FLOOR AND CEILING COSTS TO APPLY TO WESTNET RAIL

DETERMINATION OF

THE WESTERN AUSTRALIAN
INDEPENDENT RAIL ACCESS REGULATOR

IN ACCORDANCE WITH THE REQUIREMENTS OF
CLAUSE 9, SCHEDULE 4 OF THE RAILWAYS (ACCESS)
CODE 2000

24 SEPTEMBER 2003

Contents

1. Introduction

WestNet Rail (WNR) is the principal provider of "below" rail freight infrastructure in Western Australia, covering approximately 5,000 kilometres of track in the State's southwestern corner of Western Australia. WNR is a subsidiary of the Australian Railroad Group (ARG), a company owned 50:50 by Wesfarmers and Genesee Wyoming. ARG also provides above rail services in Western Australia.

Section 3 of the WA *Railways (Access) Act 1998* ("the Act") defines a "railway owner" to mean the person having the management and control of the use of the railway infrastructure. Within this context, WNR is considered to be the railway owner for the Western Australian non-urban railway infrastructure.

In accordance with Clause 9, Schedule 4 of the *Railways (Access) Code 2000* ("the Code"), the Rail Access Regulator ("the Regulator") advised WNR on 10 October 2002 of the Regulator's intention to determine the floor and ceiling costs, on a route section by section basis, for the following routes:

- Forrestfield to Kalgoorlie (EGR);
- Leonora to Kalgoorlie (Leonora);
- Kalgoorlie to Esperance (Esperance); and
- Kwinana to Bunbury Inner Harbour (SWM).

In early December 2002, WNR submitted its draft floor and ceiling determinations to the Regulator.

On 4 January 2003, the Regulator published in *The West Australian* and *The Australian* newspapers a notice of intention to determine floor and ceiling costs on these routes, with details on where further information can be obtained and inviting submissions. The closing date for submissions was 12 February 2003.

Five public submissions were received on WNR's floor and ceiling determinations (refer to Appendix 1 for the list of respondents). Two respondents also provided further additional information. The submissions are available on the Office of the Rail Access Regulator's (ORAR) website (www.railaccess.wa.gov.au).

In preparation for the Clause 9 Determination, the Regulator commissioned PricewaterhouseCoopers (PwC) to audit the WNR Access Pricing Model (APM). The first audit was completed in April 2002 and this was followed by a second audit in October 2002 to assess whether the initial concerns have been addressed. The two audit reports can be accessed on the ORAR website.

Two important reference documents in the determination of the floor and ceiling costs are the Regulator's Costing Principles Determination to apply to WNR and the

approved WNR Costing Principles. The Regulator's Determination focuses on the discussion of principles, rules and practices that were considered to be important by stakeholders when determining the floor and ceiling costs. Following the release of the Regulator's Determination on 27 September 2002, the proposed WNR Costing Principles were amended by WNR and approved by the Regulator on 19 December 2002. Both documents are also available on the ORAR website.

PwC and Hughes Consulting Services Pty Ltd (HCS) were engaged to provide advice to the Regulator on costing and engineering issues in the calculation of the floor and ceiling costs as proposed by WNR and other stakeholders. The consultants provided recommendations on what is to be an acceptable Modern Equivalent Asset (MEA) standard for each of the four nominated lines to meet current and projected levels of demand, and a review of WNR's capital, maintenance, operating and overhead costs to assess what are acceptable rates, that can be substantiated and/or benchmarked, to ensure that operating and technical efficiencies are achieved at the MEA standard. The review also included an assessment as to whether WNR has achieved the MEA standard on a line-by-line basis, and if not, what WNR would need to do to achieve that standard.

In preparing their report, PwC and HCS reviewed and considered all the submissions received from stakeholders and participated in all of the stakeholders consultation meetings that were conducted. To obtain a better understanding of the current condition of the nominated lines to enable comparative benchmarking with other rail operator's lines of similar usage and topography, track inspections were also carried out by HCS on various sections of all four lines.

The PwC and HCS report recommendations are summarised within the Regulator's Determination. However, because of the amount of commercially sensitive information relating to WNR's current operation that has been included throughout the report, the Regulator considers the PwC and HCS Report to be confidential and has not made it publicly available on the ORAR website.

To provide a second independent engineering perspective on the floor and ceiling costs proposed by WNR and other stakeholders, Bovis Lend Lease (BLL) was contracted to review the Regulator's draft of the Determination. BLL was able to confirm many of the PwC and HCS findings and recommendations as well as provide refinements to others. BLL's comments have subsequently been incorporated into the Regulator's Determination. The Regulator also considers the BLL Report to be confidential.

2. The WA Legislative Floor And Ceiling Calculation Requirements

The key legislative requirements in relation to calculating the floor and ceiling costs can be summarised as follows:

Definition of costs (Clauses 1 and 2, Schedule 4 of the Code)

All costs referred to under the Code are those that would be incurred by adopting efficient practices in the provision and management of railway infrastructure including the practice of operating a particular route in combination with other routes for the achievement of efficiencies.

Incremental costs are the operating costs and, where applicable, capital costs and overheads that the owner would be able to avoid in respect of the 12 months following the proposed access.

Operating costs are the train control, signalling and communications, infrastructure maintenance, train scheduling, emergency management and information reporting costs. The cost of maintaining the railway infrastructure is to be calculated on the basis that cyclical maintenance costs are evenly spread over the maintenance cycle. All cost items are to be based on the costs that would be incurred if the infrastructure were replaced using MEA.

Capital Costs are the costs comprising both the depreciation and risk-adjusted return on the relevant railway infrastructure. It is to be determined using an annuity formula by applying the Gross Replacement Value (GRV) of the infrastructure as the principal, the Weighted Average Cost of Capital (WACC) appropriate to the railway infrastructure as the interest rate, and the economic life in years as the number of periods.

The GRV of the railway infrastructure is calculated as the lowest current cost to replace existing assets with assets that have the capacity to provide the level of service that meets the actual and reasonable projected demand and are if appropriate, MEA.

Total Costs include the total of all operating and capital costs and overheads attributable to the performance of the access-related functions of the owner or an associate.

Determination of WACC (Clause 3, Schedule 4 of the Code)

The Regulator is required to determine, as at 30 June in each year, the WACC for the railway infrastructure associated with the non-urban network. In 2003 and every five years thereafter, the Regulator is to publicly consult when determining the WACC.

Nature of costs (Clause 4, Schedule 4 of the Code)

All costs are to be those that would be incurred by adopting efficient practices for the provision of railway infrastructure, including the practice of operating a particular route in combination with other routes to achieve efficiencies.

Allocation of costs to determine the floor (Clause 7, Schedule 4 of the Code)

The floor price of a route and associated railway infrastructure is the incremental costs resulting from the combined operations of all operators and other entities on that route and use of that infrastructure.

Allocation of costs to determine the ceiling (Clause 8, Schedule 4 of the Code)

The ceiling price of a route and associated railway infrastructure is the total costs attributable to that route and that infrastructure.

Determination of the floor and ceiling costs on routes for which access proposals are likely to be made (Clause 9, Schedule 4 of the Code)

The Regulator will be required to nominate the routes which the Regulator considers that proposals for access are likely to be made, and ask the railway owner to make an initial determination of the floor and ceiling costs of these routes. The Regulator will need to make a determination on these costs and will seek public comment before making the determination.

Review and re-determination of costs (Clause 12, Schedule 4 of the Code)

If it is considered that there is a material change in the circumstances that existed when the floor and ceiling costs were determined, the Regulator may review the costs and make a fresh determination. The Regulator may also give public notification of such a review and seek public comment on the determination.

Competition Principles (Section 20(4) of the Act)

The Act also provides a framework within which the Regulator's determination required under Clause 9, Schedule 4 of the Code is to be made.

Subsection 20(4) states:

> *In performing functions under this Act or Code, the Regulator is to take into account –*
>
> > *the railway owner's legitimate business interests and investment in railway infrastructure;*
> >
> > *the railway owner's costs of providing access, including any costs of extending or expanding the railway infrastructure, but not including costs associated*

with losses arising from increased competition in upstream or downstream markets;

the economic value to the railway owner of any additional investment that a person seeking access or the railway owner has agreed to undertake;

the interests of all persons holding contracts for the use of the railway infrastructure;

firm and binding contractual obligations of the railway owner and any other person already using the railway infrastructure;

the operational and technical requirements necessary for the safe and reliable use of the railway infrastructure;

the economically efficient use of the railway infrastructure; and

the benefits to the public from having competitive markets.

The nature of the decision-making power given to the Regulator under Clause 9 of Schedule 4 is such that it is mandatory in so far as the Regulator must exercise it by taking into account all the factors listed in Section 20(4).

However, under Clause 9 of Schedule 4 its application is discretionary in so far as the Regulator may allocate such weight to each of the factors listed in Section 20(4) as the Regulator considers appropriate for the particular case.

3. Costing Model In The WA Railways Access Regime

WNR is required to negotiate access prices between a floor and a ceiling as specified in Clauses 7 and 8, Schedule 4 of the Code. The floor and ceiling approach attempts to prevent a railway owner from extracting monopoly profits, and ensures that prices are not set so low or so high that some rail operators cross-subsidise the services provided to others.

The floor is determined by the incremental costs resulting from the operations on the section of a route and use of the infrastructure. "Incremental costs" is defined in Clause 1, Schedule 4 of the Code as the sum of the operating costs and, where applicable, the capital costs and the overheads resulting from the access seeker's operation that the railway owner would be able to avoid in respect of the 12 months following the commencement of access.

The calculation of the floor is dependent upon a number of specific circumstances which will vary based on each access application. Each operator can have a different floor and the sum of all operators' floors on a route section will be no less than the floor for that route section.

WNR will apply the following factors to calculate the floor:

- the percentage that the incremental traffic represents of the total traffic;
- the existing overall level of traffic (ie. high or low density traffic use);
- the requirements of the service (eg. high speed passenger versus low speed freight);
- the nature of the infrastructure (which will influence the operating costs) and the specific requirements of the user; and
- the nature of the train operations and its impact on overhead costs.

Similarly, the ceiling is derived from the total costs attributable to the section of a route and the use of the infrastructure. Total costs is defined in Clause 1, Schedule 4 of the Code as the total of all operating, capital and overhead costs resulting from the provision of access-related functions by WNR. For a more detailed discussion on each of these costs, refer to the Regulator's Costing Principles Determination dated 27 September 2002.

A unique approach in the WA Rail Access Regime ("the Regime") is its definition of "capital costs". Clause 2, Schedule 4 of the Code defines "capital costs" as costs:

- Comprising both the depreciation and risk adjusted return on the relevant infrastructure not including land.

- To be determined as the equivalent annual cost or annuity for the provision of the railway infrastructure, and by applying the GRV as the principal, the WACC as the interest rate and the economic life as the number of periods.

The GRV is to be calculated as the lowest current cost to replace existing assets with assets that have the capacity to provide the level of service that meets the actual and reasonably projected demand and are, if appropriate, MEA.

The components of the floor and ceiling prices and the approach to estimating these prices are not based on actual costs or the actual network but rather the hypothetical GRV of a MEA, assuming efficient practices.

There is no obligation for WNR to provide a network that is MEA or to adopt the specific maintenance practices assumed in the Regime as its actual practices. However, the standard of service assumed for the hypothetical GRV of a MEA must be consistent with what is to be provided by the actual network to meet current and reasonably projected demand.

Schedule 2 of the Code defines a “route section” as a section of the railway network that has been divided for management and costing purposes. Each route section contains its own derived ceiling and floor costs and it is between these costs that access prices will be negotiated. It should be noted that a negotiated route could equate to a route section (or part thereof) or be a combination of several route sections.

The Regulator has agreed to WNR’s definition of the railway network into the following route sections based on differences in track characteristics and traffic densities:

Forrestfield to Kalgoorlie

- Forrestfield - Midland
- Midland - Millendon Junction
- Millendon Junction - Toodyay West
- Toodyay West - Avon Yard
- Avon Yard - West Merredin
- West Merredin - Koolyanobbing
- Koolyanobbing - West Kalgoorlie
- West Kalgoorlie - Kalgoorlie

Leonora to Kalgoorlie

- Kalgoorlie - Malcolm
- Malcolm - Leonora

Kalgoorlie to Esperance

- West Kalgoorlie - Hampton
- Hampton - Kambalda
- Kambalda - Salmon Gums
- Salmon Gums - Esperance

Kwinana to Bunbury Inner Harbour

- Kwinana - Mundijong Junction
- Mundijong Junction – Pinjarra
- Pinjarra – Pinjarra East
- Pinjarra East - Alumina Junction
- Alumina Junction - Pinjarra South
- Pinjarra - Wagerup
- Wagerup - Brunswick Junction
- Brunswick Junction - Picton Junction
- Picton Junction - Bunbury Inner Harbour

To calculate the floor and ceiling costs, WNR has developed a computerised costing model, the APM, which has since been audited twice by PwC for the Regulator. The two audit reports can be accessed on the ORAR website.

The purpose of the first audit in April 2002 was to evaluate the APM's data and model integrity risks, confirm that model assumptions and logic are consistent with the Costing Principles, and randomly test the accuracy of the access pricing calculations. As several areas of the APM were found to have the potential to materially compromise data integrity and calculation accuracy, the APM was again audited in October 2002 to assess whether previous concerns have been addressed.

The WNR APM is a bottom-up model where individual activity unit costs are applied to estimated activity levels to derive floor and ceiling costs for individual route sections. The APM stores population data, including all costs and physical parameter assumptions, in a Microsoft (MS) Access database. The database has an interface that allows the user to select routes and vary assumptions prior to running the model.

Preliminary calculations are performed within MS Access, and thereafter the results are exported as text files to the Decision Support System (DSS) where final calculations are conducted and summary results on access prices are presented. As a check, the DSS calculations are mirrored in MS Excel.

4. Discussion Of Issues

4.0 Introduction

Issues pertaining to WNR's floor and ceiling determination that were considered significant are discussed under the following headings:

- Level of service and modern equivalent assets, if appropriate
- Capital costs
- Operating costs and working capital
- Maintenance costs
- Overhead costs

The following discussion commences with a review of what has been established in WNR's Costing Principles under each of the above headings. This is followed by a summary of WNR's submissions, comments received from the public consultation process, additional information provided to the Regulator by WNR based on stakeholders' comments (where applicable), recommendations from the Regulator's consultants, and the Regulator's views and comments.

4.1 Level of Service and Modern Equivalent Assets, if appropriate

i) *Costing Principles*

- The term Modern Equivalent Assets (MEA) has been defined as:

  An optimised network that is reconfigured using current modern technology serving the current load with some allowances for reasonably projected demand growth for up to five years into the future. The MEA excludes any unused or under utilised assets and allows for potential cost savings that may have resulted from technological improvement.

- The operating standards that WNR will apply for determining GRV are as follows:

  ◊ for that part of the standard gauge network that is part of the Defined Interstate Railway Network (DIRN), ie. Kalgoorlie to Kwinana, as defined by the Australian Transport Council the standards in place at 1 January 2002; and

  ◊ for the standard gauge (SG) branch lines and the narrow gauge (NG) main and branch lines the standards that WNR is required to maintain the tracks at in accordance with the lease obligations entered into in December 2000.

- A "greenfields" assumption is to be utilised for estimating a GRV on a MEA basis for WNR, and costs related to constructing around rail traffic, surface restoration and other surface diversions are excluded from the GRV. It is also assumed that the optimised network is provided by rail and within the existing corridor of land. In other words, the existing rail track alignment of the network will be considered as efficient.

- WNR would need to provide a set of assumptions that it intends to adopt when calculating a GRV on a MEA for a mainline asset, and for branch, feeder and grain lines. These are to include assumptions on rail weight, ballast depth, sleeper types (and spacing), fastener type, signalling type, passing loop lengths, manner in which bridges are to be designed, network construction rate, turnouts and formation costs.

- Where the ceiling costs calculated for a specific route section using MEA is significantly higher than the existing infrastructure calculation, the Regulator may determine that it is not appropriate to apply MEA. Under these conditions, the pre-existing infrastructure may be used in determining the ceiling costs if the existing infrastructure meets current and anticipated operational and safety standards.

- For the parts of the network that WNR is able to demonstrate are MEA, common proxies for estimating efficient costs could be the unit cost levels quoted in competitive tenders for providing actual services. However, unit rates will need to be assessed against the number of units consumed to ensure operating (productivity of inputs) and technical (type and combination of inputs) efficiency. Benchmark unit rates will also require adjustment for environmental factors as well as for factors such as the scope of the contract and the time elapsed since it was awarded.

- For the parts of the WNR network that are not considered MEA, the Regulator will benchmark their costs against other comparable assets as required.

ii) *Summary of WNR's submissions*

- WNR considers that the majority of the existing track configuration (ie. sleeper type, rail weights, etc.) can be adopted as the MEA.

- WNR proposes the following assumptions it will adopt where the existing network is not considered MEA:

  ◊ concrete sleepers for the 75km of timber sleepered track in two sections between Koolyanobbing and Kalgoorlie, and on the SWM between Kwinana and Picton Inner Harbour;

  ◊ optic fibre to provide high speed digital communications on main lines where CTC signalling is used;

- ◊ processor-based interlocking in all cases of CTC signalling systems instead of electro-mechanical interlockings; and
- ◊ a centralised train control system.

- WNR's SG and NG Codes of Practice are to apply to the MEA as WNR is required to comply with these Codes under its Rail Safety Accreditation.
- The WNR proposed MEA standards for the four rail lines are as follows.

MEA Specifications	Rail Lines			
	EGR	Leonora	Esperance	SWM
Axle load freight (tn)	21.0	21.0	23.0	21.0
Max speed freight (kph) [loaded/empty]	115/115 (SG); 115/115 (DG)	50/70 (SG)	70/80 (SG)	115/115 (NG)
Max speed passenger (kph)	195 (SG); 100 (DG)	Not applicable	Not applicable	160 (NG)
Ave formation height (m)	1.5	1.5	1.5	1.5
Rail (kg/m)	60	50	50	50
Ballast depth (mm)	300	200	250	300
Sleeper type and average number per km	Concrete; 1,500	1 in 4 steel; 1,500	1 in 2 steel; 1,640	Concrete; 1,500

Source: WNR submissions to the Regulator; 19 December 2002, 28 January 2003

iii) *Comments received in the public consultation process*

- If the existing network can meet the current and reasonably projected demand for all users taken together as claimed by WNR, then a MEA should replicate the existing service as provided and not some augmented service with a higher capacity.
- The correct GRV for a route section is that for a MEA capable of delivering the service as actually delivered, not a GRV for a MEA with a notional specification of maximum speed and axle load. Any discrepancy between the service level that could derive from the GRV which WNR is allowed, and the actual service provided to operators results in a windfall gain to WNR.
- The Regulator must extract a covenant from WNR that trains will be able to operate at these levels of service over every section of the route because that is what operators are in fact paying for. To the extent that trains cannot operate at that level of service, the Regulator must allow an appropriate discount until such time as WNR can provide the level of service that its allowed GRV reflect.

