NORTHERN STAR
RESOURCES LIMITED

ASX ANNOUNCEMENT
16 October 2018

Australian Securities
Exchange Code: NST

Board of Directors
Mr Bill Beament
Executive Chairman

Mr John Fitzgerald
Lead Independent Director

Mr Chris Rowe
Non-Executive Director

Mr Peter O'Connor
Non-Executive Director

Ms Shirley In't Veld
Non-Executive Director

Issued Capital
Shares 639.45 million
Performance Rights 10.38 million
Current Share Price A$8.90
Market Capitalisation
A$5.7 billion
Cash and Cash Equivalents
30 Jun 2018 - A$512 million

Projects

Jundee Operations
Kalgoorlie Operations
Pogo Operations
Paulsens Mine
Central Tanami (40% of JV)
Western Tanami

www.nsrltd.com

ABN: 43 092 832 892

POGO JORC RESOURCE IS 4.15MOZ AT 14.7GPT

Estimate excludes 765,000oz in non-JORC resource contained in satellite deposits, meaning the in-mine Resource is up by 24%; Total Group Resources now stand at 20.5Moz

KEY POINTS

- **Northern Star, in conjunction with independent mining consultants CSA Global, has completed a comprehensive re-estimation of the Pogo in-mine Resource; This estimate is JORC-2012 compliant**
- **The JORC-compliant Resource estimate is now 8.8Mt at 14.7gpt for 4.15Moz, utilising a cut-off grade of 6.2gpt. This new estimate is in line with the non-JORC estimate stated in Northern Star's ASX release of August 30, 2018 re the Pogo acquisition**
- **The previously reported non-JORC estimate of 4.1Moz at 12.2gpt included 765,000oz in satellite deposits external to the main Pogo mine; These deposits have not been included in this new estimate**
- **The new Resource estimate in the Pogo mine area of 4.15Moz has increased by 24% or by ~0.8Moz, predominantly through interpretation and remodelling of known mineralisation**
- **This new Resource estimate will underpin mine planning and operational optimisation at Pogo**
- **Northern Star assumed management control of the Pogo operation on 28 September 2018**
- **A$15-20 million budgeted for exploration and drilling at Pogo for FY2019**
- **Central Tanami Project: As announced on 19 September 2018, Northern Star has increased equity ownership of the Central Tanami Project (CTP) to 40% via a $20M option exercise. Equity Resources in the CTP now total 12.3Mt @ 2.8gpt for 1.1Moz**
- **Following the Pogo Resource and the increased CTP ownership, Northern Star's Group Resources stand at 188Mt @ 3.4gpt for 20.5Moz**
- **A revised JORC-compliant Ore Reserve estimate will be published following closure of FY2019 in line with Northern Star's policy**

Northern Star Resources (ASX: NST) is pleased to announce that the JORC 2012-compliant Resource at its Pogo gold mine in Alaska is 8.8 million tonnes at 14.7gpt for 4.15 million ounces.

This estimate excludes the 765,000oz in Pogo satellite deposits which were included in the 4.1Moz non-JORC resource at the time of Northern Star's acquisition (see ASX release dated August 30, 2018).

As a result, the in-mine Resource is now 24 per cent higher than at the time of the acquisition. This increase is predominantly through interpretation and remodelling of known mineralisation.

The JORC-compliant Resource includes Indicated Resources of 3.3Mt at 15.7gpt for 1.7Moz and Inferred Resources of 5.5Mt at 14.1gpt for 2.5Moz.

Northern Star Executive Chairman Bill Beament said the maiden JORC estimate, which was calculated in conjunction with independent mining industry consultants CSA Global, was an outstanding start to the Company's ownership of Pogo.

"This is an important result because it not only meets, but exceeds, our understanding of the Pogo mine and our view of its potential," Mr Beament said.

"It is also very satisfying to match the previous 4.1Moz non-JORC resource without including the 765,000oz resources contained in the satellite deposits which formed part of that original estimate.

"The upshot of this is we have already increased the in-mine Resource by 24 per cent."

Mr Beament said that with Northern Star assuming management control of Pogo on September 28, 2018 the focus would now move to resource definition and extensional drilling programs.

There are eight diamond drilling rigs currently operating at Pogo, representing an anticipated investment of A$15-20 million for FY2019.

Four of these rigs are underground, focusing on resource definition drilling in the North Zone and Leise vein system as well as targeting resource extensions within the Fun Zone.

The remaining four diamond drill rigs are on the surface, exploring new lateral and downdip extensions to the main Leise vein system adjacent to the Fun Zone production area.

Yours faithfully

BILL BEAMENT
Executive Chairman
Northern Star Resources Limited

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Competent Persons Statements

The information in this announcement that relates to Mineral Resource estimations, exploration results, data quality and geological interpretations for the Company's Project areas, other than Pogo, is based on information compiled by Brook Ekers, a Competent Person who is a Member of the Australian Institute of Geoscientists and a full-time employee of Northern Star Resources Limited. Mr Ekers has sufficient experience that is relevant to the styles of mineralisation and type of deposits 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" for the Company's Project areas, other than Pogo. Mr Ekers consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

The information in this announcement that relates to Mineral Resource estimations, exploration results, data quality and geological interpretations for the Company's Pogo project is based on information compiled by Darren Cooke, a Competent Person who is a Member of the Australian Institute of Geoscientists and a full-time employee of Northern Star Resources Limited. Mr Cooke has sufficient experience that is relevant to the styles of mineralisation and type of deposits 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" for the Company's Pogo project. Mr Cooke consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

The information in this announcement that relates to Mineral Resource estimations, exploration results, data quality and geological interpretations for the Company's Pogo project is based on information compiled by Aaron Green, a Competent Person who is a Member of the Australian Institute of Geoscientists and an employee of CSA Global. Mr Green has sufficient experience that is relevant to the styles of mineralisation and type of deposits 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" for the Company's Pogo project. Mr Green consents to the inclusion in this announcement of the matters based on this information in the form and context in which it appears.

Future performance and forward-looking statements

This announcement contains certain forward-looking statements about the Pogo mine. Often, but not always, forward-looking statements can be identified by the use of forward-looking words such as "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue", and "guidance", or other similar words and may include, without limitation, statements regarding plans, strategies and objectives of management, anticipated production dates, expected costs or production outputs for the Company, based on (among other things) their respective estimates of their production, and, in relation to the estimated future production of the Pogo mine. To the extent that this announcement contains forward-looking information, the forward-looking information is subject to a number of risk factors, including those generally associated with the gold industry. Northern Star makes no representation or warranty as to the accuracy of any forward-looking statements contained in this announcement.

