Public Submission by
Alcoa World Alumina Australia
on Clause 9 Determination on WestNet Rail

Prepared for:

Rail Access Regulator
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1. EXECUTIVE SUMMARY

Alcoa has reviewed the ceiling and floor prices and the supporting data supplied by WestNet in its submission dated 19 December 2002 on Clause 9 Ceiling and Floor pricing for the four mainlines of their network.

In our review of the data supplied by WestNet, we have concentrated on the ceiling pricing suggested for Alcoa's routes which utilise all of the South West mainline. Our analysis and the comments from our consultants would suggest that the pricing submitted would be considered high by any current measure of railway construction and maintenance costs.

All four components of the WestNet ceiling price - Capital, Maintenance, Operating and Overheads are each overstated by $1.5 million to $6 million on the South West Mainline resulting in $14 million difference between our consultant's estimates and the WestNet figures as submitted.

We consider that only one of the four categories of cost, Capital, provided an insight into WestNet's approach to costing through the detailed GHD report. However, the result is still 59% higher than our consultant's modelling. Since this 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 we consider to be overstated in the WestNet submission for the South West Mainline. The other three cost areas, Maintenance, Operating and Overheads are on average some 300% higher than our consultant's estimates and in our view are overstated by approximately $8 million.

On this basis, we do not agree with WestNet's ceiling and floor pricing and request that the Regulator review the calculations prepared by our consultants as detailed in this submission and in the supplementary confidential data provided with this submission. We also request that the Regulator seek independent verification of all costs and talk to our consultants and the contractors who have supplied us with prices and information so that the Regulator may form an opinion on a reasonable ceiling price for each of the four routes being examined under this Clause 9 Determination.

Of all the routes being reviewed in this Clause 9 Determination, the ceiling price on the South West Mainline is the most critical as it is this line that is likely to provide WestNet with revenues that could approach the ceiling limit owing to the volumes of bauxite and alumina being shipped by Alcoa and Worsley. With a captive bulk haul

market, which has no viable alternative transport mode, WestNet is a monopoly provider with significant market power. The ability of an existing bulk haul customer to effectively negotiate rates below the ceiling is extremely limited and therefore it is imperative that the ceiling on this route be set at the most efficient level.

On the South West Mainline, we submit that the ceiling price of $27.8 million provided by WestNet should be halved to provide a realistic "maximum revenue" figure for this route. In our view, a figure any higher than $13.7 million would result in either monopoly profits or significant cross-subsidisation of other lines - neither of which can be contemplated under the Code.

In view of the significant difference between the WestNet ceiling price and the recommendation of our consultants, we have sought detailed input over the past six weeks from many sources within the rail industry. We are confident that the information provided to us is accurate but we recognise that, given the limited data provided by WestNet, there may be errors in the assumptions and the application of these unit rates.

With regard to the ceiling prices submitted by WestNet, Alcoa makes the following specific recommendations for the South West Mainline:

- **Reduce the capital annuity from $15.8 million to $9.9 million**
- **Reduce the Maintenance cost from $4.8 million to $1.8 million**
- **Reduce the Operating Cost from $2.7 million to $1.1 million**
- **Reduce the Overhead Costs from $4.6 million to $0.8 million**

The result of these recommendations would be a reduction in the ceiling price for the South West Mainline from $27,825,400 to $13,731,059 which, given the likely scenario that access charges on this line will reach the ceiling, would result in an average access rate of $5.97 per thousand GTK - a figure which is still 200% of the average rate ($2.95/000 GTK) enjoyed by interstate customers of ARTC.

2. INTRODUCTION

This public submission is provided by Alcoa World Alumina (Alcoa) in response to the request for public submissions released by the Regulator on 24 December 2002. It refers to a series of documents provided by WestNet Rail (WestNet) to the Regulator in its letter dated 19 December 2002 including:

- Covering letter;
- Route section descriptions and length;
- Supplementary Information for Clause 9 Determination;
- Signalling Unit Pricing;
- Ceiling and floor and GRV Pricing;
- GHD Report Pricing of Track Infrastructure and Appendices;
- Copy of the approved Costing Principles.

This submission also includes commentary on the subsequent release of data in WestNet's letter of 28 January 2003 in response to our consultant's request to the Regulator dated 15 January 2003.

The remainder of this submission is structured as follows:

- Section 3 - Detailed responses on individual items, specifications or unit pricing used in the calculation of the Gross Replacement Value;
- Section 4 - A review of the organisation sizing for an efficient track owner and the resulting changes to Operating Costs (including both Operations and Maintenance Costs);
- Section 5 - A detailed response on the Overhead Costs and the allocation method applied by WestNet.

It should be noted that throughout this submission, prices obtained by our consultants from contractors and suppliers include all profit and risk margins. To ensure like-for-like comparison on these prices, the figures used in the GHD report have been increased by 5% to represent the component of WestNet's 20% markup associated with the contractor's margin. The balance of the WestNet markup (15%) has been allocated to Engineering, Procurement and Construction Management (EP&CM).

3. CAPITAL COST ISSUES

WestNet has provided a submission suggesting a Gross Replacement Value for the South West Mainline of $191,208,603 which is $1.1 million per mainline kilometre. We would submit that given the exclusion of cuttings and embankments and the use of a realistic specification for formation and ballast depth, that a competitive tender price for this route would be in the order of $125 million or $756,000 per mainline km. This reduction in GRV of $66 million reduces our estimate of the annual capital cost to approximately $9.9 million compared to WestNet submitted capital cost of $15.8 million - a reduction of $5.9 million. The following subsections describe these differences in detail. It should be noted that direct comparisons were possible on many unit rates and quantities due to the availability of the GHD Report.

3.1. Level Crossings

We understand from the GHD report, that level crossings have been included in the GRV calculation in two cost areas - the supply and installation of the road pavement within the rail reserve and the provision of all the track signalling, boom gates and warning devices. It is our submission that only level crossings funded by WestNet should be included in the GRV. All public road crossings are 100% funded by MRWA and all private land access crossings are funded by the affected land owner. The only justification for the inclusion of a level crossing in the GRV calculation would be a new level crossing installed as a result of a realignment of the railway across a pre-existing road. Level crossings provide safe access for road users where it is either impractical or not cost effective to provide grade separation of road and rail traffic.

If level crossings are included in the GRV calculation then the track owner is receiving a return on assets which is providing for depreciation and a risk adjusted return in a case where the track owner is not responsible for the renewal or replacement of the asset.

To support this view, the following information is extracted from the *Railway Crossings Protection in Western Australia - Policy and Guidelines*. We understand that the railway owner is only required to fulfil the obligations of the State and co-operate with a Local Government as described in this document which states in part that:

- Funds for railway crossings are provided by the government as road funds and are administered by MRWA.

- At existing railway crossings on public roads, the cost of improving railway crossing protection including pedestrian facilities is to be met by MRWA.

- Costs associated with the maintenance and operation of protection devices on public roads are generally to be equally shared between MRWA and the railway owner.

- Costs for improving railway crossing protection, including pedestrian facilities, required as a result of specific developments, or providing new protection as a result of road, pedestrian path or railway construction or upgrading, are to be met by the developers or the road or rail authority as appropriate. The costs are to include maintenance requirements extending five years beyond the completion of the development, new construction or upgrading.

We also understand that level crossings providing access to private property are the responsibility of the land owner requiring access and that WestNet is required to replace and maintain the level crossings so they are fit for purpose but **only at the cost of the private owner and only if the private owner agrees to pay such costs**.

Schedule 4, Section 4 "Nature of Costs" of the Code in referring to the Capital, Operating and Overhead Costs states that:

"The costs referred to in this Schedule are intended to be those that would be incurred by a body managing the railways network .....".

We consider that WestNet is therefore unable to claim any capital cost and only 50% of the maintenance cost at public road crossings otherwise it is in contravention of this clause which limits allowable costs to those incurred by WestNet.

We recommend that the Regulator should acknowledge that WestNet cannot claim Capital Costs for level crossing assets which are fully funded by a third party otherwise WestNet is receiving depreciation and a risk adjusted return on an asset on which no cost has been or will be incurred.

We accept that any WestNet funded level crossings should be included in the calculation of GRV.

