oreas
an analytichem company

Ore Research & Exploration P/L **ABN** 28 006 859 856
37A Hosie Street, Bayswater North, VIC 3153, Australia
P +61 3 9729 0333 | **E** info@ore.com.au | **oreas.com**

CERTIFICATE OF ANALYSIS FOR

CERTIFIED REFERENCE MATERIAL

OREAS 909

Copper Ore

Sepon Copper–Gold Mine, Savannakhet Province, Lao P.D.R.

Accredited for compliance with ISO 17034

ISO 9001

COA-2128-OREAS 909-R0 Template ID: BUP-70-10-03 Ver:0.4	27-Apr-2026

Table 1. Certified Values, Uncertainty & Tolerance Intervals in OREAS 909.

Constituent	Certified Value	95% Expanded Uncertainty		95% Tolerance Limits	
		Low	High	Low	High
Pb Fire Assay					
Au, Gold (ppb)	79.6	75.1	84.2	74.7*	84.6*
4-Acid Digestion					
Ag, Silver (ppm)	6.25	5.62	6.88	6.07	6.42
Cu, Copper (ppm)	8472	8338	8605	8416	8528
S, Sulphur (wt.%)	0.694	0.674	0.715	0.686	0.703
Infrared Combustion					
C, Carbon (wt.%)	2.92	2.86	2.98	2.90	2.95

SI unit equivalents: ppb (parts per billion; 1 x 10^{-9}) ≡ µg/kg; ppm (parts per million; 1 x 10^{-6}) ≡ mg/kg; wt.% (weight per cent) ≡ % (mass fraction).

*Gold Tolerance Limits for typical 30 g lead fire assay are determined from 20 x 1 g INAA results and the Sampling Constant (Ingamells & Switzer, 1973).

Note: intervals may appear asymmetric due to rounding.

Table 2. Indicative Values for OREAS 909.

Constituent	Unit	Value	Constituent	Unit	Value	Constituent	Unit	Value
Pb Fire Assay								
Pd	ppb	*< 5*	Pt	ppb	*< 5*			

SI unit equivalents: ppb (parts per billion; 1 x 10^{-9}) ≡ µg/kg.

Note: the number of significant figures reported is not a reflection of the level of certainty of stated values. They are instead an artefact of ORE's in-house CRM-specific LIMS.

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INTRODUCTION

OREAS reference materials are intended to provide a low-cost method of evaluating and improving the quality of analysis of geological samples. To the geologist they provide a means of implementing quality control in analytical data sets generated in exploration from the grass roots level through to prospect evaluation, and in grade control at mining operations. To the analyst they provide an effective means of calibrating analytical equipment, assessing new techniques and routinely monitoring in-house procedures. OREAS reference materials enable users to successfully achieve process control of these tasks because the observed variance from repeated analysis has its origin almost exclusively in the analytical process rather than the reference material itself. In evaluating laboratory performance with this CRM, the section headed 'Instructions for handling and correct use' should be read carefully.

Table 1 presents the certified values together with their associated 95 % expanded uncertainty and tolerance intervals. Table 2 provides indicative values, including major and trace element characterisation, Table 3 lists indicative physical properties, while Table 4 reports indicative mineralogy determined by semi-quantitative XRD analysis, Gold homogeneity, assessed by INAA, is shown in Table 5 and is further demonstrated through a nested ANOVA (see *Homogeneity Evaluation* section). Finally, Table 6 presents the performance gate intervals for all certified values.

Tabulated results of all analytes together with uncorrected means, medians, standard deviations, relative standard deviations and per cent deviation of laboratory means from the corrected mean of means (PDM[3]) are presented in the detailed certification data for this CRM (**OREAS 909-DataPack.1.0.260304_103742.xlsx**). The certified values and uncertainties in this Certificate are the sole authoritative figures. Any additional significant figures in the DataPack are provided for reference only and do not affect the certified results.

Results are also presented in scatter plots for Au by Pb fire assay and Cu by 4-acid digestion in Figures 1 to 2 respectively, together with ±3SD (magenta) and ±5 % (yellow) control lines and certified value (green line). Accepted individual results are coloured blue and individual and dataset outliers are identified in red and violet, respectively.

INTENDED USE

OREAS 909 is intended to cover all activities needed to produce a measurement result. This includes extraction, possible separation steps and the actual measurement process (the signal producing step). OREAS 909 may be used to calibrate the entire procedure by producing a pure substance CRM transformed into a calibration solution.

