

9 May 2014

## **DRILLING UPDATE AT NDONGO PROSPECT, BOLGATANGA PROJECT, GHANA**

### **HIGHLIGHTS**

- **Ndongo West - First batch of 362 RC drill samples submitted to SGS Laboratory, Ouagadougou, Burkina Faso and assay results expected 14-21 days**
- **Ndongo West – “Fresh Rock” intercepted between 2-12m down hole for the 7 holes drilled to date**
- **Ndongo West - RC rock chips mainly comprise silicified greywackes and some quartzites with disseminated pyrite specks and blebs**
- **Ndongo West - Contact widths are estimated to be between 20-50m**
- **Ndongo Central - Phase 1 RC drilling defined a ~1 km Silica-Rich Zone with possible extensions for a further ~1.5 km.**

Cardinal Resources Limited (ASX: CDV) (“Cardinal” or “the Company”), is pleased to announce that the Phase 1 RC Drilling program has commenced over the Ndongo West Zone of the Ndongo Prospect (Figure 1).

#### **From Bolgatanga, Ghana, Exploration Manager, Paul Abbott said;**

“The results of the RC Chip logging within the Ndongo West Zone are very encouraging at this early stage of the program. The visual logging confirmed mineralisation within the prominent NE trending contact zone delineated by the Gradient Array IP (GAIP) survey and the Soil Geochemical program (Figure 2).

“Having submitted the first batch of samples, we expect to be in a position to report the drill assay results within 14-21 days.

“The rocks units that were logged are mainly silicified greywackes with quartzites, most of which contain specks and blebs of sulphides (mainly pyrite with minor pyrrhotite and some arsenopyrite). Granitoid intrusives have also been intersected.

“Having this data on a daily basis, we can now selectively drill so that the entire ~1.5 km contact zone can be covered in such a way that we should be able to confidently establish parameters which will assist us in future calculations and estimates.

“We also believe that this will lead into a value proposition which could ultimately be leveraged on the back of discovery success within this zone”.

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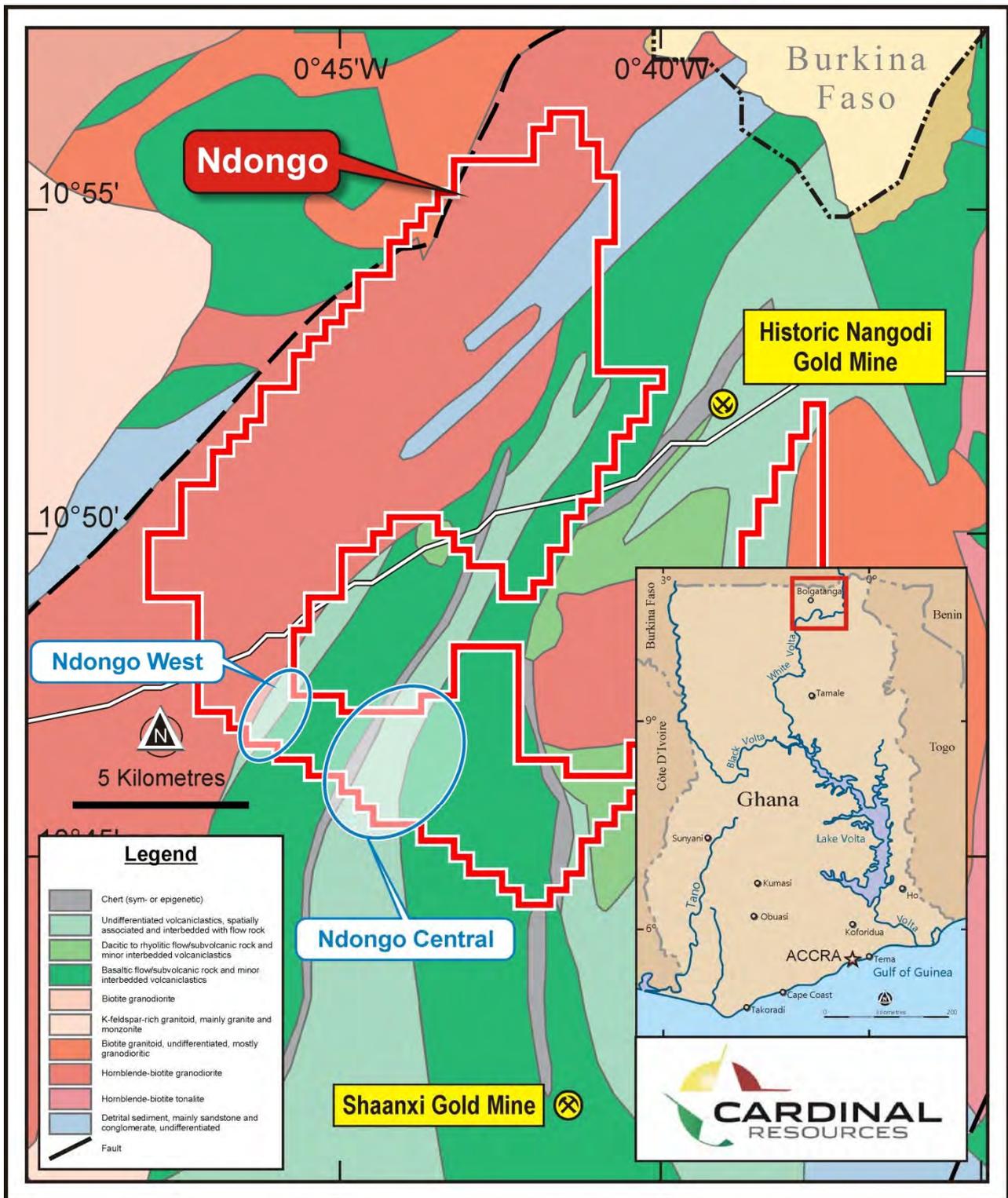


