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CARDINAL RESOURCES LIMITED

TECHNICAL REPORT ON THE NAMDINI GOLD PROJECT, GHANA, WEST AFRICA

NI 43-101 Report

Qualified Persons:
Ian T. Blakley, P.Geo.
Sean D. Horan, P.Geo.
Kathleen Ann Altman, Ph.D., P.E.

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RPA 55 University Ave. Suite 501 I Toronto, ON, Canada M5J 2H7 I **T** + 1 (416) 947 0907 **www.rpacan.com**

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Lead Author	Ian T. Blakley, P.Geo. Sean D. Horan, P.Geo. Kathleen Ann Altman, Ph.D., P.E.		(Signed) (Signed) (Signed)
Peer Reviewer	Luke Evans		(Signed)
Project Manager Approval	Ian T. Blakley		(Signed)
Project Director Approval	Deborah McCombe		(Signed)

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Roscoe Postle Associates Inc.
55 University Avenue, Suite 501
Toronto, ON M5J 2H7
Canada
Tel: +1 416 947 0907
Fax: +1 416 947 0395
mining@rpacan.com

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1 SUMMARY

EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by Cardinal Resources Limited (Cardinal) to prepare an independent Technical Report on the Namdini Gold Project (Namdini or the Project), located in Northern Ghana, in support of a Toronto Stock Exchange listing. The purpose of this report is to disclose an updated Mineral Resource estimate.

The Mineral Resource estimate has been prepared according to the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves standards and guidelines published and maintained by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (the JORC (2012) Code). RPA has reconciled the Mineral Resources to Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 and there are no material differences.

This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the property between December 16 and 20, 2016.

Cardinal is a Western Australia-based gold exploration and development company, and has been a reporting issuer on the Australian Stock Exchange (ASX) since August 2011. Cardinal's key assets are located in Ghana and include the Namdini, Bolgatanga, and Subranum Projects.

Table 1-1 summarizes Mineral Resources at the Project as of December 2, 2016.

TABLE 1-1 SUMMARY OF MINERAL RESOURCES – DECEMBER 2, 2016
Cardinal Resources Ltd. – Namdini Gold Project

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Indicated	23,864	1.21	931
Inferred	100,149	1.13	3,629

Notes:
1. JORC (2012) Code was followed for Mineral Resources.

2. Open pit Mineral Resources are estimated at a cut-off grade of 0.5 g/t Au, constrained by a preliminary pit shell.
3. Mineral Resources are estimated using a long-term gold price of US$1,500 per ounce.
4. Incorporates drill holes completed as of December 2, 2016 (up to and including NMDD061).
5. Numbers may not add due to rounding.

CONCLUSIONS

RPA offers the following conclusions:

GEOLOGY AND MINERAL RESOURCES

- The Namdini gold deposit is a large structurally controlled orogenic gold deposit with numerous features similar to deposits found elsewhere in late Proterozoic Birimian terranes of West Africa.

- Cardinal has a detailed Standard Operating Procedure Manual for Exploration and Drilling Practices that facilitates the standardization and consistency of data collection by all field technical personnel.

- In RPA's opinion, the Cardinal exploration program activities meet the CIM Exploration Best Practices Guidelines. Cardinal's protocols for drilling, sampling, analysis, security, and database management meet industry standard practices.

- Drilling has outlined mineralization with three-dimensional continuity and of size and grades that can potentially be extracted economically.

- The drill hole database was verified by RPA and is suitable for Mineral Resource estimation.

- In RPA's opinion, the December 2, 2016 Mineral Resource estimate has been completed to a level that meets industry standards, is compliant with the JORC (2012) Code, and the results are reasonable.

- At a cut-off grade of 0.5 g/t Au, Indicated Mineral Resources are estimated to total 23.86 Mt at an average grade of 1.21 g/t Au for 931,000 ounces of contained gold. At the same cut-off grade, Inferred Mineral Resources are estimated to total an additional 100.1 Mt at an average grade of 1.13 g/t Au for 3,629,000 ounces of contained gold.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Based on a review of Cardinal's data, RPA accepted the proposed overall recovery of 82%, pending review of the new metallurgical test data.

- RPA notes that the recovery appears to be dependent upon the ratios of the various lithologies, which change as the resource model is updated and depending upon the cut-off grade.

- In RPA's opinion, the refractory nature of the gold, which requires ultra-fine grinding to facilitate recovery in a cyanide leach circuit, is the major factor that has the potential to

impact the Project economics. Deleterious elements are not thought to pose a risk to the Project.

ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

- NEMAS Consult Ltd (NEMAS), of Accra, Ghana, has been contracted by Cardinal to undertake the Environmental Impact Assessment (EIA) for the Project. NEMAS has undertaken a site reconnaissance visit and commenced the Scoping stage of the process in accordance with the Ghanaian Environmental Protection Agency (EPA) procedures for the EIA study.

- Cardinal's exploration activities are undertaken such that any potential emissions and effects associated with exploration activities, which could include habitat modification and associated visual effects, are kept to a minimum.

- Relations between Cardinal and the local artisanal mining community appear cordial and respectful. Local community members are hired and trained by Cardinal for exploration activities.

- Cardinal also maintains good relations with Bolgatanga Minerals Commission personnel, Community Chiefs, and District Assemblymen. Cardinal's Public Relations Officer handles all local issues.

RISKS

The Namdini Gold Project is still in the early stages of evaluation and additional exploration, engineering, and other analysis is required to fully assess the Project.

In RPA's opinion, there are no significant technical risks and/or uncertainties that could reasonably be expected to affect the reliability and/or confidence in the exploration information and/or Mineral Resource estimate.

Independent Witness Sampling confirmed the presence of gold in the same order of magnitude as the original samples and demonstrated no significant difference in the half core and quarter core data. In addition, the reverse circulation (RC) and diamond drill data sets also appear to be comparable, especially at a composite length of three metres. Overall, the close spaced RC drilling impacts less than 10% of the overall estimated contained metal.

The quality assurance/quality control (QA/QC) program as designed and implemented by Cardinal is adequate, and the assay results within the resource database are suitable for use in a Mineral Resource estimate.

RECOMMENDATIONS

The Namdini Project hosts a significant gold deposit and merits considerable infill and resource expansion drilling, as well as advanced studies. The near-term primary objectives are to improve the confidence in the Mineral Resource estimate and initiate a Preliminary Economic Assessment (PEA).

RPA's recommendations are as follows:

GEOLOGY AND MINERALIZATION

- Further detailed studies are warranted on the lithological and structural controls on mineralization, particularly as the drilling density increases and the deposit is explored deeper.

DRILLING AND SAMPLING

- While the survey control and collar surveys are considered to be accurate and appropriate, RPA recommends that Cardinal implement a high resolution (sub-metre accuracy) Digital Terrain Model (DTM).
- All future RC holes should be downhole surveyed.
- Cardinal should implement a numerical Mine Grid, aligned along the strike of the deposit, and discontinue the use of alphanumeric sectional definitions.
- RPA concurs with Orefind Pty Ltd's (Orefind) recommendation for utilizing a core-orienting frame. This level of detail is important to determine mineralization plunges.
- With regard to sampling issues, RPA recommends the following:
  - Replace the current pre-pulverized blank material with coarse blanks.
  - Implement a certified reference material (CRM) at the average resource grade (approximately 1.2 g/t Au).
  - Allow manual insertion of blank samples after suspected high grade intervals.
  - Implement a regular umpire analysis program.
  - Carry out careful monitoring of blank and CRM sample insertion.
  - Investigate the high failure rate of CRM STD (544) so that any required adjustments can be made or replacement of that CRM with an alternative one.
  - Reject and re-assay as needed assay batch fails.
  - Implement coarse reject (after crushing) diamond duplicates.
  - Drill additional RC/DDH twinned holes for comparisons of sample results prior to any close spaced grade control RC drilling.
  - Carry out sampling on a half core basis in all future Namdini Mineral Resource drilling.

MINERAL RESOURCE MODEL

- Build mineralization wireframes based on litho-structural information, preferably using Leapfrog software. Benefits will include:
  - A potential positive impact on the gold grade.

  - A better control on estimates.
  - Improved variography and better understanding of plunges.
  - Better understanding of geology to assist exploration targeting at depth.

- While the indicator methodology is effective at outlining different grade populations associated with the controls on mineralization for the current stage of the Project, RPA recommends that as the Project advances, high and low grade wireframes should be used to constrain estimation.

- Additional bulk density information should be collected for the strongly and moderately oxidized weathered lithologies as well as for the transition and fresh meta-sediments and diorite lithologies.

- Conduct infill drilling on 50 m drill sections for those areas that are currently averaging 60 m to 80 m drill spacing, to confirm continuity and potentially upgrade Inferred Mineral Resources to Indicated. A staggered pattern is recommended to optimize planned holes, minimize over-drilling, and meet target criteria.

- Prior to drilling operations, test planned drilling configurations against the block model to ensure that the criteria are met.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Continue with metallurgical test work studies, specifically focusing on the relationship between metallurgical response and geological domains, to further optimize the processes.

- In order to accurately reflect the recoveries to be used in the future, tests should be conducted on samples containing separate lithologies, rather than on composite samples, so recovery can be reported by lithology for input into future block models.

ENVIRONMENTAL STUDIES AND PERMITTING

- Cardinal should continue with formal studies, by internationally recognized consultants, to determine the potential impact on the environment and community.

PROPOSED PROGRAM AND BUDGET

RPA has reviewed and concurs with Cardinal's proposed budgets. The recommended Phase I program, to be initiated as soon as practical, consists mainly of infill diamond drilling to upgrade Inferred Mineral Resources to Indicated Mineral Resources, targeting areas in the central core of the deposit.

Also proposed in Phase I is an update of the Mineral Resource estimate followed by a PEA (Scoping Study). The budget for this program is approximately US$1,600,000.

Details of the recommended Phase I program can be found in Table 1-2.

TABLE 1-2 PROPOSED PHASE I EXPLORATION BUDGET
Cardinal Resources Ltd. – Namdini Gold Project

Item	US$
Core Drilling (35 holes for 7,500 m)	1,100,000
Metallurgical Test Work	50,000
Environmental and Social Studies	50,000
Mineral Resource Update	100,000
Preliminary Economic Assessment	150,000
Subtotal	1,450,000
Contingency	150,000
Total Phase I	**1,600,000**

Contingent upon the Phase I program results, the proposed Phase II program consists of further drilling to the west in order to test down dip extensions of the current Mineral Resources, as well as to the north to potentially extend the mineralized zone along strike. Phase II drilling also consists of resource RC drilling designed to upgrade Indicated Mineral Resources to the Measured category in the constrained higher grade area. The budget for this Phase II exploration program is approximately US$3,000,000 (Table 1-3).

TABLE 1-3 PROPOSED PHASE II EXPLORATION BUDGET
Cardinal Resources Ltd. – Namdini Gold Project

Item	US$
Core Drilling (20 holes for 12,000 m)	2,000,000
RC Drilling (7,000 m)	600,000
Mineral Resource Update	100,000
Subtotal	2,700,000
Contingency	300,000
Total Phase II	**3,000,000**

TECHNICAL SUMMARY

PROPERTY DESCRIPTION AND LOCATION

The Namdini Gold Project is located in the northeastern region of Ghana approximately 50 km southeast of the regional centre of Bolgatanga, and close to the southern border of Burkina Faso. The Project area is located approximately six kilometres southeast of the operating Shaanxi Mining Company Limited's underground gold mine. The Universal Transverse Mercator (UTM) co-ordinates for the approximate centre of the Project are 756400.0 m N,

1177050.0 m E in WGS84/NUTM30 projection or 10°38’ 21” N Latitude and -0°39’.23” W Longitude.

The Namdini Gold Project, along with Cardinal’s larger Bolgatanga Project, encompasses approximately 660 km^2 of Paleo-Proterozoic greenstone belts in North Eastern Ghana. The Bolgatanga Project includes the Ndongo and Kungongo Prospecting Licences and the Bongo Reconnaissance Licence. The Bolgatanga Project tenements are not contiguous with the Namdini Project.

LAND TENURE

Cardinal currently holds its interest in the Namdini Project through an agreement dated July 23, 2014 (the Savannah Agreement) between Savannah Mining Ghana Limited (Savannah) and Cardinal Mining Services Limited (CMS), a wholly-owned subsidiary of Cardinal, and agreements with the holders of small scale mining licences within the area comprising the Namdini Project. Pursuant to the Savannah Agreement, CMS and Savannah agreed that CMS would have an exclusive right of first refusal to provide technical and financial support towards the development of the Project, in exchange for which CMS would be entitled to “the entire gross mineral values” won from any mining licence in respect of which CMS provided support.

Pursuant to the Savannah Agreement, Savannah has entered into Sale and Purchase Agreements and licence relinquishment agreements with holders of small scale mining licences within the Namdini Lease area where the holders of these small-scale mining licences will have surrendered their small-scale licences and all mineral rights to form part of the proposed Namdini Lease area. The small-scale licences are in the process of being surrendered.

Malik Easah, an executive director of Cardinal, is also the sole shareholder and director of Savannah. Savannah’s sole business is the Savannah Agreement. Pursuant to an Option & Loan Agreement made in 2015 (the Option Agreement) between Mr. Easah, Savannah and CMS, CMS holds an option to purchase all the outstanding shares of Savannah from Mr. Easah for $1.00 and holds all validly executed and irrevocable documents to give effect to the purchase upon exercise of the option. The Option Agreement also gives CMS the option to purchase all mining leases held by Savannah for $1.00.

The Minister of Lands and Natural Resources of Ghana signed a mining lease for Savannah (the Namdini Lease) on October 12, 2016 over an area of approximately 19.54 km^2 in the Dakoto area of the Talensi District Assembly in the Upper East Region of Ghana. The Namdini Lease is for an initial period of 15 years ending October 11, 2031. An application can also be submitted for an extension of the mining lease if required. The Namdini Lease is currently being processed by the Ghana Government. Cardinal believes that the final registration of the Namdini Lease by the Ghana Government will be completed in 2017.

Upon final registration, approval and effectiveness of the Namdini Lease, Cardinal will direct Savannah to assign the Namdini Lease to Cardinal Mining Namdini Limited, a wholly-owned subsidiary of Cardinal, pursuant to the Option Agreement.

Under the 2006 Mining Act, the indirect transfer of ownership of a mining lease is subject to the non-objection of the Minister and direct assignment of a mining lease requires the consent of the Minister. Cardinal does not anticipate that any objection will be made by the Minister to the transfer of the Namdini Lease from Savannah to Cardinal Mining Namdini Limited.

EXISTING INFRASTRUCTURE

At the time of RPA's site visit, no Cardinal infrastructure was present at the Namdini Project site other than a security hut. Fuel supply for the drills is provided by diesel tankers. Fresh water is taken from a borehole located on the Project site. Cardinal maintains trails on the Project site in order to facilitate exploration and drilling activities.

Numerous historical trenches and adits, as well as artisanal gold mining sites, are located throughout the property, however, only approximately 5% of the permit area has been affected by these activities. Artisanal miners extract gold from the saprolite horizon, but also sink shafts as deep as 20 m to recover gold from quartz veins.

HISTORY

The discovery of gold in the northeastern region of Ghana occurred in late 1930s. During the early 1960s, the Ghana Geological Survey Department carried out limited shallow drilling around prospects, which had been identified by earlier work in the 1930s. Again in the 1970s, some soil geochemistry and trenching were carried out over a 7 km stretch in the Nangodi area where most of the known prospects occur.

Driven by activity elsewhere in Ghana and Burkina Faso during the mid-1990s, numerous Canadian and Australian junior explorers started to explore the north of Ghana, which, in particular, resulted in the discovery of Youga deposit in Burkina Faso by International Gold Resources (IGR). During the same period in the mid-1990s, small-scale miners inundated the area as the traditional small-scale mining sites in southern Ghana were closed (Tarkwa, Obuasi, Konongo, etc.).

BHP was the first to conduct a major reconnaissance exploration program in the mid-1990s, covering most of the Nangodi area. Other groups that acquired prospecting concessions in the mid-1990s include IGR, Cluff Resources, Teberebie Goldfields, Ashanti Goldfields, and Africwest Gold. Renewed interest in the area, after the market downturn in 1997, began around 2004, with an increase in the gold price and as a result of the development of mines on the Burkina Faso side of the border.

The Project was first discovered in September 2013 by prospecting. A small scale mining licence was approved in 2014 and RC drilling began shortly thereafter. Prior to Cardinal, no systematic exploration had been undertaken on the Namdini property. Small scale artisanal mining began on the property circa 2013 following Cardinal's initial exploration activities.

GEOLOGY AND MINERALIZATION

The Project covers the southern extension of the Nangodi Greenstone Belt. In 2016, geological consultants from Orefind conducted an on-site structural study and then developed a structural framework with controls on, and geometry of, the gold mineralization comprising the Namdini deposit.

Orefind concluded that the rock types comprising the Namdini Project include a steeply dipping Birimian sequence of inter-bedded foliated meta-sedimentary and meta-volcanic units, which have been intruded by a medium-grained granitoid and diorite. The southern part of the Project is covered by flat lying Voltaian Basin clastic sedimentary rocks that have been deposited unconformably on the Birimian sequence and postdate mineralization and the host sequence.

Underneath the weathering profile, the Birimian units include meta-sedimentary, meta-volcaniclastic, granitoid (tonalite), and diorite. The meta-sedimentary and volcaniclastic rocks have been intensely altered with a pyrite-carbonate-muscovite-chlorite-quartz. Alteration is prevalent in the volcaniclastic rocks. Similarly, the tonalite is extensively altered and has been

overprinted by silica-sericite-carbonate assemblages. The identity of carbonate alteration is difficult and is best described as iron-carbonate in the absence of petrological or geochemical characterization.

Mineralization in the Project area is associated with both the meta-volcanosedimentary rocks and tonalite.

In all rock types, the mineralization is accompanied by visible disseminated sulphides of pyrite and arsenopyrite in both the veins and wall rocks. In diamond drill core, the mineralized zones are visually distinctive due to the presence of millimetre to centimetre wide quartz-carbonate veins that are commonly folded and possess yellow-brown sericite-carbonate selvedges.

Visible gold occurs in strongly altered granite and is associated with sub-millimetre wide silica-sericite shears.

EXPLORATION STATUS

Cardinal initiated drilling in 2014. A total of 186 diamond drill and RC holes for approximately 32,000 m were completed by Cardinal to December 2, 2016. Cardinal has also carried out geophysical, structural, and mineralogical studies.

SAMPLING, ANALYSIS AND SECURITY

Cardinal's grassroots exploration procedures are generally focused on staged exploration in order to achieve quick and effective means of sampling vast areas of land for the purpose of generating targets for further detailed work. In RPA's opinion, the drilling procedures employed by Cardinal conform to industry best practice and the resultant drilling pattern is sufficient to interpret the geometry and the boundaries of the gold mineralization with confidence. All sampling was conducted by qualified personnel under the direct supervision of appropriately qualified Senior Geologists, and was managed by an experienced Cardinal Exploration Manager.

In April 2016, Cardinal revised diamond drill core sampling practices to collect quarter core rather than half core samples. The rationale to use the quarter core approach was to enable quarter core to be available for metallurgical testing on a routine basis while retaining half core as reference in the core trays.

In mid-2016, Cardinal redirected its sample submissions from SGS Ouagadougou Laboratory in Burkina Faso to SGS Tarkwa Laboratory in Ghana. The independent SGS commercial geochemical analytical laboratories in Tarkwa and Ouagadougou are officially recognized by the South African National Accreditation System (SANAS) for meeting the requirements of the ISO/IEC 17025 standard for specific registered tests for the minerals industry.

As part of the Cardinal QA/QC, a suite of internationally accredited and certified reference material (standards) and locally sourced blanks are included in the sample submission sequence. The standards cover the gold grade ranges expected at Namdini. Interlaboratory umpire analysis was conducted in 2016.

No employee, officer, director, or associate of Cardinal carried out any sample preparation on samples from the Namdini Project exploration program. Drill core was transported from the drill site by Cardinal vehicle to the secure core yard facility at the Bolgatanga Field Exploration Office.

All samples collected for assaying are retained in a locked secure shed until they are collected by the assay laboratory. Retained drill core is securely stored in the core storage compound and pulps are securely stored in the exploration core logging area.

In RPA's opinion, the sampling preparation, security, and analytical procedures used by Cardinal are consistent with, and often exceed, generally accepted industry best practices and are, therefore, adequate for use in the estimation of Mineral Resources.

DATA VERIFICATION

Cardinal maintains strict protocols with respect to the review and validation of core logging and assay results prior to importing into the drill hole database. Assay results, received from the laboratory in PDF and CSV formats, are sent via email to the Chief Executive Office/Managing Director and the Exploration Manager for onward transfer to Datashed, which is then loaded into the database.

Cardinal technical staff carry out routine analysis of the quality control data on receipt of assay results from the laboratory in order to determine if the batch of samples has passed industry standard levels for control samples. If the batch "fails", the batch of assays is rejected and a re-assay request for the batch of samples is made to the laboratory. In RPA's opinion, the

QA/QC program as designed and implemented by Cardinal is adequate and the assay results within the database are suitable for use in a Mineral Resource estimate.

During RPA's December 2016 site visit, four diamond drill holes were laid out at the Bolgatanga exploration core processing area and RPA selected 165 diamond drill sample intervals for quarter core independent witness sampling (IWS). The samples were then sent to ALS Global in Loughrea Galway Ireland for assay. RPA concluded that the IWS samples confirmed the presence of gold in the same order of magnitude as the original samples.

MINERAL PROCESSING AND METALLURGICAL TESTING

Suntech Geomet Laboratories (Suntech), based in Johannesburg, South Africa carried out an initial range of metallurgical testwork on a 332 kg composite sample of quartered HQ diamond drill core obtained from a single drill hole (NMDD005), which included weighted proportions of meta-volcanics, granite, and diorite. The individual components were used to make a master composite which graded at 1.42 g/t Au and 1.1% S.

Subsequently, Cardinal provided RPA with additional information based on metallurgical testwork that is currently underway and which, according to Cardinal, provided a better understanding of the Suntech work.

Based on Cardinal's information, RPA accepted the proposed overall recovery of 82%, pending review of the new metallurgical test data. RPA notes that the recovery appears to be dependent upon the ratios of the various lithologies, which change as the resource model is updated and depending upon the cut-off grade.

MINERAL RESOURCES

Geological interpretation and Mineral Resource estimation were completed by RPA for Namdini incorporating drill holes completed as of December 2, 2016 (up to and including NMDD061). The Mineral Resources have been estimated to a level that meets industry standards and are compliant with the JORC (2012) Code.

RPA utilized geological wireframes generated in Leapfrog Geo version 4.0 and Single Indicator Kriging (SIK) at 0.1 g/t Au and 1.0 g/t Au to help constrain grade estimates which were estimated using Ordinary Kriging (OK) in Datamine Studio RM version 1.2.46. Assays were

capped at between 1.0 g/t Au and 25 g/t Au and composited to three metre intervals. Densities were assigned to blocks based on lithological units and weathering horizons. Blocks were classified as Indicated and Inferred based on confidence in block estimates implied by the variogram, grade continuity, and drill hole spacing. A cut-off grade of 0.5 g/t Au was used for resource reporting and Mineral Resources were constrained by a Whittle pit optimization.

Table 1-1 summarizes Mineral Resources at the Project as of December 2, 2016.

2 INTRODUCTION

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The Project was the subject of an initial JORC 2012 Mineral Resource (EGRM, 2016) based on drilling completed to August 12, 2016. RPA has prepared an updated Mineral Resource estimate in consideration of additional drill results, a recent re-interpretation of geological and mineralized domains, and revised cut-off grades. The block model has been constrained with a Whittle pit shell to demonstrate reasonable prospects for eventual economic extraction for resource reporting purposes.

SOURCES OF INFORMATION

A site visit was carried out by Ian Blakley, P.Geo., Principal Geologist with RPA, between December 16 and 20, 2016. While on site, Mr. Blakley visited Cardinal's Bolgatanga Exploration Offices and Core Processing Facility as well as the Namdini Project area. Core samples were collected to confirm the presence of gold mineralization. Subsequent meetings

to review RPA's modelling and Mineral Resource estimate process were held with Cardinal Management in Accra, Ghana on January 12 to 15, 2017 and in London, UK on January 20, 2017.

Discussions were held with the following Cardinal personnel:

- Mr. Kevin Tomlinson – Non Executive Chairman
- Mr. Archie Koimtsidis, MBA – Managing Director and Chief Executive Officer
- Mr. Malik Easah – Executive Director
- Mr. Paul Abbott, M.Sc., FAusIMM, MGSSA – Exploration Manager
- Mr. Ernest Opoku Boamah – Senior Geologist
- Mr. Seth Henry Okyere – Senior Geologist (Drill Hole Database Administrator)
- Dr. Julian F.H. Barnes – Cardinal Project Technical Manager
- Mr. Bruce Lilford – Namdini Project Manager.

Mr. Blakley is responsible for Sections 1 to 12 and 15 to 27. Mr. Sean Horan, P.Geo., RPA Senior Geologist, is responsible for Section 14. Dr. Kathleen Altman, P.E., RPA Principal Metallurgist, is responsible for Section 13.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the metric system. All currency in this report is US dollars (US$) unless otherwise noted.

a	annum
A	ampere
bbl	barrels
btu	British thermal units
°C	degree Celsius
C$	Canadian dollars
cal	calorie
cfm	cubic feet per minute
cm	centimetre
cm^2	square centimetre
d	day
dia	diameter
dmt	dry metric tonne
dwt	dead-weight ton
°F	degree Fahrenheit
ft	foot
ft^2	square foot
ft^3	cubic foot
ft/s	foot per second
g	gram
G	giga (billion)
Gal	Imperial gallon
g/L	gram per litre
Gpm	Imperial gallons per minute
g/t	gram per tonne
gr/ft^3	grain per cubic foot
gr/m^3	grain per cubic metre
ha	hectare
hp	horsepower
hr	hour
Hz	hertz
in.	inch
in^2	square inch
J	joule
k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometre
km^2	square kilometre
km/h	kilometre per hour
kPa	kilopascal
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
L	litre
lb	pound
L/s	litres per second
m	metre
M	mega (million); molar
m^2	square metre
m^3	cubic metre
µ	micron
MASL	metres above sea level
µg	microgram
m^3/h	cubic metres per hour
mi	mile
min	minute
µm	micrometre
mm	millimetre
mph	miles per hour
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
oz	Troy ounce (31.1035g)
oz/st, opt	ounce per short ton
ppb	part per billion
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
RL	relative elevation
s	second
st	short ton
stpa	short ton per year
stpd	short ton per day
t	metric tonne
tpa	metric tonne per year
tpd	metric tonne per day
US$	United States dollar
USg	United States gallon
USgpm	US gallon per minute
V	volt
W	watt
wmt	wet metric tonne
wt%	weight percent
yd^3	cubic yard
yr	year

3 RELIANCE ON OTHER EXPERTS

This report has been prepared by Roscoe Postle Associates Inc. (RPA) for Cardinal Resources Limited (Cardinal). The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Cardinal and other third party sources.

For the purpose of this report, RPA has relied on ownership information provided by Cardinal. RPA has not researched property title or mineral rights for the Namdini Project and expresses no opinion as to the ownership status of the property.

RPA has also relied entirely on Cardinal for the overview of the Ghanaian Mining Industry in Section 24.

Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

4 PROPERTY DESCRIPTION AND LOCATION

The Namdini Gold Project is located in the northeastern region of Ghana approximately 50 km southeast of the regional centre of Bolgatanga, and close to the southern border of Burkina Faso (Figure 4-1). The Project area is located approximately six kilometres southeast of the operating Shaanxi Mining Company Limited's (Shaanxi) underground gold mine. The Universal Transverse Mercator (UTM) co-ordinates for the approximate centre of the Project are 756400.0 m N, 1177050.0 m E in WGS84/NUTM30 projection or 10°38' 21" N Latitude and -0°39'.23" W Longitude. The geographic co-ordinates for the approximate centroid of the currently defined Namdini deposit are 757500.0 m N, 1177050.0 m or 10°38' 21" N Latitude and -0°38' 47" W Longitude.

The Namdini Gold Project, along with Cardinal's larger Bolgatanga Project, encompasses approximately 660 km^2 of Paleo-Proterozoic greenstone belts in North Eastern Ghana. The Bolgatanga Project includes the Ndongo and Kungongo Prospecting Licences and the Bongo Reconnaissance Licence. The Kungongo and Bongo tenements cover part of the northeast extensions of the Bole-Bolgatanga fault, while the Namdini and Ndongo tenements straddle the Nangodi Greenstone Belt. None of the Bolgatanga Project tenements are contiguous with the Namdini Project.

PROPERTY OWNERSHIP

Cardinal currently holds its interest in the Namdini Project through an agreement dated July 23, 2014 (the Savannah Agreement) between Savannah Mining Ghana Limited (Savannah) and Cardinal Mining Services Limited (CMS), a wholly-owned subsidiary of Cardinal, and agreements with the holders of small scale mining licences within the area comprising the Namdini Project. Pursuant to the Savannah Agreement, CMS and Savannah agreed that CMS would have an exclusive right of first refusal to provide technical and financial support towards the development of the Project, in exchange for which CMS would be entitled to "the entire gross mineral values" won from any mining licence in respect of which CMS provided support.

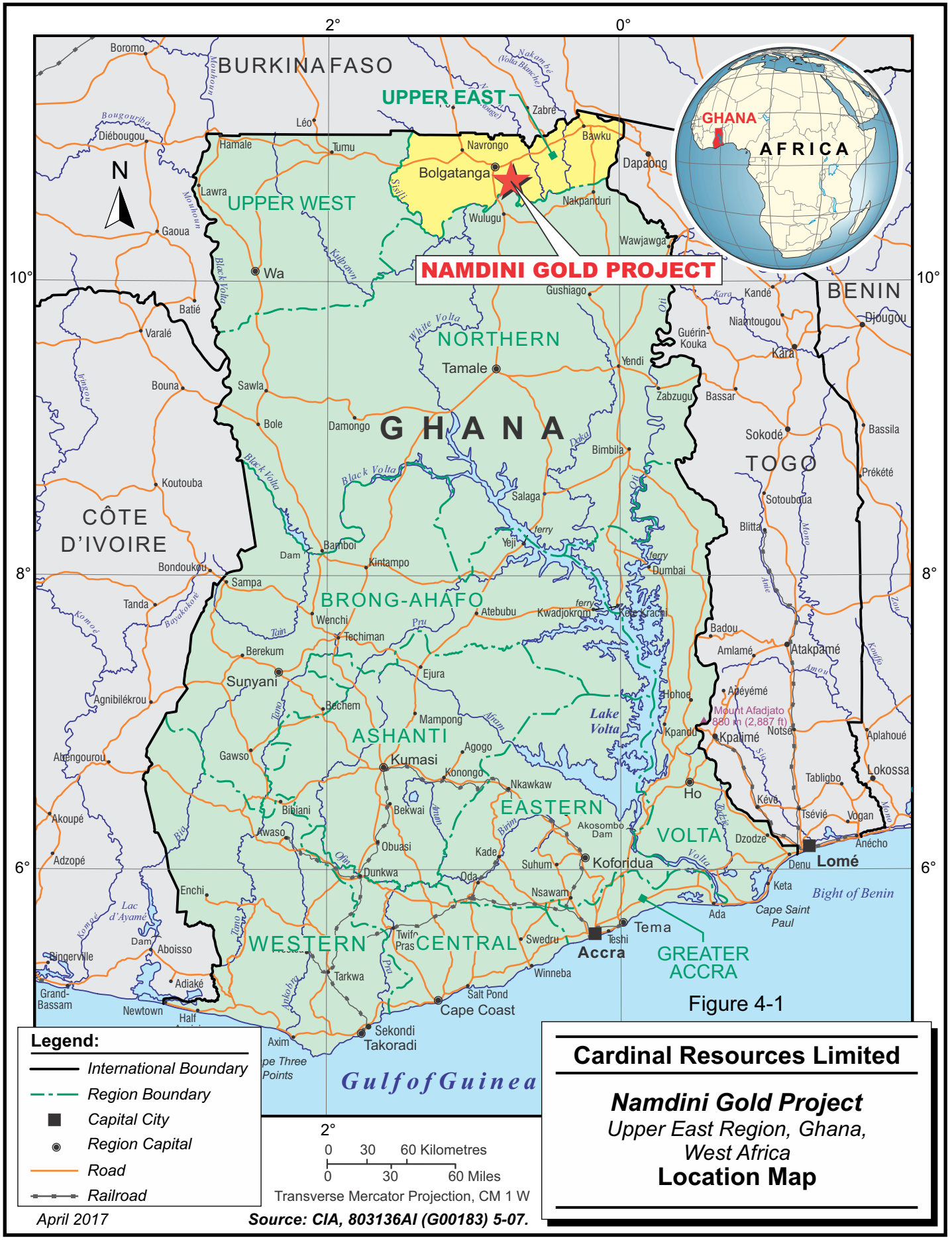


Figure 4-1

Legend:

- *International Boundary*
- *Region Boundary*
- *Capital City*
- *Region Capital*
- *Road*
- *Railroad*

2°

0 30 60 Kilometres

0 30 60 Miles

Transverse Mercator Projection, CM 1 W

April 2017

Source: CIA, 803136AI (G00183) 5-07.

Cardinal Resources Limited

Namdini Gold Project

Upper East Region, Ghana, West Africa

Location Map

Pursuant to the Savannah Agreement, Savannah has entered into Sale and Purchase Agreements and licence relinquishment agreements with holders of small scale mining licences within the Namdini Lease area where the holders of these small-scale mining licences will have surrendered their small-scale licences and all mineral rights to form part of the proposed Namdini Lease area. The small-scale licences are in the process of being surrendered.

Malik Easah, an executive director of Cardinal, is also the sole shareholder and director of Savannah. Savannah's sole business is the Savannah Agreement. Pursuant to an Option & Loan Agreement made in 2015 (the Option Agreement) between Mr. Easah, Savannah and CMS, CMS holds an option to purchase all the outstanding shares of Savannah from Mr. Easah for $1.00 and holds all validly executed and irrevocable documents to given effect to the purchase upon exercise of the option. The Option Agreement also gives CMS the option to purchase all mining leases held by Savannah for $1.00.

LAND TENURE

The Minister of Lands and Natural Resources of Ghana signed a mining lease for Savannah (the Namdini Lease) on October 12, 2016 over an area of approximately 19.54 km^2 (1,954 ha) in the Dakoto area of the Talensi District Assembly in the Upper East Region of Ghana (Figure 4-2). The Namdini Lease is for an initial period of 15 years ending October 11, 2031. An application can also be submitted for an extension of the mining lease if required. The Namdini Lease is currently being processed by the Ghana Government. Cardinal believes that the final registration of the Namdini Lease by the Ghana Government will be completed in 2017.

Upon final registration, approval and effectiveness of the Namdini Lease, Cardinal will direct Savannah to assign the Namdini Lease to Cardinal Mining Namdini Limited, a wholly-owned subsidiary of Cardinal, pursuant to the Option Agreement.

Under the 2006 Mining Act the indirect transfer of ownership of a mining lease is subject to the non-objection of the Minister and direct assignment of a mining lease requires the consent of the Minister. Cardinal does not anticipate that any objection will be made by the Minister to the transfer of the Namdini Lease from Savannah to Cardinal Mining Namdini Limited.

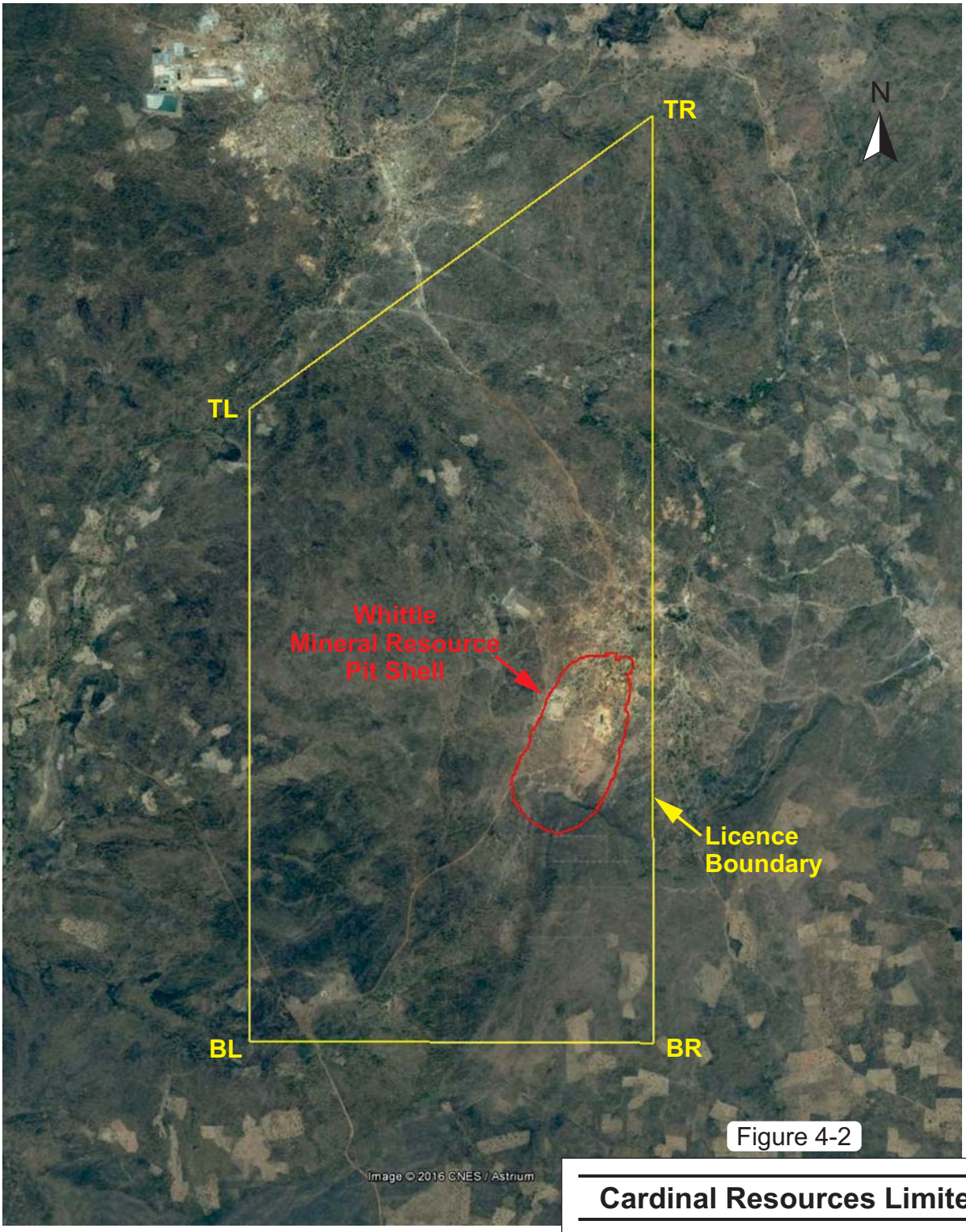


Figure 4-2

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

Licence Location Map

March 2017

Source: Google Earth, 2017.

Table 4-1 lists the corners for the Namdini Lease in longitude and latitude.

TABLE 4-1 COORDINATES OF THE NAMDINI LEASE
Cardinal Resources Limited – Namdini Gold Project

Corner	Longitude	Latitude
Top Left (TL)	10º 39' 42"	-0º 40' 15"
Top Right (TR)	10º 40' 57"	-0º 38 30"
Bottom Right (BR)	10º 37' 00"	-0º 38 30"
Bottom Left (BL)	10º 36' 60"	-0º 40' 15"

RPA DISCUSSION

RPA is not aware of any environmental liabilities on the property. Cardinal has all required permits to conduct the proposed work on the property. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

ACCESSIBILITY

The Property is located approximately 50 km to the southeast of the town of Bolgatanga, the capital of the Bolgatanga Municipal District and Upper East Region of north Ghana. The nearest airport is located in Tamale, approximately a 2.5 hour drive south of Bolgatanga via 160 km of paved road on National Highway N10. Tamale, located approximately 450 km north of the capital city of Accra, Ghana, is serviced by daily one hour scheduled commercial flights. Total access time from the Accra to the Project is approximately four hours using a combination of air and road travel, and approximately 14 hours solely by road travel. Accra has direct flights to the United Kingdom, Europe, South Africa, and the Middle East via regularly scheduled international commercial carriers.

The Property is readily accessible from Bolgatanga along paved highway followed by 15 km of well-travelled gravel roads. Access during the rainy season is slower due to waterlogged roads, however, the main access roads are passable year-round.

CLIMATE

The mean annual temperature in Bolgatanga is 28.3°C. The climate is characterized by one rainy season between May and October where the rainfall is erratic spatially and in duration. The mean annual rainfall during this period is between 800 mm and 1,100 mm. Temperatures during this period can be as low as 20°C at night, but can reach more than 35°C during the daytime (Meteoblue, 2017).

There is a long spell of dry season from December to late January, characterized by cool, dry and dusty Harmattan winds. Temperatures during this period can be as low as 15°C at night and as high as 40°C during the daytime. Humidity is, however, very low (Ghana Government, 2017).

Climatic conditions have not affected Cardinal's exploration activities, nor would they be expected to materially affect any potential mining operations.

LOCAL RESOURCES

Ghana has long mining history and has experienced technical personnel including geologists and engineers. Exploration and mining supplies are readily available within Ghana.

In 2002, the Upper East Ghana region had a total population of 964,500. In 2012, Bolgatanga recorded a settlement population of 66,685 people. The main occupations in the region in order of magnitude are, agriculture and related work, production and transport equipment work, sales, service work, and professional, technical and related work. The occupational structure of the region is not very diverse with more than two thirds of the workforce being involved in agriculture.

Within the vicinity of the property, there are two small settlements that generally rely on subsistence farming, organized artisanal mining, and harvesting of wood. These hamlets are accessed by car, motorcycle, bicycle, and on foot.

