ASX Code: "THR"

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- **Tungsten**
  Molyhil NT
  Pilot Mountain USA
- **Copper**
  Kapunda SA

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ISR GOLD RECOVERY - PROOF OF CONCEPT

KAPUNDA COPPER PROJECT

The Board of Thor Mining Plc ("Thor") (AIM, ASX: THR) is pleased to announce successful recovery of gold from samples of the Kapunda Copper ISR copper project in South Australia.

The results are from research activities on Kapunda samples by the CSIRO as part of the CRC-P* project funded by the Australian Commonwealth government for the Kapunda project owned by Environmental Copper Recovery Pty Ltd (ECR) in which Thor is acquiring a 60% interest and in respect of which potential strategic developments were announced on 5 March 2019.

Highlights:

- Successful recovery of gold from samples from historic drilling has demonstrated proof of concept at the Kapunda ISR copper project using techniques appropriate for In situ Recovery (ISR) test work;
- Results augment previously reported successful recovery of copper using ISR appropriate test work;
- Limited gold assays conducted on historic drilling at Kapunda, but results for 28 surface and drill core samples are historically reported to range from 0.6 to 5.54 dwts /ton (approx 0.93 to 8.58 grams/tonne);
- Further test work is planned to quantify gold recovery and commercial viability of the proposed development at Kapunda

Mick Billing, Executive Chairman, commented: *"This is an unexpected bonus for the Kapunda project, and potentially a very significant project enhancement."*

"There is not sufficient drilling assay information to allow a gold resource to be added to the previously published copper resource, however the information we have suggests the presence of gold relatively evenly across much of the Kapunda deposit."

"The directors of ECR and the directors of Thor are reviewing options in light of this new and potentially strategically critical information, and will provide further updates in the near term"

Background

While Kapunda was primarily a copper mine, there have been gold assays recorded from historic drill holes and surface sampling. Most of this gold sampling work is reported in open file Envelope 01651 as a progress report by L.G. Szabo for Northlands Minerals Limited in 1971. Since then, there have been sporadic reviews and re assaying of existing drill core over the past decades with inconclusive results. Some of the conclusions drawn by Szabo include:

- "Gold, silver and platinum are definitely present in the mine rocks of Kapunda"
- "The gold is persistently present throughout the exposed zone of copper mineralisation"
- "The gold values persist to a vertical depth of 600 feet in the only deep drill hole within the mine area"
- "The gold is associated with pyrite and to a lesser extent with quartz"

The following table (Table A) is compiled from the South Australian Government Department for Energy and Mining (DEM) open file envelopes Env 01651 and Env 02260 and lists significant historic drillhole intersections.

Hole Name	sample number	from (m)	to (m)	Interval length	Au g/t	Cu %
KP001	k-1	107.3	110.3	3.0	3.37	Not recorded on section
KP001	k-2	136.6	136.9	0.3	7.96	Not recorded on section
KP001	k-3	144.2	174.7	30.5	3.98	Not recorded on section
KP001	k-4	145.1	173.7	28.7	3.06	Not recorded on section
KP001	k-5	185.9	186.1	0.2	8.58	Not recorded on section
KP001	k-6	226.2	229.2	3.0	6.13	Not recorded on section
KP001	k-7	256.9	272.2	15.2	3.68	Not recorded on section
KP001	k-8	2.4	97.5	95.1	3.06	Not recorded on section
K001	K1/10	29.9	32.9	3.0	3.67	3.2
K003A	K3/18	42.1	43.3	1.2	1.53	3.8
K005	K5/17	52.7	54.3	1.5	0.31	0.3
K007	K7/19	48.2	50.6	2.4	1.84	0.3
K010	K10/12	28.3	30.5	2.1	0.61	1.2
K011	K11/23	32.8	34.0	1.2	1.53	4.4
K014	K14/23	51.2	52.7	1.5	1.53	0.1
K016	K16/16	32.6	34.7	2.1	0.31	3.8
K017	K17/21	36.9	38.3	1.4	1.84	2.1
K020	K20/58	100.6	102.4	1.8	0.61	2.0
K023	K23/18	29.0	29.6	0.6	0.31	2.0
K003A	GS85	92.4	92.4	Point Sample	1.53	5.5
K018	GS88	111.9	111.9	Point Sample	0.31	0.9
K033	GS90	106.4	106.4	Point Sample	0.61	3.1

*Table **A**: Historic drill hole intersections and gold assay values*

Hole Name	sample number	from (m)	to (m)	Interval length	Au g/t	Cu %
KV005	Historic Composite	3.0	27.4	24.4		
KV007	Historic Composite	21.3	54.9	33.5		
KV008	Historic Composite	0.0	9.1	9.1		
KV008	Historic Composite	21.3	54.9	33.5		
KV009	Historic Composite	0.0	45.7	45.7		
KV010	Historic Composite	24.4	42.7	18.3		
				Average Au + Ag	3.68	Not Available

*Table **B**: Historic composite sample of selected KV holes collected by Mines Exploration Ltd.*

