

**PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT AND  
ENVIRONMENTAL MANAGEMENT PLAN**

Goldfields Highway (H049) – Wiluna to Meekatharra Section

Reseal (SLK 697.00-704.00), Sheeting (SLK 714.58-724.58) and Sealing  
(SLK 728.08-730.08) Works



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April 2009

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## **1 INTRODUCTION**

Main Roads Goldfields-Esperance Region (MRWA) is proposing to carry out road improvement works on various sections of Goldfields Highway (H049) between Wiluna and Meekatharra. The proposed works will include resealing between SLK 697.00 and 704.00, gravel sheeting between SLK 714.58 and 724.58, and sealing between SLK 728.08 and 730.08. It should be noted that some of these SLKs may still change though depending on funding availability for the project.

In accordance with Main Roads corporate environmental assessment and approvals process, a Low Impact Environmental Screening Checklist has been completed for the project. As identified by the checklist (see Appendix B), the clearing of native vegetation outside of the road's current maintenance zone will be required for the project. A Preliminary Environmental Impact Assessment (PEIA) for the project is therefore required and this report intends to fulfil this requirement. This report also intends to fulfil the requirements of Main Roads State-wide Project Purpose Clearing Permit (CPS 818/4).

Importantly, clearing will only be required for material sources for the project due to the fact that any clearing for the actual sheeting, sealing and resealing works will be confined to the existing road maintenance zone (defined as the area which has been previously cleared in the existing transport corridor during the last 10 years for maintenance purposes). As a result, any changes in the proposed SLKs for the project are not considered to be an issue for the clearing works.

It is proposed that materials will be sourced from pre-existing pits at approximate SLKs 711, 719 and 731.6. Up to 64 hectares of native vegetation will need to be cleared for these works. The clearing will be comprised predominantly of pit extension works. For proposed clearing boundaries please see Figures 4-6 in Appendix A.

## **2 PROJECT LOCATION**

The project is located within the Shire of Meekatharra, approximately 80km east of the town of Meekatharra itself. A map showing the location of the general project area is provided in Appendix A as Figure 1.

## **3 ASSESSMENT METHODOLOGY**

### **3.1 Preliminary Desktop Study**

A preliminary assessment of the project area and its potential constraints was undertaken by reviewing a number of government agency managed databases (see Appendix C), and consulting where necessary. The following sections provide a summary of the specific methodology used for each potential environmental aspect associated with the project(s).

#### **3.1.1 Threatened Flora, Fauna and Communities**

The Species and Communities Branch of the Department of Environment and Conservation (DEC) was contacted for a search of their databases containing known populations of threatened flora and fauna.

The presence of Threatened and Priority Ecological Communities (TECs & PECs) was determined by examining Main Roads Geographic Information System (GIS) data (TEC & PEC data is supplied to Main Roads by DEC every 6 months).

### 3.1.2 ESAs and Conservation Reserves

DEC's Native Vegetation Map Viewer (<http://www.dec.wa.gov.au/land/native-vegetation-conservation/data/native-vegetation-map-viewer.html>) was used to determine the location of any ESAs. The location of any Conservation Reserves was determined by examining Main Roads GIS data and consulting with the local DEC office where necessary.

### 3.1.3 Vegetation Type, Extent and Status

Vegetation types and associations were determined by examining the Shared Land Information Platform (SLIP) Natural Resource Management (NRM) database (<http://spatial.agric.wa.gov.au/slip/>). Vegetation extent and status data was sourced from the Main Roads file "Native Vegetation in Western Australia - Extent, Type and Status" located on Main Roads Environment Intranet site ([http://intranet/online/branches/environment/word/car\\_reserve\\_analysis\\_2007.xls](http://intranet/online/branches/environment/word/car_reserve_analysis_2007.xls)).

Note: This data is provided to Main Roads via a license agreement with the DEC.

### 3.1.4 Air Quality

The need for a local air quality assessment was determined using the criteria outlined in the MRWA environmental guideline, Air Quality ([http://intranet/online/branches/environment/word/guide\\_air\\_quality.doc](http://intranet/online/branches/environment/word/guide_air_quality.doc)).

### 3.1.5 Heritage

Where necessary, non-indigenous heritage was examined by searching the Australian Heritage Places Inventory (<http://www.heritage.gov.au>), Heritage Council of Western Australia database (<http://register.heritage.wa.gov.au/>) or the local Shire's Municipal Heritage Inventory.

### 3.1.6 Aboriginal Heritage

A Search of the Department of Indigenous Affairs' (DIA) database (<http://www.dia.wa.gov.au/Heritage--Culture/Heritage-management/Register-of-Aboriginal-sites/>) was undertaken to determine whether the project area contains any Aboriginal Heritage sites.

### 3.1.7 Wetlands

The location of wetlands within the project area was determined by examining the DEC's Geographic Data Atlas mapping tool (<http://maps.dec.wa.gov.au/idelve/doedataext/>) and/or DEC's Wetland Base (<http://www.dec.wa.gov.au/management-and-protection/wetlands/wetland-base/view-wetlandbase-online.html>).

### 3.1.8 Sensitive Water Resources

The Department of Water's (DoW) Geographic Data Atlas was examined (<http://portal.water.wa.gov.au/portal/page/portal/MapsDataAtlases/GeographicDataAtlas>) to determine whether the project area supported, or was adjacent to, any significant lakes, rivers, wetlands or proclaimed areas (including public drinking water source areas).

### 3.1.9 Contaminated Sites

The presence of contaminated sites in the project area was determined by examining DEC's contaminated sites database where necessary (<http://www.dec.wa.gov.au/pollution-prevention/contaminated-sites/contaminated-sites-act/database.html>), and evaluating the surrounding land use history.



### 3.1.10 Acid Sulphate Soils

The Western Australian Planning Commission's (WAPC) acid sulphate soils maps were examined where necessary (<http://www.wapc.wa.gov.au/Publications/213.aspx>) to determine the level of risk the project area is exposed to.

### 3.1.11 Weeds

Where relevant, consultation was undertaken with the Department of Agriculture and Food (DAFWA) to determine whether there are any known populations of declared plants or significant weeds in or adjacent to the project area.

### 3.1.12 Dieback

Dieback was only considered a potential issue for the project if both the mean annual rainfall of the area is >400mm and if the project area resides below the 26<sup>th</sup> parallel. Consultation with the DEC was carried out as necessary.

## 3.2 Statutory Referral Decisions

The decision whether to refer the project to the Commonwealth's Department of Environment, Water, Heritage and the Arts (DEWHA) was based upon whether the project would impact upon matters of national environmental significance (refer to Appendix C - DEWHA's EPBC Act Protected Matters Database search). These matters of national environmental significance are assessed for impact in Section 5.

The decision whether to refer the project to the WA Environmental Protection Authority (EPA) was based upon whether the project would be a "significant proposal" as defined by the Environmental Protection Act 1986. As a result, all potential environmental aspects relating to the project have been examined for their level of significance (see Sections 5 & 6).

## 3.3 Site Investigation

A site visit was carried out by Simon Weighell (GEnv), Mark Russell (SPM), Steve Cole (PM), Ryan Groves (MM) and Barry McAuliffe (TOM) on the 6/03/09 to examine the general features of the area. Site photos were taken and are included in Appendix D.

## 4 EXISTING ENVIRONMENT

Information relating to the existing environment of the area has been summarised in Tables 1-3 below. This information has been compiled through both desktop assessments and site visits.

Table 1. General information for the project area.

Factor	Comments
<b>Geology</b>	Consists of broad plains of red-brown soils and breakaway complexes as well as red sand plains (Cowan, 2001).
<b>Climate<sup>#</sup></b>	<i>Closest Meteorological Station: Meekatharra Airport</i> <i>Avg. Annual rainfall: 236.2mm</i> <i>Avg. Max Temp ranges: 19.0<sup>o</sup>C (Jul) to 38.3<sup>o</sup>C (Jan)</i> <i>Avg. Min Temp ranges: 7.4<sup>o</sup>C (Jul) to 24.3<sup>o</sup>C (Jan)</i>
<b>Surrounding Land Use</b>	Pastoral Lease
<b>Weed prevalence</b>	Low

<sup>#</sup> Source: Bureau of Meteorology (2009)

Table 2. Flora species identified in the project area.

No.	Scientific Name	Common Name	Weed? (Y/N)
1	<i>Acacia aneura</i>	Mulga	N
2	<i>Solanum lasiophyllum</i>	Flannel Bush	N
3	<i>Acacia pruinocarpa</i>	Gidgee	N

Table 3. Vegetation association information for the project area.

Factor	Value			
Vegetation Associations	18, 29, 107, 223			
Vegetation Associations Descriptions*	<u>18</u> : Low woodland; mulga ( <i>Acacia aneura</i> ). <u>29</u> : Sparse low woodland; mulga, discontinuous in scattered groups. <u>107</u> : Hummock grasslands, shrub steppe; mulga and <i>Eucalyptus kingsmillii</i> over hard Spinifex. <u>223</u> : Succulent steppe with open scrub; scattered mulga over saltbush & bluebush.			
Scale	<b>Association</b>	<b>IBRA Region</b> (Murchison)	<b>IBRA Sub-region</b> (Eastern Murchison)	<b>Shire</b> (Meekatharra)
Veg Association	<b>18</b>			
Current Extent (ha)*	19,890,195	12,403,172	10,269,894	3,118,036
% Pre-European Extent Remaining*	99.99%	100.00%	100.00%	100.00%
Scale	<b>Association</b>	<b>IBRA Region</b> (Murchison)	<b>IBRA Sub-region</b> (Eastern Murchison)	<b>Shire</b> (Meekatharra)
Veg Association	<b>29</b>			
Current Extent (ha)*	7,903,991	2,956,383	796,236	2,854,685
% Pre-European Extent Remaining*	100.00%	100.00%	100.00%	100.00%
Scale	<b>Association</b>	<b>IBRA Region</b> (Murchison)	<b>IBRA Sub-region</b> (Eastern Murchison)	<b>Shire</b> (Meekatharra)
Veg Association	<b>107</b>			
Current Extent (ha)*	2,815,387	2,792,384	2,785,303	287,358
% Pre-European Extent Remaining*	100.00%	100.00%	100.00%	100.00%
Scale	<b>Association</b>	<b>IBRA Region</b> (Murchison)	<b>IBRA Sub-region</b> (Eastern Murchison)	<b>Shire</b> (Meekatharra)
Veg Association	<b>223</b>			
Current Extent (ha)*	2,597	2,597	2,597	2,597
% Pre-European Extent Remaining*	100.00%	100.00%	100.00%	100.00%

\* Source: DEC (2007) – see Section 3.1.3

## 5 ASSESSMENT OF ASPECTS AND IMPACTS

The following table provides a summary of potential environmental aspects associated with the project and their subsequent assessment for environmental impact. Environmental constraints mapping is provided in Appendix A (Figures 2-6).