- WNR has assumed that an embankment height of 1.5m has been allowed by the Regulator for all four routes. This assumption is incorrect and should be excluded from the capital costs allowed to WNR.

- The MEA ballast depth is assumed to be 300mm for the Koolyanobbing to Kalgoorlie route section whilst the proposed Australian Standard only requires a ballast depth of 250mm.

- The Regulator should calculate the GRV using the existing infrastructure for the route sections between Brunswick Junction and Bunbury Inner Harbour. The cut and bank distribution, as well as the actual formation data available for the route section between Brunswick Junction and Picton Junction confirm the inappropriate application of a hypothetical MEA which incorporates a 1.5m high embankment. The suggested appropriate MEA track structure commensurates with Narrow Gauge Block Train operations in the Bunbury area, namely 21 tonne axle load (tal) at 90kph, is 200 to 250mm for ballast depth and 230mm for capping thickness.

  Using the worse case conditions (soft sand), the Schramm equation in the WNR NG Code of Practice gives a ballast depth of 248mm. WNR's NG Code of Practice for Track and Civil Infrastructure specifies a ballast depth of 200mm for concrete sleepered track. The adopted ballast depth by WNR is more like 200mm.

- The WNR Costing Principles specify that WNR is required to maintain the tracks to the operating service levels in accordance with the lease obligations entered into under the Government Lease. The Regulator must obtain all relevant documents relating to the sale of the rail freight business and the lease of the rail infrastructure to ascertain the obligations imposed upon WNR to improve and maintain the rail track, and the commercial arrangements relating to that improvement and maintenance.

  In particular, the Regulator must assure himself that the purchase price was not based on, and allowed a deduction for, WNR's future obligations to expend capital to provide an operating service at a level specified in Section 12(6) of the *Rail Freight System Act* for the Koolyanobbing to Esperance route. The Regulator cannot approve the floor and ceiling prices for the WNR railway system until he has fully understood and taken into account these matters, and can explain to operators how these matters have been taken into account in his decision.

iv) *Additional information provided by WNR*

- Based on the WNR Code of Practice for Infrastructure Maintenance, WNR has included as the MEA for formation an embankment averaging 1.5 metres in height, which includes a capping layer of compacted material of 230mm.

- The Darwin to Alice Springs railway currently under construction has used an embankment design of 1.4 metres (including the capping layer). That railway essentially follows the existing topography and has few, if any cuttings and embankments.

- On the issue of double tracks from Midland to Avon, WNR cannot operate all existing trains using single track and current timetables. This is because demand is peaked especially for interstate services and it would be impractical to re-timetable those trains because of their need to meet timetables in other states. Additionally, the narrow gauge grain lines join onto the standard gauge along this section of the EGR.

v) *PwC and HCS's comments and recommendations*

- WNR has refined its definition of MEA which PwC and HCS concur as the basic tenet and philosophy for the MEA as:

  The MEA should be expressed as a total package of items which lead to an operating standard, including:

  ◊ *track standard for tangent operations (speed and axle load);*

  ◊ *the effect of curve and gradient (noting that the Regulator has already determined the existing track alignment is what should be used);*

  ◊ *the capacity and capabilities of the signalling system;*

  ◊ *the prevalence and level of protection provided at level crossings; and*

  ◊ *other public safety issues such as fencing.*

- WNR's MEA standard for determining the GRV of its SG, dual gauge (DG) and NG assets is based on its Codes of Practice, which in turn are based on the National Code of Practice that applies to the DIRN requirements. The National Code is voluntary and not enforceable by law. However, railway owners can elect to adopt the Code as part of their safety accreditation. Only the EGR is subject to the National Code but as this line pre-dates the commencement of the Code (July 2001), WNR is able to implement the National Code at a rate of progress that WNR is free to determine.

- The formation height proposed by WNR as a uniform standard MEA for each of the four routes is 1.5m including a capping layer of 230mm. A uniform formation height as sought by WNR may not be reasonable as:

  ◊ building to an average of 1.5m on the SWM does not appear necessary from an engineering perspective. The generally undulating nature of this corridor means that a high formation is unnecessary to accommodate the

required drainage structures, as a significant proportion of the drainage structures are located in depressions; and

- ◊ it may not be commercially necessary as a 1.0m formation appears capable of providing the service level requested by customers (notably Alcoa and Worsley).

In actual practice, formation heights on the SWM at some locations are minimal (eg. less than 0.5m) and from inspection, it is estimated to average only 1.0m over the length of the SWM. This estimated height (or even lower ones) is supported by submissions made by both Alcoa and Worsley. Whilst the EGR is to DIRN standard at 1.5m, both the Kalgoorlie-Leonora and Esperance lines only reach the 1.5m height through the highly flood prone sections (albeit a considerably high percentage) of these lines.

- In supporting WNR's proposed ballast depth of 300mm on the EGR, the following issues were considered:
  - ◊ the DIRN standard recommends a minimum ballast depth of 250mm, however, operators in Australia are increasing ballast depth from 200-250mm to 300mm on heavy haul lines to reduce future maintenance costs;
  - ◊ WNR SG Code of Practice has identified a 300mm depth to allow for future growth where increases in tonnage and interstate train lengths on the EGR will be the determining factor;
  - ◊ actual depth of ballast at sample locations along the EGR was greater than 270mm under concrete sleepers (locations include east of Midland, near Toodyay West, Northam, Stewart, Bonnie Vale and West Kalgoorlie); and
  - ◊ WNR has indicated that 300mm depth of ballast will be adopted on the EGR for completion of the concrete resleepering program west of Koolyanobbing.
- However, the arguments provided by WNR that ballast depth should be a uniform 300mm for all mainlines to meet the DIRN standard and the WNR SG and NG Codes of Practice are based on ideal solutions rather than the MEA required for the service needs of customers. Current ballast depth on the SWM varies from 200 to 250mm.

  On questioning WNR personnel about the potential of increasing the depth of ballast from 250mm to 300mm in conjunction with the proposed re-sleepering of SWM to make it to the MEA standard, WNR has indicated that there is no intention to increase the ballast over that which is currently in place.

HCS is of the opinion that the ballast depth on the SWM for MEA purposes should be 250mm for all sections and views this as suitable for 21 tal at a maximum speed of 115kph.

- HCS believes that the formation height and the ballast depth for the SWM can be adjusted without material detriment to WNR's ability to meet its nominated performance standards, ie. WNR can still provide the axle load and maximum speed standards with lower formation and ballast level.

- WNR was asked as to how a proposed speed of the new "Prospector" being a maximum of 160kph increasing ultimately to a maximum of 190kph, would affect the MEA for EGR passenger rail car services. The following comments were made by WNR with regard to the new "Prospector":

  ◊ the MEA should be based on current and reasonable projected demand;

  ◊ the outcome of the tangent track standard at 160/190kph is not driven by the prospector but is an outcome of the agreed standard for the DIRN for freight trains at 115kph (in other words, the MEA is set for the major demand); and

  ◊ if WNR were to set the MEA for Prospector operations at 190kph, then there would be considerably higher operating and capital costs (required to modify curves, improve level crossings and signalling systems, and install additional safety fencing and crossing loops).

  HCS recommends that the MEA for passenger rail car operations on the EGR east of Northam to Kalgoorlie be set at a maximum of 160kph and west of Northam to the Midland at a maximum of 100kph, the latter being the current speed limit on that section. HCS further suggests that this issue be reviewed at the next price reset in three years time.

- HCS is of the view that the WNR proposed MEA for the EGR (other than the maximum speed for passenger trains), Leonora and Esperance lines are acceptable.

- The recommended changes to the proposed MEA standards are as follows.

EGR	WNR MEA Specifications	Recommendation
Max speed passenger (kph)	195 (SG); 100 (DG)	160 (SG); 100 (DG)
SWM	WNR MEA Specifications	Recommendation
Average formation height (m)	1.5	1.0
Ballast depth (mm)	300	250

Source: PwC and HCS report to the Regulator; July 2003

vi) *BLL's comments and recommendations*

- The term MEA as defined in the Costing Principles is an important part of the determination of appropriate asset configuration. In order to address the criteria of "load", it is recommended that "utility" be used rather than "axle load". The function of the infrastructure is the performance delivered by an appropriate infrastructure and includes the dimensions of axle load, speed and reliability as requirements to be provided by the existing infrastructure.

- The current construction of the EGR is one where different sections have different standards. To the west of Koolyanobbing the construction is 60kg/m rail on concrete sleepers. This structure has a maximum axle load capability of 25 tonnes at 80kmph. To the east of Koolyanobbing the construction includes sections of 94lb/yd (47kg/m) rail on timber sleepers whose capacity is 23 tonne axle load at 80kmph. This section is being progressively upgraded to concrete sleepers and 60kg/m rail.

  The DIRN in its current state of construction and condition permits 23 tonne axle load as the norm and this current network includes predominantly 94lb/yd (47kg/m) rail. All new rail being used on the ARTC network is 60kg/m rail.

  Therefore the axle load and speed MEA should portray multiple utility and be expressed as 23 tonnes at 80kmph and 21 tonnes at 115 kmph. In the future, as the line is progressively relaid with 60kg/m rail, the functional capacity of the line will become 23 tonne axle load at 115kmph and 25 tonne axle load at 80kmph. Other suggested parameters are appropriate.

- With regard to the Leonora line, a MEA standard incorporating the use of 50kg/m rail should translate to a maximum axle load of 23 tonne. However, the sleeper configuration coupled with the ballast and formation condition render the line to have a practical utility of 21 tonne capacity. All other parameters are appropriate.

- The parameters suggested for the Esperance line are appropriate.

- As for the SWM, the proposed parameters reflect the historical capacity of the line with its inferior timber sleepers and variety of rail types including 82lb/yd (41kg/m) rail. The axle load and speed MEA should portray multiple "utility" and be expressed as 23 tonnes at 80kmph and 21 tonnes at 115 kmph.

vii) *Regulator's views and comments*

- In determining the MEA, consideration has to be made of some recognised and agreed standards that are to be used to achieve acceptable levels of safety and service on all lines forming the WNR network. This has been to apply an assessment of the elimination of any excess capacity, the use of current cost effective track components, the assumed use of modern network

control and communications systems, the adequacy of crossing loops, plus reviewing the track structure required for present and future demand.

In this context, the Regulator accepts WNR's proposal to consider as MEA concrete sleepers on the EGR and SWM, optic fibre and processor-based interlocking where CTC signalling is used, and a centralised train control system. The Regulator is also satisfied with WNR's explanation as to why the dual gauge system between Midland and Avon should be considered as optimised on the EGR.

- The Regulator has noted stakeholders' disagreement with the WNR approach to defining a MEA when considering the current asset configuration being used. This divergence of views relate mainly to the height of earthworks and the depth of ballast, with some stakeholders arguing that the WNR MEA will not be required now or within the next five years and hence they should not have to pay the additional incremental cost incurred by assuming greater formation and ballast than is required.

- Formation is an essential part of the railway infrastructure for safe operations and the Regulator has agreed in the Costing Principles Determination that their cost should be included in calculating the GRV. However, the Regulator has also indicated in the Determination that "independent engineering advice will be sought to review the required depth of formation in calculating the GRV as part of the Clause 9 of Schedule 4 Determination".

- The Regulator supports the view that if WNR's proposition that the existing railway infrastructure, with the noted exceptions, is MEA and can meet the current and reasonably projected demand for all users taken together, then the existing level of service and configuration, such as ballast depth and formation height, should be used as the basis of the floor and ceiling costs determination.

- Accordingly, WNR will be required to reduce formation height to 1.0m and ballast depth to 250mm as the MEA for the SWM.

- WNR has advised that the "permanent" temporary speed restricted sections on SWM are currently being withdrawn as new 1:12 turnouts on concrete bearers are replacing those that are poorly located, require extensive maintenance or are past their life cycle dates. WNR will need to provide documentary evidence to the Regulator that the MEA specifications, such as axle load and maximum speed, have been achieved after the work is complete.

- For the time being, the MEA for passenger rail car operations on the EGR from Midland to Northam will be set at a maximum of 100kph and from Northam to Kalgoorlie at 160kph. This can be adjusted, if required, when the

Regulator is advised of more definitive plans to operate the new Prospector at a higher speed.

- The Regulator has added the multiple utility measures in the MEA standards as recommended by BLL.
- Other than the changes noted above, the proposed WNR MEA forms an acceptable definition for the calculation of the floor and ceiling costs of the four routes.
- Accordingly, the WNR approved MEA are as follows.

MEA Specifications	Rail Lines			
	EGR	Leonora	Esperance	SWM
Axle load (tn) and max speed freight (kph) [loaded/empty]	21.0 at 115/115 (SG), 115/115 (DG); or 23.0 at 80/80 (SG), 80/80 (DG)	21.0 at 50/70 (SG)	23.0 at 70/80 (SG)	21.0 at 115/115 (NG) or 23.0 at 80/80 (NG)
Max speed passenger (kph)	160 (SG); 100 (DG)	Not applicable	Not applicable	160 (NG)
Ave formation height (m)	1.5	1.5	1.5	1.0
Rail (kg/m)	60	50	50	50
Ballast depth (mm)	300	200	250	250
Sleeper type and average number per km	Concrete; 1,500	1 in 4 steel; 1,500	1 in 2 steel; 1,640	Concrete; 1,500

- The Regulator recognises that there may be instances where operators will experience a level of service that is below what is deemed to be available through the MEA. The Regulator will monitor the delivery of the level of service through key performance indicators and, as indicated in the Regulator's Costing Principles Determination, will revise the MEA standard if it can be demonstrated that WNR is consistently not providing the expected standard and service. Access seekers wishing to include penalties (or discounts) for non-performance of agreed standards should incorporate the appropriate provisions in their access agreements with WNR.
- In calculating the ceiling costs of the Esperance line, Portman has requested that the Regulator obtain relevant sale documentation pertaining to the sale of the freight business by the Western Australian Government Railways

Commission to ensure that the purchase price paid by ARG was not based on, or had allowed a deduction for, WNR's future obligations to expend capital to provide an operating service at a level specified in Section 12(6) of the *Rail Freight System Act*.

Portman's concern is that if WNR is required by Government as part of the sale agreement to upgrade the Esperance line, then WNR should not be allowed to add the capital expenditure of the upgrade to its capital base in determining access rates as the company would be compensated twice, firstly in the discounted purchase price it paid for the rail system, and secondly in the prices that access parties pay to WNR for access.

The Regulator is satisfied that the sale documents do not contain any provision concerning the upgrade of the Esperance rail line or the cost of doing so. On the basis of the review and legal advice received, the Regulator would not be imposing a subsidy in the ceiling price test on any upgrade that is paid by WNR to the Esperance line.

4.2 Capital Costs

i) *Costing Principles*

- The assets included in the capital cost calculations consist of assets that are directly engaged in the provision of rail infrastructure services. These include:
  - ◊ railway track, associated track structures, over or under track structures, supports (including supports for equipment or items associated with the use of a railway);
  - ◊ tunnels and bridges;
  - ◊ stations and platforms;
  - ◊ train control systems, signalling systems and communication systems;
  - ◊ buildings and workshops; and
  - ◊ associated plant, machinery and equipment.

  Sidings or spur lines that are excluded by Section 3(3) or (4) of the Act from being railway infrastructure are not included.
- Also not included are capital assets that support operating functions. These are included in the operating cost or overhead cost calculations as appropriate. Assets in this category include motor vehicles, computers, printers, facsimile machines, photocopiers, system hardware and software,

mobile and fixed communications, office furniture and equipment. The cost of these assets is to be calculated on a net basis.

- Cuttings and embankments are not in the initial capital calculations. However, expenditures on cuttings and embankments incurred since the commencement of the Regime, to create capacity or expand the network, or improve operating standards or efficiency, will be included in the calculation of the ceiling.
- The cost of formation is to be included in calculating the GRV.
- WNR's economic life assumptions as detailed in the Costing Principles are based on engineering assessment of rail life on curves and have been approved by the Regulator.
- Key capital cost drivers to be adopted include:
  - ◊ the operating track standard, eg. axle load and speed;
  - ◊ population of supporting infrastructure, eg. bridges and culverts; and
  - ◊ topography the infrastructure covers, eg. track curvature and gradient.
- All operator and Government contributed assets are to be included in calculating the floor and ceiling costs. An amount of the contribution determined as the equivalent annual cost will be credited to the operator and the route section(s) concerned in the calculation of the over-payment in the ceiling price test.
- The appropriate design, construction and project management fee is at a rate of 20% of the total cost of the infrastructure and based on an economic life of 50 years.
- The appropriate construction rate is an average of 1 kilometre per day, and there will be sections of the network that the Regulator may consider a higher or lower rate to be more appropriate.
- The WACC is to be used as the interest rate for assessing the capital costs incurred during the construction period as a component of the GRV.

ii) *Summary of WNR's submissions*

- WNR's unit rates for track capital have been assessed independently and for signalling and communications have relied on quotations and recent tenders. WNR has built unit rates into the APM based on:
  - ◊ an independent engineering firm's report;

- ◊ tendered rates WNR has tested in the market; and
- ◊ direct quotations from suppliers,

where these rates have any adjustment for scale or scope or the impact of location these assumptions will be included.

- To assess the capital cost of the GRV for the individual nominated mainlines, WNR engaged GHD Pty Ltd (Consulting Engineers), to provide a set of unit rate costs assuming that a construction contract was being undertaken by WNR for 100kms of new track. GHD have stated that these rates obtained are particular to WA.
- The directives set by WNR for the valuation of rail infrastructure were:
  - ◊ adopt Modern Engineering Equivalent Replacement Asset principles;
  - ◊ adopt current best practices for construction;
  - ◊ adopt the most economical construction packages for each group of track component, thereby achieving lowest costs and pricing discounts;
  - ◊ adopt a “greenfields” approach for the determination of track construction;
  - ◊ allowance for wastage;
  - ◊ exclude Goods and Services Tax from the rates; and
  - ◊ exclude profit and overhead recovery of a contractor.
- The unit rates compiled by GHD have been based upon open market costs of undertaking the work, and not WNR’s costs. These unit costs include:
  - ◊ cost of materials (including volume discounts);
  - ◊ transport of materials to site;
  - ◊ allowance for material wastage;
  - ◊ costs of contract direct labour for infrastructure installation;
  - ◊ plant and equipment for construction and installation; and
  - ◊ allowance for remoteness of sites from Perth and other regional centres.
- Signalling assets include track circuits, interlocking, cabling, power supply and stand-by plant, signal equipment and telemetry equipment. Communications assets include radio control equipment, base stations, towers, communications backbone 4 fibres, carrier equipment, cabling ducts and pits.