There is a significant local labour pool available for training and recruitment for any envisioned mining operation. The Project enjoys the support of local communities.

INFRASTRUCTURE

At the time of RPA's site visit, infrastructure at the Bolgatanga Exploration Office area included the following:

- A fenced and gated compound patrolled by security.
- A brick constructed administrative office building including kitchen and bedroom accommodations.
- Gated and fenced core processing area consisting of:
  - Outdoor roofed open core logging areas
  - Indoor core sawing area
  - Locked storage area for pulps and duplicates
- Gated and fenced core storage area consisting of:
  - Outdoor roofed core storage racks
  - Bulk density station

- Security office and camp support staff accommodation.

Power is distributed to Bolgatanga from the Ghanaian national transmission and distribution system based on 225 kV above ground transmission lines.

At the time of RPA's site visit, no Cardinal infrastructure was present at the Namdini Project site other than a Security Hut. Fuel supply for the drills is provided by diesel tankers. Fresh water is taken from a borehole located on the Project site. Cardinal maintains trails on the Project site in order to facilitate exploration and drilling activities.

Numerous historical trenches and adits, as well as organized artisanal gold mining sites, are located throughout the property and only approximately 5% of the permit area has been affected by these activities. Artisanal miners extract gold from the saprolite horizon, but also sink shafts as deep as 20 m to recover gold from quartz veins.

The Namdini Project area is located approximately six kilometres southeast of the operating Shaanxi underground gold mine which is supplied by grid power. The Ghana National high voltage power grid is located approximately 30 km west of the Project.

For any future development activities, it will be necessary to build all-weather access roads and a bridge, as well as infrastructure for sufficient power and water supplies. Cardinal's surface rights allow sufficient areas for potential processing plant sites including heap leach pads (if appropriate), tailings storage areas, and waste disposal areas.

PHYSIOGRAPHY

The topography is generally flat with gently undulating terrain (Figure 5-1). The topography rises to the south where the area is overlain by the sediments. Elevation varies from 175 MASL to 250 MASL. The average elevation of the flat Savanah area is approximately 190 MASL.

The physiography of the Project area is primarily savanna grassland characterized by short scattered drought-resistant trees, scattered scrub, and grass that gets burnt by bushfire or scorched by the sun during the long dry season. The climate is very dry. The most common trees are the Sheanut, Dawadawa, and Boabab.

FIGURE 5-1 VIEW OF NAMDINI PROJECT SITE (LOOKING NORTH)

The White Volta River is located approximately seven kilometres south of the Project area. RPA is of the opinion that, to the extent relevant to the mineral project, there are sufficient surface rights and water.

6 HISTORY

EXPLORATION HISTORY

All exploration at Namdini has been completed by Cardinal. Prior to Cardinal, no systematic exploration had been undertaken on the property. Small scale artisanal mining began on the property circa 2013 following Cardinal's initial exploration activities.

The following summary of historical exploration in this region of northeastern Ghana is taken from Gleeson and Cobb (2012) who summarized the text from Griffis (2006). RPA reviewed the exploration history with Cardinal Management, who have concurred that this is a good representation and accurate recalling of the exploration history in the region.

Northern Ghana did not have extensive artisanal gold mining when compared to elsewhere in West Africa, such as southern Ghana, Côte d'Ivoire or southern Burkina Faso.

The discovery of gold in this region occurred in late 1930s when a British businessman was shown some gold-bearing quartz veins at Nangodi by a local farmer. A small underground operation was underway by 1934, which attracted the attention of Gold Coast Selection Trust (GCST) who optioned the property in 1936 and acquired a large prospecting licence area which covered most of the belt. GCST boosted the underground production, which peaked at about 5,000 ozs/annum in 1936-1937, but dropped thereafter as a result of lower grades (originally about 1 oz/ton and dropping to about 0.6-0.8 oz/ton in 1937-1939). GCST subsequently dropped the option in 1938, but mining continued on a very modest scale for a few years.

During the early 1960s, the Ghanaian Government was trying to stimulate interest and development in northern Ghana. The Ghana Geological Survey Department carried out limited shallow drilling around prospects which had been identified by earlier work in the 1930s. Again in the 1970s, some soil geochemistry and trenching were carried out over a 7 km stretch in the Nangodi area where most of the known prospects occur.

Driven by activity elsewhere in Ghana and Burkina Faso during the mid-1990s, numerous Canadian and Australian junior explorers started to explore the north of Ghana, in particular,

the discovery of Youga deposit in Burkina Faso by International Gold Resources (IGR) is significant.

During this same period in the mid-1990s, small-scale miners inundated the area as the traditional small-scale mining sites in southern Ghana were closed (Tarkwa, Obuasi, Konongo, etc.). Environmental problems were created when the artisanal miners encroached on forest reserve areas southwest of Bolgatanga. Eventually, the Small-Scale Mining Division of the Minerals Commission set aside a 72 km^2 area south of Nangodi (Shiega-Datoko) for small-scale mining. A number of licences were taken out and up to several thousand people were living and working in the general area between 1996 and 1998.

BHP was the first to conduct a major reconnaissance exploration program in the mid-1990s, covering most of the Nangodi area. BHP's work was directed towards developing both gold and base metal prospects. After an initial regional program which identified promising geochemical and geophysical anomalies, the project was largely abandoned as a result of BHP's decision to cease exploration activity in Ghana. Other groups that acquired prospecting concessions in the mid-1990s including IGR, who picked up two areas on the margins of the belt; the western area covered a large area around Navrongo and the eastern area extended to the Bawku area. Cluff Resources held two concessions on the eastern side of the belt, adjacent to BHP's Nangodi licence area, and Teberebie Goldfields acquired a concession from just north of Nangodi to the Burkina Faso border. Subsequently, Ashanti Goldfields carried out extensive work on the IGR concessions after their takeover of the company, and an Australian junior, Africwest Gold, successfully applied for a reconnaissance concession in the Nangodi area in late 1996, after the BHP licence had lapsed. The market downturn in 1997 seriously affected Africwest's ability to raise additional equity funding and their licence in the Nangodi area lapsed.

Renewed interest in the area began around 2004, with an increase in the gold price, and as a result of the development of mines on the Burkina Faso side of the border. Etruscan in 2006 carried out soil sampling, rock chip sampling, limited trenching, and reverse circulation (RC) and rotary air blast (RAB) drilling (139 holes) in the Zupliga, Fulani and Dumorlugu prospects.

The best drill intercepts were 18 m at 3.35 g/t Au. Randgold also explored the Nangodi-Bole belts from 2004 to 2009 with soil geochemistry, stream sediment sampling and rock chip sampling. The company identified eight areas, but left the area when it failed to meet their economic criteria. Red Back Mining commenced exploration work over the Nangodi Belt and adjacent areas in 2005. This included a desktop study of satellite imagery, data compilation, mapping and rock chip sampling.

Significantly, none of the historical exploration has made use of a detailed airborne geophysical survey to identify structural-lithological targets to support the ground work. In 1999, the Finnish Government flew a low resolution geophysical survey over selected areas of the country for the Geological Survey of Ghana as part of a World Bank-supported project.

PREVIOUS MINERAL RESOURCE ESTIMATE

In 2016, Cardinal commissioned EGRM Consulting Pty Ltd (EGRM) to prepare an initial Mineral Resource statement for the Project. This Mineral Resource estimate (Table 6-1) incorporates drilling information to August 12, 2016 consisting of 26,116.17 m of diamond and reverse circulation (RC) drilling, up to and including NHDD034, and was released by Cardinal on November 7, 2016. The Mineral Resource estimate is documented in a technical report prepared by EGRM dated February 17, 2017 entitled Namdini Gold Project, Mineral Report Estimate Study (Gossage, 2017).

TABLE 6-1 SUMMARY OF EGRM MINERAL RESOURCE ESTIMATE – AUGUST 12, 2016
Cardinal Resources Limited – Namdini Gold Project

Category	Tonnage (Mt)	Grade (g/t Au)	Contained Metal (Moz Au)
Indicated	7.2	1.1	0.25
Inferred	102.8	1.2	3.80

Notes:
1. Mineral Resources were prepared by EGRM Consulting Pty Ltd.
2. JORC (2012) Code was followed for Mineral Resources.
3. Mineral Resources are estimated at a cut-off grade of 0.40 g/t Au.
4. Mineral Resources are estimated using a long-term gold price of US$1,550 per ounce.
5. Bulk densities ranged from 1.80 t/m^3 to 2.83 t/m^3 depending upon lithology and weathering profile.
6. High gold assays were capped to 15 g/t Au.
7. Grade estimation was undertaken using Multiple Indicator Kriging.
8. Classification was based on drilling density and grade estimation confidence as determined by the Competent Person.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
10. Numbers may not add due to rounding.
11. Incorporates drilling completed on or before August 12, 2016 (NMDD034).

The initial Mineral Resource estimate for the Project included 0.25 Moz of gold in the Indicated category and 3.80 Moz of gold in the Inferred category. The drill spacing limited the Mineral Resource classification to 93% in the Inferred category, with a further 7% in the Indicated category located in the southern area of close spaced RC drilling.

The Mineral Resource estimate presented in Table 6-1 has been superseded by the Mineral Resource Statement presented in Section 14.

PAST PRODUCTION

No commercial production has been undertaken on the site. The historical gold production by artisanal miners is unknown. RPA observed artisanal mining operations during the December 2016 site visit.

7 GEOLOGICAL SETTING AND MINERALIZATION

REGIONAL GEOLOGY

The regional geological setting discussion presented below has been summarized from Pittuck and Arthur (2015).

The Project occurs in Paleo-Proterozoic granite–greenstone terrain in the northeastern district of Ghana, close to the border with Burkina Faso. The region contains several producing mines both on the Ghana side of the border (Shaanxi Gold Mine) and in Burkina Faso (Youga Gold Mine). Evidence of artisanal workings occurs throughout the area.

The Namdini Project area is located in the Nangodi Greenstone Belt (NGB). The NGB is the extension of the belt that crosses the border into Southern Burkina Faso. In Ghana, there are seven Paleo-Proterozoic granite–greenstone belts, which form part of the northeastern extension of the Paleo-Proterozoic Birimian basins that were created during the collision of the West African and Guyana Archean Shields. The main lithologies in the belts are volcanic–sediment sequences of Birimian age (interbedded basic to intermediate flows, felsic tuffs and fine grained sediments) overlying the earlier intervening sedimentary basins (greywackes and phyllites) of the Tarkwaian formation. These basins are separated by major faults that probably controlled early syn-Birimian sedimentary basin downfaulting.

Locally the NGB trends north-northeast to south-southwest over a distance of 30 km and turns to an east-northeast to south-southwest trend in the south of the area around Namdini. The belt is comprised of Birimian age interbedded meta-volcanics (mainly basalt flows) and meta-sediments (phyllites) and occasional cherty horizons. Some small basic to intermediate intrusions occur within the belt and have associated gold mineralization. Meta-sediments of Tarkwaian age occur adjacent to the belt and host the gold mineralization of the nearby Youga mine. Much of the area to the south of the tenements is covered by later Voltaian Basin sediments. The belts continue underneath this cover.

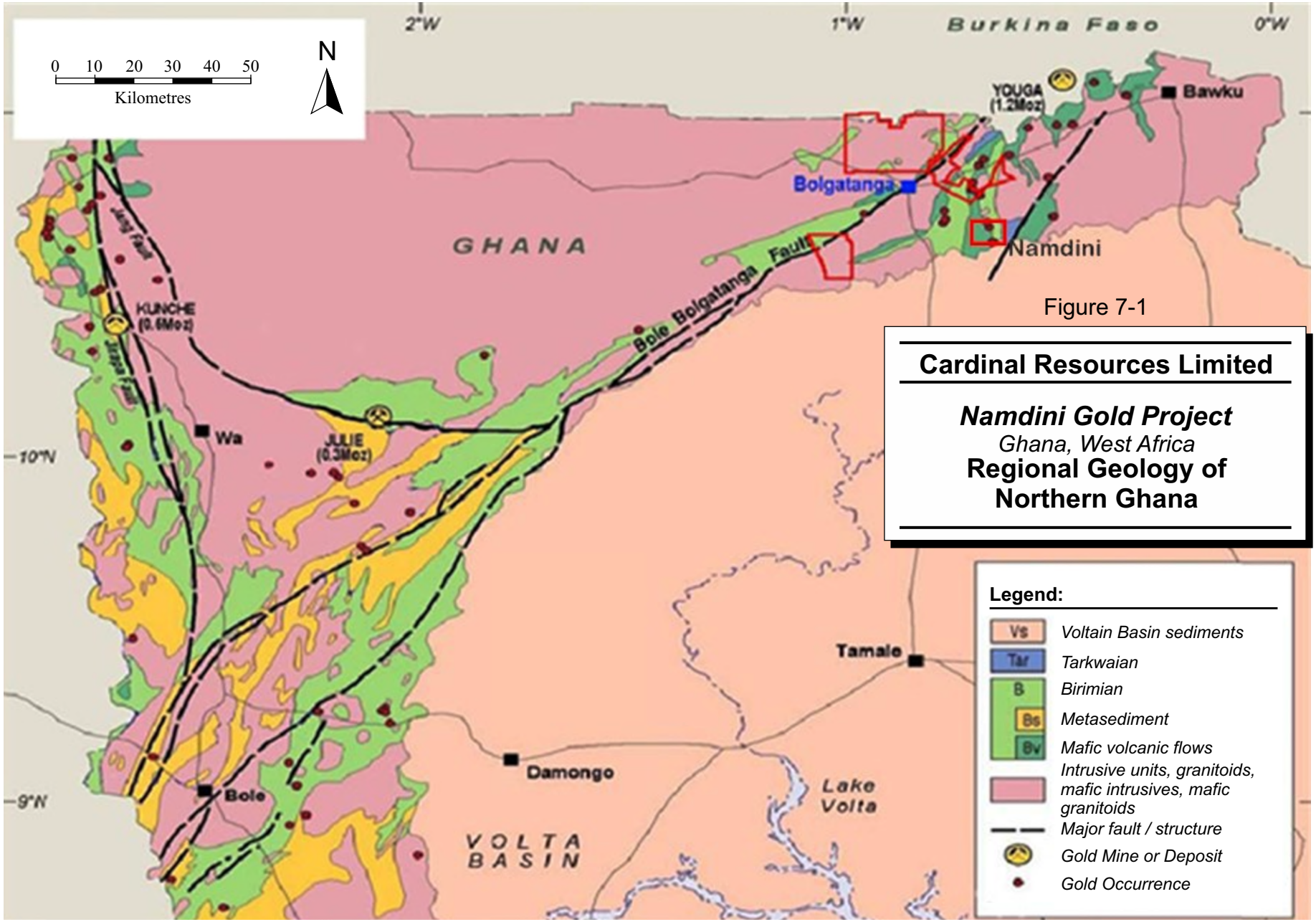


Figure 7-1

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

Regional Geology of Northern Ghana

April 2017

Source: Cardinal Resources Limited, 2017.

Structurally the northeastern region of Ghana is characterized by steep isoclinal folding with near vertical axial planes. The greenstone belts contain locally developed open symmetric folds with axial planar cleavages parallel to bedding in the steeply inclined sediments. Cardinal's Bolgatanga Project lies along the northwest trend of the Bole Greenstone Belt and is separated from the NGB by the Bole–Bolgatanga fault.

LOCAL AND PROPERTY GEOLOGY

The Project covers the southern extension of the NGB (Figure 7-2). In 2016, geological consultants from Orefind Pty Ltd (Orefind, 2016) conducted an on-site structural study and then developed a structural framework with controls on, and geometry of, the gold mineralization comprising the Namdini deposit. The following lithological descriptions are taken from Orefind.

Orefind concluded that the rock types comprising the Namdini Project include a steeply dipping Birimian sequence of inter-bedded foliated meta-sedimentary and meta-volcanic units, which have been intruded by a medium-grained granitoid and diorite. The southern part of the Project is covered by flat lying Voltaian Basin clastic sedimentary rocks that have been deposited unconformably on the Birimian sequence and postdate mineralization and the host sequence.

Underneath the weathering profile, from west to east across the Namdini area, the Birimian units include:

- Meta-Sedimentary
- Meta-Volcaniclastic
- Granitoid (Tonalite)
- Diorite
- Meta-Sedimentary.

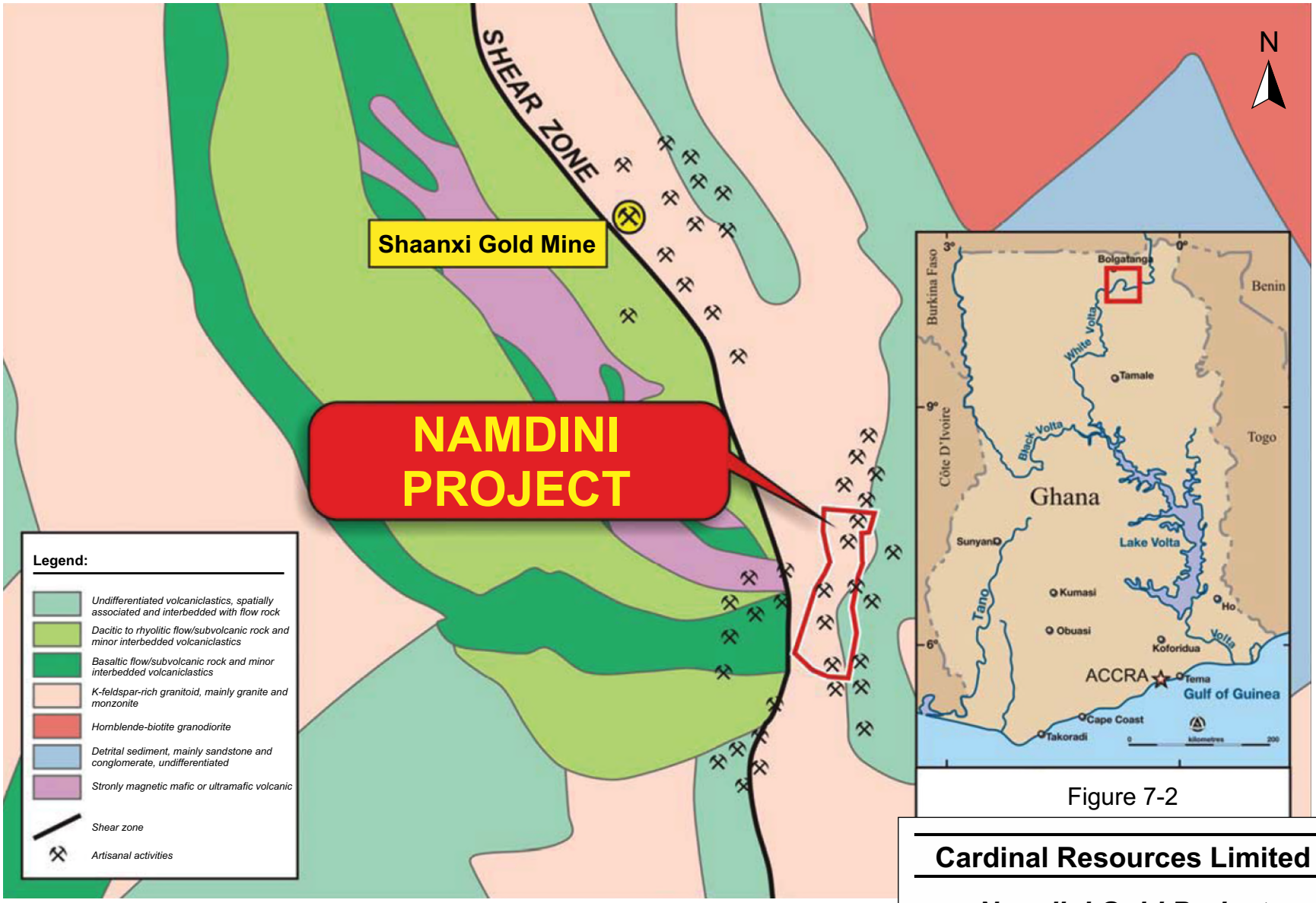


Figure 7-2

Cardinal Resources Limited

Namdini Gold Project

Upper East Region, Ghana, West Africa

Local and Property Geology

April 2017

Source: Cardinal Resources Limited, 2017.

WEATHERING PROFILE

Tropical weathering has resulted in the following weathering profile:

Strongly Oxidized (SOX): Total oxidation off all primary minerals and showing little or no primary rock texture. Complete weathering to unrecognizable saprolite beneath. SOX weathering ranges from 1.0 m to 7.5 m in thickness.

Moderately Oxidized (MOX): Material exhibits some primary rock texture, total oxidation of feldspar to clay, and total oxidation of sulphides. MOX ranges from 0.5 m to 13.0 m in thickness.

Transition (TRANS): Material showing strong primary rock textures, partial oxidation of feldspars to clay, partial oxidation of sulphides (often showing iron oxide staining). Transition ranges from 2.0 m to 14.5 m in thickness.

META-SEDIMENTARY ROCKS

The meta-sedimentary rocks have been described in thin section by Townend Mineralogical Services, of Perth, Western Australia (Townend, 2015) as fine- grained chlorite-muscovite schists.

META-VOLCANICLASTIC ROCKS

The meta-volcaniclastic rocks have been described in thin section by Townend (2015) as very fine-grained, chlorite-muscovite phyllites.

GRANITOID (TONALITE) ROCKS

Townend (2016) undertook petrological examination of granitoid samples and classified them as altered, sheared, sulphide-bearing tonalite. A tectonic foliation is developed in the intrusive rocks, but is not pervasive in the granitoid.

DIORITE ROCKS

The diorite rocks are assumed to be late stage intermediate diorite stock and dykes. They occur as altered (shearing, silicification, chlorite, and sericites) or unaltered diorite, as well as Quartz Diorite speckled with quartz and feldspar.

ALTERATION

The meta-sedimentary and volcaniclastic rocks have been intensely altered with a pyrite-carbonate-muscovite-chlorite-quartz. Alteration is prevalent in the volcaniclastic rocks. Similarly, the tonalite is extensively altered and has been overprinted by silica-sericite-carbonate assemblages. The identity of carbonate alteration is difficult and is best described as iron-carbonate in the absence of petrological or geochemical characterization. Fe-dolomite and ankerite units have been noted by Townend (2015, 2016), although these can be difficult to unequivocally identify due to a wide range of compositions noted in orogenic gold systems (e.g., Davis et al., 2001).

CARDINAL LOGGING CODES

Table 7-1 presents a summary of the revised lithological codes and descriptions used by Cardinal geologists for geological logging purposes.

TABLE 7-1 SUMMARY OF CARDINAL GEOLOGICAL LOGGING CODES AND DESCRIPTIONS
Cardinal Resources Limited – Namdini Gold Project

Code	Description
LAT	Laterite, ferruginous duricrust developed in situ.
SPR	Saprock (<20% weatherable minerals altered).
SAP	Saprolite (>20% weatherable minerals altered).
GRA	Granodiorite/Tonalite, altered Felsic rocks (sericites, muscovite, carbonate and K-feldspar).
DIO	Intermediate rocks, altered (shearing, silicification, chlorite and sericites) and unaltered diorite, Quartz Diorite speckled with quartz and feldspar.
MVO	Mafic rocks, volcaniclastics, altered (sericites, chlorites + silicification).
MSE	Metasedimentary rocks, dominated by quartz-carbonate veining + haematite and chlorite.
BX	Breccia.
QTZ	Quartz.

PROPERTY STRUCTURE

Orefind's review of diamond drill core and outcrops suggested two discrete stages of gold deposition and emplacement of vein minerals and associated alteration. Currently, the structural overprinting, geometries, and kinematics are thought to be consistent with deposition of mineralization in both D1 and D2 foliation-forming events. It is likely that this represents two stages of gold deposition punctuated by a deformation hiatus between D1 and D2, i.e., the emplacement of successive mineralization-associated vein stages does not represent a single evolving event. The formation of intense D2 structures, in particular the penetrative S1-S2

composite foliation, have strongly modified or destroyed D1 overprinting and geometric relationships.

The Namdini mineralized system is located in a zone of oblique, sinistral, east side-up shearing that developed during D2. S1 is also an intense foliation and much of the foliation development is represented by a penetrative, composite S1-S2. This suggests a formation of the host shear zone during D1, with intense reactivation of the system in D2. Overall, the intensity of D2 has resulted in a strong preferred orientation of mineralized zones controlled by S2 and mesoscale F2 folds, with any D1 controls being preserved in local D2 low strain zones. Alternatively, the deposit may be located on the limb of a fold of a larger scale than the deposit.

S1 is a pervasive foliation and commonly occurs in the hinges of D2 differentiated crenulations. S2 manifests variably as an intense foliation, a spaced cleavage, a differentiated crenulation cleavage, and as a contributor to a composite S1-S2 produced by transposition of S1. Intense deformation during D2 has commonly resulted in rotation of the S1 into the S2 orientation, resulting in transposition of S1 with S2 and the formation of a pervasive composite S1-S2 foliation.

Orefind's traverses across the mineralized sequence determined that the S1-S2 asymmetry is consistent across the deposit. S1 strikes acutely clockwise of strike of S2. This asymmetry is consistent with D2 kinematic indicators, which indicate a constant sinistral sense of shear in plan. In section, the kinematics during D2 appear to have been E-side-up. Overall, Orefind noted that the mineralized package has accommodated sinistral, E-side-up, oblique shear.

Foliations are less well developed in the tonalite, with most structures represented by quartz ± carbonate vein arrays and silica-sericite fractures/veinlets. Faults are uncommon in general. In the tonalite, faults tend to manifest as zones of enhanced quartz veining or local fracturing.

Parasitic folds are common in the core but were not observed in the field. This is interpreted as a function of exposure, rather than lack of development.

The majority of textural relationships are indicative of mineralization in D2, and this likely represents the period of greatest deposition. Structural orientation controls on the geometry of mineralized zones will be overwhelmingly along the north-northeast to south-southwest D2 trends of S2 and L12 intersection lines. Lesser orientation controls are likely to have a north-

south trend indicative of vein orientations in D2 extensional jogs, especially for quartz veins in the tonalite.

MINERALIZATION

Namdini mineralization is located in the NGB within a host sequence of meta-volcaniclastics, granitoids (tonalite), and diorites. The deposit is bounded on hanging wall and footwall sides by metasediments.

Drilling has outlined mineralization with three-dimensional continuity, with a size of approximately 1,500 m long, 550 m wide, and 450 m in depth.

In all rock types, the mineralization is accompanied by visible disseminated sulphides of pyrite and arsenopyrite in both the veins and wall rocks. In diamond drill core, the mineralized zones are visually distinctive due to the presence of millimetre to centimetre wide quartz-carbonate veins that are commonly folded and possess yellow-brown sericite-carbonate selvedges (Figure 7-3).

Petrological work by Townend (2015, 2016) showed that gold is primarily associated with sulphides, in particular pyrite, where it commonly occurs as inclusions and on the crystal margins. Gold was also noted in phyllite matrix and, to a much lesser extent, in association with ilmenite. Figure 7-4 presents a photograph and brief description of a typical polished section (Sample TNM2) from Townend, 2016.

Visible gold has been identified by Cardinal, Orefind, and RPA. Its instances occurred in strongly altered granite and were associated with silica-sericite shears that had sub-millimetre widths, as well as in the diorite.

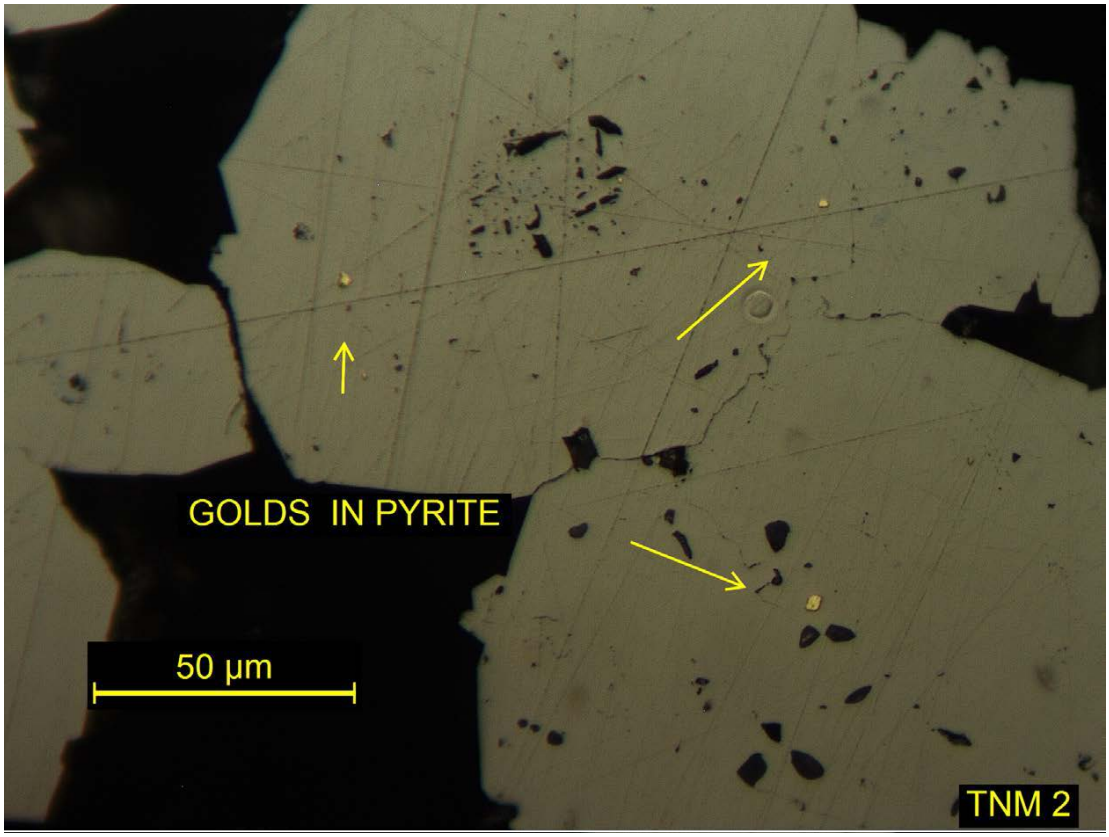
RPA COMMENTS

In RPA's opinion, further detailed studies are warranted on the lithological and structural controls on mineralization, particularly as the drilling density increases and the deposit is explored deeper.

FIGURE 7-3 NAMDINI ALTERATION – HOLE NMDD007: 227.33M TO 231.95 M

Hydrothermally altered metavolcanic. Strongly altered and sheared unit. Bleached with Quartz and Quartz-Calcite Veins, Veinlets and Stringers. Disseminated pyrite and very minor arsenopyrite with short fine grained felsite units.

FIGURE 7-4 GOLD ASSOCIATED WITH PYRITE – TOWNEND (2016) TNM2



Note.
The primary rock is a muscovite rich phyllite that shows extensive carbonate replacement. The phyllite hosts a major sulphide content and significant gold. The fine-grained muscovite shows a moderate preferred orientation and is heavily impregnated with ankerite carbonate.

The dominant ores are pyrite and arsenopyrite that occur relatively commonly through much of the phyllite matrix. Tennantite, chalcopyrite, pyrrhotite, galena, and sphalerite all occur as fines within some pyrites. Magnetite was also detected once.

About twenty-five occurrences of gold were detected optically. The vast majority occur as inclusions in pyrite. The gold appeared low in silver. These included golds in pyrites that were predominantly under 5 µm, with the exceptions of a linear nature, reaching 25 µm. Most were single particles plus a rare trio.

The host pyrites had a wide range of grainsizes from 50 µm to 600 µm. Two occurrences of gold were single fine grains of 2 µm within silicate.

8 DEPOSIT TYPES

The Namdini gold deposit appears to be a typical Birimian gold deposit, hosted in a mixture of meta-sediments, volcaniclastics, and intrusives. Birimian rocks are composed of granitic-gneiss terranes separated by linear greenstone belts of meta-sedimentary and meta-volcanic rocks.

According to Schlüter (2008), the important types of gold mineralization in Ghana occur in three types:

1) Steeply dipping quartz veins with native gold in shear zones at Birimian belt/basin boundaries.
2) Disseminated sulphide bodies, spatially, though not necessarily genetically in association with the shear zones, and quartz veins, with auriferous arsenopyrite as major host of gold.
3) Disseminated and stockwork mineralization in late-kinematic "basin type" granitoids.

The following description of Birimian gold deposit types is taken from Smith et al. (2016):

The majority of the gold occurs in two styles of mineralisation, namely mesothermal quartz vein-hosted and associated gold in metavolcanics and metasediments and modified palaeoplacer gold in conglomerates. These styles of mineralisation occur in the Palaeoproterozoic Birimian Supergroup and Tarkwaian Group that make up Ghana's mainly southwest to northeast trending Birimian belts. Significant gold resources also occur as hydrothermal mineralisation in basement-type granitoids which show some geological association with the Birimian Supergroup-hosted mesothermal mineralization. The majority of the gold mineralisation is believed to have formed between approximately 2.15 and 2.6 Ga during the Eburnean orogeny.

The mesothermal quartz vein gold mineralisation is usually confined to tectonic corridors within the Birimian belts and is strongly associated with shear zones and fault systems. The quartz veins show multiple stages of formation and are steeply dipping, with the gold mineralisation occurring either as free gold within fractures in the veins or as invisible gold within disseminated sulphides in the host rocks surrounding the veins. The vein- and

sulphide-hosted gold is strongly associated with deformational fabrics formed by the Eburnean extensional and compressional events, respectively, suggesting that disseminated sulphide mineralisation predates quartz vein-hosted mineralisation. The fluid from which the gold precipitated is believed to have been of metamorphic origin and carbon dioxide (CO_2) dominated, with lesser water (H_2O) and nitrogen (N_2) and minor methane (CH_4). Gold precipitation was probably caused by decrease in pressure, temperature and CO_2-H_2O immiscibility, at depths of between 7 and 11 km.

Hydrothermal gold mineralisation occurs in the Palaeoproterozoic belts and basin granitoids that intrude the Birimian belts, as well as in the sedimentary basins occurring between the belts. Gold mineralisation within the granitoids occurs as micro-inclusions in sulphides in small, steeply dipping stockworks and as sulphide disseminations concordant with regional faults and shears. A gold-bearing fluid similar to that for the Birimian Supergroup-hosted quartz vein gold mineralisation, but with a larger H_2O component, is proposed to have formed the granitoid-hosted gold mineralisation.

Current exploration drilling has outlined mineralization with three-dimensional continuity with a size of approximately 1,500 m long, 550 m wide and 450 m in depth, and hosted within defined Birimian gold deposit lithologies. The Cardinal exploration plan is based on defining mineralization in a size and grade that can potentially be extracted economically.

9 EXPLORATION

All exploration work on the Project has been completed by Cardinal. A field office, including core logging and storage facilities, is located in Bolgatanga.

The primary objectives of Cardinal's exploration strategy are to:

1. Improve understanding of the extent and style of mineralization in order to successfully diamond drill and to increase the size and confidence level of the Mineral Resources for Namdini.

2. Optimize deposit models and use grassroots exploration methods to search for gold and its pathfinder elements in order to potentially locate other deposits throughout Northern Ghana.

The Project was first discovered in September 2013 by prospecting. A small scale mining licence was approved in 2014 and RC drilling began shortly thereafter. After reviewing initial results, Cardinal drilled additional RC holes in the same licence area. After approximately 88 RC holes, Cardinal had sufficient confidence in the potential size of the Project that it stepped out 600 m north along strike and drilled a surface diamond drill hole (NMDD002) that intersected 87 m at 1.08 g/t Au and numerous other significant intersections.

GRASSROOTS EXPLORATION PROCEDURES

Cardinal's grassroots exploration procedures are generally focused on staged exploration in order to achieve quick and effective means of sampling vast areas of land for the purpose of generating targets for further detailed work.

All field sampling activities are carried out by a team of geologists, which is headed by an experienced Cardinal Exploration Manager. A Global Positioning System (GPS) is the most common navigation tool used by the exploration crew in the field in order to locate and update geographic information.

HISTORICAL REVIEW

Cardinal reviews all historical reports and data from any previous operators and/or academic researchers prior to the start of the any field activities. This step helps in focusing Cardinal's

exploration activities in areas of interest as well as providing the basis for the selection of appropriate sampling methods.

GEOLOGICAL MAPPING

Geological mapping is carried out throughout all the field programs, but intensified after auger sampling in order to determine the proper orientation of the structures prior to diamond drilling.

CHANNEL AND ADIT SAMPLING

Channel and adit sampling programs are undertaken where old workings are identified. Due to generally good relations with local artisanal miners, geological information is also obtained from current workings.

AUGER SAMPLING

Auger drilling, which normally targets the saprolite in situ weathered rock, collects samples from up to 5 m depth in the regolith layer. The main benefit of auger drilling is that it does not cause any significant impact to farms, forests, streams, hills or other property within the work environment.

The grid spacing for the auger sampling varies according to the project objective, which is determined by the Exploration Manager. Generally, the shallow auger sampling on a greenfield project in Ghana starts from 800 m by 50 m and subsequently infilled to 400 m by 50 m over anomalous areas. Subsequent deeper auger sampling is infilled to 200 m by 50 m to 25 m spacing over anomalous areas.

Cardinal's general auger procedures include:

- Locating the sample point and clearing the area around it to begin the auger drilling.
- Auger drilling normally goes to depths of five metres and the samples are placed into a sample tray.
- The site geologist records the hole collar information and basic geological information on the log sheet.
- The mottle zone to the saprock, as indicated by the geologist's logs is bagged for submission to the laboratory. When the sample interval is more than 1.2 m, it is divided into two separate samples and submitted to the laboratory.

- If ground conditions prevent drilling from reaching the final depth of five metres, a sample taken below the depth of 0.5 m is accepted if well logged to indicate the soil horizon or the soil type sample that was collected.
- The Hole-ID and coordinate for the point is written on a flagging tape and tied firmly to a peg in the field.
- The samples are transported to Bolgatanga by Cardinal personnel and photographed, logged, and sampled.
- When the depth of a hole is less than a metre and efforts to go further are unsuccessful in a transported environment, the sample should be logged but not submitted to the laboratory.

Cardinal's quality assurance and quality control (QA/QC) procedures for auger drilling include:

- All samples are well secured in plastic bags to ensure no contamination during transportation.
- Samples are checked against log sheets to ensure the samples have correct assay numbers written on bags.
- All control samples are inserted in proper locations and grade of control sample is well documented.
- During sampling, control samples are inserted as every 15th sample and these alternate between a standard and blank.
- Daily statistics for both line cutting and auger sampling are clearly written in ink on the log and submitted to the data entry clerk.
- All logs are exported into the database.

Auger sampling results are not utilized in Mineral Resource estimates.

AIRBORNE GEOPHYSICS

A high-resolution, 100 m line-spaced airborne magnetic-radiometric survey was carried out by Terrascan Airborne from August to December 2013 over all of Cardinal's properties in Northeastern Ghana. The data was monitored and checked during survey acquisition and was considered to be of good quality. The data was processed and interpreted by Southern Geoscience Consultants (Southern Geoscience) who generated a suite of digital images and contours.

Southern Geoscience completed a litho-structural interpretation at 1:50,000 scale over the full survey area. This interpretation provided Cardinal with a detailed Project-wide geological and structural map for exploration target development and assessment activities.

2016 EXPLORATION SUMMARY

GEOPHYSICS AND SOIL DRILLING

During the second quarter of 2016, Gradient Array Induced Polarization (IP) and Ground Magnetic (GM) surveys were completed over a 19.58 km^2 area around Namdini (Figure 9-1).

A follow-up soil auger drilling was completed by Sahara Mining Services during the last quarter of 2016 utilizing the same grid lines of 100 m by 50 m for shallow soil sampling over the accessible areas within this 19.58 km^2 area. A total of 1,133 holes for 3,909 m were augered and submitted to SGS Tarkwa for analysis. Results are currently pending. The geochemical results will be combined with the ground geophysical interpretations to delineate drill targets.

OREFIND STRUCTURAL STUDY

In the summer of 2016, Cardinal engaged Orefind, a structural geology and geological modelling consulting company, of Perth, Western Australia. The key outcomes of Orefind's assignment included:

- A field visit and on-site structural study.
- Development of a Leapfrog geological model.
- Development of a structural framework and controls on, and geometry of, gold mineralization comprising the Namdini deposit.

Orefind conducted a preliminary review of the geophysical interpretation carried out by Southern Geoscience and noted that the dominant trends in IP data show the Namdini mineralized system and surrounding host rocks to have preferred north-south to north-northeast to south-southwest trends. According to Orefind, this agrees with structural orientation data collected in the existing open pits and surrounding host rocks.

A suite of northwest-southeast trending structures is also evident and is tentatively interpreted by Orefind as comprising post-mineralization structures. The northwest-southeast trending structures are considered more prevalent than shown on the Southern Geoscience interpretation and it is unknown if these dislocate the mineralized zone.