APPENDIX A – MINERAL RESOURCES

MINERAL RESOURCES
As at 30 June 2018

NST ATTRIBUTABLE INCLUSIVE OF RESERVE	MEASURED			INDICATED			INFERRED			TOTAL RESOURCES		
	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)
JUNDEE GOLD PROJECT												
Surface	-	-	-	4,470	1.5	218	1,362	1.3	58	5,832	1.5	276
Underground	443	4.5	64	20,218	4.2	2,711	10,448	3.5	1,181	31,109	4.0	3,956
Stockpiles	831	1.0	26	-	-	-	-	-	-	831	1.0	26
Gold in Circuit	-	-	8	-	-	-	-	-	-	-	-	8
Sub-Total Jundee	1,274	2.4	98	24,688	3.7	2,929	11,810	3.3	1,239	37,772	3.5	4,267
KANOWNA GOLD PROJECT												
Surface	-	-	-	1,507	2.4	117	3,330	1.1	121	4,837	1.5	238
Underground	7,735	2.6	638	9,152	2.5	725	2,833	2.2	202	19,720	2.5	1,565
Stockpiles	23	3.7	3	-	-	-	-	-	-	23	3.7	3
Gold in Circuit	-	-	11	-	-	-	-	-	-	-	-	11
Sub-Total Kanowna	7,758	2.6	651	10,659	2.5	842	6,164	1.6	323	24,581	2.3	1,817
KUNDANA GOLD PROJECT												
Surface	-	-	-	-	-	-	-	-	-	-	-	-
Underground	1,088	4.1	145	4,850	4.8	755	4,495	4.1	594	10,434	4.5	1,493
Stockpiles	15	4.2	2	-	-	-	-	-	-	15	4.2	2
Sub-Total Kundana Gold	1,104	4.1	147	4,850	4.8	755	4,495	4.1	594	10,449	4.5	1,495
CARBINE PROJECT												
Surface	-	-	-	1,008	3.0	96	7,091	1.4	315	8,099	1.6	411
Underground	-	-	-	422	6.0	82	360	6.2	72	782	6.1	153
Sub-Total Carbine	-	-	-	1,430	3.9	178	7,451	1.6	387	8,881	2.0	564
EAST KUNDANA JOINT VENTURE												
Surface	-	-	-	148	4.8	23	201	1.6	10	349	3.0	33
Underground	1,310	7.1	298	2,919	6.2	580	768	5.4	135	4,997	6.3	1,013
Stockpiles	23	5.2	4	-	-	-	-	-	-	23	5.2	4
Gold in Circuit	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total East Kundana JV	1,333	7.0	302	3,067	6.1	603	969	4.6	145	5,369	6.1	1,050
PAULSENS PROJECT												
Surface	-	-	-	129	3.1	13	860	2.0	54	989	2.1	67
Underground	260	5.7	48	116	5.3	20	100	5.1	16	477	5.5	84
Stockpiles	11	1.6	1	-	-	-	-	-	-	11	1.6	1
Gold in Circuit	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total Paulsens	272	5.6	49	245	4.2	33	960	2.3	70	1,477	3.2	152
ASHBURTON PROJECT												
Surface	-	-	-	7,104	2.4	546	14,227	2.5	1,122	21,331	2.4	1,668
Stockpiles	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total Ashburton	-	-	-	7,104	2.4	546	14,227	2.5	1,122	21,331	2.4	1,668
CENTRAL TANAMI PROJECT JV												
Underground/Surface	2,502	2.9	232	4,430	2.8	400	4,842	2.9	453	11,774	2.9	1,085
Stockpiles	560	0.7	13	-	-	-	-	-	-	560	0.7	13
Sub-Total Central Tanami JV	3,062	2.5	245	4,430	2.8	400	4,842	2.9	453	12,334	2.8	1,097
WESTERN TANAMI PROJECT												
Underground/Surface	107	7.8	27	1,079	6.0	208	1,449	5.8	271	2,636	6.0	506
Stockpiles	375	1.4	17	-	-	-	-	-	-	375	1.4	17
Sub-Total Central Tanami JV	482	2.8	44	1,079	6.0	208	1,449	5.8	271	3,011	5.4	523
SOUTH KALGOORLIE PROJECT												
Surface	348	3.2	36	20,517	1.8	1,169	17,283	1.8	1,023	38,148	1.8	2,228
Underground	651	5.0	105	6,484	3.3	686	7,939	2.4	622	15,074	2.9	1,414
Stockpiles	537	1.5	26	-		-				537	1.5	26
Gold in Circuit												
Sub-Total South Kalgoorlie	1,536	3.4	168	27,000	2.1	1,855	25,222	2.0	1,645	53,759	2.1	3,668
POGO PROJECT (AS AT 1 JULY 2018)												
Underground	-	-	-	3,316	15.7	1,674	5,477	14.1	2,476	8,763	14.7	4,150
Stockpiles	-	-	-	-	-	-	-	-	-	-	-	-
Sub-Total Pogo	-	-	-	3,316	15.7	1,674	5,477	14.1	2,476	8,763	14.7	4,150
NORTHERN STAR TOTAL	**16,821**	**3.2**	**1,704**	**87,869**	**3.5**	**10,024**	**83,067**	**3.3**	**8,724**	**187,727**	**3.4**	**20,451**

Note:

1. Mineral Resources are inclusive of Reserves.
2. Mineral Resources are reported at various gold price guidelines (a. AUD $1,750/Oz Au- Jundee, Kanowna, Kundana Gold, Carbine, East Kundana JV, Jundee, Paulsens b. AUD $1,850 /Oz Au -Ashburton).
2. Pogo Mineral Resources are reported at a 6.17gpt cutoff grade
3. Western Tanami Project Resources are reported to JORC (2004) standards
4. Rounding may result in apparent summation differences between tonnes, grade and contained metal content.
5. Numbers are 100 % NST attributable.
6. With the exception of Pogo, all JORC (2012) Table 1 presented in the ASX release dated 2nd August 2018 remain valid.