**Table 4: Aspects and Impacts**

Aspect	Evaluation of Potential Impacts
Air quality	Not considered relevant to the proposed works.
Dust	Likely to be a minor issue during earth works. No major sensitive receivers adjacent to the project area. No significant impact expected.
Fauna	Several threatened species (including nationally protected species) and/or their habitat have been identified as potentially occurring within the project area (see Appendix C). Given the vast areas of bushland remaining within close proximity to the project area, and the mobile nature of the species in question, no significant impacts to native fauna and/or its habitat are expected.
Vegetation – clearing	<ul style="list-style-type: none"> <li>Up to 64ha of native vegetation may need to be cleared for the proposed works.</li> <li>The condition of the vegetation in the area ranges from completely degraded to very good (using the Keighery scale (Keighery, 1994)).</li> <li>The vegetation associations of the project area (see Table 3) are not currently considered underrepresented (defined as &lt;30% of pre-European extent remaining) at any of the four regional scales (State, IBRA region, IBRA sub-region and Shire). No significant impacts to the status of these associations are therefore expected given the relatively small amount of clearing involved.</li> <li>The native vegetation to be cleared does not occur within an ESA.</li> </ul>
Significant Flora / Ecological Communities	<p>According to various database searches, there are no TECs, Declared Rare Flora (DRF) or Priority Flora (PF) located within the proposed clearing areas. Furthermore, no TECs, DRF, PF or Nationally (DEWHA) protected species (see Appendix C) were identified in the project area during the site visit. No significant impacts to any of these are therefore expected.</p> <p>The buffer zone of a PEC known as “Robinson Range” does intersect the general project area but given that this buffer zone is quite large (approximately 90km in radius), and that the project area is located towards the edge of this area, no significant impact to the actual PEC itself is considered likely.</p>
Vegetation – weeds	Very few weed species were identified within the proposed clearing areas during the site visit including no declared weeds. Standard weed hygiene measures should ensure that any future weed spread is minimal.
Vegetation – dieback	Dieback is not considered a potential issue for the project since the project area receives less than 400mm of average annual rainfall.
Reserves / Conservation areas	<p>According to Main Roads GIS data, no reserves or conservation areas are located within the proposed project area. There is a DEC estate named “ex Mooloogool” (a former leasehold property proposed for conservation) located immediately adjacent to the works at pit 711 SLK, but no significant impacts to this estate are expected. It should be noted that the exact location of this estate in relation to the pit is uncertain however as highlighted by Figure 4 in Appendix A. This is because the gap in the estate which appears to be for the road reserve does not reside over the actual road. This may need to be clarified with the local DEC office prior to clearing.</p> <p>The area proposed for clearing can not be considered significant as a “stepping stone” for native fauna as the connections between remnant vegetation in the surrounding landscape are virtually unobstructed.</p>
Heritage (non-indigenous)	No items of significance were identified during the site visit. Not considered relevant to the proposed works.

**Table 4: Aspects and Impacts**

<b>Aspect</b>	<b>Evaluation of Potential Impacts</b>
Aboriginal heritage	A search of DIA's database revealed that there are 4 known sites of Aboriginal heritage significance located within the general vicinity of the proposed project area. None of these sites are situated within any of the proposed work areas however meaning that any impacts to them are considered highly unlikely. Furthermore, the proposed work areas do not appear likely to contain any unidentified Aboriginal Heritage sites of significance as they are all highly disturbed. They are also not located nearby any significant natural features which may have figured prominently in past Aboriginal use of the area (e.g. breakaways, water holes, rock shelters etc.).
Surface water/drainage	The works are considered unlikely to significantly disturb or interrupt any present drainage or surface run-off patterns. Drainage in the area has already been altered somewhat by past pit extraction works. Furthermore, the works do not intersect any significant natural watercourses.
Wetlands	Various Government Agency database searches have not revealed any wetlands within the immediate vicinity of the project area. This was confirmed during the site visit. As a result no significant impacts on wetlands are expected.
Groundwater	No significant changes to the current groundwater level or quality are expected given that water requirements for the project are considered minimal. A water source for the project has yet to be identified and therefore it is unsure whether a groundwater abstraction license will be required.
Noise and vibration	No major sensitive local receivers. The works are not expected to significantly contribute to noise levels at the nearest receivers.
Visual amenity	Not considered relevant to the proposed works.
Hazardous substances	Not considered relevant to the proposed works.
Contamination	Given the relatively superficial nature of the required earthworks, there appears to be a low risk of any significant contamination issues. A search of DEC's Contaminated Sites database did not reveal any known sites in close proximity to the project areas.
Salinity	Not considered relevant to the proposed works.
Acid Sulphate Soils	No dewatering or excavation below the water table is planned and therefore the risk of exposing or exacerbating acid sulphate soils is considered to be low.
Environmentally Significant Landforms	There are no environmentally significant landforms within close proximity of the proposed project area. No impacts expected.
Statutory Land Use Planning / Adjacent Land Use	Expansion of the existing road reserve is not required. No significant impacts to surrounding land uses are expected.

## 6 CLEARING OF NATIVE VEGETATION

Native vegetation for this project will be cleared using Main Roads State-wide Project Purpose Clearing Permit (CPS 818/4). Native vegetation describes all indigenous aquatic and terrestrial vegetation (living or dead). The term does not include vegetation that was intentionally sown, planted or propagated unless it was required under a statutory condition.

## 6.1 Avoiding, Minimising and Reducing the Impact of Clearing

The following measures have been / will be taken in an effort to avoid, minimise and reduce the impact of clearing associated with the project:

- Materials for the project are being sourced from pre-existing material pit areas meaning that any clearing for access tracks etc. will be minimal in comparison to the establishment of a new pit.
- Cleared vegetation will be stockpiled and respread over cleared areas in order to encourage natural regrowth.

## 6.2 Assessment against the DEC's Ten Clearing Principles

In assessing whether the project is likely to have a significant impact on the environment, the project has been assessed against the DEC's 10 clearing principles (Note: this assessment is also a requirement of CPS 818/4). The assessment has indicated that the project is not likely to be at variance with any of the 10 clearing principles.

<b>Principle (a)</b>	<b>Native vegetation should not be cleared if it comprises a high level of biological diversity.</b>
<b>Assessment</b>	The proposed clearing area can not be considered to have a high level of biological diversity given that extensive areas of native vegetation in a good or better condition exist immediately adjacent to the project area.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (b)</b>	<b>Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.</b>
<b>Assessment</b>	Given the highly degraded nature of the project area and the areas of native vegetation remaining adjacent to the project area, no significant impacts on native fauna or its habitat are expected.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (c)</b>	<b>Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.</b>
<b>Assessment</b>	No rare flora has been identified within or nearby the project area as a result of a desktop assessment and site visit to the area.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (d)</b>	<b>Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.</b>
<b>Assessment</b>	No TECs have been identified within the project area as a result of a desktop assessment and a site visit to the area.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (e)</b>	<b>Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.</b>
<b>Assessment</b>	The vegetation within the project area can not be considered significant as a remnant as greater than 30% of the vegetation associations in the area currently remain at all four of the regional scales.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (f)</b>	<b>Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.</b>
<b>Assessment</b>	No watercourses or wetlands are located within or in close proximity to any of the proposed clearing areas.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (g)</b>	<b>Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.</b>

<b>Assessment</b>	Given the relatively small amount of clearing involved (in the context of the intact surrounding environment), and the rehabilitation measures proposed, the clearing is considered highly unlikely to cause appreciable land degradation.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (h)</b>	<b>Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.</b>
<b>Assessment</b>	No current reserves or conservation areas are located within or in close proximity to the proposed project area. The area can not be considered significant as a “stepping stone” for native fauna as the connectivity between remnant vegetation in the surrounding area is virtually unobstructed.  There is a proposed conservation area nearby the material pit at SLK 711, but any impacts to this site are likely to be minimal.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (i)</b>	<b>Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</b>
<b>Assessment</b>	No significant change to the hydrology of the area is expected given the relatively minor nature of the works. Therefore no significant deterioration in the quality of surface or underground water is expected.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>
<b>Principle (j)</b>	<b>Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.</b>
<b>Assessment</b>	No significant change to the hydrology of the area is expected given the relatively minor nature of the works. The clearing is therefore highly unlikely to cause or exacerbate the incidence of flooding in the area.
<b>Conclusion</b>	<i>The proposal is not likely to be at variance to this principle.</i>

### 6.3 Project Specific Requirements Relating to CPS 818/4

Given that temporary clearing is required for the project, a revegetation plan is required as outlined by CPS 818/4. Since the project is located in a pastoral area (as defined by the EPA’s Position Statement No. 2 – “*Environmental Protection of Native Vegetation in Western Australia*”), the generic revegetation plan for pastoral areas can be and will be used for this project. This revegetation plan has already been approved by DEC and therefore does not require submission to the CEO of DEC prior to clearing as outlined by CPS 818/4. The plan is attached to this report as Appendix E and will be provided to the contractor carrying out the works prior to clearing.

No offsets or management strategies will be required given that there is no variance with any of the 10 clearing principles for this project.

In regards to the maximum annual clearing limit of 200ha for the Goldfields-Esperance Region, clearing for this project will be limited to an amount less than that identified (~ 64ha) if necessary in order to avoid breaching this condition.

## 7 STAKEHOLDER CONSULTATION

Given the minor nature of the works involved, no stakeholder consultation was considered necessary for the project.



## 8 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) has been developed for the project (see Appendix F) taking into account the assessments carried out above. The main aim of this EMP is to provide a management plan to assist in minimising the environmental impacts of the activities associated with the proposed works, and to identify who is responsible for the implementation of any subsequent management strategies. This EMP is predominantly for the Main Roads Project Manager's reference and provides basic requirements for any Contractor produced EMP (subject to any conditions outlined in the actual Contract).

The EMP will only address site-specific issues that were identified during the PEIA. The areas that require special management will be addressed in terms of:

- the timing of various management actions;
- the topic (e.g. vegetation);
- the objectives for each area;
- the actions that are necessary to minimise the impact;
- the responsible party for implementing the action; and
- whether the action arose from external advice or is a Main Roads requirement.

## 9 MONITORING

After clearing, the project area is to be inspected every 12 months for the first two years in order to ensure that excessive weed spread or establishment has not occurred.

## 10 AUDITING

Audits against the EMP are not required as the project is small in scale with minimal environmental risk involved. On-ground checking will be carried out by the Main Roads Goldfields-Esperance Environment Officer.