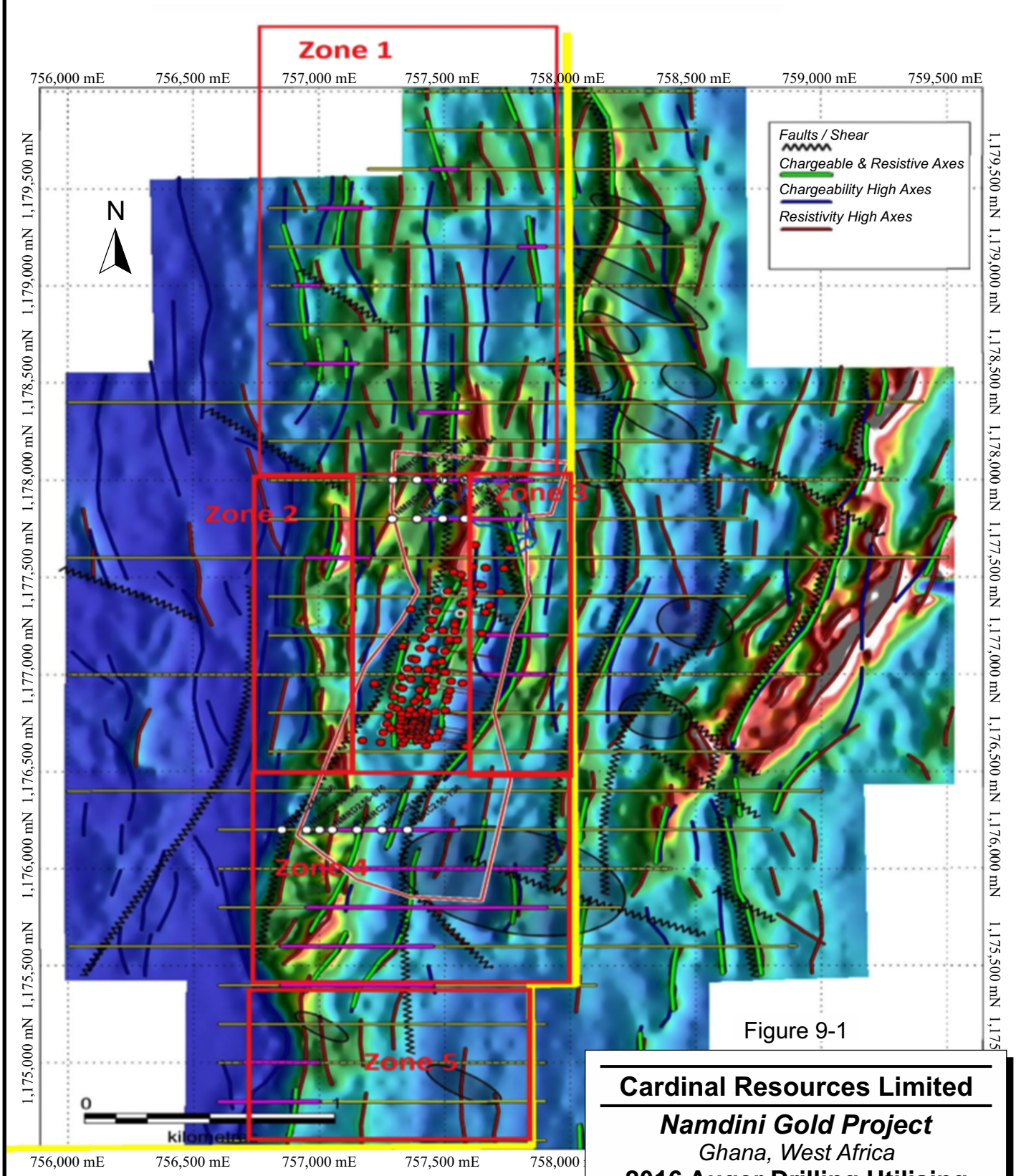


Figure 9-1

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

2016 Auger Drilling Utilising Ground Geophysical Survey Grids over Namdini

April 2017

Source: Cardinal Resources Limited, 2017.

TOWNEND MINERALOGICAL STUDY REPORT

In the fall of 2015, Cardinal submitted three rock samples to Townend. Townend prepared three polished thin sections and petrographic/mineragraphic descriptions with particular regard to gold.

In the winter of 2016, Cardinal submitted a further ten drill core samples to Townend for the preparation of polished thin sections and petrographic/mineragraphic descriptions.

RPA COMMENTS

Cardinal has a detailed Standard Operating Procedure (SOP) Manual for Exploration and Drilling Practices that provides standardization and consistency for all field technical personnel to ensure the collection of quality data. The Exploration Manager and Senior Exploration Geologists are very experienced in the region and deposit style. All exploration has been designed and carried out under the supervision of the Exploration Manager, who is a Qualified Person (QP).

In RPA's opinion, the Cardinal exploration program activities meet the CIM Exploration Best Practices Guidelines.

10 DRILLING

As noted in Section 6, all exploration at Namdini has been completed by Cardinal. Following the discovery drilling in 2013, an initial program of detailed RC drilling was undertaken in one small area, followed by a program of sectional diamond drilling. A number of holes have RC collars and diamond drill tails. During RPA's site visit, only diamond drilling was occurring. The description of RC procedures has been taken from Cardinal's SOP Manual as well as from Pittuck and Arthur (2015). Table 10-1 presents a summary of the drilling completed to December 2, 2016.

TABLE 10-1 DRILLING SUMMARY TO DECEMBER 2, 2016
Cardinal Resources Limited – Namdini Gold Project

	RC		Diamond Drill		RC Collar / DDH Tail		Total	
Year	No.	Metres	No.	Metres	No.	Metres	No.	Metres
2014	45	4,815.00	0	-	0	-	45	4,815.00
2015	42	4,619.30	5	1,656.55	5	1,184.68	52	7,460.53
2016	19	2,540.00	56	14,163.32	14	3,295.42	89	19,998.74
Total	**106**	**11,974.30**	**61**	**15,819.87**	**19**	**4,480.10**	**186**	**32,274.27**

SURVEY GRIDS

In June 2016, Sahara Mining Services (Sahara) was engaged by Cardinal to establish a survey grid on the Project in UTM WGS 84 Zone 30 north. This involved the construction of four concrete survey beacons and surveying of the beacons using a Differential Global Positioning System (DGPS).

Sahara used a Trimble R8 GPS in static survey mode to coordinate the established survey control beacons. The GPS was used in Real Time Kinematic (RTK) survey mode for the surveying of the drilled hole collars and the property boundary points. The instrument has sub-centimetre accuracy for horizontal resolution. Two receivers (one base receiver and one rover receiver) were utilized during the survey.

Sahara has flown a UAV (drone) survey over the Project based on established survey control. A detailed topographic surface was generated using a 2 m by 2 m grid.

Cardinal utilizes a local exploration grid with sections perpendicular to a baseline at a 10° azimuth. Alphabetical and alphanumeric sections, with an approximate 50 m spacing, are named, from south to north: A2, A1, and A through to T.

DRILL PLANNING AND SITE PREPARATION

Micromine geological software is used to layout drill holes. The Exploration Manager plans new drill holes on a standard 5 m by 5 m grid system with their corresponding UTM coordinates. All drilling details for the program are reviewed and approved by Senior Management prior to commencement of drilling.

The coordinates of the planned drilled holes are loaded into a hand held GPS. Drill site preparation generally involves development of property access and the removal of vegetation to ensure a flat and safe location. Generally, drill pads have dimensions of 20 m by 15 m. For RC drilling, an area must also be cleared as close as possible to the drill so that sample bags from the cyclone can be safely and efficiently placed. Site preparation for diamond drilling includes space for a rod stand, as well as the digging of two sumps. The sumps are generally 1.5 m long by 1.0 m wide by 1.0 m deep. Clearing is kept to a minimum and the sumps are fenced.

A plan map showing the location of the Namdini drill hole collars is presented in Figure 10-1.

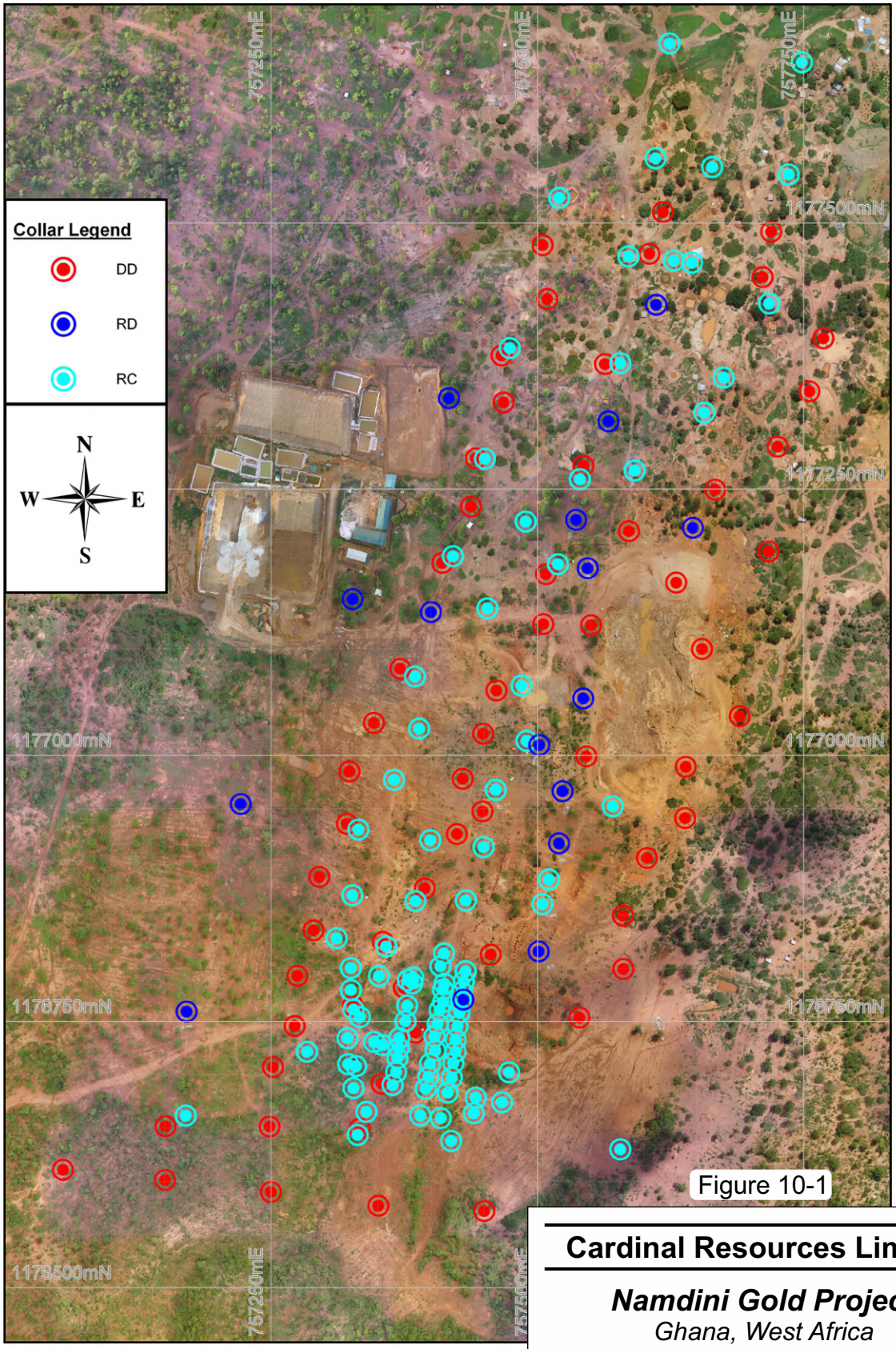


Figure 10-1

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

Plan Map of Namdini Drill Hole Collars

April 2017

Source: RPA, 2017.

RIG SETUP

The location of RC and diamond rigs is generally planned in such a way as to move short distances onto the next hole, unless there are specific hole priorities.

To line up the hole, three pegs marked with flagging tape are placed along the line of azimuth, approximately 1.5 m on the driver's side of the rig. The rig driver then drives along the tape with the edge of the right wheel of the rig. The distance from the edge of the front wheel of the rig to the collar position is usually 1.5 m. Once the rig is in position, the azimuth is checked with a compass from an appreciable distance from the rig so as not have any magnetic interference from the metals on the rig. The dip of the mast is then accurately measured with a clinometer.

COLLAR SURVEYS

The drill hole collar location is surveyed as soon as the rig moves off the drill hole using a hand held GPS that is placed on the ground close to the drill collar. A well labelled concrete is then put around the collar. The label includes the Hole-ID, X, Y, and Z coordinates the azimuth, depth, and date of completion of drilling. The accuracy of the GPS is approximately ±3 m.

Collar locations are later surveyed by Savannah surveyors using a DGPS.

DOWNHOLE SURVEYING

As a standard practice, downhole surveys are completed during drilling operations. The first downhole survey is conducted at 6 m and the second at 30 m, with subsequent surveys conducted at 30 m intervals. End of hole surveys are always conducted unless it is within 9 m from the previous survey. If there is a significant deviation (e.g., 0.1°/m from the previous survey), a second survey is taken. If there is significant survey deviation at 6 m, the hole is stopped and the rig is realigned to restart the hole.

RPA notes that a total of 84 RC drill holes in the drill hole database were not downhole surveyed. RPA recommends that all RC holes are downhole surveyed.

REVERSE CIRCULATION DRILLING PROCEDURES

Cardinal owns and operates its own RC drill rig. The unit is capable of being converted to drill diamond drill core. RPA did not observe any RC drilling operations during the December site visit. RC drilling is conducted with a nominal 5.5 in. diameter bit.

RC DRILLING PROCEDURES

A field geologist must be on site before the commencement of drilling. The geologist has planned drill sections indicating what to expect with respect to geology and mineralization as drilling progresses, as well as prepared clearly labelled sample bags for collecting samples from the cyclone.

Depending on ground conditions, a minimum of 6 m of PVC casing is used for collaring the hole. On completion of collaring, the field geologist must ensure that the hole is cleaned before drilling recommences.

Drilling in weathered zones is monitored to ensure that samples are not contaminated due to the nature of the material being drilled. In damp hole conditions or a fluctuating water table, standard procedure is to dry the hole thoroughly with air following a rod change before restarting drilling. In drilling below the water table, a booster and/or an auxiliary compressor is utilized to obtain dry samples. If dry samples are not possible, RC drilling is stopped and the hole is completed with diamond drilling.

RC SAMPLING PROCEDURES

Cardinal has detailed step by step procedures for RC sampling. A summary is presented below.

All RC samples are collected from a cyclone on one metre intervals into clearly labelled sample bags. The sample bags, which are labelled with the SAMPLE ID and the metre interval, are generally prepared in the Bolgatanga Exploration Office.

Sample bags are removed from the cyclone once the blowback has been completed. The cyclone is cleaned after every run of drilling by use of a rubber or metal mallet.

As a general rule, samples collected from the cyclone are laid out in lines of 10 samples. Between every two lines of samples, a gap of one sample width is left to allow access. Samples are laid in the same direction as the drill direction.

A sieve is used to collect some of the sample which is then washed clean prior to logging. A representative portion of the washed RC cutting is then put in a chip tray to be stored for future reference. In the very weathered zone, samples must be placed in the chip tray without washing.

RC LOGGING

Each metre of the drill cuttings is logged geologically irrespective of sample intervals. Logging is completed on printed log sheets or on a computer using a coded system. In addition to lithology, note is made of the base of complete oxidation and top of fresh rock. Also noted is the depth of the water table and sample quality.

RC SPLITTING PROCEDURES

Cardinal utilizes a three stage tier splitter which splits samples into 75% and 25%, reducing a 20 kg sample to 2.5 kg in one split. The samples are aided to fall through the splitter by tapping the splitter with a rubber mallet.

All samples to be split must be dry. The splitter is inspected to ensure that the slots are even and of equal width, have smooth surfaces, and the riffle is vertical.

Each sample is weighed before splitting using a scale. Samples must spread evenly across the top of the splitter so as not to form a cone shape or spill over the splitter to cause any loss of sample.

Between each sample, a high pressure air hose attached to the compressor or a rag and a brush are used to keep the splitter dry and clean.

Two samples are taken from the splitter. One is for analysis and the other is stored in the exploration camp for future reference. For composite samples, each metre is split and collected in sample bags, which are then mixed up and split until the required quantity is obtained.

Duplicate RC field samples are routinely collected at a ratio of one in 20. The split RC samples submitted to the assay laboratory range from approximately 2.5 kg to 3.0 kg in weight.

A bag farm is then constructed after assay results are received. All samples that return assays greater or equal to 2.1 g/t Au are stored in a bag farm location chosen by the project geologist in consultation with the Exploration Manager.

DIAMOND DRILLING PROCEDURES

Cardinal owns and operates two drill rigs for core drilling. In addition, Ghana based professional drilling companies are contracted. Diamond drill core is drilled HQ size (96 mm) with a standard tube. Triple tube is generally used at the top of the hole in weathered zones. Core recovery averages greater than 95%.

DRILL SITE PROCEDURES

The drillers carefully empty the core barrel and the core is laid out directly into the metal 'V' rack for core recovery and core marking. All markings on the core are completed at the drill site using permanent marker pens or chinagraph pencils. Geotechnical features such as rock quality designation (RQD) and core recovery measurements are recorded on site.

The core is then transferred into core trays which are labelled with Hole-ID, tray number, and an arrow at the top left hand corner of the edge of the tray. Core blocks are labelled with actual hole depths (obtained from the rod count) and are placed in the core tray at the end of each run of drilling irrespective of the length of the run. Additional core blocks labelled with core loss or cavities information are also placed in the core tray at the depth at which the event occurred. Oriented core faces are marked as 'O/M' on the core. Drill induced breaks, and other mechanical breaks as well as natural breaks are also indicated on the core.

All diamond drilling has been oriented using Reflex electronic tools with every core run being oriented and assembled/marked at the drill site using angle iron. Routine structural measurements have been collected using a Kenometer. Orefind (2015) recommended that a core-orienting frame be used to check the alpha-beta data from the Kenometer. RPA concurs with this recommendation as a high level of accuracy is required to properly determine mineralization plunges.

The field geologist/technician inspects the drill contractor supplied orientation device before it is used. The orientation marks are generally taken at the start of each new drill rod run. Ground conditions are, however, considered and an orientation mark is taken right after a poor or broken ground conditions are intersected.

A line is drawn along the orientation marks to produce an orientation line, which normally represents the bottom of hole. The orientation line continues through the core until a particular orientation mark deviates by more than 10° from it and/or if the line gets into a broken core zone where the core cannot be reconstituted. At this point, a new line is started by trying to locate reliable orientation marks. Reasons for breaks in orientation lines are stated.

The core boxes are transported by Cardinal personnel from the drill site to the Bolgatanga Exploration Office.

CORE SHED PROCEDURES

The core boxes are sorted on the logging tables by depth and the core and markers are checked.

The core is then photographed dry and also wet in order to properly capture textures and colour.

Each metre of the drilled core is geologically logged in Maxwell Geoservices Logchief logging software. Logging is both qualitative and quantitative. Geologists use a coded system and record the following required information:

1) Lithology
    a. Lithological Code
    b. Colour
    c. Tone
    d. Weathering
    e. Grain Size
    f. Structure
2) Alteration
    a. Alteration Code
    b. Intensity
    c. Style
3) Veining
    a. Vein Composition

   b. Style
   c. Percentage
   d. Alpha
   e. Beta
4) Mineralization
   a. Mineral Code
   b. Percentage
   c. Style
5) Structures
   a. Structure Type
   b. Intensity
   c. Alpha
   d. Beta
   e. Gamma
   f. Shape
   g. Roughness
   h. Fill Properties

A hand held Kenometer device is used to measure the geotechnical parameters, using the orientation line as a reference.

Sample intervals are marked on the core by the geologist during logging. The minimum sampling interval is 50 cm and the maximum is 130 cm. In general, sampling is conducted on a strict one metre interval regardless of lithology.

After all geological, geotechnical, and structural logs are completed, the core is cut and sampled. Broken zones are hand sampled. The core is cut lengthwise using a diamond saw to consistently cut along the orientation line before being correctly placed back into the tray. The right side of the core is then sampled according to the sample intervals indicated on the core by the geologist. The residual core is stored in the core shed for reference purposes. The trays are clearly labelled with the hole number, tray number, and drill interval. Cardinal originally sampled half core, however, recent drilling has three quarters of the core retained. In these cases, the right hand side half core is cut in half. Cardinal samples half core in oxide material.

Bulk density is performed on a 10 cm to 15 cm long representative piece of half cut core from each metre sample interval using a standard Archimedean water displacement method. Weathered materials are first weighed right away, then wrapped in aluminum foil and dried for 24 hours. These samples are then waxed and weighed.

After the core is cut, the geologist supervises the sampling. The cut core is placed into small plastic sample bags which have the Sample-ID marked on the outside of the bag. One sample tag is inserted in the bag and a second tag is stapled over the closed bag. Sample bags are then weighed. The quarter core samples weigh approximately 2 kg.

Certified reference materials (CRM, or standards) and blanks are also inserted into the sample stream.

The individual sample bags are then grouped into tens for placement in a large plastic bag, which, in turn, is sealed with Cardinal branded tape.

The assay laboratory provides sample transport from Bolgatanga, such that the chain of custody passes from Cardinal to the assay laboratory at the Bolgatanga sample logging facility.

RPA COMMENTS

In RPA's opinion, the drilling procedures employed by Cardinal conform to industry best practice and the resultant drilling pattern is sufficient to interpret the geometry and the boundaries of the gold mineralization with confidence. All drilling sampling was conducted by qualified personnel under the direct supervision of appropriately qualified geologists.

The survey control and collar survey are considered to be accurate and appropriate, however, RPA recommends that Cardinal implement a high resolution (sub-metre accuracy) Digital Terrain Model (DTM) and that all future RC holes be downhole surveyed.

RPA recommends that Cardinal implement a numerical Mine Grid, aligned along the strike of the deposit, and discontinue the use of alphanumeric sectional definitions.

RPA also recommends that all future Namdini Mineral Resource drilling should be sampled on a half core basis rather than the recent use of quarter core (further discussed in Section 12).

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

SAMPLE PREPARATION AND ANALYSIS

In mid-2016, Cardinal redirected its sample submissions from SGS Ouagadougou Laboratory in Burkina Faso to SGS Tarkwa Laboratory in Ghana. RPA has not visited either laboratory. The independent SGS commercial geochemical analytical laboratories in Tarkwa and Ouagadougou are officially recognized by the South African National Accreditation System (SANAS) for meeting the requirements of the ISO/IEC 17025 standard for specific registered tests for the minerals industry.

After receipt at the laboratory facility the samples are sorted and weighed. The raw samples are dried before being crushed so that 75% of the sample passes at 2 mm. A 1.5 kg riffle split sub sample is removed for further preparation with the remainder being retained as a coarse reject. This 1.5 kg sub sample is further pulverized to pass 85% at 75 µm and then a screen test is used to ensure that the particle size is sufficient. Twenty percent of pre-pulped samples delivered to the laboratory are screened to ensure that 85% of the sample is less than 75 µm.

Samples have principally been assayed using a 30 g or 50 g Fire Assay (FAA303 or FAA505) with an atomic absorption finish. SGS mixes the sample with a fluxing agent and then melt it to create a "button". Each button is dissolved in aqua and then aspirated in an acetylene flame. This process typically returns results between 0.01 ppm Au and 100 ppm Au. Samples values below 0.01 ppm Au are returned as being below detection limit. Sample values obtained above 100 ppm Au are re-analyzed with a gravimetric finish, which can determine values up to 3,000 ppm Au.

SGS has internal QA/QC procedures to ensure the results are accurate. During sample preparation, this includes the use of barren material to clean crushers and pulverizers at the beginning of each job run, confirmation of every 50th sample passing at 2 mm and 75 µm (SCR34), as well as determining the dust loss percentage every week.

QA/QC procedures during fire analysis include the following once in every 84 samples:

- Four CRMs which are compared to certified values.

- Two duplicates which follow sample procedures.
- Two pulp duplicates.
- One pulp blank sample.
- One blank sample following sample preparation procedures.

Both the remaining reject and pulverized samples are returned to Cardinal's Bolgatanga Exploration Office for secure storage.

QUALITY ASSURANCE AND QUALITY CONTROL

Quality control measures are typically set in place to ensure the reliability and confidence of exploration data. These measures include written field procedures and independent verifications of aspects such as drilling, surveying, sampling and assaying, data management, and database integrity. Appropriate documentation of quality control measures and regular analysis of quality control data are important as a safeguard for project data and form the basis for the quality assurance program implemented during exploration.

Analytical control measures typically involve internal and external laboratory control measures implemented to monitor the precision and accuracy of the sampling, sample preparation, and assaying. They are also important to prevent sample mix-up and to monitor the voluntary or inadvertent contamination of samples.

Assaying protocols typically involve regularly duplicating and replicating assays and inserting quality control samples to monitor the reliability of assaying results throughout the sampling and assaying process. Check assaying is normally performed as an additional test of the reliability of assaying results; it generally involves re-assaying a set number of sample pulps at a secondary umpire laboratory.

As part of the Cardinal QA/QC program, blanks, standards, and pulp duplicates are routinely inserted into the sample stream. A suite of internationally accredited and certified reference material and locally sourced blanks are included in the sample submission sequence. The standards cover the gold grade ranges expected at Namdini. Interlaboratory umpire analysis was conducted in 2016.

REVERSE CIRCULATION SAMPLING QA/QC PROTOCOLS

Duplicate samples were taken every 22 samples and included with the samples for assaying. In-house blanks and CRMs are inserted at every 10th sample after the duplicates.

DIAMOND DRILLING SAMPLING PROTOCOLS

QA/QC protocols were observed by inserting in-house blanks and CRMs every 22nd sample.

BLANKS

The regular submission of blank material is used to assess contamination during sample preparation and to identify sample numbering errors. Cardinal currently uses a local barren granite sourced from a quarry site in Pwalugu, south of Bolgatanga as raw blank material. Since May 2015, the granite is sent to SGS Tarkwa, where it is crushed and pulverized to the same particle size as a regular sample before being tested to ensure a below detection result. The resulting pulps are packaged into 3 kg bags, with 10 bags to a box, and returned to Cardinal for insertion. A trained technician or geologist then sub-samples the pulp. Previously this sub-sample was 110 g, however, it has since been reduced to 55 g. These pulp samples are then inserted at set intervals into the sample stream as per Cardinal's SOP. Occasionally, coarse blanks are used. RPA notes that this standard process does not allow for an extra blank sample to be manually inserted after a suspected high grade intercept.

SGS fire assayed 778 internal blanks for gold, with 409 at the Ouagadougou facility and 369 at Tarkwa. Twenty-three samples (6%) returned gold values over the 0.005 g/t Au lower detection limit, with a maximum value of 2.96 g/t Au. A total of eight samples, all in the Ouagadougou batches of assays, returned gold values above 1.0 g/t Au. Seven of those samples were clustered during the same time period. Only one sample from the Tarkwa batches returned a gold value over 0.050 ppm Au (0.260 g/t Au). In all of the above cases, it is suspected that a standard was used instead of a blank. A check was made to see if this sample could have been contaminated by failure to clean the equipment following earlier high grade material, however, all the adjacent samples in the same batch certificate were found to be below 0.260 g/t Au.

RPA is of the opinion that the analytical methods are satisfactory in regard to possible contamination.

The use of pre-pulverized blank samples in the sample stream is, in RPA's opinion, sub-optimal as it does not determine sample contamination during each batch preparation. Cardinal should implement the use of coarse blank material, preferably barren half or quartered drill core. RPA also recommends that the geologist manually insert a blank sample after a suspected high grade interval so that sample preparation can be better evaluated.

CERTIFIED REFERENCE MATERIALS (STANDARDS)

Results of the regular submission of CRMs, or standards, are used to identify problems with specific sample batches and long-term biases associated with the regular assay laboratory. CRMs are obtained in 1 kg sample bags from Geostats Pty Ltd, Perth, Western Australia.

The 1 kg standards then require packaging into 110 g samples for submission. To reduce the chance of CRMs being mislabelled, only one standard is prepared at a time. The 1 kg sample is mixed with a clean spoon, to increase homogeneity, and then a sub-sample is removed using a teaspoon. This sub-sample is weighed out with an electronic scale to ensure it is 110 g. This occurs in an area devoid of dust and is undertaken by only one trained geologist or technician to reduce human error.

Cardinal inserted 779 CRMs of nine different grades into the Namdini sample stream as listed in Table 11-1. STD (17) had only one sample and thus was not considered in this review.

RPA reviewed the results of eight CRM types as summarized in Table 11-1 and presented in Figures 11-1 to 11-8. For the eight CRM types reviewed, the average failure rate was 5.5%. CRM STD (544) produced a high failure rate (29.3%), with all but one fail very close to being within three standard deviations. If the CRM STD (544) fails are not taken into consideration (except for the one clear fail), then the overall failure rate for all CRM samples decreases to 2.2%. After errors suspected to be from incorrect standard insertion are removed, the failure rate decreases to 4.1%. Overall the Cardinal internal CRMs reviewed by RPA had a failure rate of 5.5%, however, if CRM swap errors and assays only just above three standard deviations are taken into consideration, the failure rate decreases to 0.7%.

TABLE 11-1 CARDINAL QA/QC CERTIFIED REFERENCE MATERIALS
Cardinal Resources Limited – Namdini Gold Project

CRM Name	CRM Reference Value (g/t Au)	Standard Deviation (g/t Au)	±3 Standard Deviations (g/t Au)	No. Inserted	Comments
STD (08)	0.32	0.02	0.06	52	
STD (039)	1.67	0.09	0.27	63	Four samples likely different assay standards
STD (413)	0.79	0.05	0.15	152	One likely different assay standard
STD (501)	0.43	0.03	0.09	130	Two samples likely different assay standards
STD (544)	0.27	0.02	0.06	99	High failure rate
STD (588)	1.60	0.08	0.24	76	
STD (611)	4.08	0.17	0.42	98	
STD (640)	6.70	0.21	0.63	108	
Total				**779**	

Note: Certified reference value and standard deviation taken from assay certificates.

FIGURE 11-1 CERTIFIED REFERENCE MATERIAL NO. 08 (0.32 G/T AU)

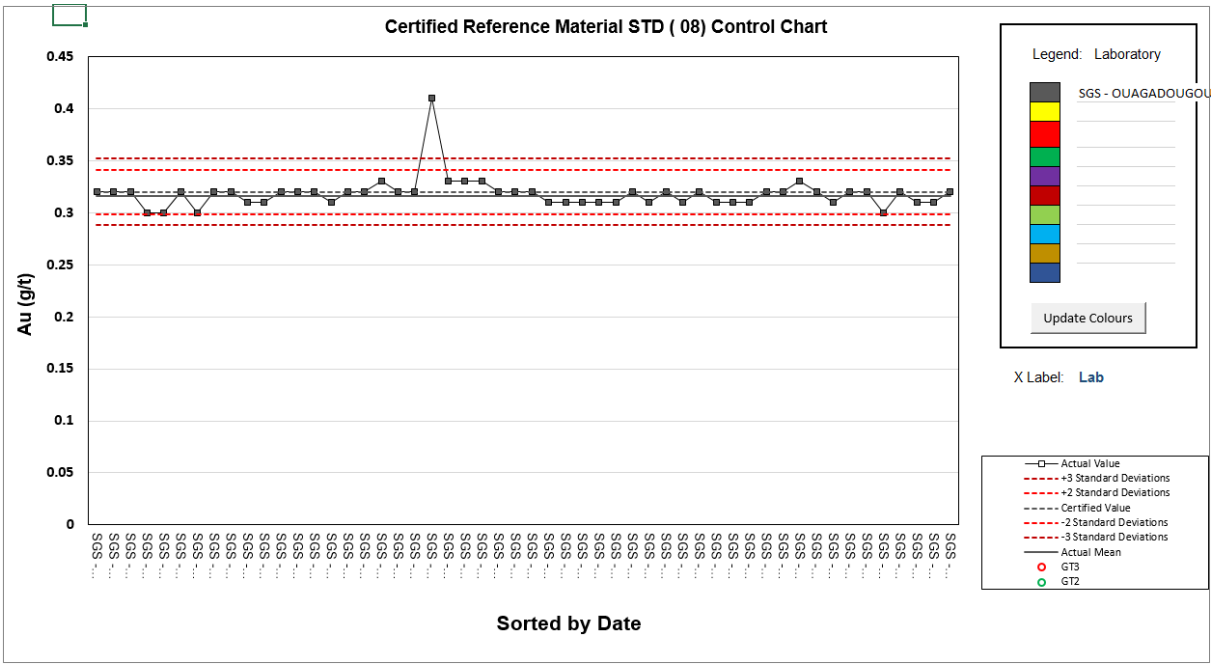


FIGURE 11-2 CERTIFIED REFERENCE MATERIAL NO. 39 (1.67 G/T AU)

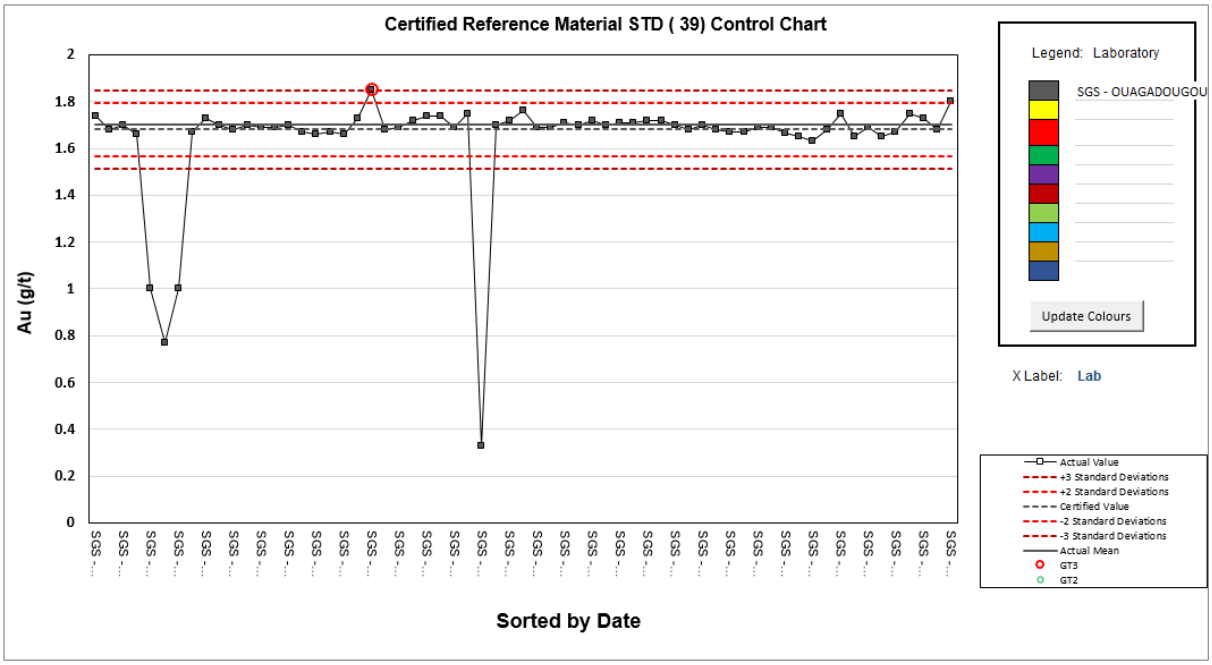


FIGURE 11-3 CERTIFIED REFERENCE MATERIAL NO. 413 (0.79 PPM AU)

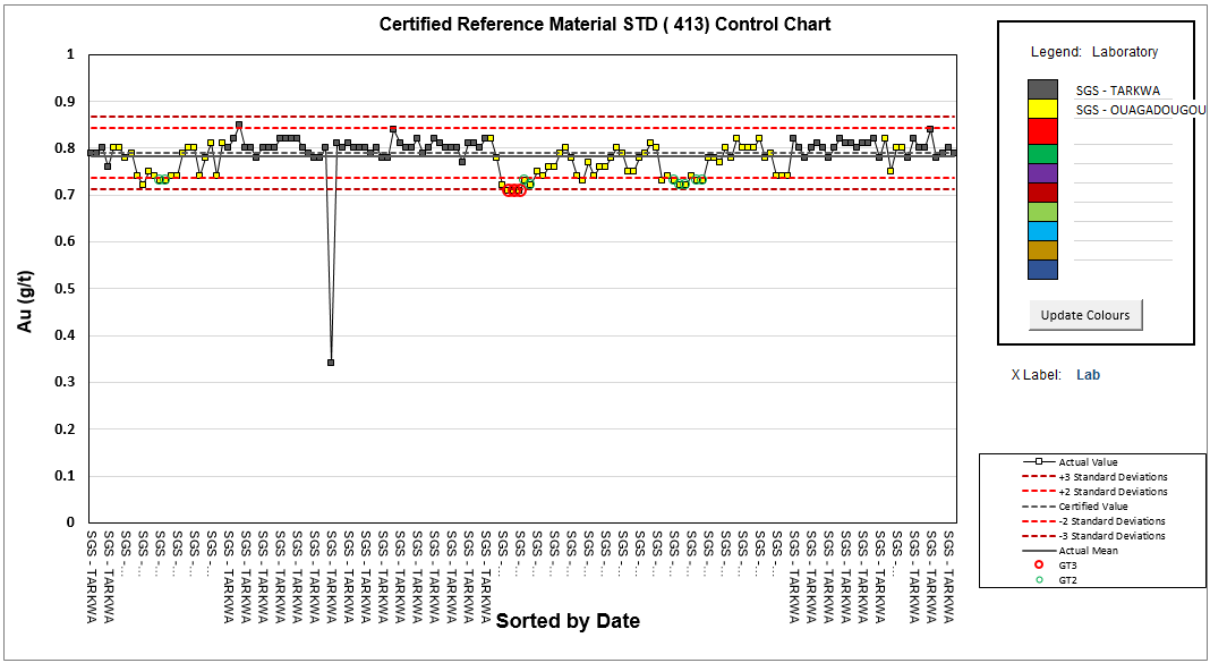


FIGURE 11-4 CERTIFIED REFERENCE MATERIAL NO. 501 (0.43 G/T AU)

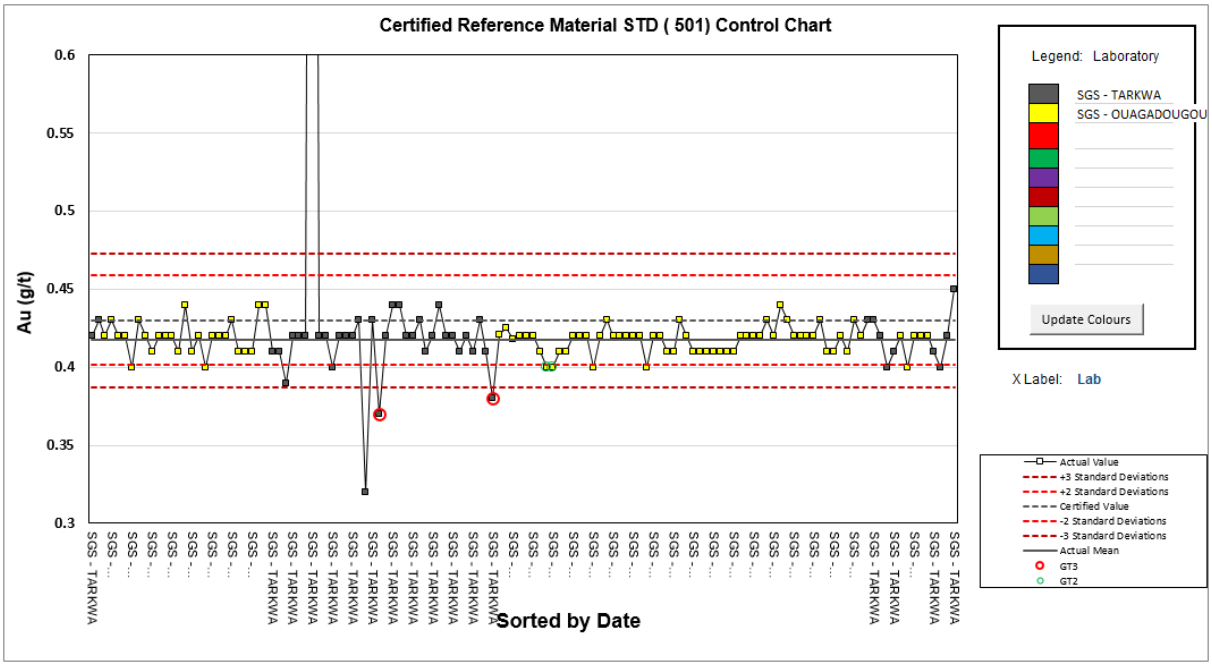


FIGURE 11-5 CERTIFIED REFERENCE MATERIAL NO. 544 (0.27 G/T AU)

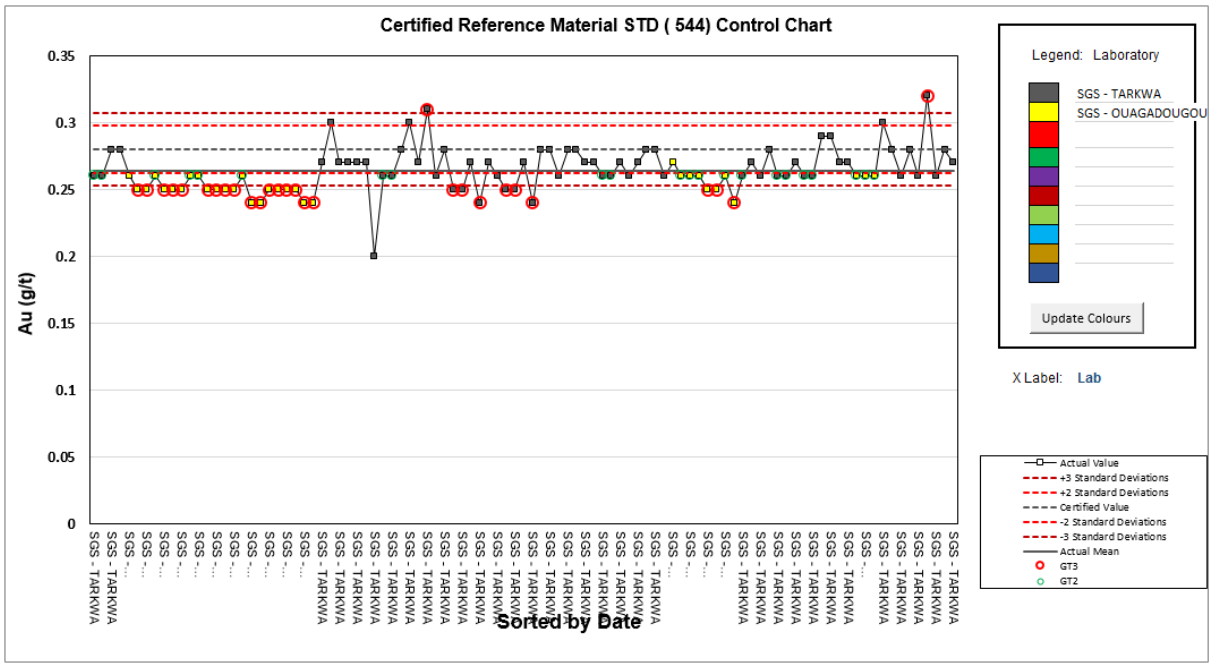


FIGURE 11-6 CERTIFIED REFERENCE MATERIAL NO. 588 (1.60 G/T AU)