We recommend that only 50% of the maintenance cost for the public road crossings should be included in the calculation of Operating Costs due to the agreement on funding with MRWA and that no maintenance costs on private crossings should be included as these are funded by the land owner.

3.2. Modern Equivalent Assets - Track

In reviewing the specification for the track that should replace the existing South West Mainline and the assumptions used in the GHD Report, our consultants have identified several features and track design anomalies that they consider should be corrected in the theoretical MEA replacement model. These are listed below with a description in the following sections explaining the reason for the reduction or exclusion:

- Earthworks - Formation height and ballast depth
- Ballast cost and transport costs
- Turnout costs and quantities used at branch lines and at Pinjarra yard
- Rail welding techniques
- Crossing Loops at Brunswick
- Crossing loop lengths

3.2.1. Earthworks

GHD has used an earthworks specification supplied by WestNet which we consider to be "gold-plated" standard for the South West Mainline. An overall formation height of 1.5 m is excessive even for an MEA track and would exceed any recent rerailing specification on narrow gauge track in Western Australia. We asked Mr Mike Beale of Halcrow Rail (who is the current Discipline Leader -Track for the joint venture working for Perth Urban Rail Development (PURD) on the Perth to Mandurah Railway) to indicate an acceptable formation requirement for the Kwinana to Bunbury line. Based on a

track specification of 70km/h, 19.5 tonne bulk haul traffic and 110 km/h, 16 tonne passenger traffic, Halcrow Rail advised that a capping layer of 230mm of selected gravel and 200mm of ballast supporting concrete sleepers at 700mm centres (1430/km) would meet this specification.

It should also be noted that our consultants have advised that the formation would be created using existing material by a process of cut and fill to minimise the amount of imported material required on site. The suggestion in the GHD report that all the formation material would be imported is not accepted by our consultants as efficient construction practice and they suggest that the entire length of the South West Mainline formation could be achieved using the "cut-to-fill" technique. On this basis, the $\$17.00/m^3$ used by GHD would change to $\$9.00/m^3$ for cut material. Over 165 km of the South West Mainline, the GHD estimate would be $28 million plus 5% contractors margin making a total of $29.4 million compared to our estimate of $18.7 million[1] - a reduction of $10.7 million.

We recommend that the Regulator's independent engineer re-evaluate the assumptions in the GHD report including the unit rates, the height of the formation, the depth of ballast and the use of cut-to-fill material rather than imported material as the source of the formation layer.

3.2.2. Ballast Depth and Cost

Ballast Depth

We note in the GHD Report that WestNet has specified a minimum depth of ballast below concrete sleepers of 300mm. We do not accept that this depth of ballast is required given the formation and capping layer specifications which have been suggested for this track structure. Under the worst formation conditions of soft soil, the Schramm equation in the Westrail NG Code of Practice gives a ballast depth of 248mm. In this case, there will be a new compacted capping layer laid on a compacted formation layer and our engineering advice (see Section 3.2.1) is that 200mm ballast is more than adequate.

[1] Based on Longrun estimate of $59,200/km for formation and $47,400/km for capping layer

The following examples show that current engineering design for new track being constructed to similar or better construction standards uses less ballast than that suggested by WestNet:

- Halcrow Rail, advisors to Perth Urban Rail Development on track design for the Perth to Mandurah railway have advised that a ballast depth of 200mm would meet WestNet's track specification for the South West Mainline and is the same depth being proposed on the 130 km/h Perth-Mandurah line;

- GHD Brisbane in its report to the QCA on Queensland Rail assets used 1.5 m^3 of ballast per metre of track (equivalent to the 1.52 m^3 for 200mm ballast depth shown in the GHD Perth Drawing SK03 supplied by WestNet). QR Coal Systems track is rated to 26 tonnes axle loads on 60 kg rail; and

- Westrail's NG Code of Practice for Track and Civil Infrastructure specifies a ballast depth of 200mm for concrete sleepered track with a shoulder slope of 1:1.5 and a shoulder width of 300mm.

We recommend that the Regulator adopt a ballast depth of 200mm to support the track specification selected for the South West Mainline.

Ballast Cost

The GHD Report provides prices for ballast on the South West Mainline based on supply from quarries in Perth ($15/t) and Bunbury ($13/t) but comments that one supplier commented that "it would be worth establishing new (additional) quarries closer to the construction sites". Our consultants have contacted Giacci Quarry at Gelorup near Bunbury to confirm supply and transport costs. Giacci have advised that multiple quarry sites would be impractical due to environmental and other approvals required and would also be uneconomical given the low transport costs and the competitive pricing of the raw material.

Giacci have advised that tender prices for large quantities (more than 100,000 tonne) would be less than $10.00/tonne ex quarry and transport costs would range from $0.10 per t-km for short distances to $0.07 per t-km for 100 km hauls. On this basis, we suggest that an average cost of $10/tonne and an

average haul distance of 51km and a rate of $0.09 per t-km be used for the South West Mainline based on road as the preferred method of transport as the short distances do not warrant the use of rail. The following table provides a comparison between the rates used by GHD and our researched rates:

Ballast Pricing	**GHD**	**Giacci**
Length of track Kwinana to Bunbury IH	165 km	165 km
Ballast qty per km of track (tonnes)	3129 t	1900 t
Total ballast qty Kwinana to Bunbury IH	516,285 t	313,500 t
Supply cost	$15/t ex Perth $13/t ex Bunbury	$10/t ex Perth or Bunbury
Delivery cost	$0.10 per t-km	$0.09 per t-km
Total supply cost[2]	$7,227,990	$3,135,000
Total delivery cost[3]	$2,633,053	$1,438,965
Total cost of ballast	**$9,861,043**	**$4,573,965**
Ballast price including markup	**$10,354,095**	**$4,573,965**

Table 3.2.2-1 Ballast pricing comparison

Based on an average price of $10/t ex quarry, we estimate the cost for ballast for the South West Mainline to be $4,573,965 compared with our estimate of WestNet's price (based on 300mm ballast depth, the GHD unit rates, an average haul distance of 51km and a 5% markup) of $10,354,095 - a reduction of $5.78 million.

[2] Based on *GHD figures of 165km of track, supplied from each end so 82.5 km is the maximum distance from each end, assume all ballast delivered to the midpoint form each end so travel distance is 41.25km plus allow 9.75km to quarry = 51km. Quantity of ballast is 3129 tonne/km x82.5 km x either $13/t for Bunbury or $15/t for Perth =total $7,227,990. Indec calc. Assume 1900 t/km x 165km x $10/t = $3,135,000.*

[3] GHD Haul cost is the total ballast qty, 516,285t x mean travel distance 51km x $0.10 per t-km = $2,633,053. *Indec calculation assumes tonnes moved over an average 51km at $0.09 per t-km = $1,438,965.*

3.2.3. Turnouts

Turnout Cost

GHD has advised in its report to WestNet that turnout prices were sought from two suppliers and only one, VAE, responded. We have approached the other supplier, TKL, who have advised that VAE were the successful tenderer for supply of NG turnouts to WestNet. On this basis, we have accepted VAE pricing as competitively based. Prices quoted for installation are markedly different from the rates quoted by GHD and it must be assumed that GHD have used a "replacement under traffic" quote rather than a "greenfields" assembly price. We would suggest that installation prices based on a quotation from Longrun Transport. Also shown in the table are prices sourced by GHD[4] on behalf of the QCA in November 2000 which were used to assess the valuation of Queensland Rail's infrastructure assets.

Turnout Costs	**Longrun**	**GHD Perth (VAE pricing)**	**GHD Brisbane (report to QCA)**
1:12, 60 kg concrete bearer NG turnout	$131,000	$118,000 + 5% = $123,900	$80,000
Installation cost (including contractors margin and risk)	$40,000	$60,000 + 5% = $63,000	$9,000
TOTAL	**$171,000**	**$186,900**	**$89,000**

Table 3.2.3-1 Supply and Installation pricing for Narrow Gauge 1:12 Tangential Turnouts.

Installation costs quoted by Longrun include the cost of ballast and all contractor margins.

We recommend that a figure for supply and install of $171,000 per narrow gauge turnout be used for the purposes of calculating GRV in WestNet's ceiling price model.

