

## ASX ANNOUNCEMENT

14 February 2022

# Diamond Drilling Confirms Mineralised Gold System at Southern Star

### Highlights

- First two diamond holes completed by Great Southern Mining have confirmed a significant mineralised system at Southern Star.
- Both diamond holes intersected the target mineralised quartz dolerite unit and significant gold bearing assemblages were noted as part of a potentially larger system.
- Standout intersection from the two-hole diamond program:
  - **20m @ 1.7 g/t Au** from 62m incl. **1.6m @ 13.2 g/t Au** from 76.6m in 21SSDD001
- Four-day litho-structural review by Outcrop Exploration coincided with diamond drilling to aid target refinement for upcoming Reverse Circulation program.
- Reverse Circulation drilling planned and set to commence this quarter.



Figure 1 - Structural analysis of recent diamond core undertaken by Marcus Willson from Outcrop Exploration

### GSN's Executive Chairman, John Terpu, commented:

*"Today's results confirm that Southern Star has all the hallmarks of a large mineralised gold system. The structural analysis of the diamond core has given GSN the first visual insight to what the gold mineralisation looked like in core and what structural and alteration assemblages are key for future targeting. The results clearly demonstrate the significance and potential of the deposit given the noted similarities of mineralisation to the much larger million-ounce open pit and underground gold mine at Rosemount and to the Ben Hur Deposit, both along strike on the same regional mineralised structure. We remain very excited at the potential of Southern Star and the wider Duketon Gold Project for continued exploration success."*

## Introduction

Great Southern Mining Limited (ASX: GSN) (“**GSN**” or the “**Company**”) is pleased to announce results from its maiden Diamond Drilling (DD) program from the Southern Star Gold Deposit at its 100% owned Duketon Gold Project located 45km north of Laverton, Western Australia.

A two hole 319.5m DD program has been completed at Southern Star. The purpose of this drilling was to obtain further insight into the gold mineralisation at Southern Star, which is open to the north, south and at depth. The two diamond holes were drilled 580m apart at opposite ends of the current known mineralisation, with the intention to examine the structural orientation of quartz veining, folding and foliation at the current extents of mineralisation.