- WNR's actual costs for track signage, access roads, shunter pathways and fencing have been used.

- Unit rates were multiplied by the population data for that particular section of the route using the MEA design standard which then produced the GRV.

- Remoteness factors have only been applied to bridge construction, culvert installation, culvert end treatment construction, and level crossing construction. The factors were not applied singularly or separately to the transport of materials.

- Existing level crossings are included in the GRV calculation. Components included in this calculation include:

  ◊ signalling protection equipment – flashing lights or boom gates, power supply, insulated joints; and

  ◊ track crossing three metres either sides of centre line of track which includes sub base preparation and bitumen surfacing.

- Refer to Appendix 2 of this Determination for WNR's proposed capital costs by routes and route sections.

iii) *Comments received in the public consultation process*

- ARTC considers that the proposed track valuation represents an over-engineered asset given the types of service and volumes expected on the Forrestfield to Kalgoorlie route in the foreseeable future, which is not significantly different to that on the ARTC network. This would have resulted in a much higher track construction cost and asset valuation. A comparison of track replacement costs per km shows the average on the ARTC network to be around $480,000/km, and $1,070,000/km on the Forrestfield to Kalgoorlie route. The difference is wide even allowing for the difference in methodologies and assumptions associated with the Optimised Replacement Cost (ORC) verses GRV approaches.

- The GRV for the railway infrastructure for Koolyanobbing to Kalgoorlie is estimated at $1,119,000/km whilst the total cost of constructing the Alice Springs to Darwin railway project (which involved the construction of 50 kilogram rail, concrete sleepers, formation, buildings, construction interest, working capital and contingency costs) is estimated at $915,000/km. To date, the usual "rule of thumb" estimate of the cost of building new railway infrastructure in "benign landscape" is between $600,000 and $700,000/km of track.

- WNR's capital costs are 59% higher than Alcoa's estimates. Since capital is the largest component of the total cost, this difference is the most significant

in dollar terms accounting for some $5.9 million of the $14 million that is considered to be overstated by WNR for the SWM.

- Worsley's estimated GRV for the Brunswick/Picton and Picton/Bunbury Inner Harbour route sections (including earthworks) to be $13,808,415 and $4,256,572 respectively based on much lower unit rates for railway infrastructure components.

- Some aspects of the data in the documentation titled "Pricing of Track Infrastructure" have not been derived in an "open market" and therefore cannot be considered to represent current best practices for construction.

- Unit pricing can be tested against road infrastructure where similar works exist including structures (bridge and culvert) and embankment construction including limestone capping. For example, the cut to fill rates from recent road projects within the Bunbury Region ranged from $2.10 to $3.15, imported fill rates from $8.30 to $12.50 and capping were $4.75 to $6.50 for 250mm of limestone road sub base.

- In estimating GRV, WNR has worked on a route basis using a standard track and infrastructure specification and used average costs for components. The information required is available on a route section basis and this is the appropriate level at which the GRV should be estimated. With differing traffic volumes it is reasonable to anticipate that maintenance costs will also vary by route section. Average costings are also not appropriate for the diversity of terrain covered in this Determination.

- Alcoa believes that only 30 turnouts should be assigned to the SWM instead of 40. The extra 10 turnouts that have been assigned by WNR include:

  ◊ additional turnouts at Kwinana (2);

  ◊ turnout at Mundijong Junction to Armadale (1);

  ◊ additional turnouts at Pinjarra to cross trains in Pinjarra yard (2);

  ◊ additional turnout at Brunswick Junction (1);

  ◊ turnout at Picton to Bunbury (1); and

  ◊ additional turnouts at Bunbury Inner Harbour (3).

- WNR has allowed for the cost of a communications system of which only 10% is required for railway operations. It has also included the cost of regulatory compliance with respect to the use of the corridor for public and private utilities (such as telecommunications carriers).

- No part of the WNR system is remote. WNR should be required to explain its criteria for identifying particular sites as remote and provide evidence to support the proposed remoteness factors. Unit labour rates used in the WNR evaluation already incorporate an allowance for remote activity.

- ARTC's network assumed remoteness factors ranging from 1.00 (0 uplift) for segments in metropolitan and surround areas to 1.08 (8% uplift) with respect to a remote segment such as Tarcoola to Parkeston, and would consider that materials transport and additional labour and associated costs on such a remote segment are likely to be higher than that which might be applicable on the Forrestfield to Kalgoorlie route.

  Other rail infrastructure valuations with respect to the Hunter Valley and Queensland coal networks assumed no allowance for remoteness of these assets.

- WNR's allowances for transportation costs are high. Rail transport for most materials would be unusual in the circumstances and would be more costly than road transport. As a minimum these prices should be assessed against road transport, especially where lead distances are short and where rail access is not available. It is also open to question as to whether transport costs obtained from ARG represent best practice in the delivery of materials.

- The loop lengths on the SWM should be standardised to 599 metres.

iv) *Additional information provided by WNR*

- WNR confirms that all unit rates for construction provided by GHD do not include overheads. They are not rates from the John Holland Construction and Engineering Pty Ltd (JHCE) maintenance rates. There is also no remoteness factor applied to the base unit rates for bridges and culverts.

- GHD's analysis has shown that the cost of transport to site of heavy materials such as ballast can vary from zero to as much as 180% of the "base" cost in Perth. The transport cost of sleepers has been shown to be as high as 25% of the base price. In the case of rail, the cost has been shown to be approximately 9% of the base price. WNR does not accept that such high transport costs to the more remote areas can merely be absorbed by the suppliers, unless the base cost was appropriately "loaded" by the suppliers to cover the cost of transportation.

- It is appropriate to apply factors, such as the WA Department of Housing and Works published factors, to individual and separate items such as labour, plant and materials. However, these factors do not include the costs of the contractor's higher overheads for camp and site office establishment, maintenance and demobilisation, accommodation, the unproductive time

caused by the delays of material supplies and transport of labourers from the campsite to the workplace, and all other activities associated with remote sites which are not encountered in the Metropolitan area. They also do not include the increased costs of transport to site of materials that have to be sourced from the Metropolitan area. The factors listed in the GHD report do, however, include such items in the overall costs of construction of a bridge, for example.

- The base price of ballast sourced from different locations, as obtained by GHD from a number of different suppliers, allowed for large purchases for a large contract. Whilst Western Australia is well sourced with granite there are only a limited number of quarries operating which can meet the specification. GHD used sources near Perth, Bunbury, Kalgoorlie (Hampton) and Esperance. WNR does not use the Esperance source because of quality issues.

- As for the communications equipment, the optic fibre cable that runs from Kalgoorlie to Perth and Bunbury is a jointly owned cable in which WNR owns four fibres outright. At the time of awarding the contract, WNR went to tender with an option for either an optic fibre or digital microwave radio and the optic fibre was the cheapest option.

  In addition to the optic fibre cable, there is a significant cost in breaking out of the cable at each interlocking to a purpose built communications cabin which contains the digital communications equipment which allows the transfer of digital messages to the signalling system. The most significant cost is the equipment to connect to the optic fibre cable and the local distribution. WNR estimates that less than 20% of the cost of the new communications system relates to the cable.

- In terms of capacity, the first two fibres (of 8 megabytes each) run end to end and also current between each installation. This capacity is fully utilised for train radio, signalling and voice telephone communications. The second two are STM 1 fibres carrying end to end only. They provide some leapfrogging capacity for the first two, and any WNR's LAN and WAN (Local and Wide Area Networks). ARG use some of this capacity for PABX (Private Automatic Branch Exchange) but meet all their equipment costs separately.

- WNR believes that the impact of including or excluding branch line signals on the main line will have minimal impact because the signalling is required for main line train operations in any case.

- WNR believes that Alcoa have understated the total number of turnouts and have not, for example, included turnouts to refuge sidings. They have also not included sufficient turnouts at Picton, for example, to accommodate the

existing level of train working and have excluded the two mainline turnouts to their private siding at Wagerup.

WNR has reviewed the allocation between branch and main lines and agrees that some of those allocated to the SWM should be allocated to the Brunswick/Worsley line. As a consequence, WNR has estimated that the SWM requires 38 turnouts to maintain an efficient train operation on this line.

- In regard to lengths for crossing loops, WNR already has to limit some crossings at certain locations because of the existing train lengths.

v) *PwC and HCS's comments and recommendations*

- HCS has tested the justifications provided by WNR for key unit rates and has compared WNR's outcomes to benchmarks available in other Australian rail networks. The comparative results as submitted by Alcoa and reviewed by HCS against other industry construction benchmarks indicated that a variance with WNR in some instances of up to 20% but in the main uniformity generally existed. The items at variance were subsequently discussed with WNR.

- WNR has advised that WA is at a cost disadvantage to the Eastern States due to a comparatively lower intensity in competition and the additional transport costs to import manufactured products from the Eastern States. A comparative review was undertaken by HCS of base prices for similar products manufactured in Queensland and WA (eg. concrete pipes and culverts) and the comparable base labour rates in both states. The results appear to be similar with about a 4% variance in both directions.

- A number of WNR's current and potentially future suppliers, both in WA and in the Eastern States, have indicated that there was a cost differential of up to 20% on some items when the WA Government Railway Commission (prior to the Government's sale of the freight business to ARG) manufactured its own track components, were not standardised with Eastern States' networks and cross Australia transport costs were much higher.

- HCS is of the view that, with efficient purchasing practices, any cost differential should progressively reduce to zero over the next 3 to 5 years because:

  ◊ WA has standardised its rail components through the use of the DIRN Code of Practice;

  ◊ new technology being introduced by manufacturers (eg. reuse of standard moulds) to reduce manufacturing costs and overheads; and

  ◊ substantial reductions in average long haul freight costs.

- GHD have typically utilised a standard available price list for large quantity purchases, with the size, mix and types required unknown. HCS is of the view that this list price is the starting level which will be discounted under a competitive tender. A new 100km rail construction would stimulate price competition to levels generating a real discount below the list price, especially when there is more than one supplier, eg. with reinforced concrete pipes (RCPs) and reinforced concrete box culverts (RCBC)s.

- Suitable crushed rock ballast material used by WNR is sourced from a number of quarries for various sections of track. The prices when used in smaller maintenance type quantities are quoted ex quarry from $14.50/tonne at Perth to $22/tonne at Merredin. WNR tenders received ex quarry for recent larger quantities vary from $14/tonne near Kalgoorlie to $17/tonne at Brunswick giving a price reduction of up to 6%. Given the assumed large purchase size and likelihood that much of the transport cost will be absorbed in a competitive tender, HCS recommends all ballast purchases assume a standard unit rate of $14.60/tonne delivered.

- The definition of “earthworks” should be expanded to note that “balanced cut and fill” representing a fixed percent of earthworks can be included, and “imported fill from borrow no further than 3km haul distance” should account for the average remaining percent fill requirement. Following clarifications with WNR, correction of an assumption on capping layer costs and subsequent testing the cost efficiency of other lines based on lower availability of cut to fill resulted in a rate of approximately $17/m^3 being deemed reasonable.

- An assumption has been made by WNR that the delivery of supply items would be to Midland Yard, and then a rate for transport of materials to site. Whilst WNR and GHD have used a broadly accepted methodology and rate, HCS is of the view that in a competitive 100km construction tender, the price required could be inclusion of delivery to the site and hence much or all of the cost of transport would be absorbed into the material cost as an outcome of the competitive process. This has recently been demonstrated in the WNR sleeper and turnout contracts where alternative transport modes were considered. WNR has included inputs of $0.10/t-km to $0.12/t-km for transport of materials from the Midland depot, however HCS considers that this is a charge more likely to be applicable to smaller maintenance works.

- WNR applies remoteness factors to bridges, culverts and level crossings, with the factor applied to the full cost. The GHD remoteness factors from Perth, are in HCS’s opinion unrealistic. Whilst little documentary information is readily available relating to recent major rail or road projects in country areas, some direction information has been verbally obtained. With regard to culvert and bridge construction, WNR track inspection staff have indicated that a rural town with a population upwards of 5,000 will have suitable personnel

experienced in standard type bridge and culvert construction. Towns where competent culvert and bridge construction staff are available and have undertaken work for WNR include Albany, Bunbury, Esperance, Geraldton, Kalgoorlie, Narrogin and York, with workers generally returning to their homes each night. HCS recommends the use of the WA Department of Housing and Works published remoteness factors which feature a maximum allowance of 15% for the most remote locations within the WNR network area and factors of 0-10% for other less remote locations.

- The following table summarises the proposed and recommended unit rates of major capital items.

Item	Rates		Comments
	WNR	Recommended	
Earthworks including capping layer①	$17.00/m^3	$17.00/m^3	Testing of cost efficiency of the four lines based on lower availability of cut to fill resulted in a rate of $17.00/ m^3 being deemed reasonable.
Ballast – 300mm thick – supply ex quarry	$13-15/tonne	$14.60/tonne	Recommended price based on an estimated efficient statewide average price for large quantities (Alcoa quote SWM).
Sleepers – Concrete NG including fasteners complete	$72.00ea	$72.00ea	Worsley line contract price.
Sleepers – Concrete SG including fasteners complete	$81.00ea	$81.00ea	EGR contract price.
Rail – 50kg/m supply to Midland weld to 110m	$103,240/km	$103,240/km	Comparable with Queensland Rail (QR) and NSW, with freight to Perth.
Rail – 60kg/m supply to Midland weld to 110m	$118,140/km	$118,140/km	Comparable with QR and NSW, with freight to Perth.
Track Laying – place all materials (excluding	SG $100,000 NG $94,000	SG $100,000 NG $94,000	Comparable cost with QR and NSW.

Item	Rates		Comments
	WNR	Recommended	
turnouts)			
Turnouts – 60kg rail 1:12 concrete bearers NG	$178,000ea	$168,000ea	SWM contract price plus $34,000 transport & installation on a greenfields site.
Turnouts – 60kg rail 1:12 concrete bearers SG	$180,000ea	$170,000ea	EGR contract price plus $42,000 installation on a greenfields site.
Culverts – RCP & RCBC supply and install	Unit rates as quoted each size	Reduce GHD unit rate prices by 5% and max remoteness factor of 1.15	Installation cost will decrease cost further on major greenfields site. WA Department of Housing and Works Remoteness Factors should be used.
Bridges – all types	SG unit rates average $11,200/m	GHD unit rates to be used and max remoteness factor of 1.15	Use the actual span and width for bridges in line section. WA Department of Housing and Works Remoteness Factors should be used.
Level Crossings	Unit rates	Highways, etc - not to exceed $15,000ea Major Roads - not to exceed $9,600ea Occup, minor roads - not to exceed $2,000ea Use appropriate m^2 rate and max remoteness factor of 1.15	Actual sizes of crossings used for calculation. ▪ Bitumen - $80/m^2$ ▪ Concrete - $70/m^2$ ▪ Gravel - $55.00/m^2$ ▪ Timbered - $35.00/m^2$ ▪ Rock/Other - $20.00/m^2$ WA Department of Housing and Works Remoteness Factors should be used.
Track Signs	$2,000/km	$2,000/km	
Fencing	$70,000/km	$70,000/km	Steel mesh or equiv public safety fencing only.
Signals	Various unit rates for range of inputs	As per WNR rates	

Item	Rates		Comments
	WNR	Recommended	
Communications	Various unit rates for range of inputs	As per WNR rates	Whilst alternative means of providing communications are possible, the Code requires reference to replacing existing assets with assets to meet MEA projected demand. Only this cable option to communication assets is seen as feasible.

Note①: Includes 0.23m capping layer. Earthwork width assumptions are NG and SG top width of 6.0m plus batters of 1m (vertical) and 1.5m (horizontal), earthworks of $10m^3/m$ and a capping layer $6.0m^2/m$. For double track assume a top width of 10m, earthworks $14m^3/m$ and a capping layer $10.0m^2/m$.

Source: PwC and HCS report to the Regulator; July 2003

- The following two tables provide some useful reference points to check the quantum of capital costs claimed by WNR with the GRV after adjustment for recommendations by HCS. However, it should be noted that benchmarking results from other jurisdictions form only broad reference points as the efficient capital costs for WNR will differ due to factors such as gauge, different traffic types (especially passenger volumes), different topography, axle loads, extent of road interfaces, etc.

Rail Lines	GRV Dollars Per Km		Comments
	WNR	Recommended	
EGR (857 km)	1,132,000	1,123,000	As a part of the DIRN, the EGR has some similarities to ARTC network with passenger traffic.
Esperance (400 km)	868,200	848,800	Lower volume track with no passenger traffic.
Leonora (262 km)	838,500	821,600	Lower volume track with no passenger traffic.
SWM (180 km)	1,062,000	961,500	The highest volume density on WNR network with passenger traffic.

Source: PwC and HCS report to the Regulator; July 2003

Rail lines	Regulator Determined ORC Values ($/km)	Comments
ARTC (4,442 km)	569,000	ORC value for network estimated by BAH for ACCC Undertaking. ARTC has fewer level crossings, flatter terrain, more moderate climate and simpler signalling systems than WNR, hence a lower maintenance costs for ARTC is expected.
QR Coal (1,919 km)	1,070,000	GHD (Brisbane) estimate (excluding electrification) for central Qld coal lines. Value completed as part on QR Access Undertaking to the QCA. The values by line vary from $980,000 to $1,170,000/km.
RIC - Hunter Valley Coal (1,115 km)	580,513	ORC component of $652.6m and a DORC value by BAH for IPART.

Source: PwC and HCS report to the Regulator; July 2003

vi) *BLL's comments and recommendations*

- PwC's and HCS's recommended unit rates are within benchmark tolerances. BLL has not had access to local (WA) market information that would make more accurate analysis possible. The context in which rates are obtained is an important pre-requisite for accurate costing and it is unknown in what context the quoted rates were obtained.