Hole_ID	East	North	RL	Max_Depth	Hole_Type	Azimuth	Dip
K001	308536	6197389	230.31	76.2	DD	0	-90
K003A	308562	6197399	232.2	100.58	DD	0	-90
K004	308509	6197389	235	93.88	DD	0	-90
K005	308468	6197370	227.91	69.49	DD	0	-90
K007	308413	6197354	228.52	76.2	DD	0	-90
K008	308483	6197374	228.06	128.32	DD	0	-90
K010	308603	6196781	218.02	91.75	DD	0	-90
K011	308514	6197384	229.16	42.6	DD	245	-65
K012	308417	6197355	228.48	120.7	DD	244	-65
K014	308385	6197346	228.66	74.98	DD	0	-90
K016	308452	6197434	235	92.66	DD	65	-65
K017	308551	6197332	228.55	72.54	DD	64	-65
K018	308419	6197546	234.4	121.92	DD	64	-65
K020	308398	6197412	230.06	107.29	DD	64	-65
K023	308435	6197296	226.48	122.83	DD	65	-64
K033	308403	6197599	237.66	107.24	DD	64	-65
KP001	308474	6197245	231	311.28	DD	65	-45
KV005	308483	6197246	224.2	91.44	MUD	0	-90
KV007	308541	6197263	225.29	63.09	MUD	0	-90
KV008	308570	6197273	226.57	54.86	MUD	0	-90
KV010	308629	6197291	227.38	49.07	MUD	0	-90

*Table **C**: Drill hole location information for historic drill holes MGA Zone 54 GDA 94*

Summary of experimental methodology

Composite samples were created from drill chip samples of 14 available drill holes stored in the South Australian Government Core Library. These samples were collected at the Tonsley Core Library, bagged and sent to CSIRO laboratories at Waterford, Perth for leach analysis.

A CSIRO thiosulfate-based product was used to leach 300 g of the sample with a 45% w0/w pulp density at 25°C. The solution pH was adjusted to 6–7 using NaOH solution. The solution colour provides an indication of oxidant concentration and solid oxidant was added to the solution during the experiment if the solution turned colourless. Two samples were leached, one in which the pH and oxidant were monitored regularly and the conditions adjusted to maintain sufficient oxidant and a suitable pH. In the second leach, the pH and oxidant were monitored only at the sampling

times of 5 h, 24 h, 48 h and 5 days.

These two tests were conducted to determine the sensitivity of the ore to the solution and to establish the extent of solution control required (which may be limited in an ISR environment). The sampling volumes were 10 mL and the copper and gold concentrations were determined by ICP-OES and ICP-MS. The final copper and gold concentrations in the solid samples were determined by digestion and ICP-OES and fire assay, respectively.

The actual percentage recovery of gold extracted could not accurately be determined during this experiment due to the low initial gold concentrations and small sample size, but the concentrations of gold in solution (0.95, 1.01, 1.11 ppm for the controlled leach and 0.92, 1.13 and 1.09 ppm for the uncontrolled leach at 5, 24 and 48 h respectively) indicates that gold extraction does occur. To confirm the actual gold extraction, larger initial leach masses would be required to ensure sufficient residual mass to allow for triplicate fire assay.

Further work will be carried out as part of the CRC-P research program on the potential recovery of gold from selected samples including spectral analysis of core remaining in the South Australian core library.

Hole_ID	East	North	RL	Max_Depth	Hole_Type	Orig_Grid_ID	Azimuth	Dip
KV003	308424	6197227	226.2	91.44	MUD	MGA94_54	0	-90
KV005	308483	6197246	225.7	91.44	MUD	MGA94_54	0	-90
KV009	308600	6197282	229.5	51.82	MUD	MGA94_54	0	-90
KV016	308334	6197419	233.3	91.44	MUD	MGA94_54	0	-90
KV019	308405	6197479	233.6	91.44	RP	MGA94_54	0	-90
KV020	308425	6197501	230.1	57.91	MUD	MGA94_54	0	-90
KV022	308474	6197539	235.7	38.1	RP	MGA94_54	0	-90
KV027	308527	6197259	226.2	91.44	MUD	MGA94_54	0	-90
KV032	308582	6197119	222.3	91.44	DD	MGA94_54	0	-90
KV033	308616	6197127	222.4	91.44	MUD	MGA94_54	0	-90
KV035	308676	6197145	223.1	91.44	MUD	MGA94_54	0	-90
KV040	308603	6196966	219.2	91.44	DD	MGA94_54	0	-90
KV041	308632	6196975	218.9	91.44	MUD	MGA94_54	0	-90
KV043	308693	6196994	218.8	79.25	MUD	MGA94_54	0	-90

*Table **D**: Drill hole coordinates for composite sample collection by ECR MGA Zone 54 GDA 94*

*CRC-P = Cooperative Research Centre Project Grant, Commonwealth Government Department of Industry and Innovation

** conversion factors Oz/long ton to grams per tonne = ((oz/lt)*31.1033)/1.016
conversion factor Dwts/long ton to grams per tonne = ((dwts/long ton)*1.556)/1.016