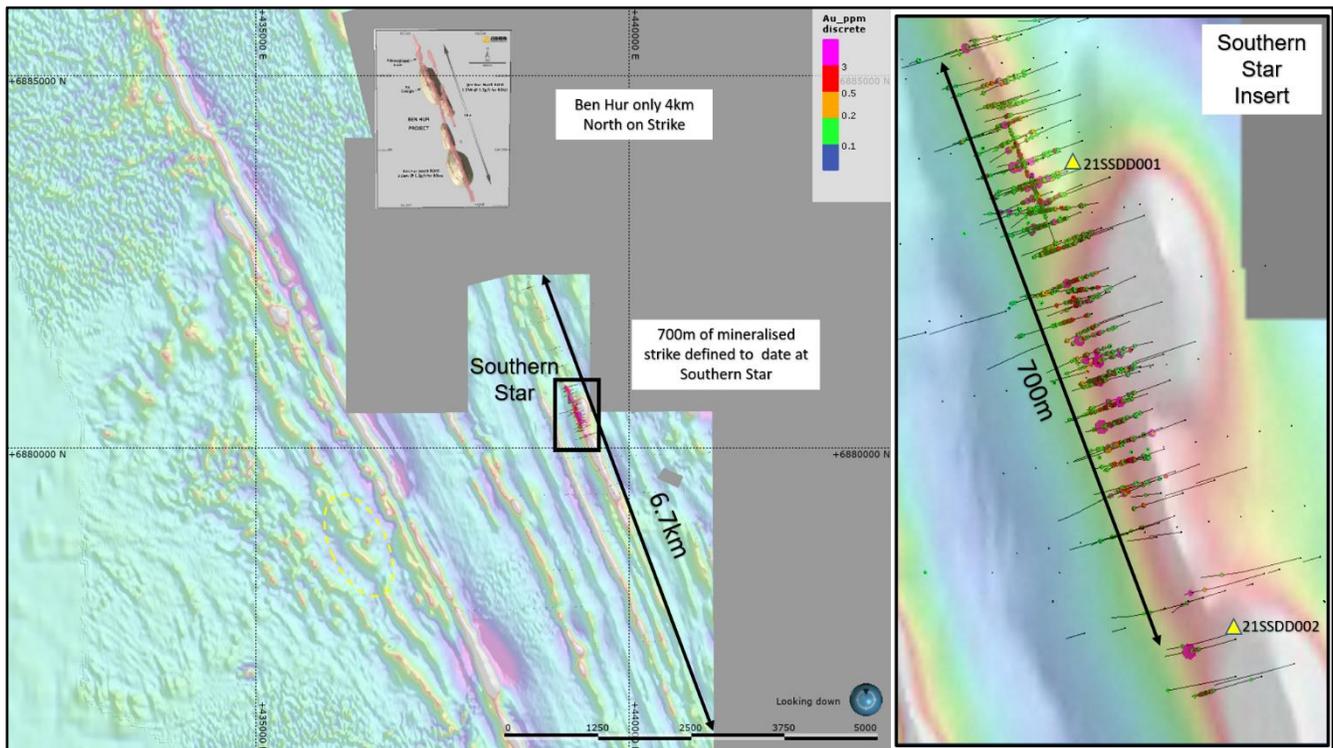


Figure 2 - Southern Star insert highlighting maximum gold downhole with location of recent diamond holes, draped magnetic data (TMI1vd) highlighting the regional 345° trending stratigraphy that host both Regis Resources' Ben Hur and Southern Star deposits.

## Technical Discussion

Gold mineralisation at Southern Star is hosted in an east-dipping 345°- trending quartz-dolerite unit which is approximately 80m wide. The drilling was designed to target the footwall of the quartz dolerite unit as this is where the primary lode is persistent and of high-grade based on assessment to date. The high-grade mineralisation can be traced for over 700m of strike length and is open in all directions (Figure 2).

Major shearing runs the length of the deposit with gold mineralisation being associated with quartz veining and sulphides within the fractionated dolerite unit, pervasive foliation was observed in both diamond holes and strikes 345° which matches the regional strike and further supports the relationship between Ben Hur and Southern Star.

The objective of the diamond drilling program was to build on the geological understanding of the deposit including the orientation of the structures controlling the gold mineralisation.

Diamond hole 21SSDD001 intersected a wide zone of multi-phased quartz veining from 56.6m to 80m. High-grade mineralisation was intersected within this zone of **20m @ 1.7 g/t Au** from 62m including **1.6m @ 13.2 g/t Au** from 76.6m. The high-grade interval correlates with previous recent Reverse Circulation drilling of **68m @ 1.9 g/t Au** from 61m incl **4m @ 15.3 g/t Au** from 89m and **5m @ 7.0 g/t Au** from 114m in 21SSRC0036 (Figure 3).