Competent Persons:

1. Brook Ekers (NST) - Jundee Gold Project; Kanowna Gold Project; Kundana Gold Project; Carbine Project; East Kundana JV; Paulsens Project; Ashburton Project; Central Tanami Project JV; Western Tanami Project; South Kalgoorlie Project
2. Darren Cooke (NST) - Pogo Gold Project
3. Aaron Green (CSA Global) - Pogo Gold Project

APPENDIX B – TABLE 1s

JORC Code, 2012 Edition – Table 1 Report
Pogo Gold Mine - October 2018
Section 1 Sampling Techniques and Data
(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
Sampling techniques	Nature and quality of sampling (e.g. 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.	The Pogo deposits (Liese, North Zone, East Deeps, South Pogo and Fun Zone) were sampled using diamond drill holes (DD) completed from both surface and underground campaigns drilled between 1994 and 2018. A total of 4,481 DD holes for 2,321,327 feet (707,549 m) were drilled to inform the Mineral Resource estimate reported herein. Other sampling methods employed in sampling the Pogo vein systems include production drilling chip sampling (sludge sampling), muck (stockpile) sampling and sporadic underground face chip sampling. These samples were excluded from the dataset used to generate the reported Mineral Resource estimate.
	Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.	Diamond drilling is sampled based on geological and mineralisation boundaries identified by the geologists during logging. Geological or mineralisation boundaries identified by geologists are, where possible, not crossed for sampling purposes. Sampling intervals are set at a minimum sample size of 0.5ft (0.15m) and a maximum sampled interval of 5ft (1.52m).
	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 (e.g. 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30g 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 (e.g. submarine nodules) may warrant disclosure of detailed information.	Diamond drilling was used to collect the samples used in the resource estimation dataset. All drill core is comprehensively logged and intervals for sampling selected based on geological and mineralogical observations by the geologist. Where practicable, samples are not collected across lithological or mineralisation boundaries. Sampling protocols at Pogo vary dependent on the purpose of the drill hole: • Exploration Drilling: Wide-spaced drilling or holes drilled for non-resource conversion purposes are cut using an Almonte core saw and half core submitted for analysis. The non-assayed portion of the core is stored on-site for a period of five years; • Resource Definition Drilling: Infill drilling for defining or converting resources to a higher confidence category are whole-core sampled, with the non-assayed portion of the core periodically disposed. For NQ core samples, minimum sample size of 0.5ft (0.15m) and a maximum sampled interval of 5ft (1.52m). For HQ drill core that is whole core sampled, samples are collected at a minimum interval of 4 inches (0.1m) and a maximum of 2.5ft (0.76m). When the HQ samples are half-core cut, the maximum sample is extended to 5ft (1.52m). Quartz vein, fault zones, silica flooding and quartz stockwork zones are sampled plus the adjacent five feet (1.52m) above and below the quartz or fault zone. Samples are crushed to 70% passing 2 mm prior to selection of a 250-gram split which is then pulverised. A 30-gram sub-sample is then selected for fire assay with a gravimetric finish (underground holes) or atomic absorption spectroscopy (AAS) finish (surface holes).
	Drill type (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g. 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.).	Drilling has been carried out from both surface and underground. Underground drilling is completed predominantly using NQ2 (50.6mm core diameter) or BQ (36.4mm core diameter) holes, however larger HQ (63.5mm diameter core) and PQ (85.0mm core diameter) holes are completed for long exploration drill holes or when poor ground conditions are encountered or expected. Surface drill holes are typically collared using PQ / HQ diameter tools and reduced to NQ2/NQ2 where necessary. Core drilled between 2009 and 2017 was generally not oriented. Since 2018, orienting of exploration drill holes using the Reflex Act III tool was introduced.

Criteria	JORC Code explanation	Commentary
		The following table provide details on the quantity and types of drill core drilled by year at the Pogo deposit:

	Feet Drilled by hole Type													
Year	15U	BQ	BQTK	HQ	HQ/NQ	MCR	NQ	NQ/BQ	NQ2	PHB	PHD	PHJL	PQ	Unknown
Unknown				34002					4385	215				82708
1994							1374							1985
1995							2011							11090
1996														19143
1997							2000							46219
1998		1175												90095
1999		3333			1519		45646.3							2113
2000			25926.5		1104		30772.5		11455					2112
2002							31594							
2005							16889.5		22622					
2006							46274	4016	12					1056
2007							34772.6		35885					
2008				6826			38341.4		99857	80				269
2009									105277					
2010								240	101434					999
2011							855		162367					3267
2012	220			28887.6			3620		154904	470	680		1503	13908
2013				96202.3			19655	409	147351	1272	5621.5			9470
2014				81471.4		274.5	96723.2	681	103888	393	6362			12130
2015	296			153492			76270.5		114327	156	2876			8844
2016				109920			1189		135385	371	540	50		
2017				67916.5			1318		162143	371	42			
2018									110510	90	220			
Feet Drilled Total	**516**	**4508**	**25,926.5**	**578,717**	**2623**	**274.5**	**449,306**	**5346**	**1,471,802**	**3418**	**16,341.5**	**50**	**1503**	**305,407**

Drill sample recovery	Method of recording and assessing core and chip sample recoveries and results assessed.	Core recovery is recorded for DD holes. Recovery is measured to the tenth of a foot (~3cm) and is recorded in the Recovery tab using Rockware Logplot 7 software. In general, recoveries are excellent and no significant issues with core loss are recognised.
	Measures taken to maximise sample recovery and ensure representative nature of the samples.	Core is processed at the Pogo core processing facility. For DD the contractors adjust their rate of drilling and method if recovery issues arise. All recovery is recorded by the drillers on core blocks. This is checked and compared to the measurements of the core by the geological team. Any issues are communicated back to the drilling contractor
	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.	There is no known relationship between sample recovery and grade. Overall recoveries are excellent and no significant issues with core loss are recognised.

Criteria	JORC Code explanation	Commentary
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.	Core logging is carried out in accordance with Pogo Mines core logging procedures manual, which is an extensive and comprehensive document. Data recorded includes, but is not limited to, lithology, structure, alteration assemblages, sulphide mineralogy, geotechnical parameters (recovery and RQD), and the presence of visible gold. Drill core is logged electronically using Rockware Logplot 7 software. Logging and sampling are carried out according to Pogo Mines protocols and are consistent with industry standards. Lithology is measured to the tenth of a foot (~3cm) scale marked from the closest core block. Rock codes have been set up specifically for the project. Logging is to a sufficient level of detail to support appropriate Mineral Resource estimation and mining studies.
	Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc.) photography.	Drill logging is both qualitative (geological features) and quantitative (geotechnical parameters) in nature. Every core tray is photographed wet.
	The total length and percentage of the relevant intersections logged.	All drill holes are logged in full, from start to finish of the hole. All intersections are logged.
Sub-sampling techniques and sample preparation	If core, whether cut or sawn and whether quarter, half or all core taken.	Diamond core drilled for Resource Definition is whole core sampled. Core drilled for exploration purposes is cut in half onsite using an industry standard Almonte core saw.
	If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.	No non-core samples have been used in the Mineral Resource estimate.
	For all sample types, the nature, quality and appropriateness of the sample preparation technique.	All sample preparation and assaying of Pogo drill core is currently being performed by Bureau Veritas (BV). Pogo sends drill core to BV in Fairbanks where the core is prepared, and a pulp is sent to the BV laboratory in Reno, Nevada or Vancouver, British Columbia for assay. Typically, the gold assays are completed in Reno and the multi-element assays are completed in Vancouver. Sample preparation includes drying, crushing to 70% passing 2 mm, splitting of a 250 g subsample, and pulverising to 85% passing 75 µm. The sample preparation techniques are considered appropriate for the style of mineralisation.
	Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.	Pogo Mine uses an industry standard QAQC programme involving standards, blanks and field duplicates which are introduced in the assay batches at an approximate rate of one control sample per eight normal samples. QC results are analysed immediately upon return of a sample batch and reported to management monthly. Overall results demonstrate no significant QAQC issues with the analytical laboratory and no systematic bias observed. Protocols are in place to deal with QAQC results that fail. In addition to Pogo QAQC, the analytical laboratory is ISO certified and conducts rigorous internal QAQC checks. Internal QAQC reports provided to Pogo personnel do not indicate any issues with the quality of the analysis provided.
	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.	Field duplicates are submitted when half core is taken to ensure that the sampling is representative of the in-situ material being collected.
	Whether sample sizes are appropriate to the grain size of the material being sampled.	Duplicate sample results correlate well, hence sample sizes are considered to be acceptable to accurately represent the gold mineralisation at Pogo Mine. Sample sizes are considered to be appropriate and correctly represent the style and type of mineralisation.
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.	The Pogo drill core is analysed using industry standard analytical techniques. For the underground holes, gold is determined by 30 g fire assay with a gravimetric finish. In holes drilled for exploration purposes, gold content is determined by 30 g fire assay with atomic absorption finish (AAS). Exploration results analysed by fire assay with the AAS finish returning > 10 ppm (0.292 oz/ton) gold are re-assayed by fire assay with gravimetric finish Select samples are assayed for forty-five elements multi-acid digestion and ICP-MS/ES finish. The technique is considered total and appropriate for the style of mineralisation under consideration.
	For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model,	No geophysical tools were used in this resource estimate.