- The following additional benchmarks showing GRV for the Queensland rail lines are derived from the QCA Working Paper 5, Valuation of Assets, Draft Determination on QR's Access Undertaking, November 2000, Table 8.1, Year 2000 $s.

Rail Lines	Track Length (km)	GRV/Track Km ($)
Blackwater	696	1,166,076
Goonyella	776	1,018,732
Moura	244	984,709
Newlands	203	1,049,261

Source: BLL report to the Regulator; September 2003

- Pertinent points to make about the GRV for the Queensland rail lines and the GRV for the WNR rail lines are as follows:

- ◊ the EGR is topographically the most difficult rail line in the WNR network where the line traverses the Darling Range. It is also the line with the most demanding speed and axle load requirements. However these characteristics are partially offset by the duplicated track over the Darling Range and the sand plain country east of Koolyanobbing;
- ◊ the Kalgoorlie to Leonora line has the least onerous performance requirements;
- ◊ the SWM traverses sand plain and the earthworks costs could be expected to be relatively less expensive. However on a per kilometre basis there is comparatively a greater number of passing loops and junctions that increase the cost of signalling and turnouts;
- ◊ the difference in cost between the Kalgoorlie to Esperance line and the SWM should largely reflect the cost of CTC signalling. However the difference is not apparent; and
- ◊ all of the Queensland rail lines traverse the Great Dividing Range and are in tropical areas. Therefore earthworks and structures costs could be expected to be more expensive. Some of the Queensland lines have large lengths of duplicated track thereby partially offsetting the rate for earthworks and structures due to economies of scale.

- BLL considers that the GRV costs proposed for the WNR rail lines are at the lower end of the achievable range.

vii) *Regulator's views and comments*

- The key steps to completing a GRV estimate based on MEA are:
  - ◊ review asset databases;
  - ◊ establish existing network capacity, and current and reasonably projected future demand on the network;
  - ◊ complete an analysis of each asset class to optimise the network to a MEA;
  - ◊ assess the current replacement cost of the MEA; and
  - ◊ confirm GRV is at efficient costs.
- Submissions made by ARTC and Portman raised issues of over-engineering, based on track weight and ballast depth, and consequent excessive asset valuation. Both stakeholders based their analysis on benchmarking with other rail networks in Australia. Whilst benchmarking is an appropriate measure in

making comparisons between rail networks, care must be taken to allow for differences, such as traffic types, the nature of the freight task, topography and climatic conditions, when making network comparisons.

- In the submissions received from Alcoa and Worsley, a similar methodology to that of HCS was followed whereby relevant unit rates for components used in large-scale rail projects (eg. Queensland coal line extensions and Alice Springs-Darwin) were obtained and compared to the unit cost rates presented by WNR. In addition, recent rail valuation reports prepared for other state competition authorities (QCA in Queensland and IPART in New South Wales) were reviewed to determine a comparative and equivalent unit rate for the various capital components required to build a section of railway for both SG and NG at the MEA standard.

- The Regulator, in the Costing Principles Determination, has indicated that there are a number of approaches to calculate the GRV. These include:

  ◊ using best practice capital cost unit rates per track kilometre for an average unit cost including rail, track, bridges, signals and communications;

  ◊ using best practice capital cost unit rates per kilometre for basic formation, rail, ballast and sleepers. Adding to this a value for items such as bridges, culverts, level crossings, cross overs on a population basis (ie. a count of the number and length of each type of asset for each line sector) plus a capital cost estimate of an efficient signalling and communication system for the network; this is then allocated back to line sectors; and

  ◊ requiring a detailed independent valuation on a route section by route section basis, which includes specific, rather than average build costs.

  The Regulator has also indicated that for those routes with potential to breach the ceiling there is merit in requiring a detailed valuation of WNR's GRV by an independent railway engineering expert. For others, benchmarking costs against best practice capital cost unit rates is appropriate.

- The concerns raised by stakeholders were tested by PwC and HCS, the result of which is a recommended list of amended unit rates of major capital items. The Regulator has noted that the amendments are relatively minor in both numbers and amount. The main difference for the divergence in HCS's estimates from WNR's is based mainly on HCS using lower prices for turnouts, ballast and earthworks, a lower remoteness factor and, for the SWM, a lower formation height and ballast depth.

- The PwC and HCS recommended changes were subsequently reviewed by BLL. BLL's advice to the Regulator was that it considers the re-calculated GRV costs for the four WNR mainlines to be within benchmark tolerances.

- The Regulator has sought advice from PwC and HCS regarding Worsley's comment that WNR's proposed calculation of the GRV for the route sections in the SWM was calculated incorrectly as it was based on a route basis using a standard track and infrastructure specification and used average costs for components. PwC and HCS are both of the view that the WNR approach of using average build costs per route multiplied by the population data for each particular section of the route to calculate the GRV and MEA by route does not create a material adverse disadvantage to any stakeholders as sections are built in groups and hence averaging by route can been adopted.

- The Regulator understands that WNR owns four fibres of a 24 fibre optic fibre cable and uses all four fibres for its communication needs. There was no evidence to support that WNR has allowed for the cost of a communications system of which only 10% is required for railway operations in its estimation of communication cost. The Code requires that cost of the optic fibre cable be the lowest current cost to replace existing asset(s) that have the capacity to provide the level of service that meets the actual and reasonably projected demand, and are if appropriate MEA. The Regulator is of the view that WNR's portion of the capital costs for the 24 fibre cable has met that requirement.

- While the findings of PwC, HCS and BLL imply that WNR's proposed unit costs were reasonably accurate in the main, WNR will be required to adopt the amended unit rates and remoteness factors as recommended by PwC and HCS.

- The Regulator agrees with WNR's proposal to use existing lengths for crossing loops, which range from 579 to 996 metres.

4.3 Operating Costs and Working Capital

i) *Costing Principles*

- Operating costs are costs directly associated with operational management of the network. They reflect a centralised train control system and include compliance costs with WNR's safety accreditation requirements under the *Rail Safety Act* and requirements for emergency management.

- Operating costs also include the approved annual working capital charge that is calculated by multiplying half the WACC by the annuity.

- WNR will test whether the operating costs used for determining the floor and ceiling are efficient in the following manner:

- ◊ benchmarking will be used where it is available and comparable;
- ◊ for certain processes and activities unit costs from competitive tendering may be used;
- ◊ if the maintenance programs are based on accepted industry standards for maintenance which describe the scope and frequency of the activity then this may be considered to be efficient;
- ◊ actual costs may be used where the consumption and scope are efficient (eg. train controller's salaries if the number of controllers and their range of duties are efficient by benchmarking); and
- ◊ actual costs may also be used where the costs come from a competitive market such as insurance, or are regulatory costs (such as the cost of rail safety accreditation).

- In measuring efficiency, WNR recognises that these costs change over time especially as a result of innovation and technological change.
- Allocation of non-sector specific operating costs is to be in accordance with the allocation rules using Gross Tonne Kilometres (GTKs) or train movements.

ii) *Summary of WNR's submissions*

- Operating costs are allocated in accordance with the allocation rules in the Costing Principles and are based on WNR's actual costs for train control, train scheduling, emergency management, and the cost of information reporting and based on a full year estimate for calendar year 2002. Some of these costs are market-based prices.
- The assumption included in the APM is that train control is centralised. WNR has not allocated train controllers by numbers to routes. The total cost of train control has been allocated based on train movements.
- Refer to Appendix 2 of this Determination for WNR's proposed operating costs and working capital by routes and route sections.

iii) *Comments received in the public consultation process*

- WNR has based the calculation of "operating costs" on its actual costs, or the costs of its contractors, in operating and maintaining the existing railway infrastructure. However, WNR's actual operating costs are irrelevant for the purposes of calculating "operating cost" under the Code. This is because the Code requires "operating costs" to be based upon costs that would be

incurred were the railway infrastructure replaced using MEA, not on actual costs of operating and maintaining existing railway infrastructure.

- The Code allows the railway owner to recover only the "efficient costs" of operating and maintaining the railway infrastructure on the basis that the railway infrastructure requires only the operation and maintenance levels of MEA. In this regard, WNR fails to demonstrate that the costs are based on efficient practices.

- With respect to operating costs (roughly train control and planning), ARTC estimated a unit cost of around $417/000 train kms for its operations (compared to the 1993-94 national average of $714/000 train kms and $481/000kms world's best practice (exc. planning)). WNR submitted an operating cost of $4.6m with respect to the Forrestfield to Kalgoorlie segment. This translates to a unit cost of around $918/000 train kms using an estimate of around 5m train kms on this route. Notwithstanding different operating practices and signalling/communications on the WNR network, this cost would appear high even though WNR's costs are based on centralised train control.

- WNR operating costs as submitted were $9.38m for the four lines of which $2.66m has been allocated to the SWM. Alcoa is of the view these costs should not exceed $4.25m and $1.125m respectively. For the SWM, this is more than 50% below the WNR estimate.

iv) *PwC and HCS's comments and recommendations*

- WNR's approach to calculating its total operating cost is to use its 2002 budget as the baseline benchmark and adjust for savings on labour costs due to the centralising of the traffic control operations plus an allowance for Working Capital.

- HCS, after reviewing WNR's actual operating costs, is of the view that the proposed operating costs in the APM (excluding working capital and after taking into consideration further reduction that would result from a centralised train control facility) appear to be reasonable,.

- The key issue in relation to operating costs is how to most fairly allocate them between route sections. The approved Costing Principles allowed for an allocation based either on GTKs or train movements. It is noted that if train movements were predominantly used this would result in a relatively higher proportion of the operating costs being allocated to the SWM due to its higher number of short haul movements. Likewise, the EGR, Esperance and Leonora lines would have relatively higher costs under a GTK allocation method.

- PwC and HCS recommend that the Regulator consider the merit of revising the allocation method to an alternate method such as a hybrid of 50:50 train movements and GTKs.

- The following is a comparison of WNR's proposed and recommended operating cost allocation.

Rail Lines	Operating Costs Less Working Capital			
	WNR's Proposed		Recommended	
	Total	$ Per Km	Total	$ Per Km
EGR (857 km)	1,294,270	1,510	2,078,618	2,425
Leonora (262 km)	67,396	257	135,369	517
Esperance (400 km)	269,490	673	611,271	1,528
SWM (180 km)	2,045,583	11,428	1,366,989	7,637

Source: PwC and HCS report to the Regulator; July 2003

v) *BLL's comments and recommendations*

- In relation to operating costs (not including working capital), it is possible to refer to two methods of cost estimation that could assist in validating WNR's submission. These are, benchmarking and bottom-up derivation, and the following comments cover estimates for the SWM.

- BLL is of the view that cost information is available from a similar determination for benchmarking purposes. Whilst information describing the exact nature of the scope of services for individual items is not available, an overall assessment should lead to a benchmark that can be used as a "sensibility check". The QCA's Draft Determination on QR's Access Undertaking, December 2000 indicates expenditure on these items as follows:

  ◊ access management – identified as "Business Management" in the QCA Determination and estimated as 1.5% of total costs;

  ◊ train control – the QCA's benchmark was 2.5% of total revenue (costs) on a stand-alone basis which was close to the bottom up derivation based on one train controller per 200,000 train kms;

  ◊ train scheduling and operations planning – identified as "operations management" in the QCA Determination and estimated as "less than 0.5% of the assessed stand-alone cost";

  ◊ RAMS management – not separately identified by the QCA;

- ◊ safe working management – included in train control and train scheduling and operations planning in the QCA analysis;
- ◊ telephone charges – incorporated into maintenance charges in the QCA Determination; and
- ◊ radio licences - incorporated into maintenance charges in the QCA Determination.

Overall, this benchmarking would result in an estimate of operating costs being approximately 10% of total costs. QCA's "total costs" included maintenance, operating and capital charges. In the context of the SWM, this would equate to an operating cost of 10% of $22m (the total cost recommended by PwC and HCS) or approximately $2.2m.

In making an assessment of costs with the benchmarking method, it is often necessary to iterate after once assuming approximate cost levels. In the above analysis where costs have been benchmarked against "total costs' the starting point has been the PwC's and HCS's recommendation. Since operating cost is overall such a small percentage of total costs, the effect of the initial assumption is minor compared to the other more substantive costs of capital cost and maintenance cost.

- In deriving bottom-up costs, an estimate of the resources for each function is required:
  - ◊ access management – legal, economic, environmental compliance, safety compliance at ½ Full Time Equivalent (FTE) staff for each function at a unit cost of $200,000 (recognising professional status and including furniture and accommodation), total cost $400,000;
  - ◊ train control – based on one train controller per 200,000 train kms (Draft Determination on QR's Access Undertaking, December 2000) at $100,000 per staff resource including equipment, 11 staff (calculated from 2.2 million train km for the SWM), total cost $1.1m;
  - ◊ train scheduling and operations planning – estimate one FTE at $150,000 including equipment including specialist IT software;
  - ◊ RAMS management – estimate one FTE at $100,000;
  - ◊ safe working management – estimate one FTE at $150,000;
  - ◊ telephone charges – these relate to external charges such as with Telstra for rental of public network capacity and mobile phones, estimate $100,000 per annum; and

◊ radio licences – estimate $50,000 per annum.

Total cost by the bottom-up method is $2.05m.

- A comparison of operating cost estimates is shown below.

Rail Lines	Operating Costs Less Working Capital ($)			
	WNR's Proposed	PwC and HCS Recommended	BLL Benchmarked	BLL Bottom-Up
SWM (180 km)	2,045,583	1,366,989	2.2m	2.05m

Source: BLL report to the Regulator; September 2003

vi) *Regulator's views and comments*

- The use of actual costs has been accepted in the approved Costing Principles on the basis that they can be shown to be efficient through benchmarking and competitive tendering. Reviews of WNR's actual costs and budgets have provided a level of confidence that the proposed costs are reasonable.
- In the Costing Principles Determination, the Regulator identified the key operating cost drivers to be:
  - ◊ the frequency of services, eg. track used for daily passenger services typically requires more frequent inspections whereas grain lines are often only used for a small part of the year and receive far fewer inspections;
  - ◊ traffic density, eg. GTKs;
  - ◊ average speed for freight and passenger services;
  - ◊ actual average axle load relative to maximum axle load;
  - ◊ climate related factors, eg. higher costs can be caused by extreme heat causing rail buckling or higher rainfall increasing the rate of degradation; and
  - ◊ the safety, quality and reliability requirements of customers and other stakeholders.
- For benchmarking purposes, WNR's working capital costs need to be deducted from the operating costs total to enable better comparability with other jurisdictions. Unfortunately, this adjustment was not made by some stakeholders in their review of WNR's proposed operating costs.
- PwC, HCS and BLL have indicated to the Regulator that they are of the view that WNR's estimate of the total operating costs (not including working

capital) for the MEA network are reasonable. On the basis of this advice, the Regulator accepts WNR's estimate of the operating costs as provided.

- As indicated by PwC and HCS, the key issue is how to fairly allocate this cost between route sections. The current WNR approach elects to predominantly use train movements for allocation which results in the SWM being allocated 57% of operating costs for the four mainlines due to the shorter average haul length.

- PwC and HCS have recommended to the Regulator that a 50:50 allocation split between train movements and GTKs for all operating costs as this may provide a more balanced and equitable allocation method. However, BLL using benchmarking and bottom-up approaches calculated an operating cost for the SWM that is similar to the WNR proposed operating cost for the four routes.

- The Regulator is of the view that there is a strong relationship between the train control function and train movements. WNR's train control cost represents about 70% of total operating costs. Other operating cost functions, such as safe working inspections, customer service and operations management, also have a correlation with train movements.

- The Regulator believes that the number of trains managed on a line (as a percent of total train movements) provides a fair indication of the intensity of management resources applied to the line. On the basis of the above arguments, the Regulator has accepted WNR's proposed methodology of using 100% train movements in the allocation of operating costs between route sections.

4.4 Maintenance Costs

i) *Costing Principles*

- WNR uses a track maintenance model which calculates the cost of maintaining the track infrastructure with the following assumptions:

  ◊ the track infrastructure is new at year 1 and is maintained to realise the defined economic life of components of the asset;

  ◊ the infrastructure maintenance levels and the frequency of the activities are deemed to comply with the Australian Standard AS4292 Parts 1 and 2 which specify safety requirements of the Railway Safety Management System;

  ◊ WNR's maintenance practices also comply with the Codes of Practice for both the SG and NG network;

- ◊ the maintenance regime is broadly classified into routine maintenance and cyclical maintenance;

- ◊ there are two major activity classifications within routine maintenance, namely routine inspections (include patrolling, on-train inspection, track condition monitoring, defined event inspections by patroller and structures inspection), and routine maintenance (which is the corrective action taken as a follow up to routine inspections); and

- ◊ cyclical maintenance represents tasks that are undertaken at regular intervals which are necessary to achieve the expected asset life (include track resurfacing, rail grinding, ballast top up and cleaning, rail defect removal and structures maintenance to achieve economic life, as well as firebreaks, scrub slashing, drainage, access roads and road seal on level crossings to meet operational and safety requirements).

  As the level of maintenance activity varies over the life of the asset, the net present value of the projected stream of maintenance costs that occurs over the life of the asset is calculated and annualised to derive an average annual maintenance charge over the life of the asset.

- The cost of repairing incidents such as fire and flood, or damage caused to the track as a result of derailments or accidents has been included in maintenance costs but only to the extent they are not recoverable from insurance or operators. The cost of repairing incidents will not be included if it can be shown that WNR is negligent in its responsibility as a railway owner. WNR intends to calculate incident costs based on a historical cost approach.

- Routine maintenance of signalling and communications is based on industry accepted inspection regimes and fault history. It includes specified periodical inspections and procedures (including testing) and responses to faults. Cyclical maintenance is significantly less important for signalling and communications and includes component rebuilds to achieve economic life. The signal and communications maintenance model is incorporated as part of the APM. The annual charge is based on an annualised value of the net present value of maintenance costs stream.

- Track and signalling maintenance costs are directly allocated to routes based on the nature and population of the infrastructure. These costs are then allocated to route sections according to train movements.

- Major periodical maintenance (MPM) is set at zero on the understanding that MPM is an asset renewal program to maintain the infrastructure in perpetuity. However, re-railing, rail grinding and re-surfacing, and ballast cleaning may be permitted as cyclical maintenance activities if they were considered necessary to achieve the targeted life of the assets.

ii) *Summary of WNR's submissions*

- WNR has been unable to directly compare the proposed maintenance activities to similar activities elsewhere because of the nature of the model in the Regime. The unit rates used are based on competitive costs achieved through WNR's contractors who provided contracted maintenance services.

