ioneer

Rhyolite Ridge Mineral Resource Upgrade

Highlights

- Total lithium-boron **Mineral Resource increased by 27%** to 154mt, containing 1.3mt lithium carbonate and 12.4mt boric acid
- **Maiden Measured Resource of 41.0mt** at 1,700ppm lithium and 14,400ppm boron
- High-grade **Upper Zone Measured Resource has 15% higher lithium and 26% higher boron grades** than the total Resource
- Proposed mining would commence with the high-grade Upper Zone, increasing cash flows in the early years of operation
- Dual revenue nature of Rhyolite Ridge is demonstrated by the deposit containing ten tonnes of boric acid for every tonne of lithium carbonate

Wednesday, 26 June 2019 – Emerging lithium-boron supplier, ioneer Ltd (**ioneer** or the **Company**) (ASX: INR) announces an updated Mineral Resource estimate for its 100%-owned Rhyolite Ridge Lithium-Boron Project (**Rhyolite Ridge** or the **Project**) in Nevada, USA.

The total lithium-boron Mineral Resource for the South Basin at Rhyolite Ridge is now estimated (at a cut-off grade of 5,000ppm boron) to contain:

- 154.0 million tonnes (**mt**) at 1,650ppm lithium (equivalent to 0.9% lithium carbonate) and 14,100ppm boron (equivalent to 8.0% boric acid)
- 1.3mt of lithium carbonate and 12.4mt of boric acid.

This represents an increase of 200,000 tonnes of lithium carbonate and 3.8mt boric acid compared to the previous lithium-boron Mineral Resource estimate.

The updated Mineral Resource includes a maiden Measured Resource of 41.0mt at 1,700ppm lithium and 14,400ppm boron; which contains a **higher-grade Measured Resource of 27.5mt at 1,900ppm lithium and 17,800ppm boron for the Upper Zone**.

Managing Director of ioneer, Mr Bernard Rowe, commented:

> "This upgraded Mineral Resource is exactly what we were aiming to achieve with the 2018/2019 drill program at Rhyolite Ridge.
>
> "The higher confidence Measured Resource relates to the planned starter pit and due to the significantly higher grades, we can expect to see a material increase in the projected early operating cash flows.
>
> "The total Resource has continued to grow with step-out drilling to the south where both the lithium and boron grades are some of the highest we have seen in the deposit.
>
> "The lithium-boron mineralisation remains open to the south where it continues to be shallow and we expect further increases to the Resource with additional drilling.
>
> "With the recent focus by the US Government on ensuring the supply of critical minerals, ioneer is well placed to become the first major domestic supplier of lithium to the American electric vehicle industry."

The planned starter pit being developed as part of the Rhyolite Ridge Definitive Feasibility Study (**DFS**) will mine the Measured Resource and is expected to provide stronger cash flows in the early years of the Project compared to the Preliminary Feasibility Study (**PFS**). These improved cash flows will become evident upon completion of the updated mine plan and schedule currently being undertaken as part of the DFS.

Lithium-boron (searlesite) mineralisation is the focus of the DFS as it represents the highest value material. The low-clay and high-searlesite content of the lithium-boron mineralisation allows for a low-cost, simple processing route due to being amenable to low-cost acid leaching.

The outcropping deposit is large, tabular, and moderately dipping. The defined dimensions are approximately 1,400 metres (**m**) by 2,500m and comprised of three ore zones which are approximately 20m in thickness.

The Mineral Resource was updated with data from ioneer's 2018-19 drilling program which comprised of 9,000m of drilling in 45 holes. Overall, the Resource is based on 24,060m of drilling in 108 holes.

The 2018-19 drilling program focussed on the area of the starter pit and the area immediately to the south. Lithium-boron grades are highest in the southwest portion of the South Basin, where the starter pit is located.

The planned starter pit will source ore mostly from the Upper Zone Measured Resource, where the grades are significantly higher.

		Oct 2018 Upper Zone Indicated Resource	June 2019 Upper Zone Measured + Indicated Resource	June 2019 Upper Zone Measured Resource
Tonnage	mt	71.9	71.5	27.5
Lithium Grade	**ppm**	**1,840**	**1,808**	**1,900**
Li Carbonate Grade	%	1.0	1.0	1.0
Boron Grade	**ppm**	**14,110**	**17,154**	**17,800**
Boric Acid Grade	%	8.1	9.8	10.2
Boric Acid to Li Carbonate Ratio		**8:1**	**10:1**	**10:1**

Compared with the October 2018 Upper Zone Indicated Resource, the grades in the June 2019 Upper Zone Measured Resource are 3% higher for lithium and 26% higher for boron. The boron grade was previously underestimated due to the inclusion of unrepresentative surface trench data. Drilling below and adjacent to the trenches in the 2018/2019 program allowed for exclusion of the trench data, resulting in an increase in the ratio of boric acid to lithium carbonate from 8:1 to 10:1.

To put the potential revenue benefit of the higher boron grades in context, **the increase in the boric acid grade in the Measured Resource equates to increased boric acid revenue of US$12/tonne of ore processed (**at the PFS boron recovery of 83.5% and a sales price of US$700/tonne of boric acid).

The Resource remains open and has significant potential to expand with further drilling of the South Basin. In particular, the high-grade lithium-boron mineralisation within the Upper Zone remains open to the south and additional drilling is being planned to test for further extensions.

The June 2019 lithium-boron (searlesite) Mineral Resource estimate does not include:

- the extensive lithium-only clay mineralisation which generally is deposited above and below the lithium-boron (searlesite) mineralisation in the South Basin at Rhyolite Ridge; and
- known lithium-boron mineralisation in the North Basin at Rhyolite Ridge, also 100% owned by ioneer.

The lithium-only clay mineralisation, occurring primarily in the upper portion of the M5 unit, is not included in the lithium-boron (searlesite) Mineral Resource estimate. The M5 lithium-only clay mineralisation is currently planned to be stockpiled and an updated Mineral Resource including this mineralisation will be estimated in due course.

Background

The previous Mineral Resource estimates for Rhyolite Ridge were released on 23 October 2018. The maiden Ore Reserve estimate for Rhyolite Ridge was released on 21 December 2018.

The Company released the PFS on 23 October 2018. The PFS included a two-stage mine development – a starter pit covering the first seven years and an expanded pit providing a mine life of over 30 years.

The lithium-boron (searlesite) Mineral Resource is contained in the B5, M5 and L6 geological units. Geological interpretation had a direct role in guiding and controlling the Mineral Resource estimation in that the mineralisation was modelled as a stratigraphically controlled lithium-boron deposit. Grade values were interpolated within the geological units using only samples intersected within those units.

Boron is contained in the mineral searlesite ($NaBSi_2O_5(OH)_2$) and lithium is tentatively attributed to lithium fixed in a magnesium silicate mineral, possibly sepiolite ($Mg_4Si_6O_{15}(OH)_2.6H_2O$).

Drilling within the South Basin deposit extends to a vertical depth of approximately 405m and the mineralisation was modelled from surface to a depth of approximately 400m below surface. Drill hole spacing varies from approximately 100m by 100m in the well-defined portions of the deposit to 200m by 200m over the remaining areas.

Appendix A contains the following Figures:

1. North and South Basin plan showing the location of drill holes and of ioneer's tenements.
2. South Basin plan showing the location of drill holes; the outlines of the June 2019 Measured Resource and Indicated Resource; and the starter pit shell.
3. Plan showing intensity of boron grades for the Upper Zone B5 geological unit.
4. Plan showing intensity of lithium grades for the Upper Zone B5 geological unit.
5. East-west cross section XS-06.
6. East-west cross section XS-12.
7. North-south long section.

Mineral Resource Statement and Parameters

June 2019 Lithium-Boron (Searlesite) Mineral Resource Estimate (5,000 B Cut-off)

Group	Classification	Tonnage	Li	B	Li_2CO_3	H_3BO_3	Contained Tonnes Li_2CO_3	Contained Tonnes Boric Acid
		mt	ppm	ppm	%	%	kt	kt
Upper Zone B5 Unit	Measured	27.0	1,900	18,000	1.0	10.3	270	2,770
	Indicated	42.0	1,750	17,150	0.9	9.8	400	4,140
	Inferred	13.0	1,950	14,800	1.0	8.5	140	1,110
	Total	**82.0**	**1,850**	**17,050**	**1.0**	**9.8**	**800**	**8,020**
Upper Zone M5 Unit	Measured	0.5	2,450	5,450	1.3	3.1	10	20
	Indicated	1.5	1,600	6,600	0.9	3.8	10	70
	Inferred	0.0	0	0	0.0	0.0	0	0
	Total	**2.0**	**1,800**	**6,350**	**1.0**	**3.6**	**20**	**80**
Upper Zone Total	Measured	27.5	1,900	17,800	1.0	10.2	280	2,790
	Indicated	44.0	1,750	16,750	0.9	9.6	410	4,210
	Inferred	13.0	1,950	14,800	1.0	8.5	140	1,110
	Total	**84.5**	**1,850**	**16,800**	**1.0**	**9.6**	**820**	**8,110**
Lower Zone L6 Unit	Measured	13.5	1,350	7,600	0.7	4.4	100	590
	Indicated	45.5	1,400	11,300	0.7	6.5	330	2,930
	Inferred	11.0	1,400	12,850	0.7	7.3	80	800
	Total	**69.5**	**1,400**	**10,800**	**0.7**	**6.2**	**510**	**4,310**
Total (all zones)	Measured	41.0	1,700	14,400	0.9	8.2	370	3,380
	Indicated	89.5	1,550	13,950	0.8	8.0	740	7,130
	Inferred	24.0	1,700	13,900	0.9	8.0	220	1,900
	Grand Total	**154.0**	**1,650**	**14,100**	**0.9**	**8.0**	**1,330**	**12,420**

Notes:

1. mt = million tonnes; Li = lithium; B = boron; ppm = parts per million; Li_2CO_3 = lithium carbonate; H_3BO_3 = boric acid; kt = thousand tonnes.

2. Totals may differ due to rounding, Mineral Resources reported on a dry in-situ basis. Lithium is converted to lithium carbonate (Li_2CO_3) using a conversion factor of 5.322 and boron is converted to boric acid (H_3BO_3) using a conversion factor of 5.718.

3. The Statement of Estimates of Mineral Resources has been compiled by Mr. Jerry DeWolfe, who is a full-time employee of Golder Associates (**Golder**) and a Professional Geologist (**P.Geo.**) with the Association of Professional Engineers and Geoscientists of Alberta (APEGA), a "Recognized Professional Organization" included in a list promulgated by ASX from time to time. Mr. DeWolfe has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity that he has undertaken to qualify as a Competent Person as defined in the JORC Code (2012).

4. All Mineral Resources figures reported in the table above represent estimates at 26 June 2019. Mineral Resource estimates are not precise calculations, being dependent on the interpretation of limited information on the location, shape and continuity of the occurrence and on the available sampling results. The totals contained in the above table have been rounded to reflect the relative uncertainty of the estimate. Rounding may cause some computational discrepancies.

5. Mineral Resources are reported in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The Joint Ore Reserves Committee Code – JORC 2012 Edition).

6. The reported Mineral Resource estimate was constrained by a conceptual Mineral Resource optimized pit shell for the purpose of establishing reasonable prospects of eventual economic extraction based on potential mining, metallurgical and processing grade parameters identified by mining, metallurgical and processing studies performed to date on the Project. Key inputs in developing the Mineral Resource pit shell included a 5,000ppm boron cut-off grade, Mining cost of US$2.67/tonne plus $0.0059/tonne-vertical meter of haulage; ore processing and grade control costs of US$45.45/ tonne of ore; boron and lithium recovery of 83.5% and 81.8%, respectively; boric acid sales price of US$700/tonne; lithium carbonate sales price of US$10,000/tonne; and sales/transport costs of US$160/tonne of product.

Comparison with Previous Resource

The table below compares the June 2019 Mineral Resource prepared by Golder with the October 2018 Mineral Resource prepared by RungePincockMinarco Ltd. (**RPM**).

Group	Classification	Tonnage mt	Li ppm	B ppm	Li_2CO_3 %	H_3BO_3 %	Contained Tonnes Li_2CO_3 kt	Contained Tonnes Boric Acid kt
June 2019 Resource	M+I	130.5	1,597	14,091	0.8	8.1	1,110	10,510
	Inferred	24.0	1,700	13,900	0.9	8.0	220	1,900
	Total	**154.0**	**1,650**	**14,100**	**0.9**	**8.0**	**1,330**	**12,420**
October 2018 Resource	M+I	104.1	1,700	12,800	0.9	7.2	950	7,540
	Inferred	17.3	1,900	11,300	1.0	6.4	180	1,110
	Total	**121.4**	**1,740**	**12,600**	**0.9**	**7.1**	**1,130**	**8,650**
Variation	M+I	26.4	-103	1,291	-0.1	0.9	160	2,970
	Inferred	6.7	-200	2,600	-0.1	1.6	40	790
	Grand Total	**32.6**	**-90**	**1,500**	**0.0**	**0.9**	**200**	**3,770**

The June 2019 lithium-boron (searlesite) Mineral Resource estimate has been constrained by applying a 5,000ppm boron cut-off grade to lithium-boron mineralisation within:

- the B5, M5 and L6 geological units; and
- a high-level optimised resource pit shell.

The October 2018 lithium-boron (searlesite) Mineral Resource was constrained only by first applying a 1,050ppm lithium cut-off grade then applying a 5,000ppm boron cut-off grade.

Compared with the October 2018 estimate, the updated June 2019 estimate has:

- a Measured Resource of 41.0mt (previously nil);
- 32.6mt (27%) increase in total tonnes;
- 1,500ppm (12%) increase in boron grade;
- 3.8mt increase in contained boric acid; and
- 90ppm (5%) decrease in lithium grade.
- 200kt increase in contained lithium carbonate

The higher overall boron grade is due to:

- additional drilling in the shallow southwest portion of the deposit which contains higher than average boron and lithium grades; and
- exclusion of trench data as only part of the mineralised units were sampled.

The slightly overall lower lithium grade is mostly related to excluding some higher lithium mineralisation below the base of the M5 Unit.

