THE MINERAL INDUSTRIES OF FRENCH GUIANA, GUYANA, AND SURINAME

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FRENCH GUIANA

In 2006, mining did not play a significant role in French Guiana’s economy. French Guiana’s mineral commodity production included cement, clays, columbite and tantalite, gold, sand, and crushed stone.

Production

Data on mineral production are provided in table 1.

Structure of the Mineral Industry

In recent years, the mineral industry of French Guiana had been focused on gold and petroleum exploration. Gold exploration was conducted by Golden Star Resources Ltd. of the United States and IAMGOLD Corp. of Canada. Golden Star held a 100% interest in the Bon Espoir gold property and earned 100% interest in the Paul Isnard gold property. IAMGOLD held a 100% interest in the Camp Caiman gold property, which is located 45 kilometers (km) southeast of Cayenne (IAMGOLD Corp., 2006b). In September 2006, IAMGOLD and Cambior Inc. of Canada announced the signing of a $3 billion plan of agreement that would merge the two companies under IAMGOLD (IAMGOLD Corp., 2006c, p. 1-2). In November 2006, IAMGOLD completed the acquisition of all the issued and outstanding shares of Cambior, which had held 100% interest in the Camp Caiman gold project (IAMGOLD Corp., 2006d, p. 1-2).

Commodity Review

Metals

Gold.—In 2005, Golden Star announced the completion of a soil survey of the Bon Espoir property’s Armina Formation. In 2006, Golden Star applied for a renewal of its exploration contract for the Bon Espoir property under a reduced area because of poor results from the soil geochemistry analysis. The company was seeking partners for the project (Golden Star Resources Ltd., 2006b).

In 2004, Golden Star entered into an option agreement with EURO Ressources S.A. to earn a 100% interest in the Paul Isnard gold property. The option agreement required Golden Star to invest $2 million in exploration, conduct a feasibility study, and disburse $3.5 million to EURO by mid-2007. Analyses were performed in 2004 to determine resource estimates for a deposit located at the southern boundary of the Paul Isnard property called the Montagne d’Or deposit (Golden Star Resources Ltd., 2006b). Other studies on the property included a pit optimization study performed by RSG Global in 2005. In 2006, RSG Global reevaluated the study and reported an inferred in-pit mineral resource of 10.2 million metric tons (Mt) at a grade of 1.7 grams per metric ton (g/t) gold (Golden Star Resources Ltd., 2006a, b). During 2007, Golden Star planned to start environmental, geologic, and mining studies of the Paul Isnard project area, including airborne topographic surveys, airborne geophysical surveys, metallurgical studies, and a soil geochemical survey (Golden Star Resources Ltd., 2006b).

In 2004, the French Government had granted Cambior a 30-square-kilometer (km²) mining concession for the Camp Caiman project, which was valid for a period of 25 years. The Camp Caiman project also included exploration permits for two adjacent properties—the 21-km² Patawa property and the 20-km² Tresor property. In mid-2005, Cambior completed a feasibility study for the potential development of Camp Caiman, and in late 2005, the company filed a permit application for the construction of a mine in the project area. During 2006, IAMGOLD (the new owner) was waiting for the necessary permit approval from the French authorities to begin the mine construction, which was expected to begin in the fall of 2007. Analyses of the Camp Caiman area revealed a contained resource of 1.1 million troy ounces [37,324 kilograms (kg)] of gold within the deposit, which had 12.3 Mt of ore with an average grade of 2.8 g/t gold. The feasibility study suggested that the Camp Caiman project could be developed as an open pit mine for an estimated cost of $115 million (IAMGOLD Corp., 2006a, p. 6, 25, 46; 2006b).

Mineral Fuels

Petroleum.—Hardman Resources Ltd. of Australia was the principal petroleum exploration company in French Guiana during 2006 and held a 97.5% interest in the offshore Guyane Maritime exclusive exploration license (Guyane EEL) which covers an area of 35,221 km². In September 2006, London-based Tullow Oil plc announced a proposal to acquire Hardman subject to approval by such agencies as the Federal Court of Australia and the Foreign Investment Review Board of Australia, and by at least 75% of Hardman’s shareholders (Tullow Oil plc, 2006, p. 2, 4-5, 7; 2007b, p. 9, 17).

In November 2006, before Tullow’s acquisition was made final, Hardman (through its wholly owned subsidiary Hardman Petroleum France S.A.S.) and Planet Oil Ltd. concluded a farm-out agreement with Gaz de France S.A. for a 20% participating interest in the Guyane EEL. The agreement reduced Hardman’s participating interest in the Guyane EEL from 97.5% to 77.5%. Gaz de France was to conduct and fund geophysical studies in the Guyane EEL area and would share the cost of the first exploration well as part of the agreement; at the end of the study, Gaz de France would have the option to form a joint venture
with Hardman or to increase its participating interest in Guyane EEL up to 30% after the completion of the first exploration well. Northern Petroleum Plc of the United Kingdom also held a 1.25% share in Guyane EEL through a 50% holding in Northpet Investments Ltd., which held a 2.5% share in the license (Rigzone.com, 2006; Northern Petroleum Plc, 2007, p. 11).

Extensive exploration had been carried out in the Guyane EEL area since the license was awarded in 2001. By 2006, approximately 9,000 km of two-dimensional (2-D) seismic data and 380 km² of three-dimensional (3-D) seismic data had been recorded and 20 prospects had been identified (Rigzone.com, 2006; Northern Petroleum Plc, 2007, p. 11; Tullow Oil plc, 2007a; 2007b, p. 9, 17).

The largest prospect identified in the Guyane EEL area was Matamata, which was estimated to contain potentially 1 billion barrels of oil. The Matamata prospect was scheduled to be drilled in late 2007 or early 2008 (Rigzone.com, 2006; Northern Petroleum Plc, 2007, p. 11).

