BEDROCK SOURCES OF PLACER GOLD-MERCURY AT THE WITLAGE CREEK PROSPECT, EASTERN SURINAME, SOUTH AMERICA

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Abstract

The region of eastern Suriname is famous for small scale gold placering, the historic Witlage Creek gold placer has been worked since the early 1900’s. This investigation was carried out to map the extent of bedrock geologic control on recent sedimentary gold placering, and to identify the primary sources of mercury present in the Witlage Creek area. Regional mapping (1:10,000 scale, ~20 km2), stream panning, and geochemical sampling of rocks and soils was used to extend previous studies. The highly productive and historic Witlage Creek gold placer has been worked since the early 1900’s.

Previous Studies.

Three geologic maps as part of the Earth Science in Suriname Project were published in 1984 by the Royal Netherlands Academy of Sciences. Amsterdam: Royal Netherlands Academy of Sciences. Exploration Geochemistry

Area 1.

Sampling was focused along the NE-SW striking anticline. Anomalous gold values, visible gold, and anomalous arsenic are associated with a felsic intrusive/volcanic complex. Coarse-grained, holocrystalline intrusive gabbro is found as float and associate with very thick laterite development. The rocks are very little deformed light-colored fine- to coarse-grained sandstones, intercalated with volcaniclastic sediments of the Rosebel Formation. These formations are described as being about 1.8 to 2 or possibly the weathered eroded remnants of mineralized rock that was along the upper portions of the northeast-striking drainage immediately north of Witlage Creek and roughly paralleling it (north of Pointapi Kreek). These rocks are an intercalated series of volcanic rocks and volcaniclastic sediments intruded by fine-grained dark- to light-green and greenish grey amphibolite and minor granitic gneiss rocks (v).

Introduction

The objective of this investigation was to extend and refine previous studies in the Witlage Creek area drainages. The region is part of a northwest-striking paleoproterozoic granite-greenstone belt of the Guiana Shield. This belt can be divided into three parts: a) the central Sipaliwini District, b) the northwestern Sipaliwini District that includes the Vitata (formerly known as Mossel) and Apostol places, and c) the northeastern Sipaliwini District that includes the eastern Sipaliwini District and eastern Suriname (former Leboule district). Many of these ancient greenstone belts were the sites of ancient placer gold fields, such as the Witlage Creek gold placer.

Regional Geologic Setting.

The region is part of a northwest-striking paleoproterozoic granite-greenstone belt of the Guiana Shield. This belt can be divided into three parts: a) the central Sipaliwini District, b) the northwestern Sipaliwini District that includes the Vitata (formerly known as Mossel) and Apostol places, and c) the northeastern Sipaliwini District that includes the eastern Sipaliwini District and eastern Suriname (former Leboule district). Many of these ancient greenstone belts were the sites of ancient placer gold fields, such as the Witlage Creek gold placer.

Structural Geology

The region is part of a northwest-striking paleoproterozoic granite-greenstone belt of the Guiana Shield. This belt can be divided into three parts: a) the central Sipaliwini District, b) the northwestern Sipaliwini District that includes the Vitata (formerly known as Mossel) and Apostol places, and c) the northeastern Sipaliwini District that includes the eastern Sipaliwini District and eastern Suriname (former Leboule district). Many of these ancient greenstone belts were the sites of ancient placer gold fields, such as the Witlage Creek gold placer.

Mafic/ultramafic(?) intrusive in the trenches. Native mercury is locally present in this rock type. Hydrothermal alteration, associated with a felsic intrusive, includes gold, copper, molybdenum, iron, and rare earth elements (REE). Native mercury values are generally higher and more broadly disseminated in the meta-sediments than in the felsic volcanics (159 ppm) and REE values are lower (La 80, Ce 15, Nd 8, Sm 15, Eu 3, Gd 4 ppm).

Stratigraphy

Paleoproterozoic rocks (Oldest to Youngest).

Paleoproterozoic granitoids intruded by the rosebel formation.

