EIS 1118

AB019864

Springvale Colliery February 1994 environmental management plan

Springvale Colliery
February 1994

Environmental Management Plan

SINCLAIR KNIGHT
CONSULTING ENGINEERS

Springvale Colliery
February 1994

Environmental Management Plan

SINCLAIR KNIGHT
CONSULTING ENGINEERS

Sinclair Knight & Partners Pty Ltd
A.C.N. 001 024 095
1 Chandos Street
St Leonards NSW
Australia 2065
Telephone: (02) 436 7222
Facsimile: (02) 438 4794

Contents

List of Tables

List of Figures

1. Introduction

1.1 Objectives

This Environmental Management Plan (EMP) has been prepared by Sinclair Knight for Springvale Coal Pty Limited for its operations in the Western Coalfields as shown on **Figure 1**. The study has been prepared in accordance with development consent conditions issued by the Minister for Planning dated 27 July 1992. The EMP will be submitted to the Greater Lithgow City Council, the Department of Mineral Resources (DMR) and the Environment Protection Authority (EPA).

This EMP addresses rehabilitation requirements, water management issues, pollution controls, monitoring and good practice. The EMP covers the pit top area and conveyor. The washery site is within Western Main Colliery and currently covered by a separate EMP.

The principal objectives of this report are to:

- provide a basis from which annual reporting to relevant government authorities can be made
- provide a framework for ongoing environmental management and monitoring
- provide specific guidelines for the operation of environmental control systems on site
- discuss rehabilitation methodologies and strategy.

1.2 Background

Springvale Coal is a joint venture company owned equally by Clutha Coal Pty Limited and Samsung Co Ltd. Springvale Coal was awarded a 20 year contract with Pacific Power for the supply of a nominal 2.0 mtpa to Mount Piper Power Station.

The mine will work the Lithgow seam which is accessed through Coal Lease 1303. The mine will produce on average 2.6 mtpa of product coal. It is anticipated that up to 600 000 tpa will be exported.

The principal components of the development comprise a longwall operation delivering Run Of Mine (ROM) coal to the pit top and coal handling area. ROM coal will be transported by overland conveyor to the existing washery at Western Main Colliery. From here, domestic coal will be transported to Mount Piper Power Station by conveyor. Export coal will be loaded on the return belt for transport to Lidsdale Rail Siding.

An Environmental Impact Statement (EIS) was prepared for the project which was placed on public display in February 1992. Development consent was granted by the Minister for Planning on 27 July 1992.

Following receipt of development consent, a report was prepared under Section 102 of the Environmental Planning and Assessment Act, 1979, to modify the consent.

The modifications included:

- Changes to the pit top layout to allow easier access for employees and materials as well as movement between the bathhouse, mine entry, car park and administration building and inclusion of a temporary internal haul road.

- Minor modifications to the water management system.

- Modification to the mine entry due to difficulties encountered in the existing old Renown Extended Colliery workings. This modification also resulted in changes to the ventilation shaft location.

- Decision to take over the existing leases and freeholding of Western Main Colliery and use of the washery. This change resulted in minor modifications to the location of the overland conveyor. The initial proposal was to construct a new washery to the north of the Western Main facilities.

Following final approval of the development in early 1993, construction works commenced. Construction activities are now at an advanced stage. Development coal is now being produced which is transported to Western Main Colliery by road for washing prior to being transported, again by road, to Mount Piper Power Station.

Construction works at the pit top area are nearing completion. The overland conveyor is expected to be operational in early 1994 with the final commissioning of the project in October 1994. By this stage, underground longwall production would have commenced and all coal handling facilities would be fully operational. Full production of 3 mtpa ROM coal will be reached in early 1995.

2. The Springvale Project

2.1 Overview

The Springvale Project involves the underground extraction of coal from the Lithgow seam by longwall mining techniques. Mined coal will be transported by conveyor from the pit top area to the washery site located at Western Main Colliery. Domestic steaming coal will be conveyed directly to Mount Piper Power Station while export coal will be conveyed to Lidsdale rail siding, located adjacent to Wallerawang Power Station.

A supply contract has been secured with the Electricity Commission of NSW (Elcom) for a nominal 2 Mtpa. The nominal contract rate can be varied by plus or minus 20%. Actual deliveries to Mount Piper Power Station can therefore vary between 1.6 Mtpa and 2.4 Mtpa in any given year. The coal supply will need to meet the specified ash content of 24% maximum. In the early years of development, it is expected that raw coal ash levels may be in excess of 24%, therefore a portion of coal will be processed in the washery and reblended with higher ash level coal prior to delivery. The average ash level within the main resource area however is expected to be about 21%. Such ash levels will provide Run of Mine (ROM) coal direct to Mount Piper Power Station. Washing will only be required to control any peaks in ash content and guarantee the specified ash level.

It is anticipated that 600 000 tpa will be regularly produced for the export steaming coal market. To meet the expected acceptable ash content of around 16%, all ROM coal to be exported will require washing. Export coal will be transported beneath the conveyor on the return belt, through the transfer point near Duncan Street, Lidsdale and to the Lidsdale rail siding. This system optimises the utilisation of the conveyor and avoids duplication and therefore minimises the impact by the conveyor system on the environment.

Additional tonnages will arise from time to time and minor local sales of up to 50 000 tonnes per year may occur during the Contract. Such minor sales will require delivery by road.

2.2 Mine Plan

The current mine plan is shown on **Figure 2**. Main access roadways have been driven in a north easterly direction to the west of the old Renown Extended Colliery workings. The workings are partially flooded and are currently being pumped out under licence from the EPA.

A maximum of seven main headings will be driven approximately 5 m wide and 3 m in height terminating in a coal roof. Cross cuts will be driven between headings at 100 m centres.

Longwall blocks will generally have a north-south orientation. Additional coal is available on the southern side of the main heading. This coal lies within the former Fernbrook Mine area which allows for effective utilisation of the available reserves within the southern lease area. These reserves could not be economically extracted from any future mining operations in the Fernbrook lease.

2.2.1 Mine Layout

The principal coal output will be extracted by means of a 245 m wide by 1 750 m long, retreating longwall face. In the latter half of the mine life, longwall blocks will be extended to in excess of 3 750 m.

Longwall block development will be by means of a two heading main and tailgate system consisting of 5 m wide roadways within the 3 m of LW2 Seam. The heading system will generally consist of a 30 m by 70 m chain pillars arrangement. An exploration and drainage heading system will be developed along the northern lease boundary. Each longwall block will be extracted uphill.

Development roadways will be driven by wide head single pass continuous miner units. Roof bolting will be undertaken immediately behind each development face.

2.2.2 Partial Extraction Areas

Partial extraction is not planned but may be undertaken in areas where subsidence protection is required. These areas were identified in the EIS and supporting Subsidence Report. Partial extraction areas have been nominated in areas where surface features are sensitive to subsidence related impacts. These areas have been included in subsidence protection zones.

Subsidence protection is also required for main access roadways, main headings and ventilation shafts.

Partial extraction involves driving a sequence of roadways and cut-throughs forming a series of intact pillars of coal. Pillars will be a nominal 35 m minimum dimension (based on one tenth of the depth of cover). This represents 26 - 30% extraction of the resource in these areas. This system provides a balance between resource recovery and environmental protection of surface features. It is likely that partial extraction will occur on final retreat which is beyond the current 20 year mine plan.

On completion of mining, full extraction can take place in the main headings outside of the subsidence protection zones. No further extraction will take place within designated subsidence protection zones.

2.3 Coal Handling Systems

2.3.1 Raw Coal Handling

Raw coal is brought to the surface by conveyor, through an adit located at the pit top area, as shown in **Figure 3**, onto a 25,000 t stockpile.

Vibratory feeders located beneath the stockpile will reclaim coal directly onto an elevating conveyor which feeds into a sizer building. The sizers will reduce the coal material to less than 50 mm.

From the sizers, the coal will be fed directly into the overland conveyor to the transfer station and washery at Western Main Colliery. If not delivered directly to Mount Piper Power Station, ROM coal not requiring washing will be conveyed directly to a 150 000 t stockpile. Space has been provided for an emergency stockpile of 600 000 t capacity in addition to the normal on-site operating stockpile requirements in the event that the power station is unable to receive coal over an extended period. Both stockpiles will be managed by front end loaders and vibratory feeders located beneath the main stockpile discharging onto an elevating conveyor which feeds to either the washery or to the product conveyor leading to Mount Piper Power Station.

2.3.2 Product Coal Handling

The Springvale mine will produce two products. The primary product will be domestic steaming coal which will be supplied to Mount Piper Power Station at a nominal rate of 2 Mtpa. As previously discussed, this rate can be varied by plus or minus 20%. The majority of coal produced will be fed directly to the power station without washing. However, to ensure that coal quality specifications are maintained, in particular during the early years of production, a portion of ROM coal may require processing within the washery and reblending with the main product stream.

The second product is export steaming coal and this will be produced at an average rate of 600 000 tpa. This product can only be produced by processing within the washery.

Until the end of 1993 product coal from the washery at Western Main was being transported to Mount Piper Power Station by truck. The washery also processes coal produced by Western Main Colliery which is currently owned by Novacoal Australia. From October 1994, the washery and coal handling infrastructure will be used exclusively by Springvale Coal.

2.3.3 Overland Conveyor

The route of the overland conveyor is shown on **Figure 4**. The conveyor is nearing completion and as of January 1994 is being used to transport coal to the Power Station.

