Australian Government

Department of Sustainability, Environment, Water, Population and Communities

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. (Further references to 'the Minister' in this form include references to the Minister's delegate.) To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be undertaken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by or on behalf of a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.
- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.

- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act or another law of the Commonwealth. Information is available on the Department's web site.

Is your action in the Great Barrier Reef Marine Park?

If your action is in the Great Barrier Reef Marine Park it may require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If a permission is required, referral of the action under the EPBC Act is deemed to be an application under the GBRMP Act (see section 37AB, GBRMP Act). This referral will be forwarded to the Great Barrier Reef Marine Park Authority (the Authority) for the Authority to commence its permit processes as required under the Great Barrier Reef Marine Park Regulations 1983. If a permission is not required under the GBRMP Act, no approval under the EPBC Act is required (see section 43, EPBC Act). The Authority can provide advice on relevant permission requirements applying to activities in the Marine Park.

The Authority is responsible for assessing applications for permissions under the GBRMP Act, GBRMP Regulations and Zoning Plan. Where assessment and approval is also required under the EPBC Act, a single integrated assessment for the purposes of both Acts will apply in most cases. Further information on environmental approval requirements applying to actions in the Great Barrier Reef Marine Park is available from http://www.gbrmpa.gov.au/ or by contacting GBRMPA's Environmental Assessment and Management Section on (07) 4750 0700.

The Authority may require a permit application assessment fee to be paid in relation to the assessment of applications for permissions required under the GBRMP Act, even if the permission is made as a referral under the EPBC Act. Further information on this is available from the Authority:

Great Barrier Reef Marine Park Authority

2-68 Flinders Street PO Box 1379
Townsville QLD 4810
AUSTRALIA

Phone: + 61 7 4750 0700
Fax: + 61 7 4772 6093

www.gbrmpa.gov.au

Do I have to pay for my referral or assessment / what are the fees?

Currently the department does not impose fees for environmental impact assessments referred and assessed under the EPBC Act. However, fees are proposed as part of cost recovery reforms to the EPBC Act. The commencement of cost recovery is subject to an amendment Bill being passed by Parliament and the making of regulations. Further details on the proposed cost recovery arrangements can be found in the draft EPBC Act Cost Recovery Impact Statement which is available at http://www.environment.gov.au/epbc/publications/consultation-draft-cost-recovery.html.

The department will inform you of your liability for potential fees prior to the introduction of cost recovery arrangements. Cost recovery arrangements will only apply to proposed actions referred to the department after 8 May 2012.

Your proposed action may be subject to fees for environmental impact assessments if:

- your referral is determined a controlled action and is still undergoing assessment under the EPBC Act at the commencement of cost recovery. Fees will only apply to the assessment work undertaken by the department after the commencement of cost recovery; and/or
- you submit an action management plan for approval of the Minister after the commencement of cost recovery. Please note this will only apply if an action management plan is listed as a condition of the approval decision under the EPBC Act.

There will be no retrospective charging for the stages of assessment initiated before cost recovery commences. Fees will only apply to those stages of the assessment that occur after cost recovery commences.

What information do I need to provide?

Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently. If a section of the referral document is not applicable to your proposal enter N/A.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in blue text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment. To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

Note: the Minister may decide not to publish information that the Minister is satisfied is commercial-in-confidence.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of Sustainability, Environment, Water, Population and Communities
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment.

The Department will write to you within 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any other Commonwealth, state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The action can proceed if undertaken in a particular manner (subject to any other Commonwealth, state or local government requirements). The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action is likely to have a significant impact a decision will be made that it is a *controlled action*. The particular matters upon which the action may have a significant impact (such as World Heritage values or threatened species) are known as the *controlling provisions*.

The controlled action is subject to a public assessment process before a final decision can be made about whether to approve it. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

The proposed action would have UNACCEPTABLE impacts and CANNOT proceed

The Minister may decide, on the basis of the information in the referral, that a referred action would have clearly unacceptable impacts on a protected matter and cannot proceed.

Compliance audits

If a decision is made to approve a project, the Department may audit it at any time to ensure that it is completed in accordance with the approval decision or the information provided in the referral. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes. If your project is in the Great Barrier Reef Marine Park and a decision is made to approve it, the Authority may also audit it. (See "*Is your action in the Great Barrier Reef Marine Park,"* p.2, for more details).

For more information

- call the Department of Sustainability, Environment, Water, Populations and Communities Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Blackjack Creek Riparian Corridor/Channel Reconstruction

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(i).

1.1 **Short description**

Use 2 or 3 sentences to uniquely identify the proposed action and its location.

Blackjack Creek is an ephemeral creek with a relatively small catchment flowing through private property and Wandobah Reserve adjacent to a residential area in Gunnedah, New South Wales, which currently cannot contain flood events greater than the 5 year ARI. This has resulted in a long history of flooding of the residential properties adjacent to it. As such Gunnedah Shire Council has undertaken investigations into flood mitigation measures in accordance with NSW government Flood Policy.

In accordance with the recommendations of the *Blackjack Creek Floodplain Risk Management Study and Plan* (Lyall and Associates 2010), Gunnedah Shire Council is proposing to reconstruct the Blackjack Creek riparian corridor/channel for a length of approximately 2km, stretching from 200m downstream of Lincoln Street to 200m upstream of the Oxley Highway Bridge, encompassing Wandobah Reserve and private property.

Please refer to the Review of Environmental Factors (REF) provided in **APPENDIX A** for greater detail. The locality and boundaries of the Reconstruction are illustrated in the maps provided in **APPENDIX B**.

1.2 **Latitude and longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

	Latitude			Longitude		
location point	degrees	minutes	seconds	degrees	minutes	seconds

The Interactive Mapping Tool may provide assistance in determining the coordinates for your project area.

If area less than 5 hectares, provide the location as a single pair of latitude and longitude references. If area greater than 5 hectares, provide bounding location points.

There should be no more than 50 sets of bounding location coordinate points per proposal area.

Bounding location coordinate points should be provided sequentially in either a clockwise or anticlockwise direction.

If the proposed action is linear (eg. a road or pipeline), provide coordinates for each turning point.

Do not use AMG coordinates.

	Latitude			Longitude		
location point	degrees	minutes	seconds	degrees	minutes	seconds
1	30	59	37.00	150	13	41.21
2	30	59	27.36	150	13	49.00
3	30	59	20.59	150	13	55.12
4	30	59	11.65	150	14	04.13
5	30	59	00.83	150	14	13.87
6	30	58	54.99	150	14	22.30
7	30	58	43.29	150	14	29.11
8	30	58	43.91	150	14	31.48
9	30	58	56.12	150	14	23.87
10	30	59	11.15	150	14	11.24
11	30	59	28.07	150	13	53.93
12	30	59	31.14	150	13	49.23
13	30	59	38.23	150	13	47.75

1.3 **Locality and property description**

Provide a brief physical description of the property on which the proposed action will take place and the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).

The Blackjack Creek Riparian Corridor/Channel Reconstruction is located in the Blackjack Creek catchment within the southern residential area of Gunnedah, New South Wales. The Reconstruction is proposed to occur within Wandobah Reserve and the properties of 'Balmoral' and 'Fermanagh' and is bound by the Oxley Highway to the north, Wandobah Road to the east and Lincoln Street/McCalls Road to the south.

Locality maps are provided in **APPENDIX B**.

1.4	**Size of the development footprint or work area (hectares)**	Approximately 20 hectares comprising of a 100m wide riparian corridor including a 30m wide channel for a length of approximately 2000m
1.5	**Street address of the site**	Wandobah Reserve, 'Fermanagh', and 'Balmoral', Wandobah Road, Gunnedah NSW 2380

1.6 **Lot description**

Describe the lot numbers and title description, if known.

The Reconstruction will occur on portions of Lot 7053 DP 1116141 (Wandobah Reserve), Lot 78 DP 755503 ('Fermanagh'), Lot 77 DP 755503 ('Balmoral') and Lot 2 DP 542293 ('Balmoral').

1.7 **Local Government Area and Council contact (if known)**

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

The relevant Gunnedah Shire Council contact for the Reconstruction is:

Lachlan Johnson
Environmental and Natural Resource Planner
02 6740 2126
lachlanjohnson@infogunnedah.com.au

1.8 **Time frame**

Specify the time frame in which the action will be taken including the estimated start date of construction/operation.

The time frame for the Reconstruction will be influenced by the Gunnedah Shire Council Flood Management Committee and Gunnedah Shire Council final approval of the Reconstruction, following a public display period, by Gunnedah Shire Council's funding acquisition procedures and by construction contractor timeframes. As such, an anticipated start date and time frame for completion cannot be provided at this time.

1.9	**Alternatives to proposed action** Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?		No
		Yes	Yes, you must also complete section 2.2
1.10	**Alternative time frames etc** Does the proposed action include alternative time frames, locations or activities?	No	No
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	**State assessment** Is the action subject to a state or territory environmental impact assessment?		No
		Yes	Yes, you must also complete Section 2.5
1.12	**Component of larger action** Is the proposed action a component of a larger action?	No	No
			Yes, you must also complete Section 2.7
1.13	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?	No	No
			Yes, provide details:
1.14	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	No	No
			Yes, provide details:
1.15	**Great Barrier Reef Marine Park** Is the proposed action inside the Great Barrier Reef Marine Park?	No	No
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.7.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

The Reconstruction will realign/reconstruct Blackjack Creek for approximately 2km stretching from approximately 200m south of the Oxley Highway Bridge in Wandobah Reserve to approximately 200m north of Lincoln Street. The following activities will occur as part of the Reconstruction:

- Site establishment, including establishment of works compounds and installation of sediment and erosion controls;
- Clear and grub the existing floodplain for the length and width of the Reconstruction;
- Strip and store topsoil from the Reconstruction area;
- Excavate channel for the length and width of the Reconstruction, in accordance with design;
- Construct mitre drains and stormwater inlets in accordance with design;
- Install any necessary protective materials at stormwater inlets and along Reconstruction length to prevent scour, in accordance with design;
- Spread excavated spoil on floodplain;
- Spread stored topsoil over excavated surfaces;
- Revegetate reconstruction in accordance with a Vegetation Management Plan to form a Vegetated Riparian Zone (VRZ);
- Maintain revegetation to ensure establishment (e.g. watering);
- Remove all works compounds and stockpiles;
- Monitor revegetation and sediment and erosion controls; and
- Removal of temporary sediment and erosion controls when monitoring determines that site is stable.

