Red River extends mine life at West 45

- **Updated West 45 Ore Reserve of 0.6Mt @ 11.6% Zinc Equivalent - 10% increase in contained metal on a zinc equivalent basis**
- **Updated West 45 Mineral Resource of 0.6Mt @ 15.4% Zinc Equivalent**
- **Thalanga Operations (West 45 & Far West) Ore Reserve of 2.1Mt @ 11.9% Zinc Equivalent and Mineral Resource of 2.3Mt @ 15.5% Zinc Equivalent**
- **West 45 mine life extended to at least 2019, with a period of simultaneous production from West 45 and Far West (from end 2018 to end 2019) resulting in increased mill throughput**
- **Optimised Life of Mine plan (extended mine life and increased mill throughput) due for release early Q1 2018**
- **Exploration continuing across Red River's Mt Windsor Belt portfolio to target further resource inventory increases.**

Red River Resources Limited (ASX: RVR) ("Red River" or the "Company") is pleased to announce an updated Ore Reserve and Mineral Resource estimate for the West 45 polymetallic massive sulphide deposit ("West 45") at the Thalanga Zinc Operation in Central Queensland has demonstrated an increase in the deposit's mine life to at least 2019.

The Ore Reserve and Mineral Resource estimate was completed in accordance with the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code).

West 45 is the first deposit to be mined by Red River at Thalanga as part of restart operations at the project. Underground mining commenced at West 45 in April 2017, with zinc concentrate production restarting ahead of schedule at Thalanga in September 2017.

West 45 has an updated Ore Reserve estimate of 0.6Mt @ 11.6% Zinc Equivalent, up from the previous estimate of 0.4Mt @ 15.0% Zinc Equivalent. The updated Ore Reserve will allow Red River to extend mining operations at West 45 to at least the end of 2019, enabling the simultaneous operation of both the West 45 and Far West mines from the end of 2018 to 2019, increasing mill throughput for this period.

Following the 21 November 2017 announcement of a maiden Ore Reserve at Thalanga Far West, the updated West 45 Ore Reserve has increased the total Thalanga Operations Ore Reserve to 2.1Mt @ 11.9% Zinc Equivalent.

Red River's Managing Director Mel Palancian commented: "*Increasing Ore Reserves at West 45 combined with the recently announced maiden Ore Reserve at Far West is an outstanding result for the future of Red River, with the potential for further mine life extensions at depth and along strike.*

"We are committed to growing resources and reserves at Thalanga and this confirms that our strategy is delivering results and mine life. The West 45 mine life will now extend to at least 2019 allowing the simultaneous operation of both West 45 and the Far West mines in 2019, increasing mill throughput for this period.

"With exploration across our landholding in the Mt Windsor Belt in Queensland continuing in tandem to our mining operations, we hope to make new discoveries that can add further life to Thalanga."

1. West 45 Mineral Resource Estimate

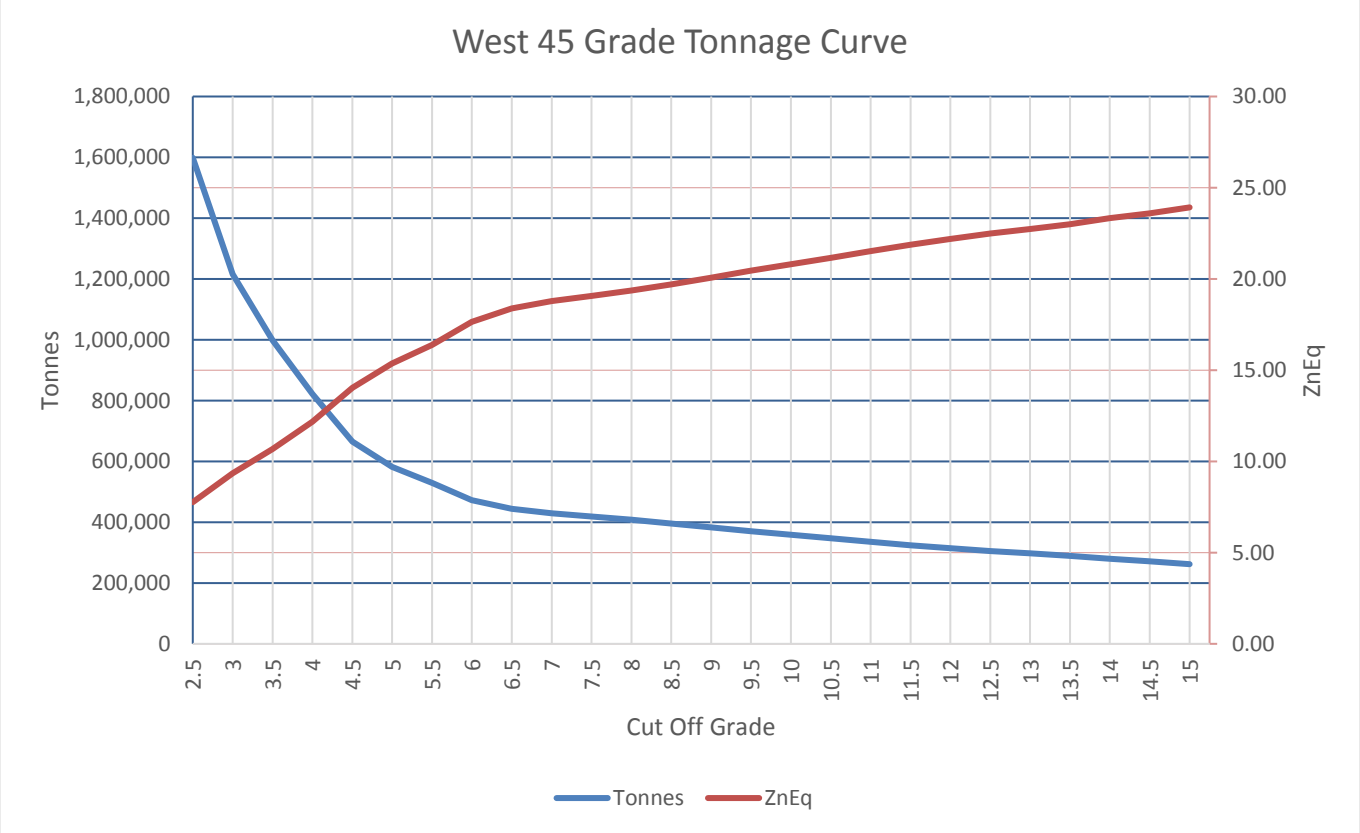
Red River staff updated the JORC 2012 compliant Mineral Resource estimate for the West 45 deposit. The previous West 45 JORC 2012 compliant Mineral Resource estimate was completed for Red River by Mining One in January 2015 (refer to ASX release "Thalanga Project – Updated Mineral Resource Estimate" dated 11 February 2015). Results of the estimation are shown in the table below, blocks were constrained by removing all blocks <5% Zn Eq., all mined material, and all non-classified blocks in respect to resource category. The grade tonnage curve for Zn Eq. is also shown below.

Table 1 West 45 Mineral Resources (>5% Zn Eq.)

Resource Class	Tonnage (kt)	Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Zn Eq. (%)
Measured	210	0.8	5.5	11.9	0.5	122	22.4
Indicated	312	0.4	2.7	6.7	0.2	45	11.7
Measured + Indicated	*522*	*0.6*	*3.8*	*8.8*	*0.3*	*76*	*16.0*
Inferred	60	0.5	2.4	5.0	0.3	51	10.0
Total	**582**	**0.6**	**3.7**	**8.4**	**0.3**	**73**	**15.4**

Source: West 45 Mineral Resource Estimate (Red River Resources, 20 December 2017)
Tonnages and grades are rounded. Discrepancies in totals may exist due to rounding.
Zinc equivalent (Zn Eq.) has been calculated using the metal selling prices, recoveries and other assumptions contained in Appendices of this announcement.
It is Red River's opinion that all elements included in the metal equivalent calculation have a reasonable potential to be recovered and sold.