Late Proterozoic gneisses are exposed in the east-central study area. Very fine-grained mafic to ultramafic intrusive rock found in outcrop along the area. Most of the mafic/ultramafic intrusive rock is 1.8 to 2 billion years old. The mafic rock is the oldest rock found in the study area. The rock is rich in olivine and pyroxene and has a porphyritic texture. The rock is composed of olivine, pyroxene, and plagioclase.

Paleoproterozoic metasediments are the oldest rocks found in the study area. The rocks are very little deformed and are composed of light-colored fine- to coarse-grained sandstones, intercalated with volcaniclastic sediments of the rosebel formation. These formations are described as being about 1.8 to 2 billion years old. These rocks are an intercalated series of volcanic rocks and volcaniclastic sediments intruded by fine-grained dark- to light-green and greenish grey amphibolite and minor granitic gneiss rocks (v). Mafic/ultramafic(?) intrusive in the trenches. Native mercury is locally present in this rock type. Hydrothermal alteration, associated with a felsic intrusive, includes gold, copper, molybdenum, iron, and rare earth elements (REE). Native mercury values are generally higher and more broadly disseminated in the meta-sediments than in the felsic volcanics (159 ppm) and REE values are lower (La 80, Ce 15, Nd 8, Sm 15, Eu 3, Gd 4 ppm).

Target area 1 but not Target area 2. Zones of anastomosing quartz veining. Pyrite and pseudomorphs after pyrite are common in this zone and are observed in the stockwork quartz veins. Gold is observed in the stockwork veins. Gold values are highest and most continuous in the target area 1 but not Target area 2.

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Native Mercury in Pans at the Head of Witlage Creek

Panning the Tributaries of Witlage Creek

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Exploration Geochemistry

Area 1.

Sampling was focused along the NE-SW striking anticline. Anomalous gold values, visible gold, and anomalous arsenic are associated with a felsic intrusive/volcanic complex. Coarse-grained, holocrystaline intrusive gabbro is found as float and associate with very thick laterite development. The rocks are very little deformed light-colored fine- to coarse-grained sandstones, intercalated with volcaniclastic sediments of the Rosebel Formation. Fine-grained dark- to light-green and greenish grey amphibolite and minor granitic gneiss rocks (v).

Area 2.

Gold mineralization, anomalous mercury, and intrusive gabbro are associated with the axis of a NW-striking anticline. Anomalous gold values, visible gold, and anomalous arsenic are associated with a felsic intrusive/volcanic complex. Coarse-grained, holocrystaline intrusive gabbro is found as float and associate with very thick laterite development. The rocks are very little deformed light-colored fine- to coarse-grained sandstones, intercalated with volcaniclastic sediments of the Rosebel Formation. Fine-grained dark- to light-green and greenish grey amphibolite and minor granitic gneiss rocks (v).

Area 3.

Gold values in the ITG00075 sample were slightly enhanced at the margins of the Pan concentrates target area. The Pan concentrates were collected over the entire Pan concentrates target area. The Pan concentrates were collected over the entire Pan concentrates target area.

Conclusions

Regional mapping (1:10,000 scale, ~20 km2), stream panning, and geochemical sampling of rocks and soils were used to extend previous studies. The highly productive and historic Witlage Creek gold placer has been worked since the early 1900’s. Although the area is famous for small scale gold placering, this investigation is the first to explore for bedrock sources of gold and mercury. The region is part of a northwest-striking paleoproterozoic granite-greenstone belt of the Guiana Shield. This belt can be divided into three parts: a) the central Sipaliwini District, b) the northwestern Sipaliwini District that includes the Vitata (formerly known as Mossel) and Apostol places, and c) the northeastern Sipaliwini District that includes the eastern Sipaliwini District and eastern Suriname (former Leboule district). Many of these ancient greenstone belts were the sites of ancient placer gold fields, such as the Witlage Creek gold placer.

Much of the gold in the Witlage area is coarse grained. Larger sample sizes and bulk metallic assay techniques that account for the large particle size may be necessary to characterize the gold grade of this gold placer. Much of the gold in the Witlage area is coarse grained. Larger sample sizes and bulk metallic assay techniques that account for the large particle size may be necessary to characterize the gold grade of this gold placer.