The conveyor will link the pit top area to the washery site, Mount Piper Power Station and Lidsdale rail siding. A single conveyor structure runs the entire route. ROM coal from the mine will travel on the upper belt to the washery, while export coal will travel on the return strand of the belt from the washery to Lidsdale rail siding.

The conveyor runs roughly in a straight line from the pit top to a point just north of Duncan Street. In this section, the conveyor travels above the pit top access road, crosses the Angus Place Colliery private haul road and over a hill which overlooks the Wallerawang Power Station. The conveyor has a slight curve at this point of 3000 m radius. The conveyor then passes beneath Mudgee Road in a 470 m long tunnel. The conveyor surfaces 80 m from Duncan Street and travels above ground, crossing over Duncan Street near the Coxs River. The conveyor structure is elevated above flood levels in the areas prone to flooding.

From the first transfer point, the conveyor swings in a 2 000 m radius in a north westerly direction, crossing agricultural land. The conveyor then swings in a reverse curve to roughly parallel the existing high voltage transmission lines which feed into Mount Piper Power Station. This section terminates at the washery site, located at Western Main Colliery.

From the washery, the overland conveyor travels across cleared land and open forest and through a saddle between two minor ridges to a transfer point. From this point, the conveyor heads due north and passes immediately west of Pacific Power's future ash storage area before entering the power station receival area via a further transfer point.

The latter section of the conveyor route passes behind both previous and current open cut extraction areas of Western Main Colliery.

The final link in the conveyor is from Duncan Street to Lidsdale rail siding. This section also crosses under Duncan Street and discharges into the existing coal stockpiling area at the siding.

Drive motors have been located to suit the conveyor design requirements. The first conveyor drive and tail-end drive of the second conveyor are located at the intersection point of these two conveyors, and will be sound rated as necessary to ensure noise impacts at residential receptors are within the limits set by license conditions.

The dual head drive motors for the second overland conveyor are located at the washery site. These motors drive the conveyor from the transfer point to the washery. The drive motors for the third and fourth conveyors are located adjacent to the Mount Piper Power Station site. The last two drive motors are located within the power station boundaries. The area between the washery and the power station is

isolated from any residential areas and cannot be viewed from any publicly accessible vantage point.

The conveyor belt will be 900 mm wide and will travel at speeds varying between 3.5 m/sec and 4.5 m/sec. The carrying capacity will be in the order of 900 tph of coal. All coal transported by the conveyor will be less than 50 mm in size.

All drives and take up stations, which include transfer points, will have a galvanised chain wire security fence erected around them. Each compound will have personnel access gates and a vehicle access gate. The remainder of the overland conveyor will be guarded or fenced as necessary.

The conveyors will be equipped with three-quarter enclosed colorbond sheeting weather covers. A galvanised wire mesh screen guard will be provided down the full length of the exposed side of conveyor sections which are not fenced as well under the conveyor to prevent contact with any moving parts. These will be installed for both safety and security purposes.

Access across the conveyor route has been provided for stock and general landholder access. The location of conveyor overpasses were determined in consultation with each affected landholder.

A service and access road has been constructed adjacent to the conveyor other than in sections where a nearby road exists.

2.3.4 Temporary Coal Handling Facilities

As part of the Development Consent issued by the Minister For Planning in July 1992, Springvale Colliery had approval for the transport of 300 000 tonnes of coal by road from the pit top area to the washery site up to 1 January 1994. Subsequent to this, the now operational overland conveyor has transported coal from the pit top to Mount Piper Power Station via the existing washery at Western Main Colliery.

The temporary facilities as shown on **Figure 5**, included a truck loop, stockpile area, reclaim hopper and conveyor leading to the washery. A front end loader was required on site to manage the stockpile and to feed coal onto the reclaim conveyor via the hopper.

Trucks entered Western Main Colliery from Mudgee Road via the main export haul road. There is an existing left turn lane and adequate site distance for out going trucks. This haul road is currently being used to access Wallerawang Rail Siding from Western Main Colliery.

Vehicles then travelled through Western Main property under agreement from the Colliery using existing haul roads. A new haul road loop connecting to existing haul roads has been constructed. This road generally follows existing contours. The road has been constructed from standard clean base material.

Top soil and overburden material was transported directly for use within Western Main's current rehabilitation program.

The site, including all remaining batter slopes, has been revegetated in accordance with development consent conditions.

3. Environmental Issues

This section outlines relevant environmental issues relating to the Springvale Mine. These issues form constraints and opportunities for the purposes of environmental management.

3.1 Regional Setting

The Springvale Mine (Coal lease 1303 and 377, Mining Lease 1326 and Exploration Lease 4587) is located approximately 4 km east of the small township of Lidsdale, 1.5 km from the Wallerawang Power Station and 9 km from the Mount Piper Power Station, within the City of Greater Lithgow. The Lease Area is situated within the western coalfields approximately 10 km north west of Lithgow and 155 km west of Sydney.

3.2 Climate

The climate of the region is largely influenced by latitude, topography, and elevation. In general the climate regime is characterised by mild-hot summers and cold winters. Rainfall and temperature tends to be seasonally distributed with the highest falls and the highest temperatures occurring in the summer months, and the lowest rainfall and temperatures experienced during the winter months.

Rainfall

The mean monthly and yearly rainfall data together with the mean number of rainy days is presented in **Table 3.1**.

Table 3.1 - Mean Rainfall Data for Lithgow

Month	Mean Monthly Rainfall (mm)	Mean No. Rainy Days
January	94	10
February	79	10
March	87	10
April	65	9
May	66	10
June	71	12
July	70	12
August	63	11
September	59	10
October	68	10
November	69	9
December	75	10
Total	**866**	**123**

Source: Bureau of Meteorology (1938-1988)

As can be seen from **Table 3.1**, rainfall distribution is seasonally distributed throughout the year with peak rainfalls occurring in December (75 mm) and January (94 mm), and the lowest falls occurring in April (65 mm).

The mean yearly rainfall is 866 mm. Although the total summer rainfall is high, much of the rain occurs in short intense storms. The mean number of rainy days per month is relatively constant throughout the year with 123 rainy days occurring annually. Snow falls have been recorded in the area between April and October, but do not usually persist for long periods of time (Bureau of Meteorology Records, Lithgow, 1965-1987).

3.2.1 Air Quality

The air quality in the district is generally regarded as good. The main sources of emissions within the area are discharges from the Wallerawang Power Station, coal mining operations, road and rail traffic, residential and agricultural developments, and bushfires.

The major air pollutant associated with coal mining operations in the district is dust. Dust is generated by a number of sources including coal product and reject stockpiles, vehicle movements and exposed areas prior to rehabilitation. Most dust emissions are generally restricted to the boundaries of each mine site.

The principal source of airborne dust will arise from the storage and transport of coal. In normal operations, coal will be transported to the power station by conveyor soon after extraction. ROM coal will have a moisture content in the order of 8%. At this level it is not conducive to dust generation. With the addition of control measures outlined in **Section 4.6** dust generation will be minimised.

3.3 Soils and Erodibility

Springvale Colliery lies on the western most edge of the coal bearing strata of the Sydney Basin in an area characterised by Narrabeen Group cliff forming sandstones. These sandstones are mainly made up of sandstones of the Grose Sub-Group and include Banks Wall Sandstone.

Because of the hardness of the Narrabeen-Triassic sandstone capping and the presence of softer underlying beds, sandy soils of low fertility and water holding capacity have been formed. There are therefore very few areas of productive agricultural land in this area despite the relatively high rainfall (Department of Agriculture of NSW, 1983). The plateau soils are characterised as being deficient in nitrogen, phosphorus, calcium and molybdenum and tend to be grey and yellow-brown sands with ironstone gravel.

The talus slopes have deeper and moister soils with higher nutrient content due both to gravity moving material downslope and richer parent material. They are characterised as comprising a higher organic content and consisting of highly erodible sandy loams (Colo Committee, 1985). The valley floors contain hard-setting sandy loam textured soils, also of poor water holding capacity and nutrient deficiencies similar to the plateau soils.

The basalt caps of the mountains within the Springvale Lease Area are very dry and stony, and although these soils are nutrient-rich, they are very skeletal.

3.4 Flora and Fauna

In the flora study undertaken as part of the EIS, 13 plant communities were identified within the area. Twenty three plant species of conservation significance occur within the Wallerawang area. Of these, populations of 4 species were observed within the lease area. Another 7 of these rare species could also occur within the area as suitable habitats exist, however, none were observed.

The fauna study carried out showed that the area affected by the project had few bodies of water, either as creeks or as dams, and much of the area showed signs of disturbance either by fire, grazing and/or logging. Only 8 native mammal species were observed in the area and there were signs of 2 more species though none were observed. A large number of introduced mammal species were observed. Forty nine bird species were observed in the area, and frogs were observed in farm dams. All fauna species located or expected to be located in the study area are classed as either abundant or common and are widely distributed in eastern Australia.

The Origma (Rock Warbler) is considered of local importance because of its close association with sandstone outcroppings but it is not considered to be threatened or endangered. The Gang-gang Cockatoo is listed in Schedule 12 of the National Parks and Wildlife Act 1974 as "Vulnerable and Rare Fauna" but it is not considered in danger over its Australian range.

Further flora and fauna investigations are proposed as part of the ongoing environmental management of the project. These are discussed in **Section 4.6.4**.

3.5 Noise

On the basis of noise studies undertaken as part of the EIS and the implementation of noise mitigation measures undertaken as part of the

proposal, it is expected that the noise criteria for the area will be satisfied. This will be confirmed during the monitoring program outlined in **Section 4.6**.