Outlook

During 2007, gold exploration and investment activities in French Guiana will likely continue as projects begun in 2005 and 2006 continue to progress. During 2007, Golden Star is expected to initiate more detailed studies in the Paul Isnard project area. IAMGOLD expects to begin construction at its Camp Caiman gold mine during the fall of 2007.

References Cited


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GUYANA

Guyana was an important bauxite producer, accounting for nearly 1% of the total world production in 2006 (Plunkert, 2007). Bauxite extraction was the main mining activity in Guyana. Other minerals produced in Guyana included clay, diamond, gold, and sand and gravel (table 1). The Guyana Geology & Mines Commission (GGMC) is the Government agency that regulates all activities in the mining sector. The commission reviews Guyana’s mining licenses, mining permits, mining concessions, prospecting licenses, prospecting permits, and quarry licenses; it also promotes mineral development and performs mineral exploration (Guyana Geology & Mines Commission, 2007).

The Mining Act of 1989, which is Guyana’s current mining law, allows four levels of mining operations in the country: small-scale claims [for properties that cover an area of no more than 460 meters (m) by 240 m (reported as 1,500 feet (ft) by 800 ft, respectively)]; medium-scale prospecting and mining permits [for properties that cover between 0.6 km² and 4.9 km² (reported as 150 acres and 1.200 acres, respectively)]; prospecting licenses [for properties that cover between 2 km² and 52 km² (reported as 500 acres and 12,800 acres, respectively)]; and permissions for geologic and geophysical surveys [for conducting reconnaissance surveys of property areas of more than 52 km² (12,800 acres), with the condition that owners of the property apply for a prospecting license if results are favorable for development]. As of 2005 (the latest year for which data were available), Guyana had 3,715 medium-scale prospecting permits and 41 prospecting licenses. In the petroleum exploration sector, the Government of Guyana offers three types of licenses: the petroleum prospecting license, which initially is offered for a period of 4 years, with two optional renewals to extend the exploration period for 3 more years each; the petroleum production license, which runs for 20 years; and the production-sharing agreement, which offers such incentives as 75% cost recovery, a 50% profit share, and a 10% reduced consumption tax on fuel for petroleum exploration operations, among other incentives (Guyana Geology & Mines Commission, 2007).

Minerals in the National Economy

In 2006, the mining sector contributed 5.8% of Guyana’s real gross domestic product (GDP); bauxite accounted for 22% of the mining sector’s contribution to the GDP. The construction sector contributed 10.4% of Guyana’s GDP (Bank of Guyana, 2007a, p. 9; 2007b, p. 116).

In 2006, total exports amounted to $600.5 million (Bank of Guyana, 2007b, p. 104). During 2006, Guyana’s mining sector experienced a significant decline in mineral production compared with that of 2005; decreases in the amount of bauxite and gold exports were reported. In terms of value, however, exports of bauxite and gold increased as a result of higher prices in the world market. Bauxite exports in 2006 amounted to 1,471,218 metric tons (t), which represented a decrease of approximately 6% compared with 2005 exports of 1,564,231 t. The total tonnage of bauxite exported in 2006 represented more than 90% of the total production of bauxite in Guyana (table 1). Bauxite exports in 2006 were valued at $67.3 million compared with $62.8 million in 2005, or increased by 7.2%. Bauxite export earnings represented 11.2% of the total value of Guyana’s exports in 2006. The market price for metallurgical-grade bauxite increased by approximately 42% to $31.8 per metric ton.
ton and the price of refractory-grade bauxite increased by about 10% to $10.1 per metric ton. Metallurgical-grade bauxite accounted for nearly 78% of the total volume of bauxite ore exported from Guyana in 2006 (Bank of Guyana, 2007a, p. 9, 17-18; 2007b, p. 102).

In 2006, the value of gold exports was $114.4 million, which was equivalent to 19.1% of Guyana’s total export value. The country exported 6,293 kg (reported as 202,336 troy ounces) of gold, which corresponded to 98.2% of the total production of gold. The price of gold on the world market increased to an average of $565.6 per troy ounce of gold compared with $415.5 per troy ounce in 2005, or by approximately 36%.

Guyana’s other significant mineral export was diamond, which was valued at $44.9 million, or about 7.5% of the total export value (Bank of Guyana, 2007a, p.18-19; 2007b, p. 102).

In 2006, the total value of imports to Guyana was $866 million. The mining industry’s main imported good was mining machinery, which accounted for $5.1 million, or nearly 0.6% of the total import value (Bank of Guyana, 2007a, p. 19; 2007b, p. 97, 99, 104).

Production

During 2006, Guyana’s mining sector experienced a significant decline in mineral production compared with that of 2005: sand and crushed stone production decreased by 50.3% and 35.4%, respectively; gold production decreased to 6,406 kg in 2006 from 8,166 kg in 2005, or by 21.6%; diamond production decreased to 340,544 carats from 356,948 carats, or by 4.6%; and bauxite production decreased to 1,558,000 t in 2006 from 1,648,000 t in 2005, or by 5.5% (table 1).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities in Guyana. The table provides the location and production capacities of these facilities.

Commodity Review

Metals

Bauxite and Alumina.—IAMGOLD and United Company RUSAL of Russia were the main companies involved in Guyana’s bauxite industry. Omai Bauxite Mining Inc. (OBMI) (a subsidiary of IAMGOLD) produced mainly refractory “A” grade super-calcined bauxite (RASC) at its Linden Mining Enterprise Ltd. (Linmine) facility. IAMGOLD held 70% interest in OBMI; the remaining 30% was held by state-owned National Industrial and Commercial Investments Ltd. (Cambior Inc., 2006; IAMGOLD Corp., 2006, p. 21, 76).

During 2006, RASC production decreased owing to a 2-month suspension between July and August in part of OBMI’s operations. IAMGOLD reported that the temporary suspension was the result of lower demand for RASC (Industrial Minerals Journal, 2007).

