

NORTHERN PIPELINE INTERCONNECTOR PROJECT STAGE 2

MANAGEMENT PLAN

Revegetation and Rehabilitation Plan

Document number: NNA001-A-PLN-010

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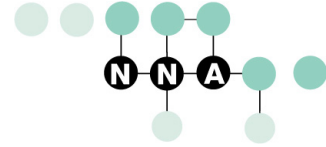
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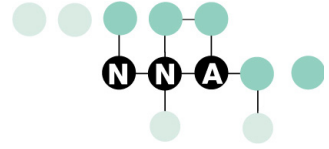
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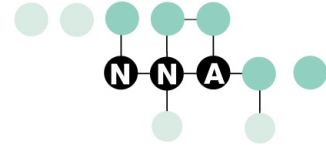
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1 INTRODUCTION

This Rehabilitation and Revegetation Plan is one component of the Construction Environmental Management Plan (CEMP) (NNA001-A-PLN-017) which provides a system and procedures to ensure the Northern Network Alliance (hereafter referred to as the 'Alliance') establishes and maintains best practice controls to manage potential environmental impacts during the construction of the Northern Pipeline Interconnector (NPI) Stage 2 and associated infrastructure (hereafter referred to as the 'Project') and, wherever practicable, realise opportunities for enhanced environmental outcomes.

The Project is a key component of the SEQ grid. Initially, the Project will transport water under existing utilised entitlement (up to 55% or 3600 ML/a has been used by Noosa Shire in the past) authorised under the *Water Resource (Mary Basin) Plan 2006* (Mary Basin WRP). This existing entitlement comprises 6500 ML/a (18 ML/d) interim water allocation (high priority) held by the SEQ Water Grid Manager within the Upper Mary River Water Supply Scheme. However, the pipe will be sized and designed to accommodate flows from future bulk water sources on the Sunshine Coast, including the Traveston Crossing Dam, should it be approved.

The NNA consists of the following partners:

- LinkWater
- Abigroup Contractors Pty Ltd
- McConnell Dowell Constructors (Aust) Pty Ltd
- Kellogg, Brown & Root Pty Ltd.

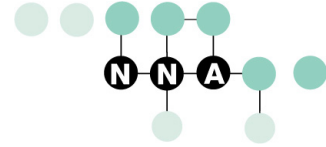
The Alliance is committed to providing the services it offers in a manner that conforms to the contractual requirements and to all relevant regulatory and legislative requirements. To achieve this, the Alliance will plan, implement and control an integrated management system that achieves the stated environmental outcomes.

The Alliance will ensure that controls are properly implemented and regularly monitored and audited to assess their effectiveness. Changes to the controls will be instigated if they are not achieving their objectives.

1.1 Project Description

The Project forms part of the drought contingency pipeline to connect existing and future water infrastructure on the Sunshine Coast with the Brisbane network. The Project will be constructed in two stages and will allow the transfer of up to 65 ML/d of potable water between the Sunshine Coast and Brisbane. Stage 1 of the Project—between Landers Shute water treatment plant (WTP) and Morayfield—is due for completion by 31 December 2008.

The completed (Stage 1 and Stage 2) Project will supply a target volume of 65 ML/d of potable fresh water to existing facilities at Caboolture for distribution to localities in the greater Brisbane region. The Project will have the capacity to deliver up to 18 ML/d (under existing entitlements for the Noosa Shire).



Subsequent interconnection of Stages of the Project may be constructed to link with the proposed Traveston Crossing Dam and/or other bulk water sources proposed for the Sunshine Coast. These subsequent Stages are not considered in this report. However, the use of a large diameter pipe capable of transporting bulk water is a basis for the design of both Stages 1 and 2 of the Project.

The key components of the Project are as follows:

- approximately 48 km of underground pipe between Noosa Water Treatment Plant (WTP) and the termination point of the Stage 1 Project at Eudlo
- a balance tank with a 5 ML capacity
- three new pump stations; and
- a new Water Quality Management Facility (WQMF) and upgrades to an existing WQMF at Landsborough.

A number of additional above-ground facilities would be required for commissioning, operation and maintenance of the system. These include:

- water quality maintenance structures
- water branch mains; and
- cleaning and communications stations.

1.2 Purpose and Scope

LinkWater has a commitment to effective environmental management and lists the environment as a key component of its overall vision to become an effective partner in delivering water security to south-east Queensland (LinkWater 2008). LinkWater is committed to adding value to the management of the natural and built environments by adhering to all appropriate local, state and federal environmental guidelines, with an underlying principle of sustainability and positive environmental outcomes (LinkWater 2008).

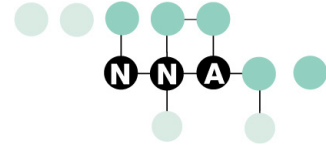
The purpose of this Revegetation and Rehabilitation Plan is to describe the rehabilitation objectives, elements and strategies necessary to address progressive and final rehabilitation within the areas impacted by construction works, and to ensure that areas affected by construction are rehabilitated to at least their original condition. On completion of construction, rehabilitation and revegetation activities will be monitored in accordance with a project-specific rehabilitation plan.

This Plan will address the requirements of all applicable legislation and aims to ensure that the commitments made by the Alliance within the Project Environmental Impact Statement (EIS) regarding Revegetation and Rehabilitation Plan.

1.3 Related Management Plans

The Revegetation and Rehabilitation Plan forms part of the overall CEMP (*NNA001-A-PLN-017*) for the Project. Where relevant, reference should also be made to the following associated management plans (MPs):

- Vegetation Management Plan (*NNA001-A-PLN-013*)



- Fauna Management Plan (*NNA001-A-PLN-007*)
- Heritage Management Plan (*NNA001-A-PLN-008*)
- Soil and Water Management Plan (*NNA001-A-PLN-011*)
- Weed and Disease Management Plan (*NNA001-A-PLN-016*)
- Waste Management Plan (*NNA001-A-PLN-014*)

1.4 Objectives and Targets

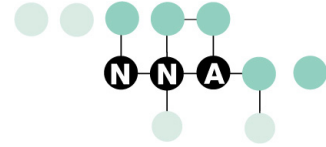
The objectives of this management plan are to:

- Minimise the overall area of disturbance.
- Undertake a comprehensive revegetation and rehabilitation program of all disturbed areas.
- Revegetation and rehabilitation undertaken in a timely manner.