The Upper Zone within the June 2019 Resource contains 84.5mt at 1,850ppm lithium and 16,800ppm boron, which are greater than the grades of 1,650ppm lithium and 14,100ppm boron in the total Resource. The planned starter pit is likely to source ore mostly from the Measured Resource within the Upper Zone.

Potassium is not included in the June 2019 Mineral Resource as the production of potassium sulphate is not currently envisaged for the Project.

Summary of Resource Estimate Parameters and Reporting Criteria

In accordance with ASX Listing Rules and the JORC Code (2012 Edition), a summary of the material information used to estimate the Mineral Resource is detailed below (for further information please refer to Table 1 in Appendix B).

- The Rhyolite Ridge Mineral Resource area extends over a north-south strike length of 2,450m (from 4,184,000 mN – 4,186,450 mN), has a maximum width of 1,250m (424,150 mE – 425,400 mE) and includes the 420m vertical interval from 1,920mRL to 1,500 mRL.

- The Rhyolite Ridge Project tenements (unpatented mining claims) are owned by ioneer Minerals Corporation, a company wholly owned by ioneer Ltd. The unpatented mining claims are located on US federal land administered by the Bureau of Land Management (**BLM**).

Geology and Geological Interpretation

- Lithium and boron mineralisation is stratiform in nature and is hosted within Tertiary-age carbonate-rich sedimentary rock, deposited in a lacustrine environment in the Basin and Range terrain of Nevada, USA.

Drilling Techniques and Hole Spacing

- Drill holes used in the Mineral Resource estimate included 42 reverse circulation (**RC**) holes and 65 core holes for a total of 8,952m within the defined mineralisation. The full database for the South Basin contains records for 109 drill holes for 24,300m of drilling.

- Drill hole spacing is 100m by 100m (or less) over most of the deposit. Spacing increases to approximately 200m by 300m along the eastern margin of the deposit.

- Drill holes were logged for a combination of geological and geotechnical attributes. The core has been photographed and measured for RQD and core recovery.

Sampling and Sub-Sampling Techniques

- Drilling was conducted by American Lithium Minerals Inc., the previous owner of the tenements between 2010 and 2011 and by ioneer in 2017 to 2019. For RC drilling, a 12.7-centimetre (**cm**) hammer was used with sampling conducted on

1.52m intervals and split using a rig mounted rotary splitter. The hammer was replaced with a tri-cone bit in instances of high groundwater flow. For diamond core, HQ core size diameter with standard tube was used. Core recoveries of 97% were achieved by ioneer at the project. The core was sampled as half core at 1.52m intervals using a standard electric core saw.

Sampling Analysis Method

- Samples were submitted to ALS Minerals Laboratory in Reno, Nevada for sample preparation and analysis. The entire sample was oven dried at 105˚ and crushed to -2 millimetre (**mm**). A sub-sample of the crushed material was then pulverised to better than 85% passing -75 microns (**µm**) using a LM5 pulveriser. The pulverised sample was split with multiple feed in a Jones riffle splitter until a 100-200 gram (**g**) sub-sample was obtained for analysis.

- Analysis of the samples was conducted using aqua regia 2-acid and 4-acid digest for ICP-MS on a multi-element suite. This method is appropriate for understanding sedimentary lithium deposits and is a total method.

- Standards for lithium, boron, strontium and arsenic and blanks were routinely inserted into sample batches and acceptable levels of accuracy were reportedly obtained. Based on an evaluation of the quality assurance and quality control (**QA/QC**) results all assay data has been deemed by the Golder Competent Person as suitable and fit for purpose in Mineral Resource estimation.

Cut-off Grades

- The Mineral Resource estimate presented in this Report has been constrained by the application of an optimised Mineral Resource pit shell for the purpose of establishing reasonable prospects of eventual economic extraction based on PFS level mining, metallurgical and processing grade parameters identified by mining, metallurgical and processing studies performed to date on the Project. The Mineral Resource pit shell was developed using Vulcan Mine Planning software.

- Key input parameters and assumptions for the Mineral Resource pit shell included the following:

    - Boron cut-off grade of 5,000ppm.

    - Overall pit slope angle of 35 degrees in the alluvium, 20 degrees in the M5, and 42 degrees in other rock units (wall angle guidance provided by EnviroMine, Inc., who is developing the geotechnical design).

    - Mining cost of US$2.67/tonne plus $0.0059/tonne-vertical metre of haulage.

    - Ore processing and grade control costs of US$45.45/ tonne of ore.

    - Boron and lithium recovery of 83.5% and 81.8%, respectively.

    - Boric acid sales price of US$700/tonne.

    - Lithium carbonate sales price of US$10,000/tonne.

    - Sales/transport costs of US$160/tonne of product.

- The presence of boron associated with lithium is considered favourable as the mineralisation potentially has higher value and, based on studies by ioneer, has potentially lower processing costs and capital requirements.

Estimation Methodology

- Drill core samples were composited to 1.52m composite lengths prior to interpolation of grade data into the block model. Composite lengths honoured geological contacts (i.e. composites did not span unit contacts). The composite length was selected based on the median sample length from the drill hole assay database.

- Following a statistical review of the grade parameters, restricted interpolation controls were applied to boron grade interpolation for all units other than the primary mineralized units B5, M5 and L6. Restricted interpolation of Boron grade data was applied in place of grade cutting or capping to allow for use of all validated grade values while limiting the potential impact of overestimating spatially isolated high-grade results in the generally unmineralised units. Restricted interpolation controls were not applied to any other grade parameters.

- The geological model used as the basis for estimating Mineral Resources was developed as a stratigraphic gridded surface model using a 7.6m regularized grid. The grade block model was developed using a 15.2m north-south by 15.2m east-west by 1.52m vertical parent block dimension with maximum sub-celling dimensions of 3.8m by 3.8m by 0.4m. The grid cell and block size dimensions represent 25 percent of the nominal drill hole spacing across the model area.

- Inverse Distance Squared (**ID^2**) grade interpolation was used for the estimate, constrained by stratigraphic unit roof and floor surfaces from the geological model. Up to four passes were used to estimate the blocks in the model and more than 99% of blocks were filled in the first two passes.

- The density values used to convert volumes to tonnages were assigned on a by-geological unit basis using mean values calculated from 249 density samples collected from drill core during the 2010-2011 and drilling programs. The density values ranged from 1.80 grams per cubic centimetre (**g/cm^3**) to 2.11g/cm^3. The density analyses were performed using the Archimedes-principle (water displacement) method for density determination, with values reported in dry basis.

Classification Criteria

- Only Mineral Resources have been categorized by Golder at present for the Project; consideration for potential Ore Reserves for the Project will be evaluated following completion of modifying factors studies currently in-progress. Estimated Mineral Resources were classified as follows:

  - Measured: 152.5m spacing between points of observation, with sample interpolation from a minimum of two drill holes.

  - Indicated: 305m spacing between points of observation, with sample interpolation from a minimum of two drill holes.

  - Inferred: 610m spacing between points of observation, with sample interpolation from a minimum of two drill holes.

- The Mineral Resource classification has included the consideration of data reliability, spatial distribution and abundance of data and continuity of geology and grade parameters.

Mining and Metallurgical Methods and Parameters

- Based on the relatively low angle dips, thicknesses and depths of the mineralised bodies that have been modelled, as well as their estimated grades, the potential extraction method is considered to be open pit mining.
- There are two types of mineralisation present:
  - lithium-boron mineralisation that is low in clay content and low-moderate in carbonate content; and
  - lithium-only mineralisation that has higher clay content and moderate to high carbonate content.
- ioneer is focussing its evaluation and testwork on the lithium-boron mineralisation as it potentially is of higher value with lower processing and capital costs.
- Based on test work completed for ioneer by Kemetco Research of Vancouver, Canada, Kappes Cassiday of Nevada, USA, Hazen Research of Colorado, USA and SGS Minerals of Ontario, Canada and reported by ioneer both the lithium-boron and lithium-only mineralisation have a reasonable expectation of economic extraction.
- Metallurgical test work has been conducted on drill core and outcrop samples and shows that the lithium-boron mineralisation is amenable to acid leaching (sulphuric).

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About ioneer

The Company's 100%-owned Rhyolite Ridge Lithium-Boron Project in Nevada, USA provides a substantial foundation for ioneer to become a responsible and profitable producer of the materials necessary for a sustainable future.

The Rhyolite Ridge Pre-Feasibility Study demonstrated the Project's scale, long life and potential to become the lowest cost lithium producer in the world as well as the largest lithium producer in the United States.

With forecast annual production of 20,200 tonnes lithium carbonate and 173,000 tonnes boric acid, Rhyolite Ridge will be a globally significant producer of both lithium and boron.

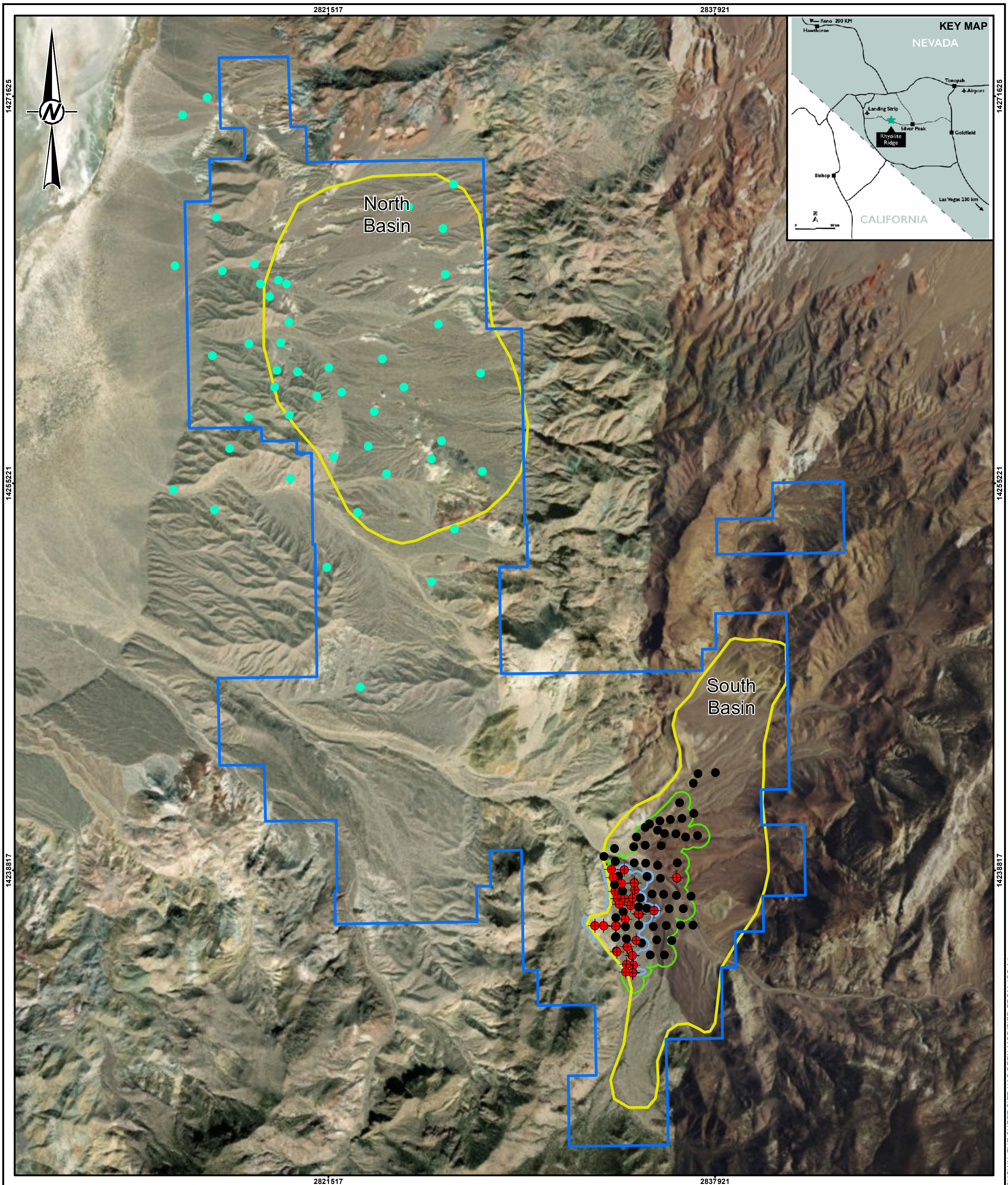
Lithium and boron are both used in a diverse range of everyday items and innovative technologies that are essential to modern life and emerging clean technologies such as electric vehicles.

Competent Persons Statement

The information in this report that relates to the June 2019 Mineral Resource estimate is based on information compiled by Jerry DeWolfe, a Competent Person who is a Professional Geologist (P.Geo.) with the Association of Professional Engineers and Geoscientists of Alberta (APEGA), a "Recognized Professional Organization" included in a list promulgated by ASX from time to time. Mr. DeWolfe is a full-time employee of Golder Associates Ltd. and is independent of ioneer and its affiliates. Mr DeWolfe has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code 2012). Mr DeWolfe consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

In respect of production targets referred to in this report and previously disclosed, the Company confirms that it is not aware of any new information or data that materially affects the information included in the public report titled "Outstanding Results from Rhyolite Ridge Pre-Feasibility" dated 23 October 2018. Further information regarding the production estimates can be found in that report. All material assumptions and technical parameters underpinning the estimates in the report continue to apply and have not materially changed.

