

MAIN ROADS OFFSET PROPOSAL
BROOKTON HIGHWAY (MUNDAYS SECTION)
SLK 231.35-236.28 in the Shire of Kondinin

September 2010

REVISION TABLE

Date	Section			Amendment
14/09/10 Version 2	Process of achieving the offset and expected outcome			• number of seedlings • monitoring frequency/duration • completion criteria
	Monitoring commitments			Frequency and duration of monitoring
	Management commitments			Completion criteria of weeds and planting

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Project:	Brookton Highway – Mundays Section SLK 231.35-236.28 in the Shire of Kondinin The project will involve widening the road to provide a two lane sealed carriage way, the replacement/upgrading of culverts and floodway and installation of a new floodway. Land will be acquired on the northern side for the length of the project to accommodate the minor realignment to reduce the existing curve at SLK 233.4 and also on the southern side to provide an area for revegetation. The project will involve the clearing of approximately 1.5ha of native vegetation mostly on the northern side and selectively from the southern side.
Date:	August 2010
Personnel:	Main Roads Wheat Belt South staff: Henryk Marek (Senior Project Manager) 9881 0522 (m) 0427 471 847 Peter Swanson (Environment Officer) 9725 5692 (m) 0437 318 721 Environmental Consultants: <u>Maunsell Australia Pty Ltd</u> 3 Forrest Place, Perth WA 6000, GPO Box B59, Perth WA 6849, Australia T +61 8 6430 2000 F +61 8 6430 2999 www.maunsell.com Kellie Gibbs (Senior Environmental Scientist – Botanist) <u>Enviroworks Consulting</u> 30 Brown St East Perth WA 6004 T+6189221 9500 F +6189221 9544 info@enviroworks.com.au www.enviroworks.com.au Dr. Stephen Connell (Consultant Botanist)
Clearing location:	Brookton Highway SLK 231.30-236.30 between Corrigin and Hyden, between Willis Road and west of Koorikin and Kulin Rock Roads intersections. This is approximately 235km south-east from Perth and approximately 10km east of Gorge Rock within the Shire of Kondinin. (Refer Figure 1 in Appendix)
Offset location:	Previously planted 4.8ha - southern side of Brookton Highway between SLK 233.4 & 236 Proposed planting of 2.8ha: 10m wide strip on the north side between 231.35 and 231.6 10m wide strip on the south side between 231.35 and 231.75 10m+ wide strip on north side between SLK 233.04 and 235.88 - Various areas and infill planting south side at Kulin Rock Road (Refer Figure 2 in Appendix)
Offset description:	Land acquisition Fencing Revegetation Monitoring Land management Infill Planting

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Reason for offset & description of impacts:	Below is a list of the Clearing Principles that have been identified by DEC Native Vegetation Conservation Branch following a <u>desktop survey</u> in their letter of response as a stakeholder (8 July 2010) and the explanations as provided in italics. The proposed clearing of 1.5 hectares of native vegetation at Brookton Highway – Mundays Section SLK 231.35-236.28 is likely to be: • ‘at variance’ with principle (a): “native vegetation should not be cleared if it compromises a high level of biological diversity”. <i>The flora survey of the project area (October 2008) identified a high number of flora species within the area and when considered in the context of the extensively cleared landscape, the vegetation assists to maintain the ecological processes within the landscape.</i> • ‘at variance’ with principle (b): “native vegetation should not be cleared if it compromises the whole part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia”. <i>The extent of clearing in the vicinity of the project area has resulted in 10-15% native vegetation retention in this area. In addition the vegetation under application is linear and provides a significant ecological corridor for native fauna, particularly avian fauna species.</i> • at variance’ with principle (e): Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared. <i>The vegetation under application is mapped as Beard Vegetation Association 955 and 1023, both of which retain less than the recommended 30% threshold level, beyond which species loss accelerates exponentially. In addition the local area retains approximately 10-15% vegetation cover and therefore has been extensively cleared.</i> • at variance’ with principle (f): Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland. <i>The project area intersects 2 minor non-perennial watercourses and some vegetation under application includes understorey vegetation which is associated with these watercourses. The proposed clearing may impact the functioning of the watercourse in the immediate vicinity of the project area.</i> • ‘maybe at variance’ with principal (i) “native vegetation should not be cleared if the clearing is likely to cause deterioration in the quality of surface or underground water. <i>The proposed clearing for the road works may cause some short term water quality issues. I understand from MRWA assessment of the proposal that the extension of culverts and the installation of an additional floodway will be implemented to ensure water quality issues as a result of the clearing are minimised.</i>				
Offset Principles addressed:	<table border="0"> <tr> <td data-bbox="389 1509 635 1666">Direct offsets:</td><td data-bbox="635 1509 1460 1666"> Previous acquisition and revegetation of 4.8ha on the southern side of the highway between SLK 233.4 & 236. Acquisition of a 10m wide strip on both sides of the project length (at least 5 hectares) for inclusion into the road reserve and revegetation (2.8ha). </td></tr> <tr> <td data-bbox="389 1711 635 1787">Contributing offsets:</td><td data-bbox="635 1711 1460 1787"> Seed collection of species from within the project area. Fencing (approximately 10km) Monitoring, weed control and future infill planting </td></tr> </table>	Direct offsets:	Previous acquisition and revegetation of 4.8ha on the southern side of the highway between SLK 233.4 & 236. Acquisition of a 10m wide strip on both sides of the project length (at least 5 hectares) for inclusion into the road reserve and revegetation (2.8ha).	Contributing offsets:	Seed collection of species from within the project area. Fencing (approximately 10km) Monitoring, weed control and future infill planting
Direct offsets:	Previous acquisition and revegetation of 4.8ha on the southern side of the highway between SLK 233.4 & 236. Acquisition of a 10m wide strip on both sides of the project length (at least 5 hectares) for inclusion into the road reserve and revegetation (2.8ha).				
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Process of achieving the offset and expected outcome