OREAS 909 is intended for the following uses:

- For the monitoring of laboratory performance in the analysis of analytes reported in Table 1 in geological samples;
- For the verification/ validation of analytical methods for analytes reported in Table 1;
- For the calibration of instruments used in the determination of the concentration of analytes reported in Table 1. When a value provided in this certificate is used to calibrate a measurement process, the uncertainty associated with that value should be appropriately propagated into the user's uncertainty calculation. Users can determine an approximation of the standard uncertainty by calculating one fourth of

the width of the Expanded Uncertainty interval given in this certificate (Expanded Uncertainty intervals are provided in Table 1).

SOURCE MATERIAL

OREAS 909 was prepared from oxide ore sourced from the Sepon Copper–Gold Mine, Savannakhet Province, Lao P.D.R. The material is representative of oxidised copper mineralisation typical of the Sepon district.

Copper occurs predominantly as finely disseminated phases within a gangue-dominated matrix. Mineralisation comprises minor residual sulphide minerals (including pyrite and chalcopyrite as identified by XRD) together with secondary and/or non-crystalline copper-bearing phases that are not readily detectable by XRD. The gangue mineral assemblage is dominated by quartz, dolomite, clay minerals (muscovite/illite and kaolinite), and minor feldspar and apatite, consistent with a weathered and oxidised ore system.

MINIMUM SAMPLE SIZE

To relate analytical determinations to the values in this certificate, the minimum mass of sample used should match the typical mass that the laboratories used in the interlaboratory (round robin) certification program. This means that different minimum sample masses should be used depending on the operationally defined methodology as follows:

- Au by lead collection fire assay: ≥ 25 g;
- 4-acid digestion with ICP-OES and/or MS finish: ≥ 0.25 g;
- C by infrared combustion furnace/CS analyser: ≥ 0.1 g.

INSTRUCTIONS FOR HANDLING & CORRECT USE

Fine powders pose a risk to eyes and lungs and therefore standard precautions including the use of safety glasses and dust masks are advised.

Pre-homogenisation of the CRM prior to subsampling and analysis is not necessary as there is no particle segregation under transport [13].

All certified values contained within this report refer to the concentration levels in the packaged state. There is no need for drying prior to weighing and analysis.

Authoritative Source of Information

This Certificate of Analysis constitutes the primary and authoritative document for the certified values, associated expanded uncertainties, and their correct use. While the accompanying DataPack provides supporting information, including raw data and uncertainty estimates with additional significant figures, these extended figures are provided solely for transparency, convenience and statistical reference. Users must rely exclusively on the values stated in this Certificate, rounded to an appropriate number of significant figures, for all metrological and analytical purposes. Any discrepancy between values presented in the DataPack and those in this Certificate shall be resolved in favour of the information provided herein.

Notice on Certificate Updates

The version of the Certificate of Analysis (COA) available on the OREAS website is considered the official and most current version. As COAs may be revised following periodic reviews, re-evaluation of data, or the availability of new information, users are strongly advised to refer to the latest online version prior to each use.
It is the user's responsibility to ensure that the most recent and applicable certificate is used to support the traceability, validity, and fitness-for-purpose of the certified reference material (CRM).

Any significant changes to the sections of this certificate will be clearly documented in the revised certificate.

QC Monitoring Using Multiples of the Standard Deviation (SD)

When applying SDs to monitor performance, it is important to recognise that laboratories differ in proficiency, and that different methods have differing levels of precision. Each laboratory has its own inherent SD (specific to an analyte–method–concentration combination), which is not directly comparable to SDs derived from a round robin.

As most data in this round robin came from world-class laboratories, the interlaboratory SDs are narrower than would be expected across a broader mix. To provide more realistic benchmarks, this report presents pooled interlaboratory SDs, incorporating both within-lab variation and between-lab bias. These should be treated as a starting point only, with QC managers refining them against their own control charts.

The performance gates shown in Table 6 are intended only to be used as an initial guide as to what a laboratory may be able to achieve. Over a period of time monitoring your own laboratory's data for this CRM, SDs should be calculated directly from your own laboratory's process. This will enable you to establish more specific performance gates that are fit for purpose for your application as well as the ability to monitor bias. If your long-term trend analysis shows an average value that differs from the certified value, the significance of this bias should be assessed against the combined standard uncertainty of the certified value and the laboratory's own measurement uncertainty. Where the observed difference lies within this combined uncertainty, the bias is generally not considered significant.

PERIOD OF VALIDITY & STORAGE INSTRUCTIONS

The certification of OREAS 909 remains valid, within the specified measurement uncertainties, until at least October 2031, provided the CRM is handled and stored in accordance with the instructions given below. This certification is nullified if the CRM is any way changed or contaminated.

Store in a clean and cool dry place away from direct sunlight.

Long-term stability will be monitored at appropriate intervals and purchasers notified if any changes are observed. The period of validity may well be indefinite and will be reassessed prior to expiry with the aim of extending the validity if possible.

