	<p>48. Conduct a desktop study, including a literature review, in accordance with EPA guidance, which addresses terrestrial vertebrate fauna (including migratory birds and aquatic vertebrate fauna), short range endemic (SRE) invertebrate fauna and aquatic invertebrate fauna.</p> <p>49. Undertake detailed (Level 2) terrestrial fauna surveys in accordance with EPA guidance, in the Development Envelope and in surrounding areas that may be directly or indirectly impacted by the proposal, including, but not limited to, Devonian reef (for their associated rare and endemic fauna species), riparian and floodplain habitats. Species habitat to be considered must include, but not be limited to, the Freshwater Sawfish (<i>Pristis pristis</i>), Dwarf Sawfish (<i>Pristis clavata</i>), Northern Quoll (<i>Dasyurus hallucatus</i>), Purple-crowned Fairy-wren (<i>Malurus coronatus</i>), Gouldian Finch (<i>Erythrura gouldiae</i>), Night Parrot (<i>Pezoporus occidentalis</i>), Greater Bilby (<i>Macrotis lagotis</i>) and Ghost Bat (<i>Macroderma gigas</i>).</p> <p>50. Based on the desktop study results, fauna survey results and field verification of habitat types, map the fauna habitats of the development envelope and surrounding areas that may be directly or indirectly impacted by the proposal, including off-channel springs and wetlands associated with the Fitzroy River floodplain and Devonian reef formations that provide refugia.</p> <p>51. Based on the outcomes of the desktop study, habitat mapping, and field surveys, list and evaluate the likelihood of occurrence of</p>



	<p>significant vertebrates and SRE invertebrates in the Development Envelope. Conduct targeted significant species surveys as warranted, having prior consultation with DWER. Map the occurrence of significant species and significant fauna habitat both within and outside the development envelope, encompassing the likely/known impact area.</p> <p>52. Ensure that the desktop study, detailed surveys, habitat mapping and targeted surveys are designed and conducted to deliver adequate data to assess the impacts of the proposal at local, regional and national scales.</p> <p>53. Provide tables and maps of the proposed direct impacts and predicted indirect impacts to significant fauna, fauna assemblages and habitats as defined by EPA guidance and Commonwealth guidance for MNES. Provide figures showing the likely extent of loss of habitat from both direct and indirect impacts.</p> <p>54. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to significant fauna, fauna assemblages and habitats at a local and regional level. Discuss cumulative impacts including the impacts from historic and current grazing.</p> <p>55. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to significant fauna and habitats through the location of infrastructure and crop areas.</p> <p>56. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts in an Environmental Management Plan/s. Summarise measures in the Environmental Review Document.</p> <p>57. Determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Offset Template (Appendix 1) in the WA Environmental Offsets Guidelines (2014) and include reference to the Commonwealth Assessment Guide for any MNES.</p> <p>58. Where significant residual impacts remain, propose an appropriate offsets package that is consistent with the WA Environmental Offsets Policy and Guidelines. Provide spatial data defining the area of significant residual impacts.</p> <p>59. Consideration and requirements for closure and decommissioning.</p>
<p><b>Relevant policy and guidance</b></p>	<p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Environmental Factor Guideline – Terrestrial Fauna (EPA, 2016)</i></p> <p><i>Technical guidance: Sampling methods for terrestrial vertebrate fauna (EPA, 2016)</i></p>

	<p><i>Technical guidance: Terrestrial fauna surveys (EPA, 2016)</i></p> <p><b>Other policy and guidance</b></p> <p><i>WA Environmental Offsets Policy (Government of Western Australia, 2011)</i></p> <p><i>WA Environmental Offsets Guidelines (Government of Western Australia, 2014)</i></p> <p><i>Western Australian Environmental Offsets Template, 2014</i></p> <p><i>Survey guidelines for Australia’s threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act</i></p> <p><i>Survey guidelines for Australia’s threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act</i></p> <p><i>Survey guidelines for Australia’s threatened fish: Guidelines for detecting fish listed as threatened under the EPBC Act</i></p> <p><i>Survey guidelines for Australia’s threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act</i></p> <p>Any relevant recovery plans, conservation advices and/or threat abatement plans.</p>
--	---

