

# Western Rail Coal Unloader

ENVIRONMENTAL ASSESSMENT

CHAPTER 2 – STRATEGIC JUSTIFICATION

- April 2007

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## 2. Strategic Justification

*This chapter provides a strategic assessment of the need, scale, scope and location for the project in relation to predicted coal supply constraints and coal demand for Mt Piper Power Station.*

*A detailed site feasibility assessment is described, comparing the relative merits of alternative sites and justifying the preferred site. An analysis of the suitability of the preferred site, with respect to potential land use conflicts with existing and future surrounding land users, is provided in a strategic planning context.*

### 2.1 Need for the Project

#### 2.1.1 Demand for Coal

The current demand for coal at Mt Piper Power Station is approximately 4 million tonnes per year, while at Wallerawang it is about 2.4 million tonnes per year. Forecast increases in electricity demand, together with the recently approved upgrade of Mt Piper Power Station providing a 14% increase in capacity, will increase the total coal demand by up to 0.6 million tonnes per year. The forecast coal demand in the future for the two power stations is about 7 million tonnes per year.

Delta Electricity currently sources most of the coal for the two power stations from local mines. There are two major long-term contracts, one with Springvale (about 1.6 million tonnes per year) which extends through to 2013 and one with Angus Place (about 2.5 million tonnes per year) until 2014. These arrangements would be expected to continue, subject to appropriate contractual arrangements, for the life of those mines. In addition, there are short term contracts Springvale and other local mines for about 1.5 million tonnes per year.

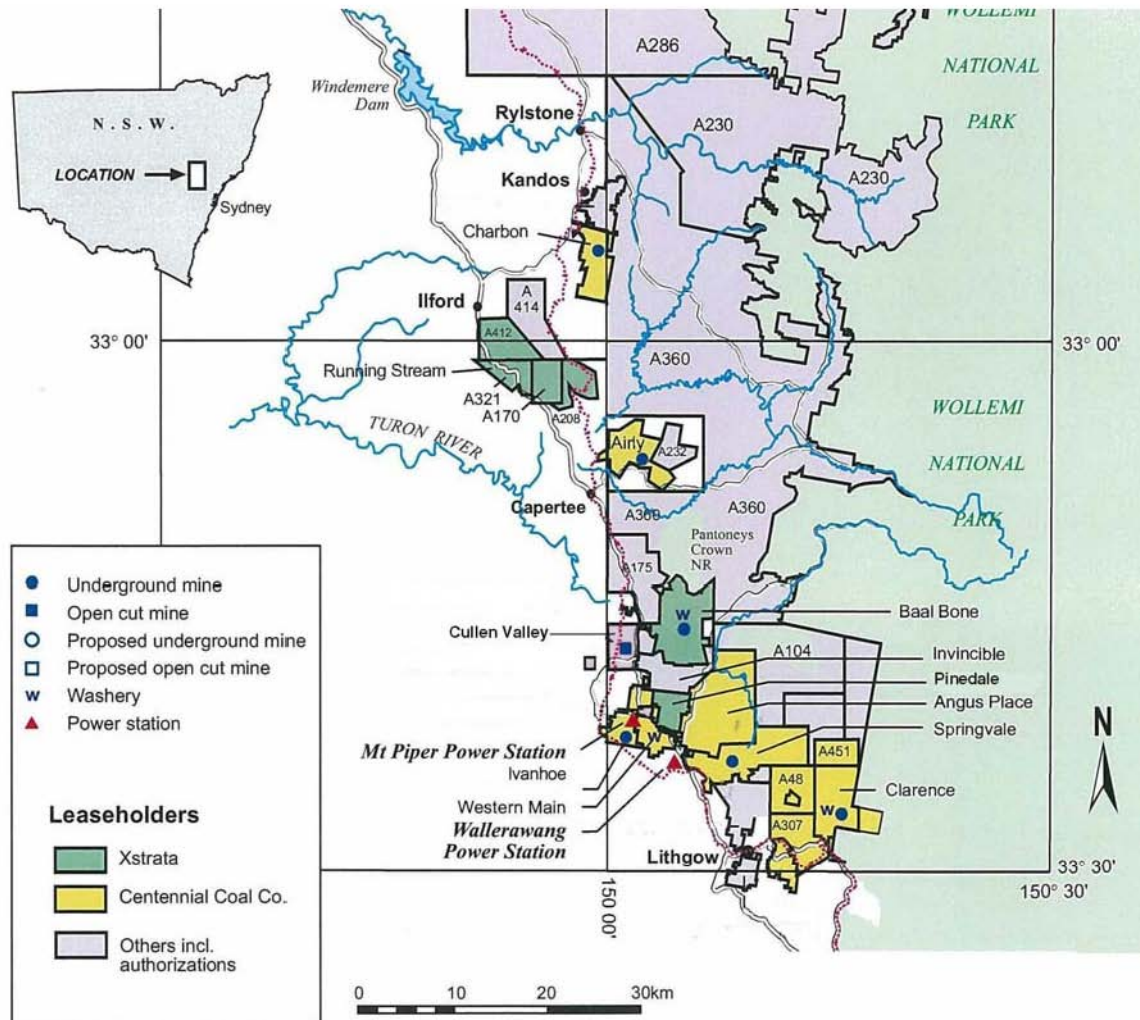
The coal supplied to Mt Piper Power Station from Springvale and Angus Place is about 3 million tonnes, the balance from those mines going to Wallerawang Power Station. Coal from Springvale to Mt Piper is delivered via conveyor and from Angus Place via a dedicated haul road.