Single-use Sachets

OREAS 909 is available in single-use, 60 g laminated foil sachets. Following analysis, it is the manufacturer's expectation that any remaining material is discarded. It is the user's responsibility to prevent contamination and avoid prolonged exposure of the sample to the atmosphere prior to analysis.

Repeat-use Packaging (e.g., 500 g plastic jars)

After taking a subsample, users should replace the lid of the jar promptly and securely to prevent accidental spills and airborne contamination. OREAS 909 contains a matrix that is not considered strongly hygroscopic under normal laboratory storage conditions*. An indicative moisture value is provided to enable users to monitor potential changes during storage by determining moisture content in their laboratory and comparing the result to the value reported in Table 3 of this certificate. The risk to stability of the CRM in regard to oxidation from the breakdown of sulphide minerals to sulphates is minimal given its sulphur concentration (~0.7 wt.% S).

*The matrix is not considered strongly hygroscopic under typical laboratory storage conditions. Exposure to substantially different temperature and humidity conditions from those prevailing during manufacture may result in minor changes in moisture content due to adsorption of atmospheric water. Hygroscopic moisture refers to weakly bound water adsorbed onto particle surfaces following exposure to ambient conditions. Equilibration with the local atmosphere may occur when the material is exposed as a thin layer (approximately 2 mm thick) for a period of up to 2 hours.

COMMINUTION AND HOMOGENISATION PROCEDURES

The materials constituting OREAS 909 was prepared in the following manner:

- Drying to constant mass at 105° C;
- Crushing and multi-stage milling to 100 % minus 30 microns;
- Homogenisation using OREAS' novel processing technologies;
- Packaging in 60 g units in laminated foil pouches and 500 g units in plastic wide-mouth jars.

PHYSICAL PROPERTIES

OREAS 909 was tested at ORE Research & Exploration Pty Ltd's onsite facility for various physical properties. Table 3 presents these findings that should be used for informational purposes only.

Table 3. Physical properties of OREAS 909.

Bulk Density (kg/m^3)	Moisture (wt.%)	Munsell Notation‡	Munsell Color‡
507	1.04	10YR 6/6	Dark Yellowish Orange

‡The Munsell Rock Color Chart helps geologists and archeologists communicate with colour more effectively by cross-referencing ISCC-NBS colour names with unique Munsell alpha-numeric colour notations for rock colour samples.

MINERALOGY

The semi-quantitative XRD results presented in Table 4 were conducted by Actlabs (Ancaster, Ontario, Canada). Quantification of crystalline mineral phases was performed using the Rietveld method, which involves calculation of the full diffraction pattern from crystal structure data. The material is composed predominantly of quartz and dolomite, with minor muscovite/illite, kaolinite, K-feldspar, calcite, apatite, pyrite and chalcopyrite.

Table 4. Indicative mineralogy of OREAS 909 by semi-quantitative XRD analysis.

Mineral / Mineral Group	% (mass ratio)
Quartz	49.1
K feldspar	4.6
Muscovite/Illite	9.6
Kaolinite	5.2
Dolomite	25.6
Calcite	1.3
Apatite	2.0
Pyrite	1.8
Chalcopyrite	0.8

ANALYTICAL PROGRAM

Ten commercial analytical laboratories participated in the program to certify the elements reported in Table 1. The following methods were employed:

- Gold by Pb collection fire assay (25-50g charge weight) with AAS (5 laboratories) and ICP-OES (5 laboratories) finish;
- Silver, copper and sulphur by 4-acid (HNO_3-HF-$HClO_4$-HCl) digestion with ICP-OES finish (10 laboratories);
- Total C by IR combustion furnace (10 laboratories).

For the round robin program, ten 1 kg test units were collected at predetermined intervals during the bagging stage immediately following homogenisation. To evaluate batch-to-batch variation at individual laboratories, samples were submitted in two batches at weekly intervals. Each batch comprised four 100 g samples, obtained by taking two 100 g scoop splits from each of two separate 1 kg test units. This sampling design enabled a nested ANOVA of the results to assess homogeneity, specifically to determine whether between-unit variance exceeds within-unit variance. This approach demonstrates that the variance of the material is uniformly distributed (see ‘Homogeneity Evaluation’ section below). The homogeneity assessment is based in part on twenty individual INAA results, including paired 10 g test portions taken from each of the ten sampling units.

PARTICIPATING LABORATORIES

1. Actlabs, Ancaster, Ontario, Canada
2. ALS, Brisbane, QLD, Australia
3. ALS, Lima, Peru
4. ALS, Vancouver, BC, Canada
5. Bureau Veritas Geoanalytical, Adelaide, SA, Australia
6. Bureau Veritas Geoanalytical, Perth, WA, Australia
7. CERTIMIN, Lima, Peru
8. Intertek Genalysis, Perth, WA, Australia
9. Intertek Testing Services Philippines, Cupang, Muntinlupa, Philippines
10. SGS del Peru, Lima, Peru

Please note: To maintain anonymity of participating laboratories, the alphabetical list above does not correspond to the Lab ID numbers shown in the scatter plots below.