[4] GHD Valuation of Queensland Rail's Below Rail Assets for the Coal Network, November 2000, Appendix B Unit Replacement Costs - Track Section 11

Turnout Quantities

WestNet has provided data to GHD that suggests that 40 turnouts are required between Kwinana and Bunbury Inner Harbour. Whilst we concur with most of the turnouts included, several crossing loops and branch line turnouts are not constructed to MEA standard which results in additional turnouts being required. For the purposes of this Clause 9 Determination we would suggest the following amendments to the quantity listing for the South West Mainline.

Turnout Quantity	**Best Practice**	**GHD Report**
Kwinana - Mundijong Jcn	4	7
Mundijong Jcn - Pinjarra	8	11
Pinjarra East - Pinjarra South	1	0
Pinjarra - Alumina Junction	2	1
Pinjarra - Wagerup North	4	5
Wagerup North - Brunswick North	6	7
Brunswick North - Picton Junction	4	5
Picton Junction - Bunbury Inner Harbour	1	4
Total Quantity (mainline use only)	**30**	**40**

Table 3.2.3-2 Minimum quantity of turnouts required - Kwinana to Bunbury Inner Harbour

The quantity of turnouts allocated between Mundijong and Pinjarra is representative of the issues here. There are three loops on this section of line plus a fourth short loop which is part of the sidings complex at Pinjarra. For mainline working, the only requirement at Pinjarra is a crossing loop. This would make a total of four loops in the section between Mundijong and Pinjarra with two turnouts per loop resulting in eight turnouts. WestNet have allocated eleven turnouts which we assume relates to the additional turnouts within the Pinjarra complex associated with the operations of Hotham Valley Tourist Railway and also the branch line to Dwellingup. The MEA design for this section would only require eight turnouts with one extra for the branch line, which we have assigned to the branch line, Pinjarra to Alumina Junction.

We recommend that only 30 turnouts are required for an MEA track construction for the South West Mainline.

The total reduction in turnout GRV based on these two studies is $2.3 million[5].

3.2.4. Rail Welding

The GHD report states that rail would be supplied to the flashbutt welding facility at Midland in 27.5m lengths and welded into 110m lengths for transporting to site where final assembly would use "thermit" welding. Our research suggests that the most efficient approach to laying new rail would be to use portable flashbutt welding machines rather than the fixed flashbutt welding facility at Midland. Several contractors contacted have recommended that portable flashbutt welding is now an established engineering practice with specialised machinery readily available for hire. The process is also cost effective as it reduces the number of thermit welds required on site. Thermit welding would only be used every 500m on tangent track and every 250m on curves to establish the correct rail stress condition.

Works Infrastructure have suggested that the normal "published" rate for portable flashbutt welding should be reduced by 35% - 40% for a greenfields installation. The following table show the comparison of rates for rail welding.

Rail Welding Costs	Works Infrastructure	GHD Report
Flashbutt Welding per rail	$120	$140
Thermit Welding per rail	$350	$450

Table 3.2.4-1 Comparison of costs for rail welding

Having established that portable flashbutt welding is indeed an acceptable engineering practice, the approach taken to welding lengths of rail to 110m prior to transport to site would become obsolete and this results in the ability to perform more welds using the flashbutt process per kilometre of track. This in turn leads to further cost savings as shown in the following table.

[5] GHD calculation $118,000 plus $60,000 plus 5% contractors margin times 40 turnouts = $7,476,000 compared to $131,000 per turnout plus $40,000 times 30 turnouts = $5,130,000

Number of welds per kilometre of track	Works Infrastructure	GHD Report
Flashbutt Welding per two rails	68 (on-site)	54.5 (factory)
Thermit Welding per two rails	4.7 (on-site[6])	18.2 (on-site)
Total number of welds per km	72.7	72.7

Table 3.2.4-2 Number and type of welds per kilometre of track

Using the quantity and pricing above, the total cost for our approach is $9,805 per km. Using the GHD unit pricing, the cost is $15,820 per km. Over the total length of the South West Mainline, the difference is just under $1 million.

We recommend that the Regulator adopt portable flashbutt welding as the efficient engineering practice for all rail welding (with the exception of rail stress welds) and alter the unit rates and quantities of rail welding accordingly.

A further saving on transport costs of rail to site will also be achieved if this approach is adopted as rail could be delivered to Kwinana SG terminal from South Australia and shipped in 27.5m lengths to site by road or rail. This saving has not been calculated.

3.2.5. Crossing Loops at Brunswick Junction

There are currently two crossing loops at Brunswick Junction which are in a stacked loop configuration (one loop is connected to the mainline, the second loop is constructed off the first loop). It is our conclusion that the second loop is used to hold or pass trains travelling to and from Collie on the branch line and is not necessary or part of the mainline operation. We contend that one crossing loop at Brunswick Junction would be sufficient to support the mainline operations.

[6] This figure is based on 2 thermit welds per rail per km on tangent track and 4 thermit welds per rail on curved track to allow for stressing the rail.

3.2.6. Crossing Loop Lengths

Crossing Loops on the South West Mainline currently accommodate train lengths from 579m to 1314m. Three crossing loops are too short to accommodate standard Alcoa trains - namely Pinjarra (579m) Yarloop (612m) and Benger (647m). Several crossing loops are excessively long as they are also part of marshalling yards or other facilities used by AWR. In particular, Picton includes a loop length of 1519m with a maximum train length of 1098m and Kwinana includes a loop length of 1502m. Neither the short loops nor the overlength loops provide an MEA asset and we suggest for the purposes of GRV, that the loops should be standardised at 900m between Kwinana and Pinjarra and 765m between Pinjarra and Bunbury. These loop lengths would accommodate all existing and proposed train lengths on these route sections and provide improved crossing options where the existing loops are too short.

We recommend that crossing loops be standardised at 900m between Kwinana and Pinjarra and at 765m between Pinjarra and Bunbury Inner Harbour.

3.3. Modern Equivalent Assets - Signalling

WestNet has provided a total cost of signalling by route section and examples of unit costs for the provision of signalling equipment. With no breakdown of the quantities of each item, no allocation methodology for centralised equipment and no list of the included and excluded items resulting from the connections to branch lines, private sidings, yards and terminals, it has been impossible to perform any meaningful analysis of the WestNet capital costs.

So that we could at least comment on the total costs submitted, we asked Gobetz Engineering Services (GES), a specialist signalling consultant, to update a previous study of the South West Mainline in an attempt to duplicate WestNet's submission. GES calculated unit quantities and applied the WestNet unit prices provided with its Clause 9 submission.

	GES	WNR		GES	
	Quantity	**Unit prices**	**Cost**	**Unit prices**	**Cost**
Conduits, cables & trenching	113,947	$72	$8,204,206	$24	$2,734,735
Power cubicle	14	$12,000	$169,865	$4,500	$63,699
CBI power	14	$9,865	$139,643	$5,000	$70,777
IRJ's	352	$5,000	$1,760,000	$3,000	$1,056,000
Signals	163	$8,090	$1,318,670	$6,300	$1,026,900
Shunt signals	0	$4,230	0	$3,500	0
loc case large	45	$6,620	$297,900	$5,600	$252,000
electrocode	52	$23,834	$1,239,368	$20,200	$1,050,400
loc case small	111	$4,580	$508,380	$4,400	$488,400
Interlocking	14	$41,628	$564,476	$40,000	$542,400
SER	14	$31,240	$423,614	$35,000	$474,600
Point machines	42	$18,380	$771,960	$22,900	$961,800
Track circuits dc	114	$2,382	$270,357	$3,000	$340,500
JRI	31	$3,250	$100,750	$4,800	$148,800
Undertrack crossings	47	$2,750	$129,250	$4,560	$214,320
Boom barriers	*7*	*$176,763*	*$1,237,341*	*$116,000*	*$812,000*
Flashing lights	*55*	*$141,045*	*$7,757,475*	*$104,000*	*$5,720,000*
Totals			$24,893,255		$15,957,332

Table 3.3-1 Comparison of unit pricing of signalling assets

GES then calculated the cost for the same quantities using their current replacement cost estimates. For the purposes of like-for-like comparison, GES have also added the cost of level crossing protection to their previous study. Table 3.3.-1 shows that there is a $9 million difference based on unit pricing variations alone, before any quantity differences are considered.