Criteria	JORC Code explanation	Commentary
	reading times, calibrations factors applied and their derivation, etc.	
	Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.	Quality control samples are inserted into the sample stream. Non-certified standards, blanks and duplicates are inserted randomly, however aim to achieve an insertion rate of approximately one in every eight samples. The Pogo Mine generates its own in-house standards from ore grade material from the mine. In-house standards are prepared at the Pogo assay laboratory, with a round-robin approach to determine the recommended value and acceptable limits. Blanks are also produced in-house and are generated from a local source of barren basalt and crushed to nominal one-inch size and inserted into sample bags prior to including into the laboratory submittal. Sand is also used as a blank. Monitoring of QA/QC results is performed by the resource geologists upon importing the individual assay certificates into the drill hole database. When failures occur, the resource geologists notify the geologist responsible for the drill hole or the core processing facility supervisor.
Verification of sampling and assaying	The verification of significant intersections by either independent or alternative company personnel.	Significant intersections are routinely inspected by alternative company personnel.
	The use of twinned holes.	No twinned holes have been complete at Pogo.
	Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.	All diamond core is carefully logged. Logging takes place at the core processing facility. Core logging (geological and geotechnical) is completed using Logplot 7 software. Logplot 7 software was designed to decrease logging and date entry time and standardise logs through the use of specific logging codes. The core logging procedures manual provides guidance to the user. Logplot 7 files are imported directly using GeoLogger. GeoLogger, a Microsoft® Access application developed by GEMS for use by Pogo, imports samples, geologic logs and down-hole surveys into the main drill hole database. All Pogo data is stored as SQL Server databases. Validation protocols are built into the importation process ensure data integrity.
	Discuss any adjustment to assay data.	No adjustments were made to the assay data.
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.	Drill rigs are aligned using the Reflex TN14 Gyrocompass. Underground collar locations underground are surveyed after completion of the drill hole using a Leica 1200 series survey station. On surface, collar locations are surveyed using a Leica RTK-GPS survey station. Downhole surveys for underground drill holes are collected at 50 ft downhole from the collar and every 100 ft thereafter using a Reflex® EZ-Trac multi-shot survey instrument. Surface drill holes are survey every 200 ft. A final survey is taken at the end of all drill holes. Deviation at the initial survey is checked against plan and the hole is redrilled if there is excessive deviation (>5%).
	Specification of the grid system used.	The grid system used is the North American Datum of NAD83 (NAD83) AKSP-3.
	Quality and adequacy of topographic control.	High quality LiDAR topographic mapping is utilised at Pogo. All Mineral Resources reported are below surface.
Data spacing and distribution	Data spacing for reporting of Exploration Results.	Drill hole spacing is highly variable. Well-drilled areas are tested by drilling on approximately 20 by 20 feet patterns, extending out to 200 feet at the peripheries of the deposits.
	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 drill hole spacing, combined with estimation quality parameters such as slope of regression and average distance to sample, were used to classify the Mineral Resource estimate. The data spacing, and distribution is considered sufficient to support the reporting of Indicated and Inferred Mineral Resources.
	Whether sample compositing has been applied.	No compositing was applied prior to submission of samples for analysis.
Orientation of data in relation to	Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.	Where practicable, the drilling was designed to intersect the mineralisation as perpendicular as possible to the dominant vein geometries. In some circumstances, the lack of drill positions resulted in holes that were oblique to the mineralisation.

Criteria	JORC Code explanation	Commentary
geological structure	If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.	The Competent Persons believe that no bias has been introduced to the data, as no single potentially bias inducing orientation dominates in any given area.
Sample security	The measures taken to ensure sample security.	Chain of custody is managed by Pogo Mine personnel. All core samples are received intact and in their entirety in their core trays at the Company's secure core processing facility. All sampling and work on the samples is carried out within the confines of this secure facility. Pogo uses pre-numbered sample ticket books for sample numbers. The drill hole number, sample interval, and date are recorded on each ticket and the tear-off ticket is labelled with the sample interval and stapled onto the core box. Core is placed in bags with the sample number marked in permanent marker and the bar code stapled to the bag. After sampling is complete, the sample bags are scanned and placed in rice bags labelled with the drill hole number and the sample sequence, ready for submission to the laboratory. Bags are sealed with a zip-tie. Samples are transported via road to the sample preparation facility in Fairbanks, Alaska. Upon receipt, any issues with sample condition is reported to Pogo personnel.
Audits or reviews	The results of any audits or reviews of sampling techniques and data.	In March 2018, Sumitomo Metal Mining Pogo LLC (SMM Pogo) commissioned Mine Technical Services Ltd. (MTS) to complete a review audit of standard procedures currently in use at the Pogo Mine in Central Alaska. Drilling, logging, sampling, analytical, QA/QC, database, modelling, density, ore control, resource estimation, mine planning, metallurgy and reconciliation procedures were audited. The CSA Global and NST Competent Persons have also reviewed sampling and assaying procedures during recent site visits. While minor recommendations for improvement were made, sampling techniques and data were generally found to be well-considered and consistent with industry good practise. CSA Global and NST personnel completed validation of the database for internal consistency and any obvious errors prior to preparation of the Mineral Resource estimate. Checks were completed for overlapping intervals, sample intervals extending beyond the hole depth, from > to intervals, and missing from or to values. Some issues were rectified. Various other potential issues such as missing surveys, missing sample data, and missing interval etc. were also identified for further review.

