



13 June 2018

Chris Hesford
Geologist
Listings Compliance (Perth)
ASX Compliance Pty Ltd

By email: Chris.Hesford@asx.com.au
tradinghaltsperth@asx.com.au

Dear Chris

RESPONSE TO ASX QUERY LETTER

Celsius Resources Limited (“**Celsius**” or “**Company**”) (ASX:CLA) refers to your letter dated 5 June 2018. We respond to your queries in the same order as raised:

- 1) *Please explain the basis for the classification of the Resource Estimate into inferred and indicated categories and why an elevation limit of "approximately 425 m below surface" was chosen to define these categories. In answering this question please address specifically how the drilling data spacing has been considered in the classification of the separate indicated and inferred portions of the Resource Estimate.*

The Mineral Resources were separated into Indicated and Inferred resource classifications based on a number of factors. Firstly, the resources were estimated using the inverse distance squared method, using a search ellipsoid whose radii dimensions were based on the second range of the double spherical model on the directional variograms. This first pass populated the geological block model and forms the basis of the Indicated Mineral Resource.

A second estimation run was then completed using a more relaxed search with dimensions equivalent to 2.5 times the initial radii. The decision to use 2.5 times the search radii for the second estimation run was a judgement call made at the discretion of the independent Competent Person, and ranges from 1.5 times to 2.5 times the first estimation run are normally employed.

These two estimates were then merged into one model and visually checked against the drillhole data. The second, more relaxed search, also allowed for complete block estimates, within the wireframe, in areas with localised strike differences.

The drillhole spacing is generally 200 metres along strike (between sections) and 100 metres along sections. Sampling within drillholes was generally 1 metre. The sample spacing (*between drillholes*) has a median value of 75.6m (*Euclidean distance*), the drillholes do vary in length and, more importantly, the coefficients of variation (*standard deviation divided by the mean*) for both Co and Cu are ≤ 1.0 . These coefficients indicate low grade variability for both Co and Cu grades, both along strike and elevation. Drill spacing itself was not considered in the classification of Mineral Resources, but rather the coordinates (especially elevation) of the intersections of the mineralised zone from the drillholes was considered.



The sample spacing, and geostatistical analysis of those samples, is the basis for the selection of the Mineral Resource estimation parameters described above. Both the Indicated and Inferred portions of the Mineral Resource are based on the sample spacing parameters described above. The Inferred Mineral Resource is extrapolated down dip from the drillhole samples and is a lower confidence part of the Mineral Resource estimate than the Indicated part of the Mineral Resource estimate.

With cobalt and copper grades having low variability, and varying drillhole lengths, a static elevation value was deemed appropriate to separate Indicated and Inferred portions of the Mineral Resource. An elevation limit of 825 RL (which is approximately 425 m below surface, depending on the surface elevation across the modelled zone) was chosen as the boundary for Indicated and Inferred classifications, due to a majority of the Indicated blocks from the first estimation run falling within this part of the Mineral Resource.

- 2) *Please advise the mining assumptions considered in the classification of the indicated and inferred portions of the Resource Estimate and what is the basis for these assumptions? In answering this question please explain the reasons for assuming that the deposit could potentially be mined by open pit methods over approximately 10 km and to a depth of approximately 425m as indicated in the Announcement.*

The Company notes that no statements have been made as to the proportion of the Mineral Resource that could be mined by open pit methods or underground mining methods.

Mining assumptions were considered for both the Indicated and Inferred portions of the Mineral Resource, with all of the resource considered to have an applicable mining method for extraction. Mining assumptions were not considered when separating the Mineral Resource into Indicated and Inferred portions, rather the Mineral Resource was sub-divided based on geological confidence.