- Maintenance activities typically include inspections, routine maintenance and cyclic maintenance:

  Inspections include patrolling, on-train inspection, track geometry car and structure inspections. Routine maintenance includes broken sleeper replacement, ballast top up following tamping, mechanical corrective surfacing, recant curves, turnout maintenance, track corrections following inspections an ultrasonic testing. Cyclic activities include firebreaks, scrub slashing, drainage, access roads, weed spraying and rail grinding.

- WNR's infrastructure maintenance management cost has been included as a maintenance cost, rather than an overhead cost.

- Signalling and communications maintenance costs are based on WNR's actual costs for routine and cyclic maintenance for the signalling and communication assets by route section and include infrastructure maintenance management costs.

- Refer to Appendix 2 of this Determination for WNR's proposed maintenance costs by routes and route sections.

iii) *Comments received in the public consultation process*

- ARTC's 2001-02 infrastructure maintenance unit cost, which includes routine maintenance, MPM and incident costs, is estimated at around $1.45/000 GTK (2000-01). This equates to around $11,500 average per km on the ARTC network, compared to historical national average of around $4.88/000 GTK (1993-94).

  ARTC estimates utilisation of the Forrestfield to Kalgoorlie route to be around 10b GTK per annum. WNR has submitted maintenance expenditure of $15.7m (excluding MPM) with respect to the Forrestfield to Kalgoorlie route. This implies a unit maintenance cost of around $1.57/000 GTK (or around $20,000/km). If MPM were to be included, WNR unit maintenance costs would be even higher. Notwithstanding topographical differences (although the Forrestfield to Kalgoorlie route could be considered as similar to the average ARTC network in total), and the higher volumes on this route, it would still appear that WNR unit maintenance costs are in excess of ARTC's.

Given that both cost structures are predicated upon unit rates incurred through a competitive tender process, and are presumably comparable, it would appear that the scope and frequency of activity on the Forrestfield to Kalgoorlie route is generally higher than that on the ARTC network on average.

- WNR maintenance cost as originally submitted is $29,123/km as compared to Alcoa's estimate of $11,500/km. This estimate has been collated from industry costs which suggests that any figure above $12,000/km cannot represent a maintenance cost for a MEA installation. Whilst the current costs on the SWM may well be in the order of $50,000/km, this has no relevance to the costs required to maintain a well constructed, high grade track as proposed to satisfy the MEA requirement under the Code. QR is maintaining existing coal rail tracks for $12,000/km, ARTC is maintaining remote interstate track for under $10,000/km. On this basis, WNR should be able to maintain MEA track for less than $12,000/km.

- If WNR's maintenance costing is to be based on its existing practice, it should be reviewed and benchmarked against current best practice.

- The WNR track and civil maintenance task is asset managed in house with the works outsourced. The works are largely outsourced to a single contractor however they do not include special tasks, eg. rail flaw detection, or major upgrades. The maintenance contract is structured as an all-inclusive labour rate for a set resource. The rate includes recovery of overheads, contract management, contract supervision, equipment ownership and operating costs and the like. The following comments are offered in relation to the existing arrangement:

  - ◊ the resource is structured around the existing asset and therefore may not be appropriate for an MEA;

  - ◊ the public tender process was conducted in 1995-96 with current rates set by escalation clauses within the agreement and also by negotiation when the resource is altered. This may not reflect current, or greenfields, best practice; and

  - ◊ the model used for the outsourcing is also not necessarily the most economic given some duplication in the Principal's and Contractor's overhead structure.

- It is unclear from the information provided how the variable economic life of individual components within the track structure is handled. As an example, ballasting is listed as a maintenance activity, does this imply WNR has factored into the maintenance cost an annual allowance for full replacement

of the ballast every 25 years, is it MPM and therefore ignored or is it taken up in how the asset is capitalised?

iv) *PwC and HCS's comments and recommendations*

- PwC and HCS are concerned that the use of separate unit rates, an approach involving the summation of costs for some 64 maintenance activities may lead to WNR's cost outcomes which are not efficient, due to:
  - ◊ opportunities to reduce costs by completing activities concurrently as part of a full package maintenance service;
  - ◊ the sizeable gap between HCS and WNR unit rate cost estimates for some activities, eg. WNR seeks a labour cost per day of $585/day whereas PwC and HCS believe an efficient labour cost per day of less than $400 is feasible. This gap of over 30% is concerning as labour typically comprises 50-60% of most maintenance activity costs. PwC and HCS completed a review of the WNR justification of the $585/day and view some cost allowances as not efficient best practice, particularly overtime and vehicles; and
  - ◊ uncertainty over the adequacy of the cost reduction applied by WNR to reflect the starting as new assumption for the MEA network.
- Discussions held with WNR permanent way staff highlighted that a number of maintenance tasks listed separately in the APM are actually undertaken concurrently (eg. curve lubrication, track alignment, walking curves, etc.). Consequently, when aggregating costs calculated as separate items, the subsequent total cost may become significantly larger than a packaged cost covering numerous activities.

  Aside from patrolling, signals and communications, and some cyclical maintenance (eg. grinding), the majority of tasks are charged for by JHCE on a time/labour basis plus materials used (eg. level crossings). In discussions with HCS, WNR and JHCE indicated that in estimating the unit rate costs for maintenance, JHCE has estimated the time required to undertake each maintenance item individually.

  On reviewing a selection of maintenance items on SWM, it become clearer that many APM items have a travel cost and safety component included which is shown can account for 40% of the item cost. Whilst some safe working and travel can justifiably be included, to achieve efficient work practices, the time required for each joint repair can conservatively be reduced by 40%, (made up of 15% in labour and vehicle unit cost with 25% in travel and safe working unit costs) hence increasing the work output undertaken per day by a gang. The WNR methodology largely appears to

relate to the time/cost in undertaking an individual item, and not the cost of maintaining all items in a specific length of track at one time over a specified period. In summary, HCS believes the cost of the sum of the components as identified separately in the APM exceeds the efficient cost of the whole for a MEA.

- It appears that a considerable time variance, waste and duplication is apparent in the undertaking of the maintenance activities to ensure a safe and efficient working railway. It can then be estimated that a cost saving can be achieved in the order of 20-25% in time savings.

- Additional savings can also be achieved in the order of 15-20% from the calculation of effective labour, machinery and transport charges to those currently negotiated with JHCE. Details of these have been presented separately to WNR for reference and comment.

- Comparison for benchmarking on a unit rate basis with other railway infrastructure operators in Australia is difficult as most do not have the detailed figures for each maintenance item. Other operators work on a section by section scheduled maintenance basis with all items inspected or maintained through a quality assurance system. Incident occurrences, such as storms, callouts or broken rails are budgeted for as unscheduled maintenance which is determined by historical reference for the time of year, age of rail, etc.

- Following consideration of WNR's detailed submissions, PwC and HCS recommend the use of a flat rate per kilometre as the basis for setting efficient maintenance costing levels for the APM. Whilst arguably there is some loss of technical accuracy in not costing maintenance as the sum of activity frequency multiplied by individual unit costs, PwC and HCS continue to hold the view that the use of single unit rates per kilometre for maintenance costs provides a superior approach in this instance.

- Use of per km unit rates is a common industry approach to assess cost efficiency and is regularly used by other network owners such as ARTC, Rail Infrastructure Corporation, Freight Australia and QR. Hence the approach is more readily amenable for completing benchmarking comparisons. It is also a far simpler approach for stakeholders to understand.

- Furthermore, the approach is easier for the Regulator to administer, check, and verify as it is significantly less prone to gaming.

- The table below provides some useful reference points to benchmark the quantum of maintenance costs claimed by WNR. However, it is noted that these results form only broad reference points as the efficient maintenance

costs for WNR will differ due to factors such as different capitalisation policies, different traffic types (especially passenger volumes), different climates, etc.

Rail Lines	Maintenance Costs ($/km)	Comments
EGR (857 km)	18,568	As a part of the DIRN the EGR has some similarities to ARTC network.
Esperance (400 km)	8,984	Lower volume track with no passenger traffic – saltpans, undulating terrain.
Leonora (262 km)	11,381	Lower volume track with no passenger traffic – flat flood prone terrain.
SWM (180 km)	25,674	Highest volume density on WNR network with some passenger traffic.
ARTC (4,442 km)	8,060	ARTC has fewer level crossings, flatter terrain, more moderate climate and simpler signalling systems than WNR, hence a lower maintenance costs for ARTC is expected. 2001/02 Annual Report $35.8m in infrastructure maintenance.
QR Coal Blackwater (695 km)	20,000	Medium/high volume coal 64mgt/an, (electrification, corporate overheads, “asset management” deleted).
QR Coal Goonyella (776 km)	26,600	High volume coal 118mgt/an, (electrification, corporate overheads, “asset management” deleted) .
QR Coal Moura (224 km)	12,200	Low volume coal 8mgt/an, built early 1960’s on graded escarpment, non-electrified – (corporate overheads, “asset management” deleted) .

Source: PwC and HCS report to the Regulator; July 2003

- As a comparison, the most similarly used NG operation to the SWM is QR’s Moura line which is a mainly coal and a small amount of general freight with the heavy loads all travelling in the one direction. Whilst the line provides access to a number of coal mines, branch grain lines, and to a power station, it has a similar density of turnouts and passing loops (although these are longer) to the SWM.

  The Moura line currently carries 8mgt/annum, and has an annual maintenance cost of $12,200/km. If that cost was extrapolated to 14mgt/annum, the annual cost would not exceed $14,000/km.

- The following table summarises the recommended maintenance costs which HCS arrived at by applying standard efficient cost unit rates for each of the

four lines. The recommended rates have been set to reflect that costs will be slightly below these levels early in the life of the line and rise to levels slightly above the recommended levels from years 6 to 10, depending on volumes with the addition of some new cyclical maintenance activity, which occurs as a line transitions from new to mid-life.

Rail Lines	Maintenance Costs ($/km)			
	WNR's Proposed		Recommended	
	Total	Per Km	Total	Per Km
EGR (857 km)	15,741,030	18,568	13,708,543	16,000
Leonora (262 km)	2,344,840	8,984	2,098,904	8,000
Esperance (400 km)	4,512,433	11,381	3,977,330	10,000
SWM (180 km)	4,803,315	25,674	2,688,720	15,000

Source: PwC and HCS report to the Regulator; July 2003

v) *BLL's comments and recommendations*

- WNR's APM contains two elements that are inconsistent with a MEA approach to maintenance.

  Firstly, certain maintenance activities have been included that would not be expected to exist when a MEA construction standard is employed. In the main, the differences between the APM and a MEA construction approach relate to the use of materials in the construction, with MEA materials and components having significantly lower deterioration than non-MEA materials and components.

  Secondly, the APM double counts maintenance effort in that when certain more modern maintenance methods are employed, other maintenance activities could be expected to be eliminated or reduced compared to less modern methods.

- The following observations can be made on the cost output spreadsheet of the APM for the SWM:

  ◊ A number of activities receive corrective maintenance in the last year of their life, a practice that is not efficient. Examples include insulated joints, turnout bearers, fastening replacement, level crossings, periodic resurfacing, rail grinding, structures (bridges, RCBs), ballast top up and rail weld rectification.

◊ A number of activities are not consistent with MEA construction, ie. the work is not required or a reduced scope of work could be reasonably expected. Examples include:

Inspections – Concrete sleepered track is not prone to heat buckling. To suggest that the scope of inspections due to heat after 10 years of operation on concrete sleepers is 5 times in the first year is unrealistic;

Corrections following patrolling – The assumption is that as assets deteriorate with age and wear, the scope of corrections (component replacement and track geometry) increases. The WNR provisions for corrections are over estimated because the profile of the correction activity is one that could be expected with timber sleepers and because the APM contains all the elements of maintenance used to reduce the amount of this ad-hoc corrective activity, such as rail grinding and bog hole rectification.

Insulated joints – The APM suggests that every 3 years an expenditure of approximately $79,000 per track km is made on insulated joints as corrective maintenance. The frequency of this maintenance is the same regardless of track section on the SWM and regardless of tonnage and the life of the component is the same at 18 years. This profile of expenditure against tonnage and age is not efficient practice. Efficient practice would see a more direct relationship to tonnage and would not have quanta as high as proposed. It should be pointed out that MEA constructed insulated rail joints are factory constructed glued joints with bolted fastenings not designed to be maintained during their life. This style contrasts with the older style of mechanical insulted joints that were field assembled and contained loose insulation retained in place by the fishplates and fishbolts. Given that most if not all maintenance for MEA insulated joints is performed by other maintenance programs such as rail grinding, resurfacing or correction after inspection, the level of expenditure points to replacement or the maintenance regime is one more aligned to non-MEA construction.

Turnout maintenance – The WNR maintenance approach to turnout bearers receiving major work at the 10 year and 20 year life points is more relevant to non-elastic fastening timber bearers. Where modern elastic fastening systems are used on timber bearers this type of maintenance is relatively light, and if coupled with the use of heel-less switchblades and glued insulated rail joints the incidence of fastening loosening on timber bearers is rare. While turnout bearers can deteriorate due to wheel impacts caused by poor rail surface or substandard formation properties, it is noted that the maintenance programs proposed by WNR include bog hole cleaning, ballast cleaning and formation repair. Turnout rail grinding has also been performed in the WNR network. Therefore there should be

little reason to expect relatively major work would be required, even with timber bearers.

Corrections following patrolling – The WNR maintenance strategy has the hallmarks of a modern strategy with inclusion of rail grinding, regular resurfacing, ballast cleaning, bog hole elimination, insulated joint maintenance, turnout maintenance and rail defect removal. It is therefore surprising that the SWM would require 94 days of an 8 man team's time during the first 10 years and up to 188 days in the third correction period. The "correction" program and costs are excessive in the light of the MEA construction and preventative maintenance program. Also incompatible with the preventative maintenance program is the concept that greater degrees of correction work occur over time. If resurfacing, ballast cleaning, rail grinding, turnout bearers and bog hole cleaning are being performed properly the deterioration of the general structure should not significantly accelerate with time. The APM indicates a doubling of effort.

◊ A number of unit costs are not efficient. Examples include inspections, rail grinding, ballast clean, and level crossings.

- A media release on 20 January 2002 by JHCE indicated a further 5 year term to provide WNR with maintenance services. The contract included the SG and NG networks, a total of 5,600kms track at an estimated value of $150m. The total maintenance expenditure on the SWM (179kms) under the MEA regime proposed by WNR is $9.3m over the first 5 years and excluding MPM.

  In the QCA's Working Paper 2 of the Draft Determination on QR's Access Undertaking, December 2000, relationships between tonnage and maintenance cost variability are established for QR's NG tracks transporting bulk products, not dissimilar to the SWM. Cost variability increases with tonnage mainly due to the MPM component increasing. That is, the renewal of worn out components. In other words, the non-MPM components of cost for many tracks are relatively unaffected by tonnage. At the tonnage range of 10 to 15m tonnes the proportion of variable (MPM) to total costs is approximately 35%. The proportion of non-MPM costs to total costs could be expected to be 65%.

  Whilst all sections WNR's network cannot be compared on a like basis as the SWM, a large percentage can be. At $9.3m for 5 years over 179kms, the total WNR network would require an expenditure of $288m for non-MPM work. The non-MPM work is approximately 65% of the total, therefore making the total expenditure approximately $440m. If only half of the network is considered then the expected expenditure may be in the order of $220m which is still well above JHCE's projected revenue. The other half of the network will also be subject to expenditure further increasing the expected

revenue. Considering the probability that the JHCE projection includes some MPM work the difference in projections is very large.

- Of all of the networks in Australia that could be compared with the SWM, the Moura line is the closest. In the QCA's Draft Decision an extensive analysis of QR's maintenance costs, including MPM, was conducted. Working Paper 2 of the Draft Decision points to an expected total maintenance cost for concrete sleeper track of approximately $18,000/km on an on-going sustainable basis including MPM but not including upgrades. A comparison of the Moura line and the SWM is provided below.

Configuration	Moura Line	SWM Line
Mainline length	180 kms	179 kms
Curve < 600m/<402m	35 kms/18 kms	17.4 kms
Predominant soil	clay	Sandy
Topography	Great Dividing Range	Coastal Plain
Small level crossings	128	59
Large level crossings	63	56
Bridges (underbridge)	22	36
Tonnage	10 to 12 MGT	10 to 14 MGT
Safe working system	CTC	CTC

Source: BLL report to the Regulator; September 2003

- Were a bottom up analysis to be performed using appropriate activity scopes and unit rates, and using the Moura line as a benchmark as a "sensibility check", the expectation for the SWM would be approximately $20,000/km including indexation since the QCA decision and MPM. Where only non-MPM is considered and where a MEA construction is assumed, an expectation of the maintenance cost for the SWM is approximately 65% of that quantum or $13,000/km track maintenance.

- As a result, the maintenance costs from the various sources can be shown below.

Rail Lines	Maintenance Costs ($/km)		
	WNR's Proposed	PwC and HCS Recommended	BLL Indicative Estimate
SWM (180 km)	25,674	15,000	13,000

Source: BLL report to the Regulator; September 2003

- Comparatively, the HCS estimates provide a closer approximation to maintenance costs than the APM. The differences between WNR's estimates and HCS estimates of maintenance costs are due to "technical efficiencies" as a result of completing maintenance activities concurrently as well as due to overlapping scopes of work especially in the preventative and corrective strategies embodied in the estimating process in the APM. In addition, the APM contains anomalies that tend to over-estimate costs.

- If individual activity scopes were to be estimated in the context of the entire maintenance program occurring and were the individual activity unit rates to be estimated in the context of other activities occurring simultaneously, the APM has the potential to produce the most accurate result of any approach.

- In order to carry out this task there are two main challenges. Firstly, estimates need to be made in the context of MEA construction and since MEA construction is uncommon in Australia, particularly where tonnages of the current WNR lines are concerned, the body of expert knowledge is very limited. Secondly, practicing maintenance personnel need to explore the opportunities available in the performance of activities concurrently, thereby maximising economies of scale and the impact of preventative maintenance strategies on corrective maintenance.

vi) *Regulator's views and comments*

- The key issue from the access seekers' submissions, the responses received and from discussions, is that there appears some scope to achieve a more cost effective completion of a maintenance outcome than estimated by the completion of some 64 individual maintenance activities at an assumed cost based on standalone completion of individual tasks. In reality, WNR can achieve significant technical efficiencies by completing many of the tasks concurrently.

