

All disturbed areas will be progressively rehabilitated throughout the life of the mine to achieve a suitable final landform (refer to **Section 5.1.3**), as shown in **Figures 2.9 to 2.14**.

2.5.3 Production Schedule

Ravensworth Operations proposes to mine up to approximately 16 Mtpa ROM coal over a period of up to 29 years. The proposed 29 year mine life will enable Ravensworth Operations to access all of the identified coal reserves deemed to be economically viable for open cut mining within the Project area. This will also enable Ravensworth Operations to operate under a single Project Approval over the total life of the Project.

2.5.4 Mining Method

As part of detailed Project design, Ravensworth Operations has reviewed the mining method and fleet specifications in response to potential environmental constraints. As described in **Section 2.5.1**, this has included a review of proposed mining equipment specifications to ensure appropriate equipment and controls have been selected. Where required, the conceptual mine plans have been adjusted, to ensure that potential environmental impacts are minimised throughout the Project (refer to **Section 2.5.1**).

2.5.5 Mining Fleet

The initial mining sequence will be undertaken through an excavator and truck mining fleet, including a number of electric rope shovels. This initial mining method will be maintained for the development of the initial box cut to the uncovering of the lower strata of the target coal seams within the Project area. From this stage of the conceptual mining sequence it is proposed that one of the existing Ravensworth Operations draglines and an electric rope shovel will be moved to the Ravensworth North pit.

A pre-strip fleet is also proposed to be utilised over the life of the Project. The pre-strip fleet will advance in front of the mining operation to uncover the upper most of the target coal seams. A fleet of trucks will also be utilised to haul overburden to out of pit and in-pit overburden emplacement areas, and extracted coal to coal processing infrastructure. The typical mining fleet that will be used over the life of the Project is outlined in **Table 2.4**.

Table 2.4 – Proposed Typical Mining and Ancillary Equipment

Equipment Type	No.	Ancillary Equipment	No.
Electric drag line	1	Drill	4
Electric rope shovel	1	Grader	3
Rear dump truck (340t)	31	Water cart	3
Rear dump truck (240t)	18	Fuel and service truck	2
Excavator	5	Wheel Loader	1
Dozers – rubber tyred	2	Hydraulic shovel	1
Dozers	12		

Note: The table outlines typical types, size and numbers of equipment for the maximum production scenario. There may be variation in numbers, size and types of equipment provided relevant assessment criteria are maintained.

The proposed general sequence of mining using the equipment described is outlined in the following sections.

2.5.6 Pre-strip Operations

Pre-strip operations include the removal of vegetation and topsoil ahead of the active mining operation. Prior to any disturbance of the surface, clean water diversions, erosion and sediment control works will be established where required. This will allow surface runoff to be diverted around the site and thus not be impacted by the mining activities, and allow collection of surface water containing sediment within the mining area to be adequately treated and provide that erosion is minimised.

Following the removal of vegetation, topsoil will be stripped and either placed in topsoil stockpiles or placed directly on reshaped overburden for rehabilitation purposes. Topsoil management is discussed further in **Section 5.1**.

2.5.7 Overburden Removal and Management

Once the mining area is cleared of vegetation and topsoil, the material lying above the target coal seams, known as overburden, is broken up through drilling and blasting to enable it to be removed. The top layer of overburden is generally weathered material that may not require blasting and this material may be removed prior to blasting.

The blasted overburden is loaded by rope shovels, hydraulic shovels and excavators into rear dump trucks for transportation to the overburden emplacement areas. From approximately Year 5 of the Project, a dragline will be utilised for overburden stripping. Based on conceptual mine planning, the existing dragline currently in operation at Narama mine will be utilised as part of the Project. The proposed movement of the dragline for use in the proposed Ravensworth North pit will require crossing of Bayswater Creek within the Project area. The proposed creek crossing will be managed to minimise potential impacts, including the restriction of the crossing point to the established Bayswater Creek diversion, and remediation of any disturbance as soon as practicable after the movement. The dragline will generally operate within the deeper sections of the proposed mining area. The rope shovels, hydraulic shovels and excavators will remove overburden at the shallower depths.

The conceptual mine plan has been developed to maximise opportunities for in pit overburden emplacement in order to minimise the requirements for out of pit overburden emplacement areas, where practicable. Based on the current mine plan, the northern out of pit overburden emplacement area will be developed during the initial stages of mining (refer to **Figures 2.9 to 2.14**). Following this, overburden will be placed both in-pit and east to an out of pit overburden emplacement area.

The proposed overburden emplacement areas will act as significant topographical barriers between the proposed mining operations and sensitive receiver areas to the east and south-east. As discussed in **Section 2.5.1**, the proposed northern overburden emplacement area has been re-designed so that impacts to threatened ecological species and significant archaeological sites at Davis Creek will be avoided. The conceptual Project designs have incorporated a buffer area of at least 200 metres from Davis Creek.

The eastern out of pit overburden emplacement area is located on the rehabilitated voids associated with the former Ravensworth No. 2, Ravensworth South and current Narama mining operations. In the eastern overburden emplacement area, overburden will be preferentially dumped into the voids associated with the former Ravensworth No. 2, Ravensworth South and Narama mine operations and will be progressively rehabilitated to ensure visual and dust impacts from the Project are minimised. The proposed haulage of overburden to the eastern out of pit emplacement area, and ROM coal (refer to **Section 2.5.8**) will require the construction of a number of crossings of Bayswater Creek. The creek crossing locations will vary over the life of the Project, as mining progresses, and

will be located within the established Bayswater Creek diversion and designed to not adversely influence flood levels, flows or velocities in Bayswater Creek.

The eastern out of pit emplacement area has been designed to progress in advance of the proposed mining sequence so that a barrier is created between the proposed mining operations and receiver areas to the south-east. As discussed in **Section 2.5.1**, the proposed eastern overburden dump has also been designed so that impacts to sensitive sites and existing users in the Project area are avoided.

The out of pit overburden emplacement areas will be developed progressively over the life of the mine to a maximum height of approximately 200 metres RL and 160 metres RL for the northern and eastern dump respectively. The overburden emplacement areas will be progressively shaped and rehabilitated as described in **Section 5.1.3**, and shown on **Figures 2.9 to 2.14**.

2.5.8 Coal Removal

Exposed coal will typically be mined by hydraulic excavators and loaded into rear dump trucks for transportation via internal haul roads to the existing Ravensworth Operations raw coal stockpile. Further details on ROM coal processing and handling is provided in **Section 2.5.9**. Coal will be transported to the ROM stockpile by conventional large capacity off-highway rear dump trucks.

2.5.8.1 Blasting

As described in **Section 2.5.7**, overburden will generally be blasted prior to removal and emplacement. In addition, where thickness is sufficient, coal seams may also be blasted prior to extraction. Blasting will typically be conducted daily with the potential for multiple blasts per day. Detailed design will be undertaken for each blast in order to maximise the blast efficiency, minimise potential dust, vibration and overpressure impacts and to ensure compliance with site specific blast conditions.

The average depth of blast drill holes will be approximately 20 metres, with the holes generally spaced between 6 and 9 metres apart. Generally, ammonium nitrate based explosives will be used either as free flowing or pumped products depending on ground conditions such as water seepage into the blast holes and the surrounding geology.

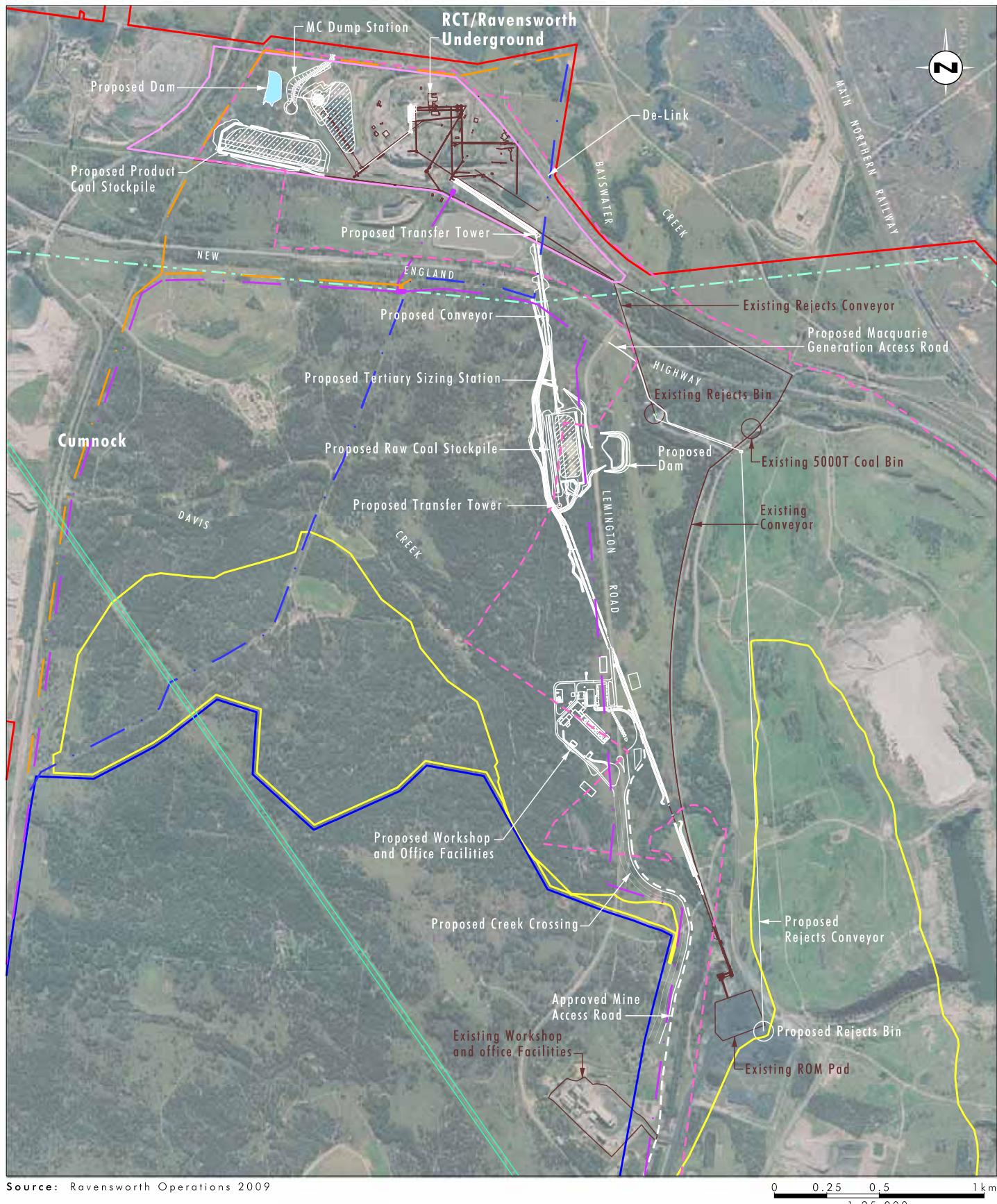
Ravensworth Operations will undertake blasting in accordance with a detailed design process that considers operational, geological and environmental constraints. Blasting will be typically restricted to daylight hours Monday to Saturday.

Ravensworth Operations will design blasts to ensure that potential impacts on surrounding features, such as infrastructure, residences, sensitive land uses and sensitive locations in the vicinity of the proposed mining operations, are managed. The potential impacts of blasting associated with these features have been considered as part of mine design and assessed in detail as part of this EA (refer to **Section 5.4**).

2.5.9 Coal Handling and Processing

2.5.9.1 ROM Coal Handling

ROM coal will be hauled by rear dump trucks via internal haul roads to the existing Ravensworth Operations ROM coal pad (refer to **Figure 2.16**). ROM coal will either be stockpiled for future processing or dumped directly into the ROM coal hopper. From this point coal is processed in primary and secondary sizing stations. Ravensworth Operations



Legend

- | | |
|---|---|
| Project Area | Existing Infrastructure |
| Ravensworth North Pit | Proposed Infrastructure |
| Out of Pit Overburden Emplacement | Existing EnergyAustralia 66kV Powerline |
| Ravensworth Coal Terminal | Proposed EnergyAustralia 66kV Powerline |
| Ravensworth Underground Mining Operations | Ravensworth Operations 66kV Realignment |
| Existing 330kV Transmission Line | |
| Proposed 330kV Transmission Line | |
| Proposed Mine Access Road | |

FIGURE 2.16

Proposed Infrastructure Layout

proposes to upgrade the existing sizing stations to provide additional capacity required for the Project. Coal processed by the sizing stations is diverted to conveyor systems for transport to Macquarie Generation for domestic power generation or to the RCHPP/RCT for further processing for the export market. Further details of the processing of coal are provided in **Section 2.5.9.2**.

After sizing at the ROM pad, domestic coal will be transferred via an existing Macquarie Generation conveyor feed system (refer to **Figure 2.16**) to supply Bayswater and Liddell Power Stations.

2.5.9.2 Coal Handling and Processing

Coal destined for export markets will be transferred via a new overland conveyor to a new Raw Coal Stockpile adjacent to a new tertiary sizing station, where it is further sized prior to being transferred to RCHPP/RCT via the new overland conveyor (refer to **Figure 2.16**). The new overland conveyor will cross the New England Highway via an overhead bridge that will also provide a crossing point for other services, and a roadway for road size vehicle access. As described in **Section 4.1**, consultation has been undertaken with the NSW Roads and Traffic Authority (RTA) regarding the proposed bridge over the New England Highway.