Given that the Mineral Resource outcrops at surface, it is reasonable to assume that a portion of the deposit could be mined using open pit methods. Given the geometry (thickness and dip) of the deposit, it is also reasonable to assume that deeper parts of the deposit would be mined using underground mining methods. The exact proportions of the two different mining methods is currently under investigation as part of a Scoping Study, and is sensitive to numerous input parameters, values for which are being determined as part of the study. Based on the preliminary results of the mining studies, it is expected that the Indicated portion of the Mineral Resource will be mined using a combination of open pit and underground methods (open stoping), and that the Inferred portion of the Mineral Resource will be mined using underground methods (open stoping) only.

- 3) *The Announcement states on page 10 that the "Inferred Mineral Resource extends 600 m down dip from deepest drillhole intersections, which varies along strike". In the absence of disclosed samples, please explain how the inferred resource has been estimated. In answering this question please explain the basis for the extrapolation applied to the inferred portion of the Resource Estimate taking into account each of the requirements of Clause 21 of the JORC Code, detailed in item F above.*

To confirm and further elaborate on the information provided in our response to Question 1, the Inferred portion of the Mineral Resource was estimated using a relaxed search based on an oriented ellipsoid with radii equivalent to 2.5 times the second modelled directional variogram range. The ranges of the



semi-variogram modelled second structures for Co, Cu and Zn along strike are 230m, 250m and 247m respectively. Given that the drillholes vary in length, the *deepest* extrapolated Inferred block estimates are only associated with the *deepest* Co and Cu samples (*composites*). If the composites are shallower, the extrapolated Inferred block estimates are also shallower. The maximum distance the Inferred portion of the Mineral Resource extends away from a sample is 600 m, and the distance of the closest samples to the upper edge of the Inferred portion of the Mineral Resource is approximately 30 m. Therefore, 100% of the Inferred portion of the Mineral Resource is based on extrapolated data. This is considered appropriate given the highly consistent nature of the geology, thickness and grade of the deposit over the (approx.) 10 km modelled area, and at depth through the Indicated portion of the Mineral Resource. Regional geological mapping and interpretation and geophysical data provides additional evidence that the DOF mineralised horizon extends well beyond the current drilling and modelling extents, both along strike and at depth. Diagrams in the ASX announcement of 16 April, 2018 illustrate the extent to which the Inferred portion of the Mineral Resource has been extrapolated.

4) *What is the basis for the 600ppm cobalt cut-off grade used in the Resource Estimate? In answering this question please explain how this cut-off accounts for the different mining methods assumed for the indicated and inferred portions of the Resource Estimate.*

The cutoff grade of 600 ppm produces a grade of resource that is expected to represent an economically mineable Indicated and Inferred Mineral Resource based on current prices for the metals of interest in the mineralisation. This expectation is supported by metallurgical test work, which has been conducted on drilling samples based on approximately this cutoff grade, various known operating cost inputs, such as mining costs and power costs, and comparisons with other copper/cobalt mines hosted in similar geology in Africa and Europe.

The Indicated portion of the Mineral Resource is expected to be mined using a combination of open pit and underground mining techniques, and the Inferred portion of the Mineral Resource is expected to be mined using underground mining techniques only.

The cutoff grade was assessed predominantly on the expected economic grade considered necessary for the more expensive mining method being contemplated, namely underground mining using open stoping techniques. It is currently uncertain how much of the Mineral Resource will be able to be accessed via open pit mining, however it is considered possible a lower cutoff grade could be employed for these portions of the Mineral Resource. Any decision to use a lower cutoff grade for these portions of the Mineral Resource would need to be supported by further metallurgical test work, which is currently under consideration by the Company.

Further, a cutoff of 600 ppm generates a coherent body of mineralisation that is expected to be able to be mined effectively.

For both the open pit and underground mining methods being assumed for both the Indicated and Inferred portions of the Mineral Resource, the cutoff grade is considered appropriate, although it is expected that earlier stage open pit mining, with a lower strip ratio (amount of waste to be removed to access the ore), will produce superior economic outcomes. As open pit mining extends deeper, it is expected that the strip ratio will increase to the point where commencing the use of underground mining methods produces a more favourable economic outcome.