In November 2006, IAMGOLD completed its acquisition of all Cambior’s shares, including those of OBMI at Linmine. In December 2006, IAMGOLD entered into a conditional share and purchase agreement with Bosai Minerals Group Co. Ltd. of China to sell IAMGOLD’s bauxite interests in Guyana. The agreement was valued at approximately $46 million. IAMGOLD started bauxite production at its OBMI operation in 2004 and became the sole owner and operator of most of the former Linmine bauxite assets and facilities in Guyana. Total sales in IAMGOLD’s first year of production at the OBMI operation reached $36.9 million. In December 2005, the average monthly high-alumina bauxite production by OBMI was reported to be 28,300 t after the completion of two kilns (IAMGOLD Corp., 2006, p. 21, 76; Industrial Minerals Journal, 2006).

In February 2007, the Government of Guyana and Bosai signed an agreement to allow Bosai to buy shares from OBMI. During 2007, while OBMI is in a management transition, bauxite production is expected to remain at about 1.5 million metric tons per year (Mt/yr). No future facility improvement plans or capacity increase was scheduled for OBMI (IAMGOLD Corp., 2006, p. 76; Industrial Minerals Journal, 2007).

RUSAL (90%) and the Government of Guyana (10%), established the Bauxite Company of Guyana Inc. (BCGI) in December 2004 as part of an agreement to develop the bauxite mining industry in Guyana. In March 2006, RUSAL acquired the assets of state mining company Aroaima Mining Company (AMC) in exchange for approximately $20 million in investment commitment to develop and expand the company in an effort to boost AMC’s production capability from 1.3 Mt/yr of bauxite to 2.5 Mt/yr by 2007. RUSAL’s investment also included new mining and drying equipment. The transaction involved almost all AMC’s assets, including the Berbice bauxite mines, a development license for the Ituni group of bauxite deposits (which has potential reserves of 100 Mt), the Kurubuku 22 (a deposit that consist of approximately 39 Mt of bauxite), and the Moblissa-Bamia bauxite deposit (which is part of the Linden bauxite group for which RUSAL had held a development license since 2004). RUSAL planned to ship approximately 1 Mt/yr of bauxite to its Nikolaev Alumina refinery in Ukraine by 2008 (United Company RUSAL, 2006a, b; 2007).

Gold.—IAMGOLD officially ceased its production operations at the Omai gold mine in September 2005 owing to the depletion of reserves. The Omai gold mine, which was owned by IAMGOLD (95%) and the Government of Guyana (5%), produced about 115,000 kg (reported as 3.7 million troy ounces) of gold from 1993 to 2005. During 2006, IAMGOLD initiated a gold exploration program to define the extent of the Fennell gold deposit; the Fennell open pit was the main ore supplier to the Omai gold mine. If sufficient ore tonnage and gold grades were discovered, IAMGOLD would consider the possibility of developing an underground mine operation. IAMGOLD also sampled and mapped the Eagle Mountain property, which is located 30 km from the Omai gold mine (IAMGOLD Corp., 2006, p. 21).

Gold Port Resources Ltd. of Canada, was involved in the following three gold projects in Guyana: the Akaiwong Gold project, which covers an area of approximately 14 km² (3,430 acres); the Five Stars Gold project, which covers an area of about 52 km² (reported as 20 square miles); and the Groete Creek Gold/Copper project, which covers an area...
of nearly 15 km² (3,800 acres). The Akaiwong project is located in western Guyana near the Cuyuni River in mining district number 4, approximately 20 km southeast of Guyana Goldfield’s Aurora Mine. The drilling program at this site began in December 2006, and preliminary results had identified areas of gold mineralization. The Five Stars is located in a historical gold-bearing zone in northwest Guyana approximately 320 km (200 miles) from Guyana’s capital city of Georgetown and 40 km west of Stratagold Corp. of Canada’s Tassawini Gold project. The Guyana Geology and Mines Commission sponsored exploration at Gold Port’s Five Stars property to carry out stream sampling between late 2006 and early 2007. The objective of the study was to identify potential drilling targets. The Groote Creek project, which consisted of the Groote Creek property and the adjacent Georgetown West property, is located about 70 km (43 miles) southwest of the capital and was in the advanced stage of gold and copper exploration. Analysis performed at this site was to define the known gold and copper zone (Gold Port Resources Ltd., 2006; 2007; Bull & Bear, The, 2007).

Guyana Goldfields Inc., which was a Canadian gold exploration and development company, held 100% interest in the Aurora and the Peters gold mine properties and 50% interest in the Aranka group of properties. The Aurora Mine and the Peters Mine were past-producing mines that reportedly had produced more than 3,011 kg (reported as 96,810 troy ounces) of gold. The Aurora property, which is located 175 km west of Georgetown near Cuyuni River, covered an area of more than 650 km² (162,000 acres) and included at least six known gold mineralization zones. These were the Aleck Hill, the East Walcott Hill, the Mad Kiss, the Rory’s Knoll, the South Mad Kiss, and the Walcott Hill. Analysis on the Aurora property revealed initial indicated resource estimates of 640,000 troy ounces at a grade of 3.55 g/t gold for the Aleck Hill zone and indicated resources of 1.33 million troy ounces at a grade of 2.84 g/t gold for the Rory’s Knoll zone. The Peters property is located 160 km southwest of Georgetown and consisted of 33.8 km² (8,358 acres). During 2007, Guyana Goldfields planned to continue exploration activities at both properties, to include diamond drilling and soil sampling and analysis (Guyana Goldfields Inc., 2007a-d).

The Aranka Group properties are located northeast of the Aurora property. In 2005, Guyana Goldfields was granted a back-in-right to acquire 50% interest in the Aranka Group properties for a period of 3 years. According to the companies’ agreement, Guyana Goldfields was to reimburse Aranka Gold Inc. of Canada for 125% of its total expenditures on the property. In 2006, Aranka held a reconnaissance permit on an area that covered more than 400 km² (100,000 acres) in the Aranka district, Cuyuni River area. In May 2006, Aranka announced the acquisition of an exclusive exploration right that covered more than 200 km² (49,000 acres). An airborne geophysical survey was completed in 2006 (Aranka Gold Inc., 2006; Marketwire, 2006).

