



16 April 2020

# WEST KALKAROO GOLD DRILLING RESULTS

### **HIGHLIGHTS**

- First round of gold assay results from the current West Kalkaroo drilling program include an intersection of 20 metres of 6.3 g/t gold in the saprolite gold zone.
- Horizontal, clay-hosted base of Tertiary gold mineralisation confirmed in several aircore drillholes, including 2 metres of 2.9 g/t gold.
- Drilling has continued without incident and under strict adherence to COVID-19 health directives issued by the South Australian Government.

Havilah Resources Limited (Havilah or Company) is pleased to report the first round of gold assay results received for its shallow gold resource drilling at West Kalkaroo (refer to ASX announcement of 24 March 2020). This drilling is being carried out by Havilah's drilling crew using the aircore (AC) drilling method, which is suited to clayey material and soft decomposed rock. The specific objectives are to define a gold resource in Tertiary age Namba Formation clays and to better define the underlying saprolite gold mineralisation within the confines of a conceptual starter open pit at West Kalkaroo (Figure 1).

Significant new clay-hosted, base of Tertiary assay results include: KKAC0494: 2 metres of 2.9 g/t gold from 29-31 metres downhole **KKAC0489**: 9 metres of 0.61 g/t gold from 32-41 metres downhole

These are near true widths as the mineralisation is essentially horizontal and was intersected by steeply angled drillholes (Figure 2). These results are significant because they occur in what would normally be considered as waste clay overburden material that must be removed to access the underlying copper-gold orebody. It is thought that the gold in these clays is secondary, having migrated upwards in acidic groundwater from the underlying primary bedrock gold mineralisation before depositing in the more carbonaceous and reduced Namba clay layers near the base of the Tertiary age sediments.

All aircore drillholes were continued into the underlying saprolite gold and native copper zones until the rock became too hard for the aircore blade bit to penetrate further (Figure 2). Significant gold intercepts in the saprolite gold and native copper zones include:

KKAC0489: 20 metres of 6.3 g/t from 77-97 metres downhole

and 10.5 metres of 1.8 g/t from 104-114.5 metres downhole (in native copper zone)

**KKAC0490:** 12 metres of 1.1 g/t from 89-101 metres downhole (in native copper zone)

KKAC0494: 2 metres of 19 g/t from 60-62 metres downhole

The intersection of 20 metres of 6.3 g/t gold in drillhole KKAC0489 is more than double the average gold grades obtained in saprolite gold intersections in nearby earlier drillholes. It highlights the importance of further drilling to obtain more confidence in the saprolite gold grades, which are typically quite variable.

The deeper intersection of 10.5 metres of 1.8 g/t in this drillhole occurs in the underlying native copper zone, which will be assayed for copper and other elements (eg rare earth elements) at a later date.

ASX: HAV



### Commenting on these new gold assay results Havilah's Technical Director, Dr Chris Giles, said:

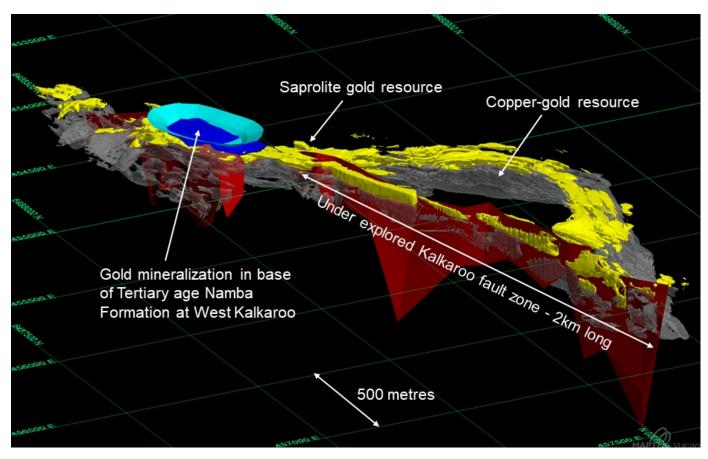
"It is pleasing that the base of Tertiary gold mineralisation persists at this location.

"Also that the saprolite gold mineralisation was intersected where predicted with very good grades and widths.

"We are fortunate to have been able to keep drilling through this very challenging period, which is partly a function of managing our own drilling operations and also having our own exploration base camp to operate from at Kalkaroo, a remote and isolated location in northeastern South Australia.

"Subject to COVID-19 directives, Havilah plans to continue with its shallow gold resource exploration drilling at Kalkaroo for the foreseeable future." he said.

This release has been authorised on behalf of the Havilah Resources Limited Board by Mr Simon Gray.



