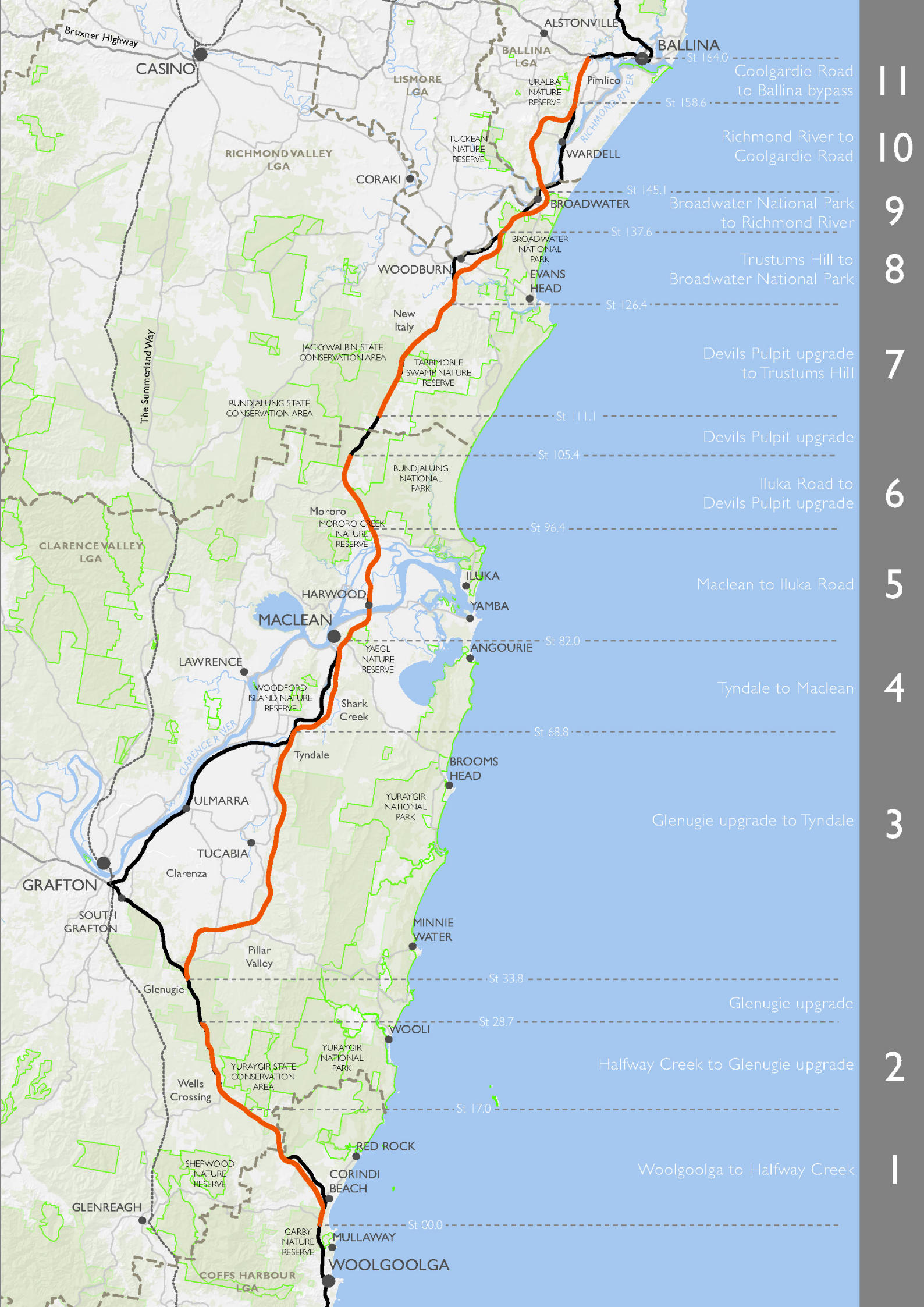


NSW Roads and Maritime Services

WOOLGOOLGA TO BALLINA | PACIFIC HIGHWAY UPGRADE SUBMISSIONS / PREFERRED INFRASTRUCTURE REPORT

Appendix G Lang Hill Environmental Work Method Statement

November 2013



Appendix G Lang Hill Environmental Work Method Statement

Environmental Work Method Statement: Extraction of material at Lang Hill

Summary/purpose

The purpose of this environmental work method statement (EWMS) for is to manage and minimise impacts on environmentally sensitive areas on or adjacent to the Lang Hill site (the 'Site'). It is a practical management tool for use by all construction contractors and sub-contractors undertaking construction activities on or around the Site.

The site will be used to excavate materials for the construction of the Woolgoolga to Ballina Pacific Highway Upgrade. The site will supply the needs of the project only and will not remain an ongoing quarry source. The site will be progressively rehabilitated with landscaping using surplus material generated by the project construction.

This EWMS describes how the excavation of earthworks material and stockpiling of material will occur so as to not cause environmental pollution or harm.

This EWMS document is a framework strategy only to be used to further develop a more detailed work method statements and control plans when construction details are better known. The document outlines the indicative works associated with extracting materials from Lang Hill and will:

- Be updated once conditions of approval are known, particularly any relating directly or indirectly to Lang Hill.
- Reflect the procedures and plans prepared as part of the environmental management system prepared by construction contractors for the project.
- Be updated to incorporate all relevant management measures from the construction environmental management plan and sub-plans.

The objectives of the document are:

- To provide guidance on how to manage material excavations to prevent environmental pollution or harm.
- To ensure that suitable controls are implemented to prevent dirty water and pollutants (including oils and grease) from entering sensitive receiving environments surrounding the site.
- To ensure that suitable controls are implemented to prevent damage or harm to aboriginal cultural heritage found within the project boundary, adjacent to the borrow site.
- To ensure that impacts on adjacent OPP habitat are avoided.
- To ensure that impacts on nearby Rous Water assets are avoided, and / or assets are adjusted as necessary.

The indicative Site and key environmental controls elements of the EWMS are detailed on Drawings 01 and 02.

Site and construction details

Table 1: Site and construction details for Lang Hill

