SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 6-K

Report of Foreign Private Issuer
Pursuant to Rule 13a-16 or 15d-16
under the
Securities Exchange Act of 1934

For the month of May, 2006

P.E.
5/31/06

Vannessa Ventures Ltd.
(Translation of registrant's name into English)

000-30462
(Commission File Number)

Suite 220, 1010 – 1st Street SW, Calgary, Alberta, Canada T2R 1K4
(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40-F:

Form 20-F [X] Form 40-F [ ]

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1): ______

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7): ___X___

Indicate by check mark whether the registrant by furnishing the information contained in this Form is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes [ ] No [X]

If "Yes" is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b): 82- .

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

VANNESSA VENTURES LTD.
(Registrant)

Date: June 6, 2006

By: /s/ Cameron B. Boyer
Name: Cameron B. Boyer
Title: Controller

EXHIBIT INDEX

Exhibit	Description
99.1	Technical Report for the Crucitas Project of Vannessa Ventures Ltd., Calgary dated February 2006 (eight paper copies)

Technical Report for The Crucitas Project of Vannessa Ventures Ltd, Calgary

February 2006
Written by Pierre-Jean Lafleur, P.Eng.

VENTURES LTD
MINING/EXPLORATION FOR DIAMONDS AND GOLD

SYSTÈMES GEOSTAT INTERNATIONAL INC.

Respectfully presented to:
Vannessa Ventures Ltd

Date: February 28th 2006

By:
Geostat Systems International Inc.
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1. Title Page and Forward

The object of this report is to provide Vannessa Ventures Ltd. and its wholly-owned subsidiary in Costa Rica, Industrias Infinito S.A., an independent opinion of the mineral resources estimates of the Crucitas Gold Mining Project in Costa Rica.

This report complies with the Canadian National Instrument 43-101. The NI 43-101, the 43-101F1 and Companion Policy 43-101CP formulate the Standards of Disclosure for Mineral Projects. It applies to public Companies in the Exploration and Mining Sector listed on the Canadian Stock Market. More information about those rules can be found at:
http://www.ccpg.ca/guidelines/index.html

Note: The picture on the title page is an aerial photo of the Crucitas site.

2. Table of Content

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3. Summary

In June of 2005, Vannessa Ventures Ltd (Vannessa) gave System Geostat International Inc (Geostat) a mandate to update its Crucitas mineral resource model and write up a Technical Report according to the National Policy 43-101 in Canada. The object of this report is to provide Vannessa Ventures Ltd. and its wholly-owned subsidiary in Costa Rica, Industrias Infinito S.A., an independent opinion of the estimation of the resources of the Crucitas Gold Mining Project in Costa Rica.

Geostat is not an associate or a subsidiary of Vannessa Ventures Ltd or any of its subsidiaries. In the preparation of this report, Geostat relied on various technical reports, maps, drawings and mine plans, as well as historic documents, as specified in the list of references, as well as on its experience in this area. The original data files come from a backup prepared by Cambior and IMC in a 1999 study or by the former owner, Placer Dome Inc (PDI) prior to 1999. These files include a mine plan designed by Cambior in 1999, prior to the adoption of the National Policy 43-101 in February 2001.

Geostat visited the Crucitas project site in Costa Rica in October 2005 and Geostat did have access to original documents such as Assay Certificates. In Costa Rica, the staff working at Industrias Infinito, a subsidiary of Vannessa, is basically the same staff that used to work for Placer Dome Inc. (PDI) as far back as 1993. They were readily available to assist Geostat in its review assessment.

The units of measure used in this report are metric and monetary units are the US dollar, unless indicated otherwise.

Geostat's responsibility is limited to using the data provided to them by Vannessa, assuming it is the best data available to perform the resource estimation of the Crucitas project. Geostat does not take any responsibility for the quality of the data, which was produced by PDI between 1993 and 1998, other than its own interpretation and verification included in this report.

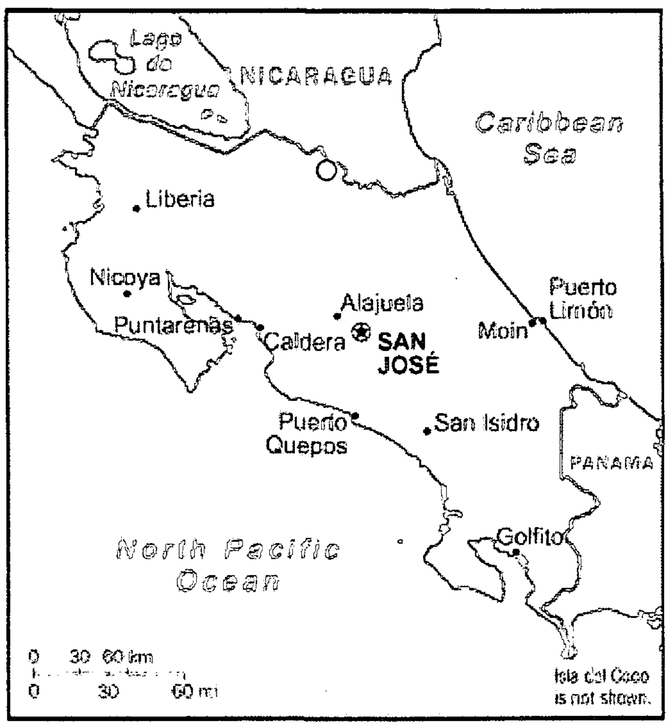
Vannessa Ventures Ltd purchased the Crucitas project in May 2000 from Lyon Lake Ltd. Geostat did a reasonable but limited verification of the quality of the geological model proposed to date, yet limited to a site visit to review and resample previous drilling core on storage at Crucitas and not involving new core drilling and not including the legal standing of the property. Geostat has found the data quality to be in good standing and it had no reason to further investigate its validity based on the evidence available at the time of writing this report.

Costa Rica has an area of 50,895 Km^2 and a population of 3 millions people. The language is Spanish and its capital city is San Jose. Costa Rica boasts a stable economy that depends essentially on tourism, agriculture, and electronics exports. Poverty has been substantially reduced over the past 15 years, and a strong social safety net has been put into place. Foreign investors remain attracted by the country's political stability and high education levels, while tourism and retirement real estate development continues to bring in foreign currencies.

Costa Rica is well known for its beaches, volcanoes and ecological reserves and it has many National Parks and promotes eco-tourism. Over the last several years there has been more focus on developing tourism, high technology, and other types of activities versus the mining industry. The tourist industry has a strong lobby in the government and recent government policies have not been favourable to the mining industry. Vannessa has indicated its intent to develop the Crucitas project in an environmentally and socially responsible manner.

The Crucitas project is being promoted, developed and managed with full respect of environmental compliances meeting or exceeding both local and World Bank standards says Vannessa, in a genuine concern and attempt to minimize impacts on the environment and the biosphere. Vannessa has also engaged in supporting and enhancing the socio-economic development of the local communities. Crucitas is located in the North Central part of Costa Rica in the Province of Alajuela. This region has a small population in a remote area. Logging and cattle-raising are the main activities in the region. The mining industry is not well developed in most of Costa Rica.

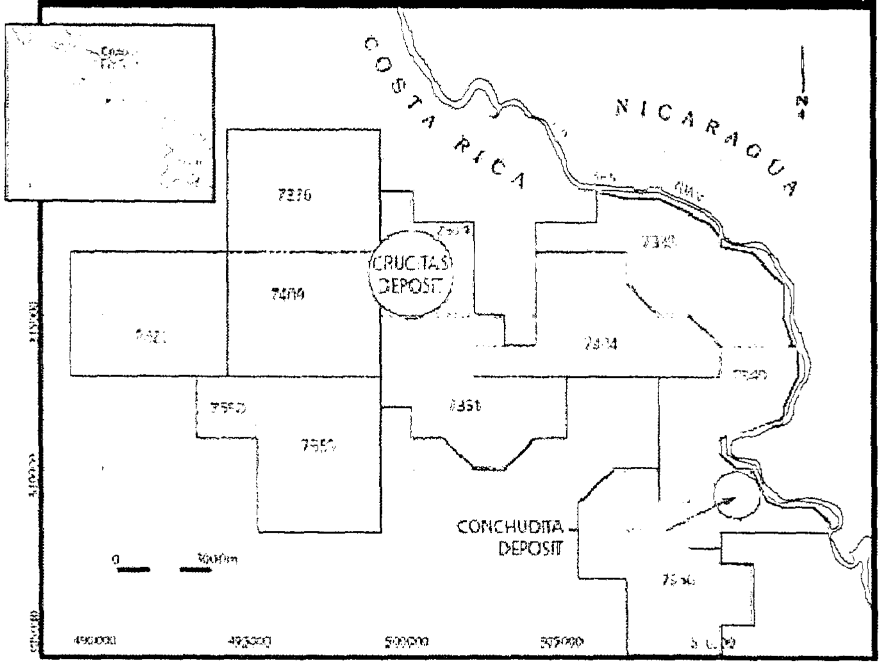
There exists a fairly good road network in the country permitting easy access from San José to the project location. The Crucitas project site is located about 100 km in straight line due North of San Jose, and some 180 km by road partly across the central mountain ridge divide between the province of San Jose to that of Alajuela, including the last 52 km on dirt road.



The country is divided by a backbone of volcanoes and mountains, an extension of the Andes-Sierra Madre chain which runs along the western side of the Americas. The Crucitas project is located in the San Juan River valley which is the northern border between Costa Rica and Nicaragua. Costa Rica is a tropical country which contains several distinct climatic zones. Annual rainfall averages 100 inches nationwide with some mountainous regions getting as much as 25 feet on exposed eastern slopes.

Costa Rica offers well educated business managers, skilled technical staff, including geo-scientists and engineers and a dependable and eager work force to make a mining company successful. The people of Costa Rica value the cooperative social organization.

CRUCITAS - CLAIMS AND PRIMARY ORE ZONES



Vannessa has experienced managerial and technical staff and maintains a head office in San Jose, and regional offices located in Cuidad Quisada, the capital of Alajuela province, and in Coopevega, the village nearest to Crucitas. When PDI first initiated exploration on Crucitas in 1993, it established most adequate camp facilities at Crucitas to accommodate up to 150 people at the peak of activities. The camp includes staff housing, a cafeteria, air-conditioned offices, a warehouse and other buildings including a sample preparation building complete with jaw and cone crushers, scales, pulveriser and drying ovens. It has diesel powered generator providing the necessary electric power for the camp installations and satellite telecommunication facilities.

History

Vannessa Ventures signed an agreement with Lyon Lake Mines Ltd. in May 2000 to acquire a 100% interest in the project. Originally staked in 1992, over US$34 million has been spent on the property to date. Between 1992 and 1994 Placer Dome conducted extensive soil sampling, geological mapping and ground geophysical programs. A 251 diamond drill hole and 90 auger drill hole program was completed between 1994 - 1996 to identify and evaluate the Fortuna, Fuentes and Botija deposits all located on the Crucitas mining concession no. 2594. In 1999, Lyon Lake Mines became the new owner and completed a 100 auger drill hole program and commissioned a feasibility study by Cambior Project and Construction Group. Since acquiring Crucitas, Vannessa has sub-contracted a number of engineering reviews, filed and secured an exploitation permit in January 2002, and submitted an Environmental Impact Assessment Mining Plan in March 2002 which received final approval in December 2005.

The following table summarizes the results of various mineral resources estimation assessments since the start of systematic exploration work in 1992 on Crucitas. Geostat wish to remind the reader that all resource estimates in the following table were completed before the adoption in February 2001 of the National Policy 43-101 by the Canadian Stock Exchange except for the Oct-05 Van-GSII estimates.

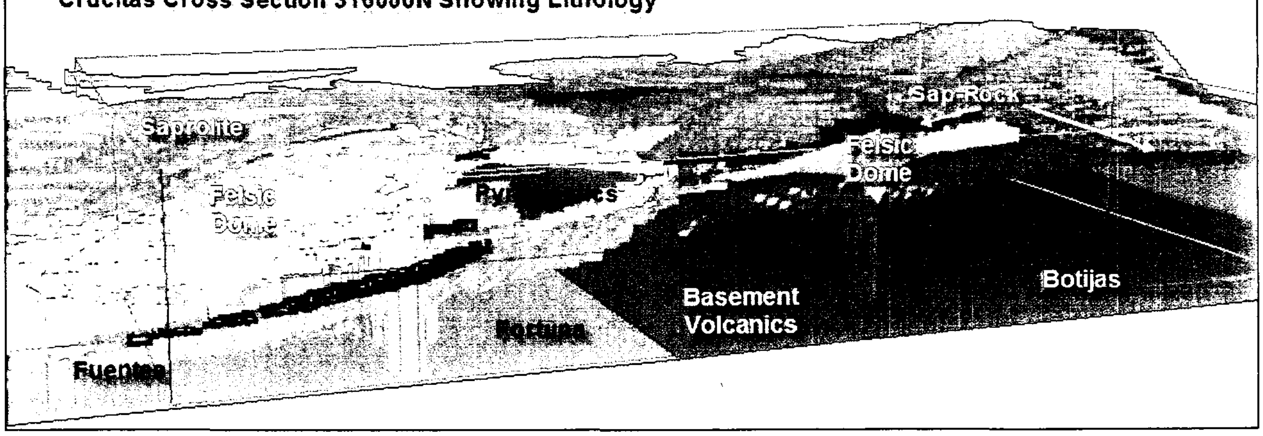
Date	Operator	Cut-off Au (gpt)	Tonnage Mtonnes	AvgGrade Au (gpt)	AvgGrade Ag (gpt)	Estimation Method	No.DDH in Model	Au Content (k Oz)
ALL ORE CATEGORIES (Fortuna, Botijas and Fuentes Zones – All Rock Types)								
sept-96	PDI	0.50	93.007	1.03	3.3	Ord. Kriging	234	3 080
Aug-99	IMC	0.75	40.885	1.50	3.2	2S Ind.Krig.	341	1 974
oct-05	Van-GSII	0.50	38.671	1.20	3.1	Ord. Kriging	343	1 397
MEASURED & INDICATED Ore Categories (All Zones - SAP, SPK and all Rock Types)								
Aug-99	IMC	0.80	29.670	1.51	3.4	2S Ind.Krig.	341	1 443
oct-05	Van-GSII	0.80	18.570	1.42	3.2	OK+Whittle	343	709
MEASURED & INDICATED Ore Categories (All Zones - SAP, SPK Rock Types Only)								
Aug-99	IMC	0.80	8.000	1.66	?	2S Ind.Krig.	341	427
oct-05	Van-GSII	0.80	3.379	1.64	1.9	OK+Whittle	343	193

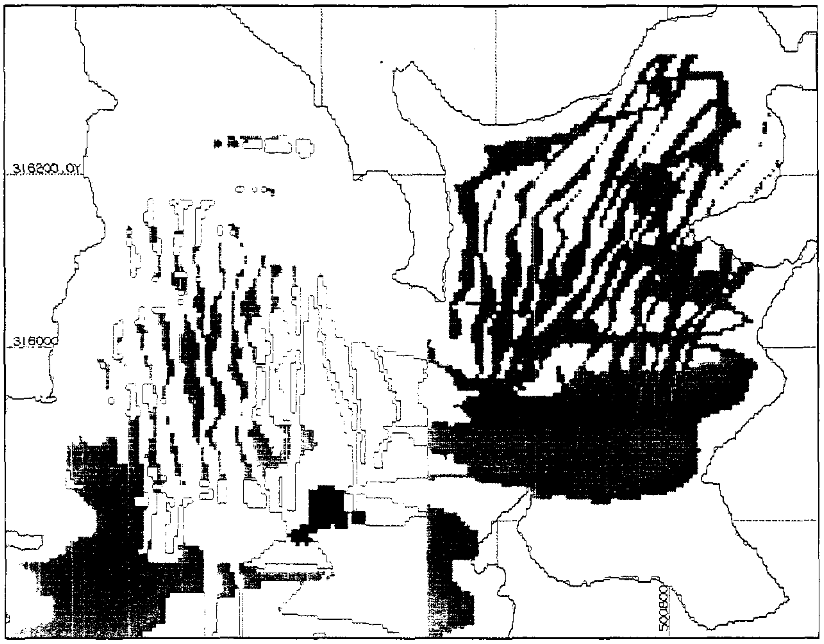
Geology

The Crucitas epithermal gold deposit is located in the Costa Rican portion of the Tertiary Volcanic Plateau of the Central American Volcanic Arc, often referred to as the Sarapiqui volcanic belt. The belt borders the northwest trending Nicaraguan Graben and parallels the Middle American Trench. The region lies at the boundary between the Cocos and Caribbean tectonic plates and is volcanically still active.

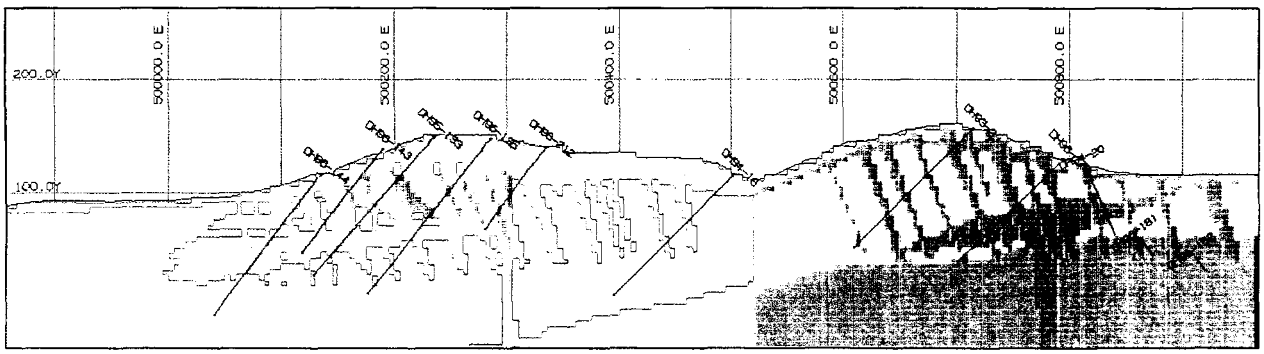
The geology of the property is composed of a volcanic series lying on the Machuca Formation. marine sediments. An extensive and widespread andesitic volcanic sequence is found in the Crucitas region. Overlying the andesitic basement is a pyroclastic sequence of flow tuffs, air-fall lappilli tuffs, and surge deposits which have been cut by felsic dome rocks and associated breccias constituting dome complexes. The domes have been emplaced following two major structural features trending NE and NW respectively. The mineral deposits are found largely associated with some of the domes and surrounding pyroclastic rocks. Young basalt flows overlie the entire sequence. The near surface rocks have been strongly oxidized to a depth averaging about 40m (up to 60m in depth locally) forming a thick saprolite. Three gold bearing zones were delineated from auger and diamond drill holes inside mining concession no 2594 (formerly exploration concession no 7339) totalling more than 35,000 meters (m): Fortuna (West), Botija (East) and Fuentes (SW). The mineralized systems are generally described as quartz veins chimneys, stockworks and breccias.

Crucitas Cross Section 316000N Showing Lithology





The plan view on the left and the section below show the arbitrary division between the Fortuna (left) and Botija (right) lithologies The saprolite appears in orange and brown for Fortuna and Botijas respectively. Likewise the pyroclastics are coloured yellow and light red while the felsic domes are shown in purple and shades of cyan on Fortuna and Botijas. Finally the basement volcanics are shown in dark green. The plan and section also show the steeply dipping mineralized structures outlined in cyan and red.



The Fortuna zone is characterized by trachyandesite – dacite to rhyolite flow dome complexes. The felsic dome flows are green, fine-grained to locally porphyritic and massive to autobrecciated. These flows are gradually replaced by coarser pyroclastics and breccias in an area covering 500 m (N-S) by 400 m (E-W) near the center of the younger felsic dome. The latter is interpreted as being related to explosive activity near northwest-trending fissure vent. A sequence of intermediate lithic tuffs, pyroclastics (PCT) is stratigraphically above and below the dome complexes, and is commonly interbedded with the dome complexes. Hydrothermal breccias overprint both the Fortuna dome complex and the pyroclastics. They are localized along pre-existing fissure vents that controlled the emplacement of the felsic domes. The latest event is the intrusion of some non-mineralized diabase dikes and sills cutting through all previous lithologies. The weathered profile is characterized by thick saprolite and saprock overburden that is locally mineralized.

Early propylitic alteration is evident in the early felsic domse, in the basement volcanics and the pyroclastic units. It is characterized by pervasive chlorite in the matrix or groundmass of fine grained volcanic fragments, together with accessory minerals such as epidote, carbonate, magnetite and hematite.

The Botijas zone is located approximately 500 m east of the Fortuna zone. The geology is comparable to the Fortuna zone, with hydrothermal alterations inside felsic dome complexes, intermediate volcanic flows, and pyroclastics also presented on previous Figures. The Botijas alteration paragenesis is similar to Fortuna except for less intensive silicification overprinting apparently due to fewer hydrothermal surge events.

The Fuentes zone is located about 150m west and down slope of the Fortuna zone. The rocks are predominantly trachyandesite to dacite flows that overlie non-mineralized basement volcanics. The alteration assemblage is mainly propylitic and includes chlorite, epidote, carbonate, pyrite, magnetite, and hematite.

Mineralization

Multiple stages of mineralization are observed in the Fortuna zone. The early stage produced disseminated values of gold in the 0.2 g Au/t to 0.6 g Au/t range during the emplacement of the dome complexes and pervasive quartz-adularia-pyrite alteration events.

Higher-grade gold is associated with vein-controlled quartz-pyrite-adularia during and following the development of the hydrothermal breccias. From their observed crosscutting relationships, there appears to be more than two stages of veining: a later stage pyrite-rich veins with minor quartz appear to crosscut earlier systems of quartz, and quartz-pyrite-adularia veins. These veins are commonly oxidized to goethite and limonite.

The dominant structural direction of the Fortuna zone is north-northwest south-southeast. This is expressed by the observed emplacement of the felsic doming, the orientation of the hydrothermal vents, the quartz-oxide veins in the oriented core, and the high-grade gold and silver distribution.

Structures in Fortuna

Mineralization is more disseminated at Botija than at Fortuna and is spatially associated with the felsic intrusive. The best pathfinders for high-grade gold and silver are pervasive oxidation with quartz flooding and microveining in the pyroclastics overlying the intrusive. The dominant structural direction in the Botija zone is is northeast-southwest based on the emplacement of the felsic intrusive and distribution of gold and silver grades.

Discovery and exploration

An independent geologist named Tim Coates carried out initial prospecting work in the dictrict and made the discovery after taking stream sediment, rock chips and soil samples in the Crucitas area. Tim Coates and Associates optioned the property to PDI that established a local subsidiary company, Placer Dome Costa Rica (PDCR) and undertook systematic exploration work on the property and neighbouring concessions. A soil survey grid was established over the gold anomalies' areas, covering an area of 3 km2, from which over 2,500 soil samples were collected. The results of the soil survey outlined an extensive area of anomalous gold greater than 500 ppb. The gold anomalies outlined by the soil survey were further tested by diamond drilling.

Three independent petrographers conducted separate studies on a total of 70 samples collected from predominantly core samples of the Fortuna and Botija deposits. A mineralogical study conducted by Stephen Kessler at the University of Michigan was performed on eight gold bearing vein samples of the Fortuna deposit using microscopy and SEM microbeam examinations. The study confirmed that the gold occurs as Ag-bearing native gold, either as free grains up to 1 mm in size, or as inclusions in pyrite and goethite. All the gold is closely associated with veining either in or at the edge of veins.

Drilling

A total of 251 exploration or in-fill diamond drill holes have been completed to date. As well, an additional 27 geotechnical, or piezometer holes, and 90 Trado (mechanical auger) holes are compiled in the Table below. Most of the holes drilled are located within the Fortuna, Botija, and Fuentes zones. The depth of the holes ranges from 1.0 to 236.2 m.

Zone	Number of holes	Drill spacing	Zone dimension	Meterage
Fortuna	137	50 m x 25 m	1.3 km x 0.5 km	20 359
Botija	61	50 m x 25 m	0.5 km x 0.5 km	7 662
Fuentes	26	100 m x 50 m	0.5 km x 0.5 km	3 170
Exploration	27	-	-	3188
Geotechnical	27	-	-	831
Trado (auger)	90	100 m x 100 m	2.5 km x 2.0 km	894
Total	368	-	-	36,104

A core orientation device was implemented starting with hole DH94-27. By using additional orientation equipment, the structures were rotated in their proper position and tabulated in the drill hole logs. The majority of the drill holes were directed to the west at an inclination that ranged between 45 to 60° from the horizontal. This was determined to be the most appropriate direction of drilling based on the structural study of the oriented core.

A saprolite auger program was established in the area north of the Botija zone, in the Coyote zone area and northwest of the Fortuna zone.

Drilling was core drilling for the most part using a variety of Longyear 34 and 38 pieces of equipment. As shown on the previous Figure, drilling was done on a 25 x 50 m regular grid in the center of Fortuna and Botijas and on a less regular spacing in the direction of extensions of the deposits.

The specific gravity (SG) data includes measurements of 607 saprolite samples, and 179 saprock samples by the buoyancy method. The average SG determined for saprolite is 1.35 (tonne per cu.m) and 1.65 for sap-rock. Systematic measurement of SG for hard rock was done as part of the core logging procedures. It varied from 2.24 to 2.65 depending on the rock type. The average specific gravity factor used in resource calculation is 2.37.

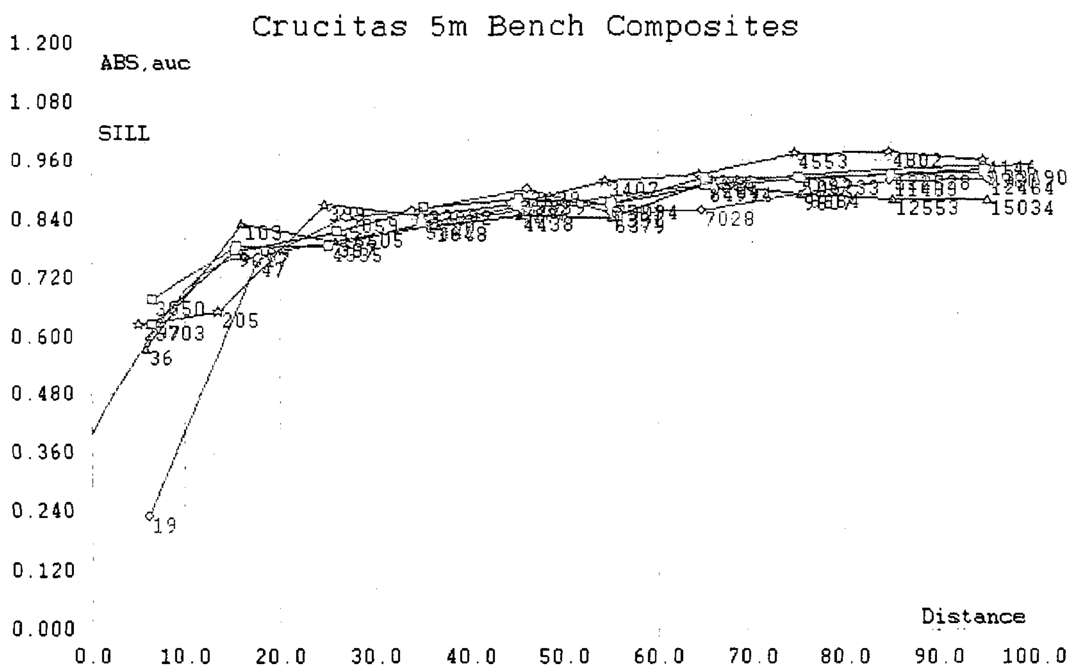
Sample preparation and approach

Meterage of the drill core was verified by the logging geologist prior to sample selection. Sample intervals were chosen and marked within the geological intervals. No samples crossed lithological contacts. Sample lengths varied depending on the geology, and did not usually exceed 1.5 m. The samples consisted of half-core cut with a diamond saw. Samples were prepared on site down to 350g coarse rejects and rejects were kept on site for security and backup. Finishing and assaying was done for most part at the Placer-Dome Research Center (PDI) in Vancouver.

Compositing is the method by which the original samples are divided, split and grouped to obtain regular size samples to avoid sampling biases. Geostat has chosen to make 1m (down the drill hole axis) composites. The majority of samples were originally about 1m in length. In 1999, Cambior used 2m composites and IMC used 6m bench composites. Geostat tested and compared those composites with the 1m composites. In addition, Geostat also generated 5m bench composites to compare results while using a resource model that excluded the steep constraining envelops.

The composites of different size were studied using statistics, geostatistics as well as plan views and sections displaying geology. Geostat selected to use the 1m composites to obtain the best results in modelling the narrow steeply dipping structures.

The variography characterizes the grade continuity of gold and silver in the deposit. Geostat prefers to use Correlograms to model the grade continuity. It is a standardized semi-variogram where gamma is divided by the sampling variance. Doing so, Geostat was able to characterize the behaviour of gold in the deposit as being isotropic with a short range of continuity and a relatively high level of unpredictability (nugget effect) which is normal in gold deposits. In addition, Geostat found that there appears to be no significant difference in the continuity of grade in all rock types and in all zones: Fortuna, Botija or Fuentes. These findings were confirmed for all sample sub-populations, composite sizes and all grade indicators in a consistent manner. The 5m bench composites display the smoothest of all variograms. Variography work indicates that 70% of the grade variation relates to data located within a 15m distance range. The grade continuity range at Crucitas is far below the drill spacing that is roughly established along a 25m x 50m grid. For that reason Geostat elected not to classify any resources in the measured category.



Variable	: auc		Date	: 06-01-2006	
Variogram	: Absolute		File	: CMP-BENCH.gsd	
Direction :	AVG	NS	DIP	ACROSS	DWDIP
Azimuth :	340.00	340.00	70.00	70.00	250.00
Dip :	0.00	0.00	-85.00	5.00	-50.00
Tolerance :	180.00	45.00	45.00	45.00	30.00
Lag Dist :	10.00	10.00	10.00	10.00	10.00

Gamma = N(0.4000) + S(0.3000, 15.0/15.0/15.0, 0.0/0.0/0.0) + S(0.2500, 100.0/100.0/

In the case of Crucitas, the geostatistical analysis does not contribute to support the narrow structured geological model nor does it negate its existence. The outline provided by Vannessa is however well supported by the sampling statistics, in particular the 42 samples described as Quartz Veins (QVN) grading more than 8 g Au/t in Fortuna. The interpretative drawing of structures by joining the high grade intercepts in drill holes does not necessarily prove their existence, unless duly exposed by test pits and trenches. It is the oriented core measurement of the structures (Section 11) and the few outcrops proving their existence that justify taking them into consideration. A geological model, to be realistic and better emulate mineralization patterns should make use of all observed features and parameters and therefore, cannot make abstraction of such structures. Since the structures do exist, we favoured using them in our final resource model.

The final equations for Kriging retained by Geostat for Fortuna and Botija are:

$$Gamma = N\,(0.40) + S_1\,(0.35,\ 7m/7m/7m) + S_2\,(0.10,\ 30m/30m/30m) + S_3\,(0.15,\ 200m/200m/200m)$$
$$Gamma = N\,(0.40) + S_1\,(0.15,\ 7m/7m/7m) + S_2\,(0.25,\ 50m/50m/50m) + S_3\,(0.20,\ 200m/200m/200m)$$

Au analysis was by fire assay, with AA finish initially on 25 g aliquots (DH94-25 to DH95-33) later increased to 50 g aliquots. Most samples were also analyzed for 27 other elements using ICP.

As far as Geostat knows, there were no specific measures taken by PDI for security other than having an efficient system to log drill core and prepare samples on site quickly and efficiently. Geostat used the facility to prepare its own samples in 2005.

In 1999, the services of Independent Mining Consultants (IMC) were retained by Lyon Lake Mines Ltd. (LLL) to build a mineable reserve model, and to run any checks it deemed necessary, during the course of the study, to validate the data. Placer Dome Inc (PDI) instituted a program to analyze blanks, checks, and standards during their exploration program. In 2005, Geostat received the data base for the Crucitas project as a Gemcom Project files set that had already been modified by Vannessa. There are 32,175 gold and silver assays ranging from 0 to 542g Au/t for gold, and 0 to 550g Ag/t for silver. It was unchanged since 1999. When available, core recovery values were read from the drill logs and incorporated into the database.

In 1999, IMC completed an independent verification of the presence of gold mineralization at the Crucitas Project by collecting samples from core and coarse rejects stored on site. In 2005, Geostat also completed an independent verification of the presence of gold mineralization at the Crucitas Project by collecting samples from core stored on site. These tests were not designed to validate the resource or average deposit grade. Neither was it designed to validate the sampling and assaying procedures utilized by PDI. Its objective was to confirm the presence of gold only, and to identify any significant differences within the test intervals between PDI's and Geostat's independent results In 2005, Geostat did review this work and took 21check samples of its own in October 2005. 18 samples were collected from the existing split drill core and 3 standard samples stored on site at Crucitas. Geostat's personnel observed and assisted in the sample preparation and handling. Geostat selected the samples to be representative of the range of deposit gold grades and rock types. In summary, the Geostat check assay procedure does validate the presence of gold in 20 samples and no gold in the blank standard sample (#3) tested.

The Crucitas ore grade material has been the subject of various ore dressing and metallurgical studies. Placer Dome did a 4 phase testing program between 1995 and 1996 using it own facilities outside Costa Rica. Vannessa added its own limited metallurgical testing. The metallurgical process consists basically in liberating and recovering gold and silver from its rock gangue, upon crushing and milling, then to leach and recover the gold though a carbon-in-pulp circuit, then strip the extracted gold and finally produce dore bullion bars using a refining furnace. The metallurgical recoveries resulting from the test work were:

Rock Type	Gold	Silver
Saprolite of Fortuna	93.0	35.0
Saprolite of Botija	94.5	35.0
Pyroclastics of Fortuna	88.0	60.0
Pyroclastics of Botija	95.0	60.0
Felsic dome of Fortuna	92.5	60.0
Felsic dome of Botija	88.5	60.0

For simplicity, Vannessa is using 96% gold recovery in saprolite and 90% in rock for the economic analysis, based on its own interpretation of the metallurgical testing.

Mineral Resources

The resources model presented in this report was developed by Geostat with the full support of Vannessa, including the geologists in Costa Rica who have been working on the project since 1993 for PDI. In essence, the resource modelling procedures were similar to what had been carried out in the past but the geological model has been improved with a new interpretation and by taking into account information which had not been fully considered before. Mainly the new geological model accounts for the presence of steeply dipping structures measured and reported by PDI (see Section 8) which were interpreted as mineralized envelops' controlling mineralization. The envelope were superimposed on the early stratigraphy and lithological interpretation model (by PDI), so to better constrain the distribution of gold in and across the lithology.

The mining reserves were not fully computed in this exercise. Vannessa has retained another consultant, MICON International Inc., for reserve modeling, pit optimization and mine planning purposes, which will convert the mineral resources into mineable reserves.

The mineral resource model for Crucitas consist of a 3D block model which is a regular grid along X, Y and Z axis used to project estimated gold and silver grades. This grid has a spacing of 5m by 5m by 5m, forming SMU (small mining unit) blocks of cubic shape, for each interval of grade calculation. Geostat block model uses the same basic design as that of Cambior in 1999. Its small SMU's allowing to represent the geology more accurately. Comparatively, IMC designed a model using SMU's 10 x 10 x 6 m high instead, representing a fully diluted less discriminate mining approach.

The Gems software package from Gemcom Software International Inc was used as well as Geostat own commercial software. The models of Cambior (ID) and IMC (IK) were also converted and made available in the Gems project files to ease comparison. The comparison main objective was to validate the 3D models.

The volumes are computed using the wiremesh representing the geological model. Vannessa made the lithological wiremesh based on the rock type codes in the block model. It did not have or could not retrieve the original (3D rings) files or solids from the existing backup files of the project. Therefore, it generated the geological solids from the block model. Those solids were compared with the drill holes on sections. Geostat found them sufficiently accurate to be used to determine the mineral resources. Vannessa also verified and corrected the topographic model it retrieved from the original PDI project files. The accuracy of the resulting geological model or wiremesh to determine volûmes could be verified using various techniques in the recent modeling exercise..

The cut-off grade is the grade at which a block of ore becomes uneconomic. In essence, it is equal to the unit cost of mining and processing a block of ore to extract gold and silver while generating a profit. The net present value of a project can be optimized and determined by using the software Whittle. To be able to outline the mineral resources, Geostat used a range of cut-offs between 0.50 and 1.25 g Au/t to classify the blocks in the block model into ore and waste. Based on updated operating costs estimates the value of 0.8 g Au/t was retained as the most likely economic cut-off in our mineral resource tables, but the final cut-off should be determined by the optimized mine plan.

In the case of gold, silver and many metal ore deposit, the distribution of values or grade is skewed, i.e., it has a long tails in the high grade values that could have a heavy weigh in the total metal balance of the mineral resources if left unchecked. In this case, Geostat has chosen to use common practice and set a maximum value of 25 g/t for gold and 50 g/t for silver.

Geostat has retained the Ordinary Kriging (OK) method for grade calculation inside and outside the structures interpreted by Vannessa's geologists. Indicator Kriging (IK) is a method generally preferred for gold deposits displaying high nugget effect as it helps improve the precision of the local (proximal) grade estimate. OK methodologies tend to smooth the grade distribution in the grade model more than IK generally. In the present case, because the geological model is deemed sufficiently constrained by the introduction of relatively narrow (5 to 30m wide) steeply-dipping mineralized envelops, the Ordinary Kriging method was deemed most adequate.

Comparison test runs showed that OK produces similar results as IK when using the structures. Once the model was set up, Geostat with Vannessa staff in Costa Rica, conducted multiple runs to compare the results of various methods. Among those runs, Geostat also reproduced the models of CPC and IMC to better compare results and insure the integrity of the database and the geological wiremesh model.

The basic settings used for the final grade interpolation model was:

1. To use composites of equal length of 1m along the drill core holes, instead of 2m for CPC and 6m by bench for IMC;

2. Find samples with a 50m search sphere (ellipsoid) using the octant rule with a minimum of 3 octants with samples but no more than 2 samples from the same drill hole;

3. To compute grade using a 2 x 2 x 2 discretisation of blocks;

4. To compute grade using a minimum of 6 and a maximum of 25 samples;

5. To fill the remaining block (not computed) inside the structures with the average sampling grade of each structures, i.e., the block that do not meet the above conditions;

6. Each structure has its grade computed only by the samples it contains, without crossing over or being to be influenced by an other structure;

7. To compute the grade outside the veins only if a block meet conditions 1 to 4;

Geostat used simple block counting and classified blocks using the 50% rule for block coding, whether the blocks were intersected by topographic surface, lithological contact, a steep dipping structure or an excavation. No mining factors were taken into consideration in this estimation. The resources were not converted into reserves. This task is mandated to Micon by Vannessa.

The classification of the resources is essentially based on the quality of drilling and thus reflects a level of confidence that the resources can be delineated with reasonable precision and that the results are reproducible. In the core of the deposit, an area where drilling is regular on a grid with 25m between sections and 50m between drill holes on section, Geostat considers the grade material as meeting indicated level of confidence for resources classification. Geostat has drawn a perimeter boundary, defining an area where the drilling is considered less regularly spaced but relatively continuous to represent the Inferred resources category.

Geostat has taken away much of the previous resources projected into some of these areas. One particular reason is that with the current geological model using steep dipping structures (or not in some cases), much of this resource does not materialize in the current resource model.

The Resources in and outside the structures basically split in two categories: Indicated and Inferred. Geostat is of the opinion that there is no Measured Resources in the Crucitas project at the moment based on the CIM definition recommended by the NP 43-101.

The total Indicated Resources above the 0.5 g Au/t cut-off grade are estimated to contain 25.1 millions tonnes at 1.22 g Au/t (985 thousand gold ounces) and at 3.17 g Ag/t (2.56 million silver ounces) in both Fortuna and Botija in and out of the structures.

Material Zone	Tonnage	Gold g/t	Silver g/t	Gold ounces	Silver ounces
saprolite					
Total Structure	3 528 630	1.60	1.91	181 422	217 052
Total OutVein	638 472	0.64	1.00	13 224	20 443
Total saprolite	4 167 102	1.45	1.77	194 646	237 495
rock					
Total Structure	16 540 075	1.32	3.51	700 919	1 863 994
Total OutVein	4 378 546	0.63	3.25	89 376	457 617
Total rock	20 918 621	1.18	3.45	790 295	2 321 611
Total	25 085 723	1.22	3.17	984 941	2 559 105

The total Inferred Resources above the 0.5 g Au/t cut-off grade are estimated to contain 12.6 millions tonnes at 1.23 g Au/t (496 thousand gold ounces) and at 3.14 g Ag/t (1.27 million silver ounces) in the Inferred category for Fortuna, Botija and Fuentes in and out of the structures.

Materia Zone	Class	Tonnage	Gold g/t	Silver g/t	Gold ounces	Silver ounces
saprolite						
	Total Structure	2 261 899	1.48	2.75	107 707	199 698
	Total OutVein	721 185	0.69	1.02	16 065	23 566
Total saprolite		2 983 084	1.29	2.33	123 772	223 265
rock						
	Total Structure	7 081 264	1.42	3.52	322 579	801 190
	Total OutVein	2 502 871	0.62	3.02	49 721	243 025
Total rock		9 584 135	1.21	3.39	372 300	1 044 215
Total		12 567 219	1.23	3.14	496 072	1 267 479

Note that Geostat has not computed Reserves. This task has been mandated to Micon International Inc., a mining consultant retained by Vannessa.

In Geostat's opinion, additional drilling may be warranted to convert inferred mineral resources into indicated resources category. Moreover, drill spacing should be improved in order to increase the level of confidence of mineral resources classification. Infill drilling would not add tonnage, but it reduces the risk of overstating or understating the mineral resources. In the case of Crucitas, a regular drill spacing of 25m by 25m or its equivalent would reduce the overall mineral resources estimation risk.

In addition, Geostat recommends that Vannessa design and implement systematic grade control procedures and methodology. One method would be to use short inclined RC drill holes, oriented so to cut across the vein systems, and the structural features controlling mineralization, as Placer Dome implemented with core drilling. A RC drilling grid laid out on a 10m x 10m pattern and grade control carried out in conjunction with mine operations would add further definition in the reserves and greatly improve mine planning.

Geostat did not perform any sort of laboratory audit.

Geostat has done its mineral resource classification based on geology and sampling quality, as well as some economic parameters. The introduction of a new geological model with steep mineralized envelops constraining grade distribution and the use of improved variography analyses, reducing the range of grade continuity of gold, resulted in a more robust and conservative resource model at Crucitas. Overall the difference between the Geostat 2005 resource model and that of IMC 1999 resource model amounts to about 30% less gold content in the mineral resources.

Pierre-Jean Lafleur, P.Eng., February 2006

4. Introduction

Geostat is not an associate or a subsidiary of Vannessa Ventures Ltd or any of its subsidiaries. The fees of Geostat for this technical report do not depend, in whole or in part, from past or future contract work or from an agreement that may have consequences on its conclusions. Geostat fees comply with the standards in the industry for this type of work.

In the preparation of this report, Geostat relied on various technical reports, maps, drawings and mine plans, as well as historic documents, as specified in the list of references, as well as on its experience in this area. Most of the information used for this work came on a set of CD containing the computer files of the Crucitas Project. The original data files come from a backup prepared by Cambior and IMC in a 1999 study or by the former owner PDI prior to 1999. These files include a mine plan designed by Cambior in 1999, prior to the adoption of the National Policy 43-101 in February 2001. Geostat was able to retrieve most of the data required for the present report such as drill holes and samples database, as well as topographic and geological surfaces (DTM – Digital Terrain Model), including lithology and structures. Geostat visited the Crucitas project site in Costa Rica and Geostat did have access to original documents such as Assay Certificates. In Costa Rica, the staff working at Industria Infinito S.A. (IISA), a subsidiary of Vannessa, is basically the same staff who worked for PDI since 1993. They were readily available to assist Geostat in its work.

Therefore, this report is based on the known information to Geostat as of October, 2005. Geostat's responsibility is limited to assuming the data provided to them is complete to perform the resource estimation of the Crucitas project.

The units of measure used in this report are metric and monetary units are the US dollar, unless indicated otherwise.

5. Reliance on Other Experts

Geostat's responsibility is limited to using the data provided to them by Vannessa, assuming it is the best data available to perform the resource estimation of the Crucitas project. Geostat does not take any responsibility for the quality of the data which was produced by PDI between 1993 and 1998 other than its own interpretation and verification included in this report. Some of the computer data used by Geostat was generated by Cambior and IMC who prepared various computer models of the mineral resources and reserves for a feasibility study requested by Lyon Lake Ltd that was completed in September of 1999. Lyon Lake did operate a small gold mine, the Beta Vargas Gold Mine, also located in Costa Rica at about the same period as it took over the Crucitas project from PDI. The author of the present report for Vannessa was asked by Lyon Lake in February 1999 to review the work in progress of Cambior and IMC. The differences of opinion between PJ Lafleur, Cambior and IMC in the interpretation of the Crucitas data remain basically the same today. They are exposed in more detail in the present report. In this regard, Geostat's responsibility is limited to its own opinion.

Vannessa Ventures Ltd purchased the Crucitas project in May 2000 from Lyon Lake Ltd. Vannessa has done limited but significant improvements in the geological model of the Crucitas project based on the existing data (as of 1998 by PDI) and by taking into consideration the opinion of the field geologists (Rodrigo Vazquez and al) who produced this data (since 1993) and who still work for the project. Geostat is taking into consideration this additional work but its responsibility is limited to making a resource and reserve estimation based on the data as supplied by Vannessa. Geostat did a reasonable but limited verification of the quality of the geological model proposed to date, not including the legal standing of the property. Geostat has found the data quality to be in good standing and it had no reason to further investigate its validity based on the evidence available at the time of writing this report. The present report intends to comply fully with the NP 43-101 rules regarding the production of a Technical Report.

Geostat did verify the data made available to them for inconsistencies, database errors entry and for its behaviour using standard statistical method applied in the exploration and mining industry. Geostat did use topographic plans and mine plans, including property limits, to determine the volume of resources available, but it did not verify completely the source of information or the legal status of the property, including the rights to own, explore and extract ore material from the site. Geostat is not aware of the existence of any claims on the property due to financial grievances (bankruptcy, mortgage, debts, etc.), liabilities or responsibilities due to environment rules, policies or claims to impeach the development of the project.

According to Geostat representative, personal knowledge of the region and satellite images, Geostat is satisfied that the geographic, topographic and geologic information used in this report is correct. The results and opinions expressed in this report are conditional to the accuracy of the geological and legal information's mentioned above, and that they are up to date and complete at the date of publication of the report. It is understood that no information susceptible to influence the conclusion of the present report were withheld from the study. Geostat assert the right, but not the obligation, to modify this report and its conclusions if new information is presented after the date of publication. Geostat assumes no responsibility for the actions of Vannessa in the distribution of the report.

6. Property Description and Location

6.1. Costa Rica Background Information

Costa Rica Statistics
Area - 50,895 square kilometers **Population** - Three million
Capital - San Jose (pop. 300,000) **Language** - Spanish
Location - Central American between Nicaragua and Panama (between 8 and 11 degrees north of the equator)
Currency - Colon (Floats, currently $1 US = about 500 CR Colon) in notes of 5,000, 1,000, 500, 100 and 50
Religion - More than 90 percent of Costa Ricans are Roman Catholic.

Human habitation can be traced back more than 10,000 years but it appears Costa Rica was sparsely populated and a relative quiet theatre in the pre-Columbian era. There is little sign of major communities and none of the impressive stone architecture that characterized the more advanced civilizations of Mesoamerica to the north and the Andes to the south.

In 1502, Columbus found no more than 20,000 indigenous living in several autonomous tribes. The Indians gave Columbus gold and he returned to Europe with reports of a plentiful supply of the yellow metal. But the adventurers who arrived to cash in found only hostile Indians, swamps and disease for their trouble. In 1562, the Spaniards attempted to colonise the region from Guatemala with little interest until the 18th century. Juan Mora Fernandez was elected the country's first head of state in 1824. His progressive administration expanded public education and encouraged the cultivation of coffee with land grants for growers.

After more than a decade of political turmoil, General Tomas Guardia seized power in 1870. Though he ruled as a military dictator, his 12 years in power were marked by progressive policies like free and compulsory primary education, restraining the excesses of the military and taxing coffee earnings to finance public works. It was Guardia who contracted Minor Keith to build the Atlantic railroad from San Jose to the Caribbean. The post-Guardia years witnessed the fitful transition to full democracy. The next important era began with the election of Dr. Rafael Angel Calderon Guardia in 1940. His enlightened policies included land reform, a guaranteed minimum wage and progressive taxation. He was succeeded by J.M Figueres Ferrer (Don Pepe) who became head of the Founding Junta of the Second Republic of Costa Rica. He consolidated the reforms introduced by Calderon and introduced many of his own: He banned the Communist Party, gave women the right to vote and granted full citizenship to blacks, abolished the armed forces, established a term limit for presidents and nationalized the banks and insurance companies. He also founded the Partido de Liberacion Nacional.

Don Pepe died in 1990 a national hero, his deeds having set the scene for the social and economic progress that would earn Costa Rica the reputation as a peaceful and stable island of democracy in one of the world's most politically unstable and often war-torn regions. When civil war broke out in neighbouring Nicaragua, Costa Rica was drawn reluctantly into the conflict, its northern zone being used as a base first for Sandinista and later for "contra" forces. In 1986, a young lawyer called Oscar Arias Sanchez was elected president on the platform of peace. Arias' tireless efforts to promote peace in the region were rewarded when the five Central American presidents signed his peace plan in Guatamala City in 1987, an achievement that earned him the Nobel Peace Prize.

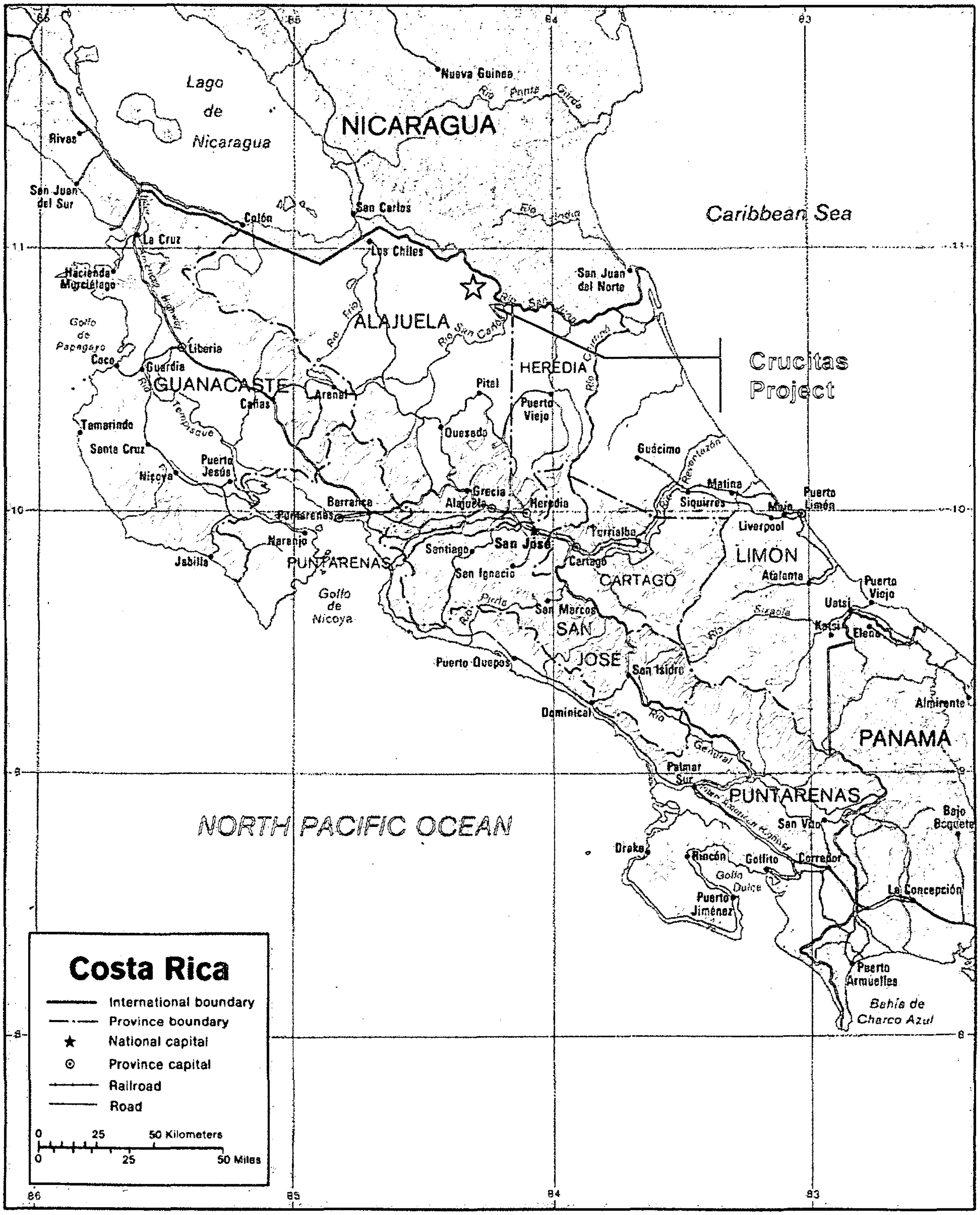


Figure 1 Location Map of Costa Rica

6.2. Current Social and political context

(Source: CIA, Nov 2005)
Costa Rica's basically stable economy depends on tourism, agriculture, and electronics exports. Poverty has been substantially reduced over the past 15 years, and a strong social safety net has been put into place. Foreign investors remain attracted by the country's political stability and high education levels, and tourism continues to bring in foreign exchange. Low prices for coffee and bananas have hurt the agricultural sector. The government continues to grapple with its large deficit and massive internal debt. The reduction of inflation remains a difficult problem because of rises in the price of imports, labour market rigidities, and fiscal deficits. The country also needs to reform its tax system and its pattern of public expenditure. Costa Rica recently concluded negotiations to participate in the US-Central American Free Trade Agreement, which, if ratified by the Costa Rican Legislature, would result in economic reforms and an improved investment climate.

6.3. Mining Industry in Costa Rica

Costa Rica is well known for its friendliness toward nature. It has been ahead of our time regarding the ecologic questions. It has many National Parks and it promotes eco-tourism. It has been more concerned in developing other types of industry than the mining industry historically. The tourist industry has a strong lobby in the government which has shown little sympathy towards miners in the past. But the tourist industry shares a common interest with the mining industry, which is the study of geology. Most tourists are attracted to Costa Rica to observe its volcanoes (60%) and other beauty of nature that are of interest to geology. Costa Rica has the only University program in Geology in the Central America region. It was establish in the 1960's. It attracts students from all of Central America. Their interest in the mining industry cannot be denied as well as to a growing number of financial and social actors in Costa Rica.

Small scale miner activities in some regions (South Pacific coast) of Costa Rica or some stories of mining activities abroad did not help promote a "clean image" for the mining industry in Costa Rica. However, the Crucitas project is being developed and managed as one of the most environmentally respectful project, says Vannessa. Crucitas is located in the North Central part of Costa Rica in the Province of Alajuela. This region has a small population in a remote area. Logging and cattle-farming are the main activities in the region. The mining industry is not well developed in all of Costa Rica, not only in this northern region. The state of economic development in and around Costa Rica should facilitate the logistic of the Crucitas Project.

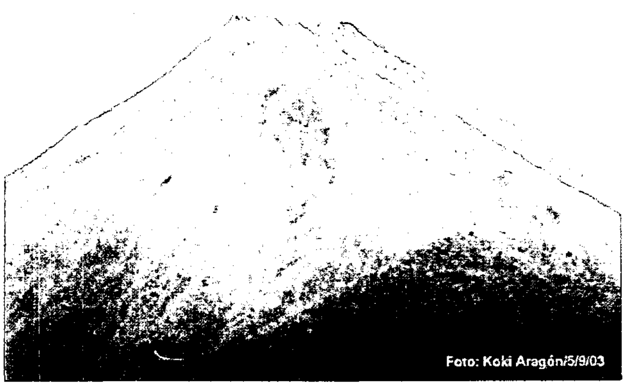


Figure 2 Pictures of the Arenal Volcano – Crucitas gold is hosted in volcanic rocks

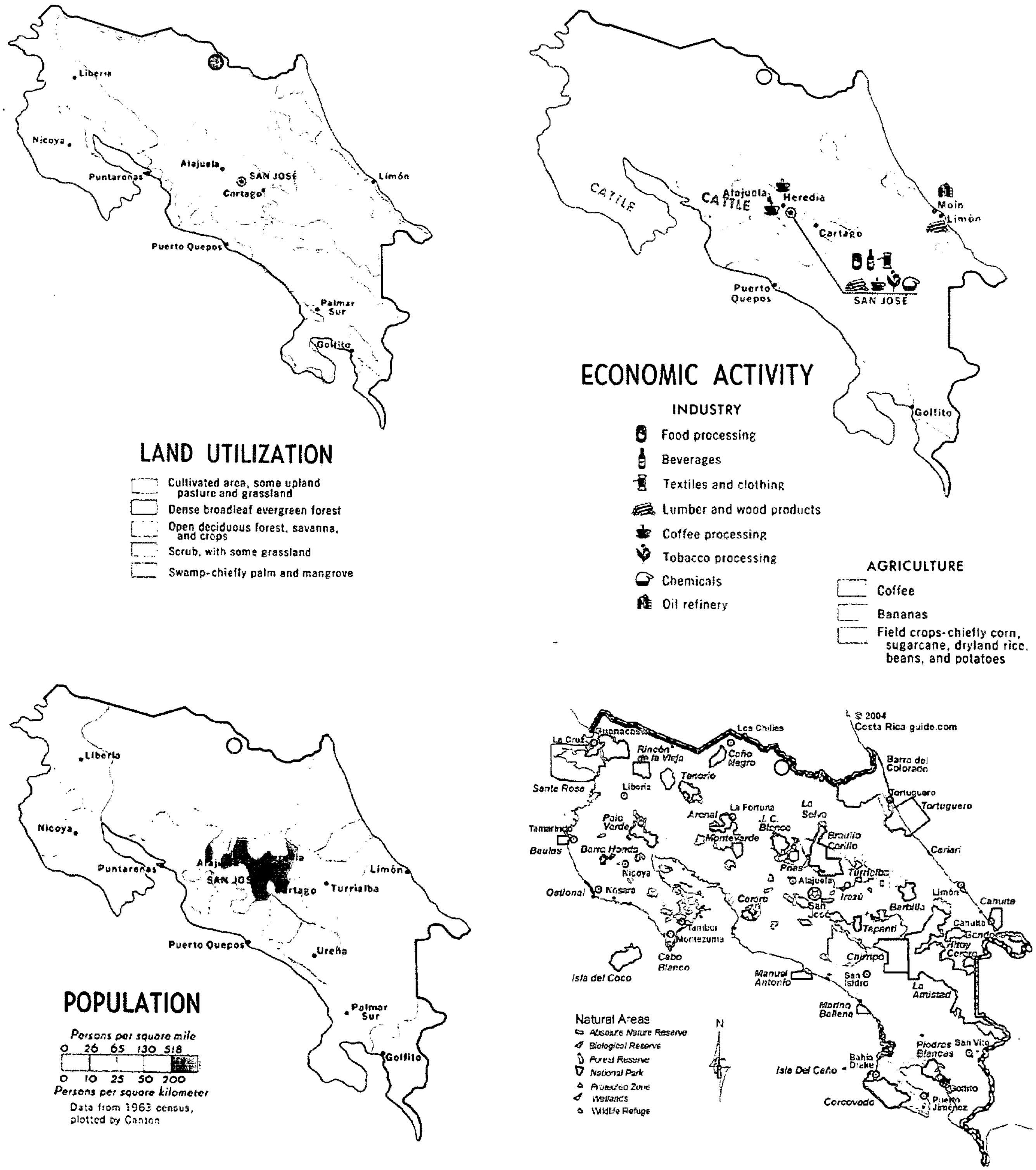


Figure 3 Various Costa Rica Maps

7. Accessibility, Climate, Local Resources, Infrastructures and Physiography

7.1. Accessibility

There are access roads from San José to the project location. The distance is about 100 km in direct line, but 180 km by road across a mountain ridge. It takes about 3 hours to reach the project site by road. The highway from San José is very good up to Naranjo, some 30 km NW, but soon turns into a picturesque but twisty country road as the road climbs the volcanic mountain range toward Ciudad Quesada and then down toward Boca Arenal where it turns on an 80 km dirt road going toward the valley of the San Juan river slightly toward the Caribbean coast. The village of Coopvega is crossed before reaching the Crucitas village at the end of the road. The mine project stands on the East side of the village.

Paved roads between cities are heavily used by trucks, buses as well as automobiles. Many bridges on steep slopes are "one way" bridges that may support heavy loads with difficulty. The 80 Km dirt road to the mine, especially after the Coopvega village, will require improvements to let heavy traffic go through.