Figure 1 West 45 Mineral Resource – Zn Eq. % Grade Tonnage Curve



2. West 45 Ore Reserve Estimate

Red River has completed an updated Ore Reserve estimate for the West 45 deposit (refer to Table 2). The Reserve estimate was determined using the mining, geotechnical, metallurgical and economic factors provided in Appendix 1 of this release.

Table 2 Thalanga West 45 Ore Reserve (>6% Zn Eq.)

Reserve Class	Tonnage (kt)	Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Zn Eq. (%)
Proved	101	0.3	2.0	4.6	0.3	38	8.4
Probable	466	0.4	3.0	6.8	0.3	56	12.4
Total	**567**	**0.4**	**2.8**	**6.4**	**0.3**	**53**	**11.6**

JORC (2012) Table Checklist of Assessment and Reporting Criteria is attached in Appendix 1 of this release. The Competent Persons statement is provided under the Competent Persons section at the end of this release. Tonnages and grades are rounded. Discrepancies in totals may exist due to rounding.
Zinc equivalent (Zn Eq.) has been calculated using the metal selling prices, recoveries and other assumptions contained in Appendices of this announcement. It is Red River's opinion that all elements included in the metal equivalent calculation have a reasonable potential to be recovered and sold.
Proved and Probable Reserves are included within (and not in addition to) the West 45 Mineral Resource estimate

3. West 45 and Far West Ore Mineral Resource and Ore Reserve Estimate

The combined West 45 and Far West Mineral now stands at 2.3Mt @ 15.5% Zn Eq., of which 2.1Mt @ 15.7% Zn Eq. is classified as Measured and Indicated Resources.

Table 3 West 45 and Far West Mineral Resource (>5% Zn Eq.)

Deposit	Resource Class	Tonnage (kt)	Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Zn Eq. (%)
West 45	Measured	210	0.8	5.5	11.9	0.5	122	22.4
	Indicated	312	0.4	2.7	6.7	0.2	45	11.7
	Measured + Indicated	*522*	*0.6*	*3.8*	*8.8*	*0.3*	*76*	*16.0*
	Inferred	60	0.5	2.4	5.0	0.3	51	10.0
	Subtotal	**582**	**0.6**	**3.7**	**8.4**	**0.3**	**73**	**15.4**
Far West	Measured	52	1.4	1.3	5.3	0.0	32	12.0
	Indicated	1,491	1.7	2.2	6.6	0.2	61	15.7
	Measured + Indicated	*1,543*	*1.7*	*2.1*	*6.6*	*0.2*	*60*	*15.6*
	Inferred	150	1.4	2.3	6.5	0.1	53	14.6
	Subtotal	**1,693**	**1.6**	**2.1**	**6.5**	**0.2**	**59**	**15.5**
Combined	Measured	262	0.9	4.7	10.6	0.4	104	20.3
	Indicated	1,803	1.5	2.3	6.6	0.2	58	15.0
	Measured + Indicated	2,065	*1.4*	*2.6*	*7.1*	*0.2*	*64*	*15.7*
	Inferred	210	1.1	2.3	6.1	0.2	52	13.2
	Total	**2,275**	**1.4**	**2.5**	**7.0**	**0.2**	**63**	**15.5**

Source: Far West Mineral Resource Estimate (Red River Resources, 21 November 2017), West 45 Mineral Resource Estimate (Red River Resources, 20 December 2017). Tonnages and grades are rounded. Discrepancies in totals may exist due to rounding
Zinc equivalent (Zn Eq.) has been calculated using the metal selling prices, recoveries and other assumptions contained in Appendices of this announcement. It is Red River's opinion that all elements included in the metal equivalent calculation have a reasonable potential to be recovered and sold.

The combined West 45 and Far West Ore Reserve now stands at 2.1Mt @ 11.9% Zn Eq.

Table 4 Thalanga Operations Ore Reserve (>6% Zn Eq.)

Deposit	Reserve Class	Tonnage (kt)	Cu (%)	Pb (%)	Zn (%)	Au (g/t)	Ag (g/t)	Zn Eq. (%)
West 45	Proved	101	0.3	2.0	4.6	0.3	38	8.4
	Probable	466	0.4	3.0	6.8	0.3	56	12.4
	Subtotal	**567**	**0.4**	**2.8**	**6.4**	**0.3**	**53**	**11.6**
Far West	Proved	48	1.3	1.0	4.4	0.0	27	10.1
	Probable	1,486	1.3	1.6	5.0	0.2	46	12.1
	Subtotal	**1,534**	**1.3**	**1.6**	**6.6**	**0.2**	**60**	**12.0**
Combined	Proved	149	0.6	1.7	4.8	0.2	36	8.9
	Probable	1,952	1.1	1.9	6.6	0.2	60	12.2
	Total	**2,101**	**1.1**	**1.9**	**6.5**	**0.2**	**58**	**11.9**

Source: Far West Mineral Ore Reserve Estimate (Red River Resources, 21 November 2017), West 45 Ore Reserve Estimate (Red River Resources, 20 December 2017)
JORC (2012) Table Checklist of Assessment and Reporting Criteria is attached in Appendix 1 of this release. The Competent Persons statement is provided under the Competent Persons section at the end of this release. Tonnages and grades are rounded. Discrepancies in totals may exist due to rounding. Zinc equivalent (Zn Eq.) has been calculated using the metal selling prices, recoveries and other assumptions contained in Appendices of this announcement. It is Red River's opinion that all elements included in the metal equivalent calculation have a reasonable potential to be recovered and sold. Proved and Probable Reserves are included within (and not in addition to) the West 45 and Thalanga Far West Mineral Resource estimates

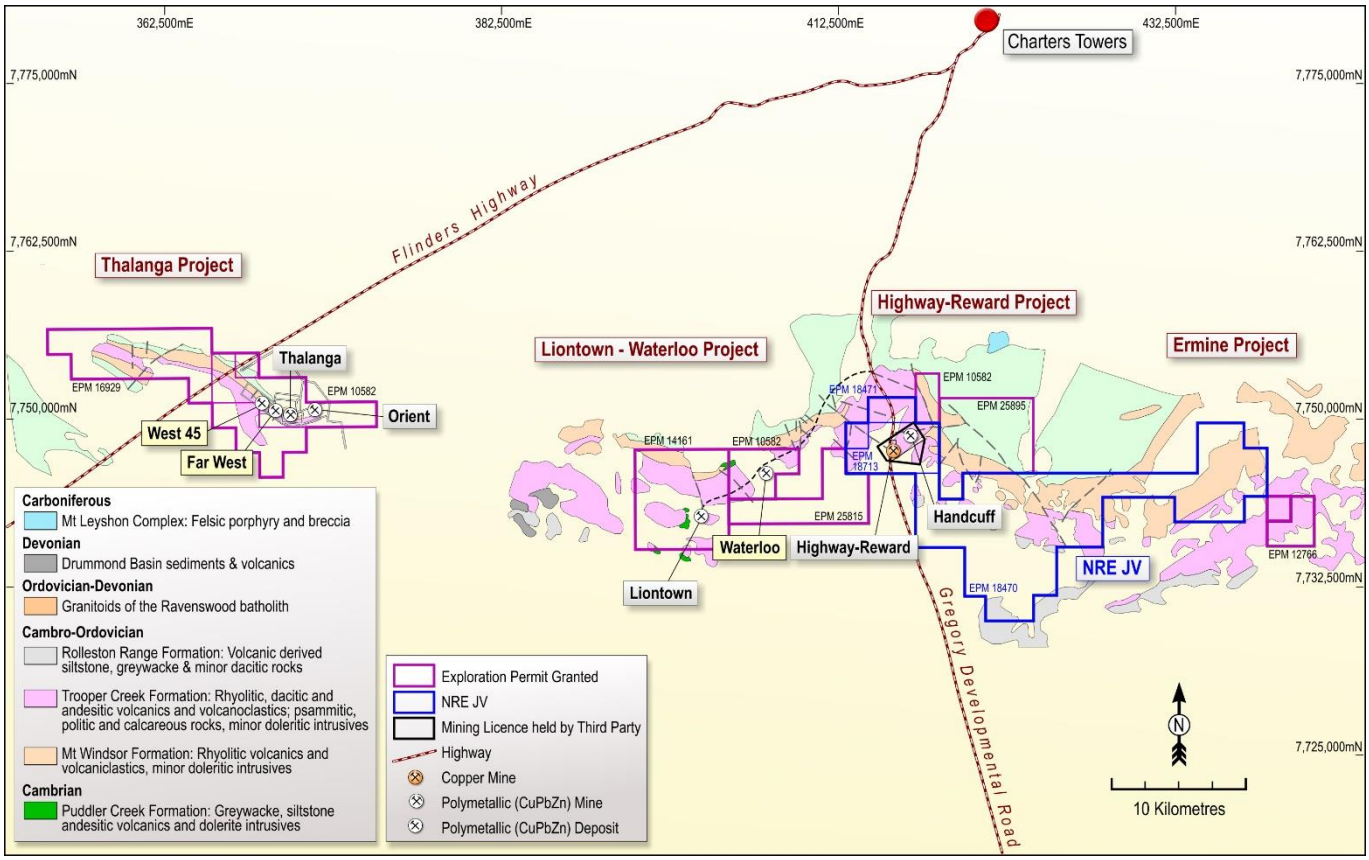
ASX Additional Information – Material Assumptions