APPENDIX A – FIGURES



LEGEND

- Tenement Boundary
- Basin Outline
- 2018-2019 Drill Hole
- Pre-2018 Drill Hole
- US Borax Drill Holes
- Measured Resource
- Indicated Resource

0 2,500 5,000

1:70,000 METRES

NOTE(S)

OUTLINE OF IONEER MINING CLAIMS OVER RHYOLITE RIDGE NORTH AND SOUTH BASINS

REFERENCE(S)

DATUM: NAD 83 STATE PLANE NEVADA WEST

CLIENT
IONEER LTD.

ioneer

PROJECT
RHYOLITE RIDGE PROJECT - SOUTH BASIN
JORC RESOURCE REPORT

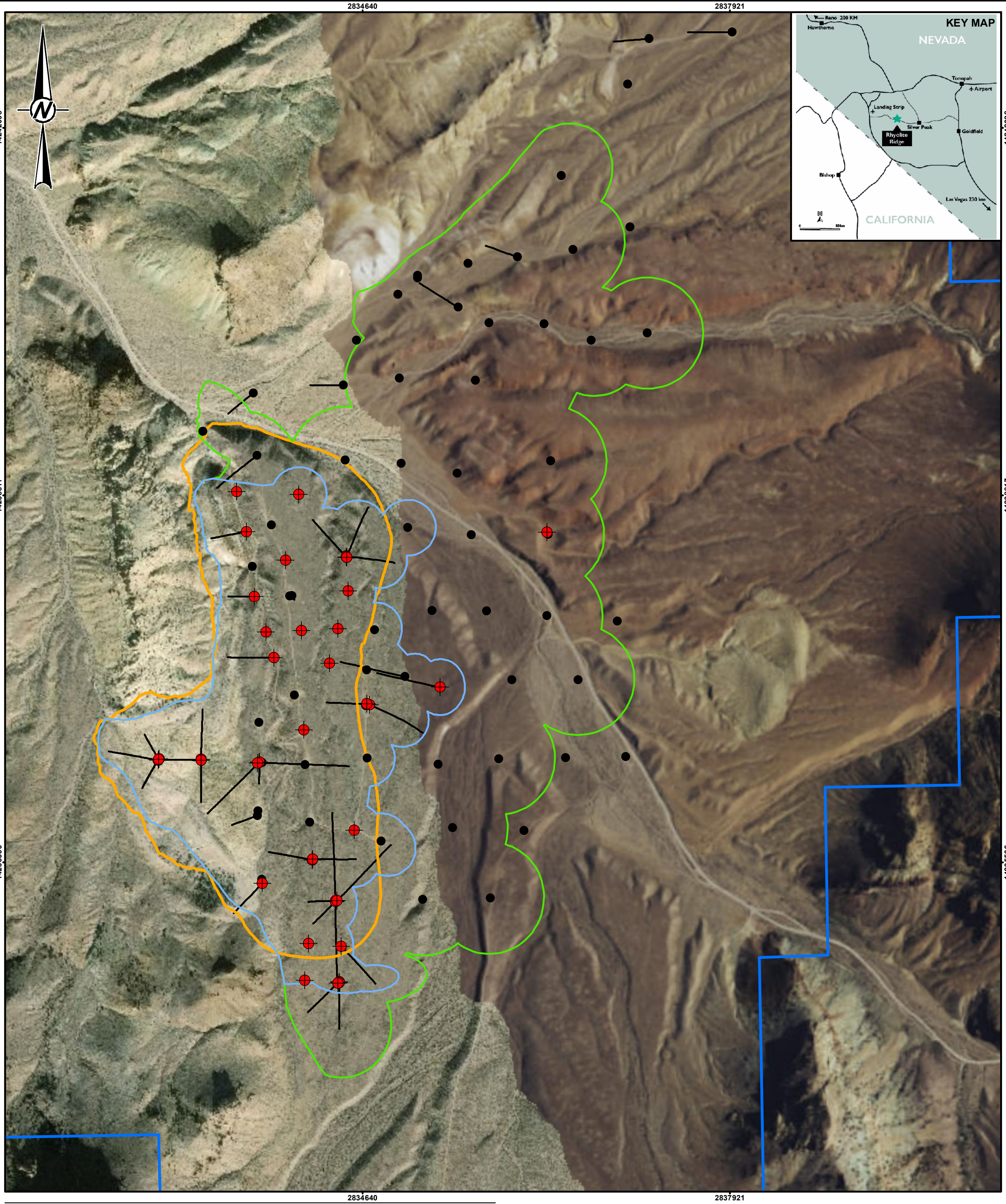
CONSULTANT

GOLDER

YYYY-MM-DD	2019-06-20
DESIGNED	JS
PREPARED	JS
REVIEWED	JDW
APPROVED	JDW

TITLE
NORTH & SOUTH BASIN PLAN MAP

PROJECT NO.	CONTROL NO.	FIGURE
18107519	RR30-K101-10-MG-REP-00007 0	01



LEGEND

- Tenement Boundary
- 2018-2019 Drill Hole
- Pre-2018 Drill Hole
- Starter Pit Shell
- Measured Resource
- Indicated Resource

0 500 1,000

1:15,000 METRES

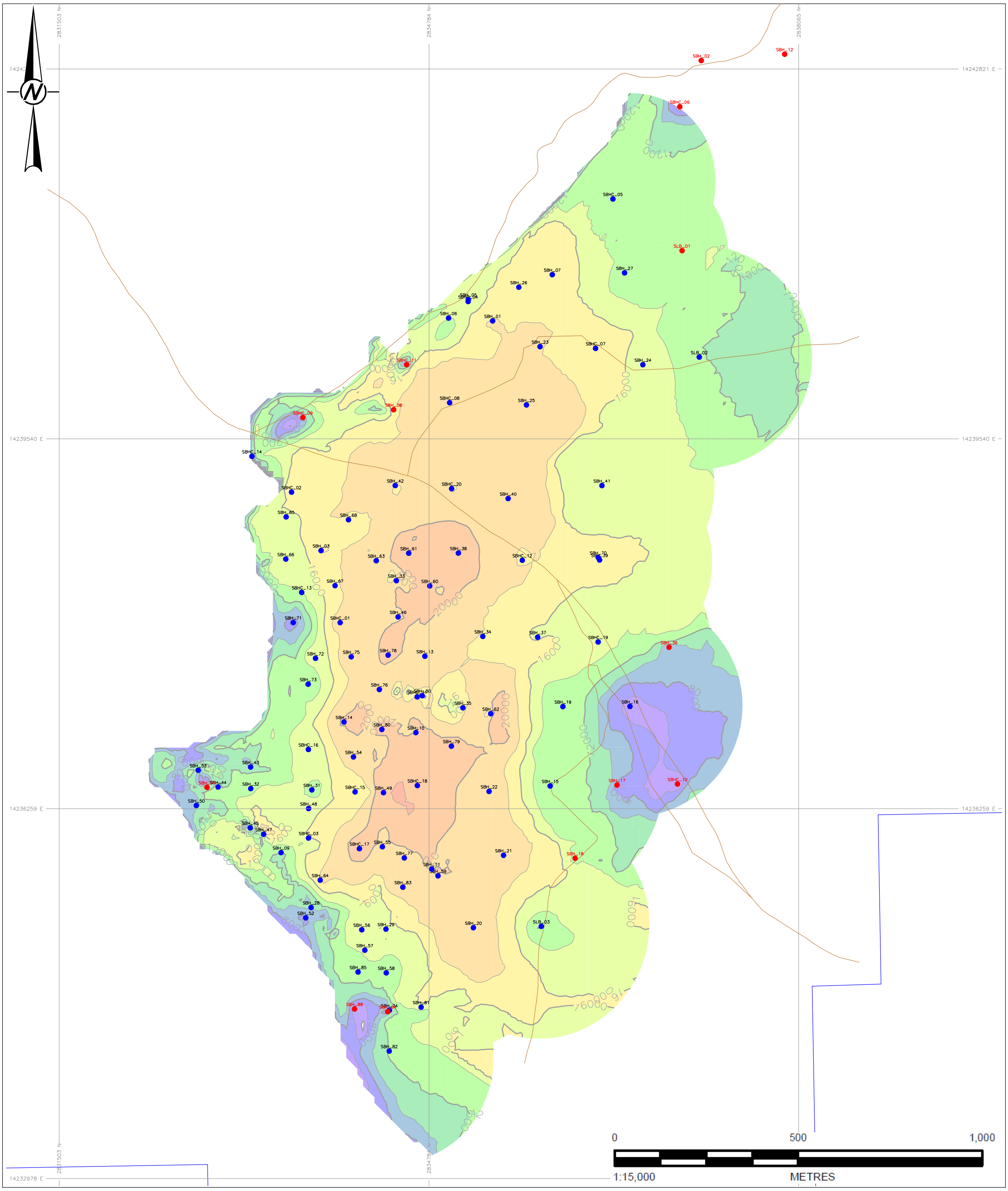
NOTE(S)

LOCATION OF STARTER PIT AND SURFACE PROJECTION OF UPPER ZONE (B5) RESOURCES

REFERENCE(S)

DATUM: NAD 83 STATE PLANE NEVADA WEST

CLIENT IONEER LTD.	ioneer	PROJECT RHYOLITE RIDGE PROJECT - SOUTH BASIN JORC RESOURCE REPORT	
CONSULTANT GOLDER	YYYY-MM-DD: 2019-06-20	TITLE **SOUTH BASIN PLAN MAP**	
	DESIGNED: JS		
	PREPARED: JS		
	REVIEWED: JDW	PROJECT NO. 18107519	CONTROL RR30-K101-10-MG-REP-00007 0
	APPROVED: JDW		FIGURE 02



LEGEND

- SLB Claim Boundary
- Composite Grade Isopleth Major / Minor
- SBH_1 5000 Drill Hole Intercept
- SBH_1 No Intercept
- Road

B5 B (ppm)

22000–24000
20000–22000
18000–20000
16000–18000
14000–16000
12000–14000
10000–12000
8000–10000
6000–8000
4000–6000

CLIENT
IONEER LTD.

ioneer

PROJECT
RHYOLITE RIDGE PROJECT - SOUTH BASIN
JORC RESOURCE REPORT

TITLE
BLOCK MODEL ISOPLETH CONTOURS
B5 BORON COMPOSITE (PPM)

CONSULTANT

GOLDER

YYYY-MM-DD	2019-06-20
PREPARED	JS
DESIGN	JS
REVIEW	JDW
APPROVED	JDW

PROJECT No.	CONTROL No.	FIGURE
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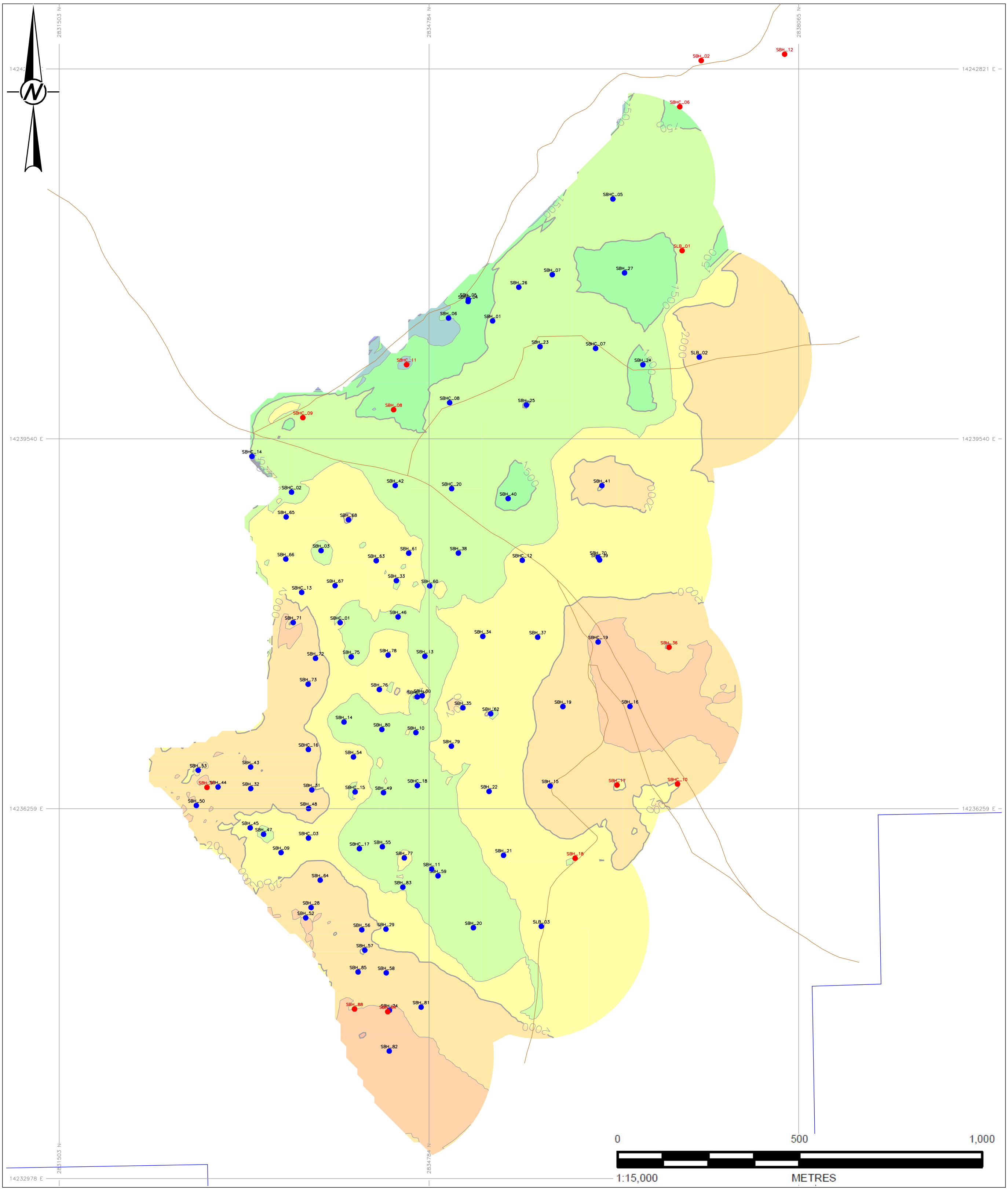


LEGEND

SLB Claim Boundary

Composite Grade Isopleth
Major / Minor

Drill Hole Intercept

No Intercept

Road

B5 Li (ppm)

2500–2750
2250–2500
2000–2250
1750–2000
1500–1750
1250–1500
1000–1250
750–1000
500–750

CLIENT

IONEER LTD.

