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***GOLD PROSPECTING
NATIONAL PROGRAM
Subject and Methodology***

Rio de Janeiro
1998

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**GOLD PROSPECTING NATIONAL PROGRAM
SUBJECT AND METHODOLOGY**

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September, 1998

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This report on Mineral Resources intends to systematize and divulge CPRM technical activity results on the fields of Economic Geology, Prospecting, Exploration and Mineral Economics. Results are shown in various kind of maps, bibliographic articles, reports and studies.

Due to the nature of these subjects, there are eight different series of reports, as listed below and at the end of this report:

1. PGE and Associates Series;
2. Gold Thematic Maps Series, 1:250.00 scale;
3. Gold Series – General Information;
4. Agricultural Mineral Resources Series;
5. Gemstones Series;
6. Mineral Economics Series;
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1 - Gold and gold prospecting importance

Program's justification

The Brazilian gold potential is undeniable due to the fact that the nation has 3.900.000 km² of its territory, about 46%, constituted by Pre-Cambrian rocks of recognized geological and metallogenetic importance, where several sequences of greenstone belts, old conglomerates, metavolcanic suites and frequent sheet-like veins swarm inserted in shear zones are to be detached as very promising geological environments.

The high number of occurrences, deposits, mines and old and recent prospects spread in several regions, confirms this potentiality for gold, which is also demonstrated by three centuries of production of the yellow metal. It is worthwhile to emphasize that Brazil was, in the eighteenth century, the most important gold producer in the world.

On the other hand, the prospecting campaigns held up to now have been absolutely incompatible with the enormous and indisputable potential already known.

The value of the world gold production reached, in 1996, the sum of US\$ 29,24 billions in regard to 2,345.5 ton. The Brazilian gold production, including that informal resulting from "garimpos" reached 64,2 ton, representing US\$ 0,801 billion, which is only 2,74% of the world total production. This is extremely small if one considers the Brazilian gold potentiality. Brazil holds a modest 10th place, preceded by South Africa, USA, Russia, Australia, Canada, China, Indonesia, Uzbequistan and Peru. Taking into consideration only the production from gold mines, excluding that from "garimpos", the Brazilian participation in the gold world production lowers to only 25 ton.

The Brazilian gold deposits, known and yet to be found, urgently need to be prospected in order to accelerate the processes of utilization and generation of hard currencies. Gold is an extremely important gift from nature but it only

becomes valuable, it only contributes to the economic and social development if prospected, evaluated and produced.

Gold is unlimitedly convertible into any currency at the international market price. It can be exchanged, without any major difficulty, into goods and services produced anywhere, further to being used, without any restrictions, in the payment of Brazilian external engagements and to increase the monetary reserves of the country.

Historical experience shows that all currencies are, at a higher or lower degree, affected by inflation, whilst gold, for thousands of years, has maintained and even increased its relative value. There are no indications that this value increasing process may be reverted.

The Government has been centering its efforts on the basic geological mapping of the country, while private companies have been investing on the detailed exploration and evaluation of areas already reasonably known (aiming at the delimitation or improvement of the reserves), mainly on the opening of new mines or in the improvement or modernization of the existent ones.

However, a more effective action is still lacking in the middle section of the gold mines generation process, namely in the gold prospecting. The latter, even in the more developed capitalist countries, has been mostly carried out by the public sector. In a poor country such as Brazil, where there is a great lack of capital for investment in the private sector, governmental action is even better justified.

Knowing the relevant importance of the production of gold in Brazil, CPRM - Companhia de Pesquisa de Recursos Minerais has planned - and put into effect the Gold Prospecting National Program - PNPO ("Programa Nacional de Prospecção de Ouro"), encompassing the whole national territory.

Under these circumstances and understanding as irreversible the option of the Government for greater private enterprise economy, the present Program aims at evaluating potential areas and targets to be afterwards explored by private enterprise which will then be able to develop procedures to discover new deposits or substantially increase the existent ones. This will create the necessary conditions for the exploitation of new gold mines and, consequently, increase the national gold production.

The laws which deal with the creation and transformation of CPRM into a Geological Survey, allow the implementation of government gold prospecting programs, bearing in mind its social achievements.

On the other hand, it is important to stress the syntonization of the program objectives with the federal Government's main guidelines, in order to supplement the performance of private enterprise.

2 - Objectives to be achieved

Objectives of the Program are as follows:

- a) To define the national geological and economic gold potential, distinguishing the more attractive areas.
- b) To stimulate discovery of deposits and to develop economic exploitation of gold, supplementing private enterprises activities.
- c) To contribute significantly to the upgrading of the national primary gold production thus making possible an

increase in the hard currencies cash reserves of the country, which is of recognized economic importance in foreign trade.

- d) To offer to whom it may concern a better knowledge of the national potentialities for gold exploration, through a set of special maps and a data processing bank.

Help to increase gold production by means of non-polluting methods thus cooperating in land reclamation.