The targets associated with this management plan are:

- No unnecessary vegetation clearing during the project.
- Revegetation to occur within 6 months of commencement of works for each subcatchment.
- Revegetation of local landform features will be undertaken in accordance with a site-specific rehabilitation plan.
- Full rehabilitation of waterways at crossing points including erosion and sediment control measures during construction and immediately post construction, and reinstatement of banks to their original contours.
- Revegetation of riparian areas using fast-growing grasses and sedges to stabilise banks with advanced stage planting of riparian tree species to assist in re-establishing canopy cover.
- Successful rehabilitation and enhancement of disturbed areas within the corridor as measured against pre-construction assessment.

The above performance criteria have been developed for this MP to assist in the delivery of desirable environmental outcomes. The performance criteria will be linked to key performance indicators (KPIs) for the Project.



2 LEGISLATION AND REGULATORY REQUIREMENTS

2.1 Licences/Permits

There are no licences and permits required for the rehabilitation of the pipeline route. Any applicable licences and permits will be sought throughout the construction period (e.g. vegetation clearing permits) and will be contained within the relevant Environmental Management Plans (EMPs).

2.2 Guidelines/References

Appropriate guidelines will be used as required. A few examples of relevant guidelines include the following:

- Maroochy Manual for Erosion and Sediment Control, 2007, Maroochy Shire Council (Sunshine Coast Regional Council).
- Riparian Land Management Technical Guidelines, 1999. Lovett, S & Price P (eds).
- A Rehabilitation Manual for Australian Streams, 2000. Rutherford, I., Jerie, K. & Marsh, N.
- Guidelines for Protecting Australian Waterways, 2002. J Bennett.
- Principles of Riparian lands Management. 2007, Lovett, S & Price P.
- Code of Environmental Practice – Onshore Pipelines, 2009, Australian Pipeline Industry Association.

2.3 Commitments

The following commitments are made in the Project EIS and are relevant to this MP. Table 1 lists these commitments.

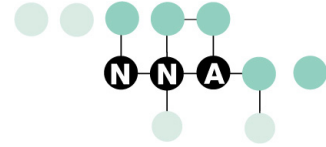
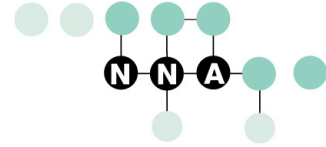


Table 1 Revegetation and Rehabilitation Plan Commitments from the Stage 2 Project EIS

NPI 2EIS Section (December 2008)	Requirement/Commitment
3.2	The community, local authorities and government agencies will be consulted throughout the construction phase.
3.2	Mitigation strategies will include timing construction to avoid works in steep sections of the pipeline route between December and February and implementation of site-specific intensive sediment and erosion control measure in risk areas.
3.3	Site rehabilitation and reinstatement will occur as a final stage of construction.
3.3	Reinstatement of local landform features will be undertaken in accordance with a project-specific rehabilitation plan.
3.3	All landforms will be restored as close as possible to their pre-construction contours, including waterway bank slopes.
3.3	Topsoil will not be stockpiled in areas where such material might be expected to cause environmental harm.
3.3 & 4	Monitoring of the recovery of impacted ecosystems and/or species will be undertaken as required.
3.3 & 4	All sites cleared of vegetation and/or ground cover will be rehabilitated and revegetated with appropriate species including plant species endemic to particular regions.
3.4	Construction will not result in significant long-term erosion and sedimentation impacts.
3.4	Clearing of riparian vegetation will only be undertaken immediately prior to construction, with reinstatement occurring immediately after the completion of construction.
3.4	Reinstatement of riparian vegetation cover will use fast-growing grasses and sedges to stabilise banks with advanced stage planting of riparian tree species to help re-establish canopy cover (with low growing species to prevent hindering power line operations when in a power easement).



3 EXISTING ENVIRONMENT

3.1 General Description

3.1.1 Existing Land Use

The majority of the Project pipeline route is located within existing road reserves (approximately 24%) or public utility easements (approximately 68%) (Alliance 2008). The corridor is located within existing cleared or disturbed easements and road reserves to minimise the encumbrance to landholders and to avoid/minimise environmental impacts associated with the Project.

The proposed Project route intersects predominantly rural and agricultural land uses, although small areas of the route traverse land intended for urban and industrial development. Land within the valleys has been highly modified and are typically characterised by more intensive uses, including cropping, road and rail infrastructure, urban communities, industrial uses and rural residential properties.

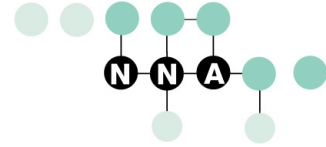
Further desktop studies, investigation/surveys may be undertaken prior to construction, as required to satisfy this MP.

3.1.2 Landforms and Soils

The Project area takes in the eastern edge of the Blackall Range, traversing a number of ridges which run west-east towards the coast. The pipeline corridor runs in a north-south direction, commencing in the rolling hills around Lake Macdonald and descending onto the floodplain of the North Maroochy River to the south. To the west of Eumundi, the route crosses a steep ridge adjacent to the Bruce Highway and traverses the western edge of Yandina township onto the South Maroochy River floodplain. South of the Yandina, the route crosses two high coastal ridges and the middle reaches of Petrie and Paynter creeks. The corridor rises again before descending onto the flats around Eudlo Creek and ascending steeply to connect with the Stage 1 works at Nobels Road.

The alignment from Landers Shute heading north to the Noosa WTP traverses the six main soil types. These soils of the alignment have been formed from the underlying geological parent materials:

- Alluvial soils within the floodplains of the main watercourses are variable in depth, texture, fertility and drainage characteristics.
- Gravelly loams can be prevalent in the narrow floodplains adjacent to lower order streams in the upper catchment areas while deep uniform textured or gradational clays (including black earths and prairie soils) are common in the broad floodplains of the major streams. Most alluvial soils are relatively resistant to erosion, due primarily to the low gradient position in the landscape, but may be prone to stream bank erosion.
- Red and yellow podzolic soils are texture contrast soils generally associated primarily with Landsborough Sandstone parent material. The soils have a sandy or loam surface horizon with a clay subsoil, and there may be a significant gravel component in the subsoil. These soils are highly susceptible to erosion, particularly where slopes exceed 8%.