PROJECT

RHYOLITE RIDGE PROJECT - SOUTH BASIN
JORC RESOURCE REPORT

TITLE

BLOCK MODEL ISOPLETH CONTOURS
B5 LITHIUM COMPOSITE (PPM)

CONSULTANT

GOLDER

YYYY-MM-DD	2019-06-20
PREPARED	JS
DESIGN	JS
REVIEW	JDW
APPROVED	JDW

PROJECT No. 18107519

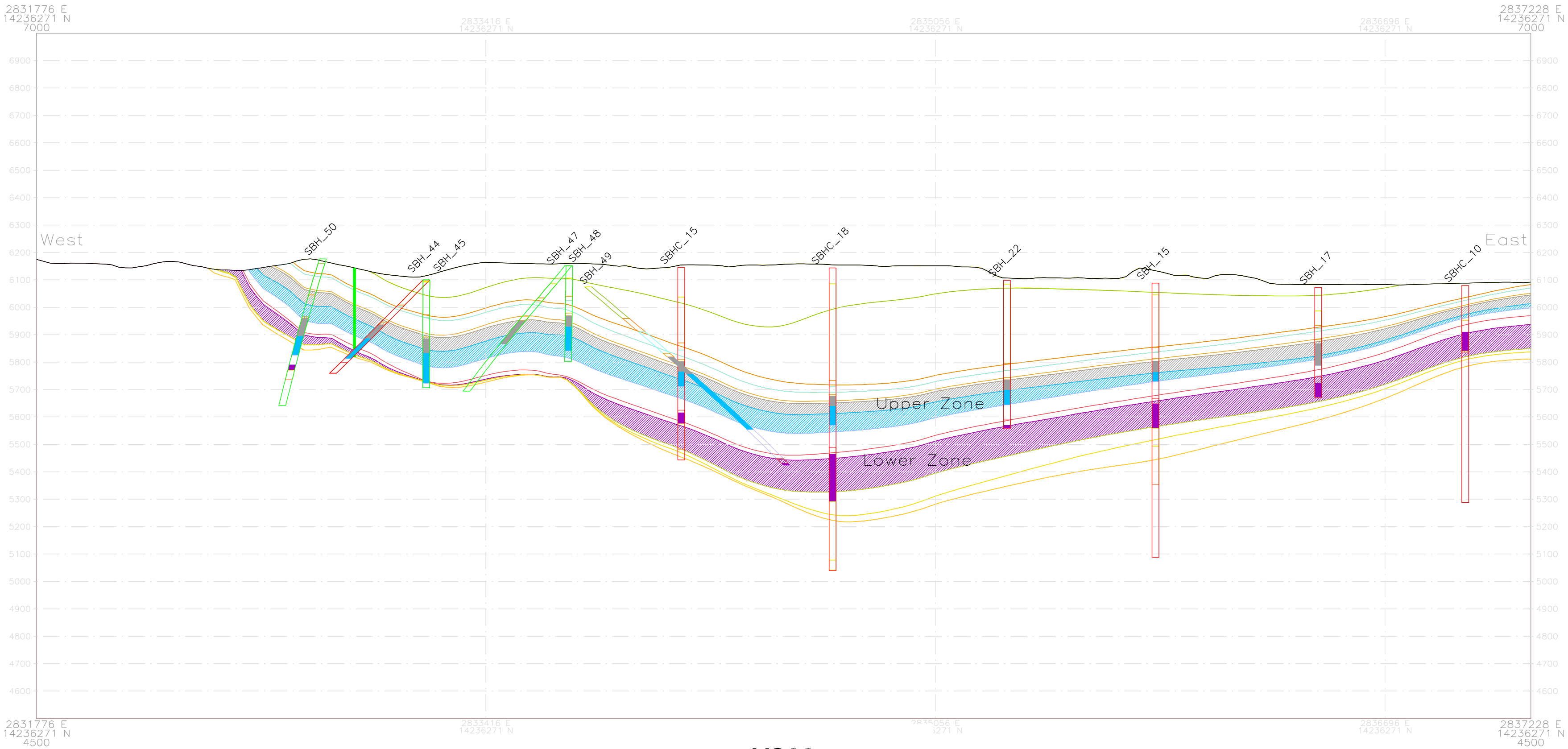
CONTROL No. RR30-K101-10-MG-REP-00007 0

FIGURE 04

Path: — | File Name: Fig04_B5_Li_PPM_Cnt.ps

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A4

25 mm



XS06

LEGEND

Q1	M5	Lsi	Drill Hole (Front)	Drill Hole (Back)
S3	B5	G7		
G4	S5	Tbx		
M4	G6	Fault		
G5	L6			

0 250 500

1:7,500 METRES

KEY MAP

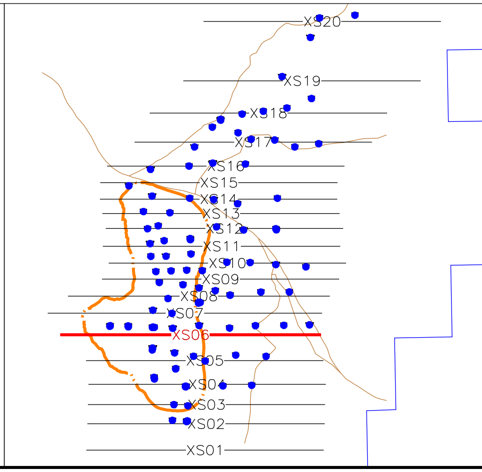
Active Cross-Section

Drill Hole

Road

SLB Claim Boundary

Starter Pit Shell



CLIENT
IONEER LTD.

PROJECT
RHYOLITE RIDGE PROJECT - SOUTH BASIN
JORC RESOURCE REPORT

TITLE
CROSS-SECTION - LOOKING NORTH
XS06

CONSULTANT

YYYY-MM-DD	2019-06-20
PREPARED	JS
DESIGN	JS
REVIEW	JDW
APPROVED	JDW

PROJECT No. 18107519

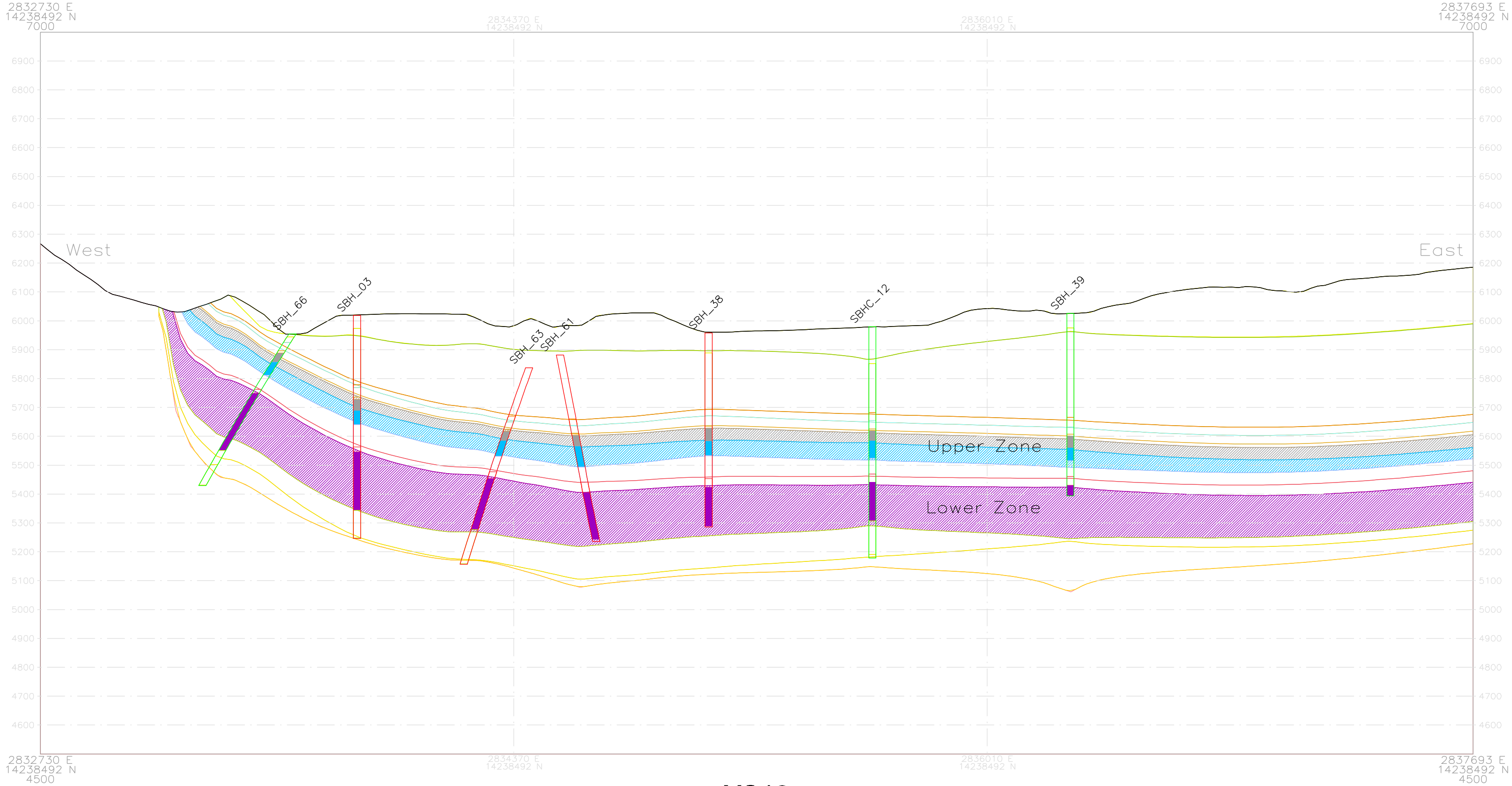
CONTROL No. RR30-K101-10-MG-REP-00007 0

FIGURE 05

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A4

25 mm

Path: --- | File Name: Fig05_XS06.ps



XS12

LEGEND

Q1, M5, Lsi, S3, B5, G7, G4, S5, Tbx, M4, G6, Fault, G5, L6

Drill Hole (Front)

Drill Hole (Back)

0 250 500

1:7,500 METRES

KEY MAP

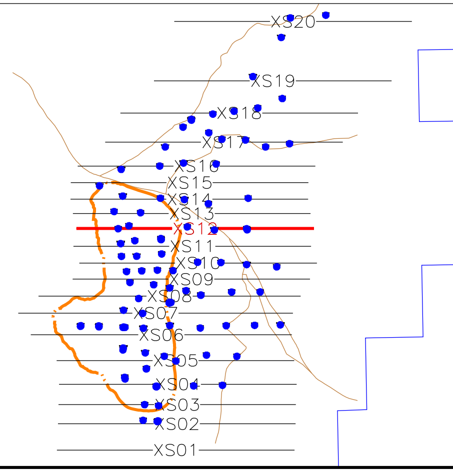
Active Cross-Section

Drill Hole

Road

SLB Claim Boundary

Starter Pit Shell



CLIENT
IONEER LTD.

PROJECT
RHYOLITE RIDGE PROJECT - SOUTH BASIN
JORC RESOURCE REPORT

TITLE
CROSS-SECTION - LOOKING NORTH
XS12

CONSULTANT

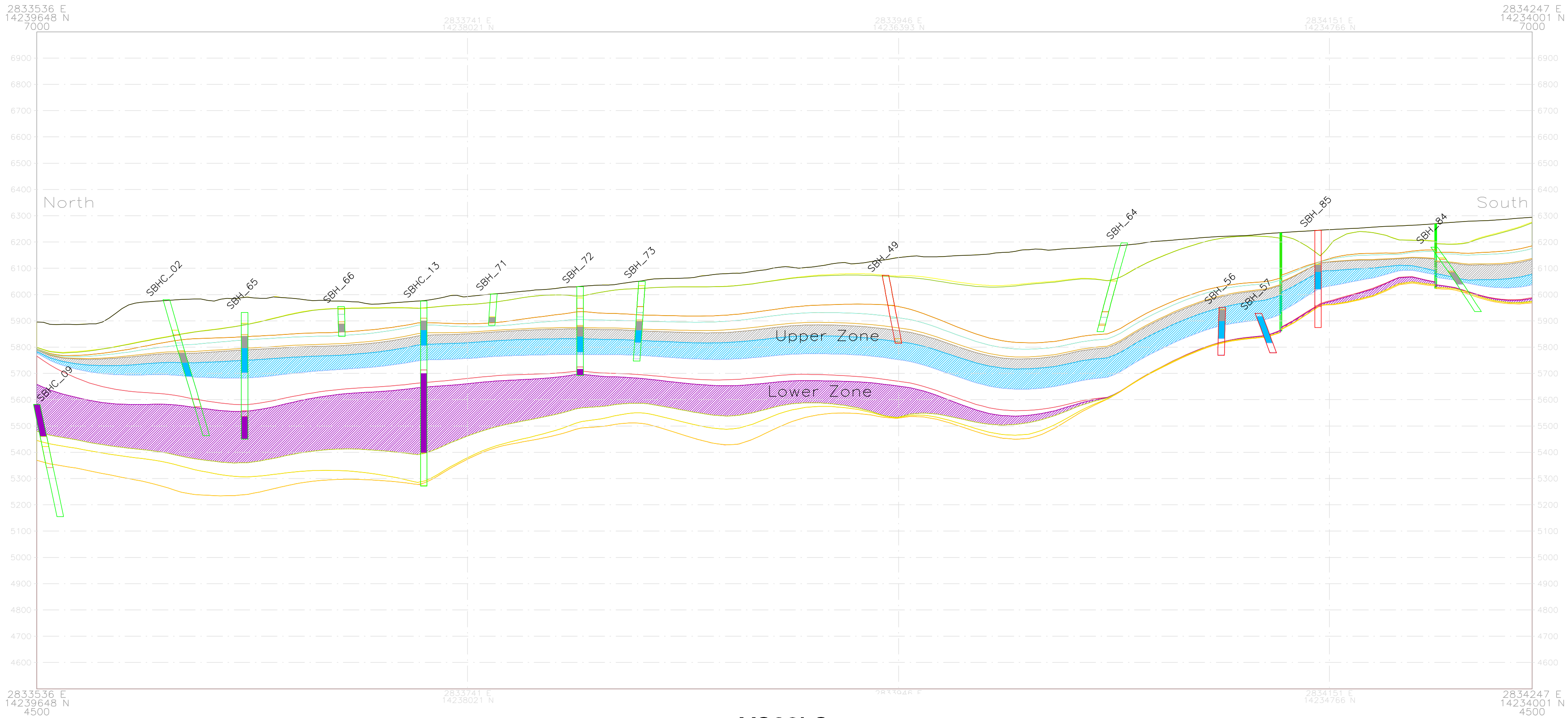
GOLDER

YYYY-MM-DD	2019-06-20
PREPARED	JS
DESIGN	JS
REVIEW	JDW
APPROVED	JDW

PROJECT No. 18107519

CONTROL No. RR30-K101-10-MG-REP-00007 0

FIGURE 06



XS02LS

LEGEND

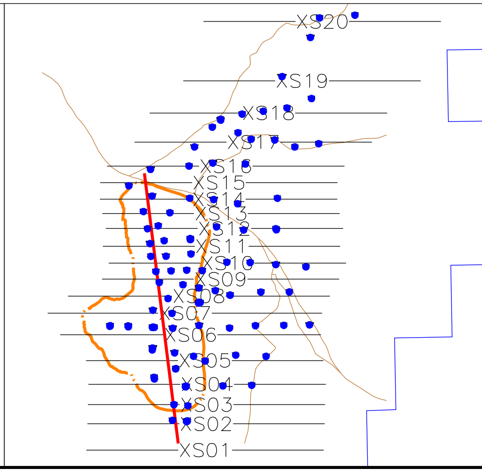
Q1	M5	Lsi	Drill Hole (Front)	Drill Hole (Back)
S3	B5	G7		
G4	S5	Tbx		
M4	G6	Fault		
G5	L6			