3.6 Hydrology

The mine is located within the upper catchment of the Wolgan River and part of the catchment of the Coxs River. The Wolgan River flows in a north north-westerly direction and is a tributary of the Capertee River, which ultimately joins the Colo River, the Hawkesbury River and Broken Bay. The Coxs River on the other hand flows in a southerly direction.

The Springvale lease area is characterised by a dendritic drainage network which comprises tributaries of the following river and creek systems:

- Coxs River
- Wolgan River (eastern and western branches)
- Marrangaroo Creek
- Kangaroo Creek.

The main drainage line associated with the coal conveyor route is Neubecks Creek, which is a tributary of the Coxs River.

The main watercourses and associated gullies within the lease area are:

- Sawyers Swamp on the western boundary
- Springvale Creek in the south-west corner
- Tributaries of Marrangaroo Creek in the south
- Carne Creek in the north east corner
- Wolgan River headwaters in the north western corner.

Sawyers Swamp contains the main fly ash dam for the Wallerawang Power Station plus a freshwater collection dam upstream, both being located immediately west of the lease area boundary.

3.7 Site Capability

The Soil Conservation Service has a Rural Capability Scheme which utilises the natural resource characteristics (particularly erosion hazard) to determine the type and intensity of agricultural use that a parcel of land can sustain. Eight land capability classes have been developed and these are assigned according to the appropriate agricultural use and soil conservation requirements that are recommended for each land area.

Much of the Springvale lease area falls within State Forest and because of this, these areas have not been included within the Soil Conservation

Scheme. The south-western portion however, and the conveyor route have been classed and mainly consist of Class IV, VI and VIII land.

An explanation of these classes is as follows:

- Class IV - Land not suitable to cultivation on a regular basis owing to limitations of slope, soil erosion, shallowness or rockiness, climate or a combination of these factors. Comprises the better classes of grazing land and can be cultivated for an occasional crop, particularly for a fodder crop or pasture renewal.

- Class VI - Productivity will vary due to soil depth and soil fertility. Comprises the less productive grazing lands.

- Class VIII - Consist of cliffs, lakes or swamps. Comprises land unsuitable for agricultural or pastoral uses. Recommended uses are those compatible with the preservation of the natural vegetation, namely: water supply catchments, wildlife refuges, national and state parks, and scenic areas.

The pit top area and access road is located on land assigned to a Class IV ranking, while the conveyor route passes through a variety of land classes, the majority, however, being Class IV. The washery site is located partly on Class IV land and partly on Class VI.

3.8 Aboriginal Archaeology

An archaeological survey of Springvale Colliery, conveyor route, and washery site was undertaken by Ms Elizabeth Rich. The survey work was undertaken as part of the EIS as well as in accordance with development consent conditions.

Consent to destroy archaeological deposits affected by the conveyor and pit top works has been obtained. Further archaeological studies will be undertaken as part of the longterm environmental management of the project. These studies will be undertaken in the Carne Creek area prior to mining activities in the area.

4. Environmental Management

Specific environmental management issues are discussed in this section. These have been divided into the key areas of water management, waste management and treatment, air quality and noise issues. Other matters relating to environmental monitoring are also discussed.

4.1 Water Management

The primary objective of the stormwater control system is to prevent contaminated stormwater from discharging off the site. This will be achieved by segregating 'clean' and 'dirty' areas using a network of clean water diversion channels and dirty water collection channels. **Figure 3** details the current systems as installed for the pit top area while the washery and transfer station are detailed in **Figure 5**.

4.1.1 Pit Top

The clean water diversion channels have been be designed to capture runoff from clean areas upslope of the dirty areas. The channels allow clean runoff to bypass the dirty areas and discharge downstream. The channels are sized to convey runoff from a 1 in 100 year storm event, critical duration. The clean water diversion channels were in place prior to any on-site construction activities and are currently fully operational.

Channel protection was required for all clean water diversion channels. Energy dissipaters have been installed at the outlets of the main clean water diversion channels. The outlets have also been rock lined for scour protection.

The main pollution control ponds have been designed to contain runoff equivalent to a 1 in 100 year, 72 hour storm event plus excess capacity for solids build up and dead storage. Approximately 6 800 m^3 of combined storage has been provided within two interconnected ponds.

The two dirty water control dams nominated in the EIS have been combined into a two cell dirty water control dam located adjacent to the crusher house.

One cell receives runoff from the pit top platform via piped and open channel flow. Dirty water runoff from the temporary coal stockpile and from the temporary coal loading access road is diverted to this cell.

The other cell receives runoff and dust suppression water from the permanent coal stockpile and crusher house areas.

The storages have been designed to cater for the 1 in 100 year, 72 hour storm event. There is however, a requirement for water to be permanently stored within the dams for dust suppression purposes. At all times, there will be sufficient freeboard to contain all run off from a 1 in

10 year, 72 hour storm event. Under normal operations and average storm events, this pond will not discharge water off site.

A clean stormwater runoff detention dam has been provided adjacent to the bathhouse/office facilities. This area was previously used for the pit top platform dirty water control dam which has been relocated next to the crusher house as described above. The detention dam will act as a sediment control facility during construction and permanently as a flow detention dam. Once landscaping works are established, this dam will form part of the clean water catchment.

The pollution control ponds provide primary settlement for gross solids. The collected stormwater will be used and disposed of by the mine as early as possible to maximise the storage capacity available following storm events.

Discharge of clarified water off site will be monitored to ensure that it satisfies EPA discharge standards. Where the discharge does not satisfy these standards, it may be treated by the addition of alum to flocculate the suspended particles.

Contaminated water from the workshop and other potential grease and oil spill areas first pass through a grit arrestor and an oil separator prior to release into the stormwater control pond. Collected oil and grit will be removed from the site by a licensed waste disposal contractor.

4.1.2 Overland Conveyor

Minor pollution control structures are provided along the entire length of the conveyor. Structures including small ponds, silt traps, energy dissipaters and silt control fences have been installed as necessary in accordance with the requirements of the Soil Conservation Service.

These works are temporary and are aimed at controlling runoff during construction works. Specific erosion and sedimentation control systems will not be required once rehabilitation works are established, apart from sediment control pits to collect run-off at each transfer point. Turkey nest ponds constructed to control runoff from areas exposed during construction will remain and will create valuable water storages and additional habitat for native fauna.

4.1.3 Washery Transfer Station and Coal Stockpile Area

The water management system for this site is shown on **Figure 5**. Clean water is diverted around the site while dirty water runoff is contained within on site pollution control ponds.

The dirty water containment structures have been designed to contain 250 m^3 of total runoff per hectare. This criteria relates to the containment of 25 mm of runoff per storm event.

The containment structures will be maintained with sufficient freeboard to satisfy the above criteria. Water stored within the structures will be siphoned off once acceptable water quality criteria is achieved. During periods of prolonged wet weather this may require active settling through flocculation.

Discharge from the pollution control structures will flow into the current main water supply dam which feeds the washery. On completion of the operation, the second pond will remain. This pond will continue to control runoff from the small area covered by the tunnel reclaim and conveyor. The remainder of the site has been revegetated as previously discussed in **Section 2.3.4**. Runoff from these areas will be diverted off site once revegetation works are established and it can be demonstrated to the EPA Inspector that they can be classified as clean.

4.1.4 Operating Guidelines

In order that the water management system operates effectively and in accordance with the design criteria, the following operating guidelines will be followed:

- Monthly checks of all ponds. Ponds to be cleaned once storage capacity has been reduced by 30 % or if sediments have become contaminated with oil or grease.
- Monthly checks of all drainage channels. Any obstructions due to debris or sediment build up to be removed.
- Water volume contained within the main pollution control ponds will be periodically checked to ensure that sufficient freeboard is available to contain runoff from the design storm event.

4.2 Waste Management

There are three areas of waste management, namely, sewage, oily waste and acidic waters.

4.2.1 Sewage Treatment

Effluent from the bathhouse will be treated on site in a series of three ponds. The first has been fitted with mechanical aeration equipment to provide additional oxygen and mixing. A second pond provides 10 days detention at average dry weather flow for settling and further pollutant reduction. The treated effluent will then be used for the irrigation of a 2.2 ha area.

The objective of the irrigation system is to maximise irrigation during the summer months or periods of dry weather. In this way, the irrigation pond will be able to store effluent during wet periods for subsequent irrigation.

The final pond serves two purposes. With a total of 30 days storage at average dry weather flow, the pond provides disinfection/polishing and has an active 10 day irrigation storage.

Irrigation of treated effluent is via a fixed spray irrigation system. Ryegrass is grown on the irrigation area to provide nutrient uptake. Harvesting of the grass is required to ensure that maximum nutrient uptake and evapotranspiration potential is maintained.

A water balance calculated for the irrigation area indicates that there will be percolation losses during winter months. The maximum percolation loss associated with full design flows and average rainfall and evapotranspiration conditions is estimated to be 65 mm of which 13 mm would be directly attributed to rainfall.

The irrigation pond should always be maintained at as low a level as possible, so as to allow for later periods of zero irrigation during wet conditions. A basic rule of thumb is to irrigate whenever weather and soil conditions allow. Continue monitoring of system performance, weather conditions and soil moisture will permit optimum operation of the system.

The maximum irrigation rate is 6 mm pr day over the entire 2.2 ha area. This is equivalent to 130 m^3 per day and could be delivered by operating the system at its nominal flow rate of 6 l/s for about 6 hours per day. This maximum rate is equivalent to the soil uptake capacity during dry conditions.