It is clear from this table that a few significant items have a major impact on the total cost. The notable differences are cabling, insulated rail joints (IRJs) and signals which account for $6.4 million difference. As an example, WestNet has quoted a unit price of $72 per metre for cabling including conduits, cables and trenching. GES advises that an efficient MEA replacement would involve direct burying of the cable and result in a figure of $24 per metre. This item alone accounts for $5.5 million difference in the signalling GRV.

Having established the differences in unit pricing between WestNet's submitted prices and current supplier prices, GES were asked to estimate the quantities of signals and equipment used by WestNet for each of the route sections on the South West Mainline and the resulting GRV figures which make up its $31,090,023 total for signalling. GES have advised that there is little correlation between the WestNet pricing and the GES model. WestNet figures for Kwinana to Mundijong, Pinjarra East to Alumina Junction, Wagerup to Brunswick Junction and Picton Junction to Bunbury Inner Harbour all appear significantly overstated but with no supporting data from WestNet, GES is unable to suggest why these differences have occurred.

With level crossing signalling costs excluded (refer to our submission in Section 3.1), the cost for signalling the South West Mainline reduces to $9,425,332[7] to which must be added an allocation for the shared cost of the train control centre which we have estimated as $1,435,051[8] and a 15%[9] EP&CM markup. The following table illustrates the results.

[7] Total estimate of signalling GRV South West Mainline of $15,957,332 less boom barriers of $812,000 and flashing lights of $5,720,000.

[8] Based on a single train control centre for the whole network which is then apportioned to the South West network and a percentage allocated to the South West Mainline based on signalling asset value.

[9] A markup of 15% rather than 20% is used as all GES unit pricing includes contractor's margins and risk provisions.

Signalling GRV (excluding Level Crossings)	WestNet submitted GRV[10]	GES Mainline only
Kwinana to Bunbury Inner Harbour	$23,777,123	$12,489,469
Percentage	100%	52%

Table 3.3-2 Comparison of GRV for Signalling (excluding level crossings)

We have concluded from this analysis that there are differences in both quantities and unit prices associated with the WestNet GRV calculation for signalling (excluding the issues surrounding level crossing protection) although we consider that the major differences relate to unit pricing. In our view, an MEA replacement of the signalling system could be achieved for $12.4 million compared with the $31.1 million submitted by WestNet - a reduction of $18.7 million in the GRV.

We recommend that the Regulator seek verification from WestNet of the included assets for signalling and also seek independent verification of supplier costs and installation methods and cost.

3.4. Modern Equivalent Assets - Communications

We asked GES to estimate the costs of replacing the communications network on the South West Mainline. The consultant has advised that the GRV proposed by WestNet is very close to the GES estimate of $6,564,795 however this amount is based on a 34Mbps radio system which has a bandwidth far in excess of WestNet's internal needs. The consultant advises that WestNet would seek to on-sell up to 90% of this additional bandwidth at a net profit to WestNet. It must be assumed that costs associated with the provision of non-railway infrastructure are excluded from the calculation of the GRV and therefore we have included only $712,304 as rail related. This estimate would compare favourably with purchasing third party bandwidth to perform the same task.

[10] WestNet's submitted figure of $31,092,023 for signalling on the South West Mainline less WestNet's Additional Information figure of $7,314,900 for level crossing protection.

We have also noted that WestNet has included the cost of regulatory compliance with respect to the "use of the corridor for public and private utilities (such as telecommunications carriers)"[11] and we dispute the inclusion of these charges as they relate directly to non-railway revenue generated by this same access.

We recommend that the Regulator examine the revenue generated outside the core business by the communications backbone and allocate only that portion of those assets used by WestNet for rail access purposes to the GRV calculation.

3.5. GRV Summary

The changes to the unit quantities and prices for each of the items mentioned above have been combined with all the other track, signalling and communications assets in a GRV Model which is reproduced in full in Appendix C. The summary for each major asset type for the South West Mainline is shown in Table 3.5-1.

GRV Summary	Total $ GRV
EP&CM and Contingencies	$20,250,226
Earthworks	$18,752,737
Bridges and Culverts	$9,701,187
Track Materials	$45,953,911
Track lay	$17,688,677
Signalling and Communications	$11,572,581
Other	$369,071
Finance Charges	$505,618
Total	**$124,794,008**

Table 3.5-1 Summary of Gross Replacement Value

[11] WestNet letter to the Regulator 19 December 2002 Item 4 "Regulatory Compliance"

The conversion of this GRV total to an annual capital charge (annuity) of $9,880,874 is also shown in Appendix C.

We recommend that the Regulator review the quantities, unit costs and WestNet's use of a 5% markup for contractor's risk and margin in each of the areas noted to ensure that an accurate assessment of GRV is achieved through this review process.

4. OPERATING COST ISSUES

Due to the absence of any data provided by WestNet, our consultant has provided three alternative references as a basis for estimating efficient operating costs:

- an estimate of the current WestNet structure and its costs;
- another Australian track owner's structure; and
- the consultant's best practice model for a similar sized network.

ARTC was selected as the example of an Australian track owner dedicated to providing users with the lowest access charges whilst still maintaining track speeds and axle loads to acceptable standards. The following table provides an overview of the main operating parameters of ARTC extracted from the ARTC 2002 Annual Report and an estimate of WestNet's equivalent parameter.

	ARTC (Annual Report 2002)	**WestNet (all figures estimated)**
Revenue from access fees	$87.8 million	Unknown
No of Employees (inc. Train Controllers)	95 positions (Average head count: 89)	151 (estimated) [includes 63 directs in maintenance]
Train controllers	34	32 (estimated)
Kilometres of track	3626km	1473 mainline kms (5000km total including branch and grain lines)
Maintenance Cost per km of mainline	$9,832/km[12]	$18,602/km[13]
Traffic Density	27.3 billion GTK freight	14 billion GTK freight (mainline estimated)
Average Access Charge per thousand GTK	$2.95 (Interstate Track)	$12.08 (Average rate[14] based on ceiling - SW Mainline)

Table 4-1 Comparison of ARTC and WestNet Rail major parameters.

[12] Based on $35.653 million "infrastructure maintenance" cost ARTC Annual Report Year Ending 30 June 2002 divided by 3626 km.

[13] Based on WestNet's Clause 9 submitted Ceiling maintenance cost for all four mainline routes of $27,401,618 divided by 1473 mainline kilometres

[14] WestNet submitted ceiling price of $27,825,400 for the South West Mainline divided by current task of 2.3 billion GTK

The table shows that the two businesses are comparable on track length and operations staff but vary significantly on the utilisation of the network, total employee count and the size of the haulage task. For a business with half of the mainline kilometres, half of the freight task and all its infrastructure maintenance (excluding signalling and communications) outsourced, WestNet is claiming double the ARTC maintenance cost per kilometre for MEA track and more than four times ARTC's access rate on the South West Mainline.

A more detailed examination of these numbers (see Appendix A) reveals that the current WestNet organisation would need to be reduced in size to 66 full time equivalent (FTE) employees[15] and spend half its proposed maintenance budget to be as efficient as ARTC. The allocation of these 66 FTEs to maintenance overhead, operating and overheads is shown below in Table 4-2.

Best Practice Staff Numbers	**Allocated to Mainlines**	**Allocated to Grain & Branch lines**
Maintenance Overhead	10	6
Operations	23	12
Overheads (includes corporate allocation of 8 FTE from ARG)	10	5
Total staff (excluding project engineers)	**43**	**23**

Table 4-2 Allocation of staff numbers to Maintenance, Operating and Overheads

When this reduced staff count is apportioned to each of the four mainlines, the allocation to the South West Mainline is 11 FTEs.

The following sections use the Suggested Best Practice staff numbers[16] defined in Appendix A to calculate Operating and Overhead Costs allocated to the four mainlines.

[15] Operating (including maintenance) and Overheads staff excluding 5 project engineering staff.

[16] Costs based on the 43 staff allocated to the mainlines.

