

## **RESUME – WARWICK DAVID BULLEN (M.Sc. Economic Geology; Pr. Sci. Nat.)**

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### **Profile:**

- A professional geologist with 20 years of experience.
- Currently President of Big Red Resources – Mineral Resource Assessment and Management Consultancy.
- Previously Vice President: Mineral Resource Management for Gold One International; Group Consulting Geologist for Jonah Mining (Mauritius); Chief Executive Officer for Jonah Mining (Democratic Republic of Congo – “DRC”); and Vice President: Geology and Exploration for Aflase Gold Ltd, South Africa.
- Managed mineral exploration projects in Ghana, Eritrea, Botswana, Malawi, Namibia, South Africa and Liberia.
- Consulting exploration geologist on mineral projects in Ethiopia and Jordan.
- Directed mineral resource management activities on Modder East and Sub Nigel gold mines, South Africa.
- Ore Reserve Manager on Harmony gold mine, South Africa.
- Senior Mining Advisor for the Government of the Northwest Territories, Canada.
- Managed South African Council for Geosciences’ metallogenic mapping program.
- Successful track record in mineral exploration.
- A Canadian citizen with extensive expatriate experience.
- Papers published in international journals and books, data presented at international conferences.
- Registered as a Professional Natural Scientist (Pr. Sci. Nat.) with the South African Council for Natural Scientific Professions (SACNSP).

### **Education:**

**2000** - Diploma in Computer Programming - Institute for Computer Studies, Toronto, Canada.

**1993** - Geostatistics (3<sup>rd</sup> Year level, distinction) - University of South Africa (UNISA).

**1991** - M.Sc. (Economic Geology) - Rhodes University, Grahamstown, South Africa.

**1987** - B.Sc. Hons (Geology) - University of Natal, Durban, South Africa.

## **PROFESSIONAL EXPERIENCE AND SKILLS**

### **CORPORATE**

#### **Experience:**

- Executive management positions held at a number of exploration/mining companies.
- Appointed to the board of two exploration/mining companies.
- Managed exploration programs/operations in diverse, challenging jurisdictions.
- Managed multi-million dollar exploration budgets.

#### **Skill Set:**

- High-level organizational and operational strategic planning.
- Execution of strategically-based business plans.
- Budgetary planning, implementation and management.
- Detail-oriented, big picture individual.

#### **Highlights:**

- Established own Mineral Resource Assessment and Management company in South Africa.
- Established exploration/mining company in the DRC from the base up.
- Won a tender, against very strong competition, for a high-quality Gécamines (Congo’s state-owned copper-cobalt mining entity) exploration asset in the DRC.
- Established network of highly influential persons in the DRC who successfully lobbied on behalf of company.
- Secured highly prospective base-precious metal concession in Zambia against strong competition.

## EXPLORATION

### **Experience:**

- Managed grassroots to advanced stage mineral exploration projects in countries across Africa, including Ghana, Eritrea, Botswana, Malawi, Namibia, South Africa and Liberia.
- Consulting exploration geologist on mineral exploration projects in Ethiopia and Jordan.
- Managed and/or personally undertook all facets of resource and reserve estimation activities on multiple exploration assets in South Africa and Liberia (to NI 43-101/JORC compliant standards) and Ethiopia – Datamine and Gemcom 3-D geo-modeling software used.
- Involved in feasibility and scoping-level studies on projects in South Africa, Ethiopia, Eritrea, Jordan, the DRC and Liberia.
- Worked on diverse mineralization types of all ages including, *inter alia*, shear zone-hosted precious and base metal deposits, epithermal gold deposits, Iron Oxide Copper-Gold “IOCG” deposits, palaeoplacer gold/uranium mineralization, intrusion-hosted PGM and chromitite occurrences, VMS and SEDEX deposits, stratabound copper/cobalt mineralization, iron ore tailings dumps, industrial minerals and coal.

### **Skill Set:**

- Designing, implementing and managing exploration/mineral resource assessment programs in challenging jurisdictions using contractors, consultants and/or own staff; generating code-compliant (JORC, SAMREC, NI 43-101) resource estimates; application of appropriate QA/QC measures to ensure data validity; evaluating exploration opportunities for possible acquisition; technical reporting; metallogenic mapping; mineral deposit modeling, keeping mineral projects in regulatory compliance; government and community liaison, employee training.
- Volumetric modeling, block modeling, and mineral resource estimation using Datamine, Gemcom and Surpac 3-D geo-modeling software.
- Target generation, interpretation and evaluation of exploration data (e.g. geochemical, geophysical, drillhole core, etc.) using, *inter alia*, GIS (MapInfo), surface mapping (Surfer) and GPS (OziExplorer) software.
- Feasibility studies, including economic evaluations.
- Project management.