3 - Main characteristics and operation guidelines

The Program was elaborated in 1991. The operational activities started in 1992, they were developed in 1993 and came into full execution in 1994. They are, in principle, permanent. It presently encompasses 10 projects located at several regional units of CPRM all over Brazil and a coordinating and supervising center in Rio de Janeiro. Altogether 20 geologists work full-time on this Program, further to experts in data processing.

Treasury funds are the institutional support to the Program.

Operational segments of the Program are as follows:

- a) Acquisition, interpretation and systematization of all main information concerning economic geology, prospecting and gold exploration in Brazil. Such information is registered on a detailed and specialized filling card,, known as FIBO (Gold Bibliographic Information Form), the elaboration of which is based on published and unpublished geological reports and research and mining special reports from DNPM (National Mineral Production Department) and mining companies reports. The FIBO's information meant to help in the evaluation of the indexes, execution of specialized maps and towards the data processing of the Program, as described in the topics 5, 6 and 7;
- b) Geology-index and Prospectivity-indexes evaluation;
- c) Drawing of geology and prospectivity indexes Maps;
- d) Program data processing;
- e) Prospective field works;
- f) Maps and data availability to the mineral community;
- g) Divuligation of the results.

4 - Work Areas

The Program intends to cover all Brazilian gold bearing areas. One hundred and two areas were selected, covering an

area of 1.142.366 km², meaning 13% of the national territory (Figure 1).