In addition, about 1 million tonnes per year is brought by truck on the public road to Mt Piper Power Station from other mines. These deliveries are on short term contracts and include coal from sources such as Baal Bone, Invincible and Pinedale Collieries.

#### 2.1.2 Coal Source Options

Prospective coal sources were investigated by Delta, with the most likely sources being the local mines of the western coalfields. Future sources of coal to replace the existing local coal will inevitably come from north of the power station, as it is located at the southern end of the western coal fields.

Existing and possible coal resources from the western coalfields are shown in **Figure 2-1**.



■ **Figure 2-1 Accessible coal resources**

Most of the operating mines in the western coal fields already supply coal to Delta and most of the smaller operations with minor reserves exist by supplying coal to Delta. Of the mines with significant reserves, Springvale and Angus Place already supply Delta. Mines such as Charbon, Clarence and Ulan also have significant reserves and construction of a rail unloader will enable them to supply significant

amounts of coal to Delta. Cullen Valley is the other mine with significant reserves and it already supplies to Delta by road transport. There are also proposed mines in the western area, notably Airly and Running Stream, all with significant reserves. These mines, if developed, would be most likely to use rail transport as any significant long term road transport would not be environmentally acceptable.

Coal for Mt Piper Power Station could notionally be sourced from the upper and lower Hunter coal mines and the southern coalfields, but high transport costs suggest these sources would not be economic.

### **2.1.3 Need for a Coal Unloader**

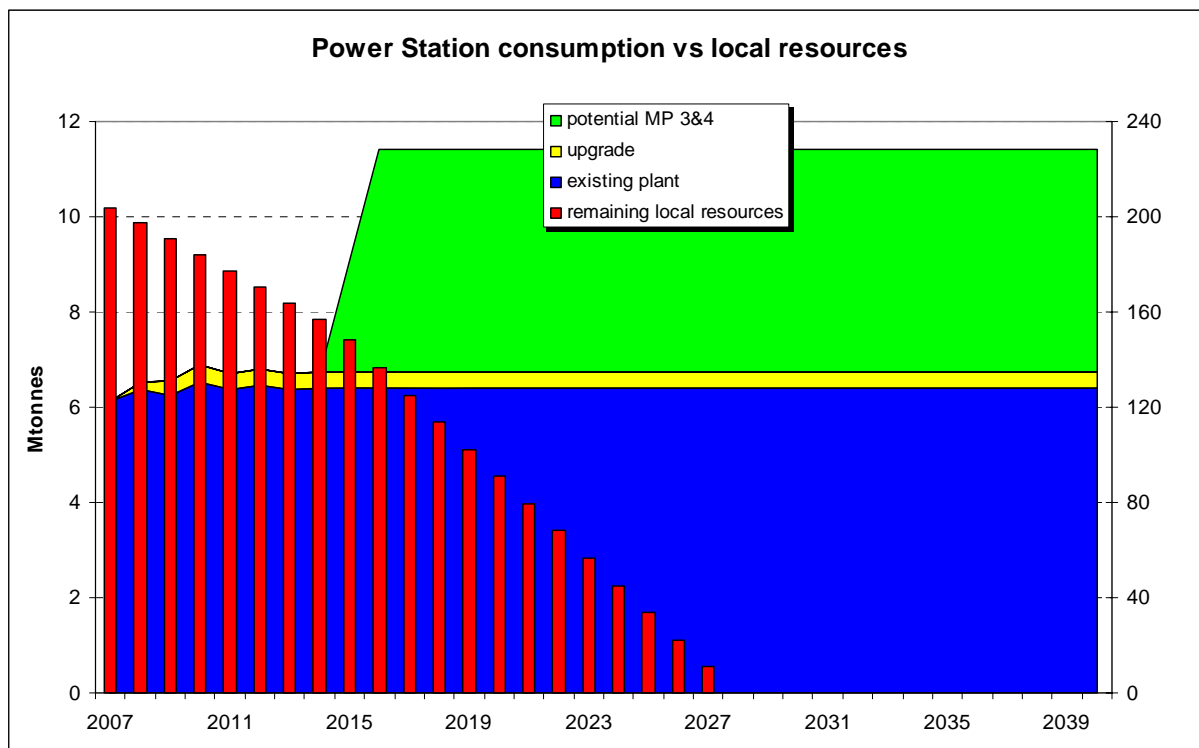
Delta has been investigating the future need for coal supplies, both for minor contracts and in the event that coal is not available (eg through accident or mine management problems) from the major contract locations. A key consideration to obtaining coal from more distant mines is the mode of transportation. Economics limits the use of conveyors to relatively short distances and additional supply via the road system above the current levels does not represent an economically viable or socially desirable option. The installation of a coal rail unloader in close proximity to the power station provides another mode of transport to provide coal for the increase in coal requirements in the short term and for future, long term security of coal supplies.