To ensure adequate grass growth it is necessary to operate the system for a minimum of 6 mm per day over the 2.2 ha irrigation area. This is equivalent to operating the system for 6 hours, one day per week.

General Operating & Maintenance Guidelines

- The pressure gauge at the pump should be regularly checked by the irrigation manager to determine that the system is operating satisfactorily and in accordance with the design specification.

- A water meter reading should be taken every day after irrigation and recorded in a log book. The nominal flow rate of the system is 6L/S (one valve operating).

- Irrigation shall not be carried out on excessively windy days where overspray is likely. On these days it may be possible to schedule irrigation for the night hours.

- Sprinklers should be checked on a regular basis for proper operation and blockages cleared.

- All lateral lines should be opened and flushed at least once every 6 months or as required.

- Pasture needs to be mowed on a regular basis to encourage water consumption and nutrient uptake.

It will be necessary to regularly check that soil moisture conditions are suitable prior to operation of the system. This can be done either by visual inspection (based on operating experience) or by the use of Tensiometers. At this stage, visual inspection will be undertaken. However, should this system fail, Tensiometer stations will be installed in the irrigation area.

4.2.2 Oily Waste

A plate oil separator facility has been installed for separating waste oil from washdown water used in the machinery washdown and cleaning area and for separating oil contamination of washdown and stormwater runoff collected from other maintenance areas.

Washdown water and affected stormwater is collected from a number of different locations on the site including:

- Vehicle washdown slab
- Maintenance and service workshop slab
- Transport slab
- Longwall fluid disposal pit,
- Oil storage area.

The total surface collection area is approximately 382 m^2. The main grit load from the machinery washdown area is separated from the washdown water in a drive-in type grit collection pit located adjacent to the truck washdown bay and the overflow directed to a stormwater collection line.

Washdown water and stormwater from remaining areas is collected in a common wastewater collection line before passing by gravity flow to a plate oil separator plant. The treated wastewater then flows again by gravity to the main pollution control dam.

The plate oil separator plant has been designed to accommodate a 1 in 5 year storm condition (maximum hydraulic flow rate 11.3 L/s), based on the first flush principle, without overflow. The duty design flow rate to meet the guaranteed performance will be for an instantaneous washdown water flow rate of 5.0 L/s.

Operating Guidelines

The oil separator is a low maintenance item but will be inspected monthly. Collected oil is to be removed by licensed contractor as required. All dockets and recepts are to be kept on site for periodic inspection by the EPA.

The grit collection pit is to be cleaned once storage volume has been reduced by 30 %.

4.2.3 Acid Mine Drainage

The pH of raw water varies but can be acidic. A caustic treatment plant has been installed to treat waters pumped from old underground workings. A new 8.5 ML dam will be constructed in the valley above the sewage treatment plant to contain water pumped from underground workings.

Caustic (Sodium Hydroxide) is pumped at a controlled rate in conjunction with aeration (to ensure oxidation of iron to iron oxide). Care is taken to keep the pH below that which could lead to calcium carbonate scale deposition (6.9 for calcium of 300 mg/L, 7.3 for calcium of 100 mg/L). This avoids potential problems with reuse of this water in underground applications.

Although the plant is automated, it is necessary to replace drums of caustic soda at regular intervals in accordance with manufactures specifications.

4.3 Air Quality Management

During the construction phase, dust sources will continue to be controlled by the implementation of the following dust control measures:

- regular watering of areas cleared of vegetation and soil stockpile areas
- regular watering of construction access roads and disturbed areas along the conveyor route
- the surface area to be disturbed will be restricted at any given time to reduce the potential for dust to be generated

- all areas which have been disturbed during construction and are not to be used in the operational phase of the development will be rehabilitated following completion of construction works

In the operational phase, dust sources will be controlled by adopting the following measures:

- water sprays will be fitted to the main coal stacking gantries and will be activated automatically to apply 2 L m^2/hour of water over the stockpile area when winds speeds exceed 20 km/hour. An anemometer will be installed to measure the wind speeds.

- provision of a three-quarter closed overland coal conveyor system for the entire length of the conveyor route. The section running past Duncan Street will be underground which will provide increased protection against fugitive dust

- the main pit top access road will be sealed to restrict dust generation due to vehicle movements

- the access road to the washery site will be gravel and watered on an irregular basis given the low expected usage

Water sprays will be operated according to EPA requirements. The objective will be to keep the outer surface of all stockpiles moist in order to reduce dust generation.

The provision of the above measures will ensure that the potential for dust generation is adequately controlled. The effectiveness of the above controls will be verified by the implementation of the environmental monitoring program discussed in **Section 4.6**.

4.4 Noise Control Management

A noise study into the likely impacts on the acoustic environment adjacent the surface operations of the Springvale Project was undertaken as part of the EIS. The study highlighted the following:

- The existing acoustic environment adjacent the pit top and washery sites is typical of a rural setting where background nighttime noise levels of < 30 dBA can be encountered under favourable weather conditions.

- A nighttime survey of the proposed site has recorded L_{A90} levels of 21 - 28 dBA at remote rural sites and 36.5 - 45.5 dBA in residential areas, where the background is dominated by Wallerawang Power Station noise emission.

- Predicted steady state noise emission from the pit top, overland conveyor and washery sites will comply with or marginally exceed the very stringent planning guidelines by only 0.2 - 0.4 dBA.

  This marginal exceedance of up to 0.4 dBA lies well within the tolerance of the prediction methodology and the measurement accuracy of precision sound level measuring equipment. Such an exceedance is not likely to evoke any form of complaint given the broadband, steady state nature of the noise emissions.

- Construction activities at the pit top and washery sites will comply with the daytime design goals. Some exceedances of design goals (up to 10-12 dBA) can be anticipated for short periods of time at residences in Duncan Street, Lidsdale and the Hunt Residence at Blackmans's Flat due to heavy earthmoving machinery operating on the overland conveyor route.

  Construction work utilising heavy diesel driven equipment must be restricted to daylight operations.

- Coal loading activities at Lidsdale Siding will continue in their present form. Noise emission levels of train movements will comply with EPA design goals based on noise measurements recently obtained at Wallerawang Siding. Rubber tyred loaders may marginally exceed the target noise levels for existing situations by up to 3 dBA. Planned operations for Springvale Coal exports will not increase noise emissions beyond existing levels, however, the frequency of train loading activities will increase from every eight weeks (present) to every six weeks (future).

- Traffic movements to/from the site will have negligible effect on the existing acoustic environment.

- Implementation of noise mitigation measures outlined in the EIS will ensure that steady state plant noise emissions at critical residential sites achieve the predicted target levels.

The provision of suitable noise mitigation measures has occurred. Noise monitoring data as detailed in **Section 4.6** will verify the adherence to EPA assessment criteria.

4.5 EPA Approvals and Licensing

Pollution Control Approval to construct has been received for the entire project, including the pit top, conveyor and coal handling facilities at Western Main Colliery. The EPA has also advised that it currently holds

the application for Pollution Control Licence. This licence will be issued one month prior to commissioning of the project.

There will be four surface water discharge points from the pit top area, three of which will be clean water derived from undisturbed areas either within or above the pit top. At only one point will the discharge require licensing and that will be from the dirty water control dam.

This point will not normally discharge off site. Instead, it will act as the main supply source for on site non-potable water. In the event of abnormal conditions, water will be analysed for non-filtrable residue and pH prior to discharge.

The spray irrigation area will be a separate licensed discharge point.

Springvale Colliery will take over the current licence held by Western Main Colliery from October 1994. This licence covers all activities at the colliery and it will be necessary for minor modifications to be made in order to take in to account the specific uses of the site in future.

Consideration may be given to seeking an additional licensed discharge point above the existing ash dam in Kerosene Vale for the possible discharge of mine water.

4.6 Environmental Monitoring

It is proposed to undertake a detailed environmental monitoring program in the areas of water, noise, air and subsidence. Environmental monitoring will provide the verification of the impact predictions made in the EIS. It will also allow the environmental performance of the operation to be assessed and will give the opportunity to fine tune the development works as they proceed.

Results of environmental monitoring will be reported on an annual basis. The environmental monitoring report will contain the previous 12 months (calendar year) of monitoring data and details of compliance with environmental approvals (licence conditions, conditions of consent and Mineral Resources approvals). The first report will be produced by 31 March 1995 and subsequent reports will be provided by 31 March each year.

A copy of this report will be sent to the following authorities:

- Department of Planning
- Environment Protection Authority
- City of Greater Lithgow Council
- Department of Mineral Resources
- Department of Water Resources.

The proposed monitoring program is outlined below.

4.6.1 Subsidence

Survey grids will be established in suitable and accessible locations above longwall panels. Existing levels will be recorded as will post mining levels.

Significant surface features will be accurately surveyed and recorded so that any noticeable physical changes can be determined. Also, existing rockfalls, cliff damage and cracking caused by natural erosion forces will be recorded so that the impacts of mining alone can be determined.

The subsidence monitoring program will provide the necessary data to accurately predict both subsidence levels and likely effects on surface features. Minor modifications may be necessary to the mine plan in light of the monitoring results.

The program will be developed in consultation with the Department of Mineral Resources as part of the longwall panel extraction approval. In addition, inspections will be carried out of the road and land improvements such as fencing in the area affected by subsidence. Maintenance work will be undertaken as necessary.