0 250 500

1:7,500 METRES

KEY MAP

- Active Cross-Section
- Drill Hole
- Road
- SLB Claim Boundary
- Starter Pit Shell



CLIENT
IONEER LTD.

ioneer

PROJECT
RHYOLITE RIDGE PROJECT - SOUTH BASIN
JORC RESOURCE REPORT

TITLE
LONG SECTION - LOOKING EAST
XS02LS

CONSULTANT

GOLDER

YYYY-MM-DD	2019-06-20
PREPARED	JS
DESIGN	JS
REVIEW	JDW
APPROVED	JDW

PROJECT No.	CONTROL No.	FIGURE
18107519	RR30-K101-10-MG-REP-00007 0	07

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A4

25 mm 0

Path: --- | File Name: Fig07_XS02LS.ps

APPENDIX B – JORC TABLE 1

The following table provides a summary of important assessment and reporting criteria used at the ioneer Ltd. Rhyolite Ridge Project (the Project) for the reporting of exploration results and Lithium-Boron Resources in accordance with the Table 1 checklist in The Australasian Code for the Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code, 2012 Edition). Criteria in each section apply to all preceding and succeeding sections. Table 1 is a checklist or reference for use by those preparing Public Reports on Exploration Results, Mineral Resources and Ore Reserves.

SECTION 1 SAMPLING TECHNIQUES AND DATA

Criteria	JORC Code 2012 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 nature and quality of the sampling from the various sampling programs includes the following: • Reverse circulation (**RC**) Drilling: a sample was collected every 1.52 metre (**m**) from a 127-millimetre (**mm**) diameter drill hole and split using a rig-mounted rotary splitter. Samples, with a mean weight of 4.8 kilograms (**kg**) were submitted to ALS Minerals laboratory in Reno, NV where they were processed for assay. RC samples represent 55% of the total intervals sampled to date. • Core Drilling: Core samples were collected from HQ (63.5 mm core diameter) and PQ (85.0 mm core diameter) drill core, on a mean interval of 1.52 m, and cut using a water-cooled diamond blade core saw. Samples, with a mean weight of 1.8 kg, were submitted to ALS where they were proceeded for assay. • Drill Hole Deviation: Inclined core drill holes were surveyed to obtain downhole deviation by the survey company (Minex Surveying) or drilling company (Idea Drilling) with a downhole Reflex Mems Gyros tool, for all but three of the drill holes. One drill hole could not be surveyed due to tool error (SBH-72), and two were intentionally surveyed using an Acoustic Televiewer (SBH-60, SBH-79). • Trenches: In addition to sampling from drill holes, samples were collected from 19 mechanically excavated trenches in 2010. The trenches were excavated from the outcrop/subcrop using a backhoe and or hand tools. Chip samples were then collected from the floor of the trench. Due to concerns with correlation and reliability of the results from the trenches, Golder has not included any of this data in the geological model or Mineral Resource estimate.

Criteria	JORC Code 2012 Explanation	Commentary

	• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	• Measures taken to ensure sample representivity include the following:
		  • Due to the nature of RC samples, lithological boundaries are not easily honoured, therefore continuous 1.52 m sample intervals were taken to ensure as representative a sample as possible. Lithological boundaries were adjusted as needed by the senior ioneer geologist once the assay results were received.
		  • Core sample intervals were selected to reflect visually identifiable lithological boundaries wherever possible, to ensure sample representivity. In cases were the lithological boundaries were gradational, the best possible interval was chosen.
		• All chip and core sampling were completed by or supervised by a senior ioneer geologist. The senior ioneer and Newfields geologists referenced here and throughout this Table 1 have sufficient relevant experience for the exploration methods employed, the type of mineralisation being evaluated and they are registered professional geologists in their jurisdiction; however, they are not Competent Persons according to the definition presented in JORC as they are not members of one of the Recognized Professional Organization" included in the ASX list referenced by JORC.
		• The Golder Competent Person was not directly involved during the exploration drilling programs and except for observing sampling procedures on two drill holes during the site visit, was not present to observe sample selection. Based on review of the procedures during the site visit and subsequent review of the data, it is the opinion of the Golder Competent Person that the measures taken to ensure sample representivity were reasonable for the purpose of estimating Mineral Resources.

	• *Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1*	• Aspects of the determination of mineralisation included visual identification of mineralized intervals by a senior ioneer geologist using lithological characteristics including clay and carbonate content, grain size and the presence of key minerals such as

Criteria	JORC Code 2012 Explanation	Commentary
	m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information	Ulexite (hydrated sodium calcium borate hydroxide) and Searlesite (sodium borosilicate). A visual distinction between some units, particularly where geological contacts were gradational was initially made. Final unit contacts were then determined by a senior ioneer geologist once assay data were available. • The Golder Competent Person was not directly involved during the exploration drilling programs; however, the visual identification of mineralized zones and the process for updating unit and mineralized contacts was reviewed with the ioneer senior geologist during the site visit. Golder evaluated the identified mineralized intervals against the analytical results and agrees with the methodology used by ioneer to determine material mineralisation.
Drilling techniques	• *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.).*	• Both RC and core drilling techniques have been used on the Project. Exploration drilling programs targeting Lithium-Boron (**Li-B**) mineralisation on the Project have been implemented by American Lithium Minerals Inc. (2010-2011) and ioneer (formerly Global Geoscience) in 2016, 2017, 2018 and 2019. • Prior to 2018, all RC drilling was conducted using a 127 mm hammer. All pre-2018 core drill holes were drilled using HQ sized core with a double-tube core barrel. • For the 2018-2019 drilling program, all core holes (vertical and inclined) were RC drilled through unconsolidated alluvium, then cored through to the end of the drill hole. All but two of the 41 core holes were drilled as PQ sized core, with the remaining two as HQ sized core. Drilling was completed using a triple-tube core barrel (split inner tube) which was preferred to a double-tube core barrel (solid inner tube) as the triple-tube improved core recovery and core integrity during core removal from the core barrel.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	• Prior to 2017, chip recovery was not recorded for the RC drilling therefore the Golder Competent Person cannot comment on drill sample recovery for this period of drilling. • For the 2017 RC drilling program, the drill holes were geologically logged as they were being drilled, however no estimates of chip recoveries were recorded therefore the Golder Competent Person cannot comment on drill sample recovery for this period of drilling.

Criteria	JORC Code 2012 Explanation	Commentary
		• For the 2010-2012 and 2016 core drilling programs, both core recovery and rock quality index (**RQD**) were recorded for each cored interval. Core recovery was determined by measuring the recovered linear core length and then calculating the recovered percentage against the total length of the core run from the drill advance. The core recovery for all the drilling ranged from 0% to 100%, with over 65 % of the drill holes having greater than 80% mean core recovery. The core recovery values were recorded by the logging geologist and reviewed by the senior ioneer geologist. The majority of the 2010-2011 and 2016 core drill holes reported greater than 95% recovery in the B5, M5 and L6 mineralized intervals. • For the 2018-2019 drilling program, both core recovery RQD were recorded for each cored interval. Core recovery was determined by measuring the recovered linear core length and then calculating the recovered percentage against the total length of the core run from the drill advance. The core recovery for all the drilling ranged from 41% to 100%, with over 65% of the drill holes having greater than 90% mean core recovery. The core recovery values were recorded by the logging geologist and reviewed by the senior ioneer geologist. In the target mineralized intervals (M5, B5 & L6), the mean core recovery was 86% in the B5, 87% in the M5 and 95% in the L6 units, with most of the drill holes reporting greater than 90% recovery in the mineralized intervals. • The Golder Competent Person considers the core recovery for the 2018-2019, 2016 and 2010-2011 core drilling programs to be acceptable based on statistical analysis which identified no grade bias between sample intervals with high versus low core recoveries. On this basis, the Golder Competent Person has made the reasonable assumption that the sample results are reliable for use in estimating Mineral Resources.
	• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	• Chip recoveries were not recorded for the 2010-2012 and 2017 RC drilling programs, and there is no indication of measures taken to maximize sample recovery and ensure representative nature of samples. • No specific measures for maximizing sample recovery were documented for the 2010-2012 and 2016 core drilling programs.

Criteria	JORC Code 2012 Explanation	Commentary
		• During the 2018-2019 drilling program ioneer implemented the use of a triple-tube core barrel to maximize sample recovery and ensure representative nature of samples. A triple-tube core barrel generally provides improved core recovery over double-tube core barrels, resulting in more complete and representative intercepts for core logging, sampling and geotechnical evaluation. It also limited any potential sample bias due to preferential loss/gain of material.
	• *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.*	• Chip recovery was not recorded for the 2010-2012 and 2017 RC drilling program and therefore there is no basis for evaluating the relationship between grade and sample recovery for samples from these programs. • Based on Golder's review of the 2010-2012, 2016 and 2018-2019 drilling recovery and grade data there was no observable relationship between sample recovery and grade.
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.*	• All core and chip samples have been geologically logged to a level of detail to support appropriate Mineral Resource estimation, such that there are lithological intervals for each drill hole, with a correlatable geological/lithological unit assigned to each interval. • The 2018-2019 drilling was also geotechnically logged to a level of detail to support appropriate Mineral Resource estimation. • Golder has reviewed all unit boundaries in conjunction with the ioneer senior geologist, and where applicable, adjustments have been made by the Golder Competent Person to the mineralized units based on the assay results intervals to limit geological dilution.
	• *Whether logging is qualitative or quantitative in nature.*	• The RC and core logging were both qualitative (geological/lithological descriptions and observations) and quantitative (unit lengths, angles of contacts and structural features and fabrics).
	• *Core (or costean, channel, etc.) photography.*	• Core photography was completed on every core drill hole for the 2010-2011, 2016 and 2018-2019 core drilling programs. • All chip trays from the RC holes were also photographed during the various RC drilling programs.

Criteria	JORC Code 2012 Explanation	Commentary
	• *The total length and percentage of the relevant intersections logged.*	• Prior to 2018, a total length of 8,900 m of RC drilling and 6,000 m of core drilling was completed for the Project, 100% of which was geologically logged by a logging geologist and reviewed by the senior ioneer geologist. • For the 2018-2019 drilling, a total length of 300 m of RC drilling and 8,800 m of core drilling was completed for the Project, 100% of which was geologically logged by a logging geologist and reviewed by the senior ioneer geologist • For the 2018-2019 drilling, 86% of the 8,800 m of core was geotechnically logged by an engineering geologist/ geotechnical engineer and reviewed by the senior ioneer geologist. The Golder Competent Person reviewed the geological core logging and sample selection for two complete drill holes.

Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.*	• The following sub-sampling techniques and sample selection procedures apply to drill core samples:
		  • During the 2010-2011 and 2016 program, core samples were collected on a mean 1.52 m down hole interval and cut in two halves using a manual core splitter. The entire sample was submitted for analysis with no sub-sampling prior to submittal.
		  • During the 2018-2019 drilling program, core samples were collected for every 1.52 m down hole interval and cut using a water-cooled diamond blade core saw utilizing the following methodology for the two target units. For the M5 unit, ½ core samples were submitted for assay, while the remaining ½ core was retained for reference. For the B5 unit, ¼ core samples were submitted for assay, while ¼ was reserved for future metallurgical test work and ½ core was retained for reference.

	• *If non-core, whether riffled, tube sampled, rotary split, etc. and whether sampled wet or dry.*	• The following sub-sampling techniques and sample selection procedures apply to RC Chip Samples:
		  • Pre-2017 RC chips samples were collected using a wet rotary splitter approximately every 1.52 m depth interval. Two samples were collected for every interval (one main sample and one duplicate). Only the main sample was submitted for analysis.
		  • 2017 RC chip samples were collected using a wet rotary splitter attached to a cyclone. One approximately 10 kg

Criteria	JORC Code 2012 Explanation	Commentary
		sample was collected every 1.52 m depth interval. All samples were submitted for analysis.
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	• The Golder Competent Person considers the nature, type and quality of the sample preparation techniques to be appropriate based on the general homogeneous nature of the mineralized zones and the drilling methods employed to obtain each sample (i.e. RC and core).
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	• Quality control procedures adopted for sub-sampling to maximize representivity include the following: • During 2016-2017 and 2018-2019 drilling programs, field duplicate/replicate samples were obtained. For the 2017 RC drilling, a duplicate sample was collected every 20th sample. For the 2016 and 2018-2019 core drilling programs two ¼ core samples were taken at the same time and were analysed in sequence by the laboratory to assess the representivity. • Twin drill holes at the same site were drilled during the 2010-2012 drilling program. The twin drill hole pairing comprises one RC drill hole (SBH-04) and one core drill hole (SBHC-01). The Golder Competent Person recommends twinning additional drill hole pairs as part of any future pre-production or infill drilling programs to allow for a more robust review of sample representivity. • The Golder Competent Person reviewed the results of the duplicate/replicate sampling and twin drill holes. For the duplicate/replicate samples, the R^2 value is 0.992, which is very good. Visual observation of the lithological intervals and the assays for the twin drill holes show that they are very similar, despite the difference in drilling techniques.
	• *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.*	• The Golder Competent Person considers the samples to be representative of the in-situ material as they conform to lithological boundaries determined during core logging. A review of the primary and duplicate sample analyses indicates a high degree of agreement between the two sample sets (R^2 value of 0.99).
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• The Golder Competent Person considers the sample sizes to be appropriate given the general homogeneous nature of the

Criteria	JORC Code 2012 Explanation	Commentary
		mineralized zones. The Li-B mineralisation occurs consistently throughout the B5, M5 and L6 target zones and is not nuggety or confined to discreet high-grade and low-grade bands.