4. Mineral Resource Estimate (Summary Information Required by Listing Rule 5.8.1)

4.1. Geology and Geological Interpretation

The West 45 polymetallic deposit is located at Thalanga Operations, 65km SW of Charters Towers in Central Queensland.

Figure 2 West 45 Location



West 45 is classified as a volcanogenic hosted massive sulphide (VHMS) style of deposit where copper, zinc, lead gold and silver mineralisation is found associated with a suite of sulphide minerals including sphalerite, galena, chalcopyrite, pyrite and other minor sulphide assemblages. Mineralised zones are typically represented by fault controlled lenses located within a blue quartz eye volcanic unit. Stratabound massive to semi-massive sulphide lenses and bands can occur throughout the quartz eye unit and consist of three textural and mineralogical main types:

- Sphalerite-galena dominant with sub-ordinate chalcopyrite, pyrite and barite; typically poorly banded, coarse grained and recrystallised, massive to semi-massive, lensoidal, and with anastomosing and gradational contacts;
- Pyrite with minor chalcopyrite and lesser barite and base-metals, commonly finely banded to massive and granular, and lie at the base the quartz eye unit and the strike extremities of the base-metal sulphide lenses; and

- Anastomosing stringer zones of pyrite-sphalerite-galena-chalcopyrite in varying proportions, frequently adjacent to the more massive sulphide lenses.

4.2. Sampling and Sub Sampling Techniques

Diamond drilling was used to obtain core samples and samples consist of half NQ2 drill core. The sample intervals were selected by company geologists based on visual mineralisation, lithology, structure and alteration. Sample intervals ranged from 0.5 to 1.45m based on geological boundaries. Samples were sawn in half using an onsite core saw.

4.3. Drilling Techniques and Hole Spacing

A series of 28 drillholes were drilled around the West 45 deposit during 2017. The program successfully intersected significant base metal mineralisation up dip and along strike of the 2015 resource area, allowing the resource to be expanded into those areas.

A total of 86 holes have been drilled in the West 45 project area (74 diamond and 12 reverse circulation), of these a total of 72 have been used to estimate resources for the project. The diamond core size drilled was predominately standard tube NQ2. The majority of diamond holes were orientated. The West 45 deposit has been drilled on an average spacing of 20m x 20m in the main resource area and down to 10m x 10m in some places. This drill spacing provides evidence of mineralised zone continuity for the purposes of resource estimation. Drill data spacing is close enough to support high geological confidence between samples. This has been verified by underground mapping and sludge sampling. No sampling compositing was necessary in the initial diamond drilling however compositing of raw assay data was completed in preparation for the resource estimation process.

4.4. Sample Analysis Method

Samples were dispatched to Intertek Genalysis Laboratories, Townsville where the samples were crushed to sub 6mm, split and pulverised to sub 75µm to produce a representative sub-sample for analysis.

Analysis consisted of a four acid digest and Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) for the following elements; Ag, As, Ba, Bi, Ca, Cu, Fe, K, Mg, Mn, Na, Pb, S, Sb, Ti, Zn, & Zr. A selection of samples was also assayed for Au using a 30g Fire Assay technique.

4.5. Estimation Methodology

The source drilling, sampling and QAQC data was used by Red River together with a 3D interpretation of the mineralised domains to form a wireframe model for the West 45 deposit. An inverse distance estimate was run to estimate copper, zinc, lead, silver and gold grades into the block model.

Red River geologists have used the current underground development at West 45 to generate a fault model which has been incorporated into the updated wireframes. A number of fault sets have been mapped and identified which has given Red River a greater ability to predict the location of the ore lenses. The new model therefore provides a more accurate reflection of the mineralisation in relation to its likely distribution. The generation of the fault model will also result in a better geotechnical understanding of the deposit.

4.6. Resource Classification

The resource classification was based on a combination of drill spacing and assessment of geological continuity of the mineralisation domains. Measured blocks were typically coded where the distance to composites averaged less than 10m, indicated blocks coded where average distance to composites was between 10m and 25m and inferred blocks coded where average was between 25m and 50m. Areas of the resource where average distance to composites was greater than 50m were not classified.

4.7. Cut-Off Grade

The resources have been reported above a 5% Zn Eq. cut-off into inferred, indicated and measured categories.

The basis for the cut-off grade is that a 5% Zn Eq. grade is assessed as the lower cut-off for definition of potential economic mineralization using the proposed underground mining methodology. The 5% Zn Eq. resource envelope provides within which the proposed mining inventory can be sourced.

4.8. Mining and Metallurgical Methods and Parameters and other Material Modifying Factors

West 45 is a fully permitted underground mining operation, which commenced production in April 2017. Red River awarded the West 45 underground mining contract to PYBAR Mining Services.

The underground mining method used is overhand benching and utilises conventional underground mechanised mining practices. The stoping sequence is based on mining bottom-up from two set horizons, one of which is being filled with cemented rockfill and the remaining stope voids will be filled with rockfill. The selected mining method is well suited to the disposition of the orebody and ground conditions; it is also flexible to enable ready adjustments to stope strike lengths as needed.

Development mining, using drill and blast methods is being undertaken. The main decline is 5.0m wide by 5.5m high and at a gradient of 1 in 7. Ore development is being mined 4.5m wide and 4.5m high. A standard underground mobile mining fleet is utilised for underground mining activities including a twin boom jumbo drill, production drill, load haul dump units and 50t trucks.

Ore produced from West 45 is processed through Red River's Thalanga Mill (refer to Figure 3), which is processing polymetallic massive sulphide ore from Red River's West 45 underground mine. The Thalanga Mill is designed for a nominal throughput of 650kpta and is running at an annualised throughput of 325ktpa. The mill uses standard industry technology to produce separate saleable copper, lead and zinc concentrates.

5. Ore Reserve Estimate (Summary Information Required by Listing Rule 5.9.1)

5.1. Material Assumptions

The material assumptions which support the West 45 Ore Reserve estimate are disclosed in the body of the announcement and outlined in the ASX Additional Information – Material Assumptions section, with the exception of commercially sensitive information.

The operating costs used by Red River in the calculation of the West 45 Ore Reserve Estimate were derived from the actual operating costs from the current West 45 operation (mining commenced at West 45 in April 2017 and processing of West 45 ore commenced in September 2017).