- The Regulator, in the Costing Principles Determination, has indicated that unit rates will need to be assessed against the number of units consumed to ensure operating (productivity of inputs) and technical (type and combination of inputs) efficiency. Benchmark unit rates will also require adjustment for environmental factors as well as for factors such as the scope of the contract and the time elapsed since it was awarded.

- The Regulator is mindful that comparing WNR's maintenance costs for both technical issues and unit rates needs to be done on a "like for like" basis between networks, recognising the differences in track axle loads, equipment and what constitutes maintenance activities.

- The particular items of difference that PwC and HCS has identified include:

- ◊ common and joint costs have not been allocated to the activity unit cost rates, such as travel time, safe working requirements and equipment sharing;
- ◊ estimates of activity scope have been based on WNR's experience with the existing non-MEA track; and
- ◊ activity frequencies have been set independently of each other.

- BLL has identified a number of inconsistencies with WNR's MEA approach to maintenance as calculated in the APM.
- PwC, HCS and BLL concluded that the WNR's proposed maintenance costs are inefficient and excessive. BLL also concluded that HCS's estimate provide a closer approximation to maintenance costs than the APM. On this basis, the Regulator will require WNR to adopt the following benchmark rates for maintenance:
  - ◊ $16,000/km for the ERG;
  - ◊ $8,000/km for Leonora to Kalgoorlie;
  - ◊ $10,000/km for Kalgoorlie to Esperance; and
  - ◊ $15,000/km for the SWM.
- Worsley has sought assurance that maintenance costs incurred for non-access related activities are not included in the floor and ceiling costs. As maintenance costs are calculated from a set of defined activities in the APM and not based on WNR's actual costs, the Regulator can confirm that this is indeed the case.
- Worsley has also sought clarification on how the variable economic life of individual components such as re-ballasting within the track structure was handled.

  Ballasting is listed as a maintenance item for the following activities:
  - ◊ top-up ballast which is performed on as required basis to maintain the design profile in accordance with the WNR Code of Practice; and
  - ◊ ballast cleaning (ie. fouling and bog holes) is the replacement of ballast fouled by foreign material or sub soils and is performed where fouling is evident.

  Re-ballasting activities associated with maintenance are not designed to provide total replacement of ballast over its life. Rather, its function is to replace ballast on a spot basis where degradation has occurred, fouled

ballast is evident or formation failure and drainage has caused bog holes to appear. The GRV calculated ballast is replaced every 25 years.

- The Regulator has provided to WNR BLL's detailed assessment of the APM. The Regulator is prepared to work with WNR to modify the input data of the APM to produce comparable outputs that have been derived by benchmarks as approved by the Regulator in this Determination.

4.5 Overhead Costs

i) *Costing Principles*

- WNR has two categories of overhead costs:
  - ◊ WNR overheads; and
  - ◊ corporate overheads.
- WNR overheads include IT and software costs, motor vehicle costs, office accommodation and support services, insurance (based on actual market prices), accreditation costs, and management costs.
- WNR's parent company, ARG, provides certain corporate overhead functions which relate to the performance by WNR of its access related functions. ARG functions include accounting and financial support (but not including the preparation and maintenance of access related financial records which is undertaken by WNR), accreditation and safety related issues and human resource matters such as payroll. ARG also has principal conduct for the provision of information technology services.
- Two proxies are used to allocate overheads. GTKs are used to allocate costs which vary more in quantum due to volumes moved, and train movements are used to allocate costs which vary more in quantum due to the number of train movements.

ii) *Summary of WNR's submissions*

- WNR overheads are an estimate of WNR's actuals based on calendar year 2002. All of WNR's overhead has been allocated as access is WNR's only function.
- WNR has also included in its calculation of floor and ceiling costs the cost of complying with a number of other regulatory functions, including:
  - ◊ the *Rail Safety Act*;
  - ◊ the *Dangerous Goods Act*;

- ◊ the *Bushfires Act*; and
- ◊ regulatory requirements such as the use of the corridor for public and private utilities (such as telecommunications carriers) and for public access.

- Overheads for services provided by ARG are included in the APM. They include:
  - ◊ accounting and audit services (based on transaction and survey and is 42% of total);
  - ◊ human resources services (based on WNR's share of total staff count);
  - ◊ group overhead costs (based on WNR's share at 31% of total);
  - ◊ information technology (based on WNR's share of total terminals and includes dedicated WNR hardware); and
  - ◊ compliance, environment and safety (based on time spent associated with each business group captured through a staff survey).
- WNR and corporate overhead costs are allocated by train movements. The following indicates the percent of GTKs or train movements allocated to each route and to all other routes.

Rail Lines	Train Movements (%)	GTK (%)
EGR	26	51
Leonora	2	4
Esperance	7	17
SWM	47	14
Other remaining lines	18	14

Source: WNR submission to the Regulator; 28 January 2003

- Refer to Appendix 2 of this Determination for WNR's proposed overhead costs by routes and route sections.

iii) *Comments received in the public consultation process*

- WNR has included overheads for services provided by ARG, WNR's parent company. Given the relationship between WNR and ARG, these costs and any other costs provided by ARG or any other affiliated companies, eg. the costs of transporting bulk track materials, should be confirmed independently as "efficient costs".

- The overhead allocation method used by WNR is inappropriate and the allocation should reflect WNR's actual overhead costs on this route. WNR has allocated 54% of overheads of all four mainlines to the SWM, which is 300-500% higher than what has been estimated by other stakeholders. The SWM has 16% of all mainline GTKs, 11% of all mainline kms and 54% of mainline train movements. It would appear that WNR is solely using train movements as a method of allocating overheads to the SWM.

- The costs of complying with regulatory regimes relating to the use of the infrastructure corridor for public and private utilities, eg. telecommunication carriers, and to the grant of public access to that corridor are not costs which are in the nature of the overheads attributable to the performance of the rail owner's access-related functions. These costs would be recoverable from those utilities and should be excluded from the WNR Determination.

iv) *PwC and HCS's comments and recommendations*

- Prior PwC audits of the APM have confirmed that overhead costs includes all associated costs such as those related to corporate, system and head office overhead costs. It also includes the overhead costs incurred within planning, survey, design, construction and operation.

- PwC and HCS recommend that the Regulator consider the merit of revising the allocation method to an alternate method such as a hybrid of 50:50 train movements and GTKs. The approved Costing Principles allowed for an allocation based either on GTKs or train movements. It is noted that if train movements were predominantly used this would result in a relatively higher proportion of the overhead costs being allocated to the SWM due to its higher number of short haul movements. Likewise, the EGR, Esperance and Leonora lines would have relatively higher costs under a GTK allocation method.

- The following compares WNR's proposed and recommended overhead cost allocation.

Rail Lines	Overhead Costs ($)			
	WNR's Proposed		Recommended	
	Total	Per Km	Total	Per Km
EGR (857 km)	2,906,322	3,391	4,667,600	5,446
Leonora (262 km)	151,339	578	303,976	1,160
Esperance (400 km)	605,149	1,513	1,372,629	3,432
SWM (180 km)	4,593,427	25,662	3,069,617	17,149

Source: PwC and HCS report to the Regulator; July 2003

v) *BLL's comments and recommendations*

- The WNR submission considers two types of overhead costs, corporate overheads and WNR overheads. Both sets of overhead lend themselves to estimations based on benchmarked data or bottom-up costs.

- For the estimation of corporate overhead costs, the benchmark approach could use previous work (QCA's Draft Determination on QR's Access Undertaking, December 2000) where individual items within overhead cost centres are applied. The elements identified in the WNR submission and those for which benchmarks are available are:

  ◊ accounting and audit services – based on transaction and survey and is 42% of total, benchmarked 0.4% of total costs;

  ◊ human resources services – based on WNR's share of total staff count, benchmarked 1% of total costs;

  ◊ group overhead costs – based on WNR's share at 31% of total, benchmarked 1.2% of total costs;

  ◊ information technology – based on WNR's share of total terminals and includes dedicated WNR hardware, benchmarked 2.2% of total costs; and

  ◊ compliance, environment and safety – based on time spent associated with each business group captured through a staff survey, benchmarked 2.15% of total costs.

  The total cost of corporate overheads using the benchmarks amount to 6.95% of total costs or approximately $1.5m.

  Alternatively, a bottom-up analysis of corporate overheads is possible by calculating the staff resources required to perform each function:

  ◊ accounting and audit services – based on transaction and survey and is 42% of total, estimated at 1½ FTEs where ½ FTE is for audit and financial compliance at $150,000 per annum, total $225,000 per annum;

  ◊ human resources services – (based on WNR's share of total staff count), estimated at 2 FTEs where ½ FTE concentrates on IR and 1½ FTEs on training, OH&S, recruitment at $150,000, total $300,000;

  ◊ group overhead costs – based on WNR's share at 31% of total, includes Director's duties, company reporting, payroll, community liaison, company secretary, legal costs, estimated at 4 FTEs at $150,000, total $600,000;

- ◊ information technology – based on WNR's share of total terminals and includes dedicated WNR hardware, estimated at 2 FTEs at $200,000 including equipment, total $400,000; and

- ◊ compliance, environment and safety – based on time spent associated with each business group captured through a staff survey, estimated at 2 FTEs at $150,000, total $300,000.

Total bottom-up cost estimate $1,825,000 per annum.

- BLL is of the view that the estimation of WNR overhead costs is also possible. WNR overheads include IT and software costs, motor vehicle costs, office accommodation and support services, insurance (based on actual market prices), accreditation costs, and management costs. They also include compliance with a number of other regulatory functions. The Regulator has indicated that the costs will be based on actual costs and benchmarked or subject to competitive tender where available.

- As comparative benchmarking costs for WNR overhead costs are not available for each of the sub-components identified, the analysis that follows uses both sources of data, benchmarks and bottom-up to estimate a "sensibility check" estimate.

  - ◊ IT and software costs – these are assumed to be PC and hand-held devices and software not associated with corporate overheads or train control and planning. No comparative benchmark data is available. A bottom-up estimate allocates $10,000 per person in the group (10 persons), total cost $100,000 per annum.

  - ◊ motor vehicle costs – these costs are assumed to be the vehicles driven by field supervision and inspectorial staff, typically hi-rail vehicles or small 4 wheel drive vehicles. Senior management vehicle costs are assumed to be part of salary packaging. Assuming there are 2 field inspectors and 1 supervisor plus at total of 1 vehicle for bridge inspections, rail flaw detection, track geometry recording and the like, total 4 vehicles at $15,000 per annum each, total cost $60,000 per annum.

  - ◊ office accommodation and support –20 m^2 per person for 10 persons at $200 per m^2 per annum, costing $40,000 for accommodation, plus 2 FTEs at $200,000, total cost $240,000 per annum.

  - ◊ insurance – benchmarked at 1.5% of total costs, approximately $350,000 (179kms compared to the QR Coal Systems Network of 1,800kms at $3.2m).

- ◊ accreditation – this cost is associated with maintaining safety accreditation under the Rail Safety Act. Benchmarked at 0.5% of WNR's proposed operating costs ($2.046m), total cost $10,230.

- ◊ management – contract management at the rate of 1 FTE for each $3m, total 1 FTE at $150,000, other management 1 FTE at $150,000, total cost $300,000.

- Total WNR overhead costs estimated at approximately $1.06m.

- A comparison of the overhead costs from the various sources is shown below.

Rail Lines	Overhead Costs ($)			
	WNR's Proposed	PwC and HCS Recommended	BLL Benchmarked	BLL Bottom-Up
SWM (180 km)	4,593,427	3,069,617	2.56m	2.885m

Source: BLL report to the Regulator; September 2003

- The comparison shows that the BLL estimate is lower than either of WNR's proposed or PwC and HCS recommended estimates. The difference may be due to either raw cost estimate difference or due to the allocation methodology used in the WNR, and PwC and HCS estimates. If an allocation methodology is to be used for overhead cost, it should be noted that some overhead functions have more relevance to asset value than to operating costs and the allocations used by the QCA make that distinction. In the case of the SWM, the importance of asset value in comparison to operating cost is highlighted by noting that:

  - ◊ the SWM constitutes approximately 3.3% of the network length, which would imply an asset value of approximately 6% of the network assuming that the grain line MEA construction costs are much lower than the SWM construction costs;

  - ◊ the SWM GTKs constitute 14% of network GTKs; and

  - ◊ the SWM train numbers constitute approximately 47% of network train numbers.

- The most complete analysis of cost allocations known to BLL are those detailed in the QCA's Draft Determination on QR's Access Undertaking, December 2000, Chapter 12, Stand-Alone Costs. In this analysis the individual cost components are considered rather than an across-the-board treatment of the total costs.

A mixture of allocation methods utilise asset value, GTKs, train kms, route kms, direct maintenance costs and train control costs.

The approach by the QCA was to consider the merits of individual components so as not to lose the significance of each component. A 50% GTK and 50% train km allocation is a common method of allocation in the QCA approach however where the activity specifically relates to the management of assets rather than the management of operations, an allocation based on asset value is more appropriate.

vi) *Regulator's views and comments*

- Reviews of WNR actual costs and budgets by PwC and HCS have provided a level of confidence that the proposed costs are reasonable.

- Similar to operating cost, the key issue is how to most fairly allocate overhead costs between line sections. The current WNR approach elects to predominantly use train movements for allocation which results in the SWM being allocated 57% of overhead costs for the four mainlines due to the shorter average haul length.

  Whilst the number of trains managed on a line (as a percent of total train movements) provides a fair indication of the intensity of administration resources applied to the line, this measure can become less accurate where a network has a key line with many shorter hauls and a range of other lines with longer average hauls. Overhead activities are not as strongly correlated with train movements as operational activities. GTKs over a line (as a percent of total GTKs) also has some relevance as a measure of the intensity of administration resources applied to a line as it reflect distance and volumes which are drivers to the size of many costs such as supervisory, planning, project management, insurance, procurement etc.

- The Regulator has examined the use of train kilometres as another possible measure but considered it unacceptable as it would unfairly allocate a large proportion of overhead cost to the vast network of grain lines which carry very little traffic. The Regulator has also considered the QCA's detailed approach to calculating the allocation of QR's overhead costs.

- PwC and HCS has recommended a 50:50 allocation split between train movements and GTKs, and for the SWM, the allocation method has calculated an overhead cost that, in the Regulator's view, is comparable to what BLL has estimated using the benchmarking and bottom-up processes.

- WNR will be required to use a hybrid 50:50 allocation split between train movements and GTKs for its overheads as the Regulator believes that this

will produce a more balanced and equitable allocation than using the proposed 100% train movement allocation method.

- BLL has suggested that there is some merit in using asset value (to reflect such items as insurance costs) together with GTKs and train movements if an allocation method is to be used for overhead cost. The Regulator will assess the inclusion of asset value in future calculations of overhead cost when the GRV of other lines, eg. the grain lines, have been determined.

- Using a hybrid 50:50 allocation split between train movements and GTKs for all overheads actually allocates a higher level of costs overall to the four lines. This is because the four lines under review account for a greater percent of total system GTKs than of total system train movements. As a result, more overheads actually get allocated to the four mainlines when allocating partly by GTKs.

- In its submission, Portman has queried whether costs associated with complying with regulatory regimes relating to the use of the infrastructure corridor for public and private utilities are legitimate costs related to the performance of the rail owner's access-related functions.

  The Regulator understands that under both its lease agreement with the State Government and as a result of legislation, WNR must give utilities and others access to the land. A number of utilities also have legislative powers of access. The Regulator considers that the costs incurred in performing this function is a legitimate overhead as it is in the interests of all parties to protect railway infrastructure such as communications and signalling equipment which run within the corridor. The Regulator further understands that these costs are in the order of $30,000 per annum which cover some 75 access applications from third parties comprising utilities and other service providers, and that there are no powers that allow WNR to recover these costs.

5. Ceiling And Floor Costs For Nominated Route Sections

The WNR model is a bottom-up model in that individual activity unit costs are applied to estimated activity levels. The strength of this technique is that all activities are captured for the estimate ensuring that all activities are represented. The weakness of this technique is that the accuracy depends on the estimated activity level and this can be problematic particularly where previous history on that activity in the specific circumstance does not exist.

This is the most important characteristic of the WNR approach. There is limited experience in undertaking a MEA construction base and the range of activities have not been undertaken in conjunction as separable activities.

The Regulator, based on the advice received from stakeholders, PwC, HCS and BLL, has made some observations in this Determination about certain activities showing costs beyond what could be expected, certain tasks being performed to a level that would be unnecessary if the other activities were performed as stated and inappropriate allocation of costs to route sections.

To arrive at the approved floor and ceiling costs, the Regulator has extensively reviewed WNR's APM and its bottom-up methodology. PwC, HCS and BLL have also conducted "reality checks" on these costs using some elements of a number of other methods of estimation, including:

- Analogy method – the National Aeronautics and Space Administration (NASA) Handbook (www.jsc.nasa.gov/bu2/PCEHHTML/pceh.htm) defines this method as comparing the proposed project to previously completed similar projects where project development information is known. Actual data from the completed projects are extrapolated to estimate the proposed project.
- Parametric modelling – as given by the American Railway Engineering and Maintenance-of-Way Association (AREMA) and detailed in Working Paper 2, QCA Draft Decision on QR's Access Undertaking, December 2000.
- Use of expert opinion – the Expert Judgement Method, as described in NASA's Handbook.
- Top-down method – similar to the Analogy method but using broader global estimates.

To the extent that the analysis of WNR's proposed floor and ceiling costs was undertaken using more than one methodology, the Regulator is confident that the approved floor and ceiling costs are both appropriate and reasonable for their intended use in the Regime.

Determining whether WNR is operating at efficient levels requires the need to:

- Determine the key cost components for measurement of efficiency;

- Identify, define and incorporate best practice performance and processes into the Costing Principles, which are then periodically updated;
- Develop and update annually an efficient cost model, based on operating the GRV network, that has the functional capacity to provide concise KPI benchmarking reports, so as to compare results against those achieved by other track owners;
- Complete a gap analysis to reconcile differences in results.

Efficient costs is a dynamic concept with organisations at best practice continuing to make further efficiency gains through implementing further innovations and productivity enhancements. Accordingly, trends in efficient costs will be monitored by the Regulator over time, and this process will take into account past productivity improvements, and any industry changes likely to influence future operating costs.

WNR's GRV will require periodic review to ensure that it continues to reflect a MEA network for the current and projected level of activity. The Regulator has indicated his intentions to review the GRV every three years but the review frequency will likely increase or decrease depending on the changes required.