Signposting of walking tracks and firetrails to be affected by mine subsidence will be undertaken prior to mining.

4.6.2 Noise

It is proposed to monitor noise levels emanating from the Project at various locations as shown on **Figure 6**. These sites will cover the pit top, overland conveyor and washery areas. The proposed monitoring locations generally cover residential receptors as well as primary noise sources.

The monitoring program will cover both day and night time periods. Each site will be monitored for both background (L_{90}) and maximum (L_{10}) noise levels.

Noise measurements will be taken during the commissioning phase in order to verify design performance specifications and the achievement of EPA assessment criteria.

Further noise monitoring will be carried out at 6 months and at 12 months, as a check on maintenance and long-term performance. If monitoring identifies areas of concern noise mitigation measures will be installed. If no areas of concern are identified noise monitoring will cease. Spot checks will also be taken following the installation of any new plant or equipment during the life of the Project.

4.6.3 Water Quality

Monitoring and inspections related to water quality on the site will be carried out on a regular basis and reported in the annual environmental report. The location of water quality sampling stations are shown on **Figure 6**. Monitoring will be undertaken on a monthly basis for each discharge point under licence. Water will be monitored initially from the single discharge point at the pit top. Monitoring requirements of the licence held by Western Main Colliery will be adhered to once taken over by Springvale Colliery.

During discharge conditions, samples will be taken and analysed for total suspended solids, total dissolved solids, turbidity and pH. Similar analyses will be undertaken on a regular basis for all water storages on site. Some analyses will also be undertaken in surrounding watercourses to establish current background water quality.

Water will only be discharged from the main pollution control dam when water quality meets EPA licence conditions.

Monitoring of underground water pumped from the Lithgow coal seam will be undertaken on a monthly basis. Samples will be monitored for pH and TPH (total petroleum hydrocarbons).

Rainfall records will also be obtained for the area. This data will be compared with nearby weather stations in order to ascertain variability caused by topographic shielding. Records will also be kept of any activities undertaken at the site that may have either a positive or negative impact on water quality.

Silt traps and oil traps will be inspected on a monthly basis and cleaned out as necessary. Erosion controls on site and areas of potential erosion will be inspected monthly in order to identify areas affected by erosion early and address the erosion before it accelerates. The amount of water held in the evaporation pond will also be inspected monthly.

The sewage treatment system will be monitored to record the L/month treated. This will ensure that the system is operating satisfactorily and any problems are identified early. The oxidation pond will probably not have to be pumped out in summer but may require pumping out in winter. If so, material from the pond will be pumped to the spray irrigation area.

Drainage areas, pits, and pipes will be inspected 6 monthly as will clean water drains. Any rubbish or organic material preventing free drainage or clogging up the systems will be removed as required.

4.6.4 Flora and Fauna

Flora and fauna habitat monitoring will be undertaken at selected locations within the mining area to identify existing species and areas of sensitive habitat.

The sites will be selected on the basis of sensitivity to subsidence related impacts and will include any drainage sensitive ecosystems (referred to as shrub swamps). The monitoring period will cover a 12 month period both before and after full extraction beneath shrub swamps.

For each monitoring site, the vegetation will be mapped in detail and species diversity and spatial distribution determined.

The monitoring of flora and fauna in the area is expected to commence within the next 2 years. Initial works will be undertaken in less sensitive swamp areas to establish the likely effect, if any, on drainage sensitive ecosystems.

4.6.5 Air Quality

Dust deposition gauges will be located at strategic places at the pit top and washery sites as shown on **Figure 6**.

The dust monitoring program will be designed to complement any future dust monitoring associated with the operation of Mount Piper Power Station. It is envisaged that monthly readings of dust deposition will be recorded.

Dust monitoring will be undertaken for a two year period or until such time as the EPA is satisfied that dust levels are satisfactorily controlled.

4.6.6 Aesthetics

A photographic record of the mine development will be maintained throughout the project life. This will include all identified escarpment areas. The photographic record will provide an ongoing assessment of the project's visual acceptability. These records form a specific

development consent condition and relate to potential subsidence impacts.

4.6.7 General Housekeeping

General site tidiness will be inspected on a monthly basis and clean ups carried out as necessary. Any drums or rubbish lying around will be disposed of correctly. The oil and fuel stores and all bunded areas will also be inspected on a monthly basis.

Monthly inspections of coal spillage from the conveyor belt will be undertaken and any spillages will be promptly cleaned up.

4.6.8 Archaeology

Archaeological surveys undertaken as part of the EIS identified areas within the mining lease that have the potential to contain archaeological deposits. These areas included Carne Creek and its cliff lines. Further archaeological surveys will be undertaken in this area prior to mining. The results of these surveys will be provided to National Parks and Wildlife.

5. Rehabilitation and Landscaping

5.1 Rehabilitation Objectives

The following objectives have been adopted for the rehabilitation strategy:

- To produce a final "walk away" landform which will be stable, aesthetically consistent with surrounding landforms and which does not preclude possible alternative final land uses.
- To minimise the environmental impact of the mine and conveyor during the construction phase and other earthworks associated with rehabilitation. This will be achieved by contouring and planting final surfaces as soon as possible, consistent with constraints imposed by the operation of the mine and associated infrastructure.
- To ensure that available topsoil resources are optimised while establishing the suitability of alternative topdressing material, in particular, the reject emplacement.
- To ensure that the drainage system at both the pit top and washery sites will remain stable and functional under extreme rainfall events.

5.2 Landscaping

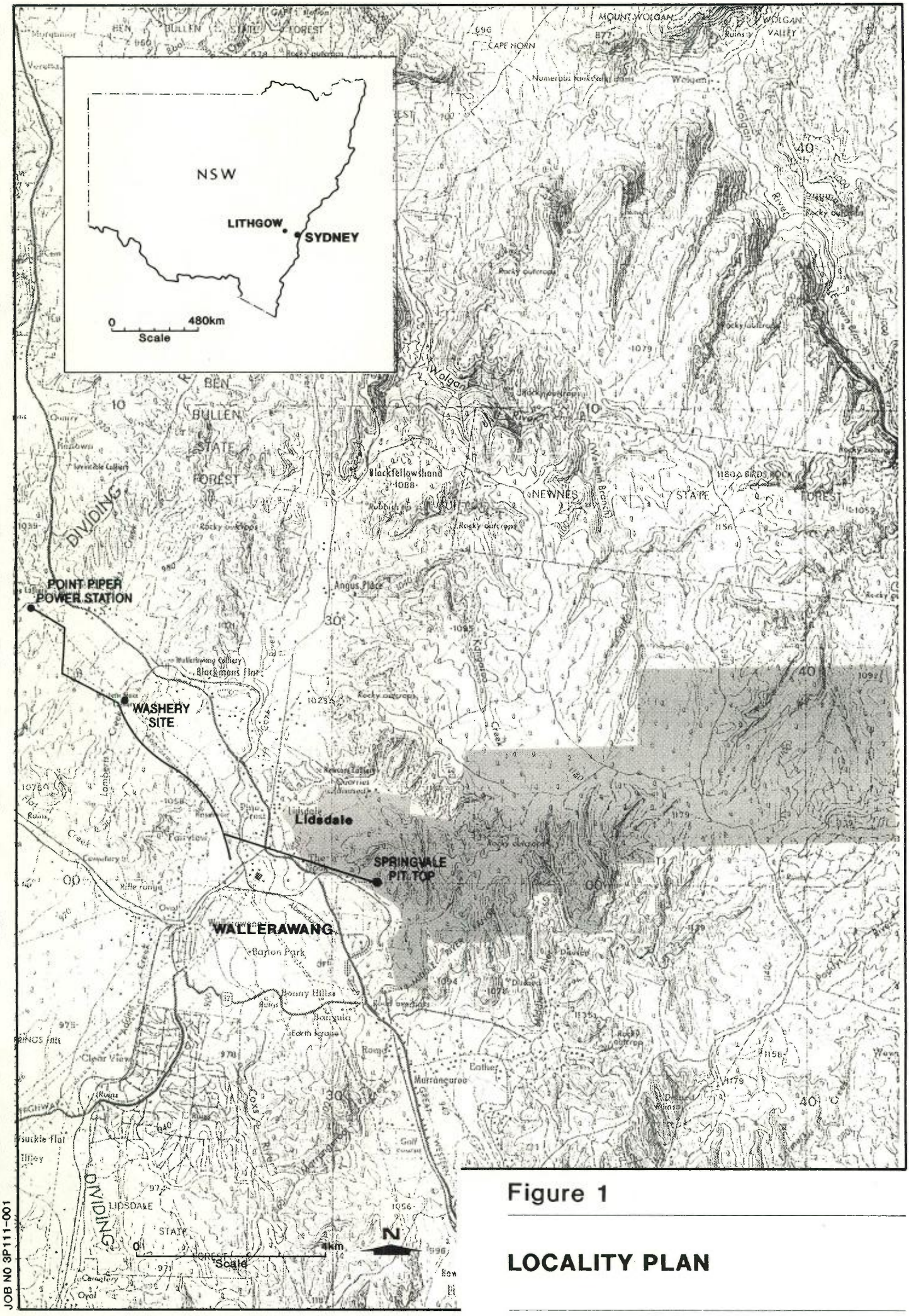
A Landscape Plan was prepared for the pit top area and the Mudgee Road underpass. These plans are shown on **Figures 7** and **8**. The works are nearing completion.

Landscaping works includes batter stabilisation around the pit top area as well as functional vegetation screening to improve the aesthetic appeal of the site.