West 45 is a fully permitted underground mining operation which commenced production in April 2017. The West 45 underground mining contract was awarded to PYBAR Mining Services (PYBAR). It is anticipated that PYBAR will continue to operate the underground mining contract for West 45 for the duration of the West 45 mine life.

5.2. Criteria Used for the Classification of Ore Reserves

There is a high level of confidence in the modifying factors (mining, processing, metallurgical, infrastructure, economic, legal, social and government) applied to the West 45 Mineral Resource. This is driven by the following considerations:

West 45 is a fully permitted operational mine, with mining commencing in April 2017. The Thalanga Plant commenced processing ore from West 45 in September 2017, and production of base metal concentrates (copper, lead and zinc) also commenced in September 2017. The concentrates produced from West 45 are sold on long term offtake agreements to Glencore (copper) and Trafigura (lead and zinc).

5.3. Mining Method and Assumptions

The underground mining method used is overhand benching and utilises conventional underground mechanised mining practices. The stoping sequence is based on mining bottom-up from two set horizons, one of which is being filled with cemented rockfill and the remaining stope voids will be filled with rockfill. The selected mining method is well suited to the disposition of the orebody and ground conditions; it is also flexible to enable ready adjustments to stope strike lengths as needed.

Kevin Rosengren & Associates completed two geotechnical assessments in 2011 which recommended sublevel intervals up to 20m and maximum stope strike lengths of 30m. The sublevel interval chosen is 20m floor to floor and stope strike lengths vary between 20 and 25m maximum. The average stope width is approximately 9m. The Ore Reserve estimate is based on a minimum stope width of 2m. Hanging wall and footwall dilution of 0.5m wide each (1m total) was included to account for stope overbreak. A recovery factor of 95% has been applied to all diluted stope tonnages.

No unplanned dilution has been applied to development ore and a recovery of 100% has been assumed. Conventional long hole drilling and blasting is being used to break the stope ore.

Development mining, using drill and blast methods is being undertaken. The main decline is 5.0m wide by 5.5m high and at a gradient of 1 in 7. Ore development is being mined 4.5m wide and 4.5m high. A standard underground mobile mining fleet is utilised for underground mining activities including a twin boom jumbo drill, production drill, load haul dump units and 50t trucks.

Ground conditions encountered in the West 45 portal and decline are good and have remained stable since mining recommenced. The decline has been bolted and meshed in the backs and walls using galvanised elements as per Kevin Rosengren & Associates recommendations. Cable bolting has been used at all intersections and where major structures daylight the decline. The mine plan intends to follow the ground control management plan previously developed and currently in use for West 45. In addition, the mine plan includes cable bolting of all stope hanging walls from ore drives using 6m long cables, 4 per ring and rings spaced at 2.5m on average. Stope brows will also be cable bolted at set points.

Groundwater inflows encountered in the mine are low and manageable with industry standard pumps.

The primary and secondary ventilation systems consisting of a surface to underground exhaust raise are installed and operational. The decline is used as the fresh air intake. An egress system with ladders from surface is installed will also be progressively installed as the mine workings become deeper. Two underground refuge chambers are utilised underground. Water supply to the underground operations is in place as well as diesel storage facility, workshops, mine offices and change houses. The run of mine ore pad and waste rock dump is also in place.

5.4. Processing Method and Other Assumptions

Ore produced from West 45 will be processed through Red River's Thalanga Mill (refer to Figure 3), which is processing polymetallic massive sulphide ore from Red River's West 45 underground mine. The Thalanga Mill is designed for a nominal throughput of 650kpta and is running at an annualised throughput of 325ktpa. The mill uses standard industry technology to produce separate saleable copper, lead and zinc concentrates. The plant flowsheet is summarised as:

- Three stage crushing circuit;
- Primary (x1) and secondary ball mill (x2) circuit;
- Regrind plant;
- Differential copper, lead and zinc flotation circuits;
- Concentrate thickening and filtration;
- Concentrate storage, blending and transport and
- Sub aqueous disposal of tailings to Tailings Storage Facility (TSF).

Figure 3 Thalanga Mill

West 45 is currently being processed and is producing quality copper, lead and zinc concentrates. The following metallurgical grades and concentrate recoveries are assumed for West 45:

Table 5 Metallurgical Grades and Concentrate Recoveries

	Copper	Lead	Zinc	Gold	Silver
Copper Concentrate					
Grade	22%			-	250 g/t
Recovery	80%			-	15%
Lead Concentrate					
Grade		60%		-	1,150 g/t
Recovery		80%		-	55%
Zinc Concentrate					
Grade			56%	-	
Recovery			89%	-	

5.5. Basis of Cut-Off Grade

The West 45 Ore Reserve was estimated using a cut-off grade of 5% Zn Eq. based on commodity pricing shown in Table 6 and Metallurgical recoveries stated in Table 5.

Table 6 Pricing Assumptions

Commodity	Units	2018+
Copper	US$/lb	3.00
Lead	US$/lb	0.90
Zinc	US$/lb	1.00
Gold	US$/oz	1,200
Silver	US$/oz	17.00
Exchange Rate	(US$:A$)	0.75

5.6. Estimation Methodology

Please refer to the discussion on this item as set out in the previous section which deals with the summary information as required by Listing Rule 5.8.1 for Mineral Resource estimates.

5.7. Other Material Modifying Factors

The West 45 deposit is located on ML1531 which is held by Cromarty Pty Ltd. (a wholly-owned subsidiary of Red River Resources) and forms part of Red River's Thalanga Zinc Project. ML1531 is in good standing.

West 45 is a fully permitted operational mine, with production having commenced in April 2017, and the ore from West 45 is processed through the Thalanga Mill, which is fully permitted and has been operating since September 2017.

The copper, lead and zinc concentrates produced at Thalanga from processing West 45 ore are sold to Glencore (copper concentrate) and Trafigura (lead and zinc concentrates) under existing concentrate offtake agreements. The copper concentrate is sold to Glencore at the Thalanga mine gate, and under the terms of the Trafigura offtake agreement, zinc and lead concentrates will be trucked 200km to the Port of Townsville, for onward delivery to customers.

For further details regarding the Glencore offtake agreement, please refer to the ASX release dated 13 June 2017 "Red River Secures Copper Offtake Agreement with Glencore" and for further details as regards the Trafigura offtake agreement, please refer to the ASX release dated 8 August 2017 "Red River Secures Zinc and Lead Offtake Agreements with Trafigura".

6. Feasibility Study

The Reserve Estimate has been prepared based on an internal feasibility study that assesses the technical and economic study of the potential viability of developing the Mineral Resources at an order of magnitude. It includes assessments, modifying and operational factors required to demonstrate that production can be reasonably justified at the time of reporting.

As part of the study, a detailed mine design and schedule was developed by Red River Resources. The study assumes that the ore produced from West 45 continues to be treated at the Thalanga Plant and will utilise all the supporting infrastructure which is being used to support the current mining operations at West 45.

About Red River Resources (ASX: RVR)

RVR is the leading ASX pure play zinc producer, with its key asset being the high quality Thalanga Zinc Project in Central Queensland. RVR commenced concentrate production at the Thalanga Zinc Project in September 2017.

RVR is focused on maximising returns from the Project by increasing plant throughput and extending mine life through increasing Mineral Resources and Ore Reserves at deposits currently in the mine plan (West 45, Thalanga Far West and Waterloo), by potentially converting Mineral Resources into Ore Reserves at Liontown and Orient and by continuing to aggressively explore our growing pipeline of high quality targets within the surrounding area.

On behalf of the Board,

Mel Palancian
Managing Director
Red River Resources Limited

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COMPETENT PERSON STATEMENTS

West 45 Mineral Resource

The information in this report that relates to the estimation and reporting of the West 45 Mineral Resource is based on and fairly represents, information and supporting documentation compiled by Mr Alex Nichol, who is a Member of the Australian Institute of Geoscientists and a full-time employee of Red River Resources Pty Ltd.

Mr Nichol has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.