- Red and yellow earths are uniform textured soils also associated with Landsborough Sandstone parent material. While still erosion prone, they are generally less susceptible than red and yellow podzolic soils.
- Gleyed podzolic and humic gleys (poorly drained acid soils) are found in some of the lower terraces of the alluvium.
- Krasnozems are deep uniform or gradational soils which, within the project area, are confined mainly to the land around Eumundi and North Arm. These soils are relatively resistant to erosion and are used for growing ginger.
- Lithosols (mainly shallow gravelly soils with minimal profile development) are common in steeper sections of the project area where grades exceed 10%. They are highly susceptible to erosion although the severity of this risk maybe mitigated by the significant stone component within the soil matrix. Minor sections of the route are located on the floodplains of the major watercourses. Soils of the upland areas are predominantly shallow, texture contrast soils that may have a significant component of stone within the profile.

3.1.3 Drainage and Waterways

The Project corridor traverses the freshwater section of the Maroochy River catchment and the south-eastern headwaters of the Mary River catchment within the Six Mile Creek sub-catchment. Sub-catchments traversed by the Project (from north to south) are as follows: the North Maroochy River, South Maroochy River, Upper Maroochy Estuary, Petrie Creek, Paynter Creek and Eudlo Creek.

The Project requires the construction of the pipeline across a number of rivers and creeks in both catchments. All surface waterways to be crossed by the pipeline are lowland freshwaters (larger slow-flowing freshwater streams and rivers below 150 m altitude) as defined by the EPP (Water).

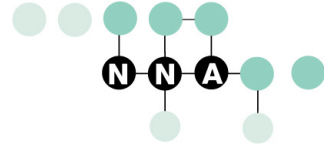
3.1.4 Vegetation

Preliminary field assessments undertaken by LAMR Pty Ltd in October 2007 and February 2008 were followed up with more detailed assessments at sites of higher environmental significance. Relevant material from the preliminary assessments undertaken by LAMR is addressed in the report 'Assessment of Impacts on Flora'.

EVR flora species likely to occur in the study area were identified by searching the EPBC Online Protected Matters search tool (DEWHA) and Wildlife Online database (EPA). These results were cross-referenced with records held by HERBRECS and the review of RE mapping to define target areas for more detailed field investigation.

The majority of the pipeline route traverses heavily disturbed urban areas, agricultural lands and cleared public utility easements. However, intact stands of vegetation still persist on ridges and steep slopes and along waterways. Areas of remnant vegetation in the study area can be grouped into the following types:

- intact gallery rainforest (RE 12.3.1), sometimes with eucalypt emergents (RE 12.3.2), occurring along waterways
- patches of reasonable size of lowland gallery rainforest now rare within SEQ



- small areas of Melaleuca wetlands in riparian depressions such as those around Eudlo Creek and its tributaries; and
- large areas of tall open eucalypt forests along coastal ridges, often contained within national parks and forest reserves.

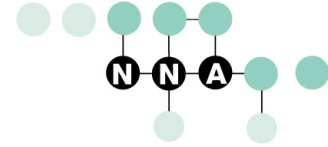
Riparian communities are an important feature of vegetation within the pipeline route. While many creeks are degraded inside the easement, most retain sufficient vegetation to act as corridors between intact habitat patches. These narrow corridors also contain important (and frequently unmapped) remnants of the endangered RE 12.3.1, which are often in good to excellent condition despite the pressures imposed by adjacent land uses. These vine forest elements also persist as an understorey to RE 12.3.2, which occurs frequently as unmapped narrow remnants along waterways in the study area.

3.1.5 Weeds

A weed survey of the proposed Project corridor has been undertaken. The weed species identified will be managed under the Weed and Disease Management Plan (*NNA001-A-PLN-016*). Information regarding weed species recorded in the alignment will be communicated via the Pre-clearing verification checklist and shown on the Environmental Constraint maps.

3.2 Environmentally Sensitive Areas/Features

Following the surveys undertaken for the EIS, a number of sites were proposed as 'Sensitive Areas'; this list of sites is attached at Appendix 1. All of these sites were visited in preparation for the development of Sensitive Area Plans (*NNA001-A-PLN-005*). Sensitive Area Plans are included in the Pre-clearing Verification Checklist.



4 REHABILITATION ELEMENTS

This Revegetation and Rehabilitation MP specifies the actions and strategies to achieve the following:

- topsoil cover to be re-established and all land and waterways disturbed by the Project are returned to a stable condition as soon as practicable after construction
- land to be returned as close as possible to its previous level of productivity
- stable landforms are re-established to original topographic contours
- revegetation and rehabilitation of riparian areas
- natural drainage patterns are reinstated
- erosion control measures to be installed in erosion risk areas; and
- the environment and disturbed habitats are to be rehabilitated to pre-construction condition.

Based on the above specification, the following elements are further considered.

4.1 Topsoil and Disturbed Areas

Areas that will be disturbed during construction include:

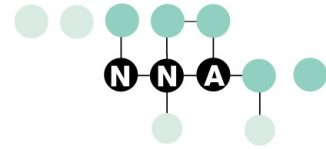
- right of way (ROW); and
- compound sites including areas adjacent to waterway crossings, access roads, laydown areas and office sites.

The ROW will be levelled to the required gradient using graders, excavators and bulldozers. Where clearing is required in riparian areas, mechanical slashers will be used in preference to bulldozers to minimise impacts soil and water resources and adjacent vegetation. Topsoil will be removed where required and stockpiled separately from any subsoil materials and not mixed, prior to reuse during rehabilitation. Controls on the reuse of topsoil in weed infested areas may be implemented so as to avoid spreading weeds.

Typical requirements during the final stages of rehabilitation include:

- During rehabilitation of the ROW, the materials will be replaced in the order in which they were removed.
- Prior to topsoiling activities, all compacted areas will be ripped.
- Post construction semi-permanent cross berms may be required on steep slopes or adjacent to waterways until revegetation has taken hold, in order to remove any storm flows off the ROW
- Other means of stabilisation i.e. rock/jute matting etc.

In addition, the excavation for the pipeline will result in some excess spoil after backfilling. It is considered that this material should be reused where possible during site reinstatement and levelling.



There are several areas adjacent to waterways which will be disturbed as a result of construction activities. Returning these disturbed areas to a stable condition following construction will occur as soon as practicable.

4.2 Topography and Landforms

Prior to the commencement of construction the entire pipeline alignment will be surveyed (including cross sections) to record pre-existing surface levels and contours. In steep terrain, additional earthworks may be required to create stable batters adjacent to the work area. The width of the ROW will be limited in steep terrain to avoid costly earthworks, the potential for slope instability and to minimise the extent of reinstatement works. Once pipeline construction is complete, pre-existing surface levels and contours will be reinstated.