Location	The Site is located north of Woodburn in Section 8 of the project between stations 134.7 and 134.9. The site is south of Broadwater National Park in a sparsely populated area and covers Lot 6 DP755624, Lot 64 DP755624, Lot 104 DP755624, and Lot 51 DP868042, owned by the Roads and Maritime Services (RMS).
Timing	<p>The Site will be used for around 12 months to supply the material for the project. Following this rehabilitation of the site is anticipated to take up to 5 years.</p> <p>Hours of operation for the Site are (as detailed in the EIS):</p> <ul style="list-style-type: none"> • Monday to Friday: 6 am to 7 pm. • Saturday: 8 am to 5 pm. • Sunday and Public Holidays: no work. <p>Should blasting be required at the site, this will only be conducted:</p> <ul style="list-style-type: none"> • Monday to Friday: 9 am to 5 pm. • Saturday: 9 am to 1 pm. • Sunday and Public Holidays: no blasting.
Extraction activities and methods	<p>The Site is expected to provide around 300,000m³ of earthworks material and be excavated down to a level of 4.5m. The site will be rehabilitated through reshaping the landform with surplus and unsuitable material from surrounding project sections and then revegetated.</p> <p>The main activities to be undertaken at the Site include:</p> <ul style="list-style-type: none"> • Site establishment / mobilisation of the site, including: <ul style="list-style-type: none"> - Installation of security and exclusion fencing. - Establishment of sedimentation and erosion control measures. - Clearing of vegetation. - Stockpiling of topsoil / overburden. - Installation of plant equipment. - Establishing site access. • Mechanical excavation, processing, stockpiling and truck haulage of material. • Monitoring and maintenance of environmental measures during the use of the Site and demobilisation when extraction is complete. This includes water quality and groundwater monitoring. • Progressive rehabilitation of the site.
Access	<p>Access to the Site will be via the project construction corridor only. A two-way sealed access and haul road will be established along the eastern boundary of the site between the project corridor and the extraction area. Material will be hauled along the project corridor for use in project section 8. Surplus and unsuitable material will be hauled along the project corridor from sections 7, 8 and 9. An appropriate permanent structure is required for the highway to cross the unnamed waterway. This would be constructed early to enable material to be hauled across the waterway.</p> <p>Access to the borrow site from the western side of the Site, along existing access tracks will be prohibited to avoid impacts on OPP habitat.</p> <p>A main compound site, with temporary office trailers and employee parking, will be located at Woodburn interchange around six kilometres south of the Site.</p>
Plant and equipment	<ul style="list-style-type: none"> • 30t Excavator • 20t Dozer • Backhoe