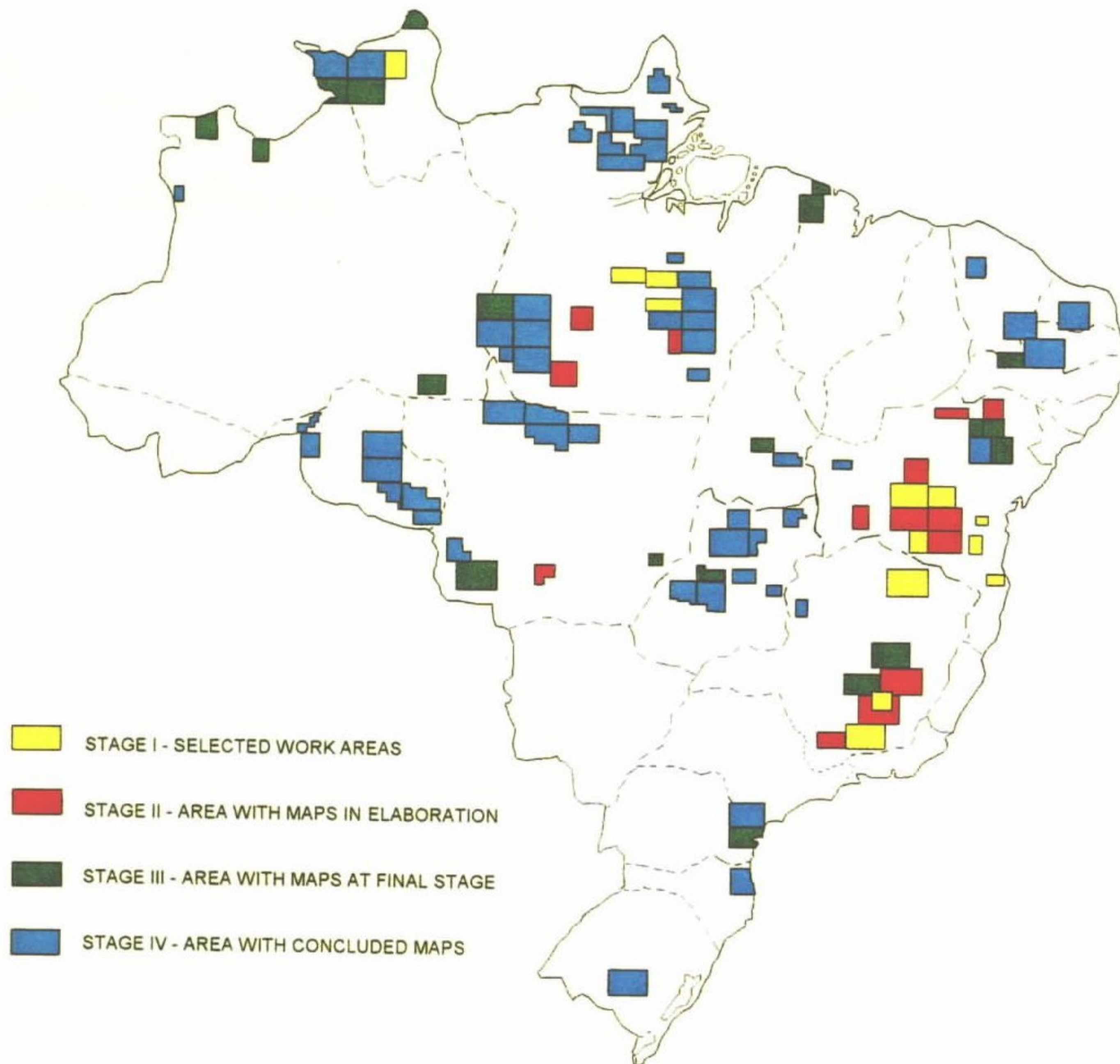


Figure 1 – Map of work areas

5 - Methodology

5.1 Quantitative Gitology

The geological science state of the art points to a conjunction of factual elements with quantitative factors. On one hand one tries to base the knowledge on unchangeable concepts such as mineralogy, petrography nature, morphology, etc. and on the other hand on quantitative elements such as width, volume, contents, production, reserves, indexes etc. This is the concept of each time more to quantify the geological accidents and moderate or even minimize the interpretations of phenomena which are generally changeable and inconstant and sometimes unreliable. This is a way to avoid the "I think" in the decision making process which should be based more on quantitative elements and less on subjective or just qualifying ones such as those expressions commonly used "this area is hot", "violent anomaly", "there are too much sulfides", "the pan yellowed"... amongst other.

Gitology is the study of ore-deposits, including its geological environment in the broadest sense and also its economic value. Quantitative Gitology is concerned with the measurement of the economic importance of the various types of ore-deposits, through indexes and parameters based on reserves and on production of a given mineral good.

Through the application of the quantitative gitology concepts, CPRM geologists involved in the Program, made a comparative table of the Standard Quantitative Gitology encompassing the varied geological environment related to the main gold deposits in the world, with the definition of gitologic types, to which are attributed the values of production and gold reserves at world level (Table 01). Fourteen (14) gitologic types were distinguished, classified by geological environment category and characterized by the following elements: *host rocks, morphology of the ore body, mineralogical association, texture and chemism of the ore, further to examples of deposits in the world and in Brazil.*

The identification and characterization, on a map, of the host environments for gold deposits related to gitologic types defined in table 1 and the quantification of the degrees of previous prospectivity and demanded prospectivity of selected targets are the major assignments of the Program. In order to reach these aims, *gitology index and prospectivity indexes* were defined.

5.2 Quantitative Gitology Index - IGQ

Represents the degree of geological favourability for gold of a given area or zone, in function of its qualification in the Standard Quantitative Gitology Table, and of the existing knowledge about the presence of showing, occurrences, deposits or mines of gold. It varies between 0 and 100 and it is calculated from the sum of the factors:

-Standard Quantitative Gitology Factor (FGQP), varying from 0 to 70, were reached taking into consideration the accumulated production plus reserves of each gitologic type, related to the words total, and

-Mineralization Factor (FM), varying from 0 to 30, was reached in function of the "status" of already existing gold mineralizations that were identified in the area.

As a matter of fact, both are directly proportional to the geological favourability.

A direct dependence of the value of the gitologic Index on the two conditioning factors becomes evident.

5.3 Previous Prospectivity Index- IPP

Is a number which indicates how and to what extent a given area has already been prospected. It varies from 0 to 100 and is reached through the sum of the values of the following factors: Geological Mapping Factor (FMG), Airborne Geophysics Factor (FAG), Geochemical Prospecting Factor (FPG), Ground Geophysics Factor (FGT),

Pits and Trenches Factor (FPT) and Drilling Factor (FSO). The variation intervals of the values of each IPP conditioning factor are established by observing a direct proportionality of the prospective importance of the kinds of fieldwork already carried out.

5.4 Demanded Prospectivity Index – IPD

Is a number which indicates the relative importance that a given area presents to be prospected. It varies from 0 to 100 and is reached through the conjugation of the IPP in such a way that for the result obtained there is an inverse proportionality between the value of IPP and the value of IPD, and a direct proportionality between the value of IGQ and that of the IPD. Thus, an area or a zone characterized as of high IGQ and low

IPP, will show an high IPD, whilst another area characterized as of low IGQ and high IPP will present a low IPD.

5.5 Systematics for the Indexes Values Calculation

a) **IGQ** = Quantitative Gitology Index: varies from 0 to 100

$$\text{IGQ} = \text{FGQP} + \text{FM}$$

-FGQP = Standard quantitative Gitology Factor: varies from 0 to 70, depending on its gitologic types position on the Standard Quantitative Gitology Table (Farina & Matos, 1994).

-FM = Mineralization Factor, according to the following FM Values Table

FM VALUES TABLE

KNOWLEDGE ABOUT GOLD MINERALIZATION IN THE AREA TO BE EVALUATED	FM VALUE
Without anomalies	0
With gold showing – geochemical anomalies and or gold pints	4
With occurrence, including active or inactive “garimpo” without production or reserves data	10
With deposit (ore-body), including active “garimpo” with production and/or reserves data	15
With economical deposit (evaluated ore-body) or mine:	
< 10 ton	21
≥10 to 50 ton	24
>50 to 100 ton	27
> 100 ton	30

b) **IPP** = Previous Prospectivity Index: varies from 0 to 100

$$\text{IPP} = \text{FMG} + \text{FAG} + \text{FPG} + \text{FGT} + \text{FPT} + \text{FSO}$$

