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China First Railway Gallilee Basin

CONCEPT DESIGN REPORT

WARATAH COAL

AUGUST 2012

REVISION 2

BRISBANE

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This document has been reviewed and approved by the following appropriately qualified and experienced Registered Professional Engineer of Queensland (RPEQ)

.....
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Contents

1	Introduction	6
1.1	Purpose of this Report.....	6
1.2	Project Location & Description	6
2	Design Information and Parameters.....	7
2.1	Design Standards	7
2.2	Reference Documents	7
3	Rail Geometry.....	8
4	Loading.....	11
4.1	Gravity Loads	11
4.2	Material Self-Weight	11
4.3	Live Loads.....	11
4.4	Wind Loads	11
4.5	Earthquake Forces.....	11
4.6	Loads from Water Flow.....	11
4.7	Detailed Design Bridge Deck Loads.....	11
	4.7.1 Precast Concrete Bridge.....	12
	4.7.2 Steel Girder Bridge	12
	4.7.3 Precast Concrete Culvert.....	13
	4.7.4 Corrugated Iron Pipe Culvert	13
5	Performance Design Criteria.....	14
5.1	Bridge Deflections	14
	5.1.1 Deflection Limits.....	14
5.2	Load Combinations	14
6	Exclusions & Clarifications.....	15

List of Figures

Figure 1.	Proposed Rail Alignment	6
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List of Tables

Table 1.	Australian Standards	7
Table 2.	ARTC & RailCorp Standards	7
Table 3.	Design Criteria.....	10
Table 4.	Live Loads.....	11

Appendices

- A River and Creek Rail Crossing Locations
- B Road and Stock Rail Crossing Locations



1 Introduction

1.1 Purpose of this Report

This concept design report has been prepared to describe the assumptions made in the preparation of the concept design for the proposed China First Railway, railway structures, as part of the Galilee Coal Project. It includes a listing of the relevant design codes, specifications and assumptions made about design loads, material strengths and properties, performance criteria, and the like.

Appendix A, included in this report, lists the river and creek crossings identified along the proposed rail alignment with an estimated bridge and culvert structure size provided. Appendix B lists the road and stock crossing locations identified along the proposed rail alignment.

1.2 Project Location & Description

The new rail line will connect a new coal mine located in the Gallilee Basin, Central Queensland, to the coal terminal facilities at the Port of Abbot Point, near Bowen, in Northern Queensland (Refer Figure 1). Due to the ground topography along the proposed rail alignment, a number of bridge and culvert structures are required to maintain the natural watercourses and to adhere to the maximum and minimum rail grades.

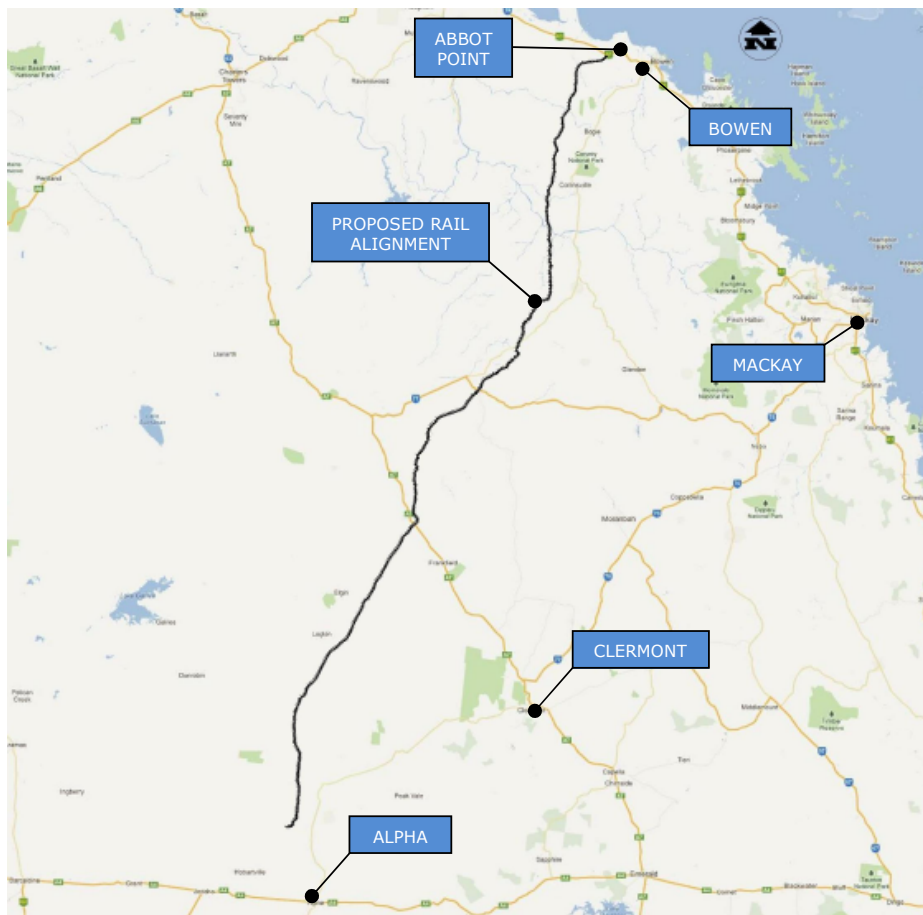


Figure 1. Proposed Rail Alignment



2 Design Information and Parameters

2.1 Design Standards

The rail structures have been generally concept designed in accordance with the Australian standards and accepted engineering principles. The table below lists the Australian Standards referenced in carrying out the concept design:

AS1170	Structural Design Actions
AS4100	Steel Structures
AS5100	Bridge Design

Table 1. Australian Standards

The rail geometry and formation have been generally checked in accordance with the Australian Rail Track Corporation (ARTC) Code of Practice and NSW Transport RailCorp, Civil Engineering Standards. The table below lists the ARTC and RailCorp Standards referenced in carrying out the concept design:

ETM-08-01	ARTC - Earthworks, Formation and Capping Material
Section 5	ARTC - Track Geometry
ESC 210	RailCorp - Track Geometry and Stability
ESC 215	RailCorp - Transit Space
ESC 410	RailCorp - Earthworks and Formation
ESC 420	RailCorp - Track Drainage
ESC 550	RailCorp - Access Roads

Table 2. ARTC & RailCorp Standards

2.2 Reference Documents

The following reference documents were used for the concept design of the project:

- Waratah Coal, Gallilee Coal Project – Environmental Impact Statement.
- Humes CMP, Corrugated Metal Pipe – Technical Manual
- Humes Box Culverts – Technical Manual
- Technical Data for Proposed 30t Axle Load Coal Hopper Wagon



3 Rail Geometry

General design criteria for the Rail Geometry and Formation are presented in the following table:

Element	Comment
<p><u>Geometry</u></p> <ul style="list-style-type: none"> Design Speeds – Loaded – Unloaded <p>(Waratah Rail EIS - Vol.3 Rail Chapter 1 - Project description - table 1, page 15)</p> <ul style="list-style-type: none"> Rail Gauge <p>(CL 6.3.1 Rail Corp ESC 210 Track geometry)</p> <p>Horizontal Geometry</p> <ul style="list-style-type: none"> Minimum horizontal radius of curvature <p>(Waratah Rail EIS - Vol.3 Rail Chapter 1 - Project description - table 1, page 15)</p> <p>Vertical Geometry</p> <ul style="list-style-type: none"> Formation Crossfall Maximum Limiting Grade (Laden) Maximum Limiting Grade (Unladen) <p>(Waratah Rail EIS - Vol.3 Rail Chapter 1 - Project description - table 1, page 15) (CL 5.1 – ETM-08-01, ARTC Code of Practice) (Table 5.2A – Section 5-C, ARTC Code of Practice)</p> <ul style="list-style-type: none"> Vertical curves to be provided where change in grade is greater than 0.2%. <p>(Table 5.2B – Section 5-C, ARTC Code of Practice) (CL 6.3.5 Rail Corp ESC 210 Track geometry)</p>	<p>80km/h 100km/h</p> <p>1435mm Nominal</p> <p>1000m</p> <p>1 in 30 1 in 200 (0.5%) 1 in 80 (1.25%)</p> <p>0.26%, V=100km/h</p>
<p><u>Formation</u></p> <ul style="list-style-type: none"> Width at top of formation Structural capping layer depth <p>(Waratah Rail EIS - Vol.3 Rail Chapter 1 - Project description – figure 2, page 15)</p> <ul style="list-style-type: none"> Ballast layer depth <p>(Waratah Rail EIS - Vol.3 Rail)</p> <ul style="list-style-type: none"> Maximum Cut/Fill Batter – Unreinforced Earth – Reinforced Earth <p>Not to exceed 1 in 3 where provision for stock crossings are required</p> <p>(Waratah Rail EIS - Vol.3 Rail Chapter 1 - Project description – figure 2, page 15) (CL 3.8 – ETM-08-01, ARTC Code of Practice)</p>	<p>12.0m 600mm</p> <p>510mm</p> <p>1 in 3 1 in 2</p>



<ul style="list-style-type: none"> • 3m Benching required where earthworks exceed 7m (CL 5.2 Rail Corp ESC 410 Earthworks and Formation) (Table 1 – ETM-08-01, ARTC Code of Practice) • Minimum shoulder width (CL 5.8 – ETM-08-01, ARTC Code of Practice) • Formation flood immunity (Waratah Rail EIS - Vol.3 Rail Chapter 1 - Project description – figure 2, page 15) • Minimum height of formation above flood immunity level (Waratah Rail EIS - Vol.3 Rail) 	<p>3.5m (Main Line)</p> <p>Q100</p> <p>600mm</p>
<p><u>Access Roads</u></p> <ul style="list-style-type: none"> • Minimum access road width (CL 4.4 Rail Corp ESC 550 Access Roads) • Minimum clearance from nearest running rail (CL 4.4 Rail Corp ESC 550 Access Roads) • Access roads to be situated above Q100 level (Waratah Rail EIS - Vol.3 Rail) • Note: Access roads to be provided downstream side of formation to minimise impact on flood extents 	<p>4.0m (Where space permits)</p> <p>3.0m</p>
<p><u>Clearances</u></p> <p>Horizontal Clearance</p> <ul style="list-style-type: none"> • Minimum distance to piers, columns & deflection walls between tracks, relative to design track centre line • Minimum distance to bridge substructures and deflection walls (except between tracks), relative to design track centreline (CL 6.1.1 Table 1 Rail Corp ESC 215 Transit Space) <p>Vertical Clearance</p> <ul style="list-style-type: none"> • Minimum main line clearance to non-electrified areas (dimension between underside face of structure and design height of low rail) (CL 6.1.1 Table 1 Rail Corp ESC 215 Transit Space) • Minimum clearance from road pavement to underside of any overhead structure (CL 4.4 Rail Corp ESC 550 Access Roads) 	<p>3.5m</p> <p>4.3m</p> <p>5.0m</p> <p>4.6m</p>