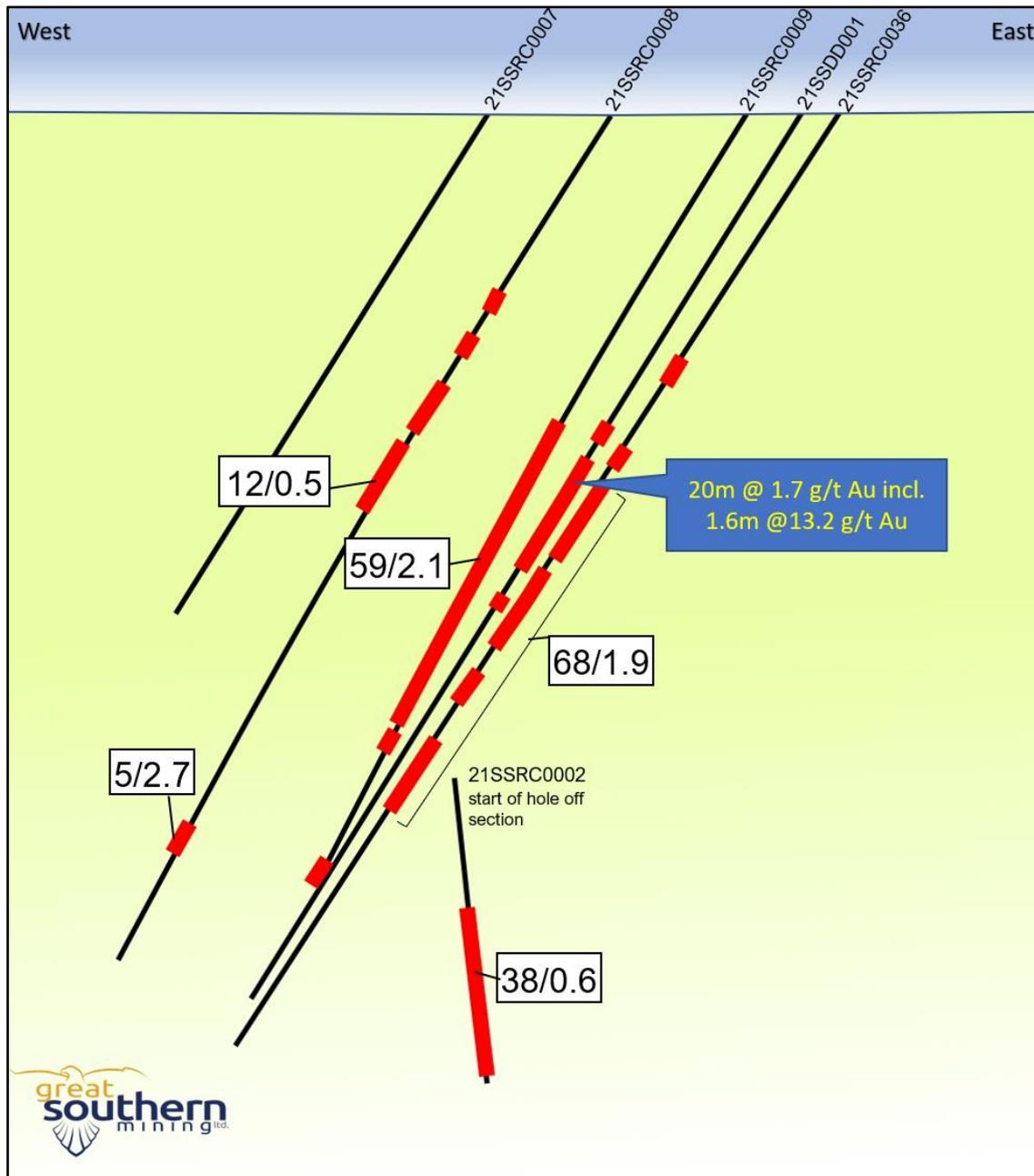


Figure 3 - Cross section centered on 6880650mN highlighting previous RC drilling and recent diamond hole.



Figure 4 - Diamond Core photo of 21SSDD001, highlighting high grade gold intervals (g/t Au) from 72m-78.4m with intense albite alteration overprinting and hydrothermal veining.

Intense sequence of alteration assemblages was observed, logging of alteration of the core took place and intense albite alteration with hydrothermal veining correlates well with the area of high-grade gold intervals (Figure 4 and Figure 5). Reviewing pathfinder data within the Leapfrog model, Bismuth, a known magmatic pathfinder, appears to correlate well with the zone of logged albite alteration.

Arsenic, a known basin/metamorphic pathfinder, appears to correlate well with the sericite/brown mica alteration, which was observed deeper downhole which correlates to a secondary zone of gold mineralisation with 8.3m @ 0.63 g/t Au from 110m intersected. This Arsenic-sericite zone sits adjacent to the albite-bismuth zone. This new understanding of alteration assemblages and pathfinder elements will be key in vectoring in on the high-grade mineralisation at Southern Star.

The second diamond hole (21SSDD002) intersected similar alteration assemblages although notably not as intense, a wide zone of quartz veining was also absent, selective sampling of the second hole from 114m to 131m was undertaken where albite alteration and a quartz veining (118-120m) was intersected. Although only limited intercepts of significant gold (>0.1 g/t Au) were intersected (0.9m @ 0.16 g/t Au from 117.1m and 0.7m @ 0.11 g/t Au from 120.6m), it is interpreted to be proximal to the mineralised zone due to the similarities in the alteration assemblages. The remainder of the core is currently being cut and multi-element analysis is being undertaken on both diamond holes.