The Reconstruction may also require the closure of Wandobah Road for short periods of time to facilitate construction. Community access to the reconstruction site will be restricted for the duration of reconstruction.

Greater detail regarding the construction of the Reconstruction can be found in the *Blackjack Creek Riparian Corridor/Channel Reconstruction - Detailed Design* (Constructive Solutions 2012), which is attached to the REF provided in **APPENDIX A**.

2.2 Alternatives to taking the proposed action

This should be a detailed description outlining any feasible alternatives to taking the proposed action (including not taking the action) that were considered but are not proposed (note, this is distinct from any proposed alternatives relating to location, time frames, or activities – see section 2.3).

Following the 1984 flood, Gunnedah Shire Council commissioned the design of a channel improvement scheme with the aim of containing floods up to the 100 year ARI. The resultant scheme involved the construction of a grassed floodway with a trapezoidal cross-section, with a low-flow concrete invert. This was not constructed. Since this time, there have been significant changes in legislation and 'best practice' management of waterways, with current practice being to consider creeks as functioning riparian zones that provide a variety of environmental benefits

in addition to flood conveyance. As such, any designs similar to the one previously proposed would not be considered acceptable by current standards.

The *Blackjack Creek Floodplain Risk Management Study and Plan* (Lyall and Associates 2010) investigated flood management measures under three broad categories – flood modification (e.g. structural measures such as levees and channel reconstructions), property modification (e.g. house raising, voluntary purchase, and development controls) and response modification (e.g. community awareness and flash flood warning system).

The following flood management measures were considered:

- Riparian corridor/channel reconstruction – hydraulic modelling showed that, in order to achieve flood mitigation to the desired level, the hydraulic capacity of Blackjack Creek would need to be increased substantially. Although economic analysis concluded that the reconstruction would have a benefit/cost ratio of less than one, the social benefits of mitigating flooding in properties currently affected by flooding from Blackjack Creek were considered to improve the benefit/cost ratio;
- Management of vegetation and stream clearing – modelling showed that stream clearing would not result in a reduction in flood levels greater than approximately 200mm and would therefore not be a viable mitigation measure for major floods of Blackjack Creek. Additionally, the cost associated with ongoing maintenance of vegetation was considered economically unfeasible;
- Detention basins – 'offline' basins (located away from main stream) were considered not to be viable for Blackjack Creek due to the limited extent of the floodplain and the nature of existing landuse. A basin constructed across the creek would require a very large storage area, with investigated storage downstream of Lincoln Street having less than one third of the required storage capacity. As such, detention basins were not considered viable flood management measures for Blackjack Creek;
- Levees – hydraulic modelling showed that 100 year ARI flood levels would be increased by up to 330mm due to the constricting effects of a levee spanning a distance of 1,650m from Bando Street to 200m upstream of the Oxley Highway Bridge. Additionally, the levee would require facilities for temporary detention and subsequent release of approximately 40,000m^3 of stored runoff from protected areas. As there are no suitable sites available throughout the eastern residential area to achieve this storage and the levee would increase flood levels, it was not considered a viable flood management measure for Blackjack Creek;
- Voluntary purchase of residential property – the residential properties affected by flooding of Blackjack Creek are technically not located in high hazard areas, flooding is relatively shallow and of short duration, there is ready access eastwards to higher ground, voluntary purchase is not favoured by residents, and voluntary purchase of affected properties is not considered economically viable. As such, this is not considered a viable flood management measure for Blackjack Creek;
- House raising – raising of all residential properties potentially affected by 100 year ARI flooding is not considered economically viable, and raising properties of brick construction is considered technically difficult. These factors, combined with relatively shallow flooding of short duration and easy access eastwards to higher ground, resulted in the conclusion that house raising is not a viable flood management measure for Blackjack Creek;
- Planning controls – the implementation of appropriate flood planning levels and flood policy by Gunnedah Shire Council was investigated and it was concluded that existing levels and policy should be updated to reflect current understanding and information regarding flooding in Blackjack Creek. This has been completed to ensure any future development will be protected from flooding, however this does not represent a viable flood management measure for existing properties subject to flooding from Blackjack Creek;
- Flash flood warning system – the implementation of a flash flood warning system for the Blackjack Creek catchment was considered economically unviable, with the ephemeral nature of Blackjack Creek, the relatively short duration and shallow depth of flooding, and

the difficulties associated with forecasting a flash flood inducing rainfall event contributing to this conclusion. Although favoured by residents, the ongoing operation of such a system should structural mitigation be implemented was also considered economically unviable; and

- Flood awareness programs – it was ascertained that, as the community already has a high awareness of flooding, additional awareness programs would not have a significant impact. It was determined that notification of flood affectation on Section 149 Certificates for flood affected properties were an appropriate method of communicating flood potential. Additionally, the preparation of a FloodSafe brochure by Gunnedah Shire Council and the State Emergency Service was recommended.

Full details of each measure, including economic analysis, can be found in the *Blackjack Creek Floodplain Risk Management Study and Plan* (Lyall and Assocaites 2010) which concluded that planning controls and revision of flood policy for Blackjack Creek should occur, and that the riparian corridor/channel reconstruction warranted further consideration, with the *Blackjack Creek Riparian Corridor/Channel Reconstruction Concept Design and Feasibility Study* considered the appropriate next step.

The *Blackjack Creek Riparian Corridor/Channel Reconstruction - Channel Options Study* and *Blackjack Creek Riparian Corridor/Channel Reconstruction - Concept Design Report* were prepared by Constructive Solutions in 2012, based on the recommendations of the report *Use of Geophysical Methods to Delineate Salt Affected Areas for Channel Reconstruction in Wandobah Reserve, Gunnedah* (Department of Infrastructure, Planning and Natural Resources 2003), the report *Blackjack Creek Floodplain Risk Management Study and Plan* (Lyall and Associates 2010), and field survey. The recommendations drawn from these reports, including the channel alignment recommended, were combined to provide a channel alignment and width that would be capable of containing a 1 in 100 ARI rainfall event whilst not intercepting areas of high salinity.

As part of the detailed design process, and as a result of recommendations arising from specialist ecological assessment of the site, alternatives such as retention of current channel alignment, excavation to greater depths, enhancement of the existing levee, and variation of channel width, depth and alignment to retain established trees were considered. As a result of these considerations it was determined that:

- Retention of the current channel alignment will not allow for containment of a 1 in 100 ARI rainfall event and will therefore result in the continuation of flooding of residential properties east of Wandobah Road;
- Retention of the current channel alignment allows for ongoing scour to occur at stormwater outlets, with Wandobah Road being susceptible to undercutting near its intersection with George Street;
- Excavation to greater depths along the current alignment is not considered optimal, as there is potential to intercept groundwater;
- Enhancement of the existing levee will not allow for containment of a 1 in 100 ARI rainfall event and will therefore result in the continuation of flooding of residential properties east of Wandobah Road, with potential for an increase in flood heights as a result of the constricting effect of a levee; and
- Variation of the channel width, depth and alignment to retain established trees is not feasible due to the above considerations, with additional construction and maintenance issues associated with retention of large trees within the excavated creek channel.

As such, it was considered that the channel alignment, width and depth proposed in the *Blackjack Creek Riparian Corridor/Channel Reconstruction - Detailed Design* (Constructive Solutions 2012) provides the most favourable outcome with regards to balancing flood mitigation requirements with environmental considerations such as groundwater, salinity and vegetation.

2.3 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative time frames, locations or activities (in section 1.10) you must complete this section. Describe any alternatives related to the physical location of the action, time frames within which the action is to be taken and alternative methods or activities for undertaking the action. For each alternative location, time frame or activity identified, you must also complete (where relevant) the details in sections 1.2-1.9, 2.4-2.7, 3.3 and 4. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, time frames or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

There are no alternative locations, timeframes, or activities that form part of the referred action.

The Reconstruction is the culmination of extensive investigative work into the most appropriate flood mitigation measure for Blackjack Creek following the stages of the NSW government Flood Policy, with Stage 4 being the implementation of a Floodplain Risk Management Plan and the construction of the mitigation measures recommended in the Plan.

2.4 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (e.g. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

Statutory Planning

The *Environmental Planning and Assessment Act 1979* and its Regulations provide the framework for the assessment of environmental impact of activities in New South Wales. The REF provided in **APPENDIX A** provides an environmental assessment of the Reconstruction which has been prepared in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979*.

Section 6 of the REF provides consideration of the factors listed in Clause 228 of the *Environmental Planning and Assessment Regulation 2000*.

As Gunnedah Shire Council is a public authority, the Reconstruction is permissible without consent under the auspices of the *State Environmental Planning Policy (Infrastructure) 2007*, with Part 3, Division 7, Clause 50(1) stating:

> *"Development for the purpose of flood mitigation work may be carried out by or on behalf of a public authority without consent on any land."*

As Gunnedah Shire Council is a public authority, the Reconstruction is exempt from requirements relating to Controlled Activity Approvals under the *Water Management (General) Regulation 2011*, with Part 3, Division 2, Subdivision 4, Clause 38 stating:

> *"A public authority is exempt from section 91E (1) of the Act in relation to all controlled activities that it carries out, on or under waterfront land."*

Provisions of the *Native Vegetation Act 2003* with regards to the clearing of native vegetation do not apply to the Reconstruction as Gunnedah Shire Council is a determining authority that has complied with Part 5 of the EPA Act with regards to environmental assessment, with Part 3, Division 4, Clause 25 stating:

> *"This Act does not apply to the following types of clearing of native vegetation:*
>
> *(g) any clearing that is, or is part of, an activity carried out by a determining authority within the meaning of Part 5 of the EPA Act if the determining authority has complied with that Part."*

Local Planning Approval

The Reconstruction site is zoned RE1 – Public Recreation under the *Gunnedah Local Environmental Plan 2012*. Environmental protection works are permitted without consent under the provisions of this zone.