Figure 1: Cardinal Resources' Ndongo Tenement

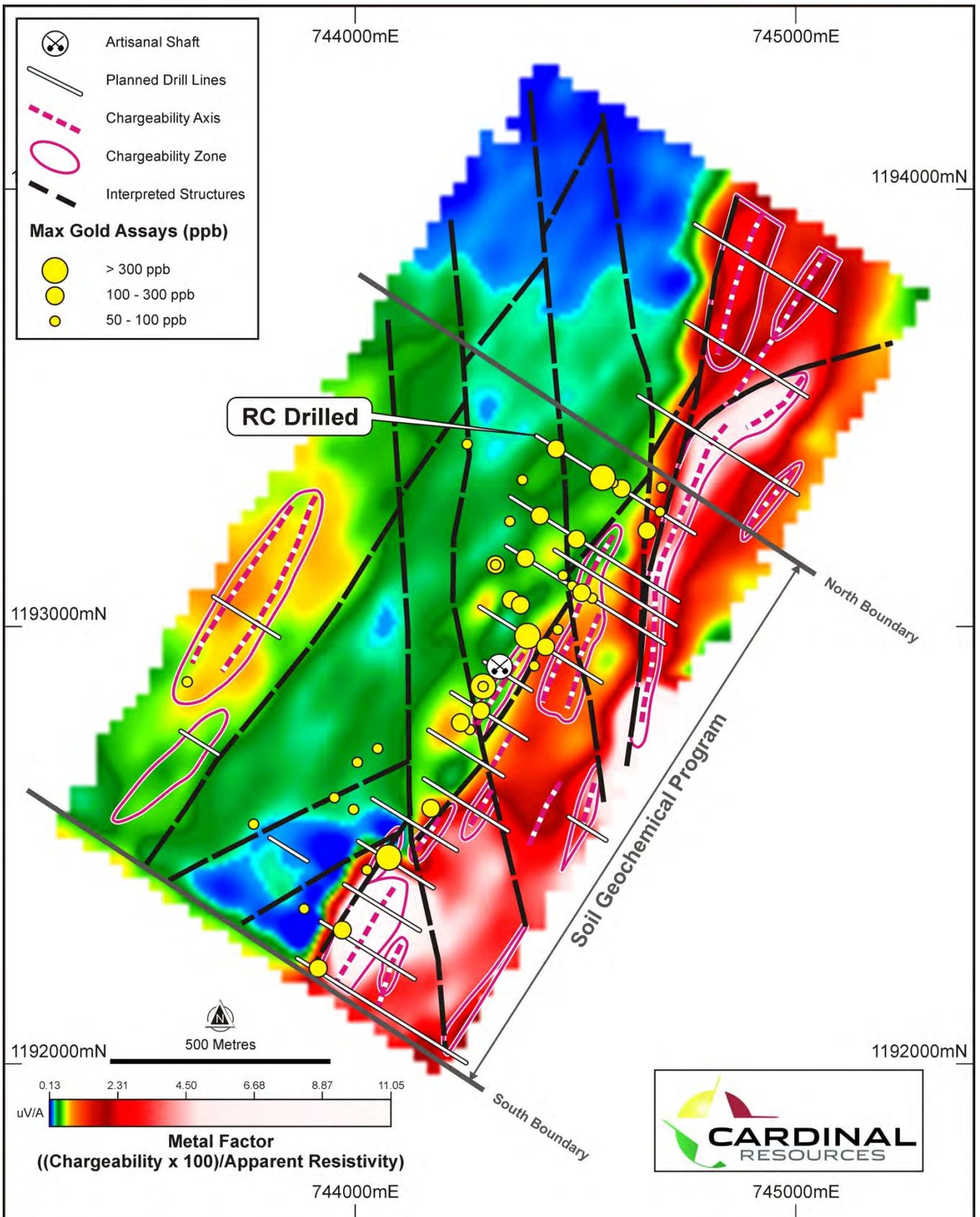


Figure 2: Ndongo West Area Gradient Array IP (GAIP) Metal Factor with RC Drilling

## **NDONGO CENTRAL ZONE**

The **high chargeability zones** on Figure 3 were confirmed by SGS Laboratory to be