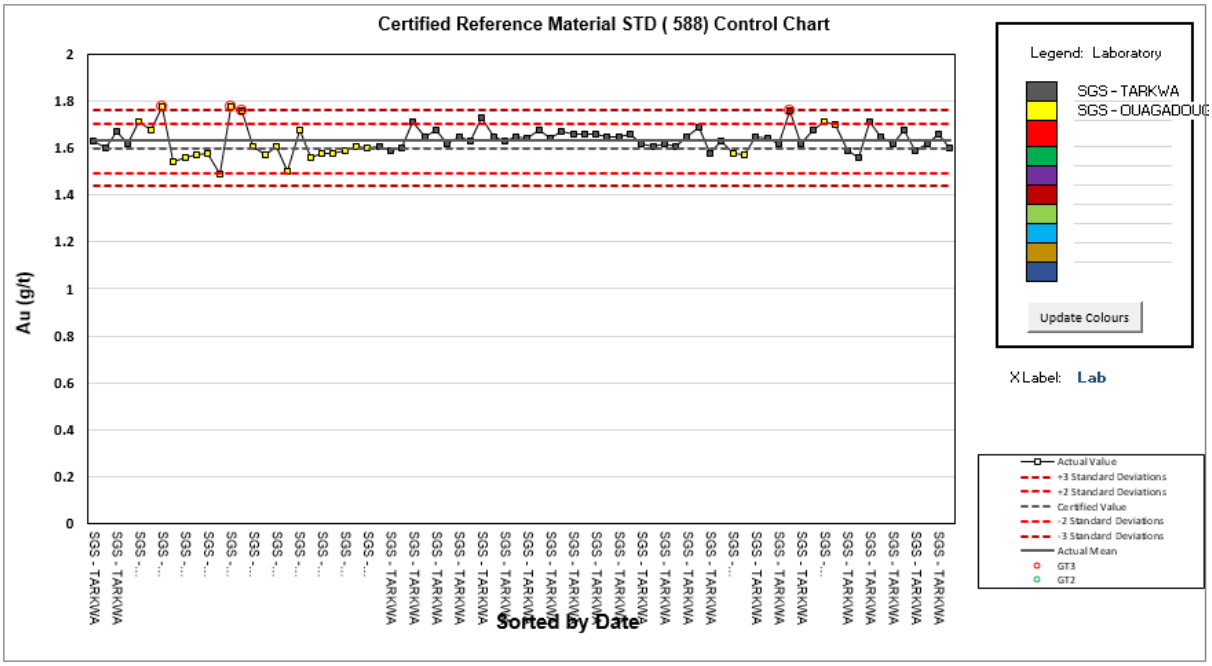


FIGURE 11-7 CERTIFIED REFERENCE MATERIAL NO. 611 (4.08 PPM AU)

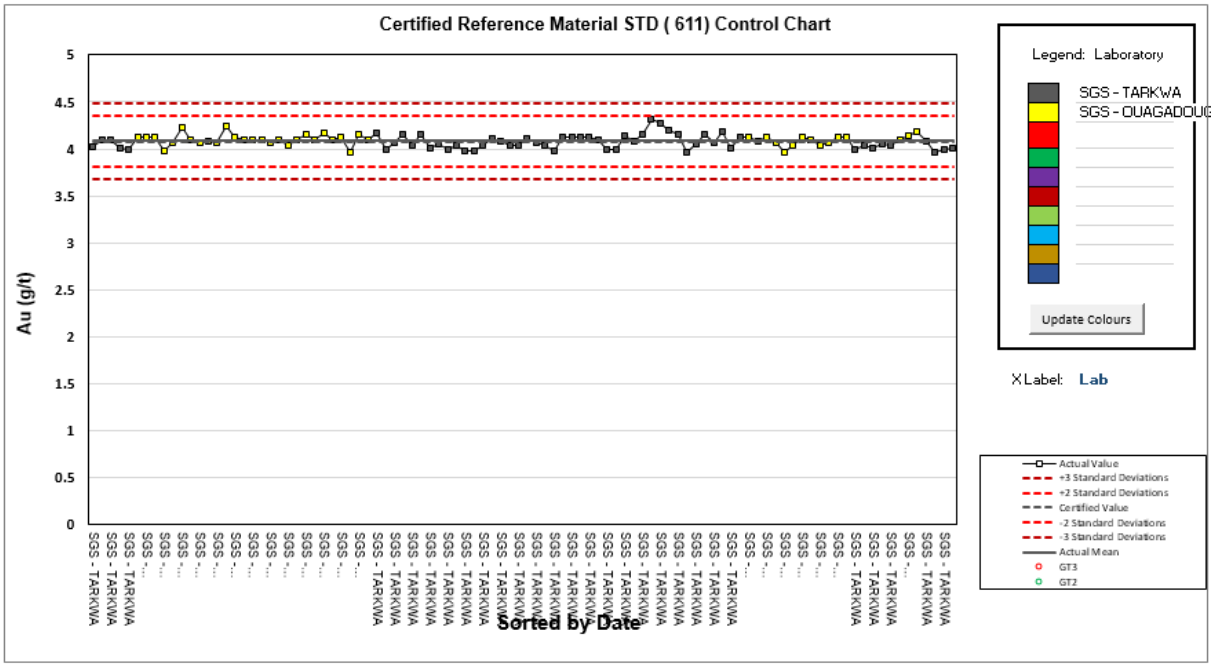
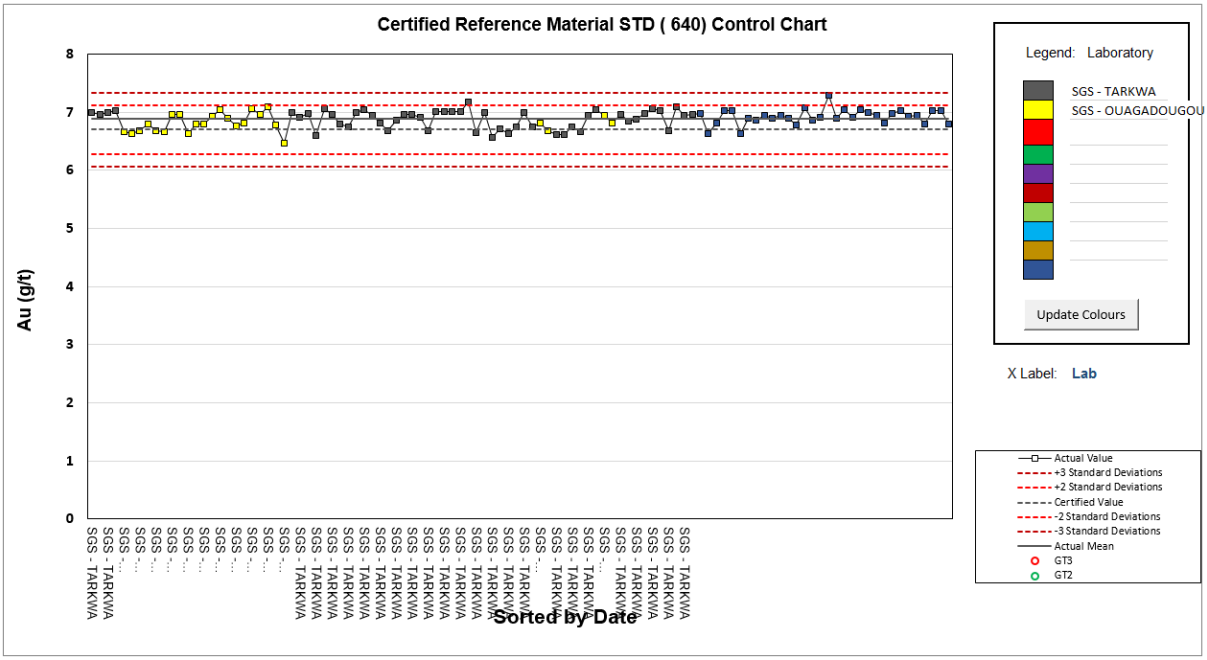


FIGURE 11-8 CERTIFIED REFERENCE MATERIAL NO. 640 (6.70 G/T AU)



DUPLICATES

RPA separately reviewed the analyses of the SGS Tarkwa and SGS Ouagadougou duplicates. Out of a total of 5,481 duplicates, 2,875 were assayed at SGS Tarkwa and 2,606 were assayed at SGS Ouagadougou. These consisted of 963 pulp duplicate samples and 3,890 reject duplicate samples. Most of the duplicate field samples (509 out of 628) were assayed at Ouagadougou.

Scatterplots and QQ plots for the field duplicates for Tarkwa and Ouagadougou (Figure 11-9) show that only a few high grade samples from Tarkwa plotted outside a ±20% deviation tolerance. A higher number of samples from the larger Ouagadougou dataset plotted outside a ±20% deviation tolerance curve. Pulp duplicate and reject duplicate scatterplots and QQ plots (Figures 11-10 to 11-11) show that no pulp or reject duplicates from either Tarkwa or Ouagadougou are outside the ±20% deviation curves.

FIGURE 11-9 SCATTERPLOTS AND QQ PLOTS FOR TARKWA AND OUAGADOUGOU FIELD DUPLICATES

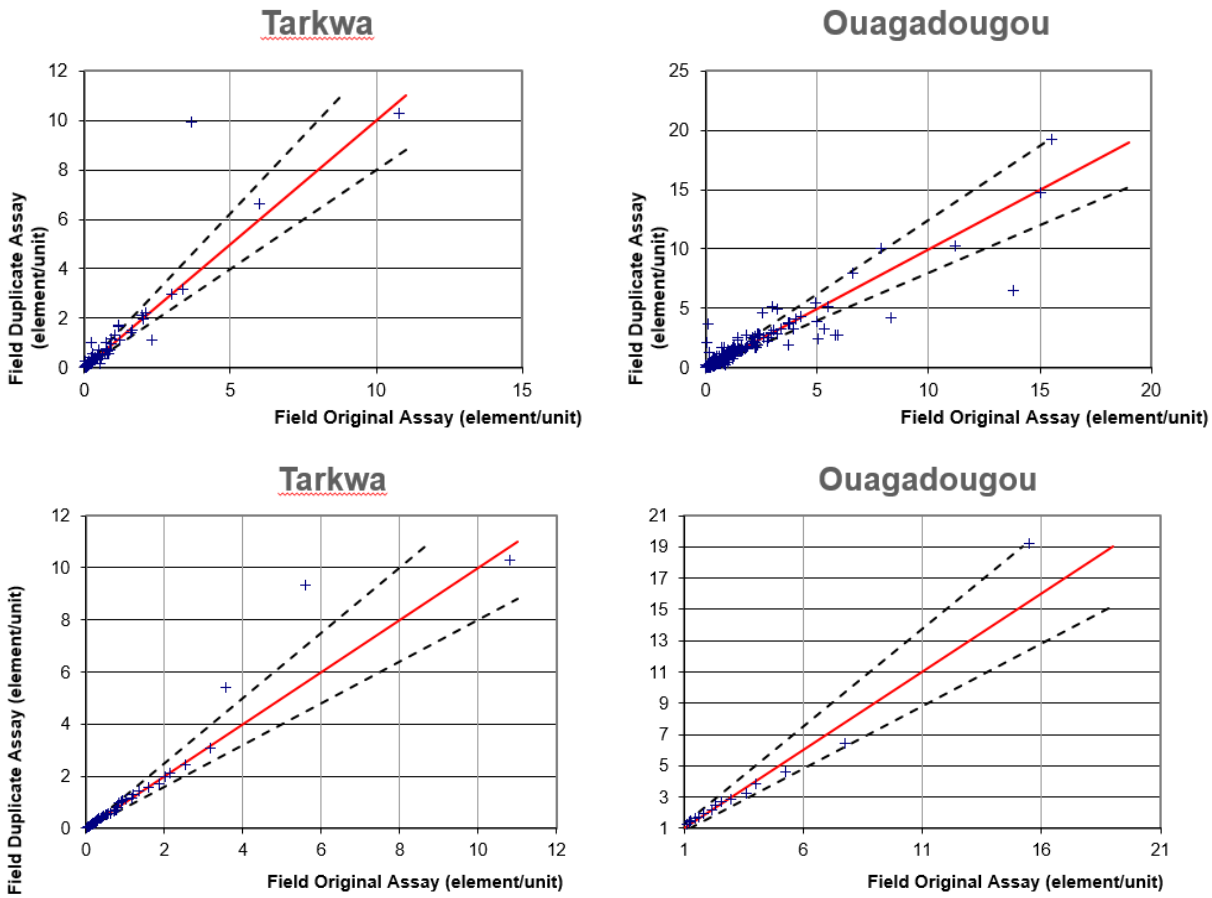


FIGURE 11-10 SCATTERPLOTS AND QQ PLOTS FOR TARKWA AND OUAGADOUGOU PULP DUPLICATES

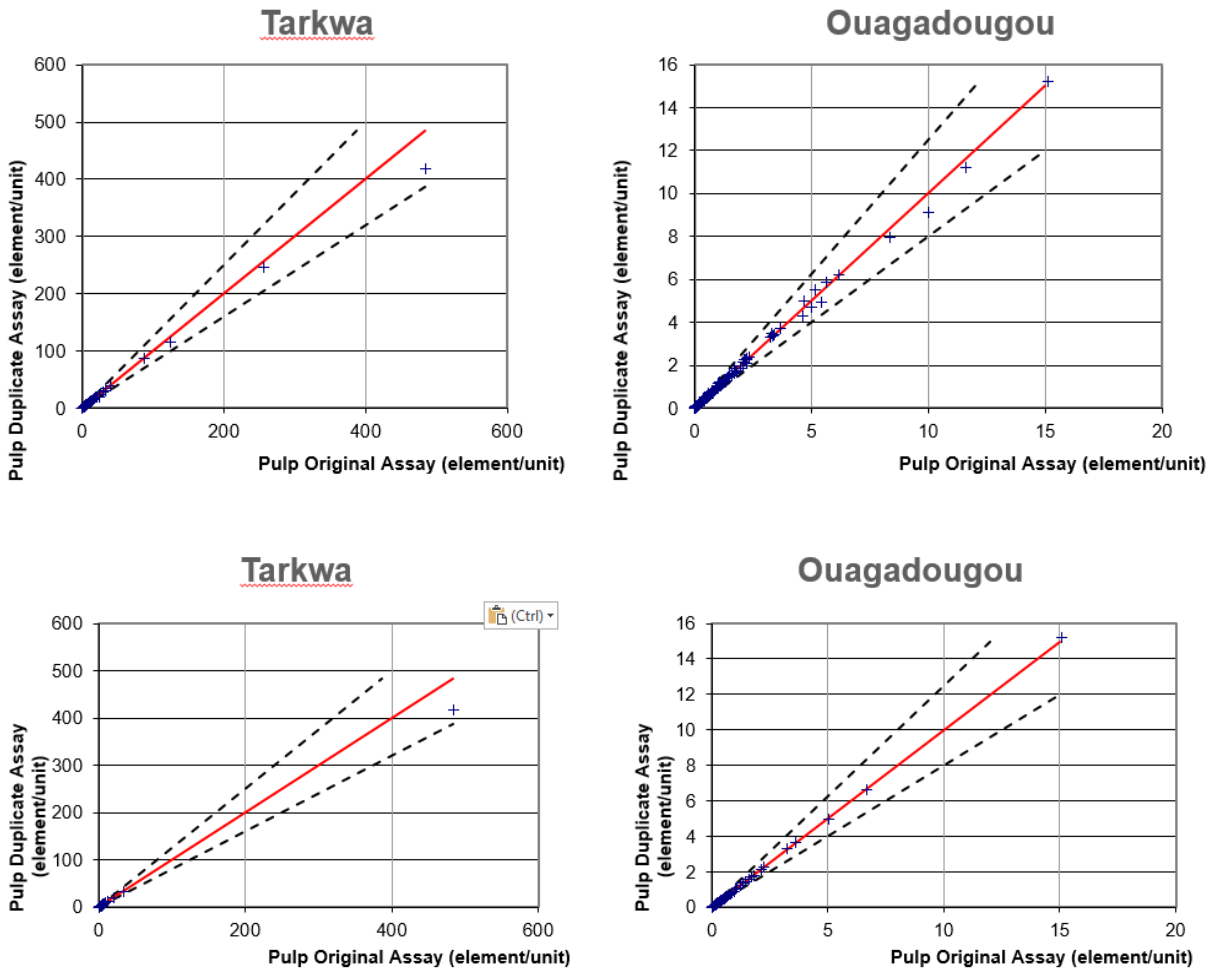
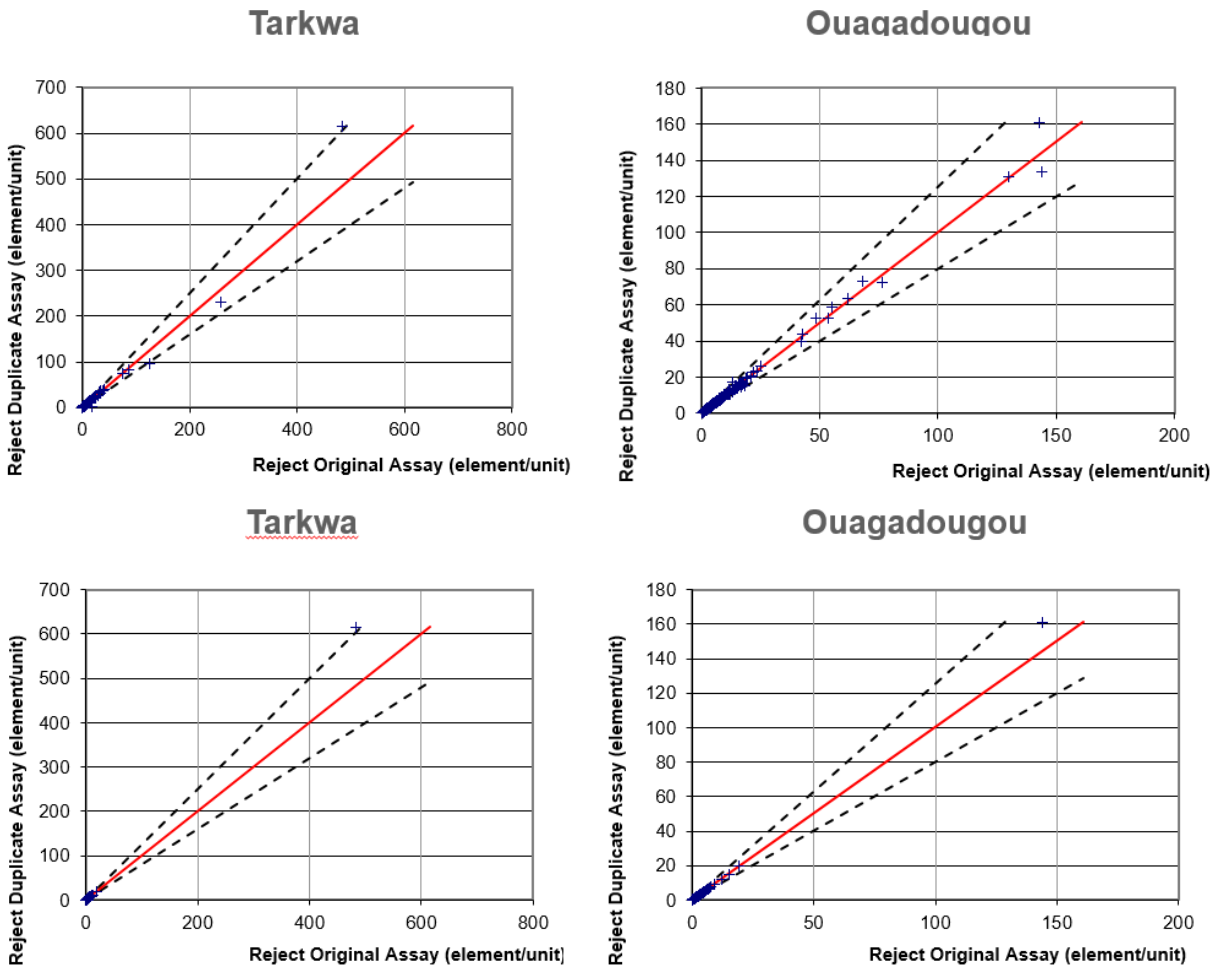


FIGURE 11-11 SCATTERPLOTS AND QQ PLOTS FOR TARKWA AND OUAGADOUGOU REJECT DUPLICATES



The correlation coefficient for field duplicate samples from SGS Tarkwa was 0.92 and SGS Ouagadougou was 0.93. The reject duplicates had a correlation coefficient of 0.99 and 1.00 respectively. The pulp duplicates had a correlation coefficient of 1.00 at both laboratories (Tables 11-2 to 11-4). The largest difference between paired sample means was observed on the SGS Tarkwa duplicates, which varied between 1.3% higher and 10.9% lower. For the SGS Ouagadougou samples, the percent difference between means was relatively low.

TABLE 11-2 FIELD DUPLICATES
Cardinal Resources Limited – Namdini Gold Project

Field Duplicates	Tarkwa		Ouagadougou	
	Original	Duplicate	Original	Duplicate
Number of Samples (N)	119	119	509	509
Mean (g/t Au)	0.51	0.56	0.68	0.68
Maximum Value (g/t Au)	10.80	10.30	15.50	19.20
Minimum Value (g/t Au)	0.01	0.01	0.00	0.01
Median (g/t Au)	0.07	0.07	0.19	0.20
Variance	1.64	2.27	2.55	2.43
Standard Deviation	1.28	1.51	1.60	1.56
Coefficient of Variation	2.51	2.67	2.35	2.29
Correlation Coefficient	0.92		0.93	
Relative Standard Deviation	80%		60%	
Absolute Percent Difference Between Means	10.9%		0.2%	

TABLE 11-3 PULP DUPLICATES
Cardinal Resources Limited – Namdini Gold Project

Pulp Duplicates	Tarkwa		Ouagadougou	
	Original	Duplicate	Original	Duplicate
Number of Samples (N)	585	585	378	378
Mean (g/t Au)	3.33	3.14	0.57	0.57
Maximum Value (g/t Au)	484.00	418.00	15.10	15.20
Minimum Value (g/t Au)	0.00	0.00	0.00	0.00
Median (g/t Au)	0.24	0.25	0.11	0.11
Variance	563.90	447.61	2.11	2.05
Standard Deviation	23.75	21.16	1.45	1.43
Coefficient of Variation	7.13	6.74	2.54	2.53
Correlation Coefficient	1.00		1.00	
Relative Standard Deviation	62%		9%	
Absolute Percent Difference Between Means	5.7%		1.1%	

TABLE 11-4 REJECT DUPLICATES
Cardinal Resources Limited – Namdini Gold Project

Reject Duplicates	Tarkwa		Ouagadougou	
	Original	Duplicate	Original	Duplicate
Number of Samples (N)	2,171	2,153	1,719	1,719
Mean (g/t Au)	2.35	2.38	2.53	2.53
Maximum Value (g/t Au)	484.00	616.00	144.00	161.00
Minimum Value (g/t Au)	0.00	0.00	0.00	0.00
Median (g/t Au)	0.74	0.77	1.09	1.10
Variance	161.49	220.57	56.01	57.91
Standard Deviation	12.71	14.85	7.48	7.61
Coefficient of Variation	5.41	6.24	2.95	3.00
Correlation Coefficient	0.99		1.00	
Relative Standard Deviation	6%		16%	
Absolute Percent Difference Between Means	-1.3%		-0.1%	

UMPIRE ANALYSIS

In June 2016, Cardinal submitted 746 pulp samples, originally assayed at SGS Ouagadougou, to Intertek Minerals Limited in Tarkwa, Ghana, for interlaboratory umpire analysis. The sample set included 292 diamond drill core samples (224 half core, 68 quarter core) and 454 RC chip samples. The fire assay analysis methodology at Interek Tarkwa is comparable with SGS Ouagadougou. RPA notes that while the Intertek laboratory is not ISO17025 accredited, it claims that its protocols are in accordance with ISO17025.

The mean value of the core sample umpire assays (4.02 g/t Au) was 89% of the core sample original assays (4.49 g/t Au) and the median value of the core sample umpire assays (0.64 g/t Au) was 95% of the core sample original assays (0.67 g/t Au) (Table 11-5). The coefficient of variation was almost identical in the core sample umpire assays (3.98) and the core sample original assays (3.99). The correlation coefficient was 0.97. RPA notes that several of the >10 g/t Au core sample original assays are higher than the core sample umpire assays (Figures 11-12 and 11-13).

TABLE 11-5 2016 UMPIRE ANALYSIS – CORE
Cardinal Resources Limited – Namdini Gold Project

Drill Core Umpire Assays	Original Fire Assay (g/t Au)	Intertek Fire Assay (g/t Au)
Number of Samples	292	292
Mean Grade (g/t Au)	4.49	4.02
Maximum Grade (g/t Au)	220.00	197.28
Minimum Grade (g/t Au)	0.01	0.01
Median Grade (g/t Au)	0.67	0.64
Variance	321.03	256.05
Standard Deviation	17.92	16.00
Coefficient of Variation	3.99	3.98
Correlation Coefficient	0.97	
Relative Standard Deviation	67%	
Percent Difference Between Means	10.3%	

FIGURE 11-12 2016 UMPIRE ANALYSIS – ALL CORE SAMPLES

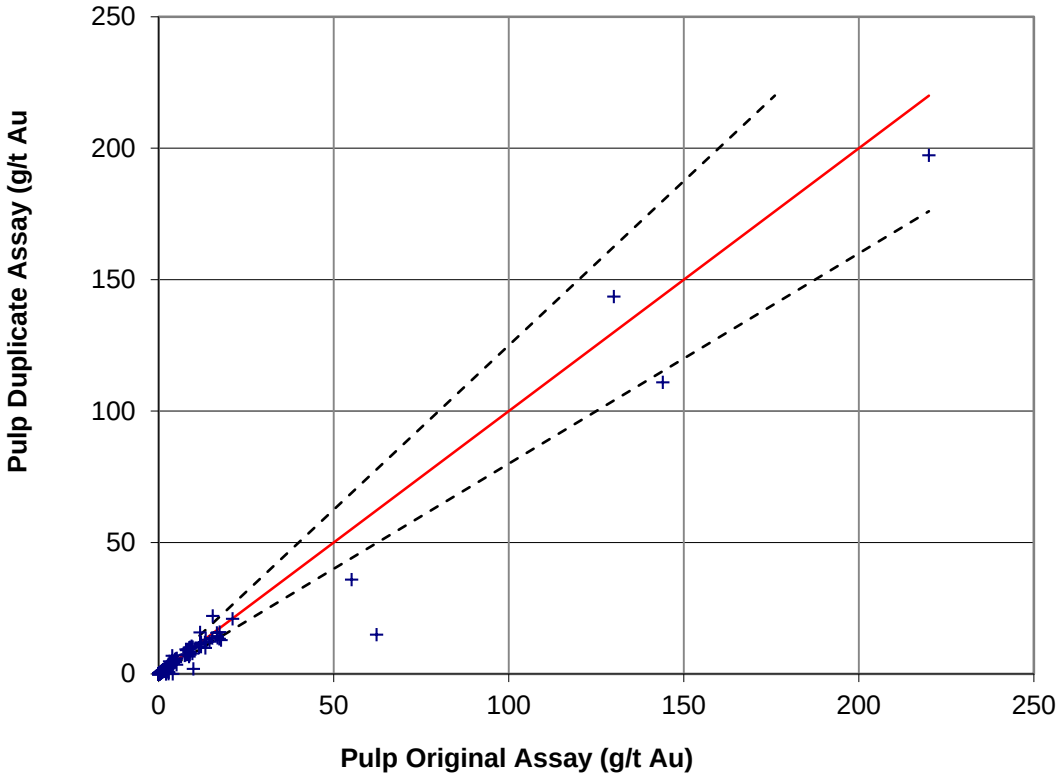
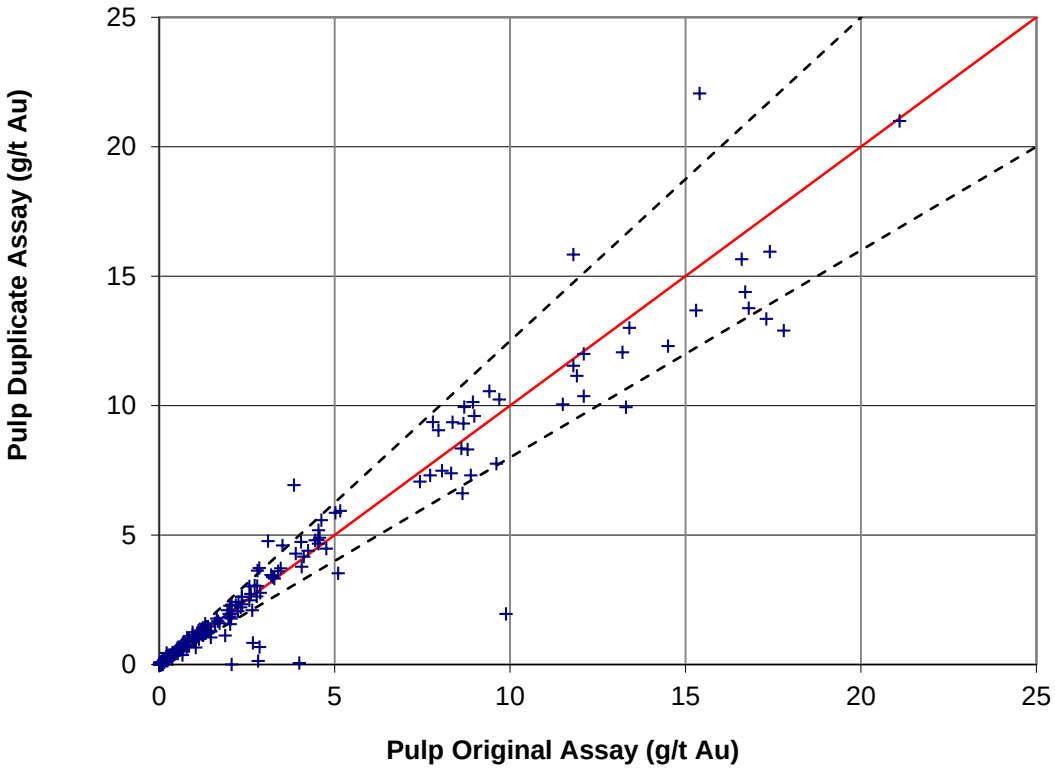


FIGURE 11-13 2016 UMPIRE ANALYSIS – CORE SAMPLES <25 G/T AU

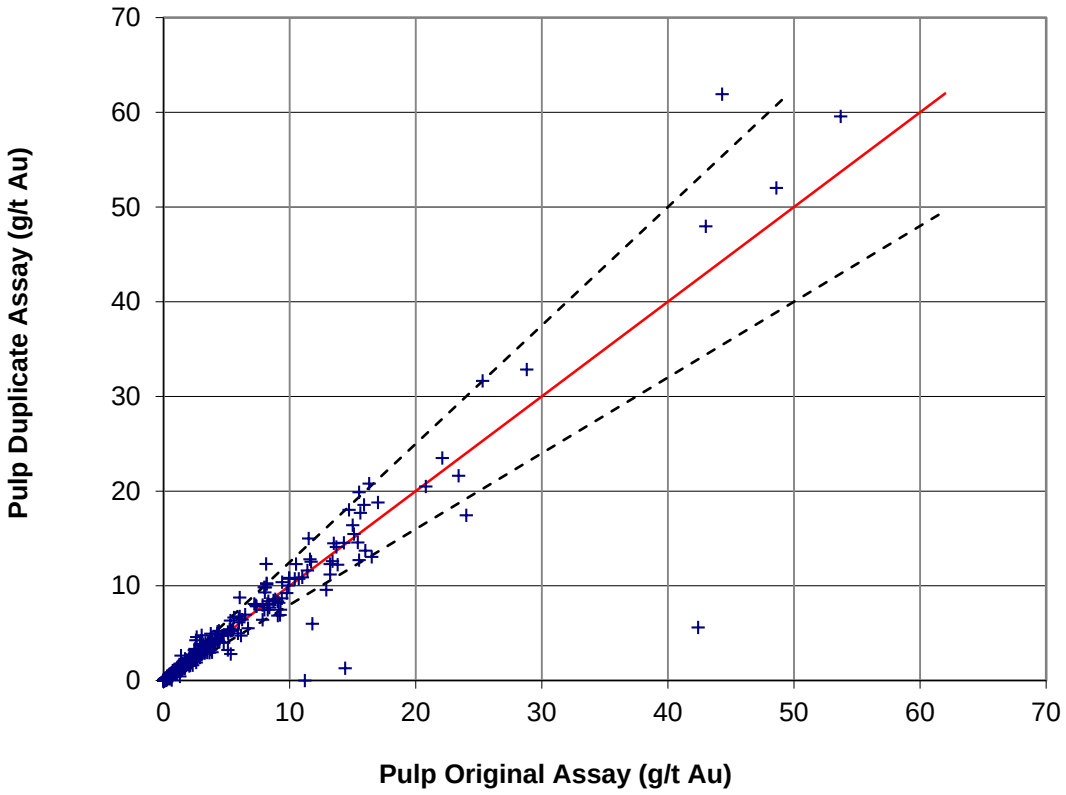


The mean value of the chip sample umpire assays (3.62 g/t Au) was 90% of the chip sample original assays value (4.07 g/t Au). It was observed that the original sample NMRC08099 was 206.09 g/t Au in the original assay but only 26.45 g/t Au in the umpire assay. Removing sample NMRC08099 from the analysis resulted in no material the difference of mean values between the original chip sample assays (3.621 g/t Au) and the umpire chip sample assays (3.617 g/t Au). The median values between the original chip sample assays (1.39 g/t Au) and the umpire chip sample assays (1.42 g/t Au) were approximately 1% different. The correlation coefficient was 0.93 (Table 11-6). RPA again notes that several of the >10 g/t Au chip sample original assays are higher than the chip sample umpire assays (Figure 11-14).

TABLE 11-6 2016 UMPIRE ANALYSIS – CHIPS
Cardinal Resources Limited – Namdini Gold Project

Reverse Circulation Chip Umpire Assays	Original Fire Assay (g/t Au)	Intertek Fire Assay (g/t Au)
Number of Samples	453	453
Mean Grade (g/t Au)	3.621	3.617
Maximum Grade (g/t Au)	53.70	61.92
Minimum Grade (g/t Au)	0.01	0.01
Median Grade (g/t Au)	1.39	1.42
Variance	40.62	45.45
Standard Deviation	6.37	6.74
Coefficient of Variation	1.76	1.86
Correlation Coefficient	0.93	
Relative Standard Deviation	45%	
Percent Difference Between Means	0.1%	

FIGURE 11-14 2016 UMPIRE ANALYSIS – REVERSE CIRCULATION CHIPS



In RPA's opinion, the comparison of original SGS and the Tarkwa umpire samples is satisfactory, although it should be noted that some original samples above >10 g/t Au assayed higher than the umpire samples.

SECURITY

No employee, officer, director, or associate of Cardinal carried out any sample preparation on samples from the Namdini exploration program. Drill core was transported from the drill site by Cardinal vehicle to the secure core yard facility at the Bolgatanga Field Exploration Office.

All samples collected for assaying are retained in a locked secure shed until they are collected by the assay laboratory. Retained drill core and RC chips are securely stored in the core storage compound, and pulps are securely stored in the Exploration Core Shed area.

RPA COMMENTS

In RPA's opinion, the sampling preparation, security, and analytical procedures used by Cardinal are consistent with, and often exceed, generally accepted industry best practices and are, therefore, adequate for use in the estimation of Mineral Resources.

In RPA's opinion, the QA/QC program as designed and implemented by Cardinal is adequate and the assay results within the database are suitable for use in a Mineral Resource estimate.

With regard to sampling issues, RPA recommends:

- Immediately replace the current pre-pulverized blank material with coarse blanks.
- Implement a CRM at the average resource grade (approximately 1.2 g/t Au).
- Carefully monitor blank and CRM sample insertions.
- Allow manual insertion of blank samples after suspected high grade intervals.
- Implement a regular umpire analysis program.
- Reject and re-assay as needed assay batch fails.
- Investigate the high failure rate of CRM STD (544) so that any required adjustments can be made or replace the CRM with an alternative one.
- Implement coarse reject (after crushing) diamond drill duplicates in order to test sub-sampling precision.
- Review RC QA/QC protocols prior to re-starting RC drilling operations.
- Drill additional RC/diamond drill twinned holes for comparisons of grade and recovery results prior to any closely spaced grade control RC drilling.

12 DATA VERIFICATION

CARDINAL DATABASE VERIFICATION PROCEDURES

When core is manually logged, the data must be captured onto the geologist laptop at the end of every shift. All logging data is then downloaded from the logging computer and synchronized into the Maxwell Geoservices Datashed drill hole database at the end of every shift. Field data must be transferred by the project geologist to the database administrator the same day as samples are submitted to the laboratory for analysis.

The database administrator then validates the data and, if any problems are encountered, the project geologist is immediately contacted and the necessary corrections are made before the data is imported into the Micromine drill hole database. Data must be in the database before any assay results are received from the laboratory. Data exported out of the database must be signed off by the database administrator.

Cardinal maintains strict protocols with respect to the review and validation of assay results prior to importing into the drill hole database. Cardinal's assay data procedures are illustrated in a flow sheet in Figure 12-1.

Assay results from the laboratory, in pdf and csv formats, are sent via email to the Chief Executive Officer/Managing Director and the Exploration Manager for onward transfer to Datashed, which is then loaded into the database.

Cardinal technical staff carry out routine analysis of the quality control data on receipt of assay results from the laboratory in order to determine if the batch of samples has passed industry standard levels for control samples. If the batch "fails", the batch of assays is rejected and a re-assay request for the batch of samples is made to the laboratory. Where re-assaying is completed, the resulting files for the batch are prioritized into 0s and 1s where the 1s supersedes the 0s.

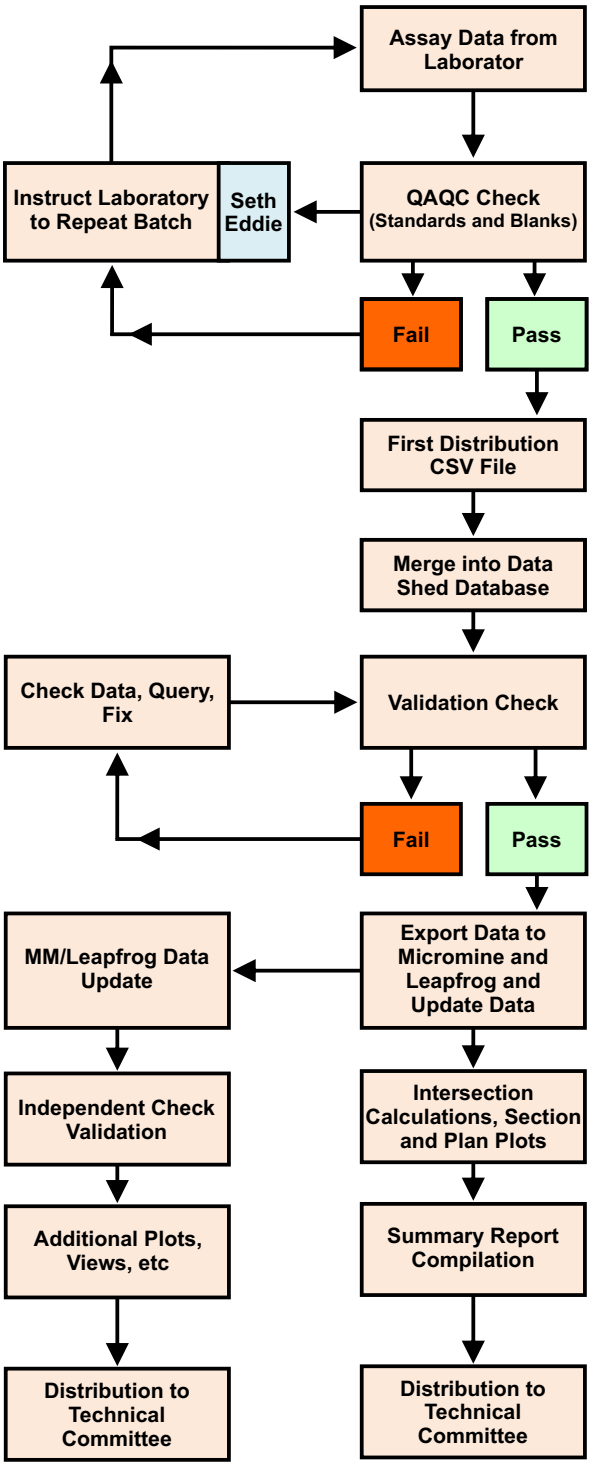


Figure 12-1

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

Assay Data Flowsheet

April 2017

Source: Cardinal Resources Limited, 2017.

DRILL HOLE DATA VALIDATION

RPA utilized Micromine v.16.5 to recompile the Namdini drill hole database. The EGRM 2016 drill hole database was used as a foundation and the additional Cardinal 2016 drilling was appended to it. Micromine has a number of integral data validation steps to ensure that the drill hole database is free of inconsistences.

Microsoft Excel and X10-Geo 1.4.12 were used to review some of the data prior to lithology modelling in Leapfrog Geo version 4.0 and block modelling in Datamine Studio RM version 1.2.46.

ASSAY CERTIFICATE VERIFICATION

Microsoft Excel was used to review 498 assay certificate files against the drill hole database for a total of 33,142 unique assays (i.e., not duplicates, CRMs, or blanks). Only 28 samples (0.08%) present in the database were not available in the assay certificate files. All “ppm Au” (g/t Au) values in the database matched the certificates’ assay values, assuming the following rules:

- Where a duplicate was taken, the original assay prevailed in the database.
- Where an assay was above detection limit, a different analysis method was used to determine concentrations and this latter value was stored in the database.