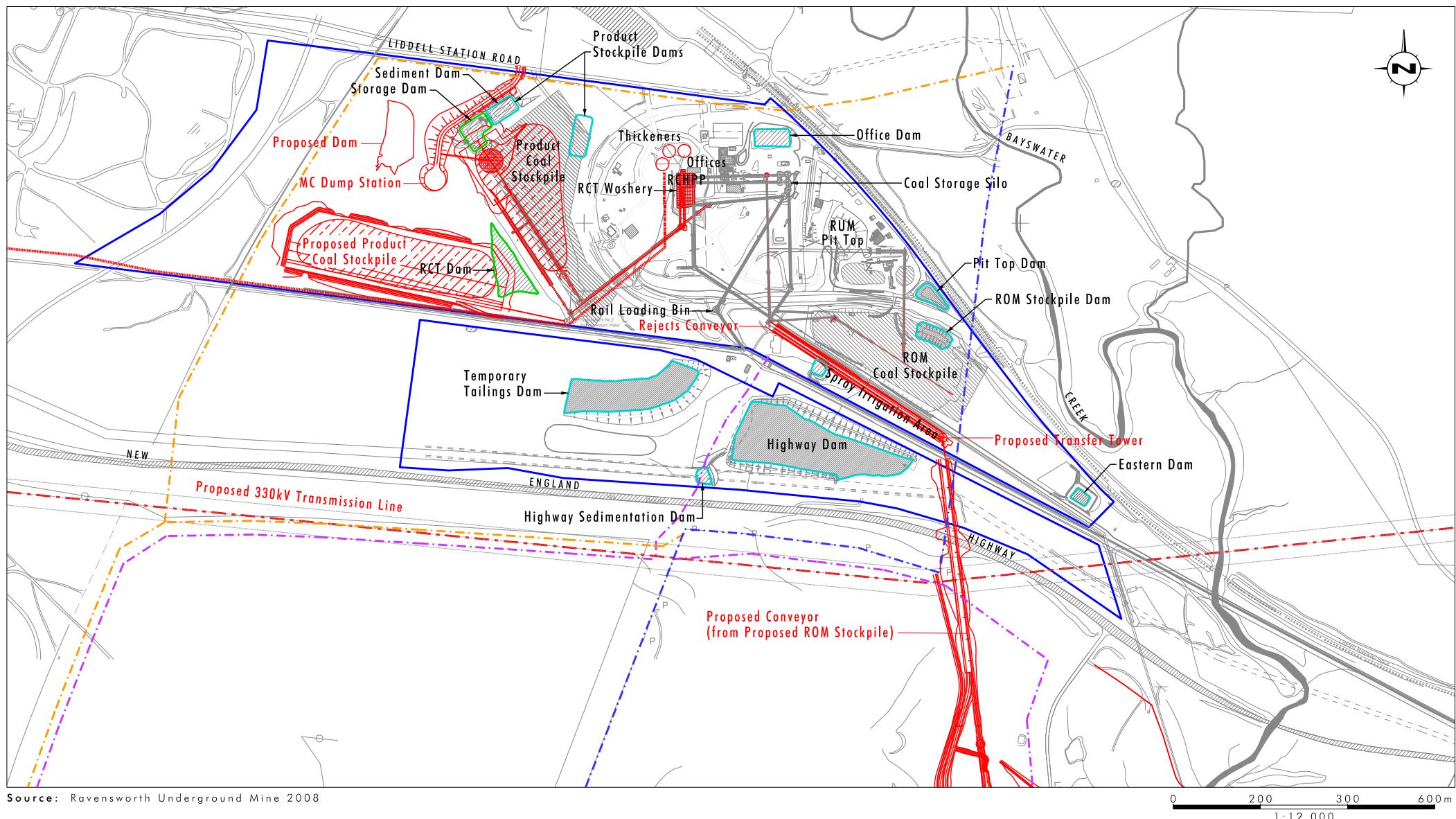
The proposed Raw Coal Stockpile is located to the west of the existing Lemington Road alignment and will contain a stockpile with stacker and reclaim tunnel infrastructure. The stacker will be a luffing design such that it can be raised and lowered to reduce the drop height of the coal to minimise dust emissions when stacking. Automated dust control sprays will also be installed at this proposed stockpile area to manage potential dust impacts. Appropriate water management infrastructure will be constructed to manage runoff from the Raw Coal Stockpile area.

Ravensworth Operations proposes to utilise the coal handling and coal processing infrastructure and facilities at the RCHPP/RCT in the northern extent of the Project area (refer to **Figure 2.17**). The RCHPP/RCT facility was originally approved in 1982 for domestic coal preparation, however, it is currently utilised as a coal preparation plant by RUM and for coal storage and train loading by RUM, Cumnock No. 1 Colliery and Muswellbrook Coal for export coal. The location of the RCHPP/RCT facility provides an opportunity for Ravensworth Operations to maximise the use of the existing coal handling infrastructure within the Ravensworth area as part of the Project.

The existing RCHPP/RCT facility has a current operational capacity of up to 8 Mtpa of ROM coal. It is proposed to upgrade RCHPP/RCT to process and transport up to 20 Mtpa of coal produced from the Project and from existing users of the facility such as RUM, Cumnock and Muswellbrook Coal.

The conceptual design for the upgrade of the RCHPP/RCT coal preparation facility is shown on **Figure 2.17** and includes the following key features:

- modification of the plant feed conveyors at RCHPP/RCT to receive coal from the Project's overland conveyor system;
- upgrade of RCHPP by the addition of two 900 tonnes per hour (tph) heavy media and spiral separation modules to increase the rate of ROM coal feed into the coal preparation plant to approximately 3000 tph;
- modification of the RCHPP to facilitate dual washing of coal and hence produce dual product specifications (thermal and semi soft coking coal) from a single feed product;



Legend

- | | |
|---|--|
| ■ Ravensworth Underground Mine Pit Top Area | — Existing EnergyAustralia 66kV Powerline |
| ■ Existing Water Storage Facilities | - - - Proposed EnergyAustralia 66kV Powerline |
| ■ Proposed Upgrade | - - - - - Ravensworth Operations Transmission Line |
| ■ Infrastructure To Be Removed | |



FIGURE 2.17

Proposed Upgrade Works at
Ravensworth Coal Handling
and Preparation Plant

- an upgrade of the coarse reject system including increasing the conveyor speed of the existing rejects conveyor from 600 tph to 1000 tph, and construction of an additional overland conveyor to a new rejects bin (refer to **Section 2.5.10**);
- reinstatement of two existing but unused tailings thickeners to upgrade the overall tailings management of the plant;
- installation of rail crossovers on the Ravensworth Rail Loop, to remove the need for trains to travel on the Newdell bi-directional line prior to rejoining the Main Northern Railway line (refer to **Figure 2.18** and **Section 2.5.9.4**);
- installation of additional tailings pipeline, and upgrade of existing tailings pipelines; and
- upgrade of the existing water management system to accommodate additional production requirements and the additional infrastructure areas.

In addition to receiving coal from overland conveyors from existing Ravensworth Operations and RUM mining operations, RCHPP/RCT receives coal via road transport from operations such as Cumnock and Muswellbrook Coal. The Project includes an upgrade of an existing intersection at Liddell Station Road to the west of the main site access to the RCHPP/RCT to improve road safety conditions for the existing road users of RCHPP/RCT (refer to **Figure 2.17**).

It is proposed to maintain the overland coal conveyors and associated coal handling infrastructure associated with existing Narama and Ravensworth West operations for the transport of coal directly to Macquarie Generation's nearby power generation stations. The existing concrete 5000 tonne surge bin, located south of the New England Highway, which services this conveyor system, will be used as part of the Project.

2.5.9.3 Product Coal Handling

As part of the upgrade of the RCHPP/RCT, Ravensworth Operations proposes to increase product stockpile areas and the feed rate to the RCHPP/RCT train loading facility. Product coal will be stockpiled on an enlarged but existing product stockpile and a proposed new stockpile (refer to **Figure 2.17**). It is proposed to lengthen the existing product stockpile by approximately 100 metres to enable storage of up to approximately 600,000 tonnes and construct a new product stockpile up to 450 metres long adjacent to the existing stockpile providing an additional 800,000 tonne storage capacity (refer to **Figure 2.17**). Stockpile capacity will be managed with the use of travelling luffing stackers and dozers. Automatic dust control sprays activated during high wind periods will be installed and maintained on the stockpiles. Both stockpiles will have the ability to reclaim coal via reclaim tunnels at 4500 tph and will supply the upgraded existing train load out facility.

2.5.9.4 Product Coal Transportation

Coal handled and processed at RCHPP/RCT will continue to be loaded onto trains on the Ravensworth Loop. It is proposed to upgrade the train loading capacity of RCHPP/RCT from 3300 tph to 4500 tph to accommodate for coal produced from both the Project and existing operations such as Muswellbrook Coal and RUM. It is proposed that up to 20 Mtpa coal may be loaded at RCT for transport to the export market via the Main Northern Railway line.

Existing rail access to RCHPP/RCT occurs from the Main Northern Railway line through a dedicated rail siding at Ravensworth Junction. Trains from the Ravensworth Loop regain access to the Main Northern Railway line by travelling on the bi-directional Newdell Line to Newdell Junction (refer to **Figure 2.18**).

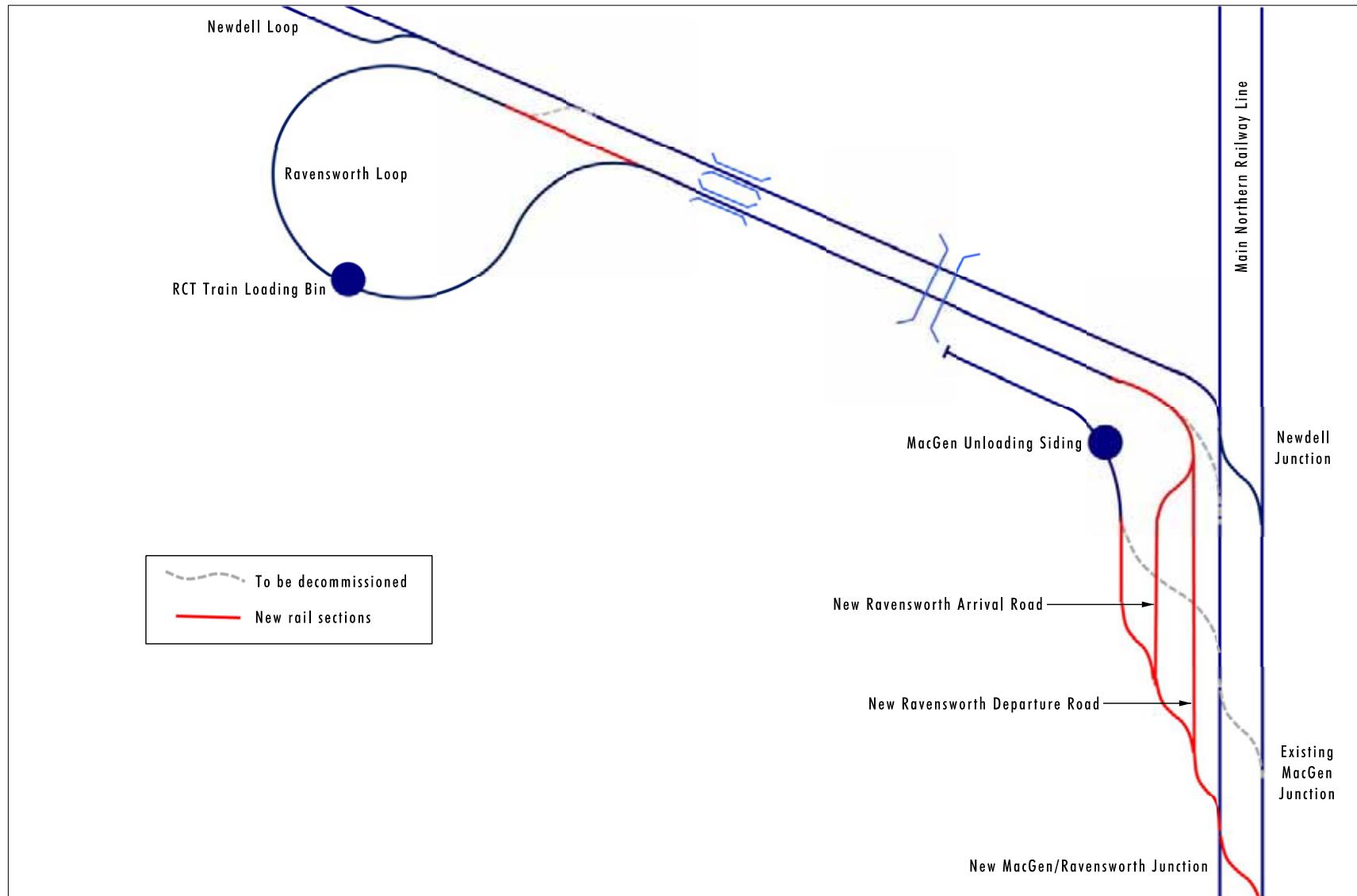


FIGURE 2.18

Schematic of Proposed
Ravensworth Loop De-Link

Prior to the exceedance of 8 Mtpa coal load out from RCHPP/RCT, Ravensworth Operations will de-link the Ravensworth Loop from the Newdell Junction, as shown on **Figure 2.18**. This will eliminate the need for trains using the Ravensworth Loop to travel on the bi-directional Newdell Line and Newdell Junction. The proposal will enable Ravensworth trains to arrive and depart from the Ravensworth Loop via a modified and upgraded Macquarie Generation junction which is to the south of Newdell Junction. Inclusive would be a modification at the Ravensworth Loop to allow bi-directional use of the Ravensworth Loop and the decommissioning of the current turnout where Ravensworth Loop trains currently access the bi-directional Newdell Line. The Macquarie Generation Junction would be relocated further south to allow standard high speed turnouts at the junction and crossover consistent with ARTC requirements. A passing loop would also be included for Ravensworth trains to provide operational capacity.