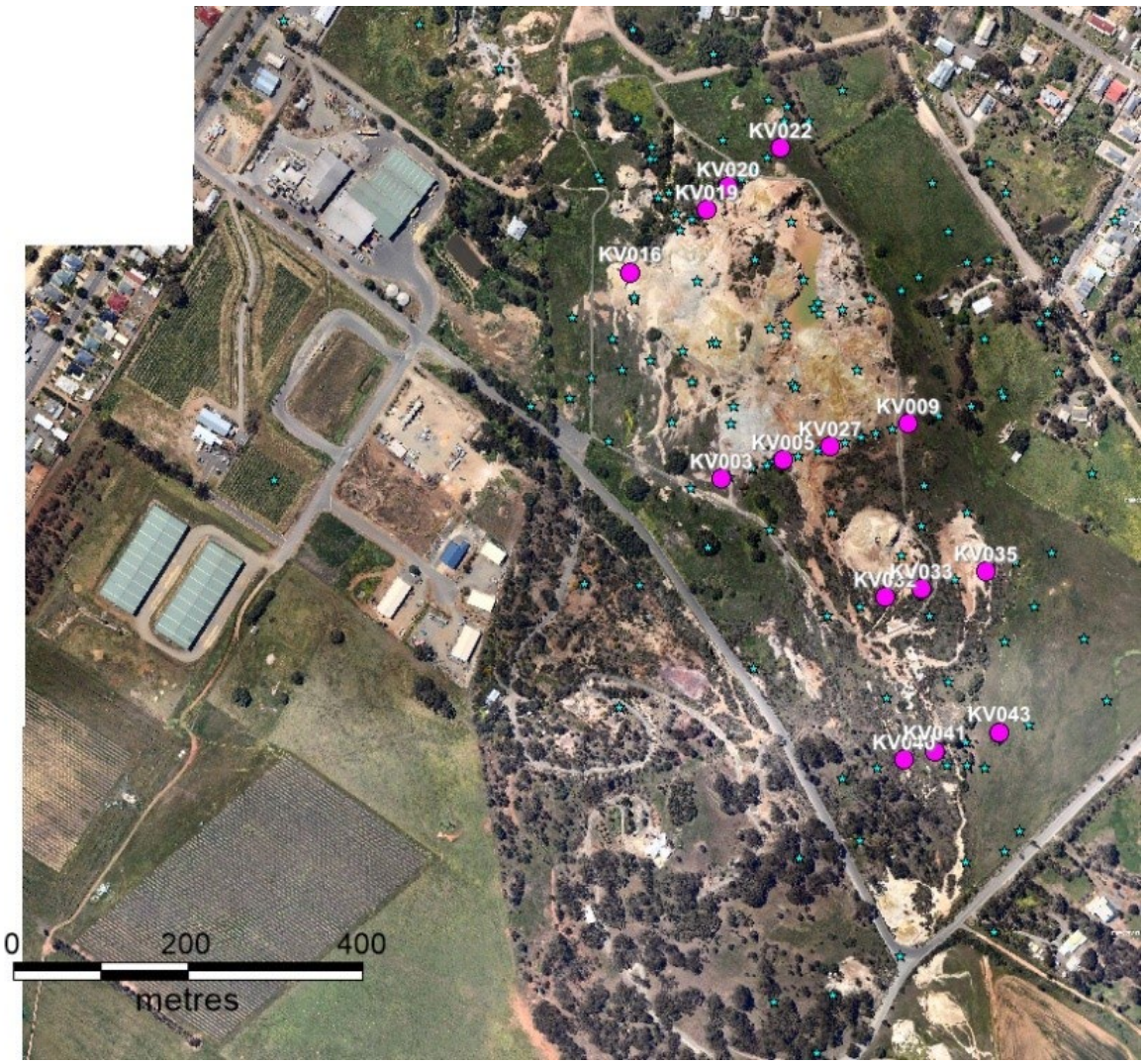

Figure 1: *Map showing location of drillholes with recorded gold intersection*

For further information, please contact:

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Competent Person's Report

The information in this report that relates to exploration results is based on information compiled by Leon Faulkner, who holds a BSc in geology and who is a Member of The Australasian Institute of Geoscientists. Mr Faulkner is an employee of Environmental Metals Recovery Pty Ltd. He has sufficient experience which is 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'. Leon Faulkner consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Updates on the Company's activities are regularly posted on Thor's website www.thormining.com, which includes a facility to register to receive these updates by email, and on the Company's twitter page @ThorMining.

About Kapunda

The Kapunda copper project is located approximately 90 kilometres north north-west of Adelaide in South Australia.

On 1 August 2017, Thor announced an agreement to earn up to 60% of a newly incorporated private Australian company, Environmental Copper Recovery SA Pty Ltd, initially via convertible loan notes of up to A$1.8 million, which will be used to fund field test work and feasibility activities at Kapunda over the next 3 years.

In turn ECR has entered into an agreement to earn, in two stages, up to 75% of the rights over metals which may be recovered via in-situ recovery ("ISR") contained in the Kapunda deposit from Australian listed company, Terramin Australia Limited ("Terramin" ASX: "TZN").

For detail of the In-situ Recovery process, investors are invited to view the ECR website; https://www.envirocopper.com.au/ .