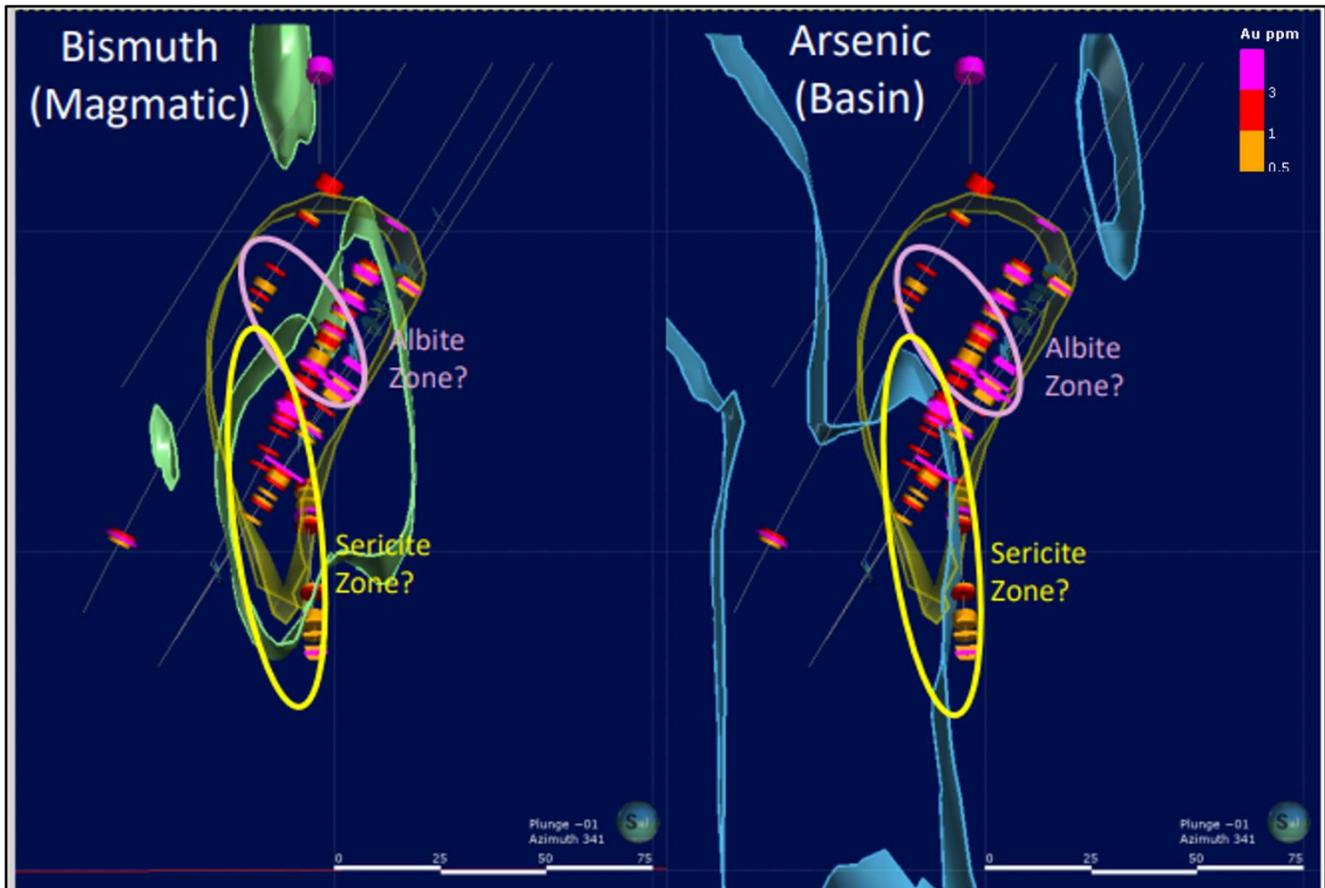


Figure - 5 Alteration zones (Albite and Sericite) logged in recent diamond core with grade shells of Bismuth (green) and Arsenic (blue) highlighting the spatial correlation of the alteration zones relative to gold (discs on drill traces) and pathfinder elements. Section centered on 6880650mN (After Wilson 2022).