In June 2004, StrataGold Corp., through its indirectly held subsidiary StrataGold Guyana Inc., acquired 100% of the Tassawini gold property in the Barima-Waini district of northwestern Guyana. Previous exploration of the property revealed its potential for high-grade gold mineralization. A diamond drilling exploration program completed in 2006 revealed a new gold discovery at the Tassawini property named Mine Creek. The exploration also confirmed that the Black Ridge, the Tassawini East, and the Tassawini West projects were all part of the same gold mineralized system as the Mine Creek project. During 2007, StrataGold planned to continue its exploration program (StrataGold Corp., 2006, p. 11; 2007).

In October 2005, StrataGold Guyana acquired the reconnaissance permit for the Brama property. The permit was a 50/50 joint venture with Newmont Overseas Exploration Ltd., which was a subsidiary of Newmont Mining Corp. of the United States. The Brama reconnaissance permit was issued for the exploration and evaluation of the property’s area of about 4,000 km² (1 million acres); the main focus was the search for gold deposits. In September 2006, the joint-venture agreement was modified to include the Monosse Project, which was an advanced gold exploration project that consisted of the B-22, the Jardine, the Phillips, the White Creek, and the Younge properties (all located within the permit area). Under the reconnaissance permit, a drilling program commenced in November 2006 in the Monosse area; a more-extensive exploration program was planned for 2007 (StrataGold Corp., 2006, p. 12; 2007).

In October 2006, the Canada-based company ValGold Resources Ltd. agreed to earn 100% interest in four prospective properties from Newmont Overseas Exploration Ltd. The properties (the Cuyani River, the Five Star, the Kartuni, and the Otomung) covered an area of approximately 0.005 km² (1.2 acres) in northwest Guyana (ValGold Resources Ltd., 2006).

Industrial Minerals

Diamond.—In 2006, the following three Canadian companies held exploration and development interests in Guyana’s gold and diamond mineral industries: Sacre-Coeur Minerals Ltd., Shoreham Resources Ltd., and Vannessa Ventures Ltd., Shoreham Resources held two option agreements in Guyana with Vannessa Ventures. The option agreements granted Shoreham Resources the right to earn 75% of the Marudi Mountain gold project and 100% of the Maple Creek-Potaro diamond and gold project. Romanex Guyana Exploration Ltd., which was a wholly owned subsidiary of Vannessa Ventures, held 100% working interest in the approximately 55.7-km² (13,774-acre) Marudi Mountain gold project and in the 35.9-km² (8,875-acre) Paint Mountain gold project. The Paint Mountain gold project is located adjacent to the Marudi Mountain property. In September 2006, Shoreham Resources announced the signing of a property option agreement with Vannessa Ventures to earn 50% working interest in both the Marudi Mountain and the Paint Mountain gold projects, through the acquisition of 50% of Romanex’s shares; the transaction was made final in March 2007. Shoreham Resources had an option to earn an additional 25% interest (for a total of 75% interest) in the gold projects. The Marudi Mountain project included the Marudi, the Mazoa, and the Peace Creek gold deposits. In 2007, Shoreham Resources planned an exploration and development program at the Marudi Mountain project (Shoreham Resources Ltd., 2006; 2007a, b).
In September 2006, Shoreham Resources and Vannessa Ventures initiated an option agreement for Shoreham to acquire a 100% working interest in the 40,000 acres of the Maple Creek-Potaro diamond and gold project in the Potaro River area. Previous analysis revealed that the project hosted alluvial diamond deposits as well as potential areas to explore for gold deposits (Shoreham Resources Ltd., 2007a, b).

Sacre-Coeur Minerals’ properties in Guyana were divided into seven regional blocks that focused on exploration for diamond and gold. Based on historic production, three of the regional blocks had the potential to host economically feasible deposits of diamond and gold; all three blocks host alluvial diamond and gold deposits. The three blocks were known as the Kurupung regional block, which covered an area of 17.1 km² (4,224 acres); the Mahdia-Issano regional block, which covered an area of 35.2 km² (8,704 acres); and the Potaro-Kuribrong regional block, which covered an area of 36.5 km² (9,024 acres). The Kurupung and the Potaro-Kuribrong regional blocks consisted of medium-scale prospecting permits, whereas the Mahdia-Issano was a small-scale claim permit and claim license. The remaining four regional blocks were prospective for primary gold, alluvial gold, and alluvial diamond. These blocks are the Kartuni regional block, which covered an area of 146.6 km² (36,224 acres); the Lower Puruni regional block, which covered an area of 920.7 km² (227,520 acres) and included the 88.1-km² (21,760-acre) Million Mountain project; the Northwest regional block, which covered an area of 921.3 km² (227,648 acres); and the Oko regional block, which covered an area of 131.6 km² (32,512 acres). The Million Mountain project, which is located about 100 km west-southwest of Georgetown in the Mazaruni mining district number 3, consisted of 21 claim permits and was the company’s most advanced project (Sacre-Coeur Minerals Ltd., 2007a, b).

Mineral Fuels and Related Materials

Oil and Gas.—Canada-based CGX Energy Inc. held interests in four properties totaling 39,659 km² (9.8 million acres) offshore Guyana. The company’s interests in the four offshore properties included 100% ownership of the Corentyne License Annex, the Corentyne License, and the Pomeroon License, and a 25% interest in the Georgetown License. Onshore, the company had a 62% interest in the Berbice License (CGX Energy Inc., 2006, p. 2).