	<ul style="list-style-type: none"> • Front End Loader • 25t Product Truck • Scraper • Grader • Excavator with rock breaker • Blasting, drilling and rock hammer equipment • Portable crushing plant • Portable screening plant
Consultation	<p>Community consultation during the works to be undertaken in accordance with the Community Communications Strategy to include but not limited to:</p> <ul style="list-style-type: none"> • Relevant Aboriginal parties. • Neighbouring landowners, particularly farming properties. • Utility providers (inc. Rous Water) and asset owners. • Residents potentially affected by noise. • Lessees of property on or surrounding the Site. <p>Public complaints will be investigated, reported and recorded in accordance with the Community Communications Strategy.</p>
Additional Instructions / control procedures informing the EWMS	<p><i>Toolbox talks and site inductions</i></p> <p><i>Erosion and Sedimentation Control Plan</i></p> <p><i>Aboriginal Heritage Management Plan</i></p> <p><i>Devils Pulpit to Ballina water monitoring protocols</i></p> <p><i>Flora and fauna management plan</i></p> <p><i>Ecological monitoring program</i></p> <p><i>Threatened fish management plan</i></p>

Sensitive environmental constraints

Table 2: Sensitive environmental constraints for Lang Hill

<p>Biodiversity</p>	<p>On the site there are small isolated remnants of open forest comprising of a low number of scattered trees and a completely modified and grazed understorey, dominated by Grey gum (<i>Eucalyptus propinqua</i>) with Coastal Blackbutt (<i>E. pilularis</i>). Vegetation on the site, including the stockpile area does not represent a constraint to construction.</p> <p>The adjoining waterway to the west of the site (refer to Drawing 01) is known habitat for the threatened Oxleyan Pygmy Perch (endangered EPBC Act and TSC Act). Oxleyan Pygmy Perch occurs at the southern end of the site.</p> <p>Broadwater National Park is situated to the east of the project alignment (and away from the Site) at this location. The ancillary facility section 8, site 3 is situated in closer proximity to the national park, however, it is over 140 metres away. There are areas of known Oxleyan Pygmy Perch habitat in the national park, the closest being over 800 metres away.</p>
<p>Sensitive receivers (for noise and vibration and air quality)</p>	<p>Sensitive receivers include two houses are located to the west of the Site, on land owned by RMS. Three houses are also located to the north of the site. These sensitive receivers are in private ownership. The houses are sensitive receivers for noise and vibration impacts, however are situated away from the Site that air quality impacts from dust generation would not be an issue.</p> <p>Also to the north of the site are two Rous Water concrete water reservoir towers. The potential impact of the works to these structures due to vibration has been raised as a concern. Air quality impacts would not be an issue.</p>
<p>Aboriginal heritage</p>	<p>The Aboriginal heritage sites, Gittoes Jali and Gittoes Jali 3 are located on Lang Hill. Testing has found a higher density of artefacts located to the south of the extraction area. A heritage artefact salvage program will be implemented for the site and project alignment (construction footprint). The parts of the Aboriginal heritage sites with a higher density of artefacts will remain undisturbed and protected, with no access allowed.</p>
<p>Surface and ground water quality</p>	<p>An unnamed waterway is located on the western side of the site. The waterway across Lang Hill is fairly degraded, with the site being used as a cattle grazing land. The waterway improves in quality as it traverses the southern extent of the Site. Appropriate erosion and sedimentation controls including sedimentation basins (90th percentile) and sediment fences will be implemented to avoid sediment flowing into the waterway.</p> <p>Water quality monitoring of this waterway will continue during the use of the Site.</p> <p>The excavation may potentially impact on the local groundwater table. However, the Site would not intersect the regional groundwater table. In particular, the excavation at the site would intersect the water table below the stream bed level. This would avoid impacts to groundwater recharge to the waterway and avoid impacts to the regional groundwater table.</p> <p>Groundwater monitoring will also continue during the use of the Site.</p>