Mr Nichol consents to the inclusion in the report of the matters based on the information in the form and context in which it appears. The information in this report that relates to database compilation, geological interpretation and mineralisation wireframing, project parameters and costs and overall supervision and direction of the West 45 Mineral Resource estimation is based on and fairly represents, information and supporting documentation compiled under the overall supervision and direction of Mr Nichol.

West 45 Ore Reserve

The information in this report that relates to the estimation and reporting of the West 45 Ore Reserve is based on and fairly represents, information and supporting documentation compiled by Mr Mel Palancian, who is a Member of The Australasian Institute of Mining and Metallurgy and a full-time employee of Red River Resources.

Mr Palancian has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'.

Mr Palancian consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

Zinc Equivalent Calculation

The net smelter return zinc equivalent (Zn Eq.) calculation adjusts individual grades for all metals included in the metal equivalent calculation applying the following modifying factors: metallurgical recoveries, payability factors (concentrate treatment charges, refining charges, metal payment terms, net smelter return royalties and logistic costs) and metal prices in generating a zinc equivalent value for copper (Cu), lead (Pb), zinc (Zn), gold (Au) and silver (Ag).

Red River has selected to report on a zinc equivalent basis, as zinc is the metal that contributes the most to the net smelter return zinc equivalent (Zn Eq.) calculation. It is the view of Red River Resources that all the metals used in the Zn Eq. formula are expected to be recovered and sold.

Where:

Metallurgical Recoveries are derived from historical metallurgical recoveries from test work carried out the Thalanga deposit. The Far West deposit is related to and of a similar style of mineralisation to the Thalanga Operations and it is appropriate to apply similar recoveries. The Metallurgical Recovery for each metal is shown below in Table 1.

Metal Prices and Foreign Exchange assumptions are set as per internal Red River price forecasts and are shown below in Table 1.

Table 1 Metallurgical Recoveries and Metal Prices

Metal	Metallurgical Recoveries (Far West)	Metallurgical Recoveries (West 45)	Price
Copper	80%	80%	US$3.00/lb
Lead	75%	80%	US$0.90/lb
Zinc	89%	89%	US$1.00/lb
Gold	47%	-	US$1,200/oz
Silver	65%	70%	US$17.00/oz
FX Rate: A$0.75:US$1			

Payable Metal Factors are calculated for each metal and make allowance for concentrate treatment charges, transport losses, refining charges, metal payment terms and logistic costs. It is the view of Red River that three separate saleable base metal concentrates will be produced at Thalanga. Payable metal factors are detailed below in Table 2.

Table 2 Payable Metal Factors

Metal	Payable Metal Factor
Copper	Copper concentrate treatment charges, copper metal refining charges copper metal payment terms (in copper concentrate), logistic costs and net smelter return royalties
Lead	Lead concentrate treatment charges, lead metal payment terms (in lead concentrate), logistic costs and net smelter return royalties
Zinc	Zinc concentrate treatment charges, zinc metal payment terms (in zinc concentrate), logistic costs and net smelter return royalties
Gold	Gold metal payment terms (in copper and lead concentrates), gold refining charges and net smelter return royalties
Silver	Silver metal payment terms (in copper, lead and zinc concentrates), silver refining charges and net smelter return royalties

The zinc equivalent grade is calculated as per the following formula:

Zn Eq. = (Zn%*ZnMEF) + (Cu%*CuMEF) + (Pb%*PbMEF) + (Au ppm*AuMEF) + (Ag ppm*AgMEF)

The following metal equivalent factors used in the zinc equivalent grade calculation has been derived from metal price x Metallurgical Recovery x Payable Metal Factor, and have then been adjusted relative to zinc (where zinc metal equivalent factor = 1).

Table 3 Metal Equivalent Factors

Metal Equivalent Factor	Copper CuMEF	Lead PbMEF	Zinc ZnMEF	Gold AuMEF	Silver AgMEF
Far West	3.3	0.9	1.0	0.5	0.025
West 45	3.3	0.9	1.0	0.0	0.025

APPENDIX ONE – THALANGA FAR WEST JORC 2012 TABLES (ORE RESERVES)

Criteria	Commentary
Mineral Resource estimate for conversion to Ore Reserves	Mineral Resource Estimate used for the West 45 reserve was the 2017 updated Resource by Alex Nichol who is a full time employee of Red River Resources. The total Measured, Indicated and Inferred Resource is 582 thousand tonnes at grades of 0.6% copper, 3.7% lead, 8.4% zinc, 0.3g/t gold, 73g/t silver using a cut-off grade of 5% zinc equivalent. The zinc equivalent grade of this resource is 15.4%. The Reserves utilises West 45 Measured and Indicated Mineral Resources. Inferred Mineral Resources are not included in the Reserves.
Site Visits, Re-start Study inputs and preparation	The following people has provided input into this Ore Reserve Study **Mr Mel Palancian** (Red River Resources): Mr Palancian has visited the site and understands the detail associated with the site. Mr Palancian is the Managing Director of Red River Resources and is responsible for the Ore Reserve Estimate for West 45. **Mr Karl Spaleck** (Red River Resources): Mr Spaleck is the Thalanga Site General Manager and has been involved with the project for approximately 3 years. Mr Spaleck is responsible for the site operations, metallurgical aspects and the environmental requirements and approvals associated with West 45 and the site operations. **Mr Donald Garner** (Red River Resources): Mr Garner has visited the site and understands the detail associated with the site. Mr Garner is an Executive Director of Red River Resources and compiled the overall economic model associated with the Project. He has visited the site and is familiar with the Project and its layout. **Mr Alex Nichol** (Red River Resources): Mr Nichol is the Geology Manager at Thalanga and is responsible for all geological aspects of West 45 including the 2017 resource estimate **Mr Johan Boosye** (Red River Resources): Mr Boosye is the Mining Manager at Thalanga and West 45. He is responsible for completing the mining study work associated with the reserves estimate including stope and development designs, scheduling and geotechnical aspects.
Study status	The Thalanga Operations have been in production since September 2017. The West 45 mine has been operating since April 2017 and is the single source for plant feed. Multiple levels in the orebody have been developed and stoping has commenced successfully. Operations over the past 3 months have demonstrated that West 45 can be successfully mined (88kt to date) and processed. This Ore Reserve was developed as part of ongoing operations at the mine. Additional resources were found via extensions to underground development and extensive diamond drilling program which lead to an updated resource estimate which in turn prompted this updated reserve estimate. A detailed mine plan and practical mining schedule was developed by site technical services team. Appropriate modifying factors relating to the selected mining method (bench stoping), geotechnical conditions and metallurgical parameters were applied. The reserves have been depleted for previously mined mineralisation.

Cut-off parameters

The economic cut-off grade for the mineralisation was determined using the Net Smelter Return (NSR) to account for the value of all payable metals which was then converted to zinc equivalents (ZnEq). The NSR values were calculated at the 'mine gate' basis and incorporate metal pricing in the table below. The NSR value was adjusted for transport costs, port handling charges and concentrate treatment and refining charges on all payable metals. Payable metals are zinc, lead, copper and silver.

The cut-off NSR value was determined from the site operating costs including mining, processing and site administration costs. The cut-off was estimated to be $125 per tonne processed based on the full operating cost. An incremental stope cut-off of $65 per tonne and an incremental development cut-off of $40 per tonne processed were also estimated as a subset of the operating costs.

The NSR cut-off was converted to zinc equivalents (ZnEq) using the commodity prices, exchange rate and recoveries shown below. ZnEq was chosen as zinc in the main revenue source when compared with the other metals produced.

The ZnEq formula was estimated as: ZnEq%= Zn% + 0.9 x Pb% + 3.3 x Cu% + 0 x Au g/t + 0.025 x Ag g/t
The mine design and therefore the Reserve Estimate has been calculated using a cut-off of 5% ZnEq and does not include incremental development material other than that included in the dilution modifying factors.