- Works will be undertaken between the months of March 2011 to July 2011, according to weather conditions.
- Controlling weeds prior to (Glyphosate: June 2010) and post rehabilitation (Fusilade: Sept-Oct) and seasonally for three years after planting
 - Ripping (250mm deep, 2m apart) and cultivating of hardstand banks, access tracks and existing sealed road surfaces in February/March at construction completion
 - Tyne cultivating and rotary hoeing of old sealed surfaces and newly acquired pastoral land
 - Spreading of mulched native [cleared] vegetative material
 - Direct seeding (May) (3kg/ha) and planting of native seedlings (2m spacing or 2500 plants/ha) (June /July)
 - Revegetation performance will be monitored quarterly for three years and infill planted in 2012 as necessary with a completion density of 70% (1750) to be achieved.

The success of the rehabilitation will be realised in the creation of new vegetated corridors as good as or better than the original bushland. These corridors will connect other remnant bushland areas, forming habitat, nesting sites and safe passage for locally migrating fauna species and the continuation of pollen and seed movement of plant species. It is expected that the corridors will mature and become semi sustainable within 10 – 25 years.

Hierarchy of avoidance, minimisation, rectification, mitigation:

Brookton Highway between Corrigin and Hyden has inadequate widths and includes some sections that consist of a single lane sealed road. The narrow width combined with sharp curves and poor sight distances at crests results in poor road geometry that is not adequate to provide safe passage for the current traffic volumes and mix of road users. Mundays section is the last section between Corrigin and Hyden of single lane seal that requires widening.

Extensive community consultation has been undertaken and a biological and an additional flora survey have been commissioned to assess vegetation types and condition within the project area.

Design amendments have been implemented accordingly so that clearing will occur on the southern side of Brookton Highway for the first 700m from the western end to the existing floodway and transition to the northern side for the remainder of the project; so the majority of the clearing will be of vegetation that is in less than Good condition.

Only a small narrow strip of Good vegetation approximately 750 meters long on the north side just east of the bend at SLK 233.4 will need to be cleared. Vegetation along Brookton Highway to the east of Koorikin / Kulin Rock Roads intersection will not be impacted.

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Like for like or better:

The majority of the vegetation to be cleared is in less than Good condition. No Threatened flora species or significant fauna sightings were recorded by either of the consultants during field investigations.

An area of approximately 4.8ha on the south side of the highway between SLK 233.4 & 236 was previously acquired and revegetated commencing in 1992 as a joint initiative by Main Roads, adjoining landowners and local environmental groups in preparation for this project. It is visually evident that there is an improvement to the landscape and fauna environment from the current density and condition of this section in comparison to adjacent areas.

An additional 10m of land along the remainder of the project length has been / is to be acquired to widen the road reserve and accommodate a further 2.8ha of revegetation. The objective is to increasingly enhance the existing road reserve by reinstating a greater total amount of vegetation as compared to the area proposed to be cleared as well as to improve areas that are degraded and/or have been disturbed previously.