The tables in Appendix 2 of this Determination summarise WNR's proposed ceiling and floor costs of the nominated route sections and the Regulator's approved floor and ceiling costs by each of these route sections. In arriving at the approved floor and ceiling costs, four sets of adjustments were made to the floor and ceiling costs submitted by WNR:

- Several inputting and transposing errors found in the APM were corrected after discussions with WNR.
- The ceiling and floor costs were recalculated to reflect the Regulator's determination of the costs as detailed in this Determination.
- With the change of the WACC for 2003-04 from 7.8 to 6.9%, a re-calculation of the floor and ceiling costs was undertaken. This accounts for a further 6 to 8% of the ceiling cost reductions depending on the relative significance of capital costs for each route section.

  The change in the WACC also has a minor impact on the floor cost calculation as some track capital costs are saved under the avoidable cost methodology. The savings are based on the difference between track capital costs at full traffic and no traffic. The difference between the two situations is mainly due to the life of the track assets. For some routes there is no difference, ie. the life of the assets are the same whether there is full traffic or no traffic. In those cases there are no track capital costs saved in the floor cost calculation, and as a result the change in WACC has no impact.
- In the Costing Principles Determination, the Regulator has agreed for WNR to apply a CPI-X factor to the ceilings of its route sections, where X has been set at one quarter of CPI for the next three years. As the revised ceiling is to apply on

1 July of each year, the approved ceiling and floor costs have been escalated by 0.97% for the period 1 January 2003 to 30 June 2003 to reflect the CPI-X increase since WNR submitted its proposal.

The following summarises the percentage change to the corrected levels of floor and ceiling costs as determined by the Regulator for the four routes.

Rail Lines	Change arising from Regulator's Determination as at December 2002		Change include WACC and CPI-X adjustments to July 2003	
	Ceiling Cost (%)	Floor Cost (%)	Ceiling Cost (%)	Floor Cost (%)
EGR	(1.0)	(7.9)	(8.1)	(6.3)
Esperance	(2.0)	12.7	(9.5)	16.1
Leonora	(1.3)	8.2	(8.4)	11.6
SWM	(18.6)	(12.1)	(22.6)	(11.0)

Note: Numbers in brackets represent reductions.

In the Costing Principles Determination, the Regulator has indicated that all operator and Government contributed assets are to be included in calculating the floor and ceiling. An amount of the contribution determined as the equivalent annual cost or an annuity will be credited to the operator and the route section(s) concerned in the calculation of the over-payment in the ceiling price test. In this way, WNR would not be able to obtain higher access revenue from operators on the route section(s) that now has a higher ceiling as a result of the contribution.

As this principle would be applied to the contributory portion of level crossing protection costs by Main Roads WA, the Regulator has provided the following indicative amount of this contribution on the four routes for stakeholders' information.

Rail Lines	Annualised Capital ($)	Annual Maintenance ($)	Total ($)
EGR	1,231,805	175,207	1,407,012
Esperance	228,228	50,138	278,366
Leonora	110,492	10,331	120,823
SWM	642,688	170,799	813,487

Source: WNR submission to the Regulator; 18 September 2003

The Regulator has a number of powers to monitor compliance by WNR with the Costing Principles. Annual audit programs will be the key monitoring tool for assessing compliance. Stakeholders would be aware that the Regulator has developed a KPI reporting system in consultation with WNR.

6. Determination

It is the view of the Regulator that the direction below appropriately address the differing needs and interests of the community, access seekers and WNR as required under Section 20(4) of the Act.

The proposed Floor and Ceiling Costs submitted by WNR dated December 2002 are not approved. Under Clause 9 (6), Schedule 4 of the Code, WNR will be required to make the amendments as tabled in Appendix 2 of this Determination to apply as from 1 July 2003.

Ken Michael

ACTING INDEPENDENT RAIL ACCESS REGULATOR

24 September 2003

Appendix 1 – Submissions Received On The WNR Floor and Ceiling Cost Determination

1. Alcoa World Alumina Australia
2. Australian Rail Track Corporation Ltd
3. AWB Limited
4. Portman Iron Ore
5. Worsley Alumina

Appendix 2 – Floor and Ceiling Tables For The Four Routes

Tables

Table 1.0 – Forrestfield To Kalgoorlie Route (EGR) – Summary as of 1 July 2003

Route Sections	Gross Replacement Value	Ceiling Price	Floor Price
Forrestfield South Points to Midland 14.5km	38,003,126	4,643,535	324,774
No 723 Points Midland to No 3 Points Millendon Junction	36,998,544	4,624,633	324,751
No 3 Points Millendon Junction to No 9 Points Tooday West	135,033,612	14,016,585	933,712
No 9 Points Tooday West to No 203 Points Avon Yard	59,410,436	6,605,152	435,828
No 203 Points Avon Yard to No 115 Points West Merredin	244,662,744	24,239,480	903,210
No 115 Points West Merredin to No 13 Points Koolyanobbing East	223,806,586	21,821,954	747,583
No 13 Points Koolyanobbing East to No 59 Points West Kalgoorlie	212,413,838	21,649,257	928,471
No 59 Points West Kalgoorlie to Network Boundary	11,858,111	1,581,039	70,395
Total	962,186,998	99,181,635	4,668,724

General Route Section Information	Route Section Lengths in Km	Track Distance Lengths in Km	Number of Level Crossings	Gross Tonnes Km '000 (actual 2002)	Train Movements (actual 2002)
Forrestfield South Points to Midland 14.5km	11	26	3	136,955	9,844
No 723 Points Midland to No 3 Points Millendon Junction	14	28	9	261,837	9,109
No 3 Points Millendon Junction to No 9 Points Tooday West	61	125	30	1,059,825	8,092
No 9 Points Tooday West to No 203 Points Avon Yard	26	52	13	443,979	7,936
No 203 Points Avon Yard to No 115 Points West Merredin	167	209	100	2,182,616	6,490
No 115 Points West Merredin to No 13 Points Koolyanobbing East	176	202	87		
No 13 Points Koolyanobbing East to No 59 Points West Kalgoorlie	192	209	33	5,621,548	6,889
No 59 Points West Kalgoorlie to Network Boundary	6	6	4		

Additions to route: All tracks servicing CBH facilities in accordance with Schedule 1s6 and sidings
Deletions to route: Forrestfield to Kewdale

Level of Service Indicators	MEA Specifications	Level of Service Indicators	MEA Specifications	
Rail gauge	dual/standard	Axle load freight (tal) and max operating speed freight (kph) [loaded/empty]	21 115/115 (DG&SG)	23 80/80
Rail weight (kg)	60			
Sleeper type	concrete	Max operating speed passenger (kph)	100(DG) / 160(SG)	
Average number of sleepers per kilometre	1,500	Average formation height (m)	1.5	
		Ballast depth (mm)	300	

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Table 1.1 – ROUTE SECTION: Forrestfield South Points to Midland
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	3,351,458	3,351,458	3,351,458		
Communications cost	328,408	328,408	328,408		
Track cost	34,417,011	34,417,011	34,323,260		
Total	38,096,877	38,096,877	38,003,126		
Progressive percentage change			(0.2)		
Ceiling Price Schedule					
Capital cost	3,373,068	3,373,114	3,363,951		
Maintenance cost	1,040,215	1,043,841	901,073		
Cost of Working Capital	131,550	131,551	131,194		
Operating cost	221,337	221,337	221,337		
Overhead cost	497,020	513,771	307,593		
Total	5,263,190	5,283,614	4,925,148	4,598,925	4,643,535
Progressive percentage change		0.4	(6.8)	(6.6)	1.0
Floor Price Schedule					
Capital cost		96,865	96,865		
Maintenance cost		81,444	71,491		
Operating cost		151,051	151,051		
Total	396,020	329,360	319,407	321,654	324,774
Progressive percentage change		(16.8)	(3.0)	0.7	1.0

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Table 1.2 – ROUTE SECTION: No 723 Points Midland to No 3 Points Millendon Junction
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	5,489,887	5,489,887	5,489,887		
Communications cost	573,846	573,846	573,846		
Track cost	31,013,302	31,013,302	30,934,811		
Total	37,077,035	37,077,035	36,998,544		
Progressive percentage change			(0.2)		
Ceiling Price Schedule					
Capital cost	3,319,406	3,319,457	3,311,210		
Maintenance cost	1,062,177	1,066,161	920,354		
Cost of Working Capital	129,457	129,459	129,137		
Operating cost	208,019	208,019	208,019		
Overhead cost	467,113	482,856	330,033		
Total	5,186,172	5,205,952	4,898,753	4,580,205	4,624,633
Progressive percentage change		0.4	(5.9)	(6.5)	1.0
Floor Price Schedule					
Capital cost		76,680	76,680		
Maintenance cost		114,768	100,257		
Operating cost		141,962	141,962		
Total	395,483	333,410	318,899	321,631	324,751
Progressive percentage change		(15.7)	(4.4)	0.9	1.0

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Table 1.3 – ROUTE SECTION: No 3 Points Millendon Junction to No 9 Points Toodyay West
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	7,542,625	7,542,625	7,542,625		
Communications cost	2,299,929	2,299,929	2,299,929		
Track cost	125,687,103	125,687,103	125,191,058		
Total	135,529,657	135,529,657	135,033,612		
Progressive percentage change			(0.4)		
Ceiling Price Schedule					
Capital cost	11,913,355	11,913,583	11,866,239		
Maintenance cost	2,336,500	2,354,148	2,035,147		
Cost of Working Capital	464,621	464,630	462,783		
Operating cost	183,862	183,862	183,862		
Overhead cost	412,869	426,783	568,512		
Total	15,311,207	15,343,006	15,116,544	13,881,930	14,016,585
Progressive percentage change		0.2	(1.5)	(8.2)	1.0
Floor Price Schedule					
Capital cost		360,753	360,753		
Maintenance cost		486,327	425,094		
Operating cost		125,476	125,476		
Total	1,013,295	972,556	911,323	924,742	933,712
Progressive percentage change		(4.0)	(6.3)	1.5	1.0

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Table 1.4 – ROUTE SECTION: ROUTE SECTION: No 9 Points Toodyay West to No 203 Points Avon Yard
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	5,040,824	5,040,824	5,040,824		
Communications cost	969,616	969,616	969,616		
Track cost	53,644,263	53,644,263	53,399,996		
Total	59,654,703	59,654,703	59,410,436		
Progressive percentage change			(0.4)		
Ceiling Price Schedule					
Capital cost	5,231,599	5,231,694	5,209,214		
Maintenance cost	1,290,989	1,298,298	1,121,563		
Cost of Working Capital	204,032	204,036	203,159		
Operating cost	182,026	182,026	182,026		
Overhead cost	408,743	422,519	360,973		
Total	7,317,389	7,338,573	7,076,936	6,541,698	6,605,152
Progressive percentage change		0.3	(3.6)	(7.6)	1.0
Floor Price Schedule					
Capital cost		120,515	120,515		
Maintenance cost		209,424	182,959		
Operating cost		124,223	124,223		
Total	504,654	454,162	427,697	431,641	435,828
Progressive percentage change		(10.0)	(5.8)	0.9	1.0

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Table 1.5 – ROUTE SECTION: No 203 Points Avon Yard to No 115 Points West Merredin
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	21,735,931	21,735,931	21,735,931		
Communications cost	4,820,869	4,820,869	4,820,869		
Track cost	219,964,570	220,175,248	218,105,944		
Total	246,521,370	246,732,048	244,662,744		
Progressive percentage change		0.1	(0.8)		
Ceiling Price Schedule					
Capital cost	21,511,401	21,527,093	21,339,235		
Maintenance cost	3,390,059	3,415,758	2,954,980		
Cost of Working Capital	838,944	839,557	832,230		
Operating cost	152,128	152,128	152,128		
Overhead cost	341,608	353,121	920,927		
Total	26,234,140	26,287,656	26,199,501	24,006,616	24,239,480
Progressive percentage change		(0.2)	(0.3)	(8.4)	1.0
Floor Price Schedule					
Capital cost		189,504	181,587		
Maintenance cost		687,947	603,619		
Operating cost		103,819	103,819		
Total	1,003,879	981,270	889,025	894,533	903,210
Progressive percentage change		(2.3)	(9.4)	0.6	1.0

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Table 1.6 – ROUTE SECTION: No 115 Points West Merredin to No 13 Points Koolyanobbing East
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	19,202,405	19,202,405	19,202,405		
Communications cost	4,398,783	4,398,783	4,398,783		
Track cost	202,695,600	202,695,600	200,205,398		
Total	226,296,788	226,296,788	223,806,586		
Progressive percentage change			(1.1)		
Ceiling Price Schedule					
Capital cost	19,535,794	19,536,161	19,328,053		
Maintenance cost	3,012,421	3,038,842	2,629,818		
Cost of Working Capital	761,896	761,910	753,794		
Operating cost	118,166	118,166	118,166		
Overhead cost	265,345	274,288	816,338		
Total	23,693,622	23,729,367	23,646,169	21,612,315	21,821,954
Progressive percentage change		0.2	(0.4)	(8.6)	1.0
Floor Price Schedule					
Capital cost		97,035	94,109		
Maintenance cost		639,898	561,939		
Operating cost		80,642	80,642		
Total	828,679	817,574	736,690	740,401	747,583
Progressive percentage change		(1.3)	(9.9)	0.5	1.0

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Table 1.7 – ROUTE SECTION: No 13 Points Koolyanobbing East to No 59 Points West Kalgoorlie
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	13,618,171	13,618,171	13,618,171		
Communications cost	8,028,891	8,028,891	8,028,891		
Track cost	193,145,220	193,145,220	190,766,776		
Total	214,792,282	214,792,282	212,413,838		
Progressive percentage change			(1.1)		
Ceiling Price Schedule					
Capital cost	18,553,470	18,553,850	18,355,246		
Maintenance cost	3,212,544	3,241,037	2,803,643		
Cost of Working Capital	723,585	723,600	715,855		
Operating cost	142,645	142,645	142,645		
Overhead cost	320,312	331,107	1,405,254		
Total	22,952,556	22,992,239	23,422,641	21,441,277	21,649,257
Progressive percentage change		0.2	1.9	(8.5)	1.0
Floor Price Schedule					
Capital cost		82,018	79,824		
Maintenance cost		843,837	737,267		
Operating cost		97,347	97,347		
Total	1,040,006	1,023,202	914,438	919,551	928,471
Progressive percentage change		(1.6)	(10.6)	0.6	1.0

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Table 1.8 – ROUTE SECTION: No 59 Points West Kalgoorlie to Network Boundary
ROUTE: Forrestfield to Kalgoorlie (EGR)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	5,060,055	5,060,055	5,060,055		
Communications cost	99,506	99,506	99,506		
Track cost	6,735,669	6,735,669	6,698,550		
Total	11,895,230	11,895,230	11,858,111		
Progressive percentage change			(0.3)		
Ceiling Price Schedule					
Capital cost	1,076,613	1,076,624	1,072,922		
Maintenance cost	396,124	396,327	341,965		
Cost of Working Capital	41,988	41,988	41,844		
Operating cost	86,087	86,087	86,087		
Overhead cost	193,311	199,827	115,278		
Total	1,794,123	1,800,853	1,658,096	1,565,850	1,581,039
Progressive percentage change		0.4	(7.9)	(5.6)	1.0
Floor Price Schedule					
Capital cost		0	0		
Maintenance cost		12,338	10,969		
Operating cost		58,750	58,750		
Total	98,223	71,088	69,719	69,719	70,395
Progressive percentage change		(27.6)	(1.9)	0	1.0

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Table 2.0 – Leonora To Kalgoorlie Route (Leonora) – Summary as of 1 July 2003

Route Sections	Gross Replacement Value	Ceiling Price	Floor Price
No 87 Points Kalgoorlie to Malcolm North Points	193,145,406	16,869,227	297,061
Malcolm North Points to Leonora WMC2	22,412,445	2,064,751	44,680
Total	215,557,851	18,933,978	341,741

General Route Section Information	Route Section Lengths in Km	Track Distance Lengths in Km	Number of Level Crossings	Gross Tonnes Km '000 (actual 2002)	Train Movements (actual 2002)
No 87 Points Kalgoorlie to Malcolm North Points	236	238	43	630,488	1,713
Malcolm North Points to Leonora WMC2	23	24	11		

Additions to route: Siding at Menzies

Level of Service Indicators	MEA Specifications	Level of Service Indicators	MEA Specifications
Rail gauge	standard	Axle load freight (tal) and max operating speed freight (kph) [loaded/empty]	21 50/70
Rail weight (kg)	50		
Sleeper type	1:4 steel	Max operating speed passenger (kph)	n/a
Average number of sleepers per kilometre	1,500	Average formation height (m)	1.5
		Ballast depth (mm)	200

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Table 2.1 – ROUTE SECTION: No 87 Points Kalgoorlie to Malcolm North Points
ROUTE: Kalgoorlie to Leonora (Leonora)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	1,494,016	1,494,016	1,494,016		
Communications cost	5,308,837	5,308,837	5,308,837		
Track cost	189,878,416	189,878,416	186,342,553		
Total	196,681,269	196,681,269	193,145,406		
Progressive percentage change			(1.8)		
Ceiling Price Schedule					
Capital cost	15,763,625	15,807,578	15,529,235		
Maintenance cost	2,037,858	2,030,540	1,825,131		
Cost of Working Capital	614,781	616,496	605,640		
Operating cost	40,254	40,254	40,254		
Overhead cost	90,391	93,437	269,910		
Total	18,546,909	18,588,305	18,270,170	16,707,167	16,869,227
Progressive percentage change		0.2	(1.7)	(8.6)	1.0
Floor Price Schedule					
Capital cost		0	43,953		
Maintenance cost		227,004	216,666		
Operating cost		27,471	27,471		
Total	270,647	254,475	288,090	294,207	297,061
Progressive percentage change		(6.0)	13.2	2.1	1.0

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Table 2.2 – ROUTE SECTION: Malcolm North Points to Leonora WMC2
ROUTE: Kalgoorlie to Leonora (Leonora)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	687,575	687,575	687,575		
Communications cost	304,697	304,697	304,697		
Track cost	22,037,030	22,037,030	21,420,173		
Total	23,029,302	23,029,302	22,412,445		
Progressive percentage change			(2.7)		
Ceiling Price Schedule					
Capital cost	1,850,770	1,855,372	1,807,626		
Maintenance cost	306,981	305,313	273,773		
Cost of Working Capital	72,180	72,359	70,497		
Operating cost	27,142	27,142	27,142		
Overhead cost	60,948	63,002	44,311		
Total	2,318,021	2,323,188	2,223,349	2,044,915	2,064,751
Progressive percentage change		0.2	(4.3)	(8.0)	1.0
Floor Price Schedule					
Capital cost		0	4,602		
Maintenance cost		21,307	20,485		
Operating cost		18,523	18,523		
Total	41,498	39,830	43,610	44,251	44,680
Progressive percentage change		(4.0)	9.5	1.5	1.0