Licences and Approvals Required

As discussed above, the Reconstruction is exempt from requiring any Controlled Activity Approval under the *Water Management (General) Regulation 2011* and is exempt from the provisions of the *Native Vegetation Act 2003* with regards to the clearing of native vegetation.

Approval from the Commonwealth Minister for the Environment through the Department of Sustainability, Environment, Water, Populations and Communities (DSEWPAC) is required; as the Reconstruction will have a significant impact on the habitat of a Commonwealth listed threatened species (the Koala).

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.11) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.
Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

A Review of Environmental Factors (REF) in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* has been prepared for the Reconstruction. This REF is provided in **APPENDIX A**.

2.6 Public consultation (including with Indigenous stakeholders)

Your referral must include a description of any public consultation that has been, or is being, undertaken. Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral. Where appropriate include copies of documents recording the outcomes of any consultations.

Public consultation has been undertaken, and will continue to be undertaken, as part of the Reconstruction project.

Relevant stakeholders were contacted at Stage 1 and Stage 3 of the *Blackjack Creek Riparian Corridor/Channel Reconstruction Concept Design and Feasibility Study* and a website has been in operation throughout the duration of the Study. A community information day and public display of the Reconstruction design and REF will occur in concurrence with the referral process.

Due diligence has been completed for the Reconstruction, with no objects or places of Aboriginal heritage significance identified during this. Any Aboriginal stakeholders with an interest in the Reconstruction will be able to participate in the community information day. Gunnedah Shire Council has an established relationship with Aboriginal stakeholders in the Gunnedah region as a result of recent large developments in the Shire. This established relationship will facilitate any further communication with Aboriginal stakeholders that may be required as the Reconstruction progresses.

Details of the consultation process can be found in Section 5 of the REF provided in **APPENDIX A**.

2.7 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.12) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

The Reconstruction is not a staged development or a component of a larger project.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

3.1 (a) World Heritage Properties

Description

The EPBC Act Protected Matters database does not list any World Heritage Properties in the search area (polygon search of Wandobah Reserve with 1km buffer).

Nature and extent of likely impact

The Reconstruction will not affect any listed World Heritage listed values of any World Heritage Properties.

3.1 (b) National Heritage Places

Description

The EPBC Act Protected Matters database does not list any National Heritage Places in the search area (polygon search of Wandobah Reserve with 1km buffer).

Nature and extent of likely impact

The Reconstruction will not affect any National Heritage values of any National Heritage Place.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The EPBC Act Protected Matters database does not list any Wetlands of International Importance (Ramsar wetlands) in the search area (polygon search of Wandobah reserve with 1km buffer)

Nature and extent of likely impact

The Reconstruction will not affect any listed Wetlands of International Importance.

3.1 (d) Listed threatened species and ecological communities

Description

The EPBC Act Protected Matters database search (**APPENDIX C**) shows that there are 21 threatened species (13 fauna and 8 flora) that have potential to occur in the search area (polygon search of Wandobah Reserve with a 1 km buffer):

1. Regent Honeyeater *Anthochaera phrygia* [82338] Endangered Species;
2. Squatter Pigeon (southern) *Geophaps scripta scripta* [64440] Vulnerable Species;
3. Swift Parrot *Lathamus discolour* [744] Endangered Species;
4. Malleefowl *Leipoa ocellata* [934] Vulnerable Species;
5. Superb Parrot *Polytelis swainsonii* [738] Vulnerable Species;
6. Australian Painted Snipe *Rostratula australis* [77037] Vulnerable Species;
7. Murray Cod *Maccullochella peelii* [66633] Vulnerable Species area;
8. Booroolong Frog *Litoria booroolongensis* [1844] Endangered Species;
9. Large-eared Pied Bat *Chalinolobus dwyeri* [183] Vulnerable Species;
10. South-eastern Long-eared Bat *Nyctophilus corbeni* [83395] Vulnerable Species;
11. Brush-tailed Rock-wallaby *Petrogale penicillata* [225] Vulnerable Species;
12. Koala *Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT) [85104] Vulnerable Species;
13. Pink-tailed Worm-lizard *Aprasia parapulchella* [1665] Vulnerable Species;
14. Finger Panic Grass *Digitaria porrecta [12768]* Endangered Species;
15. *Euphrasia arguta* [64942] Critically Endangered Species;
16. *Philotheca ericifolia* [64942] Vulnerable Species;
17. A leek-orchid *Prasophyllum sp. Wybong* (C.Phelps ORG 5269) [81964] Critically Endangered Species;
18. Cobar Greenhood Orchid *Pterostylis cobarensis* [12993] Vulnerable Species;
19. Slender Darling-pea *Swainsona murrayana* [6765] Vulnerable Species;
20. Austral Toadflax *Thesium australe* [15202] Vulnerable Species; and
21. *Tylophora linearis* [55231] Endangered Species.

The following EPBC listed threatened species are known to occur within the Reconstruction Site.

1. Koala *Phascolarctos cinereus*

   The town of Gunnedah is known to support a key population of Koalas.

There are several methods of determining the importance of Koala habitat derived from Phillips (2000b), Callaghan (unpublished) and the *State Environmental Planning Policy No. 44 Koala Habitat Protection* (SEPP 44). As noted in the Approved Recovery Plan: Recovery Plan for the Koala (DECC 2009), however these are not the only available options and neither may these be appropriate in all circumstances.

The Approved Draft Recovery Plan for the Koala (DECC 2008) provides lists of koala food trees categorised as primary, secondary and supplementary within Koala Management Areas (KMAs). Primary food trees exhibit a level of use that is significantly higher than that of other Eucalyptus species and is independent of tree density. The Gunnedah LGA is within KMA 6: Western Slopes and Plains. Bimble Box *E. populnea*, Yellow Box *E. melliodora*, White Box *E. albens*, Blakely's red gum *E. blakelyi* (all found in the Reconstruction Site and adjacent areas) are a listed as a secondary food source in this area. Categorising Koala habitat as per Phillips (2000b) the Reconstruction Site is classed as Secondary habitat (class A):

> *"Primary food tree species present, usually (but not always) growing in association with one or \ more secondary food tree species. Capable of supporting medium density koala populations (≥ 0.10 koala/ha but < 0.75 koala/ha)."*

Categorising Koala habitat as per Callaghan (unpublished) the Reconstruction Site is also classed as Secondary habitat (class A):

> *"Areas of forest or woodland where secondary food tree species alone comprise at least 50% of the overstorey trees (primary koala food tree species absent). Capable of supporting high to medium-density koala populations."*

The State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44) aims "to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline". Although SEPP 44 does not apply in relation to the assessment of development under Part 5 of the EP&A Act, it still requires a degree of consideration. SEPP 44 requires that before granting development consent under Part 4 of the EP&A Act for development on land over 1 hectare in area, a consent authority must form a view as to whether the land is "potential"' or "core" Koala habitat. Potential koala habitat is defined as:

> *"Areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15 per cent of the total number of trees in the upper or lower strata of the tree component."*

Core Koala habitat is defined as:

> *"An area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population."*

Where core Koala habitat is found to occur, SEPP 44 requires that a site-specific Koala plan of management (KPoM) be prepared.

The Gunnedah LGA is listed under Schedule 1 – Local Government Areas of State Environmental Planning Policy No 44 (SEPP 44) – Koala Habitat Protection and is well known to support a population of Koalas being the self-proclaimed 'Koala Capital of the World.' Furthermore, Poplar Box (*Eucalyptus populnea*) and White Box (*Eucalyptus albens)* recorded in the Reconstruction Site are listed 'feed tree' species identified in Schedule 2 of SEPP 44. One Koala was observed in the Cemetery immediately adjacent to the Study Area during the field survey undertaken as part of the ecological assessment. Evidence of Koalas, including multiple database records in the locality, scats and scratches on tree trunks was observed on the majority of trees in the Study Area.

Thus the Reconstruction Site has been assessed as being 'Core Koala habitat' and identified as an important wildlife corridor (not only for the Koala) facilitating movement within / between urban areas, remnant bushland and the Namoi River (OzArk 2012). The Study Area is considered to be a 'High Use Activity' area for Koalas (TSC and EPBC Act) with evidence of Koala use at 22 of the 37 koala habitat trees within Wandobah Reserve in the Study Area. This is a density of 59 per cent as per the SAT technique (Phillips & Callaghan, 1995). One mature male Koala was recorded within the Cemetery, immediately adjacent to the Study Area. According to locals, Koalas have recently moved away from the town area. Whether this is a seasonal or local movement has not yet been ascertained, however many of the scats found in the Study Area appeared to be within a week to fortnight old with no fresh scats located. Recent collar radio-tracking of koalas undertaken by Crowther did not result in the tracking of any koalas in the Reconstruction Site although some were tracked moving into town from the Gunnedah Resource Centre (Crowther pers. comm. 2013). Ongoing research by Crowther indicates that koalas have occurred in the Reconstruction site in the past (Crowther pers. comm. 2013 – see Figure 1). This is confirmed by the Office of Water and Heritage (OEH) Bionet records in the Reconstruction Site (see Figure 2) and by evidence on trees (scats and scratches) in addition to the positive identification of a male Koala. This information confirms that habitat in the Reconstruction Site is used by the local Koala population.