4.1. Operating Costs (excluding Maintenance Costs)

In the absence of any detailed information provided by WestNet to support the submitted total operating costs (excluding maintenance) of $9,380,782 for the four mainlines, our consultant has constructed an operating budget based on both the estimated WestNet personnel and the Best Practice model listed in the previous section.

This operating budget is based on an estimate of WestNet's current staffing levels and a benchmark cost for salary on-costs and other support costs required for a similar sized business. Estimates of 25% on-costs and 40% support costs have been used. Significant other major costs (for example insurance, parent company charges and radio licences) have been itemised separately and then added to the support costs. Maintenance staff and associated maintenance engineering support staff (Head Office based staff) have been excluded and assumed to be included in WestNet's submitted maintenance cost calculation.

The operating (excluding maintenance) budget was created to include all personnel required to provide services for the whole network (including grain and branch lines). As a result, each individual cost has been allocated to a major mainline route or to a grain or branch line. This results in approximately 34% of total operating cost (excluding maintenance) being associated with grain and branch lines and therefore excluded from the comparison of the operating budget created by our consultant and WestNet's total operating cost as submitted to the Regulator.

Our consultant has also estimated a "Best Practice" version of the same budget based on the head count suggested in Appendix A of this submission. The detailed spreadsheet showing these two approaches has been provided as Confidential Attachment A. The results are shown in the following table.

Operating Costs	WestNet Submitted Ceiling cost	Estimated WestNet figure	Suggested Best Practice
Total	$9,380,782	$4,864,150	$4,251,650
Percentage of ceiling	100%	52%	45%

Table 4.1-1 Comparison of Operating Costs (excluding maintenance)

Further allocating these theoretical costs to each of the four mainlines based on actual allocation of direct staff (train controllers) by region and indirect staff by GTK, the following table shows the significant differences between the WestNet ceiling costs and either the estimated WestNet budget or the "Best Practice" cost.

Operating Costs	**WestNet ceiling**	**Estimated WestNet figure**	**Suggested Best Practice**
South West Mainline	$2,660,541	$1,738,100	$1,125,600
East-West Mainline	$4,590,342	$2,416,338	$2,416,338
Kalgoorlie - Esperance	$1,375,542	$439,113	$439,113
Kalgoorlie - Leonora	$754,357	$270,600	$270,600
Sub-total	**$9,380,782**	**$4,864,150**	**$4,251,650**
Grain & Branch lines	No allocation provided	$2,032,101	$1,944,601
Total		**$6,896,250**	**$6,196,250**

Table 4.1-2 Allocation of Operating Costs to all network routes

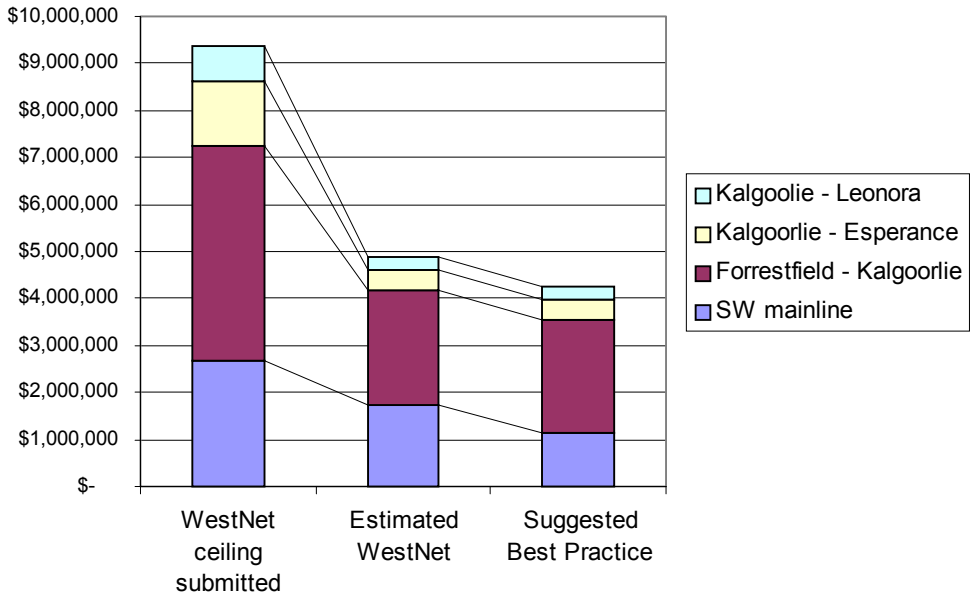

Figure 4.1-1 Allocation of Operating Costs to the Four Mainline Routes

Table 4.1-2 shows that on the South West Mainline, where there would be a high expectation that WestNet would earn close to the ceiling price, the claimed WestNet ceiling component for operating costs is almost 2.5 times our estimated efficient cost. By contrast, the percentage allocation to each of the four mainlines is consistent across the three scenarios as shown in the Figure 4.1-2.

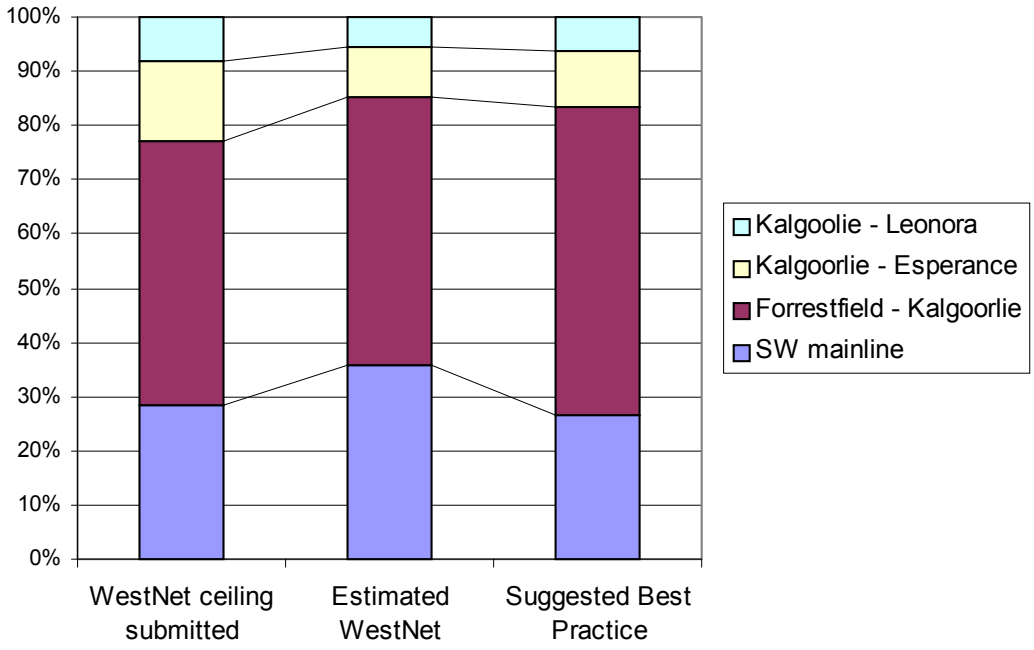

Figure 4.1-2 Allocation of Operating Costs to the Four Mainline Routes

The percentage allocation to each route in Figure 4.1-2 is within 10% suggesting that it is the absolute value of the charges (WestNet's figure of $9.38 million compared with our estimate of $4.25 million) which requires detailed analysis.

We recommend that the Regulator independently assess the basis of WestNet's submitted total operating costs as we estimate the costs allocated to the South West Mainline are overstated by 236% and overall costs for all four mainlines are overstated by 220%.

4.2. Maintenance Costs

The following table shows WestNet's claimed costs for maintenance and the equivalent cost per kilometre of line for each of the four mainlines under review in this Clause 9 Determination.

Maintenance Costs	Total Cost	Cost per km
Kwinana to Bunbury	$4,803,315	$29,123/km
Forrestfield to Kalgoorlie	$15,741,030	$24,106/km
Kalgoorlie to Esperance	$4,512,433	$11,630/km
Kalgoorlie to Leonora	$2,344,840	$9,053/km
Total /average all four routes	**$27,401,618**	**$18,602/km**

Table 4.2-1 WestNet's Maintenance Costs Claimed

The suggested cost per kilometre for both the South West Mainline and the East-West mainline are excessive given the MEA nature of the track used in the pricing model. ARTC's infrastructure maintenance costs for current aged track averages $9,874 per km under a competitively tendered performance based maintenance contract. The average cost for maintenance on the Victorian intrastate network is understood to be in the order of $7,000/km. The Regulator has also been advised[17] that recent benchmarks for similar networks have varied between $5,000 and $16,000/km.