caused by graphite, disseminated sulphides (pyrite) or a combination of both.

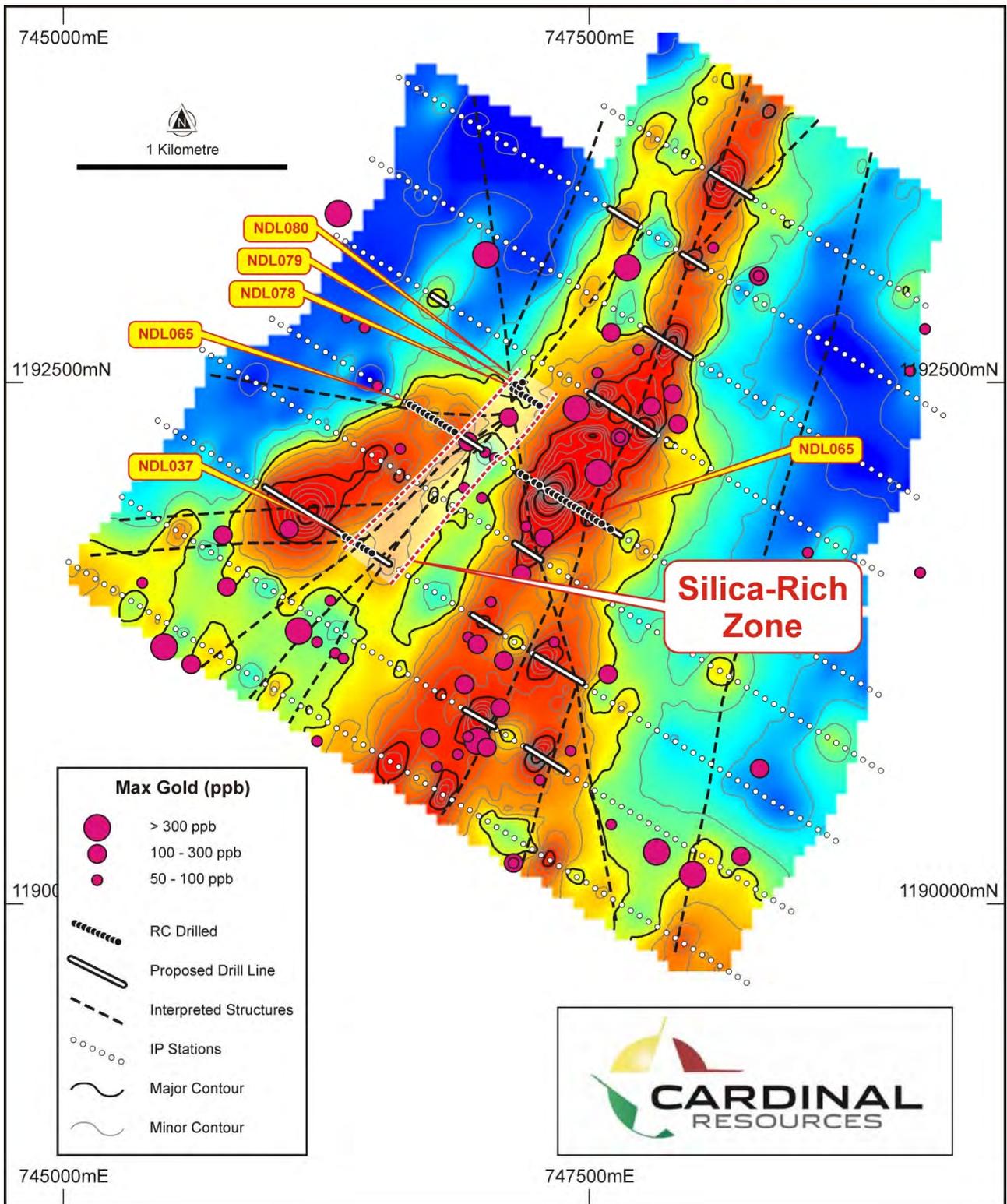
The rock chips that were initially logged on Line NDL065 in Figure 3 and submitted to SGS Laboratory were mainly graphitic phyllites with no significant results.