<p><u>Rail Bridges</u></p> <ul style="list-style-type: none"> • Minimum deck width (allow for two rail line) • Ballast layer depth • Reinforced concrete deck thickness • Allow for 36t axle load coal gondola wagon • Precast concrete deck units, maximum span • Structural steel girder truss, maximum span • Minimum freeboard from Q100 flood level to underside of bridge structure (to soffit of deck units) 	<p>10.675m</p> <p>510mm</p> <p>250mm</p> <p>360kN</p> <p>25m</p> <p>40m</p> <p>500mm</p>
<p><u>Rail Culverts (Precast Concrete)</u></p> <ul style="list-style-type: none"> • Minimum deck width (allow for two rail lines) • Ballast layer depth • Reinforced concrete deck thickness • Allow for 36t axle load coal gondola wagon • Precast concrete culvert, maximum span • Precast concrete culvert, maximum height • Minimum freeboard from Q100 flood level to underside of bridge structure (to soffit of deck units) 	<p>10.675m</p> <p>510mm</p> <p>250mm</p> <p>360kN</p> <p>3.6m</p> <p>3.6m</p> <p>500mm</p>
<p><u>Rail Culverts (Corrugated Iron Pipe)</u></p> <ul style="list-style-type: none"> • Allow for 36t axle load coal gondola wagon • Width at top of formation • Structural capping layer depth <p>(Waratah Rail EIS - Vol.3 Rail Chapter 1 - Project description – figure 2, page 15)</p> <ul style="list-style-type: none"> • Ballast layer depth <p>(Waratah Rail EIS - Vol.3 Rail)</p> <ul style="list-style-type: none"> • Maximum Cut/Fill Batter – Unreinforced Earth • Minimum fill depth over pipe 	<p>360kN</p> <p>12.0m</p> <p>600mm</p> <p>510mm</p> <p>1 in 3</p> <p>Equal to Pipe Diameter</p>

Table 3. Design Criteria

Note: the general design philosophy for determining the appropriate rail structure required estimating the depth of fill necessary to construct the formation for the rail alignment. Where the depth of fill was less than 1.2m over a structure, precast concrete culverts were specified. Where the depth of fill in general was greater than 20m, a bridge structure was specified. Where possible, corrugated iron pipes have been indicated. Information from the hydraulic consultants also dictated the type of structure to be specified and cross sectional area required.



4 Loading

4.1 Gravity Loads

General design criteria for dead and live loads are given here.

4.2 Material Self-Weight

For rail bridge concept design, dead loads have been calculated based on the following material densities:

Steel	78.5kN/m ³
Concrete	24.0kN/m ³
Ballast	12.0kN/m ³

4.3 Live Loads

For rail bridge concept design, live loads assumed for structural elements are as follows:

Loaded Zone	AS5100.2 (kN)	AS1170.1 (kPa)
Railway Traffic – 36t Axle Load	360 ⁽¹⁾	-
Access Platforms – Maintenance Access	-	5.0

(1) 360kN specified by Waratah Rail – AS5100.2 specifies maximum axle load 300kN.

Table 4. Live Loads

4.4 Wind Loads

For the purpose of this concept design, wind loads have not been considered. However for detailed design, wind loads are to be computed in accordance with AS5100.2 & AS1170.2.

4.5 Earthquake Forces

For the purpose of this concept design, earthquake forces have not been considered. However for detailed design, earthquake forces are to be computed in accordance with AS5100.2

4.6 Loads from Water Flow

For the purpose of this concept design, water flow forces have not been considered. However for detailed design, water flow forces are to be computed in accordance with AS5100.2

4.7 Detailed Design Bridge Deck Loads

The construction dead load (CDL) includes the self-weight of the structure. The superimposed dead load (SDL) includes all other dead load. Live load, or imposed load, is designated LL.



4.7.1 Precast Concrete Bridge

Loaded Zone		kN	kPa
CDL	2.2m Deep Precast Tee Deck Units (determined in analysis)	-	-
SDL	250mm Concrete Deck	-	6.0
	510mm Ballast	-	11.2
LL	Rail Traffic - 36t Axle Load	360	-
	(refer to AS5200.2 for load arrangement)		
	Access Platforms	-	5.0

4.7.2 Steel Girder Bridge

Loaded Zone		kN	kPa
CDL	Steel Girder Trusses and Cross Beams (determined in analysis)	-	-
SDL	250mm Concrete Deck	-	6.0
	510mm Ballast	-	11.2
LL	Rail Traffic - 36t Axle Load	360	-
	(refer to AS5200.2 for load arrangement)		
	Access Platforms	-	5.0



4.7.3 Precast Concrete Culvert

Loaded Zone		kN	kPa
CDL	Precast Culvert Units (determined in analysis)	-	-
SDL	250mm Concrete Deck	-	6.0
	510mm Ballast	-	11.2
	Fill layer above culverts (determined in analysis)	-	-
LL	Rail Traffic - 36t Axle Load	360	-
	(refer to AS5200.2 for load arrangement)		

4.7.4 Corrugated Iron Pipe Culvert

Loaded Zone		kN	kPa
CDL	Steel Girder Trusses and Cross Beams (determined in analysis)	-	-
SDL	250mm Concrete Deck	-	6.0
	510mm Ballast	-	11.2
	Fill layer above culverts (determined in analysis)	-	-
LL	Rail Traffic - 36t Axle Load	360	-
	(refer to AS5200.2 for load arrangement)		



5 Performance Design Criteria

5.1 Bridge Deflections

The bridge precast deck units and steel girder trusses have typically been designed to the span/effective depth limits stated in AS5100.2 for railway traffic. AS5100.2 states that deflection of railway bridges for serviceability limit state under live load plus dynamic load allowance must be limited to 1/640 of the span.

5.1.1 Deflection Limits

Precast Concrete Deck Units	Span = 25m,	Maximum Deflection = 39mm
Steel Girder Truss	Span = 40m,	Maximum Deflection = 62mm

5.2 Load Combinations

Load Combinations are to be in accordance with AS5100.2.



6 Exclusions & Clarifications

This concept design for the proposed China First Railway was developed without appropriate geotechnical information and with areas of survey data not available. It should only be used for discussion purposes with the relevant authorities and agencies. It should not be used as part of land acquisition or defining final rail corridor boundaries and should not be used for detailed budgeting purposes.



Appendix A
River and Creek Rail Crossing Locations

**WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS**



NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBE0006)
UNKNOWN (PLAIN CREEK)	0.790	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	14.000	17.053	3.053	
PLAIN CREEK	2.697	3/3.6m x 2.1m RC CULVERT	T.B.C.	12.00	-	-	18.000	21.611	3.611	
UNKNOWN (PLAIN CREEK)	2.932	3/3.6m x 1.5m RC CULVERT	\	12.00	-	-	19.935	22.400	2.465	
UNKNOWN (PLAIN CREEK)	2.964	3/3.6m x 1.5m RC CULVERT	58.00	12.00	-	-	19.935	22.500	2.565	
UNKNOWN (PLAIN CREEK)	3.018	3/3.6m x 2.7m RC CULVERT	/	12.00	-	-	18.500	22.621	4.121	
UNKNOWN	3.252	3/1.2m x 1.2m RC CULVERT	3.00	4.40	-	-	21.500	23.500	2.000	
KANGAROO CREEK	4.496	13/3.6m x 2.4m RC CULVERT	110.00	51.00	-	-	24.500	28.500	4.000	
UNKNOWN	5.052	3/3.6m x 1.5m RC CULVERT	15.00	12.00	-	-	25.000	28.764	3.764	
UNKNOWN	5.676	5/1.5m Ø C.I. PIPE	9.00	-	-	-	26.000	29.071	3.071	
UNKNOWN	6.344	3/3.6m x 2.1m RC CULVERT	20.00	12.00	-	-	26.000	29.400	3.400	
UNKNOWN	6.450	3/1.2m Ø C.I. PIPE	2.00	-	-	-	27.000	29.400	2.400	
UNKNOWN	6.588	3/3.6m x 1.5m RC CULVERT	11.00	12.00	-	-	27.000	29.400	2.400	
UNKNOWN	6.836	3/1.2m x 1.2m RC CULVERT	3.00	4.40	-	-	27.500	29.410	1.910	
UNKNOWN	7.268	5/3.6m x 2.4m RC CULVERT	37.00	19.80	-	-	25.500	29.699	4.199	
UNKNOWN	7.678	7/1.2m Ø C.I. PIPE	7.00	-	-	-	26.500	29.245	2.745	
UNKNOWN	8.038	24/1.2m Ø C.I. PIPE	25.00	-	-	-	25.000	29.119	4.119	
UNKNOWN	8.248	10/1.2m Ø C.I. PIPE	10.00	-	-	-	25.500	29.300	3.800	
UNKNOWN	9.296	4/1.8m Ø C.I. PIPE	8.00	-	-	-	27.500	30.200	2.700	
UNKNOWN	9.612	8/1.2m Ø C.I. PIPE	7.00	-	-	-	28.500	30.478	1.978	
UNKNOWN	9.882	1/25m SPAN BRIDGE	57.00	25.00	9.869	9.894	25.000	30.700	5.700	S001
SALTWATER CREEK	10.149	3/25m SPAN BRIDGE	49.00	75.00	10.111	10.186	25.500	30.800	5.300	S002
UNKNOWN	11.448	34/1.2m Ø C.I. PIPE	34.00	-	-	-	31.000	33.806	2.806	
UNKNOWN	12.527	14/1.2m Ø C.I. PIPE	14.00	-	-	-	38.000	40.400	2.400	
UNKNOWN	13.523	3/1.8m Ø C.I. PIPE	T.B.C.	-	-	-	38.500	42.918	4.418	
ELLIOT RIVER	14.200	20/25m SPAN BRIDGE		500.00	13.950	14.450	31.000	43.000	12.000	S003 & S004
UNKNOWN	14.821	8/1.8m Ø C.I. PIPE	T.B.C.	-	-	-	37.500	43.731	6.231	
UNKNOWN	16.600	TO BE CONFIRMED	T.B.C.	-	-	-	no information	no information	no information	
UNKNOWN	17.000	TO BE CONFIRMED	T.B.C.	-	-	-	no information	no information	no information	
UNKNOWN	17.550	TO BE CONFIRMED	T.B.C.	-	-	-	no information	no information	no information	
UNKNOWN	18.893	4/1.2m Ø C.I. PIPE	4.00	-	-	-	58.500	60.862	2.362	
UNKNOWN	19.390	3/1.2m Ø C.I. PIPE	3.00	-	-	-	63.000	66.466	3.466	
UNKNOWN	19.696	3/1.2m Ø C.I. PIPE	3.00	-	-	-	65.017	69.905	4.888	
UNKNOWN	20.185	3/1.2m Ø C.I. PIPE	2.00	-	-	-	69.500	75.401	5.901	
UNKNOWN	20.429	3/1.2m Ø C.I. PIPE	2.00	-	-	-	69.500	78.157	8.657	
UNKNOWN	21.438	5/1.2m Ø C.I. PIPE	5.00	-	-	-	80.765	90.164	9.399	
UNKNOWN	22.204	3/1.2m Ø C.I. PIPE	3.00	-	-	-	90.342	99.738	9.396	
UNKNOWN	22.309	5/1.2m Ø C.I. PIPE	5.00	-	-	-	91.000	101.054	10.054	
UNKNOWN	22.814	3/1.2m Ø C.I. PIPE	2.00	-	-	-	103.507	107.366	3.859	
UNKNOWN	22.935	3/1.2m Ø C.I. PIPE	2.00	-	-	-	101.000	108.880	7.880	
UNKNOWN	23.226	5/1.2m Ø C.I. PIPE	5.00	-	-	-	100.500	112.510	12.010	
UNKNOWN	23.643	1/1.2m Ø C.I. PIPE	1.00	-	-	-	113.724	117.722	3.998	
UNKNOWN	23.798	1/1.2m Ø C.I. PIPE	1.00	-	-	-	116.486	119.662	3.176	
UNKNOWN	23.992	3/1.2m Ø C.I. PIPE	2.00	-	-	-	116.000	122.095	6.095	
UNKNOWN	24.450	3/1.2m Ø C.I. PIPE	2.00	-	-	-	123.000	127.819	4.819	
UNKNOWN	24.605	4/1.2m Ø C.I. PIPE	4.00	-	-	-	124.500	129.752	5.252	
UNKNOWN	24.693	3/1.2m Ø C.I. PIPE	3.00	-	-	-	124.500	130.855	6.355	
UNKNOWN	25.248	9/1.8m Ø C.I. PIPE	22.00	-	-	-	128.000	137.790	9.790	
UNKNOWN	25.392	3/1.2m Ø C.I. PIPE	3.00	-	-	-	131.497	139.594	8.097	



WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS

NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBEO006)
UNKNOWN	25.500	1/1.2m Ø C.I. PIPE	1.00	-	-	-	135.000	140.938	5.938	
UNKNOWN	25.652	1/1.2m Ø C.I. PIPE	1.00	-	-	-	136.216	142.845	6.629	
UNKNOWN	25.707	1/1.2m Ø C.I. PIPE	1.00	-	-	-	134.870	143.522	8.652	
UNKNOWN	26.014	4/1.8m Ø C.I. PIPE	9.00	-	-	-	133.500	147.362	13.862	
UNKNOWN	26.145	1/1.2m Ø C.I. PIPE	1.00	-	-	-	135.296	149.005	13.709	
UNKNOWN	26.312	4/1.8m Ø C.I. PIPE	8.00	-	-	-	135.500	151.093	15.593	
UNKNOWN	26.728	1/1.2m Ø C.I. PIPE	1.00	-	-	-	149.586	156.292	6.706	
STOCKYARD CREEK	27.068	11/25m SPAN BRIDGE	14.00	275.00	26.930	27.205	135.673	160.530	24.857	S005
UNKNOWN	27.828	3/1.2m Ø C.I. PIPE	3.00	-	-	-	164.544	170.000	5.456	
UNKNOWN	29.239	4/1.8m Ø C.I. PIPE	8.00	-	-	-	172.000	174.700	2.700	
EMU CREEK	29.899	7/2.4m Ø C.I. PIPE	30.00	-	-	-	164.000	171.271	7.271	
UNKNOWN	30.644	9/1.8m Ø C.I. PIPE	22.00	-	-	-	164.000	170.967	6.967	
UNKNOWN	30.859	1/1.2m Ø C.I. PIPE	1.00	-	-	-	164.500	170.967	6.467	
UNKNOWN	30.965	1/1.2m Ø C.I. PIPE	1.00	-	-	-	166.500	170.967	4.967	
UNKNOWN	31.493	4/1.8m Ø C.I. PIPE	8.00	-	-	-	166.000	170.967	1.965	
UNKNOWN	31.739	3/1.2m Ø C.I. PIPE	2.00	-	-	-	168.758	170.723	2.113	
UNKNOWN	32.028	3/1.2m Ø C.I. PIPE	3.00	-	-	-	168.104	170.217	2.113	
UNKNOWN	32.476	3/2.4m Ø C.I. PIPE	12.00	-	-	-	161.000	169.484	8.484	
UNKNOWN	34.017	3/1.8m Ø C.I. PIPE	7.00	-	-	-	159.500	162.764	3.264	
UNKNOWN	34.302	2/1.8m Ø C.I. PIPE	5.00	-	-	-	157.500	161.341	3.841	
UNKNOWN	35.045	3/1.8m Ø C.I. PIPE	7.00	-	-	-	151.581	157.621	6.040	
SPRING CREEK	35.644	22/2.4m Ø C.I. PIPE	97.00	-	-	-	142.500	154.928	12.428	
UNKNOWN	36.236	4/2.4m Ø C.I. PIPE	18.00	-	-	-	145.000	152.411	7.411	
UNKNOWN	36.818	5/1.8m Ø C.I. PIPE	11.00	-	-	-	144.000	150.234	6.234	
UNKNOWN	37.305	7/1.8m Ø C.I. PIPE	16.00	-	-	-	144.076	148.752	4.676	
BOGIE RIVER	38.347	18/25m SPAN BRIDGE	450.00	450.00	38.122	38.572	127.500	146.869	19.369	S006 & S007
UNKNOWN	39.962	5/1.2m Ø C.I. PIPE	5.00	-	-	-	151.239	153.639	2.400	
UNKNOWN	40.945	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	143.241	148.706	5.465	
SANDY CREEK (NORTH)	41.769	6/25m SPAN BRIDGE	150.00	150.00	41.694	41.844	137.000	145.400	8.400	S008
SANDY CREEK (SOUTH)	42.135	11/25m SPAN BRIDGE	275.00	275.00	41.997	42.272	133.500	145.400	11.900	S009
UNKNOWN	43.008	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	147.108	149.909	2.801	
UNKNOWN	44.280	3/1.8m Ø C.I. PIPE	T.B.C.	-	-	-	148.000	151.628	3.628	
UNKNOWN	45.805	3/1.8m Ø C.I. PIPE	T.B.C.	-	-	-	153.000	163.080	10.080	
UNKNOWN	46.523	3/1.2m Ø C.I. PIPE	2.00	-	-	-	169.500	171.900	2.400	
UNKNOWN	47.074	3/1.2m Ø C.I. PIPE	3.00	-	-	-	173.000	175.338	2.338	
UNKNOWN	47.266	3/1.2m Ø C.I. PIPE	3.00	-	-	-	170.000	175.400	5.400	
UNKNOWN	47.440	4/1.8m Ø C.I. PIPE	10.00	-	-	-	167.500	175.400	7.900	
UNKNOWN	47.587	3/1.2m Ø C.I. PIPE	1.00	-	-	-	172.000	175.400	3.400	
UNKNOWN	47.767	3/1.2m Ø C.I. PIPE	3.00	-	-	-	172.000	175.400	3.400	
UNKNOWN	48.148	3/1.2m Ø C.I. PIPE	2.00	-	-	-	171.500	176.215	4.715	
UNKNOWN	48.283	3/1.8m Ø C.I. PIPE	8.00	-	-	-	167.409	176.819	9.410	
UNKNOWN	48.356	3/1.2m Ø C.I. PIPE	2.00	-	-	-	171.000	177.147	6.147	
UNKNOWN	48.654	3/1.2m Ø C.I. PIPE	3.00	-	-	-	176.097	178.497	2.400	
UNKNOWN	49.142	6/1.8m Ø C.I. PIPE	14.00	-	-	-	164.027	178.611	14.584	
UNKNOWN	49.219	8/1.8m Ø C.I. PIPE	20.00	-	-	-	163.500	178.803	15.303	
UNKNOWN	49.808	5/1.2m Ø C.I. PIPE	5.00	-	-	-	169.500	180.427	10.927	
UNKNOWN	50.163	15/3.6m x 3.6m RC CULVERT	96.00	-	-	-	169.500	181.493	11.993	
UNKNOWN	50.623	3/1.2m Ø C.I. PIPE	2.00	-	-	-	173.570	183.181	9.611	

**WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS**



NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBEO006)
UNKNOWN	50.873	9/3.0m Ø C.I. PIPE	63.00	-	-	-	176.500	184.431	7.931	
UNKNOWN	51.157	3/1.2m Ø C.I. PIPE	2.00	-	-	-	175.970	187.294	11.324	
UNKNOWN	51.499	1/1.2m Ø C.I. PIPE	1.00	-	-	-	188.252	191.372	3.120	
UNKNOWN	52.395	5/3.0m Ø C.I. PIPE	32.00	-	-	-	192.000	200.498	8.498	
UNKNOWN	52.752	7/1.8m Ø C.I. PIPE	16.00	-	-	-	194.500	203.178	8.678	
UNKNOWN	52.945	2/3.0m Ø C.I. PIPE	9.00	-	-	-	198.000	205.449	7.449	
UNKNOWN	53.200	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	200.500	207.741	7.241	
UNKNOWN	54.109	5/1.2m Ø C.I. PIPE	5.00	-	-	-	209.862	214.565	4.703	
UNKNOWN	54.210	1/2.1m Ø C.I. PIPE	2.00	-	-	-	208.738	214.098	5.360	
UNKNOWN	54.324	1/2.1m Ø C.I. PIPE	3.00	-	-	-	207.500	213.572	6.072	
UNKNOWN	56.309	34/25m SPAN BRIDGE	59.00	850.00	55.884	56.734	169.000	204.257	35.257	S010 - S012
UNKNOWN	57.182	4/1.2m Ø C.I. PIPE	4.00	-	-	-	190.894	199.888	8.994	
UNKNOWN	57.413	1/1.2m Ø C.I. PIPE	1.00	-	-	-	189.500	198.726	9.226	
OAKY CREEK	57.695	15/25m SPAN BRIDGE	49.00	375.00	57.507	57.882	165.500	197.313	31.813	S013
UNKNOWN	57.970	1/1.2m Ø C.I. PIPE	1.00	-	-	-	186.356	195.943	9.587	
UNKNOWN	58.122	1/1.2m Ø C.I. PIPE	1.00	-	-	-	185.500	195.187	9.687	
UNKNOWN	58.561	3/1.2m Ø C.I. PIPE	3.00	-	-	-	184.500	193.054	8.554	
UNKNOWN	59.526	1/3.6m x 3.6m RC CULVERT	10.00	3.60	-	-	184.000	188.170	4.170	
UNKNOWN	59.643	1/2.1m Ø C.I. PIPE	2.00	-	-	-	183.500	187.579	4.079	
UNKNOWN	59.978	3/2.4m x 2.4m RC CULVERT	16.00	8.40	-	-	176.000	185.880	9.880	
UNKNOWN	60.471	5/3.6m x 3.6m RC CULVERT	43.00	19.80	-	-	171.000	183.443	12.443	
UNKNOWN	61.176	7/3.6m x 3.6m RC CULVERT	71.00	27.60	-	-	168.000	181.274	13.274	
UNKNOWN	64.068	5/2.7m Ø C.I. PIPE	27.00	-	-	-	154.000	170.974	16.974	
UNKNOWN	64.643	7/1.2m x 1.2m RC CULVERT	9.00	-	-	-	169.181	170.861	1.680	
UNKNOWN	64.907	3/1.2m x 1.2m RC CULVERT	4.00	-	-	-	167.000	169.538	2.538	
UNKNOWN	65.509	4/1.2m Ø C.I. PIPE	4.00	-	-	-	157.500	166.535	9.035	
UNKNOWN	65.737	4/1.2m Ø C.I. PIPE	4.00	-	-	-	158.000	165.393	7.393	
UNKNOWN	65.829	4/1.2m Ø C.I. PIPE	4.00	-	-	-	158.934	164.931	5.997	
UNKNOWN	66.160	4/1.8m Ø C.I. PIPE	8.00	-	-	-	155.288	163.281	7.993	
UNKNOWN	67.305	5/1.2m x 1.2m RC CULVERT	7.00	7.20	-	-	152.500	157.615	5.115	
UNKNOWN	68.152	5/3.6m x 3.6m RC CULVERT	53.00	19.80	-	-	140.500	153.321	12.821	
CRUSH CREEK	69.359	13/3.6m x 3.6m RC CULVERT	159.00	51.00	-	-	132.500	147.293	14.793	
UNKNOWN	70.434	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	131.000	141.910	10.910	
UNKNOWN	72.181	5/3.6m x 1.8m RC CULVERT	21.00	19.80	-	-	127.926	133.177	5.251	
UNKNOWN	72.332	5/3.6m x 1.8m RC CULVERT	32.00	19.80	-	-	127.381	132.422	5.041	
UNKNOWN	72.432	3/3.6m x 1.8m RC CULVERT	13.00	12.00	-	-	126.644	131.922	5.278	
UNKNOWN	72.511	5/3.6m x 2.4m RC CULVERT	43.00	19.80	-	-	124.500	131.524	7.024	
UNKNOWN	73.194	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	122.659	128.109	5.450	
STRATHMORE CREEK FLOOD PLAIN	74.381	5/3.6m x 1.8m RC CULVERT	29.00	19.80	-	-	124.000	127.201	3.201	
STRATHMORE CREEK FLOOD PLAIN	74.478	7/3.6m x 1.8m RC CULVERT	41.00	27.60	-	-	124.136	127.200	3.064	
STRATHMORE CREEK FLOOD PLAIN	74.581	11/3.6m x 1.8m RC CULVERT	71.00	43.20	-	-	124.357	127.350	2.993	
STRATHMORE CREEK FLOOD PLAIN	74.681	3/3.6m x 1.8m RC CULVERT	12.00	12.00	-	-	124.500	127.601	3.101	
STRATHMORE CREEK FLOOD PLAIN	74.781	3/3.6m x 1.8m RC CULVERT	13.00	12.00	-	-	124.457	127.801	3.344	
STRATHMORE CREEK FLOOD PLAIN	74.883	21/3.6m x 1.8m RC CULVERT	132.00	74.40	-	-	124.192	128.000	3.808	
STRATHMORE CREEK	75.012	3/25m SPAN BRIDGE	250.00	75.00	74.974	75.049	118.500	128.200	9.700	S014
UNKNOWN	75.624	3/3.6m x 3m RC CULVERT	3.00	12.00	-	-	126.500	130.553	4.053	
UNKNOWN	75.778	3/3.6m x 1.5m RC CULVERT	18.00	12.00	-	-	129.500	132.175	2.675	
UNKNOWN	79.491	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	136.500	144.721	8.221	



WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS

NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBEO006)
UNKNOWN	79.612	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	136.744	144.360	7.616	
UNKNOWN	80.290	9/1.2m Ø C.I. PIPE	11.00	-	-	-	139.000	142.309	3.309	
UNKNOWN	81.769	3/3.6m x 1.5m RC CULVERT	10.00	12.00	-	-	134.660	137.060	2.400	
UNKNOWN	82.837	3/3.6m x 3.6m RC CULVERT	35.00	12.00	-	-	124.000	131.717	7.717	
UNKNOWN	83.289	3/3.6m x 1.8m RC CULVERT	13.00	12.00	-	-	127.250	130.255	3.005	
UNKNOWN	83.755	13/3.6m x 1.8m RC CULVERT	84.00	51.00	-	-	124.863	129.929	5.066	
PELICAN CREEK	83.985	8/25m SPAN BRIDGE	154.00	200.00	83.885	84.085	115.500	130.000	14.500	S015
UNKNOWN	84.352	5/3.6m x 1.8m RC CULVERT	22.00	19.80	-	-	125.000	129.681	4.681	
UNKNOWN	85.198	3/2.4m x 1.2m RC CULVERT	8.00	8.00	-	-	132.907	135.200	2.293	
UNKNOWN	85.628	4/1.2m Ø C.I. PIPE	4.00	-	-	-	133.900	135.980	2.080	
UNKNOWN	86.481	2/3.6m x 1.8m RC CULVERT	13.00	7.20	-	-	135.162	138.498	3.336	
UNKNOWN	87.524	3/3.6m x 2.1m RC CULVERT	21.00	12.00	-	-	142.000	145.397	3.397	
UNKNOWN	89.854	2/2.7m Ø C.I. PIPE	7.00	-	-	-	140.000	146.789	6.789	
UNKNOWN	89.902	2/2.7m Ø C.I. PIPE	7.00	-	-	-	139.500	146.563	7.063	
UNKNOWN	89.930	2/2.7m Ø C.I. PIPE	7.00	-	-	-	140.433	146.413	5.980	
UNKNOWN	90.634	5/2.7m Ø C.I. PIPE	23.00	-	-	-	134.500	142.886	8.386	
UNKNOWN	93.058	5/2.1m x 2.1m RC CULVERT	22.00	11.70	-	-	124.000	130.817	7.317	
UNKNOWN	93.160	3/1.2m Ø C.I. PIPE	3.00	-	-	-	124.035	130.307	6.272	
UNKNOWN	93.251	3/1.2m Ø C.I. PIPE	3.00	-	-	-	124.066	129.854	5.788	
UNKNOWN	93.333	3/1.2m Ø C.I. PIPE	3.00	-	-	-	124.500	129.443	4.943	
UNKNOWN	93.430	3/1.2m Ø C.I. PIPE	3.00	-	-	-	124.500	128.989	4.772	
UNKNOWN	93.530	3/1.2m Ø C.I. PIPE	3.00	-	-	-	124.000	128.547	4.547	
UNKNOWN	93.940	31/1.8m x 1.8m RC CULVERT	98.00	65.40	-	-	122.500	126.743	4.243	
UNKNOWN	95.533	34/1.5m Ø C.I. PIPE	59.00	-	-	-	122.000	125.500	3.500	
UNKNOWN	96.529	17/1.5m Ø C.I. PIPE	30.00	-	-	-	123.572	126.572	3.000	
UNKNOWN	96.750	11/1.2m Ø C.I. PIPE	12.00	-	-	-	121.955	126.475	4.520	
UNKNOWN	97.850	16/1.2m Ø C.I. PIPE	18.00	-	-	-	123.000	126.051	3.051	
BOWEN RIVER	98.697	24/25m SPAN BRIDGE		600.00	98.397	98.997	101.500	126.000	24.500	S016 & S017
BOWEN RIVER	99.250	6/25m SPAN BRIDGE		150.00	99.175	99.325	117.500	126.000	8.500	S018
BOWEN RIVER FLOOD PLAIN	99.481	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	119.070	125.693	6.623	
BOWEN RIVER FLOOD PLAIN	99.581	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	121.267	125.442	4.175	
BOWEN RIVER FLOOD PLAIN	99.681	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	121.062	125.143	4.081	
BOWEN RIVER FLOOD PLAIN	99.781	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	121.500	124.816	3.316	
BOWEN RIVER FLOOD PLAIN	99.879	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	121.500	124.474	2.974	
BOWEN RIVER FLOOD PLAIN	99.981	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	121.500	124.168	2.668	
BOWEN RIVER FLOOD PLAIN	100.080	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	121.096	123.921	2.825	
BOWEN RIVER FLOOD PLAIN	100.181	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	120.500	123.669	3.169	
BOWEN RIVER FLOOD PLAIN	100.287	35/1.5m x 1.5m RC CULVERT	79.00	73.80	-	-	119.098	123.404	4.306	
BOWEN RIVER FLOOD PLAIN	100.381	11/1.2m x 1.2m RC CULVERT	16.00	15.60	-	-	120.211	123.254	3.043	
UNKNOWN	105.593	3/1.2m x 1.2m RC CULVERT	4.00	4.40	-	-	136.500	138.370	1.870	
UNKNOWN	106.650	7/3.6m x 1.8m RC CULVERT	40.00	27.60	-	-	140.697	143.464	2.767	
UNKNOWN	106.860	3/1.2m x 1.2m RC CULVERT	3.00	4.40	-	-	141.000	143.168	2.168	
UNKNOWN	107.342	3/1.2m x 1.2m RC CULVERT	T.B.C.	-	-	-	140.500	142.503	2.003	
UNKNOWN	107.768	10/1.2m Ø C.I. PIPE	11.00	-	-	-	136.550	141.916	5.366	
UNKNOWN	107.982	3/1.8m x 0.9m RC CULVERT	3.00	6.20	-	-	140.617	141.622	1.005	
UNKNOWN	108.600	4/1.2m Ø C.I. PIPE	4.00	-	-	-	142.000	145.855	3.855	
UNKNOWN	109.012	3/1.2m Ø C.I. PIPE	3.00	-	-	-	147.000	150.979	3.979	
UNKNOWN	109.114	3/1.2m Ø C.I. PIPE	3.00	-	-	-	146.000	152.247	6.247	

**WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS**



NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBE0006)
UNKNOWN	109.622	2/2.4m Ø C.I. PIPE	9.00	-	-	-	143.000	154.892	11.892	
UNKNOWN	110.066	2/1.5m Ø C.I. PIPE	3.00	-	-	-	148.770	156.298	7.528	
UNKNOWN	110.256	1/1.8m x 0.9m RC CULVERT	1.00	-	-	-	155.932	157.280	1.348	
UNKNOWN	110.337	1/1.8m x 0.9m RC CULVERT	1.00	-	-	-	156.000	157.400	1.400	
UNKNOWN	110.537	2/1.2m Ø C.I. PIPE	2.00	-	-	-	156.187	158.587	2.400	
UNKNOWN	110.699	3/1.2m Ø C.I. PIPE	3.00	-	-	-	155.553	159.297	3.744	
UNKNOWN	110.840	2/1.2m Ø C.I. PIPE	1.00	-	-	-	157.000	159.915	2.915	
UNKNOWN	110.986	2/1.2m Ø C.I. PIPE	2.00	-	-	-	157.218	160.550	3.332	
UNKNOWN	111.355	2/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	159.000	161.400	2.400	
UNKNOWN	111.851	3/3.6m x 2.7m RC CULVERT	25.00	12.00	-	-	150.000	159.822	9.822	
UNKNOWN	112.901	3/2.1m Ø C.I. PIPE	10.00	-	-	-	146.500	154.573	8.073	
UNKNOWN	113.363	2/1.8m Ø C.I. PIPE	6.00	-	-	-	148.180	153.361	5.181	
PARROT CREEK	113.910	6/25m SPAN BRIDGE	150.00	150.00	113.835	113.985	135.500	154.000	18.500	S019
UNKNOWN	115.099	4/2.7m Ø C.I. PIPE	20.00	-	-	-	152.500	160.372	7.872	
UNKNOWN	117.139	2/1.8m Ø C.I. PIPE	4.00	-	-	-	177.000	182.702	5.702	
UNKNOWN	117.605	4/2.7m Ø C.I. PIPE	19.00	-	-	-	173.000	187.021	14.021	
UNKNOWN	118.471	4/1.8m Ø C.I. PIPE	10.00	-	-	-	189.500	195.686	6.186	
UNKNOWN	118.891	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	194.500	199.410	4.910	
UNKNOWN	119.985	3/2.7m Ø C.I. PIPE	16.00	-	-	-	200.000	207.804	7.804	
UNKNOWN	120.070	2/3.6m x 3.3m RC CULVERT	23.00	7.20	-	-	200.000	208.562	8.562	
UNKNOWN	120.816	2/3.6m x 3.3m RC CULVERT	22.00	7.20	-	-	210.500	215.284	7.784	
UNKNOWN	120.926	2/3.6m x 3.3m RC CULVERT	19.00	7.20	-	-	210.500	216.274	5.774	
UNKNOWN	120.961	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	210.500	216.594	6.094	
UNKNOWN	121.031	3/2.7m Ø C.I. PIPE	15.00	-	-	-	211.500	217.223	5.723	
UNKNOWN	121.351	3/2.7m Ø C.I. PIPE	13.00	-	-	-	215.500	220.000	4.500	
SAMBO CREEK	123.392	5/3.6m x 2.7m RC CULVERT	44.00	19.80	-	-	222.000	235.674	13.674	
UNKNOWN	124.024	3/1.2m Ø C.I. PIPE	1.00	-	-	-	236.248	243.571	7.323	
UNKNOWN	124.131	3/1.2m Ø C.I. PIPE	1.00	-	-	-	240.214	244.908	4.694	
UNKNOWN	124.176	3/1.2m Ø C.I. PIPE	1.00	-	-	-	241.500	245.465	3.965	
UNKNOWN	124.244	3/1.2m Ø C.I. PIPE	1.00	-	-	-	242.211	246.316	4.105	
UNKNOWN	124.305	3/1.2m Ø C.I. PIPE	2.00	-	-	-	244.000	247.076	3.076	
UNKNOWN	124.507	3/1.2m Ø C.I. PIPE	1.00	-	-	-	244.543	249.607	5.064	
UNKNOWN	125.228	3/1.2m Ø C.I. PIPE	3.00	-	-	-	252.000	258.614	6.614	
UNKNOWN	125.551	3/1.8m x 1.2m RC CULVERT	5.00	6.20	-	-	260.713	262.713	2.000	
UNKNOWN	127.208	2/2.7m Ø C.I. PIPE	7.00	-	-	-	262.500	280.944	18.444	
UNKNOWN	127.692	2/2.7m Ø C.I. PIPE	6.00	-	-	-	263.500	286.164	22.664	
UNKNOWN	128.079	3/1.2m Ø C.I. PIPE	1.00	-	-	-	285.227	290.928	5.701	
UNKNOWN	128.138	3/1.2m Ø C.I. PIPE	1.00	-	-	-	285.500	291.669	6.169	
UNKNOWN	128.195	3/1.2m Ø C.I. PIPE	2.00	-	-	-	287.000	292.384	5.384	
UNKNOWN CREEK	129.853	41/25m SPAN BRIDGE	1025.00	1025.00	129.340	130.365	255.500	291.900	36.400	S020 - S022
UNKNOWN	130.817	1/2.4m Ø C.I. PIPE	3.00	-	-	-	276.500	295.038	18.538	
UNKNOWN	131.107	3/2.7m Ø C.I. PIPE	16.00	-	-	-	275.500	297.383	21.883	
UNKNOWN	131.354	3/1.2m Ø C.I. PIPE	3.00	-	-	-	296.236	300.476	4.240	
UNKNOWN	132.126	3/1.2m Ø C.I. PIPE	1.00	-	-	-	303.500	310.000	6.500	
UNKNOWN	132.486	3/2.1m Ø C.I. PIPE	9.00	-	-	-	291.500	314.629	23.129	
UNKNOWN	132.717	3/2.1m Ø C.I. PIPE	10.00	-	-	-	300.000	317.518	17.518	
UNKNOWN	135.544	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	334.000	345.323	11.323	
UNKNOWN	137.643	9/1.2m Ø C.I. PIPE	9.00	-	-	-	335.500	343.264	7.764	



WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS

NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBEO006)
UNKNOWN	138.211	9/1.2m Ø C.I. PIPE	9.00	-	-	-	335.552	340.594	5.042	
SUTTOR RIVER	139.671	15/25m SPAN BRIDGE	375.00	375.00	139.483	139.858	317.500	335.000	17.500	5023
UNKNOWN	140.957	3/1.8m x 0.9m RC CULVERT	3.00	6.20	-	-	344.899	346.490	1.591	
UNKNOWN	141.684	5/2.1m Ø C.I. PIPE	15.00	-	-	-	339.500	348.810	9.310	
UNKNOWN	142.715	3/3.6m x 2.4m RC CULVERT	25.00	12.00	-	-	348.000	351.899	3.899	
UNKNOWN	143.445	9/1.8m x 0.9m RC CULVERT	14.00	-	-	-	352.000	353.800	1.800	
UNKNOWN	144.705	6/1.5m Ø C.I. PIPE	10.00	-	-	-	362.923	366.607	3.684	
UNKNOWN	145.676	3/1.8m Ø C.I. PIPE	6.00	-	-	-	374.000	378.034	4.034	
UNKNOWN	145.982	3/1.2m Ø C.I. PIPE	4.00	-	-	-	379.000	381.637	2.637	
UNKNOWN	146.907	3/3.0m Ø C.I. PIPE	19.00	-	-	-	375.000	387.003	12.003	
UNKNOWN	151.136	7/1.8m x 1.2m RC CULVERT	15.00	14.20	-	-	385.915	388.779	2.864	
UNKNOWN	153.211	3/3.0m Ø C.I. PIPE	19.00	-	-	-	382.000	389.631	7.631	
UNKNOWN	156.142	3/2.4m Ø C.I. PIPE	12.00	-	-	-	379.000	384.814	5.814	
UNKNOWN	156.671	3/2.4m Ø C.I. PIPE	11.00	-	-	-	376.500	382.655	6.155	
UNKNOWN	157.360	5/1.8m Ø C.I. PIPE	11.00	-	-	-	379.000	383.070	4.070	
UNKNOWN	160.393	3/3.0m Ø C.I. PIPE	18.00	-	-	-	362.500	376.585	14.085	
UNKNOWN	160.592	4/1.2m Ø C.I. PIPE	4.00	-	-	-	362.231	375.587	13.356	
UNKNOWN	161.185	3/3.0m Ø C.I. PIPE	19.00	-	-	-	362.059	374.616	12.557	
UNKNOWN	162.043	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	370.878	373.278	2.400	
DECEPTION CREEK	164.460	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	354.500	363.663	9.163	
DECEPTION CREEK	164.581	4/2.4m Ø C.I. PIPE	18.00	-	-	-	354.500	363.057	8.557	
DECEPTION CREEK	164.868	4/2.4m Ø C.I. PIPE	16.00	-	-	-	353.000	361.600	8.600	
UNKNOWN	165.591	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	353.721	358.010	4.289	
UNKNOWN	166.070	3/2.4m Ø C.I. PIPE	12.00	-	-	-	346.000	355.620	9.620	
UNKNOWN	167.983	5/2.7m Ø C.I. PIPE	28.00	-	-	-	332.000	346.058	14.058	
UNKNOWN	168.380	3/1.2m Ø C.I. PIPE	2.00	-	-	-	333.274	344.075	10.801	
UNKNOWN	168.813	2/2.4m Ø C.I. PIPE	8.00	-	-	-	333.298	341.905	8.607	
UNKNOWN	170.239	5/2.7m Ø C.I. PIPE	27.00	-	-	-	323.000	334.777	11.777	
BULGONUNNA CREEK	170.589	6/3.0m Ø C.I. PIPE	56.00	-	-	-	319.000	333.027	14.027	
UNKNOWN	171.368	3/2.4m Ø C.I. PIPE	13.00	-	-	-	320.500	330.582	10.082	
UNKNOWN	172.295	4/1.8m Ø C.I. PIPE	8.00	-	-	-	319.000	329.407	10.407	
UNKNOWN	173.031	2/1.8m x 0.9m RC CULVERT	3.00	3.60	-	-	325.859	327.499	1.640	
UNKNOWN	173.972	3/1.8m Ø C.I. PIPE	6.00	-	-	-	315.000	325.988	10.988	
UNKNOWN	174.823	6/1.2m Ø C.I. PIPE	6.00	-	-	-	319.500	322.181	2.681	
UNKNOWN	175.710	5/2.4m Ø C.I. PIPE	21.00	-	-	-	309.500	319.370	9.870	
UNKNOWN	176.897	3/1.8m Ø C.I. PIPE	6.00	-	-	-	309.607	317.315	7.708	
UNKNOWN	177.502	3/1.2m Ø C.I. PIPE	3.00	-	-	-	313.000	317.007	4.007	
UNKNOWN	177.844	3/1.2m Ø C.I. PIPE	3.00	-	-	-	310.500	315.374	4.874	
UNKNOWN	178.365	4/1.2m Ø C.I. PIPE	4.00	-	-	-	308.000	312.884	4.884	
UNKNOWN	178.855	3/2.4m Ø C.I. PIPE	11.00	-	-	-	297.500	310.542	13.042	
UNKNOWN	179.541	3/1.2m Ø C.I. PIPE	3.00	-	-	-	299.500	307.191	7.691	
UNKNOWN	180.185	3/1.2m Ø C.I. PIPE	2.00	-	-	-	301.395	303.975	2.580	
UNKNOWN	180.621	8/1.2m Ø C.I. PIPE	8.00	-	-	-	292.914	301.793	8.879	
UNKNOWN	181.480	3/1.8m Ø C.I. PIPE	6.00	-	-	-	289.882	300.255	10.373	
UNKNOWN	182.164	9/1.2m Ø C.I. PIPE	10.00	-	-	-	294.500	300.203	7.203	
UNKNOWN	183.141	2/2.4m Ø C.I. PIPE	9.00	-	-	-	294.500	301.175	6.675	
UNKNOWN	184.380	4/1.8m Ø C.I. PIPE	9.00	-	-	-	294.000	298.471	4.471	
UNKNOWN	184.938	3/2.4m Ø C.I. PIPE	13.00	-	-	-	289.000	296.237	7.237	

**WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS**



NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBE0006)
UNKNOWN	185.333	5/2.4m Ø C.I. PIPE	22.00	-	-	-	286.000	294.681	8.681	
UNKNOWN	185.482	3/1.2m Ø C.I. PIPE	1.00	-	-	-	286.000	294.757	8.757	
UNKNOWN	185.739	3/1.2m Ø C.I. PIPE	3.00	-	-	-	287.867	295.527	7.660	
UNKNOWN	185.872	7/1.2m Ø C.I. PIPE	7.00	-	-	-	287.000	295.920	8.920	
UNKNOWN	187.564	3/1.8m x 0.9m RC CULVERT	T.B.C.	6.20	-	-	293.000	294.700	1.700	
UNKNOWN	188.099	3/2.7m Ø C.I. PIPE	16.00	-	-	-	283.000	292.169	9.169	
UNKNOWN	188.412	2/2.4m Ø C.I. PIPE	8.00	-	-	-	282.500	290.849	8.349	
UNKNOWN	192.093	9/1.2m Ø C.I. PIPE	10.00	-	-	-	264.683	274.034	9.351	
UNKNOWN	194.208	13/1.8m x 0.9m RC CULVERT	18.00	26.20	-	-	266.500	268.200	1.700	
UNKNOWN	195.289	11/1.8m x 0.9m RC CULVERT	16.00	22.20	-	-	264.312	266.012	1.700	
UNKNOWN	196.248	7/3.6m x 1.8m RC CULVERT	41.00	27.60	-	-	261.582	265.328	3.746	
UNKNOWN	200.056	2/2.1m Ø C.I. PIPE	6.00	-	-	-	253.828	257.203	3.375	
UNKNOWN	200.691	3/2.1m Ø C.I. PIPE	10.00	-	-	-	247.500	254.030	6.530	
UNKNOWN	201.696	5/2.1m Ø C.I. PIPE	17.00	-	-	-	242.500	249.096	6.596	
UNKNOWN	205.932	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	223.500	227.826	4.326	
SUTTOR RIVER FLOOD PLAIN	226.380	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	192.668	198.650	5.982	
SUTTOR RIVER FLOOD PLAIN	226.530	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	192.500	198.650	6.150	
SUTTOR RIVER FLOOD PLAIN	226.680	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	192.045	198.650	6.605	
SUTTOR RIVER FLOOD PLAIN	226.831	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	192.000	198.650	6.650	
SUTTOR RIVER FLOOD PLAIN	226.981	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	192.500	198.650	6.150	
SUTTOR RIVER FLOOD PLAIN	227.131	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	192.500	198.650	6.150	
SUTTOR RIVER FLOOD PLAIN	227.281	15/2.1m x 2.1m RC CULVERT	66.00	34.70	-	-	191.767	198.650	6.883	
SUTTOR RIVER	228.405	83/25m SPAN BRIDGE	135.00	2075.00	227.367	229.442	187.500	198.650	11.150	S024 to S029
SUTTOR RIVER FLOOD PLAIN	229.580	15/3.6m x 3.6m RC CULVERT	195.00	58.80	-	-	190.785	198.650	7.865	
SUTTOR RIVER FLOOD PLAIN	229.730	15/3.6m x 3.6m RC CULVERT	195.00	58.80	-	-	191.208	198.650	7.442	
SUTTOR RIVER FLOOD PLAIN	229.880	15/3.6m x 3.6m RC CULVERT	195.00	58.80	-	-	190.500	198.650	8.150	
SUTTOR RIVER FLOOD PLAIN	230.037	15/3.6m x 3.6m RC CULVERT	195.00	58.80	-	-	190.000	198.650	8.650	
SUTTOR RIVER FLOOD PLAIN	230.181	15/3.0m x 3.0m RC CULVERT	135.00	49.80	-	-	191.000	198.650	7.650	
SUTTOR RIVER FLOOD PLAIN	230.330	15/3.0m x 3.0m RC CULVERT	135.00	49.80	-	-	191.000	198.650	7.650	
SUTTOR RIVER FLOOD PLAIN	230.480	15/2.7m x 2.7m RC CULVERT	110.00	45.30	-	-	191.121	198.650	7.529	
SUTTOR RIVER FLOOD PLAIN	230.630	15/2.4m x 2.4m RC CULVERT	87.00	40.80	-	-	191.500	198.650	7.150	
SUTTOR RIVER FLOOD PLAIN	230.777	15/1.8m x 1.8m RC CULVERT	49.00	31.80	-	-	192.000	198.650	6.650	
SUTTOR RIVER FLOOD PLAIN	230.930	15/1.8m x 1.8m RC CULVERT	49.00	31.80	-	-	192.500	198.650	6.150	
SUTTOR RIVER FLOOD PLAIN	231.122	15/1.8m x 1.8m RC CULVERT	49.00	31.80	-	-	192.000	198.650	6.650	
SUTTOR RIVER FLOOD PLAIN	231.230	15/1.5m x 1.5m RC CULVERT	34.00	25.70	-	-	192.955	198.650	5.695	
SUTTOR RIVER FLOOD PLAIN	231.380	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	193.502	198.650	5.148	
SUTTOR RIVER FLOOD PLAIN	231.530	15/1.2m x 1.2m RC CULVERT	22.00	21.20	-	-	194.000	198.650	4.650	
SUTTOR RIVER FLOOD PLAIN	233.609	15/1.5m x 1.5m RC CULVERT	29.00	25.70	-	-	198.500	201.106	2.606	
UNKNOWN	235.274	15/1.8m x 1.8m RC CULVERT	42.00	31.80	-	-	204.000	207.300	3.300	
UNKNOWN	236.992	11/1.2m Ø C.I. PIPE	12.00	-	-	-	211.500	216.022	4.522	
UNKNOWN	237.666	3/1.2m Ø C.I. PIPE	1.00	-	-	-	221.000	223.602	2.602	
UNKNOWN	238.234	3/1.2m Ø C.I. PIPE	1.00	-	-	-	226.500	228.900	2.400	
UNKNOWN	238.407	7/1.2m Ø C.I. PIPE	7.00	-	-	-	227.222	229.622	2.400	
UNKNOWN	239.466	9/1.2m Ø C.I. PIPE	10.00	-	-	-	227.000	229.939	2.939	
UNKNOWN	240.584	8/1.2m Ø C.I. PIPE	9.00	-	-	-	229.500	231.900	2.400	
UNKNOWN	241.183	68/1.2m Ø C.I. PIPE	76.00	-	-	-	230.000	232.400	2.400	
UNKNOWN	243.430	13/1.2m Ø C.I. PIPE	14.00	-	-	-	242.340	245.204	2.864	
UNKNOWN	243.809	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	243.000	248.158	5.158	



WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS

NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBE0006)
UNKNOWN	246.277	5/1.2m Ø C.I. PIPE	5.00	-	-	-	255.611	260.292	4.681	
UNKNOWN	247.860	7/1.2m Ø C.I. PIPE	7.00	-	-	-	259.518	262.884	3.366	
UNKNOWN	249.569	6/1.2m Ø C.I. PIPE	6.00	-	-	-	253.500	256.833	3.333	
UNKNOWN	251.085	9/1.8m Ø C.I. PIPE	22.00	-	-	-	244.000	249.254	5.254	
UNKNOWN	253.703	6/1.2m Ø C.I. PIPE	6.00	-	-	-	250.000	254.057	4.057	
UNKNOWN	254.826	16/1.2m Ø C.I. PIPE	18.00	-	-	-	242.500	248.445	5.945	
UNKNOWN	256.501	13/1.2m Ø C.I. PIPE	14.00	-	-	-	238.275	240.679	2.404	
UNKNOWN	258.730	15/1.2m Ø C.I. PIPE	16.00	-	-	-	226.921	229.807	2.886	
UNKNOWN	261.025	19/1.2m x 1.2m RC CULVERT	27.00	26.80	-	-	218.000	220.000	2.000	
UNKNOWN	264.438	69/1.2m x 1.2m RC CULVERT	97.00	96.80	-	-	217.000	219.500	2.500	
UNKNOWN	268.943	17/1.2m x 1.2m RC CULVERT	23.00	24.00	-	-	225.500	228.530	3.030	
UNKNOWN	272.283	21/1.2m x 1.2m RC CULVERT	28.00	29.60	-	-	226.500	228.500	2.000	
UNKNOWN	275.610	15/1.2m x 1.2m RC CULVERT	19.00	21.20	-	-	220.096	222.096	2.000	
UNKNOWN	276.020	3/1.2m x 1.2m RC CULVERT	4.00	4.40	-	-	220.000	222.000	2.000	
UNKNOWN	281.202	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	210.500	212.900	2.400	
UNKNOWN	284.906	9/1.8m x 0.9m RC CULVERT	13.00	18.20	-	-	206.500	209.623	3.123	
UNKNOWN	284.973	5/1.2m Ø C.I. PIPE	5.00	-	-	-	207.000	209.623	2.623	
UNKNOWN	285.005	13/1.2m Ø C.I. PIPE	14.00	-	-	-	207.000	209.623	2.623	
UNKNOWN	287.562	99/3.6m x 2.4m RC CULVERT	T.B.C.	386.40	-	-	208.500	212.160	3.660	S030
UNKNOWN	288.816	25/3.6m x 2.1m RC CULVERT	T.B.C.	90.00	-	-	209.500	212.220	2.720	S031
UNKNOWN	289.571	1/25m SPAN BRIDGE	25.00	25.00	289.558	289.583	205.062	214.600	9.538	S031
UNKNOWN	290.262	3/2.1m Ø C.I. PIPE	10.00	-	-	-	209.500	213.608	4.108	
UNKNOWN	292.103	12/1.2m Ø C.I. PIPE	12.00	-	-	-	213.000	215.384	2.384	
UNKNOWN	295.615	12/1.2m Ø C.I. PIPE	13.00	-	-	-	213.576	215.976	2.400	
UNKNOWN	300.839	6/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	211.000	213.400	2.400	
UNKNOWN	307.432	45/1.2m x 1.2m RC CULVERT	64.00	63.20	-	-	215.500	217.400	1.900	
UNKNOWN	308.808	29/1.2m x 1.2m RC CULVERT	41.00	40.80	-	-	215.000	216.900	1.900	
UNKNOWN	311.985	77/1.2m x 1.2m RC CULVERT	109.00	108.00	-	-	218.500	220.400	1.900	
UNKNOWN	316.033	10/1.2m Ø C.I. PIPE	10.00	-	-	-	226.087	230.512	4.425	
UNKNOWN	319.942	34/1.2m Ø C.I. PIPE	38.00	-	-	-	230.500	233.025	2.525	
UNKNOWN	320.435	6/1.2m Ø C.I. PIPE	6.00	-	-	-	230.500	232.692	2.192	
UNKNOWN	322.394	3/3.6m x 2.1m RC CULVERT	22.00	19.20	-	-	225.500	230.053	4.553	
UNKNOWN	322.452	17/3.6m x 1.5m RC CULVERT	87.00	64.80	-	-	227.000	230.000	3.000	
UNKNOWN	327.126	12/1.2m Ø C.I. PIPE	13.00	-	-	-	242.500	244.900	2.400	
UNKNOWN	328.741	6/1.2m Ø C.I. PIPE	6.00	-	-	-	240.000	242.459	2.459	
UNKNOWN	339.776	18/1.2m Ø C.I. PIPE	18.00	-	-	-	254.000	257.477	3.477	
UNKNOWN	340.429	46/3.6m x 3.6m RC CULVERT	365.00	180.60	-	-	253.000	258.501	5.501	
UNKNOWN	345.391	32/1.2m Ø C.I. PIPE	32.00	-	-	-	285.569	289.856	4.287	
UNKNOWN	350.992	5/3.6m x 1.5m RC CULVERT	21.00	19.20	-	-	280.500	282.700	2.200	
UNKNOWN	351.428	3/1.2m Ø C.I. PIPE	3.00	-	-	-	278.038	280.526	2.488	
UNKNOWN	352.563	5/3.6m x 1.2m RC CULVERT	17.00	19.20	-	-	274.500	277.500	3.000	
UNKNOWN	353.036	12/1.2m Ø C.I. PIPE	12.00	-	-	-	273.000	275.349	2.349	
UNKNOWN	354.321	12/1.2m Ø C.I. PIPE	13.00	-	-	-	267.979	270.546	2.567	
UNKNOWN	358.353	17/3.6m x 2.7m RC CULVERT	154.00	66.60	-	-	258.000	262.399	4.399	
UNKNOWN	360.358	5/3.6m x 1.5m RC CULVERT	22.00	19.20	-	-	256.356	258.862	2.506	
UNKNOWN	360.930	29/1.2m x 1.2m RC CULVERT	42.00	40.80	-	-	257.500	259.900	2.400	
UNKNOWN	361.013	21/1.2m x 1.2m RC CULVERT	32.00	29.60	-	-	257.500	259.825	2.325	
UNKNOWN	361.504	5/3.6m x 1.5m RC CULVERT	26.00	19.20	-	-	256.500	258.701	2.201	

**WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS**



NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBE0006)
UNKNOWN	363.327	29/1.2m x 1.2m RC CULVERT	41.00	40.80	-	-	261.500	263.320	1.820	
UNKNOWN	365.067	5/3.6m x 1.5m RC CULVERT	29.00	19.20	-	-	255.000	257.439	2.439	
UNKNOWN	365.826	5/3.6m x 1.5m RC CULVERT	28.00	19.20	-	-	255.000	257.400	2.400	
UNKNOWN	369.077	15/1.2m x 1.2m RC CULVERT	-	21.00	-	-	254.028	255.928	1.900	
UNKNOWN	369.117	3/1.2m x 1.2m RC CULVERT	-	4.40	-	-	254.028	255.900	1.872	
UNKNOWN	369.375	3/1.2m x 1.2m RC CULVERT	-	4.40	-	-	254.000	255.900	1.900	
UNKNOWN	369.595	3/1.2m x 1.2m RC CULVERT	-	4.40	-	-	253.500	255.600	2.100	
UNKNOWN	370.281	15/1.2m x 1.2m RC CULVERT	-	21.00	-	-	253.000	255.400	2.400	
UNKNOWN	370.361	15/1.2m x 1.2m RC CULVERT	-	21.00	-	-	253.000	255.400	2.400	
UNKNOWN	371.790	3/1.2m x 1.2m RC CULVERT	-	4.40	-	-	253.000	254.900	1.900	
UNKNOWN	372.106	3/1.2m x 1.2m RC CULVERT	403.00	4.40	-	-	252.500	254.400	1.900	
UNKNOWN	373.565	31/1.8m x 1.8m RC CULVERT	-	62.20	-	-	250.500	254.000	3.500	
UNKNOWN	373.651	27/1.2m x 1.2m RC CULVERT	-	38.00	-	-	251.000	254.000	3.000	
UNKNOWN	373.720	30/1.2m Ø C.I. PIPE	-	-	-	-	251.500	253.956	2.456	
UNKNOWN	373.994	52/1.2m Ø C.I. PIPE	-	-	-	-	251.500	253.780	2.280	
UNKNOWN	374.428	15/1.2m x 1.2m RC CULVERT	-	21.00	-	-	250.500	253.534	3.034	
UNKNOWN	374.650	3/1.2m x 1.2m RC CULVERT	-	4.40	-	-	252.000	253.900	1.900	
LESTREE HILL CREEK	375.079	15/1.2m x 1.2m RC CULVERT	-	21.00	-	-	252.000	254.200	2.200	
UNKNOWN	376.013	22/1.2m Ø C.I. PIPE	-	-	-	-	252.000	257.300	5.300	
UNKNOWN	376.804	48/1.2m Ø C.I. PIPE	-	-	-	-	252.154	257.300	5.146	
UNKNOWN	378.927	15/3.6m x 3.6m RC CULVERT	43.00	59.00	-	-	252.500	257.300	4.800	
UNKNOWN	381.777	15/3m x 3m RC CULVERT	46.00	54.00	-	-	256.057	260.557	4.500	
UNKNOWN	383.939	15/1.2m x 1.2m RC CULVERT	16.00	21.00	-	-	260.018	262.177	2.159	
UNKNOWN	386.871	15/1.8m x 1.8m RC CULVERT	13.00	30.00	-	-	261.773	267.000	5.227	
BELYANDO FLOOD PLAIN	387.312	27/3.6m x 3.3m RC CULVERT	T.B.C.	106.00	-	-	262.000	267.000	5.000	
BELYANDO FLOOD PLAIN	387.665	24/2.5m SPAN BRIDGE	-	600.00	387.365	387.965	260.942	267.000	6.058	S032 & S033
BELYANDO FLOOD PLAIN	388.070	53/3.6m x 3.3m RC CULVERT	T.B.C.	208.00	-	-	261.500	267.000	5.500	S033 & S034
BELYANDO RIVER	388.512	27/2.5m SPAN BRIDGE	-	675.00	388.174	388.849	255.000	267.000	12.000	S034 & S035
BELYANDO FLOOD PLAIN	389.039	97/3.6m x 2.7m RC CULVERT	T.B.C.	380.00	-	-	262.000	267.000	5.000	
BELYANDO FLOOD PLAIN	390.134	411/3.6m x 3.6m RC CULVERT	T.B.C.	1605.00	-	-	261.000	266.958	5.958	
UNKNOWN	395.444	20/3.6m x 1.8m RC CULVERT	-	78.30	-	-	269.022	271.722	2.700	
UNKNOWN	395.497	7/3.6m x 3.3m RC CULVERT	241.00	27.60	-	-	267.522	271.722	4.200	
UNKNOWN	395.522	6/3.6m x 1.8m RC CULVERT	-	23.70	-	-	269.022	271.722	2.700	
UNKNOWN	396.482	27/1.8m x 0.9m RC CULVERT	42.00	-	-	-	270.500	272.288	1.788	
UNKNOWN	398.778	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	274.000	276.400	2.400	
UNKNOWN	399.588	23/1.2m Ø C.I. PIPE	26.00	-	-	-	275.000	277.400	2.400	
UNKNOWN	401.259	25/1.5m Ø C.I. PIPE	44.00	-	-	-	276.211	279.274	3.063	
UNKNOWN	402.618	3/1.2m Ø C.I. PIPE	T.B.C.	-	-	-	276.500	280.804	4.304	
SANDY CREEK FLOOD PLAIN	403.313	15/3.0m x 3.0m RC CULVERT	135.00	49.80	-	-	277.000	280.949	3.949	
SANDY CREEK FLOOD PLAIN	403.781	20/1.2m x 1.2m RC CULVERT	28.80	28.80	-	-	278.935	281.042	2.107	
SANDY CREEK FLOOD PLAIN	404.200	20/1.2m x 1.2m RC CULVERT	28.80	28.80	-	-	278.791	281.307	2.516	
SANDY CREEK FLOOD PLAIN	404.300	20/1.2m x 1.2m RC CULVERT	28.80	28.80	-	-	278.815	281.467	2.652	
SANDY CREEK FLOOD PLAIN	404.400	20/1.2m x 1.2m RC CULVERT	28.80	28.80	-	-	278.911	281.627	2.716	
SANDY CREEK FLOOD PLAIN	404.500	20/1.2m x 1.2m RC CULVERT	28.80	28.80	-	-	278.757	281.786	3.029	
SANDY CREEK FLOOD PLAIN	404.600	20/1.2m x 1.2m RC CULVERT	28.80	28.80	-	-	278.641	281.946	3.305	
SANDY CREEK FLOOD PLAIN	404.753	10/3.0m x 3.0m RC CULVERT	90.00	33.60	-	-	277.500	282.190	4.690	
SANDY CREEK	405.100	10/2.5m SPAN BRIDGE	-	250.00	404.975	405.225	275.000	282.500	7.500	S036
SANDY CREEK FLOOD PLAIN	405.327	15/1.2m x 1.2m RC CULVERT	21.60	21.20	-	-	278.000	282.500	4.500	



**WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
RIVER AND CREEK CROSSING LOCATIONS**

NAME	APPROXIMATE CHAINAGE AT CENTRE OF CROSSING (km)	STRUCTURE TYPE	AREA REQUIRED (m ²)	STRUCTURE LENGTH (m)	APPROXIMATE START CHAINAGE (km)	APPROXIMATE END CHAINAGE (km)	APPROXIMATE CREEK BED LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	MAXIMUM HEIGHT ABOVE CREEK BED (m)	DRAWING REFERENCE (YBE0006)
SANDY CREEK FLOOD PLAIN	405.506	50/1.2m x 1.2m RC CULVERT	72.00	70.40	-	-	279.000	282.500	3.500	
UNKNOWN	407.783	15/1.2m Ø C.I. PIPE	16.00	-	-	-	283.686	286.885	3.199	
UNKNOWN	408.366	3/1.2m x 1.2m RC CULVERT	3.00	4.40	-	-	287.500	289.500	2.000	
UNKNOWN	409.025	9/1.2m x 1.2m RC CULVERT	13.00	12.80	-	-	288.538	290.668	2.130	
UNKNOWN	409.477	8/1.2m Ø C.I. PIPE	8.00	-	-	-	287.848	291.694	3.846	
UNKNOWN	410.583	13/1.2m x 1.2m RC CULVERT	18.00	18.40	-	-	293.500	295.517	2.017	
UNKNOWN	412.980	TO BE CONFIRMED	8.00	-	-	-	no information	no information	no information	
UNKNOWN	421.550	TO BE CONFIRMED	7.00	-	-	-	no information	no information	no information	
UNKNOWN	421.900	TO BE CONFIRMED	9.00	-	-	-	no information	no information	no information	
UNKNOWN	422.950	TO BE CONFIRMED	6.00	-	-	-	no information	no information	no information	
UNKNOWN	424.200	TO BE CONFIRMED	89.00	-	-	-	no information	no information	no information	
UNKNOWN	426.600	TO BE CONFIRMED	19.00	-	-	-	no information	no information	no information	
UNKNOWN	428.900	TO BE CONFIRMED	4.00	-	-	-	no information	no information	no information	
UNKNOWN	430.550	TO BE CONFIRMED	5.00	-	-	-	no information	no information	no information	
UNKNOWN	432.800	TO BE CONFIRMED	9.00	-	-	-	no information	no information	no information	
UNKNOWN	434.150	TO BE CONFIRMED	10.00	-	-	-	no information	no information	no information	
UNKNOWN	434.750	TO BE CONFIRMED	9.00	-	-	-	no information	no information	no information	
UNKNOWN	435.150	TO BE CONFIRMED	3.00	-	-	-	no information	no information	no information	
UNKNOWN	435.750	TO BE CONFIRMED	14.00	-	-	-	no information	no information	no information	
UNKNOWN	437.850	TO BE CONFIRMED	22.00	-	-	-	no information	no information	no information	
UNKNOWN	440.250	TO BE CONFIRMED	16.00	-	-	-	no information	no information	no information	
UNKNOWN	441.350	TO BE CONFIRMED	11.00	-	-	-	no information	no information	no information	
UNKNOWN	442.500	TO BE CONFIRMED	13.00	-	-	-	no information	no information	no information	
UNKNOWN	442.850	TO BE CONFIRMED	17.00	-	-	-	no information	no information	no information	
UNKNOWN	446.103	7/3.6m x 1.5m RC CULVERT	38.00	27.60	-	-	346.500	349.062	2.562	
UNKNOWN	448.239	10/1.8m Ø C.I. PIPE	23.00	-	-	-	343.387	347.937	4.550	
SALTBUSH CREEK	452.559	3/1.2m Ø STEEL PIPE	T.B.C.	-	-	-	322.529	327.843	5.314	

REFER TO DRAWINGS YBE0006 - S038, S039 & S040 FOR TYPICAL BRIDGE AND CULVERT CROSS SECTIONS



Appendix B
Road and Stock Rail Crossing Locations



**WARATAH COAL (BOWEN BASIN FIRST CHINA RAIL LINK)
ROAD AND STOCK CROSSING LOCATIONS**

NAME, LOCALITY, COUNTY	I.D.	APPROXIMATE CHAINAGE (km)	APPROXIMATE EXISTING LEVEL (m)	APPROXIMATE RAIL FORMATION LEVEL (m)	CUT / FILL HEIGHT (m)	DRAWING REFERENCE
STOCK CROSSING, GUTHALUNGRA, SALISBURY	U398BOWN05	35.100	152.833	158.370	5.538 FILL	
STRATHALBYN ROAD, BOGIE, SALISBURY		38.800	144.983	148.093	3.11 FILL	
STOCK CROSSING, BOGIE, SALISBURY	U398BOWN04	39.500	164.537	155.435	-9.102 CUT	
STOCK CROSSING, BOGIE, SALISBURY	U398BOWN04	51.300	187.838	190.920	3.082 FILL	
STRATHMORE ROAD, SPRINGLANDS, DRAKE	U321BOWN01	71.350	148.000	137.050	-10.95 CUT	
MYUNA ROAD		83.600	129.235	130.005	0.77 FILL	
STOCK CROSSING, NEWLANDS, DRAKE	U409BOWN02	100.000	121.500	124.085	2.585 FILL	
STOCK CROSSING, MOUNT COOLON, DRAKE	U403BOWN02	154.600	392.176	391.117	-1.059 CUT	
BOWEN DEVELOPMENTAL ROAD	MAIN ROAD	165.350	358.681	359.222	0.541 FILL	
SUTTOR DEVELOPMENTAL ROAD	MAIN ROAD	198.300	273.760	264.884	-8.876 CUT	
STOCK CROSSING, MOUNT COOLON, SELLHEIM	U402BOWN01	226.300	193.000	196.515	3.515 FILL	
STOCK CROSSING		263.200	218.210	218.876	0.666 FILL	
GREGORY DEVELOPMENTAL ROAD	HIGHWAY	279.850	212.000	213.342	1.343 FILL	YBE0006 - S037
ELGIN MORAY ROAD, FRANKFIELD, BELL	U401BELY02	288.950	209.785	212.357	2.572 FILL	
CLERMONT LAGLAN ROAD, FRANKFIELD, RUTLEDGE	U303BELY02	341.600	262.217	262.558	0.342 FILL	
LAGLAN PIONEER ROAD, MISTAKE CREEK, BEAUFORT	U294BELY01	377.700	256.000	256.014	0.015 FILL	
JERICHO DEGULLA ROAD, SURBITON, BEAUFORT	U291JERI02	389.300	262.500	266.097	3.597 FILL	
JERICHO DEGULLA ROAD, SURBITON, BEAUFORT	U291JERI02	404.500	278.757	280.914	2.157 FILL	
STOCK CROSSING, SURBITON, BEAUFORT	U301JERI04	425.850	UNKNOWN	320.000	UNKNOWN	
STOCK CROSSING		445.500	350.210	351.698	1.488 FILL	

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