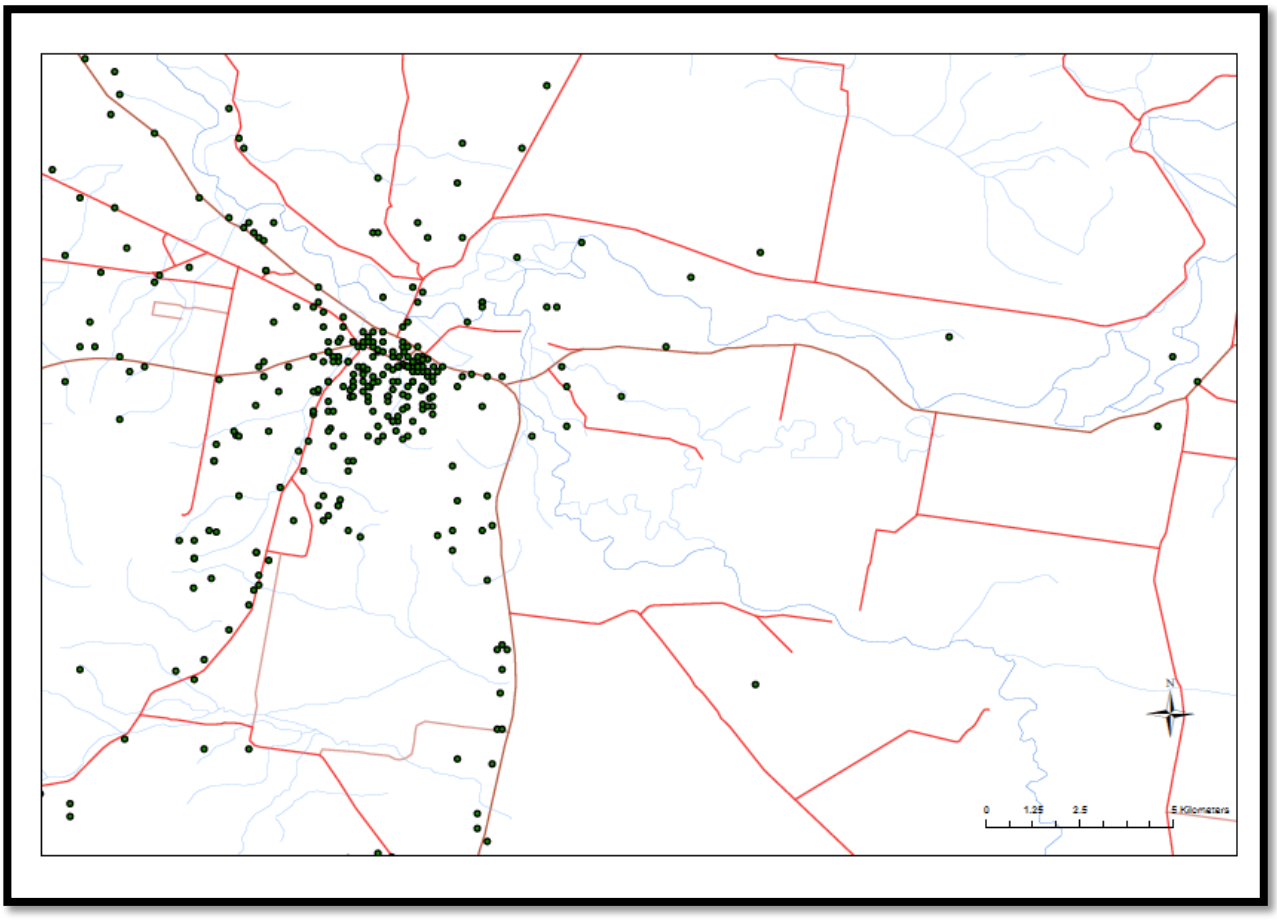

Figure 1: Koala distribution in the Gunnedah locality (Crowther pers. comm. 2013).

Figure 2: Bionet/Wildlife Atlas Recorded Flora & Fauna, Namoi CMA Liverpool Plains (Part B) subregion (Base map source: © Google Earth)

2. Grey-headed Flying Fox *Pteropus poliocephalus*

   Approximately 20 Grey-headed Flying Fox were recorded drinking from pooled water in Blackjack Creek during the nocturnal assessment. It is possible that the nectar and pollen of Eucalyptus, Melaleuca and Banksia recorded in the Study Area are also used for feeding.

Further species considered to have potential to occur in the Reconstruction Site but not observed during the field survey include the following:

1. South-eastern Long-eared Bat *Nyctophilus corbeni.* Although not recorded, suitable habitat for this species may occur in the Study Area. No known important population of this species is known to occur in the Reconstruction Site;

2. Swift Parrot *Lathamus discolour* has been previously been recorded within a 5 kilometre radius of the Reconstruction Site;

3. Spotted-tailed quoll *Dasyurus maculatus* has been previously been recorded within a 1 kilometre radius of the Reconstruction Site; and

4. Lobed Blue-grass Bothriochloa biloba has been previously been recorded within a 1 kilometre radius of the Reconstruction Site.

The EPBC Act Protected Matters database search (**APPENDIX C**) shows that there five threatened ecological communities (TECs) that have potential to occur in the search area (polygon search of Wandobah Reserve with a 1 km buffer):

1. Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions Endangered Community may occur within area;

2. Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia Endangered Community may occur within area;

3. Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland Critically Endangered Community likely to occur within area;

4. Weeping Myall Woodlands Endangered Community may occur within area; and

5. White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Community likely to occur within area.

No TECs were recorded in the Reconstruction Site.

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

Koala

An Assessment of Significance has shown that the Action is likely to impact habitat within 'Core Koala habitat' that has the potential to significantly impact a regionally significant (Crowther et al. 2009) koala population and contribute towards its decline.

Koalas within the Reconstruction Site are considered to be part of an *important population*. The removal of 'feed trees' (as listed under SEPP 44 and Koala Recovery Plan), including mostly large trees that are preferred by the koala, is considered likely to disrupt an *important population*. The Proposal will result in the removal of approximately 30 to 37 identified koala habitat trees (evidenced by koala scratches and scats) and 'feed trees' with multiple small, medium and large hollows.

Although the Gunnedah population of koalas is considered to survive in fragmented or isolated habitats, they are also subject to a swathe of threats (including urban development, vehicle strikes, heatwaves and climate change). Habitat removal within 'Core Koala Habitat' including old large 'feed trees' is a contributing factor to their decline.

In the context of koala habitat connectivity, Wandobah Reserve is considered to have interconnecting habitat with other 'Core Koala Habitat' within the locality. The trees in the impact footprint are also considered to form part of a movement corridor connecting with habitat along the Namoi River and vegetated hills and ridgelines south of Gunnedah. Thus removal of this vegetation may reduce or sever the exchange of individuals within sub-populations or restrict movements to other core habitat along the Namoi River. It should be noted that local roads and the highway also transect this movement corridor. Removing these trees within the creek will reduce koala habitat and may increase periods of exposure on the ground (potentially indirectly increasing Koala mortality) between remnants or isolated trees.

Grey-headed Flying Fox

An Assessment of Significance showed that the Action will not significantly impact on a local population of the Grey-headed Flying fox (*Pteropus poliocephalus*). Although a small group was noted in the Reconstruction Site drinking from pooled water in Blackjack Creek, other water sources are located in proximity (i.e. the Namoi River). Due to the mobile nature of this species, the Action cannot be considered as a Significant Impact.

South-eastern Long-eared Bat

An Assessment of Significance showed that the Action will not significantly impact on a local population of the South-eastern Long-eared Bat *Nyctophilus corbeni.* Impacts would occur to old hollow bearing trees with suitable nesting/roosting hollows. Due to the mobile nature of this species and absence of a known local population, the proposal is unlikely to impact this species.

Swift Parrot

An Assessment of Significance showed that the Action will not significantly impact on local populations of the Swift Parrot. The Swift Parrot is migratory and does not have breeding habitat within the Study Area or mainland Australia. One record for the Swift Parrot exists approximately 4 km south-west of the Study Area. An Assessment of Significance showed that the Action will not

significantly impact on local populations of the Swift Parrot.

Threatened Ecological Communities

None

Other Species

With respect to the Reconstruction Site, the majority of those species known to occur in the Gunnedah LGA or EPBC Act Protected Matter database search will remain unaffected by Proposal. A few EPBC listed species that have the potential to occur in the Study Area require further comment.

1. The Australian painted snipe, *Rostratula benghalensis*. This species has potential to occur within areas of riparian vegetation along Blackjack Creek and semi-permanent shallow wetland areas formed during inundation. The impact would not affect the likelihood of this species to occur. Further assessment is currently not warranted, however, if transient individuals were to be recorded then regular population monitoring should occur.

2. Spotted tailed quoll, *Dasyurus maculatus maculatus*. This species has not been detected in the Reconstruction Area and is likely to remain unaffected. Although there is an abundance of suitable large hollow bearing trees, the lack of dead and down timber and ground disturbance most likely precludes this species form the Study Area. Further assessment is not required.

3. The Regent Honeyeater *Anthochaera phrygia* is nomadic and highly mobile, capable of travelling large distances. Whilst it is possible that foraging habitat is available in the Study Area, preferred sites (Ironbark-Box Woodland) are located elsewhere. There is no known local population of Regent Honeyeaters in the Reconstruction Site. Only vagrant / migrating birds have a limited potential to occur in the Reconstruction Site during the non-breeding season. An Assessment of Significance showed that the Action will not significantly impact on local populations of the Regent Honeyeater.

4. The Superb Parrot *Polytelis swainsonii* is also highly mobile, capable of travelling large distances. Only vagrant / migrating birds have a limited potential to occur in the Reconstruction Site during the non-breeding season. An assessment of significance showed that the Action will not significantly impact on a local population of the Superb Parrot as no location population has been identified as occurring in the Gunnedah locality.