- 5) *Why does CLA consider that the metallurgical test work has been sufficient to indicate each of the metals included in the resource estimate (Cobalt, Copper and Zinc) have a reasonable potential to be commercially recovered and sold? In answering this question please set out details of the metallurgical test work that has been completed.*

Celsius has conducted significant metallurgical test work that commenced during the reconnaissance stage of drilling to gain early confirmation of the expected performance of the sulphide hosted mineralisation using conventional flotation techniques. The test work was conducted on a composite sample of approximately 200 kg weight, comprising drill core from 4 locations spread across the mineralised zone. The sulphide ore type on which metallurgical test work has been conducted to date comprises approximately 95% of the Mineral Resource. Test work is currently underway on the minor transition and oxide ore types, to assess the levels of recovery that can be expected for those ore types.

The flotation test work confirmed that the simple sulphide mineralisation comprising the deposit can be concentrated using conventional froth flotation techniques, to produce a mixed sulphide concentrate containing a majority of the cobalt, copper and zinc. Closed circuit flotation performance analysis yielded recoveries of 81% for cobalt, 83% for copper, and 54% for zinc. Whilst further optimisation of these results is considered likely, these are the currently assumed values for recovery from the work conducted to date.

The second phase of the metallurgical test work program has evaluated the amenability of the Opuwo concentrate to be leached, to liberate the metals of interest into solution. Leach testing of Opuwo concentrates has demonstrated excellent leach extraction of cobalt, copper and zinc, using relatively low pressure and temperature conditions. A series of 10 leaching tests have been completed, with several additional tests in progress, with results pending. The best leach extraction achieved for each metal reported in the Mineral Resource is as follows: cobalt: 98%, copper: 97%, zinc: 99%. These results were from the same leach test. Taking into consideration the conditions of the leach, a subsequent alternative testing regime was selected for further optimisation, and the relevant leach extractions for that test were; cobalt: 97%, copper: 84% and zinc: 98%. Further testing is underway to maximise leaching of the metals of interest, whilst minimising the leaching of other metals.

Once the metals of interest have been dissolved into sulphuric acid solution, the conventional processes of SX-EW (solvent extraction/electrowinning) will be employed to recover saleable products.

Ongoing work as part of the Scoping Study is refining the process flowsheet, and the results to date indicate that saleable products, including cobalt sulphate, copper metal, and a zinc by product, can be produced from the Opuwo mineralisation and sold. Announcements regarding the results of the metallurgical testwork programs were published to the market on 30 November, 2017 and 20 February, 2018, with further, more detailed, information to be made available as the ongoing studies advance.

- 6) *Considering the requirements of Clause 20 of the JORC Code, please explain why CLA considers that the separate indicated and inferred portions of the Resource Estimate satisfy the requirement that there are reasonable prospects for eventual economic extraction.*

Celsius considers that both the Indicated and Inferred portions of the Mineral Resource have reasonable prospects for eventual economic extraction. This expectation is supported by both the



development studies completed to date, including metallurgical and mining studies and preliminary cost estimates for these aspects, as well as comparison with other projects in Africa and Europe, where orebodies with similar grades (on a copper equivalent basis), similar geology, and similar geometry, are currently, or have historically been exploited.

Many mines in the Kupferschiefer in Europe exhibit similar characteristics to the Opuwo mineralisation. An example of a mine of this type is the KGHM copper-silver mine in Poland, which is sediment (shale) hosted, being mined using underground methods at depths of between 600 and 1,250 metres below surface, with grades of approximately 1.6% copper and 45 g/tonne silver, and an ore thickness averaging approximately 3 metres. In Africa, several of the "Ore Shale" mines/deposits in the DRC/Zambia Copperbelt exhibit similar characteristics to Opuwo in terms of size, geological setting, grade profile, thickness and depth of exploitation. Examples of these types of deposits are Lubambe, Konkola Deep, Nchanga and Kirilia Bombwe.