This solution depends on further design development and acceptance by other parties including ARTC, Coal & Allied and Macquarie Generation. If this proposal is unachievable, Ravensworth Operations will pursue alternative rail de-linking options consistent with the parameters defined in commitment number 6.3.10 (refer to **Section 6.0**). Any studies conducted in regard to rail de-linking will be undertaken by Ravensworth Operations in consultation with other key stakeholders, and in accordance with any relevant approvals.

2.5.10 Rejects and Tailings Management

As described in **Section 2.5.9**, raw coal will be processed at the RCHPP/RCT which will include the washing of raw coal for supply to export markets. During the processing of coal, waste product or reject will be generated. This is separated into a coarse and fine fraction. It is estimated that processing of raw coal at RCHPP will produce an average product yield of approximately 70 per cent. The remaining 30 per cent will be reject material that will consist of approximately 20 per cent coarse reject and 10 per cent fine fraction or tailings. The actual proportion of reject will vary depending on the properties of individual seams being processed over the life of the Project.

Typically, tailings are pumped at 30 to 35 per cent by weight solids. Once emplaced the excess water or decant water is available for recovery. Depending on the location/design of the tailings emplacement area and method of emplacement, the volume of water available for recovery can vary significantly. The objective for final design of the tailings disposal process for each of the proposed tailings emplacement areas is to maximise the feasible water recovery and optimise use of the emplacement area.

Coarse rejects from the RCHPP/RCT are currently conveyed to a coarse rejects bin south of the New England Highway (refer to **Figure 2.16**) where rejects are collected by haul trucks for emplacement in existing voids within the area or mixed with overburden material. As part of the Project it is proposed to construct a new rejects conveyor from the existing rejects bin to a new rejects bin near the existing Ravensworth Operations ROM pad area (refer to **Figure 2.16**). From the proposed rejects bin, haul trucks will transport rejects via internal haul roads for emplacement in the proposed overburden emplacement areas.

Tailings will be pumped to tailings emplacement areas at Cumnock open cut, Ravensworth South and Narama voids via above ground pipelines. The location of the proposed tailings pipelines are shown on **Figures 2.9 to 2.14** and will be dependent on the tailings emplacement area being utilised. The proposed tailings pipelines locations do not require crossing of the existing Coal & Allied conveyor and haul road adjacent to Cumnock tailings emplacement areas. Tailings will be further dewatered and consolidated by drainage and surface evaporation. When sufficiently consolidated the tailings will be progressively covered by a layer of overburden and the area will be rehabilitated.

During the early stages of mining, tailings will be pumped to existing approved tailings dams to minimise additional surface area disturbance. Within the Project area there are a number of existing reject and tailings emplacement areas currently servicing coal processing facilities associated with mining operations within the area. The existing reject and tailings emplacement areas are primarily voids associated with former open cut mining operations in the Ravensworth area (refer to **Figure 2.19**) and include:

- Cumnock Stage 1 and Stage 2 open cut tailings dams;
- RUM 7 South tailings dam – eastern final void associated with former Ravensworth South mining operations; and
- RUM surface infrastructure.

The increased coal processing capacity as a result of the proposed upgrade to the RCHPP/RCT will require the development of additional rejects and tailings management capacity for coal produced from the Project. The proposed tailings and reject emplacement areas that will be utilised for the Project are shown on **Figure 2.19** and include:

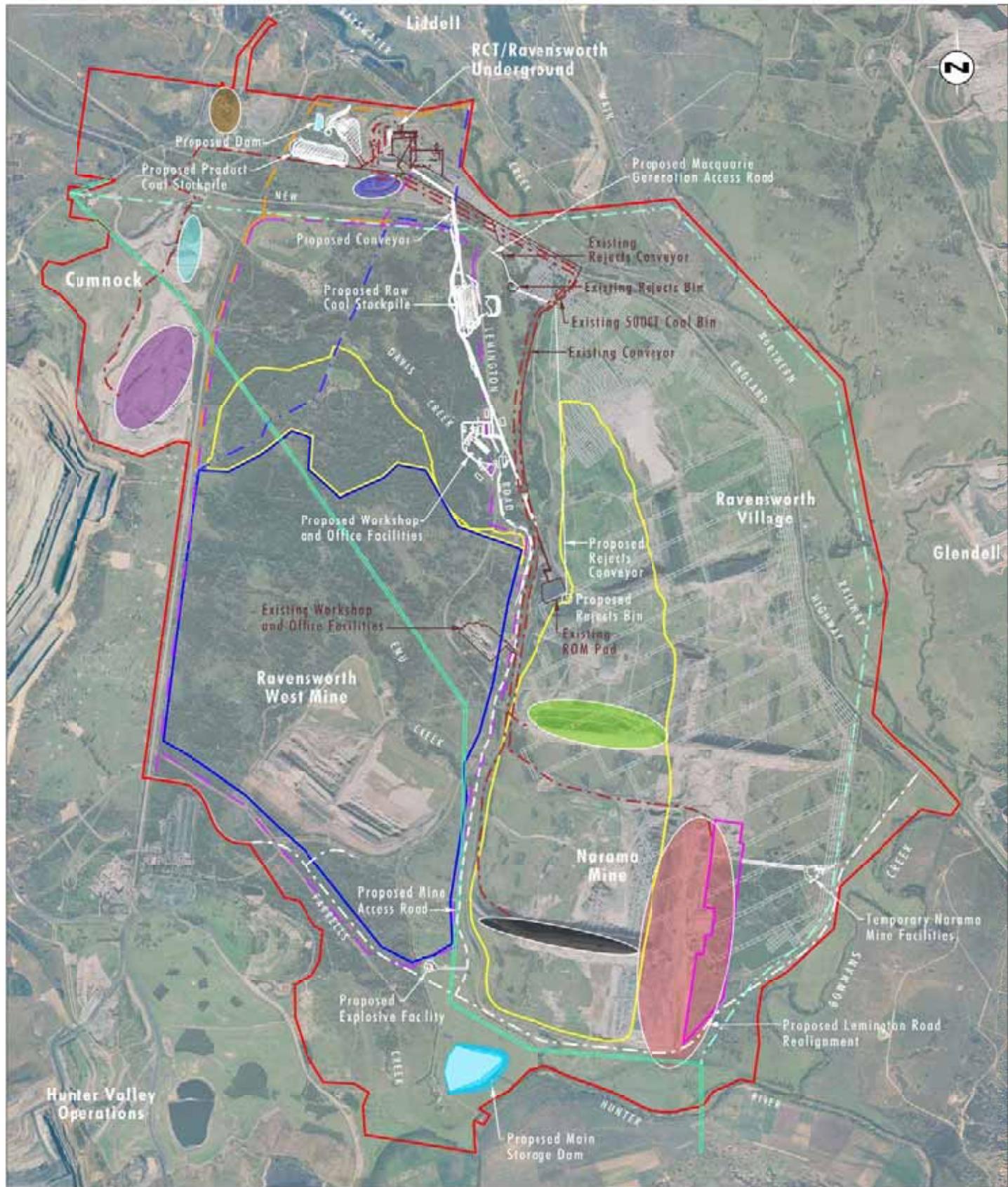
- Cumnock Stage 1/2 void;
- RUM 7 South Tailings Dam;
- Cumnock Stage 3 void;
- Cumnock Wash Plant Pit;
- Narama 9 south ramp; and
- Narama final void.

The proposed conceptual tailings emplacement design for the Cumnock Stage 3 void includes the construction of a dam wall for the emplacement of tailings on Xstrata owned land (refer to **Figure 2.9**). Ravensworth Operations is currently investigating opportunities to use the Cumnock Stage 3 void for joint tailings disposal with Coal & Allied's Hunter Valley Operations mine. The final design of any tailings emplacement areas will be undertaken in accordance with relevant approvals.

It is estimated that the proposed tailings and reject emplacement areas that will be utilised for the Project have a capacity that is sufficient to store tailings for the life of the Project.

The conceptual tailings management strategy currently provides for use of the proposed tailings emplacement areas on a staged basis to the current extent of existing voids within the Project area. Co-disposal of tailings with overburden material may also occur within the proposed emplacement areas. This may be undertaken over the life of the Project to supplement the use of existing voids. Once the storage capacity of the existing voids is reached in approximately year 20 of the Project, co-disposal will become the primary method of tailings management. The specific staging of tailings emplacement will be determined based on the refinement of operational activities and will be undertaken in consultation with the I&I through the MOP process.

A tailings strategy will be developed prior to commencement of tailings emplacement in the proposed tailings and reject emplacement areas to ensure the areas can safely support construction equipment, which is required for rehabilitation. Once the proposed tailings and reject emplacement areas can safely support such equipment, they will be rehabilitated and covered with a minimum of 2 metres of overburden in accordance with the rehabilitation



Source: Ravensworth Operations 2009

0 1.0 2.0 3 km
1:50 000

Legend

- | | | |
|---|--|--|
| — Project Area | — Proposed Infrastructure | — 9 South Ramp |
| — Ravensworth North Pit | — Existing EnergyAustralia 66kV Powerline | — Naramo Final Void |
| — Out of Pit Overburden Emplacement | — Proposed EnergyAustralia 66kV Powerline | — Ravensworth Underground Workings |
| — Naramo Extended (subject to separate approval) | — Ravensworth Operations 66kV Realignment | — Tailings Discharge Pipeline |
| — Existing 330kV Transmission Line | — RUM Surface Infrastructure | |
| — Proposed 330kV Transmission Line | — 7 South Ramp | |
| — Proposed Lemington Road Realignment | — Cumnock 1/2 Tailings Dam | |
| — Proposed Mine Access Road | — Cumnock Stage 3 Void | |
| — Existing Infrastructure | — Cumnock Wash Plant Pit | |

FIGURE 2.19

Conceptual Tailings and Reject Emplacement Areas

strategy described in **Section 5.1**. The tailings deposition strategy will be developed to include measures for managing the tailings emplacement areas following completion of tailings emplacement.

2.6 Site Infrastructure

2.6.1 Existing Infrastructure

As shown on **Figures 2.16** and **2.20**, a range of currently approved infrastructure is located within the Project area. The Project has been designed to maximise the use of existing infrastructure such as existing coal handling infrastructure including the RCHPP/RCT (refer to **Section 2.6.3**), roads, power supply and mine infrastructure.

The proposed Project Approval period will extend beyond the life of the existing development consents for existing mining operations within the Project area and approval is sought as part of this Project for ongoing use of the existing surface facilities and infrastructure in the Ravensworth Project area for the life of the Project. This includes the proposed upgrade of existing infrastructure to provide for ongoing utilisation and integration with the Project.

The ongoing use of existing infrastructure provides an opportunity for maximising synergies between the Project and existing operations through integrating the use of common infrastructure and the continued utilisation of infrastructure and facilities that would otherwise require decommissioning.

The following sections describe proposed upgrades to existing infrastructure and new infrastructure that is required for the Project.

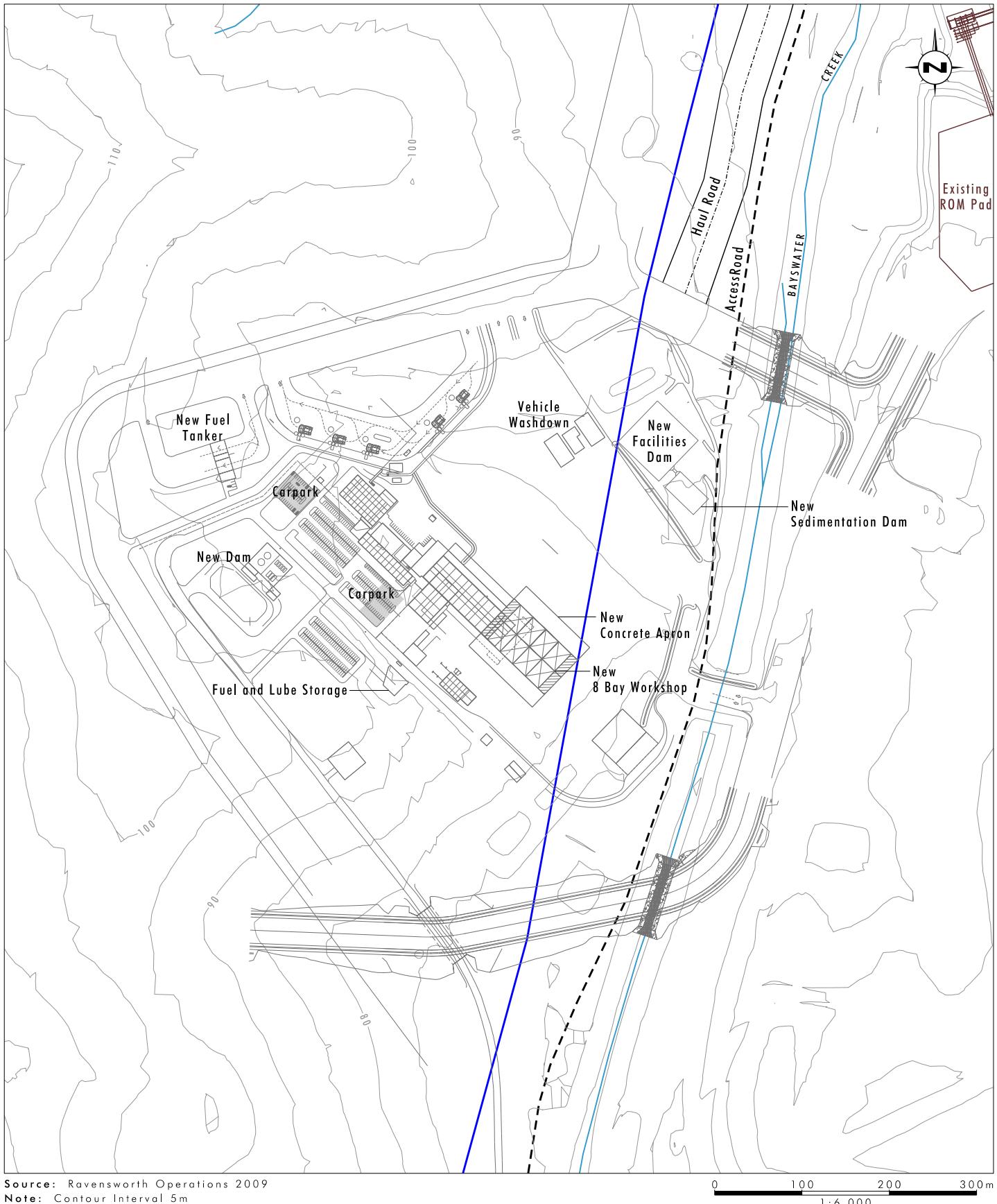
2.6.2 Mine Infrastructure Area (MIA)

Ravensworth Operations proposes to upgrade the existing Ravensworth Operations Mine Infrastructure Area (MIA) located to the east of the Ravensworth West Pit, as shown on **Figure 2.20**. This will allow for the ongoing use of this facility both in the initial stages of the Project and on an ongoing basis, if required. The proposed upgrade works include:

- refurbishment and construction of additional administration facilities (offices, bath house, first aid and emergency response, stores, etc.);
- expansion and addition to the existing workshop facilities and related maintenance infrastructure such as fuel and lubricant storage facilities, truck wash and surface water management infrastructure; and
- construction of mining operations centres and associated refuelling facilities including roads, parking and dispatch areas for the mining fleet. This will include a mine operations centre located within the open cut pit.