5.3 Future Rehabilitation

At this stage, there are no further specific rehabilitation works planned. Future works will be required once Springvale Colliery takes over the Western Main Colliery leases. In particular, there will need to be progressive rehabilitation of course reject emplacements once commenced.

It is not possible to provided details of future rehabilitation requirements or schedules. Such details will be provided following the commencement of full production and handover of the Western Main Facilities, at which stage, reject quantities and disposal sites will have been confirmed.



JOB NO 3P111-001

Figure 1

LOCALITY PLAN

LEGEND

1	JULY 1, 1994 – JUNE 30, 1995	10	JULY 1, 2003 – JUNE 30, 2004	19	JULY 1, 2012 – JUNE 30, 2013
2	JULY 1, 1995 – JUNE 30, 1996	11	JULY 1, 2004 – JUNE 30, 2005	20	JULY 1, 2013 – DECEMBER 31, 2013
3	JULY 1, 1996 – JUNE 30, 1997	12	JULY 1, 2005 – JUNE 30, 2006	— · —	SUBSIDENCE PROTECTION ZONE
4	JULY 1, 1997 – JUNE 30, 1998	13	JULY 1, 2006 – JUNE 30, 2007		
5	JULY 1, 1998 – JUNE 30, 1999	14	JULY 1, 2007 – JUNE 30, 2008		
6	JULY 1, 1999 – JUNE 30, 2000	15	JULY 1, 2008 – JUNE 30, 2009		
7	JULY 1, 2000 – JUNE 30, 2001	16	JULY 1, 2009 – JUNE 30, 2010		
8	JULY 1, 2001 – JUNE 30, 2002	17	JULY 1, 2010 – JUNE 30, 2011		
9	JULY 1, 2002 – JUNE 30, 2003	18	JULY 1, 2011 – JUNE 30, 2012		

VENTILATION SHAFT

PIT TOP AREA

KEROSENE VALE

LEOSDALE

BUNGLEBOORI

NINE MILE PINE PLANTATION (Timber Felled)