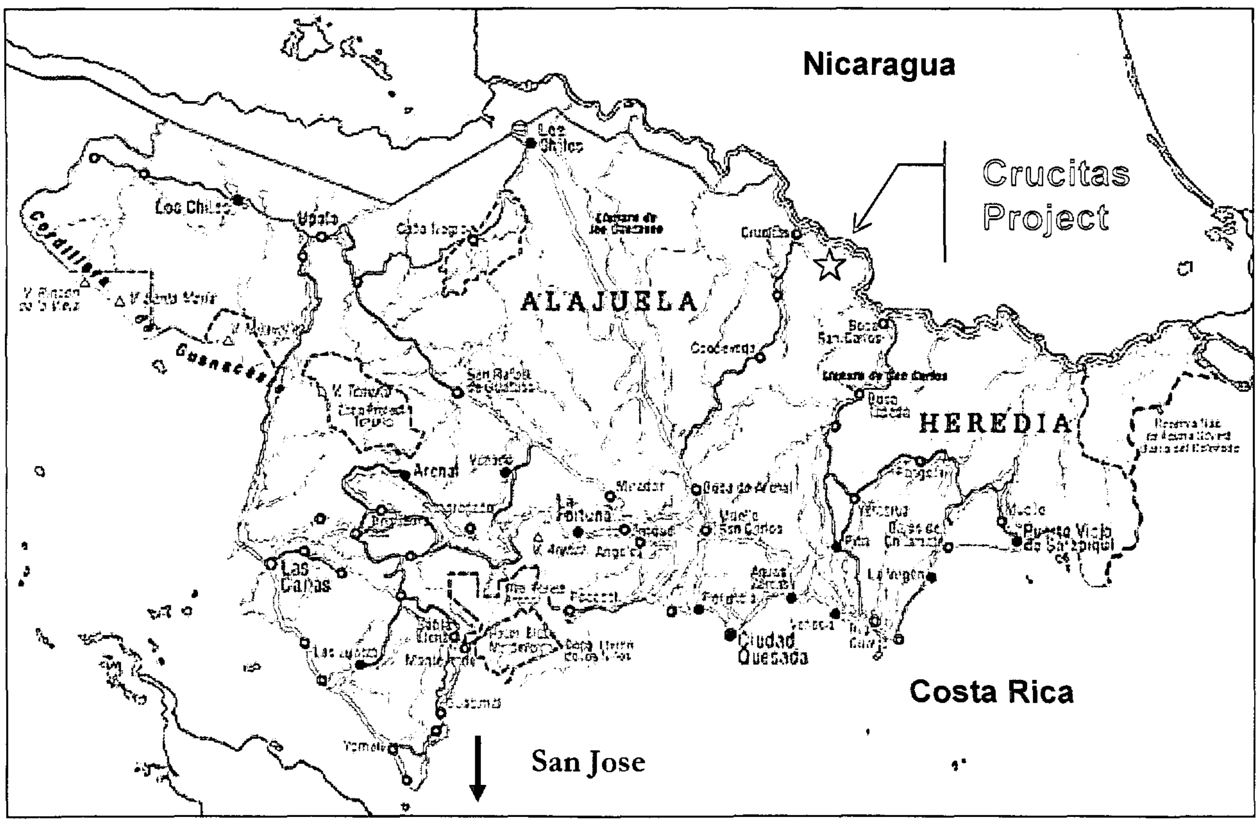


Figure 4 Regional Map showing the Crucitas Village and Project Location (red star)

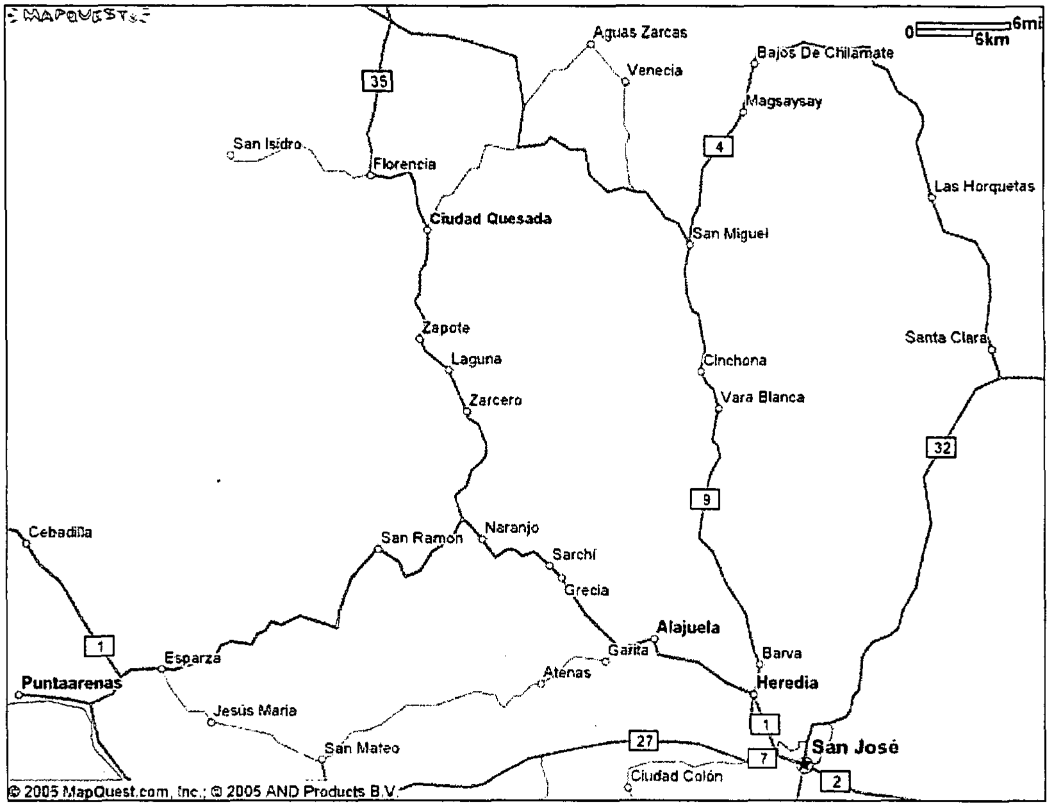
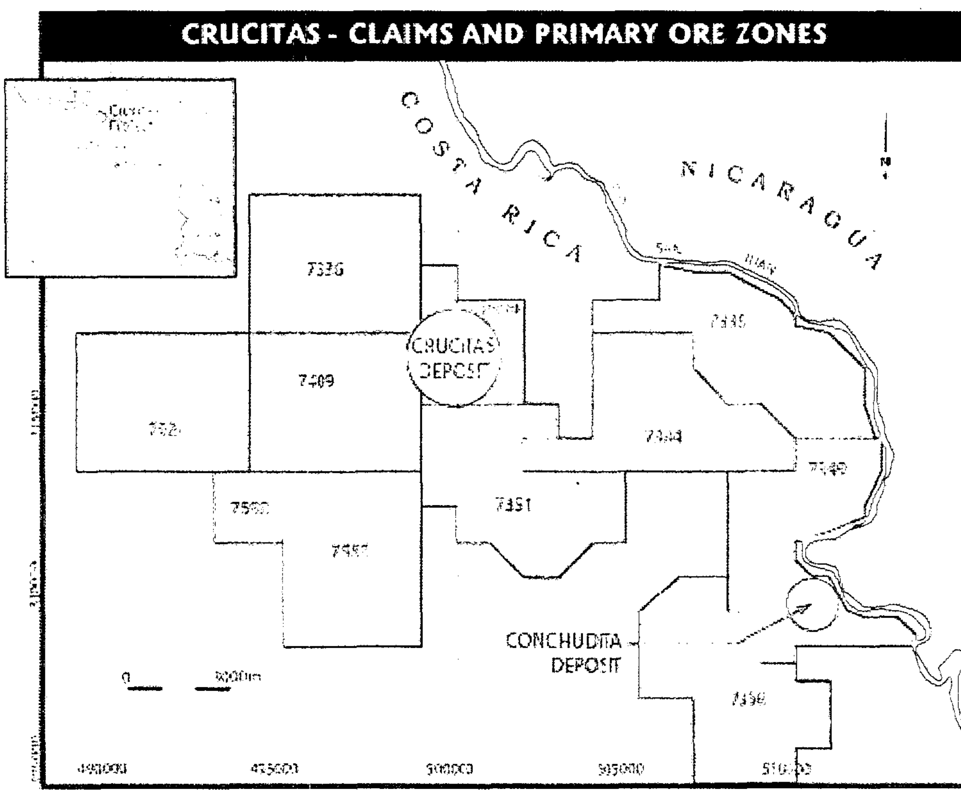


Figure 5 Road map North of San Jose Toward Alajuela (previous figure)



The Crucitas deposits are contained within Mining Exploitation Licence No. 2594 (formerly registered as Exploration Concession No. 7339). All other Exploration Concessions (nos. 7334, 7336, 7338, 7349, 7351, 7356, 7409, 7521, 7559 and 7598) originally detained by PDI are temporarily upheld by the state and can be readily re-instated upon payment of statutory fees in arrears since 1999.

Figure 6 Property Boundary and Location Map showing Gold Deposits

7.2. Climate

Costa Rica is a tropical country which contains several distinct climatic zones. There is no winter or summer as such and most regions have a rainy season from May to November and a dry season from December to April. Annual rainfall averages 100 inches nationwide with some mountainous regions getting as much as 25 feet on exposed eastern slopes. Temperature is more a matter of elevation than location with a mean of around 72 degrees in the Central Valley, 82 degrees on the Atlantic coast and 89 degrees on the Pacific coast.

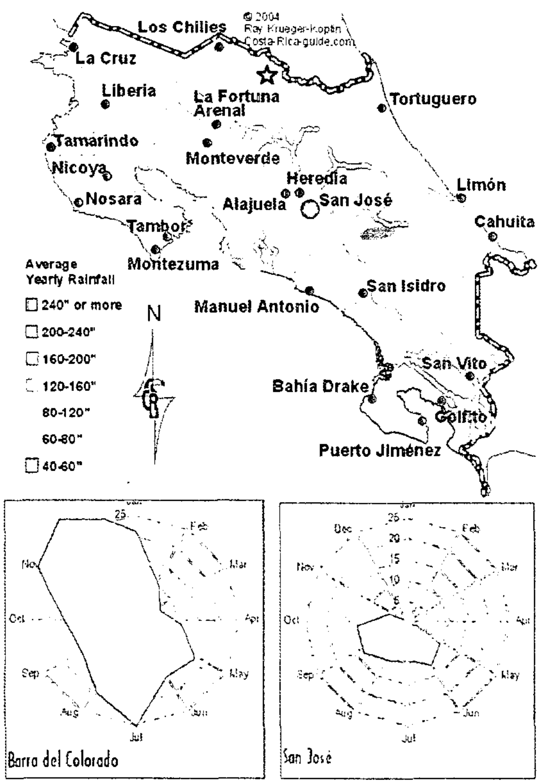


Figure 7 Maps of rain falls in Costa Rica

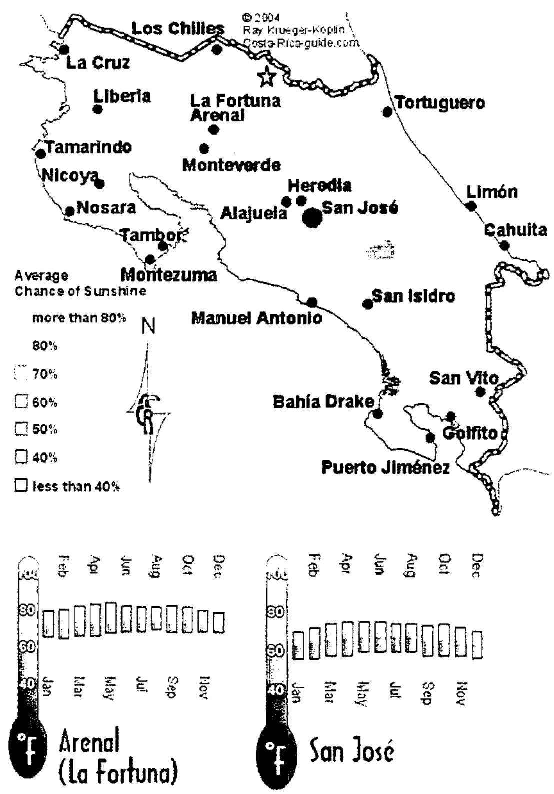


Figure 8 Sunshine and Temperatures in Costa Rica

7.3. Local Resources

7.3.1. Staff, miners and suppliers

Costa Rica offers well educated business managers, skilled technical staff and a suitable work force to make a mining company successful. However, the mining industry is not well developed in Costa Rica. Therefore, the local work force has limited experience in this specific type of industry. On the other hand, the economy of Costa Rica is relatively well developed to offer recruitment opportunities in the construction industry for example, as well as in the local forestry and farming industries.

The availability of specialized workers such as geologist has already been discussed in Section 3.3. However, there is no mining school in the Region, so mining engineers and other skilled staff may have to be foreigners.

7.3.2. Government services and taxes

This section should discuss about taxes and social services that are provided by the government and those provided by the company. Geostat has no detailed knowledge of how those responsibilities are shared at the time of writing this report, but IISA, Vannessa subsidiary in Costa Rica is very involved in social activities. The people of Costa Rica value the cooperative social organization. The company has managers and staff with a program to that effect. Among other things, they publish a magazine and organize meetings and social activities to be involved and cooperate with the local people's needs.

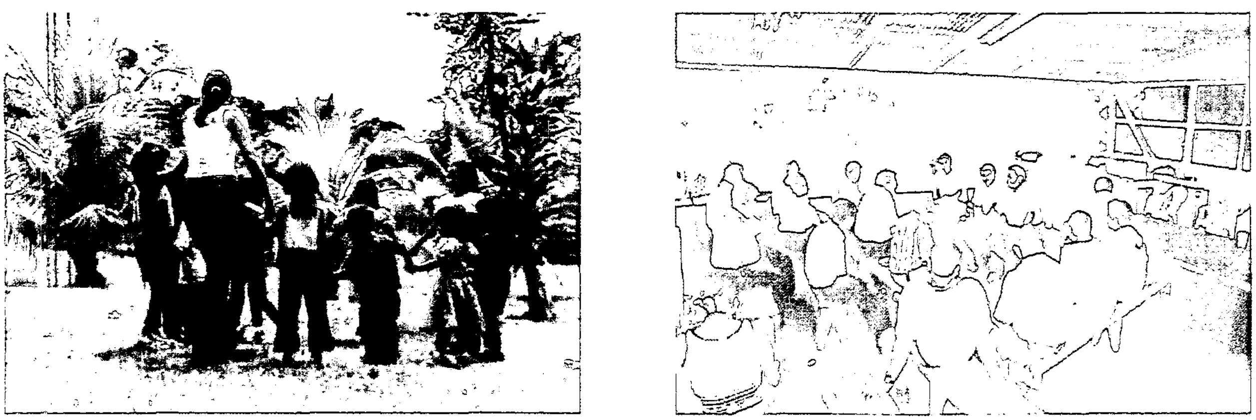


Figure 9 Vannessa promoting social values

7.4. Infrastructures

7.4.1. Regional Office

Vannessa maintains an office in San Jose, Costa Rica. It is a modern office facility in a business district where various embassies are established, among other corporations. The office is fully staffed , strategically located and well experienced to manage the company business in Costa Rica. The staff is in large part the same that has been working since PDI in 1993. The staff had been reduced after the exploration program was terminated in 1998. The management is experienced in procuring supplies and services from abroad as well as in the country. Combined with other well seasoned senior staffs based at Vannessa head office in Calgary, Canada, the company should be able to manage the project development without any major problems.

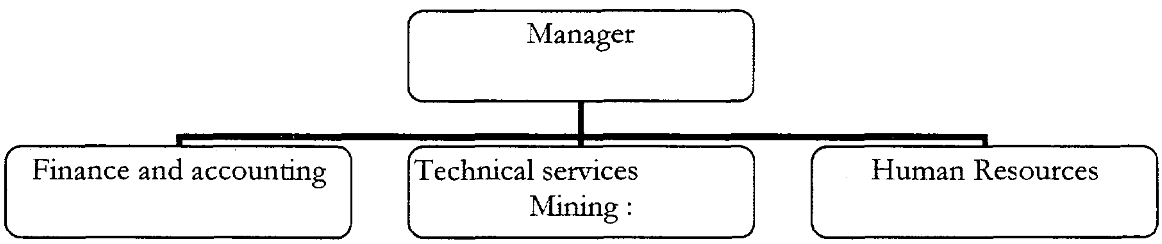


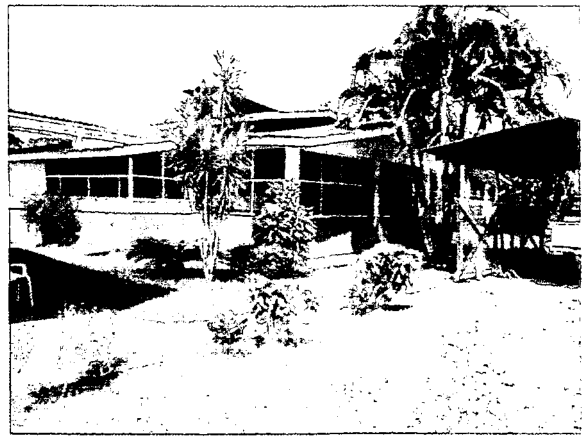
Figure 10 Organigram of Industria Infinito in Costa Rica

7.4.2. Project Site Camp

When PDI first initiated the project exploration program in 1993, it established the project office in the village of Coopevega, some 40 Km from Crucitas. Later, as the project potential grew, PDI built a camp facility on site capable to accommodate up to 150 people during the earlier exploration stage. It includes staff housing, a cafeteria, air-conditioned offices, a diesel powered generator station, a warehouse and other buildings including a sample preparation building complete with jaw and cone crushers, scales, pulverizers and drying ovens. The camp has been well maintained and has radio and satellite communications. The camp also offers basic recreational installations.

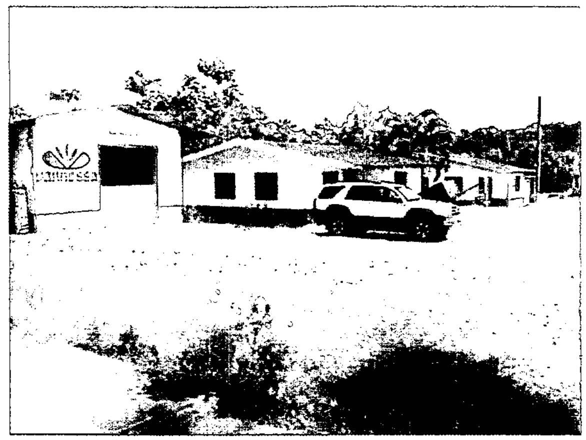
The drill core is also stored on location on proper shelves under roof protection that makes retrieving samples easy.

a) Staff accommodations on site



b) Kitchen and dinning room on site

c) Inside the geology office



d) Warehouse and offices on site

e) Road across Fortuna deposit on site

f) Project Office in Coopvega

Figure 11 Pictures of the Project Infrastructures

7.5. Physiography

The country is divided by a backbone of volcanoes and mountains, an extension of the Andes-Sierra Madre chain which runs along the western side of the Americas. Costa Rica has four distinct cordilleras or mountain ranges -- Guanacaste and Tilaran in the north, Central and Talamanca in the south. Costa Rica is part of the Pacific "Rim of Fire" and has seven of the isthmus's 42 active volcanoes plus dozens of dormant or extinct cones. Earth tremors and small quakes shake the country from time to time.

The last major quake hit on April 22, 1991. Centered on the Caribbean side southeast of San Jose, it measured 7.4 on the Richter scale. The country's highest point is Mt. Chirripo (3,797 meters). The capital, San Jose, and the neighbouring major cities of Alajuela and Heredia lies in the middle of the Meseta Central (Central Valley). Almost two-thirds of the nation's population live in this small, fertile valley. The Pacific coastal plain is much narrower than its Caribbean counterpart. Both coasts are lined with white and black sand beaches.

The Crucitas project is located in the San Juan River valley which is the northern border between Costa Rica and Nicaragua. This area is relatively flat with small hills lining the valley bottom. The valley floor is covered with tropical forest. The forest is harvested increasingly toward the paved road some 80 Km south of the project.

Figure 12 Costa Rica Physiographic Map

Figure 13 Crucitas Aerial View

8. History

Vannessa Ventures signed an agreement with Lyon Lake Mines Ltd. in May 2000 to acquire a 100% interest in the project. Originally staked in 1992, over US$34 million has been spent on the property to date. Between 1992 and 1994 Placer Dome conducted extensive soil sampling, geological mapping and ground geophysical programs. A 251 diamond drill hole and 90 auger drill hole program was completed between 1994 -- 1996 to identify and evaluate the Fortuna, Fuentes and Botija deposits on the Crucitas exploration concession. In 1997, Placer Dome completed a pre-feasibility study. In 1999, Lyon Lake Mines became the new owner and completed a 100 auger drill hole program and commissioned a feasibility study by Cambior Project & Construction Group. Since acquiring Crucitas, Vannessa has commissioned a number of engineering contracts, received an exploitation permit in January 2002, and submitted an Environmental Impact Assessment Mining Plan in December 2002 which was approved in December 2005.

Table 1 History of Resources Estimations

Date	Operator	Cut-off Au (gpt)	Tonnage Mtonnes	AvgGrade Au (gpt)	AvgGrade Ag (gpt)	Estimation Method	No.DDH in Model	Au Content (k Oz)
ALL ORE CATEGORIES (Fortuna, Botijas and Fuentes Zones – All Rock Types)								
oct-95	PDI	0.50	58.200	1.15	4.7	Polygonal	104	2 152
janv-96	PDI	0.50	83.002	1.18	3.3	Ord. Kriging	129	3 149
May-96	PDI	0.50	86.634	1.08	3.3	Ord. Kriging	199	3 008
sept-96	PDI	0.50	93.007	1.03	3.3	Ord. Kriging	234	3 080
Feb-99	CPC	0.55	76.449	1.16	4.3	Ord.Kriging	329	3 003
Feb-99	CPC	0.55	71.358	1.25	4.5	Inv. Dist 3	329	3 002
Aug-99	**IMC**	**0.75**	**40.885**	**1.50**	**3.2**	**2S Ind.Krig.**	**341**	**1 974**
oct-05	**Van-GSII**	**0.50**	**38.671**	**1.20**	**3.1**	**Ord. Kriging**	**343**	**1 397**
MEASURED & INDICATED Ore Categories (All Zones - SAP, SPK and all Rock Types)								
Aug-99	**IMC**	**0.80**	**29.670**	**1.51**	**3.4**	**2S Ind.Krig.**	**341**	**1 443**
Aug-99	IMC	1.00	24.818	1.63	3.5	2S Ind.Krig.	341	1 300
oct-05	**Van-GSII**	**0.80**	**18.570**	**1.42**	**3.2**	**OK+Whittle**	**343**	**709**
MEASURED & INDICATED Ore Categories (All Zones - SAP, SPK Rock Types Only)								
sept-96	PDI	0.60	16.400	1.35	?	Ord. Kriging	234	712
Feb-99	CPC	0.60	11.800	1.27	?	Inv. Dist 3	329	483
Aug-99	**IMC**	**0.80**	**8.000**	**1.66**	**?**	**2S Ind.Krig.**	**341**	**427**
nov-00	Zbeetnof	0.80	10.400	2.17	?	Polygonal	401	719
oct-05	**Van-GSII**	**0.80**	**3.379**	**1.64**	**1.9**	**OK+Whittle**	**343**	**193**

Table 2 Detailed Resources Estimation by IMC in May 1999

Geological Resource -- Saprolite and Hardrock					
Concession	Category	Mt	Au (g/t)	Ag (g/t)	Total Au(oz)
Crucitas	Measured + Indicated	29.7	1.51	3.41	1,440,000
Crucitas	Inferred	10.1	1.56	2.93	503,000
Conchudita	Inferred	3.2	4.56		469,000
Total	Measured, Indicated + Inferred				2,410,000

The combined saprolite and hardrock resource, as calculated by Independent Mining Consultants (May 1999), is 29.7 million tonnes measured and indicated grading 1.51 g/t gold and 3.41 g/t silver for a total of 1.44 million ounces gold. Inferred resources total 10.1 million tonnes grading 1.56 g/t gold and 2.93 g/t silver for an additional 503,000 ounces.

The above resources include the measured and indicated near-surface saprolite resource, as calculated in 2000 by G.R. Peatfield, PhD., P. Eng., and J.A. Zbeetnoff, P.Geo, which totals 10.4 million tonnes grading 2.14 g/t for 724,000 ounces using the polygonal method. This method is no longer acceptable for a project of this magnitude and at this stage of development.

In addition, Geostat wishes to remind the reader that all resource estimates in both Tables above were conducted before the adoption in February 2001 of the National Policy 43-101 ruling by the Canadian Stock Exchange. It may be kept in mind that the very low cut-off of 0.5 g Au/t and the resulting high tonnages at a low grade was designed to maximize the gold ounces estimations.

9. Geological Setting

(Section 6, 7 and 8 are *Extracts from Cambior Feasibility Study Report 1999 – rearranged and adapted by Geostat and Vannessa in 2005*)

9.1. Regional Geology

The Crucitas epithermal gold deposit is located in the Costa Rican portion of the Tertiary Volcanic Plateau of the Central American Volcanic Arc, often referred to as the Sarapiqui volcanic belt. The belt borders the northwest trending Nicaraguan Graben and parallels the Middle American Trench. The region lies at the boundary between the Cocos and Caribbean tectonic plates and is volcanically still active.

The 50 kilometer (km) belt is composed mostly of basaltic to andesitic lava flows of calc-alkaline affinity, andesitic to rhyolitic domes, and pyroclastic and epiclastic rocks of Middle Miocene age. This sequence unconformably overlies Oligocene calcareous turbidites of the Machuca Formation, which were folded and faulted prior to the Miocene volcanism. Serpentinized basalts related by some to the Pre-Santonian Santa Elena Peridotites Formation outcrop 10km northwest of Crucitas. These peridotites are considered the basement of South Central America.

Calc-alkaline basaltic to andesitic lava flows of the Aguacate Formation occur in an 80 km long Tertiary volcanic belt trending northwest southeast. The belt, which is located about 70 km southwest of Crucitas, also holds minor felsic intrusives and inter-bedded volcaniclastic rocks. This is the only other known volcanic belt in Costa Rica that hosts hardrock gold mineralization.

Major northeast trending structures that are related to Tertiary tectonic faults are present in the area. These structures may have played an important role in the emplacement of the felsic domes in the Crucitas area while further development of conjugate NE and NW structures may have localized fluid circulation and mineralization

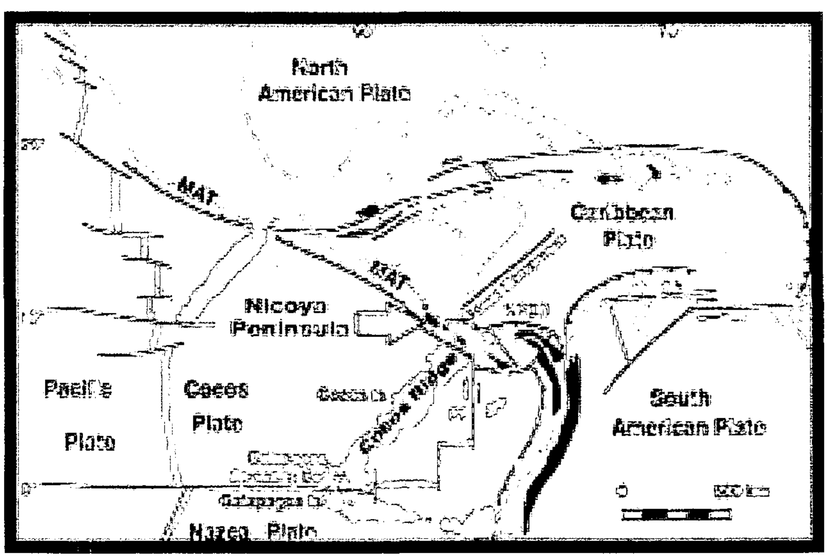
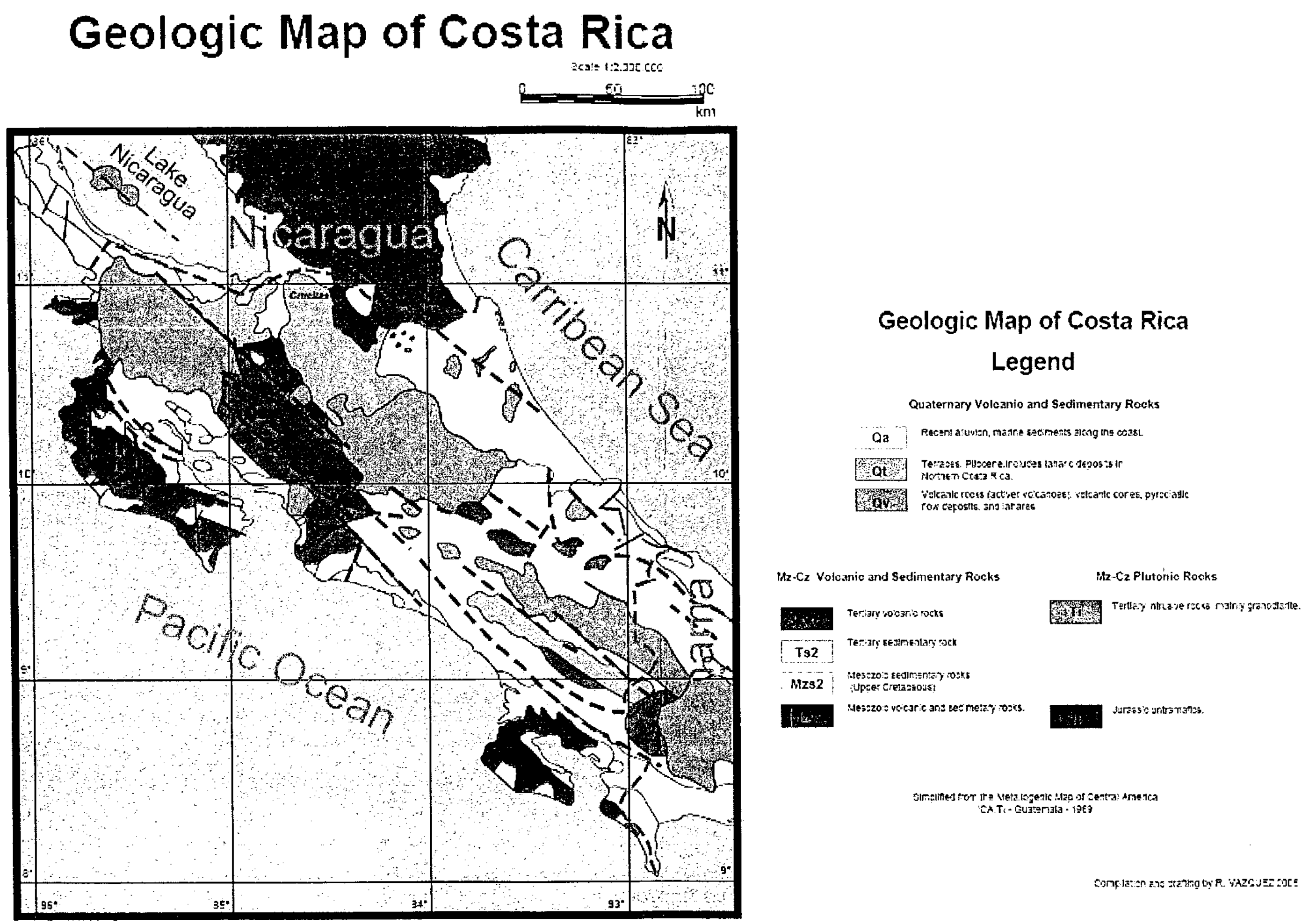


Figure 14 Tectonic setting of Costa Rica.



Simplified from the Metallogenic Map of Central America ICAITI - Guatemala - 1969

Figure 15 Geological map of Costa Rica

9.2. Local Geology

The oldest rocks on the property (20 sq. km) are the Machuca Formation Sediments. These distal marine turbidites, with inter-bedded sandstones and siltstones, outcrop in the northern part of the property. They were faulted and folded before the deposition of the lavas and tuffs that constitute the basement of the Crucitas ore deposits. This andesitic volcanic sequence is widespread in the Crucitas region. Best exposures within the property are found south of the deposit.

Overlying the andesitic basement is a pyroclastic sequence of flow tuffs, air-fall lappilli tuffs, and surge deposits which have been cut by dome rocks and associated breccias constituting dome complexes. Domes have been emplaced following two major structural trends NE and NW. Ore deposits are found associated with some of the domes and surrounding pyroclastic rocks.

Young basalts overlie the entire sequence. They could be masking felsic dome complexe such as the ore- hosting at Crucitas. The felsic domes or ridges have set through fissures (rather than round chimneys) and contributing in part to the form of the landscape today: Fortuna Hill and Fuentes/Botija.

The remaining units on the property, from the stratigraphically lower ones up, are shown in the following table:

Table 3 Simplified Crucitas Stratigraphic Column

Domain	Geological Description
SAP	Saprolite, oxide clay-rich, sometimes **contains vein relicts** *as do the underlying rocks*
SPK	Saprock, increase in competency relative to saprolite, clay rich. Usually thin
DIAB	A late NW and NE-trending diabase dyke complex. Magnetic, unmineralized, calcite-rich
RBX	Felsic dome pyroclastics and breccias. Monolithic, coarse rhyolite fragment near vents, hematite-rich matrices.
FDC2	Rhyodacite to rhyolite flows and ignimbrites hosting the **Fortuna ore**. Strongly silicic. Late hydrothermal breccias.
FINT	Hypabyssal lacolithic felsic intrusive hosting the **Botija ore** and interpreted to be a deeper-set equivalent to Fortuna's FDC2
GBX	Early dome pyroclastics, monolithic dacite fragments. Propylitic with hematite-rich matrix locally. More extensive than the FDC2 and RBX domains
FDC1	Early dome dacitic flows. Propylitic.
VOL	Like FDC1, pyritic, with massive and vesicular dacite to trachyandesite flows and pyroclastics. **Fuentes zone only**.
PCT	Heterolitic block-ash pyroclastics. Sedimentary and volcanic fragments. Most extensive unit at Crucitas
BVOL	Basement volcanics, calc-alkaline andesitic to basaltic flows and pyroclastics. Calcite and hematite-rich matrices. Magnetic and unmineralized.

Three gold bearing zones were delineated from auger and diamond drill holes inside Mining Concession no. 2594 (Exploration Concession no. 7339, originally) totalling more than 36,000 meters (m). The Fortuna zone is the most massive and is located in the central southwest portion of the Crucitas concession. The Botija zone, about a third the size of the former, lies about 500 m to the east, while the Fuentes zone is a satellite extension of the Fortuna body to the southwest. The first two are centered on felsic dome complexes that are superficially expressed as two hills, due to their felsic composition *and the quartz veins* that make them more resistant to erosion: Cerro 182 and a small hill to the east, located between Cerro 182 and Cerro 192.

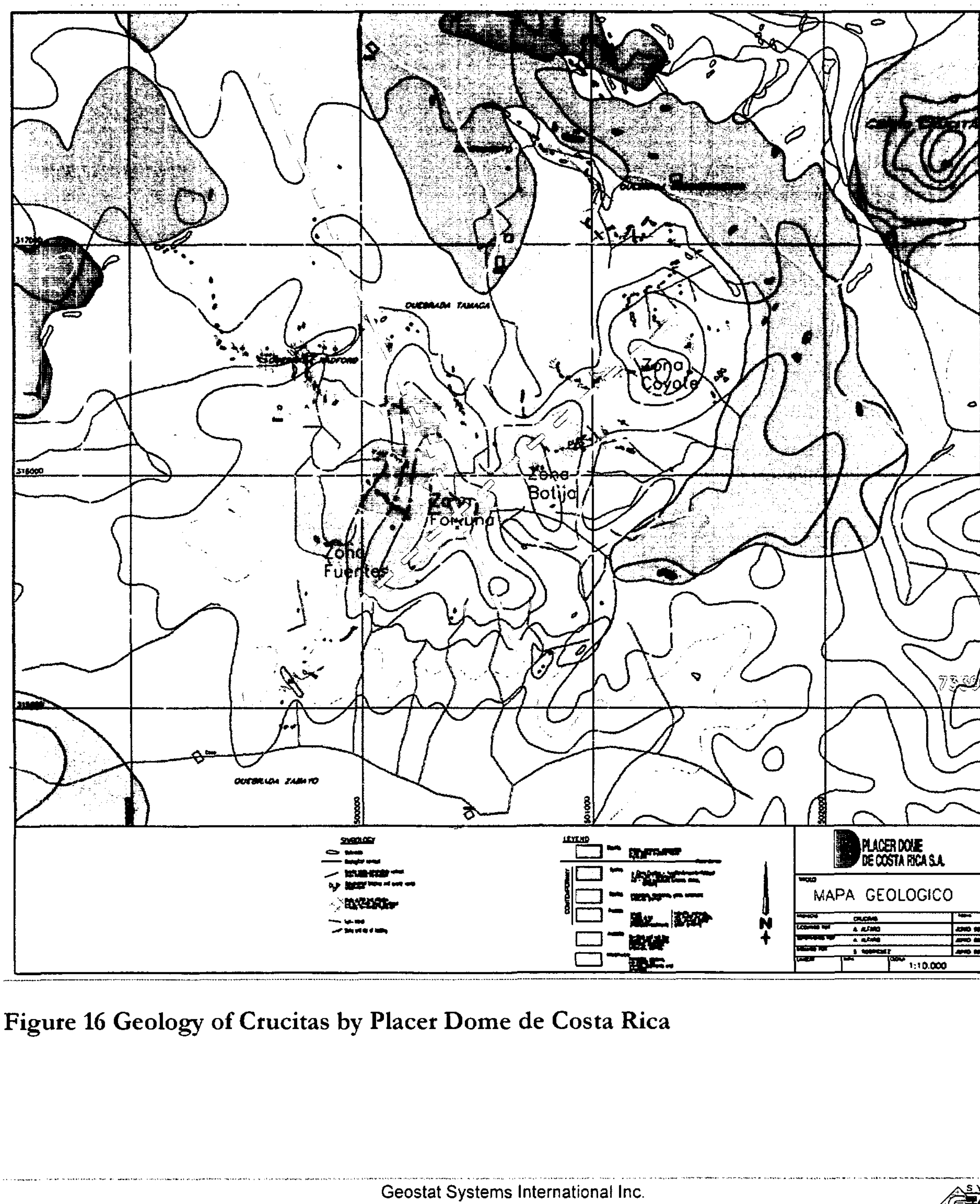
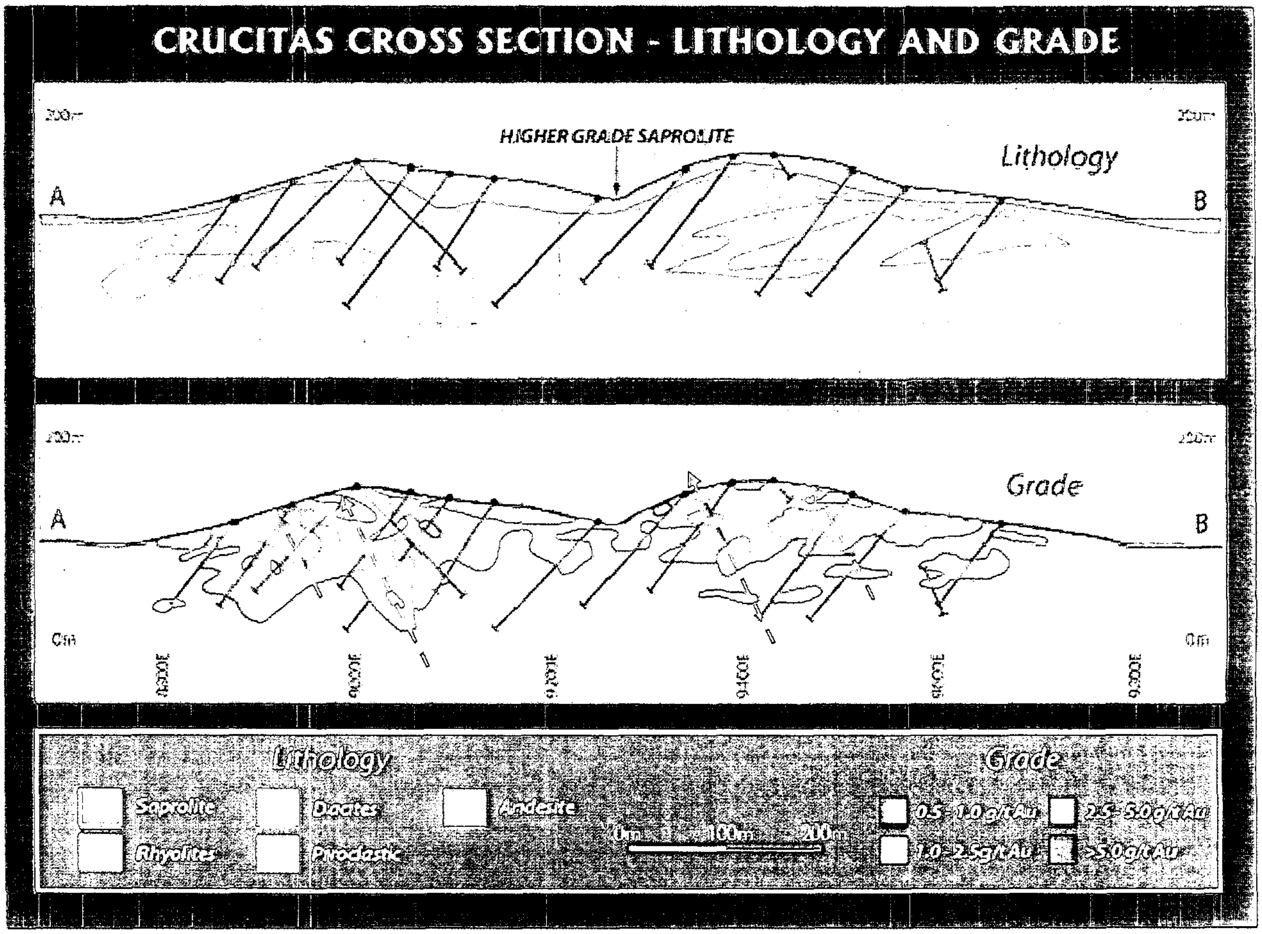


Figure 16 Geology of Crucitas by Placer Dome de Costa Rica

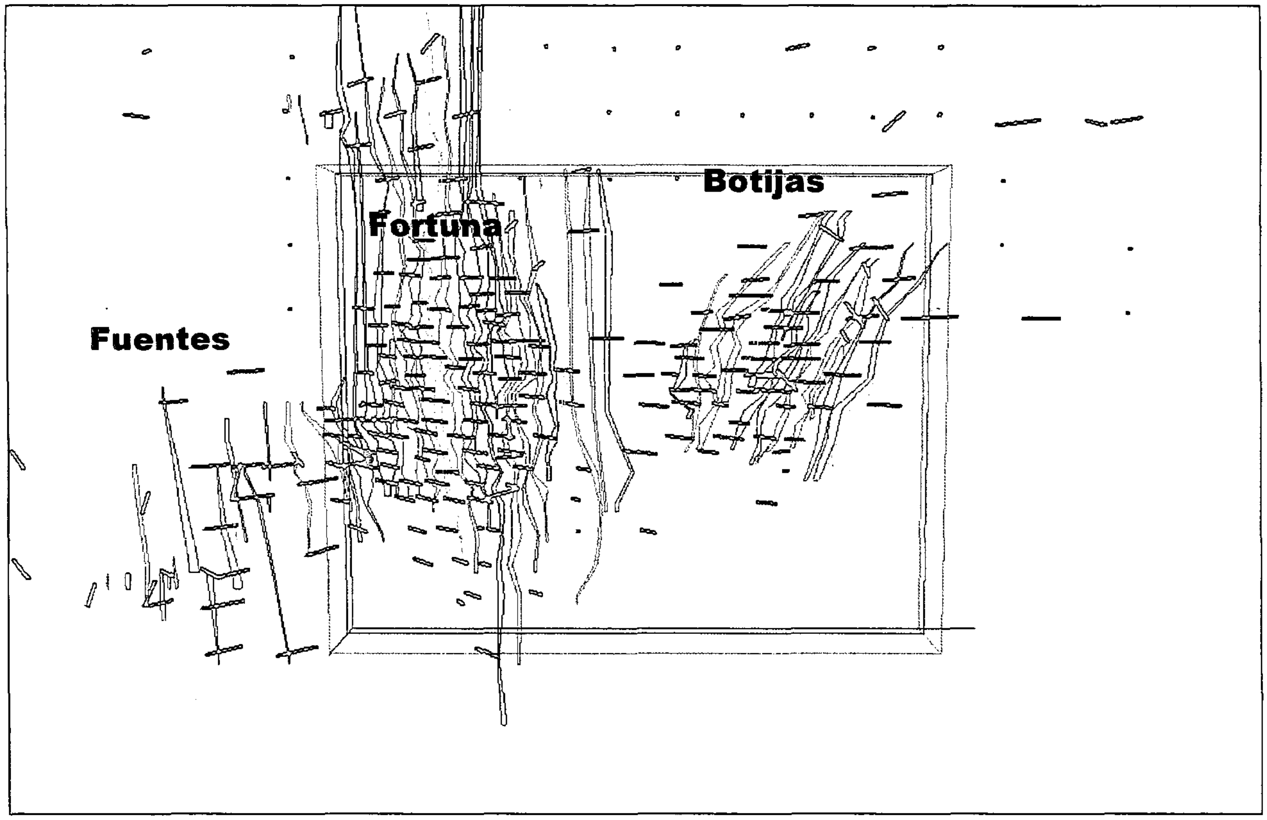


Crucitas is comprised of a gold-bearing saprolite (near-surface, weathered) resource and a gold-bearing hardrock (unweathered) resource. The above cross-section diagram illustrates how the higher-grade saprolite is situated at surface, as well as some of the drilling that has been done to identify both the saprolite and lower-grade, hard-rock resource.

Figure 17 Cross Section by PDI showing geology and grade control by lithology model

Important Note by Geostat:

The plans and sections on the following pages show the main gold bearing *steep dipping* structures which presumably concentrate gold more than the lithology which is lying flat. These structures are described in more detail in Section 8. Although technically well described by PDI, to the point of modifying their drilling pattern, these structures were never completely drawn by PDI to constraint gold grade projections. It was not done reportedly because of lack of detailed information. As we will see in the present report, it does make a difference and it represents a challenging geological feature of the Crucitas project. The gold bearing structures possibly represent a later stage of fissures reopening after the collapse of the volcanic chamber near the end of the felsic dome emplacement through similarly oriented sub-vertical vents and fractures. The fissures often contain brecciated rocks and small quartz veins forming channel ways to bring up the gold, as first described by PDI and later quoted by Cambior and IMC in Section 7 and 8 of this report. Geostat has underlined some key passage in the text with a bar on the right side of the text as for this paragraph.



Plan view showing drill holes from elevation 50 to 100 m asl. Structures projections on elev 75.

Figure 18 Local Geological Map of Crucitas

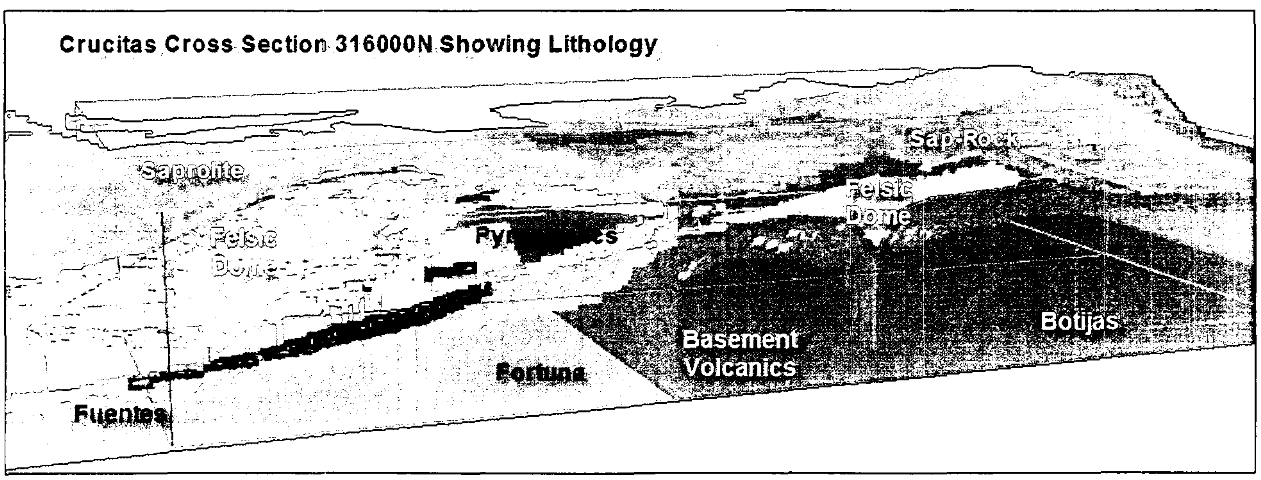
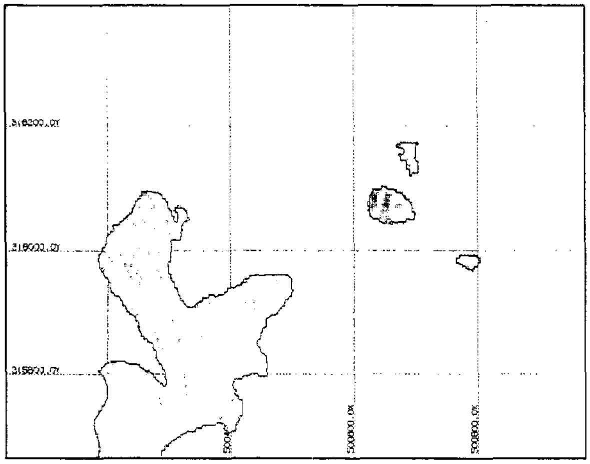
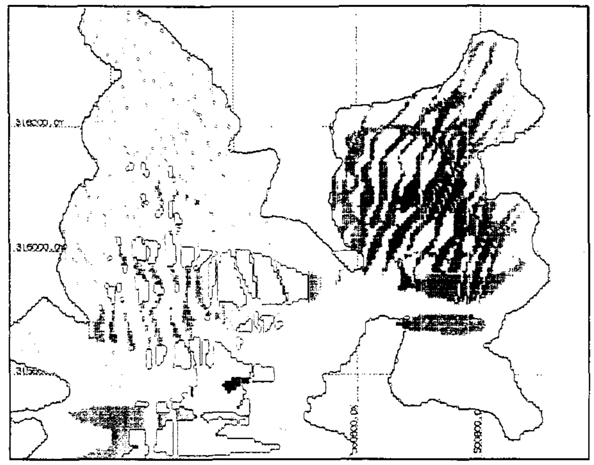
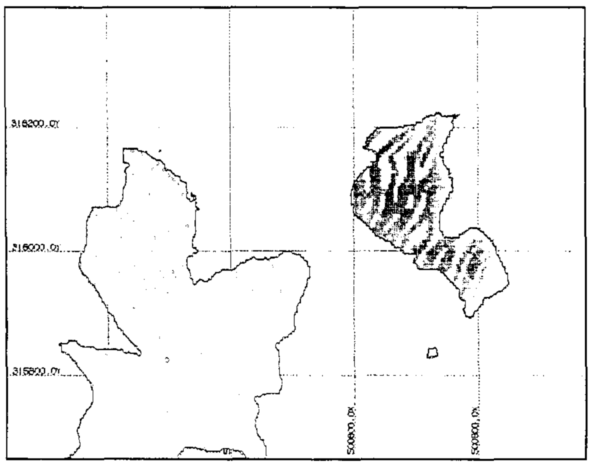


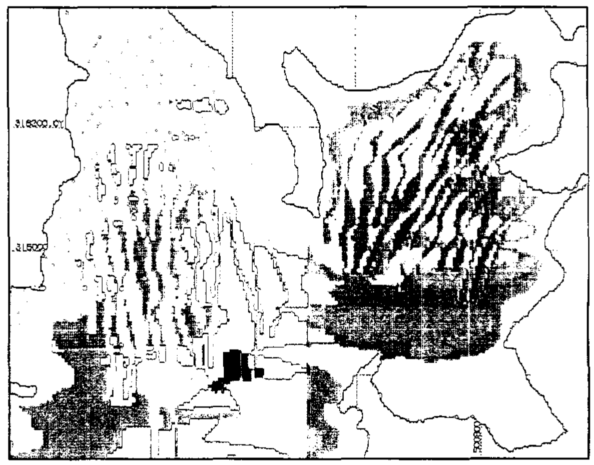
Figure 19 Cross Section 316000N showing Lithology in 3D without the gold bearing structures

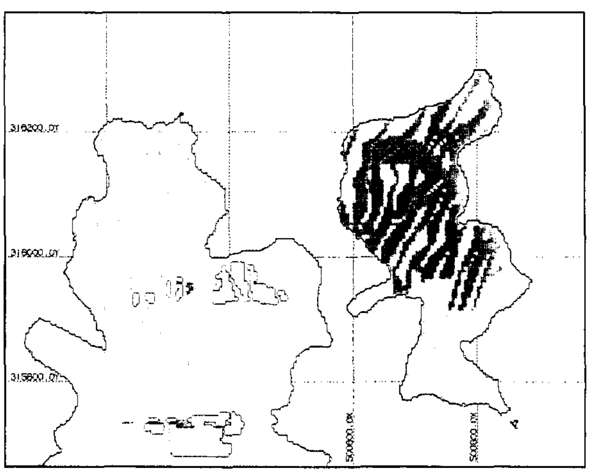
Plan Views of Lithology and gold bearing structures:

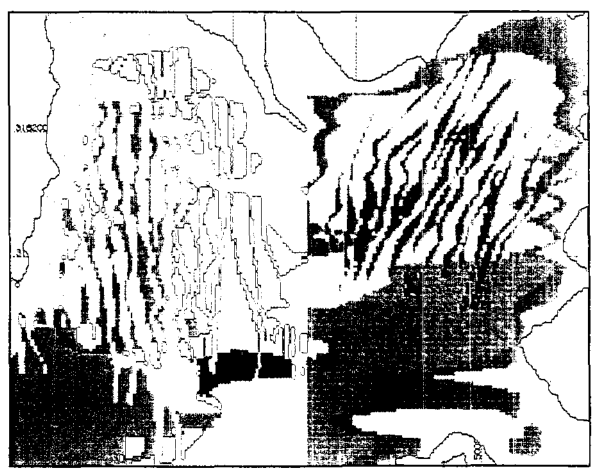

159 elevation

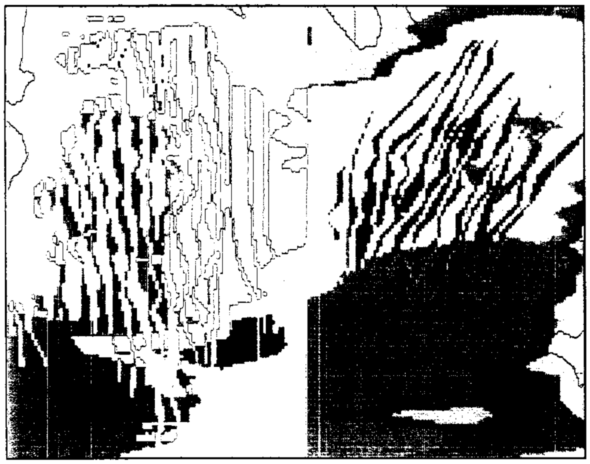

129 elevation


149 elevation


119 elevation

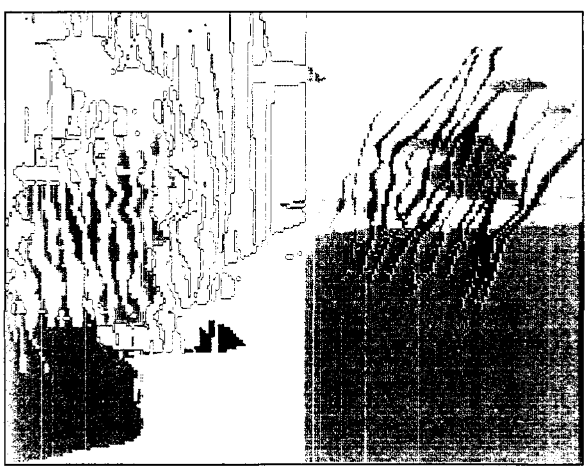

139 elevation


109 elevation

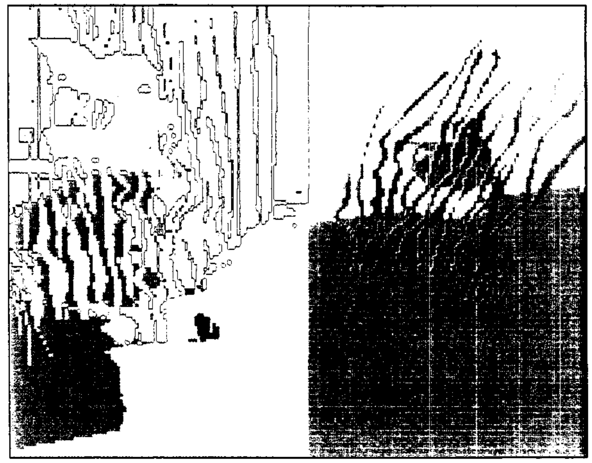


99 elevation

89 elevation

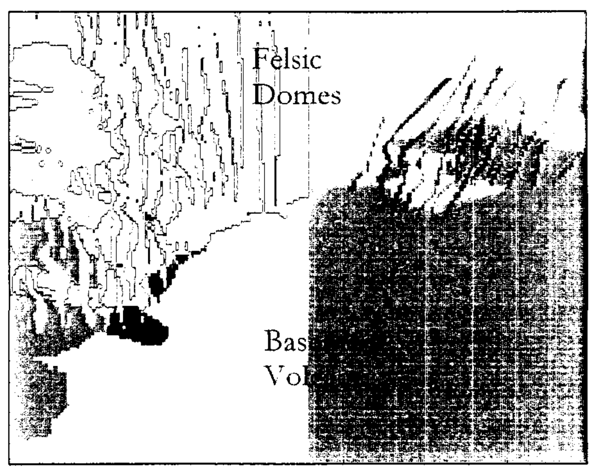


79 elevation



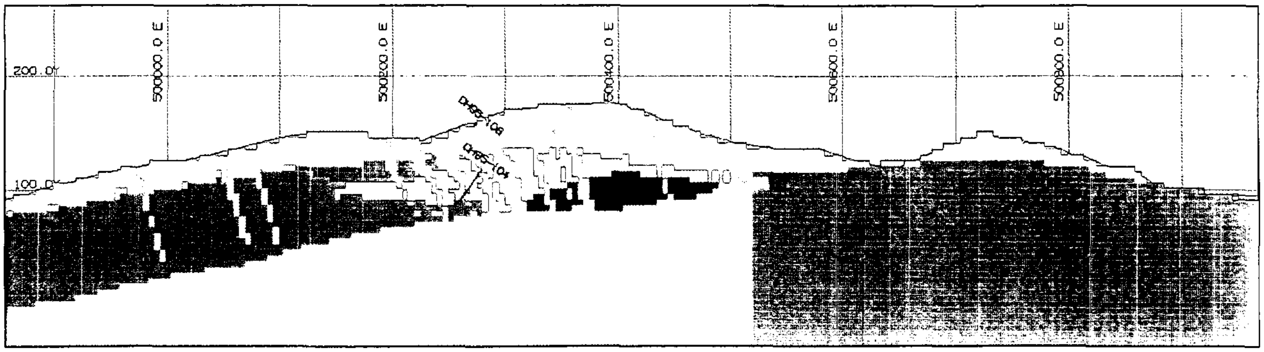
69 elevation

59 elevation

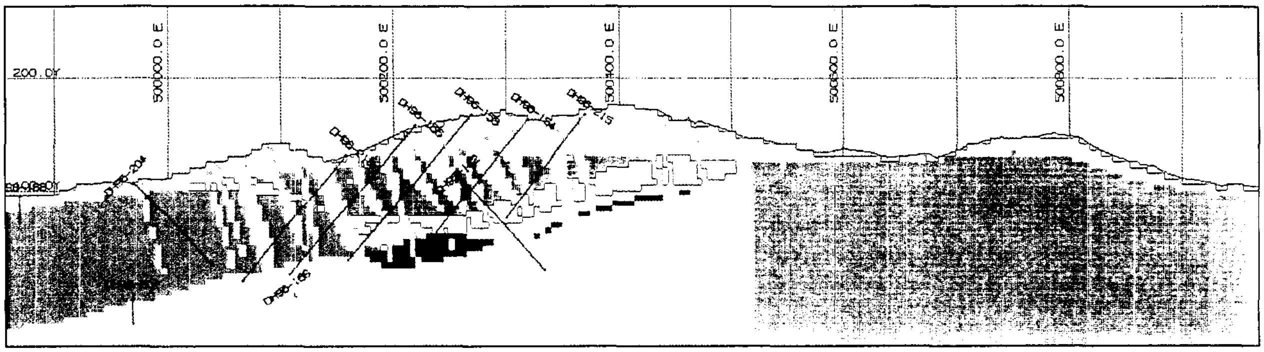


49 elevation

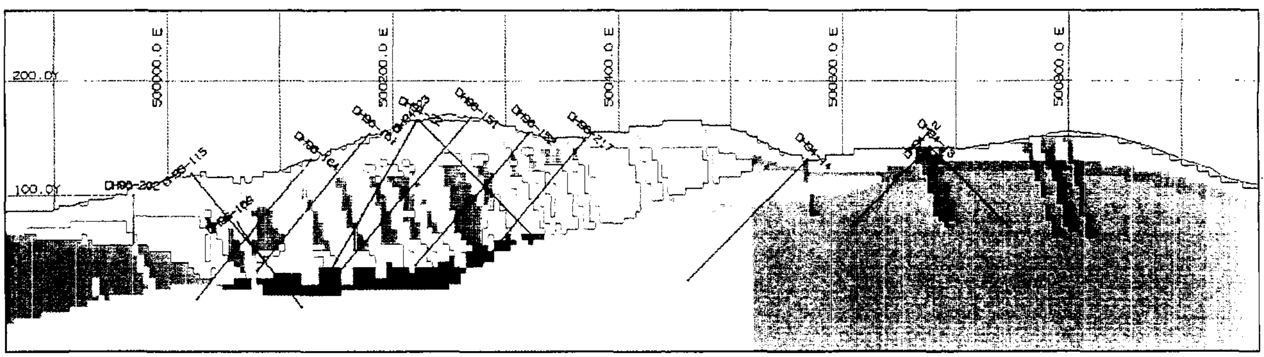
Figure 20 Lithology by level in Plan View (Fortuna left – Botija right)



Section 315 850N



Section 315 900N



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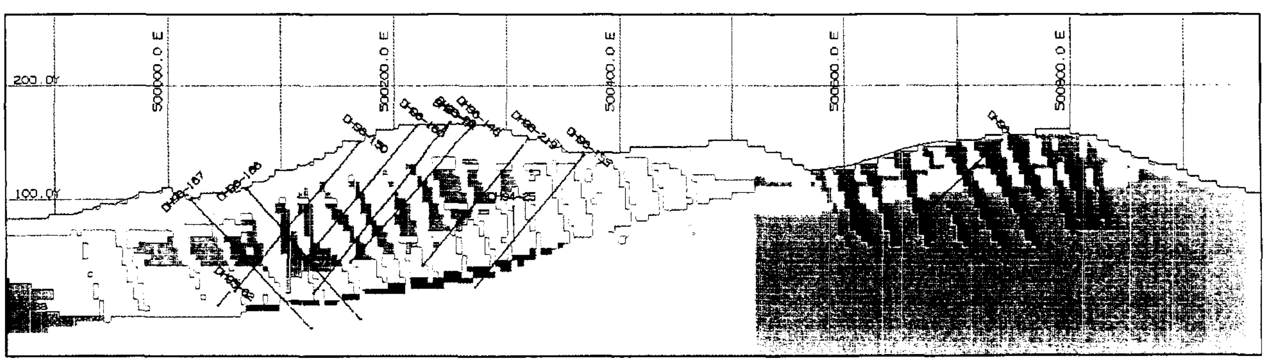
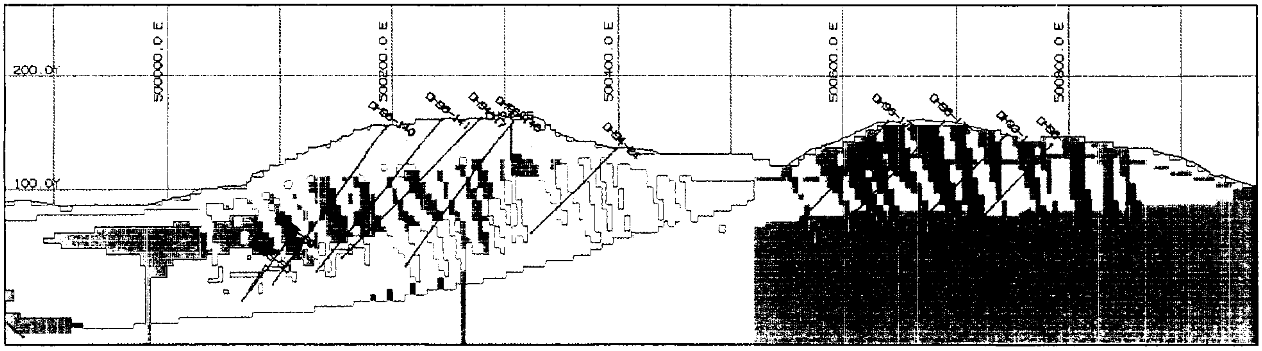
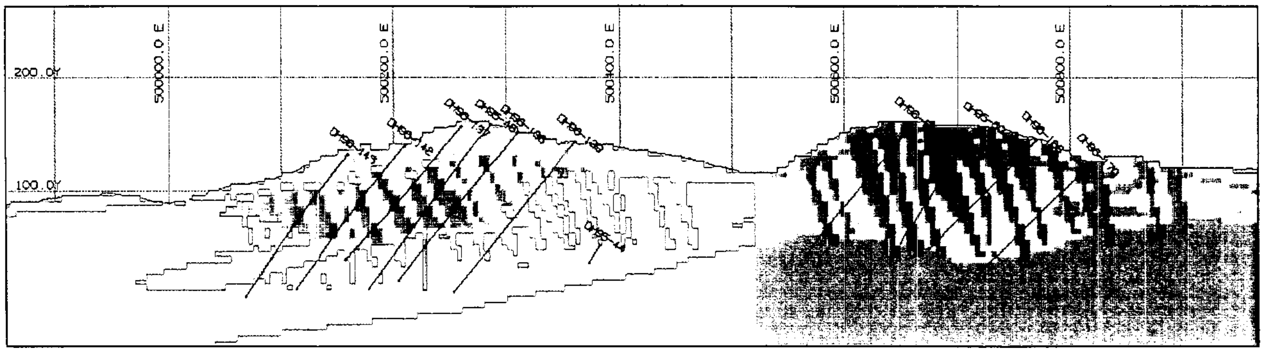