Section 2 Reporting of Exploration Results

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

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.	The total tenement area comprising the Pogo project consists of 1,259 state mining claims (17,079 ha) in addition to the mine lease claim (641 ha) and the mill site lease (1,385 ha). The Pogo operation is 100% owned by Northern Star Resources. There are no known royalties on the area subject the resource reported in this release.
	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.	Detailed legal due diligence completed as part of the Pogo acquisition demonstrates that the tenure is in good standing and secure. Pogo is a fully permitted and operational mine, and there are no foreseen permitting issues that will prevent development of the resource or any future exploration activities.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	The first modern-day exploration was conducted in the Pogo area by WGM Inc, in 1981, where strong gold-arsenic-tungsten anomalies were identified in stream sediment samples collected from the Pogo and Liese Creeks during regional reconnaissance surveys. WGM staked mining claims over the area. In 1991, the area was incorporated into the Stone Boy Joint Venture, which consisted of large claim groups focused on the Chena, Salcha and Goodpaster River basins. As part of the Stone Boy JV, exploration was conducted by WGM and financed by Sumitomo Mining Metal Corporation Ltd. and others (that later withdrew) as part of an earn-in agreement. Regional grid-based soil sampling was completed between 1991 and 1994, with three diamond drill holes funded by the Japan Oil Gas and Metals National Corporation drilled in 1994 to test a prominent gold-in soil anomaly. Based on successful anomalism returned in the initial three holes, a further 13 were drilled in the Liese Creek are in 1995, one of which was the discovery hole for the Liese vein system and graded 22.7ft at 1.838opt (6.92m @ 63.0gpt). In 1997, Sumitomo signed an agreement with Teck Resources Ltd. to acquire a 40% interest in the Pogo claims and assumed operatorship of the project in 1998. Further surface definition drilling was completed between 1998 and 2004, with the mining operation commencing in 2006.
Geology	Deposit type, geological setting and style of mineralisation.	The Project is located in the Tintina Mineral Belt, which is a 200 km-wide, 1,200 km-long arc, broadly bounded by the Tintina-Kaltag fault systems to the north and the Denali-Fairwell fault systems to the south. The region contains numerous economic deposits of gold in addition to copper, lead, zinc, silver and tungsten deposits. The lithological units in the Pogo deposit area are dominantly high grade metamorphics and later felsic to intermediate intrusive units. Key metamorphic rocks include biotite feldspar gneiss, augen gneiss and mafic schist derived from both sedimentary and igneous protoliths. Metamorphic mineral assemblages observed consist of quartz, feldspar, biotite, chlorite, muscovite, sillimanite, andalusite and garnet. The 50km long Goodpaster batholith (granite-tonalite-diorite) is the dominant intrusive complex in the district. Locally small felsic to intermediate stocks and dykes are present. The principal mineralisation is hosted in biotite-quartz-feldspar paragneiss and orthogneiss, although all other lithologies are cut. Where the veins cross intrusives, they tend to split and become stockwork zones. Gold at Pogo is predominantly hosted within laminated quartz veins ranging in thickness from <0.5m to >10m. Mineralised veins contain around 3% sulphides (arsenopyrite, pyrite, pyrrhotite, loellingite, chalcopyrite, bismithunite, sphalerite, galena, molybdenite, tetradymite, maldonite) and, a variety of Bi-Pb-Ag sulphosalts. The Pogo gold deposit is considered to be an example of a Reduced Intrusive Related Gold Deposit (RIRGD), characterised by a low sulphide content, (typically <5%) and a reduced ore mineral assemblage, that typically comprises pyrite and lacks primary magnetite or hematite. In brief, these deposits typically have the following characteristics; • Mineralisation occurs as sheeted vein deposits or stockwork assemblages and often combines gold with variably elevated Bi, W, As, Mo, Te, and/or Sb but, low concentrations of base metals • Restricted and commonly weak proximal hydrothermal alteration • Spatially and temporally related to reduced intrusions of intermediate to felsic composition.
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: o easting and northing of the drill hole collar o elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar	Not applicable given Exploration Results are not being reported.

Criteria	JORC Code explanation	Commentary
	○ 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.	Not applicable.
Data aggregation methods	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.	Not applicable given Exploration Results are not being reported.
	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.	Not applicable given Exploration Results are not being reported.
	The assumptions used for any reporting of metal equivalent values should be clearly stated.	Not applicable given metal equivalent values are not being reported.
Relationship between mineralisation widths and intercept lengths	These relationships are particularly important in the reporting of Exploration Results.	Not applicable given Exploration Results are not being reported.
	If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.	Not applicable given Exploration Results are not being reported.
	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').	Not applicable given Exploration Results are not being reported.
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.	Diagrams have been included in the body of the announcement.
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.	Not applicable given Exploration Results are not being reported.
Other substantive exploration data	Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.	Not applicable given Exploration Results are not being 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).	Not applicable given Exploration Results are not being reported.
	Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.	Diagrams have been included in this announcement.