STATISTICAL ANALYSIS

Certified Values and their uncertainty intervals (Table 1) have been determined for each analyte following removal of individual, laboratory dataset (batch) and 3SD outliers (single iteration). Outlier evaluation was conducted in accordance with ISO 17034:2016 and ISO 33405:2024. While formal statistical tests were applied, professional statistical judgment was also exercised in determining the validity of potential outliers. Assessment of systematic bias and performance using independent control materials (CRMs) was incorporated to ensure compliance with the referenced standards and to establish metrological traceability of the certified values.

95% Expanded Uncertainty provides a 95 % probability that the true value of the analyte under consideration lies between the upper and lower limits and is calculated according to the method outlined in [6] and [16]. All known or suspected sources of bias have been investigated or taken into account.

Indicative (uncertified) values (Table 2) are present where the number of laboratories reporting a particular analyte is insufficient (< 5) to support certification or where interlaboratory consensus is poor. This data is intended for 'informational purposes' only.

Standard Deviation intervals (see Table 6, 'Performance Gates') provide an indication of a level of performance that might reasonably be expected from a laboratory being monitored by this CRM in a QA/QC program. They take into account errors attributable to measurement uncertainty and CRM variability. For an effective CRM the contribution of the latter should be negligible in comparison to measurement errors. There are four sources of measurement error:

- Within-laboratory within-batch variance or analytical precision (repeatability)
- Within-laboratory between-batch variance (reproducibility)
- Between-laboratory variance and
- CRM variability

Performance gates have been calculated from the same filtered data set used to determine the certified value. Outliers are only removed once the absolute homogeneity of the CRM has been independently established, i.e., the outliers must be confidently deemed to be analytical rather than arising from inhomogeneity of the CRM.

For routine submissions (assessing the data quality of a sample batch at one laboratory) the Within-Lab SD can be used as a guide to QC monitoring. Within-Lab SD's include precision errors and batch-to-batch variance but exclude between-laboratory variance. It is calculated from the square root of the average variance for *p* laboratories and is known as the pooled repeatability standard deviation (NIST/SEMATECH e-Handbook of Statistical Methods, 2012, [10]).

Homogeneity Evaluation

For analytes other than gold, the tolerance limits (ISO 16269:2014) shown in Table 1 were determined using an analysis of precision errors method and are considered a conservative estimate of true homogeneity. The meaning of tolerance limits may be illustrated for Cu by 4-acid digestion, where 99 % of the time ($1-\alpha=0.99$) at least 95 % of subsamples ($\rho=0.95$) will have concentrations lying between 8416 and 8528 ppm. Put more precisely, this means that if the same number of subsamples were taken and analysed in the same manner repeatedly, 99 % of the tolerance intervals so constructed would cover at least 95 % of the total population, and 1 % of the tolerance intervals would cover less than 95 % of the total population. ***Please note that tolerance limits pertain to the homogeneity of the CRM only and should not be used as control limits for laboratory performance.***

The homogeneity of gold has been determined by INAA at Actlabs Ancaster using the reduced analytical subsample method which utilises the known relationship between standard deviation and analytical subsample weight (Ingamells and Switzer, 1973 [2]). In this approach the sample aliquot is substantially reduced to a point where most of the variability in replicate assays should be due to inhomogeneity of the reference material and measurement error becomes negligible. Table 5 below shows the gold INAA data determined on 20 x 1 g subsamples of OREAS 909. An equivalent scaled version of the results is also provided to demonstrate an appreciation of what this data means if 30 g fire assays were undertaken without the normal measurement error associated with this methodology. In this instance, the 1RSD of 1.96 % calculated for a 30 g fire assay sample (10.69 % at 1 g weights) confirms the high level of gold homogeneity in OREAS 909.

The gold homogeneity of OREAS 909 has also been evaluated in a **nested ANOVA** of the round robin program. Each of the ten round robin laboratories received four samples on two separate occasions and each batch of four samples were made up of paired subsamples from two different, non-adjacent 1 kg test units (see ‘Analytical Program’ section above). The purpose of the ANOVA evaluation is to test that no statistically significant difference exists in the variance between-units to that of the variance within-units. This allows an assessment of homogeneity across the entire prepared batch of OREAS 909. The test was performed using the following parameters:

- Gold fire assay – 80 samples (10 laboratories each providing analyses on 2 pairs of samples on two occasions);
- 4-acid digestion for Ag, Cu and S – 80 samples (10 laboratories each providing analyses on 2 pairs of samples on two occasions);
- C by infrared combustion furnace – 80 samples (10 laboratories each providing analyses on 2 pairs of samples on two occasions);
- Null Hypothesis, H_0: Between-unit variance is no greater than within-unit variance (reject H_0 if p-value < 0.05);
- Alternative Hypothesis, H_1: Between-unit variance is greater than within-unit variance.