In February 2018 Thor announced an Inferred JORC Resource Estimate for the Kapunda project, of 47.4 million tonnes (MT) grading 0.25% Cu, containing 119,000 tonnes of contained copper considered amenable to In-situ Recovery techniques.

For detail of the Resource Estimate Announcement, investors are invited to view the Thor website;

http://www.thormining.com/-/thor/lib/docs/asx%20releases/20180212%20ASX%20Kapunda%20Resource.pdf .

Subsequently, on 30 July 2018, the Company announced details of a CRC-P (Cooperative Research Centre) grant to the value of A$2.85 million from the Australian Commonwealth Government for the Kapunda In-Situ Copper and Gold Recovery Trial.

On 5th March 2019, the Company also announced plans to merge ECR with Environmental Metals Recovery Pty Ltd (EMR) to form a new entity EnviroCopper Ltd

About Thor Mining PLC

Thor Mining PLC (AIM, ASX: THR) is a resources company quoted on the AIM Market of the London Stock Exchange and on ASX in Australia.

Thor holds 100% of the advanced Molyhil tungsten project in the Northern Territory of Australia, for which an updated feasibility study in August 2018[1] suggested attractive returns.

Adjacent Molyhil, at Bonya, Thor holds a 40% interest in deposits of tungsten, copper, and vanadium, including an Inferred resource for the Bonya copper deposit[2].

Thor also holds 100% of the Pilot Mountain tungsten project in Nevada USA which has a JORC 2012 Indicated and Inferred Resources Estimate[3] on 2 of the 4 known deposits. The US Department of the Interior has confirmed that tungsten, the primary resource mineral at Pilot Mountain, has been included in the final list of Critical Minerals 2018.

Thor is also acquiring up to a 60% interest Australian copper development company Environmental Copper Recovery SA Pty Ltd, which in turn holds rights to earn up to a 75% interest in the mineral rights and claims over the resource[3] on the portion of the historic Kapunda copper mine in South Australia recoverable by way of in situ recovery.

Thor has an interest in Hawkstone Mining Limited, an Australian ASX listed company with a 100% Interest in a Lithium project in Arizona, USA.

Finally, Thor also holds a production royalty entitlement from the Spring Hill Gold project[5] of:

- *A$6 per ounce of gold produced from the Spring Hill tenements where the gold produced is sold for up to A$1,500 per ounce; and*
- *A$14 per ounce of gold produced from the Spring Hill tenements where the gold produced is sold for amounts over A$1,500 per ounce.*

Notes

[1] Refer ASX and AIM announcement of 23 August 2018

[2] Refer ASX and AIM announcement of 26 November 2018

[3] Refer AIM announcement of 13 December 2018 and ASX announcement of 14 December 2018

1. APPENDICES

Checklist of Assessment and Reporting Criteria (JORC Code Table 1)

Section 1: Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
	• *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.*	Since the cessation of mining, Kapunda has been explored by numerous exploration companies. Five of these companies undertook drilling and their work is summarized below. Mines Exploration Pty Ltd's (Mines Exploration) (1965 – 66) drilled diamond core holes; KP1, KP2 and KP3. The core was manually split in half and sampled at 5-foot intervals. Mines Exploration's KV series rotary drillholes (1965-1966) – were sampled at 10-foot intervals using percussion and cyclone down to water table. Below the water table drill cuttings were extracted by water pumping and wet splitting of the sludge to 1/16th fraction. This fraction was collected in calico bags and air dried. The dried 1/16th fraction was weighed and further dry split with a Symons splitter to a final (4 pound) sample. Below the water table and before commencing sampling run the hole was carefully flushed, the sampling run completed then carefully flushed again before the next drilling run. Noranda Australia Ltd (Noranda) undertook a program of percussion drilling between March and April 1970. Drill cuttings were described and sampled at 5 to 10 foot intervals. For Northlands Minerals Ltd's K series diamond holes (1972-73) the core was carefully, placed onto plastic corrugated sheets to dry before being transferred to a core tray. Adhering material (drilling mud) was washed off. Holes were split in half manually from top to bottom; half core sample intervals of various lengths were selected by the Logging Geologist to be sent for assay. Utah Development Co.'s (Utah) KD series diamond holes (1974 -76) were manually

Criteria	JORC Code explanation	Commentary
		split in half at 1m intervals, with one half submitted for assay and the other half retained. Utah's KP series percussion holes (1974 - 1976) included several drilling methods: rotary drag bit, tri cone and percussion. Percussion drilling was main form with drag bit and tri cone only used to pre-collar holes. The drillholes were sampled at 2m intervals using a mechanical rotary splitter to homogenize the sample to ensure a representative split was obtained. For percussion drilling, hammer size started at 150 mm and was reduced to 130mm as hole depth increased. The 2008 drilling undertaken by Copper Range utilized reverse circulation with the first 6m collared using a 6 ½ inch hammer bit. Individual metre sample intervals were collected in 600x900mmx150um plastic bags fitted to a rig mounted cyclone. A sub sample for analysis was then collected in a calico bag by passing the whole metre sample through a two tier riffle splitter. A summary of the drilling undertaken at Kapunda is presented in table below. Diamond core holes Total KP Mines Exploration (1965-66) 3 K Northlands (1972-73) 52 KD Utah (1974-76) 23 Total diamond core holes 78 Percussion Holes KV Mines Exploration (1965-66) 43 M Noranda (1970) 24 Z Noranda (1970) 1 KP Utah (1974-76) 36 SM Copper Range (2008) 1 SK Copper Range (2008) 4 Total percussion holes 109 **Total drillholes 187** Total meterage of all drillholes - f 22,712.8m.
	• *Include reference to measures taken to ensure sample representivity and the appropriate*	Core was aligned and measured by tape, comparing back to downhole core blocks consistent with industry practice. Documentation indicates that the diamond and percussion drilling was completed by