4.3 Drainage

Reinstatement of drainage lines and gullies within the easement will also be undertaken in accordance with a site-specific rehabilitation plan. Revegetation work will incorporate the use of plant species endemic to the particular location.

Temporary drainage systems will be used throughout the construction period, especially drainage berms to take any stormwater off the cleared ROW. Permanent drainage berms may be constructed to reduce the risk of future erosion along the corridor.

Techniques for restoration of above and below ground water movement will be addressed in progressive erosion and sedimentation controls to be developed for all areas of the Project. The Soil and Water MP (*NNA001-A-PLN-011*) addresses erosion and sediment control and will be consistent with the Maroochy Manual for Erosion and Sediment Control, 2007 and where necessary, the IEAUST's Soil Erosion and Sediment Control, Engineering Guidelines for Queensland Construction Sites 1996. Any works conducted within watercourses will be carried out in accordance with appropriate Department of Natural Resources and Water (DNRW) conditions.

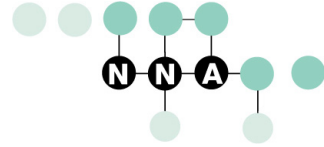
4.4 Reinstatement and Revegetation

Baseline monitoring data and photo point surveys will be undertaken prior to the commencement of construction in order to establish a baseline for post-construction reinstatement and revegetation assessments.

Where clearing of vegetation cannot be avoided, the Alliance is committed to revegetating areas promptly after the completion of construction activities, particularly in riparian areas and near waterways.

Varying degrees of site remediation will be required for different classifications of vegetation and these are reflected in the work methods outlined below.

Restorative planting of vegetation will occur progressively during construction to maintain and establish wildlife corridors and to ensure disturbance is limited to the shortest possible time frame. Directly affected landholders will be consulted prior to the construction and individual agreements will be established. Where feasible, reinstatement will commence within two weeks of pipe being laid,



although timing of reinstatement will be influenced by forecast weather conditions, local ground/soil conditions, topography and access requirements.

When revegetating, the following measures should be followed:

- Species selection and densities should be appropriate for the habitat being revegetated.
- Native species, preferably those endemic to the area, should be used.
- Turfed areas should be fenced-off to prevent access until the site is fully established.
- Ensure the necessary maintenance is provided (e.g. watering, fertilising, weeding) until the revegetated area is self-maintaining.

Proposed revegetation procedures, including seed mixes, rates and application techniques, along with procedures for establishing vegetation, including seed source, stock type and planting densities will be detailed in the Revegetation specification and site-specific revegetation plan. These will be developed by a specialised Project Ecologist/Botanist to identify significant flora and fauna, oversee translocation activities (if required) and advise on habitat restoration (site rehabilitation).

Revegetation work should be periodically assessed against baseline monitoring data and photographic points collected before the commencement of construction activities. This assessment will be conducted weekly until such time that a Foliage percentage cover of 70% of the original FPC is achieved or until handover to the client, whichever comes first.

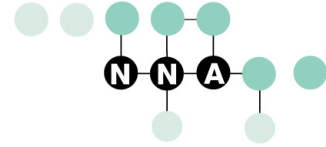
Weed management will be a key component in ensuring the success of all rehabilitated areas and is dealt with comprehensively in the Weed and Disease MP (*NNA001-A-PLN-016*).

Full reinstatement is to be undertaken where vegetation clearance has occurred in areas of high conservation value vegetation, primarily in 'endangered' regional ecosystems and identified habitat areas for threatened species. This includes Riparian Areas and Waterways

These areas are recognised as having high conservation value for ecological communities or species and, as such, reinstatement will aim to replicate the original structure and species diversity of the affected area.

In most instances, this technique will be used where construction has occurred in a constrained corridor. Revegetation efforts will comply with the following:

- Pre-construction documentation of composition and condition of vegetation to be cleared through the development of Sensitive Area Plans (*NNA001-A-PLN-005*) (SAPs) and baseline monitoring data, including photo-point survey.
- Relocation of and/or collection of seed from any significant species at the site.
- Early propagation of seeds or plant material for significant species.
- Where landowner is in agreement, mulching of all native vegetation cleared from the site and stockpiling during construction.
- Where required, mulch will be re-spread once trenching and topsoiling is completed.
- Species distribution and densities to reflect original vegetation condition as determined by a suitably qualified botanist/horticulturist and in consultation with relevant Project personnel.



- Prioritise the planting of fast-growing, colonising shrubs and groundcovers to minimise opportunities for weed invasion. Where species are easily propagated and are known to survive open planting in disturbed sites, as full a range of species recorded at the site, including canopy species, should be planted.
- No planting of deep-rooted vegetation within 5 m of the pipe centreline, only shrubs and low herbaceous species. Allowance has also to be made for a permanent vehicle access along the ROW. Re-planting must also be in accordance with the Energex Electricity Regulations/Approvals.
- Revegetation to be achieved through a combination of direct seeding techniques and planting of tubestock if necessary.
- Weed mitigation and monitoring activities to be undertaken in accord with the Weed and Disease MP (*NNA01-A-PLN-16*).
- Ongoing monitoring in accordance with approved monitoring program.

4.5 Habitat Rehabilitation

Habitat rehabilitation will consider development of the following habitat features:

- hollows / nesting boxes appropriate for key species through the district (wherever possible sourced from existing vegetation that has been felled during vegetation clearing for the Project, however, this may be supplemented with purposed built nesting boxes)
- bee hives for native bees dependent on the existing distribution and abundance
- feed trees for key species and migratory birds, these may include items such as fig trees within locations that would typically have been within the pre-clearing landscape.

4.6 Weeds

Weed removal should occur before rehabilitation and replanting, and continue until rehabilitated areas are established (refer to Weed and Disease Management Plan *NNA001-A-PLN-016*).

4.7 Constraints

Rehabilitation of the pipeline alignment will vary from area to area depending on the level of clearing, the habitats within each area as well as the ongoing operation and maintenance requirements. In addition, there are several constraints that will need to be addressed in each of the areas. These constraints are outlined in Table 2 below.

