

# UNITED NATIONS DEVELOPMENT PROGRAMME



# UNDP

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## UNITED NATIONS REVOLVING FUND FOR NATURAL RESOURCES EXPLORATION

### PROJECT RECOMMENDED BY THE ADMINISTRATOR

#### Mineral Exploration of two areas in Guyana (GUY/NR/78/001)

#### I. Background

1. The Government of Guyana offered several prospects to the Fund for consideration in the latter part of 1978. A carbonatite (alkali) complex in the Muri Mountains with associated rare-earths and phosphate was first selected by the Fund and the Government as warranting investigation, and in 1979 an evaluatory-preparatory mission was mounted to investigate the mineral potential of this area. During this consultancy mission both the Fund and the Government recommended that a project be evaluated to explore the Eastern Cuyuni Greenstone Belt for both disseminated and massive sulphides and gold.
2. The Fund's evaluation of the Muri Mountains Area and the Eastern Cuyuni Greenstone Belt was positive and has led to a work programme which combines the required work in both areas into this one project.
3. The Muri Mountain Alkaline Complex is a recent discovery and work done by the Government to date suggests that further work should be carried out to determine the geology and to delineate any potential economic deposits which may be present. It forms a distinct range trending southwest along the Brazilian border and comprises two adjacent masses consisting largely of nepheline syenite, which has intruded, and locally fenitized rocks of the Southern Guyana Granite Complex. A late metasomatic episode is associated with the development of albite and pyrochlore. The topographically distinct conical Twareitau Mountain at the east-northeast end of the complex, probably consists in part of breccia and carbonatite obscured by ironstone laterite and latosols.
4. Secondary phosphate rock (phosphorite) is a major component of the supergene material below the ferrite crust of Twareitau. Anomalous rare earth elements, high pH values in water from two streams, diagnostic of water draining from carbonate areas, and fenitization of country rocks all point to the presence of carbonatites.

5. The economic potential of carbonatites is evident from the fact that over 20 mines have been opened up during the last 20 years to exploit a variety of minerals. The Brazilian carbonatites are located in a similar environment and two deposits, Jacupiranga and Araxa, have produced approximately 362,000 tons of apatite, 460,000 tons of cement and 9,797 tons of bariopyrochlore in 1975.

6. The price of phosphate has skyrocketed in the last few years and superphosphate in Guyana now costs \$165.00 per ton. With the emphasis on agricultural development in Guyana and adjacent countries, the demand for phosphate has risen dramatically. There would be no problem in developing a viable export market in the Caribbean area, should the carbonatite deposits in South Guyana be developed.

7. The Eastern Cuyuni Area is one of the best known and most promising greenstone areas in Guyana. In addition to showing a complete greenstone sequence, it carries numerous base metals showings (copper, molybdenum, zinc) as well as several gold-fields. The Eastern Cuyuni Greenstone Belt, is a mineralized zone some 90 km. long and 8 - 16 km. wide. This ENE-WSW trending belt consists of a typical greenstone sequence of metavolcanics and tuffs with associated agglomerates, turbidites, carbonaceous shales, quartzites and pelagic type limestones. The metavolcanics comprise basic, felsic and quartz-porphyry types probably associated with several volcanic centres. The area is accessible to exploration as well as exploitation.

8. Four main centres of gold and associated base metal sulphide mineralization are recognized within the Eastern Cuyuni Greenstone Belt: (i) Peter's Mine area; (ii) Aremu area; (iii) Wariri-Mariwa area; and (iv) Groete Creek area. At Peter's Mine 40,000 ounces of gold were obtained from rich gold-bearing quartz veins during 1905-1909. Grades ranged from 0.1 oz./ton to about 6.0 oz./ton.. Extensions of primary ore shoots rich in gold have been provided at depth, and have been found to be associated with sulphides of copper, lead and molybdenum. At Aremu previous mining of gold veins occurred at the beginning of the century, and follow-up work carried out by UNDP in 1962-1969 suggests the possibility of a base metal prospect occurrence. Similarly at Wariri-Mariwa and Groete Creek, gold and copper occurrences are known to exist.

9. The work done in Eastern Cuyuni Greenstone Belt by the Government of Guyana, UNDP and the Fund's recent evaluatory mission indicates the presence of mineralization which, in the opinion of the Fund, would warrant an initial investigation to assess more conclusively the geology, grade and extent of the mineralization.

10. The proposed exploration areas are considered both on geological and economic grounds to meet the Revolving Fund's operational criteria, and any economic discovery would be beneficial to Guyana in its development.

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## II. The Project

11. The objective of the project will be the discovery and evaluation of mineral deposits of possible economic potential in two areas: (a) AREA I, the Muri Mountains Area in South Guyana, covering approximately 270 square kilometres, principally for phosphates, rare earths and niobium; and other commodities such as limestone which could be utilized for the production of cement; and (b) AREA II, the Eastern Cuyuni Greenstone Belt, covering approximately 2500 square kilometres, for disseminated and massive sulphides and gold.

12. The Minimum Work will include the following:

(a) AREA I (Muri Mountains)

- (i) Core drilling at Twareitau Mountain to test the extent of the underlying supergene phosphate horizon as well as the location and composition of the presumed carbonatite rocks;
- (ii) Sampling the soils and/or laterite over the Twareitau Complex;
- (iii) Determination of the content of heavy minerals - uranium, pyrochlore, zircon and titanium minerals - in the alluvium by sampling of pits and trenches; and
- (iv) Evaluation of the results of the above work to identify zones of potentially economic mineralization which may warrant further work.

(b) AREA II (Eastern Cuyuni)

- (i) An in-depth review of the existing airborne geophysical, geochemical, geological and mine data together with photo-geological studies;
- (ii) A Regional geochemical survey covering the greenstone section of the project area;
- (iii) Detailed geological, geochemical and ground geophysical surveys of promising areas where warranted and delineated by work effected in (i) and (ii) above; and
- (iv) Initial limited drilling, as warranted, of both potential extensions of known mineralization and high priority targets located by previous work.

13. In carrying out the Minimum Work described above, the Fund will expend not less than the equivalent of \$650,000 over a period of approximately 12 months to finance the services of national and international recruited staff as well as the provision of the necessary supplies, equipment and supporting services.

14. If the results of the Minimum Work justify additional work, it is estimated that an additional expenditure up to \$2 million may be required, to better define and evaluate the economic potential of individual ore deposit(s) to the point where, in the opinion of the Fund, development investment can be attracted.

III. Financial data

15. <u>Revolving Fund Allocation</u>	\$
Minimum Work	650,000
Possible additional expenditures for further activities following the Minimum Work	2,000,000

The financial assets of the Fund are adequate to meet the costs of this project.

IV. Recommendation

16. The Administrator recommends that:

The Governing Council

- (a) Approve this project involving Minimum Work at a cost equivalent to \$650,000 as an obligation of the United Nations Revolving Fund for Natural Resources Exploration, and possible additional expenditures for further activities, to a maximum of \$2 million, bringing total possible expenditure to the equivalent of \$2,650,000;
- (b) Decide that this approval shall be cancelled unless the Government of Guyana and the Fund shall have signed a project agreement within a period of nine months after the date of this approval, it being understood that the Governing Council shall be notified of any such cancellation at the Council's first session after such action has been taken.

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