## 11 CONCLUSIONS

Given the small scale of the project, the low significance of its impacts to the surrounding environment, and the environmental management measures proposed, the project does not require referral to the EPA.

Furthermore the project does not require referral to the DEWHA as no items of national environmental significance are likely to be impacted by the proposed works.

## 12 REFERENCES

Cowan, M., (2001) "Murchison 1 (MUR1 – Eastern Murchison subregion)", *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, Department of Conservation and Land Management, Western Australia (accessed online at [http://www.dec.wa.gov.au/pdf/science/bio\\_audit/murchison01\\_p466-479.pdf](http://www.dec.wa.gov.au/pdf/science/bio_audit/murchison01_p466-479.pdf) on 14/04/09).

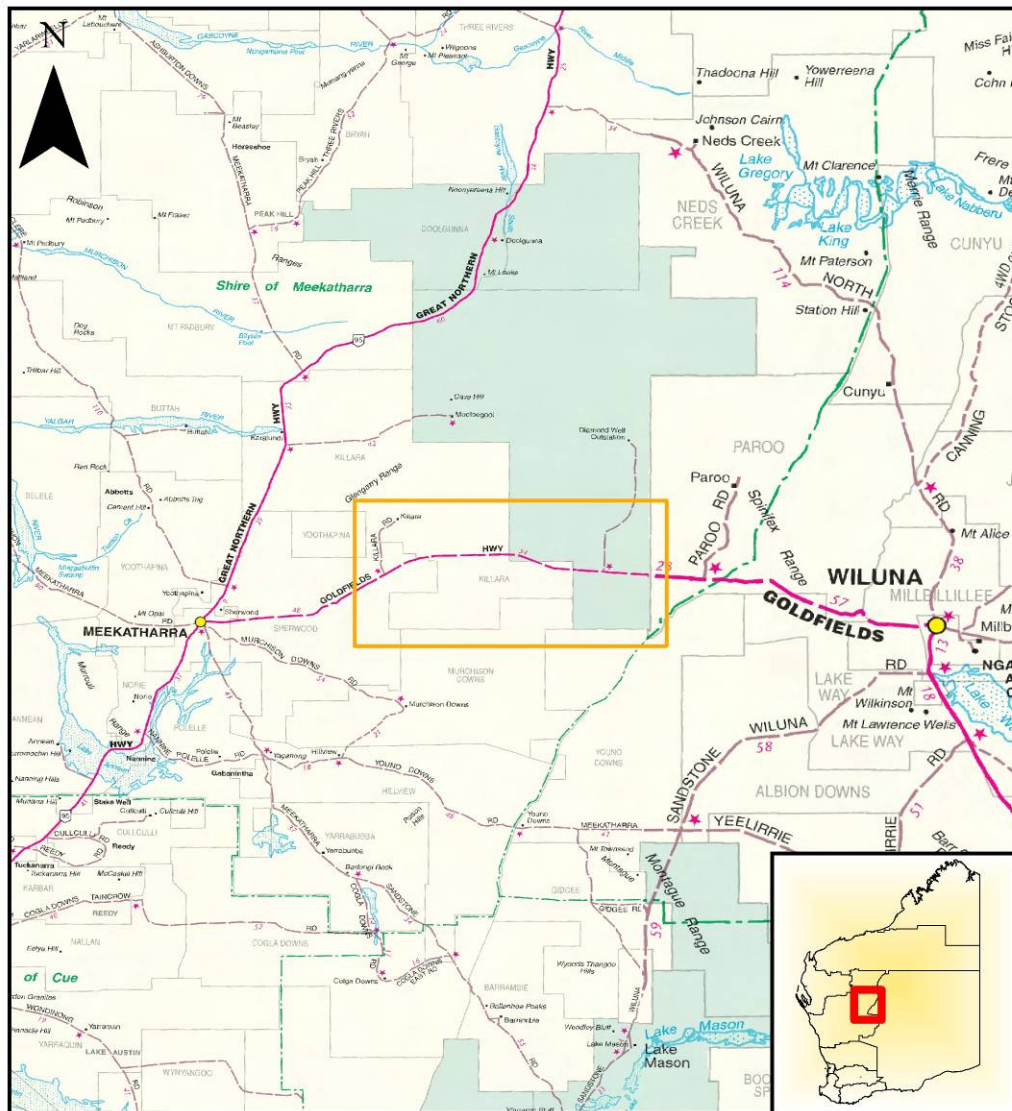
Bureau of Meteorology (BoM), (2009) "Climate Data Online", Commonwealth of Australia (accessed online at <http://www.bom.gov.au/climate/averages/> on 14/04/09).

Keighery, B.J., (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*, Wildflower Society of WA (Inc.), Nedlands, Western Australia.



# Appendix A

## Mapping




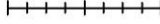

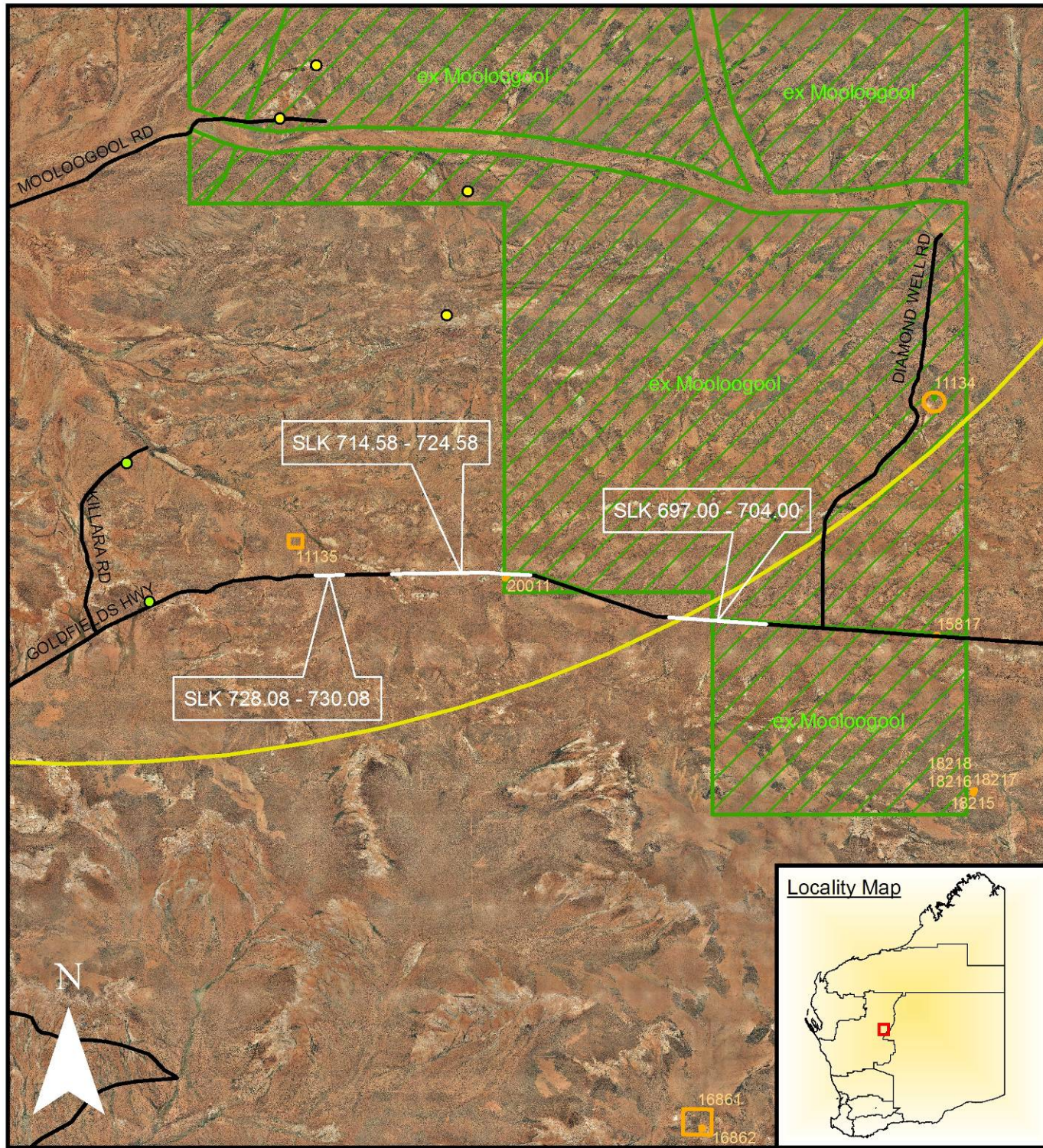
<p><b>LEGEND</b></p> <p> = Approximate Project Area</p>	<p>0 10 20 40 Km</p>  <p></p> <p>MAP INFORMATION Geographic Coordinate System: Geocentric Datum of Australia 1994 - Projection MGA Zone 50</p>	<p>PUBLISHER DETAILS</p> <p>Directorate: Regional Services Branch: Goldfields Esperance Region Author: Simon Weighell (Gerv) Data Currency: As Supplied</p> <p>Project: Projects\H49-Goldfields HWY110 - 724 SLK Sheeting\Environment\GIS Files\Wiluna to Meeka Reseal, Sheeting and Sealing Works - Project Location Map - Fig 1.mxd</p>
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Figure 1. Wiluna to Meeka Reseal, Sheeting and Sealing Works - Project Location Map