P-values represent the probability that observed differences between within-unit and between-unit variances are due to random variation, with values less than 0.05 indicating statistically significant differences. The dataset was screened for individual and laboratory (batch) outliers prior to analysis. All resulting *p*-values were not statistically significant, and the null hypothesis was therefore retained.

It is important to note that ANOVA is not an absolute measure of homogeneity. Rather, it establishes whether or not the analytes are distributed in a similar manner throughout the packaging run of OREAS 909 and whether the variance between two subsamples from the same unit is statistically distinguishable to the variance from two subsamples taken from any two separate units. A reference material therefore, can possess poor absolute homogeneity yet still pass a relative homogeneity test if the within-unit heterogeneity is large and similar across all units.

Based on the statistical analysis of the results of the inter-laboratory certification program it can be concluded that OREAS 909 is fit-for-purpose as a certified reference material (see ‘Intended Use’ above).

Table 5. Neutron Activation Analysis of Au (in ppm) on 20 x 1 g subsamples showing the equivalent results scaled to a 30 g sample mass typical of fire assay determination.

Replicate No	Au 1 g actual	Au 30 g equivalent*
1	92	87
2	97	88
3	84	86
4	70	83
5	86	86
6	79	85
7	84	86
8	86	86
9	102	89
10	76	84
11	85	86
12	94	87
13	86	86
14	102	89
15	90	87
16	95	88
17	81	85
18	72	83
19	80	85
20	76	84
Mean	86	86
Median	86	86
Std Dev.	9	2
Rel.Std.Dev.	**10.7%**	**1.96%**

*Results calculated for a 30g equivalent sample mass using the formula: $x^{30g\ Eq} = \frac{(x^{INAA} - \bar{X}) \times RSD@30g}{RSD@1g} + \bar{X}$

where $x^{30g\ Eq}$ = equivalent result calculated for a 30g sample mass
(x^{INAA}) = raw INAA result at 1 g
$\bar{X}$ = mean of 1 g INAA results

METROLOGICAL TRACEABILITY

The interlaboratory results that underpin the certified values are metrologically traceable to the international measurement scale (SI) of mass (either as a % mass fraction or as milligrams per kilogram (mg/kg)) [15]. In line with popular use, all data within tables in this certificate are expressed as the mass fraction in either weight percent (wt.%) or parts per million (ppm).

The analytical samples sent to participating laboratories were selected in a manner to be representative of the entire prepared batch of CRM. This representativeness was maintained in each submitted laboratory sample batch and ensures the user that the data is traceable from sample selection through to the analytical results. The systematic sampling method was chosen due to the low risk of overlooking repetitive effects or trends in the batch due to the way the CRM was processed. In line with ISO 17025 [8], each analytical data set received from the participating laboratories has been validated by its assayer through the inclusion of internal reference materials and QC checks during and post analysis.

Participating laboratories were selected based on demonstrated analytical competence, including prior performance in interlaboratory comparison programs conducted by ORE Pty Ltd, with consideration given to their expertise in relevant analytical methods, measurands, and sample matrices. For the measurands reported in this certificate (Table 1), data were sourced from laboratories accredited to ISO/IEC 17025. Where formal accreditation was not held for specific operationally defined measurands, metrological traceability was verified through the use of well-characterised, independently certified reference materials (CRMs) included as control samples in the round robin study.

In accordance with ISO 33405:2024 [5], clause 9.2.5, and ISO 17034:2016 [9], clause 7.12.4b), the use of such control samples provides an acceptable means of demonstrating traceability in the absence of formal accreditation. In this certification program, traceability was further supported by the agreement of measured values for control samples with their known certified values, thereby offering additional confidence in the calibration and validity of measurement results across participating laboratories.

Operationally Defined Measurands
In accordance with ISO 33405:2024, Clause 9.2.4, measurands (analytes) may be certified as operationally defined. For these measurands, traceability to the SI may not be achievable because the analytical procedure involves sample transformations (e.g., leaching or extraction). While instrument calibration can be traceable to appropriate units, the transformation steps themselves are not directly traceable and can only be evaluated through reference comparisons or harmonized procedures.