### **2.1.4 Coal Volumes Required**

Although the short term requirements for coal transport by rail will be about 2 million tonnes per year, in the longer term this would increase as local coal sources decline. An indicative assessment of the rate of decline from local resources is shown in **Figure 2-2**. The data were derived from relevant mining company annual reports and the NSW Coal Industry Profile (2005). The coal resource estimates are “proved”, and do not include probable reserves.

It should be noted that in this figure the total consumption is for both Mt Piper and Wallerawang Power Stations. This also shows the potential coal requirements should Mt Piper Power Station units 3 and 4 be built, although the construction of these units would be subject to NSW Government policy decisions. The requirement for the coal unloader is not dependent on the construction of units 3 and 4 of the power station.

The design of a coal unloader and associated infrastructure must therefore allow for the possible future increase in coal to be transported by rail. The initial supply to Mt Piper via the unloader could be about 2 million tonnes per year and the maximum supply required for Mt Piper Power Station in the medium term could be about 4 million tonnes per year (should all other sources be unavailable due to local mine breakdown or closure). Future volumes in the longer term may increase but in the sizing of equipment and facilities it has been assumed that a surge capacity equating to up to 8 million tonnes of coal per year may be transported to manage shortfall from other sources (suppliers).



■ Figure 2-2 Indicative availability of local coal resources

## 2.2 Consideration of Alternatives

### 2.2.1 Initial Site Selection Studies

A preliminary site selection study was undertaken by Delta in 2002 to assess possible locations for coal unloading. The study considered the existing coal supplies and the associated contracts and how these may be supplemented in the future. This future supply was considered on a short term and long term basis.

The sites considered for rail unloading facilities are described in **Table 2-1**. Recommendations for preferred sites were not made in this study, but a number of conclusions were able to be drawn, namely:

- Rail loops are preferable to sidings from an operational volume and efficiency (cost) point of view;
- Conveyors are preferred over trucking to transport coal from the unloader to the power station;
- Most options around Wallerawang using existing spur lines require rail access from the Main Western Line, with consequential limits to rail operations and
- Mt Piper is preferred to Wallerawang as it has a longer asset life and better tolerance of fuel specifications.