SITE VISIT

A site visit was carried out by Mr. Ian T. Blakley, Principal Geologist, between December 16 and 20, 2016. The site visit included a review of the Bolgatanga Exploration Office and a visit to the Namdini Project site.

NAMDINI PROJECT SITE

During the site visit, RPA observed drill collars and independently recorded collar locations using hand held GPS measurements for the following drill holes:

- NMDD013
- NMDD040
- NMDD044 (Figure 12-2)
- NMDD045

- NMDD048
- NMDD049
- NMDD054
- NMDD056

FIGURE 12-2 COLLAR CHECK ON DRILL HOLE NMDD044

The hand held GPS readings, within relative accuracy levels, were found to be consistent with the Cardinal DGPS measurements.

RPA also observed diamond drilling operations at drill holes NMDD063 (Cardinal drill rig), NMD062 (AMS Drilling drill rig, Figure 12-3), and NMDD065 (Toomahjt Drilling Ltd. drill rig). In RPA's opinion, the drilling operations were being completed to industry standard. No RC drills were operating at the time of RPA's site visit.

At the Namdini Project site, RPA also observed numerous current artisanal mining sites including trenches, pits, and rock cuts. Small scale crushing and panning operations were also noted.

BOLGATANGA EXPLORATION OFFICE

At the Bolgatanga Exploration Office, RPA review the core handling, logging, and sampling procedures including QA/QC insertions and bulk density testing. RPA requested and reviewed the lithological and mineral intersections versus the drill core logs and assay results from a number of diamond drill holes including:

- NMDD007
- NMDD010
- NMDD028
- NMDD034
- NMRD096

RPA also inspected the core logging, cutting, sampling, and pulp storage located in a secure compound adjacent to the Bolgatanga Exploration Office. The bulk density station is located in a secure core storage and reject storage compound located approximately 500 m from the exploration office.

FIGURE 12-3 AMS DRILL RIG

INDEPENDENT WITNESS SAMPLING

In April 2016, Cardinal revised diamond drill core sampling practices to collect quarter core rather than half core samples. The rationale to use the quarter core approach was to enable quarter core to be available for metallurgical testing on a routine basis while retaining half core as reference in the core trays. Based on a strictly volume/weight basis, one quarter HQ core should approximate one half of standard NQ core.

During RPA's December 2016 site visit, four diamond drill holes were laid out at the Bolgatanga exploration core processing area and RPA selected 165 diamond drill sample intervals for quarter-core independent witness sampling (IWS).

As the current sampling methodology is based on quarter core samples, the remaining quarter core was present in the boxes along with the remaining one-half core. Cardinal exploration personnel packaged the pertinent quarter core samples, and RPA monitored the sampling operations and final bagging. Each sample bag was inspected by RPA, marked with an RPA sample number, and then weighed. The sample bags were then collated into larger rice bags which were then sealed with Cardinal packing tape. A total of 173 samples were collected, including four blanks and four CRMs (Figure 12-4).

The Cardinal Exploration Manager personally delivered the IWS to the ALS Global facility in Kumasi, Ghana for sample preparation. The samples were prepared by crushing to 70% - 2 mm, riffle splitting off one kilogram, and pulverizing the split to over 85% passing 75 µm (PREP-31B). The samples were then sent to ALS Global in Loughrea Galway Ireland and assayed by fire assay fusion (FA-FUS03) with atomic absorption spectroscopy finish (Au-AA25) on a 50 g sample.

Table 12-1 presents the IWS results with their respective "original" sample results.

FIGURE 12-4 INDEPENDENT WITNESS SAMPLE COLLECTION

TABLE 12-1 RPA INDEPENDENT WITNESS SAMPLES

Hole	From (m)	To (m)	Interval (m)	Logged Litho	Original Sample No.	Orig. FA Assay (ppm Au)	ALS Sample No.	Au-AA26 (ppm Au)	Au-AA26 Check (ppm Au)
NMDD034	151	152	1.0	MVO	NMDD11173	0.10	RPA0001	0.09	
NMDD034	152	153	1.0	MVO	NMDD11174	2.69	RPA0002	2.57	
NMDD034	153	154	1.0	MVO	NMDD11175	0.07	RPA0003	0.09	
NMDD034	154	155	1.0	MVO	NMDD11176	0.05	RPA0004	0.01	
NMDD034	155	156	1.0	MVO	NMDD11177	0.01	RPA0005	<0.01	
NMDD034	156	157	1.0	MVO	NMDD11178	0.01	RPA0006	0.02	
NMDD034	157	158	1.0	MVO	NMDD11179	0.37	RPA0007	0.37	
NMDD034	158	159	1.0	MVO	NMDD11180	0.21	RPA0008	0.19	
NMDD034	159	160	1.0	MVO	NMDD11181	0.03	RPA0009	<0.01	
NMDD034	160	161	1.0	MVO	NMDD11182	0.01	RPA0010	<0.01	
NMDD034	161	162	1.0	MVO	NMDD11183	1.19	RPA0011	7.49	7.69
NMDD034	162	163	1.0	MVO	NMDD11184	0.15	RPA0012	0.18	
NMDD034	163	164	1.0	MVO	NMDD11185	0.05	RPA0013	0.02	
NMDD034	164	165	1.0	MVO	NMDD11186	0.09	RPA0014	0.07	
NMDD034	165	166	1.0	MVO	NMDD11188	0.43	RPA0015	0.44	
NMDD034	166	167	1.0	MVO	NMDD11189	0.53	RPA0016	0.16	
NMDD034	167	168	1.0	MVO	NMDD11190	0.07	RPA0017	0.03	
NMDD034	168	169	1.0	MVO	NMDD11191	0.02	RPA0018	<0.01	
NMDD034	169	170	1.0	MVO	NMDD11192	0.08	RPA0019	0.05	
NMDD034	170	171	1.0	MVO	NMDD11193	0.19	RPA0020	0.23	
NMDD034	171	172	1.0	MVO	NMDD11194	0.35	RPA0022	0.56	
NMDD034	172	173	1.0	MVO	NMDD11195	3.36	RPA0023	0.08	
NMDD034	173	174	1.0	MVO	NMDD11196	0.08	RPA0024	0.01	
NMDD034	230	231	1.0	DIO	NMDD11256	0.46	RPA0025	0.71	
NMDD034	231	232	1.0	DIO	NMDD11257	0.97	RPA0026	1.01	
NMDD034	232	233	1.0	DIO	NMDD11258	0.40	RPA0027	0.37	
NMDD034	233	234	1.0	DIO	NMDD11259	0.07	RPA0028	0.10	
NMDD034	234	235	1.0	DIO	NMDD11260	3.88	RPA0029	3.39	
NMDD034	235	236	1.0	DIO	NMDD11261	3.72	RPA0030	3.87	
NMDD034	236	237	1.0	DIO	NMDD11262	0.32	RPA0031	0.23	
NMDD034	237	238	1.0	DIO	NMDD11263	0.03	RPA0032	0.04	
NMDD034	238	239	1.0	DIO	NMDD11264	0.64	RPA0033	0.05	
NMDD034	239	240	1.0	DIO	NMDD11265	0.03	RPA0034	0.02	
NMDD028	156	157	1.0	MVO	NMDD09319	0.02	RPA0035	0.01	

Hole	From (m)	To (m)	Interval (m)	Logged Litho	Original Sample No.	Orig. FA Assay (ppm Au)	ALS Sample No.	Au-AA26 (ppm Au)	Au-AA26 Check (ppm Au)
NMDD028	157	158	1.0	MVO	NMDD09320	4.77	RPA0036	5.37	
NMDD028	158	159	1.0	MVO	NMDD09321	3.81	RPA0037	4.74	
NMDD028	159	160	1.0	MVO	NMDD09322	3.06	RPA0038	2.17	
NMDD028	160	161	1.0	MVO	NMDD09323	0.96	RPA0039	0.92	
NMDD028	161	162	1.0	MVO	NMDD09324	3.73	RPA0040	4.02	
NMDD028	162	163	1.0	MVO	NMDD09325	6.00	RPA0041	6.61	
NMDD028	163	164	1.0	MVO	NMDD09326	3.16	RPA0042	4.40	
NMDD028	164	165	1.0	MVO	NMDD09327	3.32	RPA0043	1.51	
NMDD028	165	166	1.0	MVO	NMDD09328	2.13	RPA0044	2.46	
NMDD028	166	167	1.0	MVO	NMDD09329	11.40	RPA0045	12.45	
NMDD028	167	168	1.0	MVO	NMDD09330	2.14	RPA0047	3.04	
NMDD028	168	169	1.0	MVO	NMDD09331	0.15	RPA0048	0.10	
NMDD028	169	170	1.0	MVO	NMDD09332	6.33	RPA0049	2.51	
NMDD028	170	171	1.0	MVO/GRA	NMDD09333	4.85	RPA0050	4.08	
NMDD028	171	172	1.0	GRA	NMDD09334	0.61	RPA0051	0.78	
NMDD028	172	173	1.0	GRA	NMDD09335	1.44	RPA0052	1.91	
NMDD028	173	174	1.0	GRA	NMDD09336	1.44	RPA0053	1.24	
NMDD028	174	175	1.0	GRA	NMDD09337	0.46	RPA0054	0.44	
NMDD028	175	176	1.0	GRA	NMDD09338	0.51	RPA0055	1.17	
NMDD028	176	177	1.0	GRA	NMDD09340	1.53	RPA0056	1.93	
NMDD028	177	178	1.0	GRA	NMDD09341	1.46	RPA0057	1.10	
NMDD028	178	179	1.0	GRA	NMDD09342	0.87	RPA0058	0.71	
NMDD028	179	180	1.0	GRA	NMDD09343	0.83	RPA0059	1.14	
NMDD028	180	181	1.0	GRA	NMDD09344	0.40	RPA0060	0.3	
NMDD028	181	182	1.0	GRA	NMDD09345	0.81	RPA0061	0.78	
NMDD028	182	183	1.0	GRA	NMDD09346	0.88	RPA0062	0.93	
NMDD028	183	184	1.0	GRA	NMDD09347	0.94	RPA0063	0.58	
NMDD028	184	185	1.0	GRA	NMDD09348	0.55	RPA0064	0.58	
NMDD028	185	186	1.0	GRA	NMDD09349	1.26	RPA0066	1.34	
NMDD028	186	187	1.0	GRA	NMDD09350	0.52	RPA0067	0.33	
NMDD029	56	57	1.0	MVO	NMDD09545	0.27	RPA0068	0.32	
NMDD029	57	58	1.0	GRA	NMDD09546	2.10	RPA0069	3.54	
NMDD029	58	59	1.0	GRA	NMDD09547	0.79	RPA0070	0.76	
NMDD029	59	60	1.0	GRA	NMDD09548	2.57	RPA0071	2.57	
NMDD029	60	61	1.0	GRA	NMDD09549	0.88	RPA0072	0.64	
NMDD029	61	62	1.0	GRA	NMDD09550	0.62	RPA0073	0.40	

Hole	From (m)	To (m)	Interval (m)	Logged Litho	Original Sample No.	Orig. FA Assay (ppm Au)	ALS Sample No.	Au-AA26 (ppm Au)	Au-AA26 Check (ppm Au)
NMDD029	62	63	1.0	GRA	NMDD09551	0.77	RPA0074	0.51	
NMDD029	63	64	1.0	GRA	NMDD09552	1.26	RPA0075	0.82	
NMDD029	64	65	1.0	GRA	NMDD09553	0.41	RPA0076	0.53	
NMDD029	65	66	1.0	GRA	NMDD09554	0.44	RPA0077	0.35	
NMDD029	66	67	1.0	GRA	NMDD09555	0.10	RPA0078	0.02	
NMDD029	67	68	1.0	GRA	NMDD09556	0.41	RPA0079	0.49	
NMDD029	68	69	1.0	GRA	NMDD09557	0.18	RPA0080	0.10	
NMDD029	69	70	1.0	GRA	NMDD09558	0.31	RPA0081	0.22	
NMDD029	70	71	1.0	GRA	NMDD09560	2.85	RPA0082	2.83	
NMDD029	71	72	1.0	GRA	NMDD09561	1.49	RPA0083	1.41	
NMDD029	72	73	1.0	GRA	NMDD09562	1.96	RPA0084	2.27	
NMDD029	73	74	1.0	GRA	NMDD09563	0.69	RPA0085	0.72	
NMDD029	74	75	1.0	GRA	NMDD09564	0.45	RPA0086	0.54	
NMDD029	75	76	1.0	GRA	NMDD09565	0.55	RPA0087	0.56	
NMDD029	76	77	1.0	GRA	NMDD09566	0.09	RPA0088	0.13	
NMDD029	77	78	1.0	GRA	NMDD09567	0.11	RPA0089	0.14	
NMDD029	78	79	1.0	GRA	NMDD09568	0.57	RPA0090	0.56	
NMDD029	79	80	1.0	GRA	NMDD09569	0.94	RPA0091	1.25	
NMDD029	80	81	1.0	GRA	NMDD09570	0.39	RPA0092	0.3	
NMDD029	81	82	1.0	GRA	NMDD09571	0.41	RPA0093	0.50	
NMDD029	82	83	1.0	GRA	NMDD09572	0.52	RPA0094	0.65	
NMDD029	83	84	1.0	GRA	NMDD09573	0.80	RPA0095	0.30	
NMDD029	84	85	1.0	GRA	NMDD09574	1.49	RPA0096	1.48	
NMDD029	85	86	1.0	GRA	NMDD09575	0.07	RPA0097	0.05	
NMDD029	86	87	1.0	GRA	NMDD09576	0.07	RPA0098	0.03	
NMDD029	87	88	1.0	GRA	NMDD09577	0.63	RPA0099	0.99	
NMDD029	88	89	1.0	GRA	NMDD09578	24.60	RPA0100	12.10	
NMDD029	89	90	1.0	GRA	NMDD09579	10.60	RPA0102	5.32	5.94
NMDD029	90	91	1.0	GRA	NMDD09580	0.39	RPA0103	0.38	
NMDD029	91	92	1.0	GRA	NMDD09582	0.51	RPA0104	0.50	
NMDD029	92	93	1.0	GRA	NMDD09583	0.96	RPA0105	0.71	
NMDD029	93	94	1.0	GRA	NMDD09584	0.88	RPA0106	1.11	
NMDD029	94	95	1.0	GRA	NMDD09585	0.86	RPA0107	0.55	
NMDD029	95	96	1.0	GRA	NMDD09586	1.05	RPA0108	1.03	
NMDD029	96	97	1.0	GRA	NMDD09587	1.27	RPA0109	1.13	
NMDD029	97	98	1.0	GRA	NMDD09588	1.94	RPA0110	1.42	

Hole	From (m)	To (m)	Interval (m)	Logged Litho	Original Sample No.	Orig. FA Assay (ppm Au)	ALS Sample No.	Au-AA26 (ppm Au)	Au-AA26 Check (ppm Au)
NMDD029	98	99	1.0	GRA	NMDD09589	2.76	RPA0111	2.57	
NMDD029	99	100	1.0	GRA	NMDD09590	1.16	RPA0112	2.29	
NMDD029	100	101	1.0	GRA	NMDD09591	1.19	RPA0113	1.69	
NMDD029	101	102	1.0	GRA	NMDD09592	1.22	RPA0114	1.30	
NMDD029	102	103	1.0	GRA	NMDD09593	0.57	RPA0115	0.85	
NMDD029	103	104	1.0	GRA	NMDD09594	0.43	RPA0116	0.50	
NMDD029	104	105	1.0	GRA	NMDD09595	0.56	RPA0117	0.48	
NMDD029	105	106	1.0	GRA	NMDD09596	0.70	RPA0118	0.52	
NMDD029	106	107	1.0	GRA	NMDD09597	0.24	RPA0119	0.48	
NMDD029	107	108	1.0	GRA	NMDD09598	0.41	RPA0120	1.95	
NMDD029	108	109	1.0	GRA	NMDD09599	0.59	RPA0121	0.38	
NMDD029	109	110	1.0	GRA	NMDD09600	0.80	RPA0122	0.87	
NMDD029	110	111	1.0	MVO	NMDD09601	0.09	RPA0124	0.05	
NMDD029	111	112	1.0	MVO	NMDD09602	0.04	RPA0125	0.02	
NMDD029	112	113	1.0	MVO	NMDD09604	0.53	RPA0126	0.37	
NMDD029	113	114	1.0	MVO	NMDD09605	0.60	RPA0127	0.42	
NMDD029	114	115	1.0	MVO	NMDD09606	0.01	RPA0128	0.01	
NMRD096	223	224	1.0	GRA	NMRD01473	0.32	RPA0129	0.37	
NMRD096	224	225	1.0	GRA	NMRD01474	0.33	RPA0130	0.30	
NMRD096	225	226	1.0	GRA	NMRD01475	0.14	RPA0131	0.18	
NMRD096	226	227	1.0	GRA	NMRD01476	3.89	RPA0132	1.40	
NMRD096	227	228	1.0	GRA/MVO	NMRD01477	2.22	RPA0133	0.62	
NMRD096	228	229	1.0	MVO	NMRD01478	0.57	RPA0134	0.27	
NMRD096	229	230	1.0	MVO	NMRD01479	0.74	RPA0135	0.87	
NMRD096	230	231	1.0	MVO	NMRD01480	1.90	RPA0136	2.63	
NMRD096	231	232	1.0	MVO	NMRD01481	2.92	RPA0137	2.48	
NMRD096	232	233	1.0	MVO	NMRD01482	3.36	RPA0138	3.99	
NMRD096	233	234	1.0	MVO	NMRD01483	2.95	RPA0139	2.50	
NMRD096	234	235	1.0	MVO	NMRD01484	4.57	RPA0140	5.03	
NMRD096	235	236	1.0	MVO	NMRD01486	4.28	RPA0141	4.31	
NMRD096	236	237	1.0	MVO	NMRD01487	0.03	RPA0143	0.02	
NMRD096	237	238	1.0	MVO	NMRD01488	0.62	RPA0144	0.19	
NMRD096	238	239	1.0	MVO	NMRD01489	0.03	RPA0145	0.04	
NMRD096	323	324	1.0	MVO	NMRD01578	0.70	RPA0146	0.34	
NMRD096	324	325	1.0	MVO	NMRD01579	3.16	RPA0147	3.85	
NMRD096	325	326	1.0	MVO	NMRD01580	0.63	RPA0148	0.90	

Hole	From (m)	To (m)	Interval (m)	Logged Litho	Original Sample No.	Orig. FA Assay (ppm Au)	ALS Sample No.	Au-AA26 (ppm Au)	Au-AA26 Check (ppm Au)
NMRD096	326	327	1.0	MVO	NMRD01581	0.74	RPA0149	0.95	
NMRD096	327	328	1.0	MVO	NMRD01582	0.05	RPA0150	0.28	
NMRD096	328	329	1.0	MVO	NMRD01583	2.17	RPA0151	1.75	
NMRD096	329	330	1.0	MVO	NMRD01584	0.02	RPA0152	0.01	
NMRD096	330	331	1.0	MVO	NMRD01585	0.03	RPA0153	0.02	
NMRD096	331	332	1.0	MVO	NMRD01586	0.06	RPA0154	2.90	
NMRD096	332	333	1.0	MVO	NMRD01587	0.52	RPA0155	0.02	
NMRD096	333	334	1.0	MVO	NMRD01588	2.78	RPA0156	0.54	
NMRD096	334	335	1.0	MVO	NMRD01589	1.02	RPA0157	0.55	
NMRD096	335	336	1.0	MVO	NMRD01590	0.33	RPA0159	0.31	
NMRD096	336	337	1.0	MVO	NMRD01591	3.23	RPA0160	4.17	
NMRD096	337	338	1.0	MVO	NMRD01592	1.95	RPA0161	1.02	
NMRD096	338	339	1.0	MVO	NMRD01593	2.96	RPA0162	3.64	
NMRD096	339	340	1.0	MVO	NMRD01594	0.98	RPA0163	4.19	
NMRD096	340	341	1.0	MVO	NMRD01596	2.07	RPA0164	2.17	
NMRD096	341	342	1.0	MVO	NMRD01597	2.25	RPA0165	4.43	
NMRD096	342	343	1.0	MVO	NMRD01598	1.64	RPA0166	3.42	
NMRD096	343	344	1.0	MVO	NMRD01599	2.66	RPA0167	1.66	
NMRD096	344	345	1.0	MVO	NMRD01600	0.81	RPA0169	0.52	
NMRD096	345	346	1.0	MVO	NMRD01601	0.11	RPA0170	0.19	
NMRD096	346	347	1.0	MVO	NMRD01602	0.23	RPA0171	0.55	
NMRD096	347	348	1.0	MVO	NMRD01603	0.62	RPA0172	0.46	
NMRD096	348	349	1.0	MVO	NMRD01604	0.07	RPA0173	0.03	

In general, the IWS gold results were in the same order of magnitude as the original sample with the exception of sample NMDD09578 with 24.6 g/t Au and IW number RPA-0100 containing 12.1 g/t Au. The fire assays have a 0.9% difference of the means, including anomalous sample NMDD09578, which RPA considers to be satisfactory in regard to precision (Table 12-2). Four blanks were submitted, three of which assayed below the detection limit and one at the detection limit (0.01 g/t Au). All of the four submitted CRMs assayed within 5% of their expected mean value.

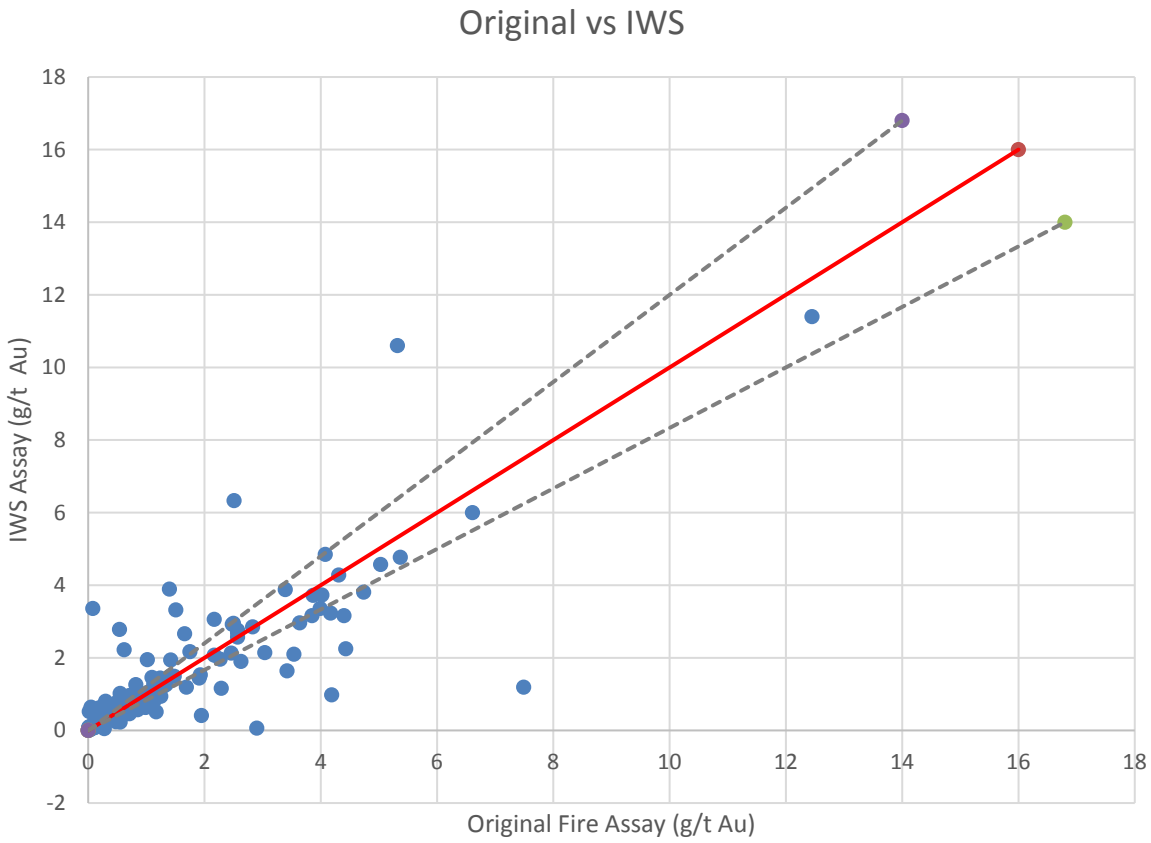
TABLE 12-2 ORIGINAL AND IWS FIRE ASSAY STATISTICS
Cardinal Resources Limited – Namdini Gold Project

	Original Fire Assay (g/t Au)	IWS Fire Assay (g/t Au)
Number of Samples	165	165
Mean Grade (g/t Au)	1.26	1.27
Maximum Grade (g/t Au)	11.40	12.45
Minimum Grade (g/t Au)	0.005	0.005
Median Grade (g/t Au)	0.63	0.56
Variance	2.83	2.93
Standard Deviation	1.68	1.71
Coefficient of Variation	1.33	1.34
Correlation Coefficient	0.75	
Relative Standard Deviation	1.3	
Percent Difference Between Means	**0.8%**	

Figure 12-5 presents a scatter plot of the IWS fire assays against the “original” fire assays. A 20% deviation tolerance level has been plotted, and as can be seen, the majority of the “pairs” fall within the tolerance spread, with IWS having a higher grade bias.

The two IWS check assay pairs contained 7.49 g/t Au and 7.69 g/t Au for an original assay of 1.19 g/t Au for the first pair and 5.32 g/t Au and 5.94 g/t Au for an original assay of 10.60 g/t Au for the second pair.

FIGURE 12-5 ORIGINAL VS. IWS FIRE ASSAY SCATTER PLOT



RPA COMMENTS

RPA is of the opinion that database verification procedures for the Namdini Project comply with industry standards and are adequate for the purposes of Mineral Resource estimation.

RPA concludes that the IWS samples have confirmed the presence of gold in the same order of magnitude as the original samples.

RPA recommends, however, that all future Namdini Mineral Resource drilling should be sampled on a half core basis rather than the recent use of quarter core.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

Suntech Geomet Laboratories (Suntech), based in Johannesburg, South Africa carried out an initial range of metallurgical testwork on a 332 kg composite sample of quartered HQ diamond drill core obtained from a single drill hole (NMDD005), which included weighted proportions of meta-volcanics, granite, and diorite. The individual components were used to make a master composite which graded at 1.42 g/t Au and 1.1% S.

The main aims of the testwork program were as follows:

- To characterize the occurrence, and confirm the association, of the gold mineralization.
- To evaluate the amenability of gold recovery to a range of extraction methods on both the run of mine (ROM) mineralization and flotation concentrate.
- To evaluate available recovery processes including whole ore cyanide leaching or flotation with subsequent re-grinding of the flotation concentrate followed by cyanide leaching in order to limit the quantity of material to be ground finer and leached.
- To evaluate various grind sizes and their impact on recovery of gold and to test reagent suites for the flotation process.
- To evaluate the mineralogical characteristics of the gold mineralization and concentrate associations using QEMSCAN (quantitative electron microscopy) and diagnostic leach evaluation.

RPA reviewed the metallurgical report from Suntech dated November 1, 2016. The data reported in the Suntech report shows flotation recovery of 95% at a primary grind size of 80% passing (P_{80}) 75 µm into 8% of the mass. The carbon-in-leach (CIL) recovery was approximately 80% when the flotation concentrate was re-ground to P_{80} 10 µm resulting in an overall recovery of 76%.

Subsequently, Cardinal provided RPA with additional information based on metallurgical testwork that is currently underway and which, according to Cardinal, provided a better understanding of the Suntech work. Cardinal reported that the master composite used for the Suntech test program had lithology ratios of 10% meta-volcanics, 11% granite, and 4% diorite and that the expected ratio in the resource was 6:3:1. The grind size for the granite in the Suntech test program was estimated to be 66.3% passing 75 µm, instead of the targeted 80%,

resulting in a poorer recovery than anticipated under proper operating conditions. Cardinal, therefore, estimated that the gold recovery would be 7.7% to 10.4% higher than the results from Suntech testwork into a mass pull of 2%.

Based on Cardinal's information, RPA accepted the proposed overall recovery of 82%, pending review of the new metallurgical test data. RPA notes that the recovery appears to be dependent upon the ratios of the various lithologies, which change as the resource model is updated and depending upon the cut-off grade. Table 13-1 compares the various ratios that have been observed for the Project to date.

TABLE 13-1 COMPARISON OF LITHOLOGY RATIOS USED FOR NAMDINI
Cardinal Resources – Namdini Gold Project

Lithology	Suntech Sample	Cardinal Memo	RPA Resource Estimate – Cut-Off Grade				
			0.2 g/t Au	0.3 g/t Au	0.4 g/t Au	0.5 g/t Au	0.6 g/t Au
Metavolcanics	40%	60%	54%	55%	55%	56%	57%
Granite	44%	30%	18%	19%	19%	19%	19%
Diorite	16%	10%	28%	27%	25%	25%	24%

In RPA's opinion, the refractory nature of the gold, which requires ultra-fine grinding to facilitate recovery in a cyanide leach circuit, is the major factor that has the potential to impact the Project economics. Deleterious elements are not thought to pose a risk to the Project.

RPA makes the following recommendations:

- Continue with metallurgical test work studies, specifically focusing on the relationship between metallurgical response and geological domains, and to further optimize the processes.
- In order to accurately reflect the recoveries to be used in the future, tests should be conducted on samples containing separate lithologies, rather than on composite samples, so recovery can be reported by lithology for input into future block models.

14 MINERAL RESOURCE ESTIMATE

SUMMARY

Geological interpretation and Mineral Resource estimation were completed by RPA for Namdini incorporating drill holes completed as of December 2, 2016 (up to and including NMDD061). The Mineral Resources have been completed to a level that meets industry standards and are compliant with the terms and definitions provided in "The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves as published by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia" (the JORC (2012) Code). RPA has reconciled the Mineral Resources to Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 and there are no material differences.

Table 14-1 summarizes Mineral Resources at the Project.

TABLE 14-1 SUMMARY OF MINERAL RESOURCES – DECEMBER 2, 2016
Cardinal Resources Ltd. – Namdini Gold Project

Category	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Indicated	23,864	1.21	931
Inferred	100,149	1.13	3,629

Notes:
1. JORC (2012) Code was followed for Mineral Resources.
2. Open pit Mineral Resources are estimated at a cut-off grade of 0.5 g/t Au, constrained by a preliminary pit shell.
3. Mineral Resources are estimated using a long-term gold price of US$1,500 per ounce.
4. Incorporates drill holes completed as of December 2, 2016 (up to and including NMDD061).
5. Numbers may not add due to rounding.

Since the previous estimate completed by EGRM in 2016, 27 drill holes totalling 6,158 m of drilling have been added to the Mineral Resource database amounting to a total of 186 drill holes for 32,275 m of drilling as of the effective date of the Mineral Resource database. RPA utilized geological wireframes generated in Leapfrog Geo version 4.0 and Single Indicator Kriging (SIK) at 0.1 g/t Au and 1.0 g/t Au to help constrain grade estimates which were estimated using Ordinary Kriging (OK) in Datamine Studio RM version 1.2.46.

Assays were capped at between 1.0 g/t Au and 25 g/t Au prior to compositing to three metre intervals. Densities were assigned to blocks based on lithological units and weathering horizons. Blocks were classified as Indicated and Inferred based on confidence in block estimates implied by the variogram, grade continuity, and drill hole spacing. A cut-off grade of 0.5 g/t Au was used for resource reporting and Mineral Resources were constrained by a Whittle pit optimization.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

MINERAL RESOURCE DATABASE

The Mineral Resource database comprises 186 drill holes for a total of 32,274 m of drilling. The database consists of collar, assay, density, lithology, structure and weathering information. A summary of the drill hole dataset used to support Mineral Resource Estimation is given in Table 14-2.

TABLE 14-2 SUMMARY OF THE RESOURCE DATABASE
Cardinal Resources Ltd. – Namdini Gold Project

	2014	2015	2016	Total
Number of Drill Holes	45	51	90	186
Total Length	4,815	7,068	20,391	32,274
Survey Records	90	174	828	1,092
Number of Assays	4,815	7,159	962	13,936
Densities	0	418	2,000	2,418
Lithology Records	4,814	5,243	3,517	13,574
Structural Records	0	1045	1,880	2,925
Weathering Records	180	202	357	739

DIGITAL TERRAIN MODEL

The Namdini Digital Terrain Model (DTM) is based on an unmanned aerial vehicle (UAV) drone survey flown over the Project area in 2016. RPA recommends that a more detailed survey (<0.5 m resolution) be undertaken in 2017.

GEOLOGICAL INTERPRETATION

The geological interpretation comprises wireframes for lithology and weathering horizons, which were developed in Leapfrog Geo, and probabilistic domains were generated using SIK in Datamine Studio RM. The wireframes for lithology were generated based on logging of the major lithological units. These included:

- Meta-Volcanics
- Granite
- Diorite
- Meta-Sediments

Weathering surfaces were generated from the intensity of weathering recorded in the logs. The weathering horizons modelled are as follows:

- SOX – strongly oxidized
- MOX – moderately oxidized
- TRANS – transitional zone
- FRESH – fresh rock

Figure 14-1 shows a typical section through the lithological and weathering model developed by RPA in Leapfrog.

While the majority of the mineralization occurs in the meta-volcanics, granite and diorite, the upper/west meta-sediment contact does not form a hard boundary in terms of the distribution of gold grades (Figure 14-2). In order to capture mineralization within the upper meta-sediment contact, the upper surface was offset by 15 m upward. A closed wireframe solid was created using the lower meta-sediment surface and the offset surface representing the ultimate wireframe constraint for block modelling (Figure 14-3).

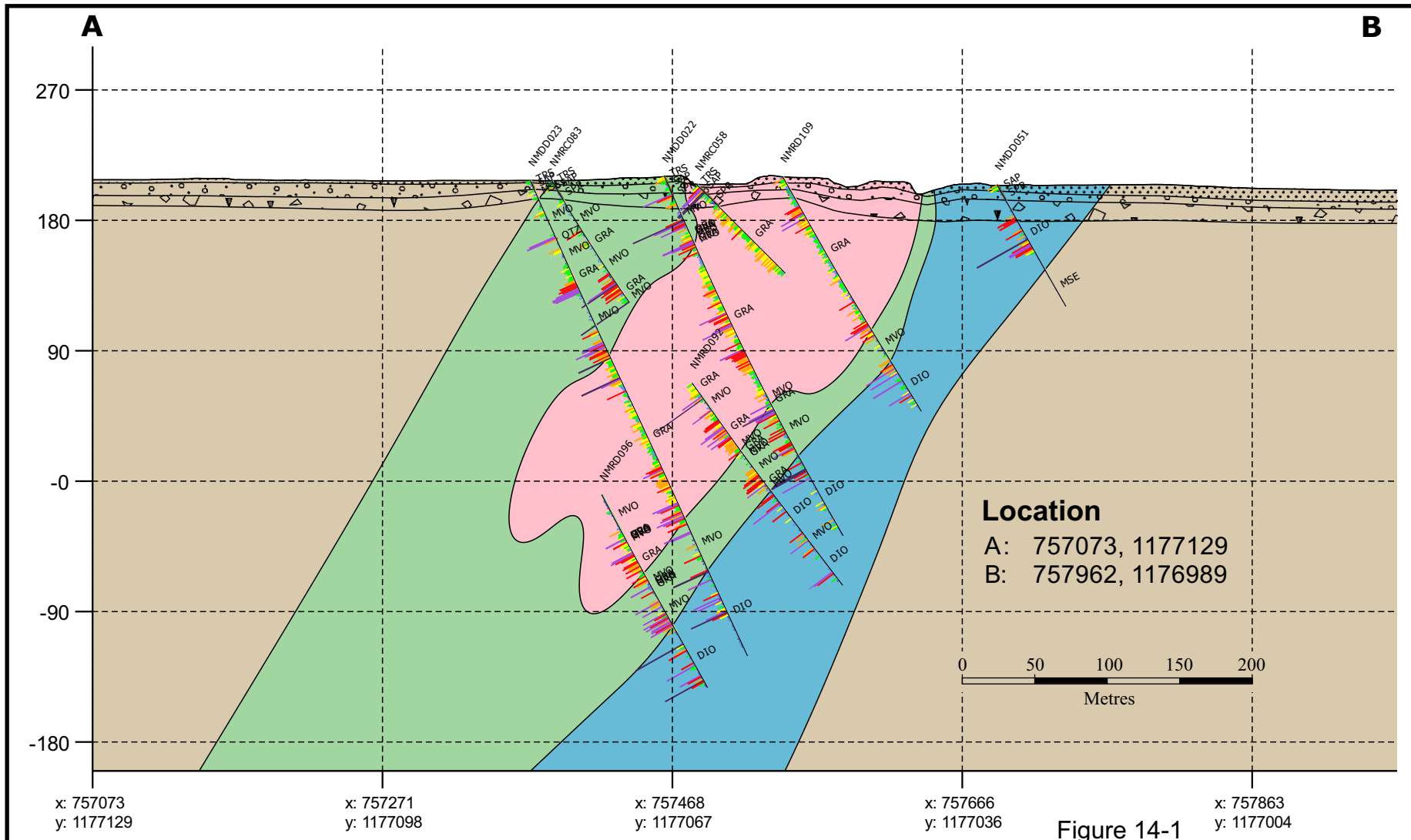


Figure 14-1

Legend:

LITHO	OXIDE	AU PPM	
Meta-volcanics	SOX	≤ 0.1	≤ 1
Granite	MOX	≤ 0.2	≤ 2
Diorite	TRANS	≤ 0.4	≤ 5
Meta-sediments	FRESH	≤ 0.6	> 5

Cardinal Resources Limited

Namdini Gold Project

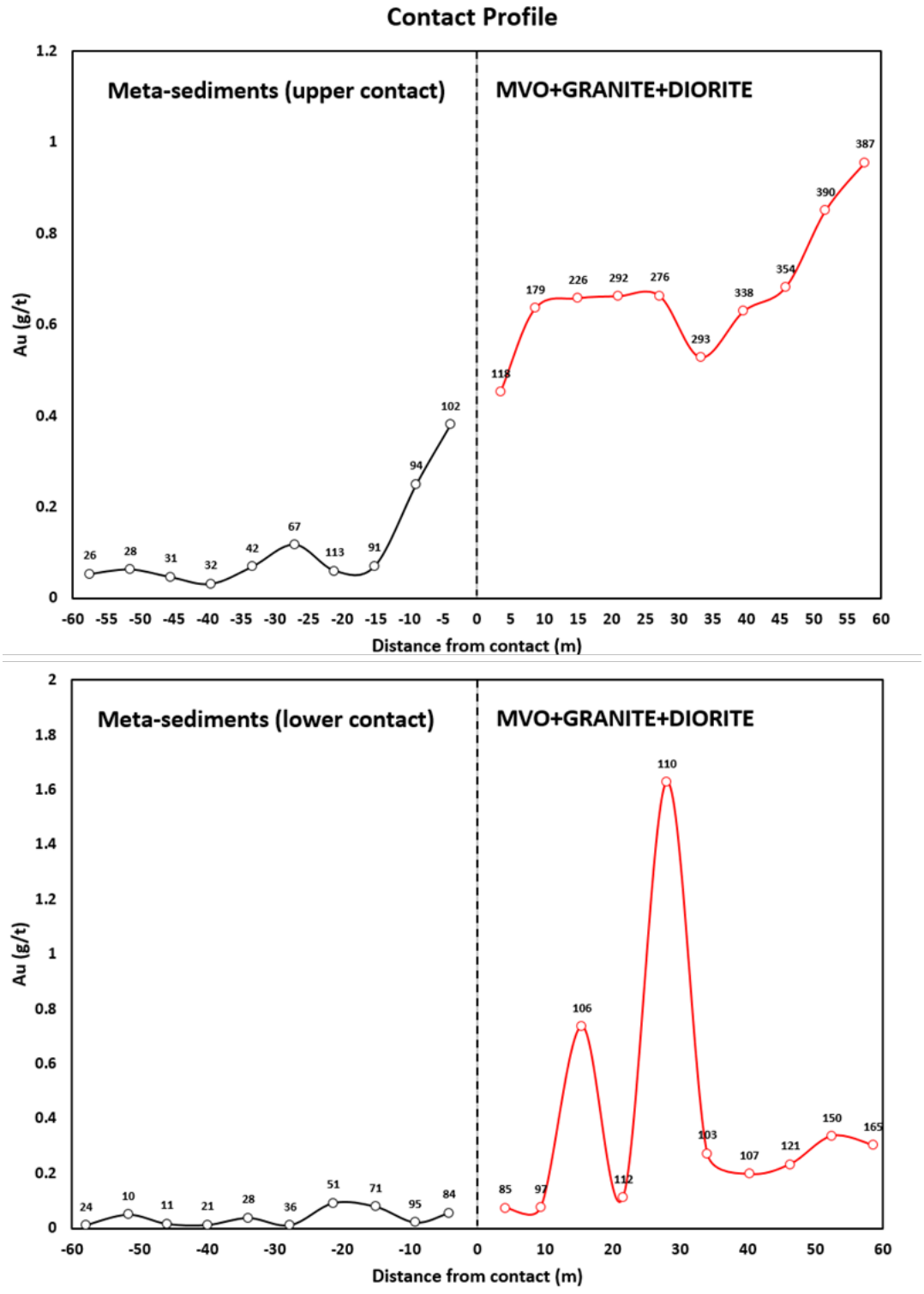
Ghana, West Africa

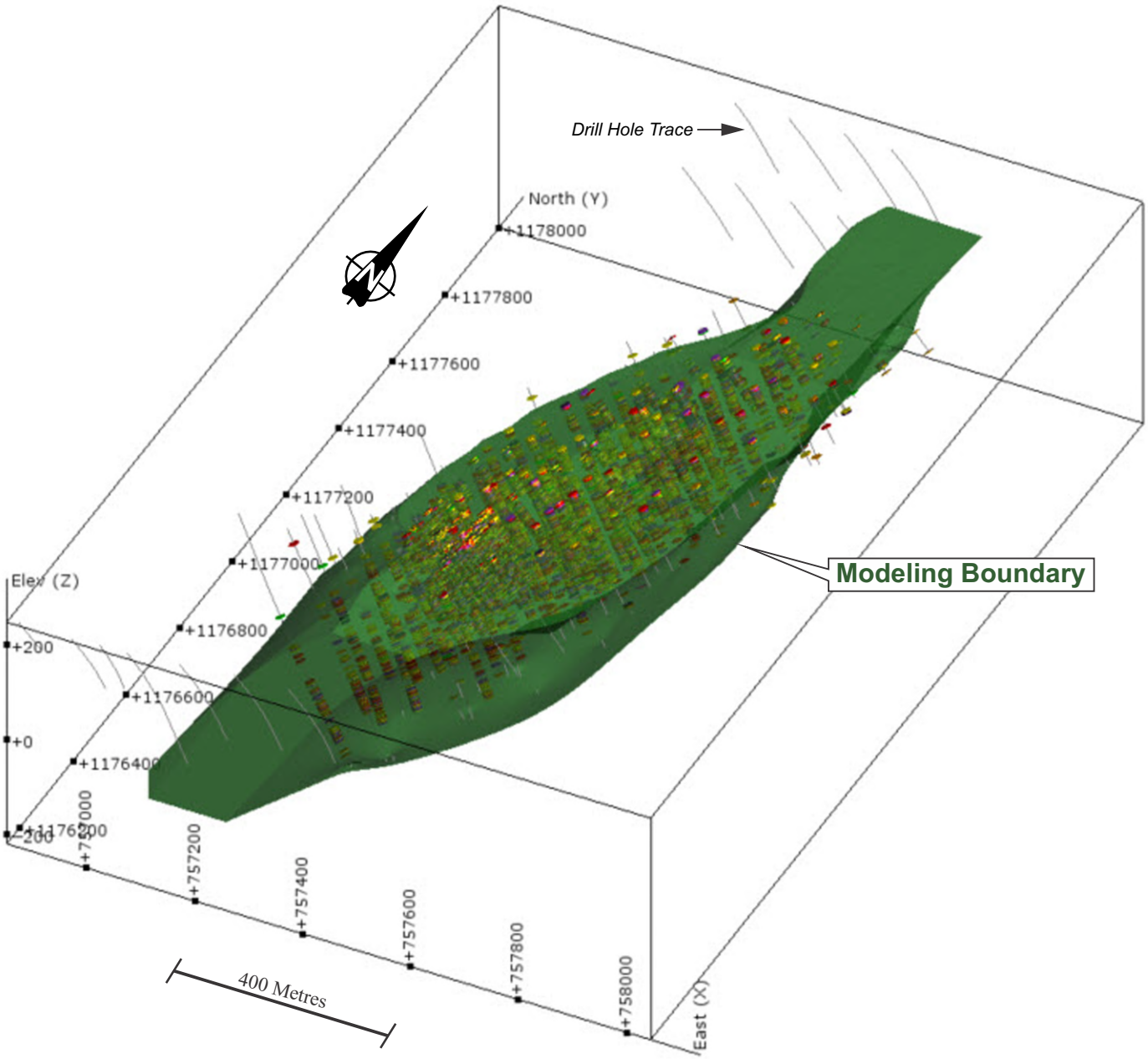
Lithological and Weathering Model

April 2017

Source: Cardinal Res., 2016.