Accordingly, characterisation of these measurands has been based on the concordance of results obtained from multiple laboratories using a common, well-defined procedure. This approach ensures fitness-for-purpose, fulfilling the requirements for metrological traceability as specified in ISO 17034:2016 and ISO 33405:2024 for operationally defined measurands.

COMMUTABILITY

The certified values reported herein are derived from measurements performed using analytical methods involving sample pre-treatment steps, such as fusion or acid digestion. These processes convert the sample matrix into a chemically simplified and stable form, facilitating calibration traceable to primary standards via solution-based calibration protocols. Due to the established robustness and effectiveness of these pre-treatment methods, issues related to commutability are not expected to impact the suitability of this Certified Reference Material (CRM) for its intended use.

OREAS CRMs are prepared from natural ore materials, ensuring the presence of matrix and mineralogical characteristics representative of typical exploration, mine and process samples. Consistent with ISO 17034:2016 and ISO Guide 30, users are advised to select CRMs with matrix and mineralisation styles closely matching those of their routine samples to minimize matrix effects and enhance analytical comparability. Detailed descriptions of the CRM’s source material and mineralogical characteristics are provided in the ‘Source Material’ section to guide appropriate CRM selection.

PERFORMANCE GATES

Table 6 below shows intervals calculated for two and three standard deviations. As a guide these intervals may be regarded as warning or rejection for multiple 2SD outliers, or rejection for individual 3SD outliers in QC monitoring, although their precise application should be at the discretion of the QC manager concerned (also see 'Intended Use' section below). Westgard Rules extend the basics of single-rule QC monitoring using multi-rules (for more information visit www.westgard.com/mltirule.htm). A second method utilises a 5 % window calculated directly from the certified value.

Standard deviation is also shown in relative percent for one, two and three relative standard deviations (1RSD, 2RSD and 3RSD) to facilitate an appreciation of the magnitude of these numbers and a comparison with the 5 % window. Caution should be exercised when concentration levels approach lower limits of detection of the analytical methods employed as performance gates calculated from standard deviations tend to be excessively wide whereas those determined by the 5 % method are too narrow. One approach used at commercial laboratories is to set the acceptance criteria at twice the detection level (DL) ± 10 %.

i.e., Certified Value ±10 % ±2DL [1].

Table 6. Performance Gates for OREAS 909.

Constituent	Certified Value	Absolute Standard Deviations					Relative Standard Deviations			5 % window	
		1SD	2SD Low	2SD High	3SD Low	3SD High	1RSD	2RSD	3RSD	Low	High
Pb Fire Assay											
Au, ppb	79.6	3.65	72.3	86.9	68.7	90.6	4.58%	9.16%	13.74%	75.7	83.6
4-Acid Digestion											
Ag, ppm	6.25	0.287	5.67	6.82	5.39	7.11	4.60%	9.19%	13.79%	5.94	6.56
Cu, ppm	8472	99	8275	8669	8176	8768	1.16%	2.33%	3.49%	8048	8895
S, wt.%	0.694	0.011	0.673	0.715	0.663	0.726	1.52%	3.03%	4.55%	0.660	0.729
Infrared Combustion											
C, wt.%	2.92	0.037	2.85	3.00	2.81	3.03	1.27%	2.54%	3.81%	2.78	3.07

SI unit equivalents: ppm (parts per million; 1 x 10^{-6}) ≡ mg/kg; wt.% (weight per cent) ≡ % (mass fraction).

Note 1: intervals may appear asymmetric due to rounding.

Note 2: the number of decimal places quoted does not imply accuracy of the certified value to this level but are given to minimise rounding errors when calculating 2SD and 3SD windows.