Several significant targets had been identified in the Corentyne petroleum prospecting license (PPL), including the Eagle prospect, which covered 120 km² (29,000 acres) and had an estimated mean resource potential of 610 million barrels of oil, and the Wishbone West prospect, which had an estimated mean resource potential of more than 100 million barrels of oil. The Corentyne PPL property covered approximately 15,000 km² (3.8 million acres) of the Corentyne License offshore Guyana; the property had been reinterpreted with 2-D seismic data taken in 1999. The petroleum agreement began in June 1998 for a period of 4 years and was renewable thereafter for up to two 3-year periods. The first renewal of the petroleum agreement was granted in November 2002. The renewal of the agreement was extended under two PPLs that included renegotiated work commitments. A dispute over the offshore borderline between Guyana and Suriname arose in 2000 and access to a portion of the contracted area in the Corentyne PPL was suspended; the dispute was resolved and, in June 2006, the term of the contract was extended to June 2013 (CGX Energy Inc., 2006, p. 2, 4, 9, 11; 2007).

The Corentyne property also had an onshore portion that consisted of 1,700 km² (415,000 acres), which together with the approximately 1,500 km² (380,000 acres) of the Berbice PPL, was known as the Berbice Block. CGX Energy created an onshore exploration program in September 2003 under which a wholly owned subsidiary, ON Energy Inc., was formed. CGX Energy’s interest was reduced to 62% after two private placements were completed at ON Energy. By October 2006, ON Energy fulfilled its contractual obligations by completing an aeromagnetic study, a geochemical sampling program, and a 2-D seismic program. During 2007, the company was planning to start an exploration well within the Berbice PPL (CGX Energy Inc., 2006, p. 6, 11; 2007).

CGX Energy owned 25% participating interest in the Georgetown offshore PPL, which it had purchased from ENI Guyana B.V.; the remaining 75% participating interest was held by Repsol YPF S.A. of Spain. The PPL covered an area of approximately 11,000 km² (2.8 million acres). A portion of the Georgetown PPL was located in the disputed border area between Guyana and Suriname, which had forced the company to suspend exploration works since 2000 (CGX Energy Inc., 2006, p. 5; 2007).

In July 2004, the Government of Guyana approved CGX Energy’s (through its wholly owned subsidiary CGX Resources Inc.) acquisition of 100% interest in the approximately 11,000 km² (2.8 million acres) Pomeroon offshore PPL, which the company purchased from Century Guyana Ltd. Future work on the property would include the acquisition of new seismic data and exploration drilling. CGX Energy reported that a total of about 410,000 cubic meters (14.5 million cubic feet) of gas has been found since 2003 at the Pomeroon oilfield. The company estimated the potential gas resource of the Pomeroon PPL to be approximately 1.08 trillion cubic meters (38 trillion cubic feet) (CGX Energy Inc., 2006, p. 5, 11-12; 2007).

Uranium.—Uranium exploration during 2006 in Guyana was carried out by the Canadian uranium exploration company, U3O8 Corp. The company obtained exclusive uranium exploration rights from the GGMC for two permitted areas that comprised 1.3 million hectares in western Guyana. Under the agreement with GGMC, U3O8 Corp. had the right to apply for a maximum of 35 prospecting licenses. The GGMC granted two reconnaissance permits to U3O8 Corp.’s indirectly wholly owned subsidiary Prometheus Resources Guyana—the CM Permit ( Permit A) and the PMCR Permit ( Permit B) (U3O8 Corp., 2006, 2007a).

The CM Permit covered 580,000 hectares (1,433,211 acres). Prometheus Resources reported eight known uranium mineralization areas within the reconnaissance permit (U3O8 Corp., 2007b).

On June 6, 2006, Prometheus Resources completed the acquisition of the 3-year PMCR Permit ( Permit B) from GGMC for a total area of 746,309 hectares (1,844,170 acres). The
PMCR permit covered the eastern boundary of the Roraima Basin. The company’s future plans for the Permit A and Permit B areas consisted of two phases. Phase 1 would include the reevaluation and testing of the known uranium showings in the Permit A area, with emphasis on the Ariacheng area by using diamond drilling, geochemical sampling, geophysical surveys, and mapping. Phase 2 would involve the evaluation and examination of the Roraima Basin for economically viable uranium deposits in the Permit B area. The proposed exploration in this area would involve the compilation of geochemical and geologic data, the analysis of historic drill cores, geochemical sampling, and isotopic analysis (U3O8 Corp., 2007c, d).

Outlook

Guyana’s mining sector will likely continue to be dominated by bauxite production. Because IAMGOLD’s OBMI property was in a period of management transition during 2006, bauxite production for 2007 was expected to remain at about 1.5 Mt. RUSAL planned to expand the production capacity at Aroaima Mining Company from 1.3 Mt/yr to 2.5 Mt/yr of bauxite by 2007. RUSAL expected to produce enough bauxite to supply RUSAL’s Nikolaev Alumina refinery in Ukraine with approximately 1 Mt/yr of bauxite by 2008.

Gold exploration activities in Guyana are likely to continue as a result of several gold exploration projects that progressed during 2006. Guyana Goldfields Inc. plans to continue exploration activities in its Aurora and Peters gold mines during 2007 (Guyana Goldfields Inc., 2007b). Shoreham Resources also plans an exploration program at the Marudi Mountain gold project in 2007, and Stratagold plans to continue its exploration program on the Tassawini property (Shoreham Resources Ltd., 2007a).

Offshore hydrocarbon exploration in Guyana will likely increase because of the progress in the resolution of the maritime boundary dispute between Guyana and Suriname. Seismic data acquisition and exploration drilling are planned for 2007 in several of CGX Energy’s properties (CGX Energy Inc., 2006, p. 7). Prometheus Resources’ future plans in Guyana include a detailed exploratory program of its uranium permit areas.