As shown in the table above, WestNet is claiming $29,123/km for a new concrete sleepered track on the South West Mainline - three times the current spend for ARTC track which has a superior axle loading and speed specification.

Our consultant has estimated the total cost for the South West Mainline should be $1,872,689 which equates to $11,349/km. A detailed spreadsheet of the inspection, caretaker and cyclical maintenance included in this total is

[17] Determination on Costing Principles to Apply to WestNet Rail, ORAR, 27 September 2002, Page 20.

provided in Appendix B and our consultant is available to explain the basis for the modelling and the assumptions used.

In the absence of any supporting documentation from WestNet, we can only suggest that the Regulator review the available data and specifically consider the high standard of track which has been constructed under the GRV model discussed earlier in this submission. The maintenance cost used in this determination must reflect the greatly reduced maintenance task which results from installing the track to an optimum specification, maintaining in meticulously to that standard over its predicted life cycle and responding to any defects in a prompt and efficient manner. Where networks are maintained with a high degree of preventative maintenance and very little reactive maintenance, costs reduce dramatically and will be at the lower end of any benchmark standard.

We recommend that the Regulator reject the WestNet submitted Maintenance Cost and conduct an independent assessment of our consultant's data and any interstate benchmarks available for new concrete sleepered track.

5. OVERHEAD COST ISSUES

A review of the allocation of overhead costs to each of the four mainlines suggests that the allocation methodology is not in line with the Costing Principles. The allocation to the South West Mainline is 54% of the total allocation to all four mainlines. With 16% of the mainline GTKs or 11% of the kilometres on the South West mainline, it is difficult to see how the allocation of $4.6 million to the South West was derived. It would appear that WestNet is using the high percentage of Train Movements (54%) to load the South West Mainline with a disproportionate overhead allocation. The following graph highlights the extent of the anomaly.

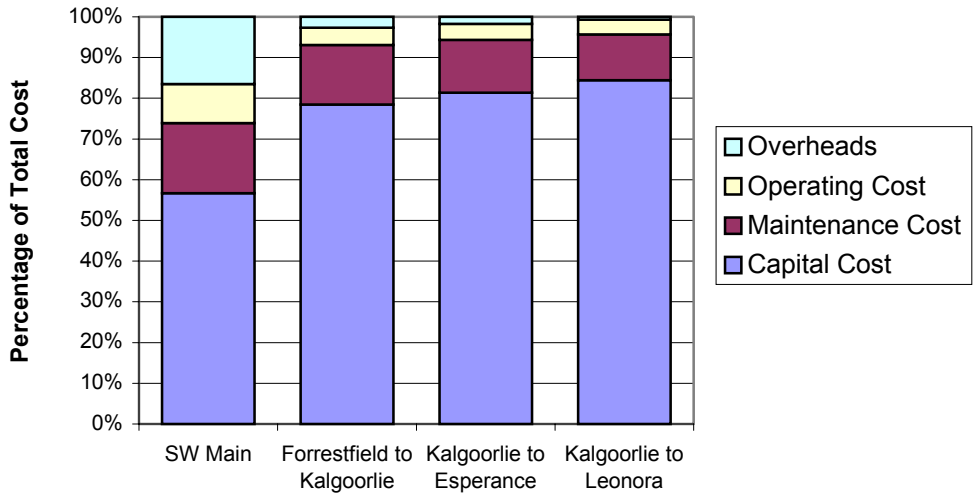

Figure 5-1 Cost Comparison of Four Mainline Routes

This graph shows that:

- Overheads on the SW Main are 16.5% of total costs compared to 2.7%, 1.7%, 0.7% of total costs on other respective routes.
- 54% of all overhead costs have been allocated to the South West Mainline

It is noted that the Costing Principles state that overheads allocation is by GTKs or train movements depending on which is relevant. WestNet also states that Human Resources and Payroll costs are allocated on head count and that IT cost allocations are based on PC terminals but it would appear that nearly every overhead cost has been allocated by train movements even though this cost driver has little relevance to overheads.

The following graph shows a comparison of three scenarios for overhead allocation - the submitted WestNet ceiling figures (including a computed grain and branch line figure), the estimated total cost allocated by the train movement percentages and the estimated total cost allocated by GTK percentages.

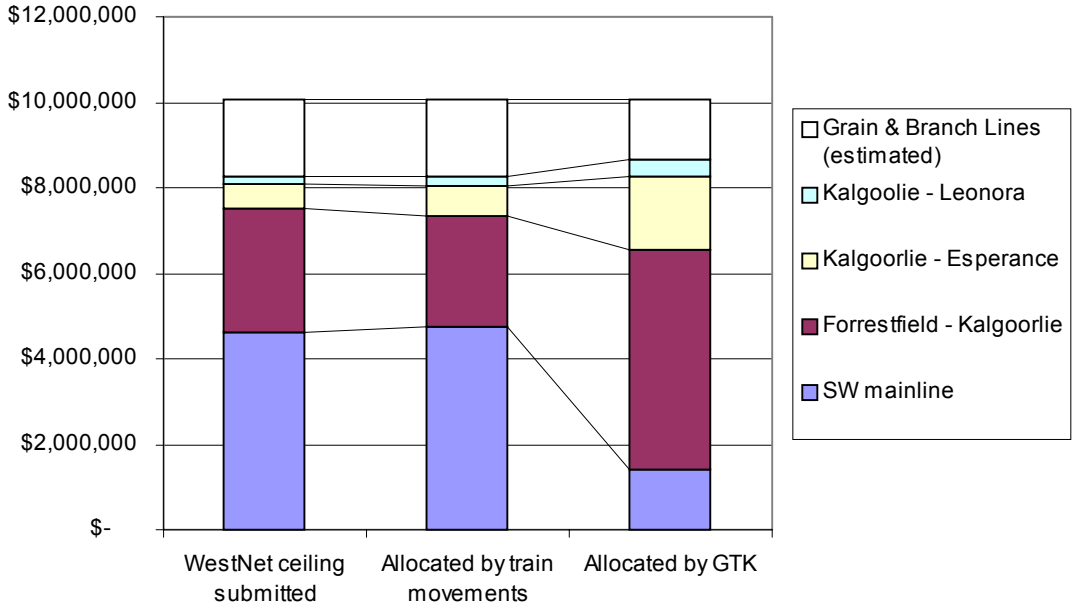

Figure 5-2 Various Allocation Scenarios

It is interesting to note the similarity between the submitted figures (column 1) and an allocation based only on Train Movements (column 2) whereas a more realistic allocation using the GTK allocation[18] method reduces overheads on the South West mainline from $4,593,427 to $1,409,601.

We recommend that the Regulator review the allocation of overhead costs by train movements which would appear to be an inappropriate cost driver for the majority of overhead charges.

[18] Figure 5-2 uses WestNet's GTK allocation percentages provided as Item (6) in their letter dated 28 January 2003. This item includes a figure of 51% for the GTK % allocated to the Forrestfield to Kalgoorlie line. This number does not correlate with our estimates of grain tonnes which travel on grain lines before joining the mainline. We suggest that there may be an error in this calculation which results in the "Forrestfield to Kalgoorlie line" receiving a higher allocation and "Other Branch Lines" receiving a lower allocation.

Following the review of the allocation of overhead costs, our consultant used the model created to estimate the operating costs for a WestNet sized organisation and a Best Practice organisation to estimate an appropriate budget for Overheads. Overhead cost in this instance includes both the internal WestNet costs and the apportioned ARG Corporate costs. The following table and graph illustrate the differences between the WestNet submitted costs, the model estimate of WestNet's current structure and the suggested Best Practice estimate.

