ASX ANNOUNCEMENT 7 July 2014

# Metallurgical tests yield Ultra-high purity + 99.9% C

**HIGHLIGHTS:**

- **Metallurgical testwork yields ultra-high purity carbon grade for Epanko graphite deposit**
- **Ultra-high purity achieved in a simple one-step purification process**
- **Large flake size and high purity levels provides entry to a multitude of markets**
- **Testwork proves graphite is suitable for the production of spherical graphite used in the high-growth lithium-ion battery market**

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**Kibaran Resources Limited (ASX: KNL) is pleased to report that recent metallurgical testwork has yielded results exceeding 99.9% carbon from a simple one-step process after flotation.**

The ultra-high purity carbon was produced from a graphite sample taken from the Company's Epanko deposit at its Mahenge Project in Tanzania.

The testwork was undertaken at NGS Naturgraphit GmbH ("NGS"), an independent company which specialises in world-wide graphite sales and carbon based products located in Germany. The testwork was overseen by the Company's graphite trader under our partnership and sales arrangement (refer announcement dated 23 December 2013). The results achieved are summarised in the following table.

**Table 1 - Carbon grades for flotation and chemical purification**

| FLAKE SIZE | | | FLOTATION CONCENTRATE | PURIFICATION GRADE |
|---|---|---|---|---|
| **Name** | **Micron** | **Mesh** | **(%)** | **(%)** |
| Extra Jumbo | >500 micron | >35 | 97.7 | **99.94** |
| Jumbo | >300 microns | >48 | 97.2 | **99.98** |
| Large | >180 microns | >80 | 96.2 | **99.95** |
| Medium | >106 microns | >150 | 95.8 | **99.91** |
| Small | >75 microns | >200 | 93.7 | **99.85** |
| Fine | <75 microns | <200 | 87.4 | **99.72** |

**Notes: Chemical Purification by HF acid. Results calculated by drying at temperatures in the range of 400 °C and from LOI.**

Ultra high purity can be reached easily in a single one step process**.** Importantly, extremely low impurities are recorded (refer table 2) confirming that there is no limitation on the application and uses of Epanko flake graphite.

With the current market focused on 94% to 97% carbon purity, Kibaran's ability to easily and inexpensively produce ultra-high purity flake graphite of 99.9% from Epanko concentrate means Kibaran is now very well positioned to tap into a multitude of markets and command a premium price. These markets include Expandable, Micronised and Spherical graphite markets.

One focus of the Company is the market for lithium ion batteries, which include both expanded and spherical graphite in its composition. Demand for these types of batteries is being driven by the surging use of portable consumer electronics such as smartphones, and hybrid and electric vehicles. This market is forecast to grow to US$34.3 billion in 2020[1]. The test results indicate that the high purity flake graphite produced from Epanko concentrates is suitable for the production of spherical graphite for Li-Ion-batteries.

[1] Citi Research Forecast - http://www.globalstrategicmetalsnl.com/_content/documents/405.pdf

**Table 2 – Impurities levels after chemical purification**

| FLAKE SIZE | | | MOISTURE | VOLATILE MATTER | ASH CONTENT |
|---|---|---|---|---|---|
| Name | Micron | Mesh | (%) | (%) | (%) |
| Extra Jumbo | >500 micron | >35 | 0.05 | 0.21 | 0.06 |
| Jumbo | >300 microns | >48 | 0.05 | 0.27 | 0.02 |
| Large | >180 microns | >80 | 0.03 | 0.51 | 0.05 |
| Medium | >106 microns | >150 | <0.01 | 0.77 | 0.09 |
| Small | >75 microns | >200 | <0.01 | 0.81 | 0.15 |
| Fine | <75 microns | <200 | 0.02 | 0.93 | 0.28 |

***Micron (µm) and Millimetre (mm).  1mm = 1000µm and carbon content determined by loss of ignition method (LOI)***

The testwork was based on the 14kg of flake graphite from Epanko as reported in announcement dated 5 June 2013, which demonstrated a significant portion of extra jumbo, jumbo and large flake distribution within the deposit (refer table 3).