The proposed mining operations include the extraction of resources within the existing MIA area (refer to **Figures 2.9** to **2.14**). However, this is dependent on detailed mine planning to confirm the viability of accessing these resources. Should detailed mine planning indicate the viability of accessing these resources, Ravensworth Operations would construct a new mine infrastructure area to the north of Davis Creek. The proposed mine infrastructure facilities are shown on **Figure 2.21**.

The proposed mine infrastructure area has been positioned to enable ready access to existing coal handling infrastructure and to minimise impacts upon archaeological sites and

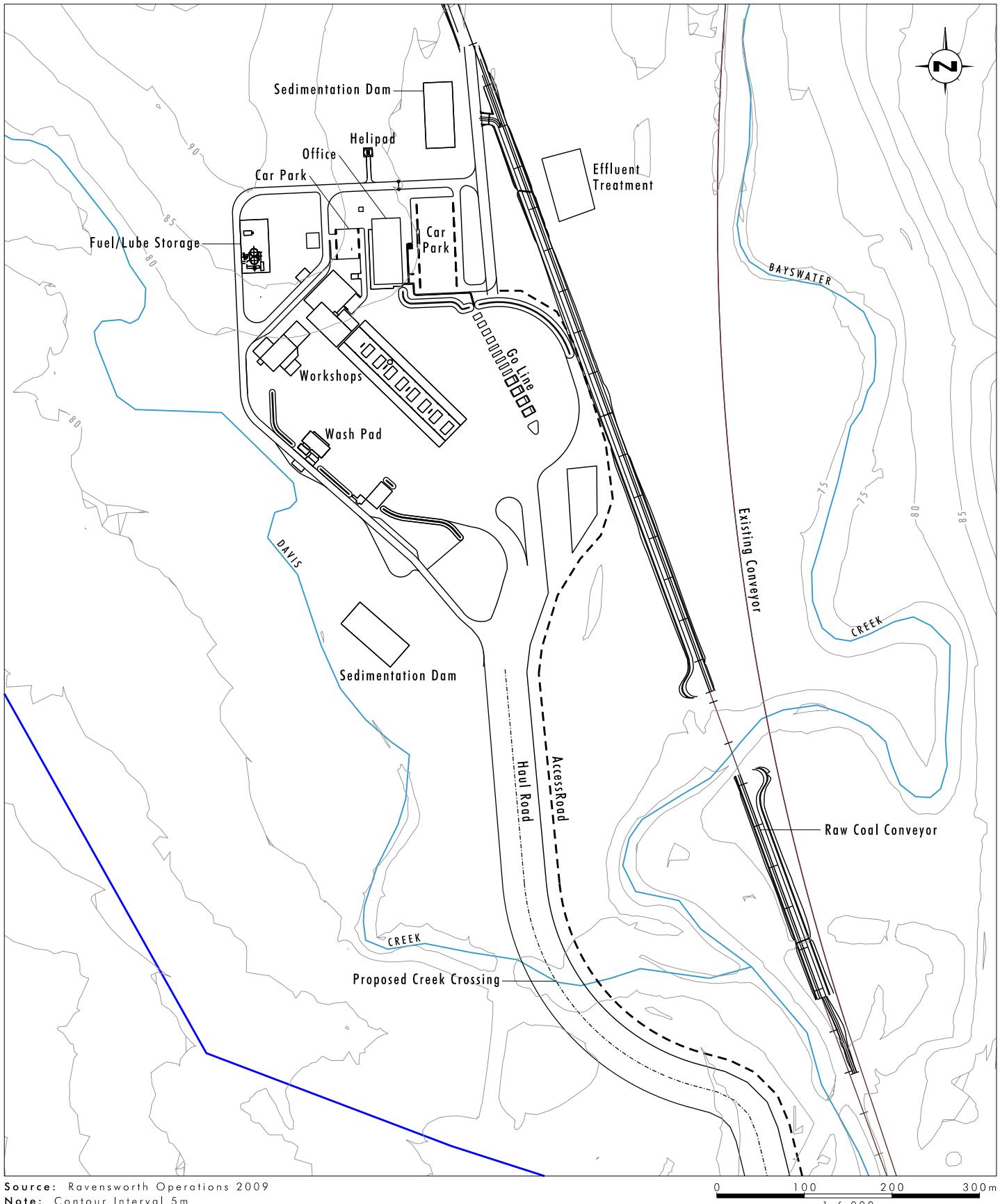


Legend

- Ravensworth North Pit
- Drainage Line

FIGURE 2.20

Existing Mine Infrastructure Area



Legend

- Ravensworth North Pit
- Drainage Line

FIGURE 2.21

Proposed Mine Infrastructure Area

ecological values identified at Davis Creek. The conceptual design of the proposed mine infrastructure area includes the following key components (refer to **Figure 2.21**):

- administration and employee facilities to provide for management, operational, maintenance, environmental and technical employees, including bath house, first aid and emergency response facilities;
- maintenance workshop facilities for the maintenance of mining equipment on site;
- vehicle wash down areas, refuelling facilities, parking areas and hardstand areas for equipment; and
- collection of runoff and washdown water, and treatment and storage of this water prior to use in coal processing or dust suppression.

The proposed MIA facilities will require the augmentation of existing ancillary services such as power, water supply and telecommunications facilities. Ravensworth Operations will consult with relevant service providers where required during detailed design and construction of the proposed infrastructure facilities.

Access to the MIA facility will be available for mining equipment requiring servicing via a haul road (refer to **Figure 2.21**). This will require the construction of a haul road crossing across Davis Creek, which will be located and designed to minimise impacts to archaeological sites and threatened species habitat located in this area. Appropriate water management controls will be constructed at the crossing to ensure water quality and sedimentation impacts are avoided.

2.6.3 Ravensworth Underground Mine surface facilities

As outlined in **Section 2.5.9**, it is proposed to upgrade RCHPP/RCT infrastructure to provide additional coal loading and transport capacity as part of the Project. As outlined on **Figure 2.17**, existing RUM surface infrastructure is located adjacent to the RCHPP/RCT facility and is integrated with this infrastructure. It is proposed to upgrade and modify RUM surface infrastructure to accommodate the proposed upgrades to the RCHPP/RCT (described in **Section 2.5.9**). The proposed upgrade to RUM surface infrastructure will include:

- upgrade and augmentation of site access and internal access roads;
- augmentation of existing water management system including water storage and transfer capabilities to improve existing water management and to provide for integration with the proposed Project water management system (refer to **Section 2.8**); and
- upgrade of existing site infrastructure including offices, administration, workshop, vehicle wash down areas and fuel storage areas.

2.6.4 Narama Mine Surface Infrastructure

During the initial stages of the Project there will be concurrent mining activity at Narama Mine. It is proposed that temporary facilities will be constructed to enable ongoing Narama operations and to manage any disruption from the Project's construction activities associated with the proposed upgrade of the existing MIA. These proposed facilities will be located to the east of Narama Mine as shown on **Figure 1.3** and will be accessed via the proposed Lemington Road realignment. The facilities to be installed include:

- administration and employee facilities to provide facilities for management, operational, maintenance, environmental and technical employees, including bath house, first aid and emergency response facilities;
- maintenance workshop facilities for the maintenance of mining equipment on site;
- vehicle wash down areas, refuelling facilities, parking areas and hardstand areas for equipment; and
- water management devices to ensure runoff and washdown water is captured, stored and treated appropriately prior to use in coal processing or dust suppression. These water management devices will form part of the proposed Ravensworth Operations Water Management System (refer to **Section 5.6.1**).

As discussed in **Section 2.5.2**, mining operations at Narama Mine will conclude in approximately Year 4 of the Project.

2.6.5 Lemington Road Realignment and Mine Access Road

The current Lemington Road alignment is located within the proposed mining area as shown on **Figure 1.3**. The northern extent of Lemington Road is proposed to be realigned to the south of the Project area. The initial 1 kilometre of the proposed realigned Lemington Road from the existing intersection with the New England Highway is consistent with the former alignment of Lemington Road prior to the commencement of the Narama mine operations in the mid 1990s (refer to **Figure 2.22**). The sections of the former Lemington Road that still exist are currently known as Brunker Lane. It is a requirement of the current Narama development consent (DA 135/90) for Ravensworth Operations to reinstate Lemington Road to its pre-mining alignment. The realigned section of Lemington Road is referred to in this assessment as the ‘proposed Lemington Road realignment’.

From the initial 1 kilometre from the existing intersection with the New England Highway, it is proposed that the realigned Lemington Road be constructed further south of the former alignment in order to provide for the proposed out-of-pit overburden emplacement over the Narama mining area as part of the Project. As outlined above, the proposed out-of-pit overburden emplacement areas have been designed to minimise the area of disturbance in the northern extent of the Project area, minimise the potential for off-site environmental impacts, and provide for an improved final landform within the Project area.

The proposed Lemington Road realignment includes the upgrade of the existing intersection with the New England Highway approximately 6 kilometres to the south of the existing intersection (refer to **Figure 2.22**). The proposed Lemington Road realignment will continue to the south of the Project area and will require a new bridge to be constructed over Bayswater Creek prior to reconnection with the existing Lemington Road within the southwestern extent of the Project area (refer to **Figure 2.22**). The proposed Lemington Road realignment has been designed to accommodate future traffic associated with the Project and surrounding road users and has taken into consideration relevant infrastructure capacity and road safety issues (refer to **Section 5.7**).

Specific details of the design of the proposed Lemington Road realignment and the design of the intersection upgrade between the proposed Lemington Road realignment and the New England Highway intersection are provided in **Sections 2.6.5.1** and **2.6.5.2** respectively.