Section 3 Estimation and Reporting of Mineral Resources

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

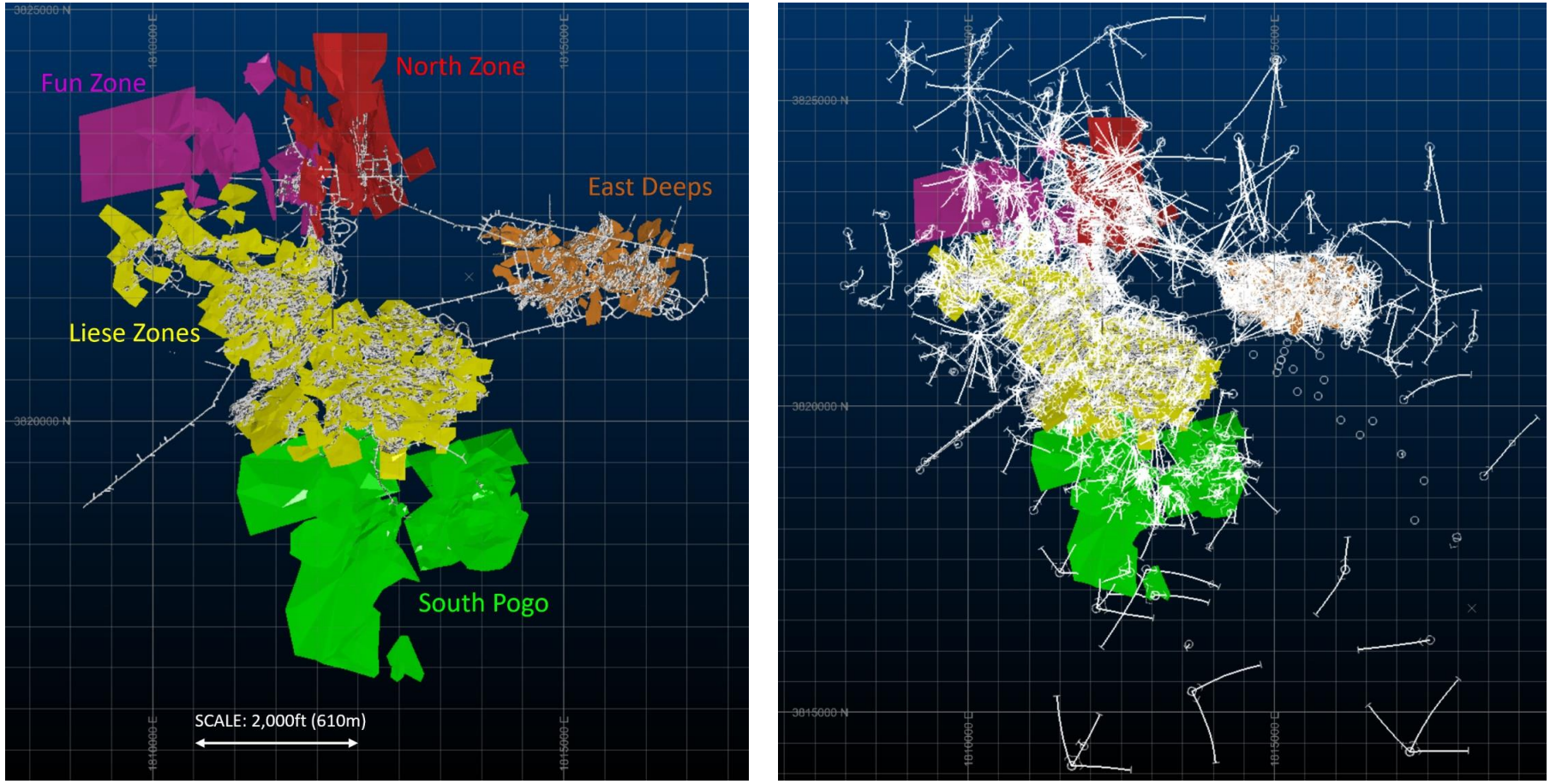
Criteria	JORC Code explanation	Commentary
Database integrity	Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.	Geologic logs saved in Logplot 7 format are imported directly using GeoLogger. GeoLogger, a Microsoft® Access application developed by GEMS for use by Pogo, imports samples, geologic logs and down-hole surveys into the drill hole database. Collar surveys are entered directly into the database in the header table by the geologist responsible for the drill hole. Down-hole surveys are recorded on slips of paper into GeoLogger and a geologist marks the survey as acceptable. The data entry procedures for samples, geologic logs, and down-hole surveys are well documented in the Pogo logging manual. All Pogo data is stored as SQL Server databases, including the drill hole database, the ore control database, and the RFID database. The data entry procedures and use of templates minimise the chance of the data being corrupted.
	Data validation procedures used.	All data was validated prior to preparation of this Mineral Resource estimate. Drill hole data was provided to CSA Global as an Access Database and imported into MICROMINE by a Senior Data Specialist to perform a series of validation exercises. Overlapping intervals, intervals that extend beyond the hole depth, intervals where from > to and missing from or to values were rectified.
Site visits	Comment on any site visits undertaken by the Competent Person and the outcome of those visits.	A site visit was completed by the CSA Competent Person from 25 June through 1 July 2018. The NST competent person has spent 3 weeks on site at Pogo between June and September 2018. Detailed review of systems and practices were undertaken. Underground workings, drill rigs and core yard facilities were inspected. Several areas for improvement in the current systems were noted, however no issues were identified that would preclude the reporting of Mineral Resource estimate in accordance with the JORC Code.
	If no site visits have been undertaken indicate why this is the case.	Not applicable.
Geological interpretation	Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.	Five major zones were modelled, Liese, Eastern Deeps, North Zone, South Zone and Fun Zone to support the Mineral Resource estimate. There is a reasonable confidence in the interpretation, which divides the deposit into numerous lenses of mineralisation for each deposit area. It is expected that the interpretation is likely to materially change on a local basis, given the structural complexity, however a higher level of confidence exists in the broader mineralisation interpretations. Liese – Quartz veins were modelled based on lithological logging, however 4 g/t Au intervals were selected in the absence of logged quartz veins. Eastern Deeps – Quartz veins were modelled based on lithological logging, however 4 g/t Au intervals were selected in the absence of logged quartz veins. 36 lodes were modelled, two very significant in terms of volume. North Zone – Quartz veins were modelled based on logging, however 4 g/t Au intervals were selected in the absence of logged quartz veins. 37 lodes were modelled, two very significant in terms of volume. South Pogo – Quartz veins were modelled based on lithological logging, however nominal 2 g/t Au intervals were selected in the absence of logged quartz veins. 17 lodes were modelled. Fun Zone – Quartz veins were modelled based on lithological logging, however 4 g/t Au intervals were selected in the absence of logged quartz veins.
	Nature of the data used and of any assumptions made.	Drill hole logging and Au grades have been used to assist in the interpretation of the mineralisation. It is assumed that the logging data is accurate.
	The effect, if any, of alternative interpretations on Mineral Resource estimation.	Alternative interpretations are probable for the less continuous lenses at each deposit. A higher confidence exists in the more significant continuous lenses, which are often supported by mining. Alternative interpretations for these lenses are generally not plausible.
	The use of geology in guiding and controlling Mineral Resource estimation.	The structural framework, which is relatively well-known after many years of mining, has guided interpretation.
	The factors affecting continuity both of grade and geology.	Mineralisation is hosted in quartz veins – which have filled dilational zones within the brittle host rock sequence. Mineralisation also occurs as a stockwork system. Continuity of the veins (geological continuity) and stockwork is governed by structural deformation porosity. The mineralisation displays a moderate nugget component with significant short-range grade variability.
Dimensions	The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.	Liese – The generally shallowly north-westerly dipping Mineral Resource extends approximately 720m in a north-easterly direction along strike and 1,300m down dip. Eastern Deeps – The shallow to moderately north-westerly dipping Mineral Resource extends approximately 530m in a north-easterly direction along strike, and 600m down dip. North Zone – The steeply east dipping Mineral Resource extends approximately 760m in a northerly direction along strike, 300m in a westerly direction across strike, and 610m down dip.