Criteria	JORC Code explanation	Commentary
	calibration of any measurement tools or systems used.	previous operators to industry standard at that time.
	• *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.*	KV series holes with 10 foot sample intervals have resulted in broader and more uniform grade intersections. The initial K series diamond drillholes suffered recovery problems but after concerted effort recoveries improved with the program. Core loss intervals in the Mineral Resource estimate were assumed to have a zero grade. Core loss is not thought to seriously affect the Mineral Resource estimate. Sampling was to industry standard at the time of drilling, with samples collected from various interval sizes depending on the company involved. Samples were assayed at certified laboratories.
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).*	KV series drillholes were rotary percussion drilling conducted with a Boyles Brothers truck mounted rotary drill rig using $4^{1}/_{2}$ inch and $2^{15}/_{16}$ inch bits. KP1, 2 and 3 were diamond holes were cored using f foot triple tube NX core barrel. Noranda's M and Z series holes were percussion drilled by Northbridge Pty Ltd. For the K series holes various core lifters, bits, core barrels and drilling muds were used. The best combination was a basket lifter with a side-discharge bit (modified face discharge bit to prevent blocking), drilling with mud (Unical, Supergel etc.) and using a normal NQ barrel. In softer rock a dry method of drilling was used that consisted of driving an NQ core barrel ahead of a down-the-hole hammer. Distortion was always present, but relatively minor. KP series holes utilised a mix of rotary drag, tricone and percussion with the majority of the drilling being percussion. The rotary drag and tricone bits being used primarily for collaring were not sampled.

Criteria	JORC Code explanation	Commentary
		KD series holes were drilled with a Longyear 38 by Boring Enterprises Pty Ltd and were primarily NQ core size with some intervals of BQ and HQ. Core was orientated using a contractor constructed device. Copper Range's SK series holes were drilled using reverse circulation.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	Core recovery was measured for each drill run between the driller's marker blocks. KV series percussion holes had chip sample bags were weighed to compare with expected mass to assess recovery/loss. K series sample recoveries were visually estimated and recorded for each interval. No historic information is available for KP series holes.
	• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	The historic records describe in length (as detailed above) the efforts that went into maximizing core recovery.
	• *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.*	Statistical analysis indicates no significant sample bias caused by preferential loss/gain of course/fine material. The KV series rotary holes which were sampled at 10 foot intervals yielded broader and more uniform grade within the mineralized zones. Average copper grade of the KV holes above the water table was 0.246% versus 0.253% below the water table.
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 drillholes have been geologically logged for recovery, lithology, mineralisation and colour with abundant petrographical and petrological studies to adequately support the Mineral Resource estimation, mining studies and metallurgical studies. KV series holes were logged in their – entirety for recovery, and colour. Four petrological samples were also described. KP1, 2 and 3 holes were logged in their entirety for lithology, mineralisation, colour and texture.

Criteria	JORC Code explanation	Commentary
		K series holes were logged for recovery, rock type, mineralisation and a geological description which included, colour, texture and grainsize. A total of 98 petrographic samples and 70 petrological samples were described. KD series holes were photographed and were geologically logged for rock type, structure, mineralogy and physical character. KP series holes were logged in their – entirety for rock type, mineralogy and physical characteristics. Geotechnical logging has been undertaken by Environmental Copper Recovery Pty Ltd (ECR) geologists on drill core stored at the South Australian Drill Core Reference Library.
	• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.*	Logging is qualitative based on visual field estimates. Qualitative code logging was conducted for lithology, alteration, veining, tone and colour. Fifteen holes stored at the South Australian Drill Core Reference Library have been scanned by Hylogger. The HyLogger core scanner is a rapid spectroscopic imaging system developed by CSIRO's Mineral Mapping Technologies Group. The HyLogger uses visible and infrared spectroscopy (wavelength range 300-2500nm and 6000-14500nm), and digital imaging, to characterise and identify dominant mineral species on core, chips and pulps, at spatial resolutions of ~1cm (spectral data) and ~0.1mm (image data).
	• *The total length and percentage of the relevant intersections logged.*	Entire holes are logged in all instances.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.*	Core from diamond drilling programs was either split manually or sawn, with half core sent to lab for assay and half core retained. Sample intervals were defined by the Logging Geologist along geological boundaries.
	• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*	KV series rotary drillholes were sampled at 10 foot intervals down to water table using air blast and cyclone. Below the water table drill cuttings were extracted by pumping and