IPP FACTORS VALUES VARIATION TABLE

FACTORS	VALUES VARIATION
FMG – Geological Mapping Factor	0 – 20
FAG – Airborne geophysics Factor	0 – 10
FPG – Geochemical Prospecting Factor	0 – 25
FGT – Ground Geophysics Factor	0 – 10
FPT – Pits and Trenches Factor	0 – 10
FSO – Drilling Factor	0 - 25

FMG VALUES TABLE

GEOLOGICAL MAPPING SCALE	FMG VALUES
< 1: 250.000	0
1: 250.000	5
1: 100.000	10
1: 50.000	15
≥ 1: 25.000	20

FAG VALUES TABLE

AREA WORKS ALREADY DONE	FAG VALUES
Without airborne geophysics	0
With regional airborne geophysics(gammaray-spectrometry, magnetometry)	5
With detailed airborne geophysics (input, etc)	10

FPG VALUES TABLE

AREA WORKS ALREADY DONE	FPG VALUES
Without geochemical prospecting	0
With stream sediments prospecting (SC)	
a) Density of 1 sample/more than 10 till 50 km ²	2
b) Density of 1 sample > 5 till 10 km ²	4
c) Density of 1 sample ≤ 5 km ²	5
With Pan Concentrates Prospecting (CB)	
a) Density of 1 sample/more than 10 up to 50 km ²	4
b) Density of 1 sample > 5 till 10 km ²	8
c) Density of 1 sample/≤ 5 km ²	10
Soil (L) and/or rock (R)	10

FGT VALUES TABLE

AREA WORKS ALREADY DONE	FGT VALUES
Without ground geophysics	0
With magnetometry	3
With IP or similar methods	7

FPT VALUES TABLE

AREA WORKS ALREADY DONE	FPT VALUES
Without pits or trenches	0
With exploratory pits and/or trenches	5
With detailed net pits and/or trenches	10

FSO VALUES TABLE

AREA WORKS ALREADY DONE	FSO VALUES
Without drilling	0
With exploratory drillings	15
With detailed drilling	25

IPD = Demanded Prospectivity Index, varies from 0 to 100

$$\text{IPD} = \frac{\text{IGQ} (200 - \text{IPP})}{200}$$

5.6 Gitology Index Map and Prospectivity Indexes Maps

Each one of the 102 areas of the Program will have 04 (four) kinds of special self explanatory maps, all of them in 1: 250.000 scale, with an updated simplified geological background. They will be presented as digitalized, georeferenced colour maps. They are described as follows:

- a) **GOLD MINERALIZATION MAP** – With the location of all gold mineralizations, they are qualified accordingly to their status (showing occurrence, deposit (ore-body), economic deposit (evaluated ore body) or mine).
- b) **QUANTITATIVE GITOLOGY INDEX MAP** – Shows the zones of each one of the calculated IGQ values in the area. Such zones, presented by means of colors and symbols, indicate different degrees of favourability of the gold potential geological environments.
- c) **PREVIOUS PROSPECTIVITY INDEX MAP** – Through symbols and colors, it individualizes zones of IPP different values. These zones indicate different levels of geological and prospecting knowledge .
- d) **DEMANDED PROSPECTIVITY INDEX MAP** - Individualizes IPD different values zones, using colors and symbols, which indicate different degrees of relative importance for additional prospective works and, as a consequence, the relative favourability for related investments.

5.7 Map of Gold Reserves and Production of Brazil

Add to the above mentioned Maps of gitology index and prospective indexes, a colour digitalized Map of Reserves and Production of Brazil, at the scale 1: 7.000.000, is available to those concerned. It indicates the main deposits (ore-bodies), economic deposits (evaluated ore bodies) and mines with their production, reserves, concession companies and "garimpos" as well the gitological types they are hosted upon.

5.8 Data Processing

Program's data recording encompasses the whole universe of already know data and information regarding geology, prospection, exploration, reserves and gold production covering all Brazilian territory.

Selection a assessment of informations are made using the FIBO (Gold Bibliographic Information File) that includes the following items:

1. Geographic localization (coordinates and federation units)
2. Real area extension
3. Area name or mineral toponomy
4. Consulted bibliographic references (authors and title)
5. Key words
6. Names of mineralized sites
7. Legal status (DNPM) – documentation and concessionaires
8. Regional geology
9. Field works already done
10. Analyses already done
11. Geochemical signature and/or of mineralogical prospecting
12. Geophysical signature
13. "Garimpos" areas characterization
14. Mineralization status

15. **Geologic types (classification according to PNPO)**

- 15.1. Classification in accordance to the bibliographic reference
- 15.2. Gold Mineralizations localization
- 15.3. Geotectonic environment
- 15.4. Stratigraphic units
- 15.5. Host-rocks
- 15.6. Mineralization conditioning
- 15.7. Gold by-products
- 15.8. Mineralization geochemical association
- 15.9. Ore-body geometrical relations
- 15.10. Hydrothermal alterations
- 15.11. Mineralization genetical relations
- 15.12. Ore-body morphology
- 15.13. Mineralization Structure and texture
- 15.14. Age of the Mineralization
- 15.16. Supergenic alterations
- 15.17. Reserves
- 15.18. Annual production
- 15.19. Accumulated production

16. **Other observations**

The data processing system that

stores this information is interactive with other CPRM systems (geological mapping, geochemical, geophysical system, etc) allowing the company to generate a wide range of products which will be made available to the users.