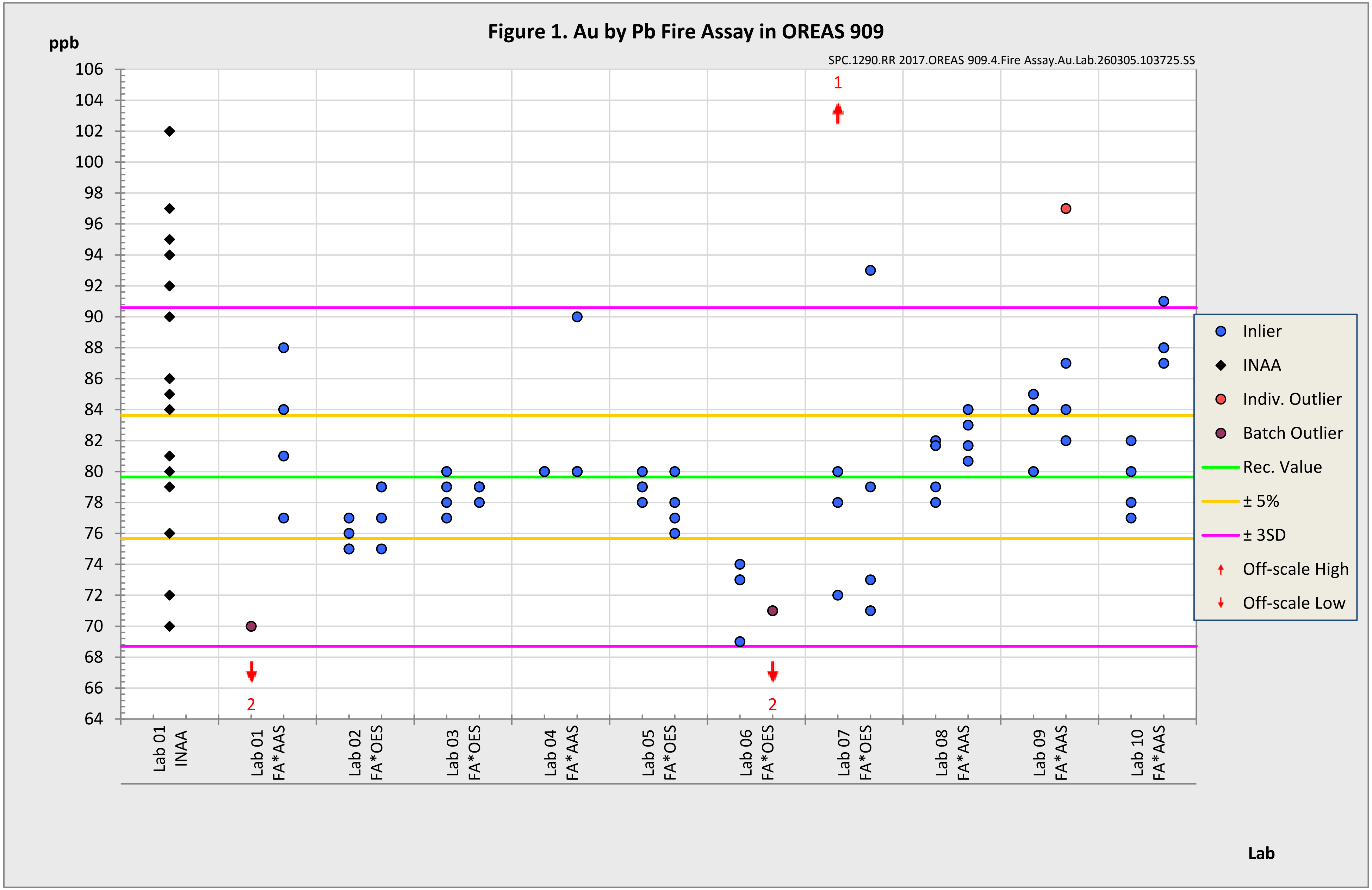
Figure 1. Au by Pb Fire Assay in OREAS 909
ppb
SPC.1290.RR 2017.OREAS 909.4.Fire Assay.Au.Lab.260305.103725.SS
106
104
102
100
98
96
94
92
90
88
86
84
82
80
78
76
74
72
70
68
66
64
1
2
2
Lab 01 INAA
Lab 01 FA*AAS
Lab 02 FA*OES
Lab 03 FA*OES
Lab 04 FA*AAS
Lab 05 FA*OES
Lab 06 FA*OES
Lab 07 FA*OES
Lab 08 FA*AAS
Lab 09 FA*AAS
Lab 10 FA*AAS
Inlier
INAA
Indiv. Outlier
Batch Outlier
Rec. Value
± 5%
± 3SD
Off-scale High
Off-scale Low
Lab