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 nature and quality of the assaying and laboratory procedures used include the following:
		  • All RC and core samples were processed, crushed, split, and then a sub-sample was pulverized by ALS Minerals in Reno, Nevada.
		  • All sub-samples were analysed by Aqua Regia with ICP mass spectrometry (**ICP-MS**) finish for 51 elements (including Lithium (**Li**)) and Boron (**B**) by NaOH fusion/ICP high grade analysis (>10,000 parts per million (**ppm**) B).
		  • Additionally, 95% of the 2018-2019 samples were analysed for Inorganic Carbon and 30% were analysed for Fluorine (F).
		  • The laboratory techniques are total.
		• The Golder Competent Person considers the nature and quality of the laboratory analysis methods and procedures to be appropriate for the type of mineralisation.

	• *For geophysical tools, spectrometers, handheld XRF instruments, etc., the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc..*	• Not applicable to this Report, no geophysical tools, spectrometers, handheld XRF instruments were used on the Project.

	• *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.*	• The following Quality Assurance and Quality Control (**QA/QC**) procedures were adopted for the various drilling programs:
		  • During the 2010-2011 program, Standard Reference Material (**SRM**) samples and a small number of field blanks were also inserted regularly into the sample sequence to QA/QC of the laboratory analysis.
		  • For 2016-2017 program, a duplicate sample was collected every 20th primary sample. Field blanks and SRM's were also inserted approximately every 25 samples to assess QA/QC.
		  • During the 2018-2019 program, QA/QC samples comprising 1 field blank and 1 SRM standard were inserted into each sample batch every 25 samples. Submission of field duplicates, laboratory coarse/pulp replicates and umpire assays were submitted in later stages of the 2018-2019 drilling

Criteria	JORC Code 2012 Explanation	Commentary

		program.
		• Golder reviewed the SRM, field blanks and field duplicates and determined the following:
		  • SRMs: Review of the five SRMs used determined that there was a reasonable variability for Li between the upper and lower control limits (± 2 standard deviation (**SD**)), however B shows an overall bias towards lower than expected values (i.e. less than the mean) for all sample programs. For each of the 5 SRMs, there were some sample outliers (both low and high), however the majority fell within the control limits. There is a concern with the SRM sample submission protocol in that ioneer leave the SRM standard name on the sample when submitting to the laboratory for analysis. This removes the blind nature from the SRM as the laboratory can readily identify which standard sample is being evaluated and confirm what the expected values are for that SRM.
		  • Field Blanks: Review of the field blanks indicate that there is some variability in both the Li and B results. There are several samples that return higher than expected values, with an increased number being from the 2018-2019 drilling program. Further review is required to determine if this is a result of the material used for field blanks (coarse dolomite) or a problem with the laboratory analysis.
		  • Field Duplicates: No field duplicates were submitted for the pre-2018 drilling programs. Review of the 230 field duplicate sample pairs from the 2018-2019 drilling program determined that there was a strong correlation between each pair, as evidenced by an R^2 value of 0.99 for Li.
		  • Umpire Laboratory Duplicates: 20 assay pulp rejects were sent from ALS to American Assay Laboratories (**AAL**) in Sparks, NV for umpire laboratory analysis. Review of the 20 umpire duplicate pairs found a strong correlation between each pair, with B returning an R^2 value of 0.98.
		• The Golder Competent Person reviewed the control charts produced for each SRM, field blank and field duplicate, and determined that there was an acceptable level of accuracy and precision for each for the purpose of estimating Mineral

Criteria	JORC Code 2012 Explanation	Commentary
		Resources.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.*	• Significant intersections have been verified by visual inspection of the drill core intervals by at least two ioneer geologists for all drilling programs.
	• *The use of twinned holes.*	• One pair of twin drill holes at the same site were drilled during the 2010-2012 drilling program. The twin drill hole pairing comprises one RC drill hole (SBH-04) and one core drill hole (SBHC-01). • The Golder Competent Person reviewed and assessed two drill holes and the variance for thickness and grade parameters were within acceptable levels.
	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*	• For the 2018-2019 drilling program, Newfields developed a series of field protocols covering all aspects of the exploration program, including surveying, logging, sampling and data documentation. These protocols were followed throughout the 2018-2019 drilling program. Formal documentation of field protocols does not exist prior to the 2018-2019 program; however, the same senior personnel were involved in the earlier programs and field protocols employed were essentially the same as those documented in the 2018-2019 protocols. • Primary field data was captured on paper logs for the 2010-2012 drilling program, then transcribed into Microsoft (**MS**) Excel files. For the 2016 through 2019 drilling, all field data was captured directly into formatted MS Excel files by logging geologists. All primary field data was reviewed by the senior ioneer geologist. • Data is stored in digital format in a MS Access database. This database was compiled, updated and maintained by Newfields personnel during the 2018-2019 drilling program. • Golder compiled all relevant information from various tabular data files provided by ioneer and Newfields into a MS Access database, which was reviewed and verified by the Golder Competent Person prior to inclusion in the geological model
	• *Discuss any adjustment to assay data.*	• There has been no adjustment to assay data.
Location of	• *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.*	• Accuracy and quality of surveys used to locate drill holes is as follows: • All inclined core drill holes were surveyed to obtain downhole

Criteria	JORC Code 2012 Explanation	Commentary
data points		deviation using a downhole Reflex Mems Gyros tool, except for SBH-72, which could not be surveyed due to tool error. Two core drill holes (SBH-60, SBH-79) were surveyed using an Acoustic Televiewer instead of the Gyros tool. • All 2018-2019 drill hole collars were surveyed using a differentially corrected GPS (**DGPS**). • Locatable pre-2018 drill holes that were previously only surveyed by handheld GPS have been re-surveyed in 2019 using DPGS. Some pre-2018 drill holes could not be located by the surveyor in 2019, and the original locations were assumed to be correct. • Upon completion, drill casing was removed, and drill collars were marked with a permanent concrete monument with the drill hole name and date recorded on a metal tag on the monument.
	• *Specification of the grid system used.*	• All pre-2018 and 2018-2019 drill holes were originally surveyed using handheld GPS units in UTM Zone 11, North American Datum 1983 (**NAD83**) coordinate system. Pre-2018 drill holes were re-surveyed using DPGS in NAD83 in 2017/2018. • All 2018-2019 drill holes and locatable pre-2018 drill holes were re-surveyed in 2019 using DPGS in UTM Zone 11, North NAD83 coordinate system. All surveyed coordinates were subsequently converted to Nevada State Plane Coordinate System of 1983, West Zone (**NVSPW 1983**) for use in developing the geological model. Those holes that could not be located had the original coordinates converted to NVSPW 1983 and their locations verified against the original locations.
	• *Quality and adequacy of topographic control.*	• The quality and adequacy of the topographic surface and the topographic control is very good based on comparison against survey monuments, surveyed drill hole collars and other surveyed surface features. • A 2018 satellite survey with an accuracy of ± 0.17 m was produced for the Project by PhotoSat Information Ltd. The final report generated by PhotoSat stated that the difference between the satellite and ioneer provided ground survey control points was less than 0.8 m.

Criteria	JORC Code 2012 Explanation	Commentary
		• The topographic survey was prepared in UTM Zone 11, NAD83, which was converted to NVSPW 1983 by Newfields prior to geological modelling.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.*	• Drill holes are generally spaced between 90 m and 170 m on east-west cross-section lines spaced approximately 180 m apart. There was no distinction between RC and core holes for the purpose of drill hole spacing. • For the 2018-2019 drilling program, there were multiple occurrences where several inclined drill holes were drilled from the same drill pad and oriented at varying angles away from each other. The collar locations for these inclined drill holes drilled from the same pad varied in distance from 0.3 m to 6.0 m apart; intercept distances on the floors of the target units were typically in excess of 90 m spacing.
	• *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 spacing is considered sufficient to establish geological and grade continuity appropriate for a Mineral Resource estimation.
	• *Whether sample compositing has been applied.*	• Samples were composited to 1.52 m intervals honouring lithological boundaries prior to grade estimation. The 1.52 m sample composite length represents the modal value of the sample length distribution.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	• Drill holes were angled between -45 and -90 degrees from horizontal and at an azimuth of between 0- and 332-degrees. • Inclined drill holes orientated between 220- and 332-degrees azimuth introduced minimal sample bias, as they primarily intercepted the mineralisation at angles near orthogonal (101 drill holes with intercept angles between 70-90 degrees) to the dip of the beds, approximating true-thickness.
	• *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.*	• Inclined drill holes orientated between 0- and 220-degrees azimuth, especially those that were drilled at between 20- and 135-degrees azimuth, generally intercepted the beds down dip (7 drill holes with intercept angles between 20-70 degrees), exaggerating the mineralized zone widths in these drill holes.

Criteria	JORC Code 2012 Explanation	Commentary
Sample security	• *The measures taken to ensure sample security.*	• The measures taken to ensure sample security include the following: • For the 2010-2011 drill holes, samples were securely stored on-site and then collected from site by ALS. Chain of custody forms were maintained by ALS. • For the 2016-2017 drill holes, samples were securely stored on-site and then collected from site by ALS and transported to the laboratory by truck. Chain of custody forms were maintained by ALS. • For the 2018-2019 drill holes, core was transported daily by ioneer and/or Newfields personnel from the drill site to the ioneer secure core shed (core storage) facility in Tonopah. Core awaiting logging was stored in the core shed until it was logged and sampled, at which time it was stored in secured sea cans inside a fenced and locked core storage facility on site. Samples were sealed in poly-woven sample bags, labelled with a pre-form numbered and barcoded sample tag, and securely stored until shipped to or dropped off at the ALS laboratory in Reno by Newfields personnel. Chain of custody forms were maintained by Newfields and ALS.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• There were no audits performed on the RC sampling or for the pre-2018 drilling programs. • The Golder Competent Person reviewed the core and sampling techniques during a site visit in December 2018. The Competent Person found that the sampling techniques were appropriate for collecting data for the purpose of preparing geological models and Mineral Resource estimates. The following recommendations were submitted to ioneer for consideration following the site visit: • Update 2018-2019 collar survey locations using high-resolution survey methods such as DGPS as soon as possible following completion of the 2018-2019 drilling. • Include survey pick-up of any pre-2018 drill holes identified in the drill hole database as being surveyed by handheld, non-differential GPS. • Update surface mapping to adjust surficial geological contacts and structures based on revised interpretation and understanding of geology from the current drilling program.

Criteria	JORC Code 2012 Explanation	Commentary
		• Revise QA/QC protocol to include field duplicates, laboratory replicates (coarse and pulp replicates) and check assay analyses at a second independent commercial laboratory. • Change SRM insertion procedure to remove the SRM name/number and identifiers other than the regular sample number prior to submitting the sample to the laboratory for analyses. • Exclude trench data from the modelling process based on visual inspection of the sub-crop trenches and the reliability and representativeness of trench analytical data used in previous model iterations.

SECTION 2 REPORTING OF EXPLORATION RESULTS

Criteria	JORC Code 2012 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 mineral tenement and land tenure for the South Basin of Rhyolite Ridge (the Project) comprise 386 unpatented Lode Mining Claims (totalling approximately 3,150 hectare (**Ha**); claim groups SLB, SLM and RR, spatial extents of which are presented in maps and tables within the body of the Report) held by ioneer Minerals Corporation, a wholly owned subsidiary of ioneer. The Golder Competent Person has relied upon information provided by ioneer regarding mineral tenement and land tenure for the Project; the Competent Person has not performed any independent legal verification of the mineral tenement and land tenure. The Competent Person is not aware of any 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 relating to the 386 Lode Mining Claims for the Project. • The mineral tenement and land tenure referenced above excludes 241 additional unpatented Lode Mining Claims (totalling approximately 2,000 Ha) for the North Basin which are located outside of the current South Basin Project Area presented in this Report. These additional claims are held by ioneer subsidiaries (NLB claim group; 160 claims) or they hold an option to acquire 100% ownership of the claims (BH claim group; 81 claims).
	• *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.*	• There are no identified concerns regarding the security of tenure nor are there any known impediments to obtaining a license to operate within the limits of the Project. The 386 unpatented Lode Mining Claims for the Project are located on federal land and are administered by the United States Department of the Interior - Bureau of Land Management (BLM).
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• There have been two previous exploration campaigns targeting Li-B mineralisation at the Project site. • US Borax conducted surface sampling and drilling in the 1980s, targeting B mineralisation, with less emphasis on Li mineralisation. A total of 57 drill holes (totalling approximately 14,900 m) were drilled in the North Borate Hills area, with an additional 12 drill holes (unknown total meterage) in the South Basin area. These