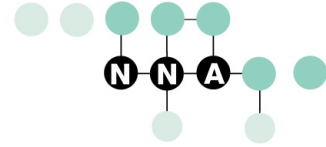
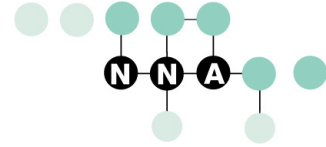


Table 2 Summary of constraints associated with rehabilitation

Constraint	Description
Weather	The rehabilitation strategy will require revision during periods of extreme weather. For example, should the current drought period extend until rehabilitation activities commence, the strategy will be revised to ensure effective and water-efficient measures are implemented.
Off-set Distances from Pipeline	The Operator of the pipeline will need to ensure that the structural integrity of the pipeline is maintained. In this regard, planting in close proximity to the pipeline must consider the root system of the chosen plant species. While deep-rooted vegetation cannot be re-established directly across the pipeline (due to potential damage to the corrosion protection systems), shallow root cropping and grassland re-establishment is encouraged.
Transmission Lines	The pipeline alignment has been determined where possible based on existing infrastructure. In this regard the level of clearing and general disturbance is minimised. In several areas the pipeline route will coexist with existing Energex infrastructure. Rehabilitation in these areas will need to be in accordance with the Energex requirements for operations and maintenance.
Land Owner Negotiations/ Requirements.	Interference to landholder activities will vary according to the level of impact caused by the construction of the pipeline. Every effort will be made to minimise this impact and each landholder will be consulted to discuss their specific requirements regarding the Project. The trench will be left open for the minimum amount of time practicable, and should not pose a long-term hazard or barrier to stock or wildlife. Temporary provisions, such as fencing, driveways or stock access to water, will be discussed with each landholder. Reinstatement works will be discussed and agreed with land owners and it is the intention of the Alliance to rehabilitate areas to at least the original condition.
Fencing/ Property Boundaries	As above.
Weed Infestation Areas	In areas which are infested with weeds the level of rehabilitation will be assessed in site-specific rehabilitation plans to ensure no spread of infestation.
Road Safety	Planting of trees and shrubs will need to consider any impact to line of sight for drivers/the Operator. This is of specific importance along the road verge where motorist's line of sight cannot be compromised. Consideration of low-growing species or grasses is considered acceptable in these locations. Specific requirements will be developed in consultation with the relevant Council.
Maintenance Tracks	An access track will be required along the pipeline route within the ROW for ongoing operations and maintenance. Some additional works may be required to access into this area- these will be determined as construction works progress. The location and rehabilitation of the access tracks will be conducted in consultation with the landholder.



5 REHABILITATION STRATEGY

Based on the rehabilitation elements outlined in Section 4 above, this section outlines the strategy to be implemented throughout the works. Rehabilitation will be progressive and must take account of:

- any special circumstances of the land
- the surrounding environment
- the need to stabilise the land
- the desirability or otherwise of returning agricultural land to a state that is as close as reasonably possible to its state before
- outstanding Construction Activities such as hydrotesting and commissioning

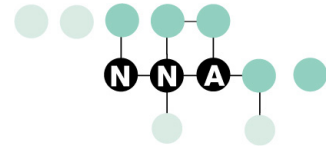
Successful rehabilitation will be as measured against pre-construction assessment.

5.1 General Rehabilitation Strategies

Rehabilitation strategies are described in Table 3 below.

Table 3 Rehabilitation Strategies

Work Phase	Activity to be undertaken	Responsibility
Pre-Construction	Photographic survey of alignment for all elements identified above i.e.: <ul style="list-style-type: none"> • topsoil and landforms • drainage • vegetation • environmentally sensitive areas 	Environmental Manager
	Survey of alignment including cross sections to record existing surface level and contours. This survey should include the locations of rivers and creeks.	Surveyors
	Undertake relevant flora and fauna surveys including (but not limited to): <ul style="list-style-type: none"> • Special Area Mapping and Plans (i.e. not Sensitive Area Plans) - see Section 5.2 • Endangered RE's and critical fauna habitat are documented • translocation of rare and threatened species where applicable • weed and disease mapping 	Environmental Manager
	Development of Work Method Statements (WMSs) to ensure that appropriate mitigation measures will be deployed throughout the construction activities. The WMSs are integrated and as such consider OHS, quality assurance and environmental requirements.	Construction Managers/ Environmental Manager
	Correct implementation of the verification procedure will ensure important environmental issues and sites are tagged prior to works commencing in an area.	Construction Manager/ Environmental Officer
During	Ensure that clearing is minimised where possible and	Site Supervisor/



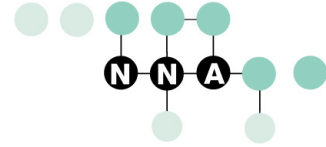
Work Phase	Activity to be undertaken	Responsibility
Construction	works are confined to approved corridor (constrained and unconstrained areas).	Environmental Officer
	Stockpiling of topsoil for reuse during rehabilitation works. Ensure that stockpiles of topsoil are separated from subsoils and covered as appropriate, or that appropriate erosion and sediment controls are in place to avoid erosion and sediment runoff.	Site Supervisor/ Environmental Officer
	Undertake weekly inspections and complete weekly inspection checklist to ensure that areas of disturbance are being minimised and that effective controls are being implemented to minimise environmental impact.	Environment Officers
	Progressive rehabilitation to be undertaken in accordance with this Rehabilitation Plan.	Site Supervisor/ Environment Officers
Post Construction	Vehicles will be confined to designated maintenance access tracks within ROW.	Operator
	Undertake monitoring and maintenance as required on rehabilitated areas to ensure long term stabilisation	Operator
	Implement corrective actions where necessary if performance objective is not being achieved. This will include replanting of species which have not survived, installation of additional controls if erosion is occurring etc.	Operator

5.2 Site Specific Special Area Plans

Extensive clearing has occurred across the Energex easements and environments have been greatly modified as a result of previous land use. The Special Areas will also require provisions to ensure the areas are rehabilitated to at least their pre-existing condition.

Site-specific Special Area Plans will be developed to address all the elements listed in Section 4 above including:

- topsoil and disturbed areas
- topography and landforms
- drainage
- erosion and sediment controls
- revegetation
- weeds
- constraints, including potential need for fire breaks where large tracts of land are being rehabilitated.