The rehabilitation will increase the connectivity, ecological value and buffer function of the road reserve and reduce weed invasion.

The offset revegetation will be undertaken using locally occurring species as much as possible ensuring that the vegetation resembles the composition and structure of the vegetation associations of the area. Additional non-local native species may also be utilised as having been proven to survive in that particular environment. The density of planting will be 2500 plants per hectare.

Ratio greater than 1:1 :

Based on the project's "footprint" and considering the extent and density of the current vegetation, an area of 1.5 ha has been estimated as requiring clearing. The condition of the vegetation of this area has been assessed as ranging from Good to Completely Degraded (EnviroWorks 2009, p7 & Maunsell 2008, p21) with the majority of clearing occurring in areas of Degraded to Completely Degraded condition.

Overall Main Roads has and proposes to rehabilitate / revegetate in total at least 7.6 hectares of impacted and currently degraded areas of road reserve and pastoral areas of newly acquired land which presently supports no vegetation other than grasses. The ratio of clearing to rehabilitation therefore is >1:5.

Main Roads also proposes to undertake monitoring, weed control and infill planting (as necessary) over the next three years to ensure that the rehabilitation is effective and successful.

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**Robust,
consistent
assessment:**

The assessment process has followed Main Roads' Environmental Assessment and Approval Process (EMS certified to ISO 14001) and requirements of Main Roads Clearing Permit CPS 818/4. In accordance with Part II of CPS 818/4, clearing has been minimised as far as possible, an assessment of the clearing impacts has been undertaken including a flora survey, an environmental management plan has been prepared and stakeholders have been invited to make submissions regarding the proposed project.

Suitably qualified and experienced consultants carried out assessments in accordance with best practice for undertaking environmental investigations. An independent Flora Survey assessment was undertaken by EnviroWorks Consulting and a Biological Survey by Maunsell Australia.

Funds have been allocated for the implementation of the offset package.

Appropriateness:

The proposed offset revegetation work is in the same location as the proposed clearing and will utilise, where practicable, local and provenance species.

The offset aims to enhance the current value of the reserve by restoring the area as an intact section of vegetation in a condition better than that which is to be cleared.

The offset proposal is considered an appropriate means of mitigating all clearing impacts.

**No net loss / net
gain:**

The ratio between clearing area and rehabilitation area is 1.5:11; so there is a large net gain and no overall net loss of vegetation. This satisfies the requirements of the DEC 'Guide to Developing a Clearing Permit Offset Proposal' and also meets Main Roads' Objective Number Five of 'Environmental Objective Targets and Indicators 6707/024'.

**Statutory
requirements
met:**

In accordance with Part II of Main Roads Clearing Permit CPS 818/4, clearing has been minimised as far as possible, an assessment of the clearing impacts has been undertaken including a flora survey, an environmental management plan has been prepared and stakeholders have been invited to make submissions regarding the proposed project.

**Defined,
documented,
audited:**

Records and Monitoring will be undertaken in accordance with Part VI of Main Roads Clearing Permit CPS 818/4. Refer to Management and Monitoring Commitments below.

**Long-term
benefit:**

Newly acquired land will be fenced to prevent public access and impacts to revegetated areas from livestock.

These areas will be vegetated and degraded areas of road reserve that have not been impacted will also be infill planted to increase plant density and improve the connectivity of the road corridor.

Ongoing monitoring will ensure the successful establishment of the rehabilitated / revegetated areas. Monitoring will occur prior to, during and after clearing for the duration of the CPS 818/4.

Management of the offset sites including infill planting and weed control will be undertaken as required following the monitoring to ensure successful establishment of the rehabilitation / revegetation.

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**Environmental
specialist
advice:**

Suitably qualified and experienced environmental staff were engaged from Maunsell (September 2008) and EnviroWorks (November 2008) with varied results. Both consultants conducted a flora survey and while Maunsell identified 127 species in 14 communities, EnviroWorks detected only 70 species in 3 communities.