The purpose of the test was to evaluate the ability to achieve 99.9% C concentrate after simple flotation.  A 5g sample from the flotation concentrate was obtained for each size fraction; this material was heated to 400$^{o}$C.

**Table 3 – Graphite flake size distribution.**

| FLAKE SIZE | | | EPANKO FLAKE DISTRIBUTION |
|---|---|---|---|
| Name | Micron | Mesh | (% Retained) |
| Extra Jumbo | >500 micron | >35 | 8.4 |
| Jumbo | >300 microns | >48 | 13.2 |
| Large | >180 microns | >80 | 28.6 |
| Medium | >106 microns | >150 | 23.6 |
| Small | >75 microns | >200 | 10.4 |
| Fine | <75 microns | <200 | 15.8 |

***Micron (µm) and Millimetre (mm).  1mm = 1000µm and carbon content determined by loss of ignition method (LOI)***

The sample provided was sourced from MHRT09, which returned 117m at 10.0% total graphitic carbon ("TGC") (location: 9035106N, 904307E). The sample was crushed to less than 1mm and then flotation tested. The average carbon head grade was reported to be 13.6% Carbon.  Large flakes of up to 3mm were observed before crushing.

The Epanko deposit has attracted a binding offtake and sales partnership agreement, which was advanced with the support of a development bank with the view for potential debt funding for the future development of the deposit.

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## JORC Code, 2012 Edition – Table 1

### Section 1 Sampling Techniques and Data

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| ***Sampling techniques*** | • *Nature and quality of sampling (eg 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.*<br>• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*<br>• *Aspects of the determination of mineralisation that are Material to the Public Report.*<br>• *In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 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 (eg submarine nodules) may warrant disclosure of detailed information.* | • The Epanko deposit was sampled by reverse circulation (RC) holes.<br>• Sampling is guided by Kibaran's protocols and QA/QC procedures<br>• RC samples are collected by a riffle splitter using a face sampling hammer diameter approximately 140 mm.<br>• All samples were sent SGS laboratory in Johannesburg for preparation and LECO analyses.<br>• All samples are crushed using LM2 mill to –4 mm and pulverised to nominal 80% passing –75 µm.<br>• Diamond core (if competent) is cut using a core saw. Where the material is too soft it is left in the tray and a knife is used to quarter the core for sampling.<br>• Trenches were sampled at 0.5m intervals, these intervals were speared and submitted for analyses. |
| ***Drilling techniques*** | • *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg 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).* | • RC holes were drilled in a direction so as to hit the mineralisation orthogonally. Face sample hammers were used and all samples collected dry and riffle split after passing through the cyclone.<br>• Diamond drilling was drilled as triple Tubed HQ diameter core. |
| ***Drill sample recovery*** | • *Method of recording and assessing core and chip sample recoveries and results assessed.*<br>• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*<br>• *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.* | • The RC rig sampling systems are routinely cleaned to minimize the opportunity for contamination; drilling methods are focused on sample quality.<br>• The selection of RC drilling company, having a water drilling background enables far greater control on any water present in the system, ensuring wet samples were kept to a minimum. |
| ***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.*<br>• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.*<br>• *The total length and percentage of the relevant intersections logged.* | • Geological logging is completed for all holes and representative across the deposit.<br>• Logged data is both qualitative and quantitative depending on field being logged.<br>• All drill holes are logged. |
| ***Sub-sampling techniques and sample preparation*** | • *If core, whether cut or sawn and whether quarter, half or all core taken.*<br>• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*<br>• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*<br>• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*<br>• *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.*<br>• *Whether sample sizes are appropriate to the grain size of the material being sampled.* | • All RC samples are split using a riffle splitter mounted under the cyclone, RC samples are drilled dry.<br>• A small fraction of samples returned to the surface wet. All samples were submitted for assay<br>• Diamond core was cut on core saw and quarter core submitted for analyses.<br>• Sample preparation at the SGS laboratory involves the original sample being dried at 80° for up to 24 hours and weighed on submission to laboratory. Crushing to nominal –4 mm. Sample is split to less than 2 kg through linear splitter and excess retained. Sample splits are weighed at a frequency of 1/20 and entered into the job results file. Pulverising is completed using LM2 mill to 90% passing –75 µm. |
| ***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.*<br>• *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.*<br>• *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.* | • Drill samples were sent to the SGS Laboratory at Mwanza (Tanzania) for sample preparation, with the pulps sent to SGS Johannesburg for assaying. The following methodology is used by SGS for Total Graphitic Carbon (TGC) analyses.<br>• Total carbon is measured using LECO technique. The sample is combusted in the oxygen atmosphere and the IR used to measure |