Work method statement

Table 3: Work method statement for Lang Hill

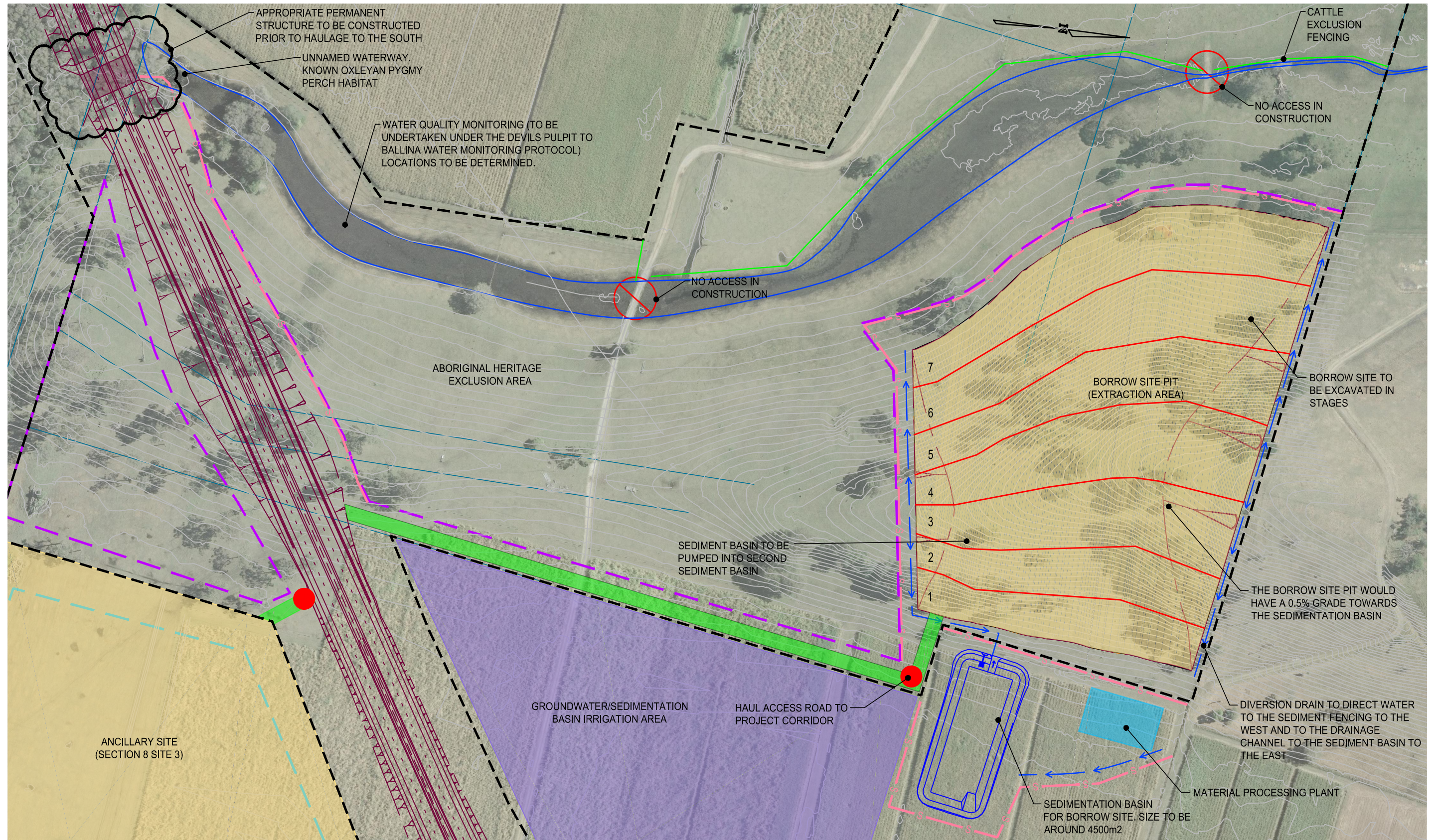
#	Sequence of work activities <i>(How will work be done?)</i>	Potential Hazards <i>(What harm can occur?)</i>	Risk <i>(Refer to CEMP)</i>	Safeguards/Controls <i>(How can the risk be minimised?)</i>	Responsibility <i>(Who will direct works to ensure compliance?)</i>
Mobilisation and establish environmental controls					
1.	Pre-construction salvage	Aboriginal artefacts are unlawfully disturbed	H	Salvage excavations of the Aboriginal heritage site that would be directly impacted would be undertaken in consultation with the registered Aboriginal parties. Refer Aboriginal heritage management plan.	Environmental Officer
2.	Pre-commencement work activities	Community are exposed to impacts without prior notice	M	Further construction noise assessment to be undertaken	Environmental Officer
				Landowners/community members who maybe affected to be notified prior to work commencing	Community Team Site Engineer
				Work limited to approved construction hours only.	Foreman Site Engineer
		Structural damage from vibration impacts	H	Vibration and blast assessment to be undertaken at sensitive receivers (including the water reservoirs) within 200 metres of any blasting	Environmental Officer
		Environmental impact	H	Excavation and relocation of underground utilities, where required for the use of the Site to be undertaken in consultation with Rous Water.	Site Engineer
	Haphazard work activities	M	Detailed site survey. Excavation extent, progression and timing is planned for project needs. Initial site layout established	Site Engineer	
3.	Site set-up, including clearing site	Public access to site.	L	Temporary security fencing installed around the perimeter of the Site Aboriginal heritage sites to be protected by temporary fencing or appropriate measures to prevent access and damage.	Foreman
		Injury / death of fauna	L	Preclearing assessment of all habitat and hollow bearing trees, including removal of any fauna detected (see RMS Biodiversity Guidelines)	
4.	Planning for the installation of the	Uncontrolled run off associated with the	M	Prepare an ESCP for the area.	Project Engineer Environmental Officer