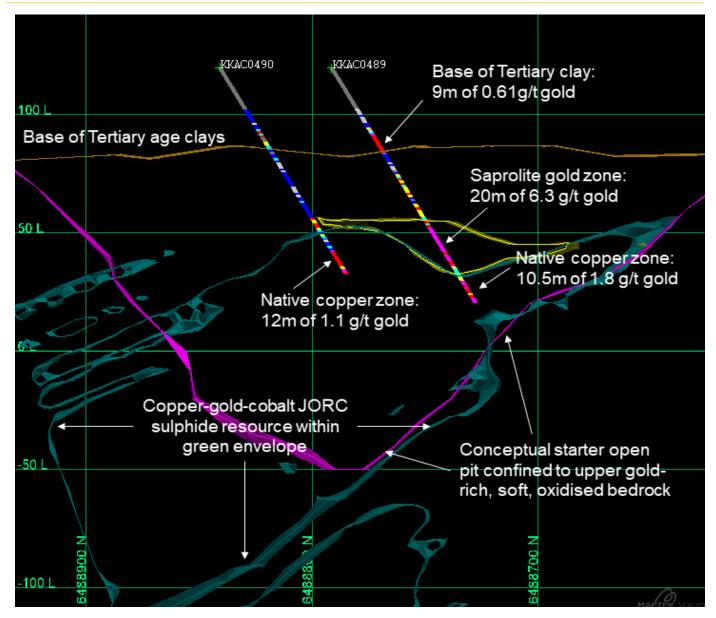
**Figure 1** The current aircore drilling campaign is being undertaken largely within the confines of the conceptual starter open pit at West Kalkaroo (light blue) and is targeting both the base of Tertiary gold mineralisation (dark blue) and underlying saprolite gold mineralisation (yellow).

For further information visit www.havilah-resources.com.au

Contact: Dr Chris Giles, Technical Director, on <a href="mailto:info@havilah-resources.com.au">info@havilah-resources.com.au</a>

Registered Office: 164 Fullarton Road, Dulwich, SA 5065





**Figure 2** Cross-section through recent West Kalkaroo aircore drillholes KKAC0489 and KKAC0490, showing gold mineralised intervals at three different levels in the deposit in both drillholes.

#### **Cautionary Statement**

This announcement contains certain statements which may constitute 'forward-looking statements'. Such statements are only predictions and are subject to inherent risks and uncertainties which could cause actual values, performance or achievements to differ materially from those expressed, implied or projected in any forward-looking statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and investors are cautioned not to put undue reliance on forward-looking statements due to the inherent uncertainty therein.

### **Competent Person's Statements**

The information in this announcement that relates to Exploration Targets, Exploration Results, Mineral Resources and Ore Reserves is based on data and information compiled by geologist, Dr Chris Giles, a Competent Person who is a member of The Australian Institute of Geoscientists. Dr Giles is Technical Director of the Company, a full-time employee and is a substantial shareholder. Dr Giles has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activities being undertaken to qualify as a Competent Person as defined in the 2012 Edition of 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Dr Giles consents to the inclusion in the announcement of the matters based on his information in the form and context in which it appears.



# **Appendix 1**

Sections 1 and 2 below provide a description of the sampling and assaying techniques in accordance with Table 1 of The Australasian Code for the Reporting of Exploration Results. Havilah confirms that it is not aware of any new information or data and that all material assumptions and technical parameters underpinning results published in the earlier market announcements continue to apply and have not materially changed.

#### Details for drillholes cited in the text

				Grid	Dip	EOH depth
Hole Number	Easting m	Northing m	RL m	azimuth	degrees	metres
KKAC0489	454546	6488731	120	154	-60	114.5
KKAC0490	454526	6488771	120	154	-60	101
KKAC0494	454328	6488784	120	155	-70	83
Datum: AGD66 Zone 54						

## **Section 1 Sampling Techniques and Data**

Criteria	JORC Code explanation	Commentary
Sampling techniques	<ul> <li>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.</li> <li>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>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.</li> </ul>	<ul> <li>Sample data was derived from aircore ('AC') drillholes as documented in the table above.</li> <li>AC assay samples averaging 2-3kg were riffle split at 1 metre intervals.</li> <li>All AC drill samples were collected into prenumbered calico bags and packed into polyweave bags by Havilah staff for shipment to the assay lab in Adelaide.</li> </ul>
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).	All AC holes were drilled using a 121mm blade bit. All samples were collected via riffle splitting directly from the cyclone