Criteria	JORC Code explanation	Commentary
		South Pogo – The moderately north-westerly dipping Mineral Resource extends approximately 720m in a northeasterly direction along strike, and 660m down dip.
Estimation and modelling techniques	The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.	Vein wireframes were used to select drill hole samples, and the database table minzon was assigned the domain code in the field minzon. Based on the drill hole coding, samples from within the mineralisation wireframes were used to conduct a sample length analysis. Based on the review, a 4 ft composite length was selected for all deposits. Semivariograms were modelled in SupervisorTM for the domain groups. The semivariogram models predominantly display low nuggets, a short-range spherical structure that generally accounts for a high proportion of the total variance for all variables and a long-range spherical structure. Kriging Neighbourhood Analysis (KNA) was used for all deposits to optimise search parameters. Search parameters for each deposit are summarised below. o Liese –.Min 4 Max 28 samples. SE 2/3 of maximum range in all directions first pass. Second pass used 1.5 times range, third pass used 2 times range. Fourth pass used 3 times range. Sichel mean applied to all blocks not estimated after passes. o Eastern Deeps – Min 4 Max 30 samples. SE 2/3 of maximum range in all directions first pass. Second pass used the full range. Third pass 1.5 range. Maximum drill hole constraint not removed for third. Just Au estimated. As, Bi, Hg exist but not estimated. Ordinary kriging. Hard boundaries between all the different lodes. Sichel mean applied to blocks not informed by the third pass o North Zone – Min 4 Max 28 samples. SE 2/3 of maximum range in all directions first pass. Second pass used the full range. Max 3 samples per drill hole. Third pass double range and maximum drill hole constraint removed. Just Au estimated. As, Bi, Hg exist but not estimated. Sichel mean applied to blocks not informed by the third pass. o South Pogo – first and second passes min 6 and max 12 samples, max 3 samples per hole; third pass min 2 and max 12 samples, max 6 samples per hole. First pass 1 times maximum range in all anisotropic directions, second pass 2 times range, third pass 875 ft. Discretisation 2 by 4 by 2 (X by Y by Z). Just Au estimated. As Bi, Hg exist but not estimated. Sichel mean applied to blocks not informed by third pass. Liese 2 extension, which was updated internal to the South Pogo model, used first and second passes min 6 and max 14 samples, max 3 samples per hole; third pass min 2 and max 16 samples, max 2 samples per hole. First pass 1 times maximum range in all anisotropic directions, second pass 2 times range, third pass 1,000 ft. Discretisation 2 by 4 by 2 (X by Y by Z). Just Au estimated. As Bi, Hg exist but not estimated. Sichel mean applied to blocks not informed by third pass. o Fun Zone – first and second passes min 6 and max 16 samples, max 3 samples per hole; third pass min 2 and max 16 samples, max 2 samples per hole. First pass 1 times maximum range in all anisotropic directions, second pass 2 times range, third pass 1,500 ft. Discretisation 2 by 4 by 2 (X by Y by Z). Just Au estimated. As Bi, Hg exist but not estimated. Sichel mean applied to blocks not informed by third Block models were constructed using Surpac software and coded by the object number from the vein wireframes to form individual mineralisation domains for each object. Gold in oz per short ton was estimated into the au_cut field. Estimation of grades for the vein domain was undertaken by Ordinary Kriging using top-capped composites restricted to the corresponding mineralisation domain in the block model minzon field.
	The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.	The current Mineral Resource estimate is the first to be reported in accordance with the JORC Code. A previous foreign estimate dated December 2017 was produced based on a fundamentally different mineralisation modelling paradigm; using implicitly generated vein models. While the current and previous estimates were based on different modelling methods, the previous estimate reports grades and tonnages that broadly correspond to those of the current estimate which provides general validation for the current model.
	The assumptions made regarding recovery of by-products.	No assumptions have been made regarding the recovery of by-products.
	Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).	Deleterious elements are not modelled, nor do they require modelling at present.
	In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.	The block sizes in relation to the average sample spacing are summarised below. o Liese – 40 Y by 10 X by 10 Z (feet) block. Drill spacing 15 to 200 feet. Mean approx. 40 feet. o Eastern Deeps – 40 Y by 10 X by 10 Z (feet) block. Drill spacing 15 to 200 feet. Mean approx. 40 feet. o North Zone – 40 Y by 10 X by 10 Z (feet) block size. Drill spacing highly variable from 60 to 200 feet. Mean approx. 80 feet. o South Pogo – 40 Y by 10 X by 10 Z (feet) block size. Drill spacing highly variable from 60 to 200 feet. Mean approx. 80 feet. o Fun Zone – 40 Y by 10 X by 10 Z (feet) block. Drill spacing 30 to 200 feet. Mean approx. 80 feet.
	Any assumptions behind modelling of selective mining units.	No assumptions have been made regarding selective mining units.