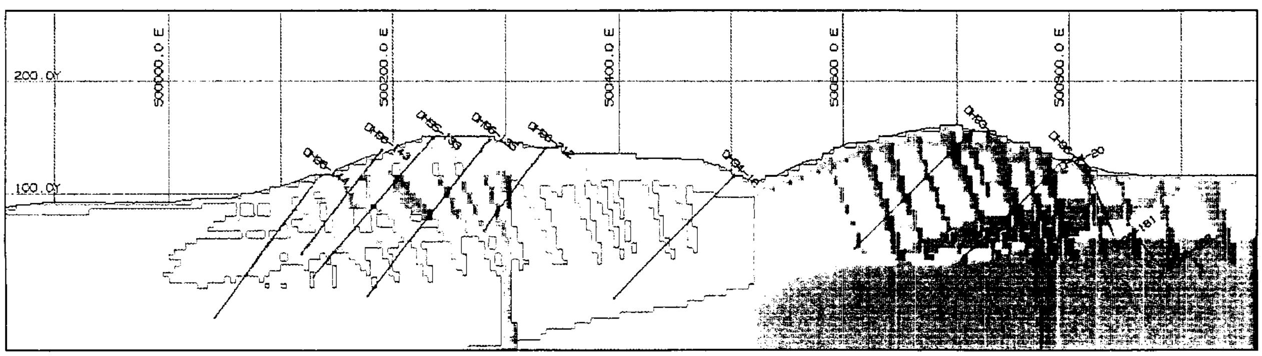
Section 316 000N



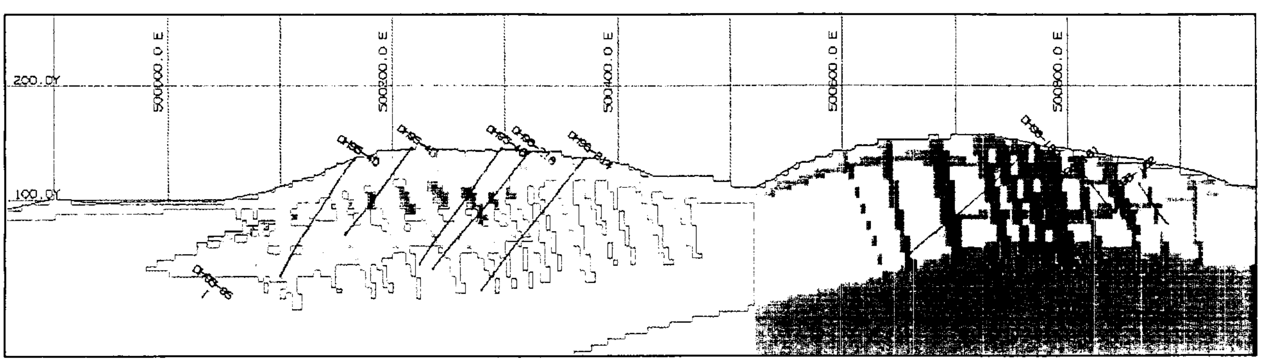
Section 316 050N



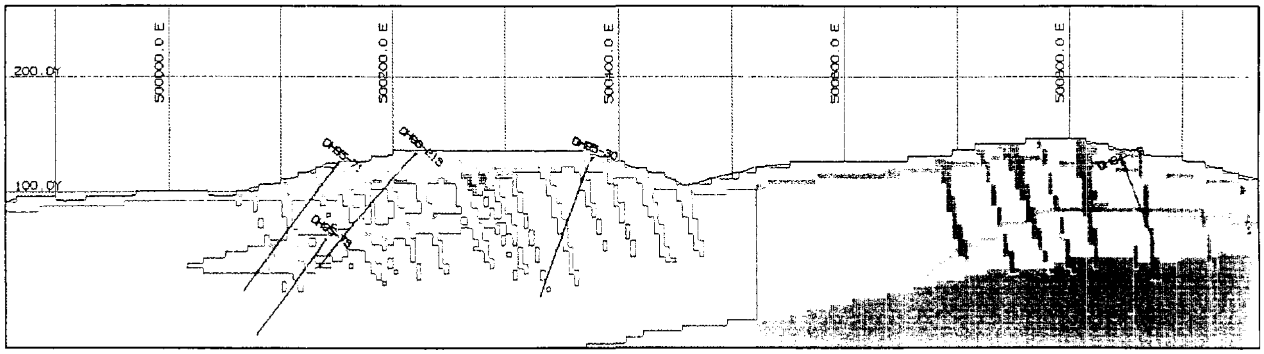
Section 316 100N



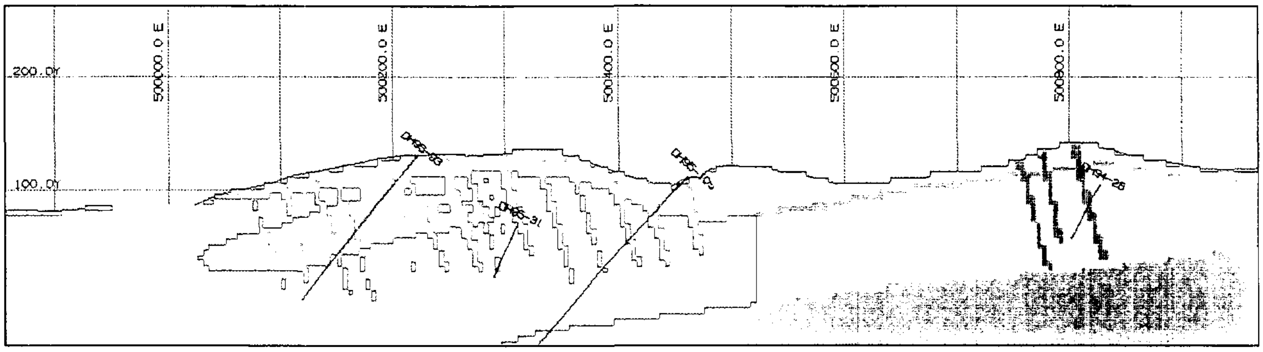
Section 316 150N



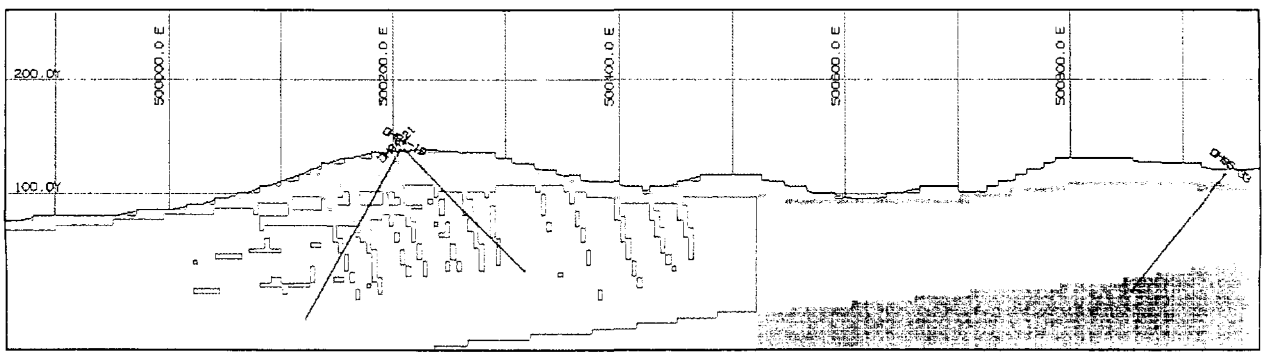
Section 316 200N



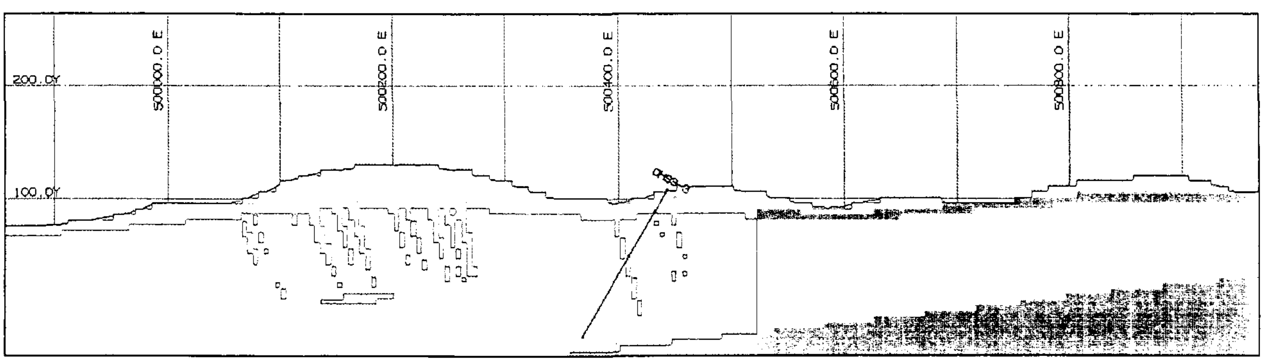
Section 316 250N



Section 316 300N

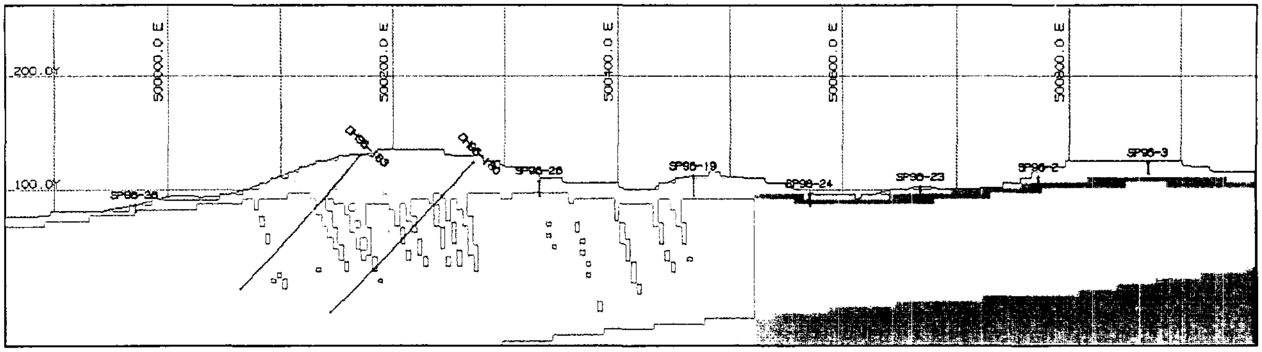


Section 316 350N

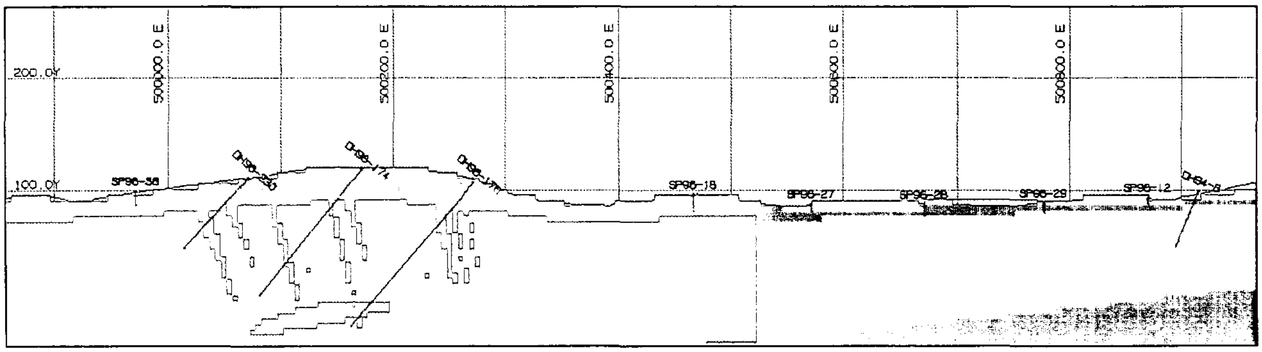


Section 316 400N

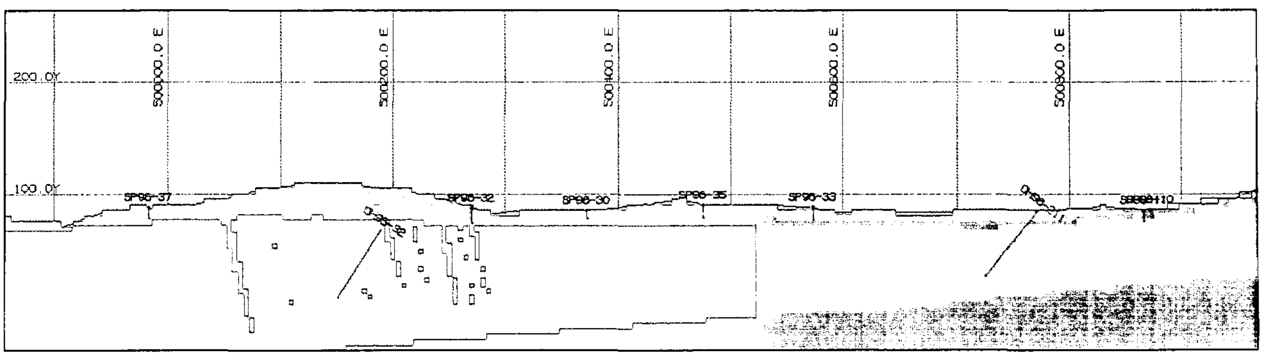
Figure 21 Sections Looking North showing Lithology and Core Drill Holes



Section 316 375N (Showing Auger)



Section 316 475N (Showing Auger)



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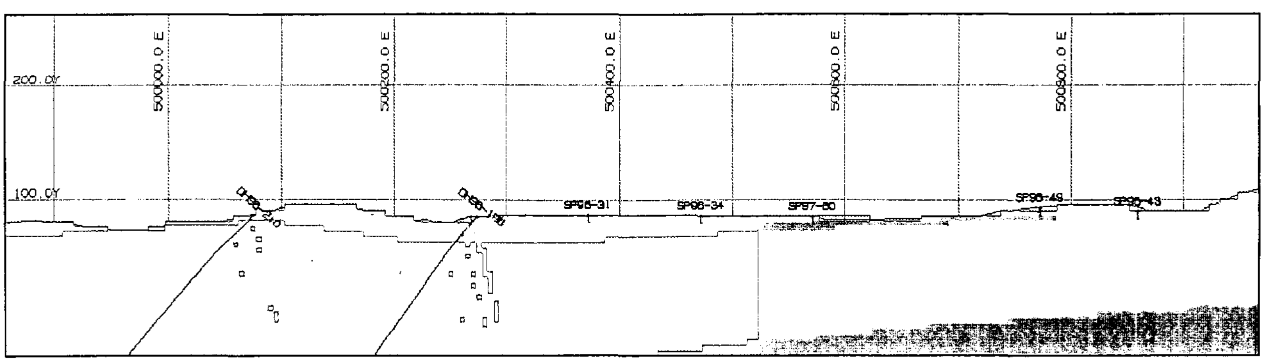


Section 316 675N (Showing Auger)

Figure 22 Sections Looking North showing Lithology and Auger Drill Holes

10. Deposit Types

10.1. Geology of the Fortuna zone

The Fortuna zone is characterized by a trachyandesite – dacite to rhyolite flow dome complexes. Two stages of doming have been recorded as an early Felsic Dome Complex 1 (FDC1) and a later Felsic Dome Complex 2 (FDC2) presented on Figures 17 to 21.

The FDC1 dome flows are green, fine-grained to locally porphyritic and massive to autobrecciated. Monolithic block-lapilli to ash flow pyroclastics are prevalent, and interbedded with the intermediate flows. The matrix is commonly hematitic and occasionally chloritic. This complex is located on the northern and southern flanks of the Fortuna hill.

The younger dome, FDC2, dominates the central and higher relief of Fortuna hill. This unit is felsic, ranging in composition from rhyodacite to rhyolite. The flows are fine-grained white to light gray, commonly flow-banded, massive to brecciated, and locally ignimbritic. Fine K-feldspar and quartz phenocrysts are also evident. These flows are gradually replaced by coarser pyroclastics and breccias in an area covering 500 m (N-S) by 400 m (E-W) near the center of FDC2. The latter has been interpreted as related to explosive activity near northwest-trending fissure vents.

A sequence of intermediate lithic tuffs, pyroclastics (PCT) is stratigraphically above and below the dome complexes, and is commonly interbedded with the dome breccias. The unit varies in thickness from 60 m near the domes to 100 m in peripheral areas. The PCT is distinguished from the dome's pyroclastics by its heterolithic assemblage of sedimentary and volcanic fragments that vary from poorly to well sorted, and range in size from ash to blocks.

Hydrothermal breccias overprint both the Fortuna dome complex and the pyroclastics. They are localized along pre-existing fissure vents that pre-conditioned the emplacement and controlled the extent of the doming. The clasts vary in size from centimeters to over a meter, and appear to be felsic dome protolith. Reaction rims along the edges of clasts demonstrate strong influxes of silica-rich hydrothermal fluids. The breccias matrix is composed of fine-grained secondary quartz and minor K-feldspar.

An unmineralized and weakly altered basement volcanic sequence, recorded as Intermediate Basement Volcanics (BVOL), underlies both dome complexes and pyroclastics. The unit consists of calc-alkaline mafic to intermediate flows and volcaniclastics. It contains abundant hematite and carbonate. The contact between BVOL and the overlying mineralized domain in the Fortuna zone has been interpreted as a fault contact steeply dipping north.

The latest event is a set of diabase dikes and sills intruding all previous lithologies. The mafic intrusions are fine to medium-grained, magnetite-rich and chloritic. The unit is located in the southern area of the Fortuna zone along the aforementioned north-dipping, northeast-trending fault contact between the BVOL and overlying domes and pyroclastics. Its thickness varies from a few meters to 25 m. Narrow dikes less than 3 m wide cut the dome complexes in the northern area along a northwest trend. Calcite veining is dominant.

The weathered profile is characterized by relatively thick saprolite and saprock facies and overburden. The presence of organic fragments and the absence of relict structural features can distinguish the overburden from the saprolite. It is usually less than 5 m thick. The saprolite which varies from 10 to 50 m in thickness can be identified by its softness, the presence of relict textures pseudomorphed to clay assemblages, and fragments of quartz veins. The saprock lies at the transition interface between the saprolite and the unweathered bedrock, and is commonly less than 10 m thick. It is characterized by the presence of cores of hard bedrock surrounded by saprolitized rocks along fractures and joint sets.

10.1.1. Alteration

Early propylitic alteration is evident in the early felsic dome, FDC1, in the basement volcanics, BVOL and the pyroclastic unit, PCT. It is characterized by pervasive chlorite in the matrix or groundmass of the volcanic fragments, together with accessory minerals such as epidote, carbonate, magnetite and hematite.

Hematitization is strongly associated with the pyroclastic units. The ash matrix is converted to a dark red from the oxidation of iron. The hematitization may be from subareal exposure, or from the circulation of oxidized meteoric waters. This hematitization most likely developed during, and following the emplacement of the felsic domes.

The subsequent alteration event is a pervasive quartz-adularia-pyrite overprint. This silicic-potassic alteration seems to be partly derived from magmatic hydrothermal processes coeval, or posterior to the felsic dome emplacement. There is evidence of pervasive and vein-controlled quartz-adularia-pyrite alteration overprinting an intense silicification event, though late stage hydrothermal alterations have masked most of the original textures. There is local intense clay alteration associated with hydrothermal activity and surface weathering. The dominant alteration clay minerals are kaolinite, illite and halloysite. Late retrograde chlorite and clay may post-date hydrothermal alteration.

Clay-rich saprolite units thicken near interpreted structures of the Fortuna zone. Sulfides in the veins are oxidized to goethite and limonite.

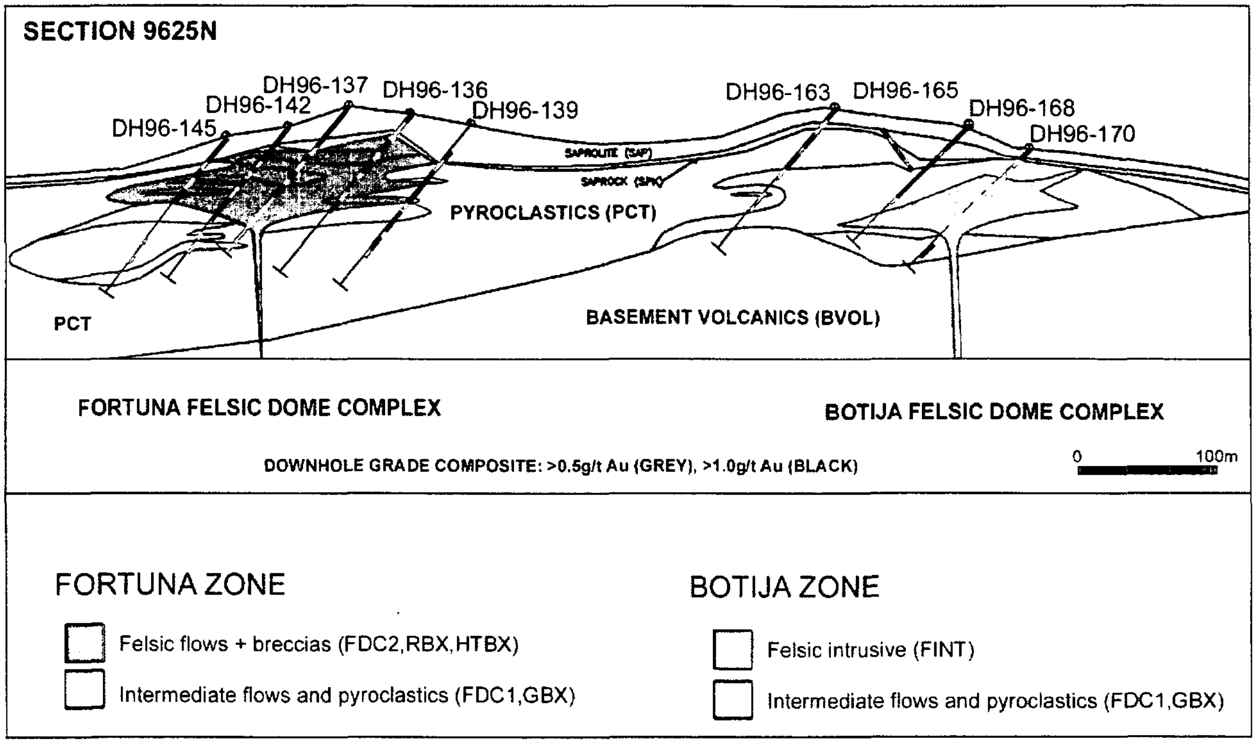


Figure 23 Diagram of the Fortuna and Botija Zones by PDI

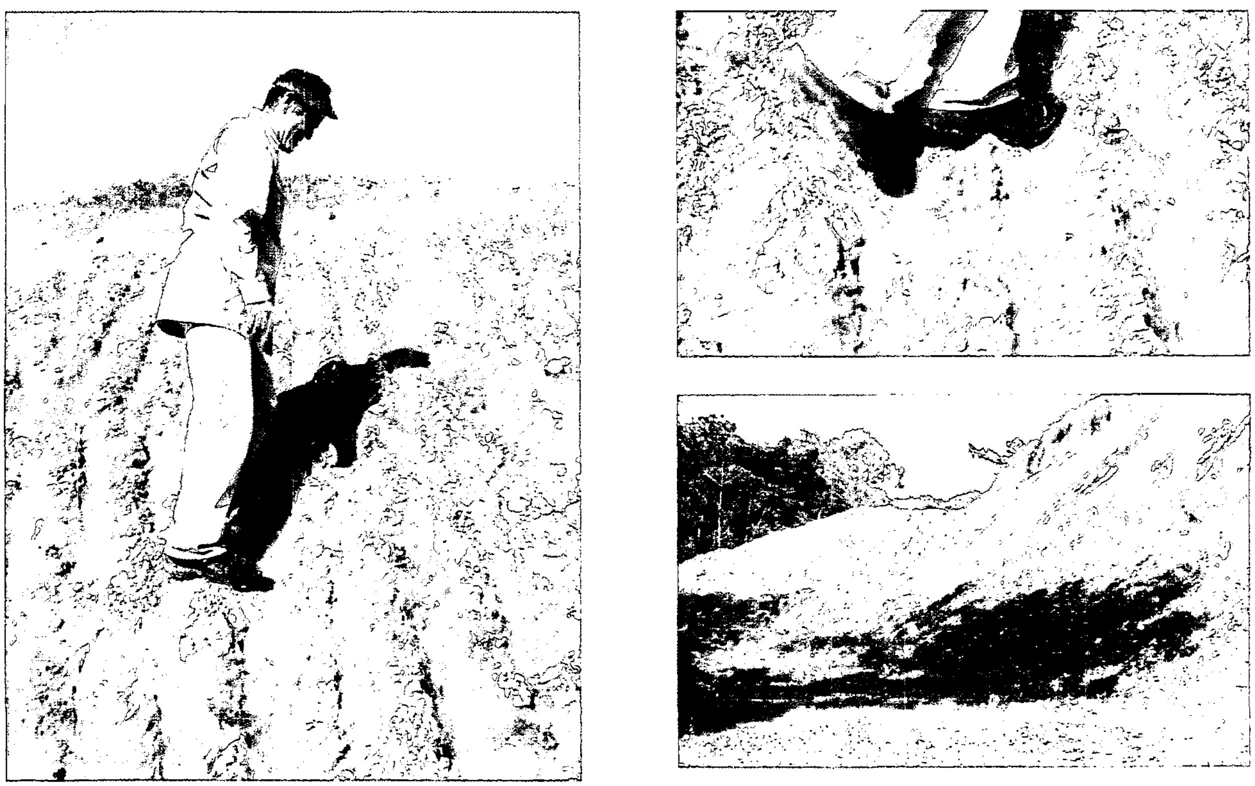


Figure 24 Pictures of Saprolite - i.e., Surface Rock Oxidation

10.2. Geology of the Botija Zone

The Botija zone is approximately 500 m east of the Fortuna zone. The geology is comparable to the Fortuna zone, with hydrothermal alterations inside felsic dome complexes, intermediate volcanic flows, and pyroclastics also presented on previous Figures. No extrusive rhyolite has been observed, but a hypabyssal felsic intrusive is present with similar composition to the rhyolite of the Fortuna zone. The intrusive is lacolithic in shape and emplaced along a northeast-trending structure. The intrusive is felsic, light green, and porphyritic with feldspar phenocrysts. There are radiating feeder dikes and sills in a 150 to 200 m long radius. The intrusive has overprinted and altered the surrounding PCT. The contact between the intrusive and the host is gradational with xenolithic margins. The intrusive and intermediate flows appear to originate from one primary vent or fissure, unlike the series of vents observed in the Fortuna zone. The PCT appears similar to Fortuna's except for the presence of more pumice fragments that are locally more ignimbritic.

Around Botija, the BVOL is significantly higher than at Fortuna, and the latter may have down-dropped along a normal fault, exposing the upper Botija zone to subsequent erosion.

10.2.1. Alteration

The Botija alteration paragenesis is similar to Fortuna except for less intensive silicification overprinting due to the absence of multiple hydrothermal events. The intrusive is strongly altered by potassic-silicic fluids with intense pervasive and locally vein controlled quartz-adularia-pyrite assemblages extending into the surrounding volcanic and pyroclastic units. As a result, the intrusive-host rock contacts are often difficult to distinguish though there appears to be a stronger silicic component closer to the intrusive.

Oxidation is strong and permeates the pyroclastics overlying the felsic dome complex. The saprolite profile is also well developed and thicker near the northeast-trending structure down to about 60 m.

10.3. Geology of the Fuentes Zone

The Fuentes zone is west of, and down slope of the Fortuna zone. The rocks are predominantly trachyandesite to dacite flows that overlie unmineralized basement volcanics. The flows are green, fine-grained and massive to autobrecciated. They are often inter-bedded with lapilli tuffs and breccias. Individual flows are often recognizable since vesiculated flow tops and flow breccia bottoms are preserved. The thickness of the Fuentes zone is between 60 and 100 m. The intermediate flows have lower silica content and are comparable to the early dome rocks at Fortuna. Flows lower in the sequence are more andesitic and basaltic. The PCT units dominate the northern area and are locally inter-bedded with the flows. The contact between the BVOL and the overlying dacite flows and pyroclastics is generally transitional but fault-related at the western edge.

10.3.1. Alteration

The alteration assemblage is mainly propylitic and includes chlorite, epidote, carbonate, pyrite, magnetite, and hematite. There is some local silicification and potassic alteration of the wallrock, with some intense stockwork quartz-pyrite-adularia veining. The oxide saprolite profile is less developed and more shallow than over Fortuna and Botija. Only minor amounts of goethite and limonite replace the sulphides.

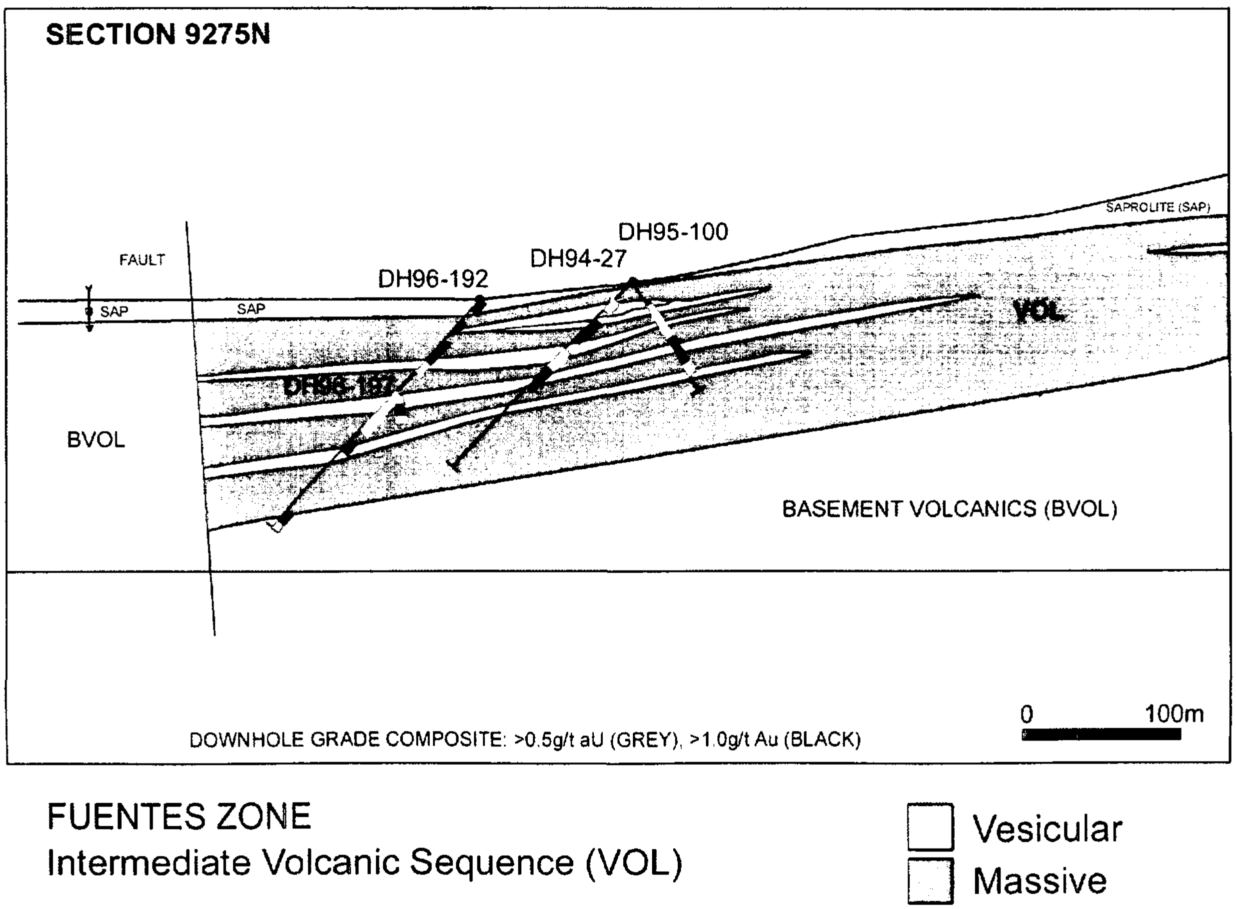


Figure 25 Bloc Diagram of the Fuentes Zone

11. Mineralization

11.1. Fortuna

11.1.1. Mineralization

Multiple stages of mineralization are observed in the Fortuna zone. The early stage produced disseminated values of gold in the 0.2 g Au/t to 0.6 g Au/t range during the build-up of the dome complexes and pervasive quartz-adularia-pyrite alteration event.

Higher-grade gold is associated with vein-controlled quartz-pyrite-adularia during and following the development of the hydrothermal breccias. From their observed crosscutting relationships, there appears to be more than two stages of veining: pyrite-rich veins with minor quartz appear to crosscut quartz, and quartz-pyrite-adularia veins. These veins are commonly oxidized to goethite and limonite. The usual oxidation texture is goethite at the center of the veins, surrounded by limonite at the selvages. Some veins contain angular fragments of wallrock. Mineralized veins are commonly observed at lithology contacts.

Visible gold has been observed in centimeter-wide veins that contain quartz, goethite, limonite, and traces of pyrite and silica matrix of hydrothermal breccias. The best pathfinder for predicting high-grade mineralization is the abundance of iron oxides in quartz veinlets.

The grade generally appears higher in saprolite overlying mineralized zones, even though there are instances were the saprolite can contain unusually low grade.

11.1.2. Structure

The dominant structural direction of the Fortuna zone is northwest southeast. This is expressed by the observed emplacement of the felsic doming, the orientation of the hydrothermal vents, the quartz-oxide veins in the oriented core, and the high-grade gold and silver distribution. It appears that intersections of the north-northwest and the conjugate northeast-trending fracture set were important conduits for the doming and hydrothermal vents. Three or more closely spaced northwest-trending minor faults are also evident in the Fortuna zone. These late, secondary structures are possibly "growth" faults. Some late epithermal gold-bearing quartz veins and diabase dikes follow these northwest-trending faults. Displacements of 20 to 40 m are suggested based on observed stratigraphic asymmetry. A closer analysis of 2484 core-oriented measurement readings performed on Fortuna (by PDI) reveals that about 70% of all readings indicate structures dipping steeper than 50 degrees, and that 67% of the overall structures are oriented between 315 and 045 degree azimuth. Within the 315-045 azimuth range it is found that 87% of the structures are steeper than 60 degree dip, that 73% are steeper than 70 degree dip and that 47% are steeper than 80 degree dip.

There are two major faults interpreted in the area. The northwest-trending drainage, Quebrada Avispas in southwestern Fortuna, may reflect an extensional block fault that separates the Fortuna zone from the Fuentes zone. Furthermore, separation of the basement volcanics with the overlying mineralized domains is interpreted to be a northeast-trending, steeply north-dipping fault contact possibly extending to the Botija zone.

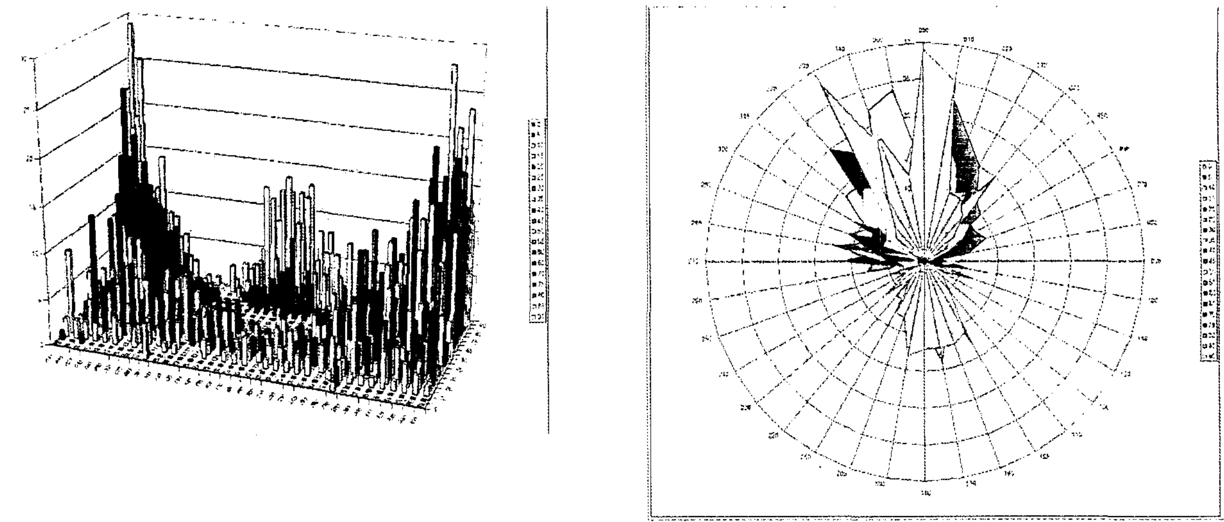


Figure 26 Oriented Core Study by PDI at Fortuna

Figure 27 Structures in Fortuna oriented N-S (Azimuth 340°)

11.2. Botija

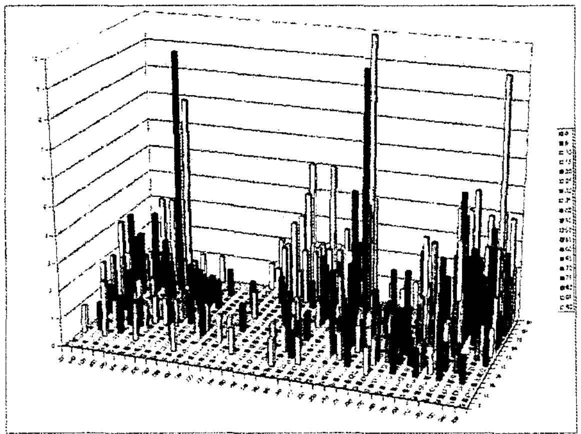
11.2.1. Mineralization

Mineralization is more disseminated at Botija than at Fortuna and is spatially associated with the felsic intrusive. The best pathfinders for high-grade gold and silver are pervasive oxidation with quartz flooding and microveining in the PCT overlying the intrusive. Visible gold has been observed in the quartz microveinlets associated with intense oxide replacement in the PCT. Less vein-controlled mineralization is observed at Botija.

11.2.2. Structure

The dominant structural direction in the Botija zone is northeast based on the emplacement of the felsic intrusive and distribution of gold and silver grades. However conjugate northwest and northeast fracture sets control the localization of quart-oxide veins.

Quebrada Tamaga, a drainage running between the Fortuna and Botija zones, has been interpreted as the expression of a major northwest-trending normal fault which may have down-dropped the Fortuna zone relative to Botija.



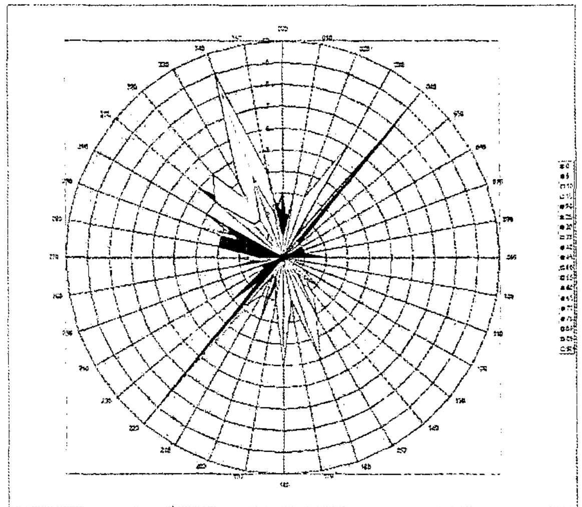


Figure 28 Oriented Core Study by PDI at Botija

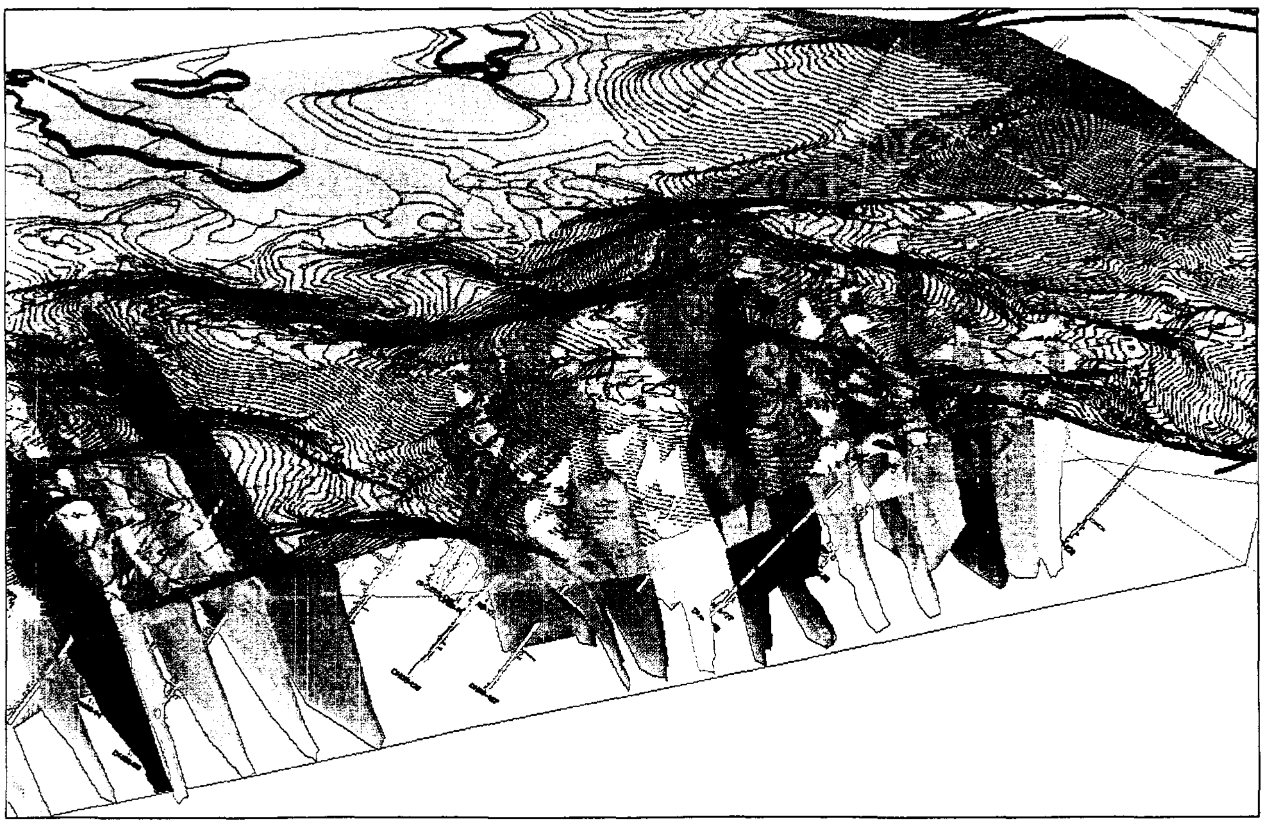


Figure 29 Structures in Botija oriented NE-SW (Azimuth 40°)

11.3. Fuentes

11.3.1. Mineralization

The Fuentes zone altered rocks are strongly pyritic. The pyrite is disseminated or fractured, and vein-controlled, in concentrations between 1 and 10%. The highest gold and silver grades are associated with stockwork quartz-pyrite veining in the more massive volcanic flows and at lithologic contacts.

11.3.2. Structure

Structural control is less apparent at Fuentes than over the other zones. Lithological more than structural features control the distribution of gold and silver mineralization. East-west trending hydrothermal vents have been postulated, as the conduits of the mineralizing fluids though the main controls for mineralization are still not well understood.

A northeast-trending normal fault bounds the western edge of the Fuentes zone where it has been down-dropped relative to its western counterpart. Unmineralized basement volcanics outcrop west of the structure.

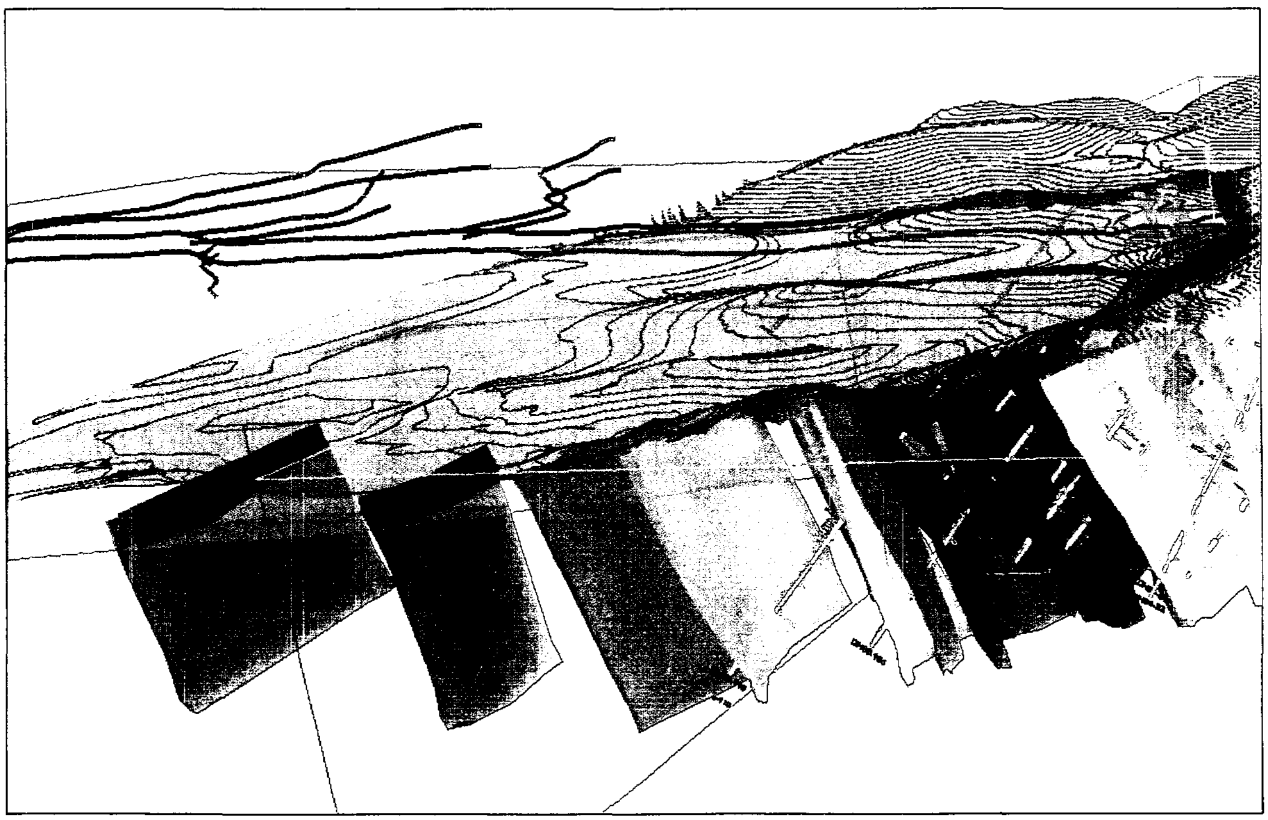


Figure 30 Structures in Fuentes are similar to Fortuna

Breccia texture (up) in oriented structures (right)

Silicified Breccia and Vein structures at Botija below

Figure 31 Pictures of Saprolite and Quartz Gold Bearing Veins (Strutctures)

12. Exploration

12.1. Prospecting and discovery by PDI

The Crucitas project was initially explored in 1992 by Tim Coates and Associates (TC & A), a small geological consulting firm that carried out initial prospecting work in the district and made the discovery after taking stream sediment, rock chips and soil samples in the Crucitas area. Silicified and pyritized boulders were first discovered in several streambeds. The boulders were sampled along with the stream sediments. Although none of the rock chip samples returned encouraging gold assay results, a stream sediment collected from the creek now known as Discovery Creek assayed > 10 parts per million (ppm) gold. Follow-up stream sediment sampling and prospecting outlined a large gold anomaly, with many of the drainages over an area > 5 km^2 yielding anomalous values. Chip samples from silicified tuffs and hydrothermal breccias in the creek beds returned assay values ranging from 0.2 to 10 ppm gold.

A total of sixty, stream sediment, rock chip, and soil samples were collected in the Crucitas area. The technique used consisted in collecting 5 kg of silt in the active bed of the creek by using a minus 10 mesh sieve. Panning was also carried out to determine the presence of visible gold. The rock samples were collected by chip sampling mineralized boulders, while soil sampling consisted of collecting 5 kg of C horizon material with a hoe pick.

12.2. Soil Survey

In late 1992, TC & A optioned the property to PDI that established a local subsidiary company, Placer Dome Costa Rica (PDCR) and undertook systematic exploration work on the property and neighbouring concessions. A soil survey grid was established over the gold anomalies' areas. It covered an area of 3 km^2, from which over 2,500 soil samples were collected. Twenty-five grid lines were cut with the use of a compass and hip chain. They totaled 68.5 km, spaced every 100 m, and on average were 1.5 km long in an east-west direction. Soil samples were taken at 50 m intervals along the grid lines by using a hand auger. Two samples were collected at each site: an upper profile sample from 0.7 to 1.0 m in depth, and a lower profile sample from 1.7 to 2.0 m in depth below the surface. Each sample consisted of approximately 500 grams (g) of material. A brief description was made for each of the samples, which included color, oxide mineralogy, and quartz vein content.

The results of the soil survey outlined an extensive area of anomalous gold greater than 500 ppb. There was no significant difference between the gold results in the upper and lower profile samples. The gold anomalies outlined by the soil survey were further tested by diamond drilling.

12.3. Petrography

Three independent petrographers conducted separate studies on a total of 70 samples collected from predominantly core samples of the Fortuna and Botija deposits. The samples came from volcanic flows, fragmental pyroclastics, and hydrothermal breccias.

Glass shards and devitrification textures were commonly observed in the PCT samples, indicating a volcanic ash matrix. Primary sanidine-orthoclase and secondary adularia were the most common types of K-feldspar observed in the volcanic flows. The petrography of the intensely altered samples points to a complex relationship between the quartz-adularia-pyrite alteration and the intense silicification events.

Three samples exhibiting visible gold in sulphide-rich veins were also examined. The petrography indicated that native gold occurs in two principal modes:

- The common mode is Au angular to irregular grains, 20 to 500 microns in size, interstitial to the quartz grains, and unassociated with the sulphides;
- The other occurrence is Au associated, with pyrite grains at the edge of quartz veins in contact with the wallrock.

A mineralogical study conducted by Stephen Kessler at the University of Michigan was performed on eight gold bearing vein samples of the Fortuna deposit using microscopy and SEM microbeam examinations. The study confirmed that the gold occurs as Ag-bearing native gold, either as free grains up to 1 mm in size, or as inclusions in pyrite and goethite. All the gold is closely associated with veining either in or at the edge of veins. It was impossible to determine whether gold was present as inclusions or solid solution in the disseminated pyrite present in the altered wallrock.

The ore mineralogy includes native gold, pyrite, goethite, argentite, Ag-bearing tetrahedrite, chalcopyrite, and covellite. The shape of the native gold varies as a function of the mineral assemblage: Gold occurs as inclusions in goethite or pyrite and is usually rounded, while angular shapes are more common in quartz-adularia veins. There is no significant difference in the fineness between the goethite or pyrite inclusions, or the native grains in veins. This suggests that gold has not relocated during oxidation.

Pyrite is widespread and occurs in grain sizes that vary from a few microns to 2 cm. At least two generations of pyrite are present:

- A first generation consists of relatively coarse-grained euhedral crystals disseminated throughout the rock. No gold inclusions were detected in any of those pyrite grains.
- The second generation of pyrite is found in veins and is associated with free gold and local argentite.

Goethite occurs in the weathered samples, replacing Fe-bearing sulphides of mainly pyrite and chalcopyrite. It is found both in veins and in wallrock, and in some case, as much as 10 cm away from the veins. Chalcopyrite occurs in minor amounts and is associated with Ag-bearing tetrahedrite in the pyrite-rich veins. There is no evidence that the goethite is hypogene.

The mineralogy of the ore-related hydrothermal alteration in these samples is mainly adularia and secondary quartz. The adularia occurs as vein mineral and also as replacement mineral in the wallrock. The secondary quartz is also common as vein and wallrock mineral. Sericite and kaolinite are found locally, but do not appear to be major components of the alteration assemblage. Instead, these minerals are more likely associated with late-stage retrograde metamorphism. The mineralogy has confirmed that the host rocks are quartz poor and K-feldspar rich. The volcanics were described as trachytes.

13. Drilling

A total of 251 exploration or in-fill diamond drill holes have been completed to date. As well, an additional 27 geotechnical, or water well holes, and 90 Trado (mechanical auger) holes are shown on Table 4. Most of the holes drilled are located within the Fortuna, Botija, and Fuentes zones. The depth of the holes ranges from 1.0 to 236.2 m.

Table 4 List of Drill Holes by Sector

Zone	Number of holes	Drill spacing	Zone dimension	Meterage
Fortuna	137	50 m x 25 m	1.3 km x 0.5 km	20 359
Botija	61	50 m x 25 m	0.5 km x 0.5 km	7 662
Fuentes	26	100 m x 50 m	0.5 km x 0.5 km	3 170
Exploration	27	-	-	3188
Geotechnical	27	-	-	831
Trado (auger)	90	100 m x 100 m	2.5 km x 2.0 km	894
Total	368	-	-	36,104

Three drill contractors were involved with the drilling at Crucitas. A local drilling contractor, Cimco S.A., drilled the initial holes using a Longyear 38. The holes drilled were HQ and NQ size. A second drilling contractor, Geotech Boyles Bros. S.A. (Boytec), drilled from hole DH94-15 onward with a similar machine. Two drill rigs completed the first drilling campaign with hole DH94-24 in May 1994. A second drilling program was contracted to Geotech Boyles in late 1994 to define the two best targets, now known as Fortuna and Botija. J.T. Thomas Ltd was also contracted from hole DH95-52 onward using Longyear 38 machines and HQ size holes. The initial 100 m x 100 m drilling pattern was later in-filled using a 25 m x 50 m pattern to test the continuity of the high grade gold mineralization. In 1999, four condemnations and eleven geotechnical holes, HQ size, were drilled by IMNSA using one Longyear 34 and one Longyear 38.

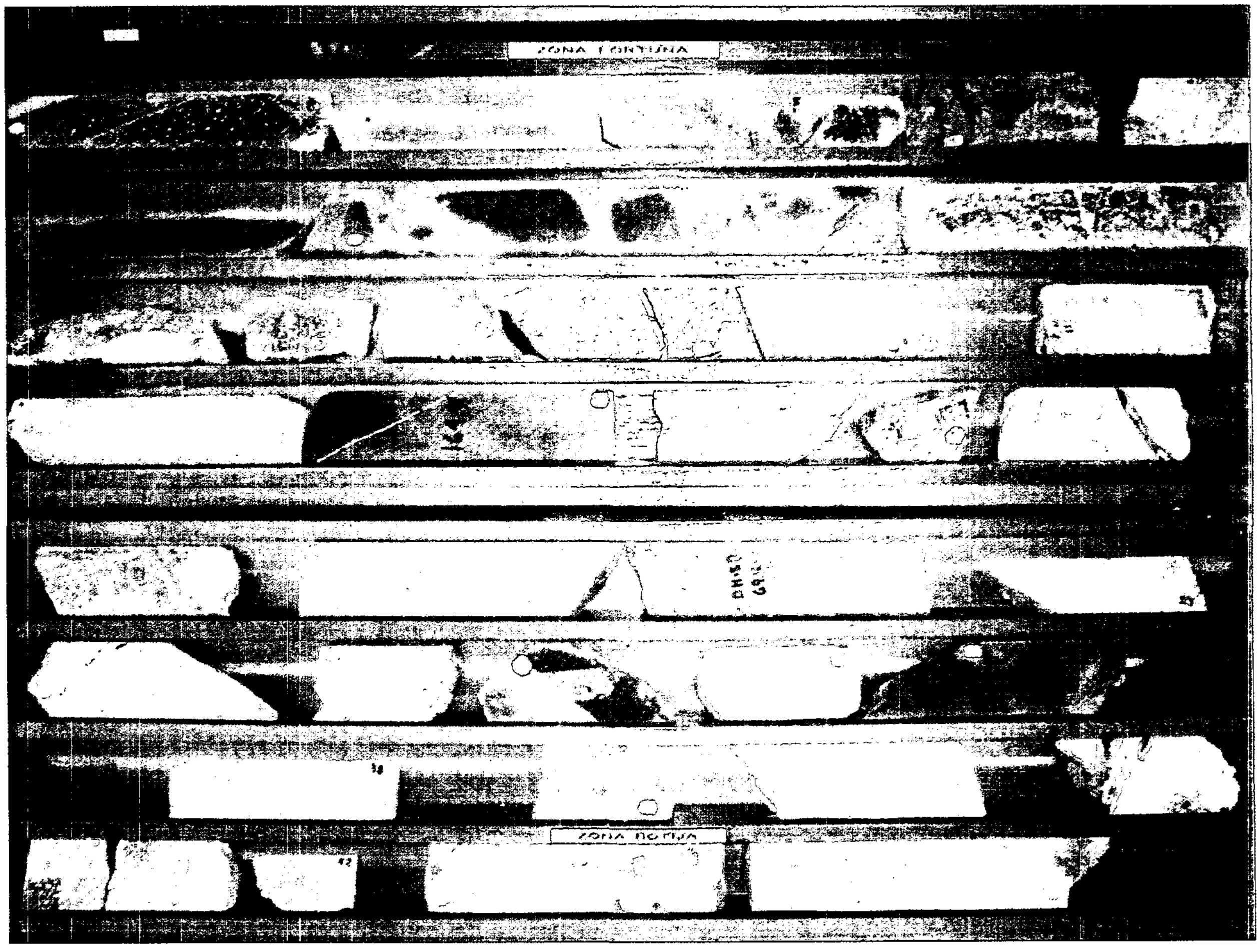
Technical problems encountered with drilling were mostly associated with poor saprolite recovery. Slow and careful drilling, with low water pressure and the use of special bits, usually obtained the best results.

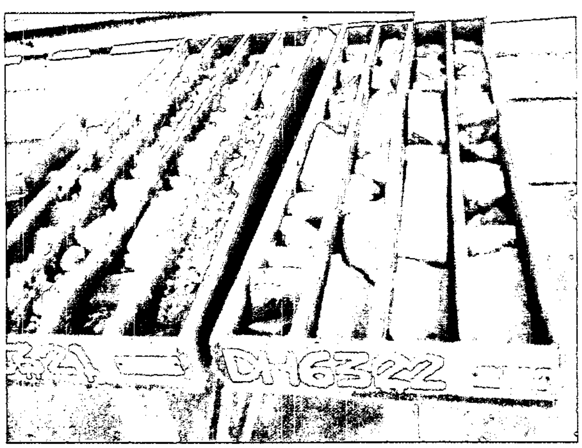
Core orientation measurement procedures were implemented starting with hole DH94-27. The device used consisted of a long narrow rod with a red crayon attached at the end which was lowered slowly through the drill bit to mark the lower edge of the core. By using additional orientation equipment, the structures were rotated in their proper position and tabulated in the drill hole logs. The majority of the drill holes were directed to the west at an inclination that ranged between 45 to 60o from the horizontal. This was determined to be the most appropriate direction of drilling based on the structural study of the oriented core.

A saprolite auger program was established in the area north of the Botija zone, in the Coyote zone area and northwest of the Fortuna zone. A total of 90 Trado Holes were completed on a 100 m grid to test extensive (> 1.0 g Au/t) geochemical anomaly and high resistivity values. The depth of the auger holes ranged from 5 to 20 m, depending on the ground conditions and defined anomalous zones, down to an average depth of 10 m. A quality control program was implemented to handle the auger samples. A sample was consistently collected every meter. To avoid any bias, the entire sample was collected and then dried. The sample was put through a cone crusher and then split repeatedly to approximately 300 g. Every 5th sample was a hidden standard or blank, and every 10th sample was a duplicate.

A total of twenty five geotechnical holes were drilled. These holes were located in the area of potential mine tailings and waste dump areas. The depth of the HQ size drill holes ranged from 15.3 to 50.0 m. Bedrock was not encountered in any of these holes. The saprolite and saprock horizons were sampled to determine any gold potential. Only one geotechnical hole returned anomalous gold values. This hole, GT96-6, is located near the northwest Fortuna trend at the northeastern edge of the proposed tailings site, and is shown in Figure 3.1. Additional ground exploration work is warranted in this area.

Bruce Geotechnical Consultants Inc. installed 50 mm diameter PVC standpipe piezometer tubes down the holes, and completed the study on the hydraulic conductivity of the saprolite and saprock.





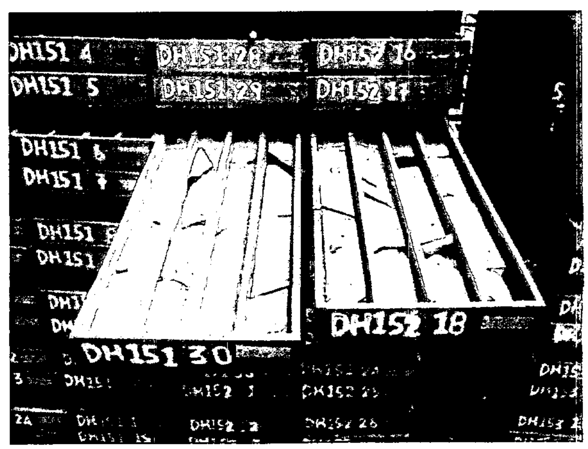


Figure 32 Pictures of Drill Core

14. Sampling Method and Approach

14.1. Drilling Description

Drilling was core drilling for the most part using a variety of Longyear 34 and 38 pieces of equipment. As shown on the Figure below, drilling was conducted on a 25 x 50 m regular grid in the center of Fortuna and Botija and on a less regular spacing in the direction of extensions of the deposits. Early on, drilling was oriented west to intersect the gold bearing structures with a better angle. This worked better for Fortuna. Drill orientation was not optimized for Botija. Core recovery was measured and core samples were taken by sawing in 2 the core using a diamond saw.

Trado or Auger holes were dug by hand in shallow holes up to 20 m depth or more using extension rods. They stopped when rock resistance was encountered or before after hitting the water table.

The description of drilling is more detailed in the previous section.

14.2. Channelling and Trenching

No channel samples were taken. There is no outcrop on the property. Some trenches were dug far north of the Fortuna Zone.

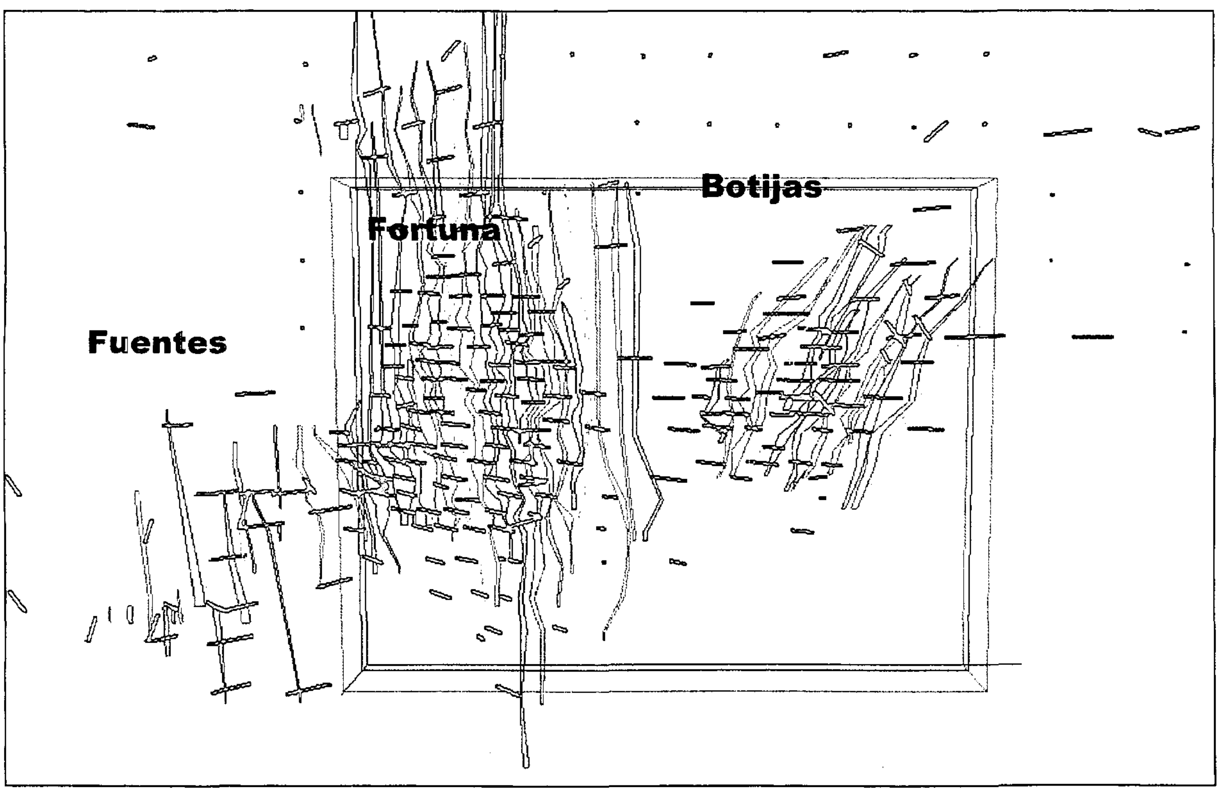


Figure 33 Plan view showing drill holes from elevation 50 to 100 m asl.

14.3. Measure of Specific Gravity

The equipment used on-site to measure the specific gravity of saprolite consisted of an electronic balance accurate to 0.01 g, a large bucket of water, thin plastic to wrap clay-rich samples water-tight, and a thin nylon line which held the sample immersed in water.

The saprolite samples were measured immediately after being collected from the field to determine in-situ wet specific gravity. The samples had to be intact and longer than 10 cm. To determine dry specific gravity, the saprolite samples were placed in an electric oven for more than 24 hours at 90° C. Fresh rock samples were typically dried in less than 3 hours.

Additional data were collected, including sample location, length, rock type, and a brief description of the clay content and of any significant mineralization.