## Next Steps

Based on the success of today's results, the RC drill rig will immediately return to Southern Star for further drilling to test for strike extensions at Southern Star with a focus on strike extension to the south where no deep drilling has taken place.

**This announcement is authorised by the Executive Chairman on behalf of the Board of GSN.**

### For Further Information Contact:

John Terpu, Executive Chairman

+61 8 9240 4111

## Ben Hur Deposit Analogue

Southern Star is analogous to the nearby Ben Hur deposit and the Rosemont (>1Moz) open pit and underground gold mine, situated 4 and 24 kilometres north-west along strike respectively. Ben Hur has been the focus of Regis Resources' recent drilling efforts culminating in a Mineral Resource estimate 390kOz @ 1.2 g/t Au (Figure 6, refer to ASX:RRL announcement 6/4/21).

All three deposits are hosted within the same quartz dolerite unit which can be traced through the Duketon Belt. Both deposits display a very similar style of mineralisation, with the primary lode proximal to the sheared footwall of the quartz dolerite, with minor lodges forming parallel to it.

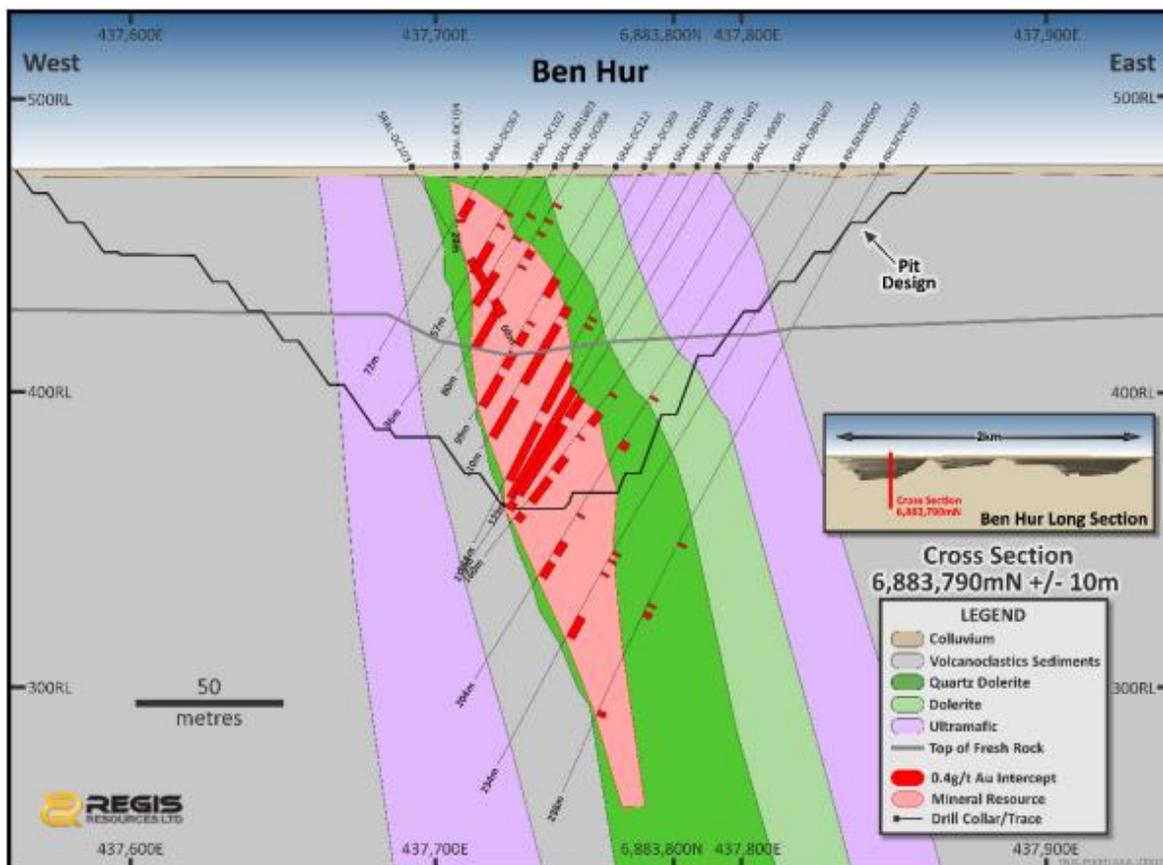


Figure 6 - Cross section 6883790mN of Regis Resources' Ben Hur deposit located only 4 km north-west and along strike of the Southern Star deposit highlighting gold mineralisation within the same quartz dolerite unit (Source ASX:RRL announcement 6/4/21)