It is also considered likely that Opuwo will enjoy some advantages over some of these similar types of mines/deposits. Specifically, the availability of infrastructure, hydroelectric grid power and access to reagents is likely to allow value added products (cobalt sulphate and copper metal) to be produced, adding further economic value to the Project. The main difference in the cost of production expected for the Indicated and Inferred portions of the Mineral Resource is expected to be the mining cost, more specifically the underground development cost to access the deeper parts of the mineralisation that comprise the Inferred Mineral Resource. An initial study reported in January, 2018 by Freiberg Mining University, Germany, provided further confidence to the Company regarding the feasibility of underground mining at Opuwo. The report concluded "Overall, the development of the DOF into a highly productive underground mine seems feasible under the currently known boundary conditions and limiting factors."

Apart from the existence of mines with similar characteristics, as described above, based on the evidence from drilling to date, it is expected that the deeper mineralisation at Opuwo is coarser grained and slightly higher grade, and that the costs associated with processing this mineralisation will at least partially offset the increased cost of deeper underground mining, compared to underground mining at shallower levels within the Indicated portion of the Mineral Resource. Parts of the Indicated Mineral Resource able to be mined using open pit techniques are, however, expected to produce the most favourable economic outcomes.

The estimation of the Mineral Resource includes sampling using a combination of Diamond Core (DC) and Reverse Circulation (RC) drillholes, generally on a 200 by 100 metre spaced grid, sampled at 1 metre intervals for RC and varying intervals based on lithology for DC. Geological logging and interpretation demonstrated the simple physical nature of the mineralised body in terms of thickness, mineralogy and orientation. The observed simple and relatively consistent mineralogy has been confirmed by QEMSCAN laboratory mineralogical testing. Local and regional geological observations and interpretations suggest a simple stratabound sedimentary hosted deposit, free of structural complexity, with the mineralised horizon interpreted to extend down dip beyond the extents of the Inferred portion of the Mineral Resource.

Statistical analysis conducted by the Independent Competent Person on this sample data deemed the mineralisation to be of a consistent chemical nature. Analysis of the data produced a search radius of 250 m along the principal direction, 250 m in the minor direction and 1 m in the vertical direction. This



search ellipse was used to populate the blocks within the block model close to the drillholes. A second pass search ellipse of 2.5 times these radii populated blocks within a broader area, encapsulating the blocks populated by the first pass. The first pass provided an estimate with a higher geological confidence, forming the basis for the Indicated portion of the Mineral Resource. All of the drillhole samples fall within this Indicated portion of the Mineral Resource. The Inferred portion of the Mineral Resource contains the outer part of the estimated area further away from the samples, thus having a lower geological confidence level. It is important to note that although no samples lie within the Inferred portion of the Mineral Resource, this estimation is still based on those samples located within the Indicated portion of the Mineral Resource.

7) *Please confirm that CLA is in compliance with the Listing Rules and, in particular, Listing Rule 3.1.*

The Company confirms that it is in compliance with the Listing Rules and, in particular, Listing Rule 3.1.

8) *Please confirm that CLA's responses to the questions above have been authorised and approved in accordance with its published continuous disclosure policy or otherwise by its board or an officer of CLA with delegated authority from the board to respond to ASX on disclosure matters.*

The above has been authorised and approved in accordance with the Company's published continuous disclosure policy or otherwise by its board or an officer of the Company with delegated authority from the board to respond to ASX on disclosure matters.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'M Ross', is positioned above the typed name.

Melanie Ross
Company Secretary

5 June 2018

Ms Melanie Ross

C/- Consilium Corporate Pty Ltd
Level 3, 216 St Georges Terrace
PERTH WA 6000

By email: mross@consiliumcorp.com.au

Dear Ms Ross

Celsius Resources Limited (“CLA”): query letter

ASX Limited (“ASX”) refers to the following:

- A. CLA’s announcement entitled “Opuwo Cobalt Project Maiden JORC Mineral Resource” (“Announcement”) lodged on the ASX Market Announcements Platform on 16 April 2018 (“Relevant Date”), disclosing:
- 72.0 million tonnes at a grade of 0.11% cobalt, 0.42% copper and 0.41% zinc in the Indicated category, and a further;
 - 40.5 million tonnes at a grade of 0.12% cobalt, 0.41% copper and 0.46% zinc in the Inferred category.