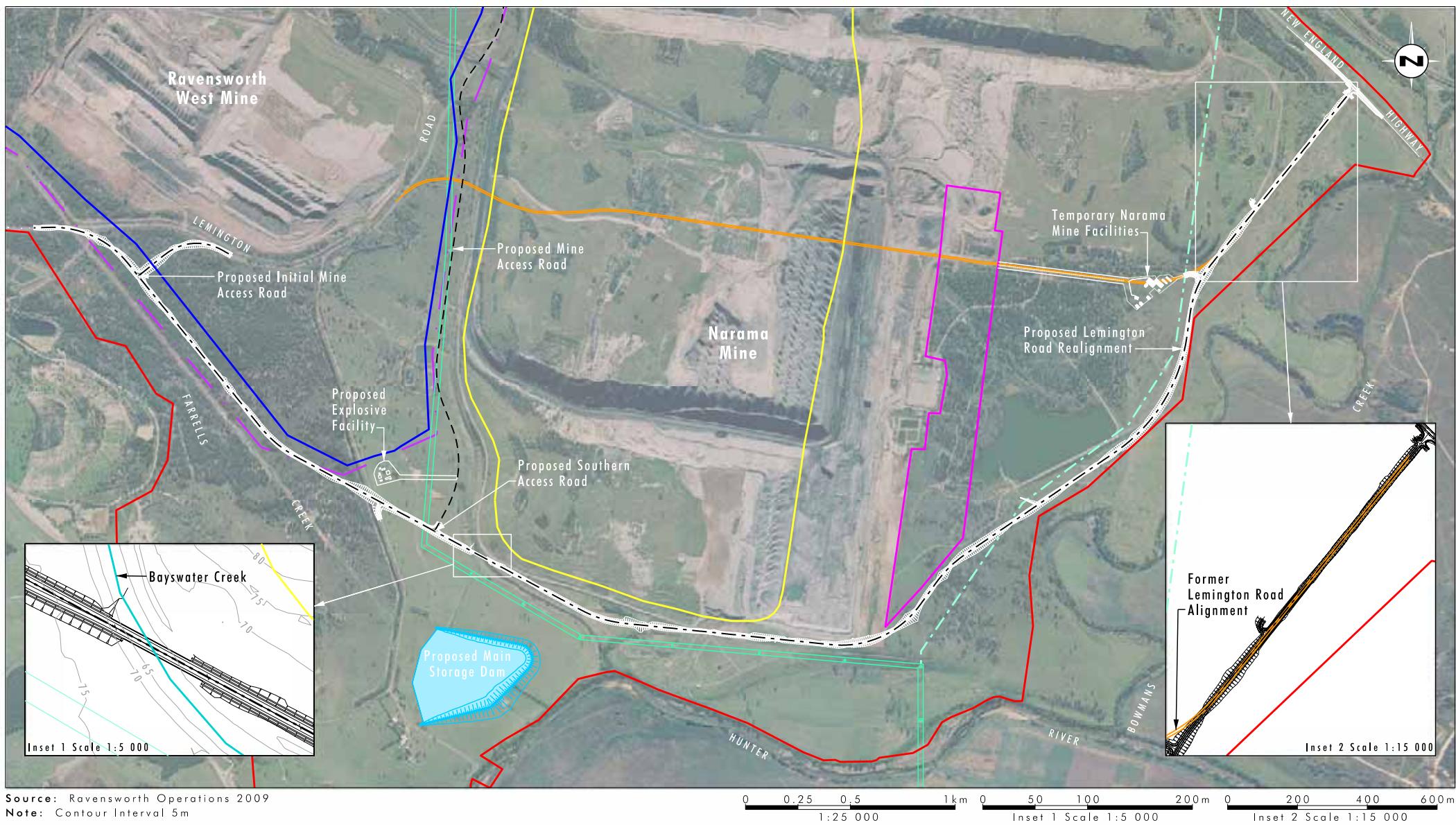


FIGURE 2.22

Proposed Lemington Road Realignment

2.6.5.1 Proposed Lemington Road Design

The proposed Lemington Road realignment has been designed in consultation with the Singleton Council and in accordance with the RTA's *Road Design Guide* (1998) and Singleton Council's Development Design Specification (March 2007) and Draft Subdivision and Infrastructure DCP, Part 1 – Design (February 2005), and will include:

- a 9 to 11 metre sealed width with two 3.5 metre lanes and 2.0 metre shoulders;
- provision to accommodate the width and turning requirements of a 25.0 metre B-Double truck;
- 100 kilometres per hour operational speed limit;
- a minimum and maximum longitudinal grade of 0.3 and 6 per cent, respectively;
- maximum cut and fill batter slopes of 1:3, which are considered traversable but not recoverable;
- an elevation above the 1 in 100 year Average Recurrence Interval (ARI) flood level associated with the Bowmans Creek/Hunter River floodplain; and
- the proposed bridge over Bayswater Creek has been designed in accordance with Australian Standards AS5100.2, AS1700.0 and AS5100.5 and has a 100 year design life.

2.6.5.2 Proposed Lemington Road realignment/New England Highway Intersection Upgrade

As discussed in **Section 2.6.5**, the proposed Lemington Road realignment intersects the New England Highway at an existing intersection of the highway with Brunker Lane (which was formerly the original Lemington Road). This intersection currently consists of eastbound and westbound through lanes on the New England Highway with widths of 3.7 and 3.8 metres respectively. A 2.6 metre wide shoulder is provided adjacent to the eastbound lanes. A 170 metre indented left-turn lane is provided for westbound traffic entering the New England Highway and a 214 metre indented right-turn lane is provided for eastbound traffic entering the New England Highway.

This intersection will be upgraded as part of the Project with the proposed design shown on **Figure 2.22**. The proposed intersection upgrade has been designed in consultation with the RTA and in accordance with the RTA's *Road Design Guide* (1998) and will include the following:

- widening of the left-turn deceleration lane by 0.3 metre;
- widening of the left-turn lane shoulder by 0.8 metre;
- widening of the right-turn deceleration lane by 0.6 metre;
- relocation of existing safety barriers to the new shoulder edges, and provision of 1.8 metre verges;
- widening of the shoulder to the southbound through lane to Singleton by 0.4 metre;

- modification of the throat of the intersection to suit lane widening; and
- removal or trimming of vegetation on the northern side of the intersection to improve sightlines for vehicles using the intersection.

2.6.5.3 Mine Access

A mine access road is proposed to be constructed from the Lemington Road realignment (refer to **Figure 2.22**). The initial mine access road will align with the intersection of the existing Lemington Road realignment and will utilise the sections of the existing Lemington Road. This access will be required in the initial stages of the Project to enable the relocation of the existing 330 kV transmission line within the Project area (refer to **Section 2.6.6**). After the completion of the proposed relocation of the 330 kV transmission line, the mine access will be relocated to the east to align with Bayswater Creek. The timing of relocation of the mine access road will be subject to final mine planning (refer to **Figure 2.22**).

The proposed mine access road will provide access to the existing and proposed MIA. The new access road will be designed as a 70 metre road corridor that provides a 20 metre wide light vehicle road and a 50 metre wide corridor for haul trucks to enable access to workshop and maintenance facilities at the existing and proposed MIA.

The location and design of the proposed access road intersections have been based on the assessment of the impacts of traffic flow and road safety along Lemington Road (refer to **Section 5.7**).

It is also proposed to maintain access to the Project area via the existing Lemington Road intersection to the north for the duration of the Project. Access to the existing Lemington Road intersection will be restricted to authorised personnel to enable access for maintenance and access to infrastructure areas. Public access to the existing northern extent will be restricted through the construction of gates and fencing, near the existing intersection with the New England Highway.

Site access for the RCHPP/RCT and RUM surface infrastructure will be maintained via Liddell Station Road, located off the New England Highway in the north of the Project area (refer to **Figure 2.22**). Access to Liddell Station Road occurs via Pikes Gully Road which has an existing intersection with the New England Highway within the northern extent of the Project area (refer to **Figure 1.3**).

2.6.6 Transmission Line Relocation

As shown on **Figure 1.3**, an existing 330 kV transmission line crosses the proposed mining area and will need to be relocated during the early stages of the Project. Ravensworth Operations has investigated a number of options for the relocation of the 330 kV transmission line. Due to the operational constraints associated with maintenance of the transmission line in proximity to mining areas, it is proposed to relocate the transmission line to a position outside of all proposed operational areas.

The relocated 330 kV transmission line will be of a similar design to the existing line. Towers are of single-circuit galvanised steel construction, with the three phases spaced horizontally, shielded by twin earthwires. The tower spacing will depend on the terrain crossed, and the adjacent infrastructure, but can be averaged at 375 metres with a maximum of about 500 metres. The tower heights will be approximately 40 metres to the earthwires. Base footings include concrete footings of approximately 10 metres by 10 metres for towers on bends, and 8 metres square for the in-line towers. Footings will be bored piles, around 10 metres deep on average.

The proposed alignment is located to the north and east of the existing alignment, as shown on **Figure 1.3**. The proposed alignment will cross the New England Highway in the vicinity of the current Lemington Road intersection and will skirt the proposed mining area prior to crossing the highway to rejoin the current alignment south of the Project area.

It is also proposed to relocate an existing 66 kV transmission line in the northern extent of the Project area (refer to **Figure 1.3**). The transmission line is an Energy Australia managed line that extends from an existing substation in the northern extent of the Project area and travels south across the existing RUM pit top area. The line provides power to other surrounding mining operations including Coal & Allied's Hunter Valley Operations to the west. The proposed relocation of this transmission line is to minimise potential interactions with ongoing operational activities at RUM, the proposed bridge over the New England Highway and the proposed northern overburden emplacement area. The proposed alignment of the 66 kV line will be located within existing disturbed areas where practicable.

There is a number of existing private transmission lines within the proposed mining area that will require relocation to enable proposed mining activities to occur. In addition, proposed new private transmission lines include a new 11 kV line from RCHPP/RCT to the raw coal system and the MIA, and a 66 kV mine power reticulation that will be located around the proposed pit shell boundary. Existing and proposed transmission lines will be used to service ancillary infrastructure such as water management pumps (surface and groundwater), mining operations and associated surface infrastructure.

2.6.7 Other Site Infrastructure

2.6.7.1 Relocation of Explosive Storage and Batching Facility

It is proposed to relocate an existing explosive storage and preparation facility located in the vicinity of the proposed Ravensworth North pit to a new location in the southern part of the Project area, adjacent to the proposed site access road (refer to **Figure 1.3**). The relocated explosives facility will be constructed and operated by a contracting company to supply explosives and associated products for use in the proposed mining operations and at other sites. The proposed facility will include the following key components:

- administration, ablutions and workshop facilities;
- bulk diesel, ammonium nitrate and emulsion storage and despatching systems;
- raw materials storage facilities; and
- water management infrastructure to manage all water runoff from this facility.

The operators of the proposed explosives and batching facility will seek any additional approvals and licences, including relevant development consent and EPL that may be required for the facility.

2.6.7.2 Electrical Infrastructure Reticulation

Power for the proposed site facilities will be sourced from the augmentation of existing electricity infrastructure in the local area and the proposed reticulation of power line infrastructure will be determined in consultation with relevant service providers.

2.6.7.3 Water Supply and Sewage Systems

Non-potable water supply for use in coal processing equipment washing and maintenance, fire fighting and other uses will be sourced from a number of primary resources including water collected from the mine site and direct pumping of water from the Hunter River in accordance with relevant licensing requirements (refer to **Section 5.6**). Potable water for use as drinking water and bath house facilities will be sourced from the proposed raw water dam or purchased from off-site suppliers (refer to **Section 5.6**).

Rain water will also be collected at MIA areas for use in toilets and further processed for potable use. Sewage and wastewater generated from the office and administration building and employee bath house will be treated on site through a package treatment plant. Options for use of the treated wastewater include irrigation of landscaped areas or re-use in the RCHPP.

2.6.7.4 Lighting

Permanent lighting will be required for the MIA, RCHPP/RCT facility and other fixed infrastructure areas including coal handling conveyors and stockpiles during night time operations.

In addition, mobile lighting will be required in active mining areas during night-time operations. This will be provided by mobile lighting plants and equipment headlights. Generally, mobile lighting plants will be located in-pit and be screened from nearby view points.

Lighting will be kept to the minimum required for operational needs and safety. All permanent lights will have shields and all lighting will be directed down onto working areas to ensure that fugitive light emissions are limited. All lighting associated with the Project will be installed and maintained in accordance with relevant Australian Standards over the life of the Project.

2.6.7.5 Other Ancillary Infrastructure

Ancillary infrastructure will be required including access tracks, telecommunications, water pipelines, communications systems and other infrastructure. The exact location of these facilities will be determined as the Project progresses depending on mining operation needs, geological conditions and other mining and environmental considerations. The specific locations will be determined as part of the detailed mine planning process for each stage and will be detailed as part of the MOP process over the life of the Project. No access for the Project is proposed across the existing Coal & Allied haul road and conveyor.

Access will also be provided to existing infrastructure in the Project area, such as the conveyor operated by Macquarie Generation. This includes a proposed access road within the northern extent of the Project area, to provide Macquarie Generation with ongoing access to land resources located in the Project area (refer to **Figure 1.3**).

In addition, water management infrastructure, including various pumps, pipelines and equipment associated with the currently approved Macquarie Generation ash disposal dam will be relocated to the north of the proposed eastern out of pit overburden emplacement area.

2.7 Construction Phase

Substantial construction works will be required during the early stages of the Project. Construction activities will be undertaken prior to and concurrently with initial mining activities. The construction phase will be undertaken on a campaign basis based on Project infrastructure requirements, with the majority of construction activities occurring within the initial 24 months of the Project. It is envisaged that up to 500 construction workers will be required during the construction phase, although the actual number of construction workers on site will be dependent on the activities associated with the specific construction campaign.

Key construction activities associated with the Project are shown on **Figures 2.9 to 2.14** and include the following key tasks:

- construction of the realignment of Lemington Road, including the upgrade of an existing intersection between this road alignment and the New England Highway. This construction activity is anticipated to take approximately 36 weeks and will commence upon commencement of the Project;
- construction of a southern mine access road from the re-aligned Lemington Road, including construction of a new intersection between this road and the New England Highway;
- construction of temporary construction facilities such as offices, maintenance workshops, equipment and supply storage and yards, and construction employee facilities;
- upgrades to the existing Ravensworth Operations MIA including refurbishment and construction of additional administration facilities, expansion of workshops and associated infrastructure and construction of an operational control centre;
- construction of a new MIA including a bath house, offices, production facilities for 550 employees, diesel fuel storage and dispensing facilities, truck washdown areas and workshops (where required). Construction of the new MIA facilities is dependent on detailed mine planning as discussed in **Section 2.6.2**;
- upgrade of ROM coal handling infrastructure including conveyors, raw coal stockpiles and a conveyor bridge over the New England Highway;
- upgrade of coal handling, RCHPP/RCT and other site infrastructure at RUM;
- construction of a new rejects conveyor and rejects bin;
- establishment of temporary surface facilities at Narama mine;
- construction of a proposed water storage dam in the south of the Project area. Construction of this dam is anticipated to take 35 weeks and will commence during Year 2 of the Project;
- relocation of the existing 330 kV transmission line. Relocation of this transmission line is anticipated to take approximately 60 weeks;
- installation of ancillary services such as powerlines, communication systems, water pipelines, dams and other water management structures. These activities will be undertaken as required throughout the life of the Project; and

- installation of appropriate fencing and gates to ensure public safety and security for the mining operations and construction operations. These activities will be undertaken as required throughout the life of the Project.