6 CORRECTIVE AND PREVENTATIVE ACTIONS

6.1 Community Liaison and Complaint Management

Refer to Section 8.1 in the Construction Environmental Management Plan (*NNA001-A-PLN-017*)

6.2 Environmental Incident/Emergency Reporting

Refer to Section 8.2 in the Construction Environmental Management Plan (*NNA001-A-PLN-017*)

6.3 Incident/Emergency Preparedness and Response

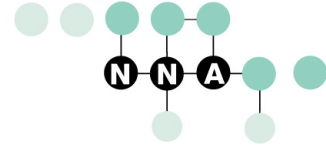
Refer to Section 8.3 in the Construction Environmental Management Plan (*NNA001-A-PLN-017*)

6.4 Incident Investigation

Refer to Section 8.4 in the Construction Environmental Management Plan (*NNA001-A-PLN-017*)

6.5 Non-conformances

Refer to Section 8.5 in the Construction Environmental Management Plan (*NNA001-A-PLN-017*)



7 INSPECTION AND MONITORING

7.1 Inspection

Weekly inspections will be undertaken throughout the construction period by the Site Environment Officers, the Site Superintendents and Project Engineers. This inspection will ensure that appropriate controls are being implemented and are effective. It will also ensure that where necessary additional monitoring is undertaken as a result of changes to activities/construction methods. Any issues identified during the weekly inspections will be recorded in the Weekly Environment Inspection Checklist (*Form G-FRM-001*).

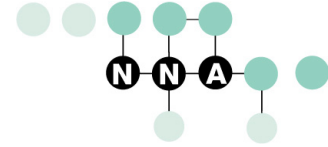
7.2 Monitoring

Monitoring of rehabilitation will determine whether rehabilitation objectives and requirements are being achieved. In particular, review of achievement of "performance criteria" should be monitored during and following rehabilitation.

7.3 Operation and Maintenance

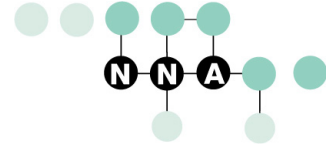
Maintenance of rehabilitated sites is often the difference between the ultimate success or failure of rehabilitation. Both during and following rehabilitation works, routine maintenance of erosion and sediment controls should be undertaken. Maintenance of revegetation may also be required, in the form of replanting or reseeding in failed areas, weed control, watering, pest control and installation/repair of tree guards and fencing for protection from grazing.

An Operations EMP will be prepared for the construction phase. This EMP will specify in more detail the arrangements for ongoing monitoring of the easement.



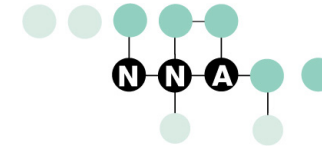
8 DEFINITIONS AND ACRONYMS

Acronym	Glossary
Aust	Australia
CEMP	Construction Environmental Management Plan (<i>NNA001-A-PLN-017</i>)
DNRW	Queensland Government Department of Natural Resources and Water
EIN	Environmental Improvement Notice
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPA	Queensland Government Environmental Protection Agency
EPP (Water)	<i>Environmental (Water) Protection Policy 1997</i>
KPI	Key Performance Indicator
LAMR	Land Assessment, Management and Rehabilitation Pty. Ltd.
LinkWater	SRWPCo now trading as LinkWater and is 100 per cent owned by the Queensland Government
Mary Basin WRP	<i>Water Resource (Mary Basin) Water Resource Plan 2006</i>
ML	Megalitre (equivalent to 1 million litres)
ML/d	Megalitres per day
MP	Management Plan
MP	Management Plan
MSDS	Material Safety Data Sheet
NCR	Non-conformance Report
NNA	Northern Network Alliance
NPI	Northern Pipeline Interconnector
QESE	Quality Environmental Safety Engineering database
RE	Regional Ecosystem
ROW	Right-of-Way
WMS	Work Method Statement
WQMF	Water Quality Management Facility
WTP	Water Treatment Plant



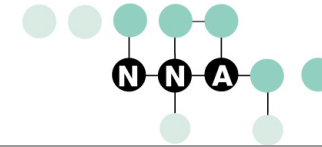
9 REFERENCE DOCUMENTS

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- Code of Environmental Practice – Onshore Pipelines, 2009, Australian Pipeline Industry Association.
- Construction Environment Management Plan (*NNA001-A-PLN-017*)
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< <http://www.linkwater.com.au/index.php?id=79>>
- Maroochy Shire Council [Sunshine Coast Regional Council] 2007, *Maroochy manual for erosion and sediment control*, accessed 5 December 2008,
< http://www.maroochy.qld.gov.au/environment/sitePage.cfm?code=manual_sediment_erosion >
- Northern Network Alliance 2008, *LinkWater Projects: Northern Pipeline Interconnector - Stage 2 Environmental Impact Statement*, released 17 January 2009.
- Principles of Riparian lands Management. 2007, Lovett, S & Price P.
- Quality Assurance Management Plan (*NNA001-A-PLN-017*)
- Riparian Land Management Technical Guidelines, 1999. Lovett, S & Price P (eds).
- Sensitive Area Plan (*NNAA001-A-PLN-005*)
- Soil & Water Management Plan (*NNA001-A-PLN-011*)
- Vallee, L, Hogbin, T, Monks, L, Makinson, B, Matthes, M & Rossetto, M 2004, *Guidelines for the translocation of threatened plants in Australia*, 2nd edn, Australian Network for Plant Conservation, Canberra.
- Weed & Disease Management Plan (*NNA001-A-PLN-016*)

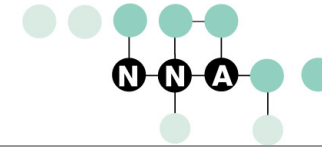


APPENDIX 1

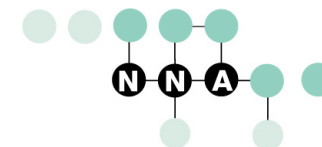
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Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
300	300-North Nobels Road-01	6RP909418	30001	0 - 0.4 km	North of Nobels Road, Eudlo	State	Potential habitat for the Pink-Underwing moth in gullies to the south and potential habitat throughout area for Large-eared Pied Bat.		Potential habitat throughout area for Large-eared Pied Bat.		Wildlife corridor of State significance.
300	300-North Nobels Road-02	5SP101373	30002	0.5km							



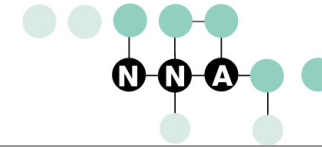
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300	300-North Nobels Road-02	4RP807488	30008	0.9km							
300	300-South Slaughter Yard Road waterway-01	1RP170287	30020	2.0 km	Waterway to the south of Slaughter Yard Road, Eudlo			RE 12.3.2			Waterway has local wildlife corridor values.
300	300-North Slaughter Yard Road waterway-01	3RP154277	30025	2.75 km	Waterway to the north of Slaughter Yard Road, Eudlo						Waterway has local wildlife corridor values. Riparian vegetation - non-remnant RE 12.3.1/12.3.2