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	erosion and sedimentation controls	works		Register ESCP with Environmental Officer for sign off.	Project Engineer Environmental Officer
5.	Provide training to personnel and subcontractors involved in site activities	Non-compliance with agreed work methods	M	Toolbox field operators on the requirements of this CMS, including environmental awareness training to identify controls and responsibilities at the site.	Foreman
6.	Mark out the location of excavation and stockpile	Damage to sensitive areas	H	Mark out the limit of the works area to minimise disturbance. Exclusion zones to be fenced to exclude entry by people or plant. Clearly delineate construction vehicle and plant access to the area to prevent disturbance/damage to adjacent vegetation and heritage sites. Fencing to remain on site until the site has been demobilised and rehabilitated.	Foreman Site Engineer
7.	Site establishment (ground disturbance)	Sedimentation due to disturbance or contamination	H	Ensure adequate ERSED controls are installed, illustrated in Figures 01 and 02, to the west of the borrow source (extraction area) and east of the identified aquatic (OPP) habitat to avoid sediment entering the waterway. Refer ESCWMS. Installation of sedimentation basins (90 th percentile), to the east of the extraction area, to capture surface water run-off from the extraction area and the access road. For the location, refer to Figure 1. Remain maximum possible distance from waterway bank. Refer ESCP. All erosion and sediment controls to be in place as per the ESCP for the Site, this is to include the materials processing area. Maintain controls as required.	Foreman
8.	Establish material stockpile area	Flood disturbance causing sediment release from the stockpile area	H	Construct compact earth platform above the 20 year flood level in accordance with hydrological recommendation. Install bunding supporting the stockpile area. All erosion and sediment controls to be in place as per the ESCP for the Site.	Project Engineer Foreman Foreman
9.	Construct two-way access track	Sedimentation due to disturbance or contamination	L	Seal access track and ensure runoff is captured and diverted to sedimentation basins.	Project Engineer Foreman

#	Sequence of work activities <i>(How will work be done?)</i>	Potential Hazards <i>(What harm can occur?)</i>	Risk <i>(Refer to CEMP)</i>	Safeguards/Controls <i>(How can the risk be minimised?)</i>	Responsibility <i>(Who will direct works to ensure compliance?)</i>
Extraction / construction					
10.	Extraction of material	Untreated runoff flowing into unnamed waterway	H	Extraction to be staged east to west and graded to the west to drain site towards sedimentation basin away from the unnamed waterway.	Foreman Site Engineer
				Excavation to be staged in sections across the site. Vegetation clearing / top soil removal will only be undertaken for that section of land subject to that stage of excavation.	
		Noise and vibration impacts to sensitive receivers	M	At each stage, localised erosion and sediment controls would be installed to direct surface runoff from the cutting to sedimentation basins.	Foreman Site engineer
				Extraction to be staged east to west to use the natural topography to provide some noise attenuation. Where a blast location is predicted to impact on a sensitive receiver, a series of trials will be undertaken at a reduced scale to determine site specific blast response characteristics to define allowable blast sizes. Blast monitoring will be undertaken during the blasts.	Environmental Officer Environmental Officer
11.	Stockpiling of material	Sedimentation movement from site	H	Stockpiles to be constructed along the contour as low, flat elongated mounds, with, where possible, no greater in height than 2 metres.	Foreman Site engineer
				Stockpiles would be seeded or have an alternative cover placed as soon as practicable. Bunding would be used around the site.	Foreman Site engineer
				Diversion drains to be established upslope to divert water around the site.	Foreman Site engineer
				Bunding around the site would be stabilised through seeding or other means and have a finished height above the 20 year flood level.	Foreman Site engineer
12.	Haulage and heavy vehicle access	Unintentional direct and indirect impacts to the unnamed waterway	H	Movement of materials from/to the project corridor is via the access road identified on Drawing 01.	Project Engineer Foreman
				Haulage of material across the unnamed waterway on the project alignment will not occur until the permanent crossing structure has been constructed. Appropriate controls and procedures will be implemented for the main alignment construction within 25 metres of the unnamed waterway (refer to the ESCP for the area)	
				Property access tracks from the west, that cross over the unnamed waterway are not to be used.	Foreman
13.	Maintenance of environmental	Runoff affecting water quality of known OPP habitat	L	The water from sedimentation basins would be used for dust suppression and if required, would be sprayed on adjoining cane land (owned by RMS) to empty the sedimentation basin.	Environmental Officer