5. Lobed Blue-grass *Bothriochloa biloba* was not recorded during the field survey in the Reconstruction Site. It is not considered likely to occur as a result of previous disturbance and regular mowing undertaken within Wandobah Reserve.

3.1 (e) Listed migratory species

Description

The EPBC Act Protected Matters database shows that there are 13 migratory species with habitat in the search area (polygon search of Wandobah Reserve with a 1 km buffer) which thus have the potential to occur in the Reconstruction site.

Migratory Marine Species:

1. Fork-tailed Swift [678] *Apus pacificus;*
2. Great Egret, White Egret [59541] *Ardea alba;*
3. Cattle Egret [59542] *Ardea ibis;*

Migratory Terrestrial Species:

4. White-bellied Sea-Eagle [943] *Haliaeetus leucogaster;*
5. White-throated Needletail [682] *Hirundapus caudacutus;*
6. Malleefowl [934] *Leipoa ocellata;*
7. Rainbow Bee-eater [670] *Merops ornatus;*
8. Satin Flycatcher [612] *Myiagra cyanoleuca;*
9. Regent Honeyeater [430] *Xanthomyza phrygia;*

Migratory Wetlands Species:

10. Great Egret, White Egret [59541] *Ardea alba;*
11. Cattle Egret [59542] *Ardea ibis;*
12. Latham's Snipe, Japanese Snipe [863] *Gallinago hardwickii; and*
13. Painted Snipe [889] *Rostratula benghalensis (sensu lato).*

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

Migratory Wetland Species have potential to occur within areas of riparian vegetation along Blackjack Creek and semi-permanent shallow wetland areas formed during inundation. Migratory Terrestrial Species have potential to occur and utilise habitat in the Reconstruction Area sporadically during times of migration. The Rainbow Bee-eater is considered to have a low potential to breed in the Reconstruction Site given there are more suitable sites located nearby (i.e deep sandy river banks associated with the Namoi River). Mitigation measures will ensure that breeding sites (should they occur) will remain unaffected.

Predicted impacts will not detrimentally alter habitat such that any listed migratory species would have the potential to occur at less densities / frequency than currently experienced.

3.1 (f) Commonwealth marine area
(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description
There are no Commonwealth marine areas in the Reconstruction site.

Nature and extent of likely impact

No impact will occur to any Commonwealth marine areas as a result of the Reconstruction.

3.1 (g) Commonwealth land
(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description
If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

Although two listed Commonwealth lands occur as listed in the EPBC Protected Matters database search (**APPENDIX C**), these are outside the Reconstruction site. The listed Commonwealth lands are:

- Australian Telecommunications Commission; and
- Commonwealth Bank of Australia.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:
- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

No impact will occur to Commonwealth lands as a result of the Reconstruction.

3.1 (h) The Great Barrier Reef Marine Park

Description

The Great Barrier Reef Marine Park does not occur anywhere near the Reconstruction site.

Nature and extent of likely impact

Address any impacts on any part of the environment of the Great Barrier Reef Marine Park.

No direct or indirect impact occurring as a result of the Reconstruction is considered likely to impact the Great Barrier Reef Marine Park.

Note: If your action occurs in the Great Barrier Reef Marine Park you may also require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If so, section 37AB of the GBRMP Act provides that your referral under the EPBC Act is deemed to be an application under the GBRMP Act and Regulations for necessary permissions and a single integrated process will generally apply. Further information is available at www.gbrmpa.gov.au

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3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area;
- will be taken on Commonwealth land; or
- will be taken in the Great Barrier Reef marine Park.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	**Is the proposed action a nuclear action?**	No	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	No	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	No	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))		

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	No	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))		

3.2 (e)	**Is the proposed action to be taken in the Great Barrier Reef Marine Park?**	No	No
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))		

3.3 Other important features of the environment

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

3.3 (a) Flora and fauna

A specialist ecological assessment of the site was undertaken by OzArk Environment and Heritage Management Pty Ltd in 2012 in accordance with OEH's Environmental Impact Assessment requirements. The specialist ecological assessment is attached as Appendix H of the REF provided in **APPENDIX A**.

The ecological assessment concluded that:

- The Study Area has been extensively modified (vegetation clearing and levee construction), disturbed (weed encroachment, rubbish dumping, and garden clipping disposal), and cleared within the southern extent for cropped paddocks;
- 111 species of vascular flora from 37 families were recorded in the Study Area during the field survey;
- Of these, 60 species are non-native, including 6 species of listed Noxious Weeds of which one species is a Weed of National Significance;
- No threatened flora, populations, or endangered ecological communities listed under the *Threatened Species Conservation* (TSC) or *Environment Protection and Biodiversity Conservation* (EPBC) Acts were recorded in the Study Area;
- The Reconstruction will result in the removal of 30-37 identified habitat trees with medium and high habitat values, which are considered to be a declining and rare resource within the landscape;
- The Reconstruction will result in the removal of additional non-hollow bearing trees and shrubs within the impact footprint that, while planted, still provide valuable habitat and flowering resources for threatened fauna;
- 61 species of terrestrial fauna from 31 families were recorded in the Study Area during the field survey;
- The abundance of honeyeaters recorded during the field survey is likely to be a result of the flowering resources in the Study Area at that time;
- No amphibians were heard calling or detected in Blackjack Creek. This may be an indication of unsuitable creek conditions for amphibian habitat;

- It is considered likely that further species of fauna may occur in the Study Area as a result of the habitat present, however they were not detected during the field surveys;

- Three species of threatened fauna were recorded in the Study Area, including the Koala (TSC and EPBC Acts), Little Lorikeet (TSC Act) and Grey-headed Flying Fox (TSC and EPBC Acts) – Figure 3;

- Hollow dependent threatened microbats and threatened owls (Masked Owl and Barking Owl) are assumed to be present in the Study Area based on the variety and number of suitable hollows present and proximity to the Namoi River[1];

- The Study Area is considered to be a 'High Use Activity' area for Koalas (TSC and EPBC Acts) with evidence of Koala use at 22 of the 37 trees within the impact footprint of the Reconstruction. This is a density of 59% as per the Spot Assessment Technique, with one mature male Koala recorded in the Cemetery adjacent to the Study Area;

- The Koala would be significantly affected by the Reconstruction as it will have a significant impact on Core Koala Habitat; and

- No other threatened fauna species will be significantly impacted by the Reconstruction.

[1] Due to extreme winds during the nocturnal assessment call-playback was unsuccessful.

Figure 3: Location of threatened flora and fauna recorded during the ecological assessment.

3.3 (b) Hydrology, including water flows

Blackjack Creek is an ephemeral creek which is subject to flows only during periods of high rainfall. Flooding generally occurs as flash floods with quickly rising levels. Hydrology for Blackjack Creek in its existing condition was investigated in the *Blackjack Creek Flood Study* (Lyall and Associates 2005), and subsequently verified by Constructive Solutions in 2012 as part of the *Blackjack Creek Riparian Corridor/Channel Reconstruction Channel Options Study*. The modelling completed by Lyall and Associates determined that flows up to the 5 year ARI magnitude would be conveyed within the existing Blackjack Creek channel and its immediate vicinity under current conditions. However, at flows equal and greater than the 20 year ARI magnitude, floodwaters would extend to a width greater than 400m over the floodplain downstream of High Street, break the right bank of the creek upstream of McAndrew park, and enter the residential area north of High Street.

The groundwater table in the vicinity of Blackjack Creek is quite high and subject to seasonal variation. Groundwater depths were investigated as part of the *Blackjack Creek Riparian Corridor/Channel Reconstruction Concept Design Report* (Constructive Solutions 2012), with 5 piezometers installed along the length of the proposed Reconstruction to facilitate monitoring throughout construction and post-site stabilisation.

Groundwater and surface water characteristics are described in detail in Section 6.2 of the REF provided in **APPENDIX A**.

3.3 (c) Soil and Vegetation characteristics

Wandobah Reserve has been the subject of extensive investigations to delineate salinity levels, with the report *Use of Geophysical Methods to Delineate Salt Affected Areas for Channel Reconstruction in Wandobah Reserve Gunnedah, NSW* (Department of Infrastructure, Planning and Natural Resources 2003) providing guidance as to where to locate the channel reconstruction in order to avoid mobilising salt. The results of this report were used to guide the design of the Reconstruction, with the channel alignment generally following areas determined to have lower salinities. Additional assessment of soil was carried out as part of the *Blackjack Creek Riparian Corridor/Channel Reconstruction Concept Design Report* (Constructive Solutions 2012). Soil profiles completed as part of this determined that the soil profile mostly comprises of medium to heavy red brown clays with some calcite, sand and gravel throughout. Greater detail is provided in Section 6.3 of the REF provided in **APPENDIX A**.

3.3 (d) Outstanding natural features

Large multiple hollow bearing Poplar Box (*Eucalyptus Bimbil*) and Yellow Box (*Eucalyptus melliodora*) that line portions of Blackjack Creek within the Reconstruction Site are considered a rare natural feature and declining resource within the landscape.

The Reconstruction site does not have any other outstanding natural features, as it has been heavily modified, disturbed and cleared.

3.3 (e) Remnant native vegetation

The Reconstruction site has been extensively modified (vegetation clearing, levee construction), disturbed (weed encroachment, rubbish dumping, garden clipping disposal) and cleared to the south for cropped paddocks. Remnant vegetation in the Study Area is consistent with Biometric vegetation ID NA185 '*Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)'*. This is consistent with the RVC 80 '*Poplar Box grassy woodland on alluvial clay soils, Brigalow Belt South and Nandewar'* (OzArk Environmental & Heritage Management 2012).

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

Blackjack Creek currently has a very shallow gradient with an average of 0.8% over its length from Lincoln Street to the Oxley Highway. This very shallow gradient will remain unaffected by the Reconstruction.