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| | | the amount of CO2 produced. The calibration of the LECO instrument is done by using certified reference materials.<br>• For the analysis of Graphitic Carbon, a 0.3g sample is weighed and roasted at 550oC to remove any organic carbon. The sample is then heated with diluted hydrochloric acid to remove carbonates. After cooling the sample is filtered and the residue rinsed and dried at 75oC prior to analysis by the LECO instrument. The analyses by LECO are done by total combustion of sample in the oxygen atmosphere and using IR absorption from the resulting CO2 produced.<br>• Laboratory certificates were sent via email from the assay laboratory to Kibaran. The assay data was provided to CSA in the form of Microsoft XL files and assay laboratory certificates. The files were imported into Datamine.<br>• Standards are inserted at approximately a 10% frequency rate. In addition, field duplicates, laboratory duplicates are collectively inserted at a rate of 10% QAQC data analysis has been completed to industry standards. . |
| ***Verification of sampling and assaying*** | • *The verification of significant intersections by either independent or alternative company personnel.*<br>• *The use of twinned holes.*<br>• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*<br>• *Discuss any adjustment to assay data.* | • Senior Kibaran geological personnel supervised the sampling, and alternative personnel verified the sampling locations.<br>• Previous drilling has twinned holes<br>• Primary data are captured on paper in the field and then re-entered into spreadsheet format by the supervising geologist, to then be loaded into the company's database.<br>• No adjustments are made to any assay data. |
| ***Location of data points*** | • *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*<br>• *Specification of the grid system used.*<br>• *Quality and adequacy of topographic control.* | • Sample locations pickedup by hand held GPS.<br>• WGS84 Zone 36 South<br>• No coordinate transformation was applied to the data.<br>• Downhole surveys collected by multi-shot camera, |
| ***Data spacing and distribution*** | • *Data spacing for reporting of Exploration Results.*<br>• *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.*<br>• *Whether sample compositing has been applied.* | • Spacings are sufficient for Mineral Resource has been estimated with the available data.<br>• Drill hole locations are at a nominal 50 m (Y) by 25 m (X) spacings.<br>• Data spacing and distribution are sufficient to establish the degree of geological and grade continuity.<br>• No compositing has been applied to exploration data. |
| ***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.*<br>• *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.* | • All holes have been orientated towards an azimuth so as to be able intersect the graphitic mineralisation in a perpendicular manner.<br>• RC holes were drilled at variable dips to define the geology and contacts of the deposit.<br>• Some holes were dtrilled vertical to test contact positions. |
| ***Sample security*** | • *The measures taken to ensure sample security.* | • Samples were stored at the company's secure field camp prior to dispatch to the prep lab by contacted transport company, who maintained security of the samples. |
| ***Audits or reviews*** | • *The results of any audits or reviews of sampling techniques and data.* | • No audits or reviews of sampling or results have been conducted to date. |