Criteria	JORC Code explanation	Commentary
Drill sample recovery	<ul> <li>Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>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.</li> </ul>	<ul> <li>Overall, AC sample recoveries were considered to be quite acceptable for interpretation and modelling purposes.</li> <li>The sample yield and wetness of the AC samples was routinely recorded in drill logs. Very few samples were too wet to split. No evidence of sample bias due to preferential concentration of fine or coarse material was observed.</li> <li>Sample recoveries were continuously monitored by the geologist on site and adjustments to drilling methodology were made to optimise sample recovery and quality where necessary.</li> </ul>
Logging	<ul> <li>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.</li> <li>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</li> <li>The total length and percentage of the relevant intersections logged.</li> </ul>	<ul> <li>All AC samples were logged by an experienced geologist directly into a digital logging system with data uploaded directly into an Excel spreadsheet and transferred to a laptop computer.</li> <li>All AC chip sample trays and some back-up samples are stored on site at Kalkaroo.</li> <li>Logging is semi-quantitative and 100% of reported intersections have been logged.</li> <li>Logging is of a sufficiently high standard to support any subsequent interpretations, resource estimations and mining and metallurgical studies.</li> </ul>
Sub-sampling techniques and sample preparation	<ul> <li>If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</li> <li>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> <li>Quality control procedures adopted for all subsampling stages to maximise representivity of samples.</li> <li>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.</li> <li>Whether sample sizes are appropriate to the grain size of the material being sampled.</li> </ul>	<ul> <li>AC drill chips were received directly from the drilling rig via a cyclone and were riffle split on 1 metre intervals to obtain 2-3 kg samples.</li> <li>Sampling size is considered to be appropriate for the style of mineralisation observed. Assay repeatability for gold and other metals has not proven to be an issue in the past and is checked with regular duplicates.</li> <li>All Havilah samples were collected in numbered calico bags that were sent to ALS assay lab in Adelaide.</li> <li>At ALS assay lab the samples are crushed in a jaw crusher to a nominal 6mm (method CRU-21) from which a 3kg split is obtained using a riffle splitter. The split is pulverized in an LM5 to 85% passing 75 microns (method PUL-23). These pulps are stored in paper bags.</li> <li>All samples were analysed for gold by 50g fire assay, with AAS finish using ALS method Au-AA26.</li> <li>All sample pulps are retained by Havilah and other elements (such as copper and rare-earth elements) will be assayed using these pulps as required in the future.</li> </ul>
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.	<ul> <li>Fire assay method Au-AA26 is a total gold analysis.</li> <li>Assay data accuracy and precision was continuously checked through submission of</li> </ul>



Criteria	JORC Code explanation	Commentary
	<ul> <li>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.</li> <li>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.</li> </ul>	field and laboratory standards, blanks and repeats which were inserted at a nominal rate of approximately 1 per 25 drill samples.  • Assay data for laboratory standards and repeats for Kalkaroo were previously statistically analysed and no material issues were noted.
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.  Discuss any adjustment to assay data.	<ul> <li>Checking of the new Au assays against Au assays from adjacent earlier drillholes indicated good overall correlation.</li> <li>Rigorous internal QC procedures are followed to check all assay results.</li> <li>All data entry is under control of the responsible geologist, who is responsible for data management, storage and security.</li> </ul>
Location of data points	<ul> <li>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.</li> <li>Specification of the grid system used.</li> <li>Quality and adequacy of topographic control.</li> </ul>	<ul> <li>The holes were not surveyed owing to their short depth.</li> <li>Present drillhole collar coordinates were measured from nearby earlier differential GPS located drillhole collars by tape measure and should have an accuracy of under +/- 1 metre. After completion of the drilling program all holes will be surveyed in UTM coordinates using a differential GPS system with an x:y:z accuracy of 20cm:20cm:40cm and will be quoted in AGD66 Zone 54 datum.</li> </ul>
Data spacing and distribution	<ul> <li>Data spacing for reporting of Exploration Results.</li> <li>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.</li> <li>Whether sample compositing has been applied.</li> </ul>	<ul> <li>Havilah drilling is aiming for a nominal 25m x 25m spacing of drillholes to define a resource in the base of Tertiary clays and to upgrade confidence levels in the saprolite gold zone. In general drillholes are angled perpendicular to the strike of the primary copper-gold mineralisation at West Kalkaroo.</li> <li>Sample compositing was not used.</li> </ul>
Orientation of data in relation to geological structure	<ul> <li>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</li> <li>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.</li> </ul>	<ul> <li>The drillhole azimuth and dip was chosen to intersect the mineralised zones as nearly as possible to right angles and at the desired positions to maximise the value of the drilling data.</li> <li>At this stage, no material sampling bias is known to have been introduced by the drilling direction.</li> </ul>
Sample security	The measures taken to ensure sample security.	<ul> <li>AC chip samples are directly collected from the riffle splitter in numbered calico bags.</li> <li>Several calico bags are placed in each</li> </ul>