References Cited


11.6 U.S. GEOLOGICAL SURVEY MINERALS YEARBOOK—2006
The main bauxite operators in Suriname were BHP Billiton Ltd. and Suriname Aluminum C., LLC (Suralco) (a subsidiary of Alcoa World Alumina and Chemicals). BHP Billiton held 45% interest in all its bauxite mining and refining operations in Suriname, and the remaining 55% was owned by Suralco. BHP Billiton managed all four mines, and Suralco held the exploitation licenses, which were issued by the Government of Suriname and would expire in 2032 (BHP Billiton Ltd., 2006, p. 18-20). Table 2 is a list of the major mineral industry facilities in Suriname. The table provides the location and production capacities of these facilities.

Commodity Review

Metals

Bauxite and Alumina.—Production operations in Suriname included the four open pit bauxite mines and one alumina refinery that were jointly owned by BHP Billiton and Suralco. These were the Coermotibo Mine, the Kaaimangrasie Mine, the Klaverblad Mine, the Lelydorp III Mine, and the Paranam refinery. The Coermotibo Mine and the Lelydorp III Mine were expected to be depleted by 2007. Production from the Kaaimangrasie Mine and the Klaverblad Mine, which had been developed at a cost of $300 million, was expected to offset production from the depleted mines.

The Coermotibo Mine used a surface strip-mining method and was located 150 km east of Paramaribo. The mining operations at this facility were commissioned in 1991 and would be depleted by 2007 based on reserve estimates. The facility management planned to continue operations until July 2011 to process stockpiled and remaining material. Coermotibo’s nominal bauxite production capacity was 1.7 Mt/yr. The Kaaimangrasie Mine was located 38 km southeast of Paramaribo and 24 km east of the Paranam refinery. The development of Kaaimangrasie Mine began in November 2005, and full operation started in July 2006. The mine was expected to operate until November 2009 and would produce a projected of 2 Mt/yr of bauxite. The Klaverblad facility, which also had a production capacity of 2 Mt/yr of bauxite, is located 23 km southeast of Paramaribo and 11 km east of the Paranam refinery facility. The development of the Klaverblad Mine commenced in July 2005 and mine operations began in April 2007; the mine was scheduled to be operational until August 2011. The Lelydorp III Mine, which is located 25 km south of Paramaribo and 15 km west of the Paranam refinery, started operations in 1997 with a nominal bauxite production capacity of 2 Mt/yr; it was expected to close in February 2007 (BHP Billiton Ltd., 2006, p. 18-19, 21; 2007, p. 23-24; Cairo, 2006).

In 2006, production of alumina increased to 2,153,000 t from 1,944,000 t in 2005, which was an increase of 10.8% (table 1). The increase in alumina production was aided in part by the completion of the 250,000-metric-ton-per-year (t/yr) expansion of the Paranam refinery in 2005. The expansion increased the total capacity of the refinery to 2.2 Mt/yr. The refinery, which was located in Paraman, produced metallurgical-grade alumina and was managed by Suralco (BHP Billiton Ltd., 2006, p. 20; 2007, p. 25).

BHP Billiton and Suralco held an exploration license for the Bakhuis Mountains region in western Suriname. In November 2003, the Government granted BHP Billiton and Suralco a renewable license for a period of 25 months that covered an area of 2,780 km². Exploration of the area was concluded in November 2005. During 2006, the companies began negotiation with the Government to obtain the mining rights for the Bakhuis area. A proposed feasibility study was scheduled to begin in 2007 (BHP Billiton Ltd., 2006, p. 21; 2007, p. 25).

Gold.—Gold production from the Rosebel gold mine decreased by nearly 12% to 9,362 kg in 2006 from 10,619 kg in 2005 (table 1). IAMGOLD held a 95% interest in Rosebel Mine through its subsidiary Rosebel Gold Mines N.V.; the remaining 5% interest was held by the Government of Suriname. IAMGOLD acquired this property in November 2006 through its merger with Cambior. The Rosebel open pit gold mine, which is located approximately 100 km south of Paramaribo, commenced operations in February 2004. The six major deposits identified in the Rosebel property area included the East Pay Caro, the Koolhoven, and the Pay Caro, which are located in the northern part of the property, and the Mayo, the Rosebel, and the Royal Hill deposits, which are located in the southern part of the property. The 2006 gold production reported by the Rosebel gold mine came from the Pay Caro and the Royal Hill pits. Future plans for Rosebel included the mining of a low-grade ore zone in 2007, with a projected production of 7,930 kg/yr of gold (reported as 255,000 troy ounces). At yearend 2006, the measured and indicated reserves in the Rosebel Mine were estimated to be approximately 118,000 kg of gold. The estimated life of the mine was 12 years (IAMGOLD Corp., 2006, p. 6, 20-21).
In November 2006, Golden Star entered into a joint-venture agreement with Newmont Mining Corp.’s subsidiary Newmont Overseas Exploration Ltd. Both companies (Golden Star and Newmont) were based in the United States. The joint venture was to explore the 743-km² Saramacca gold project, which is located in the Brokolonko Range in eastern Suriname. Under the agreement, Newmont could earn 51% interest in the project by investing $6 million during a period of 5 years. During the first year, Newmont’s investment of $1.1 million was to fund such exploration efforts as diamond core drilling, ground geophysical surveys, and soil augering. Other planned works included mapping of the area and reconnaissance sampling (Golden Star Resources Ltd., 2006).

Mineral Fuels

Oil and Gas.—Suriname’s state-owned oil company, Staatsolie Maatschappij Suriname N.V., produced 4.8 million barrels (Mbbl) of crude petroleum in 2006, which was a 9.6% increase compared with the 4.38 Mbbl produced in 2005. According to the company’s 2006 annual report, the increase was the result of increases in daily crude production to 14,090 barrels per day (bbl/d) from 12,450 bbl/d at its 975 producing wells. Investments in Staatsolie’s property amounted to $72.2 million during 2006, which was spent in production development and other projects. In 2006, Staatsolie commenced commercial production at the 58-well oilfield in Calcutta from which 53 wells started production. In 2006, annual crude production from this field amounted to nearly 226,500 bbl, which was about 50% less than the projected 455,590 bbl. The 2006 yearend proved reserves stood at 13 Mbbl in the Calcutta field, 57 Mbbl in the Tambaredjo field, and 18 Mbbl in the Tambaredjo northwest area (Staatsolie Maatschappij Suriname N.V., 2007, p. 7, 8).