■ **Table 2-1 Sites considered in preliminary site assessment**

<b>Site</b>	<b>Considerations</b>
1. Ivanhoe No 2 Colliery (north of Mt Piper PS)	This site is owned by Centennial Coal. Other private property impacted, particularly for rail line. Design considered for siding, with limited capacity. Any increased capacity means major civil works would be required. Conveyor would transport coal to Mt Piper PS. Rail route from Mudgee line at Portland is long and would have flora and fauna impacts and noise issues for Portland
2. Lidsdale Siding	Branches off the Main line at the entrance to Wallerawang PS, making rail operations more difficult and potentially limiting tonnage. Location near Wallerawang not preferred. Transfer of coal to Mt Piper requires link to haul road or Springvale conveyor duplication. Proximity to residents and potential problems with noise
3. Baal Bone Colliery	Owned privately. May interfere with existing mine operation. 8-10 km from Mt Piper. Trucks may be required for coal transport. If conveyors used there would be high cost over this distance, and likely to encounter environmental (flora and fauna) problems
4. Wallerawang Colliery	Access would be off the main line near Wallerawang PS, making rail operations more difficult and potentially limiting tonnage. Site too small for loop. Reinstatement of rail line would be required at high cost. Small site and construction would be expensive due to sloping terrain. Noise impacts would be experienced at Blackmans Flat
5. Springvale Washery site	Land not owned by Delta. Access from the Main line, making rail operations more difficult and potentially limiting tonnage. Site is too small to incorporate rail loop. Small site and construction would be expensive due to sloping terrain. Transfer of coal to Mt Piper requires partial conveyor duplication. Noise impacts would be experienced at Blackmans Flat
6. North west of Wallerawang Power Station	Similar problems to Option 2 in general. Increased capacity through additional room for a loop, but this brings increased private property ownership issues
7. South west of Mt Piper Power Station	Located on flat land adjacent to Wallerawang – Mudgee line. New conveyor required. No nearby residences and no need for trains to go through Wallerawang
8. South east of Wallerawang Power Station site	Located on flat land next to the Main Western line. Rail access to the site is difficult, making rail operations more difficult and potentially limiting tonnage. Location near Wallerawang not preferred. Transfer of coal to Mt Piper requires link to haul road or Springvale conveyor duplication. Trains would need to go through Wallerawang
9. North east of Wallerawang Power Station	Sloping land next to Main Western Line. Rail access to the site is difficult, making rail operations more difficult and potentially limiting tonnage. Location near Wallerawang not preferred. Transfer of coal to Mt Piper requires link to haul road or Springvale conveyor duplication. Trains would need to go through Wallerawang
10. Wallerawang PS site	Similar problems to Option 8
11. North west of Mt Piper PS	Rail route from Mudgee line between Portland and Cullen Bullen. Relatively flat site for rail loop. Many land owners potentially affected – both directly through property acquisition or by noise and visual impact. Conveyors to Mt Piper PS

### 2.2.2 Detailed Selection Studies

Delta undertook a detailed feasibility and site selection study in 2005 in which site options identified at the preliminary stage were reviewed and assessed against a set of engineering, environmental and financial (capital and operating) criteria.

From this process four options were identified and assessed in detail and ranked to enable a preferred option to be selected.

The four options assessed in detail comprise:

- Option 1 – Cullen Bullen. This option is located to the north of the Mt Piper Power Station, with the rail loop and train unloading station placed on rural flat grazing land between Portland and Cullen Bullen. The overland conveyor from the rail unloading point to the power station would cross flat grazing and bush land to the north of the power station. This corresponded with Site 11 in the preliminary study;
- Option 2 – Wallerawang. The rail facility would be located to the southeast of Wallerawang Power Station, with the rail loop and unloading station on the flat cleared land adjacent to the power station. The overland conveyor to Mt Piper Power Station would traverse cleared and bush land, following the route of the existing Springvale overland conveyor. This corresponded with Site 8 in the preliminary study;
- Option 3 – Pipers Flat. The facility would be located to the south west of the Mt Piper Power Station, with the rail loop and train unloading station on the flat cleared land at the bottom of the ridge. The overland conveyor from the unloading station to Mt Piper Power Station would cross steep topography covered with bush and over partially cleared land adjacent to the power station. This corresponded with Site 7 in the preliminary study;
- Option 4 – Portland. This option would be located to the west of the Mt Piper Power Station, with the rail loop and unloading station located on the flat cleared ground to the west of the power station but with the rail line on a steep topography. The overland conveyor from the unloading station to the power station would traverse the ground adjacent to the power station. This was derived partially from Site 1 in the preliminary study.

The four options are shown in **Figure 2-3** and their assessment against the site selection criteria is summarised in **Table 2-2**.

The criteria chosen were based on engineering (construction and operation) and environmental which included biophysical and social parameters.