## About Great Southern Mining

Great Southern Mining Limited is a leading Australian listed exploration company with significant land holdings in the world-renowned gold districts of Laverton in Western Australia and Mt Carlton in North Queensland. All projects are strategically located within 25km of operating mills and major operations.

The Company's focus is on creating shareholder wealth through efficient exploration programs and strategic acquisitions of projects that complement the Company's existing portfolio of quality assets.

For further information regarding Great Southern Mining Limited please visit the ASX platform (ASX:GSN) or the Company's website [www.gsml.com.au](http://www.gsml.com.au).

## Competent Person's Statement

The information in this report that relates to Exploration Results is based on information compiled or reviewed by Simon Buswell-Smith, a Competent Person who is a Member of the Australian Institute of Geoscientists. Mr. Buswell-Smith is Exploration Manager WA of Great Southern Mining Limited. Mr. Buswell-Smith has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken 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. Buswell-Smith consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

## Forward Looking Statements

Forward-looking statements are only predictions and are not guaranteed. They are subject to known and unknown risks, uncertainties and assumptions, some of which are outside the control of the Company. Past performance is not necessarily a guide to future performance and no representation or warranty is made as to the likelihood of achievement or reasonableness of any forward-looking statements or other forecast. The occurrence of events in the future are subject to risks, uncertainties and other factors that may cause the Company's actual results, performance or achievements to differ from those referred to in this announcement. Given these uncertainties, recipients are cautioned not to place reliance on forward looking statements. Any forward-looking statements in this announcement speak only at the date of issue of this announcement. Subject to any continuing obligations under applicable law and the ASX Listing Rules, the Company, its directors, officers, employees and agents do not give any assurance or guarantee that the occurrence of the events referred to in this announcement will occur as contemplated.

Table 1 - Recent diamond drillhole locations at Southern Star

Drillhole	Easting	Northing	Dip	Azimuth	Depth
<b>21SSDD0001</b>	439282	6880671	-60	250	160
<b>21SSDD0002</b>	439468	6880121	-60	250	159.5

Table 2 - Significant Intersections for Southern Star (Significant Intercepts are >1m @ 0.1g/t Au with a maximum internal dilution of 2 metre for intervals.

Hole ID	Depth From	Depth To	Interval Width	Au g/t
<b>21SSDD0001</b>	35.4	39	3.6	0.20
	46	47	1	0.14
	56	59	<b>3</b>	<b>1.48</b>
<i>Incl</i>	57.25	58	<b>0.75</b>	<b>5.20</b>
	62	82	<b>20</b>	<b>1.71</b>
<i>Incl</i>	76.6	78.2	<b>1.6</b>	<b>13.18</b>
	87	89	2	0.86
	101.2	101.8	0.6	1.34
	104.2	107	2.8	0.18

Hole ID	Depth From	Depth To	Interval Width	Au g/t
	110	118.3	8.3	0.63
	124.4	126.1	0.8	0.11
<b>21SSDD002</b>	117.1	118	0.9	0.16
	120.6	121.3	0.7	0.11