5.9 Products Availableness

The following products are available, through the Program, to the national and international community:

1. Special maps (including digitized maps in a magnetic environment)
2. Technical documentation generated in a magnetic environment – are the result of a number of consultations.
3. Specific technical reports

These products are available in paper, magnetic media (diskettes or CD-ROM), direct access to CPRM computers or in the CPRM Internet home page in the following address: <http://www.cprm.gov.br>.

6 - Program's Present Stage

Working Areas Map (**Figure 1**) shows the state of the art of the thematic maps at scale 1:250.000 CPRM will, periodically, let the public know all new information that will result from the works continuity.

The Brazilian Gold Reserves and Production Map is already available.

Data and information already stored in the system, corresponded, on 12.31.97, to 473 FIBO (Gold Bibliography Information File)

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8 - Bibliography

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Standard Quantitative Gitology Table

STANDARD QUANTITATIVE GEOLOGY TABLE

GEOLOGICAL ENVIRONMENTS CATEGORY		TYPE	HANGING AND FOOTWALL/ HOST ROCK	ORE BODY MORPHOLOGY	ORE PARAGENESIS	ORE TEXTURE	ORE CHEMISM
Laterite/ saprolite		I - Residual/supergenic	Laterite, gossan, eluvium and variegated rocks	Stratiform and/or irregular	Native gold, iron and manganhydroxide, pyrite	Concretionary, botryoidal and disseminated	Au, Pd
ASSOCIATION WITH VOLCANIC SEDIMENTARY ROCKS	Eventually folded and metamorphosed sequences	II - Sulphide rich ophiolite	Pillowed tholeiitic basalts associated with sedimentary pelagic-carbonated rocks	Lenticular	Pyrite, chalcopyrite and sphalerite	Massive	Cu, Au
		III - Marine volcano-sedimentary rocks with predominance of a bimodal volcanic suite (tholeiitic to calc-alkalic series) and less sedimentary components	Rhyolite, dacite, andesite and less basalts and sedimentary rocks	Lenticular	Pyrite, chalcopyrite, pyrrhotite, sphalerite, galena, tetraedrite, bornite and barite	Massive	Zn, Pb, Cu, Ag, Au or Zn, Cu, Pb, Ag, Au
		IV - Sulphide mineralization predominantly associated to sedimentary rocks with less volcanic components	Shale, claystone and conglomeratic turbiditic sequences	Stratiform	Pyrite, pyrrhotite, galena, sphalerite, chalcopyrite and barite	Massive	Pb, Zn, Ag, Au
	Medium to low metamorphosed folded sequences	V - Greenstone Belts and similar	Basic, intermediate and acid volcanic rocks, volcanoclastic and chemical metasedimentary rocks, mainly cherts and iron formations	Lenticular	Pyrite, pyrrhotite, chalcopyrite and sphalerite	Massive	Zn, Cu, Ag, Au
Association with volcanic rocks		VI - Subaerous volcanic, related to subduction zone. Bimodal calcalkalic andesitic to rhyolitic suite. Cenozoic age.	Andesite, rhyolite, trachyte, tuffs, volcanic breccias, arcose arenites, siltstones and conglomerates	Stringers and discordant lodes	Native gold, electrum, argentite, tetraedrite, tennantite, proustite, sphalerite, galena, pyrite and chalcocite	Massive	Au, Ag, Zn, Pb
ASSOCIATION WITH PLUTONIC ROCKS	VII - Porphyry copper		Intrusives porphyritic acidic rocks, including tonalites, granodiorites and granitic to monzogranitic rocks	Stockworks	Pyrite, chalcopyrite, bornite, molybdenite, calcocite, galena, sphalerite and native gold	Disseminated	Cu (Au-Mo)
	VIII - Skarn		Pure or calc-silicate rocks of chemical or clastochemical origin	Stratiform and/or stringers	Enargite, chalcopyrite, pyrite, sphalerite, argentite, tetraedrite, galena, proustite, Pb-Ag sulfides	Disseminated and massive porous bands	Au, Ag, Cu, Zn e Pb
	IX - Quartz-auriferous loads peripheral to intrusive rocks of intermediary to acid composition		Sedimentary, metamorphic, volcano-sedimentary and magmatic rocks, including granodiorites, monzonite, diorites, acidic volcanic, calc-alkalic andesites and pyroclastic rocks	Stringers, stockworks and/or irregular (breccia pipes)	Native gold, electrum, pyrite, argentite, chalcopyrite, galena, sphalerite, tetraedrite, Ag-sulfides	Vuggy, crustifications, colloform structures and rarely disseminated	Au, Ag, Cu, Pb e Zn
ASSOCIATION WITH SEDIMENTARY ROCKS	Unmetamorphosed	X - Recent placers	Alluvium	Stratiform and/or lenticular	Gold, diamond	Disseminated	Au
	Very low grade metamorphism	XI - Carbonaceous-carbonated rock sequences	Siltic or argillous carbonated sequences, carbonated sequences and turbiditic sequences	Stratiform	Native gold, stibnite, cinnabar, arsenopyrite, magnetite, chalcopyrite	Disseminated	Au, Hg, Ag, As, Sb
	Low to median grade metamorphism	XII - Itabirites with ferriferous to manganiferous carbonated levels	Ferriferous to manganiferous layers in banded iron formations	Stratiform	Native gold, uraninit, pyrite, Fe-Pt and Os-Ir, sperrylite, pentlandite, sphalerite, chromite, cobaltite	Disseminated, massive or banded	Au
		XIII - Paleoplacers of archean to lower proterozoic	Mature oligomithic conglomerates, polymithic conglomerates with haematitic matrix, and sercitequartzites	Lenticular	Native gold, uraninit, pyrite, Fe-Pt and Os-Ir, sperrylite, pentlandite, sphalerite, chromite, cobaltite	Disseminated	Au, Ag, U, EGP
ASSOCIATION WITH SHEARED ROCKS	XIV - Quartz-auriferous loads related to large crustal lineaments (including faults and shear zones)		Rocks of variegated nature	Stringers, stockworks and irregular	Native gold, Au-Ag tellurids, pyrite, pyrrhotite, arsenopyrite, tetraedrite, tennantite, ag-sulfides, argentite, sphalerite and galena	Massive and disseminated	Au, Ag