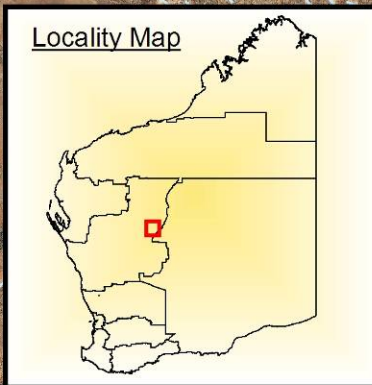
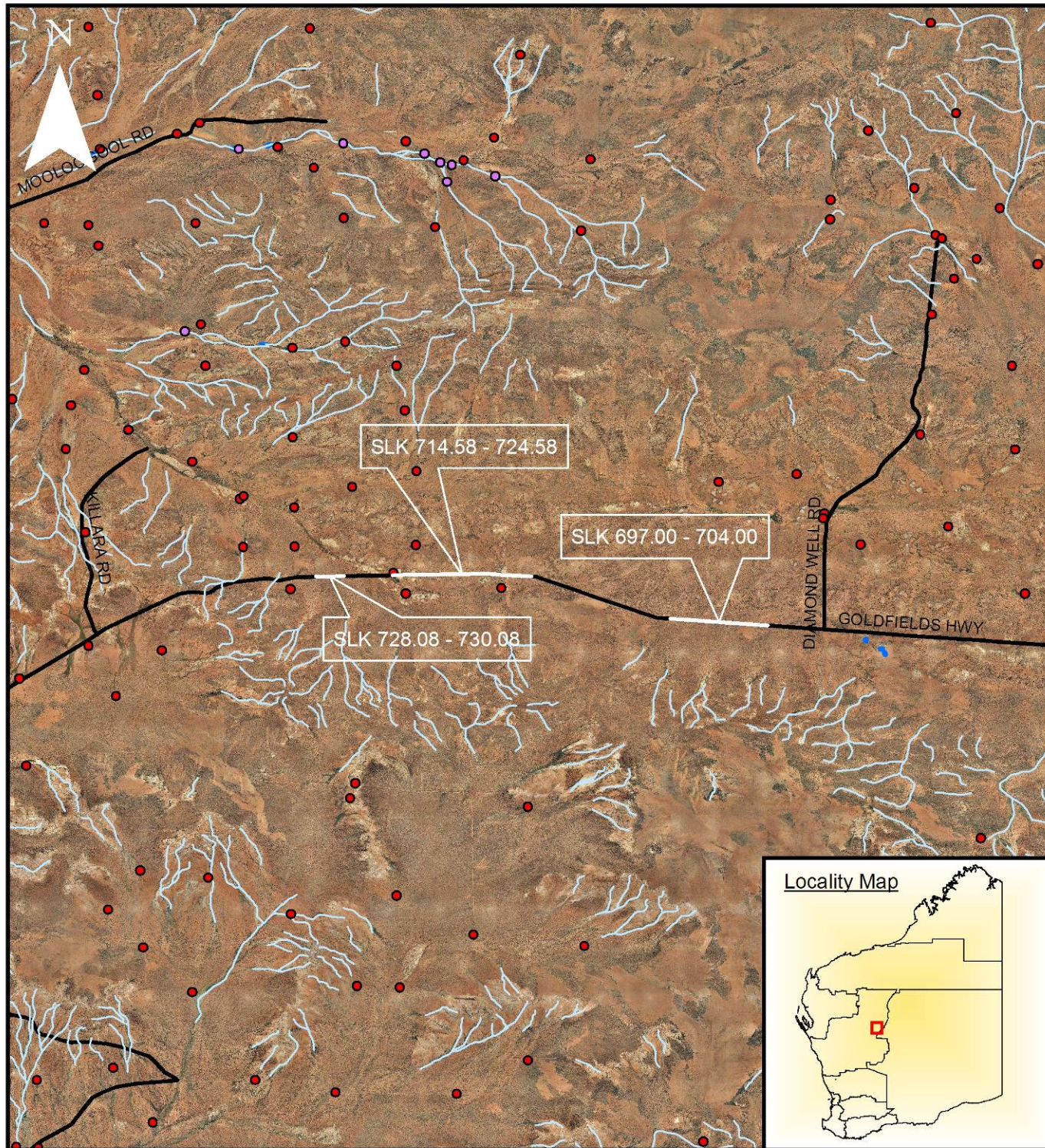




<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li><span style="color: green;">●</span> THFL - WA Herb</li> <li><span style="color: yellow;">●</span> THFL - MRWA</li> <li>— Road Network</li> <li><span style="border: 1px solid yellow; display: inline-block; width: 10px; height: 10px;"></span> TECs/PECs</li> <li><span style="border: 1px solid orange; display: inline-block; width: 10px; height: 10px;"></span> Aboriginal Sites</li> <li><span style="border: 1px solid green; background: repeating-linear-gradient(45deg, transparent, transparent 2px, green 2px, green 4px); display: inline-block; width: 10px; height: 10px;"></span> DEC Lands</li> <li><span style="border: 1px solid red; display: inline-block; width: 10px; height: 10px;"></span> Non-indigenous Heritage</li> <li><span style="border: 1px solid purple; display: inline-block; width: 10px; height: 10px;"></span> ESAs</li> </ul>		<p>0 4 8 16 Km</p> <p><b>mainroads</b> WESTERN AUSTRALIA</p> <p>MAP INFORMATION Geographic Coordinate System: Geocentric Datum of Australia 1994 - Projection MGA Zone 50</p>	<p><b>PUBLISHER DETAILS</b></p> <p>Directorate: Regional Services Branch: Goldfields Esperance Region Author: Simon Weighell (GEnv) Data Currency: As Supplied</p> <p>Project: Projects\H49-Goldfields HWY\710 - 724 SLK Sheeting\Environment\GIS Files\Wiluna to Meeka Reseal, Sheeting and Sealing Works - Env Constraints Map A - Fig 2.mxd</p>
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Figure 2. Wiluna to Meeka Reseal, Sheeting and Sealing Works - Environmental Constraints Map A

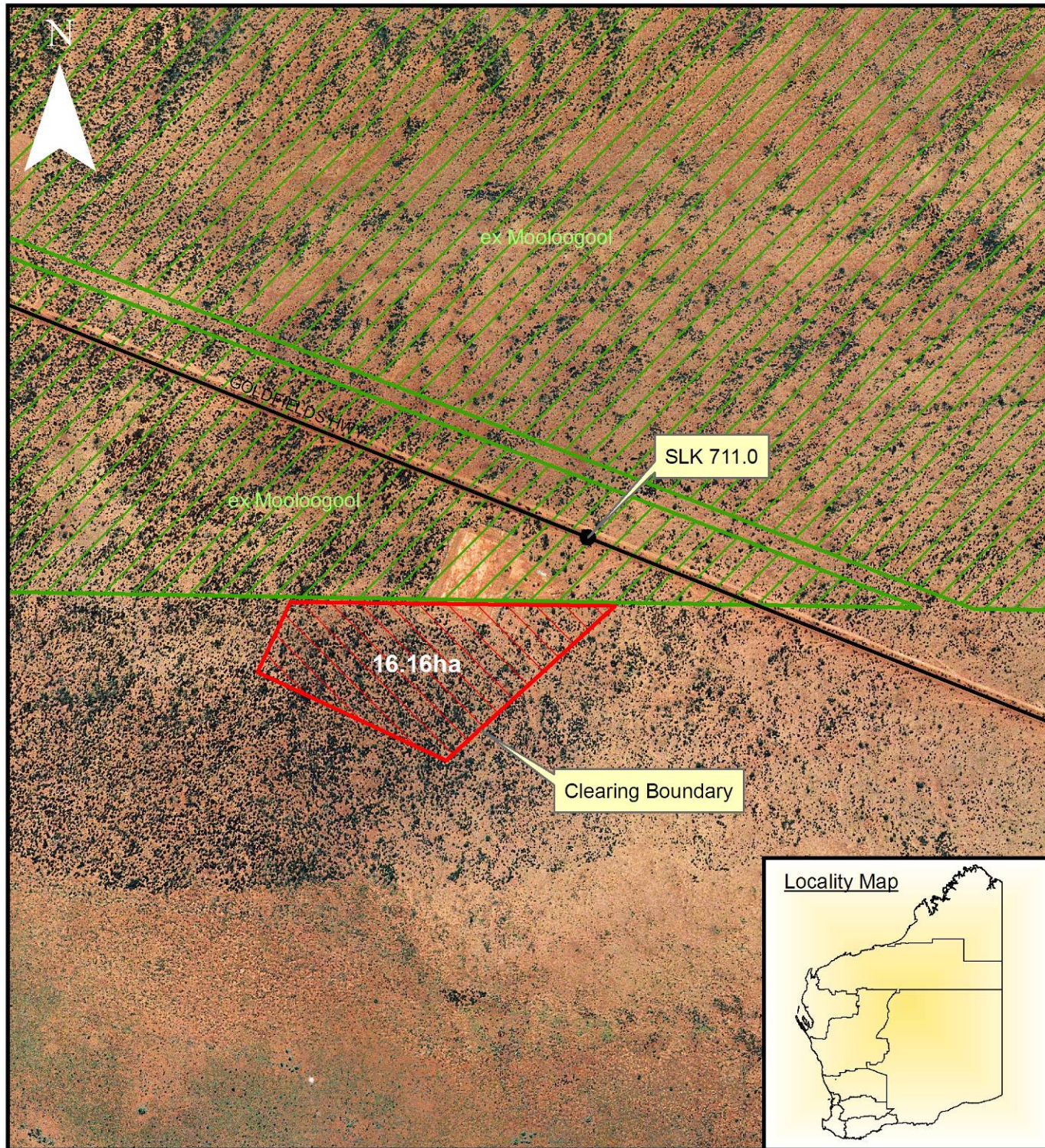




<b>LEGEND</b> <ul style="list-style-type: none"> <li><span style="color: yellow;">●</span> Waterpoints</li> <li><span style="color: red;">●</span> Bores</li> <li><span style="color: blue;">●</span> Springs</li> <li><span style="color: purple;">●</span> Waterholes</li> <li><span style="color: lightblue;">—</span> Watercourses</li> <li><span style="border-bottom: 1px solid black; width: 20px; display: inline-block;"></span> Road Network</li> <li><span style="background-color: darkblue; width: 15px; height: 10px; display: inline-block;"></span> Reservoirs</li> <li><span style="border: 1px solid white; width: 15px; height: 10px; display: inline-block;"></span> Lakes</li> <li><span style="background-color: lightblue; width: 15px; height: 10px; display: inline-block;"></span> PDWSAs</li> </ul>		<p>0 4 8 16 Km</p> <p><b>mainroads</b> WESTERN AUSTRALIA</p> <p>MAP INFORMATION Geographic Coordinate System: Geocentric Datum of Australia 1994 - Projection MGA Zone 50</p>	<b>PUBLISHER DETAILS</b> Directorate: Regional Services Branch: Goldfields Esperance Region Author: Simon Weighell (GEnv) Data Currency: As Supplied Project: Projects\H49-Goldfields HWY\710 - 724 SLK Sheeting\Environment\GIS Files\Wiluna to Meeka Reseal, Sheeting and Sealing Works - Env Constraints Map B - Fig 3.mxd
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Figure 3. Wiluna to Meeka Reseal, Sheeting and Sealing Works - Environmental Constraints Map B