		Cut-off Grade	Incremental Stope Cut-off Grade	Incremental Development Cut-off Grade
Total Operating Cost	AUD	$125	$65	$40
Cut-off Grades	**ZnEq**	**9.0%**	**5.0%**	**3.0%**
Note: Cut-off Grades have been rounded				

Zinc Equivalents (ZnEq)	**Zn**	**Pb**	**Cu**	**Au**	**Ag**
Commodity Prices USD/lb or /oz	1.0	0.9	3.0	1,200	17.0
Forex AUD:USD	0.75	0.75	0.75	0.75	0.75
Recoveries	89%	80%	80%	-	70%
ZnEq Factors	**1**	**0.9**	**3.3**	**0**	**0.025**
Notes: ZnEq factors have been rounded					

Mining factors or assumptions

The underground mining method used is overhand benching and utilises conventional underground mechanised mining practices. The stoping sequence is based on mining bottom-up from two set horizons, one of which is being filled with cemented rockfill and the remaining stope voids will be filled with rockfill. The selected mining method is well suited to the disposition of the orebody and ground conditions; it is also flexible to enable ready adjustments to stope strike lengths as needed.

Kevin Rosengren & Associates completed two geotechnical assessments in 2011 which recommended sublevel intervals up to 20m and maximum stope strike lengths of 30m. The sublevel interval chosen is 20m floor to floor and stope strike lengths vary between 20 and 25m maximum. The average stope width is approximately 9m. The Ore Reserve estimate is based on a minimum stope width of 2m. Hangingwall and footwall dilution of 0.5m wide each (1m total) was included to account for stope overbreak. A recovery factor of 95% has been applied to all diluted stope tonnages.

No unplanned dilution has been applied to development ore and a recovery of 100% has been assumed. Conventional long hole drilling and blasting is being used to break the stope ore.

Development mining, using drill and blast methods is being undertaken. The main decline is 5.0m wide by 5.5m high and at a gradient of 1 in 7. Ore development is being mined 4.5m wide and 4.5m high. A standard underground mobile mining fleet is utilised for underground mining activities including a twin boom jumbo drill, production drill, load haul dump units and 50t trucks.

Ground conditions encountered in the West 45 portal and decline are good and have remained stable since mining recommenced. The decline has been bolted and meshed in the backs and walls using galvanised elements as per Kevin Rosengren & Associates recommendations. Cable bolting has been used at all intersections and where major structures daylight the decline. The mine plan intends to follow the ground control management plan previously developed and currently in use for West 45. In addition the mine plan includes cablebolting of

	all stope hangingwalls from ore drives using 6m long cables, 4 per ring and rings spaced at 3.5m on average. Stope brows will also be cable bolted at set points. Groundwater inflows encountered in the mine are low and manageable with industry standard pumps. The primary and secondary ventilation systems consisting of a surface to underground exhaust raise are installed and operational. The decline is used as the fresh air intake. An egress system with ladders from surface is installed will also be progressively installed as the mine workings become deeper. Two underground refuge chambers are utilised underground. Water supply to the underground operations is in place as well as diesel storage facility, workshops, mine offices and change houses. The run of mine ore pad and waste rock dump is also in place.
Metallurgical factors or assumptions	The Thalanga polymetallic processing facility is approximately 1.5km from the West 45 portal and has successfully treated ore from West 45 to produce zinc, lead and copper concentrates. The processing facility consists of a three stage crushing circuit including a primary jaw crusher and, secondary and tertiary cone crushers, a 640kW primary ball plant, two 640kW secondary ball plants, separate copper, lead and zinc flotation circuits, separate copper, lead and zinc thickeners, a vertical filter press and associated reagent dosing systems and control systems. A regrind mill is also a part of the circuit but is not needed and therefore on standby. The maximum throughput of this plant treating poly metallic ore is considered to be 650kt per annum as achieved in 1996. The Company is operating the plant at a throughput of approximately 325kt per annum for processing West 45 and considers that there will be surplus capacity in the processing plant. The processing facility utilises differential flotation of copper, lead and zinc minerals and is a common and proven beneficiation method throughout the mining industry but also at Thalanga. The process plant is appropriate to the West 45 style of mineralisation as demonstrated by current production of quality zinc, lead and copper concentrates from West 45 and is not novel in its nature. Metallurgical testwork was conducted on the West 45 mineralisation in 2008 by Eacham Metallurgy Laboratory on two composite samples (high and low grade) which were compiled from two drillholes. Metallurgical domains at West 45 are assumed to be generally uniform with the exception of high and low grade areas. The metallurgical factors applied in the economic evaluations are; zinc 89% recovery & 56% concentrate grade, lead 80% recovery & 60% concentrate grade plus 55% recovery of silver into the lead concentrate, copper 80% recovery & 22% concentrate grade plus 15% recovery of silver into the copper concentrate. There are no material deleterious elements expected that will prevent the saleability of the concentrates.
Environmental	The project is a disturbed mine site currently on care and maintenance. The Thalanga Operations' region is characterised by flat, open plains and situated relatively high in this landscape, at the foot of a rocky range that crosses the Flinders Highway. The topography of the mining leases is generally flat to gently undulating terrain. Typical wet season rainfall occurs from November to March; with average annual rainfall of 662mm and wettest months of January and February. Average annual maximum temperature is 30^0C and average wind speed is ~8km/h. Evaporation in the region varies from ~1,500mm to ~2,500mm; generally ~2,000mm. The Thalanga processing facility, associated infrastructure including the existing tailings storage facility are permitted in accordance to statuary authorities. The West 45 mine site has a granted mining lease. The mining activities are continuation of approved activities including storage of selected mine waste in existing dumps, tailings in the exiting tailings storage facility and mine water through the exiting water management and storage facilities.
Infrastructure	All of the infrastructure for the process plant and supporting areas are in place. The process plant has been refurbished and infrastructure for the West 45 mine is in place and operating. The site is powered from the Queensland electricity grid and adequate power supply is available. Water is recycled and reused on site and supplemented by an existing borefield which has been assumed to provide adequate volumes. Access to the site is via as sealed road off the Flinders Highway; approximately 60km from Charters Towers. Mobile telecommunications are accessible from the Telstra mobile network from Charters Towers and there is data and fixed line telecommunications.

<table>
<tr><td></td><td>Mining at West 45 is undertaken by a contractor. The workforce is mostly from Charters Towers and are bussed daily.</td></tr>
<tr><td>Costs</td><td>Capital and operating costs have been built up using physicals from the mining schedule, current mining contractor rates applicable to West 45 (actual contract) and site costs.

Concentrate transport, handling costs and shipping costs are sourced from current site contacts. Concentrate treatment and refining costs are sourced from current offtake contracts.

Queensland government royalties were applied as per published rates (State Revenue Office) for the various metals recovered. Royalties to third parties have also been accounted for in the economic assessment as per their respective agreements.</td></tr>
<tr><td>Revenue factors</td><td>The West 45 head grades and tonnage were determined on a monthly basis from a detailed schedule of mining of the Ore Reserve after the application of dilution and recovery factors. The schedule is based on a logical mining development and stoping sequence of the Ore Reserve. Transport costs, port handling charges, shipping costs, smelter treatment charges, refining costs were included in the economic model. Payable terms for metals in zinc, lead and copper concentrates were derived from the company's zinc, lead and copper offtake agreements and included in the economic model.

The revenues are based on production of zinc, lead and copper in concentrates and silver credits in the lead and copper concentrates. Commodity prices used for economic assessments are listed below.

<table>
<tr><th>Commodity</th><th>Unit</th><th>2018+</th></tr>
<tr><td>Zinc</td><td>USD/lb</td><td>$1.00</td></tr>
<tr><td>Lead</td><td>USD/lb</td><td>$0.90</td></tr>
<tr><td>Copper</td><td>USD/lb</td><td>$3.00</td></tr>
<tr><td>Gold</td><td>USD/oz</td><td>$1,200</td></tr>
<tr><td>Silver</td><td>USD/oz</td><td>$17.00</td></tr>
<tr><td>Foreign Exchange USD:AUD</td><td></td><td>0.75</td></tr>
</table>
</td></tr>
<tr><td>Market assessment</td><td>The majority of the West 45 value is derived from zinc then lead then copper. London Metal Exchange (LME) zinc stocks have been steadily declining over the past 3 years. It is anticipated that declining zinc inventories will persist depending on global demand strength and the market price will be favourable. Similarly copper and lead is seeing a resurgence and enjoying strong demand and favourable market pricing.