## JORC Code 2012 Edition – Table 1

### Section 1 Sampling Techniques and Data

Criteria	Commentary
<b>Sampling techniques</b>	<ul style="list-style-type: none"> <li>Diamond drill core was cut in half and intervals were selected by the geologists relative to lithological contacts, alteration and mineralogy. Individual samples generally do not exceed 1m and are greater than 0.3m.</li> <li>The HQ core was the sent to Bureau Veritas laboratory, placed in oven for drying (as required up to 8hrs) Core Samples - 10mm crush where required - 3mm boyd crush where required/split down to around 3kg.</li> <li>The samples have been analysed by Firing a 40 gm (approx) portion of the sample for fire assay</li> <li>Field QC procedures involved the use of Certified Reference Materials (CRM's) as assay standards and blanks.</li> </ul>
<b>Drilling techniques</b>	<p>The drilling operation was undertaken by experienced drilling contractor Orlando Drilling.</p> <ul style="list-style-type: none"> <li>Diamond Drilling (DD) drilling was conducted with a modern truck mounted diamond rig</li> <li>HQ3 63.5 mm diameter core.</li> <li>Holes orientations were surveyed using a Reflex-multi at approximately 10m intervals.</li> </ul>
<b>Drill sample recovery</b>	<ul style="list-style-type: none"> <li>Core recovery is systematically recorded from the commencement of diamond coring to the end of hole, by reconciling against drillers depth blocks and production plods with that obtained from geological logging process.</li> <li>Core recoveries were typically averaging 90%. With isolated minor zones of lower recovery through clay and shear/fault zones.</li> <li>No relationship has been established between core recovery and grade, there is no reason to expect a sample bias.</li> </ul>
<b>Logging</b>	<ul style="list-style-type: none"> <li>All DD drilling was logged by experienced geologist to a level of detail to support a MRE <ul style="list-style-type: none"> <li>Lithology, veining, mineralisation, alteration, weathering, structure, and oxidation were recorded;</li> <li>Geotechnically logging of RQD and fracture count were also obtained</li> <li>RC logging is qualitative and descriptive in nature and</li> </ul> </li> <li>All drill core was logged was photographed.</li> </ul> <p>All data was recorded/logged in the field in Log Chief deposit and subsequently transferred to the electronic drillhole database (DataShed5).</p>
<b>Sub-sampling techniques and sample preparation</b>	<ul style="list-style-type: none"> <li>Half core sampling has been undertaken on the diamond drill core at selected intervals by the geologist.</li> <li>Sample type is regarded as appropriate.</li> <li>Field QC procedures involved the use of Certified Reference Materials (CRM's) as assay</li> </ul>

Criteria	Commentary
	<p>standards and blanks.</p> <ul style="list-style-type: none"> <li>• Sample size is regarded as appropriate.</li> </ul>
<p><b>Quality of assay data and laboratory tests</b></p>	<ul style="list-style-type: none"> <li>• Assay technique is Fire assay and is regarded as total</li> <li>• Assaying of the DD drilling samples are being conducted by Bureau Veritas, Perth.</li> <li>• Field QC procedures involved the use of Certified Reference Materials (CRM's) as assay standards, in conjunction and blanks. The results of this analysis are reviewed when results are received.</li> <li>• The fire assay gold analyses undertaken are considered a total assay method and is an appropriate assay method for the target-style mineralisation.</li> </ul> <p>Standard lab QC was also implemented as part of the geochemical testing protocol.</p> <p>No geophysical tools have been applied to the samples, or down hole, at this stage.</p>
<p><b>Verification of sampling and assaying</b></p>	<p>Results are verified by the geologist before importing into Datashed.</p> <p>No twin holes have been conducted; however, the diamond holes have been used to verify nearby RC drilling</p> <p>Data is collected by tablet in the field and is imported into Datashed5.</p> <p>DD Field QC procedures involved the use of Certified Reference Materials (CRM's) as assay standards and blanks.</p> <p>Assay data is reviewed prior to importing into Datashed no adjustments are made to raw assay files.</p>
<p><b>Location of data points</b></p>	<ul style="list-style-type: none"> <li>• All data location points referred to in this report are in:</li> <li>• Datum: Geodetic Datum of Australia 94 (GDA94) Projection: Map Grid of Australia (MGA)</li> <li>• Zone: Zone 51</li> <li>• All collar surveys were completed using handheld GPS (+/- 5m accuracy).</li> <li>• Drill rig alignment was attained using a handheld compass and verified with downhole surveys collected near-surface followed by approximately every 10m.</li> <li>• Downhole surveys were routinely carried out, generally on continuous measure, conducted using Reflex-multishot.</li> <li>• The 3D location of individual samples is considered to be adequately established and in line with industry standards for this stage of exploration.</li> <li>• Topography is nominal at this stage holes will be picked up using a DGPS in the future</li> </ul>
<p><b>Data spacing and distribution</b></p>	<ul style="list-style-type: none"> <li>• The drill hole spacing ranges is not systematic, however most holes are drilled at 250° across the regional strike. Drill hole collar positions are based solely on the drilling of specific exploration targets. And are display in diagram in body of the report.</li> <li>• The DD drill holes were planned to test the extension or down plunge extension of the ore body.</li> <li>• Diamond drilling is required to accurately understand the thickness and grade of the high-grade gold.</li> <li>• The current drill hole spacing and distribution is not sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure and classification.</li> <li>• no compositing has been applied to DD holes compositing has been applied to areas of less interest and for regional exploration holes.</li> </ul>
<p><b>Orientation of data in relation to geological structure</b></p>	<ul style="list-style-type: none"> <li>• The drill holes have been designed to cross cut the main lithology 250° to maximise structural, geotechnical and geological data.</li> <li>• No drilling orientation and/or sampling bias has been recognised at this time.</li> </ul>
<p><b>Sample security</b></p>	<ul style="list-style-type: none"> <li>• Logging has been carried out by GSN and contract personal who were always on-site during drilling.</li> <li>• No third parties have been allowed access to the samples.</li> <li>• Samples were shipped directly from site to a secure stored site in Laverton to undergo</li> </ul>