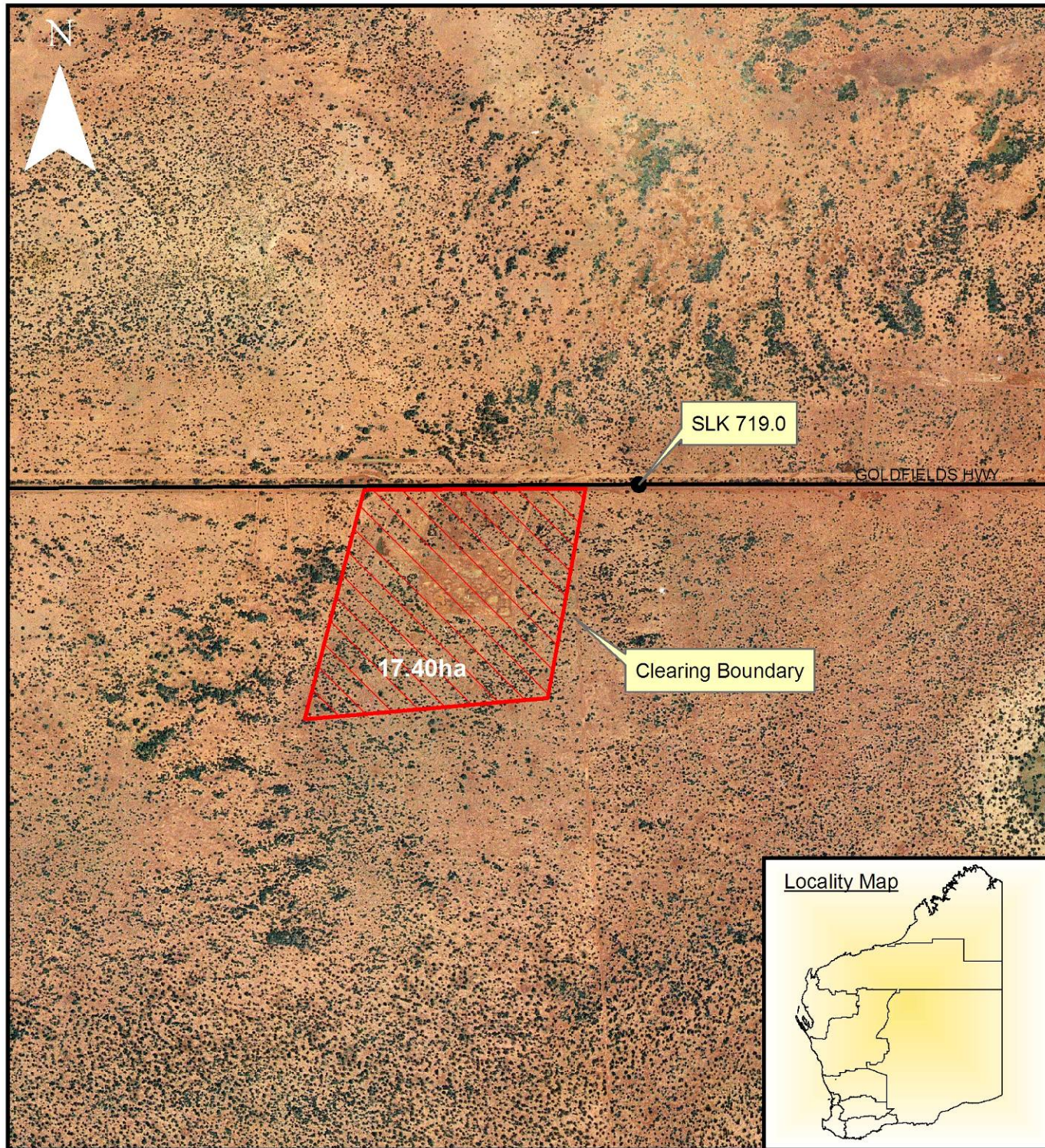




<b>LEGEND</b> <ul style="list-style-type: none"> <li>● THFL - WA Herb</li> <li>● THFL - MRWA</li> <li>● Waterpoints</li> <li>● Bores</li> <li>● Springs</li> <li>● Waterholes</li> <li>— Watercourses</li> <li>— Road Network</li> <li>■ TECs/PECs</li> <li>■ Aboriginal Sites</li> <li>■ DEC Lands</li> <li>■ Non-indigenous Heritage</li> <li>■ Reservoirs</li> <li>■ Lakes</li> <li>■ PDWSAs</li> <li>■ ESAs</li> </ul>		0 100 200 400 Meters   <b>mainroads</b> WESTERN AUSTRALIA <small>MAP INFORMATION            Geographic Coordinate System: Geocentric Datum of Australia 1994 - Projection MGA Zone 50</small>	<b>PUBLISHER DETAILS</b> Directorate: Regional Services Branch: Goldfields Esperance Region Author: Simon Weighell (GEnv) Data Currency: As Supplied Project: Projects\H49-Goldfields HWY\710 - 724 SLK Sheeting\Environment\GIS Files\Wiluna to Meeka Reseal, Sheeting and Sealing Works - Env Constraints Map C - Fig 4.mxd
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Figure 4. Environmental Constraints Map C - Pit @ SLK 711

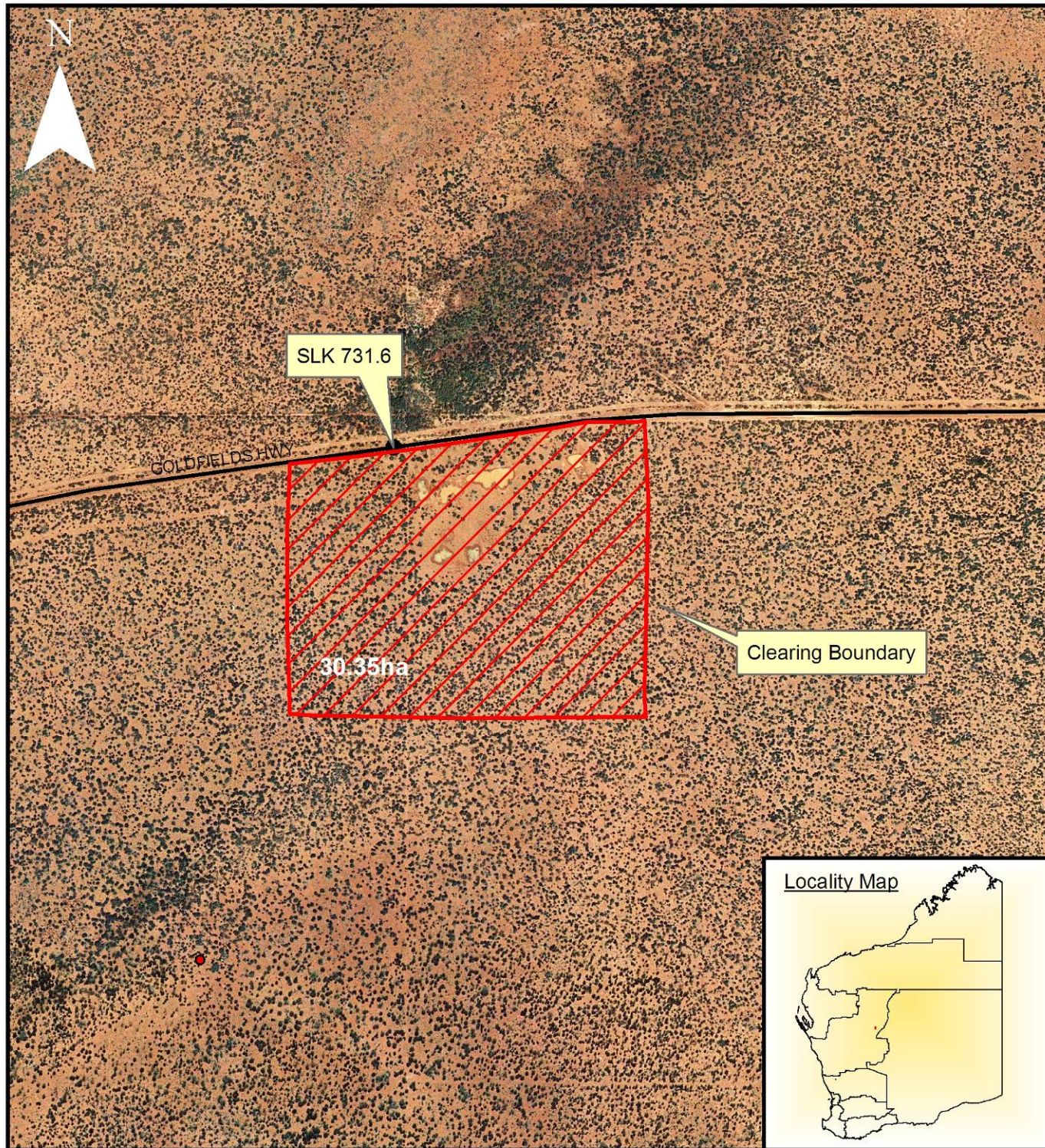




<b>LEGEND</b> <ul style="list-style-type: none"> <li>● THFL - WA Herb</li> <li>● THFL - MRWA</li> <li>● Waterpoints</li> <li>● Bores</li> <li>● Springs</li> <li>● Waterholes</li> <li>— Watercourses</li> <li>— Road Network</li> <li>■ TECs/PECs</li> <li>■ Aboriginal Sites</li> <li>■ DEC Lands</li> <li>■ Non-indigenous Heritage</li> <li>■ Reservoirs</li> <li>■ Lakes</li> <li>■ PDWSAs</li> <li>■ ESAs</li> </ul>		0 50100 200 Meters   <b>mainroads</b> WESTERN AUSTRALIA <small>MAP INFORMATION            Geographic Coordinate System: Geocentric Datum of Australia 1994 - Projection MGA Zone 50</small>	<b>PUBLISHER DETAILS</b> <small>Directorate: Regional Services            Branch: Goldfields Esperance Region            Author: Simon Weighell (GEnv)            Data Currency: As Supplied            Project: Projects\H49-Goldfields            HWY\710 - 724 SLK            Sheeting\Environment\GIS            Files\Wiluna to Meeka Reseal,            Sheeting and Sealing Works - Env            Constraints Map D - Fig 5.mxd</small>
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Figure 5. Environmental Constraints Map D - Pit @ SLK 719





<b>LEGEND</b> <ul style="list-style-type: none"> <li>● THFL - WA Herb</li> <li>● THFL - MRWA</li> <li>● Waterpoints</li> <li>● Bores</li> <li>● Springs</li> <li>● Waterholes</li> <li>— Watercourses</li> <li>— Road Network</li> <li>■ TECs/PECs</li> <li>■ Aboriginal Sites</li> <li>■ DEC Lands</li> <li>■ Non-indigenous Heritage</li> <li>■ Reservoirs</li> <li>■ Lakes</li> <li>■ PDWSAs</li> <li>■ ESAs</li> </ul>		0 50100 200 Meters   <b>mainroads</b> WESTERN AUSTRALIA <small>MAP INFORMATION            Geographic Coordinate System: Geocentric Datum of Australia 1994 - Projection MGA Zone 50</small>	<b>PUBLISHER DETAILS</b> <small>Directorate: Regional Services            Branch: Goldfields Esperance Region            Author: Simon Weighell (GEnv)            Data Currency: As Supplied            Project: Projects\H49-Goldfields            HWY\710 - 724 SLK            Sheeting\Environment\GIS            Files\Wiluna to Meeka Reseal,            Sheeting and Sealing Works - Env            Constraints Map E - Fig 6.mxd</small>
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Figure 6. Environmental Constraints Map E - Pit @ SLK 731.6



# Appendix B

## Low Impact Screening Checklist

Form No. 6707/001/01

### Checklist - Low Impact Screening Checklist

The Low Impact Screening Checklist is part of the environmental assessment and approval process, refer to in Figure 2 in the Main Roads environmental guideline Environment Assessment and Approvals. It should be noted that the checklist does not address Aboriginal heritage issues. Please refer to Main Roads guideline *Aboriginal Heritage* for the heritage assessment process.