(the “Resource Estimate”).

- B. ASX Listing Rule 5.6 states:

*“Subject to rule 5.10, a public report prepared by an *entity must be prepared in accordance with rules 5.7 to 5.24 if applicable and Appendix 5A (JORC Code) if applicable if the report includes a statement relating to any of the following.*

- **Exploration targets.*
- **Exploration results.*
- **Mineral resources or *ore reserves.*
- **Production targets.”*

- C. Clause 4 of the JORC Code states:

“Transparency and Materiality are guiding principles of the Code, and the Competent Person must provide explanatory commentary on the material assumptions underlying the declaration of Exploration Results, Mineral Resources or Ore Reserves.

In particular, the Competent Person must consider that the benchmark of Materiality is that which includes all aspects relating to the Exploration Results, Mineral Resources or Ore Reserves that an investor or their advisers would reasonably expect to see explicit comment on from the Competent Person. The Competent Person must not remain silent on any material aspect for which the presence or absence of comment could affect the public perception or value of the mineral occurrence.”

- D. Clause 9 of the JORC Code states:

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“A Public Report concerning a company’s Exploration Targets, Exploration Results, Mineral Resources or Ore Reserves is the responsibility of the company acting through its Board of Directors. Any such report must be based on, and fairly reflect, the information and supporting documentation prepared by a Competent Person.”

E. Clause 20 of the JORC Code states:

“All reports of Mineral Resources must satisfy the requirement that there are reasonable prospects for eventual economic extraction (ie more likely than not), regardless of the classification of the resource.

Portions of a deposit that do not have reasonable prospects for eventual economic extraction must not be included in a Mineral Resource. The basis for the reasonable prospects assumption is always a material matter, and must be explicitly disclosed and discussed by the Competent Person within the Public Report using the criteria listed in Table 1 for guidance. The reasonable prospects disclosure must also include a discussion of the technical and economic support for the cut-off assumptions applied.

Where untested practices are applied in the determination of reasonable prospects, the use of the proposed practices for reporting of the Mineral Resource must be justified by the Competent Person in the Public Report.

Geological evidence and knowledge required for the estimation of Mineral Resources must include sampling data of a type, and at spacings, appropriate to the geological, chemical, physical, and mineralogical complexity of the mineral occurrence, for all classifications of Inferred, Indicated and Measured Mineral Resources. A Mineral Resource cannot be estimated in the absence of sampling information.”

F. Clause 21 of the JORC Code states:

“In circumstances where the estimation of the Inferred Mineral Resource is presented on the basis of extrapolation beyond the nominal sampling spacing and taking into account the style of mineralisation, the report must contain sufficient information to inform the reader of:

- the maximum distance that the resource is extrapolated beyond the sample points*
- the proportion of the resource that is based on extrapolated data*
- the basis on which the resource is extrapolated to these limits*
- a diagrammatic representation of the Inferred Mineral Resource showing clearly the extrapolated part of the estimated resource.”*

G. ASX confirms the JORC Code applies to the Resource Estimate.

Having regard to the above, ASX asks CLA to respond separately to each of the following questions and requests for information:

1. Please explain the basis for the classification of the Resource Estimate into inferred and indicated categories and why an elevation limit of "approximately 425 m below surface" was chosen to define these categories. In answering this question please address specifically how the drilling data spacing has been considered in the classification of the separate indicated and inferred portions of the Resource Estimate.
2. Please advise the mining assumptions considered in the classification of the indicated and inferred portions of the Resource Estimate and what is the basis for these assumptions? In answering this question please explain the reasons for assuming that the deposit could potentially be mined by open pit methods over approximately 10 km and to a depth of approximately 425m as indicated in the Announcement.
3. The Announcement states on page 10 that the "Inferred Mineral Resource extends 600 m down dip from deepest drillhole intersections, which varies along strike". In the absence of disclosed samples, please explain how the inferred resource has been estimated. In answering this question please explain the basis for the extrapolation

applied to the inferred portion of the Resource Estimate taking into account each of the requirements of Clause 21 of the JORC Code, detailed in item F above.