Overhead Costs	WestNet Submitted Ceiling cost	Estimated WestNet figure[19]	Suggested Best Practice[20]
Total	$8,256,237	$5,443,776	$5,233,076
Percentage of ceiling	100%	66%	63%

Table 5-1 Comparison of Overhead Costs

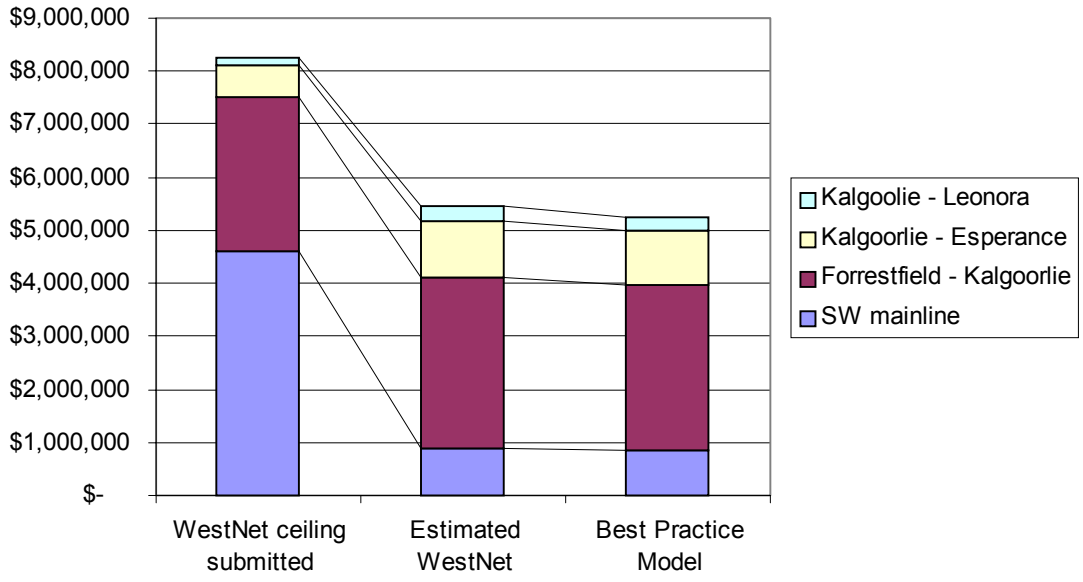

Figure 5-3 Comparison of Overhead Costs

[19] Based on Confidential Attachment A "Summary Clause 9 Networks" figures for WestNet internal overhead of $3,588,350 plus ARG allocated overheads of $1,855,426.

[20] Based on Confidential Attachment B "Summary Clause 9 Networks" figures for Best Practice overheads including WestNet internal overhead of $3,377,650 plus ARG allocated overheads of $1,855,426.

The Best Practice allocation to the four mainlines is $5,233,076 and the South West mainline allocation is $851,896[21] - a reduction of $4.4 million on the submitted figures from WestNet.

We recommend that the Regulator review the calculations of our consultants and seek independent advice on benchmark costs to verify the efficient cost of providing these internal management and corporate services

[21] Based on Confidential Attachment B "Summary Clause 9 Networks" South West mainline only figures of $549,850 for WestNet overheads plus $302,046 for ARG allocation of overheads.

6. CEILING PRICE SUMMARY

The comments and costs proposed in the previous sections result in a reduction of each of the four components of the ceiling price on the South West Mainline. Our consultant has used the revised unit costs and quantities to calculate an updated GRV for the track, signalling and communications assets. This has then been converted to an annuity based on the PMT formula and economic lives listed in the Costing Principles. Our estimates for operating, maintenance and overhead costs have been added to this figure to give an overall ceiling of $13,731,059 for the South West Mainline. It is our submission to the Regulator that a ceiling price in excess of this figure would represent monopoly profits on this line and result in a less competitive market for all users of the South West Mainline.

The following table summarises the results of our investigations.

Ceiling Price - South West Mainline	**WestNet Ceiling**	**Alcoa Recommendation**
Capital Cost annualised	$15,768,117	$9,880,874
Maintenance Cost	$4,803,315	$1,872,689
Operating Cost	$2,660,541	$1,125,600
Overhead Cost	$4,593,427	$851,896
Total	**$27,825,400**	**$13,731,059**

Table 4.2-1 Comparison of Ceiling Prices - South West Mainline

We recommend that the ceiling price for the South West Mainline should be $13.7 million and not $27.8 million as stated by WestNet in its submission to the Regulator.

7. OTHER ISSUES

7.1. Defined Route Sections

Page 23 Section 7.3 of the Costing Principles by WestNet Rail - dated 19 December 2002 states that two (2) of the route sections on the SW Main include:

- Pinjarra - Alumina Junction; and
- Alumina Junction - Pinjarra South.

However, Westnet's Ceiling Price Schedule provided as part of its Clause 9 submission lists three (3) route sections over this part of the railway including:

- Pinjarra - Pinjarra East;
- Pinjarra East - Alumina Junction; and
- Pinjarra East - Pinjarra South.

We accept that defining the track in three route sections removes the overlap that occurs between Pinjarra East and Alumina Junction however the final definition needs to match the Costing Principles and one or the other will require amendment.

We acknowledge WestNet's recent clarification on distance measurements between Pinjarra and Alumina junction as being approximately 1.7 km and not 3 km as stated in their Clause 9 submission.

APPENDIX A

OPERATING STRUCTURE

ARTC v WestNet v Best Practice

APPENDIX A Operating Structure - ARTC v WestNet v Best Practice

Our consultants have examined the organisational structure of ARTC and WestNet in order to estimate a Best Practice model for a track owner operating the four mainlines being examined under this Clause 9 Determination. The model also includes the staff required to manage the grain and other branch lines which make up the entire network. By approaching the estimate in this way, the economies of scale associated with the whole network will be correctly incorporated.

In the absence of any detailed data on costs or staff numbers, the figures and staff levels for WestNet are all estimated. The following analysis follows the corporate structure of ARTC.

Engineering and Infrastructure

The GM Engineering and Infrastructure in ARTC is responsible for all infrastructure maintenance and new or upgrade project works across the ARTC network from NSW to the WA border. He has 20 staff of which 4 are dedicated to project work, 6 managers - one in each of the disciplines of mechanical, signalling, communications, technology, and two in civil, 3 engineers and 7 staff responsible for contract management or asset management. We estimate that WestNet has 18 similar head office staff.

Due to the structure of WestNet's current maintenance contract with John Holland and the in-house maintenance of signalling and communications, WestNet has additional engineering staff responsible for both the direction of the maintenance contractor and supervisors and technicians responsible for the maintenance of the signalling and communications network. It is estimated that there are 19 staff assumed to be in indirect positions and 63 staff employed directly on maintenance of signals and communications equipment. ARTC has no additional staff in this role as the task has been outsourced and is included in ARTC's maintenance cost. It is not clear from the information provided by WestNet whether the indirect engineering staff are considered to be an overhead or a maintenance cost. We have assumed that these staff would not be required in an MEA environment and that total responsibility for maintenance would rest with a contractor operating under a performance based contract.

The best practice number shown below is based on ARTC's organisation but without the staff associated with project work and includes one less asset manager due to the more compact nature of the network in WA. The engineers associated with project work have

been removed as they are claimed by WestNet as part of the 20% EP&CM markup of capital costs in the GRV calculation.

Engineering & Infrastructure	ARTC	WestNet (estimated)	Best Practice
Direct Staff (signalling and comms)	0	63	0
Indirect Staff Numbers	21	37	16

Table A-1 Engineering and Infrastructure Staff Numbers

Operations and Customer Service

The General Manager of Operations and Customer Service in ARTC has 18 staff and 34 train controllers responsible for the movement of 27 billion GTKs of freight. The train controllers are all based at one train control centre in South Australia. WestNet has an estimated 7 staff and 32 train controllers operating from four train control centres. For the purposes of the Clause 9 determination, one train control centre has been assumed and we estimate that this would result in four less train controllers being required. We consider that the customer service staff numbers are adequate given that WestNet only has one intrastate client (AWR) and has a wholesale agreement with ARTC for interstate traffic. The Best Practice number is therefore based on WestNet staff levels but with four less train controllers resulting from the amalgamation of the four train control centres.