<b>Subterranean Fauna</b>	
<b>EPA objective</b>	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.
<b>Relevant activities</b>	<ul style="list-style-type: none"> <li>• Excavation</li> <li>• Alteration of surface water flows</li> <li>• Flood irrigation</li> <li>• Application of fertilisers, pesticides and chemicals, and use of hydrocarbons</li> </ul>
<b>Potential impacts and risks</b>	<ul style="list-style-type: none"> <li>• Mortality and loss of habitat from excavation.</li> <li>• Impacts to habitat from changes in groundwater levels and changes to soil and/or groundwater quality.</li> </ul>
<b>Required work</b>	<p>60. Conduct a desktop study, including a literature review, in accordance with EPA guidance, which addresses subterranean fauna.</p> <p>61. Undertake subterranean fauna surveys in accordance with EPA guidance, in the Development Envelope and in surrounding areas that are likely to be directly or indirectly impacted by the proposal.</p> <p>62. Map the occurrence of subterranean fauna species and subterranean fauna habitat within the development envelope and the survey area.</p> <p>63. Provide tables and maps of the proposed direct impacts and predicted indirect impacts to subterranean fauna and subterranean fauna</p>

<b>Subterranean Fauna</b>	
	<p>habitat as defined by EPA guidance. Provide figures showing the likely extent of loss of habitat from both direct and indirect impacts.</p> <p>64. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to subterranean fauna and subterranean fauna habitat at a local and regional level. Discuss cumulative impacts.</p> <p>65. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to subterranean fauna and subterranean fauna habitat through the design and location of infrastructure.</p> <p>66. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts.</p> <p>67. Determine and quantify any significant residual impacts by applying the Residual Impact Significance Model (page 11) and WA Offset Template (Appendix 1) in the WA Environmental Offsets Guidelines (2014) and include reference to the Commonwealth Assessment Guide for any MNES.</p> <p>68. Where significant residual impacts remain, propose an appropriate offsets package that is consistent with the WA Environmental Offsets Policy and Guidelines. Provide spatial data defining the area of significant residual impacts.</p> <p>69. Consideration and requirements for closure and decommissioning.</p>
<b>Relevant policy and guidance</b>	<p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Environmental Factor Guideline – Subterranean Fauna</i> (EPA, 2016)</p> <p><i>Technical guidance: Sampling methods for subterranean fauna</i> (EPA, 2016)</p> <p><i>Technical guidance: Subterranean fauna survey</i> (EPA, 2016)</p> <p><b><i>Other policy and guidance</i></b></p> <p><i>Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation At 1999: Matters of National Environmental Significance</i> (Commonwealth of Australia, 2013).</p> <p><i>WA Environmental Offsets Policy</i> (Government of Western Australia, 2011)</p> <p><i>WA Environmental Offsets Guidelines</i> (Government of Western Australia, 2014)</p> <p><i>Western Australian Environmental Offsets Template, 2014</i></p>

<b>Social Surroundings</b>	
<b>EPA objective</b>	To protect social surroundings from significant harm.
<b>Relevant activities</b>	<ul style="list-style-type: none"> <li>• Earthworks and clearing of vegetation</li> <li>• Construction and operation of water infrastructure</li> <li>• Diversion of surface water flows</li> <li>• Irrigation of crops</li> <li>• Application of fertilisers, pesticides and chemicals, and use of hydrocarbons</li> </ul>
<b>Potential impacts and risks</b>	<ul style="list-style-type: none"> <li>• Physical damage to or loss of parts of the environment that have significant value Aboriginal heritage and cultural value (including Aboriginal heritage sites, West Kimberley National Heritage Place values, important pools, bush tucker and bush medicine) and subsequent impacts to mythological, cultural and heritage values</li> <li>• Loss of access to and use of parts of the environment that have significant Aboriginal heritage and cultural value for Traditional Owners</li> <li>• Physical damage to or loss of parts of the environment that have significant natural heritage value (including West Kimberley National Heritage Place values, e.g. Gogo fossil sites, Devonian Reef, Geike Gorge) and Fossil Downs Station.</li> <li>• Visual amenity of the proposed Fitzroy River National Park. The Park supports the potential for visitor recreation, education and scenic enjoyment. Naturalness, diversity and ruggedness, the key indicators of human preference for landscape scenic quality, are currently found throughout this area.</li> </ul>
<b>Required work</b>	<p><b><i>Aboriginal heritage and culture</i></b></p> <p>70. In consultation with the Traditional Owners, identify and characterise the Aboriginal heritage and cultural values in the proposal area in accordance with EPA guidance and Commonwealth guidance for MNES. Undertake surveys (including anthropological, archaeological, flora and fauna) in the Development Envelope and in surrounding areas that are likely to be directly or indirectly impacted by the proposal.</p> <p>71. Provide maps showing the recorded locations of significant Aboriginal heritage and cultural values in the survey area.</p> <p>72. Provide tables and maps of the proposed direct impacts and predicted indirect impacts to significant Aboriginal heritage and cultural values.</p> <p>73. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to Aboriginal heritage and cultural values at a local and regional and national level. Discuss</p>

### Social Surroundings

cumulative impacts including the impacts from the former Pillara mine.

74. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to Aboriginal heritage and cultural values through the location of infrastructure and crop areas. Discuss how the proposal has been designed to minimise the disturbance footprint and the development envelope.

75. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts in an Environmental Management Plan/s (included in the EMP is a Heritage Management Plan). Summarise measures in the Environmental Review Document.

#### ***Natural heritage***

76. Identify and characterise the natural heritage values in the proposal area in accordance with EPA guidance and Commonwealth guidance for MNES. Undertake surveys in the Development Envelope and in surrounding areas that are likely to be directly or indirectly impacted by the proposal.

77. Provide maps showing the recorded locations of significant natural heritage values in the survey area.

78. Provide tables and maps of the proposed direct impacts and predicted indirect impacts to significant natural heritage values.

79. Undertake a quantitative assessment of the significance of potential direct and indirect impacts (including cumulative impacts) of the proposal to natural heritage values at a local and regional level.

80. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to natural heritage values through the location of infrastructure and crop areas. Discuss how the proposal has been designed to minimise the disturbance footprint and the development envelope.

81. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts in an Environmental Management Plan/s. Summarise measures in the Environmental.

#### ***Historic heritage***

82. Identify and characterise the historic heritage values in the proposal area in accordance with EPA guidance and Commonwealth guidance for MNES. Undertake surveys in the development envelope and in surrounding areas that are likely to be directly or indirectly impacted by the proposal, particularly the travelling stock route.

83. Provide maps showing the recorded locations of significant historic heritage values in the survey area.

<b>Social Surroundings</b>	
	<p>84. Provide tables and maps of the proposed direct impacts and predicted indirect impacts to significant historic heritage values.</p> <p>85. Undertake a quantitative assessment of the significance of potential direct and indirect impacts of the proposal to historic heritage values at a local, regional and national level. Discuss cumulative impacts including the impacts from the former Pillara mine.</p> <p>86. Apply the mitigation hierarchy. Discuss how the proposal has been designed to avoid and minimise impacts to historic heritage values through the location of infrastructure and crop areas. Discuss how the proposal has been designed to minimise the disturbance footprint and the development envelope.</p> <p>87. Discuss proposed specific monitoring, management and mitigation measures to reduce residual impacts in a Heritage Management Plans. Summarise measures in the ERD.</p> <p>88. Consideration and requirements for closure and decommissioning.</p>
<b>Relevant policy and guidance</b>	<p><b><i>EPA Policy and Guidance</i></b></p> <p><i>Environmental Factor Guideline – Social surroundings (EPA, 2016)</i></p> <p><b><i>Other policy and guidance</i></b></p> <p><i>Commonwealth of Australia West Kimberley Gazettal Notice, 31 August 2011</i></p> <p><i>West Kimberley Place Report</i></p> <p><i>Engage Early: Guidance for proponents on best practice Indigenous engagement for environmental assessments under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).</i></p>

#### **4. Other environmental factors or matters**

The EPA has identified the following other environmental factors or matters relevant to the proposal that must be addressed during the environmental review and discussed in the Environmental Review Document:

1. Air Quality
  - characterise the greenhouse gas emission key sources from the proposal;
  - estimate the expected Scope 1 (direct) and Scope 2 (energy indirect) greenhouse gas emissions; and
  - analyse the greenhouse gas intensity (i.e. quantity of CO<sub>2</sub>-e generated per tonne of product produced) of the proposal.

#### **5. Stakeholder consultation**

The proponent must consult with stakeholders who are affected by, or are interested in the proposal. This includes Aboriginal Traditional Owners and custodians the decision-making authorities (see section 6), other relevant state and Commonwealth government agencies

and local government authorities, including of adjoining and downstream lands that may be affected, the local community and environmental non-government organisations.

The proponent must document the following in the ERD:

- identified stakeholders;
- the stakeholder consultation undertaken and the outcomes, including decision-making authorities' specific regulatory approvals and any adjustments to the proposal as a result of consultation; and
- any future plans for consultation.