14.3.1. Saprolite SG Measurements

The specific gravity of saprolite was determined with the sample wrapped in thin plastic, weighted in air (W_{air}), and then carefully immersed in water and weighted again (W_w). The specific gravity would then be calculated using the following equation:

$$SG_{sap} = \frac{Mass}{Vol.} = \frac{W_{air}}{(W_{air} - W_w)}$$

The buoyancy method uses the weights of the in-situ wet material in air and in water, and the dry weight of the same material in air. The specific gravity is then calculated using the following equation:

$$SG_{sap-bm} = \frac{W_{air-dry}}{(W_{air-wet} - W_{w-wet})}$$

The specific gravity (SG) data includes measurements of 607 saprolite samples, and 179 saprock samples by the buoyancy method. Saprolite and saprock samples were collected every 3 to 5 m for each hole between holes DH95-96 to DH96-237.

The lower and upper limits of the SG data for saprolite are 1.15 and 1.85; the mean is 1.35 and the median is 1.31. The lower and upper limits for saprock are 1.40 and 2.19, whereas its mean is 1.65 and its median 1.63. The results are presented in Table 5. Mean buoyancy specific gravity values were used for the modeling.

Table 5 Saprolite and Saprock Specific Gravity Statistics

Type	Saprolite			Saprock		
S.G type	Buoyancy	Dry	In-situ	Buoyancy	Dry	In-situ
Number	607	414	616	179	118	179
Mean	**1.35**	**1.48**	**1.77**	**1.65**	**1.70**	**1.96**
Median	1.31	1.45	1.76	1.63	1.70	1.95
Min.	1.15	1.10	1.25	1.40	1.24	1.66
Max.	1.85	2.01	2.15	2.19	2.15	2.72
Std dev.	0.15	0.17	0.11	0.18	0.17	0.14

14.3.2. Rock SG Measurements

The moisture content in bedrock is low, and only dry specific gravity measurements were required for the different rock types. Rock samples were selected by a geologist at approximately every 5 m for all holes to DH96-237. Half-split and cut core segments were measured preceding hole DH95-86. Rock classification is based on those corresponding domains in the geology model. Table 6 presents the same statistics as previously for the saprolite and saprock samples. Some outlier data were trimmed from the database, and the more robust median statistic was used for the modelling purposes. The average used in resource calculation is 2.37.

Table 6 Rock Specific Gravity Statistics

Type	PCT	FDC1	FDC2	RBX	FINT	VOL	BVOL	DIAB
Number	1355	522	361	227	14	134	102	12
Mean	2.34	2.38	2.38	2.35	2.44	2.41	2.24	2.62
Median	**2.37**	**2.41**	**2.41**	**2.38**	**2.48**	**2.42**	**2.24**	**2.65**
Min.	1.52	1.71	1.60	1.83	2.14	1.92	1.88	2.30
Max.	2.94	2.76	2.76	2.76	2.57	2.81	2.63	2.81
Std dev.	0.16	0.16	0.16	0.17	0.11	0.19	0.16	0.15
Trimmed	52	13	10	5	0	1	1	0

14.4. Compositing

Compositing is the method by which the original samples are divided, split and grouped to obtain regular size samples to avoid sampling biases. The choice of the compositing method is a function of the nature of the geology and/or to adapt it to the mining method used.

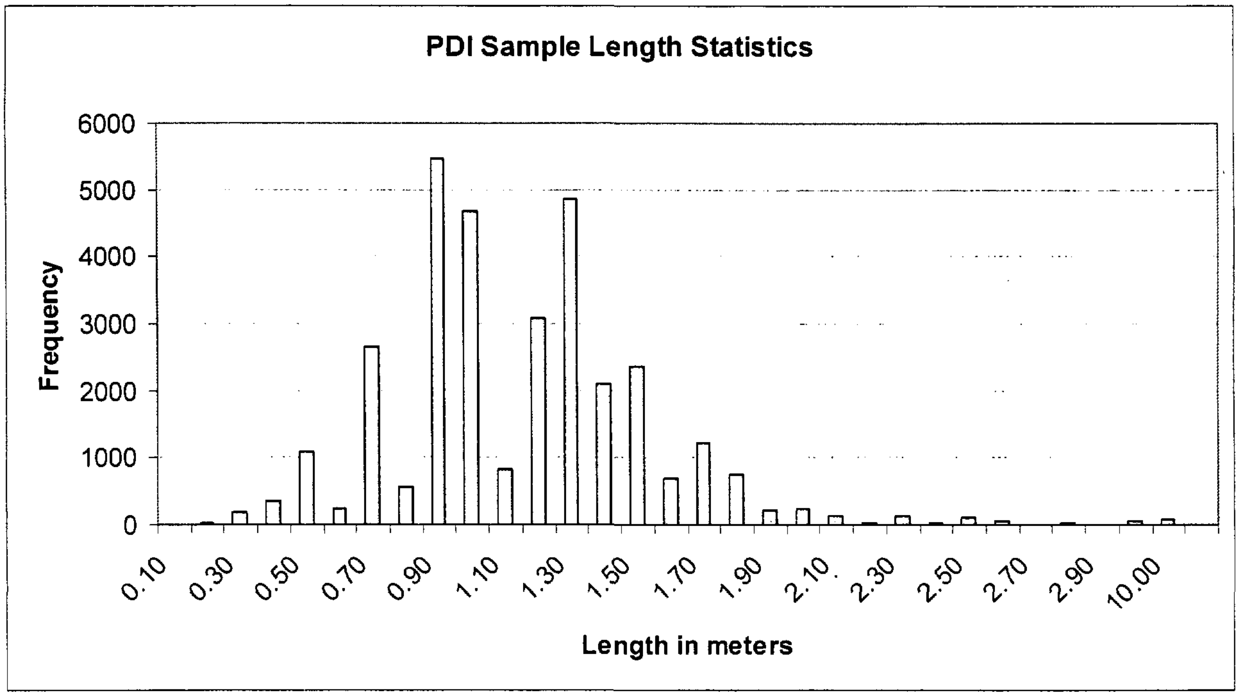


Figure 34 PDI Sample Length Statistics

14.4.1. 1m Composites down the Hole

Geostat has chosen to make 1m down the drill hole axis composites. The majority of samples were originally about 1m in length. Placer Dome used very detailed sampling of irregular length the first two years of the project to study the geology and to learn what mechanism controlled the gold mineralization. See Figure 34 above.

While smaller samples or composites tend to display a greater sampling variance and accentuate the effect of coarse grains of gold (nugget effect) present in occasional samples, since the ore deposit is broken down into a multitude of smaller structures in this case, uing smaller composite presents several advantages and some disadvantages as follow:

1. The data composited has similar characteristic to the original geological data – geology is more likely to be taken into consideration as in the structure outlines themselves;

2. The number of resulting composites is larger than with longer composites – making more point available to compute the local grade but sampling variations increases – computing time is not increased because computing is limited to one structure at a time;

3. Average grade do not differ on the whole depending on the selection criteria. Detailed grade variation modelling may be unreliable and mining selectivity may be hard to achieve. The opposite is also true. Too much smoothing may dilute grade in excess.

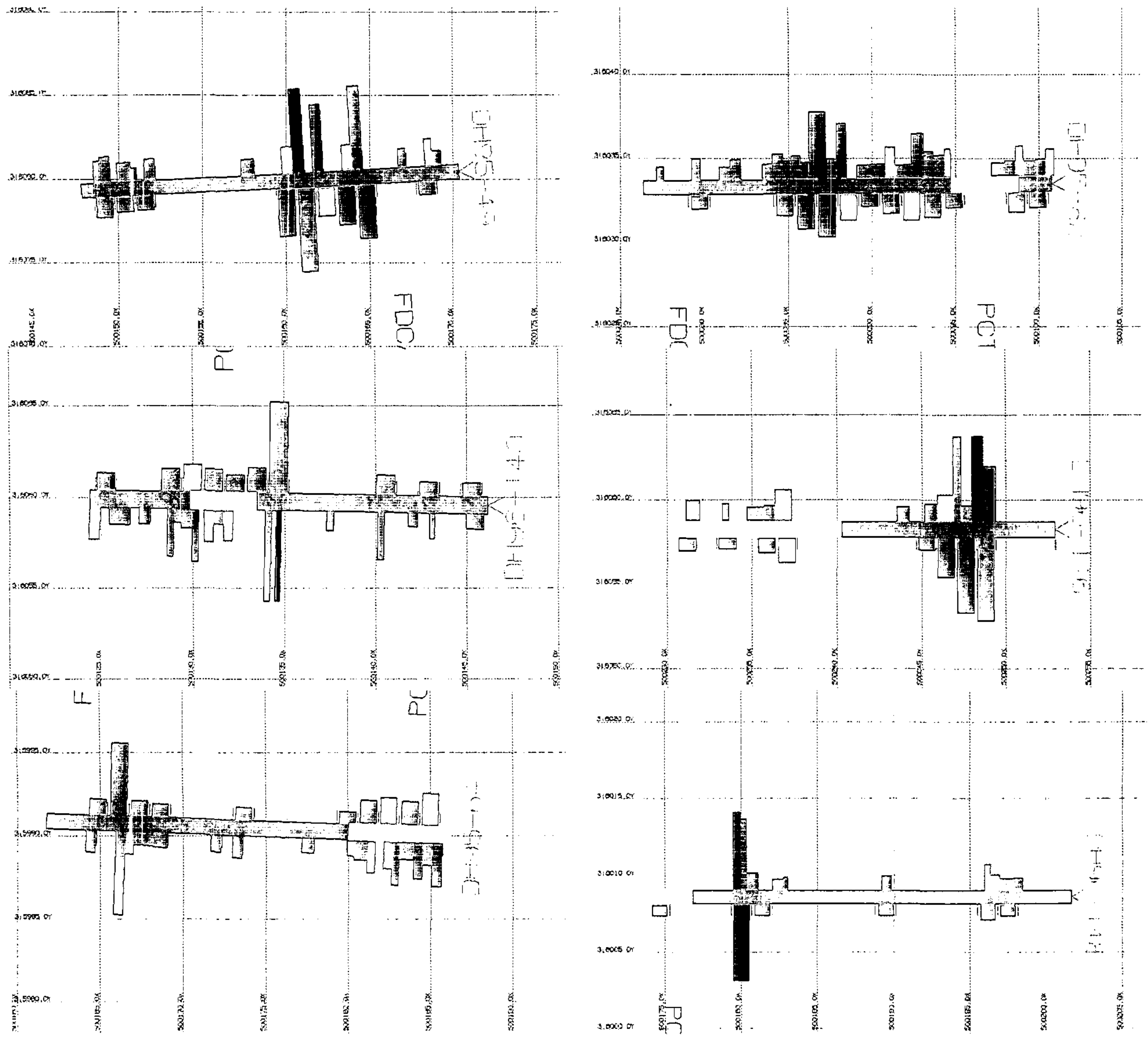


Figure 35 Examples of the effect of 2m compositing on original assays (with litho).

The following tables show the average grade of gold, the number of 1m composites and rock codes for the structures and the lithology.

Table 7 Fortuna 1m Composites Statistics

Fortuna 1m Composites in Steep Dipping Structures (Azimuth 340°)

Nb	Structure Code																										
	F01	F02	F04	F06	F08	F09	F10	F105	F11	F12	F14	F16	F17	F18	F20	F22	F23	F24	F26	F27	F28	F30	F31	F33	F34	F36	Total
LITHO	201	202	204	206	208	209	210	2105	211	212	214	216	217	218	220	222	223	224	226	227	228	230	231	233	234	236	
ABT										14	8	3		4			2										31
AND												1					4		6								11
ASH							1		1	1		27			1	7	3	1		5		6		2			55
BAS												1															1
CON		3																					1	1			5
DAC	11	19	6	16	22	11	9	5	28	59	28	47		33	32	43	90	49	56			17		6			587
DIAB										1					5	1	8		4					4			23
FBX		10	9		17	24	100	45	85	126	73	34		82	110	149	146	80	110	53	16	4	9	7			1289
GOU					16		3		6	8	6			3	1	6	2	6	2					2			61
LAP		56	7	2	35	42	13	30	34	30	95	88	5	115	119	99	57	17	73	141	46	37	14	3			1158
LAT		2	12	2	128	38	11	6	39	33	140	65		134	139	107	155	33	119	114	51	120	38	17	27	8	1538
LBT			5		54	30	39	21	21	69	25	23		84	51	99	79	75	110	19	17	2		18	7		848
NR										5					1			1					1				8
OVB					9		3		1	9	18	12		10	23	19	10	10	7	9	12	12	1			9	174
QVN					2	1	1		2	2	3	6		3	6	5	3	1	1	1		3				2	42
RHY					9					18	27	17		41	16	33	9	9	29	8				2			218
SAP	2	11	30	36	52	19	59	34	37	37	83	56	12	96	128	194	75	105	147	122	44	18	27	17		36	1477
SPK							18			15				12	3			10			8						66
VBX																			4								4
Total	13	101	69	56	344	165	257	141	254	427	506	380	17	617	635	762	643	397	668	472	194	219	91	79	34	55	7596

Auc	Structure Code																										
	F01	F02	F04	F06	F08	F09	F10	F105	F11	F12	F14	F16	F17	F18	F20	F22	F23	F24	F26	F27	F28	F30	F31	F33	F34	F36	Total
LITHO	201	202	204	206	208	209	210	2105	211	212	214	216	217	218	220	222	223	224	226	227	228	230	231	233	234	236	
ABT										0.84	2.07	0.88		0.77			1.21										1.18
AND												10.11					1.51		1.10								2.07
ASH							7.93		0.32	1.64		0.64			1.02	2.36	0.59	1.75		0.96		1.71		0.32			1.16
BAS												0.44															0.44
CON		0.74																					0.31	5.44			1.60
DAC	3.78	1.97	0.93	1.25	1.27	1.84	1.26	0.88	0.68	1.38	1.22	1.39		1.56	1.50	1.70	1.15	1.88	1.41			1.21		1.60			1.44
DIAB										0.34					0.01	4.07	0.02		0.02					0.89			0.36
FBX		3.29	2.84		2.05	3.15	1.43	1.31	1.02	1.83	0.95	1.49		1.11	1.57	1.82	1.39	1.82	1.99	2.13	2.35	0.51	1.13	0.72			1.61
GOU					1.09		0.25		0.98	0.68	1.23			1.20	0.98	1.68	0.78	12.73	1.03					3.34			2.27
LAP		1.27	2.92	0.79	0.69	1.63	1.48	0.88	0.54	1.36	1.53	1.36	6.80	1.29	1.60	2.15	1.23	1.77	1.54	1.52	1.20	1.60	1.68	0.43			1.47
LAT		3.03	2.18	0.85	1.87	0.89	0.99	0.94	1.33	1.64	1.90	1.00		1.81	1.94	1.32	2.42	2.80	1.11	0.94	1.70	1.68	1.06	0.90	1.16	1.14	1.63
LBT			1.40		0.99	0.97	1.19	1.00	3.07	0.90	1.62	1.15		1.58	1.37	1.60	1.02	1.51	1.15	1.10	1.21	3.05		0.83	4.55		1.33
NR										1.95					0.83			0.00					2.63				1.65
OVB					0.59		1.20		1.07	1.04	1.84	0.90		2.25	2.58	2.36	1.41	2.14	1.17	0.46	0.90	1.43	0.66			3.12	1.69
QVN					4.46	3.85	3.07		5.42	11.68	3.57	10.43		2.34	8.07	12.78	6.27	5.87	0.61	8.82		19.29				4.24	8.17
RHY					0.84					2.36	1.41	0.66		0.75	0.93	1.64	3.29	0.63	3.39	3.91				0.98			1.68
SAP	1.22	2.66	3.63	1.42	1.42	1.51	1.52	2.59	1.00	2.98	1.04	1.59	1.05	2.77	2.70	1.74	1.70	1.56	1.17	2.01	2.45	1.96	1.08	2.47		1.12	1.84
SPK							1.02			1.08				3.90	3.33			1.69			1.36						1.80
VBX																			0.04								0.04
Total	3.38	1.77	2.81	1.33	1.43	1.57	1.38	1.45	1.16	1.64	1.47	1.40	2.74	1.70	1.94	1.82	1.61	1.93	1.43	1.59	1.70	1.87	1.17	1.35	1.86	1.56	1.63

Table 8 Botija 1m Composites Statistics

Botija 1m Composites in Steep Dipping Structures (Azimuth 70°)

cmp	Structure Code															
	B01	B02	B03	B04	B05	B06	B07	B08	B09	B12	B13	B14	B15	B16	B18	Total
LITHO	**101**	**102**	**165**	**104**	**105**	**106**	**107**	**108**	**109**	**112**	**113**	**114**	**115**	**116**	**118**	
ABT					2											2
AND					2						1					3
ASH	2	4		5				1			2		20	20	15	69
DAC	1	4	5	2	3	21	6	30	42	13	34	10	15	17	4	207
DIAB									1							1
FBX			16	23	11	24			20				4			98
GOU			4		3	3	1	1			1					13
LAP	15	23	80	110	74	102	43	146	116	88	72	8	22	31	17	947
LAT	23	17	72	70	57	68	5	19	8	18	13	14	18	7	38	447
LBT	3	4	20	35	18	4	6	17	12	18	45	4	11	5		202
NR						2										2
OVB		3	6	4	9	10	6	8	29	4	15	7	7	3	5	116
QVN			1									1				2
RHY					4	14	3	9	32	15	11			8	4	100
SAP	27	15	61	32	46	56	26	78	97	79	55	37	19	21	11	660
VBX							5									5
Total	**71**	**70**	**265**	**281**	**229**	**304**	**101**	**309**	**357**	**235**	**249**	**81**	**116**	**112**	**94**	**2874**

AUc	Structure Code															
	B01	B02	B03	B04	B05	B06	B07	B08	B09	B12	B13	B14	B15	B16	B18	Total
LITHO	**101**	**102**	**165**	**104**	**105**	**106**	**107**	**108**	**109**	**112**	**113**	**114**	**115**	**116**	**118**	
ABT					0.39											0.39
AND					0.06						0.24					0.12
ASH	0.87	1.01		1.09				0.94			1.61		1.67	1.46	1.87	1.53
DAC	0.36	2.16	0.02	0.45	0.38	1.41	0.84	1.26	1.20	2.31	1.33	1.22	1.37	1.97	1.07	1.35
DIAB									0.01							0.01
FBX			2.30	0.84	1.44	1.37			0.88				1.20			1.30
GOU			1.13		0.57	0.29	0.14	5.22			0.53					1.00
LAP	1.25	1.82	1.46	1.34	1.34	1.22	1.09	1.55	1.44	1.45	0.80	1.05	1.26	1.35	0.66	1.33
LAT	0.82	0.78	1.27	1.58	1.37	1.39	0.84	1.20	1.06	1.28	1.14	0.38	0.36	0.67	0.56	1.16
LBT	1.31	1.22	2.03	0.90	0.30	1.06	0.39	1.67	0.95	0.90	0.83	1.31	0.89	1.02		1.02
NR						1.07										1.07
OVB		1.70	1.32	1.00	2.18	2.32	1.93	5.65	6.84	2.89	1.41	1.67	1.49	0.85	1.38	3.27
QVN			2.03									2.57				2.30
RHY					0.38	0.56	0.78	2.96	0.87	0.94	0.79			0.55	0.39	0.95
SAP	0.53	0.95	1.82	1.36	2.28	1.93	2.38	3.04	2.41	2.80	1.39	3.76	1.79	1.40	1.54	2.19
VBX							0.78									0.78
Total	**0.82**	**1.31**	**1.55**	**1.29**	**1.43**	**1.41**	**1.37**	**2.04**	**2.00**	**1.89**	**1.07**	**2.28**	**1.27**	**1.35**	**0.96**	**1.55**

Table 9 Other 1m Composites outside Structures Statistics

Other 1m Composites outside the Steep Dipping Structures

LITHO	Auc	Nb
ABT	0.31	179
AND	0.03	699
ASH	0.21	395
BAS	0.04	50
BT	0.16	5
CON	0.36	9
DAC	0.40	3637
DIAB	0.03	319
FBX	0.37	1565
GOU	0.17	296
LAP	0.26	6018
LAT	0.29	4961
LBT	0.27	2372
NR	0.47	6
OVB	0.67	434
QFP	0.01	398
QVN	3.49	22
RHY	0.28	536
SAP	0.35	3249
SPK	0.74	87
VBX	0.09	227
Total	**0.30**	**25464**

14.4.2. 5m Composites by Bench

To facilite comparison with previous resources estimates, Geostat also did a 3D block model based on 5m bench composites without the structured ore outline to confine compositing. This procedure is similar to IMC model which used 6m bench composites. Such approach is found to decrease noticeably the nugget effect. On the other hand, as the next sub-section will show, the grade continuity did not changed much. The ranges established through variography analyses were longer but not much longer than 25 m. The continuity remained unidirectional also. Geostat had hoped the variography of the 5m bench composites would display a preferential orientation for gold grade continuity along the reported structures. It was not the case. We feel it is unlikely these characteristics will change, no matter how much sampling is done. These results are consistent with what we observed in the field. It is typical of epithermal gold deposits to display high nugget effects and short ranges. The gold hydrothermal solutions came up through fissures in volcanic rock along brecciated material. Only small veinlets were able to develop at best most of the time. In other words and without going into detail of the petrographic study, there are no particular features bearing gold that has opened wide and long enough to display some sort of anisotropy. The following sub-section will elaborate more on this matter.

14.5. Geostatistical Analysis

This sub-section presents the variography of the Crucitas project. The variography characterize the grade continuity of gold and silver in the deposit. It sets the parameters used to project the sample grades in space to estimate the grade of the deposit.

The grade of the geological units and the grade of production are distinct. The geostatistical analysis may put the emphasis more on geology if it uses shorter composites and on production if it uses longer bench composites. This is just one step in the process of modelling the resource. Consistency is required to obtain a correct grade model and resource estimation report to be converted to mining reserves using the corresponding mine factors (dilution and recovery).

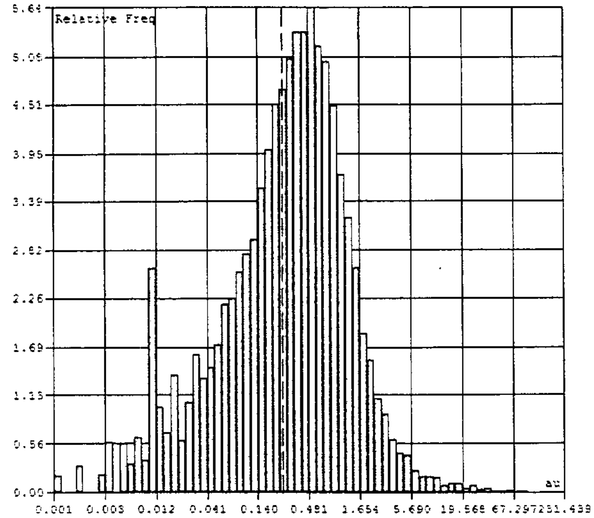
The following figures show the Statistics of 2m composites tested by Geostat. They are the same composites used by CPC in its 1999 Feasibility Study. This analysis is based on composites grouped by rock type based on lithology, not structures. The Correlogram (standardized variogram developed by Geostat) allows us to see that the data characteristics are about the same in all rock types.

Geostat tested 5m bench composites to compare with IMC composites set with a 6m bench interval. That exercise, and other comparison between the 2m and the 5m composites analysis, and the results from the 1m composites are also discussed at the end of this sub-section.

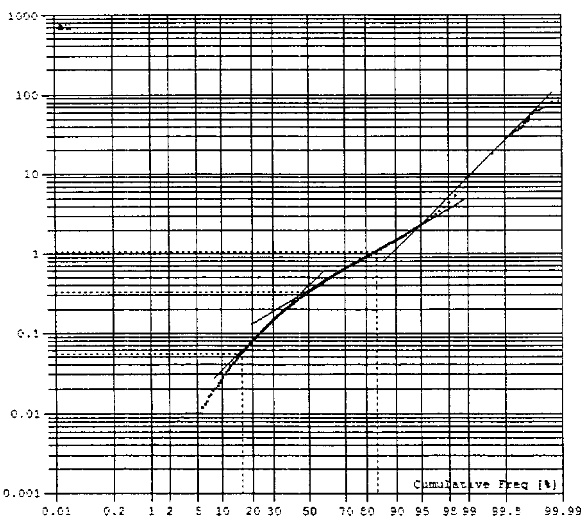
The breaks or points of inflexion in all probability curves are always at the same values: 0.2 and 2.0 g Au/t. They could represent a laboratory artefact wrapped around the average grade which is around 1.0 and 2.0 g Au/t and 0.2 g Au/t could have been set as the effective detection limit. But PDI sampling procedures at the laboratory were standard to detect gold between 0.1 and 30 g Au/t. PDI report 2 events that inserted gold in the host rocks: one broad low grade event and one higher grade probably confined to the steep dipping structures often marked by breccias. Bench composites (>5m) tend to straighten the cumulative frequency probability line, therefore masking this geological feature, if that is what it is.

The continuity of grade is equal in all direction most of the time. Based on a study of indicators, the high grade (2.0) is highly nuggety (made of coarse grains of gold erratically distributed), while the low grade (0.2) is more continuous (made of fine grains of gold more evenly distributed). Here again, some of this may be induced by changes in sample preparation procedure to break down the expected coarse grain of gold into a fine powder to render the sample material homogeneous. This is a standard procedure so that the laboratory can repeat their results while the samples are actually hampered by their natural condition of containing an unpredictable number of coarse grains of gold from time to time.

It may be noticed that the quality of the Correlogram will appear to decrease when a subset of the whole database is used. That is due to using less data, not necessarily data of a lesser quality. It should be looked at as a sort of fuzziness in the picture and not read as a variation in the data characteristic, unless justified and meaningful changes occur.

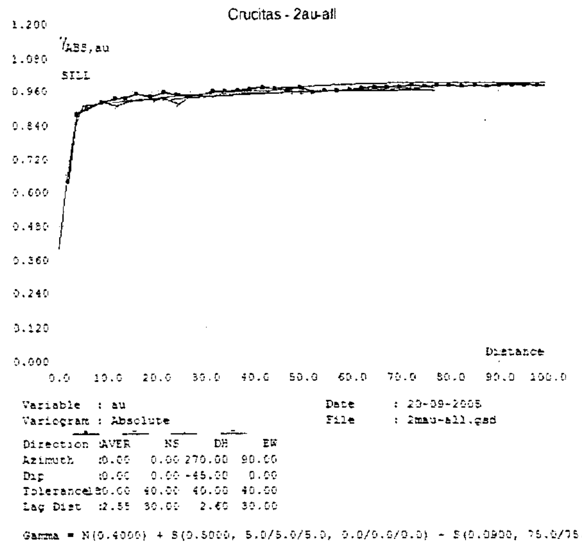


a) Histogram

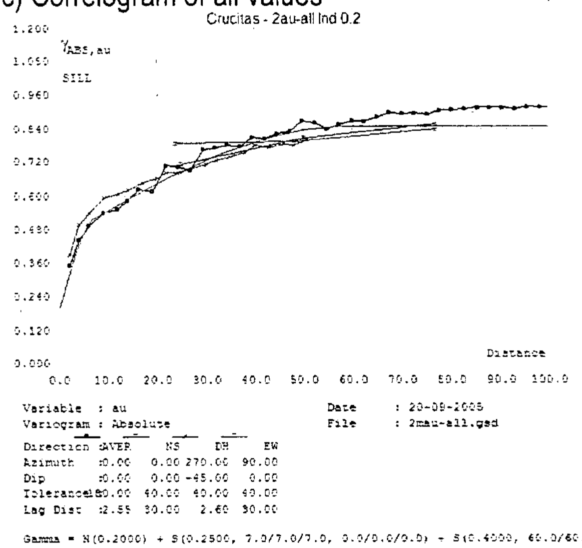


b) Probability Curve

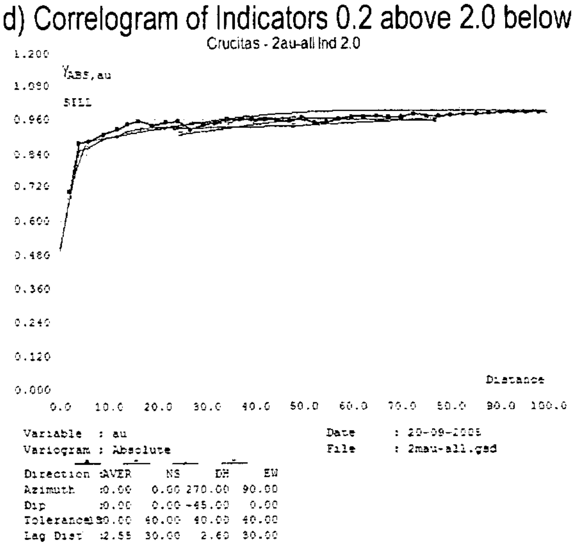
Figure 36 Statistics for 2m Composites Gold assays for all rock types

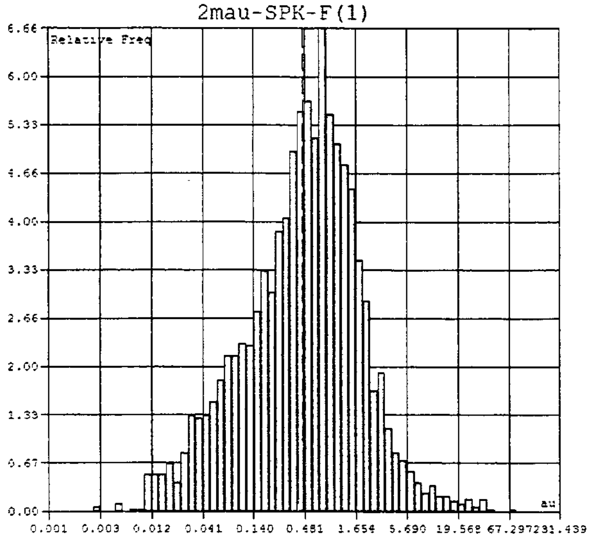


c) Correlogram of all values

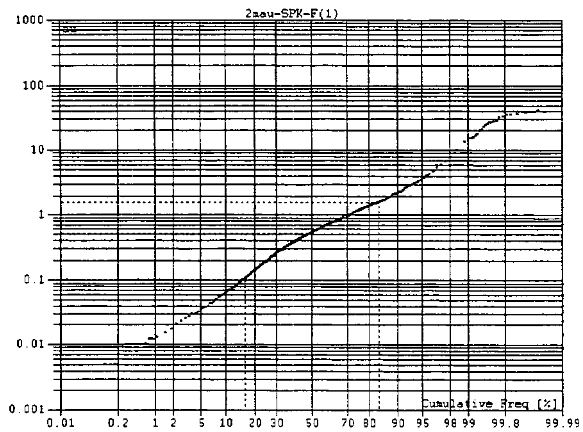


d) Correlogram of Indicators 0.2 above 2.0 below



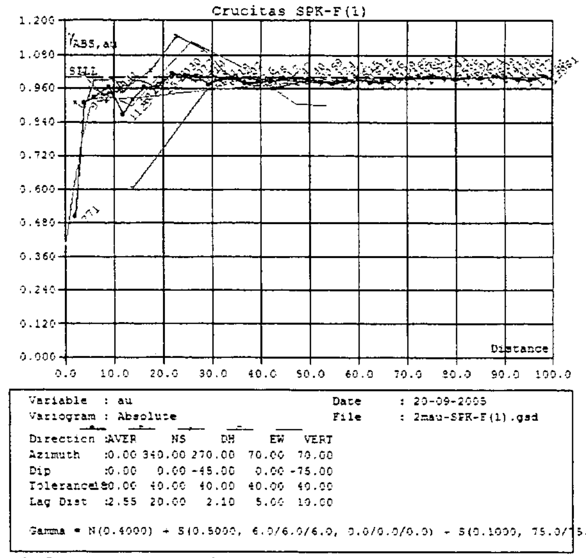


a) Histogram

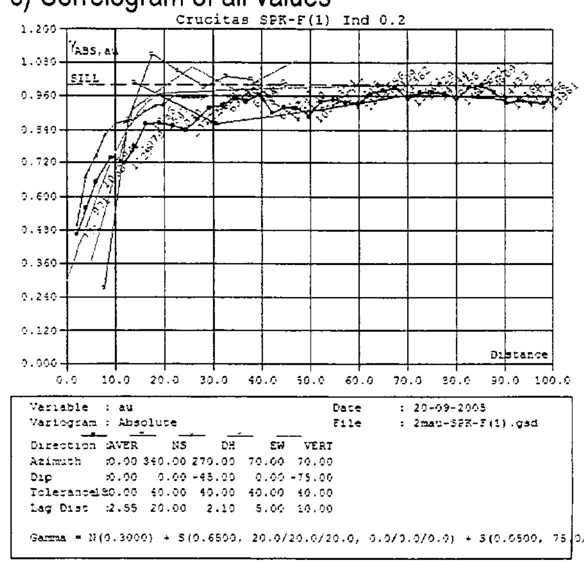


b) Probability Curve

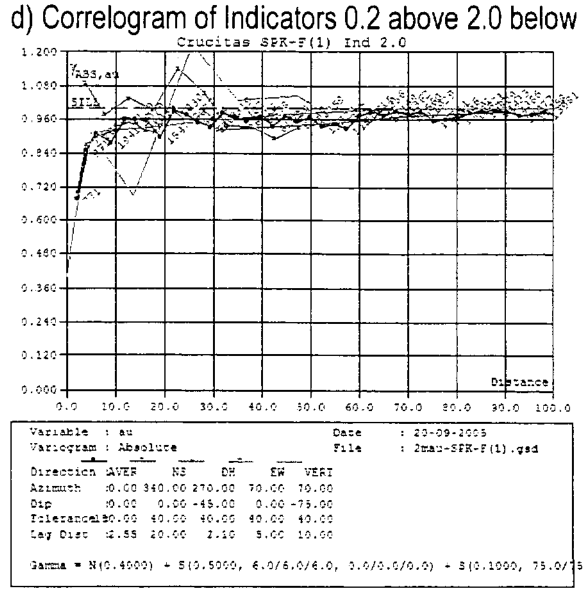
Figure 37 Statistics for 2m Composites Gold assays in SPK for Fortuna

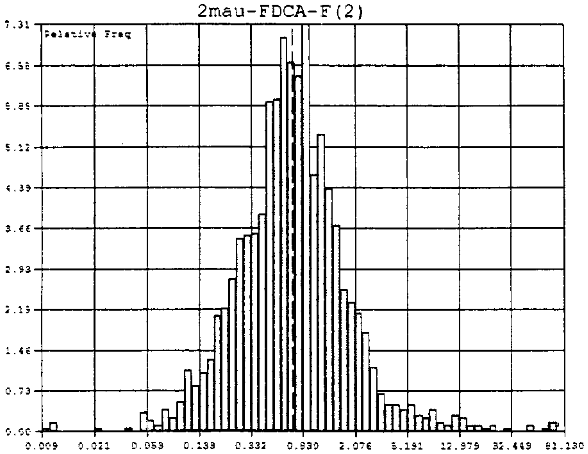


c) Correlogram of all values

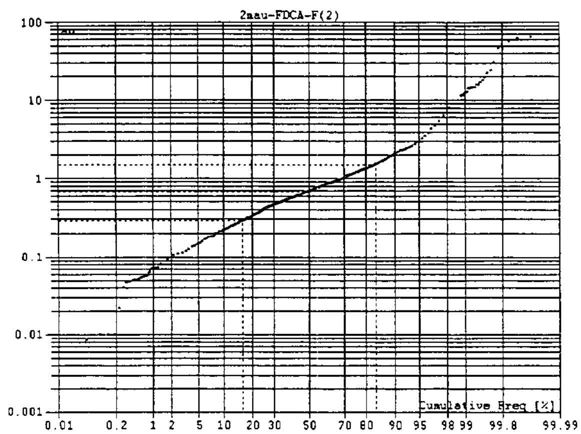


d) Correlogram of Indicators 0.2 above 2.0 below



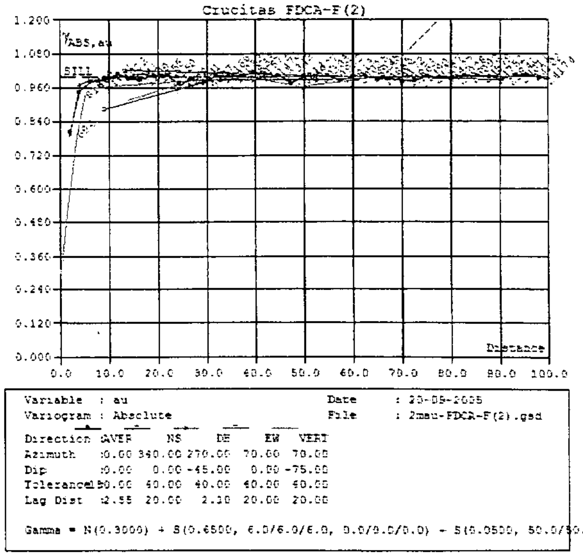


a) Histogram

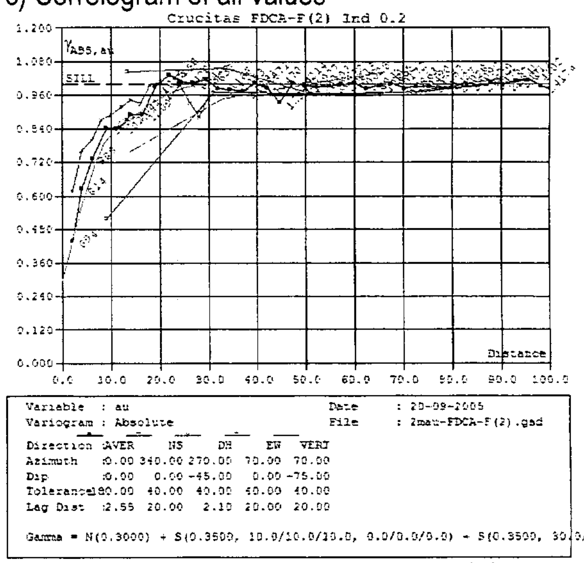


b) Probability Curve

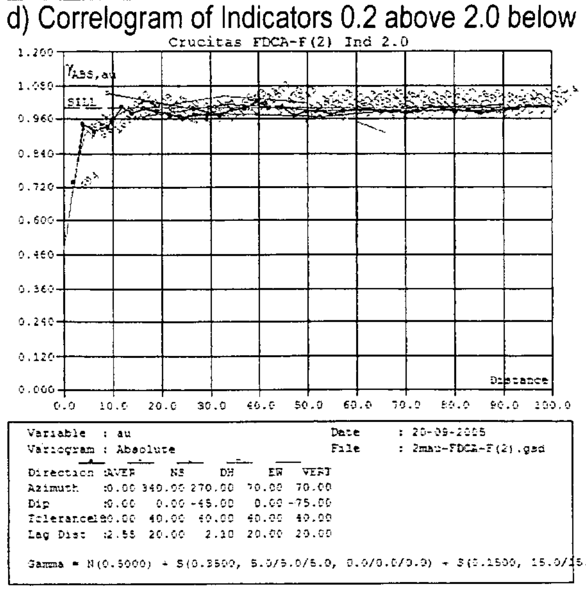
Figure 38 Statistics for 2m Composites Gold assays in FDCA for Fortuna

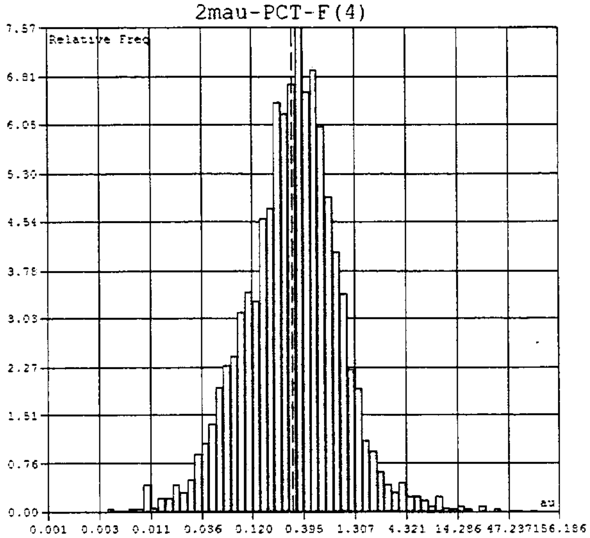


c) Correlogram of all values

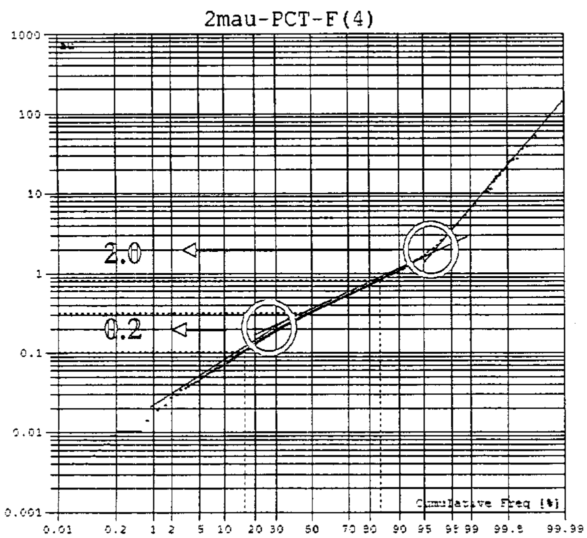


d) Correlogram of Indicators 0.2 above 2.0 below



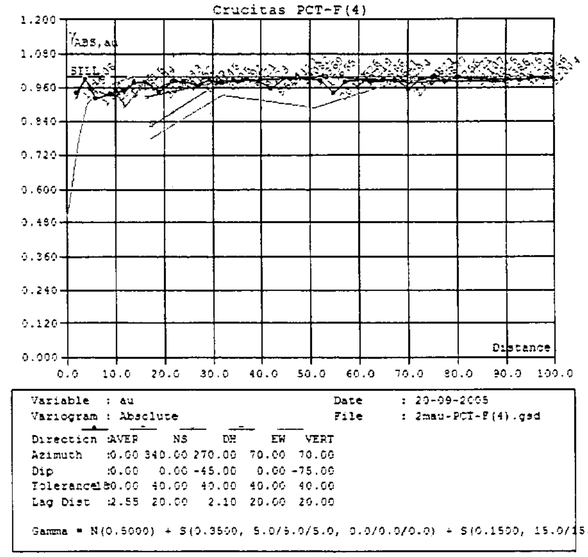


a) Histogram

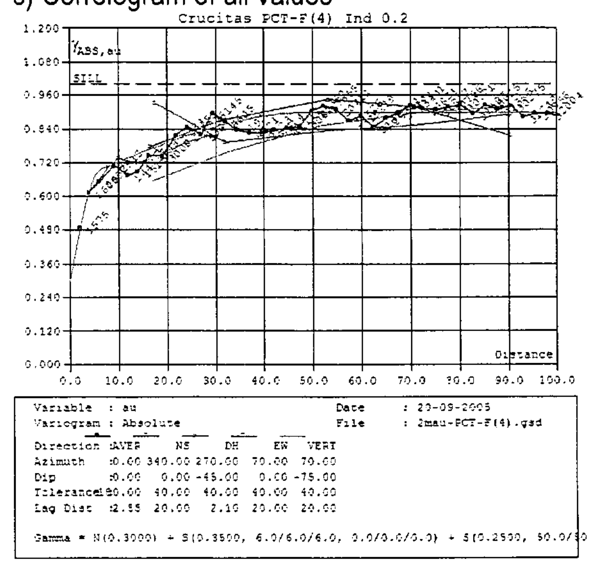


b) Probability Curve

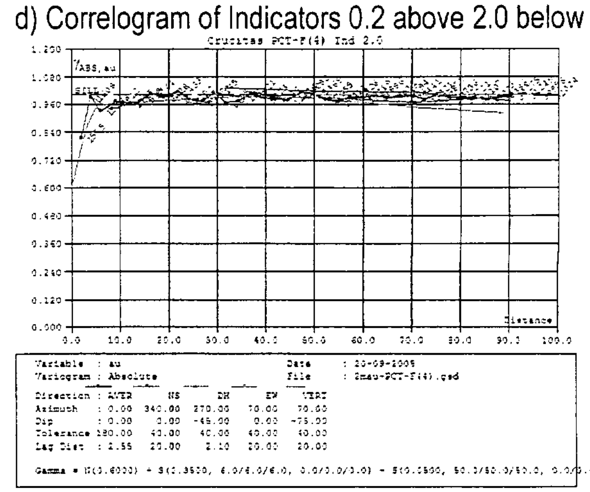
Figure 39 Statistics for 2m Composites Gold assays in PCT for Fortuna

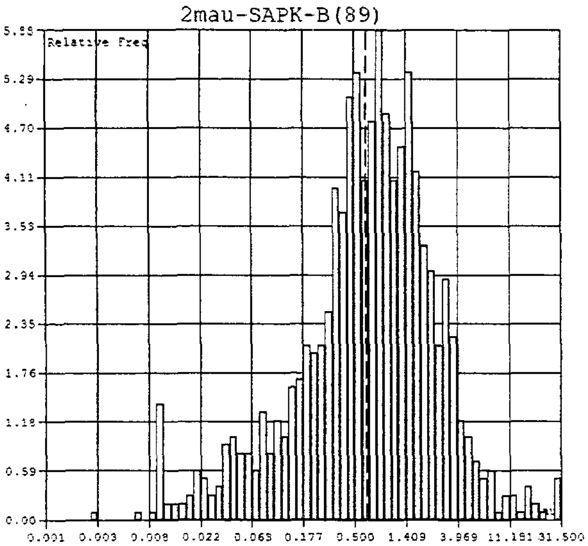


c) Correlogram of all values

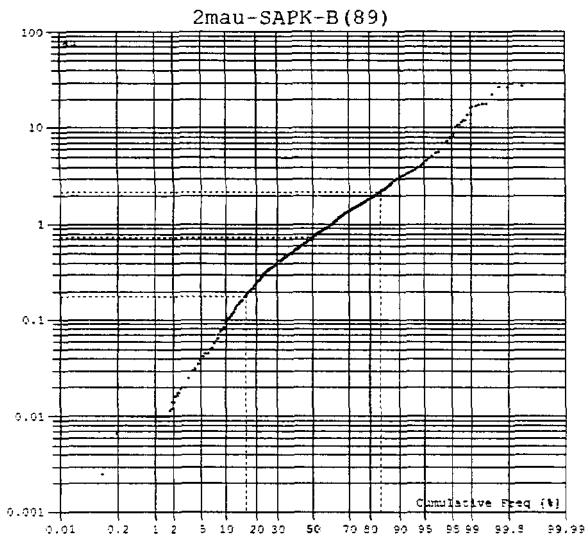


d) Correlogram of Indicators 0.2 above 2.0 below



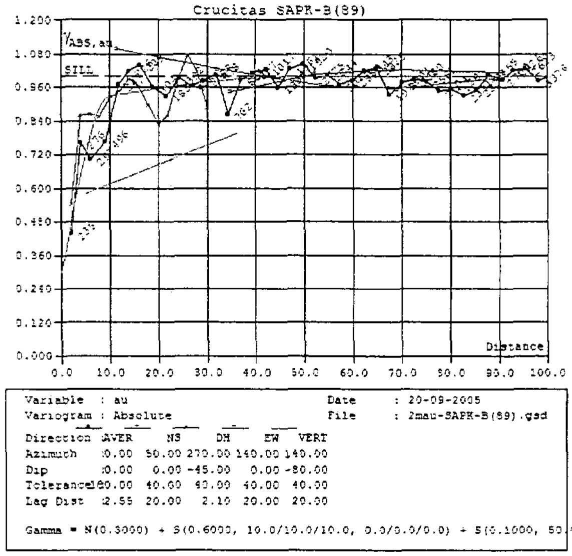


a) Histogram

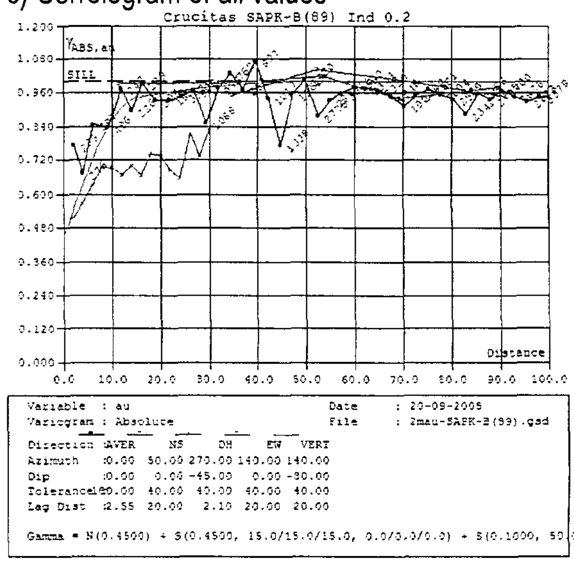


b) Probability Curve

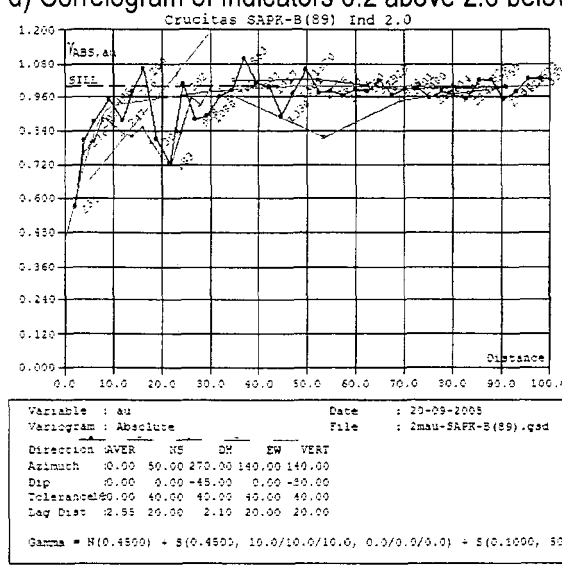
Figure 40 Statistics for 2m Composites Gold assays in SAPK for Botija

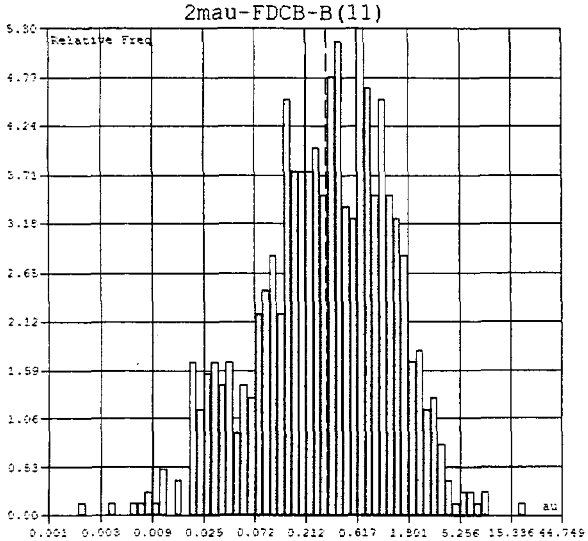


c) Correlogram of all values

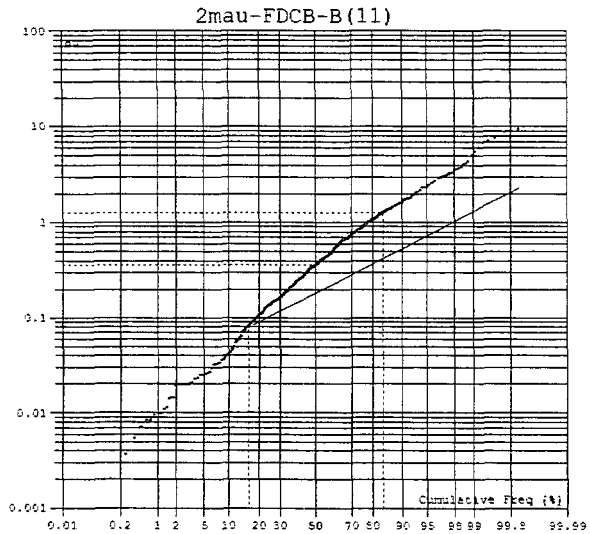


d) Correlogram of Indicators 0.2 above 2.0 below



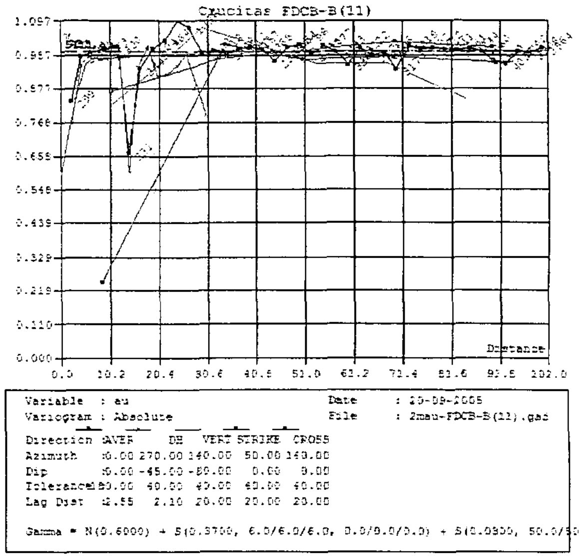


a) Histogram

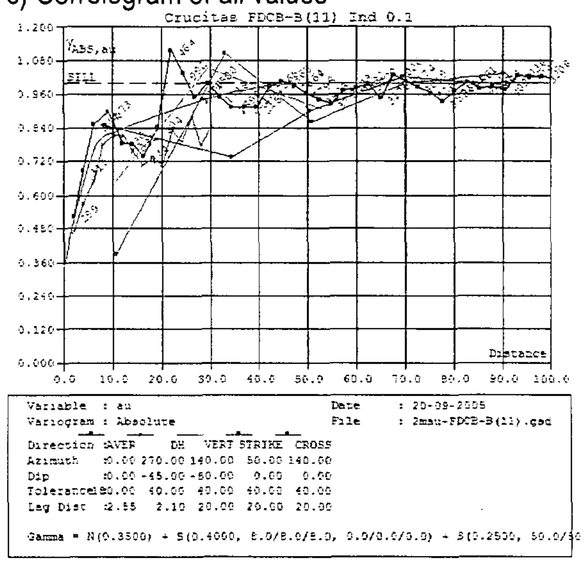


b) Probability Curve

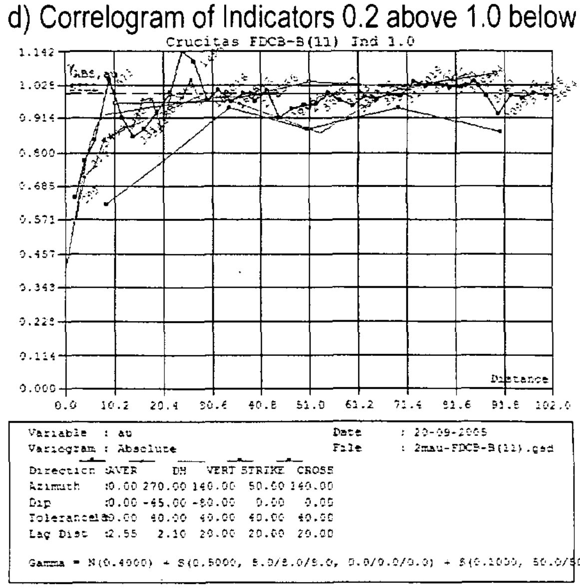
Figure 41 Statistics for 2m Composites Gold assays in FDCB for Botija

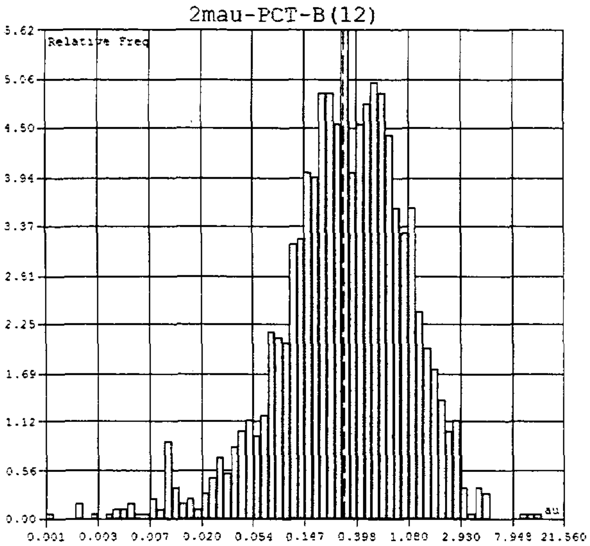


c) Correlogram of all values

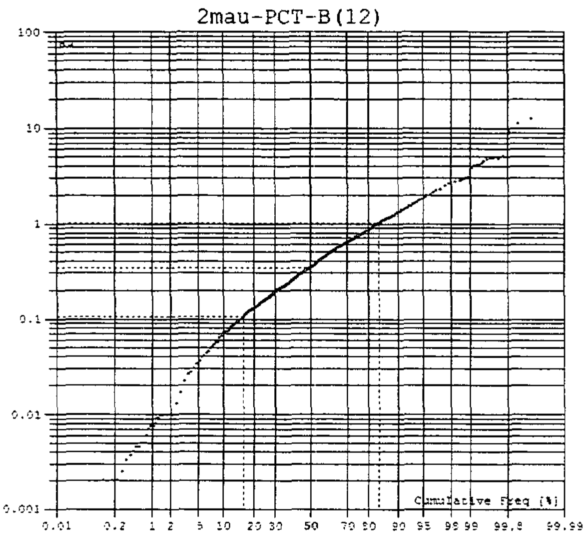


d) Correlogram of Indicators 0.2 above 1.0 below



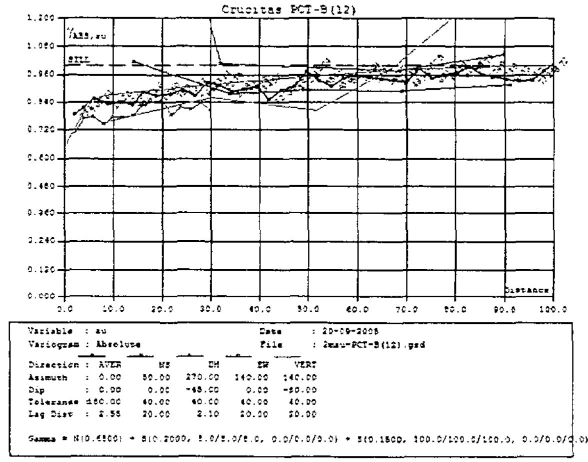


a) Histogram

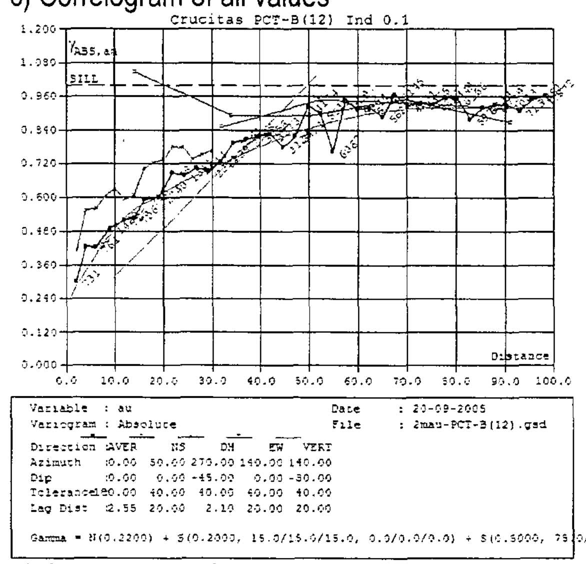


b) Probability Curve

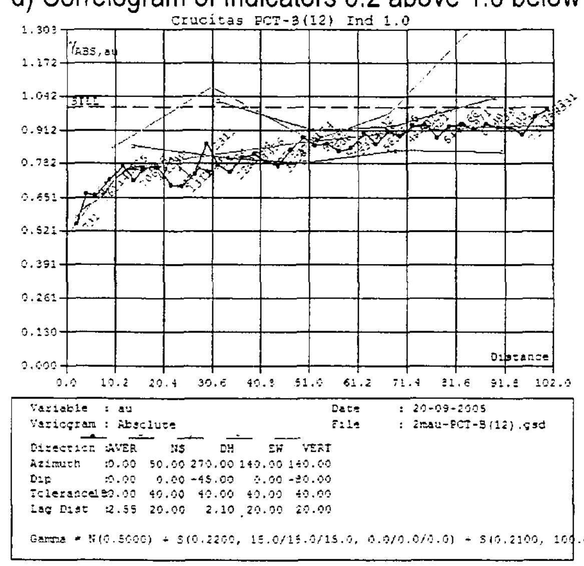
Figure 42 Statistics for 2m Composites Gold assays in PCT for Botija

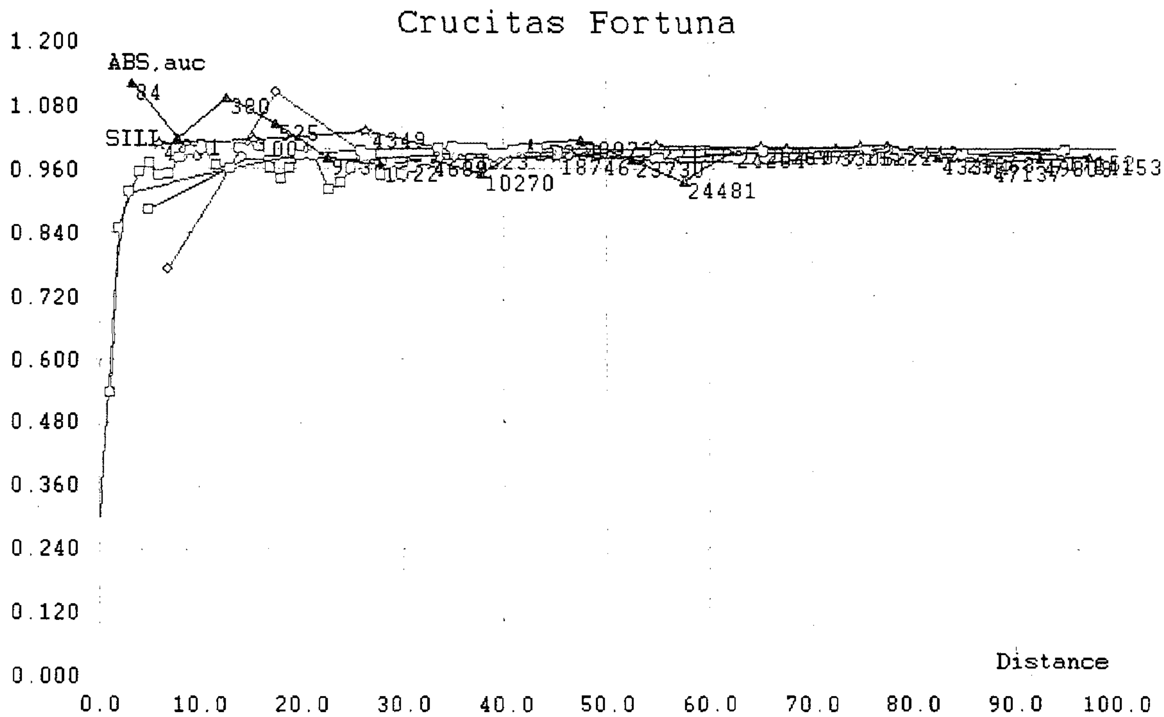


c) Correlogram of all values



d) Correlogram of Indicators 0.2 above 1.0 below





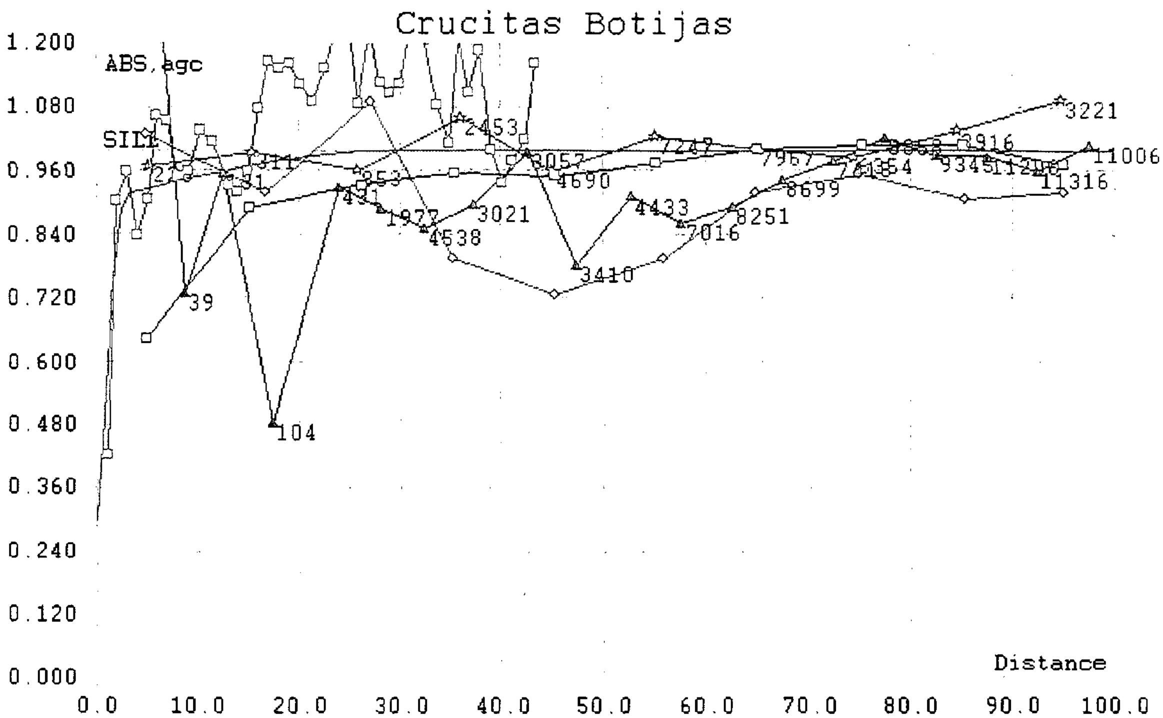
Variable : auc Date : 06-01-2006
Variogram : Absolute File : Fortuna.gsd

Direction :	AVG	NS	DIP	ACROSS	DWDIP
Azimuth :	340.00	340.00	70.00	70.00	250.00
Dip :	0.00	0.00	-85.00	5.00	-50.00
Tolerance :	180.00	45.00	45.00	45.00	30.00
Lag Dist :	10.00	10.00	10.00	5.00	1.10

Gamma = N(0.3000) + S(0.6000, 3.0/3.0/3.0, 0.0/0.0/0.0) + S(0.1000, 30.0/30.0/30.0,

Figure 43 Correlogram of Fortuna 1m composites in all structures (7,596 composites)

On this enlarged graphic of the Fortuna data, it is clear that there is no significant difference in grade continuity between directions and that the grade continuity has a very short range (mostly less than 10m). However, the data set comprised only the 1m composites (7,596) located inside the envelopes of the steep dipping structures. Since this does include most of the high grade samples (avg 1.63 g Au/t), it does not "see" the suspected more even low grade material (0.30 g Au/t) located outside those envelopes. Therefore, this analysis would only highlight the grade behaviour inside the structures, not the difference between the samples in and out of the structures to help locate and outline those structures. This analysis shows the grade continuity inside the structures to be nuggety, very short range and unidirectional. This is about the same behaviour that we observe in the 2m composite with a high grade indicator (without the structures for sample tagging). In fact, the statistics and logic indicate that we are looking at the same data and we are getting the same results in the grade continuity study using Correlograms.