Criteria	JORC Code explanation	Commentary
		wet splitting of the sludge to $^{1}/_{16}^{th}$ fraction. This fraction was collected in calico bags and air dried. The dried $^{1}/_{16}^{th}$ fraction was weighed and further dry split with a Symons splitter to a final (4 pound) sample. Below the water table and before commencing the next sampling run the hole was carefully flushed, once the sampling run completed the hole was carefully flushed again before the next drilling run. KP series percussion holes were sampled at 2m intervals using a mechanical rotary splitter to homogenize the sample from which representative split was obtained. For percussion drilling, hammer size started at 150mm and was reduced to 130mm as hole depth increased. (Env02705 page 549).
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	Documented sample preparation techniques followed best practice of the time and are considered adequate.
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	No additional historical information is available on quality control procedures to that detailed above.
	• *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.*	Techniques followed best practice of the time including regular cleaning of the cyclones and splitters and careful flushing of holes when water encountered. Comparison of results of twinned holes indicates sampling is representative. 14 Surface samples were assayed for copper and gold by Daniel C Griffith Pty Ltd exploration laboratories using AAS and Fire assay, these were check assayed for Copper by Sharp and Howell Pty Ltd. While Gold was check assayed by the Royal Melbourne Institute of Technology. Chip sampling of KP001 was assayed for gold by Daniel C Griffith using AAS and Fire assay, check assayed by Sharp and Howell Pty Ltd and triple checked by Spectrum analytical services using Fire Assay Aqua Regia – AAS methods. 2 composite samples were prepared from the surface samples and were assayed by Daniel C Griffith Pty Ltd and Sharp and

Criteria	JORC Code explanation	Commentary
		Howell Pty Ltd. Both showed comparable results. 2 sets of replicate samples were assayed by Daniel C Griffith Pty Ltd and showed comparable results.
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	Sample sizes are considered appropriate.
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.*	Assaying was carried out at certified analytical laboratories and the techniques are considered appropriate, although little historical information is available on checks and standards. Mines Exploration KP holes and Northland's K series were analysed by Amdel Analytical Services (Amdel) for copper using their F1 scheme, an A.A.S. method. Amdel claimed a +/-5% accuracy. KD series drillholes were assayed by Labtech Pty. Ltd. - 101B for copper using a hot, long perchloric acid digestion, AAS determination. No information is available on checks and standards. Utah's KP series rotary percussion drillholes were analysed at Labtech Pty Ltd. Midland W.A. using a hot long perchloric acid digestion with AAS determination for copper No information is available on checks and standards.
	• *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.*	Geophysical tools, spectrometers, handheld XRF instruments, etc. were not available to earlier companies. Terramin utilised hand held XRF analyses to validate copper assays from selected percussion holes stored at the South Australian Drill Core Reference Library and as an aid to geological interpretation. No geophysical tools were used by Terramin to estimate published mineral or element percentages.
	• *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.*	Minimal historical information is available on the use of standards, blanks or duplicates. The use of check analyses were documented by Northland. Check analyses were undertaken at their main laboratory, Amdel and cross lab checks done at Robertson

Criteria	JORC Code explanation	Commentary
		Research and McPhar Geophysics. Original assay reports from Amdel show that at the time they ran a mix of standards and blanks every fifteenth sample, although the results of these internal lab checks were not documented.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.*	Utah's KD005 which returned from 45m, 27m @ 1.18% copper was resampled by Copper Range in 2007. Copper Range's resampling returned from 45m, 27m @ 1.20% copper. Utah's deep intercept of primary copper sulphide in KD011 returned from 426m, 11m @ 2.00% copper was resampled by Terramin returned from 426m, 11m @ 1.89% copper and 0.1g/t gold. Terramin's samples were a quarter cut of the remaining half core sample. (TZN ASX announcement – 1st Quarter Report, 29/4/2016) Other significant intersections from drill core have been visually reviewed by Terramin and ECR staff. Terramin has also utilised a hand held XRF to validate copper assays of percussion holes stored at the South Australian Drill Core Reference Library.
	• *The use of twinned holes.*	There were two sets of planned twin holes: KD001 twinned drillhole K015 and KD0019 twinned drillholes KP046 and K076. There are a further 6 pairs of drillholes that are close enough to be considered twins. As part of compiling data for the Kapunda Mineral Resource estimate it was deemed necessary to be comfortable with the wide variety of drilling and sampling methods used on the Kapunda Project over a number of years. In order to look at the issue it was decided to; • Compare summary statistics for the different drillhole series. • Compare a selection of twined holes. • Compare poor recovery core holes with good recovery drillholes