FIGURE 14-2 CONTACT PLOTS FOR THE META-SEDIMENT CONTACTS





Legend: (Au ppm)

≤ 0.1	≤ 1
≤ 0.2	≤ 2
≤ 0.4	≤ 5
≤ 0.6	> 5

Figure 14-3

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Namdini Gold Project

Ghana, West Africa

Boundary for Block Modelling

April 2017

Source: RPA, 2017.

Trend surfaces were generated in Leapfrog based on the grade trends, lithological contacts, and foliation as per structural measurements. The trend surfaces were used to extract dip and dip direction angles for dynamic anisotropy. Dynamic anisotropy was used for both SIK. The dynamic anisotropy angles interpolated into the blocks are shown in Figure 14-4. The arrows represent the dip and dip direction or the first two ZXZ rotation angles for each block.

EXPLORATORY DATA ANALYSIS

The raw assays statistics by lithology are given in Table 14-3. A total of 65% of the metal (Au*length) is located within the meta-volcanics, 17% in the granite, 16% in the diorite, and 2% within the meta-sediments. The granite is the highest grade lithology followed by the meta-volcanics. While boundary conditions between the meta-volcanics, granite, and diorite do not show sharp mineralization contacts (Figure 14-5), the granite and meta-volcanics are more favourable mineralization hosts with the highest grades occurring along the margins of the granite (both inside and outside the granite).

TABLE 14-3 RAW ASSAY STATISTICS BY LITHOLOGY
Cardinal Resources Ltd. – Namdini Gold Project

		Grade (g/t Au)					
Lithology	**Count**	**Minimum**	**Maximum**	**Mean**	**Standard Deviation**	**Variance**	**Coefficient of Variation**
Meta-Volcanics	17,953	0.00	257.00	0.84	3.42	11.67	4.05
Granite	4,294	0.00	143.00	0.94	3.29	10.82	3.52
Diorite	7,330	0.00	484.00	0.53	7.39	54.58	13.82
Meta-Sediments	5,280	0.00	12.10	0.06	0.36	0.13	5.54

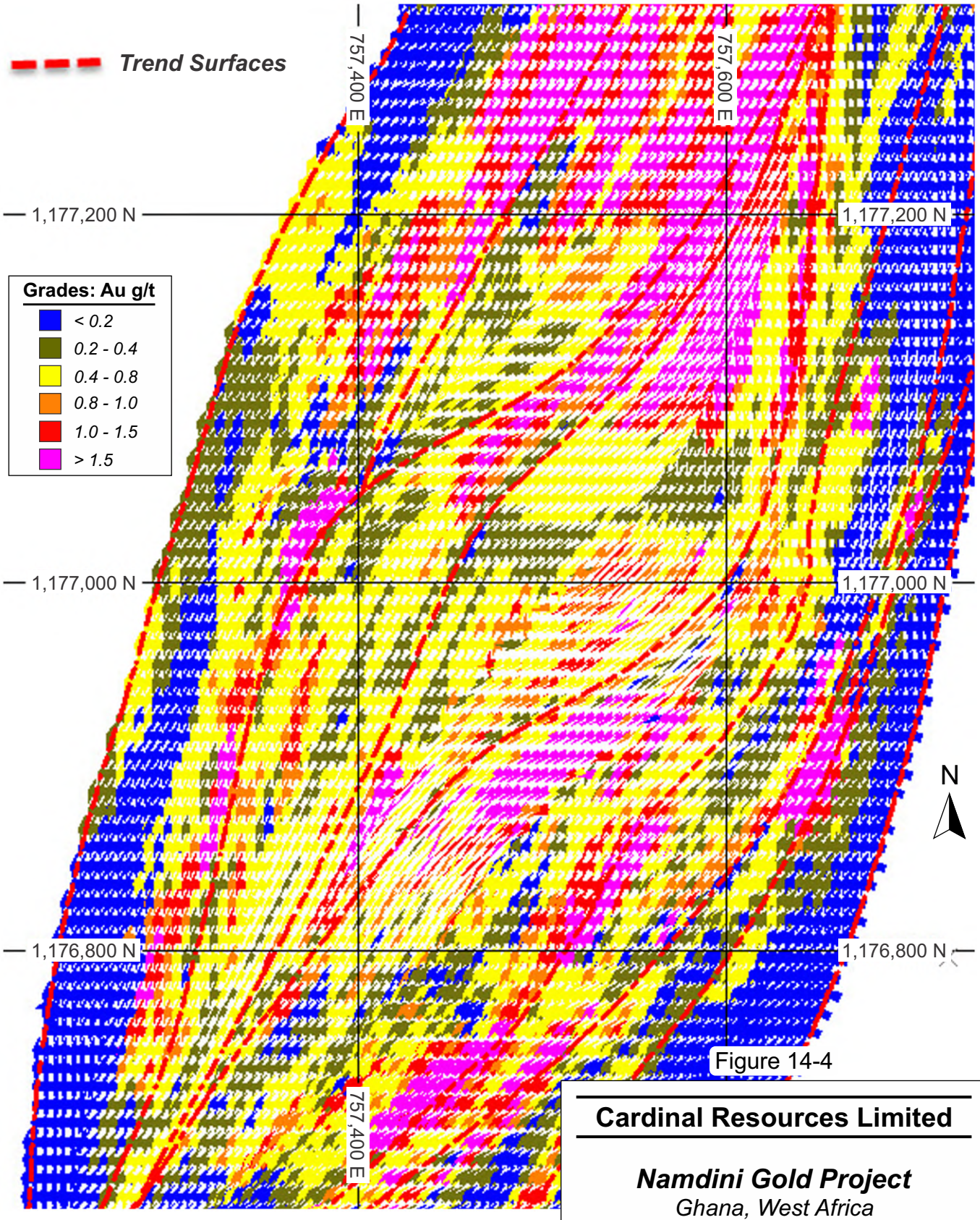


Figure 14-4

Cardinal Resources Limited

Namdini Gold Project

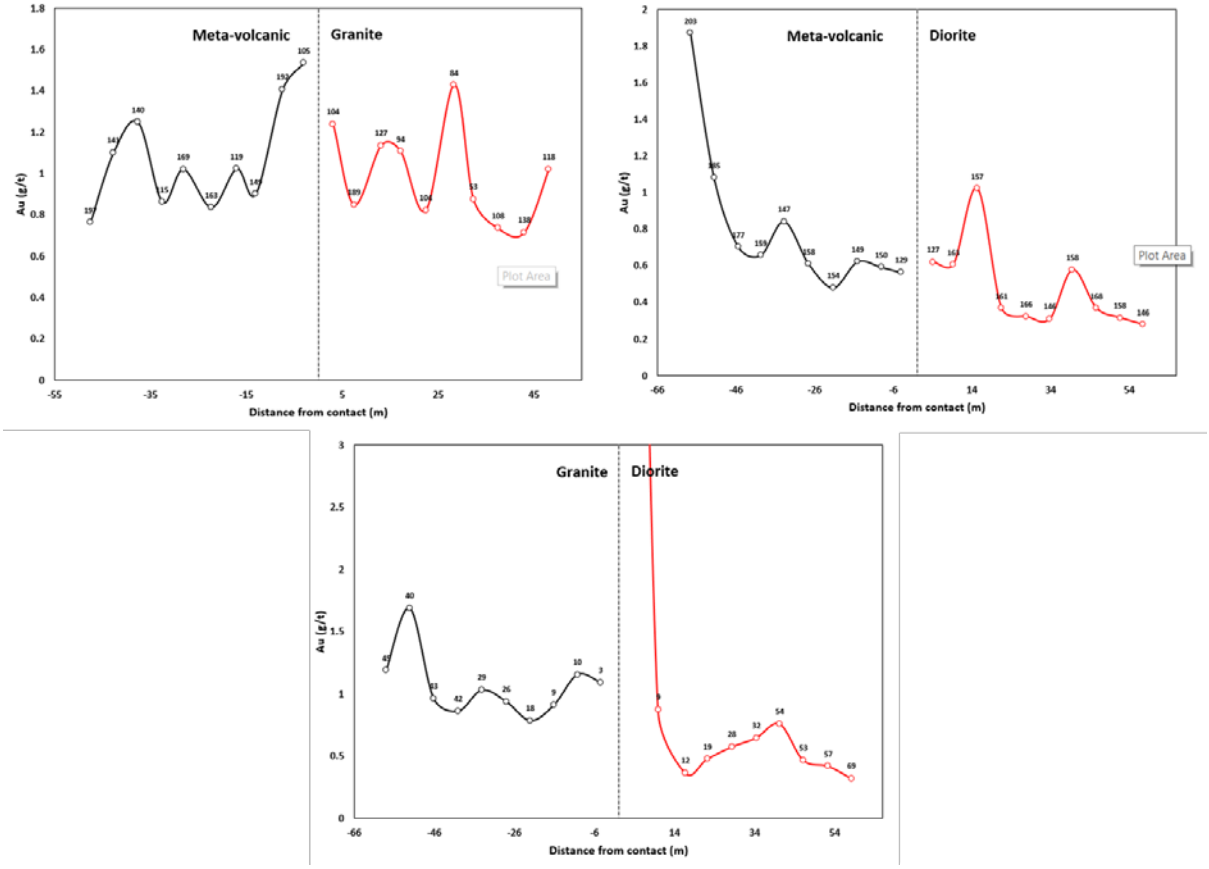
Ghana, West Africa

Trend Surfaces

April 2017

Source: RPA, 2017.

FIGURE 14-5 CONTACT PLOTS FOR THE META-VOLCANICS, GRANITE AND DIORITE



PROBABILITY DOMAINS

Probability domains were generated using SIK at 0.1 g/t Au and 1.0 g/t Au grade thresholds. The thresholds were selected for the following purposes:

- Separate out the anomalous mineralization from barren rock (0.1 g/t Au).
- Provide a high grade domain within the background mineralization to assist capping analysis and to restrict the influence of high grades on surrounding lower grade mineralization.

For the SIK process, assays were capped to 25 g/t Au and then composited to three metres. The nugget effect, an exponential structure, and a spherical structure were fit to experimental indicator correlogram points for the 0.1 g/t Au indicator while a nugget effect and an exponential structure were fit to traditional indicator variogram points for the 1.0 g/t Au indicator (Figures 14-6 and 14-7). Indicator interpolation was performed using OK and the following search strategy:

- Search ellipse ranges 100 m by 100 m by 20 m for pass one, expanding by a factor of two and four for the second and third passes.
- Minimum, maximum, and maximum per hole of 5:20:4, 5:20:4, and 1:20:4 for pass one, two, and three respectively.
- Dynamic anisotropy based on the trend surfaces

FIGURE 14-6 INDICATOR CORRELOGRAM FOR 0.1 G/T AU THRESHOLD

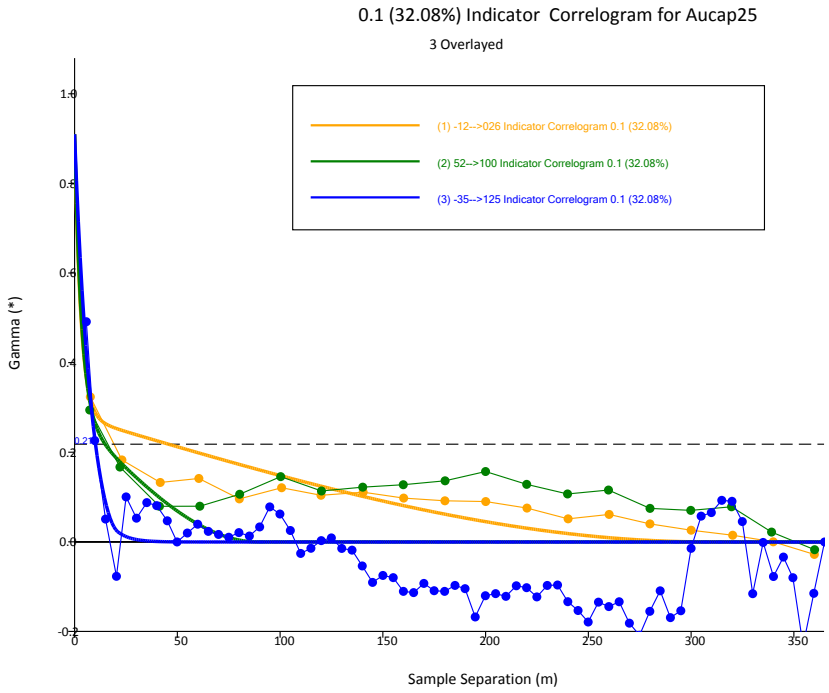
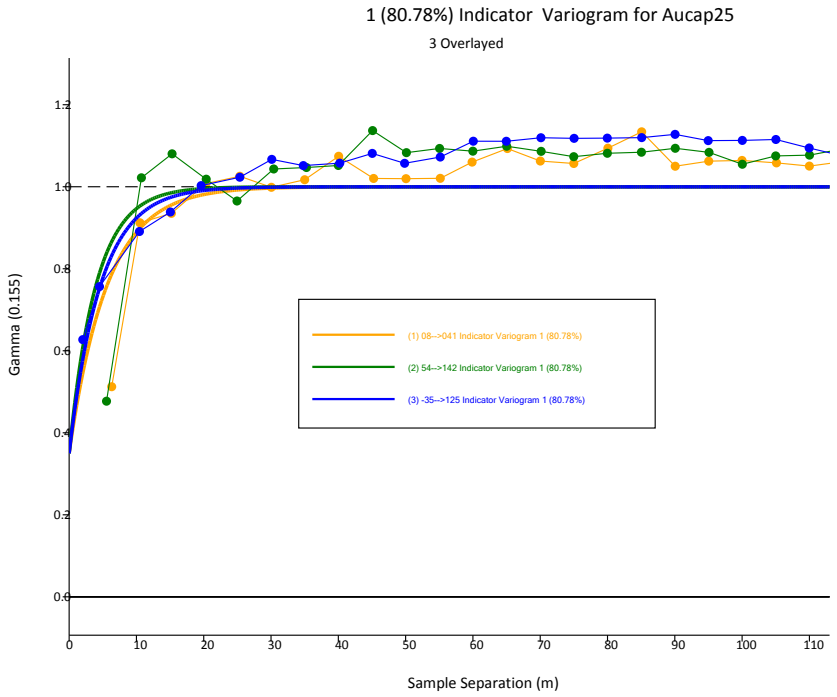


FIGURE 14-7 INDICATOR VARIOGRAM FOR 1.0 G/T AU THRESHOLD



A probability threshold of 0.4 was selected for the 0.1 g/t Au indicator. For the 1.0 g/t Au indicator, two probability thresholds were selected at 0.35 and 0.6, allowing for a buffer between low and high grade mineralization. The probability domains were used for controlling sample sharing during interpolation. The sample sharing strategy and domain coding is illustrated in Table 14-5.

The initial block size for SIK was 2.5 m by 2.5 m by 2.5 m, which was re-blocked to 5 m by 10 m by 5 m blocks using a majority rules approach for domain assignation.

While the indicator methodology is effective at outlining different grade populations associated with the controls on mineralization for the current stage of the Project, RPA recommends that as the Project advances, high and low grade wireframes should be used to constrain estimation.

Figure 14-8 shows a vertical section through the deposit with blocks coloured by probability domain as described in Table 14-4.

TABLE 14-4 PROBABILITY DOMAINS AND SAMPLE SHARING STRATEGY
Cardinal Resources Ltd. – Namdini Gold Project

		Composites			
Model	Domain	0.1 g/t Indicator P<0.4	0.1 g/t Indicator P>0.4	1.0 g/t Indicator P>0.35	1.0 g/t Indicator P>0.6
	0.1 g/t Indicator P<0.4	DOMAIN=0			
	0.1 g/t Indicator P>0.4		DOMAIN=1		
	1.0 g/t Indicator P>0.35			DOMAIN=2	
	1.0 g/t Indicator P>0.6				DOMAIN=3

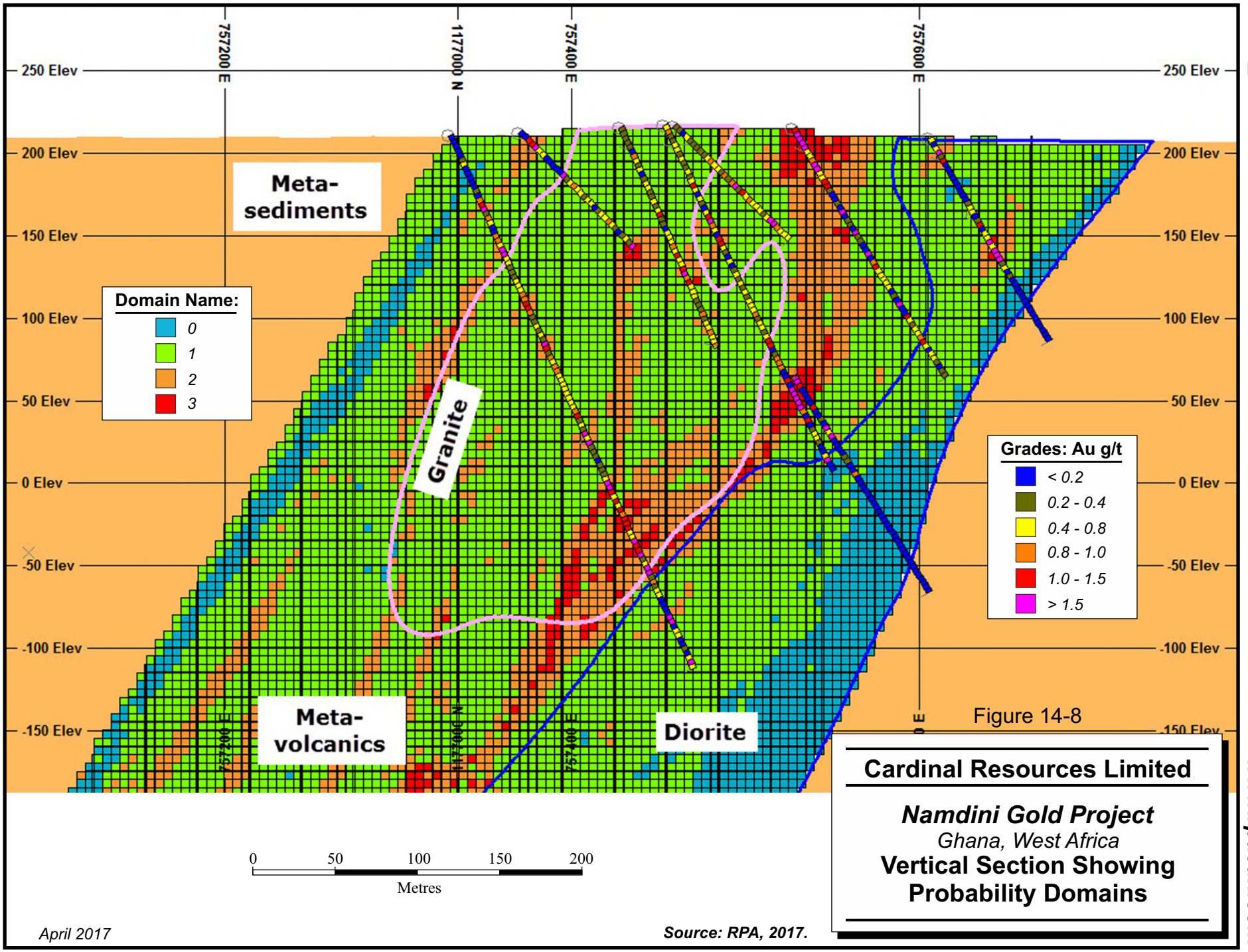


Figure 14-8

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

Vertical Section Showing Probability Domains

April 2017

Source: RPA, 2017.

TREATMENT OF HIGH GRADES

Raw assays were capped based on the analysis of histograms, log probability plots, and decile analyses. The assays were grouped according to the probability domains determined by SIK. A summary of the capping grades is given in Table 14-5 and a comparison between capped and uncapped assay statistics is given in Table 14-6.

TABLE 14-5 CAPPING GRADES
Cardinal Resources Ltd. – Namdini Gold Project

Domain	Capping Grade (g/t Au)	Metal Loss
0	1	19%
1	10	6%
2	15	4%
3	25	19%

TABLE 14-6 COMPARISON BETWEEN CAPPED AND UNCAPPED ASSAYS
Cardinal Resources Ltd. – Namdini Gold Project

Domain	Capped / Uncapped	Count	Grade (g/t Au)			Standard Deviation	Variance	Coefficient of Variation
			Minimum	Maximum	Mean			
0	Uncapped	7,301	0.00	14.60	0.05	0.29	0.09	5.41
0	Capped	7,301	0.00	1.00	0.04	0.12	0.01	2.75
1	Uncapped	16,591	0.00	220.00	0.48	2.26	5.10	4.73
1	Capped	16,591	0.00	10.00	0.45	0.76	0.57	1.69
2	Uncapped	3,825	0.00	76.60	1.40	2.71	7.32	1.93
2	Capped	3,825	0.00	15.00	1.35	2.06	4.23	1.52
3	Uncapped	3,127	0.00	484.00	3.14	12.88	165.92	4.10
3	Capped	3,127	0.00	25.00	2.55	3.58	12.83	1.41

COMPOSITING

Approximately 80% of the samples for Namdini are one metre and 19% of the samples are less than one metre (Figure 14-9). A composite length of three metres was chosen considering the dominant sampling length and the block size selected. Composites were generated from the top to the bottom of drill holes and composites less than 1.5 m in length were discarded. A summary of the composite statistics by lithology is given in Table 14-7 and a summary of composite statistics by probability domain is given in Table 14-8.

TABLE 14-7 COMPOSITE STATISTICS BY LITHOLOGY

Cardinal Resources Ltd. – Namdini Gold Project

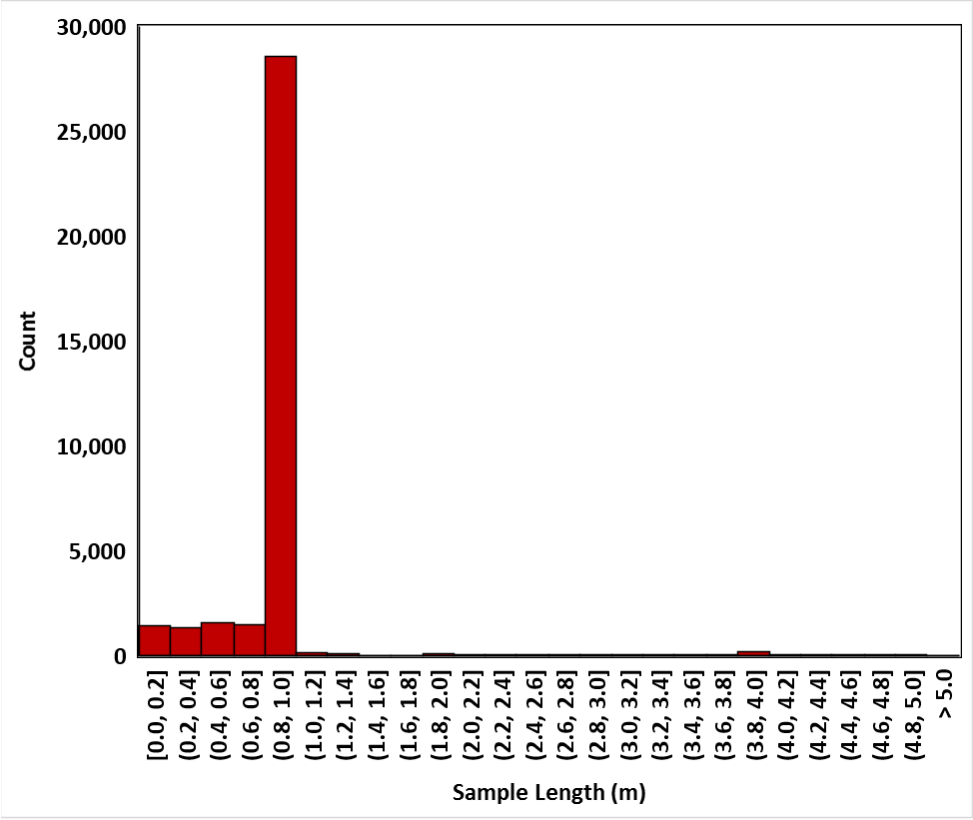
Lithology	Count	Grade (Au g/t)			Standard Deviation	Variance	Coefficient of Variation
		Minimum	Maximum	Mean			
Meta-Volcanics	5,379	0.00	18.89	0.78	1.34	1.79	1.72
Granite	1,302	0.00	13.73	0.87	1.19	1.42	1.36
Diorite	2,156	0.00	12.01	0.37	0.89	0.79	2.41
Meta-Sediments	1,892	0.00	3.33	0.03	0.16	0.02	5.63

TABLE 14-8 COMPOSITE STATISTICS BY PROBABILITY DOMAIN

Cardinal Resources Ltd. – Namdini Gold Project

Domain	Count	Grade (Au g/t)			Standard Deviation	Variance	Coefficient of Variation
		Minimum	Maximum	Mean			
0	2,169	0.01	3.31	0.05	0.11	0.01	2.48
1	4,918	0.01	6.68	0.44	0.51	0.26	1.16
2	1,207	0.01	11.47	1.36	1.41	1.98	1.03
3	868	0.00	18.89	2.58	2.43	5.88	0.94

FIGURE 14-9 HISTOGRAM OF SAMPLE LENGTHS



BLOCK MODEL

Wireframes were filled with whole blocks measuring 5 m by 10 m by 5 m. Due to narrow weathering surfaces generated in Leapfrog and differences in density, a sub-blocked model was generated for weathering and densities. The sub-blocked weathering/density model was then regularized to the parent cell size using a majority rules approach for weathering codes and volume weighting for density. The block model setup is presented in Table 14-9.

TABLE 14-9 NAMDINI BLOCK MODEL PARAMETERS
Cardinal Resources Ltd. – Namdini Gold Project

Parameter	X	Y	Z
Origin	5	10	5
Block Size	756,600	1,176,100	-200
Number of Blocks	320	190	100

BULK DENSITY

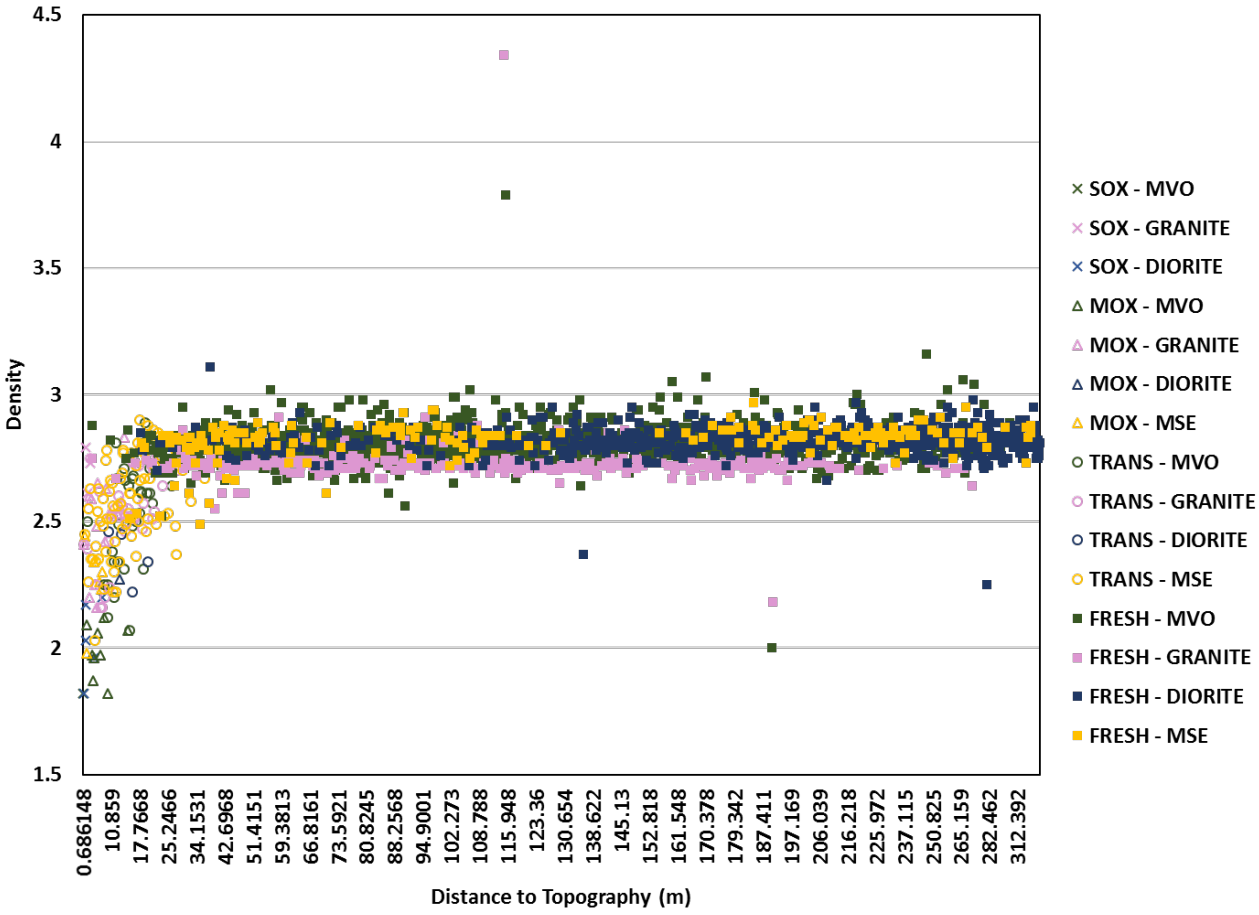
Densities were assigned to blocks based on lithology and weathering horizon. Densities were checked for depth relationships (Figure 14-10) and outliers were removed using Rosner analysis. The removal of 48 outlying density measurements had very little impact on the resulting densities. A density of 1.8 was assigned to the SOX domain due to a lack of data. The mean densities and density assignation are summarized in Table 14-10.

RPA recommends the collection of additional bulk density information for the SOX and MOX weathered lithologies as well as for the TRANS and FRESH meta-sediments and diorite lithologies.

TABLE 14-10 BLOCK MODEL DENSITY STATISTICS AND ASSIGNATION
Cardinal Resources Ltd. – Namdini Gold Project

Weathering Domain / Lithology	Number of Measurements	Average Density with Outliers	Number of Outliers	Average Density Outliers Removed	Density Assigned
SOX					
MVO	1	1.82	0	1.82	1.8
GRANITE	3	2.71	0	2.71	1.8
DIORITE	5	2.04	0	2.04	1.8
MOX					
MVO	9	1.99	0	1.99	2.0
GRANITE	16	2.51	0	2.51	2.51
DIORITE	1	2.27	0	2.27	2.27
MSE	5	2.26	1	2.25	2.25
TRANS					
MVO	35	2.54	0	2.54	2.54
GRANITE	40	2.54	0	2.54	2.54
DIORITE	8	2.58	0	2.58	2.58
MSE	79	2.58	0	2.58	2.58
FRESH					
MVO	1,152	2.81	8	2.81	2.81
GRANITE	285	2.73	26	2.73	2.73
DIORITE	707	2.82	3	2.82	2.82
MSE	180	2.82	10	2.82	2.82

FIGURE 14-10 DENSITY VERSUS DEPTH



VARIOGRAPHY

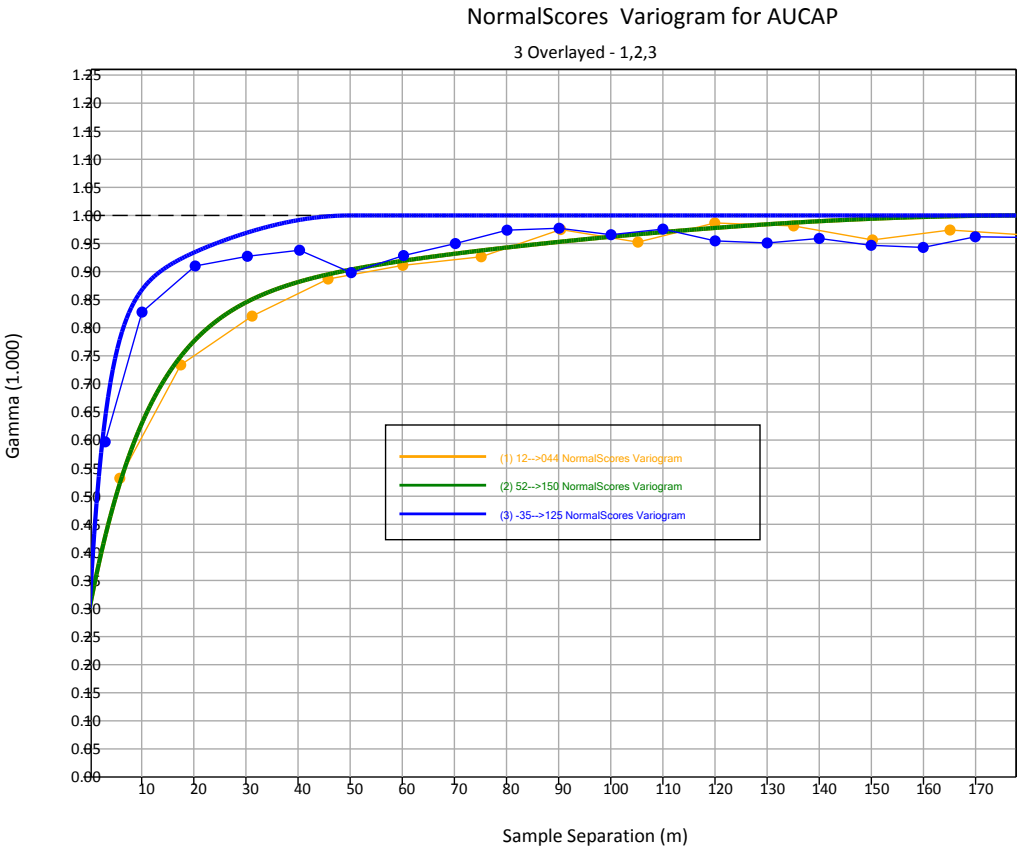
A single normal-scored experimental variogram was generated for probability domains 1, 2, and 3. The nugget effect, an exponential structure, and a spherical structure were fit to the normal-scored variogram and the variogram model was back-transformed to original units.

Given the changing foliation directions and the use of dynamic anisotropy, RPA modelled the variograms as isotropic with respect to the major and semi-major directions. The minor direction was set to a similar shape as the downhole variogram. The variogram was used to support OK, the search strategy, Global Change of Support (GCOS) validation, and classification criteria. The variogram, model parameters are given in Table 14-11 and the directional variograms are shown in Figure 14-11. No rotations have been given as the variogram model was rotated according to the dynamic anisotropy angles during interpolation.

TABLE 14-11 NAMDINI VARIOGRAM PARAMETERS
Cardinal Resources Ltd. – Namdini Gold Project

	Nugget	C1	C2
Gamma	0.43	0.5	0.07
Range 1	0	60	180
Range 2	0	60	180
Range 3	0	10	50

FIGURE 14-11 DOMAIN 1,2,3 NORMAL-SCORED VARIOGRAM



INTERPOLATION PARAMETERS

Grade was interpolated using OK. Inverse Distance Cubed (ID^3) and Nearest Neighbour (NN) estimates were run for validation purposes. Samples were shared across adjacent probability domains according to the strategy illustrated in Table 14-5. The search parameters were selected based on variography and were adjusted based on a validation feed-back loop. The main driver for adjusting the search was the grade tonnage curve implied by the GCOS model. The search was oriented using dynamic anisotropy based on the trend surfaces modelled. The sample search strategy is given in Table 14-12.

TABLE 14-12 NAMDINI SEARCH PARAMETERS
Cardinal Resources Ltd. – Namdini Gold Project

Parameter	Pass 1	Pass 2	Pass 3
Search Ranges			
X (m)	40	80	200
Y (m)	40	80	200
Z (m)	5	10	25
Sample Selection			
Minimum	3	3	1
Maximum	8	8	8
Maximum per Hole	2	2	2

CUT-OFF GRADE

In order to demonstrate reasonable prospects for eventual economic extraction, Mineral Resources are reported within a preliminary optimized pit shell. The Whittle Mineral Resource pit shell constraints (Table 14-13) were determined by RPA assuming a large scale conventional open pit operation with drill, blast, load, and haul unit operations. The 5 m by 5 m by 5 m Mineral Resource block model was re-blocked in Whittle to 10 m by 10 m by 10 m for evaluation.

While the Whittle reported cut-off grade was 0.37 g/t Au, RPA has rounded the value to 0.5 g/t Au for Mineral Resource reporting.

RPA also used Whittle to determine a constrained higher grade area (“Starter Pit Shell”) in order to provide Cardinal with a spatial focus for the upcoming 2017 Exploration Program.

TABLE 14-13 ASSUMPTIONS FOR MINERAL RESOURCE PIT SHELL CONSTRAINTS
Cardinal Resources – Namdini Gold Project

Description	Units	Value
Gold Sale Price	US$/oz	1,500.00
NSR Royalty	%	5.00
Maximum Overall Pit Slope Angle:		
Fresh Rock	degrees	50
Weathered Rock	degrees	35
Reference Mining Cost	US$/t moved	2.00
Process Recovery, Au	%	82.0
Process Cost	US$/t	12.00
G&A Costs	US$/t	2.00

CLASSIFICATION

Definitions for resource categories used in this report are consistent with those defined by CIM (2014) and adopted by NI 43-101. In the CIM classification, a Mineral Resource is defined as "a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction". Mineral Resources are classified into Measured, Indicated, and Inferred categories. A Mineral Reserve is defined as the "economically mineable part of a Measured and/or Indicated Mineral Resource" demonstrated by studies at Pre-Feasibility or Feasibility level as appropriate. Mineral Reserves are classified into Proven and Probable categories. There are no Mineral Reserves on the property.

The Namdini classification criteria consider the variogram for the probability domains 1, 2, and 3 as well as the continuity of grade above the cut-off and the continuity of grades exceeding 1.0 g/t Au. Blocks within 75 m from the nearest sample were considered Inferred while blocks located within contiguous areas with an average drill spacing of less than 60 m (corresponds to the first variogram structure or 93% of the variogram sill) were considered as Indicated. Simplified wireframes for Inferred and Indicated were generated in Leapfrog and were used to assign the classification codes. There are no Measured Mineral Resources estimated at Namdini. A minimum of 25 m spaced drill holes would be needed to support the Measured classification, in RPA's opinion.

The final block classification and average drill hole spacing is shown in Figure 14-12.