All projects are to be screened to identify those that are Low Impact.

Projects that have "No" to all items are classed as Low Impact and should be implemented using standard contract clauses in the Tender Document Process.

Projects that have "Yes" to any item will require further environmental assessment and will be implemented using an Environmental Management Plan.

Tick "Yes" or "No" for every item.

Project Name 2889/18... SHOOTING (SIGNALING) ON GOLDFIELD'S HIGHWAY (H0219)...

ITEM NO.	ITEM	Y	N
1	New road or road reserve to be created or expansion of existing road reserve.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Works require clearing of native vegetation outside the maintenance zone.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Works require clearing of native vegetation that is older than 10 years old within the maintenance zone.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Works to occur outside normal working hours.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Passes over, adjoins or drains directly into a wetland or sensitive watercourse.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Local natural drainage regime / hydrology will be changed.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Dewatering, or a new water bore required.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Known potential source of hazardous materials within or adjoining project area. e.g. Acid Sulphate Soils, existing petrol station, industrial site or waste disposal site (landfill)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Buildings will require demolition.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Completed By: Signature [Signature] Date 16/03/09  
Name STEVE COLE Title PROJECT MANAGER

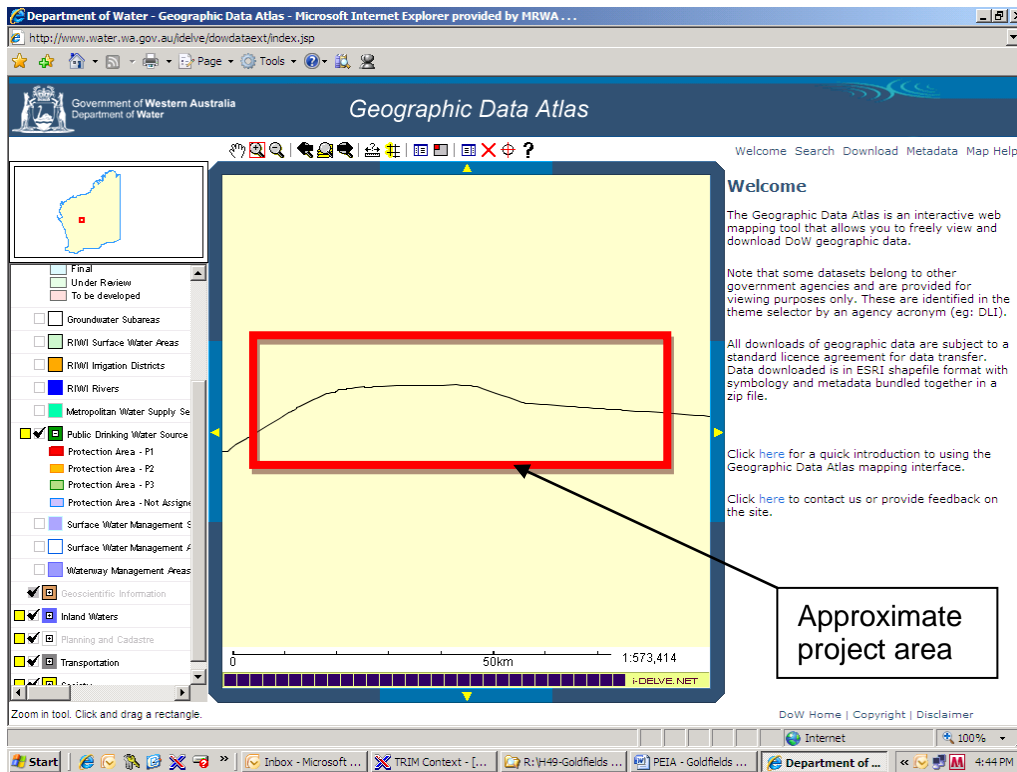
To be reviewed by a Main Roads Environment Officer: Signature S. Weighell Date 16/3/09  
Name SIMON WEIGHELL Title AEV

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

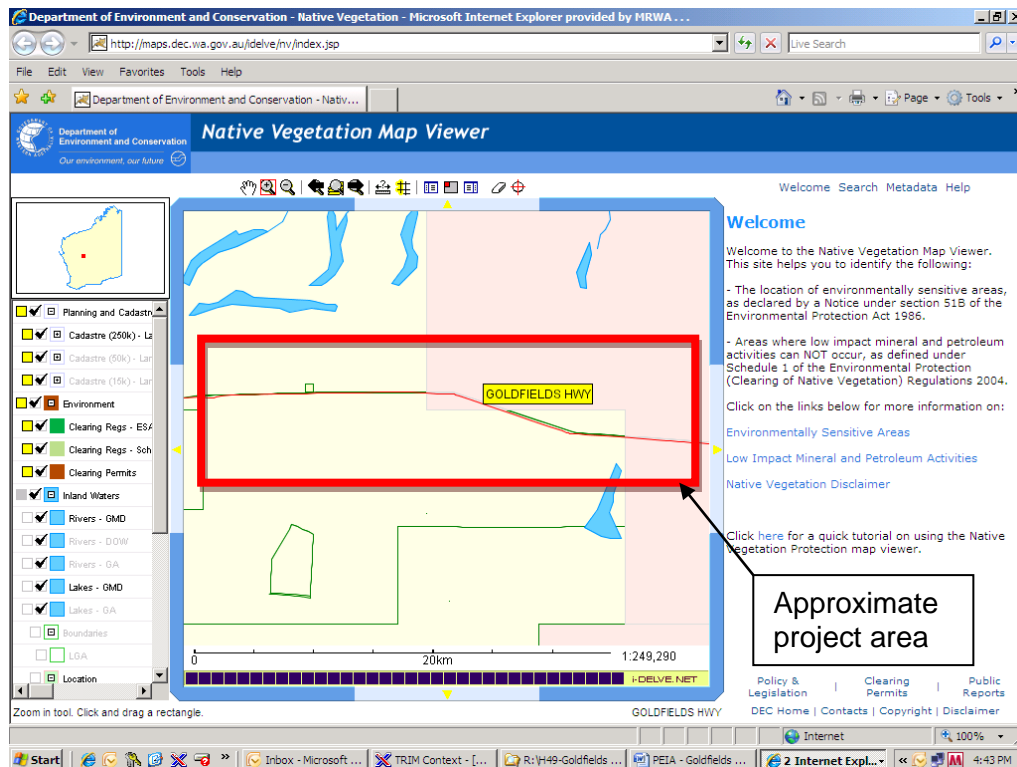


# Appendix C

## Government Agency Database Searches



DoW's Geographic Data Atlas showing no Public Drinking Water Source Areas within the immediate vicinity of the project area.



DEC's Native Vegetation Map Viewer showing no ESAs within the proposed project areas.

DEC's Threatened Fauna database search results:

**Threatened and Priority Fauna Database**

Page 1 of 1

25.812 °S 118.423 °E / 27.11 °S 120.326 °E Goldfields Hwy, Wihuna-Meekatharra(+~50km buffer)

\* *Date* *Certainty* *Seen* *Location Name* *Method*

**Schedule 1 - Fauna that is rare or is likely to become extinct**

*Bettongia lesueur lesueur* **Boodie (Shark Bay)** 1 records

This species is the only macropod that lives on a regular basis in burrows of its own construction.

2006 1 0 Wihuna Diggings

*Dasycercus cristicauda* **Crest-tailed Mulgara, Minyiminysi** 3 records

This small carnivorous marsupial lives in burrows and occurs in arid sandy regions from the eastern Pilbara to central Australia.

2007 1 1 Wihuna Caught or trapped  
2007 1 1 Wihuna Caught or trapped  
2007 1 2 Wihuna Caught or trapped

*Leipoa ocellata* **Malleefowl** 3 records

This species was once widely distributed across southern Australia. It prefers woodland or shrubland with an abundant litter layer that provides essential material for the construction of its nest mound.

2006 1 0 Wihuna Tracks  
2007 1 0 Wihuna Definite signs  
2007 1 1 Wihuna Day sighting

**Priority Four: Taxa in need of monitoring**

*Sminthopsis longicaudatus* **Long-tailed Dunnart** 1 records

This small marsupial feeds mainly on arthropods and lives in rugged rocky areas.

1981 2 1 Meekatharra Day sighting

*Ardeotis australis* **Australian Bustard** 1 records

This species is uncommon and may occur in open or lightly wooded grasslands.

1982 1 4 Wihuna Day sighting

*Burhinus grallarius* **Bush Stonecurlew** 1 records

A well camouflaged, ground nesting bird which prefers to 'freeze' rather than fly when disturbed. It inhabits lightly timbered open woodlands.

2001 1 MEEKATHARRA

*Pomatostomus superciliosus ashbyi* **White-browed Babbler (western wheatbe** 1 records

This species of bird lives in eucalypt forests and woodlands, and forages on or near the ground for insects and seeds.

1978 1 Millbillillie Day sighting

\* Information relating to any records provided for listed species:-

Date: date of recorded observation

Certainty (of correct species identification): 1=Very certain; 2=Moderately certain; and 3=Not sure.

Seen: Number of individuals observed.

Location Name: Name of reserve or nearest locality where observation was made



Method: Method or type of observation

Friday, 27 February 2009



Department of Environment and Conservation

## Aboriginal Heritage Inquiry System results for the project area:

 <p>Government of Western Australia Department of Indigenous Affairs</p>	<h3 style="margin: 0;">Aboriginal Heritage Inquiry System</h3> <p style="margin: 0;">Register of Aboriginal Sites</p>	 <p style="font-size: 8px; margin: 0;">THE DEPARTMENT OF INDIGENOUS AFFAIRS</p>
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**Search Criteria**

4 sites in a search box. The box is formed by these diagonally opposed corner points:

MGA Zone 50	
Northing	Easting
7062836	680495
7082208	766408

**Disclaimer**

Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.