Staatsolie planned to carry out a crude petroleum production development program in 2007 to increase production to 5.11 Mbbl/yr, or by an estimated 6.5% compared with production in 2006. The company expected to increase crude petroleum production to 14,650 bbl/d of oil, or by nearly 4% compared with production in 2006. Other plans under the development program included the drilling of 91 new wells in the Calcutta field and 67 wells in the Tambaredjo field, in addition to exploration efforts in prospective areas (Staatsolie Maatschappij Suriname N.V., 2007, p. 18).

Staatsolie’s refinery processed 2.5 Mbbl of crude in 2006, which was a 7.4% decrease from the 2.7 Mbbl processed in 2005. The petroleum products produced at the refinery included asphalt bitumen, diesel, and various grades of fuel oil. The company planned to increase its refinery capacity to 15,000 bbl/d from 7,000 bbl/d in the near future (Staatsolie Maatschappij Suriname N.V., 2007, p. 7, 10).

Paradise Oil Company N.V. (a wholly owned subsidiary of Staatsolie, which was established in December 2005 and became fully operational in May 2006) ran joint-venture operations that involved the parent company and third parties. Under the joint-venture, Paradise Oil and its partners would enter into a production-sharing contract with Staatsolie. In February 2007, Staatsolie signed its first production-sharing contract for the onshore blocks Coronie and the Uitkijk through its Paradise Oil subsidiary. The production-sharing contract involved the joint venture between Paradise Oil and Hardman Resources Ltd. of Australia, which was a wholly owned subsidiary of Tullow Oil plc. Under the agreement, Hardman would acquire 40% working interest by funding an initial exploration program for $8.5 million; Paradise Oil was the operator and held the remaining 60% interest. The onshore blocks covered an estimated area of 6,716 km² [reported as 2,593 square miles] (Coronie) and 1,961 km² [reported as 757 square miles] (Uitkijk), both of which are located adjacent to the Calcutta and the Tambaredjo oilfields (Hardman Resources Ltd., 2006; Staatsolie Maatschappij Suriname N.V., 2007, p. 10, 12).

In July 2006, Staatsolie inaugurated a 14-megawatt powerplant at Tout Lui Faut. At yearend, production at the powerplant had reached 27 million kilowatthours, which represented a partial-year production. Staatsolie expected to increase its powerplant production in its first full year of production in 2007. The plant was to be incorporated as a separate entity named Staatsolie Power Company Suriname N.V (Staatsolie Maatschappij Suriname N.V., 2007, p. 7, 12).

Outlook

In 2007, bauxite mining in Suriname was expected to remain at the 2006 production level; output from the depleted Coermotibo and Lelydorp III Mines was to be offset by production from the Kaaimangrasie and the Klaverblad bauxite mines.

Gold production was expected to decrease owing to Rosebel management plans to mine a low-grade ore zone in 2007. In January 2007, the management of Rosebel reported a halt in the mine’s operation that could negatively affect total gold production for the year (IAMGOLD Corp., 2006, p. 21).

Petroleum-related exploration activities were expected to increase in 2007. Paradise Oil planned to start exploration on the Coronie onshore oil block at the end of 2007 and on the Uitkijk block by mid-2007 (Staatsolie Maatschappij Suriname N.V., 2007, p. 10, 12).

In the near future, production of petroleum products was expected to increase owing to Staatsolie’s plans to more than double the refinery capacity with investment of about $600 million in exploration and improvements during the next 5 years. For 2007, Staatsolie planned to invest $71 million, of which 95.6% would be allocated to crude petroleum production development and exploration, and 3.8% to refinery operation projects (Staatsolie Maatschappij Suriname N.V., 2007, p. 7, 10, 18).

References Cited

### TABLE 1
FRENCH GUIANA, GUYANA, AND SURINAME: PRODUCTION OF MINERAL COMMODITIES

(Thousand metric tons unless otherwise specified)

<table>
<thead>
<tr>
<th>Country and commodity</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRENCH GUIANA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cement metric tons</td>
<td>62,000</td>
<td>62,000</td>
<td>62,000</td>
<td>62,000</td>
<td>62,000</td>
</tr>
<tr>
<td>Clays do.</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Columbite and tantalite kilograms</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Gold, mine output, Au content do.</td>
<td>3,290</td>
<td>3,296</td>
<td>2,773</td>
<td>1,955</td>
<td>2,000</td>
</tr>
<tr>
<td>Sand</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Stone, crushed</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td><strong>GUYANA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bauxite, dry equivalent, gross weight</td>
<td>1,690</td>
<td>1,846</td>
<td>1,506</td>
<td>1,648</td>
<td>1,558</td>
</tr>
<tr>
<td>Clay metric tons</td>
<td>NA</td>
<td>NA</td>
<td>3,000</td>
<td>12,000</td>
<td>NA</td>
</tr>
<tr>
<td>Diamond carats</td>
<td>248,436</td>
<td>412,537</td>
<td>444,940</td>
<td>356,948</td>
<td>340,544</td>
</tr>
<tr>
<td>Gold, mine output, Au content kilograms</td>
<td>13,581</td>
<td>11,707</td>
<td>11,148</td>
<td>8,166</td>
<td>6,406</td>
</tr>
<tr>
<td>Sand metric tons</td>
<td>186,327</td>
<td>253,674</td>
<td>142,092</td>
<td>573,150</td>
<td>285,000</td>
</tr>
<tr>
<td>Stone, crushed do.</td>
<td>54,746</td>
<td>154,093</td>
<td>285,583</td>
<td>315,964</td>
<td>204,000</td>
</tr>
<tr>
<td><strong>SURINAME</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bauxite, gross weight</td>
<td>4,002</td>
<td>4,215</td>
<td>4,052</td>
<td>4,757</td>
<td>4,924</td>
</tr>
<tr>
<td>Alumina</td>
<td>1,900</td>
<td>2,004</td>
<td>2,039</td>
<td>1,944</td>
<td>2,153</td>
</tr>
<tr>
<td>Cement, hydraulic</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Clays, common</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Gold, mine output, Au content kilograms</td>
<td>300</td>
<td>300</td>
<td>8,513</td>
<td>10,619</td>
<td>9,362</td>
</tr>
<tr>
<td><strong>Petroleum:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude thousand 42-gallon barrels</td>
<td>4,500</td>
<td>4,300</td>
<td>4,100</td>
<td>4,380</td>
<td>4,800</td>
</tr>
<tr>
<td>Products do.</td>
<td>2,700</td>
<td>2,600</td>
<td>2,500</td>
<td>2,700</td>
<td>2,500</td>
</tr>
<tr>
<td>Sand and gravel:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravel</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Sand, common</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
<td>160</td>
</tr>
<tr>
<td>Stone, crushed and broken</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

