Kwesi Appiah bets on West Africa

Leon Louw

In a recent interview Ghanaian geologist Kwesi Appiah tells Leon Louw, editor of African Mining and Mining Mirror that the next big gold deposit will most likely be discovered in West Africa.

Kwesi, when did you start your career in the African mining industry, and please give us a short summary of your history and qualifications.

My career in the African mining industry started immediately after I finished university in May 2009. I studied geology. At the moment, I am employed as a senior geologist and business development manager at the Australian based Corporate Geoscience Group. I am also a member of the Australian Institute of Geoscientists. My experience covers eight years of greenfields and brownfields exploration and feasibility studies, as well as open-pit mining, including the management and supervision of exploration and mine development programmes in Côte d'Ivoire, Mali, Ghana, Tanzania and Senegal.

I gained incredible experience when working at the giant (>40 million ounces (Moz)) Obuasi orogenic lode gold (Au) deposit in the Ashanti Belt of Ghana and being part of the Wassa underground project, also in Ghana. That was certainly a career highlight. In addition, I have been part of the team that implemented and improved the structural model for down-dip extensions of sulphide orebodies at the Wassa mine (>2.0Moz Au). The new model added an additional 0.5Moz of gold to the feasibility study target, ahead of schedule and on budget, while simultaneously helping to increase the monthly production target by 20 000 ounces (oz). The project in Mali, where we extended the life of mine at the Syama mine (>5Moz Au) by an additional four years beyond the expected target, was another significant milestone.

You have worked on a number of projects in West Africa. What would you regard as the major challenges of working in Africa?

Although Africa is a continent rich in natural resources such as ore, minerals, precious stones, and metals, it tends to be overlooked by expatriates when they are looking at working overseas. The main reason for this is the continent’s reputation for economic, social, and political problems, which tend to scare expatriates. This leaves a very small amount of foreigners who are willing and eager to relocate to Africa for work. Most of the reports that filter out of Africa are negative and revolve around civil war, poverty, political instability, and the rampant Aids epidemic. This is enough to scare away the majority of mining expatriates, particularly when they have families to consider.

To be a geologist in Africa requires skill and tenacity. What advice do you have for young aspiring geologists who want to become involved in the mining industry in Africa? What should they look out for and where are the opportunities?

Study, work hard, do well in science, search the internet for information on geologists and the mineral industry, get into a co-op programme during college, and join professional bodies as a student member so you can learn more about the field before deciding how you use your geology degree. Once you graduate, never stop learning, and create a wide personal and professional network of contacts — in mining and mineral exploration and outside the field. Young aspiring geologists should be patient, pay attention to detail, and be assertive.

You have worked extensively in Ghana. We all know about the great gold deposits in Ghana, but what other interesting minerals can be found in this West African treasure chest?

Ghana is also a major producer of bauxite, manganese and diamonds. In 2011, production of bauxite dropped by 22% compared to the previous year, resulting in a decline in sales from the export of bauxite. Ghana’s economic geology is centred around Proterozoic rock types, notably the Birimian and Tarkwian systems. The Proterozoic Birimian Belt in West Africa hosts nearly all of the known gold deposits in Ghana, Burkino Faso and Côte d’Ivoire. The Ashanti Gold Belt of south-western Ghana, part of the volcano sedimentary Birimian Belt, includes seven producing mines. Gold mineralisation in the Birimian is mainly in the form of auriferous quartz veins of ‘reefs’ and as sulphide ore. Tarkwian system rocks consist of a thick series of argillaceous sediments resting unconformably on the Birimian. Gold is found in these sediments, occurring as blanket reefs or conglomerate beds, similar to those of the Witwatersrand in South Africa. Alluvial diamonds, about 80% of industrial grade, are produced on a large scale. Primary Kimberlites have yet to be found.

Which projects have you been involved with in West Africa? Please give us some background on each project.

I have been involved in a few projects. Perseus’ Edikan gold project first produced gold in August 2011 and achieved commercial production on 1 January 2012. The company holds 480km² of tenements centred on the Ashanti Gold Belt, 25–65km from AngloGold Ashanti’s 60Moz Obuasi gold deposit. The deposit has 5.08Moz of measured and indicated resources, 2.0Moz of inferred resources, and...
2.28 Moz of reserves.

Asanko's gold mine comprises two projects, previously referred to as the Obotan and Esaase, and they are held by Asanko’s wholly owned subsidiaries Adansi Gold Company (AGM) and Keegan Resources, respectively. Following the acquisition of PMI Gold Corporation by Asanko in February 2014, the Obotan and Esaase projects were consolidated. The AGM concessions are located in the Amanias West district of the Ashanti region of Ghana, about 250km north-west of the capital Accra, and about 50–80km south-west of the regional capital of Kumasi. The concessions form an integral part of Asanko’s property in Ghana. They are held by their subsidiaries Adansi and Asanko, and are situated in the northern part of the Asankrangwa Gold Belt. Adansi is 100% owned by Asanko, while Asanko is held 90% by Asanko and 10% by the Government of Ghana.