**Copyright**

Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Aboriginal Sites established and maintained under the Aboriginal Heritage Act 1972 (AHA).

**Legend**

<b>Restriction</b>	<b>Access</b>	<b>Coordinate Accuracy</b>
<b>N</b> No restriction	<b>C</b> Closed	Accuracy is shown as a code in brackets following the site coordinates.
<b>M</b> Male access only	<b>O</b> Open	<b>[Reliable]</b> The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
<b>F</b> Female access	<b>V</b> Vulnerable	<b>[Unreliable]</b> The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

**Status**

<b>L</b> Lodged	<b>IR</b> Insufficient information (as assessed by Site Assessment Group)	<b>Site Assessment Group (SAG)</b> Sites lodged with the Department are assessed under the direction of the Registrar of Aboriginal Sites. These are not to be considered the final assessment.  Final assessment will be determined by the Aboriginal Cultural Material Committee (ACMC).
<b>I</b> Insufficient information	<b>PR</b> Permanent register (as assessed by Site Assessment Group)	
<b>P</b> Permanent register	<b>SR</b> Stored data (as assessed by Site Assessment Group)	
<b>S</b> Stored data		

**Spatial Accuracy**

Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:250' means Easting=5000000, Zone=50.

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© Government of Western Australia Report created 14 Apr 2009 16:49:06. Identifier: 563031. Page 1



## Aboriginal Heritage Inquiry System

Register of Aboriginal Sites

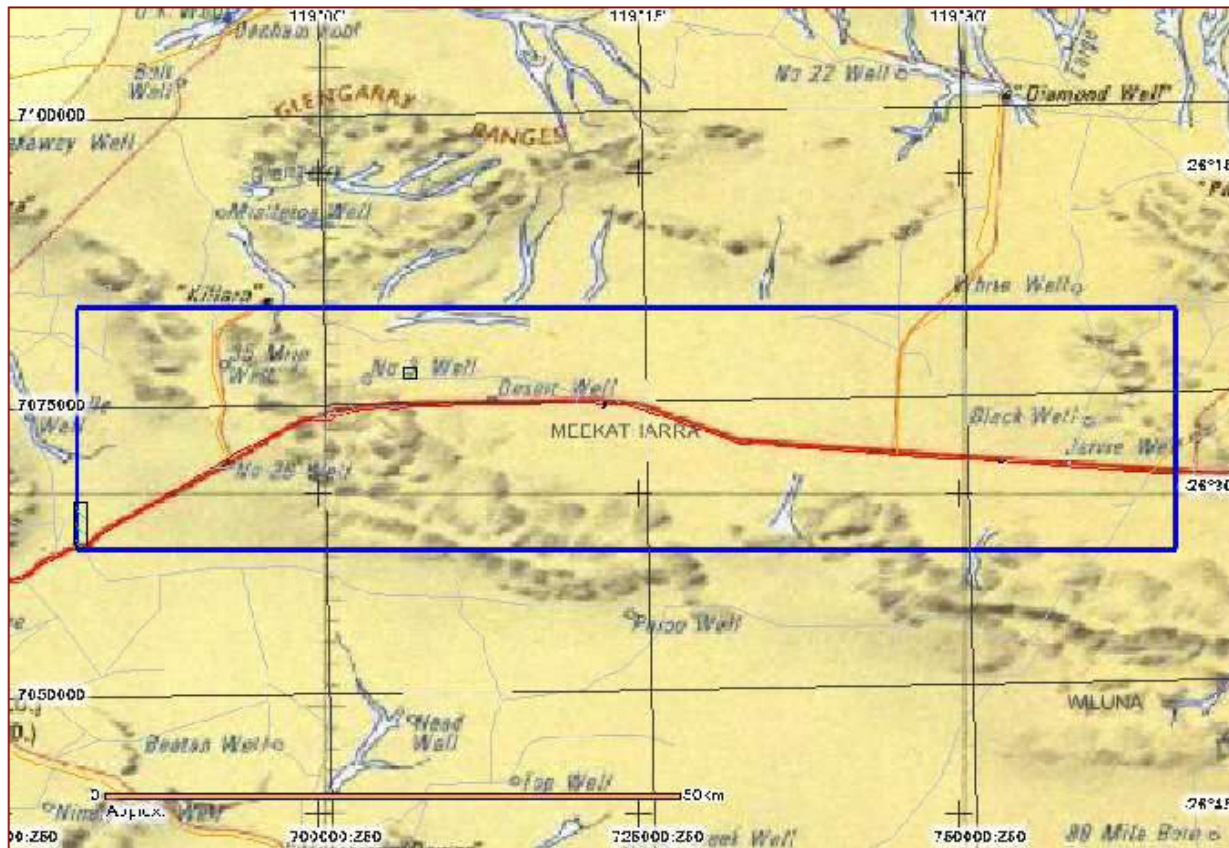


Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
11135	P	O	N	Meekatharra-Wiluna	Artefacts / Scatter			708641mE 7077853mN Zone 50 [Unreliable]	P01017
15817	P	O	N	Wiluna-Meekatharra 05	Artefacts / Scatter			752560mE 7089271mN Zone 50 [Reliable]	
20011	P	O	N	Opa4 - Semi-Permanent Lake And Campsite	Artefacts / Scatter, Grinding patches / grooves	Camp, Water Source	*Registered Informant names available from DIA.	721730mE 7074561mN Zone 50 [Reliable]	
20013	P	O	N	Goldfields Highway Ceremonial Area	Ceremonial, Mythological		*Registered Informant names available from DIA.	880773mE 7064901mN Zone 50 [Reliable]	



## Aboriginal Heritage Inquiry System

Register of Aboriginal Sites



**Legend**

- Highlighted Area
- Town
- Map Area
- Search Area

Copyright for base map information shall at all times remain the property of the Commonwealth of Australia, Geoscience Australia - National Mapping Division. All rights reserved.

Copyright for Native Title Land Claim, Local Government Authority, Mining Tenement boundaries shall at all times remain the property of the State of Western Australia. All rights reserved.

For further important information on using this information please see the Department of Indigenous Affairs' Terms of Use statement at <http://www.dia.wa.gov.au/Terms-Of-Use/>

DEWHA's EPBC Act Protected Matters Report for the project area:

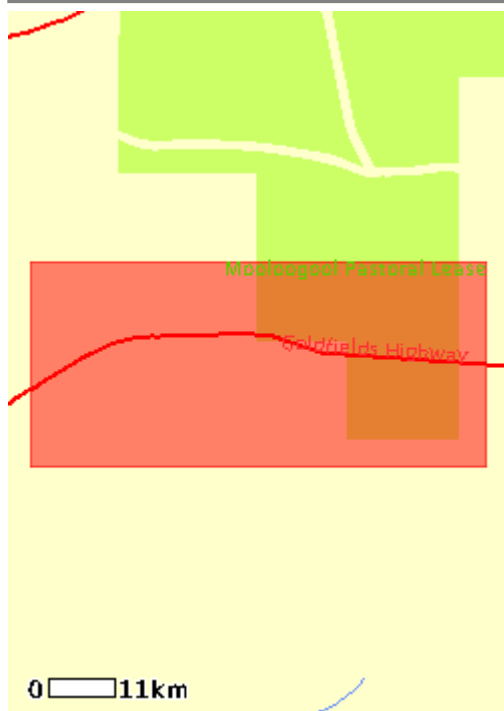
**EPBC Act Protected Matters Report**

14 April 2009 18:42

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the [caveat](#) at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at <http://www.environment.gov.au/atlas> may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>



This map may contain data which are  
© Commonwealth of Australia  
(Geoscience Australia)  
© 2007 MapData Sciences Pty Ltd, PSMA

**Search Type:** Area  
**Buffer:** 0 km  
**Coordinates:** -26.3101,118.8501, -26.6489,118.8501, -26.6489,119.6008, -26.3101,119.6008



**Report Contents:** [Summary](#)  
[Details](#)

- [Matters of NES](#)
  - [Other matters protected by the EPBC Act](#)
  - [Extra Information](#)
- [Caveat](#)  
[Acknowledgments](#)

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## **Summary**

### **Matters of National Environmental Significance**

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>.

<b>World Heritage Properties:</b>	None
<b>National Heritage Places:</b>	None
<b>Wetlands of International Significance: (Ramsar Sites)</b>	None
<b>Commonwealth Marine Areas:</b>	None
<b>Threatened Ecological Communities:</b>	None
<b><u>Threatened Species:</u></b>	3
<b><u>Migratory Species:</u></b>	5

### **Other Matters Protected by the EPBC Act**

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a



member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov.au/epbc/permits/index.html>.

<b>Commonwealth Lands:</b>	None
<b>Commonwealth Heritage Places:</b>	None
<b>Places on the RNE:</b>	None
<b><u>Listed Marine Species:</u></b>	4
<b>Whales and Other Cetaceans:</b>	None
<b>Critical Habitats:</b>	None
<b>Commonwealth Reserves:</b>	None

### **Extra Information**

This part of the report provides information that may also be relevant to the area you have nominated.

<b>State and Territory Reserves:</b>	None
<b>Other Commonwealth Reserves:</b>	None
<b>Regional Forest Agreements:</b>	None

## **Details**

### **Matters of National Environmental Significance**

Threatened Species [ <a href="#">Dataset Information</a> ]	Status	Type of Presence
<b>Birds</b>		
<a href="#"><i>Acanthiza iredalei iredalei</i></a> Slender-billed Thornbill (western)	Vulnerable	Species or species habitat likely to occur within area
<b>Mammals</b>		
<a href="#"><i>Rhinonicteris aurantius (Pilbara form)</i></a> Pilbara Leaf-nosed Bat	Vulnerable	Species or species habitat likely to occur within area
<b>Plants</b>		
<a href="#"><i>Pityrodia augustensis</i></a> Mt Augustus Foxglove	Vulnerable	Species or species habitat likely to occur within area
Migratory Species [ <a href="#">Dataset Information</a> ]	Status	Type of Presence
<b>Migratory Terrestrial Species</b>		
<b>Birds</b>		
<a href="#"><i>Merops ornatus</i></a> Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
<b>Migratory Wetland Species</b>		
<b>Birds</b>		
<a href="#"><i>Ardea alba</i></a> Great Egret, White Egret	Migratory	Species or species habitat may occur within area

<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel	Migratory	Species or species habitat may occur within area
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### **Migratory Marine Birds**

<a href="#">Apus pacificus</a> Fork-tailed Swift	Migratory	Species or species habitat may occur within area
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<a href="#">Ardea alba</a> Great Egret, White Egret	Migratory	Species or species habitat may occur within area
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### **Other Matters Protected by the EPBC Act**

Listed Marine Species [ <a href="#">Dataset Information</a> ]	Status	Type of Presence
---	--------	------------------

#### **Birds**

<a href="#">Apus pacificus</a> Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
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<a href="#">Ardea alba</a> Great Egret, White Egret	Listed - overfly marine area	Species or species habitat may occur within area
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<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel	Listed - overfly marine area	Species or species habitat may occur within area
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<a href="#">Merops ornatus</a> Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
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### **Caveat**

The information presented in this report has been provided by a range of data sources as [acknowledged](#) at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the *Environment Protection and Biodiversity Conservation Act 1999*. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under "type of presence". For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the [migratory](#) and [marine](#) provisions of the Act have been mapped.