Operations & Customer Service	ARTC	WestNet	Best Practice
Directs (train controllers)	34	32	28
Indirect Staff Numbers	19	7	7

Table A-2 Operations and Customer Service Staff Numbers

Overhead and Corporate

ARTC has 21 support staff in the corporate area including the finance team, risk and safety team, development and the Chief Executive Officer and his assistant. We estimate that WestNet has 9 staff plus the equivalent of another 8 Full Time Equivalent (FTE) (20 part-time ARG corporate staff allocated by various cost drivers) providing support

services. The Best Practice number is based on the economy of scale provided to WestNet through the ARG group facilities and therefore the sharing of resources at the corporate level with AWR and ASR. This reduces the allocation of corporate services on the basis of the comparative head count in the three organisations. We have also reduced the number of WestNet staff by two administrative positions.

Corporate Support	**ARTC**	**WestNet (estimated)**	**Best Practice**
Indirect Staff Numbers	21	17	15

Table A-3 Overhead and Corporate Staff Numbers

In summary, we believe that the current WestNet organisational structure is not efficient when compared with other privatised track ownership structures in Australia or overseas. As shown in the following comparison table, we would suggest that a structure based on 66 FTEs (plus an additional 5 project related engineers making a total of 71 FTE) would be capable of managing the entire network (mainline, grain and branch lines) as required under the Code.

Total Organisation	**ARTC**	**WestNet (estimated)**	**Best Practice**
Staff Numbers	**95**	**166.65**	**66 + 5 project engineers**

Table A-4 Total Organisation Staff Numbers

In the analysis under the Clause 9 Determination, these staff would be split between branch lines and mainlines and further allocated to Maintenance, Operations and Overheads as follows:

Best Practice Staff Numbers	Allocated to Mainlines	Allocated to Grain & Branch lines
Maintenance	10	6
Operations	23	12
Overheads (includes 8 FTE from ARG)	10	5
Total excluding Projects	**43**	**23**
Projects (charge to Capital EPC&M)	5	
Total	**48**	**23**

Table A-5 Staff Numbers Split by Main and Branch Lines

The staff numbers associated with the WestNet estimated structure and the Best Practice Model have been used to construct an Operating and Overhead annual budget. The detailed budget is provided as Confidential Attachment A to this submission.

The total dollar estimates from this spreadsheet for the four mainline routes are shown in Table A-6.

Operating & Overhead Budget - Four Mainlines only	WestNet submitted	WestNet (estimated)	Best Practice
Maintenance Overhead	Unknown	$2,595,775	$1,629,469
Operations	$9,380,782	$4,864,150	$4,251,650
Overheads (WestNet & ARG)	$8,256,237	$5,443,776	$5,233,076
Totals	**$17,637,019**	**$12,903,701**	**$11,114,195**

Table A-6 Operating and Overhead Budget from Attachment A

APPENDIX B

ANALYSIS OF MAINTENANCE COSTS

South West Mainline

APPENDIX B Analysis of Maintenance Costs - South West Mainline

The table below lists the maintenance cost provided by WestNet and the corresponding cost per km for the South West Mainline. The costs per kilometre for short sections of track are distorted by the high ratio of turnouts to normal track. A better comparison is the overall cost per kilometre over a particular route or over the whole of the South West Mainline where the average cost is $29,123/km.

Route Section	WestNet $	Km used	$/km
Kwinana - Mundijong Jct	739,542	26	28,444
Mundijong Jct - Pinjarra	1,301,131	43	30,259
Pinjarra - Pinjarra East	148,990	1.7	87,641
Pinjarra East - Alumina Jct	184,428	0.233	791,536
Pinjarra East - Pinjarra South	63,756	1	63,756
Pinjarra - Wagerup	532,481	33	16,136
Wagerup - Brunswick Jct	910,318	39	23,341
Brunswick Jct - Picton Jct	619,241	17	36,426
Picton Jct - Inner Harbour	303,428	4	75,857
Totals - All Route Sections	**4,803,315**	**164.933**	**$29,123**

Table B-1 Maintenance Costs as submitted by WestNet for South West Mainline

Our consultants commissioned Longrun Transport to develop a maintenance model based on a new MEA track capable of supporting the current freight and passenger requirements. The model assumes that the track will be regularly maintained to an optimum standard to produce the lowest whole-of-life cost. It has been assumed that the track would be maintained for its useful life but that no MPM or "life-extending" renewals would be performed. A copy of the model is provided in Appendix C, and the results are summarised in the following table. Each section of line has been computed separately using an updated version[22] of the WestNet data on distances, turnouts, crossing loops, bridges, culverts etc.

[22] Based on 165 km of mainline track with 10.8 km of crossing loops and 30 turnouts

Route Section	Longrun Cost Estimate	Km used	$/km
Kwinana - Mundijong Jct	$248,673	26.39	
Mundijong Jct - Pinjarra	$349,581	43.28	
Pinjarra - Pinjarra East - Alumina Junction	$48,163	1.86	
Pinjarra East - Pinjarra South	$39,354	1.06	
Pinjarra - Wagerup	$273,901	31.34	
Wagerup - Brunswick Jct	$324,454	39.34	
Brunswick Jct - Picton Jct	$146,271	18.22	
Picton Jct - Inner Harbour	$51,820	3.52	
Totals - All Route Sections	**$1,482,220**	**165.0**	**$8,983/km**
Add Maintenance O/H[23]	**$390,469**		
Maintenance Total	**$1,872,689**		**$11,349/km**

Table B-2 Maintenance Costs provided by Longrun Transport for South West Mainline

To further verify the likely cost of maintenance on this type of track, Longrun Transport was also asked to approach WAGR for information on the maintenance task on the Northern Suburbs Railway (NSR) which was constructed to a very similar standard some 10 years ago. The following comparison shows the maintenance task undertaken by WAGR to maintain the track to specification (a higher operating specification than the South West Mainline) in comparison to the maintenance task assumed in the Longrun estimates. Both WAGR and Longrun reflect the much lower caretaker maintenance requirement of a concrete sleepered track when compared to the existing track which uses ageing timber sleepers and a poor formation structure. The higher figure quoted for caretaker maintenance of 0.050 persons/km for the NSR reflects the added responsibilities

[23] Maintenance Overhead Allocation is taken from the Indec "Best Practice" Model (see Confidential Attachment B for more details) which allocates Head Office based maintenance support staff to each of the four mainlines and calculates an annual budget for these staff and their support costs.

associated with turnouts at stations and yards including all turnouts at City Station.

Maintenance Task	Units	NSR	Longrun
Inspectors	Persons/km	0.014	0.023
Track Recording	Runs/yr	4	2
Ultrasonic Detection	Runs/yr	2	2
Caretaker force	Persons/km	0.050	0.017
Surfacing	Yrs to tamp	10	3
Sleeper Replacement	Slprs/yr	0	0
Rail Replacement	% replace/yr	.05	.014
Ballast clean	Yrs to clean	Not planned	No allowance
Rail Grinding	Yrs to grind	5 (curves only)	10
Weed spray	Runs/year	1	1
Bogholes & tunnels		Minor	Minor
Level crossings		0	Rate
Structures (bridges & culverts)		0	Rate
Drain cleaning	Yrs to clean	2	1

Table B-3 Comparison of WAGR and Longrun Maintenance Task Frequency

Table B-3 shows that the maintenance allocation to the South West Mainline is generally conservative with almost double the inspections and three times the tamping runs. The number of caretaker maintenance personnel is less by a factor of three due mainly to the freight nature of the rail traffic and the reduction in track recorder runs reflects the reduced ride quality specification.

APPENDIX C

LONGRUN GRV CALCULATION

CONVERSION OF GRV TO ANNUITY

LONGRUN MAINTENANCE MODEL

APPENDIX C

Longrun GRV Calculation

Please refer to Excel Spreadsheet - Temp1_Rev 2 FINAL.xls

Conversion of GRV to Annuity

Please refer to Excel Spreadsheet - Appendix C - GRV to Annuity.xls

Longrun Maintenance Model

Please refer to Excel Spreadsheet -Temp2_Rev1 FINAL.xls

APPENDIX D

Indec estimate of Current WestNet Operating and Overhead Allocation Model

Submitted as Confidential Attachment A

APPENDIX E

Indec "Best Practice" Version of Operating and Overhead Allocation Model

Submitted as Confidential Attachment B