## 6. Decision-making authorities

At this stage, the EPA has identified the authorities listed in Table 4 as decision-making authorities (DMAs) for the proposal. Additional DMAs may be identified during the course of the assessment.

**Table 5. Decision-making authorities**

Decision-making authority	Relevant legislation
1. Minister for Environment	<i>Wildlife Conservation Act 1950</i> <i>Conservation and Land Management Act 1984</i>
2. Minister for Water	<i>Rights in Water and Irrigation Act 1914</i> <ul style="list-style-type: none"> <li>• Water abstraction licence</li> <li>• Bed banks permit</li> </ul>
3. Minister for Aboriginal Affairs	<i>Aboriginal Heritage Act 1972</i> <ul style="list-style-type: none"> <li>• <i>Section 18 clearances</i></li> </ul>
4. Minister for Lands	<i>Land Administrative Act 1997</i> <ul style="list-style-type: none"> <li>• Landuse changes</li> </ul>
5. Pastoral Lands Board	<i>Land Administration Act 1997</i> <ul style="list-style-type: none"> <li>• Easements on crown land for pumping stations</li> </ul>
6. Shire of Derby / West Kimberley	<i>Planning and Development Act 2005</i> <ul style="list-style-type: none"> <li>• Planning Approval</li> </ul>

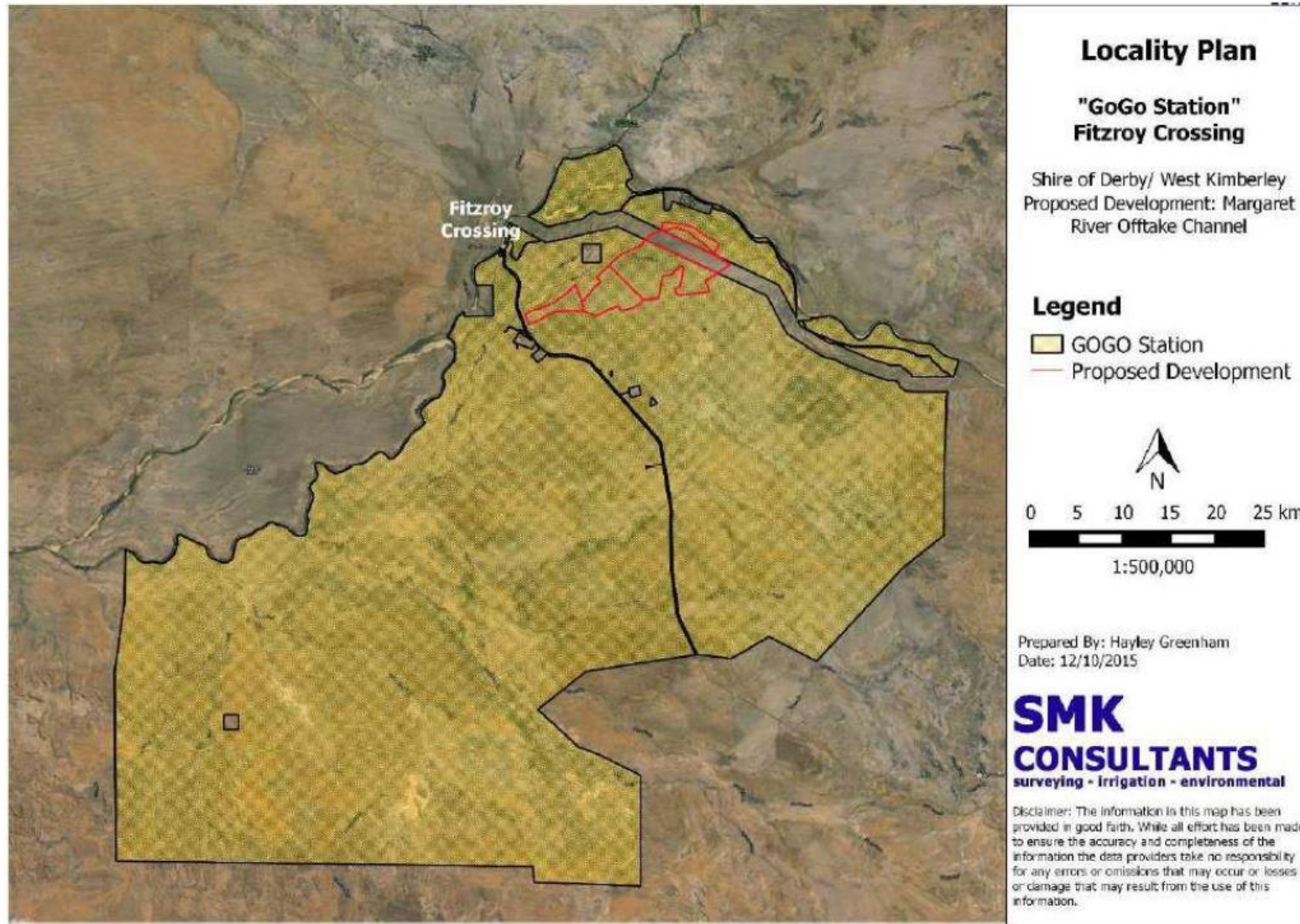


Figure 1 – Regional location



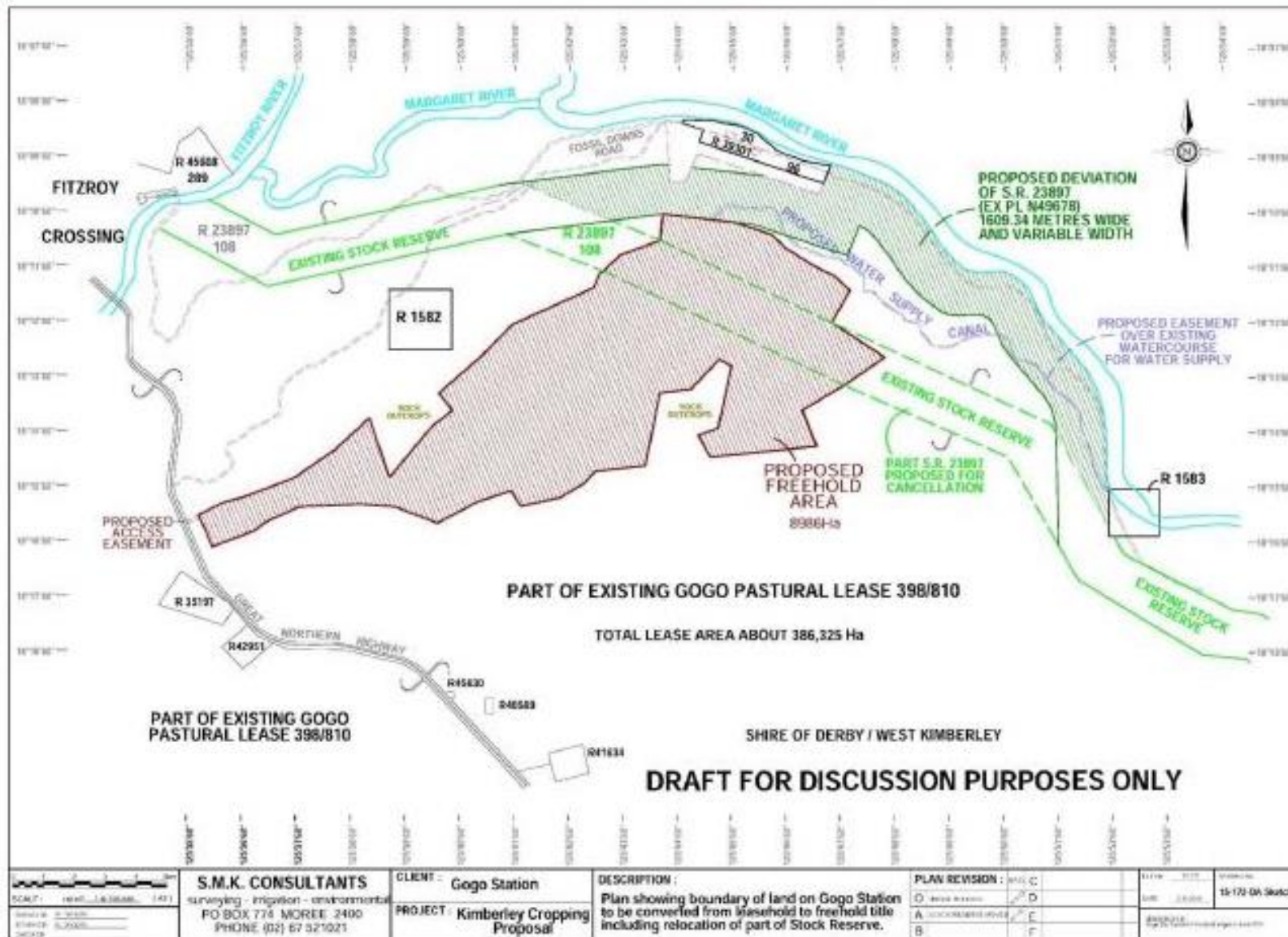


Figure 2 – Development envelope

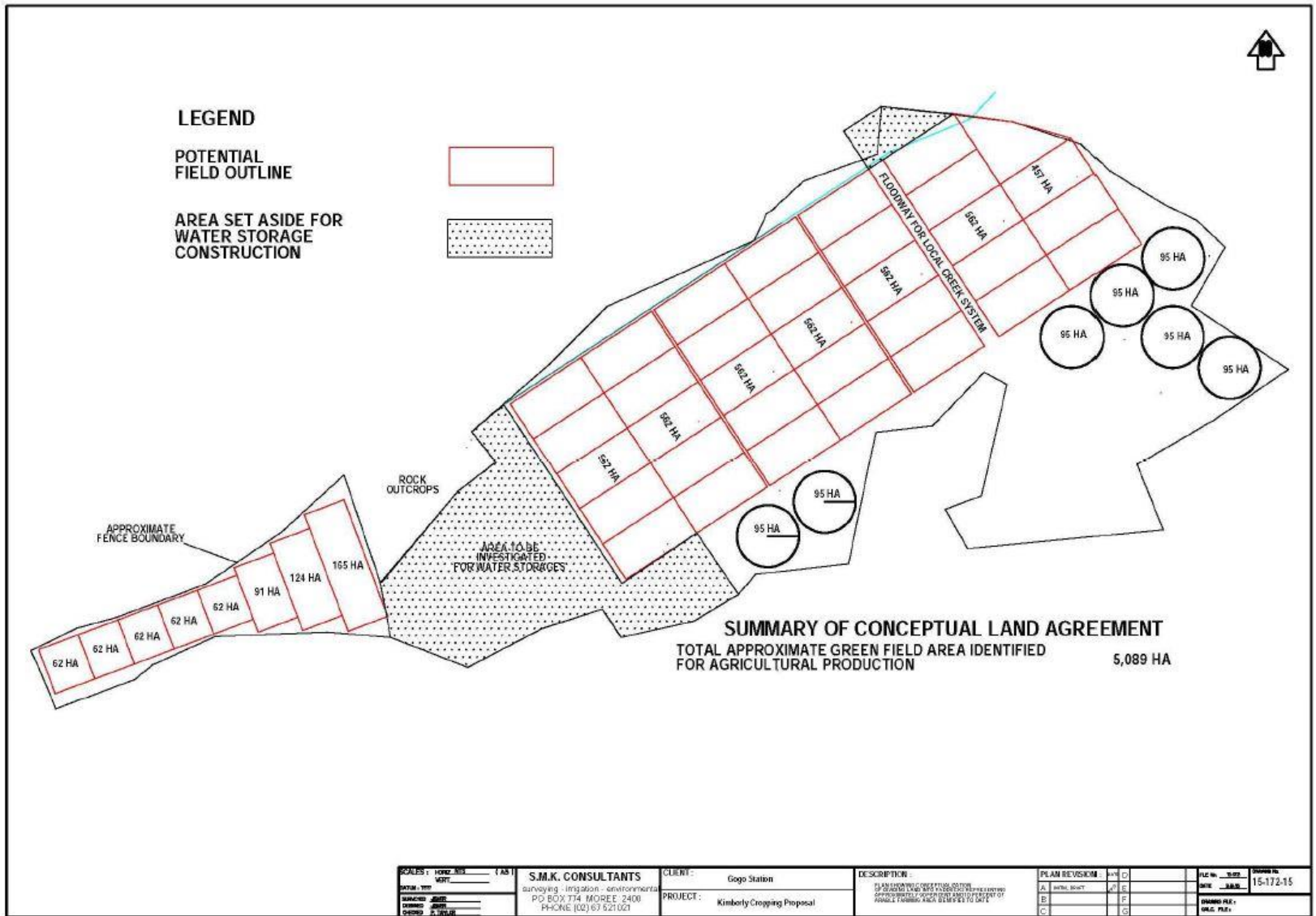


Figure 3 – Indicative footprint

**Appendix A - *Environment Protection and Biodiversity Conservation Regulations 2000***  
**Schedule 4: Matters to be addressed by draft public environment report and environmental  
impact statement.**