Site access during the construction phase is dependent on the location of the construction activities outlined above. In the initial stages of the Project, access for construction purposes will occur via the existing Lemington Road located in the northern extent of the Project area or via Liddell Station Road for the proposed RCHPP/RCT works. Further details on the proposed access to the Project area during the construction phase are provided in **Section 5.7**.

2.8 Water Management

2.8.1 Existing Water Management System

The existing mining operations within the Project area have comprehensive water management systems in place which cover all operational areas. These systems include water management infrastructure to control and manage water captured within the existing operational areas. It includes a range of water storage infrastructure consisting of an integrated system of dams, including the Ravensworth Operations 1000 ML dam, and storages associated with former underground workings.

2.8.2 Greater Ravensworth Water Sharing System

Xstrata operations in the greater Ravensworth area, including the existing Ravensworth Operations, Mt Owen Complex, Liddell Colliery, Cumnock Colliery and RUM, participate in the Greater Ravensworth Water Sharing System (GRWSS). The GRWSS links the existing water management systems to enable the sharing and beneficial re-use of water between operations. The operations are linked through a range of water transfer infrastructure and storages including surface storages, voids and former underground workings.

The location of the Project provides an opportunity for the integration of the water management systems of existing operations within the Project area and the broader GRWSS. Ravensworth Operations has undertaken detailed studies on the GRWSS to assess the opportunities for the integration of the Project into this system including the beneficial re-use of existing mine water sources for uses such as coal processing, dust suppression and vehicle wash down. The integration of the Project into the GRWSS will enable the development of the Project whilst minimising the need to access external water resources.

2.8.3 Conceptual Water Management Overview

The conceptual design of the water management system for the Project is based on the following key objectives:

- maximising available water through effective management of water captured on site including the appropriate treatment through the design of structures that:
 - divert clean water around disturbed areas;
 - effectively capture all dirty water from disturbed areas; and
 - appropriately treat all dirty water on site prior to any discharge in accordance with relevant guidelines.

- maximising the capture of water on site for beneficial recycling and re-use on site including use in on-site processing such as coal processing, vehicle wash down and dust suppression;
- providing for efficient movement of water around the site over the life of the Project through the effective design of water management structures to transfer water from areas of capture to areas of on-site re-use; and
- maximising the integration with the existing water management systems of surrounding operations participating in the GRWSS to maximise beneficial sharing and re-use between these operations.

The proposed water management structures are designed to divert clean water around areas to be disturbed by the Project as well as capture, collect and treat dirty water for re-use on site or within the Greater Ravensworth area. Decant systems would be added to the coal processing system utilised for the Project to maximise water recovery from tailings. The proposed water management structures are briefly introduced below and discussed further in **Section 5.6**.

2.8.4 Mine Water Management Dams

The detailed water resources assessment (refer to **Section 5.6**) included a review of mine water storage requirements for the Project. As part of this review of water management requirements, Ravensworth Operations has identified the need for additional water storage capacity for the Project.

It is proposed to maximise the use of the final voids and underground mine workings associated with former mining operations within the Project area for water storage and management, where possible. As shown on **Figure 1.3**, it is also proposed to construct a 1300 ML water storage dam within the southern extent of the Project area. The proposed water storage dam will be designed to provide additional water storage for use as part of the Project and will enable participation in the GRWSS.

Mine water controls that will be utilised for the Project will include a series of catch drains and sediment dams to capture surface water runoff from disturbed areas. These controls have been designed to move with the disturbed areas over the life of the Project. The controls will include pollution control dams for the capture of surface water runoff from potentially contaminated areas. Captured dirty water will be treated as required to remove sediment, oil and fuels, prior to being directed to the mine water management system. The conceptual design of the mine water management system is described in **Section 5.6**.

An objective of the proposed water management system for the Project is to maximise the efficiency in the transfer of water on site. The overall conceptual design premise is to maximise water capture from disturbed catchment on site. A large portion of water captured on site will be from disturbed areas including proposed mining and overburden areas. The key areas of water re-use on site include infrastructure areas and coal processing at the RCHPP/RCT in the northern extent of the Project area. In order to transfer water to these areas, the conceptual water management system includes a number of water staging dams located on site to enable the efficient movement of water on site (refer to **Section 5.6**).

Water captured and re-used on site will be supplemented, in part, by water sourced from surrounding Xstrata operations participating in the GRWSS. The conceptual water management system for the Project has been designed to enable this integration through the modification of existing water management infrastructure and proposed water management infrastructure to be constructed as part of the Project. In addition, Ravensworth Operations will source raw water from a proposed high volume (approximately 50 ML/day) pump station

located on the north-western bank of the Hunter River adjacent to the proposed Main Storage Dam in the vicinity of the existing pump station. Further details on the conceptual water management system are provided in **Section 5.6.1**.

The conceptual design of water management systems is to enable the transfer of waste effectively for sources external to the Project area.

2.8.5 Emu Creek Diversion

An existing section of Emu Creek is located within the Project area and will be mined through during approximately Year 5 of the Project. Emu Creek is an ephemeral creek, and is a tributary of Bayswater Creek which flows into the Hunter River in the south of the Project area. Bayswater Creek has been highly modified due to an existing approved diversion channel constructed as part of open cut mining operations at Narama. The upper catchment of Emu Creek has been highly modified through the development of existing mining operations to the west of the Project area.

It is proposed to divert the section of Emu Creek around the proposed mining area to enable the effective management of water from the upper catchment, including existing mining operations such as Coal & Allied's Hunter Valley Operations located to the west of the Project area. The proposed Emu Creek diversion has been designed to consider other mining operations including Coal & Allied's currently approved West Pit operation which has been designed to drain to the current Emu Creek catchment. The proposed Emu Creek diversion will capture upstream runoff at the western boundary of the Project area. The captured runoff will subsequently be transferred to a holding dam in the Davis Creek catchment via a pump and pipeline system prior to controlled release into Davis Creek. The proposed Emu Creek diversion will be implemented before mining reaches the natural creek line and will be reinstated in approximately Year 19 when the proposed mining operation has advanced past the natural creek line. The design of the Emu Creek diversion proposed in this assessment is conceptual and based on catchment and flood modelling that reflects both current and approved natural and disturbed catchments in the area.

As part of future licensing requirements for the diversion, Ravensworth Operations will undertake further detailed design based on this concept, in consultation with relevant authorities and surrounding land users, including Coal & Allied.

The progressive rehabilitation of the proposed disturbance area will include the reinstatement of the existing section of Emu Creek along its current approximate alignment. Further details of the Emu Creek diversion are provided in **Section 5.6.1**.

2.9 Workforce and Hours of Operation

Once at full operation, it is proposed that approximately 550 people will be employed by the Project. Mining operations are planned to continue to be undertaken on a 24 hours per day, seven days per week basis.

Construction activities may be undertaken on a 24 hours per day, 7 days per week basis, with key construction activities expected to be completed within approximately three years from the commencement of the Project.

2.10 Project Alternatives

As described in **Section 2.5.1**, Ravensworth Operations has undertaken detailed concept and pre-feasibility investigations for the Project and as part of this process numerous alternative mine and infrastructure plans were considered. The overall aim of the process of the consideration of alternatives was to ensure that the Project maximises environmental, social and economic benefits. The key alternatives to the Project that were considered included:

- alternative mine plans and mining methods, including the potential for underground mining operations within the Project area;
- alternative coal handling and processing infrastructure;
- alternative mine infrastructure locations, including a range of considerations for the proposed Lemington Road realignment; and
- various options for environmental management controls and offsets.

Further details on the alternatives considered as part of the Project design process are outlined in the following sections.

2.10.1 Alternative Conceptual Mine Plans

The development of the conceptual mine plan evolved throughout the Project planning process in consideration of existing operations, geological data, mine safety, the economic basis of the target resource and the consideration of environmental constraints.

A range of alternative conceptual mine layouts have been considered throughout the conceptual project design process. As outlined in **Section 2.5.1**, the most significant of these alternatives was the potential for mining economical coal resources to the north of Davis Creek. The limiting of proposed open cut mining areas to the south of Davis Creek, in response to the identification of a range of significant ecological and archaeological features, resulted in an overall reduction in the proposed disturbance area of approximately 490 hectares.

2.10.2 Alternative Mining Methods

Throughout the conceptual design process for the Project, a range of alternate mining methods were considered, including the consideration of potential extraction of the target resources via underground mining methods. A detailed review of conditions to determine the viability of underground mining highlighted a number of constraints to the use of underground mining methods within the Project area. This assessment indicated it was not economically feasible to extract the target resource via underground mining methods.

The key limitations to resource extraction via underground mining methods were the economical and mine safety considerations associated with the geological characteristics of the target coal resource. Due to constraints resulting from the key geological structures within the Project area (refer to **Section 2.4.3**), and characteristics of the coal resource, such as coal seam moisture and thickness, it was considered that only three seams within the Project area could be economically mined through an underground mining. This represents approximately 20 per cent of the total target resource within the Project area that can be accessed via the proposed open cut mining method (refer to **Section 2.4**).

A range of open cut mining methods were investigated, which included a specific review of alternate mining equipment, mine layout and production rates for the Project. This included consideration of the scale of the mining fleet and associated implications for coal handling, processing and transportation and potential for impacts associated with noise and dust emissions.

An alternative of limiting all out-of-pit overburden emplacement areas to the previously disturbed areas associated with former mining operations within the Project area was also considered. Whilst this alternative would reduce the area of disturbance, off site environmental impacts, including air quality and noise impacts, would be increased by maximising out-of-pit emplacement in closer proximity to key receiver areas, including Camberwell Village. The proposed out-of-pit overburden emplacement areas have been designed in consideration of the need to limit the area of disturbance as far as practicable, whilst balancing the potential off-site environmental impacts on surrounding key receiver areas, including Camberwell Village.

The limitation of out-of-pit overburden emplacement areas immediately north of the proposed Ravensworth North pit, has necessitated an extensive mining fleet to accommodate lengthened haul distances. This represents increased operational costs for the Project, however, these have been considered essential to the proposed mine plan design and the need to limit mining operations to the south of Davis Creek. Moreover, as outlined in **Sections 5.2** and **5.3**, Ravensworth Operations has limited the potential off site environmental impacts associated with the increased mining fleet through incorporation of appropriate mine design principles and equipment selection. In addition, as outlined in **Section 5.11**, Ravensworth Operations has committed to implementing a range of strategies over the life of the Project to maximise energy efficiency through mining operations and minimise potential greenhouse gas emissions.

2.10.3 Alternative Coal Handling and Processing

A number of coal handling and processing alternatives have been considered throughout the project planning process. This included the consideration of the construction and operation of a new CHPP to the south of the New England Highway. This option was not favoured due to the need for further areas of land disturbance to the north of Davis Creek, and the loss of operational efficiencies through the proposed upgrade of the RCHPP/RCT facility as part of the Project. In addition, it was considered more economical to upgrade the existing RCHPP/RCT facility compared to the construction and operation of new CHPP infrastructure.

The proposed upgrade of the RCHPP/RCT facility will assist in the realisation of the latent capacity of this existing coal handling infrastructure and maximise current sharing of infrastructure and resources, including water supply. In addition, through appropriate design and operation, the proposed upgrade of RCHPP/RCT will minimise the potential operational impacts on surrounding mining operations, through minimising the introduction of additional connections to existing shard infrastructure, including the Main Northern Railway line.

2.10.4 Alternative Infrastructure Options

The location of surface facilities such as the proposed MIA, water management infrastructure, roads, alignment of powerlines were considered in terms of practicality and proximity to mining operations, and also to ensure impacts to environmentally sensitive areas and sensitive receivers was minimised. Two key surface infrastructure features include the existing Lemington Road and an existing 330 KV transmission line, which are located within the proposed mining area, and are proposed to be relocated as part of the Project (refer to **Section 2.6**).

Various options have been considered for the proposed relocation of the 330 kV transmission line, including the relocation of the transmission line immediately east of the proposed Ravensworth North pit. This option would necessitate the relocated 330 kV transmission line to run through the centre of the Project area. Due to the potential implications for operational conflicts with the Project, including mine safety concerns and potential infrastructure damage this alternative is not considered the preferred option for the transmission line relocation. The proposed relocation of the 330 kV transmission line to the eastern extent of the Project area will minimise any potential interactions with this infrastructure over the life of the Project.

The proposed realignment of Lemington Road within the Project area is similarly constrained, which has necessitated the proposed relocation to the south-eastern extent of the Project area (refer to **Section 2.6.5**). The key constraints include:

- realignment to the east of the proposed Ravensworth North pit is constrained due to the narrow corridor between the proposed pit and Bayswater Creek and eastern out-of-pit overburden emplacement areas. This potential alignment would have a high level of interaction that would necessitate multiple haul road crossings of Lemington Road and also require specific management to minimise potential blasting impacts;
- realignment to the west of the proposed Ravensworth North pit is constrained by infrastructure associated with the adjoining Coal & Allied coal conveyor; and
- restricting mining operations to maintain the existing alignment of Lemington Road would result in the sterilisation of a significant proportion of the identified coal resource within the Project area.

As outlined in **Section 2.6.5**, the initial 1 kilometre of the proposed realignment of Lemington Road from the existing intersection with the New England Highway is consistent with the former alignment of Lemington Road prior to the construction of the existing approved Narama mining operation. The current development consent for the Narama operation requires the reconstruction of Lemington Road to this pre-mining alignment upon the cessation of mining at Narama. As outlined in **Section 2.6.5**, the northern section of the former alignment of Lemington Road incorporates the existing Brunkers Lane and an existing intersection with the New England Highway.