Criteria	JORC Code explanation	Commentary
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	<ul> <li>polyweave bag which are then sealed with cable ties. The samples are transported to the assay lab by Havilah personnel at the end of each field stint.</li> <li>There is minimal opportunity for systematic tampering with the samples as they are not out of the control of Havilah personnel until they are delivered to the assay lab.</li> <li>This is considered to be a secure and reasonable procedure and no known instances of tampering with samples occurred during the drilling programs.</li> <li>Ongoing internal auditing of sampling techniques and assay data has not revealed any material issues.</li> <li>Robert Dennis who was formerly employed by consulting firm RPM Global Asia Limited ('RPM') visited Kalkaroo during November 2016 and found field procedures to be of acceptable industry standard.</li> <li>Wanbao Mining and RPM completed independent re-sampling and assaying for Kalkaroo and found results to be reliable.</li> </ul>

# **Section 2 Reporting of 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.	<ul> <li>Security of tenure is via current mining leases over Kalkaroo, owned 100% by Havilah.</li> <li>Havilah owns the Kalkaroo Station pastoral lease on which the drilling is being conducted.</li> </ul>
	The security of the tenure held at the time of reporting along with any known impediments to obtaining a license to operate in the area.	
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	<ul> <li>Kalkaroo was explored by a number of major mining groups in the past including Placer Pacific Limited, Newcrest Mining Limited and MIM Exploration Pty Ltd, who completed more than 45,000m of drilling in the region.</li> <li>All previous exploration data has been integrated into Havilah's databases.</li> </ul>
Geology	Deposit type, geological setting and style of mineralisation.	<ul> <li>In general the mineralisation style is stratabound replacement and vein style copper-gold mineralisation within Willyama Supergroup rocks of the Curnamona Craton.</li> <li>At Kalkaroo, the stratabound mineralisation is uniformly distributed along more than 3 km of strike that follows an arc around the 35 degree dipping northern nose of the Kalkaroo south dome. It is hosted by an 80m-120m</li> </ul>



Criteria	JORC Code explanation	Commentary
		thick mineralised horizon that is sandwiched between psammitic footwall rocks and a thick pelitic hangingwall sequence.  In part, the mineralisation is associated with near-vertical, mineralised quartz vein breccia fracture/fault fillings, which probably formed channel ways for the mineralising fluids. Interference folding resulted in dome structures which probably acted as structural traps for the rising mineralising fluids carried by these vertical structures.  The mineralising events were associated with iron-rich and sodium-rich alteration fronts, which are manifest as widespread finegrained magnetite in the lower sandy formations and as pervasive albite alteration, overprinted by later potassic veining and alteration.  Erosion in the Mesozoic and Tertiary period exposed the region to prolonged and deep weathering. Consequently, the original sulphide mineralisation shows typical supergene enrichment features in its upper part, caused by oxidation of the primary sulphides in the weathering zone, forming a soft clay rich rock called saprolite. This is manifest in a sub-horizontal stratification of the ore minerals from top to bottom:  1. Supergene free gold in saprolite, with generally minor copper, recoverable by gravity and cyanide leaching methods.  2. Native copper and gold in saprolite, largely recoverable by gravity methods.  3. Chalcocite dominant with gold, recoverable by conventional flotation.  4. Chalcopyrite dominant with gold and locally rich molybdenum, recoverable by conventional flotation.
Drill hole information	A summary of all information material to the under-standing of the exploration results including a tabulation of the following information for all Material drill holes:	This information is provided in the accompanying table for the relevant drillholes.
	o easting and northing of the drill hole collar	
	<ul> <li>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</li> </ul>	
	o dip and azimuth of the hole	
	o down hole length and interception depth	
	o hole length	
	If the exclusion of this information is justified on	



Criteria	JORC Code explanation	Commentary
	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.	
Data aggregation methods	<ul> <li>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated.</li> <li>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.</li> <li>The assumptions used for any reporting of metal equivalent values should be clearly stated.</li> </ul>	Not applicable as not reporting mineral resources.
Relationship between mineralisation widths and intercept lengths	<ul> <li>These relationships are particularly important in the reporting of Exploration Results.</li> <li>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</li> <li>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known').</li> <li>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</li> </ul>	<ul> <li>Downhole lengths are reported. Drillholes are typically oriented with the objective of intersecting mineralisation as near as possible to right angles, and hence downhole intersections in general are as near as possible to true width.</li> <li>For the purposes of the geological interpretations and resource calculations the true widths are always used.</li> <li>Not applicable as not reporting a mineral discovery.</li> </ul>
Balanced Reporting	<ul> <li>drill hole collar locations and appropriate sectional views.</li> <li>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.</li> </ul>	Not applicable as not reporting mineral resources.
	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.	
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.	Relevant geological observations are reported.
Further work	The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large- scale step-out drilling).	Additional drilling may be carried out in the future to explore strike and depth extensions and for resource delineation.



Criteria	JORC Code explanation	Commentary
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	