Excavation depths range from 0.2m to 2.3m. Greater details of the proposed gradient and excavation depths can be found in the detailed design included in Appendix A of the REF provided in **APPENDIX A**.

3.3 (g) Current state of the environment

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

Blackjack Creek traverses Wandobah Reserve and the private properties of 'Fermanagh' and 'Balmoral' in Gunnedah NSW. Wandobah Reserve is a Gunnedah Shire Council recreational area which has been heavily modified by previous vegetation clearing, flood events, flood mitigation works, and revegetation activities. Blackjack Creek consists of a grassed channel for the majority of Wandobah Reserve, with a deeper, narrower channel present at the upstream section in the southern section of Wandobah Reserve.

'Fermanagh' and 'Balmoral' are agricultural properties which have been heavily modified for cropping and grazing purposes, with extensive vegetation clearing surrounding Blackjack Creek. The riparian zone is unfenced for both properties. Cropping and grazing, on 'Fermanagh' and 'Balmoral' respectively, occur right up to the banks of Blackjack Creek. The creek itself is poorly defined and very shallow throughout these properties.

Some erosion is evident at existing stormwater outlets; however the site is generally well covered with grasses.

Six species of noxious weed have been identified within the Reconstruction site as part of the ecological assessment undertaken for the REF. Feral animals were not noted as an issue in the ecological assessment; however mitigation measures to discourage feral animals (such as waste being appropriately disposed of to discourage foxes) are included in the REF.

Blackjack Creek has a historical record of floods exceeding the 20 year ARI magnitude, including those in 1984, 2008 and 2010. During these events, flooding of the residential area north of High Street to the east of Wandobah Road has occurred.

Modelling completed by Lyall and Associates in 2005, and subsequently verified by Constructive Solutions in 2012, determined that flows up to the 5 year ARI magnitude would be conveyed within the existing Blackjack Creek channel and its immediate vicinity under current conditions. However, at flows equal and greater than the 20 year ARI magnitude, floodwaters would extend to a width greater than 400m over the floodplain downstream of High Street, break the right bank of the creek upstream of McAndrew park, and enter the residential area north of High Street.

It was determined that 104 properties would be subject to above-floor flooding of up to 0.9m during a flood at the 100 year ARI magnitude, with flood damages predicted to be $3.45 million (Lyall and Associates 2010).

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

There are no Commonwealth Heritage Places or other places recognised as having heritage values located in or near the Reconstruction site. A search of the New South Wales heritage

register identified one heritage item for the Gunnedah Shire Council Local Government Area. This item is the Gunnedah Railway Station Group, which is not located within the Reconstruction site and will not be impacted by the Reconstruction.

It is noted that, given the historical patterns of European settlement within the Gunnedah region, there is some potential for remnants of original farm houses, watering points such as windmills, or other agriculturally-related items to occur which could potentially be disturbed by construction of the Reconstruction. However, it is considered that, given the well-represented nature of such items throughout Gunnedah and other Local Government Areas, any disturbance of such items as a result of the Reconstruction will not result in a significant negative impact to European heritage values in Gunnedah.

3.3 (i) Indigenous heritage values

A search of the *Aboriginal Heritage Information Management System* (AHIMS) dated 23 April 2012 showed that there are no Aboriginal sites or places located in or near the Reconstruction site.

Several site features result in the consideration that it is highly unlikely that any Aboriginal objects or places would be found within the Reconstruction site. These include:

- The highly modified nature of the Reconstruction site, particularly through the southern extent where vegetation clearing, cultivation and grazing has previously disturbed the soil;
- The highly disturbed nature of the Reconstruction site, with historical flooding events previously disturbing the soil; and
- The presence of a permanent water source (the Namoi River) to the north of the Reconstruction site, with the ephemeral nature of Blackjack Creek being less suitable for historical utilisation.

3.3 (j) Other important or unique values of the environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

There are no national parks, conservation reserves, wetlands of national significance, or other important environmental value which will be affected by or an in close proximity to the Reconstruction. However, as noted in the ecological assessment (OzArk Environmental and Heritage Management 2012) completed as part of the REF provided in **APPENDIX A**, the Reconstruction site has the potential to act a wildlife corridor from south to north for fauna travelling from habitat areas located to the south to the Namoi River to the north of the Reconstruction site.

3.3 (k) Tenure of the action area (eg freehold, leasehold)

'Balmoral' and 'Fermanagh' are freehold properties which are not currently owned by Gunnedah Shire Council. As part of the Reconstruction process, Gunnedah Shire Council will undertake the necessary acquisition process for the sections of these properties that form part of the Reconstruction. Informal discussions with the landholders have commenced.

Wandobah Reserve is Crown Land, with Gunnedah Shire Council being the trustee.

3.3 (l) Existing land/marine uses of area

Wandobah Reserve is currently used a public recreation area. The sections of 'Fermanagh' and 'Balmoral' which are part of the proposed Reconstruction as currently utilised for agricultural purposes such as cropping and grazing.

3.3 (m) Any proposed land/marine uses of area

The entire Reconstruction site is zoned RE1 – Public Recreation under the Gunnedah Local Environmental Plan 2012. There are no other proposed land uses of the area.

4 Measures to avoid or reduce impacts

Note: If you have identified alternatives in relation to location, time frames or activities for the proposed action at Section 2.3 you will need to complete this section in relation to each of the alternatives identified.

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:
- what the measure is,
- how the measure is expected to be effective, and
- the time frame or workplan for the measure.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

Provide information about the level of commitment by the person proposing to take the action to implement the proposed mitigation measures. For example, if the measures are preliminary suggestions only that have not been fully researched, or are dependent on a third party's agreement (e.g. council or landowner), you should state that, that is the case.

Note, the Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided on the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:
- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, if your proposal proceeds to these stages).

It should be noted that under the EPBC Act Environmental Offsets Policy (DSEWPaC October 2012) the minimum (90%) direct offset requirement have been met for the Protected Matter Attributes *Area of Habitat* and *Koala Feed Trees*.

The following table provides a summary of the mitigation measures proposed for the Reconstruction, as per the REF provided in **APPENDIX A**.

Table 1 – Proposed mitigation measures

Category	Mitigation Measure
Air	• Staged clearing of vegetation ahead of construction to minimise area of exposed soil; • Regular watering of areas of active construction and exposed soil; • Establishing appropriate vegetative cover over disturbed areas following channel reconstruction in accordance with Reconstruction Vegetation Plan; • Assessment of daily meteorological conditions to ensure that any dust generating activities are halted during unfavourable

Category	Mitigation Measure
	conditions; • Regular servicing of vehicles and machinery in accordance with manufacturer specifications; and • Ensuring vehicles are not left idling for extended periods of time.
Water	• Construction according to design; • Groundwater Monitoring Plan; • Installation of protective materials according to design; and • Erosion and Sediment Control Plan.
Soils and Geology	• Erosion and Sediment Control Plan; and • Vegetation Management Plan.
Noise and Vibration	• Undertaking construction between the hours of 7am-6pm Monday to Friday and 8am-1pm on Saturday; • Notifying affected residents prior to undertaking any activities which produce high noise levels; • Ensuring vehicles are not left idling for extended periods of time; • Fitting of residential class mufflers to all vehicles and machinery, where possible; and • Regular servicing of vehicles and machinery in accordance with manufacturer specifications.
Traffic and Transport	• Implementation of suitable traffic control procedures to prevent unnecessary traffic impacts and related road safety issues; • Signage in accordance with GSC Workplace Health and Safety requirements informing passers-by of the construction works; and • Ensuring, where possible, that transport of heavy machinery, construction equipment and other construction items is conducted outside of peak flow times.
Flora	• Areas of vegetation to be cleared should be clearly marked with high visibility tape to ensure that accidental clearing does not occur; • Tree clearing should be undertaken with care, in accordance with details provided in Section 6.7; • Best practice weed management practices should be in place to prevent the transfer of weed seeds and vegetative materials, with all measures to be implemented prior to commencement of construction and maintained throughout the duration of construction and site stabilisation; • Any herbicides used should be waterway friendly, as per Department of Primary Industries guidelines; • An Erosion and Sediment Control Plan should be implemented and maintained for the duration of construction

Category	Mitigation Measure
	and site stabilisation; • Progressive rehabilitation of the Study Area upon completion of construction of each section; • Retention of top soil in order to maintain a viable seed bank, with topsoil to be used in rehabilitation. Soil should be respread as soon as possible after excavation in order to maximise fertility, seed viability and microbial activity; • Exposed ground should be sprayed with native grass seeds, as per the Vegetation Management Plan; and • Rehabilitation of the creek in accordance with the Vegetation Management Plan.
Fauna	• A Koala Plan of Management should be prepared and rehabilitation should include proposals to enhance and expand Core Koala Habitat, with direction on successful revegetation for the Koala in the Gunnedah area to be drawn from Crowther *et al*. 2010; • As part of the Koala Plan of Management a site induction of all site personnel should occur to ensure that Koalas are protected in the Reconstruction site; • Prior to any tree clearing, care should be taken to identify nests and/or roosting sites and/or threatened species, including: ○ A pre-clearing check of hollow bearing trees in the impact footprint to identify breeding sites of threatened species; ○ Inspection of trees prior to pushing or felling to ensure nests are vacant, with pushing or felling to occur immediately after inspection; ○ If a bird is present in a nest, trees surrounding it should be cleared first to encourage dispersement. If the bird is nestling, all feasible measures should be taken to collect the bird and remove it to a safe location, including contacting local WIRES representatives; and ○ Thorough inspection of all trees to be trimmed or removed for the presence of Koalas or other fauna immediately prior to clearance; ○ A suitably qualified person able to identify Koalas will ensure that no Koalas are located in trees to be felled or pruned. Searches will be conducted prior to every tree removal and overseen and checked off by the GSC project manager. Where a Koala is present in a tree to be felled or pruned, it will be allowed to move out of the tree of its own accord, generally overnight; ○ Logs with hollows from felled trees may be scattered throughout the Reconstruction site to provide additional habitat; • To reduce the risk of vehicular strikes with any Koalas as a result of the increased traffic movements and heavy