EXAMPLES IN THE WORLD	EXAMPLES IN BRAZIL	ACCUMULATED GOLD PRODUCTION (1493-1991)		RESERVES IN 1991 + ACCUMULATED PRODUCTION UNTIL 1991		QUANTITY OF CONSIDERED GOLD DEPOSITS AND MINES		STANDARD QUANTITATIVE GITOLOGY FACTOR
		T	%	T	%	Unidade	%	
Pueblo Viejo (Dom. Rep.), Los Cacaos (Dom. Rep.), Boddington (Australia)	Serra Pelada (PA), Cuiabá (MT), Salamangone (AP), São Bento (MG)	62	0,1	625	0,4	9	2,3	15
Skouriotissa (Chypre), Ergani Maden (Turkey), Morgul (Turkey), Anyox (Canada)		128	0,1	327,6	0,2	14	3,5	5
Kuroko (Japan), Shasta (USA), Buchans (New Foundland), Besshi (Japan), Granduc (Canada), Borealis (USA)	Camaquã (RS), Bico de Pedra (MG)	152	0,1	2.387,5	1,5	24	6,1	30
Sullivan (USA), Meggen (Germany), Rammelsberg (Germany), Cobar (Australia), Jerome (USA)		281	0,3	440	0,3	7	1,7	15
Millenbach (Canada), Iron King (USA), Kolar (India), Noranda (Canada), Val D'Or (Canada), Porcupine (Canada), YellowKnife (Canada), Berberon Mountain (South Africa)	Morro Velho (MG), Passagem (MG), São Bento (MG), Cuiabá (MG), Faz. Brasileiro (BA), Faz. Maria Preta (BA), Crixás (GO)	24.193,7	21,8	28.276,7	17,6	179	45,3	65
Comstok (USA), Round Mountain (USA), Guanajuato (Mexico), Emperor Mine (Fidji), Iwato (Japan)		11.834	10,7	13.318,3	8,2	39	9,8	50
Chuquicamata (Chile), Bisbee (USA), Ok Tedi (Papua New Guinea)		2.252	2,0	9.442	5,8	42	10,6	40
Tintic (USA), Hedley (Canada), Marvel Loch (Australia), Lupin Deposit (Canada)		822	0,7	1.035	0,6	11	2,8	20
Rosslund (Canada), Butte (Canada), Charsters Towers (Australia), Alma (USA)	Tapajós (PA)	1.729	1,6	2.389,5	1,5	22	5,5	30
Kilo Moto (Zaire), Bendigo Ballarat (Australia), Sinturu (Borneo), Morobe (New Guinea)	Tapajós (PA), Jequitinhonha (MG), Madeira (RO)	19.485	17,6	24.508,3	15,2	-	-	5
Carlin (USA), Gold Quarry (USA), Jeritt Canyon (USA), Queen Charlotte (Canada)	Morro do Ouro (MG), Rio Salsa (BA), Luziânia (GO), Rio do Carmo (GO)	446	0,4	1.973,5	1,2	16	4,0	30
	Cauê (MG), Congo Soco (MG), Conceição (MG), Pitangui (MG)	86	0,1	96,4	0,1	4	1,0	5
Rand (South Africa), Takwa (Gana), Elliot Lake (Canada), Blind River (Canada)	Jacobina (BA), Moeda (MG)	43.818	39,5	65.929	41,7	11	2,8	70
Mother Lode (USA), Bendigo (Australia), Le Chatelet (France), Bourneix (France), Olympic Dam (Australia), Big Bell (Australia), Consort (South Africa)	Cumaru (PA), Salamangone (AP), Serra do Emilio (PA), Faz. Ouro Fino (MG), Brusque (SC), Pontes e Lacerda (MT), São Francisco (RN)	5.467,3	5,0	9.407,2	5,7	17	4,6	40
	TOTAL	110.756	100	160.156	100	395	100	