Criteria	JORC Code 2012 Explanation	Commentary
		drill holes were not available for use in the current Study. • American Lithium Minerals Inc and Japan Oil, Gas and Metals National Corporation (**JOGMEC**) conducted further Li exploration in the South Basin area in 2010-2011. The exploration included at least 465 surface and trench samples and 36 drill holes (totalling approximately 8,800 m), of which 21 were core and 15 were RC. Data collected from this program, including drill core, was made available to ioneer. The Golder Competent Person reviewed the data available from this program and believes this exploration program, except for the trench data, was conducted appropriately and the information generated is of high enough quality to include in preparing the current geological model and Mineral Resource estimate. • Due to concerns regarding the ability to reliably correlate the trenches with specific geological units as well as concerns regarding representivity of samples taken from incomplete exposures of the units in the trenches, the Golder Competent person does not feel the trench sample analytical results are appropriate for use and has excluded them from use in preparing the geological model and Mineral Resource estimate.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Li-B mineralisation at Rhyolite Ridge occurs in two separate Miocene sedimentary basins; the North Basin and the South Basin, located within the Silver Peak Range in the Basin and Range terrain of Nevada, USA. The South Basin is the focus of the Study presented in this Report and the following is focused on the geology and mineralisation of the South Basin. • The South Basin stratigraphy comprises lacustrine sedimentary rocks of the Cave Spring Formation overlaying volcanic flows and volcaniclastic rocks of the Rhyolite Ridge Volcanic unit. The Rhyolite Ridge Volcanic unit is dated at approximately 6 mega-annum (**Ma**) and comprises rhyolite tuffs, tuff breccias and flows. The Rhyolite Ridge Volcanic rocks are underlain by sedimentary rocks of the Silver Peak Formation. • The Cave Spring Formation comprises a series of 11 sedimentary units deposited in a lacustrine environment, as shown in the following table. Within the study area the Cave Spring Formation can reach total thickness in excess of 120 m. Age dating of

Criteria	JORC Code 2012 Explanation	Commentary
		overlying units outside of the area and dates for the underlying Rhyolite Ridge Volcanic unit bracket deposition of the Cave Spring Formation between 4-6 Ma; this relatively young geological age indicates limited time for deep burial and compaction of the units. The Cave Spring Formation units are generally laterally continuous over several miles across the extent of the South Basin; however, thickness of the units can vary due to both primary depositional and secondary structural features. The sedimentary sequence generally fines upwards, from coarse clastic units at the base of the formation, upwards through siltstones, marls and carbonate units towards the top of the sequence. • The key mineralized units are in the Cave Spring Formation and are, from top to bottom, the M5 (high-grade Li, low- to moderate-grade B bearing carbonate-clay rich marl), the B5 (high-grade B, moderate-grade Li marl) and the L6 (broad zone of laterally discontinuous low- to high-grade Li and B mineralized horizons within a larger low-grade to barren sequence of siltstone-claystone). The sequence is marked by a series of four thin (generally on the scale of several metres or less) coarse gritstone layers (G4 through G7); these units are interpreted to be pyroclastic deposits that blanketed the area. The lateral continuity across the South Basin along with the distinctive visual appearance of the gritstone layers relative to the less distinguishable sequence of siltstone-claystone-marl that comprise the bulk of the Cave Spring Formation make the four grit stone units good marker horizons within the stratigraphic sequence. • The Cave Springs Formation is unconformably overlain by a unit of poorly sorted alluvium, ranging from 0 to 40 m (mean of 20 m) within the Study Area. The alluvium is unconsolidated and comprises sand through cobble sized clasts (with isolated occurrences of large boulder sized clasts) of the Rhyolite Ridge Volcanic Rocks and other nearby volcanic units.

Criteria	JORC Code 2012 Explanation	Commentary

Formation	Model Unit	Mean Thick (m)	Min. Thick (m)	Max. Thick (m)	Lithology Description
Alluvium	Q1	20	2	60	Sand through cobble sized clasts, isolated boulder size clasts of Rhyolite Ridge Volcanic Rocks and other nearby volcanic units
Cave Springs Fm.	S3	70	3	230	Mixed lacustrine sediments (claystone, marl, siltstone, and thin sandstone)
	G4	10	1	20	Coarse gritstone (immature volcaniclastic wacke)
	M4	10	6	30	Carbonate rich, with interbedded marl
	G5	0	1	10	Coarse gritstone
	M5	20	3	90	Carbonate-clay rich marl, high-grade Lithium, low- to moderate-grade Boron
	B5	20	6	40	Marl, high-grade Boron, moderate-grade Lithium
	S5	20	3	40	Siltstone-claystone, barren of Lithium and Boron
	G6	10	1	40	Coarse gritstone
	L6	40	3	110	Marl, siltstone-claystone, laterally discontinuous low- to high-grade Lithium and Boron mineralized horizons within a larger low-grade to barren sequence
	Lsi	30	3	60	Silicified siltstone-claystone
	G7	20	2	50	Coarse gritstone, diamictite, grading into tuff
Rhyolite Ridge Volcanics	Tbx	40	6	170	Quartz-feldspar lithic tuff containing minor biotite, phenocrystic-rich lithic tuff, and massive lithic tuff breccia, volcanic lava flows and welded tuff

Criteria	JORC Code 2012 Explanation	Commentary
		• Structurally, the South Basin is folded into a broad, open syncline with the sub-horizontal fold axis oriented approximately north-south representing the long axis of the basin. The syncline is asymmetric, with moderate to locally steep dips along the western limb, a flat central area, and interpreted steep dips on the eastern edge. The stratigraphy is further folded, including one significant southeast plunging syncline located in the southern part of the study area. The basin is bounded along its western and eastern margins by regional scale high angle faults of unknown displacement, while localized steeply dipping normal, reverse and strike-slip faults transect the Cave Spring formation throughout the basin. Displacement on these faults is generally poorly known but most appear to be on the order of 10s of metres of displacement although several located along the edge of the basin may have displacements greater than 30 m. • Li-B mineralisation is interpreted to have been emplaced by hydrothermal/epithermal fluids travelling up the basin bounding faults; based on Li-B grade distribution and continuity it is believed the primary fluid pathway was along the western bounding fault. Differential mineralogical and permeability characteristics of the various units within the Cave Spring Formation resulted in the preferential emplacement of Li-B bearing minerals in the M5, B5 and L6 units. Li-B mineralisation occurs in isolated locations in some of the other units in the sequence, but with nowhere near the grade and continuity observed in the aforementioned units.
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:* ○ *easting and northing of the drill hole collar* ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* ○ *dip and azimuth of the hole* ○ *down hole length and interception depth* ○ *hole length.*	• Exploration Results are not being reported. • A summary table providing key details for all identified drill holes for the Project is presented by type and drilling campaign in the following table:

<table>
<tr><th>Criteria</th><th>JORC Code 2012 Explanation</th><th>Commentary</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th rowspan="2">Drill Type</th><th rowspan="2">Year</th><th colspan="2">Inclined</th><th colspan="2">Vertical</th><th rowspan="2">Total Drill Holes</th><th rowspan="2">Total Depth (m)</th></tr>
<tr><th>Count</th><th>Total Depth (m)</th><th>Count</th><th>Total Depth (m)</th></tr>
<tr><td rowspan="3">RC Drill Holes</td><td>2010-2012</td><td>6</td><td>1,355</td><td>8</td><td>2,038</td><td>14</td><td>3,393</td></tr>
<tr><td>2016-2017</td><td>2</td><td>707</td><td>25</td><td>4,582</td><td>27</td><td>5,289</td></tr>
<tr><td>2018-2019</td><td></td><td></td><td>1</td><td>299</td><td>1</td><td>299</td></tr>
<tr><td rowspan="3">Core Drill Holes</td><td>2010-2012</td><td>2</td><td>531</td><td>19</td><td>4,608</td><td>21</td><td>5,139</td></tr>
<tr><td>2016-2017</td><td></td><td></td><td>3</td><td>853</td><td>3</td><td>853</td></tr>
<tr><td>2018-2019</td><td>28</td><td>6,415</td><td>14</td><td>2,671</td><td>42</td><td>9,087</td></tr>
<tr><td colspan="2">Total</td><td>38</td><td>9,008</td><td>70</td><td>15,052</td><td>108</td><td>24,060</td></tr>
</table>
</td></tr>
<tr><td></td><td>• 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.</td><td>• Of the 112 drill holes reviewed, 108 (42 RC and 66 core) were included in the geological model and 4 were omitted. One RC twin hole was omitted in favour of the cored hole at the same location. Three water/geotechnical drill holes were omitted due to a lack of lithology and quality data relevant to the geological model.</td></tr>
<tr><td>Data aggregation methods</td><td>• 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.</td><td>• Exploration Results are not being reported.
• All grade parameters presented as part of the Mineral Resource estimates prepared by Golder are presented as mass weighted grades.
• Drill core samples were composited to 1.52 m composite lengths prior to interpolation of grade data into the block model. Composite lengths honoured geological contacts (i.e. composites did not span unit contacts). The composite length was selected based on the median sample length from the drill hole assay database.
• No minimum bottom cuts or maximum top cuts were applied to the thickness or grade data used to construct the geological models. Restricted interpolation was applied to B grade data for units other than the targeted mineralized units (B5, M5 and L6; discussed further in the Estimation and Modelling Techniques section of this Table 1).
• A cut-off grade of 5,000 ppm B was applied during the Mineral Resource estimation process for the purpose of establishing reasonable prospects of eventual economic extraction based on high level mining, metallurgical and processing grade parameters identified by mining, metallurgical and processing studies</td></tr>
</table>

Criteria	JORC Code 2012 Explanation	Commentary
		performed to date on the Project.
	• *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 as individual intercepts or Exploration Results are not being reported.
	• *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• Metal equivalents were not used in the Mineral Resource estimates prepared by Golder.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.*	• All drill hole intercepts presented in the Report are down hole thickness not true thickness. As discussed in the Orientation of Data section of this Table 1, most drill hole intercepts are approximately orthogonal to the dip of the beds (intercept angles between 70-90 degrees).
	• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*	• Based on the geometry of the mineralisation, it is reasonable to treat all samples collected from inclined drill holes at intercept angles of greater than 70 degrees as representative of the true thickness of the zone sampled.
	• *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 as individual down hole intercepts or 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.*	• Appropriate plan maps and sections are appended to the Report.
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.*	• 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;*	• Surficial geological mapping performed by a senior ioneer geologist was used in support of the drill holes to define the outcrops and subcrops as well as bedding dip attitudes in the geological modelling. Mapped geological contacts and faults were imported into the model and used as surface control points for the corresponding beds or structures.

Criteria	JORC Code 2012 Explanation	Commentary
	potential deleterious or contaminating substances.	
Further work	• *The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).*	• Additional in-fill drilling and sampling may be performed based on the results of current mining project studies
	• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• No diagrams are applicable as no additional areas within the South Basin are recommended for further exploration at this time.

SECTION 3 ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	JORC Code 2012 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.*	• Measures taken to ensure the data has not been corrupted by transcription or keying errors or omissions included recording of drill hole data and observations by the logging geologists using formatted logging sheets in Microsoft (**MS**) Excel. Data and observations entered into the logging sheets were reviewed by senior ioneer and Newfield's geologists prior to importing the data into the MS Access drill hole database. • Golder evaluated the tabular data provided by ioneer for errors or omissions as part of the data validation procedures described in the following section.
	• *Data validation procedures used.*	• Golder performed data validation on the drill hole database records using available underlying data and documentation including but not limited to original drill hole descriptive logs, core photos and laboratory assay certificates. Drill hole data validation checks were performed in MS Access using a series of in-house data checks to evaluate for common drill hole data errors including but not limited to data gaps and omissions, overlapping lithology or sample intervals, miscorrelated units, drill hole deviation errors and other indicators of data corruption including transcription and keying errors. • Database assay values for every sample were visually compared to the laboratory assay certificates to ensure the tabular assay data was free of errors or omissions. • Minor errors, omissions or proposed revisions were identified by Golder during the review process; these included typographic errors and omission of some data and observations as well as some re-correlations of geological units to honour the grade data. While minor these errors, omissions or revisions were material. In each instance the error, omission or revisions were reviewed with ioneer and Newfield's senior geologists and any updates to the data were incorporated into the geological database
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	• The Golder Competent Person Jerry DeWolfe, P.Geo. made a personal inspection site visit was performed on the Project site from December 3rd to 5th 2018 by for the Project. • During the site visit the Golder Competent Person visited the

Criteria	JORC Code 2012 explanation	Commentary
		ioneer core shed in Tonopah NV, and the South Basin area of the Rhyolite Ridge Project site, which is the focus of the current exploration and resource evaluation efforts by ioneer. • The Golder Competent Person observed the active drilling, logging and sampling process and interviewed site personnel regarding exploration drilling, logging, sampling and chain of custody procedures. • The outcome of the site visit was that the Golder Competent Person developed an understanding of the general geology of the Rhyolite Ridge Project. The Golder Competent Person was also able to visually confirm the presence of a selection of monumented drill holes from each of the previous drilling programs as well as to observe drilling, logging and sampling procedures during the current drilling program and to review documentation for the logging, sampling and chain of custody protocols for previous drilling programs.
	• *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.*	• The Golder Competent Person is confident that the geological interpretation of the mineral deposit is reasonable for the purposes of Mineral Resource estimation.
	• *Nature of the data used and of any assumptions made.*	• The data used in the development of the geological interpretation included drill hole data and observations collected from 66 core and 42 RC drill holes, supplemented by surface mapping of outcrops and faults performed by ioneer personnel. Regional scale public domain geological maps and studies were also incorporated into the geological interpretation. • It is assumed that the mineralized zones are continuous between drill holes as well as between drill holes and surface mapping. It is also assumed that grades vary between drill holes based on a distance-weighted interpolator.
	• *The effect, if any, of alternative interpretations on Mineral Resource estimation.*	• There are no known alternative interpretations.
	• *The use of geology in guiding and controlling Mineral Resource estimation.*	• Geology was used directly in guiding and controlling the Mineral Resource estimation. The mineralized zones were modelled as stratigraphically controlled Li-B deposits. As such, the primary