A revised drill plan to then test **low chargeability zones** and more resistive rock units on lines NDL078, NDL079, NDL080 and then on line NDL037 resulted in rock chips that comprise quartzites with disseminated sulphides (pyrite) which subsequently defined a ~1 km “Silica-Rich Zone” located between the graphitic phyllites on line NDL065 (Figure 3).

Graphite is commonly associated with major shear structures and this type of geological setting where there is graphite present within the footwalls of an orebody, to this extent, is also similar to some of the largest producing mines in southern Ghana including **AngloGold Ashanti’s Obuasi (JSE:ANG) gold mine** and the **Golden Star Resources Limited Bogoso-Prestea mines (TSX:GSC)**.

**AngloGold Ashanti Ltd: Obuasi Mine** has reported gold resources of 20 Moz and annual production of circa 350,000 oz Au pa.

**Golden Star Resources Ltd: Bogoso-Prestea mines** report Mineral Reserves of 2.0 Moz at an average grade of 3.17 g/t Au; Measured and Indicated Mineral Resources of 3.0 Au Moz at an average grade of 3.28 g/t Au. Two plants with combined processing capacity of 4.2 mtpa are estimated to produce 165,000 – 180,000 oz Au in 2014.



**Figure 3: Ndongo Central Area DDIP chargeability image and anomalous gold-in-soil values with proposed drill lines and RC holes drilled to date.**

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**Competent Person's Statement**

The information in this report that relates to geophysical results and Interpretation is based on information compiled by **Mr William Peters**, a Consulting Geophysicist (Crosmin Pty Ltd) at Southern Geoscience Consultants. Mr Peters is a Fellow of the Australasian Institute of Mining and Metallurgy and Chartered Professional (Geology), and has sufficient experience which is relevant to the type of 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'. Mr Peters consents to the inclusion in this report of the matters reviewed by him in the form and context in which they appear.

Information in this report that relates to the Bolgatanga Project is based on information compiled by **Mr Paul Abbott**, a full time employee of Cardinal Resources Limited, who is a Fellow of the Australasian Institute of Mining and Metallurgy and a Member of the Geological Society of South Africa. Mr Abbott 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 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Abbott consents to the inclusion in this report of the statements based on his information in the form and context in which it appears.