MARANGAROO

COOK

0 Scale 1500m

N

JOB NO 3P111-001

Figure 2

MINE PLAN

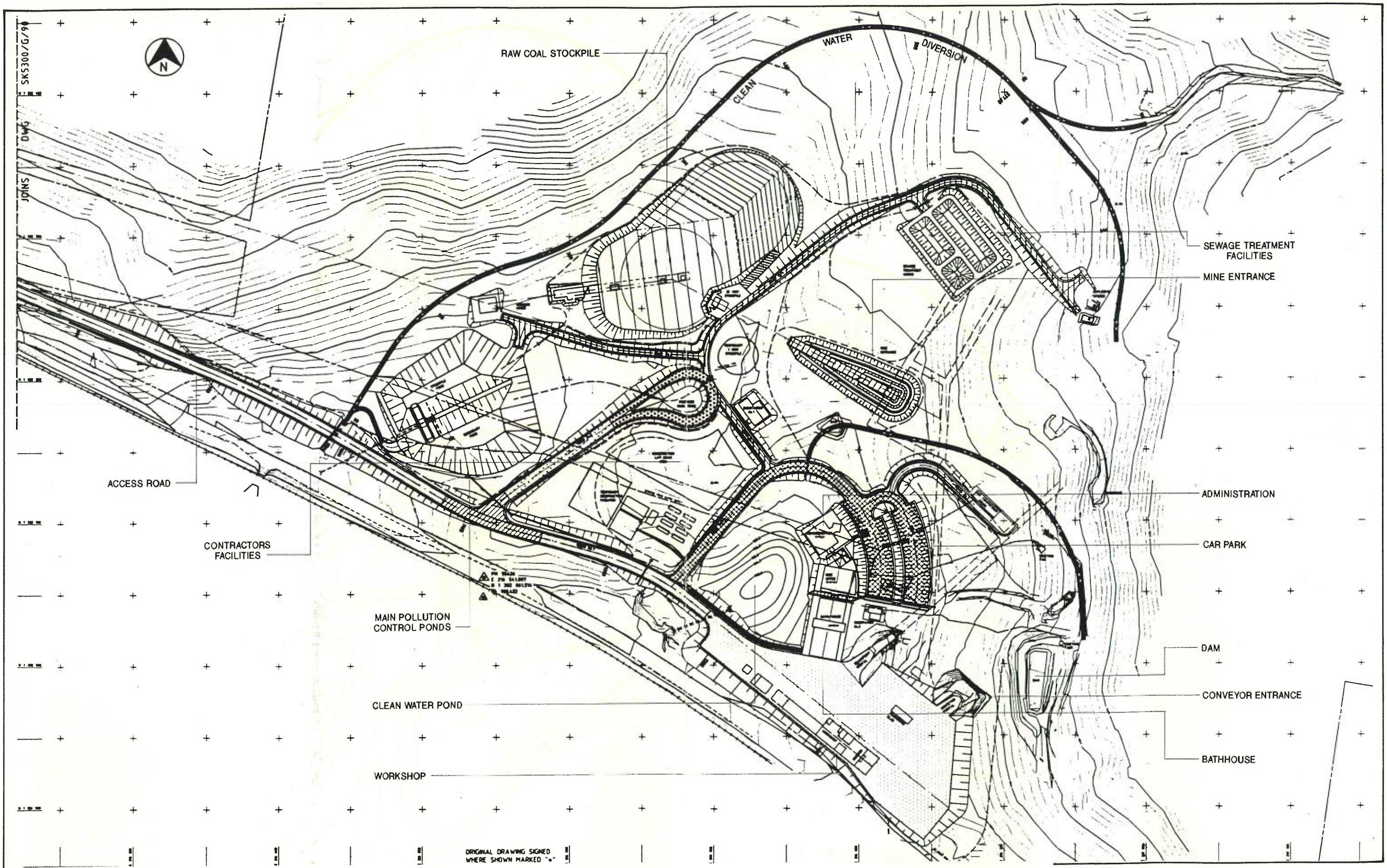


Figure 3

PIT TOP LAYOUT

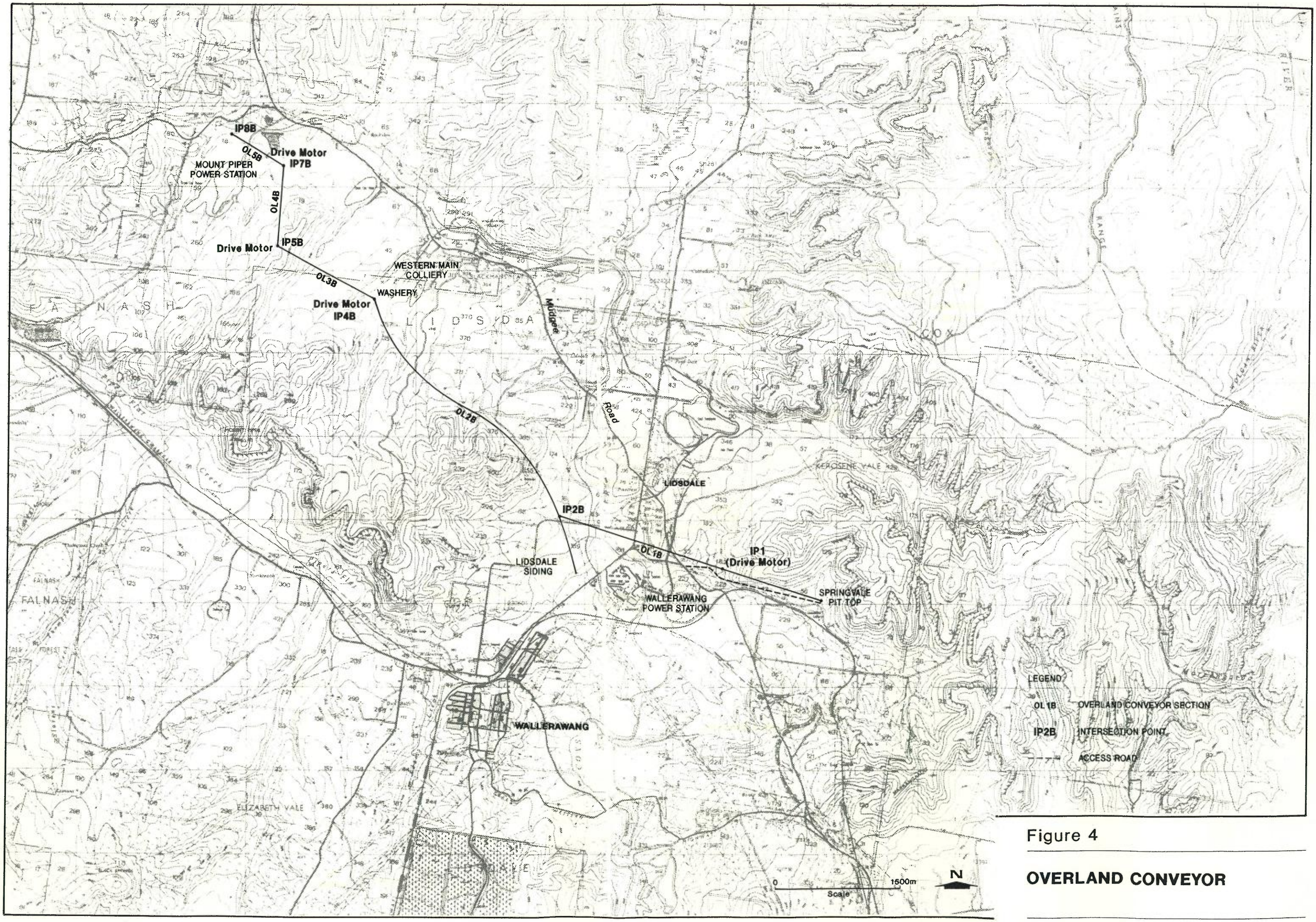


Figure 4

OVERLAND CONVEYOR

JOB NO 3P111-001

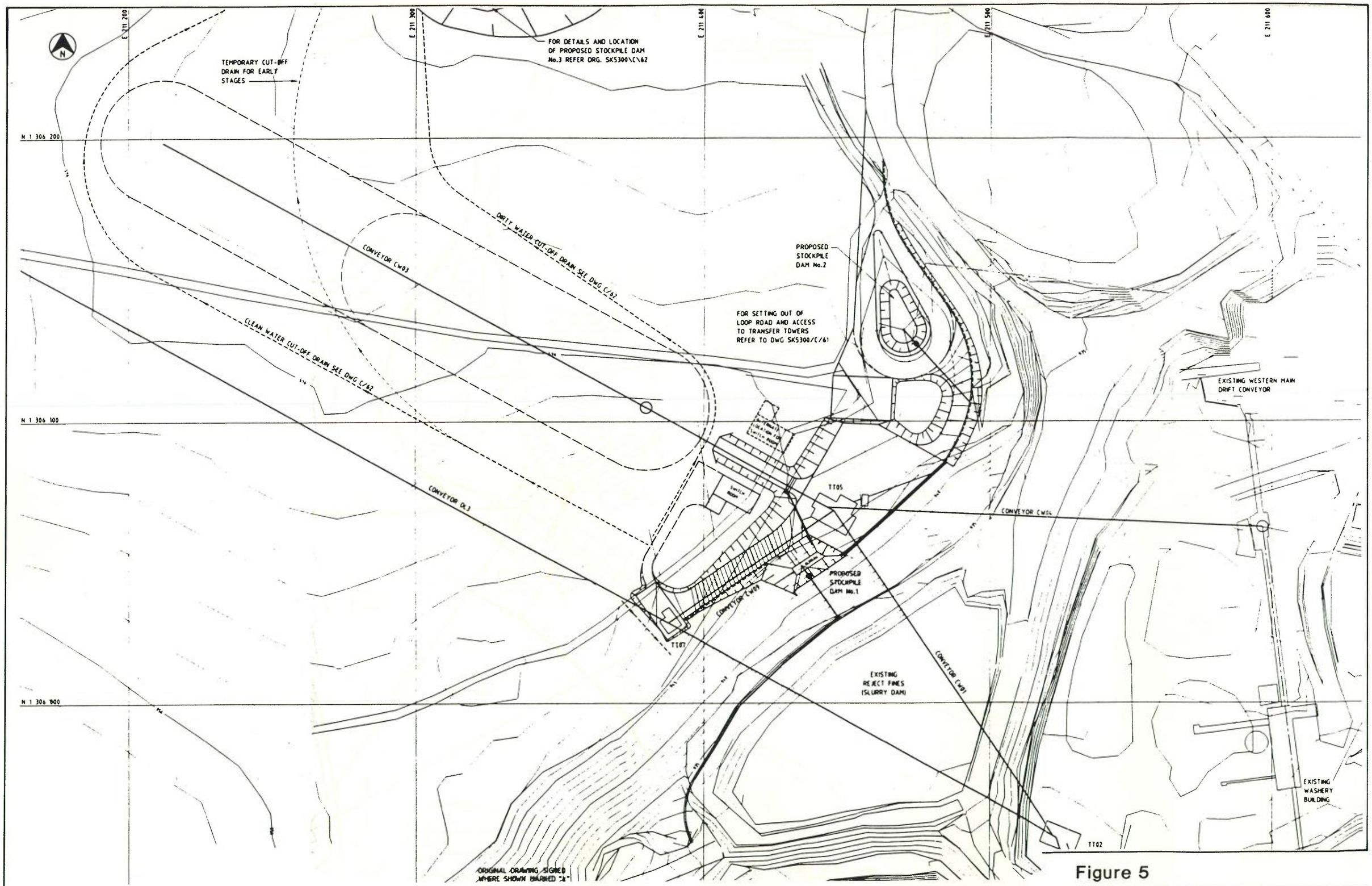
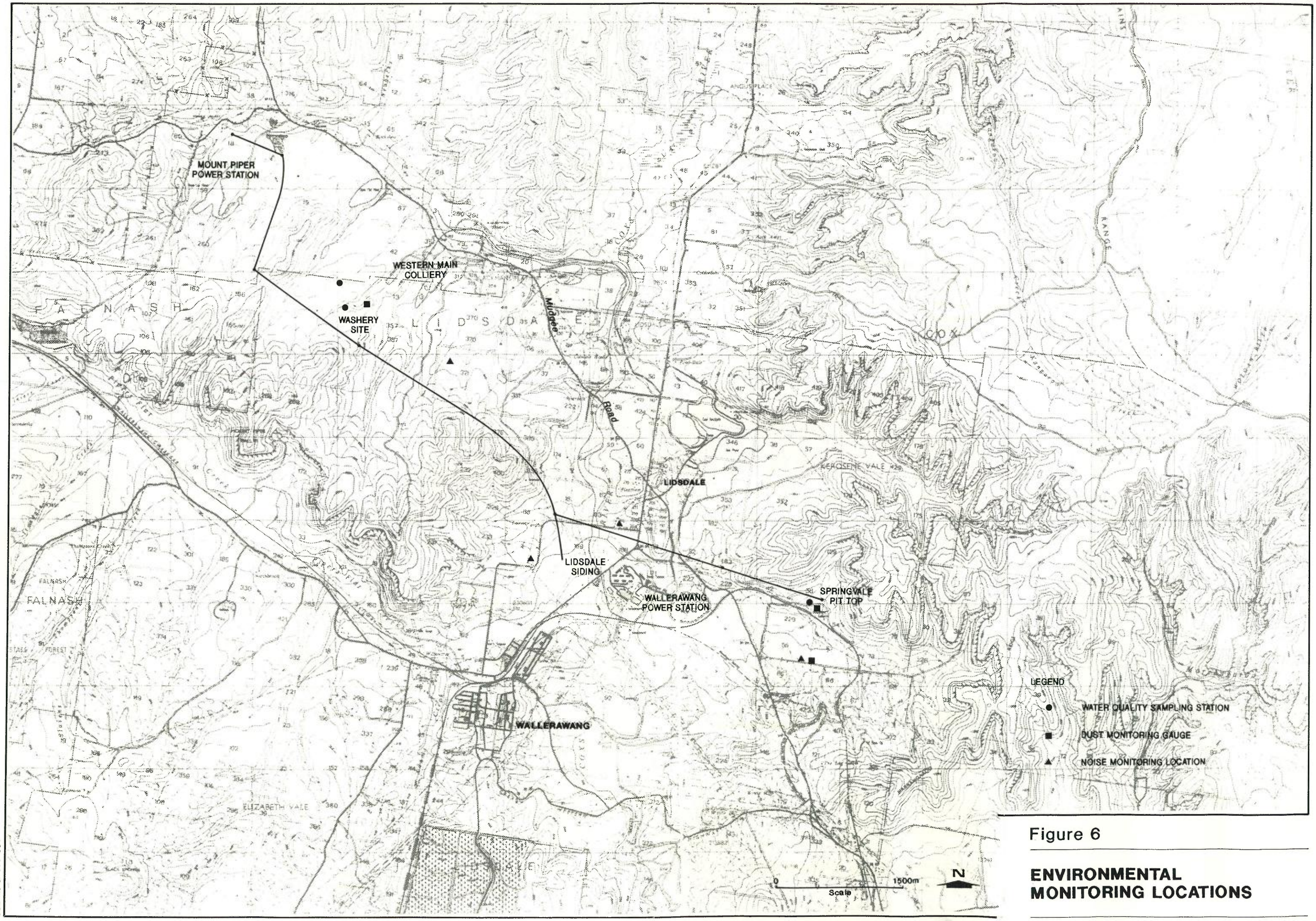