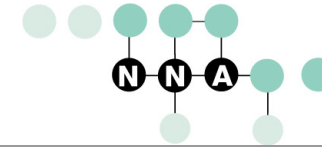
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
300-301	300/01-McGilchrist Road veg-01	3RP171034, 6RP810281, 5SP121792, 4RP884062, 10RP224865, 7RP217592	30031, 30032, 30034, 30035, 30036, 30101	3.5 - 5.0 km	Remnant vegetation within easement between McGilchrist and Chevallum Roads, Chevallum	Regional, State		12.3.1/12.3.2/12.3.5			
301	301-Gully Winston Road South-01	1RP28013, 1RP91344, 22RP887960	31104, 31105, 31106	5.5 - 6.0 km	Slope and gully south of Winston Road South, Woombye	State and Local		RE 12.3.2	Potential habitat for Tusked Frog and Koala.		Local east-west wildlife corridor.
301	301-Drainage north Winston Road-01	2RP69424, 1RP69424	31113, 31114	6.5 km	Drainage line north of Winston Road, Woombye			RE 12.3.1	Tusked Frog present. Potential habitat for Elf Skink.		Local wildlife corridor.



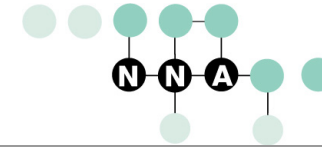
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301	301- Drainage north Winston Road-02	5SP130323	31117	7.0 km	Drainage line north of Winston Road, Woombye			RE 12.3.2	Potential habitat for Tusked Frog and Elf Skink.		
301	301-Gully south Nambour Connection Road-01	9SP110884, 8SP172908, 1RP109849	31121, 31122, 31123	8.0 km	Gully south of Nambour Connection Road, Woombye				Tusked Frog present and potential habitat for Koala & Lewin's Rail.		Local east-west wildlife corridor
301	Gully south Nambour Connection Road-01	5SP156934	31128								



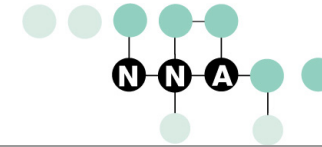
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
301	301-Paynters Creek Crossing-01 and 02	1SP147228, 12RP196988	31135, 31136	10.0 - 10.25 km	Paynters Creek— Crossing 1 & 2	State	Potential habitat for Giant Barred Frog.	RE 12.3.2	Potential habitat for Giant Barred Frog and Elf Skink.		Local east-west wildlife corridor
301	301-East of Paynters Creek Northern Crossing-01	4RP195810, 6RP28178 (may need access via 2RP836638)	31137, 31139 (may need access via 31140)	11.25 - 11.5 km	Paynters Creek— Northern crossing	Local		RE 12.3.1	Potential habitat for Giant Barred Frog.		
302	302-Petrie Creek Crossing-01	6RP220222	31168	14.0 km	Petrie Creek Crossing	State	Potential habitat for Giant Barred Frog.	Degraded RE 12.3.1/12.3.2.	Elf Skink present. Potential habitat for Tusked Frog.		Local wildlife corridor.



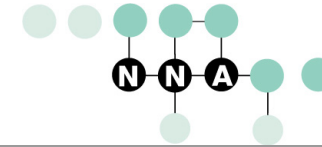
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
302	302-Tuckers Creek Crossing-01	12RP94474	30330	15.0 km	Tuckers Creek crossing behind Maroochy Shire Council Depot, Nambour		Potential habitat for Giant Barred Frog.		Potential habitat for Giant Barred Frog, Tusked Frog and Elf Skink.		Riparian vegetation
302	302-Vegetation north of Tuckers Creek-01	135NPW672	30332	15.0 - 15.5 km	Vegetation north of, and running parallel to, Tuckers Creek, Nambour (Road reserve along southern boundary of Ferntree Creek			RE 12.3.1 (check if cleared)	Potential habitat for Tusked Frog and Elf Skink.		



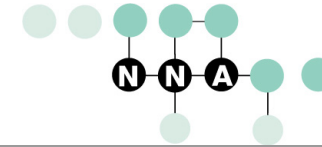
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
					National Park)						
302	302-Dams at end of Tuckers Creek Road-01	8RP886266	30359	16.25 km	Dams either side of easement at the end of Tuckers Creek Road, Nambour			RE 12.3.2 (check if cleared within easement)	Potential habitat for Tusked Frog and Elf Skink.		



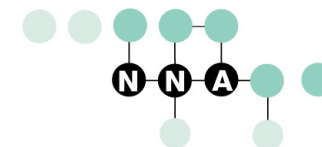
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
302-304	302/304-Tuckers Creek Tributary-01	10RP230796, 2RP206847	30365, 31002	17.0 - 17.75 km	Significant RE 12.3.2 vegetation along Tuckers Creek tributary to the immediate west of the existing easement, RE 12.3.1/12.3.2 regrowth adjacent to crossing location		Potential for Giant Barred Frog.	RE 12.3.2	Potential for Elf Skink and O. truncatus, Tusked Frog, Koala, Green-thighed Frog and Giant Barred Frog.		
304	304-Ferntree Creek National Park-01	12SP201521, 10SP201521, 9SP201521	31009, 31010, 31011	17.75-18.25		Local					



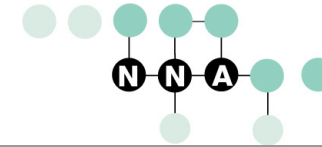
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
304	304-Rocky Creek-01	4RP207955, 3RP178889	31013, 31014	19.8 km	Rocky Creek (also called Caboolture Creek in some reports)				Tusked Frog present and potential habitat for Koala.		
304	304-Open forest woodland adjacent to Mt Crombe Road - 01	4RP207955, 3RP178889	31019, 31017, 31015	20.3 km	Open forest woodland to the north, adjacent to Mt Combe Road			RE 12.12.12	Tusked Frog present and potential habitat for Koala.		
304-305	304/305-Tributaries of South Maroochy River-01	700SP171080	30503	21.5 km	Tributaries of South Maroochy River						Narrow corridor for local movement with north-south linkages.