Criteria	Commentary
	<p>evaluation.</p> <ul style="list-style-type: none"> <li>Select samples for geochemical analysis were transported from Laverton to Bureau Veritas in Perth where upon receipt the samples are officially checked in and appropriate chain of custody documentation received.</li> </ul> <p>All sample information is kept in paper and digital form. Digital data is backed up onto the Company server regularly and then externally backed up daily.</p>
<b>Audits or reviews</b>	No audits or reviews have been conducted.

## Section 2 Reporting of Exploration Results

Criteria	Commentary
<b>Mineral tenement and land tenure status</b>	The tenement E38/3501 is in good standing and was granted on February 17 2021. Great Southern Mining Ltd is the holder
<b>Exploration done by other parties</b>	Relevant exploration done by other parties are outlined in the body of this report or previous GSN ASX announcements.
<b>Geology</b>	Mineralisation at Southern Star occurs as several stacked lenses within a sequence of foliated sheet-like gabbroic intrusive units and is associated with quartz veining and sulphide alteration between two strike parallel shear zones. The deposit is hosted in a fractionated dolerite sill, overturned and younging to the west that is over 100m wide in areas. Within this dolerite sill the most fractionated part, a quartz-magnetite rich unit up to 80m wide, appears to be the preferential host of the gold mineralisation.
<b>Drill hole Information</b>	<p>All the drill holes reported in this report are summarized in in the report</p> <p>Easting and northing are given in MGA94 – Zone 51 coordinates.</p> <p>RL is AHD</p> <p>Dip is the inclination of the hole from the horizontal. Azimuth is reported in magnetic degrees as the direction the hole is drilled..</p> <p>Down hole length is the distance measured along the drill hole trace. Intersection length is the thickness of an anomalous gold intersection measured along the drill hole trace.</p> <p>Hole length is the distance from the surface to the end of the hole measured along the drill hole trace.</p>
<b>Data aggregation methods</b>	<p>Significant assay intervals are recorded above 0.1g/t Au with a maximum internal dilution of 2m. no top cuts applied.</p> <p>A breakdown of the high-grade Interval is shown in the body of the report.</p>
<b>Relationship between mineralisation widths and intercept lengths</b>	<p>All significant intersections are quoted as downhole widths. The mineralisation has a near vertical orientation most holes are drilled at a -60-degree dip which is industry standard.</p> <p>All lengths are reported as downhole and the section in the body of the report displays the relationship between drill hole angle and mineralisation interpretation.</p>
<b>Diagrams</b>	Relevant Diagrams are included in the body of this report.
<b>Balanced reporting</b>	All matters of importance have been included.
<b>Other substantive exploration data</b>	All relevant information has been included.

Criteria	Commentary
<b><i>Further work</i></b>	Future exploration includes assessment of recent drill results. Mineralisation is open along strike and at depth. Diagrams highlight potential area of interest for follow up work.