**Disclaimer**

Certain statements contained in this announcement, including information as to the future financial or operating performance of Cardinal Resources and its projects, are forward-looking statements that:

- may include, among other things, statements regarding targets, estimates and assumptions in respect of mineral reserves and mineral resources and anticipated grades and recovery rates, production and prices, recovery costs and results, capital expenditures, and are or may be based on assumptions and estimates related to future technical, economic, market, political, social and other conditions;
- are necessarily based upon a number of estimates and assumptions that, while considered reasonable by Cardinal Resources, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies; and,
- involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements.

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All forward looking statements made in this announcement are qualified by the foregoing cautionary statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and accordingly investors are cautioned not to put undue reliance on forward-looking statements due to the inherent uncertainty therein.

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**JORC Code, 2012 Edition – Table 1**
**DRILLING UPDATE AT NDONGO PROSPECT, BOLGATANGA PROJECT, GHANA**
**Section 1 Sampling Techniques and Data**

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
<b>Sampling techniques</b>	<i>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.</i>	Nature and quality of sampling is carried out under QAQC procedures as per industry standards, with duplicates taken every 20 <sup>th</sup> sample, with standards and blanks inserted at a ratio of 1:30.
	<i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i>	Sample representivity is ensured through a 3 tier riffle splitter, as it provides an unbiased sample.
	<i>Aspects of the determination of mineralisation that are Material to the Public Report.</i>	The determination of mineralisation is not yet known.
	<i>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.</i>	Industry standard reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 50 g charge for fire assay.

Criteria	JORC Code explanation	Commentary
<b>Drilling techniques</b>	<i>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).</i>	Reverse Circulation drilling with a standard tube, Remet 5 ½ inch Hard Face (face-sampling) button drilling bit.
<b>Drill sample recovery</b>	<i>Method of recording and assessing core and chip sample recoveries and results assessed.</i>	Method of recording and assessing chip samples was on a hand held Motion F5te Tablet PC using a set of standard templates supplied by Maxwell Geoservices, Perth (Maxwell).
	<i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i>	The measures taken to maximize sample recovery are through a cyclone and a 3 tier riffle splitter. This method ensures maximum sample recovery and an unbiased representative sample to be assayed.
	<i>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.</i>	No relationship is known to exist between sample recovery and grade, and no sample bias may have occurred due to preferential loss/gain of any fine/coarse material.
<b>Logging</b>	<i>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.</i>	Chip samples have been geologically logged to a level of detail to support appropriate future Mineral Resource estimations.
	<i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i>	Logging is quantitative. Chip samples are photographed in dry form.
	<i>The total length and percentage of the relevant intersections logged.</i>	All holes are logged in full.

Criteria	JORC Code explanation	Commentary
<b>Sub-sampling techniques and sample preparation</b>	<i>If core, whether cut or sawn and whether quarter, half or all core taken.</i>	No core has been drilled.
	<i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i>	The sub-sampling technique uses a 3 tier riffle splitter and is sampled dry.
	<i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i>	Sample preparation is completed at SGS Laboratories, Ouagadougou, Burkina Faso. All preparation equipment is flushed with barren material prior to the commencement of sample preparation. The entire sample is dried, crushed to a nominal 2mm using a Jaw Crusher, and pulverised (85-90% passing 75 micron size fraction) using LM5 grinding mills. A 250 gram split is retained for fire assay with AAS finish to 1ppb detection limit. The remainder is returned and stored at Cardinal's Bolgatanga premises.
	<i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i>	Quality control procedures adopted for all sub-sampling stages to maximize representivity of samples uses commercial certified reference material (CRM) for standards.
	<i>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.</i>	The measures taken to ensure that the sampling is representative of the in- situ material collected is to insert duplicates at every 20 <sup>th</sup> sample. Approximately 3kg samples from the splitter are retained from each sample and stored on the company's premises in Bolgatanga for possible re-assay.
	<i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i>	The sample sizes are considered appropriate to give an accurate indication of gold mineralisation.