Variable : agc   Date : 06-01-2006
Variogram : Absolute   File : Botijas.gsd

Direction :	AVG	NS	DIP	ACROSS	DWDIP
Azimuth :	40.00	40.00	130.00	130.00	70.00
Dip :	0.00	0.00	-85.00	-5.00	-50.00
Tolerance :	180.00	45.00	45.00	45.00	30.00
Lag Dist :	10.00	10.00	10.00	5.00	1.10

Gamma = N(0.3000) + S(0.6000, 3.0/3.0/3.0, 0.0/0.0/0.0) + S(0.1000, 30.0/30.0/30.0,

Figure 44 Correlogram of Botija 1m composites in all structures (2,874 composites)

The graphic above indicates that the Botija data is more variable than Fortuna when compared to the previous graphics. We already know that Botija is smaller, that it has less data and that drilling orientation was not optimized as for Fortuna. Therefore, if we discount the lower quality of the variography based on the difference of the quality of the data, it is likely that the grade characteristics are very similar, if not identical for Botija and Fortuna. In other words, the difference between the Botija and the Fortuna data set are not significant from a geostatistical point of view. Since the grade variation is unidirectional and it as the same characteristic in both Botija and Fortuna, a single variogram equation is required to compute grades in both. See examples of equation resolution at the bottom of the graphics in the form of:

$$Gamma = N\ (0.xx) + S_1\ (0.xx,\ dx/dy/dz) + S_2\ (0.xx,\ dx/dy/dz)$$

Where N is the nugget effect and S the speric (or else) model parameters. In the Correlogram, Gamma is divided by the sampling variance and the sum of all gammas is equal to 1.

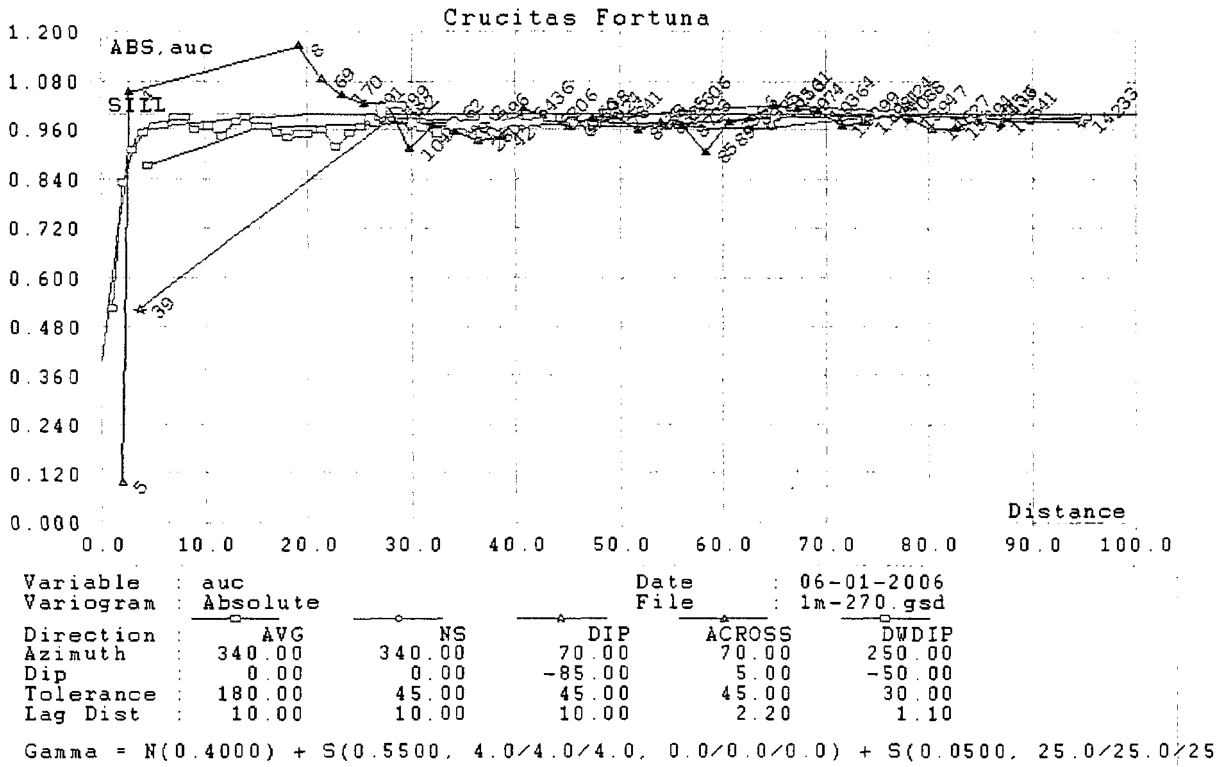


Figure 45 Testing Drill Hole with Azimuth 270° Only for Fortuna 1m composites

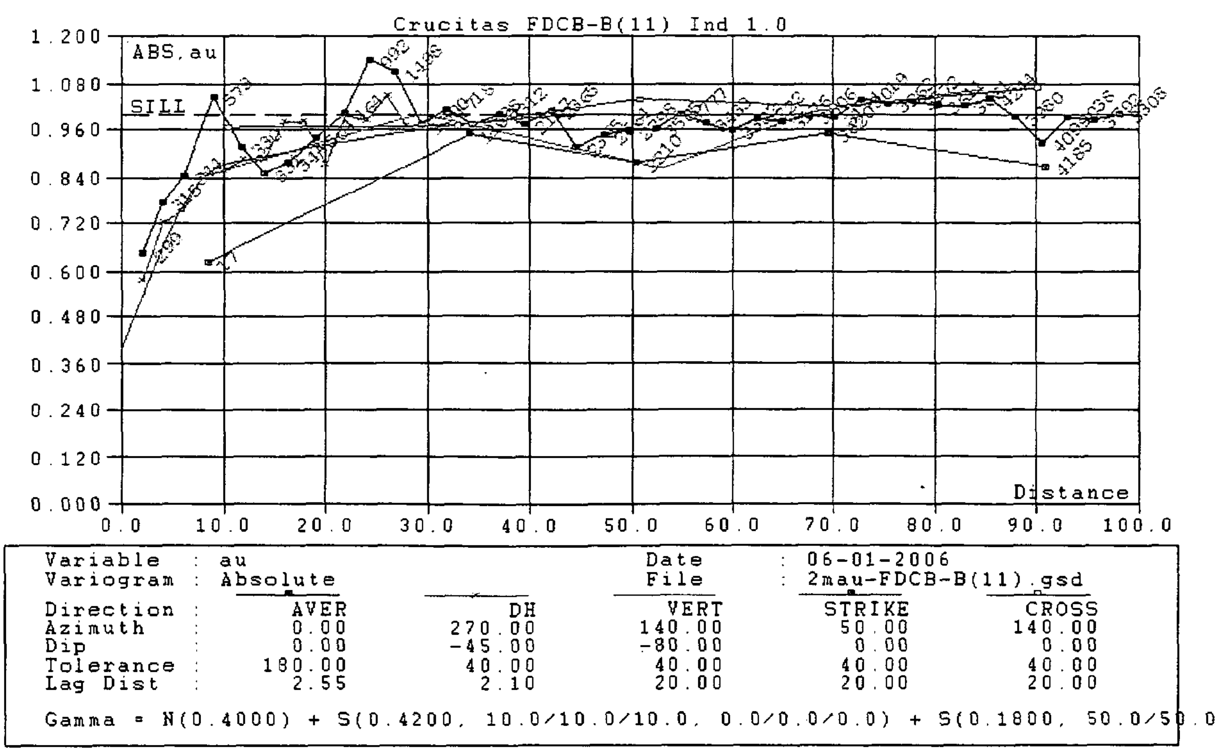


Figure 46 Botija FDCD (11) - Indicator 1.0 g Au/t

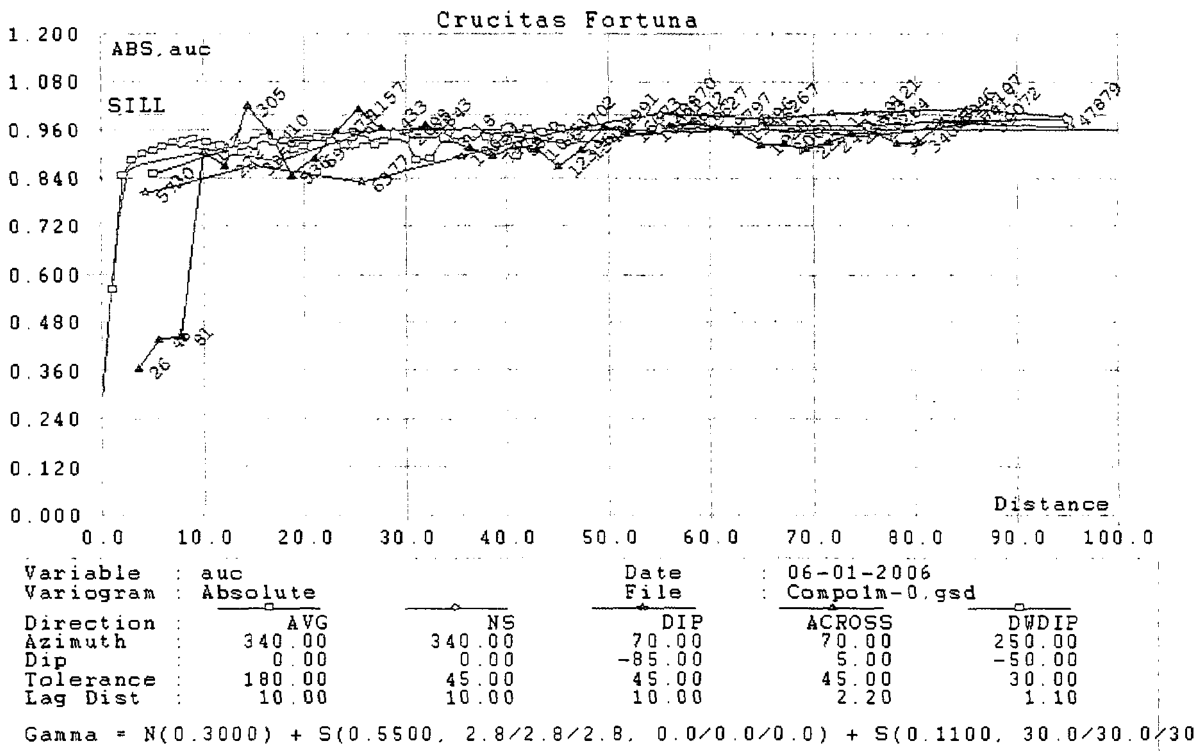
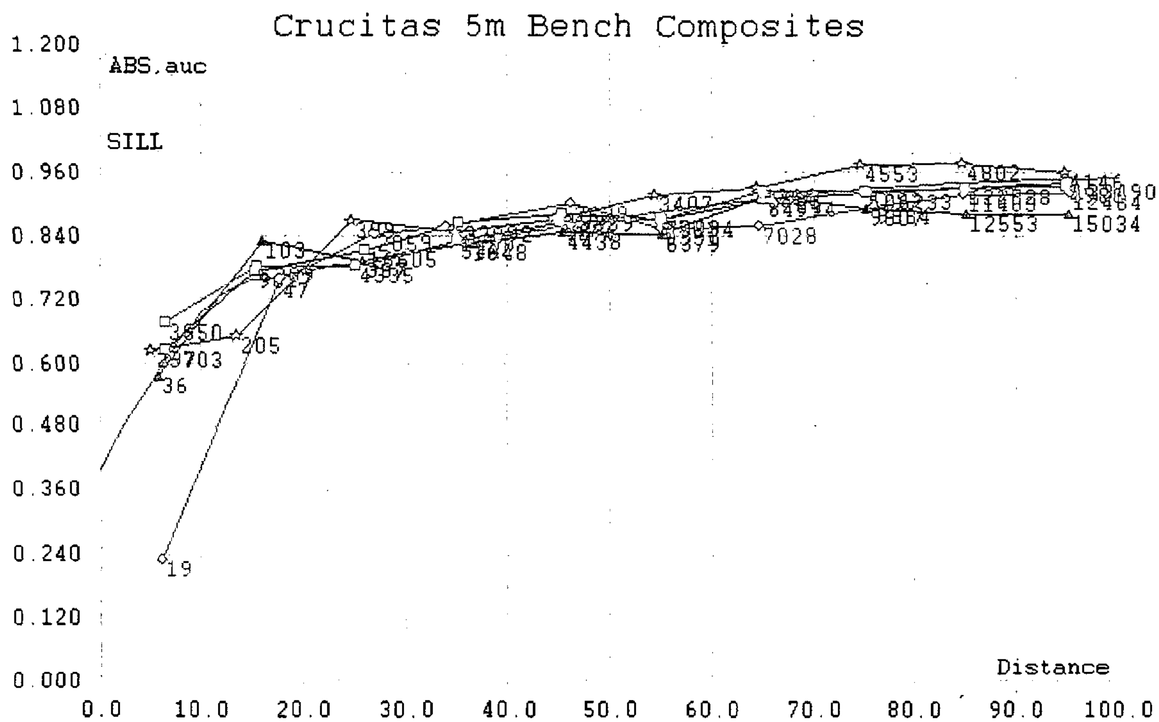


Figure 47 Correlogram of Other 1m Composites Outside the Structures (25,646 composites)

The 3 figures above help us draw the following conclusions:

- The 1 m composites geostatistical behaviour does not differ much from the 2m composites.
- Making a special case for the samples coming from the oriented drill holes with a 270° azimuth does not make a significant difference either.
- Using indicators shows that the range of continuity for very low grade is very good and can reach 50m or more, but such low grade material has no economic bearing. The range of high grade composites, which is what matters in this case, does not change significantly. An indicator of 2 g Au/t already displays behaviour similar to the variogram without the indicator. This fact limits the benefits of using Indicator Kriging.
- Using the structures envelops to analyze the data adds little to the understanding of the grade continuity.

In addition to making a statistical analysis of the data using the structured model to segregate the samples, Geostat has tested a model using a methodology similar to IMC in 1999. For this purpose, 5m composites were generated by bench. The results of this analysis, which does not take into account the structures to segregate the samples, follow. If the structures exist, Geostat made the assumption that such an analysis was more likely to see their effect on grade variations in space.



Variable	: auc		Date	: 06-01-2006	
Variogram	: Absolute		File	: CMP-BENCH.gsd	

Direction :	AVG	NS	DIP	ACROSS	DWDIP
Azimuth :	340.00	340.00	70.00	70.00	250.00
Dip :	0.00	0.00	-85.00	5.00	-50.00
Tolerance :	180.00	45.00	45.00	45.00	30.00
Lag Dist :	10.00	10.00	10.00	10.00	10.00

Gamma = N(0.4000) + S(0.3000, 15.0/15.0/15.0, 0.0/0.0/0.0) + S(0.2500, 100.0/100.0/

Figure 48 Correlogram of 5m Bench Composites

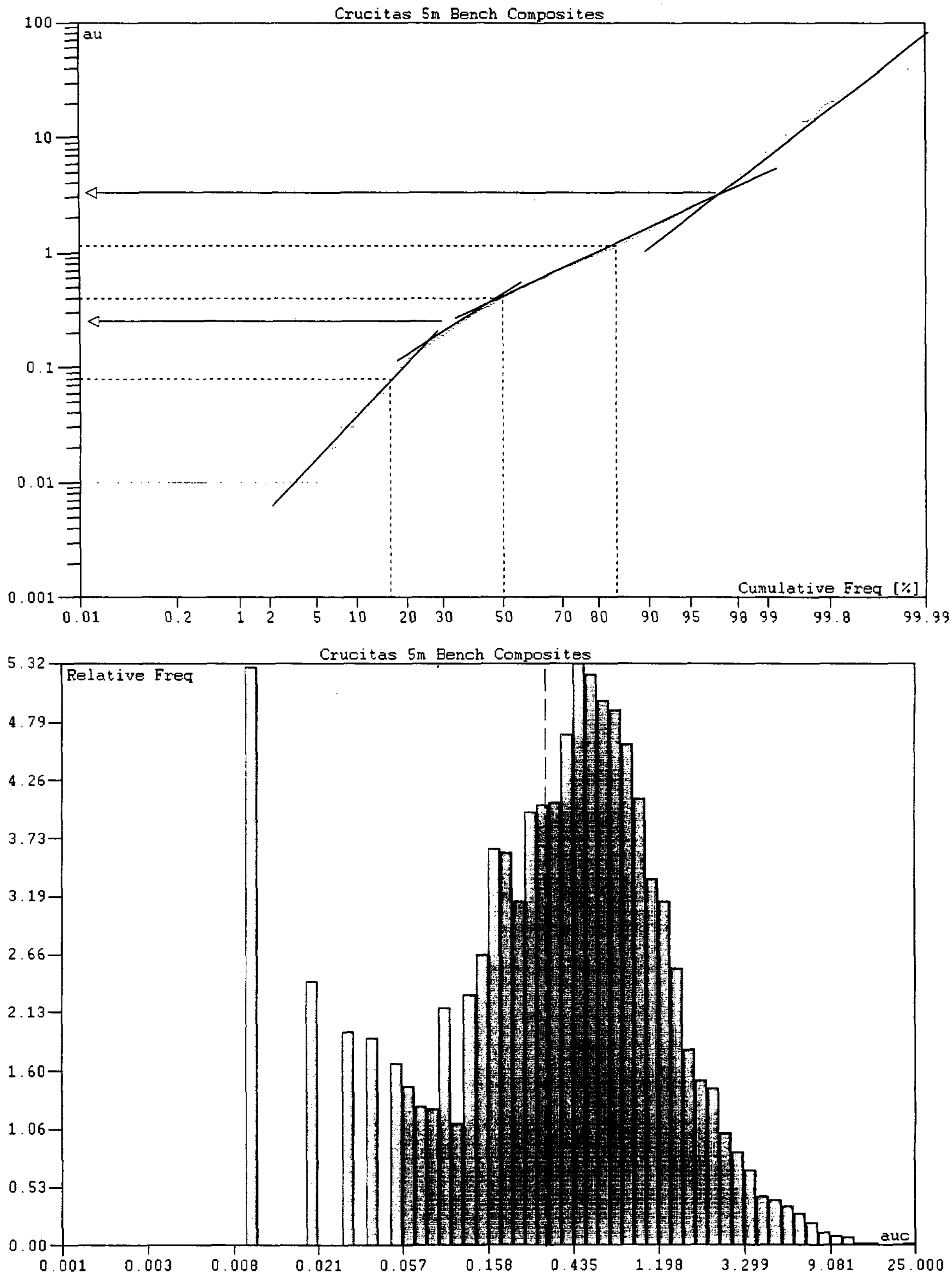
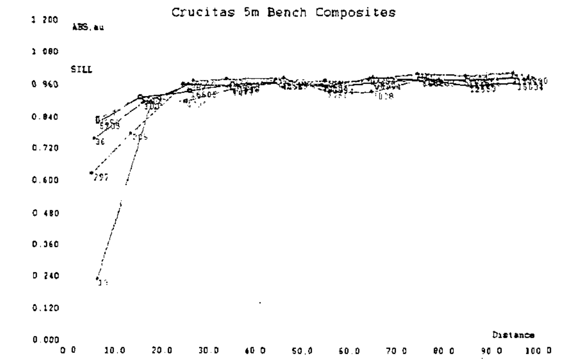
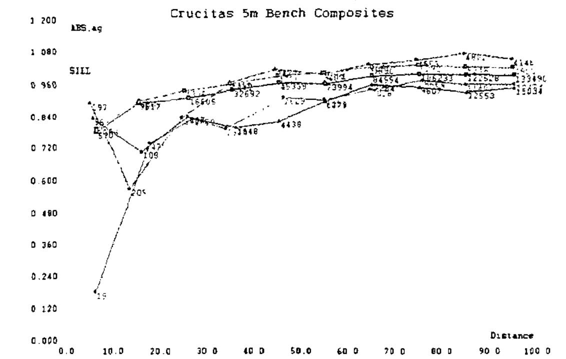


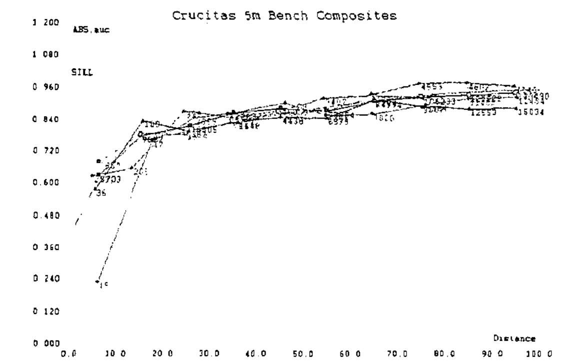
Figure 49 Statistics for gold of the 5m Composites by Bench



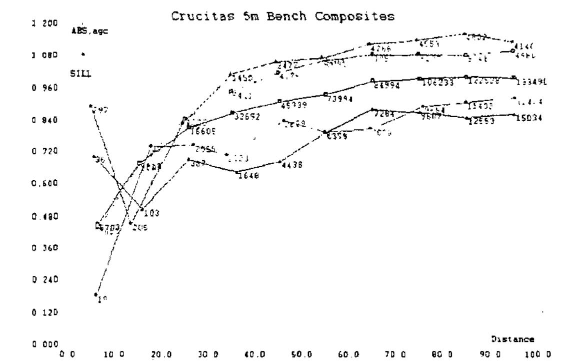
a) Uncut Gold



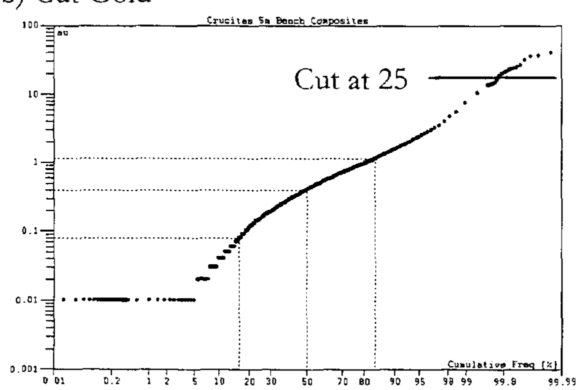
d) Uncut Silver



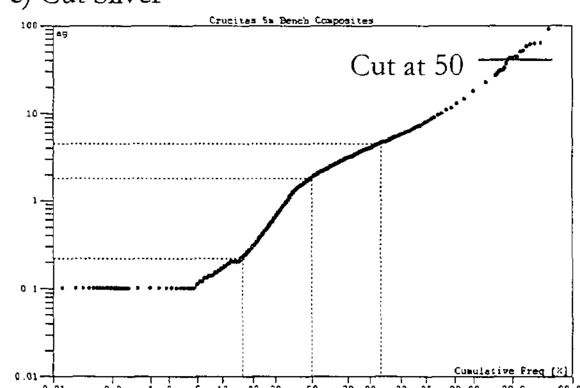
b) Cut Gold



e) Cut Silver



c) Gold Cumulative Frequency Probability



f) Silver Cumulative Frequency Probability

Figure 50 Statistics and Correlogram of Gold and Silver 5m Bench Composites

The variography of the 5m bench composites should be very comparable to the analysis of IMC 6m bench composites or it should be, but Geostat came to different conclusions than IMC regarding the range of continuity and the anisotropy. See Appendix 6. As the graphic above shows, the curves are much smoother than when using the 2m or 1m composites. That is because the variance of grades is reduced automatically when making larger composites. Longer composites eliminate the noise in the data set. This is acceptable if the 'noise' is not legitimate and useful geologically speaking. It also contributes to lower the nugget effect although it is not reduced significantly in this case when compared to shorter composites. Longer composites also increase the range of continuity but again not significantly considering that 70% of the grade variance is explained by components at shorter range than 15m.

The better condition of the variogram made with 5m bench composites is due to the growing influence of the low grade samples which offer a better continuity as shown in previous graphics. The low grade samples outnumber the high grade ones by more than 2 to 1. Also see Appendix 5.

14.5.1. Conclusion of the Geostatistical Analysis

It may be noticed that the impact of cutting grades increases the apparent range of grade continuity both for gold and silver. This is logical. In addition, silver displays an anisotropy when cut. Geostat has no explanation for this unusual response of the data at the moment. Since silver does not carry any significant economic weigh, it does not necessitate more study in our opinion for the time being.

The impact of using larger composites on the resources is a much lower grade but much larger tonnage. If low grade and high grade material cannot be separated on a mining scale, it is deemed appropriate to use such a model. The positive impact of using longer composites and larger SMU is to reduce the margin of error of estimation. But the smoothing effect which increases the "dilution" induced by the model may also have a negative economic impact. The resource model, including sample size, should fit the optimal mining plan, but that is unknown at the exploration stage.

On the other hand, a model using more discrete values may be compared to a simulation exercise where geology has a stronger say or, as in this case, a model fully constrained by geology (vertical structures multiple envelops and short 1m composites). It is always possible to group small samples into large composites but not the other way around. From a statistical point of view, a large block with a low margin of error or many smaller blocks with a higher margin of error are equivalent if the smaller blocks are considered as a group that occupies a similar volume to the large SMU. As a group of small blocks, their margins of error tend to cancel each other out. Individually, they may be more unreliable, but the more discrete model offers the unique opportunity of considering selective mining as a possibility. Vannessa is the first operator to consider that possibility by attempting to outline the steep dipping structures making the conduit of gold hydrothermal solutions.

In the case of Crucitas, the geostatistical analysis does not contribute much to support the narrowly structured geological model nor does it negate its existence. The anisotropy it could artificially induce by having gold concentrated in the elongated, narrow and steep structures is not measurable in the final geostatistical analysis, whether using short or long composites or whether constrained by structures, lithology and/or benches or not. It does not mean that the structures do not exist; but they cannot be seen with the existing data in the Correlogram. It is likely that it will never be seen. The variography is not a condition of the data quality, rather it is an aid to the understanding of the geological character of the deposit. Whatever goes on at a very small scale is unlikely to matter for mining production or geological interpretation. More data will eventually be gathered but the amount of details it will procure might not change the definition describe here.

Geostat has also tested the block models made with and without indicators as well as with and without the structures. As long as the fact that grade continuity limited in range is respected and the data is processed consistently, the global results are similar when measured in total ounces of gold. Since the structures do exist, we favoured using them in our final resource model. Furthermore, while the outline provided by Vannessa is not well supported by the geostatistical analysis, it does match sampling statistics, in particular the 42 samples described as Quartz Veins (QVN) grading more than 8 g Au/t in Fortuna. Geostat notes that loosely drawing structures by joining the high grade intercepts in drill holes does not prove their existence. It is the oriented core measurement of the structures (Section 11) and the few outcrops proving there existence that justify taking them into consideration. It is deemed the most likely geological model suitable to support the resource model.

On a larger scale, the question is whether or not selective mining will be required. Given the geostatistical analysis that Geostat has done and the block model generated to outline the mineral resources of the Crucitas project, it remains difficult to say if the structured geological model offers an opportunity to improve production scheduling. The differences observed between the grades and tonnages estimated by the previous operators are significant, but it reflects the opportunity and uncertainty of mining selectively or over-diluting the existing material.

The final equations for Kriging retained are:

For Fortuna:

$$Gamma = N\,(0.40) + S_1\,(0.35,\ 7m/7m/7m) + S_2\,(0.10,\ 30m/30m/30m) + S_3\,(0.15,\ 200m/200m/200m)$$

For Botija:

$$Gamma = N\,(0.40) + S_1\,(0.15,\ 7m/7m/7m) + S_2\,(0.25,\ 50m/50m/50m) + S_3\,(0.20,\ 200m/200m/200m)$$

For all other case:

$$Gamma = N\,(0.30) + S_1\,(0.60,\ 3m/3m/3m) + S_2\,(0.10,\ 30m/30m/30m)$$

15. Sample Preparation, Analyses and Security

15.1. Sample Preparation

Meterage of the drill core was verified by the logging geologist prior to sample selection. Sample intervals were chosen and marked within the geological intervals. No samples crossed lithological contacts. Sample lengths varied depending on the geology, and did not usually exceed 1.5 m. Any veins larger than 10 cm, or geological intervals with dense veining, were separated out as samples. Sample numbers were assigned to the sample intervals and were labelled on the core boxes. The "from-to" sample intervals were written in the corresponding sample booklet. The core was then photographed to document the logging and sampling intervals.

The samples consisted of half-core. Samples for holes DH93-1 to DH-95-50 were split on-site using a core-splitter, and were then sent to a Vancouver laboratory for further preparation and analysis.

- Samples from holes DH93-1 to DH94-24 were prepared and analyzed at Bondar-Clegg in Vancouver.
- Samples of holes DH94-25 to DH95-50 were prepared at CDN Resource Laboratories and analyzed at Placer-Dome Research Center (PDI) in Vancouver.
- Samples of holes DH95-51 to DH96-237 were prepared on-site down to 350 g coarse rejects and were then sent to PDI Research Center for pulverization and analysis. The rejects are kept on-site for storage.
- Samples of holes DH-99-290 to DH 99-292 were prepared and assayed on site.
- Samples from DH-99-293 were prepared on site and sent to Laguna Gold laboratory for assaying.

15.2. Analyses

Bondar-Clegg analyzed the core samples for holes DH93-1 to DH94-24 and all rock, soil, and silt samples. The analytical method for Au was by fire assay of a 30 g aliquot with AA finish. Assay results that exceeded 10 ppm were re-analyzed by fire assay with gravimetric finish. Eight elements, including Ag, Cu, Pb, Zn, Mo, As, Sb, and Bi, were determined by Inductively Coupled Plasma (ICP). Hg was also analyzed by cold vapor AA finish. The high (>10 ppm) Ag values were re-analyzed using gravimetric finish.

The PDI Research Center analyzed the samples for holes DH94-25 to DH96-237. Au analysis was by fire assay, with AA finish initially on 25 g aliquots (DH94-25 to DH95-33) later increased to 50 g aliquots. All samples were also analyzed for 27 other elements using ICP. The high assay values for Ag (>10 ppm), Cu (>4000 ppm), and Mo (>1000 ppm) were re-analyzed. Samples from the 1999 drilling program were assayed on site (DH 99-290 to DH 99-292) (10 grs. AR/AA). Hole DH 99-293 was assayed using 50 grs (F.A./AA)

15.3. Security

As far as Geostat knows, there were no specific measures taken by PDI for security other than having an efficient system to log drill core and prepare samples on site quickly and efficiently. That system was set-up progressively between 1993 and 1994. The PDI laboratory rock standard probably stands above industry standard average. Geostat used the equipment installed by Placer Dome on location to prepare its own samples and was able to notice hands-on that the staff hired and trained by PDI was still available and performed well their duties.

In addition, the geologist had their office on site, leaving no gaps in supervision at the time of drilling between 1993 and 1999. See Figure 11, page 34. The only exception was the first campaign before the office construction on site which used the office in Coopvega for core logging. In addition, standard check samples were used systematically as well as internal and independent duplicates. That procedure is explained in more detail in the following section. The original core was sawed in 2 halves to keep a witness on site which was tested at least by IMC in 1999 and Geostat in 2005.

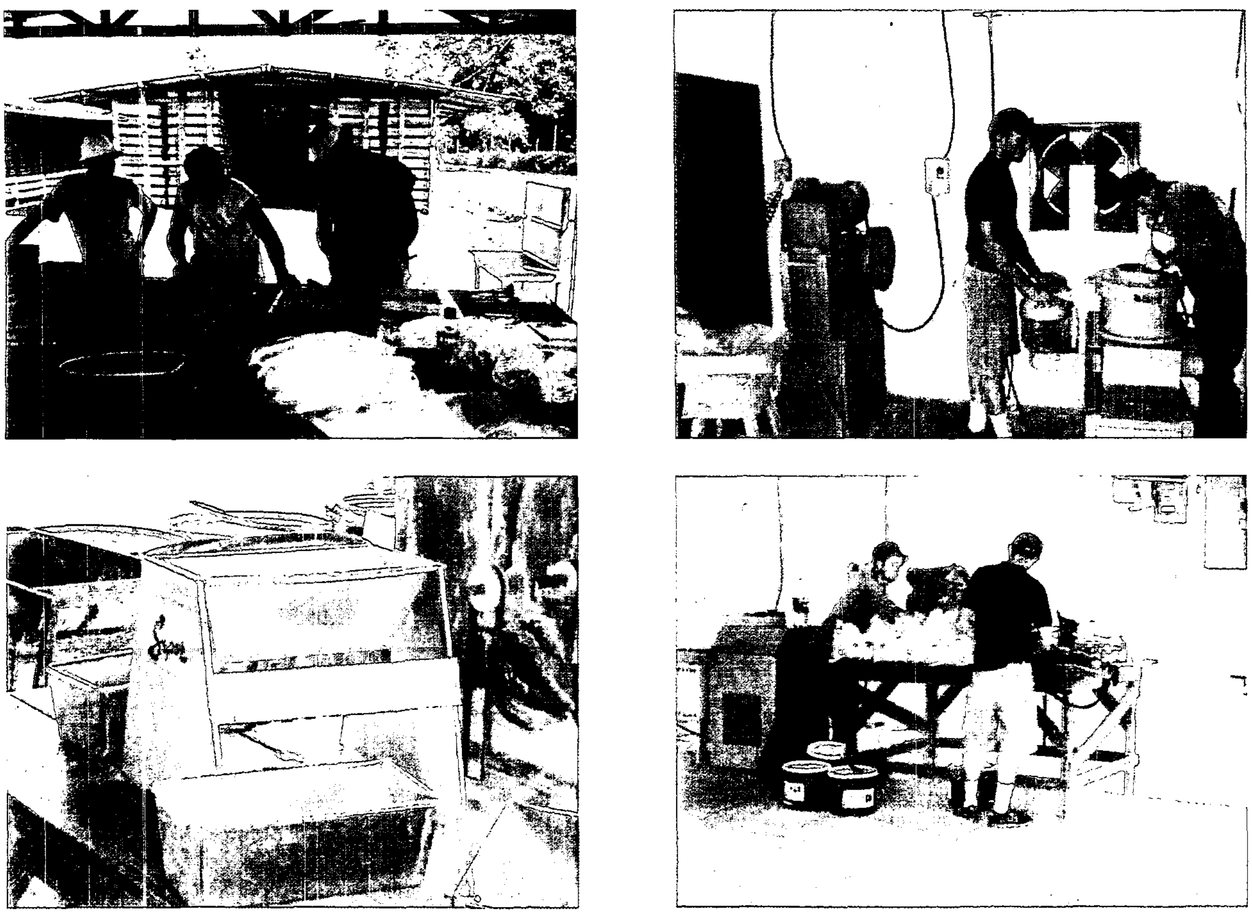


Figure 51 Pictures of the Sample Preparation Facilities on Site (2005)

16. Data Verification

16.1. Introduction

In 2005, Geostat received the data base for the Crucitas project as a Gemcom Project files set that had already been modified by Vannessa. The original Gemcom project directory bore the name Cambior_1999 and it included the drill hole database which did not change since 1999 as well as the block models produced both by Cambior and IMC in 1999. Vannessa started working on upgrading the geological model by adding the gold bearing steep dipping structures. Vannessa also verified the topography and other aspect of the model to insure the integrity of the information in this project file set.

Cambior reported in its Feasibility Study commissioned by Lyon Lake in 1999 that the database consists of a series of drill logs in GEOLOG format, and tabular summaries on ASCII flat files with all the relevant information (collar locations, survey data, lithological abbreviations, and gold and silver assays). The former series were imported into GEMCOM for Windows software, and a dozen holes were checked against the actual drill logs for importation accuracy.

There are 32,175 gold and silver assays ranging from 0 to 542g Au/t for gold, and 0 to 550g Ag/t for silver. Approximately 300 assays, or slightly less than 1% of the assay database, were examined against the Bondar-Clegg assay certificates for errors in data entry. No meaningful errors were found, except for five rounding errors from the conversion of parts per billion (ppb) results into g/t in the drill logs.

Examination of the survey data reveals that no collars were resurveyed for their final orientation and dip, and that all that was left were initial survey measurement and strings of Sperry Sun down-hole survey shots, which have been known to be plagued with problems and cannot be used to read a hole orientation near the casing. This introduces a small amount of uncertainty in the final location of the drill targets.

When available, core recovery values were read from the drill logs and incorporated into the database. The range of recoveries varies from 0% to 273%, though the upper values (>100%) may be typographical errors. Out of 32,175 recovery values ranging from 0 to 100%, less than 5% (748 values) fall below 50%, and the mean recovery is 87.5%.

Figure 34 below illustrates the behaviour of the average gold grade with variable core recoveries. It reveals no systematic trends either of increasing or decreasing gold grades with lower recoveries, and the fluctuation is well within a confidence interval of one standard deviation (±3.3 g/t).

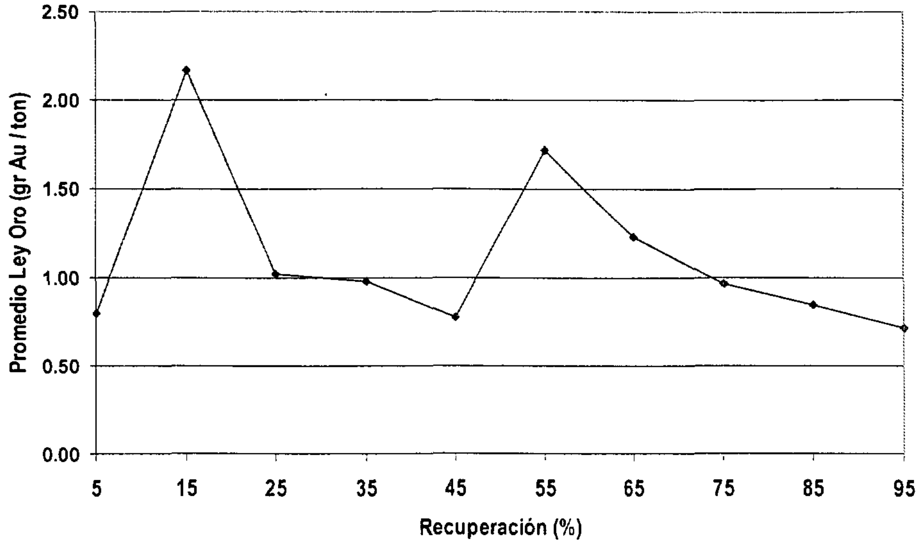


Figure 52 Gold Grade (left – Y axis) and Core Recovery (below – X axis)

16.2. Verification of Placer Dome Blanks and Standards

In 1999, the services of Independent Mining Consultants (IMC) were retained by Lyon Lake Mines Ltd. (LLL) to build a mineable reserve and mine model, and to run any checks it deemed necessary, during the course of the study, to validate the data. Placer Dome Inc (PDI) instituted a program to analyze blanks, checks, and standards during their exploration program. The PDI report, entitled Cerro Crucitas Project, Pre-Feasibility Study, Volume 1 Geology, summarizes the procedures adopted by Placer Dome procedures that were utilized. IMC could not specifically verify the application of the procedures, because they had been completed prior to the involvement of Lyon Lake or Cambior's Project & Construction Group (CPC) on the project. IMC did not, however, discover any evidence that would cast doubt on PDI description of procedures to collect and analyze checks, blanks, and standards. As an independent verificator, IMC collected samples while on site, and had them assayed by a third party laboratory under the direction of IMC personnel. The results of that work are summarized in the next sub-section. In 2005, Geostat did review this work and took 21check samples of its own in October 2005. Geostat findings are discussed at the end of this section (13.5) of the present report.

In 1999, IMC did obtain a copy of the PDI database containing checks, blanks, and standards during the site visit and was able to confirm PDI resulting statistical analysis based on the same information. The following description of PDI quality assurance and quality control (QA-QC) program is summarized from the PDI report. This discussion focuses on QA-QC for gold, since that is the only significant economic metal at Crucitas. Geostat reproduced and verified those results in its report to demonstrate that the data they used are valid, but neither Geostat nor IMC, were involved in the project when the data was being produced by PDI from 1993 to 1999. Core from drill holes DH93-1 through DH94-24 was split on site and sent to Bondar Clegg in Vancouver for preparation and assay. A Bondar-Clegg internal QA-QC program was implemented on the samples from drill holes DH93-1 through DH94-24 with "several standards and blanks randomly inserted into each work order". Assay techniques for gold utilized a 30 g aliquot. Duplicates of samples with values higher than 0.50 g Au/t showed a high variance due to an apparent nugget effect.

Drill Holes DH94-25 to DH95-50 were split on site, prepared at CDN Resource Laboratories, and assayed at the PDI Research Center laboratory. From Drill Hole DH94-25 to DH95-33, a 25 g aliquot was used for assay. From DH95-34 through DH96-237, a 50g aliquot was utilized. Beginning with drill holes DH95-25 through DH96-236, a field program of blind checks, blanks, and standards was implemented by PDI. For every set of 20 samples, a standard, a blank, and two duplicates were inserted. IMC has found a number of PDI reports that present the statistical analysis of the check, blank, and standard data. Those reports indicate acceptable statistical results. Geostat reviewed the blanks and standard results produced by PDI and basically agrees with their findings of IMC. **Geostat does not have the results of the duplicates.**

In 1999, IMC reports that "the duplicates consisted of two sets. The first set of data was a '*blind original*' sample inserted in the sample shipment. PDI text describes this as a second split of the preceding drill sample. This set is referred to as the '*Blind Original versus Blind Duplicate (Borg vs Bdup)*'. It is understood that this '*blind original*' was a second split of crushed material (about 350 g), since pulverizing was not performed on site." **Geostat did notice the presence of 'puck' type pulverizers on site. This is consistent with the fact that the standard samples inserted in batch of prepared samples destined to external assay laboratory came as pulverized material. See next sub-section 13.3 for more details.**

The PDI laboratory submitted a second group of duplicates to an outside laboratory for testing. This set was labeled "Internal Original versus Internal Duplicate (Iorg vis Idup). The Internal Duplicate sub-samples were submitted to an outside laboratory as a check on the PDI laboratory and consisted of a duplicate assay pulp. The International Plasma Laboratory (IPL) was used for the outside lab running the Idup samples. A series of roughly 1,088 samples were assayed by both AA finish and gravimetric finish as a check on the AA procedure. To verify the results, IMC utilized the data file obtained from the site, and checked the overall results from all data generated by PDI by combining and comparing all check, blank, and standard data issued from PDI QA-QC program into a common data file for evaluation, regardless of the drill sequence number. It turns out that IMC combined assay lots of different aliquots size into one set of data files for analysis, but this is believed to have little consequence on the overall validity of their analysis.

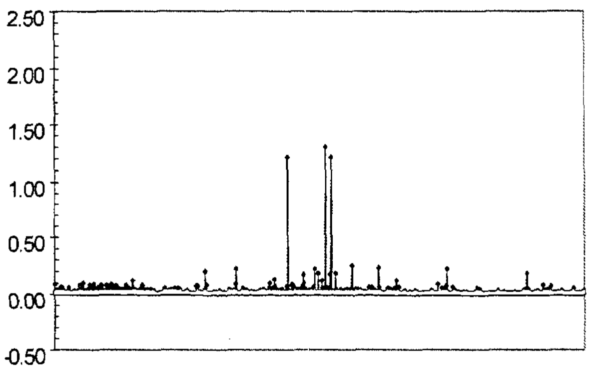
Figure 39 a) summarizes the response of 1,675 blanks that were inserted into the assay stream for analysis. All but three of the samples reported a waste or trace value from the assay procedures. The three values that reported grades greater than 1.2 g Au/t could have been mislabeled, or might reflect some cross contamination from other samples. This rate is less than 0.20% of the blank samples, and does not indicate a significant problem in reporting blank values.

Figure 39 (b) to (g) illustrates the results of all of the standard values reported by PDI. The observed trend is that the PDI assays were roughly 2 to 5 % lower than the standard values. The variance about the expected value is generally small for the check results. Higher-grade samples illustrate higher variance normally expected.

The minor bias, indicated by the standards results, implies that the PDI values are conservatively low compared with the standards values, and can consequently be used for the determination of reserves.

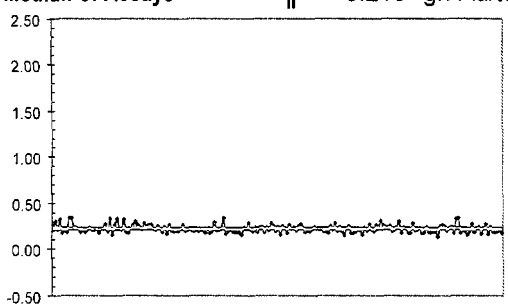
a) Blanks

Standard Nominal Value	0.000 gr. Au/ton.
Number of Assays	1 675
Median of Assays	0.017 gr. Au/ton.



b) Standard 2

Standard Nominal Value	0.220 gr. Au/ton
Number of Assays	198
Median of Assays	0.219 gr. Au/ton



c) Standard 3

Standard Nominal Value	0.830 gr. Au/ton.
Number of Assays	244
Median of Assays	0.797 gr. Au/ton.

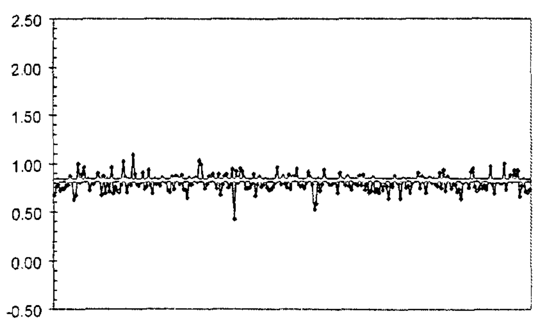
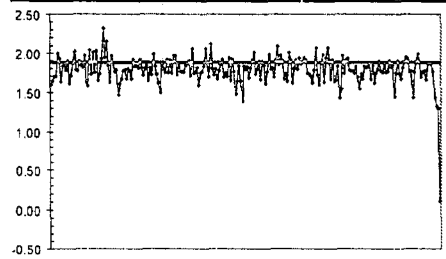


Figure 53 Blanks and Standards Assays

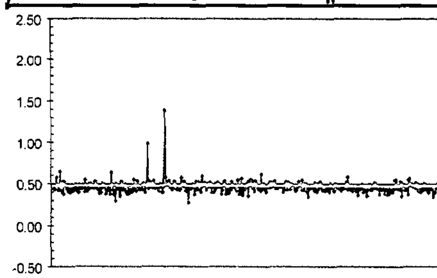
d) Standard 4

Standard Nominal Value	1.880 gr. Au/ton
Number of Assays	233
Median of Assays	1.783 gr. Au/ton



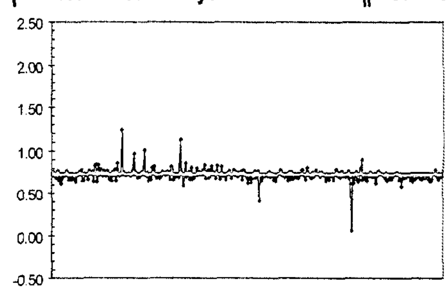
e) Standard 5

Standard Nominal Value	0.480 gr. Au/ton
Number of Assays	435
Median of Assays	0.458 gr. Au/ton



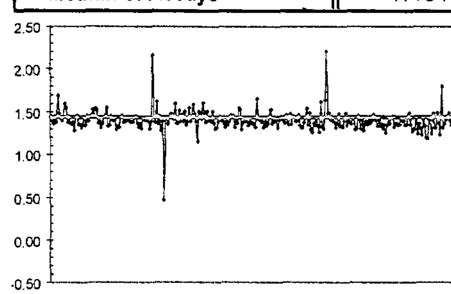
f) Standard 6

Standard Nominal Value	0.730 gr. Au/ton
Number of Assays	350
Median of Assays	0.720 gr. Au/ton



g) Standard 7

Standard Nominal Value	1.440 gr. Au/ton.
Number of Assays	291
Median of Assays	1.401 gr. Au/ton.



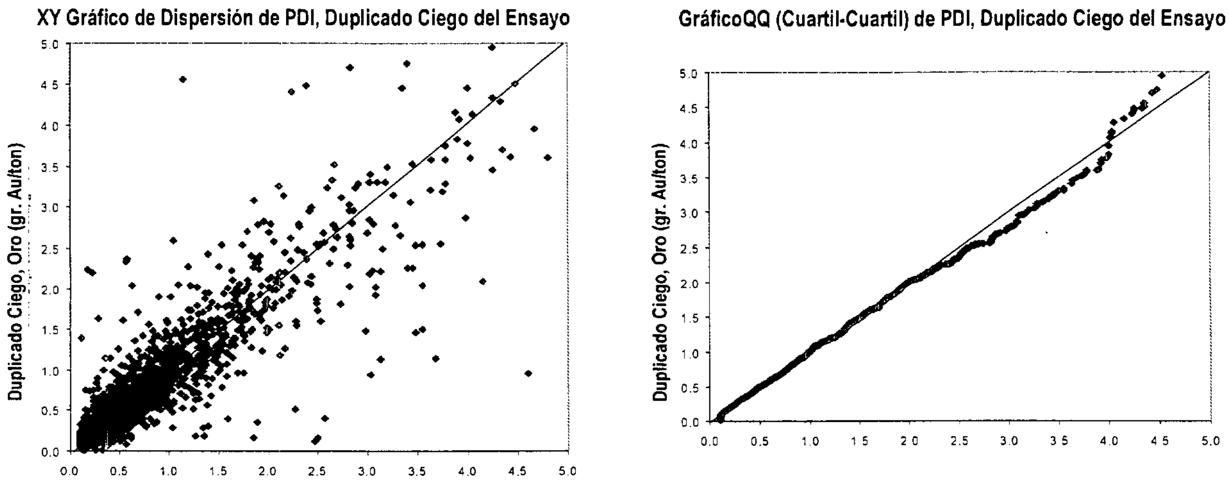
16.3. Placer Dome Verified Duplicate Assays

In 1999, the duplicate analysis completed by PDI was reviewed by IMC by tabulating XY scatter plots and QQ population plots for both the blind duplicates and the internal duplicates. Figure 54 summarizes the results of the blind duplicates, and Figure 55 illustrates the results of the internal duplicates. **Geostat did not have this data at the time of writing this report, but it reproduces the findings of IMC here since the reproducibility of sample results is important to demonstrate.**

The data range within the blind duplicate check (crushed material to the same lab) ranges from 0.01 to values over 100 g Au/t. In order to focus on the meaningful range of data, the mean value was calculated above 0.10 g Au/t, and the values were plotted from 0.10 to 5.0 g Au/t. The XY scatter plot illustrates the high degree of variance in preparation of a data split. There is, however, no evidence of bias between the two sample sets. The QQ plot of the ranked (not paired) data illustrates a general 1 to 1 correlation between the two data sets.

Figure 55 summarizes the results of the internal checks submitted to an external lab. IMC holds the opinion that these are likely duplicate pulp samples rather than crushed material as in the previous data set. As should be expected, the variation of the sample pairs is substantially less than in the blind samples. There are a few "outlier" samples that may be explained by "coarse gold" or simple mislabeling of samples. Comparison of means, and review of the QQ plot indicates that the original assay is, on the average, about 1% less than the outside duplicate. This level of bias is too small to quantify with this database. In summary, there is no apparent bias between the internal original and internal duplicate samples.

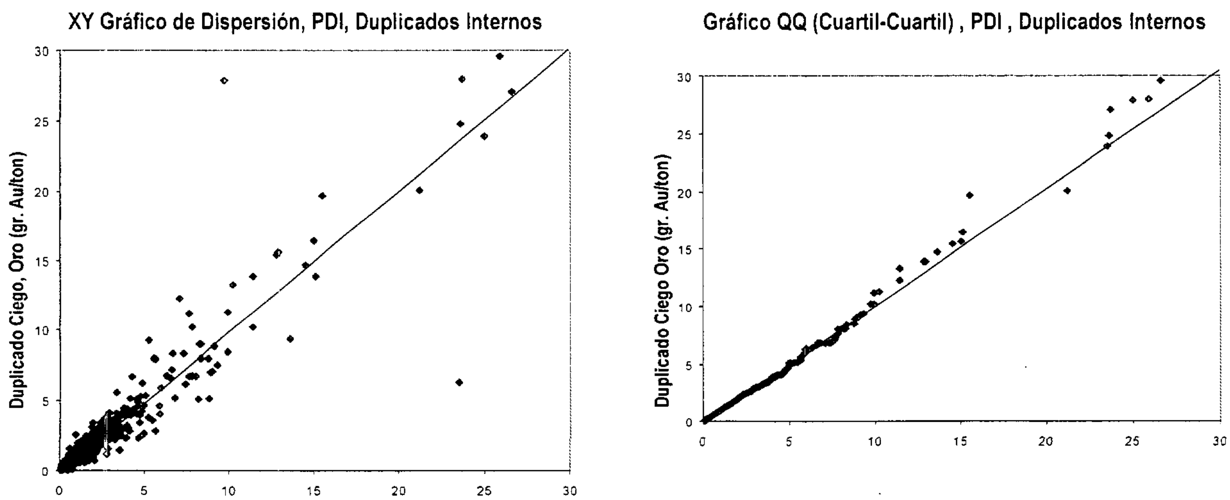
All of the project data and all of the QA-QC evaluation of the data were from the single source of PDI. Although all information reviewed by IMC indicates that the data set is reliable, an independent confirmation of the presence of gold mineralization at Crucitas was completed by IMC in 1999 and by Geostat in 2005 with independent assays. These exercises are discussed in the next two sub-sections.



Estadísticas Básicas para Todos los Pares		
	Original Oro gr. Au/ton	*Duplicado* Oro gr. Au/ton
Número	3 427	3 427
Media gr. Au/ton	0.692	0.724
Desviación Estándar	1.890	2.616
Max gr. Au/ton	44.40	100.00
Min gr. Au/ton	0.01	0.01

Estadísticas Básicas - Original > 0.10 gr. Au/ton		
	Original Oro gr. Au/ton	*Duplicado* Oro gr. Au/ton
Número	2 558	2 558
Media gr. Au/ton	0.913	0.914
Desviación Estándar	2.143	2.263
Max gr. Au/ton	44.40	41.20
Min gr. Au/ton	0.10	0.01

Figure 54 Placer Dome Blind Duplicate Assay Results (from crushed material)



Estadisticas Básicas para todos los Pares		
	Original Oro gr. Au/ton	*Duplicado* Oro gr. Au/ton
Numero	2 024	2 024
Media gr. Au/ton	1.275	1.291
Desviación Estándar	7.536	7.829
Max gr. Au/ton	217.00	249.00
Min gr. Au/ton	0.01	0.01

Estadisticas Básicas - Original > 0.10 gr. Au/ton		
	Original Oro gr. Au/ton	*Duplicado* Oro gr. Au/ton
Numero	1 538	1 538
Media gr. Au/ton	1.667	1.688
Desviación Estándar	8.608	8.946
Max gr. Au/ton	217.00	249.00
Min gr. Au/ton	0.10	0.01

Figure 55 Placer Dome Internal Duplicate Assay Results (from pulverized material)

16.4. Independent Verification of Gold Occurrence by IMC (1999)

IMC completed an independent verification of the presence of gold mineralization at the Crucitas Project by collecting samples from core and coarse rejects stored on site. This test was not designed to validate the resource or average deposit grade. Neither was it designed to validate the sampling and assaying procedures utilized by PDI. Its objective was to confirm the presence of gold only, and to identify any significant differences within the test intervals between PDI's and IMC's independent results.

IMC collected 30 samples from the existing split drill core or diamond drill coarse rejects stored on site at Crucitas. The list of samples was generated by IMC while on site; hence, there was no opportunity for sample modification prior to their collection. IMC personnel accompanied LLL sample handlers as the samples were pulled from core trays or from coarse reject storage. IMC personnel observed and assisted in the sample preparation and handling. Sample numbering, recording, bagging, and preparation for shipment was prepared by IMC engineers. The samples were checked as baggage on the same flights as the IMC site visit personnel, and were under IMC control until delivered to the sample preparation laboratory.

IMC selected the samples to be representative of the range of deposit gold grades. More emphasis was placed on sampling of "ore grade" mineralization as opposed to waste, because of the obvious economic impacts. Waste samples were included, however, to obtain some understanding of the original assay ability to categorize ore and waste.

Hard rock and saprolite samples are represented on the list. Five of the saprolite samples had been crushed completely by PDI, and stored as coarse rejects. They have been coded with an "R" on Table 3.5. The coarse rejects were poured through a Jones splitter a number of times until roughly 1 kg of sample was bagged for the IMC sample.

Hard rock or saprock samples were obtained by sawing the existing half core with a diamond saw to obtain a ¼ core sample, leaving ¼ in the core tray. If the core sample was not intact, it was split by hand, by dividing the loose material in half longitudinally with a spoon half placed in a sample bag. Samples that were sawn were dried on site at 100° C for roughly 1 to 2 hours.

The samples were delivered by IMC to Metcon Research, Inc. of Tucson, Arizona for sample preparation. All samples were crushed to 10 mesh, and split to obtain roughly 1 kg. The entire 1 kg was pulverized by a ring and puck pulverizer. The pulp was rolled, and about 150 g was sent to Skyline Laboratories, of Tucson, Arizona for Fire Assay. Skyline fire assayed a 50g aliquot with a gravimetric finish. The 50 g aliquot is the same size as recorded in the later PDI assay procedure descriptions. The original sample value was not provided to Metcon or Skyline. IMC did provide Metcon with a broad range of expected assay result to assure proper selection of assay finish.

In summary, the IMC check assay procedure does validate the presence of gold in the 30 samples tested. In addition, a statistical analysis of the results indicates that the mean grade of the 29 samples in the original data base, and the mean grade of the 29 test results are not sufficiently different to be rejected as different values. One sample was removed from the test because it was a high outlier value in the check assay results.

Results of the assay checks are presented on Table 10. The original value from the assay database is shown adjacent to the check assay result. Sample IMC-1 was reported in the database at a value of

1.90 g Au/t. The check result was 28 g Au/t, which implies some degree of "nugget effect", may exist in the deposit. This very high value outlier was removed from any further statistical calculations by IMC.

The mean, variance, and standard deviation of the original and check values are shown on the bottom of the table. The mean gold value for the 29 samples utilized were 1.65 g/t for the original set and, 1.48 g/t for the check data set: a difference of 9.8%.

IMC prepared two statistical tests of the means of the two sample sets being tested:

A Paired "t" statistic;
The "Smith-Satterthwaite Statistic" (SWT).

The results of both tests are distributed according to the Students "t" distribution, with 28 degrees of freedom and 55 degrees of freedom respectively. In summary, the Paired "t" and the SWT would have to be greater than about 2.0 to prove that the mean of the two data sets are different (with a 90% confidence). Since both of the statistics are less than 2.0 for both gold and silver, the test indicates that the means are sufficiently close to be acceptable.

Table 10 Results of Independent Assay Check for Gold and Silver - IMC 1999

Results of Independent Assay Check for Gold and Silver
Core Samples Collected by IMC on 25 March 1999

IMC Number	DH Number	From Meters	To Meters	C=Core R=Coarse Reject	Original Sample No.	Tag Sample No. for Preparation	Original Data Base Au Grade g/tonne	Metcon Prep Skyline Assay Fire Assay g/tonne	Original Data Base Ag Grade g/tonne	Metcon Prep Skyline Assay Fire Assay g/tonne
IMC 1	DH-55	16.80	18.10	C	27224	89651	1.90	28.00	0.20	27.00
	Outlier Response of Above Sample Eliminated from Calculation of Mean and Variance									
IMC 2	DH-55	27.15	28.10	C	27236	89652	1.22	0.60	2.60	2.00
IMC 3	DH-55	36.75	38.15	C	27247	89666	7.56	9.50	8.00	8.00
IMC 4	DH-55	46.90	47.90	C	27258	89664	1.17	1.15	15.00	10.00
IMC 5	DH-149	66.95	67.75	C	41816	89655	1.09	1.65	3.50	4.00
IMC 6	DH-149	88.90	89.90	C	41846	89654	1.07	0.60	2.10	2.00
IMC 7	DH-149	111.30	112.70	C	41877	89653	0.61	0.50	2.10	0.50
IMC 8	DH-149	133.10	134.75	C	41907	89657	1.05	0.40	1.10	1.00
IMC 9	DH-149	155.70	156.70	C	41937	89656	4.22	2.35	5.40	7.00
IMC 31	DH-149	98.40	99.40	C	41859	89665	1.48	2.35	1.70	2.00
IMC 32	DH-149	121.20	122.00	C	41891	89667	0.22	0.20	0.90	1.00
IMC 10	DH-24	23.60	25.50	C	2603	89659	1.76	2.05	4.70	3.00
IMC 11	DH-24	47.45	48.90	C	2618	89658	4.47	2.00	6.30	4.00
IMC 12	DH-24	79.19	80.69	C	2640	89661	0.38	0.35	4.00	2.00
IMC 13	DH-50	18.60	19.70	C	26577	89660	4.12	1.80	8.00	4.00
IMC 14	DH-50	36.90	37.95	C	26598	89662	0.83	0.85	0.20	0.50
IMC 15	DH-134	35.40	36.30	R	38571	99431	0.24	0.25	0.40	0.50
IMC 16	DH-134	57.60	58.25	C	38604	89668	3.90	2.65	3.60	3.00
IMC 17	DH-134	84.80	85.80	C	38638	89669	0.45	1.00	2.70	3.00
IMC 18	DH-134	111.60	112.40	C	38672	89670	0.93	1.20	3.20	3.00
IMC 19	DH-48	11.55	12.75	C	26168	89673	2.19	2.65	0.20	0.50
IMC 20	DH-48	27.20	27.90	C	26189	89674	0.60	0.55	0.10	0.50
IMC 23	DH-2	29.42	30.92	C	1092	89671	1.27	2.20	3.20	7.00
IMC 24	DH-2	59.95	61.42	C	1112	89672	0.44	0.20	5.40	3.00
IMC 25	DH-2	72.10	73.12	C	1120	89675	0.26	0.50	2.60	0.50
IMC 26	DH-2	117.80	119.27	C	1152	99426	0.38	0.55	2.50	1.00
IMC 27	DH-175	12.20	13.70	R	52754	99428	1.96	1.20	0.20	0.50
IMC 28	DH-175	27.40	28.70	R	52774	99430	0.03	0.03	0.60	0.50
IMC 29	DH-175	47.20	48.80	R	52794	99429	2.34	1.90	1.30	2.00
IMC 30	DH-175	68.30	69.60	R	52814	99427	1.20	1.55	6.00	6.00
						Number	29.00	29.00	29.00	29.00
						Mean	1.64	1.48	3.37	2.83
						Variance	2.91	3.05	10.19	6.58
						Std Dev	1.71	1.75	3.19	2.56

Hypothesis Test Parameters for 29 Sample Pairs	Original Versus Check Gold	Original Versus Check Silver
Paired "t"	0.931	1.725
Smith-Satterthwaite	0.355	0.707

16.5. Independent Verification of Gold Occurrence by Geostat (2005)

Like IMC, Geostat completed an independent verification of the presence of gold mineralization at the Crucitas Project by collecting samples from core stored on site. This test was not designed to validate the resource or average deposit grade. Neither was it designed to validate the sampling and assaying procedures utilized by PDI. Its objective was to confirm the presence of gold only, and to identify any significant differences within the test intervals between PDI's and Geostat's independent results.