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Table 3.0 – Kalgoorlie To Esperance Route (Esperance) – Summary as of 1 July 2003

Route Sections	Gross Replacement Value	Ceiling Price	Floor Price
West Kalgoorlie West to Hampton South Points	17,966,630	2,009,404	107,730
Hampton South Points to Kambalda South Points	32,050,126	3,195,467	129,940
Kambalda South Points to Salmon Gums North Points	196,163,681	18,104,426	544,016
Salmon Gums North Points to Esperance Start Esperance Port Siding	93,105,533	8,793,003	277,991
Total	339,285,970	32,102,300	1,059,677

General Route Section Information	Route Section Lengths in Km	Track Distance Lengths in Km	Number of Level Crossings	Gross Tonnes Km '000 (actual 2002)	Train Movements (actual 2002)
West Kalgoorlie West to Hampton South Points	17	18	7	495,873	4,492
Hampton South Points to Kambalda South Points	38	39	12		
Kambalda South Points to Salmon Gums North Points	227	230	54	2,798,297	2,471
Salmon Gums North Points to Esperance Start Esperance Port Siding	106	113	51		

Additions to route: All tracks servicing CBH facilities in accordance with Schedule 1s6 sidings

Level of Service Indicators	MEA Specifications	Level of Service Indicators	MEA Specifications
Rail gauge	standard	Axle load freight (tal) and max operating speed freight (kph) [loaded/empty]	23 70/80
Rail weight (kg)	50		
Sleeper type	1:2 steel	Max operating speed passenger (kph)	n/a
Average number of sleepers per kilometre	1,640	Average formation height (m)	1.5
		Ballast depth (mm)	250

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Table 3.1 – ROUTE SECTION: West Kalgoorlie West to Hampton South Points
ROUTE: Kalgoorlie to Esperance (Esperance)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	3,384,439	3,384,439	3,384,439		
Communications cost	527,027	527,027	527,027		
Track cost	14,226,587	14,226,587	14,055,164		
Total	18,138,053	18,138,053	17,966,630		
Progressive percentage change			(0.9)		
Ceiling Price Schedule					
Capital cost	1,515,019	1,522,175	1,507,683		
Maintenance cost	310,524	349,275	309,062		
Cost of Working Capital	59,086	59,365	58,800		
Operating cost	94,262	94,262	94,262		
Overhead cost	211,668	218,801	163,439		
Total	2,190,559	2,243,878	2,133,246	1,990,100	2,009,404
Progressive percentage change		2.4	(4.9)	(6.7)	1.0
Floor Price Schedule					
Capital cost		0	7,156		
Maintenance cost		37,686	34,215		
Operating cost		64,329	64,329		
Total	103,231	102,015	105,700	106,695	107,730
Progressive percentage change		(1.2)	3.6	0.9	1.0

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Table 3.2 – ROUTE SECTION: Hampton South Points to Kambalda South Points
ROUTE: Kalgoorlie to Esperance (Esperance)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	565,433	565,433	565,433		
Communications cost	1,119,022	1,119,022	1,119,022		
Track cost	30,658,572	30,658,572	30,365,671		
Total	32,343,027	32,343,027	32,050,126		
Progressive percentage change			(0.7)		
Ceiling Price Schedule					
Capital cost	2,635,990	2,651,341	2,625,552		
Maintenance cost	503,494	500,851	443,930		
Cost of Working Capital	102,804	103,402	102,398		
Operating cost	67,762	67,762	67,762		
Overhead cost	152,164	157,292	193,383		
Total	3,462,214	3,480,648	3,433,025	3,164,769	3,195,467
Progressive percentage change		0.5	(1.4)	(7.8)	1.0
Floor Price Schedule					
Capital cost		0	15,351		
Maintenance cost		71,221	64,961		
Operating cost		46,245	46,245		
Total	120,108	117,466	126,557	128,692	129,940
Progressive percentage change		(2.2)	7.7	1.7	1.0

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Table 3.3 – ROUTE SECTION: Kambalda South Points to Salmon Gums North Points
ROUTE: Kalgoorlie to Esperance (Esperance)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	2,888,671	2,888,671	2,888,671		
Communications cost	6,282,420	6,282,420	6,282,420		
Track cost	188,870,378	188,870,378	186,992,590		
Total	198,041,469	198,041,469	196,163,681		
Progressive percentage change			(0.9)		
Ceiling Price Schedule					
Capital cost	16,137,252	16,230,670	16,066,515		
Maintenance cost	2,388,611	2,372,962	2,105,912		
Cost of Working Capital	629,353	632,997	626,594		
Operating cost	53,526	53,526	53,526		
Overhead cost	120,194	124,245	706,284		
Total	19,328,936	19,414,400	19,558,831	17,930,500	18,104,426
Progressive percentage change		0.4	0.7	(8.3)	1.0
Floor Price Schedule					
Capital cost		0	93,419		
Maintenance cost		434,290	395,842		
Operating cost		36,529	36,529		
Total	486,466	470,819	525,790	538,790	544,016
Progressive percentage change		(3.2)	11.7	2.5	1.0

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Table 3.4 – ROUTE SECTION: Salmon Gums North Points to Esperance Start Esperance Port Siding
ROUTE: Kalgoorlie to Esperance (Esperance)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	1,683,500	1,683,500	1,683,500		
Communications cost	2,859,353	2,859,353	2,859,353		
Track cost	94,226,362	94,226,362	88,562,680		
Total	98,769,215	98,769,215	93,105,533		
Progressive percentage change			(5.7)		
Ceiling Price Schedule					
Capital cost	8,072,049	8,118,224	7,639,153		
Maintenance cost	1,309,804	1,302,128	1,138,426		
Cost of Working Capital	314,810	316,612	297,928		
Operating cost	53,939	53,939	53,939		
Overhead cost	121,123	125,205	355,783		
Total	9,871,725	9,916,108	9,485,229	8,708,530	8,793,003
Progressive percentage change		0.4	(4.3)	(8.2)	1.0
Floor Price Schedule					
Capital cost		0	46,176		
Maintenance cost		222,276	185,908		
Operating cost		36,811	36,811		
Total	266,763	259,087	268,895	275,320	277,991
Progressive percentage change		(2.9)	3.8	2.4	1.0

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Table 4.0 – Kwinana To Bunbury Inner Harbour Route (SWM) – Summary as of 1 July 2003

Route Sections	Gross Replacement Value	Ceiling Price	Floor Price
Kwinana (No 3 Facing Points) to Mundijong Junction Points	29,028,056	3,361,915	259,408
Mundijong Junction Points to Pinjarra (No 25 Points)	44,174,585	5,642,028	545,405
Pinjarra to Pinjarra East	1,596,352	572,808	118,498
Pinjarra East to Alumina Junction	757,322	665,174	160,774
Pinjarra East to Pinjarra South	849,695	241,008	44,827
Pinjarra to Wagerup	27,763,158	2,822,695	142,683
Wagerup to Brunswick Junction	39,957,029	4,323,482	276,406
Brunswick Junction to Picton Junction	21,263,159	2,737,305	284,493
Picton Junction to Inner Harbour	7,098,433	1,323,278	205,553
Total	172,487,789	21,689,693	2,038,047

General Route Section Information	Route Section Lengths in Km	Track Distance Lengths in Km	Number of Level Crossings	Gross Tonnes Km '000 (actual 2002)	Train Movements (actual 2002)
Kwinana (No 3 Facing Points) to Mundijong Junction Points	26	29	22	463,212	9,326
Mundijong Junction Points to Pinjarra (No 25 Points)	43	48	19	777,394	10,917
Pinjarra to Pinjarra East		1	0	41,591	10,241
Pinjarra East to Alumina Junction	1.7	1	0		
Pinjarra East to Pinjarra South	1	1	0		
Pinjarra to Wagerup	33	33	15	251,396	6,066
Wagerup to Brunswick Junction	39	42	38	482,855	8,552
Brunswick Junction to Picton Junction	17	21	16	298,309	11,348
Picton Junction to Inner Harbour	4	4	4	58,267	8,464

Deletions to route: ① Kwinana to Alco Alumina and Bauxite facilities; ② Bunbury Inner Harbour Junction to Alcoa facility

Level of Service Indicators	MEA Specifications	Level of Service Indicators	MEA Specifications	
Rail gauge	narrow	Axle load freight (tal) and max operating speed freight (kph) [loaded/empty]	21 115/115	23 80/80
Rail weight (kg)	50			
Sleeper type	concrete	Max operating speed passenger (kph)	160	
Average number of sleepers per kilometre	1,500	Average formation height (m)	1.0	
		Ballast depth (mm)	250	

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Table 4.1 – ROUTE SECTION: Kwinana (No 3 Facing Points) to Mundijong Junction Points
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	6,900,161	6,900,161	6,900,161		
Communications cost	1,279,989	1,279,989	1,279,989		
Track cost	23,996,040	23,996,040	20,847,906		
Total	32,176,191	32,176,191	29,028,056		
Progressive percentage change			(9.8)		
Ceiling Price Schedule					
Capital cost	2,694,510	2,694,511	2,442,118		
Maintenance cost	739,542	743,955	418,807		
Cost of Working Capital	105,086	105,086	95,243		
Operating cost	208,800	208,800	208,800		
Overhead cost	468,866	484,668	382,525		
Total	4,216,804	4,237,020	3,547,493	3,329,618	3,361,915
Progressive percentage change		0.5	(16.3)	(6.1)	1.0
Floor Price Schedule					
Capital cost		43,569	42,472		
Maintenance cost		118,630	71,791		
Operating cost		142,495	142,495		
Total	366,586	304,694	256,758	258,400	259,408
Progressive percentage change		(16.9)	(15.7)	0.6	1.0

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Table 4.2 – ROUTE SECTION: Mundijong Junction Points to Pinjarra (No 25 Points)
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	6,118,448	6,118,448	6,118,448		
Communications cost	2,223,493	2,223,493	2,223,493		
Track cost	41,045,868	41,045,868	35,832,644		
Total	49,387,809	49,387,809	44,174,585		
Progressive percentage change			(10.6)		
Ceiling Price Schedule					
Capital cost	4,070,860	4,070,860	3,674,654		
Maintenance cost	1,301,131	1,308,367	735,479		
Cost of Working Capital	158,764	158,764	143,311		
Operating cost	511,470	511,470	511,470		
Overhead cost	1,148,524	1,187,235	863,779		
Total	7,190,749	7,236,696	5,928,693	5,587,826	5,642,028
Progressive percentage change		0.6	(18.1)	(5.7)	1.0
Floor Price Schedule					
Capital cost		62,618	60,973		
Maintenance cost		211,217	127,845		
Operating cost		349,052	349,052		
Total	778,070	622,887	537,870	540,165	545,405
Progressive percentage change		(19.9)	(13.6)	0.4	1.0

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Table 4.3 – ROUTE SECTION: Pinjarra to Pinjarra East
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	418,722	418,722	418,722		
Communications cost	24,598	24,598	24,598		
Track cost	1,319,061	1,319,061	1,153,032		
Total	1,762,381	1,762,381	1,596,352		
Progressive percentage change			(9.4)		
Ceiling Price Schedule					
Capital cost	147,094	147,094	134,593		
Maintenance cost	148,990	149,058	71,299		
Cost of Working Capital	5,737	5,737	5,249		
Operating cost	169,005	169,005	169,005		
Overhead cost	379,507	392,297	199,138		
Total	850,333	863,191	579,284	567,305	572,808
Progressive percentage change		1.5	(32.9)	(2.1)	1.0
Floor Price Schedule					
Capital cost		0	0		
Maintenance cost		3,339	2,023		
Operating cost		115,337	115,337		
Total	172,276	118,676	117,360	117,360	118,498
Progressive percentage change		(31.1)	(1.1)	0	1.0

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Table 4.4 – ROUTE SECTION: Pinjarra East to Alumina Junction
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	576,141	576,141	576,141		
Communications cost	7,747	7,747	7,747		
Track cost	196,792	196,792	173,434		
Total	780,680	780,680	757,322		
Progressive percentage change			(3.0)		
Ceiling Price Schedule					
Capital cost	73,991	73,991	72,108		
Maintenance cost	184,428	184,464	85,507		
Cost of Working Capital	2,886	2,886	2,812		
Operating cost	232,543	232,543	232,543		
Overhead cost	522,183	539,781	270,676		
Total	1,016,031	1,033,665	663,646	658,784	665,174
Progressive percentage change		1.7	(35.8)	(0.7)	1.0
Floor Price Schedule					
Capital cost		5	5		
Maintenance cost		858	524		
Operating cost		158,698	158,698		
Total	233,371	159,561	159,227	159,229	160,774
Progressive percentage change		(31.6)	(0.2)	0	1.0

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Table 4.5 – ROUTE SECTION: Pinjarra East to Pinjarra South
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	157,419	157,419	157,419		
Communications cost	17,520	17,520	17,520		
Track cost	788,458	788,458	674,756		
Total	963,397	963,397	849,695		
Progressive percentage change			(11.8)		
Ceiling Price Schedule					
Capital cost	81,641	81,641	72,445		
Maintenance cost	63,756	63,806	31,114		
Cost of Working Capital	3,184	3,184	2,825		
Operating cost	63,538	63,538	63,538		
Overhead cost	142,676	147,484	75,161		
Total	354,795	359,653	245,083	238,693	241,008
Progressive percentage change		1.4	(31.9)	(2.6)	1.0
Floor Price Schedule					
Capital cost		0	0		
Maintenance cost		1,708	1,034		
Operating cost		43,361	43,361		
Total	65,196	45,069	44,395	44,395	44,827
Progressive percentage change		(30.9)	(1.5)	0	1.0

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Table 4.6 – ROUTE SECTION: Pinjarra to Wagerup
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	2,549,976	2,549,976	2,549,976		
Communications cost	675,896	675,896	675,896		
Track cost	27,920,502	27,925,110	24,537,286		
Total	31,146,374	31,150,982	27,763,158		
Progressive percentage change		0	(10.9)		
Ceiling Price Schedule					
Capital cost	2,478,247	2,478,663	2,224,166		
Maintenance cost	532,481	542,167	308,209		
Cost of Working Capital	96,652	96,668	86,742		
Operating cost	146,042	146,042	146,042		
Overhead cost	327,944	338,996	251,622		
Total	3,581,366	3,602,536	3,016,781	2,795,578	2,822,695
Progressive percentage change		0.6	(16.3)	(7.3)	1.0
Floor Price Schedule					
Capital cost		0	414		
Maintenance cost		69,011	41,258		
Operating cost		99,666	99,666		
Total	211,179	168,677	141,338	141,312	142,683
Progressive percentage change		(20.1)	(16.2)	0	1.0

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Table 4.7 – ROUTE SECTION: Wagerup to Brunswick Junction
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	8,454,823	8,454,823	8,454,823		
Communications cost	1,434,260	1,434,260	1,434,260		
Track cost	34,246,648	34,246,648	30,067,946		
Total	44,135,731	44,135,731	39,957,029		
Progressive percentage change			(9.5)		
Ceiling Price Schedule					
Capital cost	3,627,366	3,627,368	3,312,952		
Maintenance cost	910,318	916,629	533,763		
Cost of Working Capital	141,467	141,467	129,205		
Operating cost	202,600	202,600	202,600		
Overhead cost	454,944	470,277	409,407		
Total	5,336,695	5,358,341	4,587,927	4,281,947	4,323,482
Progressive percentage change		0.4	(14.4)	(6.7)	1.0
Floor Price Schedule					
Capital cost		34,752	33,548		
Maintenance cost		164,838	100,679		
Operating cost		138,264	138,264		
Total	395,880	337,854	272,491	273,751	276,406
Progressive percentage change		(14.7)	(19.3)	0.5	1.0

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Table 4.8 – ROUTE SECTION: Brunswick Junction to Picton Junction
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	3,429,468	3,429,468	3,429,468		
Communications cost	823,294	823,294	823,294		
Track cost	19,139,318	19,139,318	17,010,397		
Total	23,392,080	23,392,080	21,263,159		
Progressive percentage change			(9.1)		
Ceiling Price Schedule					
Capital cost	1,947,479	1,947,480	1,786,070		
Maintenance cost	619,241	622,422	348,113		
Cost of Working Capital	75,952	75,952	69,657		
Operating cost	263,657	263,657	263,657		
Overhead cost	592,052	612,005	406,036		
Total	3,498,381	3,521,516	2,873,533	2,711,008	2,737,305
Progressive percentage change		0.7	(18.4)	(5.7)	1.0
Floor Price Schedule					
Capital cost		43,309	42,029		
Maintenance cost		95,589	58,379		
Operating cost		179,932	179,932		
Total	399,374	318,830	280,340	281,760	284,493
Progressive percentage change		(20.2)	(12.1)	0.5	1.0

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Table 4.9 – ROUTE SECTION: Picton Junction to Inner Harbour
ROUTE: Kwinana to Bunbury Inner Harbour (SWM)

	WNR proposed levels dated 19 December 2002	Adjustments to correct errors found in the APM	Determined by Regulator as at December 2002	Adjustment with 30 June 2003 WACC	CPI-X adjustment to 1 July 2003
GRV (dollars)					
Signalling cost	2,486,863	2,486,863	2,486,863		
Communications cost	222,043	222,043	222,043		
Track cost	4,755,053	4,755,053	4,389,527		
Total	7,463,959	7,463,959	7,098,433		
Progressive percentage change			(4.9)		
Ceiling Price Schedule					
Capital cost	646,929	646,929	618,717		
Maintenance cost	303,428	303,962	156,429		
Cost of Working Capital	25,230	25,230	24,130		
Operating cost	247,928	247,928	247,928		
Overhead cost	556,731	575,494	314,726		
Total	1,780,246	1,799,543	1,361,930	1,310,566	1,323,278
Progressive percentage change		1.1	(24.3)	(3.8)	1.0
Floor Price Schedule					
Capital cost		20,565	19,993		
Maintenance cost		22,694	13,861		
Operating cost		169,198	169,198		
Total	290,654	212,457	203,052	203,578	205,553
Progressive percentage change		(26.9)	(4.4)	0.3	1.0

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