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		• Compare rotary drilling with diamond drilling within a specific, geologically constrained spatial area. • The process entailed creating a 2m downhole composite set of drill assays and splitting these into their component drill series types for statistical analysis. Results; • The results in general show no significant bias due to drilling type. • Twin holes Q-Q plots indicate there is little bias. • There appears to be very little difference between holes with poor core recovery versus those with good core recovery. • While there are some individual difference between rotary and diamond holes, looking at a larger sample they appear to give relatively consistent results.
	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*	Primary data was recorded on paper log sheets, photocopies of originals were submitted as part of statutory reporting. These have subsequently been scanned to PDF and made available online at South Australian Resources and Information Gateway (SARIG)in the Resource and Energy Georeference Database. Terramin was also able to obtain digital data sets of the drill data from Copper Range Ltd and the digital data set used by Stuart Metals NL (Stuart Metals) for their 1992 Kapunda Resource estimate. Where differences were found between the data contained in the original company reports and the data provided by Stuart Metals database, the original companies' values were used. The data was entered into Excel spreadsheets before being imported into a Maxwell Geo Services' DataShed and QAQCR which was used to validate the data viz; overlapping intervals, excessive drillhole

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		deviation, assay QAQC. Secondary validation by Maptek's Vulcan software and visual validation was also undertaken.
	• *Discuss any adjustment to assay data.*	No adjustments are made to reported summary intersections. The Mineral Resource estimate makes an allowance for core loss with lost intervals assumed to have a zero grade.
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.*	Mines Exploration established the original grid baseline parallel to main strike of mineralization with grid north at 335 degrees magnetic. All subsequent companies, except for Copper Range used this grid. Initial survey control was by licensed surveyor using theodolite. Collars were fixed by theodolite surveys and metal pin bench marks. Coordinate position 1000N 00E (collar of drillhole KV002). The majority of drill collar locations were recorded in company reports and in Stuart Metals digital database. A few remaining drillhole collar locations were obtained from georeferenced maps. Originally drillhole collar RL's were calculated relative to drillhole KV002 but Northland in 1972 had the site resurveyed relative to the State Datum. To allow for the incorporation of drillhole data from Copper Range an affine transformation was used to convert the earlier drillhole coordinates to MGA Zone 54 (GDA 94).
	• *Specification of the grid system used.*	The data is reported in grid system MGA Zone 54 (GDA94).
	• *Quality and adequacy of topographic control.*	In 1972 Northland Minerals contracted surveying consultants Alex & Symonds Pty Ltd to survey the site and locate drill collars. The level datum used throughout the grid and drillhole levelling is based upon a Lands Department Bench Mark Number 6921. A digital terrain model was created by Terramin from the survey's 528 survey points collected across the deposit. Drillhole collar RL's not picked up during this survey were then assigned a value from this

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		surface. With the exception of the historic workings, the area has low relief. The site has a gentle slope to the south, over the 1,500m of strike length there is just a maximum difference of 25m in collar RLs.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.*	Drillhole spacings and sample interval lengths are considered appropriate.
	• *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.*	The data spacing and the characteristics of the Kapunda mineralisation determined from reviewing historical drilling results, and visual inspections of the core are suitable for the defined Mineral Resource to be classified as Inferred for ISR. However, the protocol for estimation and reporting of Mineral Resources for exploitation using ISR has a number of additional steps compared to conventional mining and processing. Before any portion of the Kapunda Mineral Resource can be classified as Indicated or Measured pump testing and hydrogeological modeling will be required.
	• *Whether sample compositing has been applied.*	Field sample compositing was not undertaken on any of the diamond or percussion drill samples. Sample sizes are considered appropriate.
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.*	The orientation of the drilling is considered to be appropriate for the oxide copper and secondary copper sulphide mineralisation.
	• *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.*	Drilling orientation is not deemed to have introduced any significant sampling bias.
Sample security	• *The measures taken to ensure sample security.*	Chain of custody management was not documented.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	Prior to acquiring the Kapunda Project from Maximus Resources Ltd (Maximus), Terramin audited the Stuart Metals database against original reports and viewed drill core at the South Australian Drill Core Reference Library. Historical density techniques were considered inappropriate and discarded. New measurements collected by TZN and ERC show that density had previously been

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		overcalled by over 10%. All data was loaded into a DataShed database and validated. Mineralisation was then visually checked and modelled using Maptek's Vulcan. Re-assaying of drill core by Copper Range and Terramin has confirmed the veracity of original sampling techniques and results. External audits and review of modelling techniques and data has been undertaken by Leon Faulkner from ECR.

Section 2: Reporting for Exploration Results

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 Kapunda Mineral Resource is located approximately 90 km north of Adelaide and sits within exploration license (EL) 6198 held by Terramin Exploration Pty Ltd (Terramin Exploration). EL 6198 is currently in good standing and owned 100% by Terramin Exploration. In August 2017 Terramin Exploration entered a joint venture agreement with ECR (TZN ASX announcement – New Copper Joint Venture Development, 2/8/2017) who will investigate the potential to extract the copper through low cost in-situ recovery (ISR) from shallow oxide ores in and around the historic Kapunda Mine area. The majority of the Mineral Resource sits beneath the heritage listed Kapunda Mine historic site which is owned by Light Regional Council. The southern extent of the Mineral Resource sits beneath freehold farmland. With the Kapunda Mine historic site heritage listed and the encroachment of housing within a few hundred metres of the site there is no likelihood of extracting copper by traditional open cut or underground mining techniques. ISR is seen as the only potential method that could be permitted to extract copper. The site consists of an unrehabiliated historic