Current demand for zinc, lead and copper concentrates from West 45 is high and it is anticipated that this favourable selling environment will continue.

The company has offtake agreements with Trafigura for Zinc and Lead concentrates and with Glencore for copper concentrates which include future production from West 45.</td></tr>
<tr><td>Economic</td><td>Mine production and ore processing inputs have been detailed in the sections above and have been included in the economic assessment. The capital and operating cost inputs have also been discussed above and are considered to be with ± 15% accuracy and have been included in the economic assessment.

The mining, processing, capital cost and operating cost schedules form the basis of the financial model which utilises commodity prices and foreign exchange rates detailed above. The NPV was calculated using a discount rate of 8% and is positive and sensitivities around commodity prices and costs have been tested.</td></tr>
<tr><td>Social</td><td>West 45 and the Thalanga Operations are approximately 60km from Charters Towers which is a mining and agriculture based community of approximately 8,200 people. The Company sources the majority of its workforce from the Charters Towers community and skilled workers are available. In addition the site is a bus in/out from Charters Towers which further strengthens community support for the mine and benefits for the community. The Company has received only positive indications from local landholders and the Charters Towers community to date as the community sees the direct benefits of the operations.</td></tr>
<tr><td>Other</td><td>The Thalanga Operations and West 45 do typically receive higher rainfall in summer and early autumn and dryer periods in winter. In some years the 'wet season' rainfall can be double the average and these peak events could adversely impact the site and operations. The Flinders Highway from Charters Towers and the sealed site access road is rarely cut-off and in the event that it is cut-off due to flooding, it is likely to be less than one week. This may impact short term production however it is unlikely to impact longer term production estimates.
The Company is not aware of any material legal risks.</td></tr>
</table>

	The West 45 mine and Ore Reserve are located on a granted Mining Lease with a current Plan of Operations and Environmental Authority approved by the state government. The Company plans to fund ongoing capital development of West 45 through operational cash flows and existing funds.
Classification	The Ore Reserve estimate is classified as Proven and Probable Ore Reserves and this accurately reflects the confidence of the deposit in line with guidelines set out in the JORC Code (2012). The Ore Reserve estimation and classification methods are considered by the Competent Person to be appropriate for the style and nature of the deposit.
Audits or reviews	The Ore Reserve estimate has been internally reviewed.
Discussion of relative accuracy/ confidence	The West 45 Ore Reserve is a global estimate derived from the global West 45 Mineral Resource. The Ore Reserve was classified as Proven and Probable based on Mineral Resources classified as Measured and Indicated. The accuracy of the Ore Reserve is reflected in the classification of the Ore Reserve and the classification of the underlying Mineral Resources upon which it is based. Confidence in the Ore Reserve is high as the mine is largely developed, drilled and in operations. The plan and schedule were completed to a high standard with appropriate modifying factors. The level of accuracy for the study is considered to be ±15%.

APPENDIX ONE – WEST 45 JORC 2012 TABLES

JORC Code, 2012 Edition - Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *Aspects of the determination of mineralisation that are Material to the Public Report.* • *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	• The deposit was primarily sampled via half core samples based on geological considerations within diamond drill holes drilled on a 20m x 20m up to a 60m x 60m pattern through the deposit • The holes were orientated to ensure drill intersections were approximately perpendicular to the dip and strike of the ore lenses and overall geological package. • Diamond core and reverse circulation drill samples were crushed and assayed for Cu, Pb, Zn, Ag, Fe and Au via Atomic Absorption Spectrum (AAS) for the base metals and fire assay with an AAS finish for gold.
Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	• A total of 86 holes have been drilled in the West 45 project area (74 diamond and 12 reverse circulation), of these a total of 72 have been used to estimate resources for the project. The diamond core size drilled was predominately standard tube NQ2. The majority of diamond holes were orientated.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	• The diamond core drill recovery was monitored using a combination of the drillers run sheets, core block markings and manual piecing together of core and measurement by Red River Resources Geologists and Field Assistants in the core processing facility. Any core loss was noted within the logging sheets. • The majority of the resource is based on diamond drilling, the deposit predominately consists of zinc, lead and copper mineralization, there are no concerns regarding loss of fine material during the core sampling process for this deposit.
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	• All diamond core and reverse circulation chips were logged for geological and geotechnical characteristics. Rock type, alteration style and sulphide mineral content were logged by a site geologist. The logging was sufficient to enable

Criteria	JORC Code explanation	Commentary
	• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	creation of detailed geological model that supports the resource estimate. Core photographs are taken of each core tray and stored as part of the resource database dataset. • The total length of the drilling is 23,558. Subsequent to the previous resource estimate 3,372m of drilling has been added to the data set.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• NQ2 sized diamond core was marked up and cut in half with a diamond core saw. The right side of the core as sampled according to the geological intervals selected by the site Geologist. Where an uneven distribution of mineralisation was observed in the core a cut line was marked up to ensure unbiased sampling. • The RC samples were poured through a riffle splitter after the sample was circulated from the drill face through a cyclone and into a large plastic bag. • The methodology of selecting half core via geological intervals guarantees that the core samples are representative. The reverse circulation drilling samples are collected on 1m intervals so there is no selectivity bias with these. • The sample sizes vary from material sourced from the core samples given the varying sample lengths. The RC samples are generally 5-10 kg. • The sample sizes are appropriate given the relatively even distribution of base metal grades within the deposit
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.* • *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.* • *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	• The Intertek laboratory completed internal standard and duplicate samples. The results of these samples indicate that there are no known material biases in the West 45 assay dataset. • Red River also insert standards blanks and duplicates. This QAQC data set indicates that there are no material biases in the West 45 assay data set. • Red River staff completed a laboratory visit to the Townsville Intertek facility. The facility, processes and staff capability were all of an adequate standard
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*	• The West 45 deposit has been drilled on an average spacing of 20m x 20m in the main resource area and down to 10m x 10m in some places. This drill spacing provides evidence of mineralized zone continuity for the purposes of resource estimation. • Drill data spacing is close enough to support high geological confidence between samples.

Criteria	JORC Code explanation	Commentary
	• *Discuss any adjustment to assay data.*	This has been verified by underground mapping and sludge sampling on three levels • Data gathered has been verified and validated by Company geologists to ensure that samples match geological logs, photos and surrounding data sets • No sampling compositing was necessary in the initial diamond drilling however compositing of raw assay data was completed in preparation for the resource estimation process.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.* • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	• The gird used for locating the samples was MGA Zone 55. Previous sampling and the underground workings were converted from Thalanga West grid to MGA. • Collar locations were set out using hand held GPS. After drilling the collars were picked up by differential GPS. • Downhole surveys were performed with a digital magnetic downhole camera. Results were verified by intersecting drillholes with underground development and surveys validated by company geologists for acceptable deviation from previous surveys and magnetic interference levels. • The topography surface is represented by a wireframe file that has been edited over time by the site survey team. The surface covers the complete Thalanga Far West deposit area. The surface is an accurate representation of the actual topographic surface at the site scale.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.* • *Whether sample compositing has been applied.*	• The West 45 deposit has been drilled on an average spacing of 20m x 20m in the main resource area and down to 10m x 10m in some places. This drill spacing provides evidence of mineralized zone continuity for the purposes of resource estimation • Drill data spacing is close enough to support high geological confidence between samples. This has been verified by underground mapping and sludge sampling • No sampling compositing was necessary in the initial diamond drilling however compositing of raw assay data was completed in preparation for the resource estimation process
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.* • *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	• The majority of diamond holes were orientated to provide an approximate perpendicular intersection angle with the main mineralized zones. • No sampling bias is assessed as been caused by the drilling orientation.