Geostat collected 21 samples: 18 from the existing split drill core and 3 standard samples stored on site at Crucitas. The list of samples was generated by Geostat while on site; hence, there was no opportunity for sample tempering prior to their collection. Geostat personnel accompanied Vannessa sample handlers as the samples were pulled from core trays storage. Geostat's personnel observed and assisted in the sample preparation and handling. Sample numbering, recording, bagging, and preparation for shipment was prepared by Geostat engineer. The samples were checked as baggage on the same flights as the Geostat site visit personnel, and remained under Geostat control until delivered to the sample preparation and assay laboratory back in Canada.

Geostat selected the samples to be representative of the range of deposit gold grades. More emphasis was placed on sampling of "ore grade" mineralization as opposed to waste, because of the obvious economic impacts. Waste samples were not included. Three samples using PDI Laboratory Standards were taken on site to verify the reliability of grade reproduction of samples.

Hard rock and saprolite samples are represented on the list. Saprolite is more difficult to find in the core boxes today because it has been the object of repetitive sampling from third party interest and for metallurgical testing. Because saprolite is often loose material, some of those samples were bagged like the auger samples which make them more difficult to retrieve as they were piled between core racks, under the same roof. After some 10 years of storage, some bags are prone to tear. After multiple unsuccessful attempts to get samples of saprolite near surface in the core boxes, the shallowest samples of saprolite were taken at some 47 m down the hole. Therefore, the samples taken of the saprolite probably represent more saprock than laterite at that depth. The Litho field in Table 11 gives the type of material sampled according to the drill log.

Hard rock or saprock samples were obtained by splitting the existing sawed half core with a core splitter instead of a diamond saw, which was out of commission, to obtain a ¼ core sample, leaving ¼ in the core tray. If a half-core sample appeared crushed, it was split by hand, by dividing the loose material in half longitudinally with a spoon half placed in a sample bag. Samples were dry enough to be crushed directly in the jaw crusher followed by a cone crusher to be reduced to sand. All samples were then poured through a Jones splitter until roughly 300 g of sample was obtained and bagged for the Geostat sample (using a scale). The rejects were kept in storage at the mine for later verification, if required, and to provide an eventual backup. The 3 standard samples (# 3, 14 and 18) were already pulverized, but the 18 other samples were not when delivered by Geostat to the laboratory.

The samples were delivered by Geostat to ALS Chemex Laboratories in Val d'Or (Quebec, Canada) for sample preparation and assaying using a 50 g aliquot. A 100 g portion of the 300 g sent to the ASL laboratory was sent after preparation (pulverization for homogenization) to the Boulamaque Laboratory in Val d'Or for assaying of 2 portions of 1 assay-ton (30 g). All samples were analysed using fire assay and finished by gravimetry - for gold and AA for silver - at both laboratories. Geostat did provide both laboratories with a broad range of expected assay result to assure proper selection of assay finish.

In summary, the Geostat check assay procedure does validate the presence of gold in 20 samples and no gold in the blank standard sample (#3) tested. In addition, a statistical analysis of the results using the Student Test indicates that the mean grade of the 18 samples in the original data base, and the mean grade of the 18 test results for the 2 laboratories used by Geostat are not sufficiently different to be rejected as different values. The majority of check samples gave results similar to the original values both for gold and silver and each individual paires. However, the duplicate assays from both laboratories chosen by Geostat, ALS Chemex and Bourlamaque Laboratories, presented much less difference than compared with the original assays. The later indicate that the nature of the ore at Crucitas, while "nuggety", allow assay results to be repeated relatively easily for a gold ore.

The strongest differences in gold grade assayed (check samples # 2, 8, 10, 11, 17 and 21) are induced by the difference in the method of sampling and the coarse grain nature of gold found in the samples. Gold grain size variations are not usually measured directly in individual samples but indirectly using semi-variograms. While the sampling variance is increased significantly by taking ¼ of the core instead of ½ of the core in the original samples, as well as by splitting the core instead of sawing it in two, the results from Geostat samples are deemed comparable to the original PDI assays. Check samples verify well the data 12 times out of 18 assays for both gold and silver.

Results of the assay checks are presented on Table 11. The original value from the assay database is shown adjacent (left) to the check assay result. In fact, the assay results obtained for the same check samples by two independent laboratories, ALS and Bourlamaque, match very well for an epithermal gold deposit of relatively low grade. In addition, the Bourlamaque double assays using 30g aliquot also demonstrate a relatively high efficiency to determine gold grade of the Crucitas ore type with a single standard fire assay using a 30 g aliquot. See Table 12. These results of the check samples program are sufficient to say the assays in Vannessa database are reliable based on a limited verification exercise, according to the mining industry standard and practice.

While the data is likely to have been correctly sampled and assayed, our limited check sample program shows that 1 time in every 3 assays, the assays are likely to differ by more than double, even triple the value of gold when comparing results from the same location in the same core and at the same depth in the drill holes. This illustrates the 'nugget effect' resulting from having very few but relatively coarse grains of gold and silver in the samples. These results and their variance are what we would expect for this type of mineralization.

The lack of repeatability in gold sample assays, if acceptable by standard industry practice, does imply that any grade distribution model derived from these samples will inherit some inaccuracy which cannot be resolved with the existing data, no matter how sophisticated the modelling method. Only sampling method apparent to mining production could improve our knowledge of the quality of existing data results. A mineralogical study can characterize the distribution of gold grain size at the microscopic scale with or without metallurgical testing to support it. Alternatively, systematic sampling on a small but tight grid (10m by 10m) like a blast hole pattern - ideally inclined so to cut across the structural fabric of the mineralization - can verify the accuracy of grade interpolation using the current samples. Geostat will discuss mineralogy in Section 15 and sampling in Section 18 and 19.

Table 11 Results of Independent Assay Check for Gold and Silver - Geostat 2005

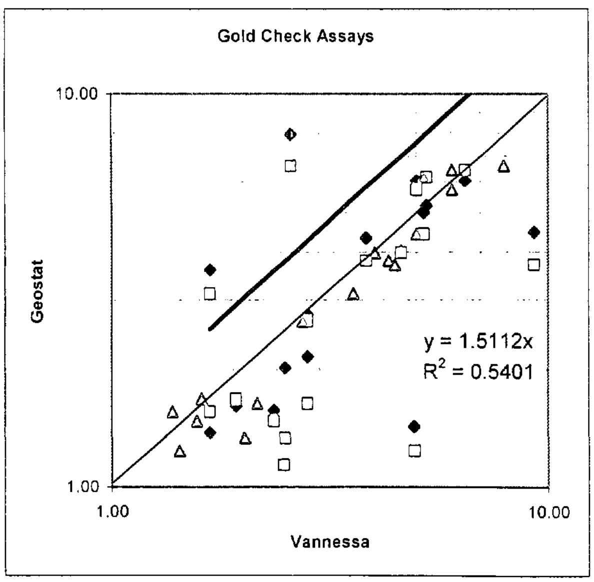
Check Samples Program **October 2005**

By Geostat **for Vannessa Ventures Ltd** **Crucitas project**

								PDI original		ALS Chemex		Bourlamaque	
Rec	Section	Area	Hole-ID	From	To	Sample no	Litho	Au	Ag	Au	Ag	Au	Ag
3		Fortuna	STD1			3		0.02	0.0	0.00	0.0	0.00	0.0
14		Fortuna	STD8A (5)			14		0.57	3.4	0.57	3.4	0.52	4.0
18		Botijas	STD10 (7)			18		1.42	2.8	1.42	2.8	1.77	3.0
1	316000	Fortuna	DH96-160	121.20	122.30	1	FELD	1.68	26.0	1.38	17.4	1.56	18.0
2		Fortuna	DH96-150	86.00	87.50	2	FELD	1.68	12.0	3.59	6.6	3.12	5.0
4		Fortuna	DH96-219	53.30	54.60	4	FELD	1.93	6.0	1.61	4.3	1.68	4.0
5		Fortuna	DH96-219	49.20	50.65	5	FELD	5.20	15.0	5.01	13.9	4.44	17.0
6		Fortuna	DH96-219	138.40	139.40	6	PCT	2.36	4.4	1.57	4.1	1.48	4.0
7		Fortuna	DH96-219	139.40	140.60	7	PCT	2.82	5.1	2.75	4.6	2.66	5.0
8		Fortuna	DH96-166	47.20	48.20	8	FELD	2.58	1.6	7.93	3.4	6.60	4.0
9	315900	Fortuna	DH96-154	47.20	48.60	9	FELD	4.62	14.0	4.02	15.8	3.98	17.0
10		Fortuna	DH96-154	60.60	61.40	10	FELD	4.94	14.0	1.43	10.5	1.24	11.0
11		Fortuna	DH96-153	67.30	68.00	11	FELD	12.90	29.0	36.40	75.0	40.04	49.0
12		Fortuna	DH96-156	30.00	31.00	12	SPAK	5.28	5.5	5.21	3.3	6.17	8.0
13		Fortuna	DH96-218	109.20	110.30	13	DAC	2.82	5.4	2.16	4.5	1.64	5.0
15		Fortuna	DH96-136	99.40	101.70	15	DAC	6.46	15.0	6.03	6.7	6.44	7.0
16		Botijas	DH96-177	97.20	98.50	16	LBT	3.84	10.0	4.33	12.7	3.80	12.0
17		Botijas	DH96-177	98.50	99.40	17	LAP	2.50	24.0	2.02	26.4	1.34	27.0
19		Botijas	DH93-1	87.25	88.76	19	LAT	5.01	9.1	6.03	3.6	5.72	5.0
20		Botijas	DH95-126	104.60	105.80	20	DAC	2.48	10.0	0.95	1.4	1.14	2.0
21		Botijas	DH95-63	80.90	81.90	21	LAT	9.30	24.0	4.47	25.5	3.70	27.0
Student Test : au/au and ag/ag (Greater than 2 mean significant difference)								0.61	0.91	1.00	0.89	0.65	0.96

5.32 strong individual difference in triplet

2.48 high individual difference in triplet



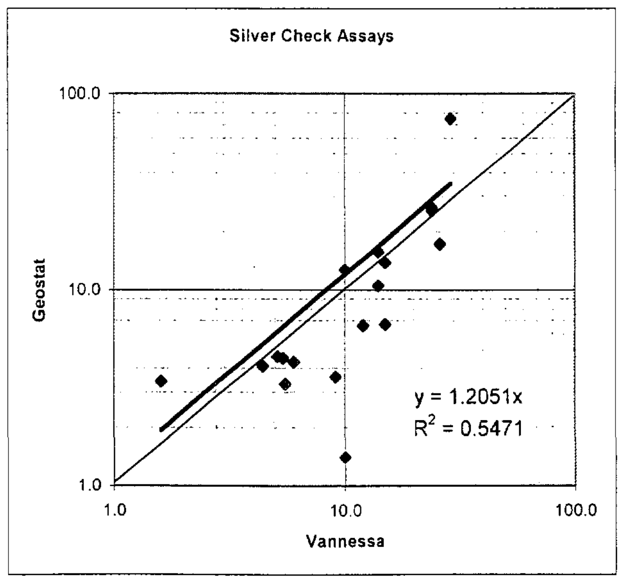
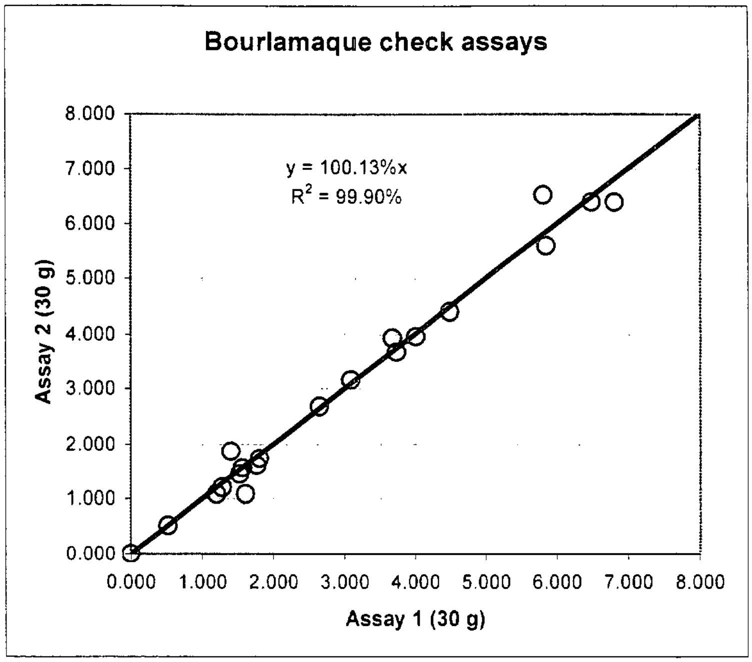


Table 12 Bourlamaque Comparative Results

Bourlamaque (double 30g aliquot)

Sample	Au g/t	Au2	au_avg	Ag g/t
CV-01	1.560	1.560	1.560	18
CV-02	3.080	3.160	3.120	5
CV-03	0.000	0.000	0.000	0
CV-04	1.760	1.600	1.680	4
CV-05	4.480	4.400	4.440	17
CV-06	1.520	1.440	1.480	4
CV-07	2.640	2.680	2.660	5
CV-08	6.800	6.400	6.600	4
CV-09	4.000	3.960	3.980	17
CV-10	1.280	1.200	1.240	11
CV-11	40.000	40.080	40.040	49
CV-12	5.800	6.530	6.165	8
CV-13	1.400	1.870	1.635	5
CV-14	0.520	0.520	0.520	4
CV-15	6.480	6.400	6.440	7
CV-16	3.670	3.930	3.800	12
CV-17	1.600	1.080	1.340	27
CV-18	1.800	1.730	1.765	3
CV-19	5.840	5.600	5.720	5
CV-20	1.200	1.080	1.140	2
CV-21	3.730	3.670	3.700	27



16.6. Diamond Drilling Versus Auger Drilling

PDI drilled a series of Auger drill holes in saprolite zones of the deposit. These were labelled the "SP" series holes and they surround the diamond-drilled area of the deposit; however, the majority of these SP holes are north of the main zones of Fortuna and Botija, which indicates the presence of ore grade mineralization in the saprolite. In 1999, IMC completed a brief test of the SP hole data by comparing them with the nearest diamond drill result within the same saprolite unit.

The procedure was as follows: For each SP Hole assay, the nearest diamond drill hole (DDH) assay was found, maximum search parameters were set in increasing increments from 10 to 100 m spacing between the two data types, basic statistics of the SP and DDH holes were compared; and "t" statistic comparisons of mean values were completed. The comparison was then repeated with 6 m composites.

The test results found only 16 pairs of assay spaced closer than 30 m apart. There were 54 pairs at 40 m spacing, and 107 pairs at 50 m spacing. Table 13 summarizes the results at those two maximum spacings, since there are too few pairs for statistical comparison at closer spacings.

Table 13 Nearest Neighbor Comparison Auger SSP Holes to Diamond DDH Holes

Maximum Separation Meters	Number of Pairs	SP Assays		DDH Assays		"t" Statistic	"t" Degrees of Freedom	Paired "t" Statistic	"t" Degrees of Freedom
		Mean g Au/t	Variance	Mean g Au/t	Variance				
Assays									
40	54	0.856	1.543	0.855	2.503	0.006	100.3	000.3	53
50	107	0.678	1.375	0.722	1.602	0.268	210.8	0.182	106
Composites									
40	8	0.803	0.273	0.731	0.356	0.255	13.8	0.474	7
50	107	0.652	0.476	0.674	0.341	0.103	33.1	0.146	17

The results of the hypothesis test are unclear, considering the few samples and the high variance of the small sample set. IMC expressed the opinion they had the impression that the Auger "SP" holes were possibly losing gold compared with the diamond drill holes, possibly because it is difficult to recover Qtz vein fragments with the auger.

IMC's review of PDI's documentation was unclear regarding the sample protocols for the Auger holes. The Auger holes are also generally spaced 100 m apart (wider than the statistical range in the NS direction). These two factors along with the uncertain statistical comparison have led IMC to form the opinion that the SP holes should not be included within the calculations of measured and indicated resources or reserves.

The Auger "SP" holes will be used to make an estimate of potential saprolite resources at the "inferred" level of confidence, but the measured and indicated resources and potential reserves will be based on the diamond drilling information only.

Geostat finds the spacing between Auger holes much too large to draw any conclusion at this stage. Furthermore, the existing Auger data does not support well the geological model that implies gold spread through lithology assuming continuity nearing 100 meters. See Section 14.

16.7. Rock Codes

Geostat has verified the rock codes used in the current block model. PDI reportedly used 21 rock codes to represent the lithology in core logging. We found several set of rock codes and rock names in the tables for assays and composites, including one by IMC with 7 rock codes.

The current block model uses only 14 rock codes to represent the lithology. Geostat has compared the rock codes with the lithology on sections and plan views and found the rock codes to match the lithology. This is not a valid test since the current lithology was drawn from the rock codes in the block model, but the lithology does match that in the documents and previous reports produced by PDI and IMC, as well as the drill logs in the Gemcom database within the accuracy of the block model (5 x 5 x 5m). The following Table shows the basic rock codes with respect to lithology only and some statistics based on the 2m composites. It excludes the presence of the cross cutting structures which is documented in Table 7, Table 8 and Table 9 using 1m composites.

Table 14 List of Rock Names and Rock Codes

File name	Rock name	Rock code	Type cmp	Number of composites	Med Au (g/t)	Avrg Au (g/t)
Fortuna SAPK	Saprolite and rock	1	2m	2,720	**0.52**	**1.28**
Fortuna FDCA	Felsic Dome A	2	2m	2,078	**0.68**	**1.32**
Fortuna FDCB	Felsic Dome B	3	2m	863	**0.36**	**0.72**
Fortuna PCT	Pyroclastics	4	2m	4,157	**0.32**	**0.70**
Fortuna BVOL	Basic Volcanics	5	2m	715	0.02	0.14
Fortuna DIAB	Diabase Intrusive dyke	6	2m	177	0.01	0.07
Fuentes VOL	Volcanics (Fuentes)	7	2m	1,422	**0.25**	0.57
All Fortuna+Fu		*1-7*	*2m*	*12,132*		0.88
Botijas SAP	Saprolite	8	2m	749	**0.83**	**1.60**
Botijas SPK	Saprolite and rock	9	2m	258	**0.50**	**1.09**
Botijas FDCA	Felsic Dome A	10	2m	199	**0.32**	**0.59**
Botijas FDCB	Felsic Dome B	11	2m	778	**0.36**	**0.77**
Botijas PCT	Pyroclastics	12	2m	1700	**0.33**	**0.59**
Botijas BVOL	Basic Volcanics	13	2m	822	0.03	0.11
All Botijas		*8-13*	*2m*	*4506*		*0.73*
Undefined		14	2m	1138	0.01	0.10
Air		500	2m	251	0.01	0.11
2mau_all.cmp		**1-14 +500**	**2m**	**18,027**	0.31	**0.78**

17. Adjacent Properties

Costa Rica does not have a well developed mining industry, but modern exploration for gold has increased in the last 20 years. Among the projects of interest, there are the usual small scale gold miners and some other relatively small projects as described below.

17.1. South Pacific Coast small scale miners

Small scale gold mining such as gold panning in rivers is reported in various areas in Costa Rica. The main area known to have more continuous activity of this kind is the South Pacific Coast, near Panama. There is tunnelling gold mining in the area of Abangares also.

On the Pacific coast, the following Canadian mining companies were present in the last 20 years:

1) Las Lilas Mining Project in Quebrada Grande de Liberia, owner of the subsidiary Tierra Colorada S.A of Barrick Gold, a Canadian company;
2) Mining Rio Chiquito de Tilaran, owned by Corporation Minerals Mallon S.A, a subsidiary of the Canadian Mallon Minerals. Newmont Mining was also involved in exploring the property (Mining Magazine, March 1992:179);
3) Mining La Union, in La Union of Montes de Oro, owned by Minerales La Union S.A, a Canadian subsidiary;
4) Mining Beta Vargas in La Pita de Chomes, Puntareanas and San Juan of Abangares-Guanacaste, owned by the subsidary Novontar S.A of Lyon Lake Mines of Canada;
5) Ariel Resources Ltd, in La Junta de Abangares, the oldest Canadian mining in Costa Rica, extracts gold through three subsidiaries:
    a. Mining Tres Hermanos, operated by el Valiente Ascari;
    b. Mining San Martin, operated by Mining of Sierra Alta S.A; and,
    c. Mining El Recio, operated by Minera Silencio S.A.

17.2. Beta Vargas

Beta Vargas is a small gold mine located La Pita de Chomes, Puntareanas and San Juan of Abangares-Guanacaste that was developed and put into production by Lyon Lake Ltd in the 1990's. This mine reportedly extracted 60,000 ounces of gold. Lyon Lake acquired the Crucitas project from PDI in 1999 and passed it along to Vannessa in May 2000.

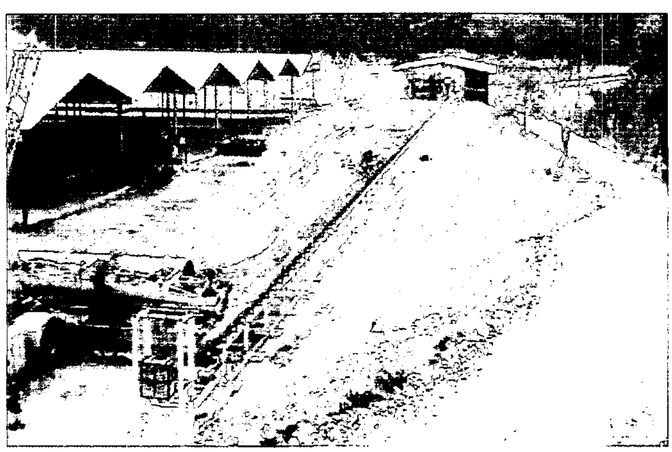


Figure 56 Beta Vargas Gold Mine

18. Mineral Processing and Metallurgical Testing

18.1. Milling

The Crucitas project is not and has not been in production yet. The camp site comprises various basic infrastructures but it does not include any mineral beneficiation or processing facilities. However, the Crucitas ore grade material has been carefully characterised and subjected to various ore dressing and metallurgical studies. Placer Dome conducted a 4 phase testing program between 1995 and 1996 using in-house expertise and facilities outside Costa Rica. Vannessa added its own limited metallurgical testing.

18.2. Metallurgical Testing

The metallurgical process consists basically in liberating and recovering gold and silver from its rock gangue. In the case of Crucitas, like most gold ore, the precious metal is found in its native form, i.e., gold and silver that may be amalgamated (electrum) but are not usually combined with other mineral elements into a more complex molecule. A complex molecule often increases the volume of the target. Gold is often found native and it has a very high density. This makes the task of finding and isolating the targeted gold grains more difficult as opposed to ores like coal, iron, salts and even copper, lead and zinc , the latter generally found as sulphides ore where the targeted metals account for variable percentage weight (usually between 25% and 50% depending the commodities under consideration) of the marketable mineral concentrate. In the case of sulphides, the minerals sought are plainly visible to the naked eye and ore grade material is measured in percent. In the case of gold, given its high density (19.3) and its high price, even a very low concentration on the scale of 1ppm (one part per million), generally invisible to the naked eye, may be economic to extract.

Gold's high density makes the tinniest gold grain difficult to find, free and recover. Ancient and traditional gold extraction used almost exclusively gravimetric processes. Gravimetric concentration of gold is still widely used for alluvial gold mining operations and is sometimes incorporated as a parallel circuit in modern milling and processing flowsheets and layouts. Mercury amalgamation was added to gravimetry and became widely spread in colonial times but its toxicity and resulting impact on the environment and fauna has contributed to its banning as an extractive agent in the commercial mining industry. For over a century now, it has been discovered that cyanide can be used to dissolve gold and this has been applied in industrial processes to increase gold ore recovery. Cyanide has replaced mercury to help recover fine gold grains. There are active and passive cyanidation processes. The active cyanidation is the process where cyanide is added in a controlled environment (inside 'thickener' cells) after crushing and milling the rock to collect gold through adsorption, separating it from the solid waste (gangue) which is then eliminated. The passive cyanidation is usually called 'heap leaching' where crushed ore is laid on revolving pads and sprinkled with a cyanide solution to extract gold. In both cases of cyanidation, gold in solution must be precipitated either in carbon in pulp and/or using the Merrill Crow process (zinc oxide columns).

Placer Dome has done a number of tests to measure the efficiency of each process on the Crucitas material. The present report will not attempt to reproduce those results which are available in the Feasibility Study published in 1999, as well as in Placer Dome documents reported prior to 1999. We will simply say that the general conclusion of those studies point to using a flowsheet at the mill were a SAG mill is used to deal with the high variability of the quality of material to be processed, as in going from saprolite to hard rock, and an active cyanide circuit to maximize the recovery of gold.

Geostat has been informed that Vannessa has requested additional metallurgical test hoping to further improve the proposed flowsheet by injecting oxygen peroxide to accelerate the gold recovery. The current solution that Vannessa supports eliminates the use of gravimetry. In the following sub-section, Geostat will look at some metallurgical test results to stress the importance of metallurgical testing for the determination of economic factors (costs and recovery). These in turn will help determine an adequate cut-off grade to convert the mineral resources into mineable ore reserves.

18.2.1. Gravimetry and Cyanuration

The following tables present some of the results of metallurgical testing involving the use of gravity to highlight some of the differences between the processes tested by Placer Dome. PDI did metallurgical testing in 4 phases:

I. The first phase of testing used 5 composites samples representing the saprolite and the sap-rock of the Fortuna and Botija zones respectively, plus one of hard rock. Their combined grade averages 1.87 g Au/t. They were used to measure gold recovery in a heap leaching fashion (80%), test gravimetric recoveries with a Knelson cell (>50%) and cyanidation of tails using bottle roll. This test indicated recoveries of gold in the range of 95% to 97%. Acid generation was also tested at this point.

II. The second phase of testing used 3 composite of the same material as in the previous test to optimize the use of cyanide when combining saprolite and hard rock. Grinding was optimized (P_{80} 150 μ) to lower cyanide consumption to 0.14 Kg/t with 4 Kg/t of lime. This test achieved similar gold recoveries at the various steps (gravity ±50%; overall ±95%). Flotation of tails was also tested.

III. The third phase of testing involved 9 new composites representing the various rock type in more detail (North/South splits). These samples had a lower grade (1.23 g Au/t) than in phase I and relatively low sulphur. Optimal use of cyanide define in Phase II was used to refine the use of gravity, cyanidation and flotation by rock type. Grinding was raised to P_{80} 100 μ and cyanide concentrations were lowered to 0.07 Kg/t in saprolite but did not changed (0.15 Kg/t) in hard rock. Gravimetry improved slightly (4%) in Botija but did not changed otherwise. Transposing these results to industrial scale would reduce gravimetric gold recovery to 25-30%. It would be probably more profitable to use more cyanide and grinding to avoid using gravimetry altogether. Calculated recoveries would be 97% in saprolite and ±94% in hard rock according to this PDI. This phase of testing also help calibrate grinding, sedimentation (thickening) and cyanide destruction. A SAG mill could be used while gravimetry and flotation may offer no advantage. Following are 3 Tables showing the results of Phase III:

Table 15 Phase III Testing - Assays of Head Composites (*Table 5.6 FS 1999*)

Composite Name	Description of composite (sector, area, type)	Au (g/t)	Ag (g/t)	Cu (g/t)	As (%)	S (%)
FNS	Fortuna, north zone, saprolite	1.08	5	70	0.01	0.02
FSS	Fortuna, south zone, saprolite	1.25	1	60	0.02	0.01
FNP	Fortuna, north zone, pyroclastic	1.69	2	60	0.01	0.01
FSP	Fortuna, south zone, pyroclastic	1.11	5	90	0.01	1.09
FNFD	Fortuna, north zone, Felsic Dome	1.45	7	70	0.01	1.48
FSFD	Fortuna, south zone, Felsic Dome	1.03	6	70	0.01	0.81
BS	Botija, saprolite	0.91	5	60	0.01	0.71
BP	Botija, pyroclastic	1.45	5	70	0.01	1.08
BFD	Botija, Felsic Dome	1.08	3	30	0.01	0.72

Table 16 Phase III Testing - Summary of Metallurgical Results (*Table 5.7 FS 1999*)

Composite Name	Concentration by Gravity		Tails Cyanidation	Recovery total % Au (@ P_{80}, μ)		
	Optimum P_{80} μ	Recovery in % Au		Gravity+ Cyanidation	Cyanidation[1] Concentrate and tails	Direct cyanidation of mineral
FNS	n.a.	24.8	98.0	98.5 (106)	91.7 (40)	97.0(32)
FSS	n.a.	27.5	98.9	99.2 (246)	97.8 (229)	98.8 (242)
FNP	211	39.8	77.7	86.6 (238)	89.9 (263)	82.1 (266)
FSP	286	53.4	66.1	84.2 (308)	88.7 (146)	89.4 (160)
FNFD	283	35.4	83.7	89.5 (281)	n.a.	90.9 (152)
FSFD	261	25.4	84.6	88.5 (280)	87.6 (219)	n.a.
BS	n.a.	27.8	93.0	94.9 (244)	97.9 (203)	97.4 (215)
BP	224	53.0	75.6	88.5 (255)	91.2 (127)	91.7 (135)
BFD	287	63.6	82.8	93.7 (304)	91.0 (110)	92.3 (151)

Note 1:The concentrate by gravity regrinded and cianidated together with tails.

Table 17 Phase III Results - Metallurgical Results by Rock Type (*Table 5.8 FS 1999*)

Rock Type	Gravity Concentrate		Tails Cyanidation	Flotation[1]	Global Recovery Au (%)	
	Opt. P_{80} µ	Au Rec. Range (avg%)	Recovery %Au		Gravity + Cyanidation	Gravity + Flotation
Saprolite	212	14-47 (25)	96.1	67.6	97.1	75.7
Pyroclastic	211	18-71 (48)	79.8	89.2	89.5	94.4
Felsic Dome	261	18-65 (42)	85.0	80.5	91.3	90.7
Avg. Calc.	**211**	**18-65 (39)**	**86.1**	**80.7**	**92.3**	**87.6**

Note 1: Recovery calculated to get global recovery with average recovery of gravity circuit.

IV. This phase of testing by PDI used 11 composites averaging 1 g Au/t. Lixiviation in columns was used to probe heap leaching in more detail probably. It gave results inexplicably much lower (56%) than the CIP testing (92%) by as much as 35% lower. The poor results may be attributed to poor quality samples (low grade; nugget effect?). In any case, this process is put aside in spite of its lower cost.

The work index measured in the various test varies between 12.0 and 16.5. Saprolite is expected to account for 20% of the gold recovered. It is estimated that gold could be extracted in between 20 and 36 hours using CIP with no gravity and no flotation. The expected recoveries by type of material by transposing test results to an industrial scale would be as shown in the following table:

Table 18 Expected Industrial Precious Metal Recoveries

Rock Type	Gold	Silver
Saprolite of Fortuna	93.0	35.0
Saprolite of Botija	94.5	35.0
Pyroclastics of Fortuna	88.0	60.0
Pyroclastics of Botija	95.0	60.0
Felsic dome of Fortuna	92.5	60.0
Felsic dome of Botija	88.5	60.0

For simplicity, Vannessa is using 96% gold recovery in saprolite and 90% in rock for the economic analysis, based on its own interpretation of the metallurgical testing.

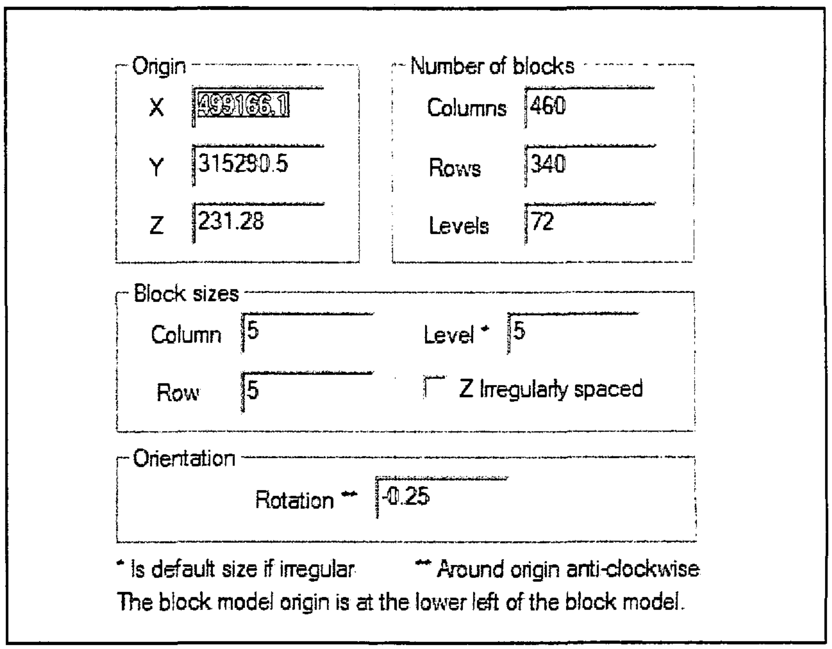
19. Mineral Resource and Mineral Reserve Estimates

The resources model presented in this report was developed by Geostat with the full support of Vannessa, including the geologists in Costa Rica who have been working on the project since 1993 for PDI. In essence, the resource modelling procedures were similar to what had been carried out in the past but the geological model has been improved with a new interpretation and by taking into account information which had not been fully considered before. Mainly the new geological model accounts for the presence of steeply dipping structures measured and reported by PDI (see Section 8) which were interpreted as mineralized envelops controlling mineralization. The envelopes were superimposed on the early stratigraphy and lithological interpretation model (by PDI), so to better constrain the distribution of gold in and across the lithology.

The mining reserves were not fully computed in this exercise. Vannessa has retained another consultant, MICON International Inc., for reserve modeling, pit optimization and mine planning purposes, which will convert the mineral resources into mineable reserves.

19.1. Methodology

The mineral resource model for Crucitas consist of a 3D block model which is a regular grid along X, Y and Z axis used to project estimated gold and silver grades. This grid has a spacing of 5m by 5m by 5m, forming SMU (small mining unit) blocks of cubic shape, for each interval of grade calculation. Geostat block model uses the same basic design as that of Cambior in 1999. Its small SMU's allowing to represent the geology more accurately. Comparatively, IMC designed a model using SMU's 10 x 10 x 6 m high instead, representing a fully diluted less discriminate mining approach.



In addition to the block model used to represent the grade and distribution of gold in the saprolite and rock, a wiremesh was drawn in 3D using various sets of cross sections to represent geology. The sections usually coincide with the drill hole patterns. The interpretation on sections displays the geology, including the lithology, the faults and folds, as well as alteration envelopes or structures that may help determine the volume and tonnages of the different type of material available, especially the one bearing gold.

The Gems software package from Gemcom Software International Inc was used as well as Geostat own commercial software. The models of Cambior (ID) and IMC (IK) were also converted and made available in the Gems project files to ease comparison. The comparison main objective was to validate the 3D models.

19.1.1. Volumetric

The volumes are computed using the wiremesh representing the geological model, as described above. The wiremeshed solids can be relatively complex as shown in the various figures representing the geology in Section 6 and 8.

Vannessa made the lithological wiremesh based on the rock type codes in the block model. It did not have or could not retrieve the original (3D rings) files or solids from the existing backup files of the project. Therefore, it generated the geological solids from the block model. Those solids were compared with the drill holes on sections. Geostat found them sufficiently accurate to be used to determine the mineral resources. Vannessa also verified and corrected the topographic model it retrieved from the original PDI project files.

The accuracy of the resulting geological model emulated by the wiremesh solids to determine volumes can be verified using various techniques. It is possible to count the number of block from the grade model inside each geological 3D unit. Needling is another method offered by Gems to compute the volume inside 3D solids. Finally, contouring by level or on sections can be used to compute the volume in a different ways as in projections (extrusions) to mid distance between sections or the truncated cone formula. Geostat made multiple verifications as its work progressed to double check volumes in the given time frame with the available data. Geostat restrained itself from redoing the geological model from the drill holes. This time consuming task should be assigned to the field geologists who collected the data, should it be done again, to validate the information at the same time. Drill hole survey is of particular interest. In this case, Vannessa could meet this goal eventually, maybe when new drilling is available.

Volumes can be converted into tonnages by multiplying them by the density or specific gravity (SG) of each solid or block. In the case of Crucitas, SG factors were determined by rock types as described in Section 14.3 of the report.

19.1.2. Cut-off Grade

The cut-off grade is the grade at which a block of ore becomes uneconomic. In essence, it is equal to the unit cost of mining and processing a block of ore to extract gold and silver with a profit. Since the average unit cost of mining and processing depends on the economics of the whole project or its parts thereof, the determination of the cut-off grade should vary as a function of time and location, given a specific mining plan. Production scaling factor will change the average cost of mining and processing. Planning and actual production are likely to differ, especially because the price of gold will change in time. The future is difficult to forecast. However, it is a common practice in the industry to use a single average cut-off grade to differentiate ore and waste.

The net present value of a project can be optimized and determined by using the software Whittle. Whittle uses the Lersch-Grossman algorithm, a special case of linear programming in 3D for pit design. This application has various levels of sensitivity which are discuss in greater detail in appendix 3.

To be able to outline the mineral resources, Geostat used a range of cut-off in the order of its predecessor between 0.50 and 1.25 g Au/t to classify the blocks in the block model into ore and waste. We have retained the value of 0.8 g Au/t as the most likely cut-off in our mineral resource tables, but the final cut-off should be determined by the mine plan.

19.1.3. Capping Value Threshold

In the case of gold, silver and many metallic ore deposit, the distributions of values or grades are skewed, i.e., they show long tails in the high grade value ranges that could weigh heavily in the total metal balance of the mineral resources if left unchecked. These sparse but heavy weight values are called "outliers" and usually represent samples that have captured usually rare coarse grains of metal or "nuggets". This natural phenomenon makes those specific samples more likely to overstate the actual metal content of their surroundings. It is assumed to be the case more frequently with high grade samples. Hence, it is common practice in the industry of cutting or capping those values to a certain threshold value. There are various ways to apply capping values. It can be done in one stage, multiple stages, gradually within a range, based on statistics, following a normal distribution, etc.

In this case, Geostat has chosen to use common practice and set a maximum value of 25 g/t for gold and 50 g/t for silver. After computing the resources with and without various capping values, it was determined that those values had little effect on the total gold content of the mineral resources. Therefore, the method used by Geostat could be more conservative. However, it does limit the impact of the few high grade samples that are more or less isolated from the others as is the case in the north area of Fortuna, for example. The overall resource grade being relatively low may explain the weak impact the use of capping value has on the overall gold resources.

The effect of the capping value would be more noticeable in areas of sparse drilling and sampling. In the areas that have more samples, the effects of the occasional outliers are automatically dampened by the many and much lower grade samples surrounding it. Conversely, when many high grade samples are clustered together, then it may be correct to assign a relatively high grade value to such an area and not use a capping value.

The need for using a capping value may be seen when the grade of the resource increases, as if it drifted, from the measured and indicated resources toward the inferred resources. Crucitas data tend to display the contrary, after applying the values mentioned above for gold and silver.

In this specific case, grouping the samples and making the grade projections on each structure respectively is likely to have limited the impact of the occasional local high grade sample. If a particular structure happened to bear frequent high grade samples, then it may be because it is a high grade structure after all. Therefore, Geostat believes that the use of capping values are warranted in this case and that the procedures it adopted may help differentiate high grade from low grade areas in the deposit. Indicator Kriging can achieve a similar goal (without necessarily tracing detailed structures) if the data is sufficient in quantity and quality. Using a detailed geological interpretation, as long as it is valid, should produce a more accurate resource grade model.

19.1.4. Interpolation Method of Grades

Geostat has retained the Ordinary Kriging (OK) method for grade calculation inside and outside the structures interpreted by Vannessa's geologists. Indicator Kriging (IK) is a method generally preferred for gold deposits displaying high nugget effect as it helps improve the precision of the local (proximal) grade estimate. OK methodologies tend to smooth the grade distribution in the grade model more than IK generally. In the present case, because the geological model is deemed sufficiently constrained by the introduction of relatively narrow (5 to 30m wide) steeply-dipping mineralized envelops, the Ordinary Kriging method was deemed most adequate. Comparison test runs showed that OK produces similar results as IK when using the structures. Also see previous sub-section 19.1.3.

Once the model was set up, Geostat with Vannessa staff in Costa Rica, conducted multiple runs to compare the results of various methods. Among those runs, Geostat also reproduced the models of CPC and IMC to better compare results and insure the integrity of the database and the geological wiremesh model. Some of these results are further discussed in Section 20 of the present report.

The basic settings used for the final grade interpolation model was:

1. To use composites of equal length of 1m along the drill core holes, instead of 2m for CPC and 6m by bench for IMC;
2. Find samples with a 50m search sphere (ellipsoid) using the octant rule with a minimum of 3 octants with samples but no more than 2 samples from the same drill hole;
3. To compute grade using a 2 x 2 x 2 discretisation of blocks;
4. To compute grade using a minimum of 2 and a maximum of 12 samples;
5. To fill the remaining block (not computed) inside the structures with the average sampling grade of each structure, i.e., the block that do not meet the above conditions;
6. Each structure has its grade computed only by the samples it contains, without crossing over to be influenced by an other structure;
7. To compute the grade outside the veins only if a block meet conditions 1 to 4;
8. High grade capping for gold is 25 g/t and samples with grade between 10 g/t and 25 g/t had there range of influence limited to half the basic range of 50m or 25m;
9. High grade capping for silver is 50 g/t and samples with grade between 25 g/t and 50 g/t had there range of influence limited to half the basic range of 50m or 25m;

This grade model is not the worst case scenario (see Section 18.5), but it is the best estimate in the case were the steep dipping structures are the gold bearing features that concentrate gold. Therefore, it is deem relatively conservative, especially when compared to previous mineral resource model.

Table 19 List of the Different Computer Runs

Run and Compare Diff. Models

Marginal zones

Fuentes

Inferred - few vertical structure - ... ounces

SAP Surf

100 m auger grid – Inferred – 30 000 ounces

MI(?)-INF

PDI/CPC

Cut-off > 0.5 = 3 millions ounces

IMC

Cut-off > 0.75 = 2 millions ounces

CLC

Table 1 List of Test Runs of Block Models Compared to Previous Models

Test run parameters		Results
CLC-GSI no cut-off (BM 5x5x5 with 1m composites) using steep structures		
Base Core Settings	Extension Fill	*Gold ounces*
OK sph (50m)/octant (3,2) *[0.858M]*	+ OK sph (100m)/no octant	1.60 M
OK sph (75m)/octant (3,2)	+ OK sph (100m)/no octant	1.20 M
OK sph (100m)/octant (3,2)		1.32 M
IK sph (50m)/octant (3,2) *[0.5/2.0/5.0]*	+ OK sph (100m)/no octant	1.58 M
OK sph (50m)/octant (3,2)	+ all (avg) DH intersect filled Solid	1.57 M
3D Solid intersect of Drill Holes		1.56 M
Previous models using lithology only – no steep structures constraints		
PDI/CPC OK/ID 2m cmp – 0.5 cut-off		3.00 M
IMC IK 6m cmp – 0.75 cut-off		2.00 M

Best Choice Model

Notes: Density is not adjusted for structure in Saprolite (above bedrock). This means ounces are overstated in this table. It should be used for comparative purposes only.

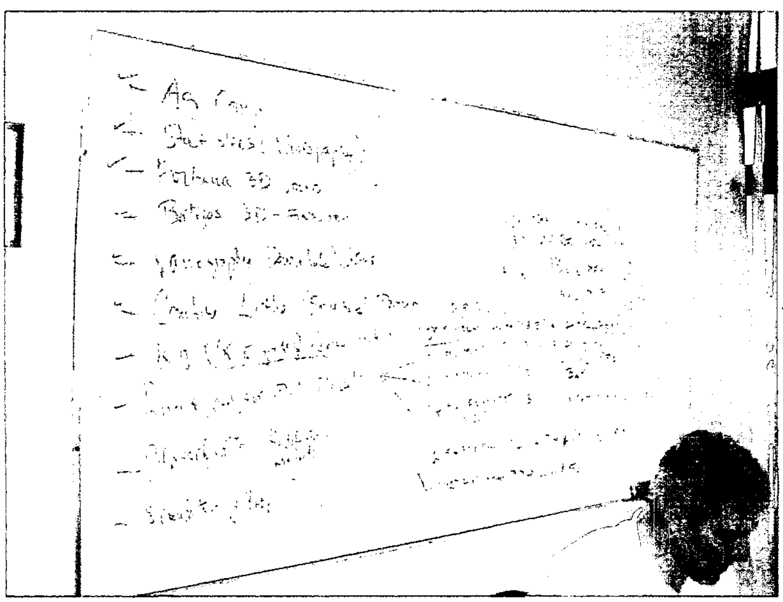


Figure 57 Picture of the work laid out and done in San Jose, Costa Rica, in October 2005

19.1.5. Calculation of Tonnes and Grades (weighing method)

Tonnes and grades were calculated using the volumetric reporting functions of the Gemcom software. Geostat used simple block counting and classified blocks using the 50% rule for block coding, whether the blocks were intersected by topographic surface, lithological contacts, steeply dipping structures or excavations. No blocks are counted twice nor are left behind. Given that the small block size (SMU 5m x5m x5m) allows to trace detailed geology as well as mining, it is deemed unbiased. Therefore, the fractions of blocks should be spread following a normal distribution and cause no significant error in tonnage and grade calculation.

The model does not take into account mining dilution and recovery. However, the grouping of blocks in the report by structures and outside the structures, allow for "internal dilution" to be integrated, if required.

19.2. Method to compute Reserves

19.2.1. Mining Factors (equipment)

No mining factors were taken into consideration in this estimation. The resources were not converted into reserves. This task has been mandated to Micon International by Vannessa. However, Geostat does recommend to use mining factors reflecting a selective mining operation in agreement with the adopted geological and resource models. Since Vannessa is planning to extract the ore from an open pit, it will have to decide between a strong grade control program enabling greater selectivity in operations or applying cautionary mining factors, say 15% dilution and 85% tonnage recovery, to convert the resources into reserves in the pit.

19.2.2. Dilution and (Mining) Recovery

See above.

19.3. Classification method

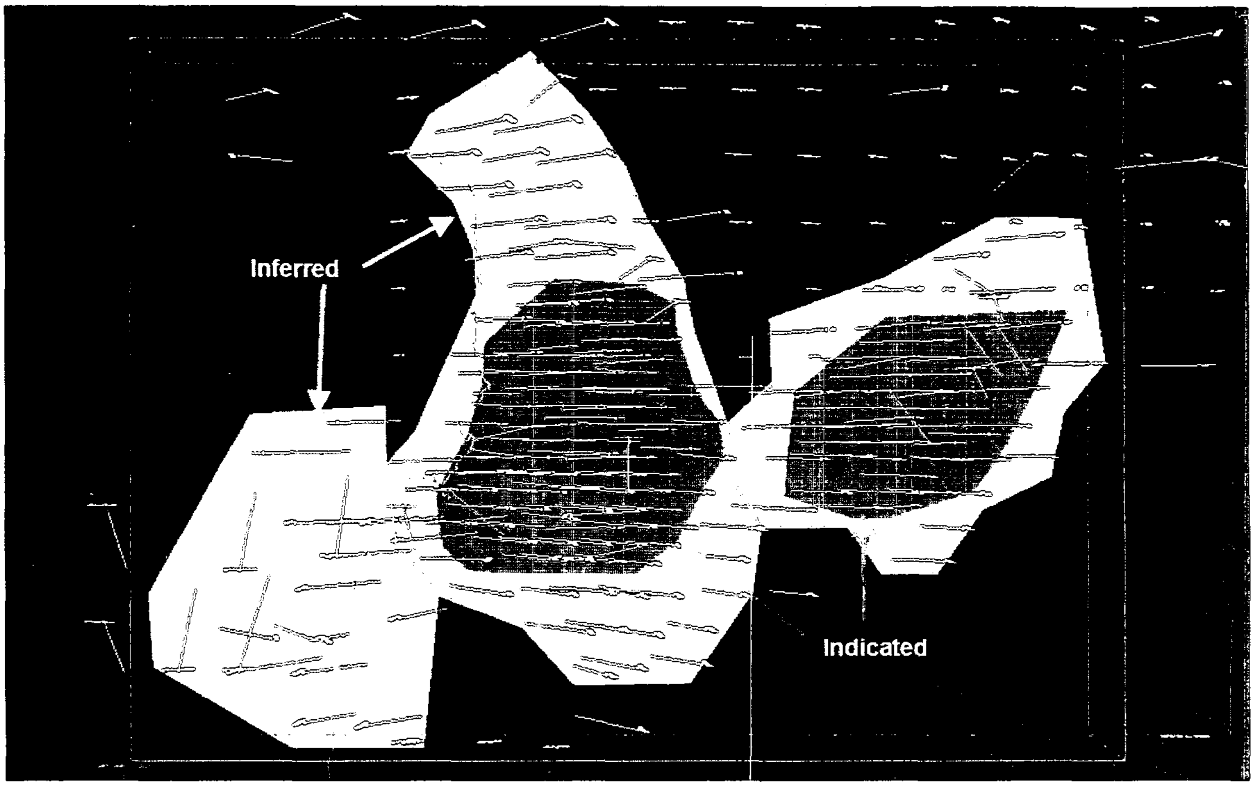
The classification of the resources is based on the quality and quantity of drilling information. See Figure 58 below. Also see Section 21.1.

In the core of the deposit, where drilling is regular on a grid with 25m between sections and 50m between drill holes on section, Geostat considers and reports the grade material as indicated resources. Because the drilling on Fortuna is more systematic and covers the core of the deposit better, Geostat has split the indicated resources on Fortuna into Indicated class I and II. The Indicated class I refers to the near surface saprolite while the Indicated class II refers to the deeper hard rock resources that are defined by the same drilling density and geological level of confidence.

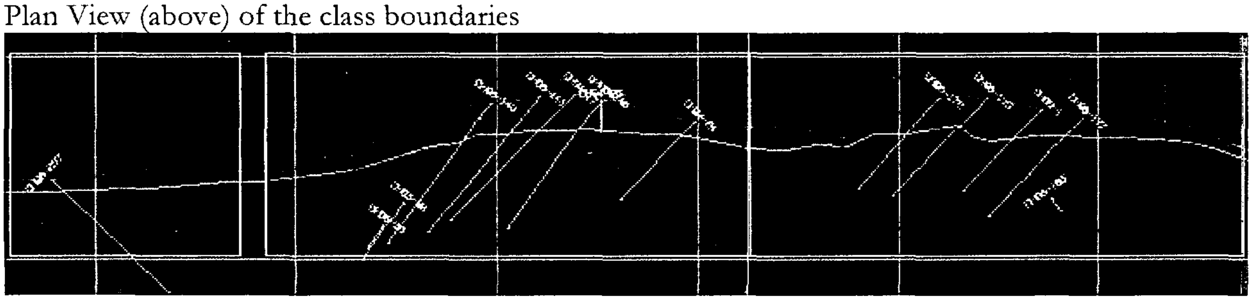
The areas surrounding the core of the deposit are more sparsely drilled. Geostat has thus, drawn a boundary where the drilling appears less regularly spaced yet still relatively continuous to represent the Inferred resources. The sections in Figure 58 display the suggested boundary between Indicated and Inferred resources.

Beyond those boundaries, are found additional drill holes, representing exploration attempts, sometimes systematic in tracking observed geological features. This is largely the case for the Trado (Auger) holes which have been drilled on a 100m square grid covering a large area to North-East of Fortuna and Botijas. The Trado drilling is relatively shallow and restricted to the saprolite horizon and not every hole struck good grade, but some did and warrant further investigation as legitimate exploration targets. The same goes for core drill holes along the North extension of the Fortuna hill and Fuentes where some holes have intersected very good grade. Some of these areas may substantiate additional resources after more exploration work has been done.

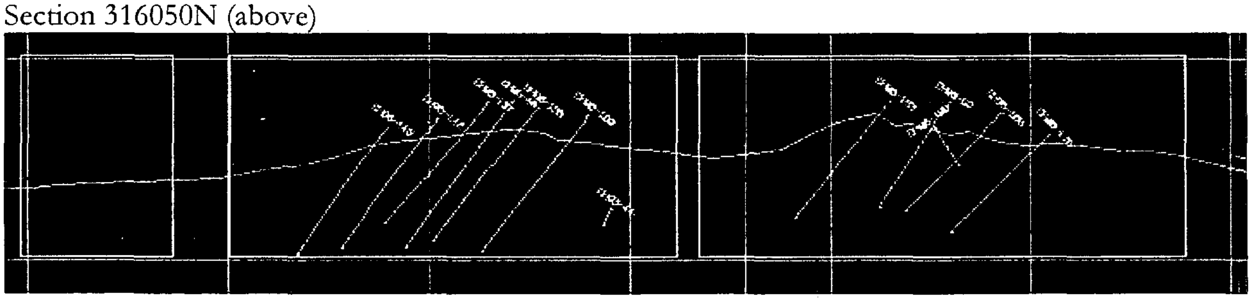
Geostat has taken away much of the previous resources projected into some of these areas. The current geological model using steep dipping structures (or not in some cases), does not reconcile much of the previous resources in those very sparsely drilled areas. Using steep dipping structures which are relatively narrow provide additional constraints while attempting to correlate widely spaced intercepts and does not permit to readily differentiate the structures.



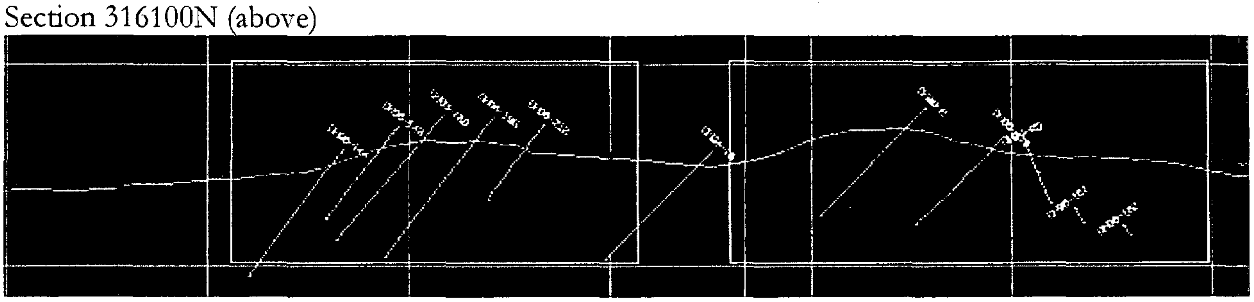
Plan View (above) of the class boundaries



Section 316050N (above)



Section 316100N (above)



Section 316150N (above)

Figure 58 Class Outlined as a Function of Drilling

19.4. Resources and Reserves Statement

Using the data described in this section, essentially the same data that was used in 1999, and a geological model representing a significant change in the geological model, Geostat in close collaboration with Vannessa's technical staff, has built a new resource model for the Crucitas Project. This resource model comprises three Zones: Fortuna, Botijas and Fuentes. Each zone comprises several sub-parallel steeply dipping and narrow structures which are used to discriminate potential ore grade material in and out of the structures for reporting.

The Resource Tables are basically split in two categories: Indicated and Inferred. Geostat has further split each table of the resources between lithology (saprolite and rock), and inside and outside the vein structures. All the tables below were produced using a 0.5 g Au/t cut-off grade.

Geostat is of the opinion that there is no Measured Resources in the Crucitas project at the moment based on the strict definitions of the CIMM recommended by the NI 43-101 guidelines.

Table 20 Indicated Resources above a 0.5 g Au/t cut-off grade by Zone

Fortuna

Material Zone	Class	Tonnage	Gold g/t	Silver g/t	Gold ounces	Silver ounces
saprolite						
	Total Structure	2 188 237	1.59	1.83	111 925	128 984
	Total OutVein	389 277	0.64	1.02	8 054	12 820
Total saprolite		**2 577 513**	**1.45**	**1.71**	**119 979**	**141 805**
rock						
	Total Structure	11 241 986	1.32	3.49	478 206	1 259 664
	Total OutVein	3 036 820	0.63	3.12	61 112	304 803
Total rock		**14 278 806**	**1.17**	**3.41**	**539 318**	**1 564 467**
Total		**16 856 319**	**1.22**	**3.15**	**659 297**	**1 706 272**

Botija

Material Zone	Class	Tonnage	Gold g/t	Silver g/t	Gold ounces	Silver ounces
saprolite						
	Total Structure	1 340 394	1.61	2.04	69 497	88 067
	Total OutVein	249 195	0.65	0.95	5 170	7 623
Total saprolite		**1 589 589**	**1.46**	**1.87**	**74 666**	**95 690**
rock						
	Total Structure	5 298 089	1.31	3.55	222 714	604 330
	Total OutVein	1 341 726	0.66	3.54	28 264	152 814
Total rock		**6 639 815**	**1.18**	**3.55**	**250 977**	**757 144**
Total		**8 229 404**	**1.23**	**3.22**	**325 644**	**852 834**

The total Indicated Resources above the 0.5 g Au/t cut-off grade are estimated to contain 25.1 millions tonnes at 1.22 g Au/t (985 thousand gold ounces) and at 3.17 g Ag/t (2.56 million silver ounces) in both Fortuna and Botijas in and out of the structures.

Table 21 Total Indicated Resources above a 0.5 g Au/t cut-off grade

Material	Zone	Class	Tonnage	Gold g/t	Silver g/t	Gold ounces	Silver ounces
saprolite							
	Structure						
		Ind I					
			1 854 584	1.59	1.73	95 059	103 121
		Ind II					
			1 674 046	1.60	2.12	86 363	113 930
	Total Structure		**3 528 630**	**1.60**	**1.91**	**181 422**	**217 052**
	OutVein						
		Ind I					
			299 301	0.66	0.63	6 321	6 104
		Ind II					
			339 171	0.63	1.31	6 903	14 339
	Total OutVein		**638 472**	**0.64**	**1.00**	**13 224**	**20 443**
Total saprolite			**4 167 102**	**1.45**	**1.77**	**194 646**	**237 495**
rock							
	Structure						
		Ind II					
			16 540 075	1.32	3.51	700 919	1 863 994
	Total Structure		**16 540 075**	**1.32**	**3.51**	**700 919**	**1 863 994**
	OutVein						
		Ind II					
			4 378 546	0.63	3.25	89 376	457 617
	Total OutVein		**4 378 546**	**0.63**	**3.25**	**89 376**	**457 617**
Total rock			**20 918 621**	**1.18**	**3.45**	**790 295**	**2 321 611**
Total			**25 085 723**	**1.22**	**3.17**	**984 941**	**2 559 105**

The total Inferred Resources above the 0.5 g Au/t cut-off grade are estimated to contain 12.6 millions tonnes at 1.23 g Au/t (496 thousand gold ounces) and at 3.14 g Ag/t (1.27 million silver ounces) in the Inferred category for both Fortuna, Botijas and Fuentes in and out of the structures.

Table 22 Total Inferred Resources above a 0.5 g Au/t cut-off grade

Materia	Zone	Class	Grade	Tonnage	Gold g/t	Silver g/t	Gold ounces	Silver ounces
saprolite								
	Structure							
		Inferred						
			Top-soil	442 152	1.56	2.47	22 187	35 102
			Au > 0.5	1 819 747	1.46	2.81	85 521	164 597
		Total Inferred		2 261 899	1.48	2.75	107 707	199 698
	Total Structure			2 261 899	1.48	2.75	107 707	199 698
	OutVein							
		Inferred						
			Au > 0.5	721 185	0.69	1.02	16 065	23 566
		Total Inferred		721 185	0.69	1.02	16 065	23 566
	Total OutVein			721 185	0.69	1.02	16 065	23 566
Total saprolite				2 983 084	1.29	2.33	123 772	223 265
rock								
	Structure							
		Inferred						
			Top-soil	358 977	1.71	5.15	19 767	59 410
			Au > 0.5	6 722 286	1.40	3.43	302 813	741 780
		Total Inferred		7 081 264	1.42	3.52	322 579	801 190
	Total Structure			7 081 264	1.42	3.52	322 579	801 190
	OutVein							
		Inferred						
			Au > 0.5	2 502 871	0.62	3.02	49 721	243 025
		Total Inferred		2 502 871	0.62	3.02	49 721	243 025
	Total OutVein			2 502 871	0.62	3.02	49 721	243 025
Total rock				9 584 135	1.21	3.39	372 300	1 044 215
Total				12 567 219	1.23	3.14	496 072	1 267 479

Note that Geostat has not computed Reserves. This mandate has been given to Micon International by Vannessa.

20. Other Relevant Data and Information

20.1. 'Nugget Effect' (grain size) and sampling variance

The "nugget effect" is the disturbance caused by the presence of relatively coarse grains of gold (or any mineral) in samples. It contributes to make the occasional high grade sample appear to have higher grade than its environment. The opposite is also true, i.e. when material containing a small number of coarse grains, the reported low grade samples may "just have missed" the sparse grain of mineral (gold). There exist different methods to counter the perverse effect of the presence of coarse grains on sampling.

The first method would be to take larger samples to allow to catch more grains and then to obtain better statistics, but that is not always convenient and the significant work involved may lead to other types of error in sample preparation, handling, etc.. Bulk sampling or taking large samples in deep trenches or large diameter wells would be an example of the application of this method. Mine production with a mill, at a small or bench-scale level, would provide an ultimate way of assessing the grade of a deposit, but care must be taken for the mill to optimize recovery of the coarse particles to get fair results. To Geostat knowledge, no such work was ever done at Crucitas.

Another method to enlarge size of the samples is to group them as larger composites, but then some geological details may be lost in this operation. This was attempted at Crucitas and it is discussed already in this report.

The laboratory may take additional measures to homogenize the material from the samples before assaying. Current laboratory procedures are very efficient, but this does not necessarily compensate for the sample quality, just the assay precision. They are often mistaken.

Since collecting quality sampling may be difficult to achieve for each individual sample, which is often the case for gold, there may be no alternative other than multiplying the number of samples. Meaningful statistics, average and normal distribution will be improved with a large number of samples. Sampling errors would cancel each other. The proximity of many unbiased samples to a single biased sample, should it be the case, will reduce the faulty sample negative effect simply by decreasing the respective weight of the samples involved in the calculation.

At Crucitas, the high grade samples are reported to carry coarse grains of gold. This would be logical, but more specifically, the sampling statistics and geostatistics indicate that for samples with gold concentrations as low as 1 to 2 g/t, such bias is relatively strong. See Section 16 (Validation), Section 18 (Metallurgy) and Section 14 (Geostatistical Analysis).

20.2. Reconciliation of Production and Forecasting

Crucitas is not in production; therefore it is not possible to compare production results with its forecast based on a mine plan and resource calculation. However, there have been at least three major events leading to a full exercise to estimate the mineral resource and the mining reserves and at least one full feasibility study based on the same data but significantly different results.

As a result of the work presented here, the mineral resource model is significantly different than previously projected by PDI, CPC and IMC. It remains unclear to Geostat why CPC and IMC "simplified" the PDI model and why they did not take into account the structures. Geostat is even less familiar with PDI model. The reader should be aware that PJ Lafleur, now working with Geostat and writing this report in 2005, had been called by Lyon Lake in February 1999 to review the CPC and IMC findings. My conclusions then have now been confirmed by the more detail work done in 2005 for Vannessa. As is exposed in this section and section 5, if CPC and IMC lowered the computed gold resource available compared with PDI, Geostat is lowering it somewhat more by adding reasonable constraints such as:

1. The deep dipping gold bearing structures outlined by specific wiremesh envelops;
2. Much shorter range of continuity of grade (less than 25m);
3. No preferred grade continuity direction.

Geostat feels compelled to apply those constraints based on its analysis and to conform to the Canadian Stock Market National Policy 43-101. Geostat reminds the reader that previous mineral resource estimations were done before this ruling was adopted in February 2001. Geostat does not explicitly intend to pass a judgement on previous resource estimation. A number of technical reasons, some unknown to Geostat, may explain those results. Geostat only interest with the present work is to perform its task in the best interest of Vannessa shareholders.