Figure 5

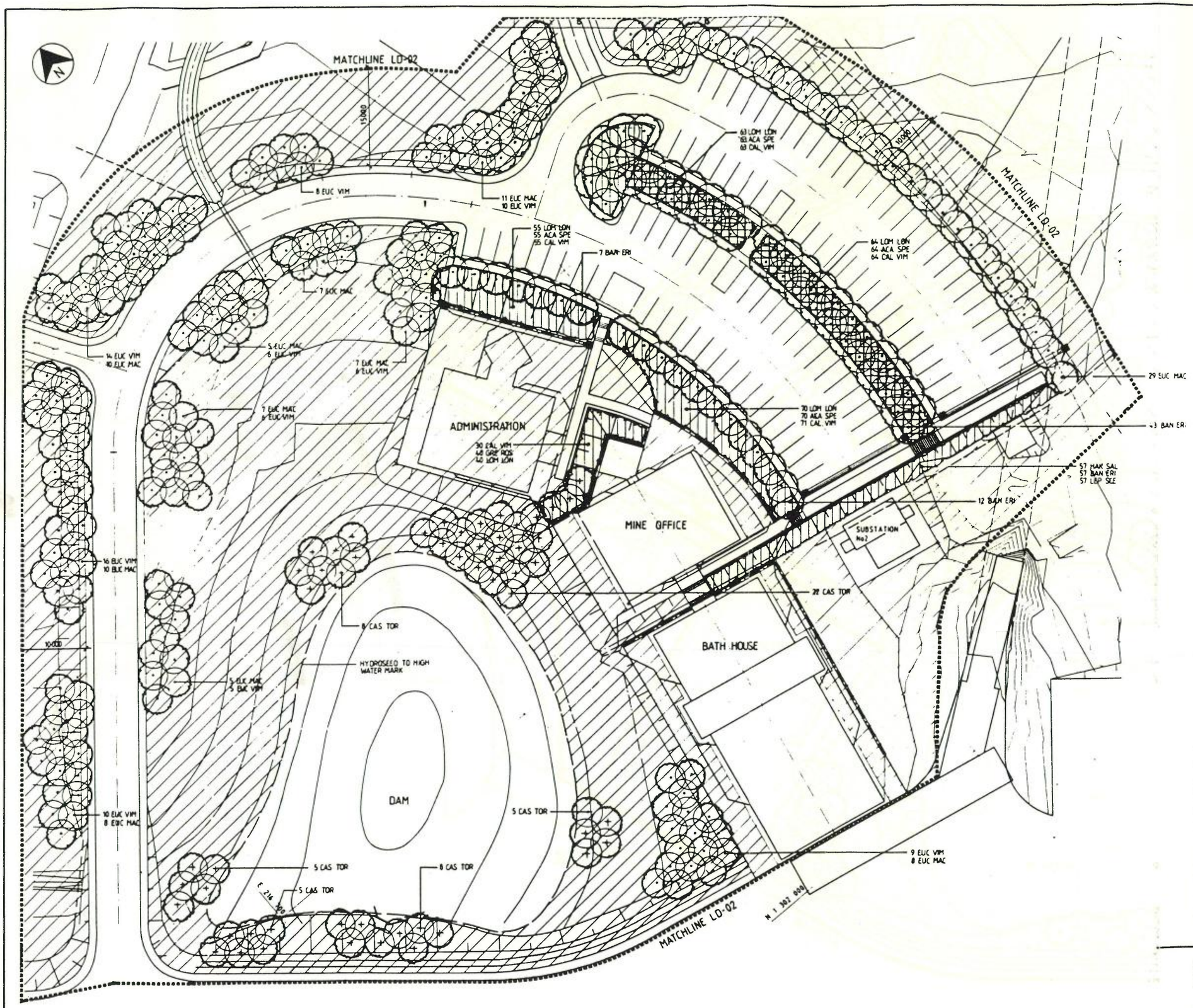
WASHERY AND TRANSFER STATION



JOB NO 3P111-001

Figure 6

ENVIRONMENTAL MONITORING LOCATIONS



LEGEND

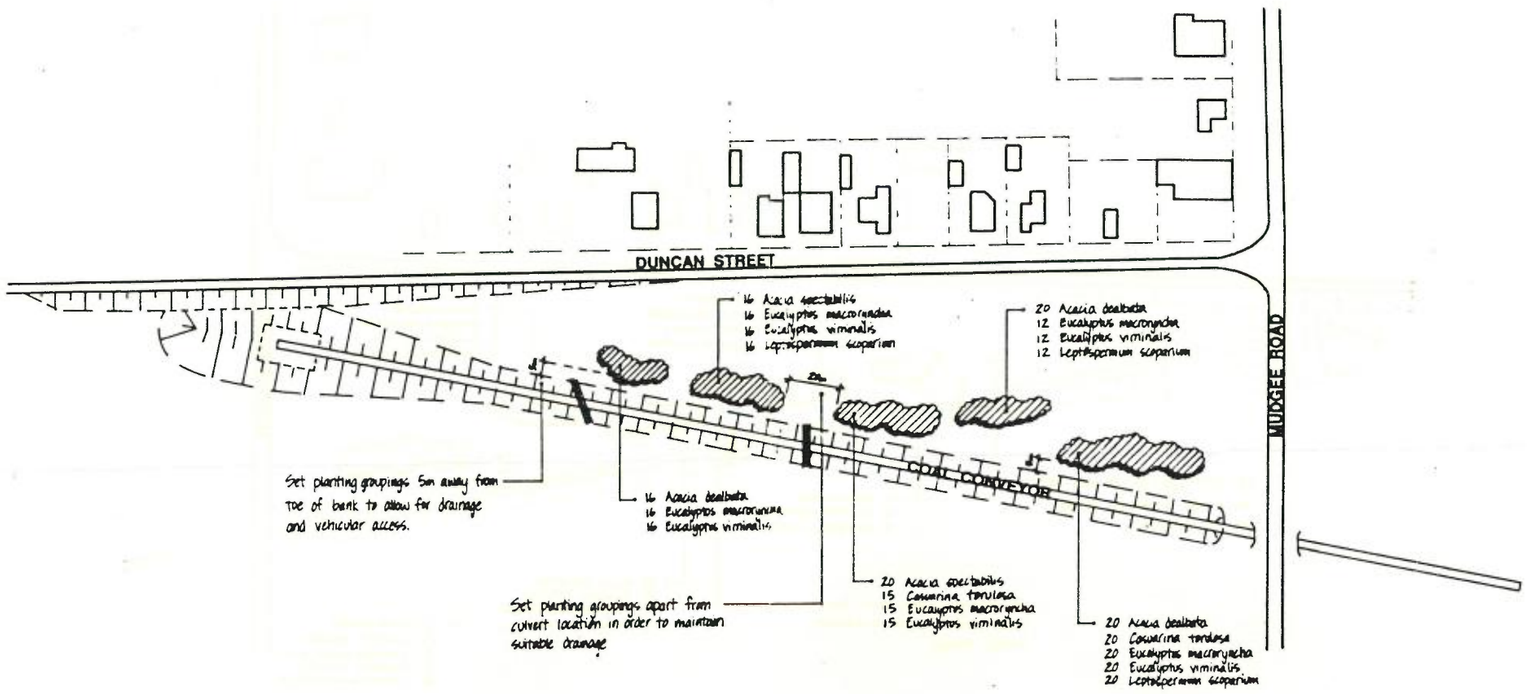
- 5 LITRE TREE PLANTING AS SPECIFIED REFER DETAIL 1, 5
- 150mm SHRUB PLANTING AS SPECIFIED REFER DETAIL 2, 5
- 150mm SHRUB PLANTING IN SLOPE STABILISATION MESH AS SPECIFIED REFER DETAIL 4, 5
- HYDROSEEDING AS SPECIFIED
- CENTRAL CORE AREA BOUNDARY
- TIMBER EDGE AS SPECIFIED REFER DETAIL 6

PLANT SCHEDULE

CODE	BOTANIC NAME	No	POT	MIN HT	MIN SP
	TREES				
CAS TOR	CASUARINA TORULOSA	53	5 LIT	500	300
EUC MAC	EUCALYPTUS MACRORHYNCHA	107	5 LIT	500	300
EUC VIM	EUCALYPTUS VIMINALIS	84	5 LIT	500	300
	SHRUBS				
ACA SPE	ACACIA SPECTABILIS	252	150 mm	300	150
BAN ERI	BANKSIA ERICIFOLIA	119	150 mm	300	150
CAL VIM	CALLISTEMON VIMINALIS	223	150 mm	300	150
GRE ROS	GREVILLEA ROSEMARINIFOLIA	40	150 mm	300	150
MAK SAL	HAKEA SALICIFOLIA	57	150 mm	300	150
LEP SCE	LEPTOSPERMUM SCOPARIUM	57	150 mm	300	150
LOM LON	LOMANDRA LONGIFOLIA	292	150 mm	300	150

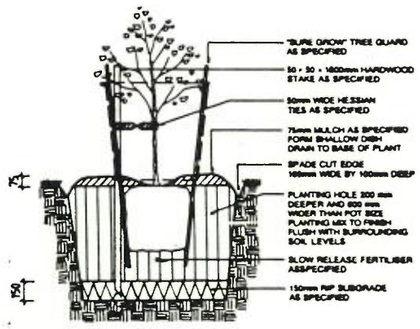
Figure 7

LANDSCAPING PLAN – PIT TOP

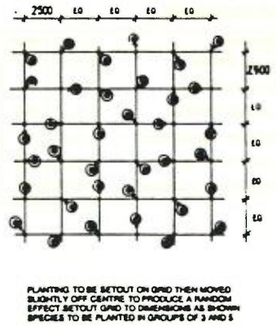


LEGEND

- SPOT PLANTING
- BANK BY OTHERS
- EXISTING DWELLINGS
- CULVERT BY OTHERS



01 **5 LITRE TREE IN GRASS**
SECTION



PLANTING TO BE SETOUT ON GRID THEN MOVED SLIGHTLY OFF CENTRE TO PRODUCE A RANDOM EFFECT. SETOUT GRID TO DIMENSIONS AS SHOWN SPECIES TO BE PLANTED IN GROUPS OF 3 AND 5

02 **MASS PLANTING LAYOUT**
PLAN

PLANT SCHEDULE

No	Botanic Name	Pot	Min Ht	Min Sp
56	Acacia dealbata	5 Lit	500	300
36	Acacia spectabilis	5 Lit	500	300
35	Casuarina torulosa	5 Lit	500	300
79	Eucalyptus macrorrhyncha	5 Lit	500	300
79	Eucalyptus viminalis	5 Lit	500	300
48	Leptospermum scoparium	5 Lit	500	300

Figure 8

LANDSCAPING PLAN – MUDGEE ROAD UNDER