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	controls			Sediment and erosion controls (including bunding and sedimentation basins) will be monitored daily to maintain effectiveness of controls. A formal environmental inspection, including sediment control inspections, will occur weekly using a project specific checklist.	Environmental Officer
Formal inspection will occur within 24 hours of the commencement of any rainfall event (>10 millimetres) and every 24 hours during any prolonged period of rainfall. A review should also occur when it has been identified that control measures are not performing effectively.				Foreman Environmental Officer	
The sediment levels in sediment basins will be regularly inspected. Where this is approaching 30 per cent of the sediment storage capacity, the basin would be cleared. Sediment would be placed in an appropriately bunded temporary stockpile.				Environmental Officer	
Sediment fences will be regularly inspected for undercutting, sagging and overtopping, general condition of the fence and repaired immediately. Where appropriate, gravel will be applied to the base of sediment fencing where potential undercutting or end running has been observed.				Environmental Officer	
If a sediment fence fails, the catchment area and flow type (concentrated or sheet) will be reviewed to determine if the fence and flow controls are appropriate or require to be modified.				Environmental Officer	
Sediment deposits behind the fence will be removed before it reaches one third of the height of the fence. The sediment would be placed in an appropriately bunded temporary stockpile.				Environmental Officer	
Damage to sensitive areas		L	The Aboriginal heritage exclusion fencing would be regularly inspected and maintained.	Environmental Officer	
			Regular inspections and toolbox talks to ensure that access to the site is not gained via existing structures across the unnamed waterway.	Environmental Officer	
Demobilisation and rehabilitation					
14.	Rehabilitation	Untreated runoff flowing into waterways	M	The borrow source site will be filled with surplus material to the greatest extent possible from surrounding project sections. The landform would aim to mimic the existing landform.	Foreman Site engineer
				Shaped areas will be covered with appropriate level of topsoil, using where possible, the previously stripped topsoil, then revegetated with grass and ground cover plantings as per the Landscape and Urban Design Strategy identified within the EIS Working paper- Urban design landscape character and visual impact assessment.	Foreman Site engineer

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				Stockpiles, exposed batters and drainage lines are to have a 50 per cent groundcover equivalent within a month of inactivity. This can be achieved using a combination of vegetative cover or lining. The unnamed waterway would be fenced to exclude fauna and allowed to regenerate to improve water quality and stream bed quality. Appropriate riparian plant species will be incorporated into the rehabilitation of the already disturbed Oxleyan Pygmy Perch habitat.	Foreman Site engineer
15.	Demobilisation	Moving of sediments off site	L	Sediment controls are not to be removed from the area until the site vegetation cover has been reinstated to 70 per cent ground cover.	Environmental Officer
16.	Maintenance of rehabilitation	Invasion by weeds	M	Rehabilitation of the site (including rehabilitation of the waterway) would be monitored until the vegetation has stabilised.	Environmental Officer