Only EnviroWorks assessed the clearing against the Clearing Principles and their comments based on a field assessment for the principles considered by the DEC as being or may be at variance (as noted earlier) are included below. Note: their estimate of the area to be cleared (4.36ha) has since been revised and reduced to 1.5ha.

a) Fewer species occur on the northern verge which is narrower than the southern verge. This is considered to be a comparable number of species to other surveys completed of road verges in the local area and not a high level of biodiversity by comparison for the local area.

b) No fauna sites (nests, burrows, standing and fallen tree trunks etc.) were observed during field work. A number of bird species utilise the vegetation and associated fauna for food resources, however no breeding or other significant habitat was observed. The road verge does not form part of a regional ecological linkage.

e) The vegetation types present (based on pre-european vegetation types, Beard 1979) are fragmented by agricultural clearing and are considered to be under conservation threat (Connell & Ebert 2002). However the clearing proposed is minimal (4.36 ha) and on its own is not considered a significant threat to the remaining remnant vegetation of these types.

f) The study area is associated with seasonal minor ephemeral creek line and sheet drainage west of the central bend. However minimal clearing of vegetation will occur within this creek line (a few trees). There is limited understorey and the vegetation in this area is impacted by weed invasion. It is not considered to be intact riparian vegetation. The proposed clearing is unlikely cause significant impacts to the watercourse.

i) The existing vegetation is already degraded and the verges are not wide. It is unlikely that there will be any additional impact on ground or surface water quality beyond that experienced already.

MRWA Environment Officer for Wheat Belt South Region undertook the EIA and developed the EMP (June 2010) and will be involved in implementing the offset package.

	Proposed clearing	Proposed offset
Area:	1.5ha over a 5km length	7.6 hectares Refer to attached drawing

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Species:	Refer to Maunsell Biological Survey: Appendix A and EnviroWorks Flora Survey (p15 & 16).	Refer to attached Rehabilitation Plan (p8)
Community Type:	Two vegetation associations were identified by Maunsell (p21): 955 represented state wide with 7.7% Medium woodland, York Gum, Wandoo and Salmon Gum (Eucalyptus salmonophloia). 1023 represented state wide with 6.4% Mosaic: Shrublands, scrub heath (South East Avon)/Shrublands, Allocasuarina campestris thicket. EnviroWorks identified a third: Mosaic: Medium woodland; salmon gum & gimlet / Shrublands; mallee scrub, redwood & black marlock represented state wide with 6%.	The offset revegetation will be undertaken using locally occurring species as much as possible ensuring that the vegetation resembles the composition and structure of the vegetation associations of the area. Additional non-local native species may also be utilised as having been proven to survive in that particular environment.
Condition:	The condition of the vegetation throughout the project area has been assessed in the Biological Survey using the Keighery scale, identifying that nearly 35% is in a 'Completely Degraded' condition. The best quality vegetation was considered to be 'Good' and consisted of 20% of the total area. Large areas of the project area that are completely cleared or mainly support introduced species were considered to be 'Degraded - Completely Degraded'.	The offset aims to enhance the current value of the reserve by restoring the area as an intact section of vegetation in a condition better than that which is to be cleared. The proposed clearing may be considered to reduce the integrity of the remaining vegetation through fragmentation, however given the current condition and sparseness of the existing vegetation; it is likely that the revegetation works proposed will in fact enhance and improve the survival of remaining specimens.
Ecological function:	This section of road is classified as road reserve, for the purposes of road construction. The current condition of the majority of the area proposed to be cleared does not represent an ecosystem that could be considered as sustainable in structure or function.	The rehabilitation will ultimately increase the connectivity, ecological value and buffer function of the road reserve and reduce weed invasion providing a much more sustainable ecosystem for the long term.
Other values:		
Monitoring commitments :	Ongoing monitoring will ensure the successful establishment of the rehabilitated / revegetated areas. Monitoring will occur prior, during and after clearing on a quarterly period for the duration of the CPS 818/4 for at least three years.	
Management commitments :	Management of the offset sites will be undertaken if required following the monitoring. This will include infill planting and weed control to ensure successful establishment of the rehabilitation / revegetation. Infill planting will achieve a completion criteria of 70% (1750 plants/ha). Weed cover up to 35% will be acceptable.	

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**Agencies
consulted &
submissions
received:**

The following agencies were consulted by MRWA with regards to the proposed clearing:

- Department of Environment and Conservation Native Vegetation Conservation Branch;
- Shire of Kondinin;
- Department of Water;
- Roadside Conservation Committee;
- Department of Agriculture and Food (Soil and Land Conservation Commission);
- Conservation Council Western Australia; and
- the local community

Submissions were invited from stakeholders in June 2010. Responses received from DEC Native Vegetation Conservation Branch and Department of Agriculture are attached.

REFERENCES:

Beard, J.S. (1972) *Vegetation Survey of Western Australia, Vegetation Series Sheet SI 50-4 Hyden 1:250, 000 series, Western Australia*. Map and Explanatory Notes to Sheet SI 50-4. Vegmap Publications, Sydney.