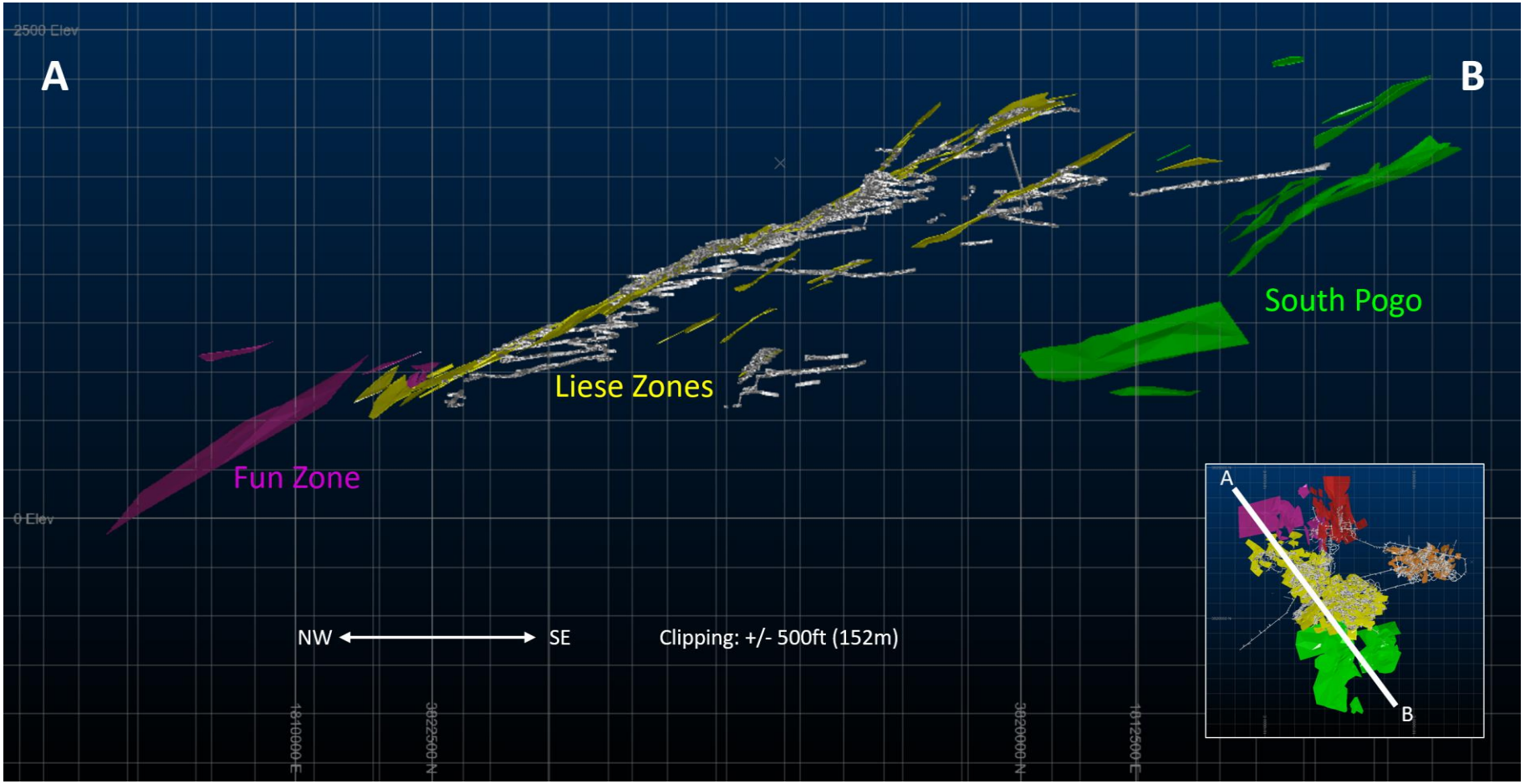
Criteria	JORC Code explanation	Commentary
	Any assumptions about correlation between variables.	No assumptions have been made regarding correlation between variables.
	Description of how the geological interpretation was used to control the Resource estimates.	Drill hole sample data was flagged using domain codes generated from the mineralisation interpretations, which were completed with due consideration of the structural framework at Pogo. Mineralisation boundaries were treated as hard boundaries for grade estimation.
	Discussion of basis for using or not using grade cutting or capping.	A review of grade outliers was undertaken for each deposit to ensure that extreme grades are treated appropriately during grade interpolation. Although extreme grade outliers within the grade populations of variables are real, they are potentially not representative of the volume they inform during estimation. If these values are not cut, they have the potential to result in significant grade over-estimation on a local basis. The cutting strategy was considered and applied as follows: o Review histograms and log-probability plots for values beyond a lognormal distribution o Review mean-variance plots to ensure that potential top-cuts did not have significant impact on the mean and variance o Cut the values from the populations for the domain for statistical assessment o Reset the data exceeding the maximum value, which were cut from the statistical assessment, to that maximum. Cutting was applied on a lode by lode basis.
	The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.	Block model validation was completed using visual methods in section and 3D with comparisons made between the input raw drill hole data, composites and blocks, and numerical validation methods, such as histogram, log-probability and swath plots. The validation showed the strong conditional bias predicted from the estimation approach, but the block model estimates appropriately reflect the composites, showing a reasonable local estimate.
Moisture	Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.	Tonnages are estimated on a dry basis.
Cut-off parameters	The basis of the adopted cut-off grade(s) or quality parameters applied.	The Mineral Resources have been reported at a cutoff of 6.17 g/t Au, or 0.18 oz/short ton, which, in the opinion of the Competent Person, is a suitable lower cutoff as required by the reasonable prospects hurdle.
Mining factors or assumptions	Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.	Pogo is an underground gold mine producing 900 ktpa to produce approximately 300 koz of gold per annum. After significant time validating underground workings, including stopes and development, the block model was coded with 'mined = 1' where sub-block centroids were inside any of the solid wireframes. These wireframes are not a true reflection of the workings received, as the validation removed many triangles to allow the objects to become valid for coding the block model. However, CSA Global estimates from visual review the valid object are likely to be within 95% of the volume of the original wireframes. Grades and densities with 'mined = 1' were not reset, which allows the model to be reconciled against previous MREs. Mined areas were not reported.
Metallurgical factors or assumptions	The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.	Pogo is an underground gold mine and CIL processing plant. Gold recovery is currently ~90%. There are no indications in the available data that metallurgical factors change in the material estimated in this Resource model.
Environmental factors or assumptions	Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a green fields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.	Pogo is an operating mine that is fully permitted in accordance with United States federal laws and regulations in addition to Alaskan state laws and regulations. Waste and residual process material is used as either components in rockfill, paste fill or stored on the dry stack tailings facility. There is currently adequate storage capacity at site that would enable waste disposal of the material that potentially may be generated by extraction of future economic material in the Resource estimate.
Bulk density	Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.	A density of 2.68 g/cm3, or 0.0835 short ton/ft3 was used for the mineralisation.
	The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit.	The density value has been based on testwork conducted on 121 samples taken from the operating mine, across each of the main mineralised zones. The weighted average of these samples was determined and has been chosen as the applied density.

Criteria	JORC Code explanation	Commentary
	Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.	The lithologies which host the gold mineralisation contain a significant abundance of quartz. There is no major lithological variation which would justify the assignment of different densities for different materials.
Classification	The basis for the classification of the Mineral Resources into varying confidence categories.	The Mineral Resource has been classified as both Indicated and Inferred on a semi qualitative basis, following due consideration of all criteria contained in Section 1 a d section 2 of JORC Table 1, and statistical parameters pertaining to the estimate quality; including estimate slope of regression, minimum and average distances to informing samples, number of informing samples and search pass number.
	Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).	Appropriate account has been taken of all relevant criteria including data integrity, data quantity, geological continuity, and grade continuity.
	Whether the result appropriately reflects the Competent Person's view of the deposit.	The Mineral Resource estimate appropriately reflects the Competent Person's views of the deposit.
Audits or reviews	The results of any audits or reviews of Mineral Resource estimates.	The current model has not been audited by an independent third party but has been subject to CSA Global's internal peer review processes.
Discussion of relative accuracy/ confidence	Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.	The Mineral Resource accuracy is communicated through the classification assigned to this Mineral Resource. The Mineral Resource estimate has been classified in accordance with the JORC Code, 2012 Edition using a qualitative approach. All factors that have been considered have been adequately communicated in Section 1 and Section 3 of this Table.
	The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.	The statement relates to global estimates of tonnes and grade.
	These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	Global reconciliation between historic mine production and the Resource estimate indicated the model is robust.

REPRESENTATIVE PLANS & CROSS SECTIONS



(LEFT): Plan view of the Pogo Resource interpretation with development shown; (RIGHT): Plan view of drill hole data used in the Resource estimate. Units are shown in feet.



(ABOVE): Representative cross section through the Pogo deposit showing the Resource interpretation of the mineralised veins. Existing development is shown in white.