Category	Mitigation Measure

	equipment associated with the Reconstruction all vehicles and machinery will be speed limited to a maximum of 20km/h within the Reconstruction site;
	• Appropriate fire hazard reduction controls will be implemented, including the carrying of fire extinguishers on vehicles and machinery;
	• Construction works should occur outside the spring breeding period for most hollow dependent fauna and outside the Rainbow Bee-eater breeding season between November and January;
	• All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent the provision of forage habitat for foxes, rats, dogs and cats;
	• Any herbicides used should be waterway friendly, as per Department of Primary Industries guidelines;
	• An Erosion and Sediment Control Plan should be implemented and maintained for the duration of construction and site stabilisation;
	• Replication of a natural riparian system in the restored areas should be implemented throughout the Reconstruction; and
	• The following Biodiversity Offsets should be implemented:
	  ○ Habitat values of hollow bearing trees are to be replaced at a 1:1 ratio with nest boxes suitable for large owls, rosella/grass parrots, Brown Treecreepers and microbats. These nest boxes:
	  ▪ Are to be maintained until plantings reach a suitable size;
	  ▪ Should be placed in adjacent appropriate habitat as identified in consultation with the National Parks and Wildlife Service;
	  ○ Primary feed trees for Koala in the Gunnedah locality should be planted at a ratio of 1:10, with plantings aimed at linking existing remnant vegetation through the use of corridors, in partnership with existing recovery plans and Namoi revegetation programs;
	  ○ Impacted vegetation of the Poplar Box grassy woodland or Box-Gum Woodland communities should be offset with plantings at a 1:1 ratio; and
	• Rehabilitation of disturbed areas and riparian vegetation will occur along the length of Blackjack Creek in the Reconstruction site. Trees to be planted as part of the riparian rehabilitation will include River Red Gum (Eucalyptus camaldulensis), a preferred Koala feed tree.

Heritage	• Establishment of 'no go' areas for all non-essential construction areas, with no excavation to occur outside the propped reconstruction; • Ensuring construction staff or contractors are made aware of potential for objects of Aboriginal cultural heritage significance to occur on site as part of the site induction

Category	Mitigation Measure
	process; • Minimise, where possible, vehicle access to the site, with works compound, parking areas and stockpiling areas to be clearly designated; and • If any objects of potential Aboriginal cultural heritage significance are found during soil disturbance, work must cease immediately and the OEH Aboriginal Heritage Planning Officer at Dubbo must be contacted.
Chemical and Hazardous Substance Management	• Using any chemical or hazardous substance on site in accordance with safe handling practices, including provisions of any relevant Material Safety Data Sheets; • Storage of any chemicals or hazardous substances in accordance with safe handling practices, including being stored in a bunded area and removed from site when not in use; • Ensuring that a chemical spill kit is kept on site at all times; and • Locating any works compound at least 40m from any drainage line, including Blackjack Creek.
Contaminated Land	• If potential contamination is encountered during construction, undertake appropriate testing and remediation, as necessary
Visual Impacts	• Locating stockpiles and works compounds, where possible, in areas away from roads and out of the line of sight of any nearby residents or passers-by; • Removing vehicles and machinery from site when not in use; • Implementing and maintaining appropriate erosion and sediment control in accordance with Erosion and Sediment Control Plan; and • Carrying out revegetation in accordance with Vegetation Management Plan.
Social Impacts	• Provision of notification to residents of anticipated commencement and completion dates for the Reconstruction, via a letterbox drop and/or advertising in the local newspaper; • Maintaining a project webpage linked to the GSC website in order to provide the community with ongoing progress updates for the Reconstruction; • Ensuring that GSC administration staff are aware that any queries or concerns relating to the Reconstruction should be directed to the GSC project manager; and • Ensuring that the GSC project manager, or their representative, respond to any such queries or concerns appropriately and within a reasonable timeframe.
Safety	• Inducting all site staff and contractors, with site induction to cover all relevant aspects of Workplace Health and Safety,

Category	Mitigation Measure
	including emergency procedures; • Ensuring all staff and contractors are appropriately trained, with heavy vehicles and machinery only to be operated by qualified personnel; and • Installing and maintaining adequate safety measures for the duration of the construction, in accordance with Workplace Health and Safety laws and regulations.
Electricity Usage and Greenhouse Gas Emissions	• Regular servicing of vehicles and machinery in accordance with manufacturer specifications; • Ensuring vehicles are not left idling for extended periods of time; and • Undertaking revegetation in accordance with Vegetation Management Plan.
Resource and Waste Management	• All disturbed soil is to be used on site, with stripped topsoil to be stockpiled for revegetation and excavated soil used as fill where required. Any additional soil will be evenly distributed across the site; • Seeds and/or plants for revegetation will be sourced locally, where possible, to ensure provenance; and • Any additional wastes generated will be disposed of at the nearest Waste Management Facility, with recycling to occur if possible.
Cumulative Impacts	• Any future developments should consider the contribution of the development to stormwater volumes being handled by Blackjack Creek, with provision of adequate management measures to prevent any reduction in the carrying capacity of Blackjack Creek

5 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

5.1 Do you THINK your proposed action is a controlled action?

	No, complete section 5.2
Yes	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

5.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

	Matters likely to be impacted
	World Heritage values (sections 12 and 15A)
	National Heritage places (sections 15B and 15C)
	Wetlands of international importance (sections 16 and 17B)
Yes	Listed threatened species and communities (sections 18 and 18A)
	Listed migratory species (sections 20 and 20A)
	Protection of the environment from nuclear actions (sections 21 and 22A)
	Commonwealth marine environment (sections 23 and 24A)
	Great Barrier Reef Marine Park (sections 24B and 24C)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

The National Koala Conservation and Management Strategy 2009-2014 identifies the Gunnedah Koala population as a 'significant population'.

As detailed in the *EPBC Act Species Profile and Threats Database for the Koala Phascolarctos cinereus (combined populations of Qld, NSW and the ACT*) (DSEWPaC 2012), there are no quantitative estimates of koala population size for Gunnedah (Curran 1997; Smith 1992). The Gunnedah koala population was believed to sit at around 3000 animals in 2010. State-wide surveys have indicated that the Gunnedah koala population is regionally significant (Crowther et al. 2009) and increasing (Smith 1992; Lunney 2009) against the state trend. A recent study confirmed a significant increase in the Gunnedah Koala population in 2006, compared with Koala populations in 1986 (Lunney 2009). Further research has attributed the known unquantified increase in Koala populations in the Gunnedah region to revegetation aimed at addressing soil salinity problems (Lunney et al. 2009). However since this time diminishing availability of habitat, increased vehicle strikes and a heatwave in 2009 led to high koala mortality (Crowther et al. 2010). The introduction of Chlamydia to the Gunnedah koala population in 2008 is also

likely to affect future fecundity and population viability. Finally, the impact of forecasted climate change to the local population remains unknown (Lunney and Hutchings 2012; Crowther et al. 2010).

As at January 2012, 19 key threatening processes are listed under the EPBC Act. Of these, Predation by *European red fox, Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases* and *Land clearance* are relevant to the Koala. In addition to these listed key threatening processes, a range of other processes are recognised as threatening the survival of the koala in NSW. Current threats to the Gunnedah Koala population include:

- Pressure on available habitat;
- Vehicle strike;
- Bushfire;
- Chlamydia. The NSW Office of Environment and Heritage Koala Page notes that local extinctions are possible where there is loss of fertility due to Chlamydia;
- Physical Isolation;
- Genetic Isolation; and
- Predation.

Future threats to the Gunnedah Koala population have been discussed previously and include:

- Habitat clearing;
- Habitat fragmentation. The NSW Office of Environment and Heritage Koala Page note that local extinctions are possible where there is loss of fertility due to Habitat fragmentation;
- Unknown effect of Climate Change on the Gunnedah Koala population; and
- The forecasted increase in maximum temperatures and catastrophic weather events that would result in more frequent and intense heat waves.

Thus, in an absence of reliable population datasets or population modelling based on current and future threats, all areas of 'Core Koala Habitat' could be considered critical to the species survival. Removal of feed trees including large trees that are preferred by the koala is considered likely to disrupt the known *important population* of the species, contributing to its decline and thus risk of extinction.

Consideration also needs to be given to the habitat to be removed in terms of facilitating Koala movement within the landscape. Riparian vegetation along Blackjack Creek within the Reconstruction Site is also considered to form part of a koala movement corridor connecting with habitat along the Namoi River and vegetated hills and ridgelines south of Gunnedah. Revegetation will attempt to replace koala habitat (albeit not immediately) as koalas are not restricted to using old-growth eucalypts and will frequently use 10 to 20 year-old tree plantings (Crowther and Lunney 2006). A Study on Koala movements in the Gunnedah locality published by the Environmental Trust (Restoration) August 2011 supports the likelihood that Koala plantings will be successful. Key findings extracted from this study include:

- The GPS tracking data show that koalas are not walking randomly across the landscape, but along the edges of paddocks, roadsides, railway tracks and Travelling Stock Routes (TSRs);
- Koalas are frequently walking across open paddocks to access isolated paddock trees. The level of use of roadside reserves and railway track corridors by koalas highlighted by this

study is a major concern as road and rail related injury is one of the highest causes of koala death or entry into care;

- Tracked koalas moved frequently between these plantings, through paddocks to isolated trees and to remnant woodland stands;

- Koalas are moving considerable distances across the landscape, with movement of three to four kilometres over several weeks being a common occurrence. This includes movements to and from landholder-initiated tree plantings, between plantings, and between old paddock trees and trees along fence lines and remnant tree patches; and

- Koalas therefore capitalised on the success of the plantings by using the full diversity of habitat resources available.