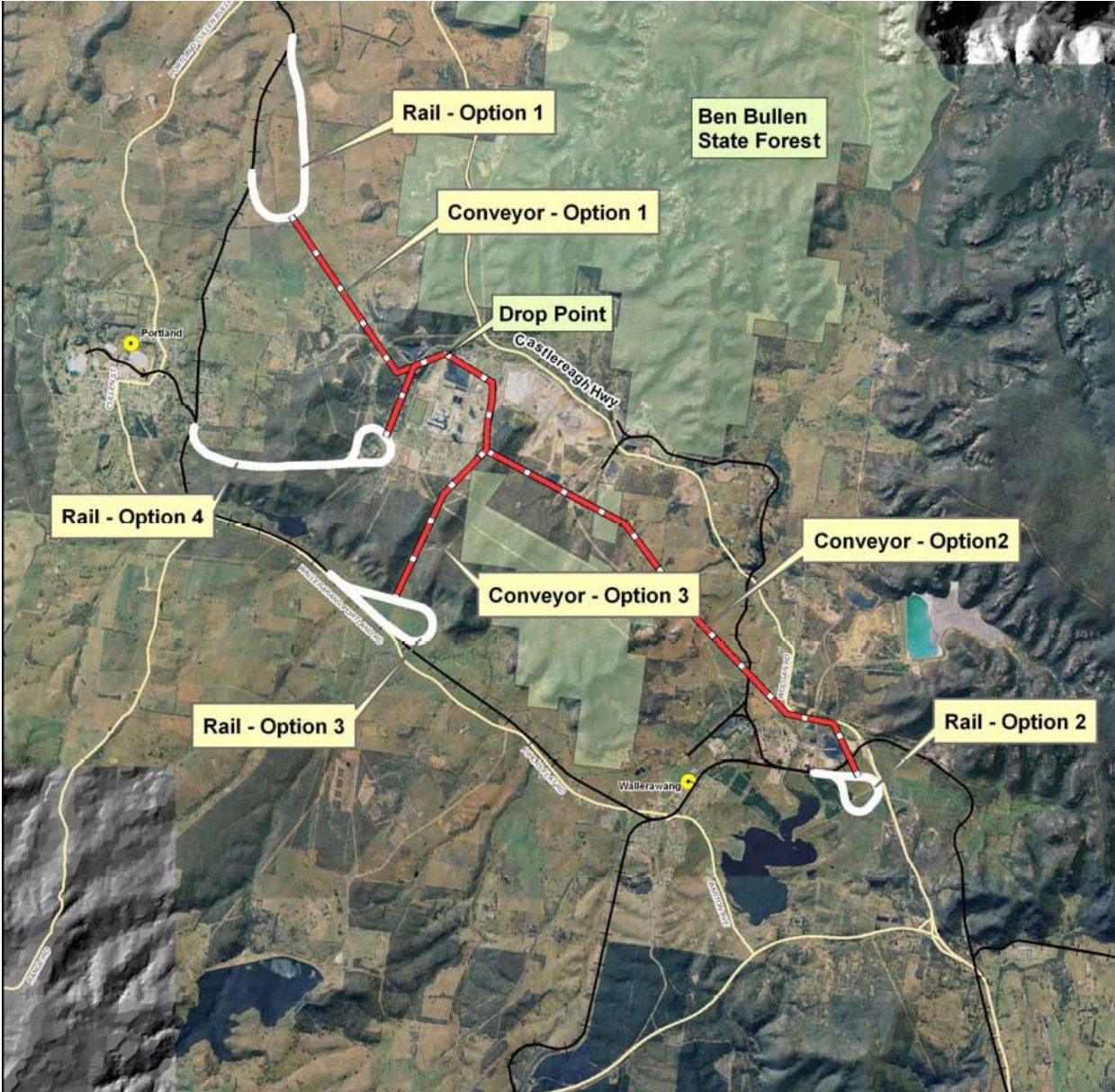


Figure 2-3 Four Options Assessed

■ **Table 2-2 Rail Unloader Options Assessment**

<b>Option and Criteria</b>	<b>Assessment</b>
<b>Option 1 Cullen Bullen</b>	
Construction	<ul style="list-style-type: none"> <li>■ Low capital costs and high acquisition costs</li> <li>■ Limited earthworks</li> </ul>
Rail Operations	<ul style="list-style-type: none"> <li>■ Opportunity for longer loop</li> <li>■ Easy gradient</li> </ul>
Conveyor Operations	<ul style="list-style-type: none"> <li>■ Medium conveyor length</li> </ul>
Environmental Effects	<ul style="list-style-type: none"> <li>■ Waterway effects - Surface water issues due to crossing Hunts Creek</li> <li>■ Access – crosses existing road. Community disturbance and severance impacts</li> <li>■ Ecology - Conveyor effects on woodland – 660 m long</li> <li>■ Heritage - Possible effects on cemetery</li> <li>■ Noise and dust – 9 residential properties within 250 m and 21 properties within 1 km</li> <li>■ Visual impacts - 9 residential properties within 250 m and 21 properties within 1 km</li> <li>■ Social effects - direct impact on 22 parcels of land in private ownership. Potential severance of several other properties</li> </ul>
<b>Option 2 Wallerawang</b>	
Construction	<ul style="list-style-type: none"> <li>■ High capital costs and low acquisition costs</li> <li>■ Limited earthworks for loop</li> <li>■ Costly earthworks for conveyor</li> </ul>
Rail Operations	<ul style="list-style-type: none"> <li>■ Small loop only possible on Delta property. To extend for appropriate length would require relocation of Castlereagh Highway</li> </ul>
Conveyor Operations	<ul style="list-style-type: none"> <li>■ Long conveyor length</li> <li>■ Conveyor to traverse steep slope topography and bushland</li> </ul>
Environmental Effects	<ul style="list-style-type: none"> <li>■ Waterway effects – minor drainage crossings for rail loop. Conveyor crosses Coxs River</li> <li>■ Access – relocate existing road</li> <li>■ Ecology – widen Springvale conveyor through bushland. Distance over 1920 metres</li> <li>■ Heritage – known indigenous sites from the area</li> <li>■ Noise and dust – 29 residential properties within 250 m and 349 properties within 1km</li> <li>■ Visual effects – issues for properties in Wallerawang, Lidsdale and Blackmans Flat</li> <li>■ Social effects - direct impact on 3 lots of land in private ownership. Loop will sever a number of parcels of land.</li> </ul>

<b>Option 3 Pipers Flat</b>	