RPA notes that there is a good potential to upgrade a significant portion of Inferred Mineral Resources to Indicated by targeting areas which are currently close to the required drill spacing for Indicated. The relationship between tonnes, grade, and sample spacing inside of the pit at a 0.5 g/t Au cut-off grade is shown in Figure 14-13. With respect to infill drilling, RPA recommends the following:

- Diamond drill a staggered infill pattern in areas with an average drill hole spacing between 60 m and 80 m in order to upgrade Inferred Mineral Resources to Indicated.
- Prior to drilling operations, test planned drilling configurations against the block model to ensure that the criteria are met.

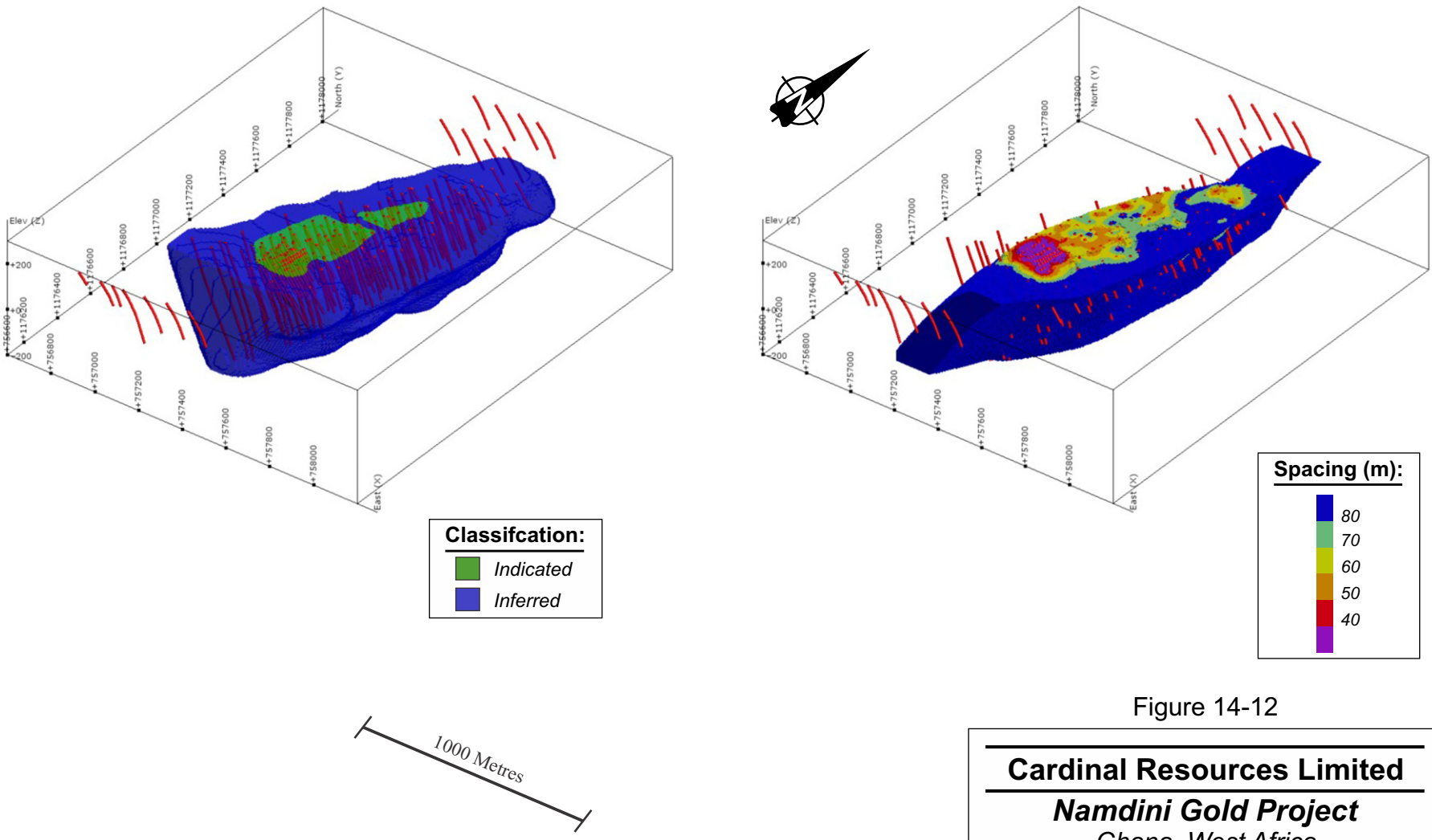


Figure 14-12

Cardinal Resources Limited

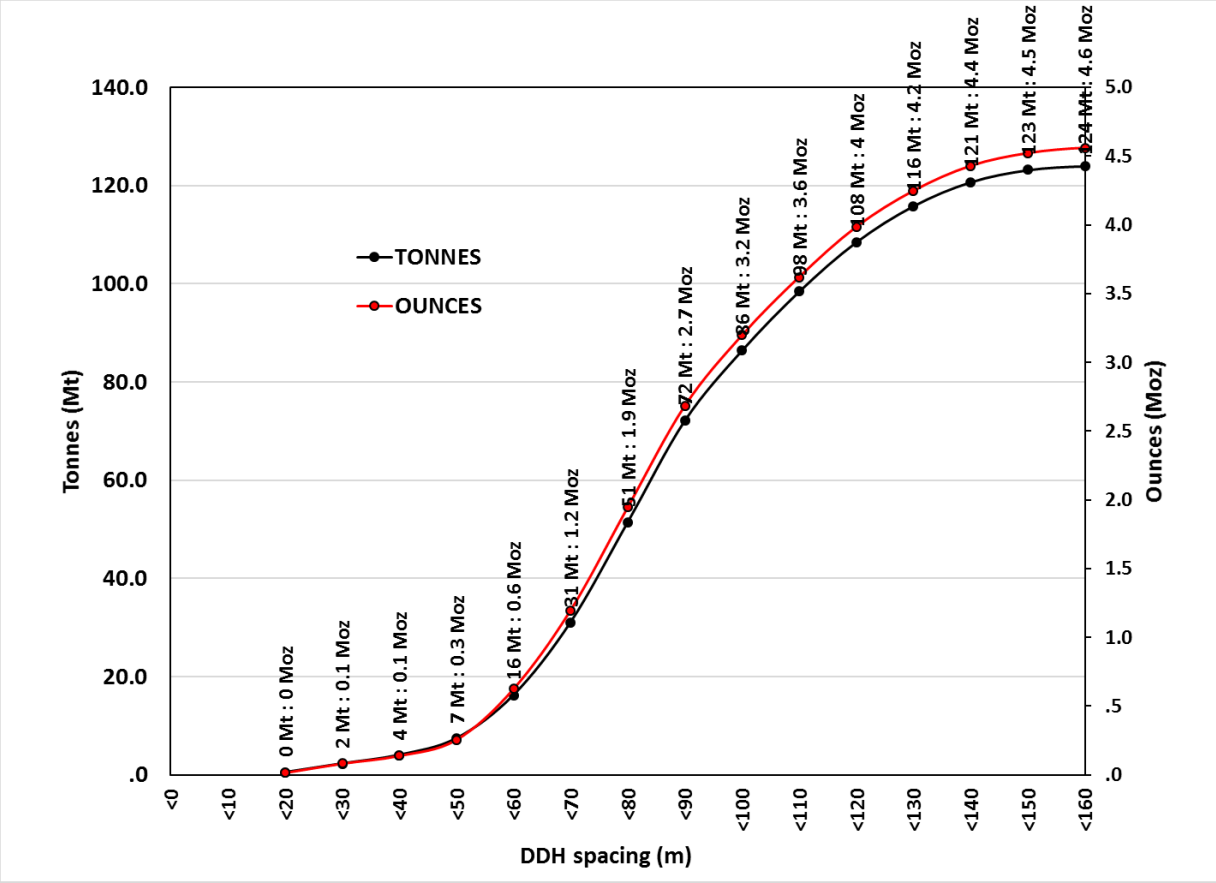
Namdini Gold Project

Ghana, West Africa

Isometric View of the In-Pit Blocks Showing Classification and Drill Hole Spacing

Source: RPA, 2017.

FIGURE 14-13 TONNES AND OUNCES VERSUS DRILL HOLE SPACING



VALIDATION

The OK block estimates were validated using the following methods:

- Visual inspection of plans and vertical sections of blocks versus composite grades (Figures 14-14 and 14-15).
- Comparison between OK, ID^3, NN, and composite statistics (Table 14-14).
- Swath plots and comparison between histograms (Figure 14-16).
- Comparison between the OK grade tonnage curve and the theoretical grade tonnage curve as per the GCOS model (Figure 14-17).

For validation purposes, only blocks classified as Indicated and Inferred were considered. RPA is of the opinion that the block model validation results are reasonable.

TABLE 14-14 STATISTICAL COMPARISON BETWEEN OK, ID^3, NN AND COMPOSITES
Cardinal Resources Ltd. – Namdini Gold Project

Statistic	Sample Data	Declustered Sample Data	OK	OK vs. Declustered Composites	ID^3	ID^3 vs. Declustered Composites	NN	NN vs. Declustered Composites
Points	6,993	6,993	327,050		327,050		327,050	
Mean (g/t Au)	0.87	0.80	0.79	-2%	0.79	-1%	0.79	-1%
Std Dev (g/t Au)	1.34	1.33	0.78	-41%	0.83	-38%	1.32	-1%
Variance (g/t Au)	1.79	1.77	0.61	-65%	0.68	-61%	1.74	-1%
CV (g/t Au)	1.54	1.66	1.00	-40%	1.04	-37%	1.66	0%
Maximum (g/t Au)	18.89	18.89	12.45	-34%	12.79	-32%	18.89	0%
75% (g/t Au)	1.00	0.92	0.92	0%	0.92	1%	0.91	-1%
50% (g/t Au)	0.45	0.39	0.56	44%	0.55	42%	0.41	4%
25% (g/t Au)	0.18	0.15	0.36	146%	0.35	140%	0.15	5%
Minimum (g/t Au)	0.00	0.00	0.00	0%	0.00	0%	0.00	0%

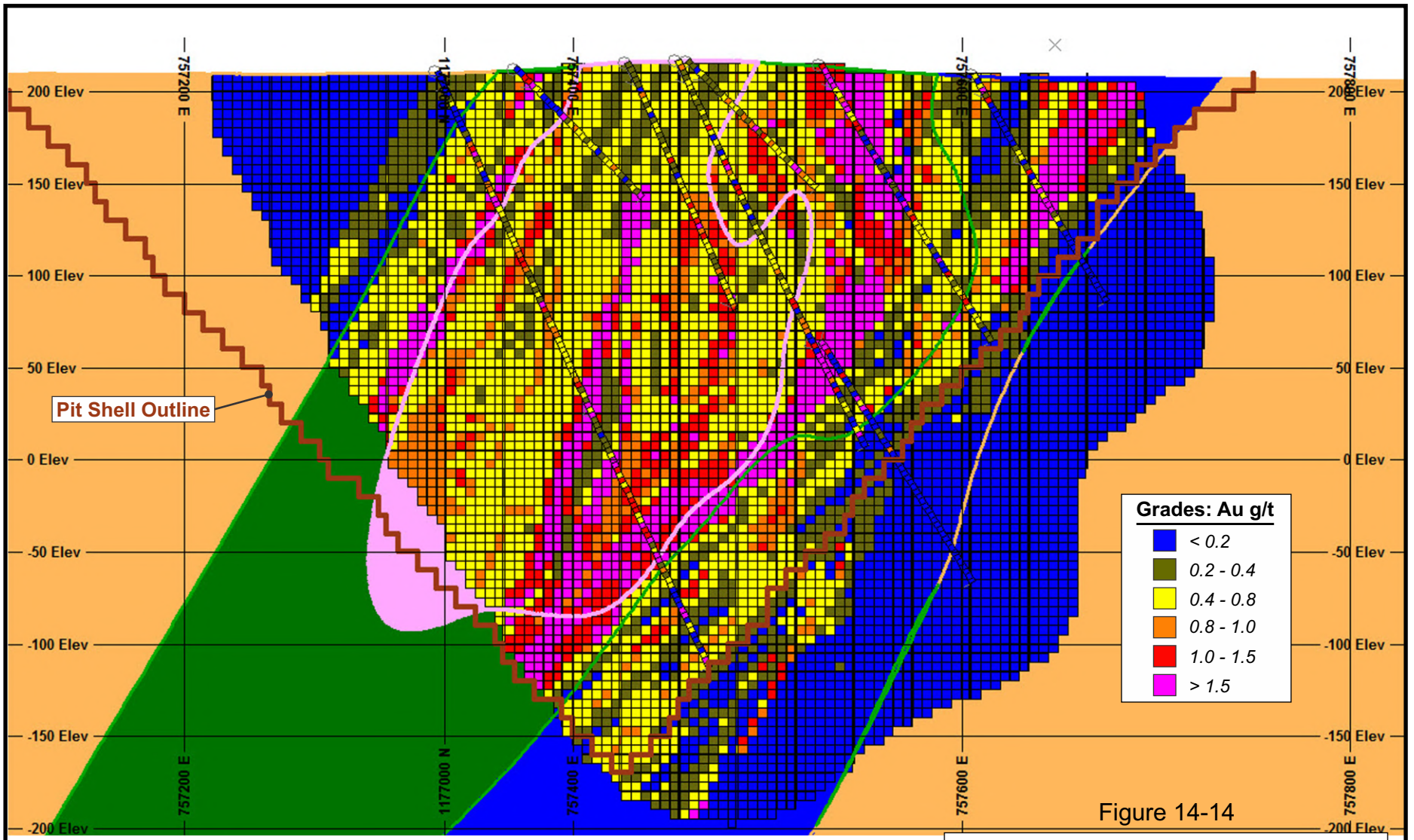


Figure 14-14

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

Vertical Section Block Versus Composite Grades

April 2017

Source: RPA, 2017.

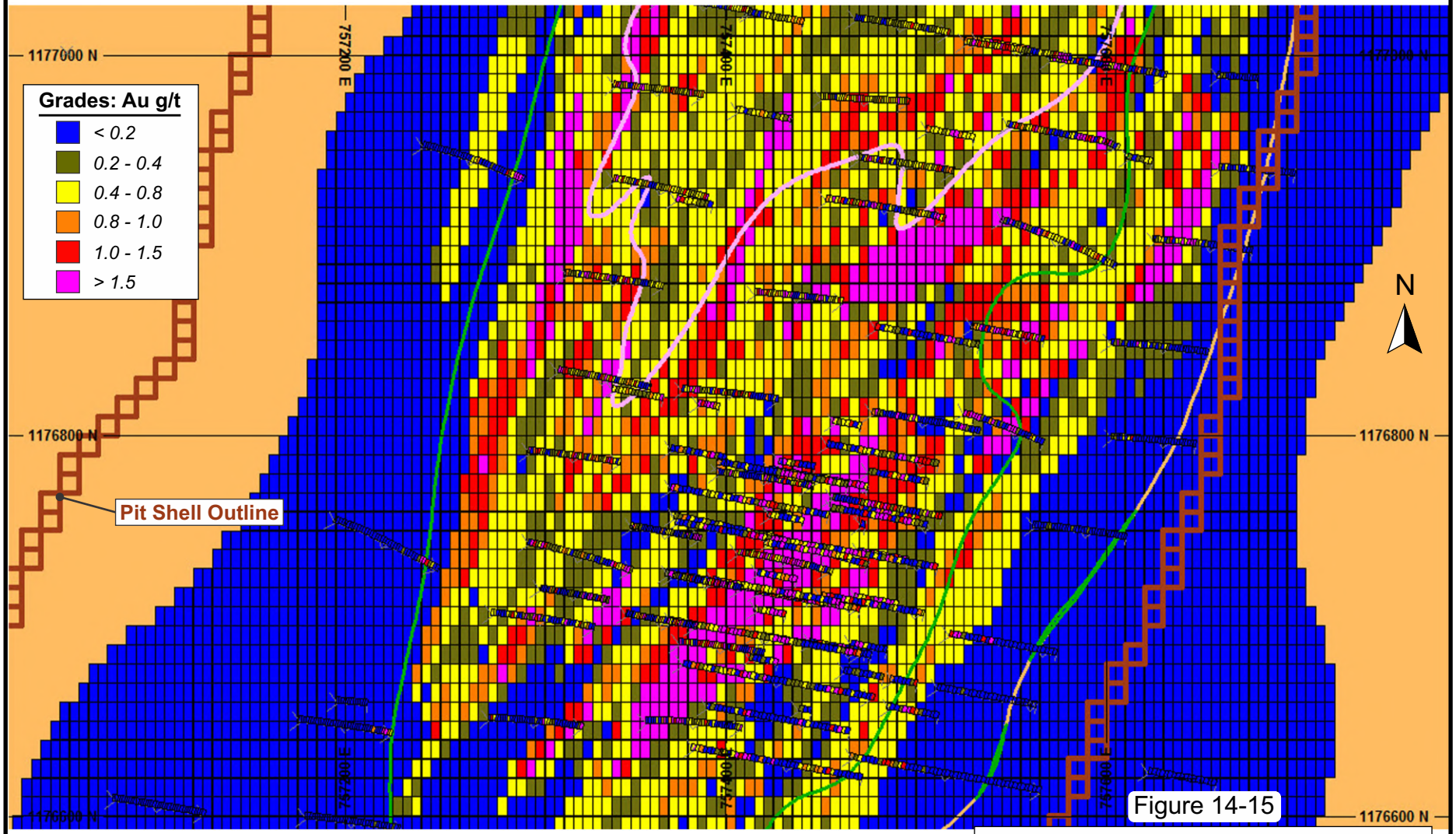


Figure 14-15

Cardinal Resources Limited

Namdini Gold Project

Ghana, West Africa

Plan Section Block Versus Composite Grades

April 2017

Source: RPA, 2017.

www.rpacan.com

FIGURE 14-16 SWATH PLOTS AND HISTOGRAM COMPARISON

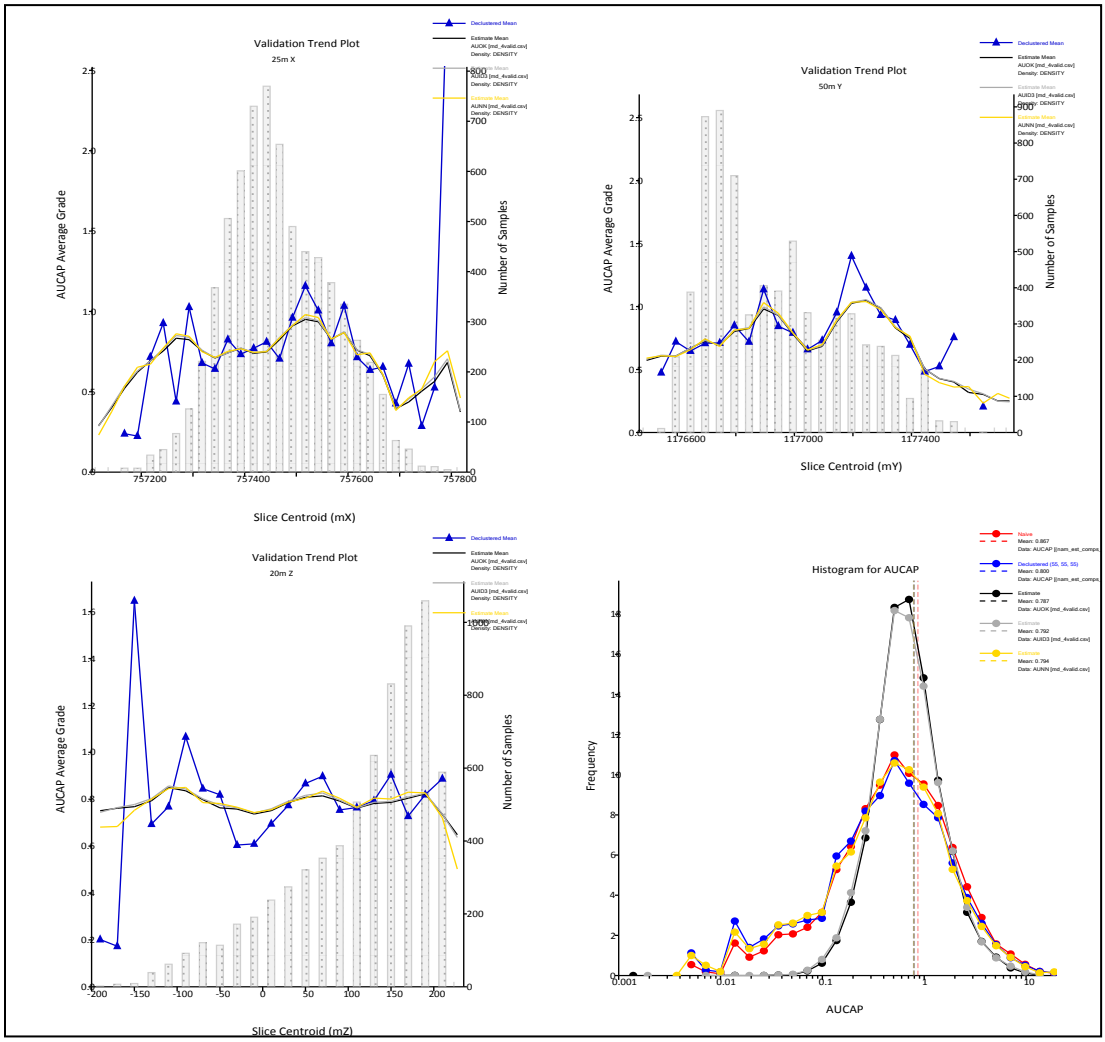
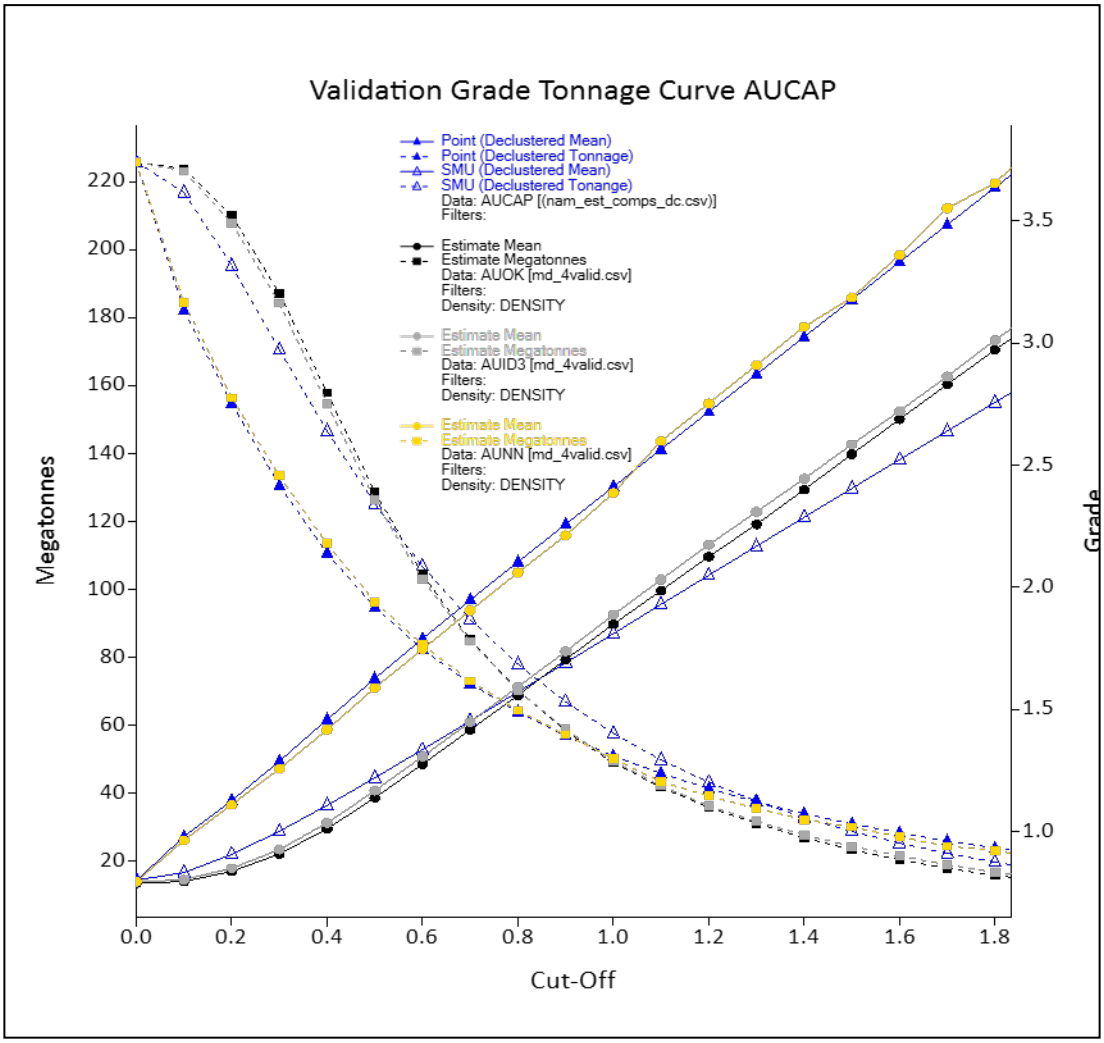


FIGURE 14-17 GLOBAL CHANGE OF SUPPORT CHECK



MINERAL RESOURCES

In order to demonstrate reasonable prospects for eventual economic extraction, Mineral Resources have been reported within a Whittle optimized pit at a cut-off grade of 0.5 g/t Au. A summary of Mineral Resources effective as of the December 2, 2016 by rock type is given in Table 14-15. The sensitivity of Mineral Resources to cut-off grade is shown in Table 14-16.

TABLE 14-15 MINERAL RESOURCES BY LITHOLOGY – AS OF DECEMBER 2, 2016
Cardinal Resources Ltd. – Namdini Gold Project

Category/Lithology	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Indicated			
Meta-Volcanics	16,369	1.24	650
Granite	6,464	1.21	250
Diorite	923	0.95	28
Meta-Sediments	108	0.62	2
Indicated Total	**23,864**	**1.21**	**931**
Inferred			
Meta-Volcanics	55,020	1.19	2,113
Granite	20,169	1.04	673
Diorite	23,985	1.07	822
Meta-Sediments	975	0.66	21
Inferred Total	**100,149**	**1.13**	**3,629**

Notes:
1. JORC (2012) Code was followed for Mineral Resources.
2. Open pit Mineral Resources are estimated at a cut-off grade of 0.5 g/t Au, constrained by a preliminary pit shell.
3. Mineral Resources are estimated using a long-term gold price of US$1,500 per ounce.
4. Incorporates drill holes completed as of December 2, 2016 (up to and including NMDD061).
5. Numbers may not add due to rounding.

TABLE 14-16 SENSITIVITY OF MINERAL RESOURCES TO CUT-OFF GRADE
Cardinal Resources Ltd. – Namdini Gold Project

Category	Cut-Off Grade (g/t Au)	Tonnage (000 t)	Grade (g/t Au)	Contained Metal (000 oz Au)
Indicated	0.3	32,803	0.99	1,046
	0.4	28,381	1.09	996
	0.5	**23,864**	**1.21**	**931**
	0.6	19,821	1.35	860
	0.7	16,462	1.49	790
Inferred	0.3	145,142	0.90	4,209
	0.4	123,094	1.00	3,960
	0.5	**100,149**	**1.13**	**3,629**
	0.6	80,885	1.26	3,289
	0.7	65,818	1.41	2,976

COMPARISON WITH PREVIOUS ESTIMATE

At a cut-off grade of 0.5 g/t Au, the Mineral Resource estimate completed by RPA represents a 231% increase in tonnes, a 10% increase in grade, and a 266% increase in ounces for Indicated and a 3% decrease in tonnes, a 2% decrease in grade, and a 5% decrease in ounces for Inferred compared to the EGRM estimate. The differences can be attributed to the following, in descending order of significance:

- Additional 27 drill holes totalling 6,158 m.
- Changes to the classification criteria.
- Changes to the Mineral Resource estimation methodology.
- Changes to cut-off grade.
- Mineral Resource constrained by a Whittle pit.

Table 14-17 summarizes the differences between the current and the previous Mineral Resource estimates, reported at a cut-off grade of 0.4 g/t Au and 0.5 g/t Au.

TABLE 14-17 RPA 2017 VERSUS EGRM 2016 MINERAL RESOURCES
Cardinal Resources Ltd. – Namdini Gold Project

Category	Tonnes	Grade (Au g/t)	Ounces
EGRM December 2016			
Indicated	7,201,050	1.10	254,675
Inferred	102,785,479	1.15	3,800,383
RPA February 2017 @ 0.4 g/t Au cutoff			
Indicated	28,381,113	1.09	996,417
Inferred	123,094,011	1.00	3,960,335
RPA February 2017 @ 0.5 g/t Au cutoff			
Indicated	23,863,923	1.21	931,079
Inferred	100,148,613	1.13	3,628,895
Difference (RPA (0.4 g/t COG)-EGRM %)			
Indicated	294%	-1%	291%
Inferred	20%	-13%	4%
Difference (RPA (0.5 g/t COG)-EGRM %)			
Indicated	231%	10%	266%
Inferred	-3%	-2%	-5%

15 MINERAL RESERVE ESTIMATE

There is no current Mineral Reserve estimate for the Project.

16 MINING METHODS

This section is not applicable.

17 RECOVERY METHODS

This section is not applicable.

18 PROJECT INFRASTRUCTURE

This section is not applicable.

19 MARKET STUDIES AND CONTRACTS

This section is not applicable.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

Cardinal notes a continuing trend toward substantially increased environmental requirements and evolving corporate social responsibility expectations in Ghana, including the requirement for more permits, analysis, data gathering, community hearings, and negotiations than have been required in the past for both routine operational needs and for new development projects. There has also been a trend to longer lead times in obtaining environmental permits.

ENVIRONMENTAL STUDIES

Environmental matters in Ghana, including those related to mining, fall primarily under the oversight of the Environmental Protection Agency (EPA), as well as the Minerals Commission and the Inspectorate Division of the Minerals Commission. The EPA has laws and regulations that govern, among other things, environmental and socio-economic impact assessments and statements, environmental management plans, emissions into the environment, environmental auditing and review, and mine closure and reclamation, to which the Corporation's operations are subject. Additional provisions governing mine environmental management are provided in the 2006 Mining Act and the various Minerals and Mining Regulations which came into force in 2012.

Cardinal duly registered the Project with the EPA through the submission of an application form. On November 20, 2016, the EPA, under reference number CA 6954/2 directed Cardinal to carry out an Environmental Impact Assessment study (EIA) and submit an Environmental Impact Statement (EIS) to the EPA, in line with the requirement of the Ghana EIA Procedures and Legislative Instrument (LI) 1652. As a first phase in the preparation of the EIS report, the EPA has further directed that a Scoping Study to generate the Terms of Reference for the EIA study be conducted and that a Scoping Report be submitted to the EPA for review.

NEMAS Consult Ltd (NEMAS), of Accra, Ghana, has been contracted by Cardinal to undertake the EIA for the Project. NEMAS has undertaken a site reconnaissance visit and commenced the scoping stage of the process in accordance with the procedures for the EIA study (NEMAS, 2017).

With regard to exploration practices, as per the Cardinal Exploration SOP Manual, any potential emissions and effects associated with exploration activities, which could include habitat modification and associated visual effects, are kept to a minimum. Auger drilling is used as a primary grassroots exploration tool as this method does not cause significant impact on the hole surroundings.

For diamond and RC drilling site preparation and access in the Savannah grassland, it is mostly undergrowth that is cleared, while larger trees are preserved. Drill sites are kept clean of rubbish and free of oil or fuel spills, and are then remediated upon completion of drilling. Each completed drill hole has a PVC pipe protruding out of the ground (with a cement pad listing the drill hole information) that is painted yellow to prevent damage.

SOCIAL OR COMMUNITY IMPACT

The only local community near the Project site comprises artisanal miners and their families. RPA noted that relations between Cardinal and the local artisanal miners appear cordial and respectful, especially as they are allowed to proceed with minor surface artisanal mining while Cardinal exploration activities are ongoing.

Local community members are hired and trained by Cardinal for exploration activities including clearing lines for geochemical surveys, drill site preparation and clean up, and assisting Geological Technicians with RC sample collection. All Cardinal personnel are given a preliminary induction briefing on site relative to the tasks required. Personnel protective equipment (PPE) is provided as required. For the security of all, the Ghana Police Service patrol the Project site 24 hours a day, 7 days a week.

Cardinal has undertaken various community support projects including building a community hall, as well as drilling and equipping a potable water well.

Cardinal also maintains good relations with Bolgatanga Minerals Commission personnel, Community Chiefs, and District Assemblymen. Cardinal's Public Relations Officer handles all local issues.

21 CAPITAL AND OPERATING COSTS

This section is not applicable.

22 ECONOMIC ANALYSIS

This section is not applicable.

23 ADJACENT PROPERTIES

There is no publicly reported information on any properties adjacent to the Namdini Gold Project.

24 OTHER RELEVANT DATA AND INFORMATION

GHANAIAN MINING INDUSTRY OVERVIEW

The following overview on the Ghanaian Mining Industry was provided by Cardinal.

INTRODUCTION

Ghana is situated on the west coast of Africa, approximately 600 km north of the Equator on the Gulf of Guinea. Accra, the capital city of Ghana, is located almost exactly on the Prime Meridian. The former British colony changed its name from the Gold Coast to Ghana on achieving independence on March 6, 1957. Ghana is now a republic with a population of approximately 25 million people and a democratically elected government. English remains the official and commercial language.

The total land area of the country is approximately 238,000 km^2 and the topography is relatively flat. Ghana has a tropical climate with two rainy seasons and two dry seasons each year.

GHANAIAN LEGAL SYSTEM

The Ghanaian legal system is generally modelled after and based on British common law. The laws of Ghana include the Constitution, national laws passed by Parliament (or under authority granted by Parliament) and the common law of Ghana. The common law of Ghana includes customary rules which apply to particular communities in Ghana.

Cardinal has found Ghana to be stable (politically and economically) over the time in which it has engaged in operations in Ghana.

MINING REGULATORY FRAMEWORK

The Constitution of Ghana vests title in every mineral in its natural state to the President of Ghana on behalf of, and in trust for, the people of Ghana. The exercise of any mineral right in the form of reconnaissance, exploration or exploitation of any mineral in Ghana requires an appropriate licence or mineral right to be issued by the Government of Ghana acting through the Minister responsible for Lands and Natural Resources. The Minister responsible for Lands

and Natural Resources administers, promotes and regulates Ghana's mineral wealth through the Minerals Commission, a governmental organization established in accordance with the Minerals Commission Act 1993 (Act 450) and the Minerals and Mining Act 2006 (Act 703) (the 2006 Mining Act).

Pursuant to the 2006 Mining Act, a number of regulations were passed in 2012 to clarify and implement provisions of the 2006 Mining Act. These regulations relate to matters such as licensing, local content, technical issues, mineral right holding costs, mine support services and resettlement and payment of compensation to persons impacted by mining operations. The 2006 Mining Act provides for a number of categories of licences.

A reconnaissance licence confers on the holder the right to search for a specific mineral or commodity within the licence area by geochemical and photo-geological surveys or other remote sensing techniques. Except as otherwise provided in the licence, it does not permit drilling, excavation or other sub-surface techniques. A reconnaissance licence is normally granted for up to one year and may be renewed by the Minister from time to time for periods up to one year at a time upon application by the holder. The size of the area over which a reconnaissance licence may be granted is limited to 5,000 contiguous blocks or 1,050 km^2.

A corporate body duly registered in Ghana can apply to the Minerals Commission for a renewable exploration (prospecting) license granting exclusive rights to explore for a particular mineral in a selected area for an initial period not exceeding three years. A prospecting licence may be renewed for a maximum of two further terms of up to three years each, subject to surrender of a portion of the area.

When exploration has successfully delineated a mineral reserve, an application may be made to the Minerals Commission for conversion to a mining lease, granting a company the right to produce a specific product from the concession area, normally for a period of 30 years or a lesser period that may be agreed upon with the applicant.

Once a licence or mineral right is issued to an entity by the Government of Ghana, Ghanaian mining laws prevent that licence or mineral right from being transferred, assigned or mortgaged by the licensee or mineral right holder without the prior written approval of the Minister responsible for Lands and Natural Resources. The Ghana Minerals Commission is also required to maintain a public register of all applications, grants, variations, transfers,

suspensions, and cancellations of such licences or mineral rights. Official searches may be conducted in the public register to obtain information regarding any licence or mineral right granted by the Government of Ghana.

The 2006 Mining Act requires that any person who intends to acquire a controlling share of the equity of any mining company that has been granted a mineral right, must first give notice of its intent to the Minister responsible for Lands and Natural Resources and also obtain the no objection of the Minister prior to acquiring a controlling share.

Under the 2006 Mining Act, the Government of Ghana is entitled to a 10% free carried interest in all companies that hold mining leases. The 10% free carried interest entitles the Government to a pro-rata share of future dividends. The Government has no obligation to contribute development capital or operating expenses.

The Government of Ghana also has the right to acquire an additional interest in such companies for a price fixed by agreement.

Under the 2006 Mining Act, the Government of Ghana is empowered to acquire a special or "golden" share in any mining company. The special share would constitute a separate class of shares with such rights as the Government and the mining company might agree. Though deemed a preference share, it could be redeemed without any consideration or for a consideration determined by the mining company and payable to the holder on behalf of the Government of Ghana.

In the absence of any such agreement, the special share would have the following rights:

- it would carry no voting rights but the holder would be entitled to receive notice of, and to attend and speak at, any general meeting of the members or any separate meeting of the holders of any class of shares;
- it could only be issued to, held by, or transferred to the Government of Ghana or a person acting on behalf of the Government;
- the written consent of the holder would be required for all amendments to the organizational documents of the company, the voluntary winding-up or liquidation of the company, or the disposal of any mining lease, or the whole or any material part of the assets of the company;

- it would not confer a right to participate in the dividends, profits or assets of the company or a return of assets in a winding-up or liquidation of the company; and
- the holder of a special share may require the company to redeem the special share at any time for no consideration or for a consideration determined by the company.

To Cardinal's knowledge, for as long as it has been operating in Ghana, no mining company has been requested to issue a special share.

The Government of Ghana has a pre-emptive right to purchase all gold and other minerals produced by mines in Ghana. The purchase price would be agreed by the Government of Ghana and the mining company, or the price established by any gold hedging arrangement between the company and any third party approved by the Government, or the publicly quoted market price prevailing for the minerals or products as delivered at the mine or plant where the right of pre-emption was exercised.

GHANAIAN ROYALTIES AND TAXES

Ghanaian law sets mineral royalties at a flat rate of 5% of mineral revenues. The corporate income tax rate is 35% of taxable income for mining companies. Capital expenditures (tax depreciation) are deductible at a flat rate of 20% over a five-year period.

The tax regulations disallow expenditures from one mining area as a deduction from revenues in a separate mining area belonging to the same company in determining the company's taxable income for tax purposes.

In 2012, the Government of Ghana announced its intent to introduce a 10% windfall profit tax on mining companies in 2013. As a result of the decline in spot gold prices during 2013 the Government of Ghana suspended its implementation of the proposed windfall profit tax. However if gold prices increase, the Government of Ghana may proceed with its plan to implement the proposed 10% windfall profit tax. Under the 2006 Mining Act, the Government of Ghana may enter into a stability agreement with the holder of the mining lease, to ensure that the holder of the mining lease will not, for a period not exceeding fifteen years from the date of the agreement,

1. be adversely affected by a new enactment, order, instrument or other action made under a new enactment or changes to an enactment, order, instrument that existed at the time of the stability agreement, or other action taken under these that have the

effect or purport to have the effect of imposing obligations upon the holder or applicant of the mining lease, and

2. be adversely affected by subsequent changes to:
    a. the level of and payment of customs or other duties relating to the entry of materials, goods, equipment and any other inputs necessary to the mining operations or project,
    b. the level of and payment of royalties, taxes, fees and other fiscal imports, and
    c. laws relating to exchange control, transfer of capital and dividend remittance.

A stability agreement entered into is subject to ratification by the Parliament of Ghana.

In 2011, the Government established a tax stability renegotiation team to review the existing tax stability agreements of some major mining companies operating in Ghana.

ENVIRONMENTAL AND OTHER LAWS AND REGULATIONS

All phases of mineral exploration, project development, and operations are subject to environmental laws and regulations. These laws and regulations may define, among other things, air and water quality standards, waste management requirements, and closure and rehabilitation obligations. In general, environmental legislation is evolving to require stricter operating standards, more detailed socio-economic and environmental impact assessments for proposed projects, and a heightened degree of accountability of companies and their officers, directors, and employees for corporate social responsibility, and health and safety. Changes in environmental regulations, and the way they are interpreted by the regulatory authorities, could affect the way the Corporation operates, resulting in higher environmental and social operating costs that may affect the viability of operations.

Environmental matters in Ghana, including those related to mining, fall primarily under the oversight of the Environmental Protection Agency (“EPA”), as well as the Minerals Commission and the Inspectorate Division of the Minerals Commission. The EPA has laws and regulations that govern, among other things, environmental and socio-economic impact assessments and statements, environmental management plans, emissions into the environment, environmental auditing and review, and mine closure and reclamation, to which the Corporation’s operations are subject. Additional provisions governing mine environmental management are provided in the Minerals and Mining Act, 2006, and the various Minerals and Mining Regulations which came into force in 2012.

Cardinal notes a continuing trend toward substantially increased environmental requirements and evolving corporate social responsibility expectations in Ghana, including the requirement for more permits, analysis, data gathering, community hearings, and negotiations than have been required in the past for both routine operational needs and for new development projects. There has been a trend to longer lead times in obtaining environmental permits.

Cardinal's mineral exploration activities and anticipated development, mining and processing operations will also be subject to various laws governing prospecting, development, production, taxes, labor standards, occupational health and safety, land rights of local people and other matters. New rules and regulations may be enacted or existing rules and regulations may be modified and applied in a manner that could have an adverse effect on the Cardinal's financial position and results of operations.