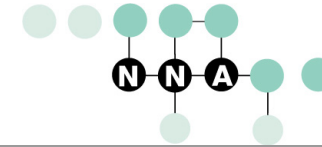
Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
305	305-South Maroochy River (including Mount Combe Creek)-01	2SP137831, 261C311580	30504, 30507	22.0 km	South Maroochy River (including Mount Combe Creek)		Potential habitat for Giant Barred Frog.	RE 12.3.1	Potential habitat for Giant Barred Frog, Tusked Frog, Elf Skink, Platypus and Koala.		
305	305-Tributary of the North Maroochy River-01	937C311485	30546	23.5 km	Tributary of the North Maroochy River						Local wildlife corridor with east-west linkages.
305	305-Browns Creek-01	2CG6223	30555, 30559	25.5 km	Browns Creek at Lees Road			RE 12.3.1			Local wildlife corridor.



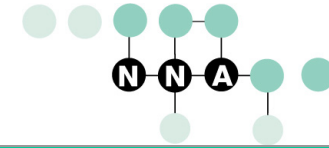
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305	305-Tributary of the North Maroochy River-02	2RP906929	30561	26 km	Tributary of the North Maroochy River						Local wildlife corridor.
305	305-Running Creek-01	21SP124797	30567	26.5 km	Running Creek			RE 12.3.1			State wildlife corridor.
306	306-Gold Creek-01	2SP127417, 3SP116472	30611, 30612	29.5 km	Gold Creek			RE 12.3.2/12.3.1			
306	306-Balsam Road-01	N/A Road Reserve	N/A Road Reserve	31.0 - 31.5 km	Balsam Road	State		RE 12.9-10.14/12.9-10.1			
307	307-Dam and vegetation to west of Bruce Highway-	N/A Road Reserve	N/A Road Reserve	32 km	Dam and vegetation to the west of the Bruce Highway, Eumundi	Regional		?			



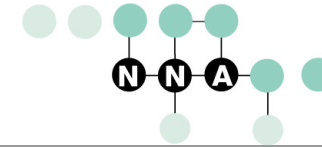
Site Details						Sensitive Environmental Features					
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	01										
307	307-Vegetation to the west of Bruce Highway-01	N/A Road Reserve	N/A Road Reserve	32.5 - 33 km	Vegetation to the west of the Bruce Highway			RE 12.9-10.14/12.3.2 (from botanist -mapped as RE 12.12.12)			Regionally significant wildlife corridor
307	307-Sandy Creek-01	N/A Road Reserve	N/A Road Reserve	33.25 km	Sandy Creek			RE 12.3.1	Potential habitat for Tusked Frog, potential habitat for Giant Barred Frog.		Regional wildlife corridor.



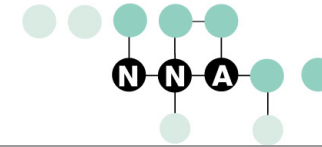
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307	307-North Maroochy River-01	N/A Road Reserve	N/A Road Reserve	34.75 km	North Maroochy River		Potential habitat for Giant Barred Frog.	RE 12.3.1	Potential habitat for Giant Barred Frog, Tusked Frog, Elf Skink, Platypus and Echidna.		Local wildlife corridor.
307	307-Vegetation north of Neeraway Road-01	N/A Road Reserve	N/A Road Reserve	35.0 km	Vegetation north of Neeraway Road		Potential habitat for Giant Barred Frog.		Potential habitat for Giant Barred Frog and Tusked Frog.		
307	307-Vegetation within corridor-01	2SP127433	30720	36.0 km	Vegetation within corridor	Regional	Potential habitat for Giant Barred Frog	RE 12.3.11/12.3.2	Potential habitat for Tusked Frog and Giant Barred Frog.		



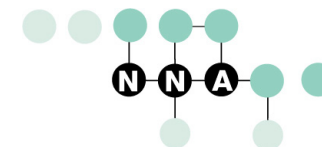
Site Details						Sensitive Environmental Features					
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308	308-Gully at Holts Road-01	2RP208569	30801	37.0 - 37.25 km	Gully at Holts Road	State		RE 12.9-10.16	Potential habitat for Elf Skink.		Regional wildlife corridor.
308	308-Un-named waterways-01	2RP894887	30817	39.5 km	Unnamed waterways	State		RE 12.3.1/12.3.2	Potential for Tusked Frog and Koala		Regional wildlife corridor.
308	308-South of Tewantin Road-01	2SP105441	30821	40.0 km	South of Tewantin Road, Cooroy	Local			Alyxia magnifolia present.		
308	308-Pearsons Road Drainage-01	100SP112631, 3RP215922, 3RP169814	30903, 30930, 30931	41.5 km	Pearsons Road, drainage reserve, Cooroy	Local	Xanthostemon oppositifolius	RE 12.3.2/12.3.1	Symplocos harroldii		



Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
308	308-Six Mile Creek (left branch) close to Lamonts Road-01	11SP161946, 10SP161946, 2RP174721	30932, 30933, 30934	42.6 km	Six Mile Creek (left branch) close to Lamonts Road	Local	Potential for Xanthostemon oppositifolius, Oxleyan Pygmy Perch and Mary River Turtle.	RE 12.3.2/12.3.1	Oxleyan Pygmy Perch and Tusked Frog.		
309	309-Kennedys Road-01	2RP174721, 952FTY1672		43.5 - 44.5 km	Kennedys Road	Regional and Local		RE 12.3.2, 12.9-10.1/12.9-10.17			



Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
309	309-Kennedys Road-02	112MCH793, 3SP108094	30936, 30942, 30944	45.5 - 46.5 km	Easement off Kennedys Road to Six Mile Creek (left branch) and anabranch	State	Xanthostemon oppositifolius present. Potential for Mary River Turtle Mary River Cod and Oxleyan Pygmy Perch.		Tusked Frog present. Potential for Oxleyan Pygmy Perch.		State wildlife corridor.



Site Details						Sensitive Environmental Features					
Area	Site Name	Plan	Property Number	Approx. Chainage	Description of Location	BioSig	MNES	RE	NCA (Species)	NCA (Protected Area)	Ecosystem
309	309-Six Mile Creek main channel-01	118MCH814	30922	47.5 km	Six Mile Creek main channel (downstream of dam wall) crossing		Mary River Cod present. Potential habitat for Lungfish and Mary River Turtle; Xanthostemon oppositifolius in copse next to park.				