### **Highlights:**

- Discovered, with colleague, world-class Highbury lithium deposit in South Africa.
- Discovered first primary gold occurrence in Jordan at Abu Kusheiba.
- Positively identified, for the first time, IOCG mineralization in the Matsitama Schist Belt, Botswana.
- Sited first significant drillhole at Emba Derho VMS deposit in Eritrea which intersected 20m of massive sulphide mineralization – Emba Derho now considered a world class base metal deposit.
- Discovered largest mineralizing structure in the Adola gold field, Ethiopia, developing new, highly prospective exploration targets in the process.
- Designed mineral resource assessment program at East Sakaro in the Adola gold field leading to the discovery of a high grade, economic, blind gold deposit – currently being developed into a mine.
- Successfully completed resource assessment program on iron ore tailings dumps in Liberia under extremely challenging conditions – from initial auger drilling through to signed-off (by SRK) JORC compliant resource/reserve estimates.

## MINING/MINERAL ECONOMICS

### **Experience:**

- Directed mineral resource management activities on Modder East and Sub Nigel gold mines, South Africa.
- Managed resource and reserve estimation activities on nine shafts at Harmony gold mine, South Africa – Datamine 3-D geo-modeling software used.
- Implemented and directed grade control measures on Harmony mine.
- Oversaw mine planning activities at Modder East and Sub Nigel gold mines, South Africa.
- Senior Advisor to the Government of the Northwest Territories (GNWT), Canada, on mining-related matters.
- Financially modeled and economically assessed new and potential mining projects in the Northwest Territories, Canada, gold projects in South Africa and Ethiopia, and base metal projects in Eritrea, Jordan and the DRC.

- Developed and implemented new economic modeling techniques for the GNWT.
- Carried out wide-ranging economic studies of the mineral industry in the Northwest Territories and elsewhere in the world to aid in government policy development.

**Skill Set:**

- Orebody modeling, code-compliant resource estimation and classification.
- Generating, auditing and interpreting NI 43-101, JORC and SAMREC compliant reserve and resource data.
- Researching, developing and implementing new ore reserve management techniques.
- Managing grade control and mine planning activities.
- Generating and implementing policies and operating procedures i.r.o. Mineral Resource Management.
- Strong negotiation and presentation skills
- Economic evaluation of mineral deposits using discounted cash flow criteria, sensitivity and break-even analysis, and probabilistic risk analysis.
- Extensive knowledge of the economics of the minerals industry as a whole.

**Highlights:**

- Member of two due diligence teams involved in the successful acquisition of competing mining operations adjacent to Harmony gold mine.
- Developed NPV maximization model to determine optimum cut-off grades on Harmony (still used today).
- Developed Visual Basic computer program to financially evaluate currently operating mines containing more than one orebody with differing economic criteria. Program copyrighted and trademarked by the Government of the Northwest Territories, Canada.
- Geostatistically remodeled Modder East orebody on East Rand, South Africa, resulting in significant improvement in project value.
- Added +10 million, NI 43-101 compliant ounces of gold to Alease Gold's resource base through the implementation of asset-specific evaluation programs.
- Closely involved in the feasibility study of Sub Nigel gold mine, South Africa.

**EMPLOYMENT HISTORY**

March 2010 to present:	<b>President</b> , Big Red Resources (own company)
June 2009 to February 2010:	<b>Vice President: Mineral Resource Management</b> , Gold One International
September 2007 to May 2009:	<b>Group Consulting Geologist/Chief Executive Officer</b> , Jonah Mining (Mauritius)/Jonah Mining (DRC)
April 2006 to August 2007:	<b>Vice President: Geology and Exploration</b> , Alease Gold Ltd, South Africa
May 2004 to March 2006:	<b>Consulting Exploration Geologist</b> , MIDROC Gold Mine P.L.C., Ethiopia
September 2000 to May 2004:	<b>Senior Mining Advisor</b> , Government of the Northwest Territories, Canada
February 2000 to August 2000:	<b>Diploma in Computer Programming</b> from The Institute for Computer Studies, Toronto, Canada
February 1998 to January 2000:	<b>Senior Exploration Geologist</b> , Phelps Dodge of Africa
June 1997 to January 1998:	<b>Senior Exploration Geologist</b> , Obenemase Gold Mine, Ghana (Mine placed on care and maintenance January 1998)
September 1995 to May 1997:	<b>Ore Reserve Manager</b> , Harmony Gold Mine, South Africa
January 1988 to August 1995:	<b>Deputy Manager – Metallogenic Mapping</b> , Council for Geoscience, South Africa