Criteria	JORC Code explanation	Commentary
Sample security	• *The measures taken to ensure sample security.*	• Samples were supervised by either the drill crew or Company staff at all times. Given the base metal nature of the deposit sample security was not assessed as a significant risk.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• No independent audits have been conducted as part of this estimation. Internal reviews and verifications have been performed throughout the process. No material issues were identified in the reviews

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• No joint ventures exist over the property however a 4% NSR is payable to Thalanga Copper Mines in addition to the standard Queensland government royalty. • The license area is current. • West 45 sits within ML1531
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The deposit was drilled by RGC Thalanga Pty Ltd between 1994-1998 and Kagara Copper Pty Ltd between 2007-2011.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The deposit consists of stratiform sulphide lenses and stringer zones developed within quartz eye volcanoclastics located between a dacite hangingwall and rhyolite footwall.

Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:*
	  ○ *easting and northing of the drill hole collar*
	  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*
	  ○ *dip and azimuth of the hole*
	  ○ *down hole length and interception depth*
	  ○ *hole length.*
	• *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*
		• A list of each resource drillhole location and interval has not been supplied in this updated resource report as these were provided in the previous resource report released in January 2015, the collar information for the new diamond holes drilled in 2017 are however provided.

Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.* • *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• The exploration results reported for the West 45 deposit were included as weighted average assay intervals for Zn, Pb, Cu, Ag and Au. No cutting of high grades was completed when reporting as exploration results
Relationship between mineralisation	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with*	• The mineralisation is interpreted to be steeply dipping. Drillholes have been designed to intercept the mineralisation as close to

Criteria	JORC Code explanation	Commentary
widths and intercept lengths	*respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	perpendicular as possible. • The Down hole widths are reported. True widths are likely to be 60% of the down hole length.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• These are included in the body of the updated resource report for the drill collars used in the resource estimate.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• All significant drill intercepts from the 2017 diamond drilling program are provided
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• Not Applicable
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Further infill and extensional drilling will be conducted to test the along strike (east and west) host horizon.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.* • *Data validation procedures used.*	• The survey, sampling and logging data was electronically imported into the resource database. Checks were also made of the original lab sample sheets and the database to ensure that transcription errors were not present. A visual check was also made of the drill traces, assay and logging data in the 3D environment of Datamine to ensure that results correlated between drillholes and were inline with the geological interpretation and mineralization continuity. Further checks to the rate of change if the downhole surveys were performed and any anomalous surveys were identified and investigated. The results of the investigation showed that a small percentage of surveys were erroneous however they were not material to the spatial location of the ore intersections.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• Alex Nichol is site based and has been involved in the mapping, logging and interpretation of the deposit. Underground mapping of the deposit and structures has confirmed the validity of the interpretation and estimation.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• The confidence in the overall geological interpretation is high and has been confirmed by continued infill drilling, underground mapping and underground sampling conducted with a production drill rig. • The dacite, quartz eye volcanclastics and rhyolite geological units have been modelled and are used to define general areas of rock types within the deposit. The mineralized zones typically occur within the quartz eye volcanoclastics. Diseminated mineralisation has been noted in the plane of foliation within the rhyolite unit. Late stage precious metal mineralisation has been noted in quartz veins within the dacite. • The mineralized lenses occur within the quartz eye volcanoclastic package, they are discrete pods of massive sulphide and stringer mineralization, some fault control on these zones is evident that does cause termination or offset of individual lenses. • The introduction of a fault model has enabled the ore body model to be offset in accordance with underground observations. It has also been noted that there is some temperature zonation within the deposit. This is in agreement with the accepted genetic model for

Criteria	JORC Code explanation	Commentary
		VHMS deposits
Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	• The strike length of individual mineralized pods ranges from 50m to 325m, thickness of the zones ranges from 0.5m to 20m. The resource domains are located from surface topography and extend to a depth of 250m.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.* • *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.* • *The assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• The resource model was constructed using Datamine software. High grade mineralised domain wireframes were constructed using a nominal 7% ZnEq boundary and low grade mineralised domains were constructed using a nominal 3% ZnEq boundary. These domains were used to constrain the estimate. • High grade Zn, Cu, Pb, Ag and Au top cuts were applied using a combination of the 95% confidence interval, histograms, cumulative probability plots and operational experience from the Thalanga and West 45 operations. This method was applied to the ore domains (including low grade) and at a separate threshold to the waste domain. 40 zinc samples were capped in the ore domains and 24 samples in the waste domain. • A composite file was created using a composite length of 1m. The median sample length within the assay dataset is also 1m. • Variograms were not created due insufficient quantity of sample pairs within the relatively small dataset, sufficiently resolved variograms were not created. • An inverse distance estimate was run given the lack of variograms. This method was however deemed to be suitable given the style and orientation of the mineralization. The maximum search distance used was 40m • The estimation process was validated by comparing global block grades with the average composite grades, visual checks comparing block grades with raw assay data and volume checks of the ore domain wireframe vs the block model volume. • The wireframes were developed using surface drillholes (both diamond and RC), underground drilling (from the production drill rig), underground chip sampling and mapping. Only surface drilling was used for the estimation • The validation steps taken indicate that the block estimates are a realistic representation of the source assay data and that the block model volumes are valid in comparison to the modelled interpretation.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• The resource tonnages have been estimated on a dry basis

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Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• A cut – off using 5% Zn Eq has been used to report resources. This was chosen as the lower limit of potentially economically extractable material within an underground mining operation in this style of deposit throughout a zinc price cycle.
Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	• The proposed mining method is via underground long hole stoping techniques. The tonnes and grades of the material outside the ore domains has been estimated and will be assessed as part of the reserves calculation. As such, the model provides all the inputs required for assessing dilution. The expected minimum mining widths are approximately 2m.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	• The ore is planned to be crushed and concentrates containing Zn, Pb and Cu produced. Au and Ag will also be extracted and contained within the concentrates as payable elements. Production has shown that a saleable concentrate can be produced from the West 45 ore. The ore is being processed at the recommissioned Thalanga processing facility
Environmen-tal factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	• The tailings produced during the creation of the concentrate will be disposed of at the currently permitted Thalanga tailings facility. Waste rock from the mine will be placed on the existing waste dump locations. Approvals for mining of the West 45 deposit by the Queensland State Government are in good standing.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.* • *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and*	• The bulk densities for the ore and waste rock types were measured using the Archimedes method, that is (Dry Weight / (Dry Weight – Wet Weight). The samples were measured throughout the drill holes so that samples were included in all domains. The density data set was reviewed to ensure that the data was robust. Once validated and spatially located the density measurements were estimated

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	alteration zones within the deposit. • *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	with the same parameters as the assay values. Where density was not estimated (due to number or distance of samples from blocks) an assumed value of 2.8 was assigned. This assumption understates any ore that does not have an estimated density (density of Zone 1 is 3.3).
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The resources have been classified according to the sample spacing, the presence of mapping and underground sampling, and the modelled continuity of both the thickness and grade of the mineralized zones in the view of the resource geologist. Measured, Indicated and Inferred blocks have been reported. • The resource classification is deemed appropriate in relation to the drill spacing and geological continuity of the mineralized domains. • The classification appropriately reflects the Competent Persons confidence of the estimate of the ore body.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• The internal reviews conducted identified no critical issues with regard to the estimation. However, there are a number of minor, non-material, errors that will be rectified for future estimates.
Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.* • *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• The resource estimate is deemed to be an accurate reflection of both the geological interpretation and tenure of mineralization within the deposit. The current interpretation is performing well as a predictor of the spatial distribution of the deposit and the estimated grades are in accordance with assayed grades. Partial reconciliation from the mine to mill indicate that the predicted grades are present in the mine feed. These factors provide confidence in the estimate.