Construction	<ul style="list-style-type: none"> <li>■ Low capital costs and medium acquisition costs</li> <li>■ Earth works required for loop straightforward</li> <li>■ Earthworks for conveyor more difficult</li> </ul>
Rail Operations	<ul style="list-style-type: none"> <li>■ Long loop possible</li> <li>■ No gradient problems</li> </ul>
Conveyor Operations	<ul style="list-style-type: none"> <li>■ Difficult grade</li> <li>■ Medium conveyor length</li> </ul>
Environmental Effects	<ul style="list-style-type: none"> <li>■ Waterway effects – rail loop crosses Pipers Flat Creek, Thompsons Creek and Irondale Creek</li> <li>■ Access – no issues</li> <li>■ Ecology – Conveyor through bushland. Distance over 1990 metres</li> <li>■ Heritage – known indigenous sites from the area</li> <li>■ Noise and dust – 2 residential properties within 250 m and 14 properties within 1km</li> <li>■ Visual effects – issues for a small number of properties on Pipers Flat Road</li> <li>■ Social effects - direct impact on 3 lots of land in private ownership, but 1 residential property</li> </ul>
<b>Option 4 Portland</b>	
Construction	<ul style="list-style-type: none"> <li>■ Low capital costs and low land acquisition costs</li> <li>■ Extensive earthworks required, including tunnel</li> </ul>
Rail Operations	<ul style="list-style-type: none"> <li>■ Loop design difficult. Steep gradient and small loop only</li> </ul>
Conveyor Operations	<ul style="list-style-type: none"> <li>■ Conveyor length short and easily constructed</li> </ul>
Environmental Effects	<ul style="list-style-type: none"> <li>■ Waterway effects – minor drainage crossings for rail loop</li> <li>■ Access – relocate existing road</li> <li>■ Ecology – Clearance for rail loop – undisturbed woodland over 2,550 metres. Clearance for conveyor – undisturbed woodland 570 metres</li> <li>■ Heritage – known indigenous sites from the area</li> <li>■ Noise and dust – 24 residential properties within 250 m and 369 properties within 1km</li> <li>■ Visual effects – issues for properties in the Portland area</li> <li>■ Social effects - direct impact on 1 lot of land in private ownership. Loop will sever a number of parcels of land</li> </ul>

The feasibility and site selection study found that Option 1 – Cullen Bullen, Option 3 – Pipers Flat and Option 4 – Portland provided potentially favourable options for the facility. Option 2 – Wallerawang was the least favoured location due to the cost and operation of the conveyor and the generally negative environmental effects compared with the other options evaluated.