Thus, in light of these findings, it is highly likely that the biodiversity offsets will be successfully utilised by the local Koala population.

The consistency of the Action with the recovery objectives within the *Approved Recovery Plan: Recovery Plan for the Koala* (DECC 2009) are listed in Table 2.

Table 2: Action Consistency with the Recovery Objectives - Approved Recovery Plan: Recovery Plan for the Koala (DECC 2009)

National Koala Recovery Strategy – Recovery Actions Objectives	Consistency with Plan	Comments
• **Objective 1: Conserve koalas in their existing habitat**	Not consistent	The Reconstruction Site has been deemed 'Core Koala Habitat'. Potential project alternatives that conserve habitat important for koala conservation have not been selected as the preferred option due to other environmental constraints.
➢ Specific objective 1a: Identify and conserve habitat important for koala conservation	Not consistent	The Reconstruction Site has been deemed 'Core Koala Habitat'. Potential project alternatives that conserve habitat important for koala conservation have not been selected as the preferred option due to other environmental constraints.
➢ Specific objective 1b: Assess the impact of habitat loss and fragmentation on koala populations	N/A	The works could potentially contribute to current research being undertaken.
➢ Specific objective 1c: Integrate koala habitat conservation into local and state government planning processes	Not consistent	The potential conservation of koala habitat in the Reconstruction Site has not been integrated into local and state government planning processes. The proposed rehabilitation of the site will however take into account: • The Comprehensive Koala Plan of Management currently being developed by Gunnedah Shire Council in accordance with State Environmental Planning Policy No. 44 Koala Habitat Protection (SEPP 44). • The Approved Recovery Plan: Recovery Plan for the Koala (DECC 2009) ; and • Crowther et al 2010 advice on the successful revegetation for the koala in the Gunnedah area.
➢ Specific objective 1d: Develop appropriate road risk management in koala habitat	Consistent	Vehicle and heavy machinery collisions will be reduced via mitigation measures during the construction phase of the Action.
➢ Specific objective 1f: Develop and implement strategies to reduce the impact of fires on koala populations	N/A	Bushfire Risk will be reduced via mitigation measures during the construction phase of the Action.
• Objective 2: Rehabilitate and restore koala	Impartial	Rehabilitation and offsetting impacts of koala

habitat and populations		habitat would occur. There would however be a 10-20 year time lag until the habitat could be considered likely to be utilised by the koala population.
➢ Specific objective 2a: Revegetate and rehabilitate selected sites	Consistent	Rehabilitation and offsetting impacts of koala habitat would occur. There would however be a 10-20 year time lag until the habitat could be considered likely to be utilised by the koala population.
➢ Specific objective 2b: Make appropriate use of translocation	Consistent	A translocation proposal consistent with the NPWS Policy for the Translocation of Threatened Fauna in NSW (NPWS 2001b) will be prepared for any proposed movement of koalas. It is unlikely that koala translocation to elsewhere within the Gunnedah Koala population would be required.
• Objective 3: Develop a better understanding of the conservation biology of koalas	N/A	
• Objective 4: Ensure that the community has access to factual information about the distribution, conservation and management of koalas at a national, state and local level	Impartial	Consultation regarding the Action will be ongoing. The economic and non-biological value of the Koala in the community requires further consideration, i.e. does the community outweigh flood security in preference to retaining large hollow bearing trees within Core Koala Habitat. Consultation will contribute to the Community Survey being undertaken as part of the Comprehensive Koala Plan of Management to be prepared by Gunnedah Shire Council in accordance with State Environmental Planning Policy No. 44 Koala Habitat Protection (SEPP 44).
➢ Specific objective 4a: Prepare and distribute educational material and involve the community in koala conservation	Impartial	Consultation regarding the Action will be ongoing. Consultation will contribute to the Community Survey being undertaken as part of the Comprehensive Koala Plan of Management to be prepared by Gunnedah Shire Council in accordance with State Environmental Planning Policy No. 44 Koala Habitat Protection (SEPP 44).
➢ Specific objective 4b: Understand the cultural significance of koalas	Impartial	Consultation regarding the Action will be ongoing.
• Objective 5: Manage captive, sick or injured koalas and orphaned wild koalas to ensure consistent and high standards of care	Consistent	Accredited and licensed wildlife rehabilitation groups will continue to rescue and rehabilitate injured, orphaned and/or diseased koalas according to the NPWS policy Koala Care in NSW: Guidelines and Conditions (Lunney and Matthews 1997), including an upgraded recording system.
• Objective 6: Manage over-browsing to prevent both koala starvation and ecosystem damage in discrete patches of habitat	N/A	
• Objective 7: Coordinate, promote the implementation, and monitor the effectiveness of the NSW Koala Recovery Plan across New South Wales	N/A	

6 Environmental record of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** Yes, Gunnedah Shire Council has a satisfactory record of responsible environmental management, including the development, implementation and ongoing management of local environmental plans, development control plans, floodplain risk management plans, and plans of management for threatened species.	Yes	
6.2	**Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details** No, Gunnedah Shire Council has not ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of the natural resources.		No
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** N/A – Gunnedah Shire Council is not a corporation.		
6.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?** **Provide name of proposal and EPBC reference number (if known)** No, Gunnedah Shire Council has never previously referred an action under the EPBC Act or been responsible for undertaking an action referred under the EPBC Act.		No

7 Information sources and attachments

(For the information provided above)

7.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

- Constructive Solutions (2013), *Blackjack Creek Riparian Corridor/Channel Reconstruction – Review of Environmental Factors (DRAFT)*
- Constructive Solutions (2012), *Blackjack Creek Riparian Corridor/Channel Reconstruction - Channel Options Study*
- Constructive Solutions (2012), *Blackjack Creek Riparian Corridor/Channel Reconstruction - Concept Design Report*
- Constructive Solutions (2012), *Blackjack Creek Riparian Corridor/Channel Reconstruction - Detailed Design*
- Crowther, M.S., D. Lunney, J. Lemon, R. Wheeler & G. Madani (2010), *Restoration of koala habitat in Gunnedah II: movement of koalas across a patchy rural landscape*. In: Australian Mammal Society 56th Meeting. Canberra, ACT
- Crowther, M.S., C.A. McAlpine, D. Lunney*, I. Shannon & J.V. Bryant (2009), Using broad-scale, community survey data to compare species conservation strategies across regions: A case study of the Koala in a set of adjacent 'catchments'. Ecological Management &* Restoration. 10:S88-S96
- Curran, T. (1997), *Gunnedah Shire Council preliminary koala management study: Koala corridor study*
- Department of Environment and Climate Change NSW (2008), *The Approved Draft Recovery Plan for the Koala*
- Department of Infrastructure, Planning and Natural Resources (2003), *Use of Geophysical Methods to Delineate Salt Affected Areas for Channel Reconstruction in Wandobah Reserve, Gunnedah*
- DSEWPaC (2012), *Species Profile and Threats Database Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) — Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)*
- DSEWPaC (2010), *National Koala Conservation and Management Strategy 2009-2014*
- Environmental Trust (Restoration) August (2011), *Restoring koala habitat in Gunnedah: building on a 1990 success*
- Lunney, D. and Matthews, A. (1997), *Guidelines and Conditions for Koala Care in New South Wales. Rehabilitation Guidelines.* NSW National Parks & Wildlife Service, Hurstville
- Lyall and Associates (2010), *Blackjack Creek Floodplain Risk Management Study and Plan*
- Lyall and Associates (2005), *Blackjack Creek Flood Study*
- OzArk Environmental and Heritage Management (2012), *Ecological Assessment: Blackjack Creek Restoration in Gunnedah, NSW*

- Smith, M. (1992), *Koalas and land use in the Gunnedah Shire: a report on the Bearcare project*. NSW National Parks and Wildlife Service, Hurstville.

All references are either available online or may be obtained from Gunnedah Shire Council on request.

7.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

All information provided is drawn from the documents forming the *Blackjack Creek Riparian Corridor/Channel Reconstruction Concept Design and Feasibility Study*, including the REF provided in **APPENDIX A**, with the specialist studies, database searches, previous reports and other information provided in the REF considered accurate at the time of publication.

All information has been prepared and reviewed by persons with suitable qualifications, with the REF prepared following current guidelines from relevant government bodies.

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than two megabytes (2mb) so they can be published on the Department's website. Attachments larger than two megabytes (2mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)		
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)		
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)		
	copies of any flora and fauna investigations and surveys (section 3)		
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)		
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[2].

Project title:

8.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act[3], this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[4].

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[2] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

[3] *If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A,* EPBC Act*). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.*

[4] *If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

Name	Robert E. Campbell
Title	General Manager
Organisation	Gunnedah Shire Council
ACN / ABN (if applicable)	80 183 655 793
Postal address	PO Box 63 Gunnedah NSW 2380
Telephone	(02) 6740 2100
Email	michaelsilver@infogunnedah.com.au

Declaration I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.

I understand that giving false or misleading information is a serious offence.

I agree to be the proponent for this action.

I acknowledge that I may be liable for fees related to my proposed action following the introduction of cost recovery under the EPBC Act.

Signature

Date 21-1-13.

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	Sarah Horne
Title	Environmental Scientist/Project Officer
Organisation	Constructive Solutions Pty Ltd
ACN / ABN (if applicable)	ACN 070 324 640 ABN 72 070 324 640
Postal address	PO Box 1498 Tamworth NSW 2340
Telephone	02 6762 1969
Email	sarah@constructivesolutions.com.au
Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature  Date 21/01/13

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ❑ Completed all required sections of the referral form?
- ❑ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ❑ Provided a map showing the location and approximate boundaries of the project area?
- ❑ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ❑ Provided complete contact details and signed the form?
- ❑ Provided copies of any documents referenced in the referral form?
- ❑ Ensured that all attachments are less than two megabytes (2mb)?
- ❑ Sent the referral to the Department (electronic and hard copy preferred)?