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LISTAGEM DOS INFORMES DE RECURSOS MINERAIS

SÉRIE METAIS DO GRUPO DA PLATINA E ASSOCIADOS

- Nº 01 - Mapa de Caracterização das Áreas de Trabalho (Escala 1:7.000.000), 1996.
 Nº 02 - Mapa Geológico Preliminar da Serra do Colorado - Rondônia e Síntese Geológico-Metalogenética, 1997.
 Nº 03 - Mapa Geológico Preliminar da Serra Céu Azul - Rondônia, Prospecção Geoquímica e Síntese Geológico-Metalogenética, 1997.
 Nº 04 - Síntese Geológica e Prospecção por Concentrados de Bateia nos Complexos Canabrava e Barro Alto - Goiás, 1997.

SÉRIE MAPAS TEMÁTICOS DE OURO - ESCALA 1:250.000

- Nº 01 - Área GO-09 Aurilândia/Anicuns - Goiás, 1995.
 Nº 02 - Área RS-01 Lavras do Sul/Çaçapava do Sul - Rio Grande do Sul, 1995.
 Nº 03 - Área RO-01 Presidente Médici - Rondônia, 1996.
 Nº 04 - Área SP-01 Vale do Ribeira - São Paulo, 1996.
 Nº 05 - Área PA-15 Inajá - Pará, 1996.
 Nº 06 - Área GO-05 Luziânia - Goiás, 1997.
 Nº 07 - Área PA-01 Paru - Pará, 1997.
 Nº 08 - Área AP-05 Serra do Navio/Cupixi - Amapá, 1997.
 Nº 09 - Área BA-15 Cariparé - Bahia, 1997.
 Nº 10 - Área GO-01 Crixás/Pilar - Goiás, 1997.
 Nº 11 - Área GO-02 Porangatu/Mara Rosa - Goiás, 1997.
 Nº 12 - Área GO-03 Niquelândia - Goiás, 1997.
 Nº 13 - Área MT-01 Peixoto de Azevedo/Vila Guarita - Mato Grosso, 1997.
 Nº 14 - Área MT-06 Ilha 24 de Maio - Mato Grosso, 1997.
 Nº 15 - Área MT-08 São João da Barra - Mato Grosso/Pará, 1997.
 Nº 16 - Área RO-02 Jenipapo/Serra Sem Calça - Rondônia, 1997.
 Nº 17 - Área RO-06 Guaporé/Madeira - Rondônia, 1997.
 Nº 18 - Área RO-07 Rio Madeira - Rondônia, 1997.
 Nº 19 - Área RR-01 Uraricaá - Roraima, 1997.
 Nº 20 - Área AP-03 Alto Jari - Amapá/Pará, 1997.
 Nº 21 - Área CE-02 Várzea Alegre/Lavras da Mangabeira/Encanto - Ceará, 1997.
 Nº 22 - Área GO-08 Arenópolis/Amorinópolis - Goiás, 1997.
 Nº 23 - Área PA-07 Serra Pelada - Pará, 1997.
 Nº 24 - Área SC-01 Botuverá/Brusque/Gaspar - Santa Catarina, 1997.
 Nº 25 - Área AP-01 Cassiporé - Amapá, 1997.
 Nº 26 - Área BA-04 Jacobina Sul - Bahia, 1997.
 Nº 27 - Área PA-03 Cuiapucu/Carará - Pará/Amapá, 1997.
 Nº 28 - Área PA-10 Serra dos Carajás - Pará, 1997.
 Nº 29 - Área AP-04 Tumucumaque - Pará, 1997.
 Nº 30 - Área PA-11 Xinguara - Pará, 1997.
 Nº 31 - Área PB-01 Cachoeira de Minas /Itajubatiba/Itapetim - Paraíba/Pernambuco, 1997.
 Nº 32 - Área AP-02 Tartarugalzinho - Amapá, 1997.
 Nº 33 - Área AP-06 Vila Nova/Itapuru - Amapá, 1997.
 Nº 34 - Área PA-02 Ipitinga - Pará/Amapá, 1997.
 Nº 35 - Área PA-17 Caracol - Pará, 1997.
 Nº 36 - Área PA-18 Vila Riozinho - Pará, 1997.
 Nº 37 - Área PA-19 Rio Novo - Pará, 1997.
 Nº 38 - Área PA-08 São Félix - Pará, 1997.
 Nº 39 - Área PA-21 Marupá - Pará, 1998.
 Nº 40 - Área PA-04 Três Palmeiras/Volta Grande - Pará, 1998.
 Nº 41 - Área TO-01 Almas/Natividade - Tocantins, 1998.
 Nº 42 - Área RN-01 São Fernando/Ponta da Serra São Francisco - Rio Grande do Norte/Paraíba, 1998.