Despite being the lowest overall cost, the engineering and environmental issues associated with Option 4 – Portland were considered too great. Option 1 – Cullen Bullen and Option 3 – Pipers Flat were regarded more favourably in the study.

Option 1 had the:

- Lowest overall capital cost but a relatively high land acquisition cost;
- Best rail loop and earthworks outcomes; and
- Good overall environmental outcome, although the impacts on land owners (acquisition) and on neighbours would be high.

Option 3 had:

- The next best overall capital cost and a reasonable land acquisition cost;
- Good rail loop and earthworks outcomes;
- A good overall environmental outcome, with the least effect on land owners (acquisition) and on neighbours.

Delta selected Option 3 – Pipers Flat for further consideration as it had the lower overall cost (capital and land acquisition) of the two and a better environmental and social outcome. Further opportunities to minimise potential impacts were investigated in the preliminary design for that option. This was done by locating the rail loop and hopper in a smaller area on one property and moving the departure point from the main line to east from the point that is shown in **Figure 2-3**.

Consultation with relevant Government agencies suggested further consideration should be given to sites on the southern side of Pipers Flat Creek, away from the drainage issues potentially affecting the Option 3 site.

Two alignment options (Options 5a and 5b) (shown in **Figure 2-4**) were investigated but discarded due to:

- The need to provide two level crossings in Pipers Flat Road to allow train passage to and from the main line. This would require the use of land to the north of Pipers Flat Road;
- Direct effects on at least 3-4 properties with residences on the southern side of Pipers Flat Road. These properties would need to be acquired;
- The moving of the unloader and loop onto the southern side of Pipers Flat Road would also result in up to 10 other residences being located within view and within 1 km of the project.





Figure 2-4 Rail Loop Options at Pipers Flat Road



A loop adjacent to Centennial Coal's property (Option 5a) would reduce significantly the number of creek crossings, although it would be located close to the dam on Centennial Coal's property and close to Pipers Flat Creek downstream of the dam. Option 5b would utilise the property already acquired by Delta but would need to cross both Thompsons Creek and Irondale Creek twice. The land where these crossings would be required does not appear to be as flood affected as the land to the north of the road near the junction of Thompsons Creek and Pipers Creek.

The rail unloader would need to be on the south of Pipers Flat Road to allow trains of 1,050 m in length not to extend back on to the main line or on to Pipers Flat Road. The conveyor would also need to extend across Pipers Flat Creek. For both options the conveyor would need to be up to 900 metres longer than proposed.

Any advantages possibly gained in terms of flood management would be more than offset by the disadvantages associated with greater amenity impacts, issues of road crossing and access and costs associated with a longer conveyor operation and land acquisition. As long as any flood issues can be managed on the Option 3 site, there would be no benefit in relocating to the southern side of Pipers Flat Road.

### **2.2.3 Suitability of the preferred site**

#### **Land use**

Delta Electricity owns the majority of the land required for the project. This includes Lots 1 and 2 DP 800003 (site of the proposed rail loop and coal unloader), and Lot 191 DP 629212, Lots 13 and 14, DP 804929, DP 829065, and Lot 2 DP 702619 (site of the power station).

The proposed coal conveyor from the unloader to Mt Piper would traverse property owned by Centennial Coal, comprising Lots 159/160/ 164/165/166 DP 751638 and Lot 15 DP 804929. The coal conveyor would follow or be adjacent to the approximate alignment of an existing easement (DP 645476) for a water supply pipeline which connects Thompsons Creek Dam and Mt Piper Power Station and where an access road exists.

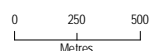
The location of the preferred site and key geographic features are shown in **Figure 2-5**. The proposed site for the rail loop and coal unloader is located at 708 Portland Road, Wallerawang. This property is in an area commonly identified as "Pipers Flat" and is located between Pipers Flat Road and the base of the ridgeline that forms Mount Piper. Pipers Flat consists of undulating pasture land that is located at approximately RL 900 m AHD. This area has been used for primary production (cattle grazing) and comprises a cleared flat area that is traversed by Irondale Creek and Thompsons Creek which join Pipers Flat Creek, a tributary of the Cocks River. This cattle grazing activity would cease prior to construction beginning. The residence on the site would be used as an office by Delta or demolished.