On the other hand, it should be made clear that the data used by Geostat is the same drill hole database with the same assay results and the same lithological model as in 1999. It comprises more than 35,000 original samples from 343 drill holes. The geological setting is a relatively simple and a typical lithology in a volcanic environment that is also easy to verify. Only the specific mode of distribution through steep dipping narrow structures and the range of continuity of gold grade were modified by Geostat based on its analysis of the samples and in accord with Vannessa technical staff including field geologist that participate to the deposit discovery.

The differences between the various historical estimations of the mineral resources can be broken down into 3 categories. The discovery by Placer Dome in the 1990's was an achievement crowning some extensive exploration work. Its conclusions probably include a certain amount of wishful thinking and projections based on the hope to find more gold as exploration progress. The Lyon Lake Feasibility Study done by CPC and IMC lowered the expectation in the mineral resources, but it continues to overstate the resources at the outside edge of the deposit, mostly in the Inferred category. At the core of the deposit where the drill holes are regularly spaced between regularly spaced sections also, the difference is less between all estimates, in the categories of measured and indicated resources. Finally, Geostat has modified the classification of the mineral resources according to its findings.

20.3. Computer Model Orientation

Note that the drill holes and sections were originally shown in the local mine grid coordinate system; however, for engineering design simplification, all future spatial reference after 1999 were done in the Lambert Coordinate System, as it is widely used in Costa Rica. The following conversion formula can be used to go from the local mine grid to the Lambert grid:

$$x = \cos 0.25^\circ\, x' + \cos 89.75^\circ\, y' + 491{,}227.74$$

$$y = \cos 90.25^\circ\, x' + \cos 0.25^\circ\, y' + 306{,}522.55$$

$$z = z' - 8.72$$

Where x, y, z are respectively the easting, northing and elevation coordinates of a point in the Lambert Coordinate System.

Where x', y', z' are the easting, northing and elevation coordinates of a point in the local mine grid system.

20.4. Drilling optimization

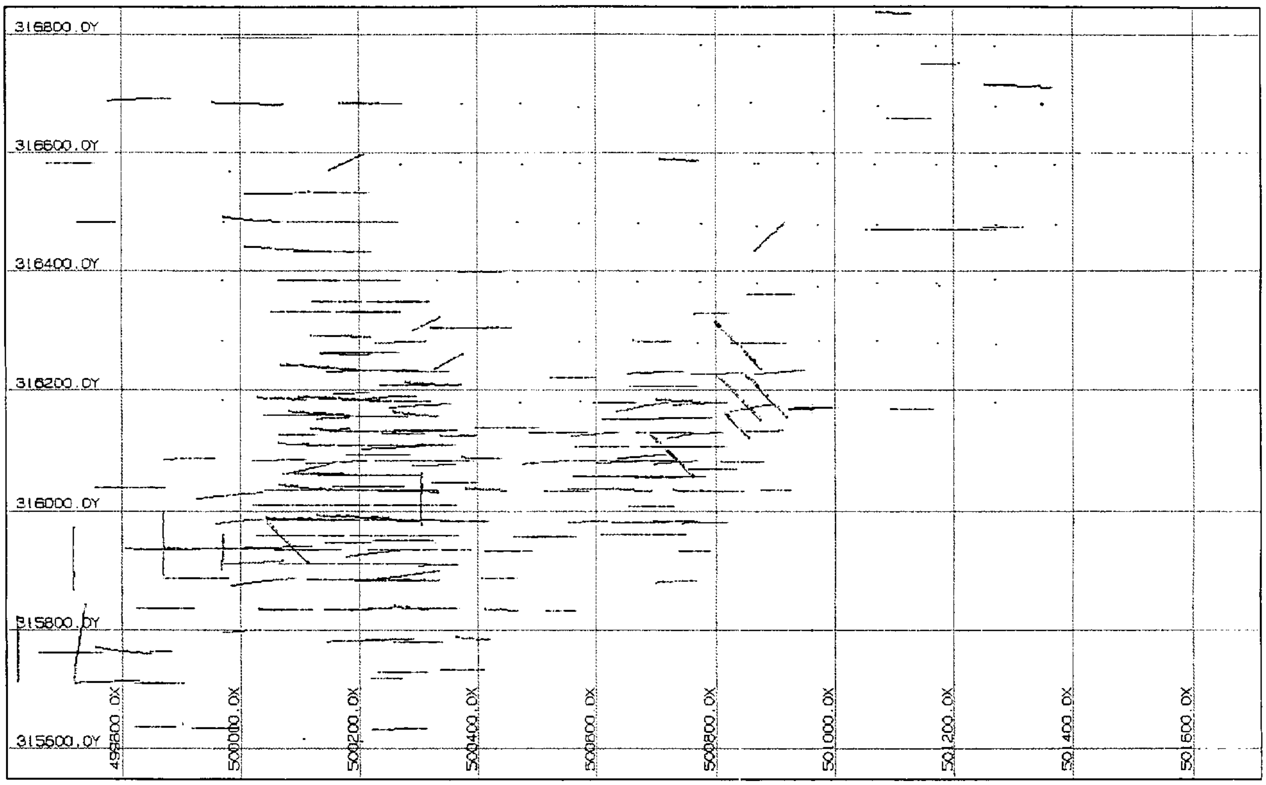


Figure 59 Plan view of drilling pattern

During exploration, drilling was done in all directions. It has been optimize for Fortuna early in the 1990's by Placer Dome and oriented West. A few drill holes have been turned SW, also South and finally SE which is better for Botija probably. Spacing is as narrow as 25m between drill holes sections and 50 m spacing between drill holes on the section in the core of the deposit and up to 100m on a regular grid and more in areas with less drilling. It was determined by PDI that optimal drilling should be oriented toward the West. Most drill holes have that orientation, in spite of the fact that is not the best orientation at Botija.

20.5. Comparing Gold and Silver Values

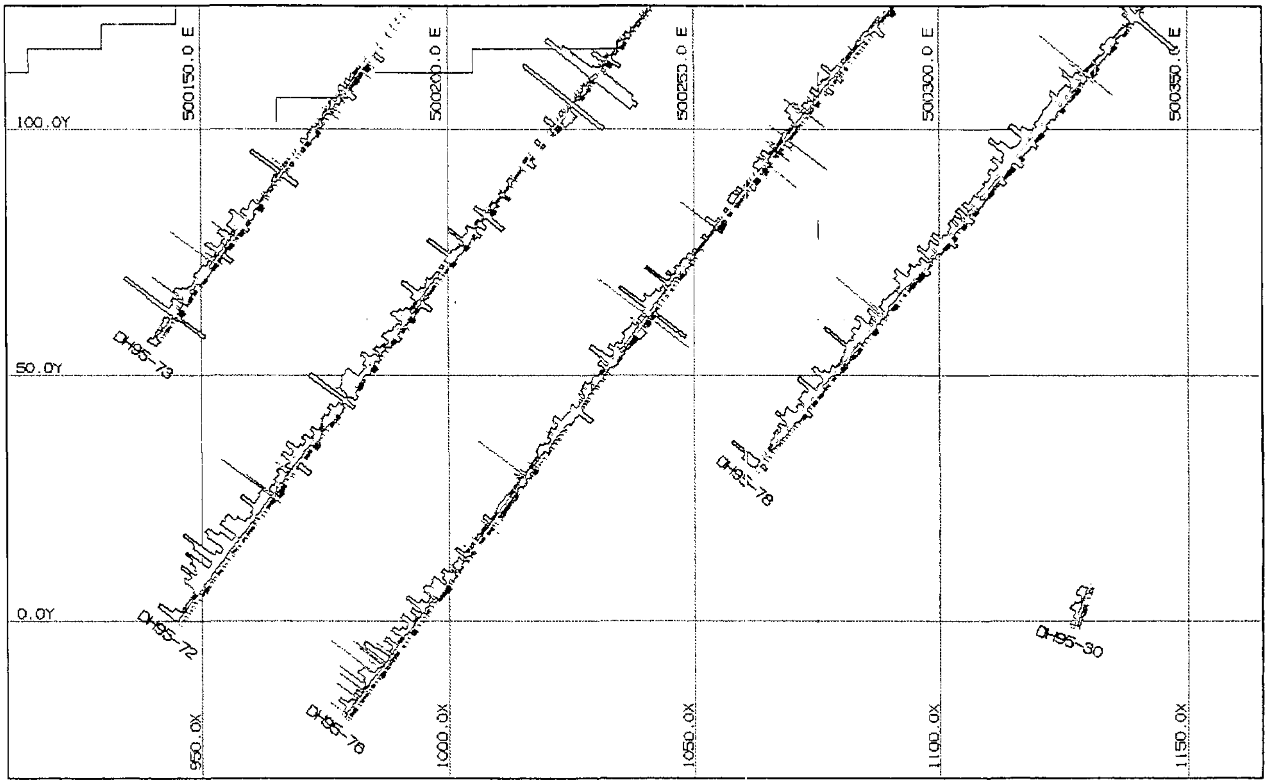


Figure 60 Silver (above) and Gold (below) in Drill Holes Assays on Section 316225N

High grade gold values in drill-hole samples usually have a corresponding high grade silver value. The contrary is not so true apparently by looking on sections. If silver recovery are significant in the metallurgical process, it may suggest a grade model should take into account both gold and silver grades to determine the economic value of the project. On the section above, the colour scheme is described in Table 23 below.

Table 23 Colour Table for sample grades

>= Lower Bound	< Upper Bound	Colour
0.00000	0.62500	Light Blue
0.62500	1.25000	Blue
1.25000	2.50000	Light Cyan
2.50000	5.00000	Cyan
5.00000	10.00000	Light Green
10.00000	20.00000	Green
20.00000	40.00000	Light Red
40.00000	80.00000	Red

21. Interpretation and Conclusions

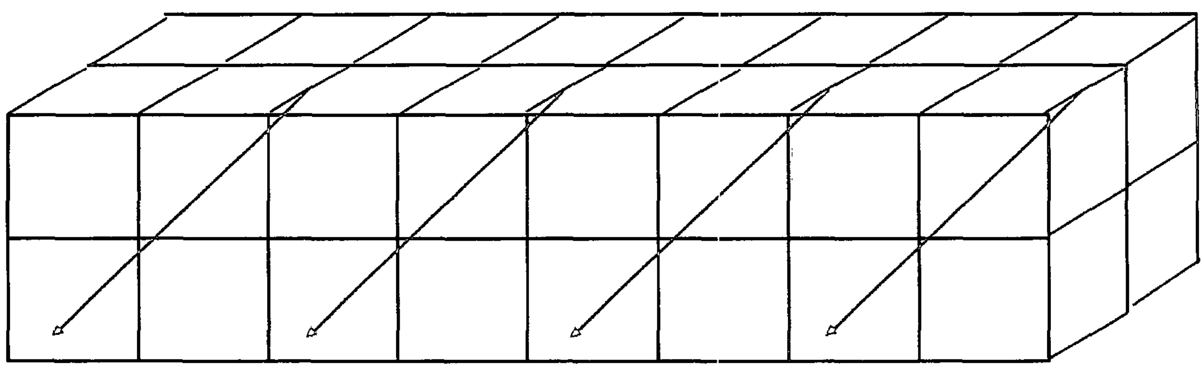
21.1. Drill spacing

In Geostat's opinion, drill spacing should be improved to upgrade mineral resources category. Infill drilling would not add tonnage, but it would reduce the risk of overstating or understating the mineral resources. In the case of Crucitas, a regular drill spacing of 25m by 25m or its equivalent would reduce mineral resources estimation risk.

In addition, Vannessa must design and implement a method to control grade. One method of choice would be to use short incline RC drill holes. They should be oriented in an optimal fashion by taking geology into consideration, as Placer Dome started doing with core drilling. A RC drilling grid may be started where the mining could start to convert some resources from indicated to measured and to determine the mining factor with more accuracy to help convert mineral resources into ore reserves.

The cost of such work is very low compared to the risk of constructing the mill and choosing mine equipment of a size which is not optimal.

Crucitas - RC Grade Control Drilling Pattern and Cost



Drilling Pattern:
-45 dip Due West, 10m step-out, single or double row
Across grain of the veins / mineralized shoots

Operating Cost

$	5.00	/ft	(Sigma Mine, Oct 2005)
$	**13.94**	/m	USD per Meter

Unit Cost

dh avg length		15	m
Tonnage		1200	tonnes
Single row	$	0.17	/tonne
Double row	***$***	***0.09***	***/tonne***

Figure 61 Drill spacing for Definition Drilling on a 10m x 10m grid

21.2. Audit of laboratories

Geostat did not perform any sort of laboratory audit. All of PDI samples were assayed in Placer Dome laboratories outside of Costa Rica or a commercial laboratory of its choice many years ago. This was done before 1999.

21.3. Classification

Geostat has done its mineral resource classification based on geology and sampling quality, as well as some economic parameters. When using block models, it has become popular to use some feature of the block model to classify the ore such as the Kriging variance, a certain number of samples used to determine the grade of each block, the distance relative to a certain set of conditions (nb of samples, octants, nb of drill holes per hole, etc.) or any combination of the resource model features.

Over the course of its 25 years experience, Geostat has audited a number of projects where we saw many system of ore classification. We also specialize in Geostatistics. Geostat was never convince that a method of classifying mineral resources that make the model look like a Swiss cheese full of wholes (or drill holes look like stacks of lollipops row after row) is either practical or logical. We agree with the idea of having a systematic approach, but taking mining operations into consideration, it is generally more convenient to use geology, sampling and drilling quality to outline simple monolithic blocks representative of the various mineral resource classes. It is one of the reasons why the NP 43-101 requires a QP. A person with the right experience must draw the line.

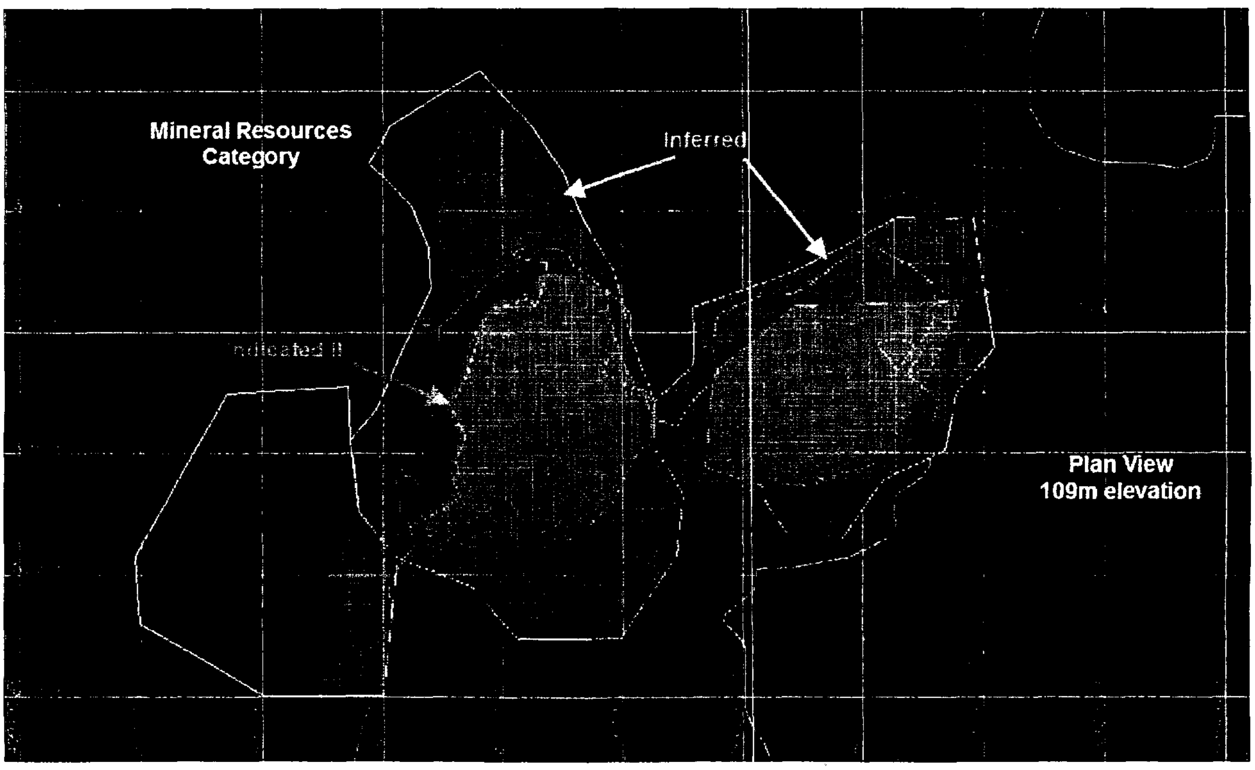


Figure 62 Plan View level 109m - Category of Mineral Resources

21.4. Reconciliation

The estimation of IMC using a cut-off of 0.80 g Au/t (and up to 1.00 g Au/t in their report) was the most realistic resource model of that period (1993 to 1999).

As we will find out in the present report, there are other criteria that should have been used to cut the resource estimation further, as we did, to be even more realistic. Geostat now claims that the resources stand at:

Table 24 Resources Estimation by Geostat in 2005

[illegible]	[illegible]	[illegible]	[illegible]	Tonnage	AU	AU	[illegible]	[illegible]
RESOURCES	**Mea+Ind+Inf**	[illegible]	[illegible]	T	gpt	Onces	[illegible]	[illegible]
FORTUNA	VHG (> 5.0gpt)	23.819	2.21	52,650	6.12	10,017	8.32	13,632
	HG (2.0-5.0gpt)	1478.238	2.001	2,889,250	2.7	242,683	4.2	386,654
	MG (1.2-2.0gpt)	5192.493	2.06	10,514,713	1.84	603,036	3.57	1,188,053
	LG (1.0-1.2gpt)	7103.217	2.073	14,612,129	1.63	742,015	3.4	1,558,378
	SPG (0.5-1.0gpt)	**10281.108**	**2.102**	**21,604,725**	**1.37**	**918,822**	**3.27**	**2,195,104**
	waste (<0.5gpt)	10862.472	2.107	22,890,876	1.3	923,921	3.13	2,226,413
	Total	**10862.472**	**2.107**	**22,890,876**	**1.3**	**923,921**	**3.13**	**2,226,413**
BOTIJAS	VHG (> 5.0gpt)	5.523	1.38	8,566	5.75	1,533	1.81	429
	HG (2.0-5.0gpt)	487.84	1.931	922,044	2.61	74,733	3.42	100,305
	MG (1.2-2.0gpt)	1827.693	2.051	3,703,388	1.8	207,246	3.26	380,276
	LG (1.0-1.2gpt)	2392.688	2.073	4,924,224	1.63	249,189	3.18	490,732
	SPG (0.5-1.0gpt)	**3425.86**	**2.109**	**7,221,194**	**1.36**	**306,173**	**3.11**	**699,926**
	waste (<0.5gpt)	3519.532	2.114	7,441,882	1.33	308,769	3.09	714,432
	Total	**3519.532**	**2.114**	**7,441,882**	**1.33**	**308,769**	**3.09**	**714,432**
OUTVEIN	VHG (> 5.0gpt)	0	0	0	0	0	0	0
	HG (2.0-5.0gpt)	6	2.245	13,470	2.16	907	3.19	1,338
	MG (1.2-2.0gpt)	74.042	1.994	132,587	1.51	6,222	2.69	12,368
	LG (1.0-1.2gpt)	199.422	2.006	372,902	1.24	14,372	2.67	33,240
	SPG (0.5-1.0gpt)	**4194.791**	**2.083**	**8,692,234**	**0.64**	**172,127**	**2.52**	**683,937**
	waste (<0.5gpt)	110558.226	2.226	246,095,243	0.15	1,156,850	1.28	9,826,897
	Total	**110558.226**	**2.226**	**246,095,243**	**0.15**	**1,156,850**	**1.28**	**9,826,897**
Total Cutoff 0.5 gpt						**1,397,121**		**3,578,967**

The following table compares the current resource estimation with the one from 1999 by IMC. It should be noted that the format used is that of 2005 which takes into account the drawing of vertical gold bearing structures. These geological features were not used in the resource model previous to 2005. In addition, Geostat found that the range of continuity for gold grade was not as long as forecasted in previous geostatistical analysis. Gold is nuggety (coarse grain) and that combined with other natural characteristic of gold affects sample quality much more than for most mineral.

As a result of changing the geological model and the range of grade continuity of gold, the difference between these two resource models amount to 30% less gold would be available in the resources. In spite of having a significantly different shape that would impact mining, the more than 35,000 samples taken in the field condition the results of the resource estimates, in particular at the core of the deposit, where tonnages and grades do not vary significantly, regardless of the geological interpretation.

Table 25 Comparison of Resource Estimates 2005 (left) and 1999 (right)

ROCKGROUP	GRADEGROUP	Tonnage	AU	AU	Tonnage	Au	Au
COMPARED TO	**IMC**	T	gpt	Onces		g/t	Onces
FORTUNA	VHG (> 5.0gpt)	52 650	5.92	10 017	54 135	6.40	11 142
	HG (2.0-5.0gpt)	2 889 250	2.61	242 683	1 286 303	2.99	123 594
	MG (1.2-2.0gpt)	10 514 713	1.78	603 036	5 508 734	1.80	318 247
	LG (1.0-1.2gpt)	**14 612 129**	**1.58**	**742 015**	**7 640 708**	**1.59**	**391 082**
	SPG (0.5-1.0gpt)	**21 604 725**	**1.32**	**918 822**	**11 003 323**	**1.32**	**466 169**
	waste (<0.5gpt)	22 890 876	1.26	923 921	22 209 164	0.78	558 343
	Total	**22 890 876**	**1.26**	**923 921**	**22 209 164**	**0.78**	**558 343**
BOTIJAS	VHG (> 5.0gpt)	8 566	5.57	1 533	23 390	7.16	5 382
	HG (2.0-5.0gpt)	922 044	2.52	74 733	669 647	2.87	61 756
	MG (1.2-2.0gpt)	3 703 388	1.74	207 246	2 145 667	1.88	129 881
	LG (1.0-1.2gpt)	**4 924 224**	**1.57**	**249 189**	**2 811 639**	**1.69**	**152 670**
	SPG (0.5-1.0gpt)	**7 221 194**	**1.32**	**306 173**	**3 545 516**	**1.48**	**168 402**
	waste (<0.5gpt)	7 441 882	1.29	308 769	7 358 848	0.83	195 661
	Total	**7 441 882**	**1.29**	**308 769**	**7 358 848**	**0.83**	**195 661**
OUTVEIN	VHG (> 5.0gpt)	0	0.00	0			
	HG (2.0-5.0gpt)	13 470	2.09	907			
	MG (1.2-2.0gpt)	132 587	1.46	6 222			
	LG (1.0-1.2gpt)	**372 902**	**1.20**	**14 372**	***21 804 653***	***1.69***	***1 184 033***
	SPG (0.5-1.0gpt)	**8 692 234**	**0.62**	**172 127**	***26 336 160***	***1.58***	***1 339 781***
	waste (<0.5gpt)	246 095 243	0.15	1 156 850			
Total Cutoff 0.5 gpt				**1 397 121**			**1 974 352**

Total	VHG (> 5.0gpt)	61 216	5.87	11 550
	HG (2.0-5.0gpt)	3 824 764	2.59	318 323
	MG (1.2-2.0gpt)	14 350 688	1.77	816 504
	LG (1.0-1.2gpt)	19 909 255	1.57	1 005 576
	SPG (0.5-1.0gpt)	**37 518 153**	**1.16**	**1 397 122**
	waste (<0.5gpt)	276 428 001	0.27	2 389 540
	Total	**30 332 758**	**2.70**	**2 629 811**

In addition, Geostat propose to withdraw the measured category and converts that material into indicated resources. It has no immediate impact on the mineral resources statement of the project. The Canadian Institute of Mines (CIM) code suggests some mine working should support the measured category such as adits, trenches, a trial pit and/or a grid of closed spaced RC drill holes like blast holes used in production grade control.

Drilling was done on a regular grid with a 25 by 50 meter spacing at best. The gold deposit is on a hill covered with a tropical forest and a few exploration drill roads dug in top soil covering the deposit. There is some (but very few) evidence of reminiscences of gold bearing quartz veins that show up on surface (Botija). In 2005, Vannessa was the first owner to pay attention to field geologist and try to use this information more completely. Additional work should be done to demonstrate the impact of such primary features on gold production. It does not require extensive or deep work. Any reasonable target area could be outlined and the work would define resources in the measured category.

21.5. The worst case scenario

Geostat has tested a worst case scenario by using Ordinary Kriging without the structures, assuming they do not predominantly confined gold grades. It is a model similar to that used by IMC in 1999, except that Geostat uses short ranges of grade continuity as defined by its geostatistical analysis. Geostat has used 5m bench composites instead of the 6m bench composites used by IMC and Ordinary Kriging instead of Indicator Kriging. This type of model is closer to a real production situation if no selectivity is applied during mining. In addition, it dampens the nugget effect considerably. The variography updated with these composites displays a better continuity but the range of continuity does have very short ranges accounting for most of the grade within a 20 m.

The grade continuity remains largely isotropic. One objective of this particular study was to "see" the direction of the structures in the samples' statistics But that could not be demonstrated. An explanation could be that the drill spacing of 25 m between sections and 50 meters between holes on sections is beyond the short range of continuity.

The block model in this scenario was modified to 10m x 10m x 5m (bench height) dimensions. The results of the resource estimation were a much lower grade, as expected, as the impact of the cut-off decreases the total economic resources significantly (by 30%). See **Appendix 5 for more details.**

22. Recommendations

22.1. Study of continuity of the deposit

22.1.1. Geological Interpretation – Controlling Structures- Grade Control

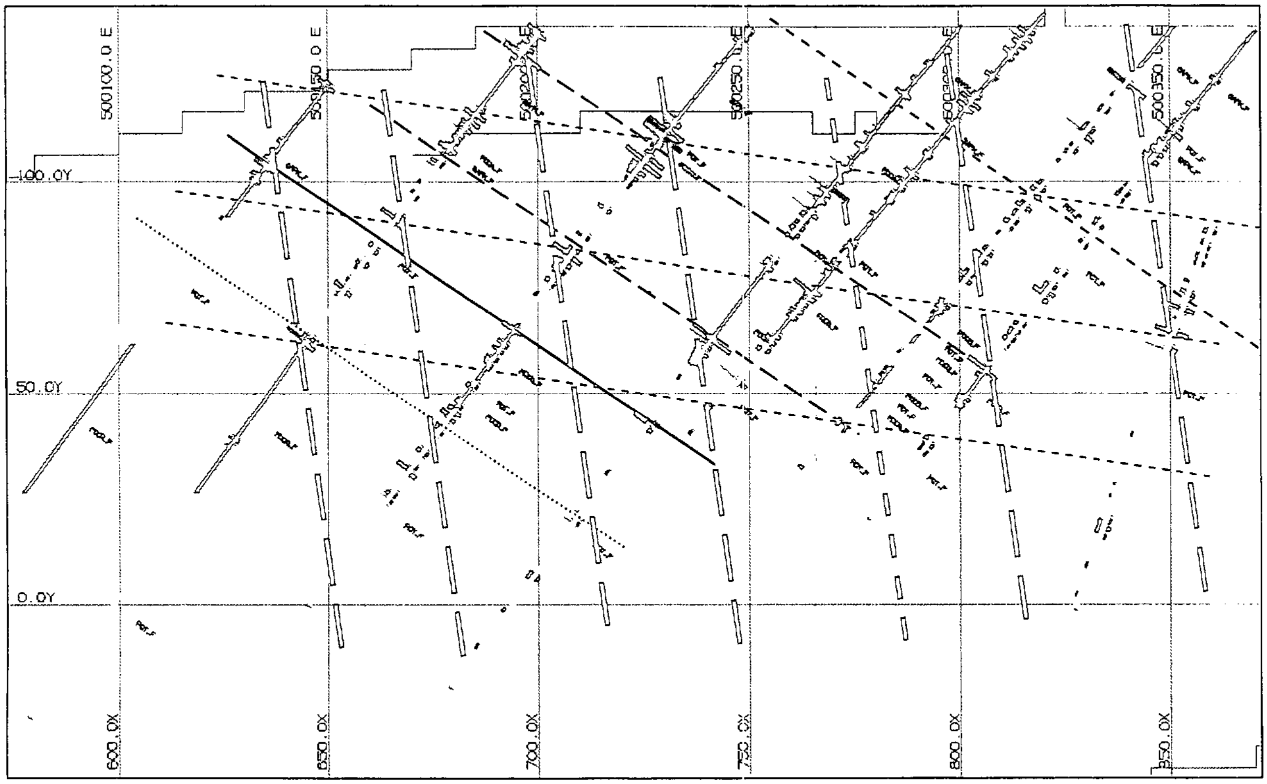


Figure 63 Section 316229N Showing gold bearing structures

On cross section (see above), the many high grade samples allow to trace many continuity direction that may or may not be true (bleu, green and magenta lines). The high variability of gold grade due to the "nugget effect" (grain sizing and sorting) justifies all sorts of interpretation. In fact, gold bearing quartz veins which are fractures in hard rock filled with the gold mineralization often has conjugated veins systems.

Generally speaking, an epithermal gold deposit occurs within relatively short distance of surface (1 to 2km pre-erosion) and is deposited from hot fluids. The fluids temperature range from less than 100C to about 300C and can appear at the surface as hot springs during the formation of deposits. The latter are most often formed in areas of active volcanism around the margins of continents.

Epithermal gold mineralization can be formed from two types of chemically distinct fluids; "low sulphidation" (LS) fluids (a mixture of rainwater that has percolated into the subsurface and magmatic water which are reduced and have a near-neutral pH) and "high sulphidation" (HS) fluids, which are more oxidized and acidic. LS fluids are that has risen toward the surface, carrying gold in solution and depositing it when the water approaches the surface and boils. HS fluids are mainly derived from a magmatic source and deposit gold near the surface when the solution cools or is mixing with rainwater.

In both LS and HS models, fluids travel toward the surface via fractures in the rock, and mineralization often occurs within these conduits. LS fluids usually form cavity-filling veins, or stockworks, that host the gold. The hotter, more acidic HS fluids tend to penetrate farther into the host rock, creating mineralization that may include veins but which is otherwise scattered throughout the rock. Minerals associated with LS systems are quartz (including chalcedony), carbonate, pyrite, sphalerite and galena, whereas an HS system contains quartz, alunite, pyrite and copper sulphides such as enargite. LS systems tend to be higher in zinc and lead, and lower in copper, with a high silver-to-gold ratio. HS systems can be higher in arsenic and copper with a lower silver-to-gold ratio.

Crucitas is interpreted as a low sulphidation epithermal deposit, and like many such epithermal gold deposit, the hydrothermal solutions migrated up through a fracture network, typically sub-vertical, to release the pressure to which they are submitted at depth. On the way up, they may find transversal fissures such as lithological contacts or more porous rocks such as pyroclastics which allows some diffusion of the gold bearing hydrothermal solution in flat veins or low grade disseminated rocks. In the saprolite, gold can be found freed from the gangue rock (carbonates, silicates and/or sulphides) by oxidation and sometimes concentrated in laterites, but more likely in alluvial placers (river gravel).

At Crucitas, Placer Dome reports that the main carrier of gold is the vertical structures, i.e., the quartz veins with their roots in hard rock at depth. There is no systematic evidence of concentration of gold in the saprolite near surface. This model could not clearly be established through the geostatistical analysis of samples. Therefore it is recommended to verify the current interpretation by digging trenches, a close drill grid (RC) or developing a trial pit to collect bulk samples to demonstrate the range, continuity and orientation of the gold grade distribution

22.2. Grade Capping Value

As the graphics and the colour table below show, a 25 g/t for gold and a 50 g/t for silver capping values may be appropriate visually. By using Kriging to model the grade distribution, proper smoothing should result by estimating the resource grade from sample grades for gold.

However, Geostat feels that grade capping should be tested again with capping values like 20, 15 and 10 g Au/t and curves drawn of the declining gold ounces in the resources upon changing the capping values to reach a definitive conclusion on grade capping.

The following graphics show gold grades in g/t from 2m composites scaled at 1m:1g/t.

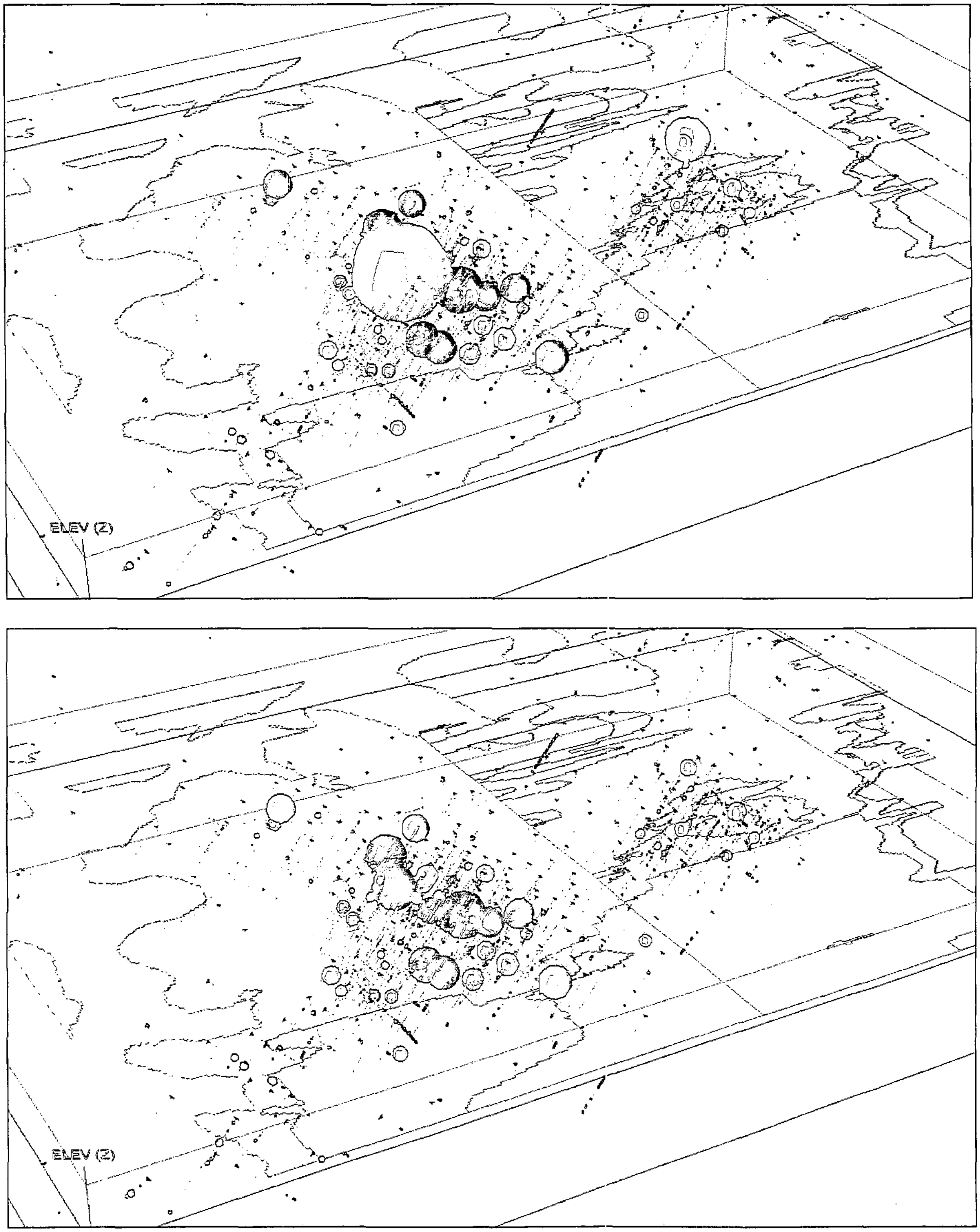


Figure 64 Showing gold grade with (above) and without (below) the high grade samples > 80 g/t

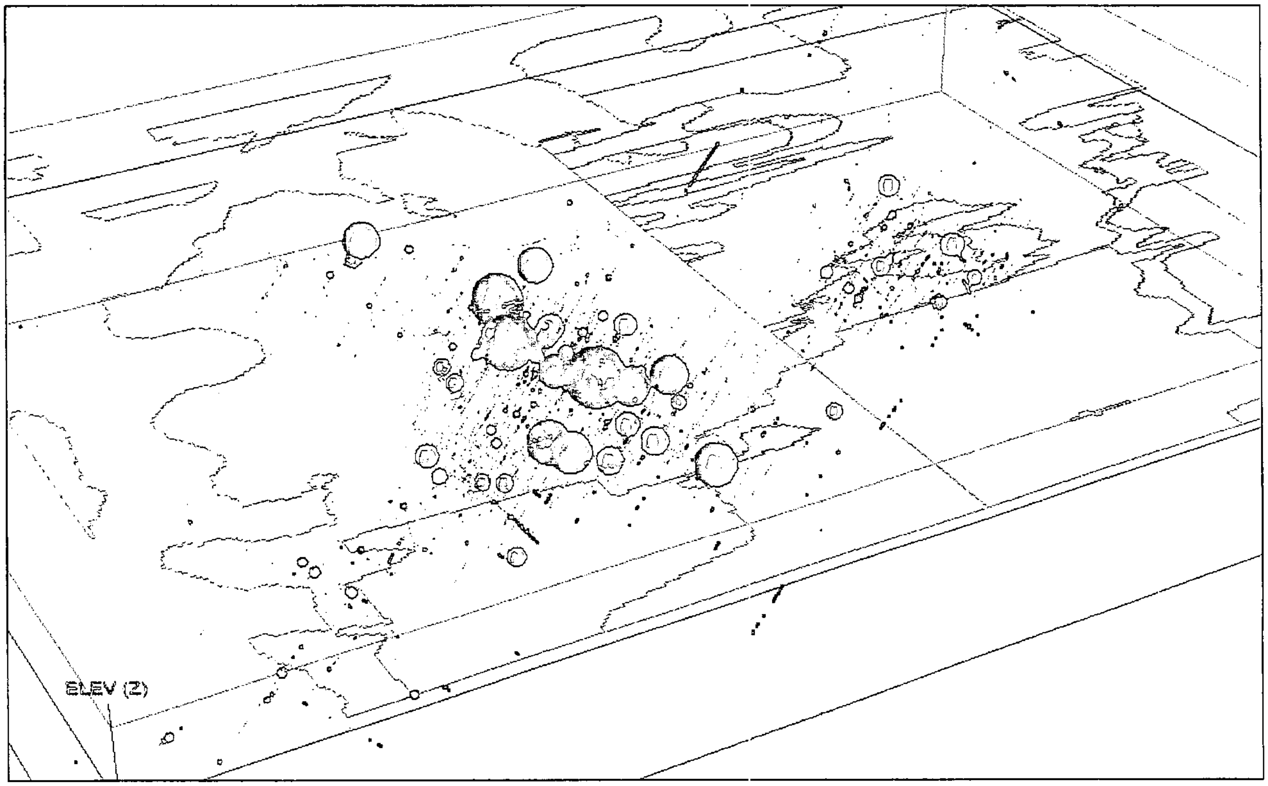


Figure 65 Same as before without drill hole traces.

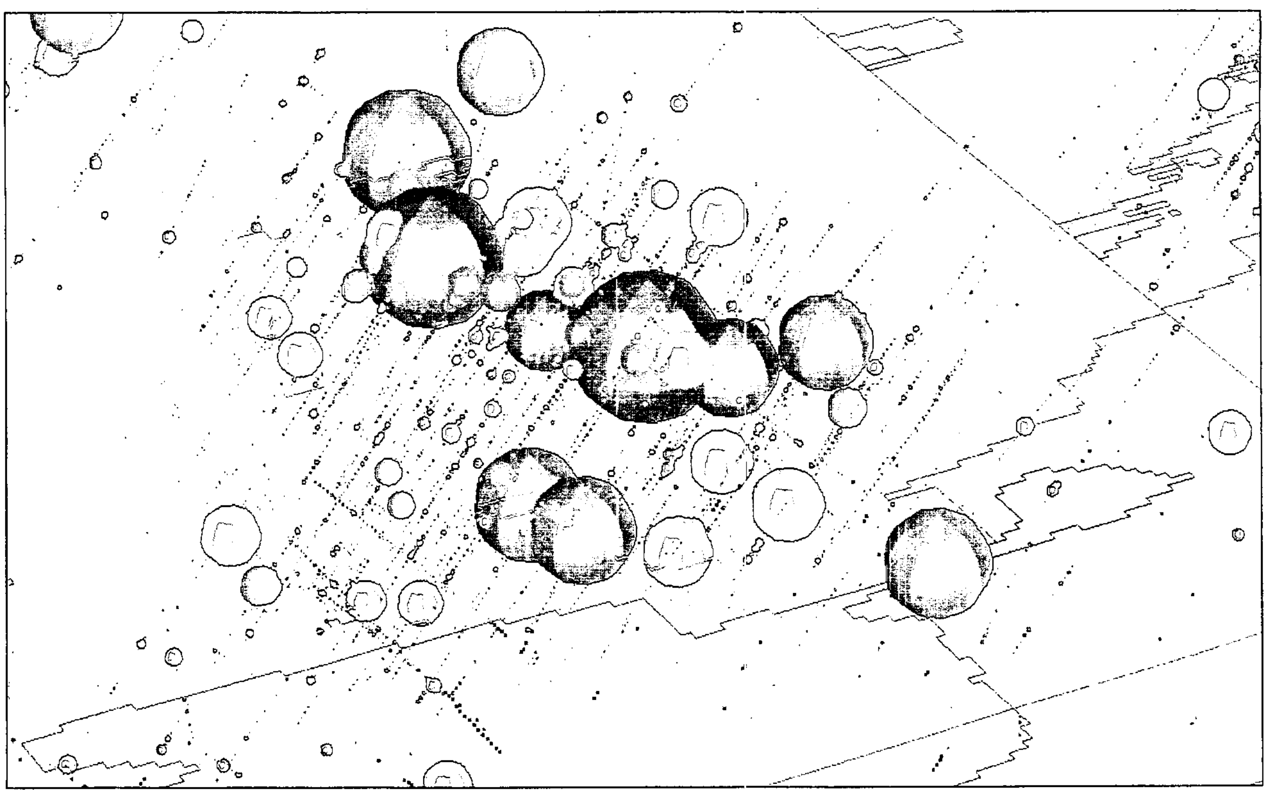
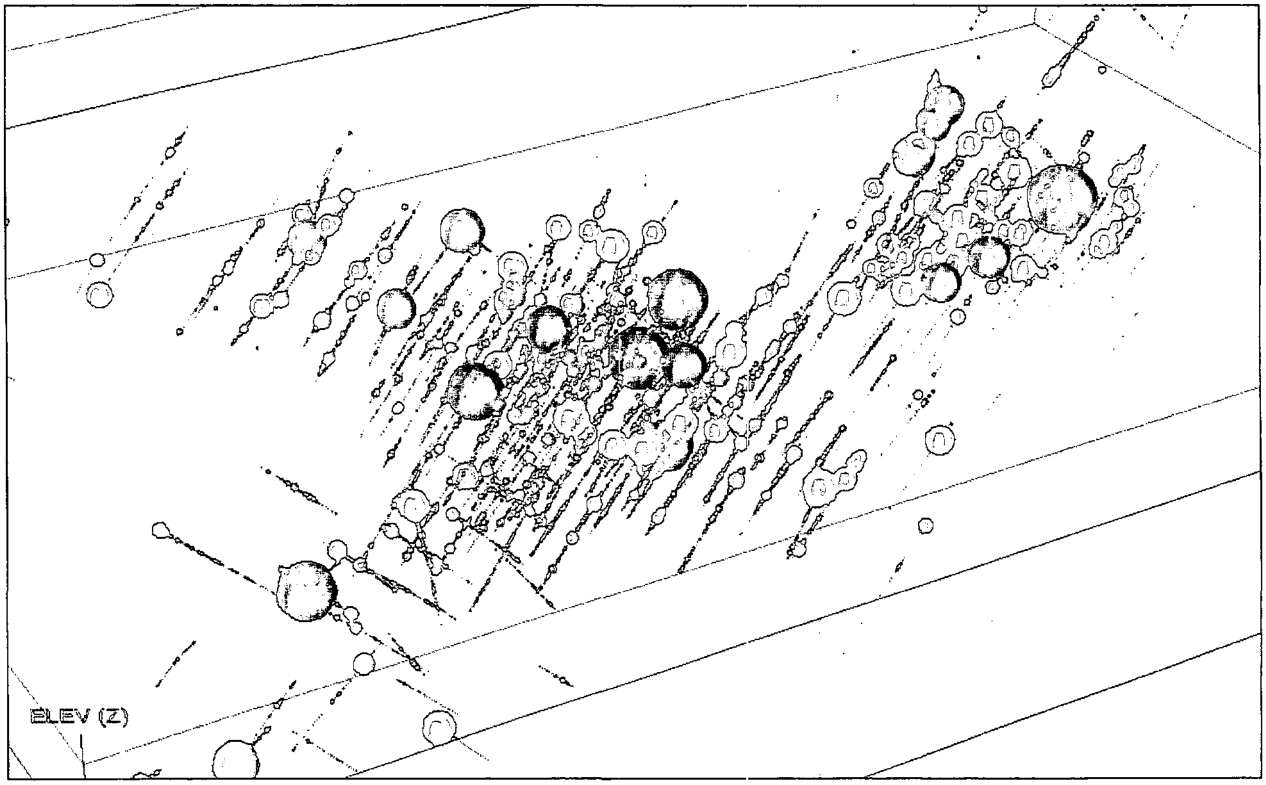


Figure 66 Same as above zoomed in. All sample with values > 1 g/t.



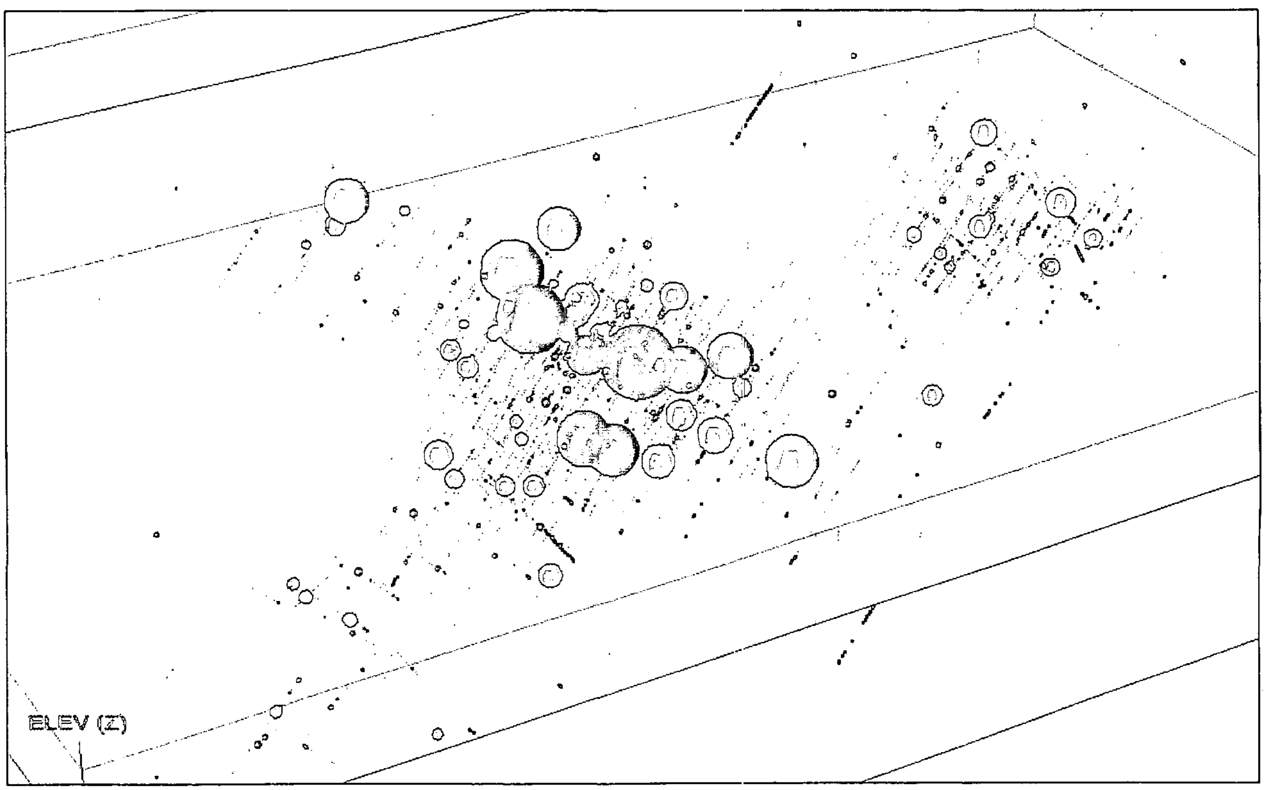


Figure 67 Silver (above) compared to gold (below), using the same colour scales without high grade (>80 g/t).

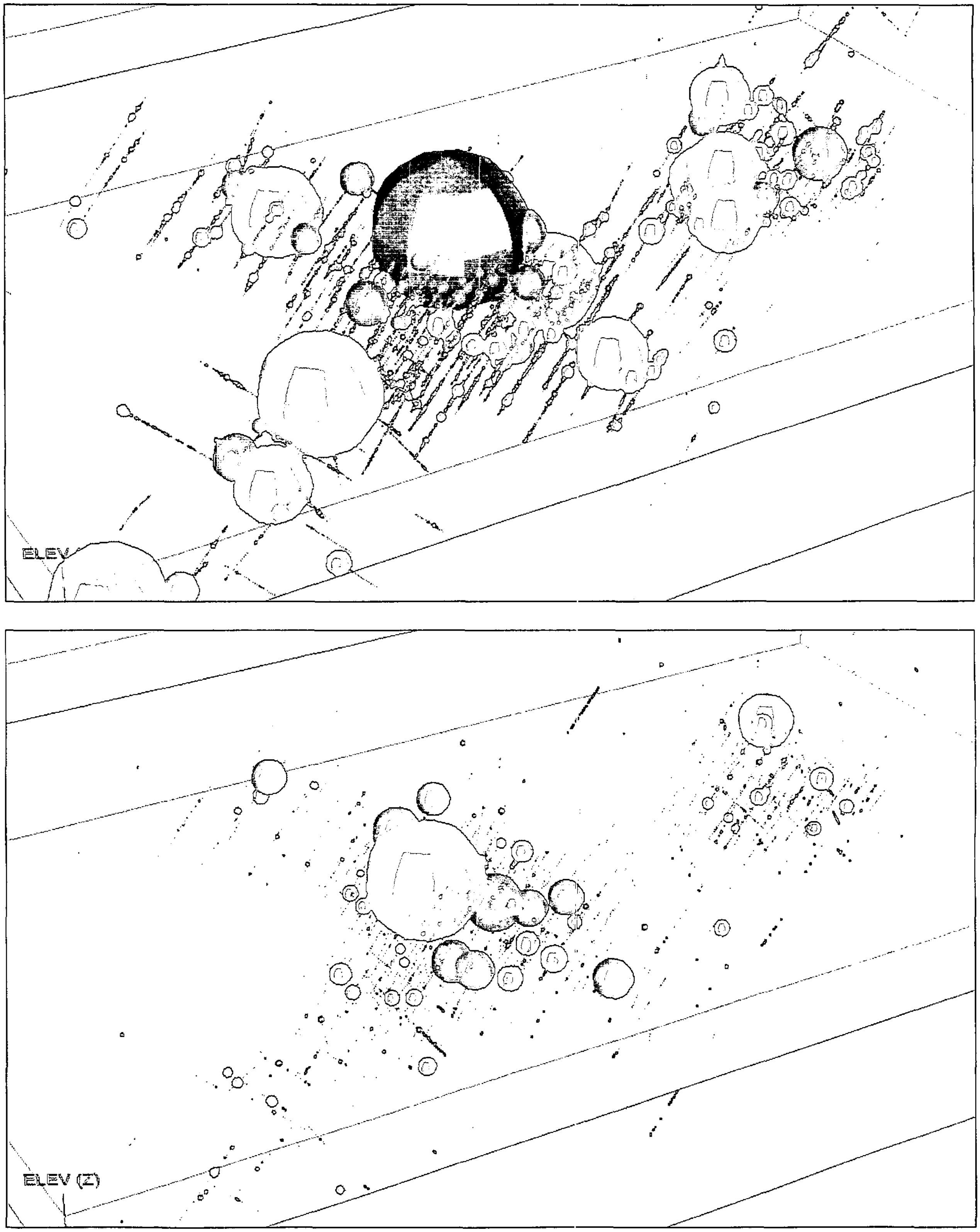


Figure 68 Silver (above) compared to gold (below), using the same colour scales with the high grade (>80 g/t).

22.3. Classification of Reserves

There is no reserves estimation in this report. This task has been assigned to Micon by Vannessa.

23. References

- CIM Report on Diamond Drilling as an aid in ore definition at the Dome Mine for presentation at the 83rd Annual General Meeting of the C.I.M.M., Calgary - May 1981: by D.S. Rogers

- NI 43-101 Final Rule, February 2001, OSC

- CIM, Guide pour l'estimation des Ressources et des Réserves. 2001

- IGCP Project 433: Caribbean Plate Tectonics; Scientific Report of Field Workshop to the "Nicoya Complex" in Costa Rica; M. Iturralde-Vinent and the field workshop group

- Costa Rica Information on the Internet at http://centralamerica.com/cr/info/

- Costa Rica Maps on the Internet at http://costa-rica-guide.com/fr_maps.htm

24. Date and Signature Page

This report was written by Pierre-Jean Lafleur, P. Eng. on behalf of Geostat System Internatinal Inc.

The release date of this report is January 2006.

Prepared in Blainville, Canada this January 31th 2006.

Pierre Jean Lafleur, P.Eng.,
For Geostat System International Inc.

25. Additional Requirements for Technical Reports on Development Properties and Production Properties

This section will be satisfied by the work of Micon which was assigned the task of making the mine plan and the economic analysis by Vannessa.

26. Illustrations

The required illustrations are inserted in the various sections of the report.

27. Appendices

27.1. Appendix 1 : Glossary

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27.2. Appendix 2 : Grade Correlation (Silver and Gold)

Gold and silver correlation has the reputation of not matching very well in the Crucitas Project. In particular, the field geologists have made the observation that silver in the saprolite has been leached. This phenomenon can be observed in some drill holes but not all the drill holes.

In the rock in particular, gold and silver peaks tends to match as shown in the following figures. Silver does not carry much economic interest, but this analysis shows it can be used to help trace the gold bearing structures when gold, which is less abundant, does not behave as well because of the 'nugget effect'.

In the resource model, silver values tend to be about 2.5 times greater than gold. In the scatter plot in Figure 69, the core cluster of sample values indicates that the overall silver to gold ratio value is 10:1, a common 'natural' and historical ratio. Crucitas does not favour the economic recovery of silver which is low grade and sometimes outside the gold rich vertical structures.

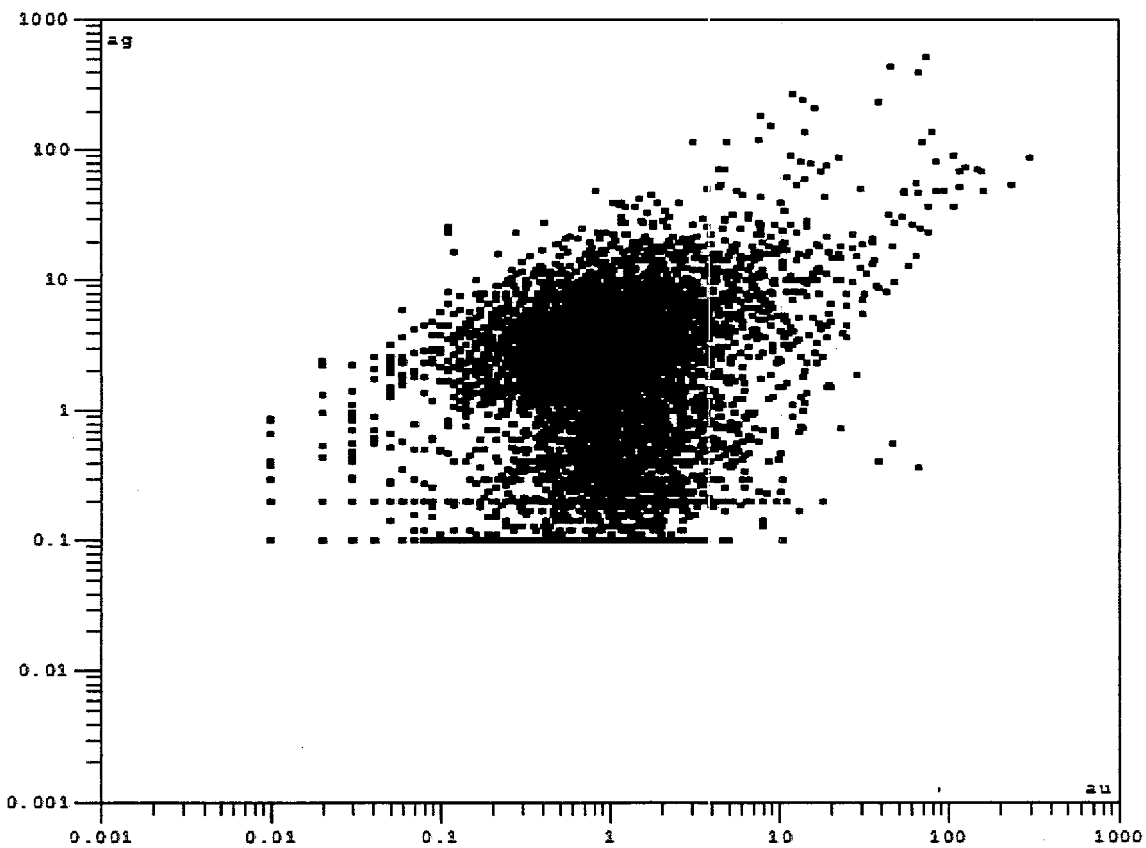

Figure 69 Correlation of Gold and Silver in Fortuna (1m composites)

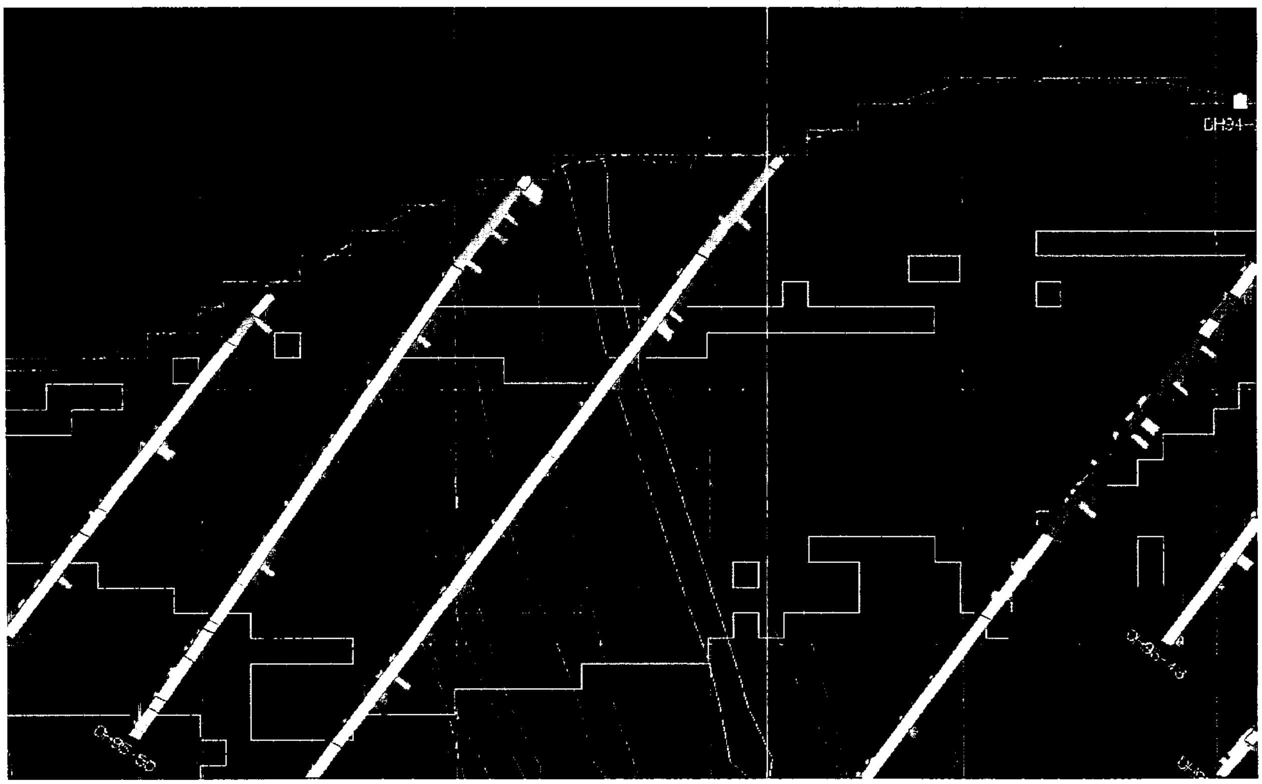

Figure 70 Section 316 075 N Showing some Silver value in Saprolite

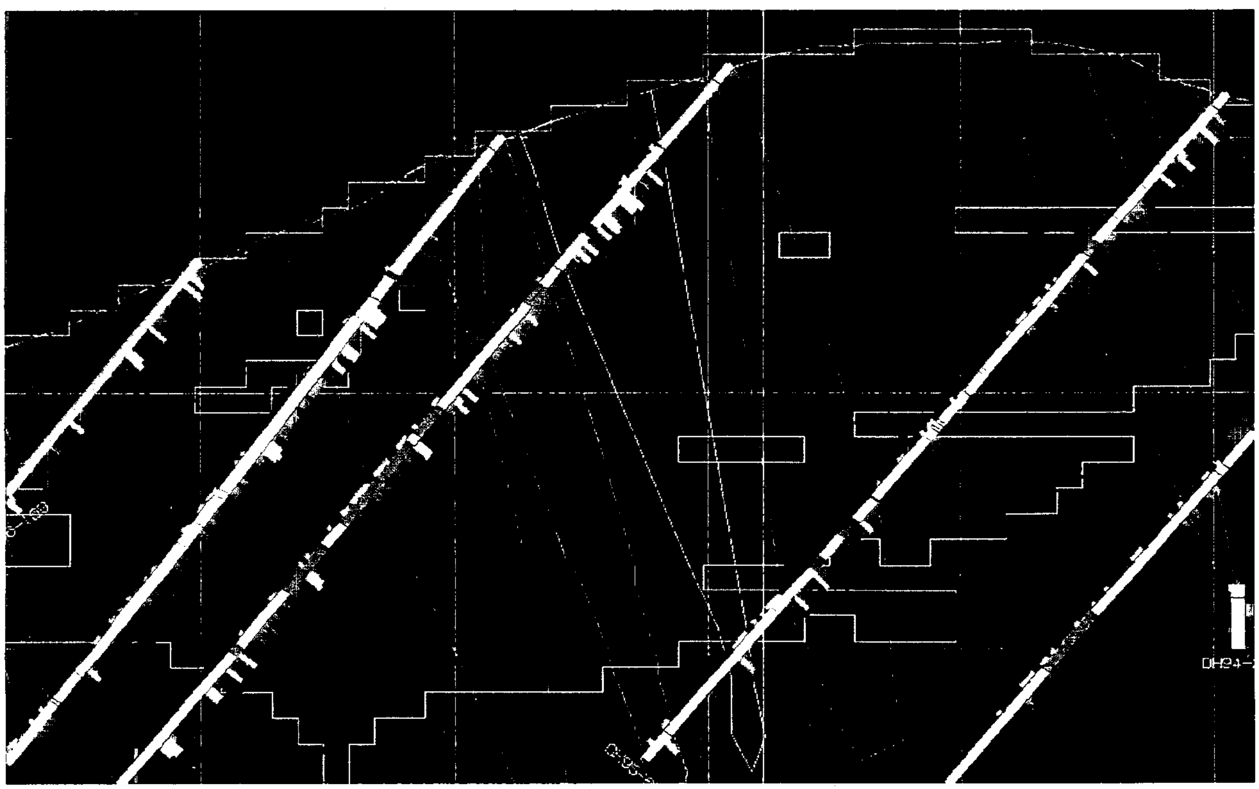

Figure 71 Section 315 975 N Showing some Silver value in Saprolite

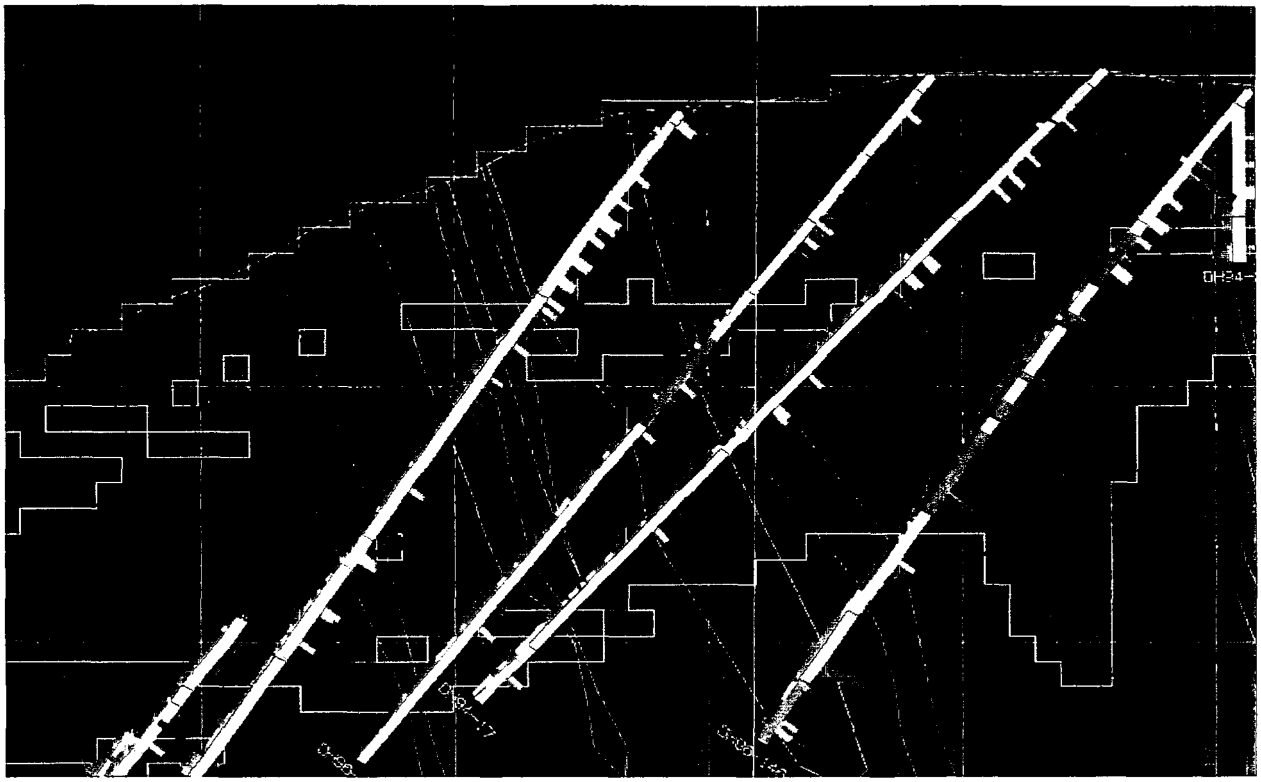

Figure 72 Section 316 050 N showing the lack of silver values in Saprolite

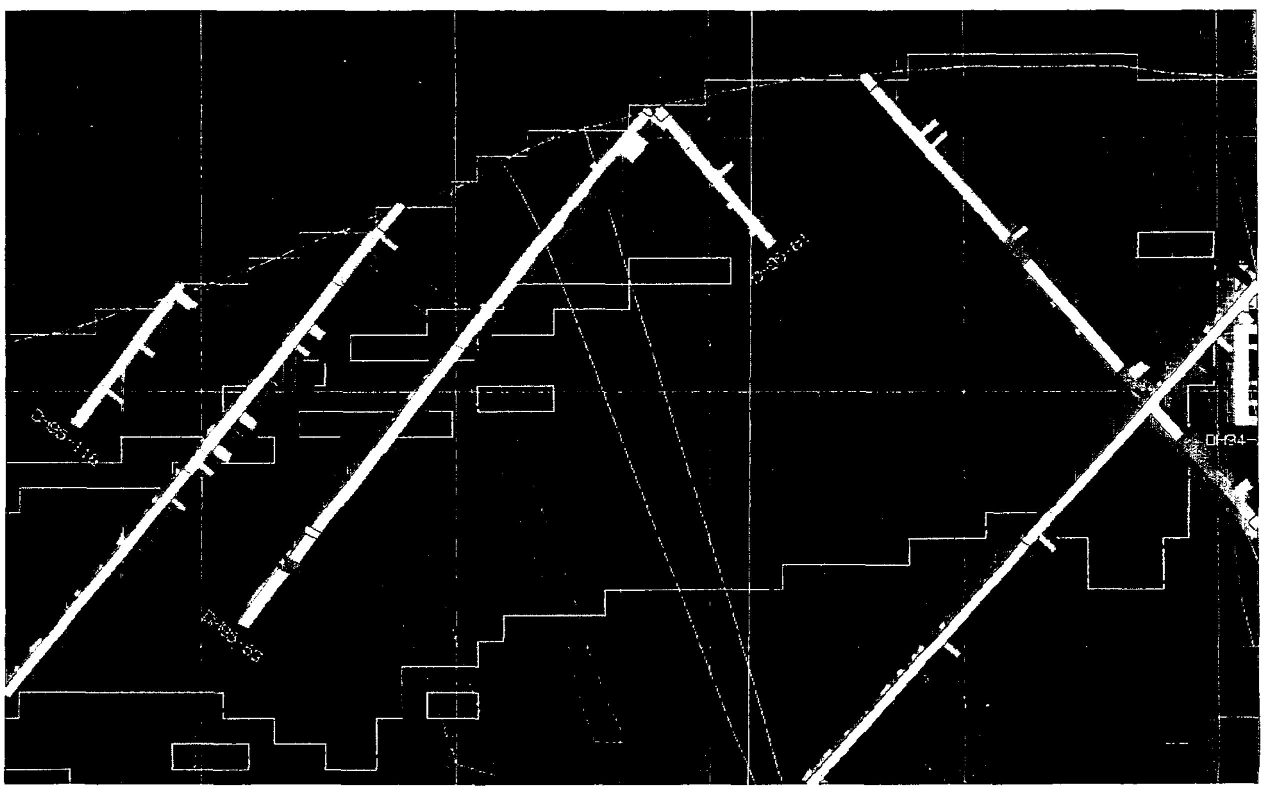

Figure 73 Section 316 025 N showing the lack of silver values in Saprolite

27.3. Appendix 3 : Metallurgical Testing Results

The following tables present a summary of the 4 phases of metallurgical testing done by Placer Dome between 1995 and 1996. The table numbers refer to the tables in the Feasibility Study prepare by Cambior in 1999 for Lyon Lake.