SÉRIE MAPAS TEMÁTICOS DE OURO - ESCALA 1:250.000 (cont.)

- Nº 43 - Área GO-06 Cavalcante - Goiás/Tocantins, 1998.
- Nº 44 - Área MT-02 Alta Floresta - Mato Grosso/Pará, 1998.
- Nº 45 - Área MT-03 Serra de São Vicente - Mato Grosso, 1998.
- Nº 46 - Área AM-04 Rio Traíra - Amazonas, 1998.
- Nº 47 - Área GO-10 Pirenópolis/Jaraguá - Goiás, 1998.
- Nº 48 - Área CE-01 Reriutaba/Ipu - Ceará, 1998.
- Nº 49 - Área PA-06 Manelão - Pará, 1998.
- Nº 50 - Área PA-20 Jacareacanga - Pará/Amazonas, 1998.
- Nº 51 - Área MG-07 Paracatu - Minas Gerais, 1998.

SÉRIE OURO - INFORMES GERAIS

- Nº 01 - Mapa de Reservas e Produção de Ouro no Brasil (Escala 1:7.000.000), 1996.
- Nº 02 - Programa Nacional de Prospecção de Ouro - Natureza e Métodos, 1998.
- Nº 03 - Mapa de Reservas e Produção de Ouro no Brasil (Escala 1:7.000.000), 1998.
- Nº 04 - Gold Prospecting National Program - Subject and Methodology, 1998.
- Nº 05 - Mineralizações Auríferas da Região de Cachoeira de Minas – Municípios de Manaíra e Princesa Isabel – Paraíba, 1998.
- Nº 06 - Programa Nacional de Prospecção de Ouro - Manual Técnico, 1998.

SÉRIE INSUMOS MINERAIS PARA AGRICULTURA

- Nº 01 - Mapa Síntese do Setor de Fertilizantes Minerais (NPK) no Brasil (Escala 1:7.000.000), 1997.

SÉRIE PEDRAS PRECIOSAS

- Nº 01 - Mapa Gemológico da Fronteira Oeste do Rio Grande do Sul, 1997.
- Nº 02 - Mapa Gemológico da Região Lajeado/Soledade/Salto do Jacuí - Rio Grande do Sul, 1998

SÉRIE OPORTUNIDADES MINERAIS - EXAME ATUALIZADO DE PROJETO

- Nº 01 - Níquel de Santa Fé - Estado de Goiás, 1996.
- Nº 02 - Níquel do Morro do Engenho - Estado de Goiás, 1996.
- Nº 03 - Cobre de Bom Jardim - Estado de Goiás, 1996.
- Nº 04 - Ouro no Vale do Ribeira - Estado de São Paulo, 1996.
- Nº 05 - Chumbo de Redenção - Estado da Bahia, 1996.
- Nº 06 - Turfa de Caçapava - Estado de São Paulo, 1996.
- Nº 07 - Ouro do Rio Jaru - Estado da Rondônia, 1996.
- Nº 08 - Ouro de Natividade - Estado do Tocantins, 1997.
- Nº 09 - Gipsita do Rio Cupari - Estado do Pará, 1997.
- Nº 10 - Zinco (Chumbo e Cobre) de Palmeirópolis - Estado de Goiás, 1997.
- Nº 11 - Fosfato de Miriri - Estados da Paraíba e Pernambuco, 1997.
- Nº 12 - Turfa da Região de Itapuã - Estado do Rio Grande do Sul, 1997.
- Nº 13 - Turfa de Águas Claras - Estado do Rio Grande do Sul, 1997.
- Nº 14 - Turfa - Estados de Alagoas/Paraíba/Rio Grande do Norte, 1997.
- Nº 15 - Nióbio de Uaupés - Estado do Amazonas, 1997.
- Nº 16 - Diamante do Rio Maú - Estado da Roraima, 1997.
- Nº 17 - Platina, Níquel e Cobre - Estado da Rondônia, 1997.
- Nº 18 - Turfa de Santo Amaro das Brotas - Estado de Sergipe, 1997.
- Nº 19 - Diamante de Santo Inácio - Estado da Bahia, 1997.
- Nº 20 - Ouro de Itapetim - Estados de Pernambuco e Paraíba, 1997.
- Nº 21 - Carvão nos Estados do Rio Grande do Sul e Santa Catarina, 1997.

SÉRIE DIVERSOS

- Nº 01 - Informe de Recursos Minerais - Diretrizes e Especificações - Rio de Janeiro, 1997.
- Nº 02 - Argilas Nobres e Zeolitas na Bacia do Parnaíba - Belém, 1997.

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