ALL CONTROLS ON PLAN SUBJECT TO DETAILED DESIGN AND SURVEY

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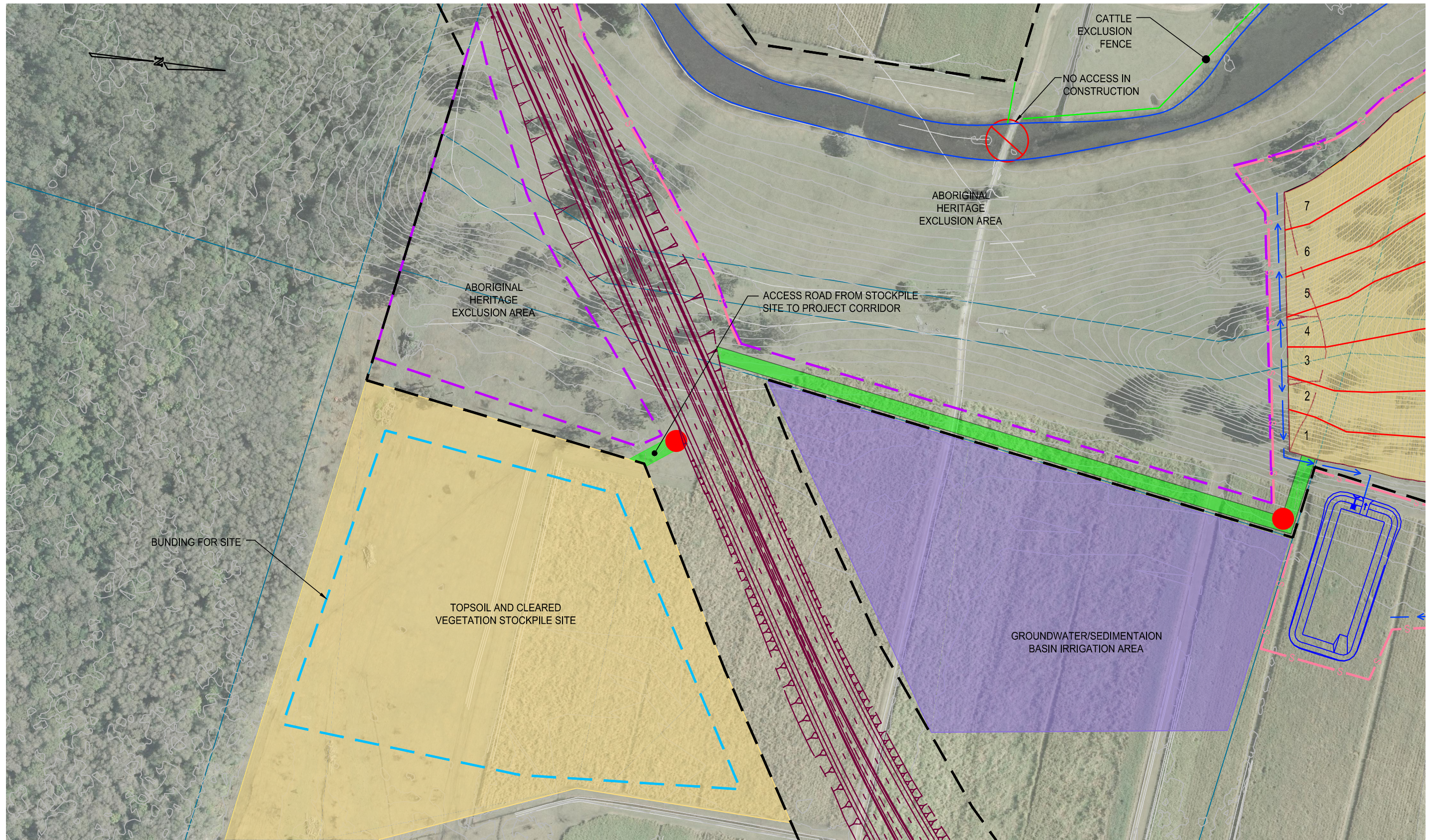
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ROADS AND MARITIME SERVICES
 PACIFIC HIGHWAY UPGRADE
 WOOLGOOLGA TO BALLINA PLANNING ALLIANCE
 CONCEPT DESIGN
 LANG HILL ENVIRONMENTAL
 WORK METHOD STATEMENT

FILE No.	DRAWING	PRINTED DATE	SHEET No.
	ENV-FIG-01	16/08/2013	01
REGISTRATION NUMBER			
0010.110.RC.4215			



- PUMP LINE
- DIVERSION DRAIN
- S- SEDIMENT FENCE
- PROJECT BOUNDARY
- EXCLUSION FENCE
- SITE ACCESS POINT

ALL CONTROLS ON PLAN SUBJECT TO DETAILED DESIGN AND SURVEY

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SCALES	
	SCALE 1:2000
Co-ordinate System: MGA Zone 56	Height Datum: A.H.D.

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ROADS AND MARITIME SERVICES

PACIFIC HIGHWAY UPGRADE
 WOOLGOOLGA TO BALLINA PLANNING ALLIANCE
 CONCEPT DESIGN
 LANG HILL ENVIRONMENTAL
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FILE No.	DRAWING ENV-FIG-02	PRINTED DATE 16/08/2013	SHEET No.
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0010.110.RC.4215			