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 February 16, 2007

Figure 2-5 Site Location and Local Features



To the north and west (on northern side of the Pipers Flat Road) the land is owned by Centennial Coal. The adjoining land to the north includes Mt Piper which rises steeply to a maximum of RL 1050 metres AHD. The ridge of Mt Piper is covered in natural vegetation up to the boundary of Mt Piper Power Station, beyond the ridge. Although the area is well vegetated, there is some evidence of extraction and/or construction activity in places, especially close to the power station. The area owned by Centennial Coal is subject to coal leases and may be mined in the future.

At the western end of Centennial Coal's property is a dam on Pipers Flat Creek. It was originally used as a water source for power generation for the concrete works at Portland. Water from the dam is currently used by Centennial Coal.

The property to the east of the rail loop site is privately owned, with the residence located in the north east corner behind the ridge line which partially separates the property from the preferred site.

Pipers Flat Road forms the main road corridor connecting the township of Wallerawang in the southeast with Portland further northwest. The Wallerawang – Mudgee Rail Line (generally known as the Mudgee Line) is located adjacent to the project site, running parallel with Pipers Flat Road.

Rural properties are located on the southern side of Pipers Flat Road. A number are used primarily as residences, others have some cattle grazing and one (Premier Farms) is used as an egg farm. **Figure 2-5** shows the property boundaries and the location of residences. Thompsons Creek Road has a number of small rural residential lots adjacent to the State Forest.

The township of Wallerawang is located about 4 km and the Wallerawang Power Station approximately 6 km to the east of the project site. The township of Portland is located about 4 km to the north west of the site.

### **Zoning and future land use**

The proposed development is located within the City of Lithgow local government area and is subject to the provisions of the Lithgow City Local Environmental Plan (LEP) 1994. The development site is zoned Rural (General) 1 (a) and the proposal is permissible with consent in this zone. The LEP indicates that this zone provides flexibility while protecting rural lands and other uses are permitted, where appropriate, including certain industrial development. Lands bordering the site, including the Centennial lands and the existing Mt Piper Power Station site, are also zoned Rural (General). Forest areas nearby are zoned Rural (Forestry) 1(f).

The rural properties on the southern side of Pipers Flat Road are zoned General Rural 1(a). Council's draft discussion paper for the Strategic Plan (Geolyse, 2006) indicates that:

- Only 64% of the land zoned General Rural is capable of sustaining agricultural production (grazing);



- This agricultural land is fragmented by small holdings. A majority of prime agricultural land within the LGA has already been divided into holdings less than 400 ha;
- Few holdings with agriculturally capable land are large enough to be self sufficient agricultural enterprises. There are only 9 holdings that meet a level of turnover required to cover costs where the holding size is greater than 1,000 ha.

Given their size, the project site and nearby areas are not regarded as viable agricultural enterprises, at least in terms of beef cattle production.

Lithgow Council is undertaking a strategic planning process at present to help develop its Local Environmental Plan. There are a number of Rural (Small Holdings) 1 (c) zones in the LGA, and the discussion paper issued as part of the strategic planning process suggests there is additional subdivision potential within these areas (more than 700 lots) under the current planning provisions.

There are no proposals before Council to change the status of the General Rural zoning of properties along Pipers Flat Road, nor increase density or subdivide these lands into Rural Small Holdings. Notwithstanding the possible outcomes of the strategic planning process, it is unlikely that the General Rural areas on Pipers Flat Road would be considered for Rural Small Holdings zoning. Although Council is undertaking a strategic planning process at present and no information is available about future land use options, it seems unlikely that any changes in land use or zoning may occur in the areas adjacent to the project site.

The preferred site is suitable for the proposed development in that:

- Its change in land use from a general rural (beef grazing) to its use as a rail loop and coal unloader would have no significance or impact on the agricultural activities within the area;
- The land uses in areas adjacent to the preferred site are unlikely to change in the future from the General Rural zoning to any other form of land use, nor would development densities in the area be expected to change;
- The proposed use is consistent with other land uses in the area, given the major land ownership on the property boundary by a coal company suggests a future of coal mining nearby. The other neighbours are separated from the site by a regional road and a freight rail line;
- The wider area comprises Mt Piper Power Station, Wallerawang Power station and many coal mines and associated infrastructure; and
- The existing Mudgee rail line passes along the edge of the site.