Criteria	JORC Code explanation	Commentary
<b>Quality of assay data and laboratory tests</b>	<i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i>	<p>The pulverized rock sample is weighed and mixed with flux and fused using lead oxide at 1100°C, followed by cupellation of the resulting lead button (Dore bead). The bead is digested using 1:1 HNO<sub>3</sub> and HCl and the resulting solution is submitted for analysis.</p> <p>The digested sample solution is aspirated into the Flame Atomic Absorption Spectrometer (AAS), aerosolised, and mixed with the combustible gas, acetylene and air. The mixture is ignited in a flame whose temperature ranges from 2,100 to 2,800°C. During combustion, atoms of the gold in the sample is reduced to free, unexcited ground state atoms, which absorb light. Light of the appropriate wavelength is supplied and the amount of light absorbed can be measured against a standard curve.</p> <p>Results have a lower gold detection limit of 1ppb. The AAS equipment is calibrated with each job.</p> <p>The analytical technique is industry standard fire assay which is considered to be a total digest of gold.</p>
	<i>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.</i>	No hand held geophysical tools are used.

Criteria	JORC Code explanation	Commentary
	<i>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.</i>	<p>Sample preparation checks for fineness are carried out by the laboratory as part of their internal procedures to ensure the grind size of 85-90% passing 75 micron is being attained. Each batch of 100 samples has 5 checks (20%), with the grind size varying between 87-99% passing 75 micron, which is acceptable. Laboratory QAQC involves the use of internal lab standards using certified reference material and blanks.</p> <p>Certified reference materials, having a range of values, and in-house blanks are inserted at a ratio of 1:44. Duplicate samples are taken every 22<sup>nd</sup> sample.</p> <p>External laboratory checks are done on a three monthly basis through Laboratories Quality Services International (LQSI). Recent LQSI checks of Fire Assay analyses on Low Grade Oxide Material produced acceptable levels of accuracy and precision.</p>
<b>Verification of sampling and assaying</b>	<i>The verification of significant intersections by either independent or alternative company personnel.</i>	The verification of significant intersections by either independent or alternative company personnel has not occurred.
	<i>The use of twinned holes.</i>	There has been no use of twinned holes.
	<i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i>	Primary data was collected on a hand held Motion F5te Tablet PC using a set of standard templates supplied by Maxwell. Daily data was synchronised and digitally captured by Maxwell for validation and compilation into Excel and Access spreadsheets and stored on the Cardinal servers located in Bolgatanga, Ghana, West Africa.
	<i>Discuss any adjustment to assay data.</i>	No significant results were received for Ndongo Central area. No assay data for Ndongo West have yet been received.

Criteria	JORC Code explanation	Commentary
<b>Location of data points</b>	<i>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.</i>	Accuracy of drill hole collar surveys is +/- 3m using a hand held Garmin GPSmap 62s GPS.  No down hole surveys were performed.
	<i>Specification of the grid system used.</i>	WGS84 Sector 30N, with local grid baseline at 302° True North and lines at 100m intervals and stations at 25m along lines.
	<i>Quality and adequacy of topographic control.</i>	Quality and adequacy of topographic control was supplied by Southern Geoscience Consultants (Perth) using satellite imagery.
<b>Data spacing and distribution</b>	<i>Data spacing for reporting of Exploration Results.</i>	Data spacing is 100m (northing) and 25m (easting).
	<i>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.</i>	The data spacing and distribution is considered to be sufficient to establish a degree of geological continuity for this reverse circulation drilling program.
	<i>Whether sample compositing has been applied.</i>	No sample compositing has been applied.
<b>Orientation of data in relation to geological structure</b>	<i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i>	The orientation of sampling achieves unbiased sampling of possible structures as drilling is orientated normal to the foliation of the deposit.
	<i>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.</i>	No orientation based sampling bias has been identified in the data to date.

Criteria	JORC Code explanation	Commentary
<b>Sample security</b>	<i>The measures taken to ensure sample security.</i>	The measures taken to ensure sample security are through an independent Ghanaian security contractor. Samples are stored at Cardinal's base camp located at Bolgatanga, Ghana, West Africa under security until collected by SGS Laboratories and transported to their Ouagadougou laboratory in Burkina Faso.
<b>Auditor reviews</b>	<i>The results of any audits or reviews of sampling techniques and data.</i>	Sampling techniques are of industry standards. Data is audited by Maxwell, who have not made any other recommendations.