From the initial 1 kilometre from the existing intersection with the New England Highway, it is proposed that the realigned Lemington Road be constructed further south of the former alignment in order to provide for the proposed out-of-pit overburden emplacement over the Narama mining area as part of the Project. As outlined above, the proposed out-of-pit overburden emplacement areas have been designed to minimise the area of disturbance in the northern extent of the Project area, minimise the potential for off-site environmental impacts and provide for an improved final landform within the Project area.

Alternative road access options were considered including maintenance of the existing northern mine access road. Consideration was given to interactions with existing operations in the Project area and to minimising the number of new intersections required with the New England Highway.

2.10.5 Alternative of Not Proceeding

The alternative of not proceeding has also been considered, however this option is not considered appropriate as it is expected that the environmental and social impacts of the Project can be effectively managed and not proceeding would result in the loss of the substantial economic and social benefits of the Project as discussed in **Section 5.13**.



SECTION 3.0

Statutory Provisions



Ravensworth
Operations

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3.0 Statutory Provisions

The following section identifies relevant State and Commonwealth legislation and discusses the application of these planning provisions to the Project.

3.1 Commonwealth Legislation

A summary of the Commonwealth legislation potentially relevant to the Project is provided in **Table 3.1**.

Table 3.1 – Relevance of Commonwealth Legislation to the Ravensworth Operations Project

Act	Comments	Approval Required?
Environmental Protection and Biodiversity Conservation Act 1999	<p>Under the EPBC Act the approval of the Commonwealth Minister for the Environment is required for any action that may have a significant impact on matters of national environmental significance, including world heritage properties, National Heritage Places, Ramsar wetlands, cetaceans, migratory species, threatened species, critical habitats or ecological communities listed in the EPBC Act, Commonwealth land, marine area or reserves and nuclear actions.</p> <p>As outlined in Section 5.5, an ecological assessment undertaken for the Project identified a number of species listed under the EPBC Act. As such a referral will be made to the Department of Environment, Water, Heritage and the Arts to determine whether the Project is a controlled action under the Act and therefore requires approval from the Commonwealth Minister for the Environment, Heritage and the Arts.</p>	Yes if the Minister determines that the Project is a controlled action
Native Title Act 1993	<p>The <i>Native Title Act 1993</i> is administered by the National Native Title Tribunal who are responsible for maintaining a register of native title claimants and bodies to whom native title rights have been gained. The Act prescribes that Native Title can be extinguished under certain circumstances, including the granting of freehold land. Areas of land within the Project area where native title may not have been extinguished include public road reserves and Crown land.</p> <p>A portion of Crown land and Crown roads are located within the Project area (refer to Figure 1.5). In the event that a native title claim exists over the Crown land or roads, the relevant native title holders will be consulted either prior to the granting of a mining lease over these areas or prior to the closure of any roads.</p>	No

3.2 New South Wales Legislation

3.2.1 Environmental Planning and Assessment Act 1979

Major Development

Because the Ravensworth Operations Project relates to 'coal mining' which is a class of development listed in Schedule 1 of the SEPP (Major Development) 2005, it requires approval under Part 3A of the EP&A Act. Clause 5(1)(a) of Schedule 1 to the Major Development SEPP applies to this Project.

As the Project will be approved under Part 3A of the EP&A Act, the Minister for Planning will determine the Project Application. In addition, the following provisions of the EP&A Act are relevant to the approvals process under Part 3A of the Act.

Application of Environmental Planning Instruments

The Project is located wholly within the area to which the Singleton Local Environmental Plan 1996 (Singleton LEP) applies.

However, Section 75R of the EP&A Act provides that environmental planning instruments, other than SEPPs, do not apply to projects approved under Part 3A of the Act, other than as detailed below.

Permissibility

Under Section 75J(3) of the EP&A Act and clause 8O of the EP&A Regulation, the Minister cannot approve the carrying out of a project that would be wholly prohibited under an environmental planning instrument and is not the subject of an authorisation or requirement under section 75M to apply for approval of a concept plan.

The land which is the subject of the Project Application is located wholly within Singleton LEP zoning Rural 1(a). Coal mining is a permissible land use within zone 1(a) with development consent. As mining is permissible in the whole of the Project area, the Minister can approve the Project pursuant to Section 75J(3) of the EP&A Act and clause 8O of the EP&A Regulation and the Project does not require the approval of a concept plan.

Approvals legislation which does not apply

Under Section 75U of the EP&A Act, if the Project is granted project approval under Part 3A of the EP&A Act, the following authorisations (refer to **Table 3.2**), which may otherwise have been relevant, will not be required to carry out the Project.

Table 3.2 - Authorisations which do not apply

Act	Approval
<i>Fisheries Management Act 1994 (FM Act)</i>	Permit for works or structures within a waterway.
<i>Heritage Act 1977</i>	Disturbance to an item listed on State Heritage Register or Interim Heritage Order; Excavation permit.
<i>National Parks & Wildlife Act 1974</i>	s87 preliminary research permit; s90 consent to destroy relics.
<i>Water Management Act 2000</i>	Water use approval, water management work approval or activity approval.
<i>Native Vegetation Act 2003</i>	Consent for the clearing of native vegetation.
<i>Threatened Species Conservation Act 1995</i>	Licence to harm or pick threatened species, populations or ecological communities or habitat.

Approvals legislation to be applied consistently

If the Project is granted project approval under Part 3A of the EP&A Act, the following authorisations (refer to **Table 3.3**), which will be required for the Project, must not be refused by the relevant approval authority and must be substantially consistent with the terms of the Project approval.

Table 3.3 - Approvals legislation to be applied consistently with Project Approval

Act	Approval	Authority
<i>Coal Mine Health and Safety Act 2002 (CMHS Act)</i>	Section 100 approval for the establishment of emplacement areas.	Industry and Investment NSW (Mineral Resources) (I&I)
<i>Mine Subsidence Compensation Act 1961 (MSC Act)</i>	Development within Mine Subsidence District	Mine Subsidence Board (MSB)
<i>Mining Act 1992 (Mining Act)</i>	New Mining Lease for overburden emplacement in the Ravensworth South void. A consolidation of existing mining leases is also proposed. A new MOP will also be required.	Industry and Investment NSW (Mineral Resources) (I&I)
<i>Protection of the Environment Operations Act 1999 (PoEO Act)</i>	Environment Protection Licence, to include the increased coal mining production, processing rates, water discharge and monitoring points associated with the Project.	Department of Environment, Climate Change and Water (DECCW)
<i>Roads Act 1993 (Roads Act)</i>	Permit to impact on a public road	State roads – NSW Roads and Traffic Authority (RTA) Local roads – Singleton Council Crown roads – Department of Lands

3.2.2 Other State Legislation

A summary of State Legislation relevant to the Project is provided in **Table 3.4**.

Table 3.4 - Summary of State Legislation and Relevance to the Project

Planning Provision	Comments	Further Approval Required?
<i>Occupational Health and Safety Act 2000 (OH&S Act)</i>	<p>On 1 September 2005 the <i>Dangerous Goods Act 1975</i> was repealed by the <i>OHS Amendment (Dangerous Goods) Act 2003</i> and the supporting OHS Amendment (Dangerous Goods) Regulation 2005.</p> <p>The changes mean that dangerous goods are now regulated under the OH&S Act and the Occupational Health and Safety Regulation 2001.</p> <p>There are no specific licensing or approval requirements for the management of dangerous goods under the OH&S Act and any dangerous goods at the facility will be managed within the Occupational Health and Safety management framework established by the OH&S Act. All people with unsupervised access to explosives or concentrated ammonium nitrate must now be licensed.</p>	No
<i>Crown Lands Act 1989 (Crown Lands Act)</i>	<p>The Crown Lands Act provides for the administration and management of Crown land in the eastern and central divisions of NSW. Crown land may not be occupied, used, sold, leased, dedicated, reserved or otherwise dealt with unless authorised by this Act or the <i>Crown Land (Continued Tenures) Act 1989</i>. The Minister may grant a 'relevant interest' such as a lease, licence or permit, over Crown land for the purpose of any infrastructure, activity or other purpose that the Minister thinks fit.</p> <p>There are a number of parcels of Crown land located within the Project area associated with Crown Roads. Ravensworth Operations is currently liaising with the Department of Lands regarding closure of the Crown Roads within the Project area</p>	Yes
<i>Water Management Act 2000 (WM Act)</i>	<p>Ravensworth Operations proposes to continue to extract water from the Hunter River catchment. The Project will not require approval under sections 89, 90 or 91 of the WM Act due to the operation of section 75U of the EP&A Act. Future surface water extractions will be approved under the <i>Water Management Act 2000</i> and regulated under the <i>Water Sharing Plan for the Hunter Regulated River Water Source 2003</i> and the <i>Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009</i>.</p>	No

Table 3.4 - Summary of State Legislation and Relevance to the Project (cont)

Planning Provision	Comments	Further Approval Required?
<i>Water Act 1912</i> (Water Act)	<p>The licensing provisions of the Water Act still apply. The Water Act is administered by the Department of Water and Energy (DWE). Under the Act, a permit and/or licence must be obtained to extract surface water (Part 2 of the Act) or groundwater (Part 5 of the Act).</p> <p>An approval under Part 2 of the Act will be required for the extraction of surface water for the Project.</p> <p>An approval under Part 5 of the Act will be required for the Project to intercept and extract groundwater from mine workings and for the proposed groundwater monitoring bores.</p> <p>Ravensworth Operations already maintains Water Licences for Industrial purposes (refer to Section 5.6).</p>	Yes
<i>Dams Safety Act 1978</i> (Dams Safety Act)	<p>This Act requires that the NSW Dams Safety Committee (DSC) periodically review large dams that may constitute a hazard to human life and property. These dams are known as prescribed dams and are listed in Schedule 1 of the Dams Safety Act. Any new prescribed dams are to be designed to the satisfaction of the DSC. Any dams required to be constructed as part of the Project will be subject to assessment in accordance with the DSC requirements to determine if any of these dams will be prescribed dams.</p> <p>The existing 1000 ML dam located in the south-eastern extent of the Project area is a prescribed dam under the Dams Safety Act.</p>	Yes
<i>Environmentally Hazardous Chemicals Act 1985</i> (EHC Act)	<p>Under the EHC Act a licence is required for any storage, transport or use of prescribed chemicals. Should such a licence be required under this Act during the life of the Project, Ravensworth Operations or the relevant sub-contractor will obtain a licence prior to the storage, transport or use of prescribed chemicals.</p>	No

3.3 State Environmental Planning Policies

State Environmental Planning Policies (SEPPs) are environmental planning instruments created by the State government. In addition to the Major Development SEPP, the following SEPPs are relevant considerations for the Project.

3.3.1 State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33)

SEPP 33 requires the consent authority to consider whether an industrial proposal is a potentially hazardous industry or a potentially offensive industry. A hazard assessment is completed for potentially hazardous or potentially offensive development to assist the consent authority to determine acceptability of a Project.

The existing Ravensworth Operations are not classed as hazardous or offensive development under SEPP 33. As the Project is a consolidation and extension of existing mining operations within approved mining leases, the Project is not considered potentially hazardous or potentially offensive. Therefore SEPP 33 is not applicable.

3.3.2 State Environmental Planning Policy 44 – Koala Habitat Protection (SEPP 44)

SEPP 44 restricts a Council from granting development consent for proposals on land identified as core koala habitat without preparation of a plan of management.

An extensive ecological assessment has been conducted and found no core koala habitat within the Project Area (refer to **Section 5.5**). Consequently, the requirement for preparation of a koala plan of management does not apply.

3.3.3 State Environmental Planning Policy - (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP)

The Mining SEPP repeals SEPP 11 - Traffic Generating Development, SEPP 37 - Continued Mines and Extractive Industries and SEPP 45 - Permissibility of Mining.

With regards to coal mining, the Mining SEPP provides that development for the purpose of mining may be carried out only with development consent. The Minerals SEPP also defines mining developments that are prohibited, exempt or complying development. These provisions do not affect the requirement for approval under Part 3A of the EP&A Act for the Project.

Part 3 of the Mining SEPP only has application in respect of development applications made under Part 4 of the EP&A Act. Given that the Project requires approval under Part 3A of the EP&A Act and not Part 4 of the EP&A Act, these provisions of the Mining SEPP have no application to it. However, for completeness sake a discussion of these provisions follows.

Under Clauses 12 and 13 of the Mining SEPP the consent authority must consider the compatibility of the Project with other surrounding land uses including existing mines. A description of surrounding land uses and potential interactions with the Project are provided in **Section 5.1.2**. As discussed in **Section 3.2.1**, the Project is permissible under the provisions of the Singleton LEP and is therefore permissible under the Mining SEPP.

Clause 14 of the SEPP requires the consent authority to apply consent conditions, where necessary, that ensure the Project is undertaken in an environmentally responsible manner. In addition, the consent authority must also consider resource recovery, waste minimisation, transportation of material via the public road system and rehabilitation needs associated with the Project.

Under the Mining SEPP, the consent authority must consider an assessment of the greenhouse gas emissions, including downstream emissions, of the development. The determination must be made in regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions. A full greenhouse gas and energy assessment, including a quantitative analysis of the Scope 1, 2 and 3 emissions from the Project, and a qualitative assessment of the impacts of these emissions, was undertaken for the Project (refer to **Section 5.11**).

The provisions of the Mining SEPP do not affect the requirement for approval under Part 3A of the EP&A Act for the Project or require any additional approvals for the Project.

3.3.4 State Environmental Planning Policy 55 - Remediation of Land (SEPP 55)

SEPP 55 aims to provide a state-wide planning approach to the remediation of contaminated land and to reduce the risk of harm to human health and the environment by consideration of contaminated land as part of the planning process. Under SEPP 55, a consent authority must not consent to the carrying out of development on land unless it has considered any potential contamination issues. However, SEPP 55 does not include any express provisions applying to it to Part 3A projects and therefore is of no application to the carrying out of the Project, if approved.