1Estimated; estimated data are rounded to no more than three significant digits.  2Revised.  NA Not available.
3Table includes data available through November 1, 2007.
4Source: Direction Regionale de l’Industrie, de La Recherche et de l’ Environment and Bureau de Recherches Géologiques et Minières.
5Reported figure.
6In addition to the commodities listed, Guyana’s Government also reported laterite production, in metric tons: 2004--44; 2005--12,000; and 2006--NA; and loam production, in metric tons: 2004--3,000; 2005--4,000; and 2006--21,017.
7Source: Guyana Geology and Mines Commission.
8Source: World Bureau of Metal Statistics.
9Source: BHP Billiton Group.
10Source: Cambior Inc.
11Source: IAMGOLD Corp.
12Source: Staatsolie Maatschappij Suriname N.V.
### TABLE 2
**GUYANA AND SURINAME: STRUCTURE OF THE MINERAL INDUSTRIES IN 2006**

(Thousand metric tons unless otherwise specified)

<table>
<thead>
<tr>
<th>Country and commodity</th>
<th>Major operating companies and major equity owners</th>
<th>Location of main facilities</th>
<th>Annual capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GUYANA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bauxite</td>
<td>Aroaima Bauxite Co. (United Company RUSAL, 90%, and Government, 10%)</td>
<td>Aroaima, East Berbice District</td>
<td>2,000</td>
</tr>
<tr>
<td>Do.</td>
<td>Omai Bauxite Mining Inc. (IAMGOLD Corp., 70%, and Government of Guyana, 30%)</td>
<td>Omai Bauxite Mine and Processing Plant located close to Linden on the Demerara River about 100 kilometers south of Guyana's capital city of Georgetown</td>
<td>1,500</td>
</tr>
<tr>
<td>Gravel</td>
<td>Baracara Quarries (private)</td>
<td>Quarry near Bartica, Mazaruni-Potaro District</td>
<td>100</td>
</tr>
<tr>
<td>Silica sand</td>
<td>Minerals and Technology Ltd. [Minerals and Chemicals of Texas (United States)]</td>
<td>Sand Hills, Demerara River, West Demerara District</td>
<td>300</td>
</tr>
<tr>
<td>Stone</td>
<td>Mazaruni Granite Products Inc. of Mazaruni River (private)</td>
<td>Mazaruni River</td>
<td>3,650</td>
</tr>
<tr>
<td><strong>SURINAME</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alumina</td>
<td>Suriname Aluminum Co., LLC (Suralco) (Alcoa, Inc., 55%, and BHP Billiton Ltd., 45%)</td>
<td>Refinery at Paranam (produces metallurgical-grade alumina)</td>
<td>2,200</td>
</tr>
<tr>
<td>Bauxite</td>
<td>do.</td>
<td>Lelydorp III Mine, open pit mine, located 25 kilometers south of Paramaribo, District of Marowijne. Expected to close in February 2007</td>
<td>2,000</td>
</tr>
<tr>
<td>Do.</td>
<td>do.</td>
<td>Coermonibo Mine, surface strip mine, located 150 kilometers east of Paranam. Expected to be depleted by 2007</td>
<td>1,700</td>
</tr>
<tr>
<td>Do.</td>
<td>do.</td>
<td>Klaverblad Mine, open pit mine, 23 kilometers southeast of Paramaribo. Expected to commence in May 2007</td>
<td>2,000</td>
</tr>
<tr>
<td>Do.</td>
<td>do.</td>
<td>Kaaimangrasie Mine, open pit mine, located 38 kilometers southeast of Paramaribo. Operations started in July 2006</td>
<td>2,000</td>
</tr>
<tr>
<td>Cement</td>
<td>Vensur N.V. (private, 100%)</td>
<td>Paramaribo, District of Para</td>
<td>60</td>
</tr>
<tr>
<td>Gold</td>
<td>kilograms</td>
<td>Rosebel Gold Mines N.V. (Cambior, Inc., 95%, and Government of Suriname, 5%)</td>
<td>10,500</td>
</tr>
<tr>
<td>Petroleum</td>
<td>thousand 42-gallon barrels</td>
<td>Staatsolie Maatschappij Suriname N.V. (Government, 100%)</td>
<td>4,500</td>
</tr>
<tr>
<td>Do.</td>
<td>do.</td>
<td>Tambaredjo, District of Saramacca</td>
<td>460</td>
</tr>
<tr>
<td>Petroleum products</td>
<td>do.</td>
<td>Calcutta field (58 wells)</td>
<td>2,600</td>
</tr>
<tr>
<td>NA</td>
<td>Not available.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>