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as [extinct or considered as vagrants](#)
- some species and ecological communities that have only recently been listed
- [some terrestrial species](#) that overfly the Commonwealth marine area
- migratory species that are very [widespread, vagrant, or only occur in small numbers](#).

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

### **Acknowledgments**

This database has been compiled from a range of data sources. The Department acknowledges the following custodians who have contributed valuable data and advice:

- [New South Wales National Parks and Wildlife Service](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Water and Environment, Tasmania](#)
- [Department of Environment and Heritage, South Australia Planning SA](#)
- [Parks and Wildlife Commission of the Northern Territory](#)
- [Environmental Protection Agency, Queensland](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)

- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- Other groups and individuals

[ANUcliM Version 1.8, Centre for Resource and Environmental Studies, Australian National University](#) was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

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Last updated: Thursday, 20-Nov-2008 14:17:56 EST

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## Appendix D

### Site Photos

Photos of Pit @ 719 SLK taken on 06/03/09:

















Photos of Pit @ 711 SLK taken on 06/03/09:















# Appendix E

## Revegetation Plan for Pastoral Areas

### Main Roads WA – Revegetation Plan for Pastoral Areas

Condition 14(e), CPS 818

**Date:** 21/04/09. **Project:** Wiluna to Meekatharra Reseal, Sheeting and Sealing Works, SLK 697.00 – 730.08.

**Manager:** Main Roads WA.

**Location and size of clearing:** For project areas located within the pastoral / rangelands region north of the agricultural area as described in the Environmental Protection Authority's Position Statement No.2.

**Location and size of revegetation:** Primarily for areas that were cleared for searching and extracting road building materials (e.g. borrow pits, etc.), and other project related temporary clearing.

**Clearing description:** Machine clearing.

**Revegetation description:** Replacement of topsoil material regeneration.

**Reason for revegetation:** Revegetation of temporary cleared areas, in accordance with condition 14 of clearing permit CPS 818.

#### Revegetation / rehabilitation requirements:

**Site preparation:** All vegetation will be cleared from the works area and non-weed infested vegetation is stockpiled. Stockpiled vegetation will be placed in a manner that will prevent damage to adjacent vegetation by machinery. Weed infested vegetation will be disposed of at an appropriate site and not used for revegetation purposes. Burning of the cleared vegetation will not be permitted.

Topsoil will be stripped to a maximum depth of 100mm, and will be stored in a weed free (as far as possible) area, as close as possible to the area to be rehabilitated. Topsoil will be placed in windrows of less than 1.5m in height and reinstated as soon as practicable to maintain viability of in-situ seeds.

**Weed control:** Appropriate weed control will be carried out when weeds are present, both prior to topsoil stripping and where weeds become established on or between the stockpiled materials. Weed control will take place prior to the respreading of topsoil to ensure weeds are killed and not transported to other areas.

Control measures include the removal of weeds to an approved dumpsite, or treatment of weeds such as by using herbicides mixed in accordance with manufacturer's instructions and applied by a licensed operator. Where practicable, weeds will be removed prior to or when they are in flower, and prior to seeding.

All machinery will be cleared of soil build up and vegetative material before entering and leaving the site to help minimise the transportation of weeds and their seeds.

Exposed areas such as bare batters and borrow pits shall be promptly rehabilitated to

# Main Roads WA – Revegetation Plan for Pastoral Areas

Condition 14(e), CPS 818

reduce the potential for weed establishment. Where works are adjacent to good quality vegetation, where weeds from within the project area are likely to spread to and result in environmental harm to the adjacent area, those weeds will be controlled annually until 12 Dec 2010.

***Regeneration / direct seeding / planting at an optimal time:***

The following rehabilitation works are undertaken on areas of disturbed earth requiring rehabilitation:

- Topsoil is uniformly respread to a typical depth of 100mm over the project area. In project areas where topsoil has not been removed and/or is not available, other substrate, such as gravel, may be substituted as a growth medium.
- Project areas will be ripped to a minimum depth of 200mm deep with rip lines approximately 300mm apart. Where slopes are present, rip lines shall follow natural contours.

The following rehabilitation works are undertaken at borrow / gravel pits:

- Overburden and then topsoil will be uniformly and evenly spread over the disturbed areas of the pit. Depending on the slope of drainage lines within the pit, small swales from the topsoil will be formed to reduce erosion velocities and encourage the deposition of seeds.
- The whole of the existing pit floor, including drainage lines, will be ripped to a depth of 300-500mm deep with rip lines between 500-800mm apart (if the material in the pit is able to be ripped).
- All stockpiled vegetation will be spread along the contour and the pit floor to help promote seed deposition and to reduce erosion velocities.

***Vegetation establishment period:***

The vegetation establishment period is for at least twelve months following the completion of the works. During this period, maintenance and monitoring will be undertaken (see below).

***Ongoing maintenance and monitoring:***

After revegetation works, revegetated areas will be inspected annually for a minimum of two years to monitor and control weeds and to measure the effectiveness of revegetation works.

When unwanted weed foliage cover exceeds 25% after the initial two year period, further actions will be implemented to monitor and control these weeds. The additional monitoring and weed control will be conducted annually until 12 Dec 2010 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

***Monitoring commitments:***

Post revegetation site inspections will be carried out annually for a minimum of two years to monitor unwanted weeds and measure the effectiveness of revegetation works. Monitoring of sites where unwanted weed foliage cover exceeds 25% after the initial two year period will continue annually until 12 Dec 2010 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

***Management commitments:***

Undertake annual weed control of unwanted weeds annually until 12 Dec 2010 or until the unwanted weed foliage cover falls below 25%, whichever is sooner.

***Agencies consulted and submissions received:***

Nil.

## Appendix F

### Environmental Management Plan

ENVIRONMENTAL MANAGEMENT PLAN					
Timing	Topic	Objective	Action	Responsible Party	Advice
All phases of construction	Vegetation Clearing - Record-keeping	All projects should maintain the required records relating to clearing native vegetation under CPS 818/4.	Record: - a copy of the PEIA & EMP (Minor projects), - a map showing the location where the clearing occurred, recorded in an ESRI Shapefile, - the size of the area cleared (in hectares), - the dates on which the clearing was done.	Project Manager	DEC
All phases of construction	Revegetation	Ensure that temporarily cleared areas are revegetated to an acceptable standard.	Carry out revegetation works in accordance with the approved revegetation plan.	Contractor / Project Manager	DEC
Pre-Construction	Induction / Start-up meeting	Create awareness in all construction personnel of the environmental aspects associated with the project.	All construction staff to be informed of the environmental aspects associated with the project prior to any works being undertaken.	Contractor / Project Manager	Main Roads
Pre-Construction	Vegetation - Clearing	Ensure that the overall objectives of the works are compatible with maintaining the biological integrity of the surrounding environment, and minimising the loss of vegetation and the level of degradation.	Clearly mark no go areas and any trees or shrubs to be kept.	Contractor / Project Manager	Main Roads
			Cleared vegetation that is not infested with dieback or weeds is to be mulched and returned to the soil profile where possible.		
			Cleared vegetation is not to be burnt and any dieback or weed infested material is to be disposed of at an approved site.		
Construction	Weed & Dieback Management	Ensure the dieback status of the project area does not change as a result of the works; and, ensure that the risk of weed spread or establishment is minimised as far as is practically possible.	Contractor is to ensure that all equipment brought on to site is free of soil and vegetative material. Equipment is to be cleaned (washed down or brushed) prior to traversing areas of changing dieback status (except when entering dieback infested areas).	Contractor	Main Roads / DEC



ENVIRONMENTAL MANAGEMENT PLAN					
Timing	Topic	Objective	Action	Responsible Party	Advice
Construction	Noise, Vibration and Dust	Ensure that the construction of the proposal does not become a nuisance to the public.	Any complaints regarding dust, noise or vibration will be attended to as soon as possible.	Contractor / Project Manager	Main Roads
Construction	Pollution and Litter	Ensure that the works are managed to a standard that minimises pollution or the risk of pollution occurring.	The designated servicing area will be bunded to contain any spills or leaks or it will drain into a temporary sump. It will not be located in an area adjacent to drainage areas or watercourses.	Contractor	Main Roads
			Emergency cleanup procedures shall be implemented in the case of any spillage. These will include control of spilled material and removal of contaminated soil to an approved site. The contractor shall ensure appropriate equipment is available at all times and shall notify the Project Manager of a spill.	Contractor	Main Roads
			All waste oil will be collected for disposal/recycling and any empty fuel/oil containers, used filters and waste hydraulic parts are to be collected and stored in an allocated area before being removed to an approved site.	Contractor	Main Roads
			The project areas, including hardstand areas, will be kept in a tidy manner at all times.	Contractor	Main Roads
Construction	Fire	Ensure that the fire risk associated with the construction of the proposal is minimised.	No fires shall be lit within the project area and standard fire prevention methods (e.g. spark arresting mufflers) are to be employed by the contractor.	Contractor	Main Roads
Construction	Environmental Incidents	Ensure that any environmental incidents that occur during works do not have a significant or long term impact on the environment.	Implement corrective and preventive actions in liaison with an environmental specialist and Main Roads Manager Environment where necessary.	Contractor / Project Manager	Main Roads
		Record the details of any environmental incidents to fulfil corporate requirements.	Complete and submit environmental incident report forms in accordance with the Main Roads corporate procedure 6707/042 <i>Environmental Incident Reporting and Investigation</i> .	Contractor / Project Manager	Main Roads

<b>ENVIRONMENTAL MANAGEMENT PLAN</b>					
<b>Timing</b>	<b>Topic</b>	<b>Objective</b>	<b>Action</b>	<b>Responsible Party</b>	<b>Advice</b>
Post-Construction	Rehabilitation	Leave the project area free from debris.	All waste materials from the development are to be completely removed from the site upon completion of works. Final clean-up shall be to the satisfaction of the Project Manager.	Contractor	Main Roads