Resolute Mining’s Cote d’Ivoire gold project is a greenfields exploration project with very limited previous work. A review of the geological setting highlights the presence of artisanal workings, major geological structures, and geological setting that indicate the prospectivity for gold mineralisation. The Bonikro Gold Mine operated by Newcrest is located 70km from the Mangkono concession, and the geological setting of Bonikro mineralisation is interpreted to be similar to the Mangkono geology.

OreZone’s Bombore gold project in Burkina Faso is located just 85km east of the capital city Ouagadougou, adjacent to the national paved highway, the RN4. The project is in an area of moderate population density, and local infrastructure includes a high voltage power line nearby, and access to both sufficient water and a local labour force. Bomboré is now fully permitted having received all environmental approvals. As a result of changes to the resource statement, the company plans to update the 2015 feasibility study in 2016, prior to considering its options to secure the required full project financing to construct an operation. The project also benefits from a large underlying sulphide orebody that has been drilled and studied and could be developed as part of a second phase plant expansion at higher gold prices.

GoldenStar (Wassa/ Huni Butre) is located in the south-western region of Ghana about 75km north-east of the town of Tarkwa. It lies in the Birimian province of the West African Precambrian shield, within the southern portion of the Ashanti Greenstone Belt. The mine is accessible by a combination of paved and gravel roads, and electric power to the site is available locally from the Ghana power grid. The mine hosts a 2.7 million tonnes per annum (Mtpa) carbon-in-leach (CIL) processing plant, and ore is currently sourced from the single large Wassa Main pit.

Gold Fields’ Tarkwa Gold Mine located in Ghana near the southern end of what is commonly referred to as the Tarkwa Basin, 300km by road west of Accra, and is easily accessible with an established infrastructure. The open-pit surface operation exploits narrow, tabular auriferous conglomerates similar to those mined in the Witwatersrand Basin of South Africa. Mining is currently taking place from six pits — Pepe, Atuabo, Mantraim, Teberebie, Akontansi and Kottraverchy — and the mine uses a conventional CIL plant as well as a heap leach facility. In the twelve months ending December 2011, Tarkwa produced 717 000 oz of gold from the milling and heap leach operations at a cash cost of USD552/oz.

**You have been involved at Golden Star’s Wassa Underground project in Ghana. What are specific highlights for you about this project?**

The Wassa Underground has advanced significantly since development began in July 2015, from a single orebody (the B Shoot) to adding the F Shoot, which Golden Star believes to be a parallel zone to the main mining stopes along the B Shoot structure. The underground economic potential of the F Shoot was first recognised in 2014 when stope optimisations were conducted for the company’s preliminary economic assessment of the Wassa Underground. The initial resource was small and only consisted of a few stopes that were defined by a handful of holes; it was, therefore, decided to further test this target in early 2015 using surface drill rigs. The results of this drilling were used to update the Wassa Underground resource models used for the feasibility study completed in 2015. The recent drilling programmes have successfully extended the F Shoot target north of the current reserve and the company plans to assess the full potential of the F Shoot, which remains open down plunge to the south. The main and ventilation declines have reached a position where access to the F Shoot mineralisation is being developed. The twin declines will continue down plunge to access the B Shoot stope areas. The declines have advanced approximately 1 060m in total since development start-up in July 2015.

**What opportunities are there for mining entrepreneurs in Ghana? Is it worth having a look?**

Yes, it is worth having a look. Gold is the major moneymaker, together with other minerals including manganese, bauxite and diamonds. Quarrying is also another good opportunity in Ghana, which consists mostly of smaller-scale operations that produce sand, gravel, cement, limestone, and granite. Large and small-scale quarry mining operations provide an estimated 524 000 jobs for Ghanaians.

**What is your outlook for the industry in Ghana specifically and for Africa as a whole?**

Africa, a continent endowed with immense natural and human resources as well as great cultural, ecological and economic diversity, remains underdeveloped. Most African nations suffer from military dictatorships, corruption, civil unrest and war, underdevelopment, and deep-rooted poverty. The majority of the countries classified by the UN as least developed are in Africa. Numerous development strategies...
have failed to yield the expected results. Although some believe that the continent is doomed to perpetual poverty and economic slavery, Africa has immense potential.

Where will the next big gold deposit in Africa be found? Will it be in West Africa?

Côte d'Ivoire, like much of West Africa, has great gold potential and it has been at the forefront of exploration activities since the introduction of a new favourable mining investment code in 1995. Artisanal workings and exploration for gold and diamonds are widespread. In addition, there are a host of international companies actively pursuing gold mining opportunities in the country. I'm convinced that the next big gold deposit will be found in West Africa; one of the world's great gold regions. Based on the current West African mining industry, the region has excellent endowment and high prospectivity with many multi-million ounce gold discoveries to date. West Africa has been the world leader in discovery rate and development of new mines in the past 15 years.