Notwithstanding, Ravensworth Operations would implement general land contamination management and mitigation measures and any potential contamination issues will be assessed and dealt with in the mine closure and decommissioning processes (refer to **Section 5.1.3**). The Project will be designed to prevent contamination and the storage and handling of chemicals will be undertaken in accordance with Australian Standards and relevant DECCW guidelines. A closure and decommissioning strategy, including a contaminated land management strategy, will be developed for the decommissioning and closure of the Project in consultation with I&I (refer to **Section 5.1**). This management strategy will incorporate the investigation and remediation of any contaminated land and will be included in MOPs submitted to I&I for approval should this Project be approved.



SECTION 4.0

Consultation and Identification of Environmental and Community Issues



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4.0 Consultation and Identification of Environmental and Community Issues

Community and agency consultation are key to the preparation of the EA and necessary to determine the relevant issues to be considered through the assessment process. Consultation with relevant stakeholders including affected landholders, the surrounding community, community groups, government authorities, service providers, Aboriginal groups and other relevant stakeholders commenced during the early Project planning phases and has continued through the preparation of the EA.

The details of the authority consultation program are outlined in **Section 4.1**, with details of consultation with the community and other stakeholder groups outlined in **Section 4.2**. An outline of the key issues identified during the consultation process, and where this has been addressed in the EA, is included in **Section 4.4**.

4.1 Authority Consultation

There has been extensive consultation with government authorities throughout the assessment process including:

- initial briefings regarding Project details and the proposed environmental assessment approach;
- a Planning Focus Meeting to which all key agencies were invited and included an inspection of the Project area; and
- various meetings with relevant agencies to discuss assessment outcomes and specific issues relevant to the agency.

A summary of the agency consultation during the EA preparation is provided in **Table 4.1** below.

Table 4.1 - Summary of Agency Consultation

Agency	Date	Purpose
Department of Planning (DoP)	3 November 2008	Initial Project briefing
	18 February 2009	Planning Focus Meeting and site inspection
	5 August 2009	Project Update and detailed briefing on approach and preliminary outcomes of Noise Impact Assessment
	19 August 2009	Preliminary ecological survey outcomes and overview of the proposed Biodiversity Offset and Rehabilitation Strategy
	8 - 9 September 2009	Project area tour and inspection of proposed Biodiversity Offset Areas
	5 October 2009	DoP issue of the final DGRs for the Project

Table 4.1 - Summary of Agency Consultation (cont)

Agency	Date	Purpose
Department of Environment, Climate Change and Water (DECCW)	18 February 2009	Planning Focus Meeting and site inspection
	27 April 2009	Overview of the Project, proposed Aboriginal archaeological survey strategy and schedule, proposed Aboriginal consultation program, and general approach to archaeological offset strategies.
	19 August 2009	Preliminary ecological survey outcomes and overview of the proposed Biodiversity Offset and Rehabilitation Strategy
	8 - 9 September 2009	Project area tour and inspection of proposed Biodiversity Offset Areas
Industry and Investment NSW (I&I)	12 November 2008	Initial Project briefing
	16 December 2008	Presentation of the Conceptual Mine Plan (CMP) to technical representatives
	18 February 2009	Planning Focus Meeting and site inspection
	20 August 2009	Project area inspection and briefing on mine title consolidation process
Singleton Council	24 November 2008	Initial Project briefing provided to Mayor, GM and
	3 February 2009	Project update provided to Mayor, GM and senior planning staff
	9 March 2009	Presentation to Councillors and Environment Committee on the proposed strategy for the environmental assessment
	16 July 2009	Discussion of conceptual design details for Lemington Road realignment and briefing on detailed design process
	1 October 2009	Project update provided to General Manager
	13 October 2009	Discussion of process for land subdivision for land transfer within Project area
Department of Environment, Water, Heritage and the Arts (DEWHA)	2 September 2009	Project briefing and outcomes of the ecological assessment specifically in relation to matters of National Environmental Significance and the referral process under the EPBC Act
Department of Transport and Infrastructure	19 January 2009	Initial Project briefing and introduction of design concepts for proposed Lemington Road realignment and proposed conveyor bridge
	18 February 2009	Planning Focus Meeting and site inspection
	15 July 2009	Project update and detailed briefing on design for proposed Lemington Road realignment and proposed conveyor bridge

Organisations that were sent the Preliminary Environmental Assessment but did not attend the Planning Focus Meeting, included the Department of Water and Energy (DWE), Singleton Council, Department of Lands (now NSW Land and Property Management Authority) and Mine Subsidence Board (MSB). Ravensworth Operations will consult further with these agencies to discuss any relevant issues through the assessment and approval process for the Project.

In addition to the specific meetings shown in **Table 4.1**, there was extensive correspondence, telephone calls and discussions with numerous agencies throughout the assessment process.

4.2 Other Stakeholder Consultation

4.2.1 Community Consultation

The Project is located in an area that is relatively remote from any residential areas. Several private rural residences are located within a few kilometres of the southern boundary of the Project and the village of Camberwell is located approximately 5 kilometres to the south-east (as described in **Section 1.3**). In addition there are a number of private landholders located to the south and south-east of the Project area.

This section identifies the stakeholders relevant to the Project, the methods of communication for each stakeholder group, the timing of consultation and the feedback mechanisms provided.

Stakeholders consulted in relation to the Project included:

- local landholders – including Camberwell Village residents and the nearest residents located in proximity to the Project area;
- community groups – including Ravensworth Community Consultative Committee;
- environmental groups – Hunter and Central Rivers Catchment Management Authority;
- Aboriginal stakeholder groups who have registered an interest in the Project (refer to **Section 5.8**);
- other mining operations – Coal & Allied, Ashton Coal, Integra Coal and other Xstrata Operations surrounding the Project area;
- service providers – TransGrid, ARTC, Energy Australia, Hunter Valley Coal Chain Logistics Team, Dyno Nobel, Orica Mining Services; and
- corporate stakeholders – employees, Xstrata Corporate, shareholders and commercial partners.

The consultation process for the Project was undertaken in a number of definable phases that align with the key milestones of the EA process. The key phases of the consultation process for the Project included:

- **Phase 1** of the consultation program involved consultation with stakeholders during the early phases of the preparation of the EA for the Project. The main purposes of this stage of consultation were to inform stakeholders of the details of the Project and the proposed environmental assessment process, and to identify the issues that the stakeholders would like addressed in the EA.
- **Phase 2** of the consultation program involved consultation with stakeholders following the substantial completion of the environmental studies for the EA. The main purpose of this stage of the consultation program was to update the stakeholders on the status of the Project, provide feedback on the results of the environmental assessment and to provide opportunity for feedback on proposed environmental management commitments.

Ravensworth Operations will undertake ongoing consultation with community stakeholders throughout the assessment and approval process. This consultation will focus on providing any additional feedback in relation to specific issues associated with the Project.

A range of methods were used to engage the community throughout the preparation of the EA, as outlined below.

- community information sheets/brochures. Ravensworth Operations circulates a newsletter, *Face to Face*, to residents in close proximity to the proposed Ravensworth Project. The newsletters, sent bi-annually, provide an introduction to the proposed Project, key environmental issues, the approvals path and a number of updates on the Project and assessment;
- individual meetings with surrounding landholders. This included one-on-one meetings with residents and landholders in close proximity to the Project to identify issues and obtain baseline information early in the EA process. Further consultation with landholders was undertaken to provide feedback on technical studies and to discuss proposed management measures;
- Ravensworth Community Consultative Committee (CCC) meetings. The Ravensworth CCC includes representatives from local government, government agencies and the community, and was established under the existing development consents for the existing mining operations. The Ravensworth CCC has been provided with a number of Project briefings in November 2008, February 2009, May 2009 and October 2009. In addition, the Liddell CCC was provided with a Project briefing in late 2008;
- Community Information Day at Ravensworth Homestead. An information day was held at Ravensworth Homestead on 12 March 2009 to provide Project information and provide the opportunity for the local community to ask questions and discuss the proposed Project. The community information day was attended by a number of local community members;
- Community Information Day at Glennies Creek Hall. An information day was held on 8 December 2009 to provide the local community with the opportunity to discuss the results of the EA and the Project. This information day was attended by 20 local residents;
- environmental assessment update. A booklet that summarised the key findings of the EA was provided to residents and other stakeholders who attended the Community Information Day at Glennies Creek Hall. The EA update was subsequently made available to any interested stakeholders; and
- Community Feedback Sheets. Community Feedback Sheets were issued to all participants at the Community Information Day in order to provide a mechanism for direct feedback and the expansion of any issues raised during the community consultation.

The primary community issues raised during the consultation process included:

- potential impacts from blasting, air quality and noise, including consideration of the effects of topography and weather;
- potential socio-economic impacts;
- ongoing environmental management;

- surface and groundwater impacts; and
- tailings management and rehabilitation.

The key issues identified throughout the consultation process and where they have been addressed in the EA are summarised in **Section 4.4**. Ravensworth Operations will continue to consult with key community stakeholders.

4.2.2 Aboriginal Community Consultation

Twenty nine Aboriginal stakeholder groups who registered an interest in the Project or who were previously known to have an interest in the Project area were consulted regarding the Aboriginal archaeology assessment completed for the Project. This consultation was undertaken on a number of occasions during the assessment process in accordance with relevant guidelines and is discussed further in **Section 5.8.1**.

4.2.3 Service Provider Consultation

Service providers who have infrastructure within the Project area, or who may provide services for the Project, have been consulted by Ravensworth Operations during the Project design and EA phases. The key service providers include TransGrid and Energy Australia. Extensive consultation has been undertaken by Ravensworth Operations with these service providers so that any Project design or management issues could be identified and addressed through Project design. Xstrata Coal NSW has consulted with ARTC regarding the increased rail volumes as part of the Hunter Valley Coal Chain Logistics Corporation. Further consultation is planned with ARTC regarding the de-linking of RCT and Newdell rail loops.

4.2.4 Other Stakeholder Consultation

Ongoing consultation was undertaken throughout the Project design and EA process with surrounding mining companies and land users. This included meetings with a number surrounding coal mining companies, including Coal & Allied, Xstrata owned mines, Ashton Coal, Integra Coal Operations, Macquarie Generation and Muswellbrook Coal. The Bloomfield Group, who operates the nearby Rixs Creek Colliery, declined to participate in the consultation process. Consultation with these stakeholders has been undertaken throughout the preparation of the EA, through a range of meetings, in order to provide a briefing on the Project and obtain feedback on specific issues raised during the consultation process.

As outlined in **Section 1.3**, there is a range of existing land owners and users within the Project area, including Coal & Allied and Macquarie Generation. Ravensworth Operations have undertaken ongoing consultation with these stakeholders throughout the project design process and the development of feasibility studies for the Project. This consultation has included specific matters such as arrangement of land access for baseline studies, information provision and the identification of specific issues to be addressed through conceptual project design and the preparation of detailed environmental studies as part of the EA. In addition, project briefings were provided to Dyno Nobel and Orica mining services to discuss potential interactions with these facilities.

Ravensworth Operations will undertake ongoing consultation with these stakeholders to address any specific issues raised throughout the assessment and approval process.

4.3 Environmental Risk Analysis

An environmental risk analysis was undertaken for the Preliminary Environmental Assessment that was prepared for the Project (Umwelt 2009c) to identify the key issues that required detailed assessment as part of this EA (refer to **Appendix 3**). The methodology used for the environmental risk analysis was generally in accordance with the Xstrata Coal NSW (XCN) Health, Safety, Environment and Community (HSEC) Standard 1.02 Risk Management, (XCN 2007a) which follows the general principles outlined in Australian Standard AS/NZS 4360:2004 *Risk Management* (Standards Australia, 2004).

The method used for the environmental risk analysis encompassed the following key steps:

1. Establish the context for the risk analysis process;
2. Identify environmental and community aspects and potential risks;
3. Analyse risks; and
4. Evaluate risks to determine the key issues requiring further assessment.

The Preliminary EA which included the environmental risk assessment was provided to DoP along with the Project Application in order to assist with issuing the DGRs for the Project. The Preliminary EA was also provided to other relevant government agencies with whom DoP consulted regarding the DGRs.

A detailed assessment of each of the key environment and community issues identified for the Project is provided in **Section 5.0**, as discussed in **Section 4.4**.

4.4 Identification of Environmental and Community Issues

Identification of key environmental and community issues for the EA for the proposed Ravensworth Operations Project is based on consideration of:

- the planning and environmental context for the locality (refer to **Sections 1.0, 2.0 and 3.0**);
- the environmental risk assessment of potential environmental impacts associated with the Project (refer to **Section 4.3** and **Appendix 3**);
- outcomes of the community and authority consultation process (refer to **Sections 4.1 and 4.2**);
- the DGRs for the proposed Project (refer to **Section 1.4**); and
- baseline studies completed as part of preparation of the EA.

Table 4.2 provides a summary of the key issues identified through these processes and provides reference to the section of the EA in which these issues have been addressed.

Table 4.2 – Key Environmental and Community Issues

Issue	EA Reference
Land Resources, Rehabilitation and Decommissioning	Section 5.1
Air Quality	Section 5.2
Noise Generation	Section 5.3
Blasting and Vibration	Section 5.4
Ecology	Section 5.5
Surface and Groundwater	Section 5.6
Traffic and Transport	Section 5.7
Aboriginal and non-Aboriginal Heritage	Sections 5.8 and 5.9
Visual Impacts	Section 5.10
Greenhouse Gas Emissions	Section 5.11
Waste Management	Section 5.12
Socio-Economic Impacts	Section 5.13