Maunsell/AECOM, December 2008: *Biological Survey - Brookton Highway: Munday's section SLK 231.34 - 236.30*

EnviroWorks, June 2009: *Flora of Corrigin-Kondinin Road (Brookton Hwy)*, Shire of Kondinin. Dr. Stephen Connell, Consultant Botanist

Denton, P. (Environment Officer MRWA) July 2010 *Rehabilitation Plan: Brookton Hwy – Munday's Section*, internal document for offset proposal.

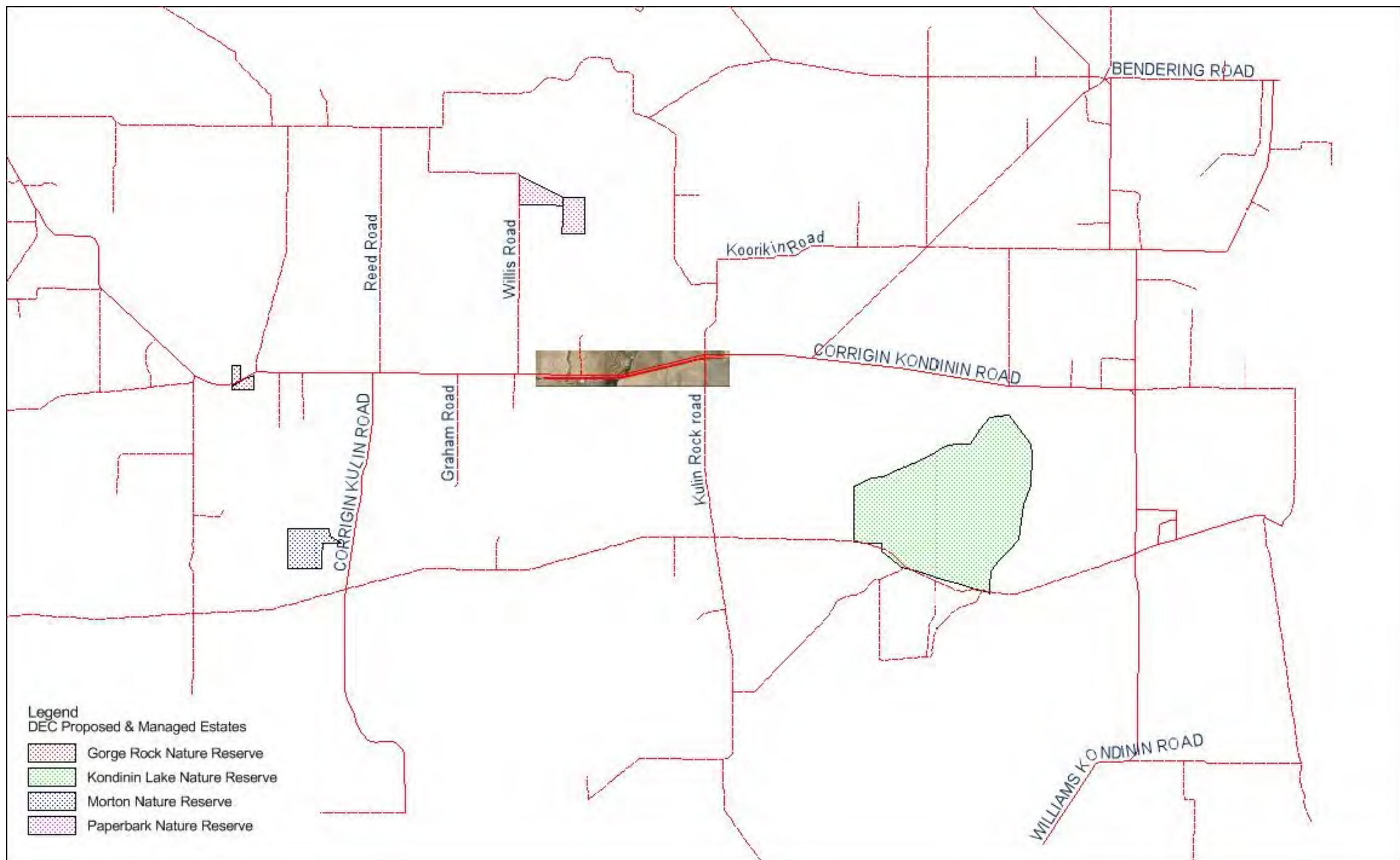


Figure 1: Project location