## Section 2 Reporting of Exploration Results

| Criteria | JORC Code explanation | Commentary |
|---|---|---|
| ***Mineral tenement and land tenure status*** | • *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.*<br>• *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.* | • The tenements are 100% owned by Kibaran wholly owned subsidiary and are within granted and live prospecting licenses.<br>• The Mahenge project consists of PL 8204/2012 |
| ***Exploration done by other parties*** | • *Acknowledgment and appraisal of exploration by other parties.* | • Historical reports exist for the project area as the region was first recognised for graphite potential in 1914 and 1959.<br>• No recent information exists. |
| ***Geology*** | • *Deposit type, geological setting and style of mineralisation.* | • The Mahange Project is hosted within a quartz–feldspar-carbonate graphitic schist, part of a Neoproterozoic metasediment package, including marble and gneissic units. two zones of graphitic schist have been mapped. |
| ***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:*<br>  ○ *easting and northing of the drill hole collar*<br>  ○ *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar*<br>  ○ *dip and azimuth of the hole*<br>  ○ *down hole length and interception depth*<br>  ○ *hole length.*<br>• *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.* | • Sample and drill hole coordinates are provided in body of report. |
| ***Data aggregation methods*** | • *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.*<br>• *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.*<br>• *The assumptions used for any reporting of metal equivalent values should be clearly stated.* | • No high-grade cuts were necessary.<br>• Aggregating was made for intervals that reported over 1% TGC (Total graphitic carbon). The purpose of this is to report intervals that may be significant to future metallurgical work.<br>• There is no implication about economic significance. Intervals reporting above 8% TGC are intended to highlight a significant higher grade component of graphite, there is no implication of economic significance.<br>• No equivalents were used. |
| ***Relationship between mineralisation widths and intercept lengths*** | • *These relationships are particularly important in the reporting of Exploration Results.*<br>• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*<br>• *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').* | • All RC holes have been orientated towards an azimuth so as to be able intersect the graphitic mineralisation orthogonally<br>• Given dip variations are mapped down hole length are reported, true width not known' |
| ***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.* | • See main body of 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.* | • Results presented in report. |
| ***Other substantive exploration data*** | • *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.* | • Field mapping was conducted first to define the geological boundaries of the graphitic schist with other geological formations. |
| ***Further work*** | • *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*<br>• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.* | • Diamond drilling is planned to be completed for further metallurgical testwork |

***About Kibaran Resources Limited:***


*Kibaran Resources Limited (ASX: KNL or "Kibaran") is an exploration company with highly prospective graphite and nickel projects located in Tanzania.*

*The Company's primary focus is on its 100%-owned Epanko deposit, located within the Mahenge Graphite Project. Epanko currently has an Inferred Mineral Resource Estimate of 14.9Mt, grading 10.5% TGC, for 1.56Mt of contained graphite, defined in accordance with the JORC Code. This initial estimate only covers 20% of the project area. Metallurgy has found Epanko graphite to be large flake and expandable in nature.*

*Kibaran also has rights to the Merelani-Arusha Graphite Project, located in the north-east of Tanzania. Merelani-Arusha is also considered to be highly prospective for commercial graphite.*

*Graphite is regarded as a critical material for future global industrial growth, destined for industrial and technology applications including nuclear reactors, lithium-ion battery manufacturing and a source of graphene.*

*In addition, the Kagera Nickel Project remains underexplored and is located along strike of the Kabanga nickel deposit, owned be Xstrata, which is considered to be the largest undeveloped, high grade nickel sulphide deposit in the world.*

[1] *"This information was prepared and first disclosed under the JORC Code 2004. It has not been updated since to comply with the JORC Code 2012 on the basis that the information has not materially changed since it was last reported."*

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The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by Mr Andrew Spinks, who is a Member of The Australasian Institute of Mining and Metallurgy included in a list promulgated by the ASX from time to time. Andrew Spinks is a director of Kibaran Resources Limited and has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves". Andrew Spinks consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.