Criteria	JORC Code 2012 explanation	Commentary
		directions of continuity for the mineralisation are horizontally within the preferentially mineralized B5, M5 and L6 geological units.
	• *The factors affecting continuity both of grade and geology.*	• The primary factor affecting the continuity of both geology and grade is the lithology of the geological units. Li-B mineralisation is favourably concentrated in marl-claystone of the B5, M5 and L6 units. Mineralogy of the units also has a direct effect on the continuity of the mineralisation, with elevated B grades in the B5 and M5 units associated with a distinct reduction in carbonate and clay content in the units, while higher Li values tend to be associated with elevated carbonate content in these units. • Additional factors affecting the continuity of geology and grade include the spatial distribution and thickness of the host rocks which have been impacted by both syn-depositional and post-depositional geological processes (i.e. localized faulting, erosion and so forth).
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.*	• The Mineral Resource evaluation presented in this Report covers an area of approximately 275 Ha within the South Basin of Rhyolite Ridge. The Mineral Resource plan dimensions, defined by the spatial extent of the B5 unit Inferred classification limits, are approximately 2,900 m North-South by 1,600 m East-West. The upper and lower limits of the Mineral Resource span from surface, where the mineralized units outcrop locally, through to a maximum depth of 400 m below surface for the base of the lower mineralized zone (L6 unit). • Variability of the Mineral Resource is associated primarily with the petrophysical and geochemical properties of the individual geological units in the Cave Spring Formation. These properties played a key role in determining units that were favourable for hosting Li-B mineralisation versus those that weren't. • On a basin scale, proximity/distance relative to the interpreted source pathways for the mineralizing fluids is a key component in grade distribution and variability across the deposit; Li and B grades appear highest in the southwest portion of the South Basin, proximal to the western bounding fault of the basin.
Estimation	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including*	• Geological modelling and Mineral Resource estimation for the Project was performed under the supervision of the Golder

<table>
<tr><th>Criteria</th><th>JORC Code 2012 explanation</th><th>Commentary</th></tr>
<tr><td rowspan="2">and modelling techniques</td><td>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.</td><td>Competent Person.
• Based on a statistical analysis, extreme B grade values were identified in some of the units other than the targeted B5, M5 and L6 units. As a result, restricted interpolation was applied to B grades in units other than the B5, M5 and L6.
• The geological model was developed as a gridded surface stratigraphic model and a stratigraphically constrained grade block model using ABB MineScape (v6.1.1) StratModel and BlockModel, which are computer-assisted geological, grade modelling, and estimation software applications.
• Domaining in the model was constrained by the roof and floor surfaces of the geological units. The unit boundaries were modelled as hard boundaries, with samples interpolated only within the unit in which they occurred.
• Key modelling and estimation parameters included the following:
<table>
<tr><td>Estimation Method</td><td>Inverse Distance Squared</td></tr>
<tr><td>Search Volume Geometry</td><td>Ellipsoid</td></tr>
<tr><td>Search Radius (Pass 1/2/3/4)</td><td>152.4/304.8/609.6/6,096 m</td></tr>
<tr><td>Estimation Block Size (x/y/z)</td><td>15.2/15.2/1.52 m</td></tr>
<tr><td>Sub-cell Size (x/y/z)</td><td>3.81/3.81/0.38 m</td></tr>
<tr><td>Discretization (x/y/z)</td><td>2/2/2</td></tr>
<tr><td>Minimum Number of Samples (Pass 1/2/3/4)</td><td>4/4/4/4</td></tr>
<tr><td>Maximum Number of Samples (Pass 1/2/3/4)</td><td>16/16/16/16</td></tr>
<tr><td>Maximum Number of Samples Per Hole (Pass 1/2/3/4)</td><td>2/2/2/2</td></tr>
<tr><td>Weighting Used</td><td>Density and length</td></tr>
</table></td></tr>
<tr><td>• The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</td><td>• A maiden Indicated and Inferred Mineral Resource estimate of 393 million tonnes (Mt) at 0.9% Lithium Carbonate and 2.9% Boric Acid for the Project was completed by RungePincockMinarco Ltd. (RPM) in 2016 (“Maiden Resource for South Basin at Nevada Lithium-Boron Project”, October 10, 2016, Global Geoscience Press Release) and subsequently updated by RPM in 2017</td></tr>
</table>

Criteria	JORC Code 2012 explanation	Commentary
		(*"Global Geoscience Limited Doubles High-Grade Lithium-Boron Mineral Resource"*, October 31, 2017, Global Geoscience Press Release.) and October 2018 (*"Updated Rhyolite Ridge Mineral Resource Statement"*, October 23, 2018, Global Geoscience Press Release) with additional drilling. Golder has reviewed these estimates and a high-level comparison with the 2019 estimate has been completed and is presented in this Report. • There has been no Li-B production on the Project to date.
	• *The assumptions made regarding recovery of by-products.*	• No by-products are being considered for recovery at present.
	• *Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).*	• In addition to Li and B, the geological model also included 12 additional non-grade elements (Sr, Ca, Mg, Na, K, As, Rb, Cs, Mo, Fe, Al, W) to allow for calculation of acid consumption values for the metallurgical process. No deleterious elements were estimated.
	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*	• The stratigraphic gridded surface model was developed using a 7.62 m regularized grid. The grade block model was developed from the stratigraphic model using a 15.2 m North-South by 15.2 m East-West by 1.52 m vertical parent block dimension with sub-cell dimensions of 3.81 m by 3.81 m by 0.38 m. The grid cell and block size dimensions represent 25 percent of the nominal drill hole spacing across the model area. • Grade interpolation into the model blocks was performed using an Inverse Distance Squared (**ID^2**) interpolator with up to four search passes with search distances of 152.4 m, 304.8 m, 609.6 m and 6,096 m.
	• *Any assumptions behind modelling of selective mining units.*	• Assumptions relating to selective mining units were based on the interpretation that the Li-B mineralisation encountered is stratigraphically constrained and that mineralized and non-mineralized units can be selectively separated by existing mining and processing methods.
	• *Any assumptions about correlation between variables.*	• No assumptions or calculations relating to the correlation between variables were made at this time.
	• *Description of how the geological interpretation was used to control the resource estimates.*	• The geological interpretation was used to control the Mineral Resource estimate by developing a contiguous stratigraphic model

Criteria	JORC Code 2012 explanation	Commentary
		(all units in the sequence were modelled) of the host rock units deposited within the basin, the roof and floor contacts of which then served as hard contacts for constraining the grade interpolation. Grade values were interpolated within the geological units using only samples intersected within those units; sub-celling was applied to allow for improved definition of geological contacts relative to the model blocks at the upper and lower contacts of the units.
	• *Discussion of basis for using or not using grade cutting or capping.*	• Grade capping or cutting was not applied for the targeted mineralized units B5, M5 and L6 as a statistical analysis of the grade data indicated there was no bias or influence by extreme outlier grade values. • Restricted interpolation of Boron grade data was applied in place of grade cutting or capping in the other units on the model besides the targeted mineralized units B5, M5 and L6; to allow for use of all validated grade values while limiting the potential impact of overestimating spatially isolated high-grade results in the generally unmineralized units. Restricted interpolation controls were not applied to any other grade parameters. Mineral Resources were not estimated for the other units however grade was interpolated to allow for potential mining dilution evaluations during later studies.
	• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• The geological model validation and review process involved visual inspection of drill hole data as compared to model geology and grade parameters using plan isopleth maps and 180 m spaced cross-sections through the model. Drill hole and model values were compared statistically as well as via along-strike and down-dip swath plots. • No reconciliation data is available because the property is not in production.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• The estimated Mineral Resource tonnages are presented on a dry basis. • A moisture content of 5% for the mineralized units has been assumed for mining and other modifying factors studies currently underway but should be evaluated as part of future analytical

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		programs.

Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• The Mineral Resource estimate presented in this Report has been constrained by the application of an optimized Mineral Resource pit shell. The Mineral Resource pit shell was developed using Maptek Vulcan Mine Planning software.
		• Key input parameters and assumptions for the Mineral Resource pit shell included the following:
		  • B cut-off grade of 5,000 ppm.
		  • Overall pit slope angle of 35 degrees in the alluvium and 42 degrees in other rock units (wall angle guidance provided by EnviroMine, Inc., who is developing the geotechnical design).
		  • Mining cost of US$2.67/tonne (**t**) plus US$0.0059/t-vertical m of haulage.
		  • Ore processing and grade control costs of US$45.45/ t of ore.
		  • Boron and Li recovery of 83.5% and 81.8% respectively.
		  • Boric Acid sales price of US$700/t.
		  • Lithium Carbonate sales price of US$10,000/t.
		  • Sales/Transport costs of US$160/t of product.

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.*	• The Mineral Resource estimate presented in this Report was developed with the assumption that the Li-B mineralisation within the Mineral Resource pit shell, as described in the preceding section, has a reasonable prospect for eventual economic extraction using current conventional open pit mining methods. • The mining factors or assumptions used in establishing the reasonable prospects for eventual economic extraction of the Li-B mineralisation are based on preliminary results from mine design and planning work that is in-progress as part of an ongoing Feasibility Study for the Project. • Except for the Mineral Resource pit shell criteria discussed in the preceding section, no other mining factors, assumptions or mining parameters such as mining recovery, mining loss or dilution have been applied to the Mineral Resource estimate presented in this Report.
Metallurgical factors or	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of*	• The metallurgical factors or assumptions used in establishing the reasonable prospects for eventual economic extraction of the Li-B

Criteria	JORC Code 2012 explanation	Commentary
assumptions	*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.*	mineralisation are based on preliminary results from metallurgical and material processing work that is in-progress as part of an ongoing Feasibility Study for the Project. This test work was performed using current processing and recovery methods for producing Boric acid and Lithium carbonate products.
Environment-al 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 greenfields 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.*	• Environmental and socio-economic studies are in progress for the Project; however there have been no environmental factors or assumptions applied to the geological modelling and or estimated Mineral Resources presented in this Report. Environmental assumptions and factors will be taken into consideration during future modifying factors studies for the Project.
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.*	• The density values used to convert volumes to tonnages were assigned on a by-geological unit basis using mean values calculated from 249 density samples collected from drill core during the 2010-2011 and 2018-2019 drilling programs. The density analyses were performed using the water displacement method for density determination, with values reported in dry basis. • The application of assigned densities by geological unit assumes that there will be minimal variability in density within each of the units across their spatial extents within the Project area. The use of assigned density with a very low number of samples, as is the case with several waste units, is a factor that increases the uncertainty and represents a risk to the Mineral Resource estimate confidence.
	• *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences*	• The Archimedes-principle method for density determination accounts for void spaces, moisture and differences in rock type.

<table>
<tr><th>Criteria</th><th>JORC Code 2012 explanation</th><th>Commentary</th></tr>
<tr><td></td><td>between rock and alteration zones within the deposit.</td><td></td></tr>
<tr><td></td><td>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</td><td>Density values were assigned for all geological units in the model, including mineralized units as well as overburden, interburden and underburden waste units. By-unit densities were assigned in the grade block model based on the block geological unit code as follows:
<table>
<tr><th colspan="2">Grade Model Density Parameters:</th><th>Mean of Density g/cm3</th></tr>
<tr><td>Q1</td><td rowspan="5">Overburden</td><td>1.80</td></tr>
<tr><td>S3</td><td>2.01</td></tr>
<tr><td>G4</td><td>2.00</td></tr>
<tr><td>M4</td><td>2.00</td></tr>
<tr><td>G5</td><td>1.98</td></tr>
<tr><td>M5</td><td rowspan="2">Mineralised</td><td>2.09</td></tr>
<tr><td>B5</td><td>1.95</td></tr>
<tr><td>S5</td><td rowspan="2">Interburden</td><td>1.99</td></tr>
<tr><td>G6</td><td>2.00</td></tr>
<tr><td>L6</td><td>Mineralised</td><td>2.11</td></tr>
<tr><td>Lsi</td><td rowspan="3">Underburden</td><td>2.00</td></tr>
<tr><td>G7</td><td>2.00</td></tr>
<tr><td>Tbx</td><td>2.00</td></tr>
</table></td></tr>
<tr><td>Classification</td><td>The basis for the classification of the Mineral Resources into varying confidence categories.</td><td>The Mineral Resource estimate for the Project is reported here in accordance with the “Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves” as prepared by the Joint Ore Reserves Committee (the JORC Code, 2012 Edition).
A Maiden Ore Reserve estimate of 15.8 Mt at 1.0% Lithium Carbonate and 7.0% Boric Acid for the Project was completed by RPMGlobal USA Inc. (RPM Global) and released in December 2018 (“Rhyolite Ridge Drilling Update and Maiden Ore Reserve”, December 21, 2018, ioneer Press Release). Updated Mineral Reserves will be estimated as part of the ongoing Feasibility Study for the Project, following completion of modifying factors studies currently in-progress.</td></tr>
</table>

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		• Golder performed a statistical and geostatistical analysis for the purpose of evaluating the confidence of continuity of the geological units and grade parameters. The results of this analysis were applied to developing the Mineral Resource classification criteria.
		• Estimated Mineral Resources were classified as follows:
		  • Measured: 152.5 m spacing between points of observation, with sample interpolation from a minimum of two drill holes.
		  • Indicated: 305 m spacing between points of observation, with sample interpolation from a minimum of two drill holes.
		  • Inferred: 610 m spacing between points of observation, with sample interpolation from a minimum of two drill holes.

	• *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).*	• The Mineral Resource classification has included the consideration of data reliability, spatial distribution and abundance of data and continuity of geology and grade parameters.
	• *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• It is the Golder Competent Persons view that the classification criteria applied to the Mineral Resource estimate are appropriate for the reliability and spatial distribution of the base data and reflect the confidence of continuity of the modelled geology and grade parameters.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• Beyond high level review for the purpose of understanding the Project history, no formal audits or reviews of previous or historical Mineral Resource estimates were performed as part of the scope of work; Mineral Resource estimation evaluation is limited to the estimate prepared by Golder and presented in this Report.
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.*	• Golder performed a statistical and geostatistical analysis and applied Mineral Resource classification criteria to reflect the relative confidence level of the estimated Mineral Resource tons and grades estimated globally across the model area for the Project.
	• *The statement should specify whether it relates to global or*	• The Mineral Resource tons and grade have been estimated

Criteria	JORC Code 2012 explanation	Commentary
	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.	globally across the model area for the Project.
	• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• Reconciliation against production data/results was not possible as the Project is currently in the development stage and there has been no production on the Project to date.