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		mining site covered by numerous old workings including open cut pits, shafts and waste dumps. There are also remnants of Australia's first heap leach trials which were undertaken in the 1950's. Vegetation regrowth has been minimal because of the high copper content of the soils and a large portion of the historic workings fenced off for the safety of the general public.
	• *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.*	EL 5262 is currently in good standing. The majority of the project area falls within the Kapunda Mine historic site which is owned by the Light Regional Council and as such the land is classified as exempt land under the South Australian Mining Act 1971. This will require a waiver of exemption to be signed before any exploration or mining activities can take place. Clearance from the Department of Environment, Water and Natural Resources (DEWNR) will be required before activities can be conducted within the Heritage Site. Proximity to the Kapunda township means that significant community engagement will need to be carried out before preliminary testing or mining operations can be conducted.
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	Since the cessation of mining, Kapunda has been explored by several different government agencies and exploration companies including; SA Dept of Mines (1961-64) Mines Exploration (Broken Hill South) (1964-69) Minefields Exploration (1970) Noranda (1970) Northern Minerals Syndicate (1970-72) Northland Minerals (1971-85) (including Utah Development Co. (1974-78) Aztec Minerals Ltd (1987-88) Shell company (1995) Stuart Metals (1995-99) Minefinders Pty Ltd (1999-2000) Flinders Mines Ltd (2003-08) Copper Range (2007 – 09) Maximus (2008-2013) Terramin (2013-present) Work carried out by these groups has

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		included geophysics, mapping, rock chip sampling, trenching, percussion and diamond drilling. Metallurgical and economic studies on the feasibility of restarting the Kapunda mine have been undertaken on at least 2 occasions. The largest phases of exploration occurred during the mid-1960's through to the mid 1970's with several groups undertaking detailed drilling programs. A brief summary of the larger drilling programs is provided below. Detail is available in the open file envelopes on the South Australian government's SARIG website. Mines Exploration Pty. Ltd. 3 Diamond holes 45 Percussion holes Noranda Australia Ltd. 56 percussion holes Northland Minerals Ltd. 53 diamond holes 369 Auger holes (not used in the Mineral Resource estimate) 11 percussion holes Utah Development Co. 18 diamond core holes 66 non-core holes Copper Range 4 RC holes 1 Diamond core hole
Geology	• *Deposit type, geological setting and style of mineralisation.*	The Kapunda Mineral Resource is located in the Tindelpina Shale Member of the Tapley Hill Formation. It is a structurally controlled copper deposit with the orebody sitting on the western limb of an antiform with primary copper mineralisation consisting of an en echelon series of lodes striking at ~020 degrees magnetic and dipping ~70 degrees west. Secondary supergene enrichment has taken

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		place leading to the development of a significant copper enriched zone with kaolinized metasediments. Mineral species targeted by this Kapunda Mineral Resource include copper oxides (azurite, malachite and cuprite) and secondary copper sulphide minerals (chalcocite and covellite) within 100m of surface.
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*	No new drillhole data or other exploration results are reported. All information has been compiled from "open file envelopes" available for download through the South Australian Government's SARIG website- http://minerals.statedevelopment.sa.gov.au/
	• *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.*	No new exploration results have been reported, all information is publically available from SARIG.
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.*	No new exploration results have been reported, all information is publically available from SARIG.

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	The assumptions used for any reporting of metal equivalent values should be clearly stated.	No metal equivalents are reported.
Relationship between mineralisation widths and intercept lengths	*These relationships are particularly important in the reporting of Exploration Results.* *If the geometry of the mineralisation with 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').*	No new exploration results have been reported, all information is publically available from SARIG.
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.*	Figures 1 in main text.
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.*	No new exploration results have been reported, all information is publically available from SARIG.
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.*	The overall copper grade of the Mineral Resource estimate fits within the accepted parameters for copper ISR operations. Initial hydrogeological investigations show that the en echelon and conjugate fracture systems provide transmissivity values within the range needed for successful ISR operations. The gold mineral species targeted are considered to be potentially recoverable by ISR as indicated by laboratory testing but further work is needed to confirm this. The majority of the Mineral Resource sits below the current water table. Methods have been patented to economically extract gold from a CSIRO thiosulphate solution

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		Laboratory testing of samples with different lixiviant systems is required to assess the recoverability of the ore and determine the mineral species that will exist in the pregnant solutions.
Further work	*The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*	Following approvals from the Light Regional Council and regulators, a groundwater sample from the mineralized lode system will be collected and be used in the laboratory testing of lixiviant systems on core samples to be undertaken by CSIRO. Additional work on existing core samples will include QEMSCAN and Micro CT studies. Further hydrogeological investigations including aquifer pump testing and beneficial use studies will be undertaken. Understanding the hydrogeology of the area is critical to the Kapunda Project. Consequently, detailed hydrogeological investigations will be undertaken to accurately model groundwater parameters. These models will allow ECR to undertake design work to ensure that there is no compromising existing users' water quality or ability to access water. Groundwater Science has been engaged by ECR to carry out further groundwater studies.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Additional drilling is required to better define and potentially extend the southern limits of the Kapunda mineralisation, Figure 2.