4. What is the basis for the 600ppm cobalt cut-off grade used in the Resource Estimate? In answering this question please explain how this cut-off accounts for the different mining methods assumed for the indicated and inferred portions of the Resource Estimate.
5. Why does CLA consider that the metallurgical test work has been sufficient to indicate each of the metals included in the resource estimate (Cobalt, Copper and Zinc) have a reasonable potential to be commercially recovered and sold? In answering this question please set out details of the metallurgical test work that has been completed.
6. Considering the requirements of Clause 20 of the JORC Code, please explain why CLA considers that the separate indicated and inferred portions of the Resource Estimate satisfy the requirement that there are reasonable prospects for eventual economic extraction.
7. Please confirm that CLA is in compliance with the Listing Rules and, in particular, Listing Rule 3.1.
8. Please confirm that CLA's responses to the questions above have been authorised and approved in accordance with its published continuous disclosure policy or otherwise by its board or an officer of CLA with delegated authority from the board to respond to ASX on disclosure matters.

When and where to send your response

This request is made under, and in accordance with, Listing Rule 18.7. Your response is required as soon as reasonably possible and, in any event, by not later than half an hour before the start of trading (ie before 9.30 a.m. AEST) on Tuesday 12 June 2018.

ASX reserves the right to release a copy of this letter and your response on the ASX Market Announcements Platform under Listing Rule 18.7A. Accordingly, your response should be in a form suitable for release to the market.

Your response should be sent to me by e-mail at chris.hesford@asx.com.au and tradinghaltsp Perth@asx.com.au. It should not be sent directly to the ASX Market Announcements Office. This is to allow me to review your response to confirm that it is in a form appropriate for release to the market, before it is published on the ASX Market Announcements Platform.

Listing Rules 3.1 and 3.1A

In responding to this letter, you should have regard to CLA's obligations under Listing Rules 3.1 and 3.1A and also to Guidance Note 8 *Continuous Disclosure: Listing Rules 3.1 – 3.1B*.

It should be noted that CLA's obligation to disclose information under Listing Rule 3.1 is not confined to, nor is it necessarily satisfied by, providing the information requested in this letter.

Further, if the information requested by this letter is information required to be given to ASX under Listing Rule 3.1 and it does not fall within the exceptions mentioned in Listing Rule 3.1A, CLA's obligation is to disclose the information "immediately". This may require the information to be disclosed before the deadline set out in this letter and may require CLA to request a trading halt immediately.

If you wish to request a trading halt, you must tell us:

- the reasons for the trading halt;
- how long you want the trading halt to last;
- the event you expect to happen that will end the trading halt;
- that you are not aware of any reason why the trading halt should not be granted; and
- any other information necessary to inform the market about the trading halt, or that we ask for.

We will require the request for the trading halt to be in writing. The trading halt cannot extend past the commencement of normal trading on the second day after the day on which it is granted.

You can find further information about trading halts in Guidance Note 16 *Trading Halts & Voluntary Suspensions*.

Suspension

If you do not respond to this letter by the deadline set out above or if ASX does not consider your response to be satisfactory, ASX is likely to suspend trading in CLA's securities under Listing Rule 17.3.

If you have any queries or concerns about any of the above, please contact me immediately.

Yours sincerely

[Sent electronically without signature]

Chris Hesford

Geologist, Listings Compliance (Perth)