GHANAIAN POLITICAL RISK

The Fraser Institute 2015 mining survey, published in June 2016, included a Policy Perception Index (PPI) which is a composite index measuring the overall policy attractiveness of the mining jurisdictions for investment. The index is composed of survey responses to 15 policy factors that affect investment decisions. Ghana ranked at 52 out of 109 jurisdictions.

25 INTERPRETATION AND CONCLUSIONS

RPA offers the following conclusions:

GEOLOGY AND MINERAL RESOURCES

- The Namdini gold deposit is a large structurally controlled orogenic gold deposit with numerous features similar to deposits found elsewhere in late Proterozoic Birimian terranes of West Africa.
- Cardinal has a detailed Standard Operating Procedure Manual for Exploration and Drilling Practices that facilitates the standardization and consistency of data collection by all field technical personnel.
- In RPA's opinion, the Cardinal exploration program activities meet the CIM Exploration Best Practices Guidelines. Cardinal's protocols for drilling, sampling, analysis, security, and database management meet industry standard practices.
- Drilling has outlined mineralization with three-dimensional continuity and of size and grades that can potentially be extracted economically.
- The drill hole database was verified by RPA and is suitable for Mineral Resource estimation.
- In RPA's opinion, the December 2, 2016 Mineral Resource estimate has been completed to a level that meets industry standards, is compliant with the JORC (2012) Code, and the results are reasonable.
- At a cut-off grade of 0.5 g/t Au, Indicated Mineral Resources are estimated to total 23.86 Mt at an average grade of 1.21 g/t Au for 931,000 ounces of contained gold. At the same cut-off grade, Inferred Mineral Resources are estimated to total an additional 100.1 Mt at an average grade of 1.13 g/t Au for 3,629,000 ounces of contained gold.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Based on a review of Cardinal's data, RPA accepted the proposed overall recovery of 82%, pending review of the new metallurgical test data.
- RPA notes that the recovery appears to be dependent upon the ratios of the various lithologies, which change as the resource model is updated and depending upon the cut-off grade.
- In RPA's opinion, the refractory nature of the gold, which requires ultra-fine grinding to facilitate recovery in a cyanide leach circuit, is the major factor that has the potential to impact the Project economics. Deleterious elements are not thought to pose a risk to the Project.

ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

- NEMAS Consult Ltd (NEMAS), of Accra, Ghana, has been contracted by Cardinal to undertake the EIA for the Project. NEMAS has undertaken a site reconnaissance visit and commenced the Scoping stage of the process in accordance with the EPA procedures for the EIA study.

- Cardinal's exploration activities are undertaken such that any potential emissions and effects associated with exploration activities, which could include habitat modification and associated visual effects, are kept to a minimum.

- Relations between Cardinal and the local artisanal mining community appear cordial and respectful. Local community members are hired and trained by Cardinal for exploration activities.

- Cardinal also maintains good relations with Bolgatanga Minerals Commission personnel, Community Chiefs, and District Assemblymen. Cardinal's Public Relations Officer handles all local issues.

RISKS

The Namdini Gold Project is still in the early stages of evaluation and additional exploration, engineering, and other analysis is required to fully assess the Project.

In RPA's opinion, there are no significant technical risks and/or uncertainties that could reasonably be expected to affect the reliability and/or confidence in the exploration information and/or Mineral Resource estimate.

Independent Witness Sampling confirmed the presence of gold in the same order of magnitude as the original samples and demonstrated no significant difference in the half core and quarter core data. In addition, the RC and diamond drill data sets also appear to be comparable, especially at a composite length of three metres. Overall, the close spaced RC drilling impacts less than 10% of the overall estimated contained metal.

The QA/QC program as designed and implemented by Cardinal is adequate, and the assay results within the resource database are suitable for use in a Mineral Resource estimate.

26 RECOMMENDATIONS

The Namdini Project hosts a significant gold deposit and merits considerable infill as well as resource expansion exploration, as well as advanced studies. The near-term primary objectives are to improve the confidence in the Mineral Resource estimate and initiate a Preliminary Economic Assessment.

RPA's recommendations are as follows:

GEOLOGY AND MINERALIZATION

- Further detailed studies are warranted on the lithological and structural controls on mineralization, particularly as the drilling density increases and the deposit is explored deeper.

DRILLING AND SAMPLING

- While the survey control, and collar surveys are considered to be accurate and appropriate, RPA recommends that Cardinal implement a high resolution (sub-metre accuracy) DTM.

- All future RC holes should be downhole surveyed.

- RPA also recommends that Cardinal implement a numerical Mine Grid, aligned along the strike of the orebody, and discontinue the use of alphanumeric sectional definitions.

- RPA concurs with Orefind's recommendation for utilizing a core-orienting frame. This level of detail will be important to determine mineralization plunges.

- With regard to sampling issues, RPA recommends the following:
    - Replace the current pre-pulverized blank material with coarse blanks.
    - Implement a CRM at the average resource grade (approximately 1.2 g/t Au).
    - Allow manual insertion of blank samples after suspected high grade intervals.
    - Implement a regular umpire analysis program.
    - Carry out careful monitoring of blank and CRM sample insertion.
    - Investigate the high failure rate of CRM STD (544) so that any required adjustments can be made or replacement of that CRM with an alternative one.
    - Reject and re-assay as needed assay batch fails.
    - Implement coarse reject (after crushing) diamond duplicates.
    - Drill additional RC/DDH twinned holes for comparisons of sample results prior to any close spaced grade control RC drilling.
    - Carry out sampling on a half core basis in all future Namdini Mineral Resource drilling.

MINERAL RESOURCE MODEL

- Build mineralization wireframes based on litho-structural information, preferably using Leapfrog software. Benefits will include:
  - A potential positive impact on the gold grade.
  - A better control on estimates.
  - Improved variography and better understanding of plunges.
  - Better understanding of geology to assist exploration targeting at depth.

- While the indicator methodology is effective at outlining different grade populations associated with the controls on mineralization for the current stage of the Project, RPA recommends that as the Project advances, high and low grade wireframes should be used to constrain estimation.

- Additional bulk density information should be collected for the strongly and moderately oxidized weathered lithologies as well as for the transition and fresh meta-sediments and diorite lithologies.

- Conduct infill drilling on 50 m drill sections for those areas that are currently averaging 60 m to 80 m drill spacing, to confirm continuity and potentially upgrade Inferred Mineral Resources to Indicated. A staggered pattern is recommended to optimize planned holes, minimize over-drilling, and meet target criteria.

- Prior to drilling operations, test planned drilling configurations against the block model to ensure that the criteria are met.

MINERAL PROCESSING AND METALLURGICAL TESTING

- Continue with metallurgical test work studies, specifically focusing on the relationship between metallurgical response and geological domains, to further optimize the processes.

- In order to accurately reflect the recoveries to be used in the future, tests should be conducted on samples containing separate lithologies, rather than on composite samples, so recovery can be reported by lithology for input into future block models.

ENVIRONMENTAL STUDIES AND PERMITTING

- Cardinal should continue with formal studies, by internationally recognized consultants, to determine the potential impact on the environment and community.

PROPOSED PROGRAM AND BUDGET

RPA has reviewed and concurs with Cardinal's proposed budgets. The recommended Phase I program, to be initiated as soon as practical, consists mainly of infill diamond drilling to upgrade Inferred Mineral Resources to Indicated Mineral Resources, targeting areas in the central core of the deposit.

Also proposed in Phase I is an update of the Mineral Resource estimate followed by a PEA (Scoping Study). The budget for this program is approximately US$1,600,000.

Details of the recommended Phase I program can be found in Table 26-1.

TABLE 26-1 PROPOSED PHASE I EXPLORATION BUDGET
Cardinal Resources Ltd. – Namdini Gold Project

Item	US$
Core Drilling (35 holes for 7,500 m)	1,100,000
Metallurgical Test Work	50,000
Environmental and Social Studies	50,000
Mineral Resource Update	100,000
Preliminary Economic Assessment	150,000
Subtotal	1,450,000
Contingency	150,000
Total Phase I	**1,600,000**

Contingent upon the Phase I program results, the proposed Phase II program consists of further drilling to the west in order to test down dip extensions of the current Mineral Resources, as well as to the north to potentially extend the mineralized zone along strike. Phase II drilling also consists of resource RC drilling designed to upgrade Indicated Mineral Resources to the Measured category in the constrained higher grade area. The budget for this Phase II exploration program is approximately US$3,000,000 (Table 26-2).

TABLE 26-2 PROPOSED PHASE II EXPLORATION BUDGET
Cardinal Resources Ltd. – Namdini Gold Project

Item	US$
Core Drilling (20 holes for 12,000 m)	2,000,000
RC Drilling (7,000 m)	600,000
Mineral Resource Update	100,000
Subtotal	2,700,000
Contingency	300,000
Total Phase II	**3,000,000**

27 REFERENCES

Barnes, J.H.F. Dr., 2016: Namdini Gold Project, Independent Project Review, Northern Ghana, West Africa. Prepared by Hiscen Limited on behalf of Cardinal Resources Limited. May 2016.

Cardinal Resources Ltd (2015): Procedure Manual. Internal unpublished document.

Cardinal Resources Ltd, 2016: Press Release, www.cardingal7_Nov_2016_4_Million_Ounce_Maiden_Resource_at_Namdini.pdf. November 7, 2016

Gossage, B (2017): Namdini Gold Project, Mineral Report Estimate Study, Prepared by EGRM Consulting Pty Ltd on behalf of Cardinal Resources Limited. http://cardinalresources.com.au/uploads/documents/2017/20_Feb_2017_Mineral_Resource_Estimate_Study_Report_-_EGRM_Consulting_Pty....pdf. February 17, 2017.

Gleeson, P., and Arthur, J., 2015: Independent Geological Report and Review, Namdini Gold Project Northern Ghana, West Africa. Prepared for Cardinal Resources Ltd. Report prepared by SRK Consulting (UK) Limited. April 2015.

Gleeson, P., and Cobb M., 2012: Independent Geologist's Report Bolgatanga Gold Project, Ghana Subranum Gold Project, Ghana Kilo-Moto Gold Project, Democratic Republic of Congo. Prepared for Ridge Resources Ltd by SRK Consulting (Australasia) Pty Ltd. September 2012.

Gleeson, P., and Cobb M., 2012: Independent Geologist's Report Bolgatanga Gold Project, Ghana Subranum Gold Project, Ghana Kilo-Moto Gold Project, Democratic Republic of Congo. Prepared for Ridge Resources Ltd by SRK Consulting (Australasia) Pty Ltd. September 2012.

Gleeson, P., and Arthur, J., 2015: Independent Geological Report and Review, Namdini Gold Project Northern Ghana, West Africa. Prepared for Cardinal Resources Ltd. Report prepared by SRK Consulting (UK) Limited. April 2015.

Ghana Government, Upper East Region, www.ghana.gov.gh/index.php/about-ghana/regions/upper-east, (January 16, 2017).

Griffis, R., et al., 2006. Minerals Commission of Ghana, Gold Deposits of Ghana.

Meteoblue, Climate Bolgatanga, www.meteoblue.com/en/weather/forecast/modelclimate/bolgatanga_ghana_2302821, (January 16, 2017).

NEMAS Consult, 2017: Environmental Protection Agency of Ghana's Requirements for the Issuance of Environmental Permit for Cardinal Resources Upper East Large Scale Gold Mining Project. Internal Letter. February 27, 2017.

Schlüter, T., 2008: Geological Atlas of Africa, 2nd edition: Berlin Heidelberg, Springer-Verlag, pp. 301.

Smith, A.J.B., Henry, and Frost-Killian, S, 2016: A review of the Birimian Supergroup and Tarkwaian Group-Hosted Gold Deposits of Ghana. DST-NRF Centre of Excellence for Integrated Mineral and Energy Resource Analysis, Department of Geology, University of Johannesburg, South Africa. http://www.episodes.org/index.php/epi/article/viewFile/95775/71139 (January 16, 2016)

28 DATE AND SIGNATURE PAGE

This report titled "Technical Report on the Namdini Gold Project, Ghana, West Africa" and dated April 5, 2017 was prepared and signed by the following authors:

(Signed and Sealed) "*Ian T. Blakley*"

Dated at London, UK
April 5, 2017

Ian T. Blakley, P.Geo.
Principal Geologist

(Signed and Sealed) "*Sean D. Horan*"

Dated at Toronto, ON
April 5, 2017

Sean D. Horan, P.Geo.
Senior Geologist

(Signed and Sealed) "*Kathleen Ann Altman*"

Dated at Lakewood, CO
April 5, 2017

Kathleen Ann Altman, Ph.D., P.E.
Principal Metallurgist

29 CERTIFICATE OF QUALIFIED PERSON

IAN T. BLAKLEY

I, Ian T. Blakley, P.Geo., as an author of this report entitled “Technical Report on the Namdini Gold Project, Ghana, West Africa” prepared for Cardinal Resources Limited dated April 5, 2017, do hereby certify that:

1. I am a Principal Geologist and Vice-President and General Manager of RPA UK Ltd. of One Fetter Lane, Suite 413, London, UK EC4A 1BR.

2. I am a graduate of the University of Waterloo, Waterloo, Ontario, Canada, in 1984 with a Bachelor of Science degree in Honours Co-operative Applied Earth Sciences/Geology Option.

3. I am registered as a Professional Geoscientist in the Province of Ontario (Reg. #1446). I have worked as a Geologist for a total of 34 years since my graduation. My relevant experience for the purpose of the Technical Report is:
    - Review and reporting, including Mineral Resource estimation, as a geological consultant on numerous exploration and mining projects around the world for due diligence and regulatory requirements.
    - Vice-President – Exploration with a Canadian private company exploring and developing world-class gold assets in northeastern Kazakhstan.
    - Chief Geologist with a major Canadian mining company responsible for the management of geological exploration, resource definition and production.
    - Senior Mines Exploration Geologist for new capital underground mining projects including exploration and definition drilling, resource definition, infrastructure positioning, production and reconciliation.
    - Exploration Geologist responsible for sampling and mapping programs at gold and base metal properties in Canada.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I visited the Namdini Gold Project from December 16 to 20, 2016.

6. I am responsible for Sections 1 to 12 and 15 to 27 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

8. I have had no prior involvement with the property that is the subject of the Technical Report.

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 5th day of April, 2017.

(Signed and Sealed) "*Ian T. Blakley*"

Ian T. Blakley, P. Geo.

SEAN D. HORAN

I, Sean D. Horan, P.Geo., as an author of this report entitled “Technical Report on the Namdini Gold Project, Ghana, West Africa” prepared for Cardinal Resources Limited dated April 5, 2017, do hereby certify that:

1. I am Senior Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.

2. I am a graduate of Rhodes University, South Africa, in 2003 with a B.Sc. (Hons.) degree in Environmental Studies, and in 2004 with a B.Sc. (Hons.) degree in Geology. I also have a post-graduate certificate in Geostatistics from the University of Alberta, Canada.

3. I am registered as a Professional Geologist in the Province of Ontario (Reg.#2090). I have worked as a geologist for a total of 10 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Geological consulting to the mining and exploration industry in Canada and worldwide, including resource estimation and reporting, due diligence, geostatistical studies, QA/QC, and database management.
   - Geologist responsible for all geological aspects of underground mine development, underground exploration, resource definition drilling planning, and resource estimation at a gold mine in Ontario, Canada.
   - Geologist with an alluvial diamond mining and prospecting company in Angola.
   - Experienced user of AutoCAD, Datamine Studio 3. SQL Database Administration, Visual Basic, Javascript (Datamine Studio 3), Century Systems (Fusion SQL drill hole database tools), Snowden Supervisor, and GSLIB.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I did not visit the Namdini Project.

6. I am responsible for Section 14 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

8. I have had no prior involvement with the property that is the subject of the Technical Report.

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 5th day of April, 2017.

(Signed and Sealed) "*Sean D. Horan*"

Sean Horan, P.Geo.

KATHLEEN ANN ALTMAN

I Kathleen Ann Altman, Ph.D., P.E., as an author of this report entitled “Technical Report on the Namdini Gold Project, Ghana, West Africa” prepared for Cardinal Resources Limited dated April 5, 2017, do hereby certify that:

1. I am Principal Metallurgist and Director, Mineral Processing and Metallurgy with RPA (USA) Ltd. of Suite 505, 143 Union Boulevard, Lakewood, Co., USA 80228.

2. I am a graduate of the Colorado School of Mines in 1980 with a B.S. in Metallurgical Engineering. I am a graduate of the University of Nevada, Reno Mackay School of Mines with an M.S. in Metallurgical Engineering in 1994 and a Ph.D. in Metallurgical Engineering in 1999.

3. I am registered as a Professional Engineer in the State of Colorado (Reg. #37556) and a Qualified Professional Member of the Mining and Metallurgical Society of America (Member #01321QP). I have worked as a metallurgical engineer for a total of 35 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Review and report as a metallurgical consultant on numerous mining operations and projects around the world for due diligence and regulatory requirements.
   - I have worked for operating companies, including the Climax Molybdenum Company, Barrick Goldstrike, and FMC Gold in a series of positions of increasing responsibility.
   - I have worked as a consulting engineer on mining projects for approximately 15 years in roles such a process engineer, process manager, project engineer, area manager, study manager, and project manager. Projects have included scoping, prefeasibility and feasibility studies, basic engineering, detailed engineering and start-up and commissioning of new projects.
   - I was the Newmont Professor for Extractive Mineral Process Engineering in the Mining Engineering Department of the Mackay School of Earth Sciences and Engineering at the University of Nevada, Reno from 2005 to 2009.

4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I did not visit the Namdini Project.

6. I am responsible for Section 13 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

8. I have had no prior involvement with the property that is the subject of the Technical Report.

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 5th day of April, 2017.

(Signed and Sealed) "*Kathleen Ann Altman*"

Kathleen Ann Altman, Ph.D., P.E.

30 APPENDIX 1 – JORC (2012) CODE TABLE 1

The following table provides a summary of important assessment and reporting criteria used at the Namdini Gold Deposit for the reporting of Mineral Resources and Ore Reserves 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.

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.*	• Diamond Drill (DD) and Reverse Circulation (RC) samples are taken on strict 1.0 m intervals for assay purposes. • Drilling is undertaken using two Cardinal owned rigs (one RC/DD and one DD). • Auger drilling and grab sampling are used during early stage exploration but are not included in any resource. • Sampling is carried out under QA/QC procedures that included the regular insertion of standards, blanks, and duplicates.
	• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	• Sample representivity is ensured through detailed logging and sampling procedures.
	• *Aspects of the determination of mineralisation that are Material to the Public Report.*	• The gold mineralisation occurs in sheared and highly altered rocks containing sulphides (pyrite and arsenopyrite).
	• *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.*	• HQ core is quartered, with the same quarter consistently sampled. One metre samples are taken irrespective of lithological units. The quarter core samples weigh ~2 kg, which are dried, then crushed and a split portion of <1.5 kg is pulverised to produce a 50 g charge for fire assay.

Criteria	JORC Code Explanation	Commentary
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).*	• DD holes are drilled exclusively using HQ rods (63.3 mm). Triple tube in saprolite at top of the hole. Core is orientated using Reflex equipment. • RC samples use a 5.5 inch drill bit.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	• DD recovery is measured at the rig by comparing the core length with the known distance drilled. • RC recovery is measured by weighing the entire recovered sample and comparing it to a known reference value for each lithology and weathering zone. • Results are recorded on a hand held Motion F5te Tablet PC using a set of standard templates supplied by Maxwell Geoservices, Perth (Maxwell).
	• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	• DD sample recovery is maximised by reducing drilling speed in poor ground conditions. • RC sample recovery is maximised by minimising fine loss through blow off and ensuring dry samples are obtained. • RC holes observed as having poor recovery are stopped and are continued with a DD tail.
	• *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.*	• 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.
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.*	• Core samples have been logged for lithology, alteration style and intensity, mineralisation, structures and veining on a very detailed level that is suitable to support Mineral Resource estimates.
	• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc)*	• Logging is both qualitative (e.g. alteration intensity) and quantitative (e.g. vein percentage).

Criteria	JORC Code Explanation	Commentary
	photography.	• Core is photographed both in dry and wet form.
	• *The total length and percentage of the relevant intersections logged.*	• All holes are logged in full.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.*	• HQ core his quartered and sampled, with the remaining three quarters of core stored in the original core trays and stacked on shelves under cover in the core shed.
	• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*	• RC samples are dried and riffle split on a three tier system.
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	• Sample preparation is currently completed at SGS Laboratories, Tarkwa, Ghana. All preparation equipment is flushed with barren material prior to the commencement of sample preparation. The entire sample is dried, crushed to a nominal 2 mm using a Jaw Crusher, then <1.5 kg is split using a Jones type riffle splitter. The reject sample is retained in the original sample bag. The split is pulverised in a LM2 grinding mill to a nominal 85% passing 75 µm size fraction. An approximate 50 g sub-sample split is taken for fire assay with the pulverized residue retained in a plastic bag.
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	• Samples are homogenised at both 2 mm and 75 µm particle sizes prior to sub-sampling. Reject samples are routinely analysed by both Cardinal and SGS to ensure that samples are representative. Cardinal Reject duplicates show a correlation coefficient of between 0.99 and 1.00.
	• *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.*	• All samples are taken on 1.0 m intervals down the entire length of the hole. Every sample is submitted for analysis regardless of geology. • DD samples are always from the right side of the core

Criteria	JORC Code Explanation	Commentary
		to reduce possible selection bias. • Field duplicates of remaining quarter core (DD) or retained riffle split samples (RC) are submitted routinely. The vast majority plot within ± 20% deviation and have a correlation coefficient between 0.92 and 0.93.
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• The sample sizes are considered appropriate to give an accurate indication of gold mineralisation.
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.*	• Samples are analysed using an industry standard FAA505 fire analysis on 50 g sample with an atomic absorption finish. Results are returned between 0.01 ppm Au and 100 ppm Au. Samples returning results above 100 ppm are re-assayed using a gravimetric finish which returns results up to 3000 ppm Au. These processes are considered total gold digestion. • The pulverized rock sample is weighed and mixed with flux and fused using lead oxide at 1,100°C, followed by cupellation of the resulting lead button (dore bead). The bead is digested using 1:1 HNO3 and HCI and the resulting solution is submitted for analysis. • The digested sample solution is aspirated into the Flame Atomic Asborption 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°C to 2,800°C. During combustion, atoms of the gold in the sample are 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.

Criteria	JORC Code Explanation	Commentary
	• *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.*	• No hand held geophysical tools are used.
	• *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.*	• In RC samples Cardinal insert field duplicates every 22nd sample. Blanks or CRMs are inserted 10 samples after the duplicate • DD samples have blanks or CRMs are inserted every 22nd sample. • Internal laboratory quality control is carries out to ensure particle size is correct. Laboratory QA/QC includes inserting standards, blanks, and duplicates. • External laboratory checks are done on a quarterly basis through Laboratories Quality Services International (LQSI).
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.*	• Independent consulting firms EGRM and RPA have carried out independent sampling programs.
	• *The use of twinned holes.*	• There are no twinned holes.
	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.*	• Primary data was collected on a hand held Motion F5te Table PC using a set of standard templates supplied by Maxwell Geoservices, Perth (Maxwell). Data is synchronised daily with the Maxwell database for validation and compilation into Excel and Access spreadsheets. It is stored on Cardinal computers located in Bolgatanga, Ghana, West Africa.
	• *Discuss any adjustment to assay data.*	• Adjustments are only made to assay data where gravimetric finishes occur or when re-assaying occurs due to batch failure.
	• *Accuracy and quality of surveys used to locate drill*	• Drill holes are laid out using a Garmin GPSmap 62s

Criteria	JORC Code Explanation	Commentary
Location of data points	*holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	GPS. • Once drilling is completed, drill hole collars are surveyed using a differential GPS (DGPS) by Sahara Mining Services.
	• *Specification of the grid system used.*	• WGS84 Sector 30N, with local grid baseline at 010° True North and lines at 50 m to 100 m intervals and stations at 50 m along lines.
	• *Quality and adequacy of topographic control.*	• Topography is measured using a ± 2 m drone survey. • Drill hole collar locations are recorded using DGPS by Sahara Mining Services.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results*	• The drill holes are approximately 50 m base upon drill 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 data spacing and distribution is considered to be sufficient to establish geological and grade continuity appropriate for an Indicated and Inferred Mineral Resource.
Orientation of data in relation to geological structure	• *Whether sample compositing has been applied.*	• All sampling is undertaken at 1.0 m so no sample compositing is required
	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	• The drilling is generally orientated normal to the dip and foliation of the deposit. DD core is orientated so that structures can be recorded,
	• *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.*	• No orientation based sampling bias has been identified in the data to date as drilling is completed perpendicular to strike.
Sample security	• *The measures taken to ensure sample security.*	• Samples are taken from site to the exploration office in Bolgatanga by Cardinal company personell. The exploration office compound has security contractors.

Criteria	JORC Code Explanation	Commentary
		Samples are transferred to the laboratory by SGS staff. Pulp rejects are stored at the exploration compound in locked storage.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• Sampling techniques are of industry standards. Data is audited by Maxwell Geoservices (Perth), who have not made any recommendations. • Independent consultants EGRM and RPA have attended site and have not observed any issues that could materially affect the mineral resource.

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.*	• Cardinal Resources Limited ("Cardinal") currently holds its interest in the Namdini Project through an agreement dated July 23, 2014 (the "Savannah Agreement") between Savannah Mining Ghana Limited ("Savannah") and Cardinal Mining Services Limited ("CMS"), a wholly-owned subsidiary of Cardinal, and agreements with the holders of small scale mining licences within the area comprising the Namdini Project. Pursuant to the Agreement, CMS and Savannah agreed that CMS would have an exclusive right of first refusal to provide technical and financial support towards the development of the Namdini Project, in exchange for which CMS would be entitled to "the entire gross mineral values" won from any mining licence in respect of which CMS provided support. • Pursuant to the Savannah Agreement, Savannah has entered into Sale and Purchase Agreements and licence relinquishment agreements with holders of small scale mining licences within the Namdini Lease area where the holders of these small-scale mining licences will have surrendered their small-scale licenses and all mineral rights to form part of the proposed Namdini Lease area. The small-scale licences are in the process of being surrendered. • Malik Easah, an executive director of Cardinal, is also the sole shareholder and director of Savannah. Savannah's sole business is the Savannah Agreement. Pursuant to an Option & Loan Agreement made in 2015 (the "Option Agreement") between Mr. Easah, Savannah and CMS, CMS holds an option to

Criteria	JORC Code Explanation	Commentary
		purchase all the outstanding shares of Savannah from Mr. Easah for $1.00 and holds all validly executed and irrevocable documents to given effect to the purchase upon exercise of the Option. The Option Agreement also gives CMS the option to purchase all mining leases held by Savannah for $1.00. • The Namdini Mining Licence is located in NE Ghana. The Minister of Lands and Natural Resources of Ghana signed a mining lease for Savannah (the "Namdini Lease") on October 12, 2016 over an area of approximately 19.54 km^2 (1,954 ha) in the Dakoto area of the Talensi District Assembly in the Upper East Region of Ghana. • The Namdini Lease is for an initial period of fifteen years (15) ending October 11, 2031. An application can also be submitted for an extension of the mining lease if required. The Namdini Lease is currently being processed by the Ghana Government. Cardinal believes that the final registration of the Namdini Lease by the Ghana Government will be completed during the course of 2017. • Upon final registration, approval and effectiveness of the Namdini Lease, Cardinal will direct Savannah to assign the Namdini Lease to Cardinal Mining Namdini Limited, a wholly-owned subsidiary of Cardinal, pursuant to the Option Agreement. • Under the 2006 Mining Act the indirect transfer of ownership of a mining lease is subject to the non-objection of the Minister and direct assignment of a mining lease requires the consent of the Minister. Cardinal does not anticipate that any objection will be made by the Minister to the transfer of the Namdini Lease from Savannah to Cardinal Mining Namdini

Criteria	JORC Code Explanation	Commentary
		Limited.
	• *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.*	• Under the 2006 Mining Act the indirect transfer of ownership of a mining lease is subject to the non-objection of the Minister and direct assignment of a mining lease requires the consent of the Minister. Cardinal does not anticipate that any objection will be made by the Minister to the transfer of the Namdini Lease from Savannah to Cardinal Mining Namdini Limited
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• The deposit is a greenfields discovery by Cardinal so no previous exploration has been undertaken.
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The deposit type comprises gold mineralisation within sheared and highly altered rocks containing sulphides (pyrite and arsenopyrite). • The geological setting is a Paleo-Proterozoic Greenstone Belt comprising Birimian metavolcanics, volcaniclastics & metasediments located in close proximity to a major 30 km approximately North-South regional shear zone with splays. • The style of mineralisation is hydrothermal alteration containing disseminated gold-bearing sulphides.
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:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *hole length*	• No individual exploration results are included within this report.
	• *If the exclusion of this information is justified on*	• There has been no exclusion of information.

Criteria	JORC Code Explanation	Commentary
	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.	
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.*	• Individual Exploration results are not reported in this document. All drilling results are completed on 1 m intervals and any top cutting of grades are at those determined during the resource estimation.
	• *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.*	• All sampling and results are provided on 1 m intervals.
	• *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	• No metal equivalent values were used for this report.
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.*	• DD drill core is orientated so that true intercept widths can be determined.
	• *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.*	• The mineralisation occurs on approximately 10 Drilling is generally on a 100 perpendicular to the strike. Down dip mineralisation occurs on a variety of angles due to structural controls, although it can be observed dipping steeply towards the west. The mineralisation steepens at depth.
	• *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').*	• No exploration results are reported in this document.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These*	• Appropriate locality map, plan view and sections are included in the NI 43-101 Technical Report dated March

Criteria	JORC Code Explanation	Commentary
	should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.	27, 2017.
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.*	• No exploration results are reported in this document.
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.*	• Airborne and ground geophysical surveys have provided Cardinal with a detailed project- wide geological and structural map for exploration target development and assessment. • Initial metallurgical testing completed on one non-representative hole (NMDD005). Subsequent test program has been undertaken to ensure representivity. Results of this are pending.
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).*	• Two phases of drilling (DD and RC) are planned to upgrade Inferred material to Indicated based upon optimal drill spacing.
	• *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Drilling will take place on and between existing drill spacings.

SECTION 3 – ESTIMATION AND REPORTING OF MINERAL RESOURCES

Criteria	JORC Code 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.*	• RPA compared approximately 99% of the assays in the drill hole database with the electronic assays certificates and found no errors.
	• *Data validation procedures used.*	• RPA ran a number of database queries and carried out visual checks to confirm the data is valid and acceptable to support resource estimation work. RPA also reviewed the QA/QC results and took independent ¼ core samples.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	• RPA visited the site from December 16th to 20th 2016. This included drilling operations at Namdini and Cardinal Bolgatanga exploration offices and core processing facility.
	• *If no site visits have been undertaken indicate why this is the case.*	• N/A
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	• Gold mineralization above the cut-off of grade is widespread within the meta-volcanic, granite and diorite rocks which can be interpreted and modelled with a high degree of confidence. There is a sharp mineralization boundary with the meta-sediments in the footwall while the hangingwall contact exhibits a more diffuse mineralization boundary. Higher grade mineralization (>1 g/t Au) can be traced along structural corridors related to a pervasive NW-SE foliation which has been warped around the more competent granite. There is abundant structural information from oriented core which confirms this assumption.

Criteria	JORC Code Explanation	Commentary
	• *Nature of the data used and of any assumptions made.*	• The drill hole database used for Mineral Resource Estimation consists of DD core and RC samples . Numerous validation steps have taken by RPA, Cardinal and various consultants. RPA is of the opinion that the drill hole database is of sufficient quality to support the estimation of Mineral Resources.
	• *The effect, if any, of alternative interpretations on Mineral Resource estimation.*	• At the current stage of the project, alternative geological interpretation would have a minimal impact on the Mineral Resource Estimate. • As the project advances towards the declaration of Mineral Reserves, the characterization and treatment of higher grade mineralization and the application of a litho-structural model including mineralization wireframes will become increasingly important.
	• *The use of geology in guiding and controlling Mineral Resource estimation.*	• The Mineral Resource Estimate uses, lithological and structural information collected to guide the interpretation. Grade estimates are constrained by lithological boundaries and dynamic anisotropy angles have been calculated from trend surfaces which correspond to lithological contacts, grade trends and structural measurements. • Single indicator kriging was used to constrain higher grade areas which correspond to areas of increased intensity of foliation.
	• *The factors affecting continuity both of grade and geology.*	• The continuity of grade is associated with a pervasive foliation, alteration, sulphides and the spatial distribution of lithologies including the interaction between structure and lithological competency contrasts.

Criteria	JORC Code Explanation	Commentary
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.*	• Grade above the Mineral Resource cut-off grade is widespread extending over and area 200 m wide (horizontal thickness), 1.1 km along strike and to a depth of 400 m below surface. Mineralization generally dips at 55 changes in dip corresponding to lithological contacts and foliation directions.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including 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.*	• Block estimates have been constrained within wireframe solids for the meta-volcanics, granite and diorite rocks, with meta-sediments contacting in both the hangingwall and footwall generated in leapfrog Geo version 4.0. A 15 m buffer was applied to the hangingwall due to the presence of mineralization in the meta-sediment hangingwall. • Compositing, indicator kriging and grade estimation was performed using Datamine Studio RM. • Samples were composited from the top to the bottom of the drill holes at three metre intervals down hole. A small number of composites that were located at the end of holes with lengths less than 1.5 metres were discarded. • Single indicators at 0.1 g/t Au and 1 g/t Au were used to separate out lower and higher grade populations. A hard boundary using the 0.1 g/t Au indicator while a semi-soft sample sharing approach was used for 1 g/t Au indicator at probability thresholds of 0.35 and 0.6 to define low, transitional and high grade domains. • Capping was applied separately for the four indicator domains . These capping levels were 1 g/t Au, 10 g/t Au, 15 g/t Au, and 25 g/t Au. • Grade estimation was performed using ordinary kriging using dynamic anisotropy for search

Criteria	JORC Code Explanation	Commentary
		orientation. • The search passes were 40 m by 40 m by 5 m with an expansion factor of two and five for the second and third passes respectively. The ranges were based on variography, the distribution of drill hole spacing and a validation feed-back loop.
	• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.*	• An Inverse Distance Cubed (ID3) and Nearest Neighbour (NN) estimate was run in parallel with the ordinary kriging estimate. The inverse distance cubed estimate's grade tonnage curve compares well with the ordinary kriging estimate. • Resulting estimates were compared with the previous estimate performed by EGRM. For the same area covered by EGRM, the RPA estimate statistics and results are within 5% for grade, tonnes and ounces at the cut-off grade. RPA's estimate has the benefit of additional drilling and covers a larger area accounting for the global variances.
	• *The assumptions made regarding recovery of by-products.*	• There is no assumption made regarding the recovery of any by-product.
	• *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).*	• No block models for potentially deleterious or other non-grade variables have been built.
	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*	• The block size used measures 5 m by 10 m by 5 m, which is approximately one fifth of the nominal drill hole spacing in the along strike direction. The block size is appropriate given the large amount of control due to dynamic anisotropy and the relatively low coefficient of variation for each domain. The search criteria is appropriate given the feed-back validation performed.

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	• *Any assumptions behind modelling of selective mining units.*	• The estimate was compared to the Global Change of Support (GCOS) model and the grade tonnage curve compares reasonably well.
	• *Any assumptions about correlation between variables.*	• None
	• *Description of how the geological interpretation was used to control the resource estimates.*	• Trend surfaces corresponding to foliation directions, grade trends and lithological contacts were used for the calculation of dynamic anisotropy angles. The angles were used to orient the search ellipsoids during interpolation.
	• *Discussion of basis for using or not using grade cutting or capping.*	• A disproportionate amount of metal is located within the upper tails of the assay distributions. Histograms, log probability plots and decile analyses were used to evaluate the proportions of metal at risk and to establish appropriate capping levels. The indicator domains provide a method grouping spatially correlated assays for the application of unique capping levels.
	• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• Standard validation procedures were performed on the block model including: visual inspection of composite versus block grades on plan and vertical sections; comparisons between the ordinary kriging estimate, ID3, NN and the declustered sample means; swath plots in the X, Y and Z directions; and comparisons between the ordinary kriging, ID3 and GCOS grade tonnage curves.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnages are estimated on a dry basis.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• The resource estimate was reported using a 0.5 g/t Au cut-off grade is constrained by a Whittle pit shell

Criteria	JORC Code Explanation	Commentary
		based on a US$1,500/oz gold price using factors relevant to location and proposed mining method.
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.*	• Conventional open pit operation with drill, blast, load and haul unit operations.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of 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.*	• Milling mineralized material followed by flotation and cyanide leaching of the concentrate. • Initial assumptions proposed an overall recovery of 82%, pending results of the new metallurgical test data. • Recovery appears to be dependent upon the rations of the different lithologies, which change as the resource model is update and depending upon the cut off grade.
Environmental 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*	• Cardinal's exploration activities are undertaken such that any potential emissions and effects associated exploration activities, which could include habitat modification and associated visual effects, are kept to a minimum. • NEMAS Consult Ltd (NEMAS), of Accra, Ghana, has been contracted by Cardinal to undertake the

Criteria	JORC Code Explanation	Commentary
	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 Impact Assessment study for the Project. • NEMAS has undertaken a site reconnaissance visit and commenced the Scoping stage of the process in accordance with the Ghanaian Environmental Protection Agency procedures for the EIA in order to submit an Environmental Impact Statement (EIS).
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.*	• Bulk density is determined using Archimedes principal on DD core samples.
	• *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.*	• Weathered terranes are wrapped in foil and dried out before being wax coated.
	• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	• Assigned bulk density values were determined for lithological and weathering domains. Density outliers were removed using Rosner outlier detections applying a 95% confidence interval. A density of 1.8 t/m^3 was assigned to the strongly oxidised horizon since the average measured density appears too high.
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.*	• Mineral resources were classified based on variography. Indicated mineral resources required an average three dimensional drill hole spacing of less than 60 m and were estimated within the first pass. The continuity of higher grade material (>1 g/t Au) was also considered. The current drill hole spacing does not support Measured Mineral Resources. Inferred resources required a maximum

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		of 75 m to the closest composite and were estimated within the second search pass.
	• *Whether appropriate account has been taken of all relevant factors (ie 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).*	• There is a relatively low risk for tonnes above the cut-off grade due to the pervasive gold mineralization exceeding the cut-off grade. The average grade of the deposit above the cut-off grade is sensitive to the treatment and volumes applied to high grades. The majority of the resources require additional drilling to facilitate conversion to Measured and Indicated categories and the current classification designation support this.
	• *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The resulting classification reflects the Competent Person's view of the deposit.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• Mineral resources have been undertaken by independent external consultants.
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.*	• RPA's model has an overall increase in tonnages and contained metals from previous resource estimates by EGRM. The difference can be attributed to: o Additional 27 drill holes totalling 6,158 metres o Changes to the classification criteria o Changes to the Mineral Resource Estimation Methodology o Changes to cut-off grade o Mineral Resource constrained by a Whittle pit. • The following methods were used to determine the accuracy of the resource estimation: o Visual inspection of plans and vertical

Criteria	JORC Code Explanation	Commentary
		sections of blocks versus composite grades. o Comparison between OK, ID3, NN and composite statistics. o Swath plots and comparison between histograms. o Comparison between the OK grade tonnage curve and the theoretical grade tonnage curve as per the GCOS model.
	• *The statement should specify whether it relates to global or 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.*	• The majority of the resource has been classified as inferred and is a global estimate. Additional drilling is required.
	• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	

31 APPENDIX 2 - COMPETENT PERSON'S STATEMENTS

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JORC CODE 2012 COMPETENT PERSON'S STATEMENT

The information in this release that relates to exploration results is based on information compiled by Ian T. Blakley, a Competent Person who is a member of the Association of Professional Geoscientists of Ontario. Mr. Blakley is a Principal Geologist and Vice-President and General Manager of RPA UK Ltd. with Roscoe Postle Associates Inc. Mr. Blakley has sufficient experience that 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'. Ian T. Blakley consents to the inclusion in this release of the exploration results for the Namdini Project in the form and context in which it appears. Mr. Blakley confirms that the information contained in Appendix 1 of this release that relates to the reporting of exploration results is an accurate representation of the available data and studies for the Namdini Project.

Dated 5 April 2017

(Signed) "*Ian T. Blakley*"

Ian T. Blakley, P.Geo.

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JORC CODE 2012 COMPETENT PERSON'S STATEMENT

The information in this release that relates to "Mineral Resources" is based on information compiled by Sean D. Horan, a Competent Person who is a member of Association of Professional Geoscientists of Ontario. Mr. Horan is a Senior Geologist with Roscoe Postle Associates Inc. Mr. Horan has sufficient experience that 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'. Sean D. Horan consents to the inclusion in this release of the Mineral Resource estimate for the Namdini Project in the form and context in which it appears. Mr. Horan confirms that the information contained in Appendix 1 of this release that relates to the reporting of Mineral Resource estimate is an accurate representation of the available data and studies for the Namdini Project.

Dated 5 April 2017

(Signed) "*Sean D. Horan*"

Sean D. Horan, P.Geo.

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JORC CODE 2012 COMPETENT PERSON'S STATEMENT

The information in this release that relates to metallurgical testing and mineral processing is based on information compiled by Kathleen Ann Altman, Ph.D., a Competent Person who is a Professional Engineer in the State of Colorado, USA. Dr. Altman is a Principal Metallurgist and Director, Mineral Processing and Metallurgy with Roscoe Postle Associates Inc. Dr. Altman has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity which she 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'. Kathleen Ann Altman consents to the inclusion in this release of the metallurgical testing and mineral processing results for the Namdini Project in the form and context in which it appears. Dr. Altman confirms that the information contained in Appendix 1 of this release that relates to the reporting of metallurgical testing and mineral processing is an accurate representation of the available data and studies for the Namdini Project.

Dated 5 April 2017

(Signed) "*Kathleen Ann Altman*"

Kathleen Ann Altman, Ph.D., P.E.