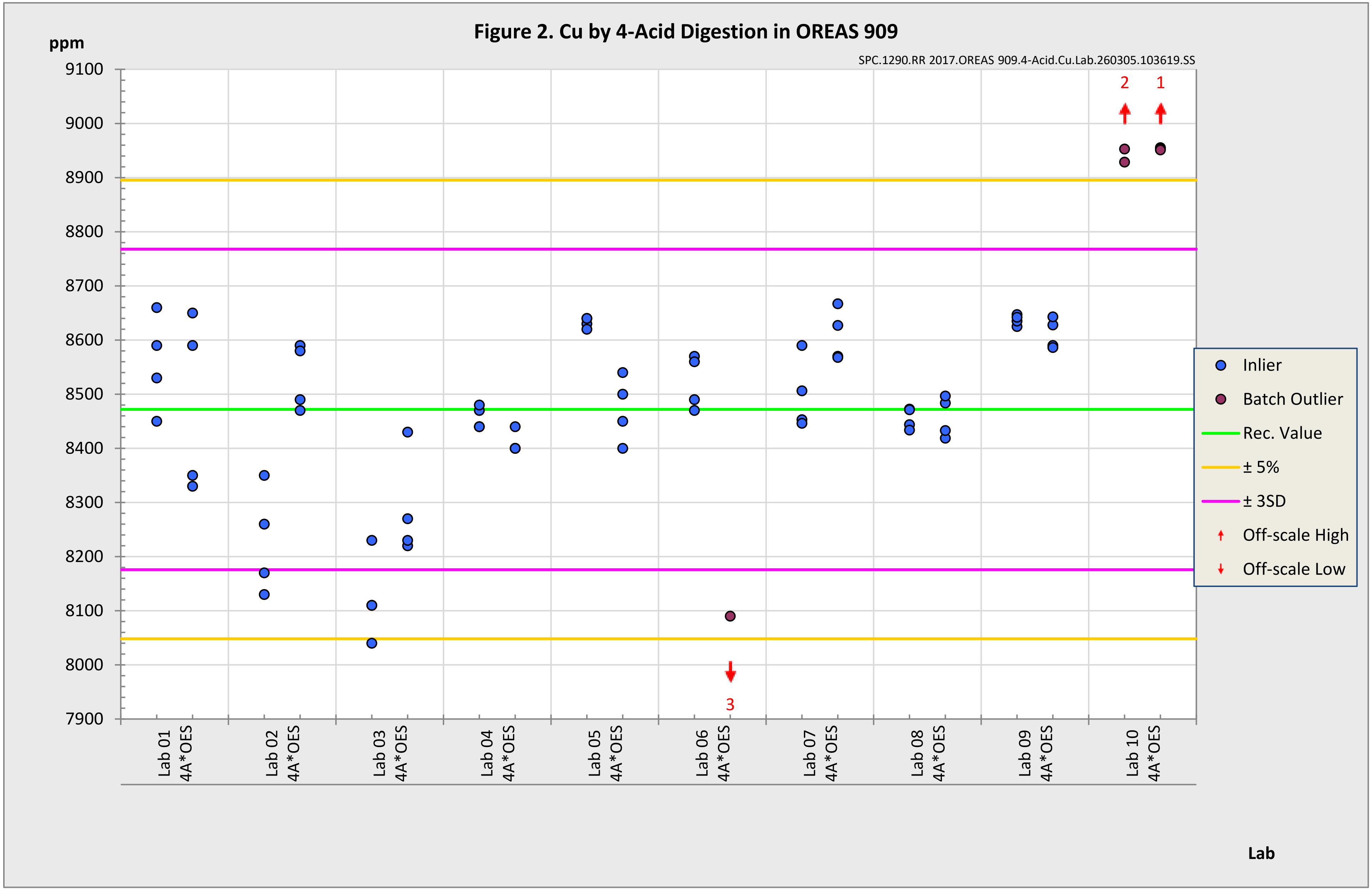
Figure 2. Cu by 4-Acid Digestion in OREAS 909
SPC.1290.RR 2017.OREAS 909.4-Acid.Cu.Lab.260305.103619.SS
ppm
9100
9000
8900
8800
8700
8600
8500
8400
8300
8200
8100
8000
7900
2
1
3
Lab 01 4A*OES
Lab 02 4A*OES
Lab 03 4A*OES
Lab 04 4A*OES
Lab 05 4A*OES
Lab 06 4A*OES
Lab 07 4A*OES
Lab 08 4A*OES
Lab 09 4A*OES
Lab 10 4A*OES
Lab
Inlier
Batch Outlier
Rec. Value
± 5%
± 3SD
Off-scale High
Off-scale Low

PREPARER AND SUPPLIER

Certified reference material OREAS 909 is prepared, certified and supplied by:

ORE Research & Exploration Pty Ltd
37A Hosie Street
Bayswater North VIC 3153
AUSTRALIA

Tel: +613-9729 0333
Web: www.oreas.com
Email: info@ore.com.au

CERTIFYING OFFICER

Craig Hamlyn (B.Sc. Hons - Geology), Technical Manager - ORE P/L

ACCREDITATION

ORE Pty Ltd is ISO 9001:2015 certified by Lloyd's Register Quality Assurance Ltd (LRQA) for its quality management system (QMS) encompassing the development, manufacturing, certification and supply of CRMs.

ORE Pty Ltd is ISO 17034:2016 accredited as a reference material producer (RMP) by the National Association of Testing Authorities (NATA) in Australia (accreditation number 20483).

LEGAL NOTICE

Ore Research & Exploration Pty Ltd has prepared and statistically evaluated the property values of this reference material to the best of its ability. The Purchaser by receipt hereof releases and indemnifies Ore Research & Exploration Pty Ltd from and against all liability and costs arising from the use of this material and information.

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DOCUMENT HISTORY

Revision No.	Date	Changes applied
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