## Section 2 Reporting of Exploration Results

(Criteria listed in section 1 will also apply to this section where relevant)

Criteria	JORC Code explanation	Commentary
<b>Mineral Tenement and Land Status</b>	<i>Type, name/reference number, location and ownership including agreements or material issues with third parties including joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</i>	The Ndongo Prospect, within the Bolgatanga Project, is located in NE Ghana. The granted Prospecting Licence is held by Cardinal Resources Ghana Limited ( <b>Cardinal Ghana</b> ), a wholly owned subsidiary of Cardinal Resources Limited ( <b>Cardinal</b> ) (ASX: CDV):
	<i>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.</i>	There are no known impediments to operate within the Ndongo Prospect granted licence area.

Criteria	JORC Code explanation	Commentary
<b>Exploration Done by Other Parties</b>	<i>Acknowledgment and appraisal of exploration by other parties.</i>	No previous systematic exploration has been undertaken.
<b>Geology</b>	<i>Deposit type, geological setting and style of mineralisation</i>	<p>The geological setting is a Paleoproterozoic Greenstone Belt comprising Birimian metavolcanics &amp; metasediments, with felsic to intermediate intrusives.</p> <p>The target deposit type is structurally controlled gold deposits, ranging from small-scale, high-grade shear-hosted quartz veins occurring along lithological contacts and within shear zones, to larger tonnage disseminated deposits associated with stock works along, or within, contacts of felsic to intermediate intrusives.</p>
<b>Drill hole information</b>	<p><i>A summary of all information material to the understanding of the exploration results including tabulation of the following information for all Material drill holes:</i></p> <ul style="list-style-type: none"> <li>• <i>Easting and northing of the drill hole collar</i></li> <li>• <i>Elevation or RL (Reduced Level – elevation above sea level in meters) of the drill hole collar</i></li> <li>• <i>Dip and azimuth of the hole</i></li> <li>• <i>Down hole length and interception depth</i></li> <li>• <i>Hole length</i></li> </ul>	A summary of all information for Ndongo West will be provided upon receipt and analysis of assay results.
	<i>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.</i>	No material contiguous mineralisation was intercepted at the Ndongo Central Zone.

Criteria	JORC Code explanation	Commentary
<b>Data aggregation methods</b>	<i>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.</i>	No weighting averaging techniques nor cutting of high grades have been applied.
	<i>Where aggregated 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.</i>	No aggregated intercepts were undertaken.
	<i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i>	No metal equivalent values are used for any reports.
<b>Relationship between mineralisation widths and intercept lengths</b>	<i>These relationships are particularly important in the reporting of exploration results.</i>	The relationship between mineralisation widths and intercept lengths is not yet known.
	<i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i>	The geometry of the mineralisation with respect to the drill hole angle is not yet known.
	<i>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').</i>	Only down hole lengths are reported and true widths of mineralisation are not yet known.
<b>Diagrams</b>	<i>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 plane view of drill hole collar locations and appropriate sectional views.</i>	Appropriate maps are included in this announcement.

Criteria	JORC Code explanation	Commentary
<b>Balanced Reporting</b>	<i>Where comprehensive reporting of all Exploration Results is not practical, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</i>	Assay results pending.
<b>Other substantive exploration data</b>	<i>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observation; 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.</i>	Geophysical results are included as images. The interpretation shown is subject to possible change as new information is gathered. Interpretation of geophysical data is by its nature, subject to ambiguity.  No bulk sampling, metallurgical, mineralogical or geotechnical assessments have been completed.
<b>Further Work</b>	<i>The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large – scale step – out drilling).</i>	A combination of reverse circulation and diamond drilling is planned, followed by possible additional ground geophysical surveys depending on the results of the drilling.
	<i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i>	Images included shows the extent of anomalous zones and planned drilling at the Ndongo Central and Ndongo West Zones. Additional targets at Ndongo will be assessed with a combination of geochemistry, ground geophysics and drilling.