TABLA 5.2

Pruebas Fase I – Resultados Metalúrgicos Importantes						
Compuesto # (Wi, kWh/t)	Nombre del compuesto	Pruebas de Botella		Conc. Gravedad	Cianuración de Colas	
		P_{80} Um	Rec Au %	Rec. Au %	P_{80} Um	Rec. Au %
1 (3.45)	Saprolita Zona Este	173	83.4	16.4	109	93.6
2 (10.02)	Hypógeno Zona Este	1,331	74.3	54.4	95	92.3
3 (3.66)	Saprolita Zona Oeste	269	83.5	53.9	80	94.4
4 (7.16)	Hipógeno Volcánico Zona	1,053	89.5	55.7	102	91.5
5 (12.15)	Domo Félsico Zona Oeste	1,507	78.3	89.5	100	94.4

Note: La Zona este se llamó luego Botija, la Zona oeste se llamó luego Fortuna

Tabla 5.4

Pruebas Fase II – Resumen de Resultados Metalúrgicos						
Compuest o #	P_{80} (um) Graveda d/ Flotación	Concentración por Gravedad	Cianuracion de las Colas	Flotation[1] de las Colas	Gravedad + Cianuración	Gravedad +
		% Rec. Au	Rec. Au / Ag		Recuperación Total Au	
		@Cian./Flot.	%		%	
1	76 / 76	42.6 / 49.5	92.6 / 31.4	58.6 / 48.8	95.8	79.1
2	141 /	60.0 / 59.2	91.5 / 57.0	88.6 / 59.0	96.6	95.3
3	152 /	47.9 / 48.4	90.5 / 56.6	86.8 / 44.4	95.1	93.2

Nota 1: Incluye el concentrado preliminar y el concentrado "scavenger" (lo último recuperable).
2: Recuperación global ajustada por el promedio de recuperación por concentración por gravedad calculada.

Tabla 5.7

Pruebas Fase III – Resumen de Resultados Metalúrgicos						
Nombre del Compuesto	Concentración por Gravedad		Cianuración de colas	Recuperación total % Au (@ P_{80},um)		
	Óptimo P_{80} um	Recuperación % Au		Gravedad + Cianuración	Cianuración[1] Concentrado y Colas	Cianuración Directa del Mineral
FNS	n.d.	24.8	98.0	98.5 (106)	91.7 (40)	97.0(32)
FSS	n.d.	27.5	98.9	99.2 (246)	97.8 (229)	98.8 (242)
FNP	211	39.8	77.7	86.6 (238)	89.9 (263)	82.1 (266)
FSP	286	53.4	66.1	84.2 (308)	88.7 (146)	89.4 (160)
FNFD	283	35.4	83.7	89.5 (281)	n.d.	90.9 (152)
FSFD	261	25.4	84.6	88.5 (280)	87.6 (219)	n.d.
BS	n.d.	27.8	93.0	94.9 (244)	97.9 (203)	97.4 (215)
BP	224	53.0	75.6	88.5 (255)	91.2 (127)	91.7 (135)
BFD	287	63.6	82.8	93.7 (304)	91.0 (110)	92.3 (151)

Nota 1: El concentrado por gravedad re-molido y cianurado junto con las colas.

Tabla 5.11

Pruebas Fase IV – Rasgos Metalúrgicos Importantes						
Compósito	Pruebas Lixiviación en Columna Material Grueso			Lixiviación & Concentración por Gravedad % Rec. Au		
	Tamaño Quebrado	Total (% Rec. Au)	Cribado (% Rec. Au)	Concentrado Gravedad	Gravedad + Cianuración	Lixiviación/Grave-
FNP	-1.5”	45.9	30.3	41.4	94.7	53.8
FSP	-1.5”	33.2	28.0	33.4	92.1	61.0
BP	-1.5”	27.0	37.2	34.7	90.8	62.5
FNFD	-1.5”	60.8	16.2	29.2	95.8	59.7
FSFD	-1.5”	35.0	20.0	28.0	93.4	63.3
BFD	-1.5”	58.3	25.1	44.1	93.9	59.8
FLG	-1.5”	34.3[1]	n.d.	n.d.	n.d.	n.d.
BLG	-1.5”	77.6[1]	n.d.	n.d.	n.d.	n.d.
FNP	-0.5”	64.3	46.8	40.3	92.9	59.9
FSP	-0.5”	52.7	32.5	45.2	90.3	43.2
BP	-0.5”	49.2	44.9	44.3	93.0	56.4
FNFD	-0.5”	71.9	58.6	30.5	89.7	67.8
FSFD	-0.5”	52.8	22.8	29.8	92.3	31.6
BFD	-0.5”	71.0	48.8	51.9	88.8	57.9

Nota: 1 Mejor resultado de series de pruebas no-optimizadas.
Nota: 2 Resultados de las pruebas de lixiviación de columna obtenidos después de un tiempo de 68 a 74 días.

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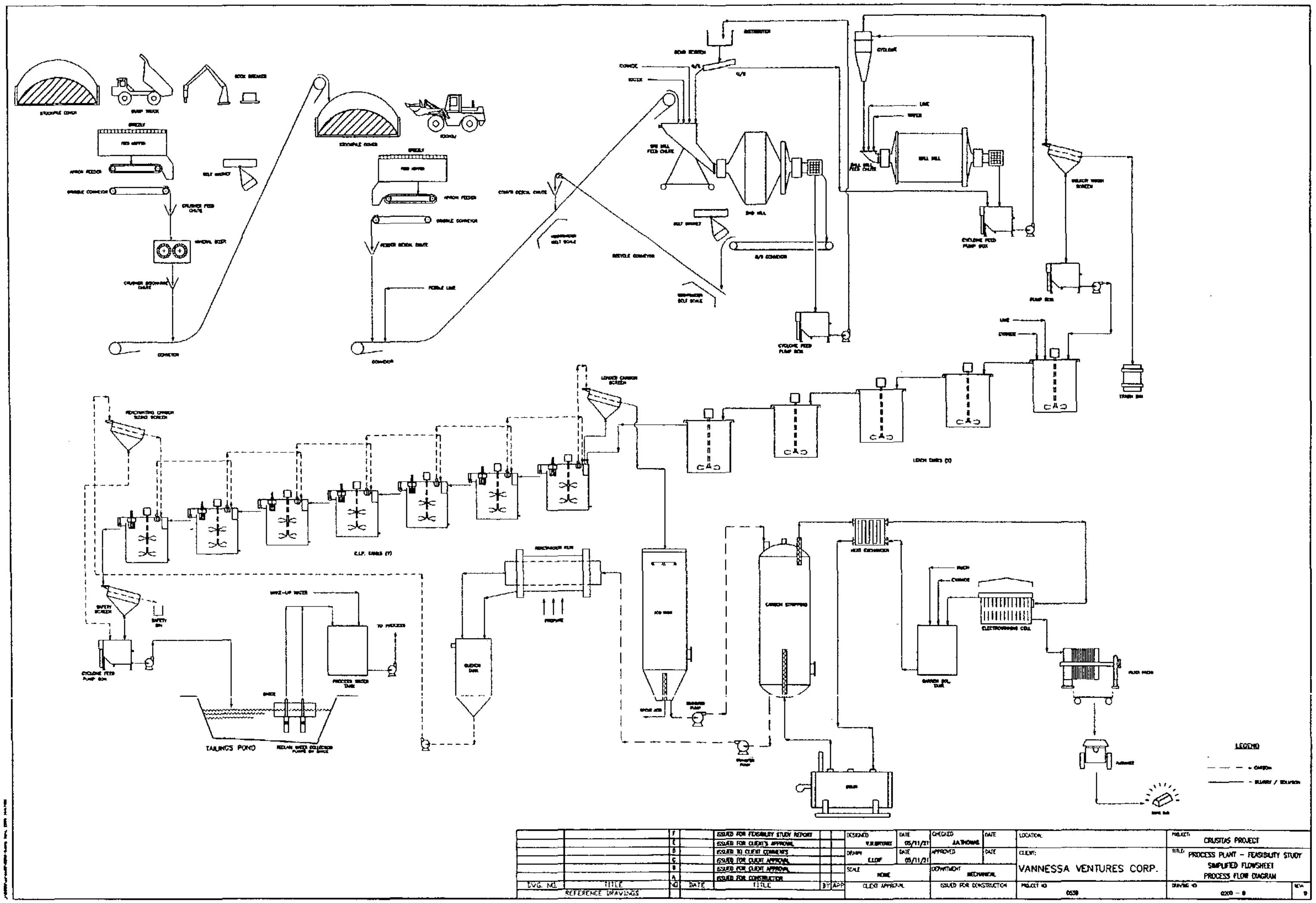


Figure 74 Current Mill Flowsheet from Vannessa

27.4. Appendix 4 : Variography of Data for 5m Bench Composites by Michel Dagbert

On the next pages, the reader will find Michel Dagbert Report regarding the Variography of Crucitas.

Variography of gold grade from sample data in the Las Crucitas deposit

The purpose of the exercise reported in this note is to try and establish a spatial continuity model for the Au grade of samples from DHs on the Las Crucitas epithermal gold deposit in Costa

1- Data available

Table 1 summarizes the sample data files available to us :

File	Type	Number	Tags	Med Au (g/t)	Avrg Au (g/t)
2mau_all.cmp	2m	18,027	1-14+500	**0.31**	NC 0.78
Fortuna SAPK	2m	2,720	1	**0.52**	**NC 1.28**
Fortuna FDCA	2m	2,078	2	**0.68**	**NC 1.32**
Fortuna FDCB	2m	863	3	**0.36**	**NC 0.72**
Fortuna PCT	2m	4,157	4	**0.32**	**NC 0.70**
Fortuna BVOL	2m	715	5	0.02	NC 0.14
Fortuna DIAB	2m	177	6	0.01	NC 0.07
Fuentes VOL	2m	1,422	7	**0.25**	NC 0.57
All Fortuna+Fu	*2m*	*12,132*	*1-7*		NC 0.88
Botijas SAP	2m	749	8	**0.83**	**NC 1.60**
Botijas SPK	2m	258	9	**0.50**	**NC 1.09**
Botijas FDCA	2m	199	10	**0.32**	**NC 0.59**
Botijas FDCB	2m	778	11	**0.36**	**NC 0.77**
Botijas PCT	2m	1700	12	**0.33**	**NC 0.59**
Botijas BVOL	2m	822	13	0.03	NC 0.11
All Botijas	*2m*	*4506*	*8-13*		*NC 0.73*
Others	2m	1138	14	0.01	NC 0.10
Others	2m	251	500	0.01	NC 0.11
Compo1m-o	1m	25,464	No	0.17	NC 0.31 C 0.30
Fortuna Min.	1m	7,596	No	0.94	NC 2.04 C 1.63
Fortuna Min. 270	1m	6,669 6886?	No No	0.96 0.76	NC 2.05 C 1.64 NC 1.67 C 1.34
Botijas Min.	1m	2,874	No	0.98	NC 1.64 C 1.55
Botijas Min. 270	1m	2,364	No	0.98	NC 1.58 C 1.51
CMP_Bench	5mB	5,885	1-14+500	0.38	NC 0.78 C 0.68

Table 26 Statistics of composite data files reviewed

As illustrated on Figures 1 and 2, litho tags 1 to 7 on one end and 8 to 13 on the other end correspond to the same litho type succession but in Fortuna and Botijas zones. Types 14 and 500 are for material outside those two zones (Figure 3)

In both zones, there is a strong litho zonality with Sap and Sap Rock at the top, felsites and pyroclastites in the middle and volcanics at the bottom.

Quick statistics of uncut Au grade of 2m composites in each type (Table1) show that **mineralization is limited to Sap, Sap Rock, Felsites and Pyroclastites**. Best median grades are in Sap and Sap Rock as well as the Felsite A of Fortuna. Felsites (except FDCA in Fortuna) and Pyroclastires have about the same median grade

The 1m composite dataset is split in "unmineralized" (Compo1m-o) composites and "mineralized" composites in Fortuna and Botijas zones. The "mineralized" zones are dipping 85o to N70 in Fortuna and 85o to N130 in Botijas. If we add unmineralized 1m composites (25,464 @ NC 0.31 g/t and C 0.30 g/t), mineralized 1m composites in Fortuna (7,596@ NC 2.04 g/t and C 1.63 g/t) and mineralized 1m composites in Botijas (2,874@ NC 1.64 g/t and C 1.55g/t), we get 35,934 1m composites with average NC of 0.78 g/t (fit 2m and 5m bench composites) and C of 0.68 g/t (fit 5m bench composites).

Fortuna min. 270 and Botijas Min. 270 are 1m composites in mineralized zones but only in the latest Placer DH dipping to west.

The grade distribution of the 5m bench composites reflects the dilution with 5m benches : at a 0.7 g/t economic cut-off, we get 30.1% of the 5m bench composites above cut-off at an average cut grade of 1.68 g/t. Above the same cut-off, we get 25.1% of 1m composites above at an average cut grade of 1.94 g/t

2- Are there subvertical mineralized zones?

So far, it looks like the consensus about grade continuity in Las Crucitas is that it is very much constrained by the sub-horizontal lithology zoning i.e. the best continuity (longest ranges) is along any direction of the average plane of lithological units and the worst continuity (shortest ranges) is along the sub-vertical direction perpendicular to this plane

A new interpretation has emerged recently, which consists in delineating sub-vertical bands of mineralization across sub-horizontal lithology units. The average plane of those bands dip 85o to N70 in Fortuna and 85o to N130 in Botijas. Those orientations are visible on core samples as well as on some outcrops. Limits of mineralized bands are defined on drill hole sections by contouring intervals with "good" grade. The 1m composites files listed in Table 1 reflect that discrimination between mineralized (median grades of 0.94 g/t in Fortuna and 0.98 in Botijas) and un-mineralized material (median grade of 0.17 g/t in outside mineralized bands).

Because of the high contrast of median grade within and outside the mineralized bands, it is very much likely that after interpolating blocks within bands from just composites within bands and blocks outside bands from just composites outside bands, most of the blocks within bands are estimated above economic cut-offs in the 0.5-1.0 g/t range and most of the blocks outside bands are estimated below those cut-offs. In other words, estimated resources above cut-off are mostly dependent of the interpreted bands and not at all of the way block grade is interpolated from samples.

Obviously, if those bands are real, this is the way to go. But they are "artificial", the actual distribution of ore and waste in blocks will be found more random with more dilution of grade in all the blocks and in the end, less ounces above economic cut-offs (even if the ounces at no cut-off are the same).

To check the validity of the sub-vertical mineralized bands model in Fortuna , we have computed variograms/correlograms in various directions of the horizontal and EW vertical planes. In the horizontal plane, we expect to see a better continuity in the direction N340 compared to N70 and in the EW vertical plane, we expect to see a better continuity in the direction dipping 80o to east than along the direction dipping 10o to west. Since mineralized bands cross lithology limits, variograms are computed from all composites in Fortuna except those in the lower volcanics which are definitely lower grade. In other words, we work with composites in tags 1 to 4 for Fortuna and in tags 8 to 12 for Botijas

In the horizontal plane (Figure 4), there is no evidence of a better continuity along NS or N160. In the EW vertical plane (Figure 5), there is no evidence of a better continuity along dips 80 to east or west. Same appears in variograms of indicator data (0.5 and 0.7 g/t cut-off) of 5m bench composites (not shown).

Hence, at the moment, in Fortuna F1-4, we would favor an ordinary kriging of the Au grade of 10x10x5m blocks from the cut Au grade of 5m bench composites with an isotropic correlogram model of high nugget effect and a fairly large search (around 50m radius).

Michel Dagbert
07-11-2005

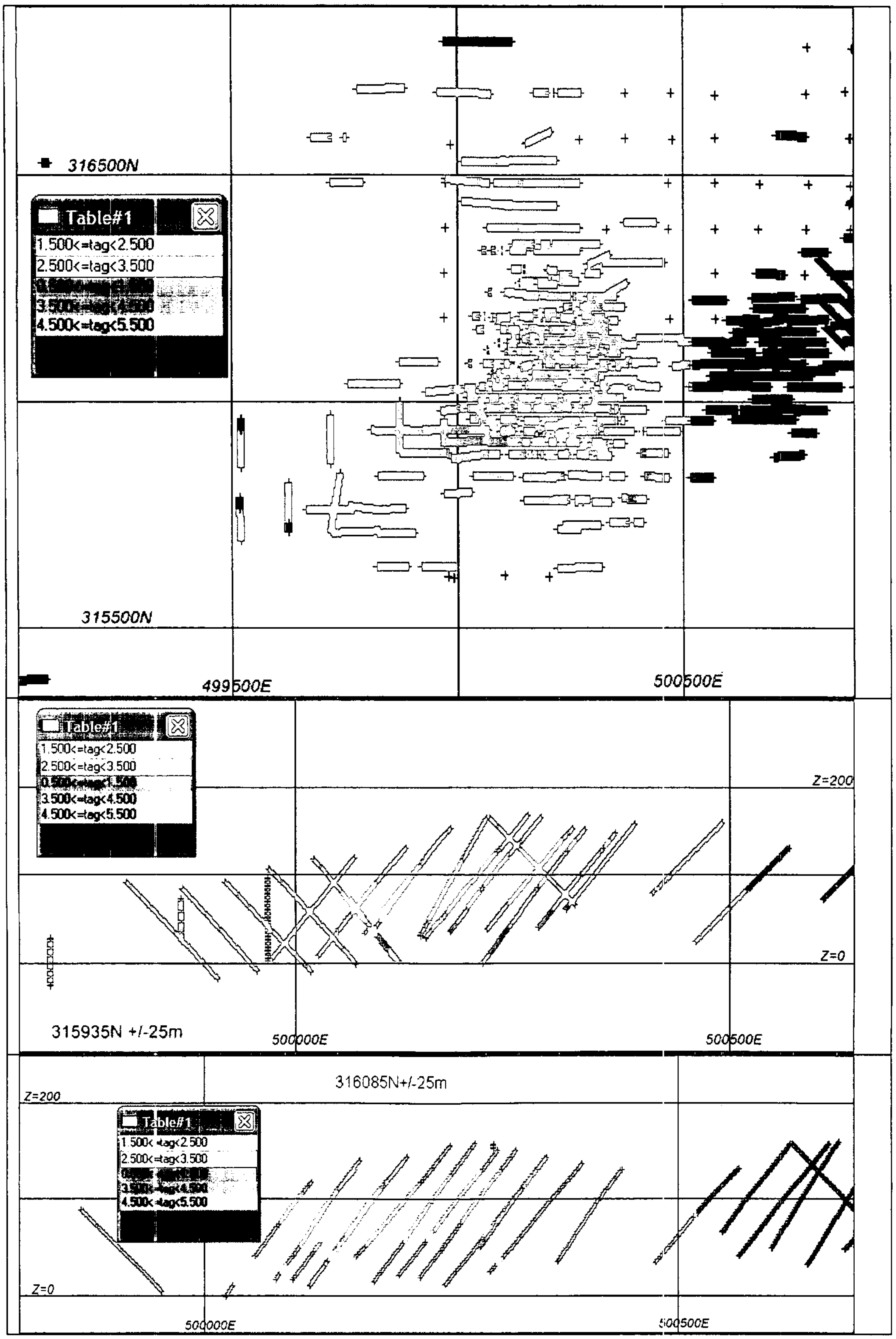


Figure 75 Spatial distribution of litho tags from 2m composites in Fortuna Zone

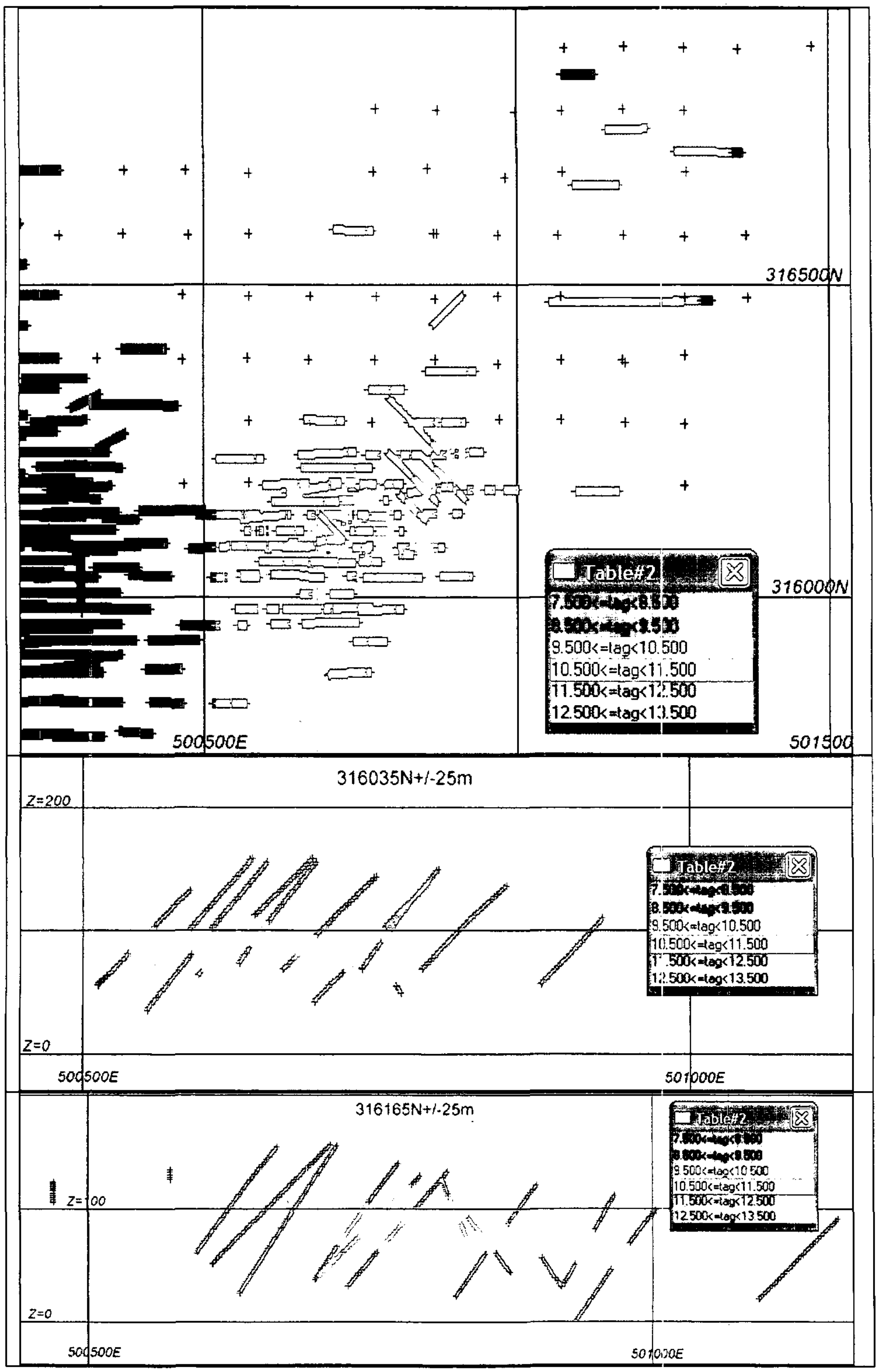


Figure 76 Spatial distribution of litho tags from 2m composites in Botijas Zone

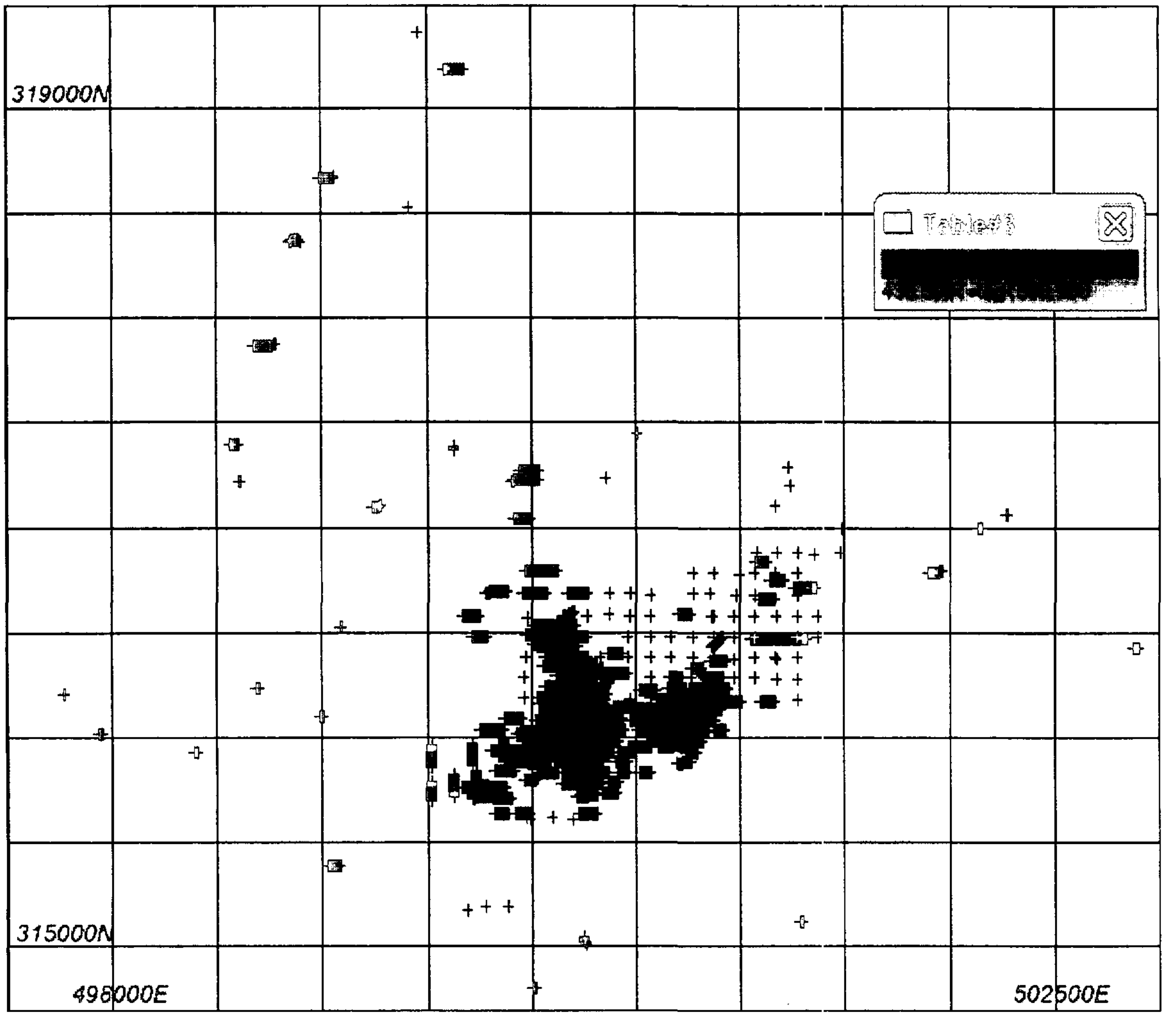


Figure 77 Spatial distribution of litho types from 2m composites outside Fortuna and Botijas zones

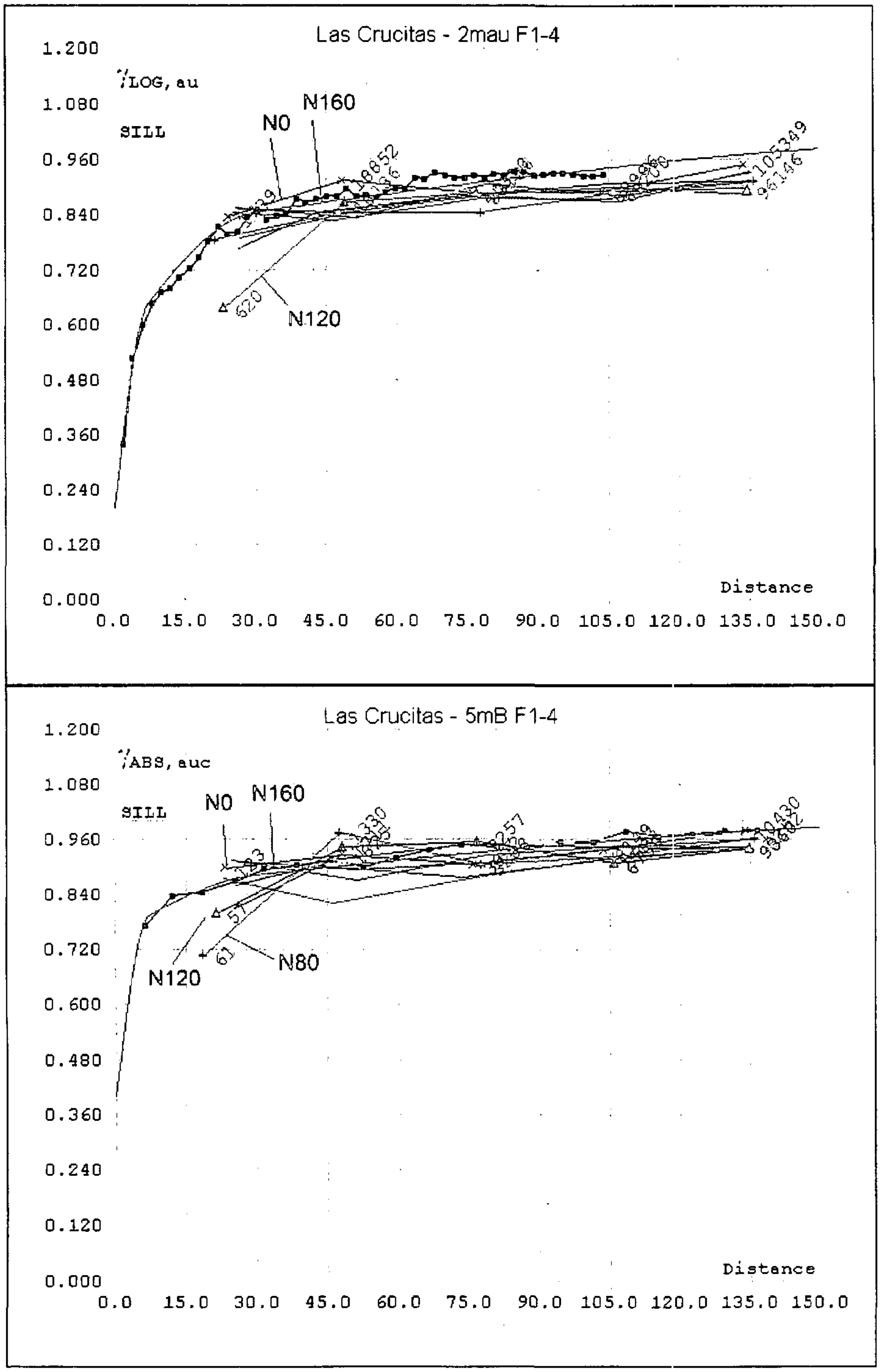


Figure 78 Correlograms of Au grade along horizontal directions in Fortuna

Top = log correlograms of uncut grade for 2m down-hole composites . Bottom = correlograms of cut grade for 5m bench composites. Tags F1-4 only. Directions are average (black with filled squares) + 9 horizontal directions at 20o azimuth intervals.

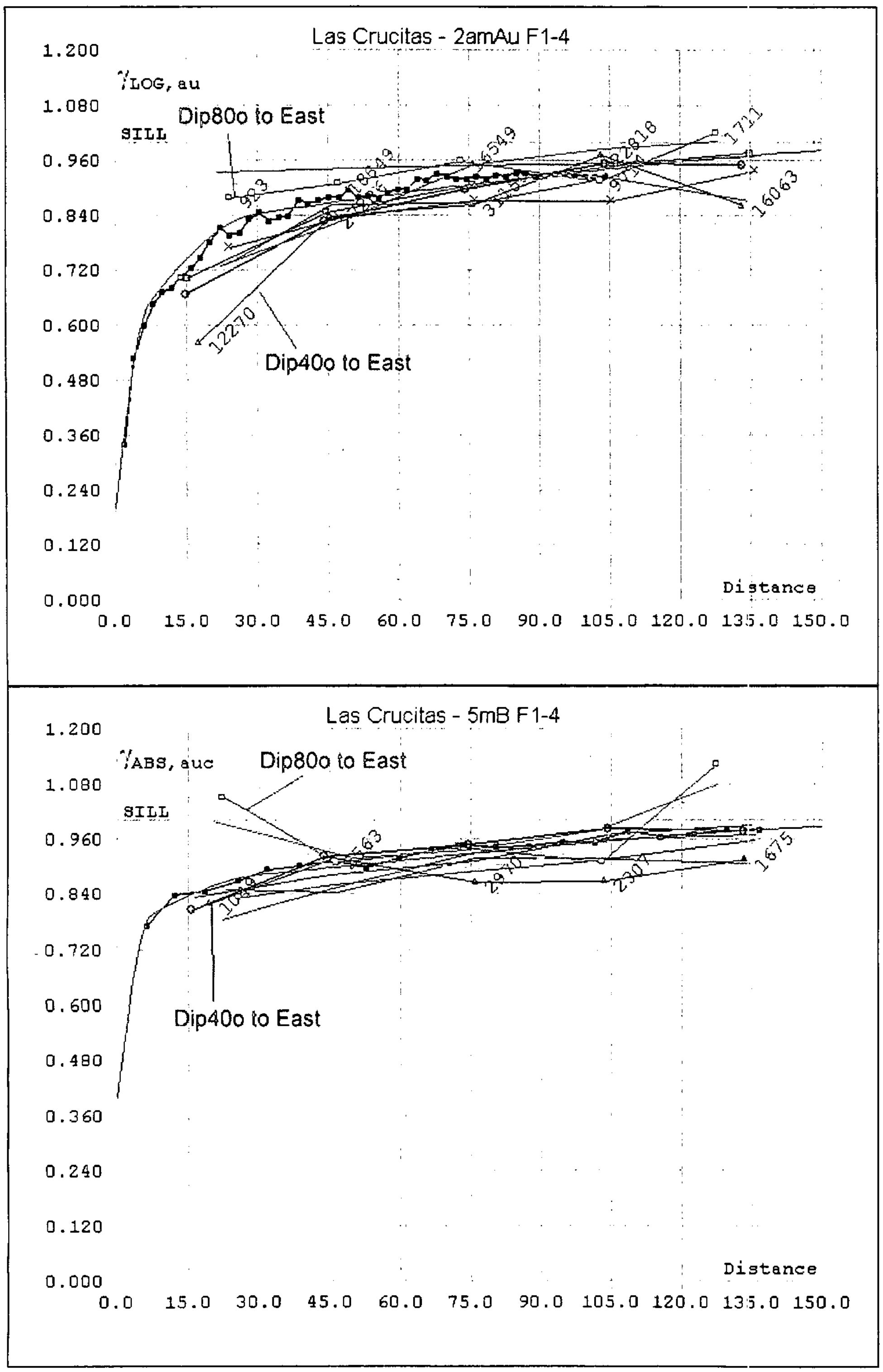


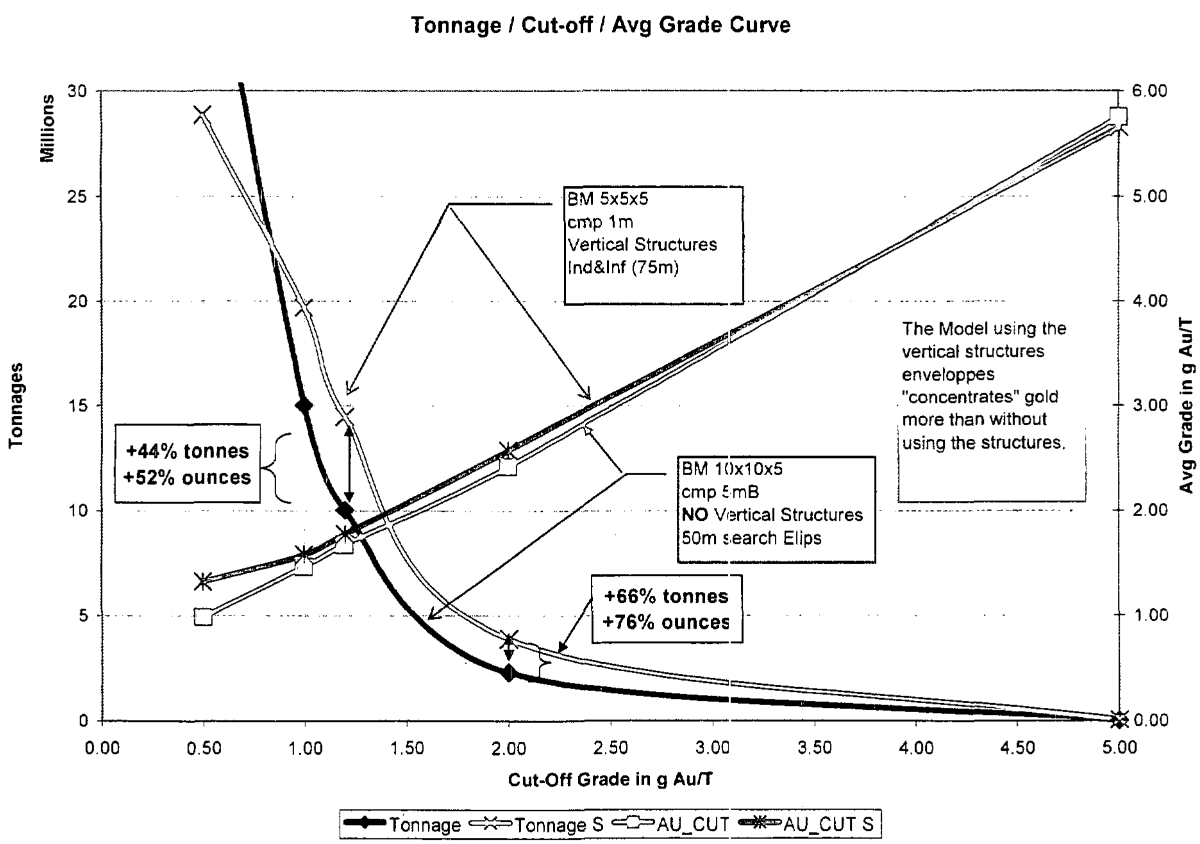
Figure 79 Correlograms of Au grade along directions of EW vertical sections in Fortuna

Top = log correlograms of uncut grade for 2m down-hole composites . Bottom = correlograms of cut grade for 5m bench composites. Tags F1-4 only. Directions are average (black with filled squares) + 9 horizontal directions at 20o dip intervals intervals.

Table A5-1 Comparative Resource estimates

				BM 10x10x5 cmp 5mB			**BM 5x5x5 cmp 1m**		
ROCKGROUP	GRADEGROUP	Volume	Density	Tonnage	AU CUT	AU CUT	Tonnage S	AU CUT S	AU CUT So
		M**3	T per M**3	T	gpt	Onces	T	gpt	Onces
Fortuna	VHG (>5.0)	0	0.000	0	0.00	0	52 650	5.87	9 620
	HG (2-5)	827	1.792	1 483 235	2.43	112 099	2 958 547	2.68	246 430
	MG (1.2-2)	4 099	1.906	7 813 129	1.67	406 420	10 698 403	1.84	613 054
	LG (1-1.2)	6 108	1.952	11 923 689	1.47	546 241	14 723 820	1.64	749 659
	SPG (0.5-1)	16 518	2.047	33 810 553	0.98	1 035 750	21 606 688	1.37	923 472
	waste	124 885		280 308 734	0.03	247 339	1 284 188	0.12	5 073
	Total	**141 404**	**2.221**	**314 119 287**	**0.13**	**1 283 090**	**22 890 876**	**1.30**	**928 545**
Botijas	VHG (>5.0)	17	1.350	22 950	5.95	4 245	7 624	5.62	1 333
	HG (2-5)	603	1.434	865 420	2.63	70 860	941 851	2.60	76 314
	MG (1.2-2)	1 407	1.568	2 206 085	1.96	134 164	3 748 072	1.80	210 236
	LG (1-1.2)	1 858	1.660	3 083 700	1.71	164 071	4 961 048	1.63	251 924
	SPG (0.5-1)	3 417	1.890	6 457 209	1.20	240 230	7 225 675	1.37	308 096
	waste	52 583		112 395 419	0.01	29 532	216 207	0.36	2 533
	Total	**56 000**	**2.122**	**118 852 628**	**0.07**	**269 763**	**7 441 882**	**1.34**	**310 629**
Total		**197 404**	**2.193**	**432 971 915**	**0.12**	**1 552 852**			

ROCKGROUP	GRADEGROUP	Class	Cut-Off	Tonnage	AU_CUT	Onces	Tonnage S	AU_CUT S	Onces S
Fortuna & Botijas		VHG (>5.0)	5.00	22 950	5.75	4 245	60 274	5.65	10 953
		HG (2-5)	2.00	2 348 655	2.42	182 959	3 900 398	2.57	322 743
		MG (1.2-2)	1.20	10 019 214	1.68	540 584	14 446 475	1.77	823 289
		LG (1-1.2)	1.00	15 007 389	1.47	710 312	19 684 868	1.58	1 001 583
		SPG (0.5-1)	0.50	40 267 762	0.99	1 275 981	28 832 363	1.33	1 231 568
		waste	0.00	392 704 153	0.02	276 871	1 500 394	0.16	7 606
		Total		**432 971 915**	**0.11**	**1 552 852**	**30 332 758**	**1.27**	**1 239 173**



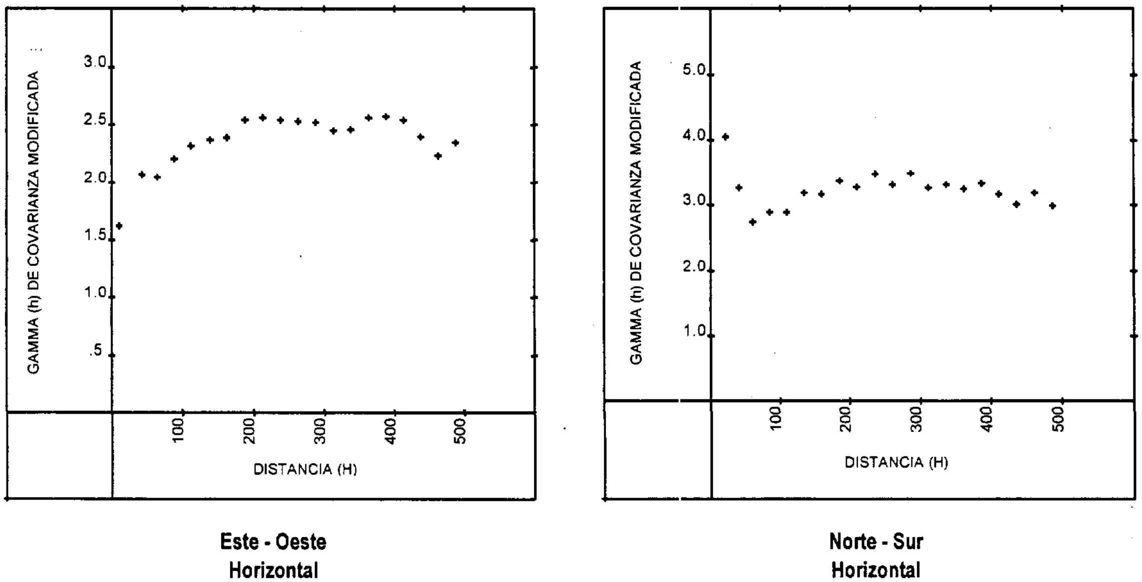
27.5. Appendix 5 : Variography of Placer Dome and IMC

Table 2: PDI's Gold Variography Models						**First model**			**Second model**		
Type	**C_1**	**a_1(m)**	**Type**	**C_2**	**a_2(m)**	**Type**	**C_1**	**a_1(m)**	**Type**	**C_2**	**a_2(m)**
Au	1 SAPK-F	X	90	0	.32	S	.733	**10.8**	S	.39	**86.8**
		Y	0	0	.32	S	.733	**10.8**	S	.39	**86.8**
		Z	-	90	.32	S	.733	**3.9**	S	.39	**17.9**
Au	8 SAP-B	X	90	0	.26	S	.355	**18**	S	.587	**71.7**
		Y	0	0	.26	S	.355	**18**	S	.587	**71.7**
		Z	-	90	.26	S	.355	**3**	S	.587	**10.7**
Au	9 SPK-B	X	90	0	.285	S	.266	**10.7**	S	.603	**70.7**
		Y	0	0	.285	S	.266	**10.7**	S	.603	**70.7**
		Z	-	90	.285	S	.266	**2**	S	.603	**12.8**
Au	2 FDCA-F	X	70	0	.179	S	.445	**7.6**	S	.302	**40.2**
		Y	340	0	.179	S	.445	**20**	S	.302	**75.9**
		Z	-	90	.179	S	.445	**3.8**	S	.302	**25.7**
Au	10 FDCA-B	X	90	0	.16	S	.248	**3.9**	S	.281	**12.5**
		Y	0	0	.16	S	.248	**3.9**	S	.281	**12.5**
		Z	-	90	.16	S	.248	**3.9**	S	.281	**12.5**
Au	4 PCT-F	X	70	0	.24	S	.50	**18.8**	S	.29	**67.1**
		Y	340	0	.24	S	.50	**23.3**	S	.29	**83.2**
		Z	-	90	.24	S	.50	**5.8**	S	.29	**69.1**
Au	12 PCT-B	X	60	0	.21	S	.45	**27.8**	S	.39	**84.1**
		Y	330	0	.21	S	.45	**15.3**	S	.39	**49.2**
		Z	-	90	.21	S	.45	**4.1**	S	.39	**24.7**

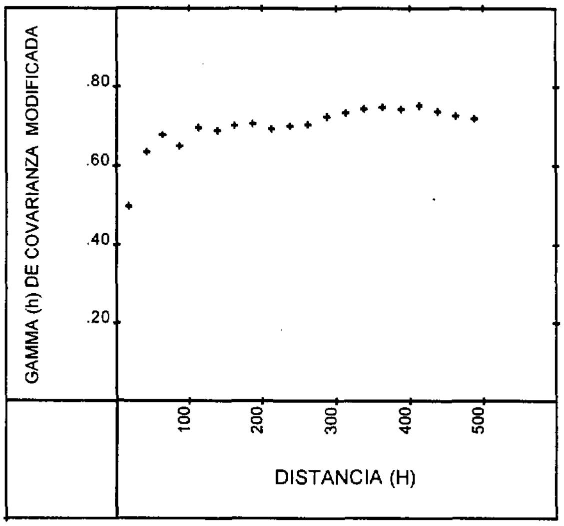
Table 5: 2 Stage Indicator Kriging Parameters – IMC (Aug. 99)

ROCK CODE 1,2 & 3 & Zones	DIRECTIONS		Search Ranges (m)			Data per hole	Data used per Block		Variography (same as Search Radii)	
	X	Y	X	Y	Z		Min	Max	Co	C total
West Fortuna (15 deg West dip)	N90/0	N00/0	100	50	19	3	1	10	0.2	1.0
East Fortuna (15 deg East dip)	N90/0	N00/0	100	50	19	3	1	10	0.2	1.0
West Bojitas (15 deg West dip)	N90/0	N00/0	100	50	19	3	1	10	0.2	1.0
East Bojitas (15 deg East dip)	N90/0	N00/0	100	50	19	3	1	10	0.2	1.0

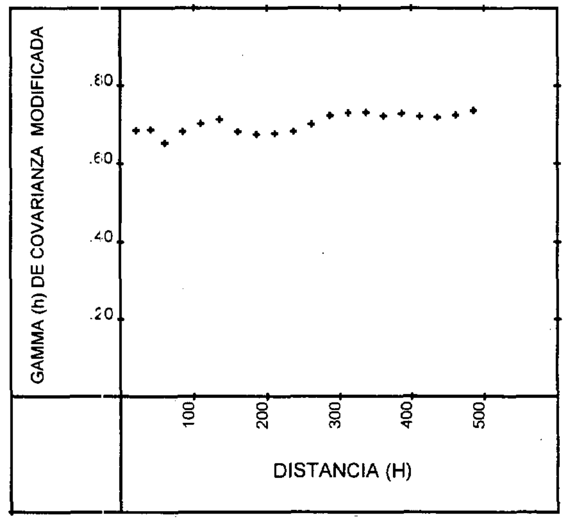
- Block Size: 10m x 10m x 6 m (high)
- 6 m Composites; Top Grade Cut at 25 gpt Au
- Two Discriminators: 0.7 gpt and 1.5 gpt Au
- Specific Gravity: Saprolite 1.35; SapRock 1.65; Hard Rocks 2.39 t/m^3



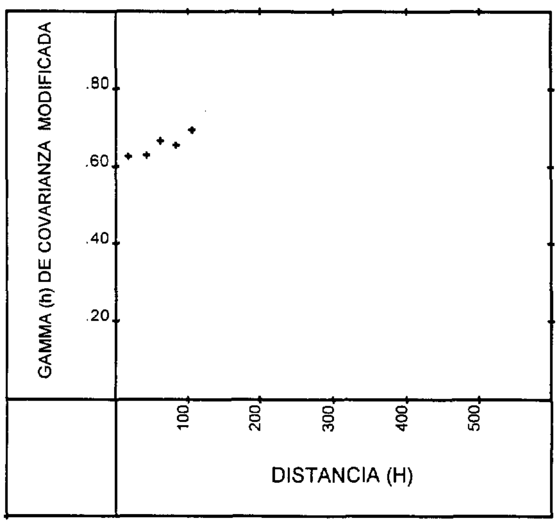
INDUSTRIAS INFINITO S.A. Subsidiaria Lyon Lake Mines Ltd **PROYECTO CRUCITAS** Permiso 7339	**Variogramas Saprolita** **Covarianza Modificada**	**Figura 3.12**



N67E
Horizontal

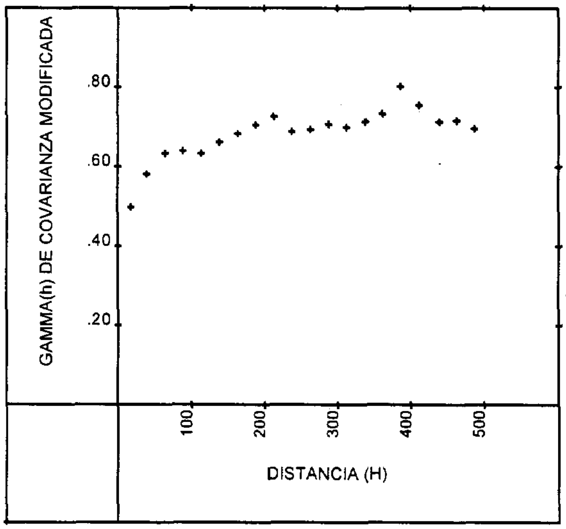


Norte - Sur
Horizontal

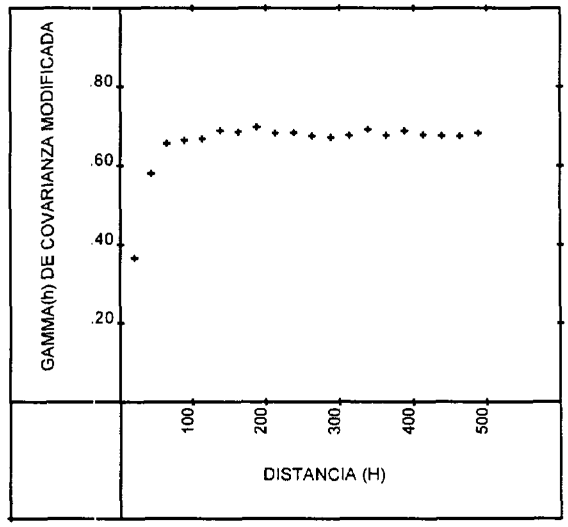


Vertical

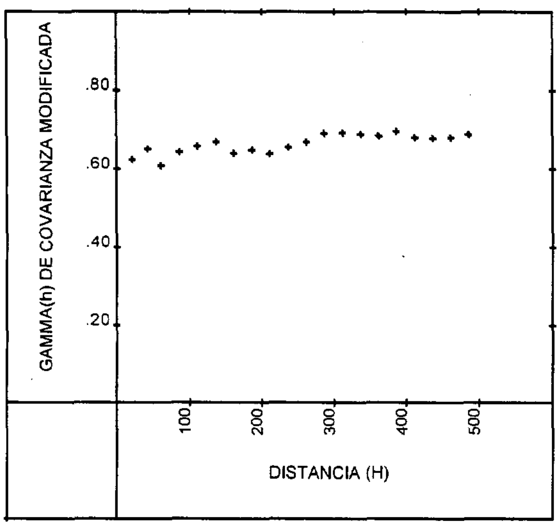
INDUSTRIAS INFINITO S.A. Subsidiaria de Lyon Lakes Mines Ltd **PROYECTO CRUCITAS** Permiso 7339	**Variogramas Rocas Volcánicas Variadas** **Covarianza Modificada**	**Figura 3.13**



Dirección Este
Hacia Abajo, 22 Grados de Inclinación

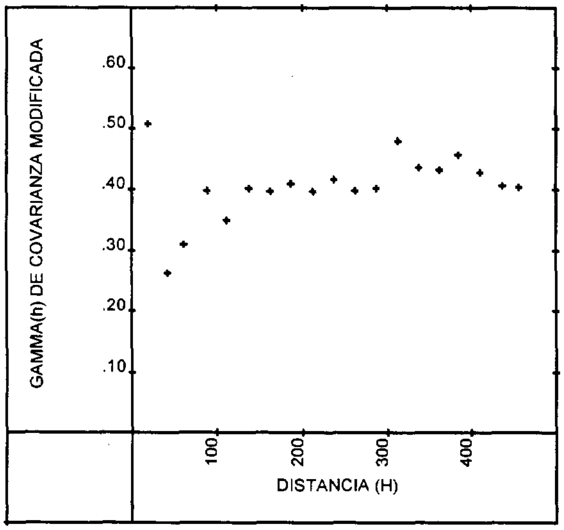


Dirección S 67 O
Hacia Abajo 22 Grados de Inclinación



Norte - Sur
Horizontal

INDUSTRIAS INFINITO S.A. Subsidiaria de Lyon Lakes Mines Ltd **PROYECTO CRUCITAS** Permiso 7339	**Rocas Volcánicas Variadas, Fortuna** **Covarianza Modificada**	**Figura 3.14**



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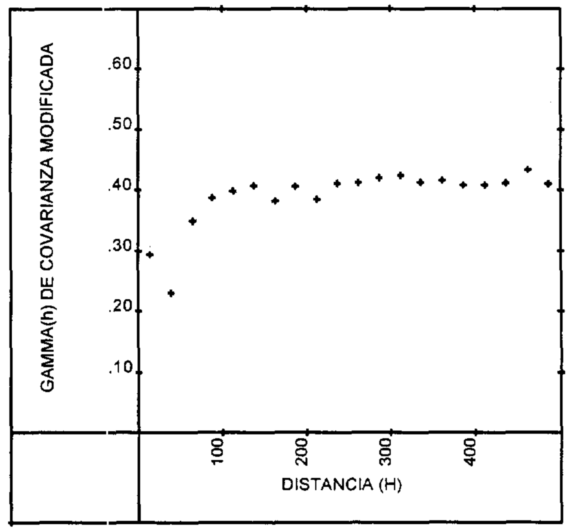
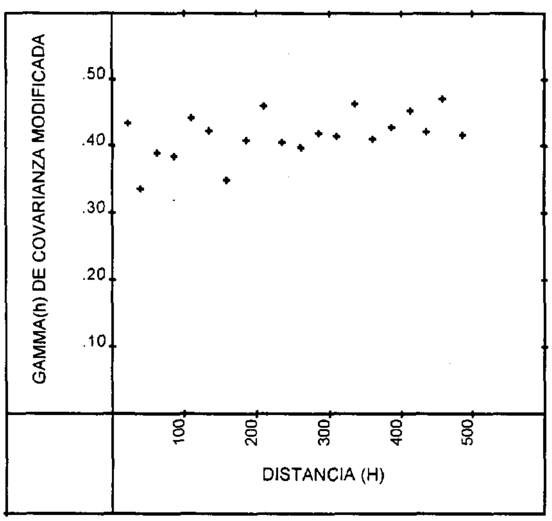
22 Grados Inclinación Hacia Abajo



Dirección - Oeste
22 Grados de Inclinación hacia Abajo



Dirección - Norte
Horizontal

INDUSTRIAS INFINITO S.A. Subsidiaria de Lyon Lakes Mines Ltd **PROYECTO CRUCITAS** Permiso 7339	**Rocas Volcánicas Variadas Zona Botija** **Covarianza Modificada**	**Figura 3.15**

28. Certification

28.1. Certificate of qualification for Pierre Jean Lafleur, ing.

I, Pierre Jean Lafleur, certify that:

- I am resident at 933 Carré Valois, Ste-Thérèse, Québec, Canada, J7E 4L8
- I am a registered Professional Engineer in the Province of Québec (OIQ # 39862).
- I am a member of the Canadian Institute of Mines and Metallurgy.
- I am graduated from École Polytechnique of Montreal (B. ENG.).
- I have practice my profession in exploration, geology and mining for more than 25 years, with extensive experience in gold, base metals and industrial minerals as well.
- I have visited the Crucitas Project site on a trip to Costa Rica from October 11th to 21st 2005 and I took my own samples from the old drill core in storage on site.
- I am the author of present technical report.
- The reader should be aware that PJ Lafleur, now working with Geostat and writing this report in 2005, had been called by Lyon Lake in February 1999 to review the CPC and IMC findings as an Independent Consultant.
- I am a Qualified Person according to the National Policy 43-101. I have read the norm and I understand the terms and implications.
- I have not received, nor do I expect to receive directly or indirectly any interest in any form for the Crucitas project, or any property or project from Vannessa Ventures LTD.

Prepared in Blainville, this February 28th 2006.

Pierre-Jean Lfl

INGÉNIEUR · ENGINEER
Pierre-J. Lafleur
39862
QUÉBEC

Pierre Jean Lafleur, P.Eng.,

for Geostat System International Inc.

28.2. Assay Certificates

C.P. / P.O. BOX 550 148, AVENUE PERREAULT VAL D'OR (QUÉBEC) J9P 4P5 TÉL.: (819) 824-4337
FAX.: (819) 824-4745

LABORATOIRE D'ANALYSE BOURLAMAQUE LTÉE.
BOURLAMAQUE ASSAY LABORATORIES LTD.

CERTIFICAT D'ANALYSES
CERTIFICATE OF ANALYSIS

No. 83784 Pg 1/2

CLIENT Systèmes Geostat International Inc.
PROJET
PROJECT Pierre-Jean Lafleur
ÉCHANTILLONS
SAMPLES Pulpes
REÇU DE
RECEIVED FROM Chimitec

VAL D'OR (QUÉBEC) Le 11 novembre 2005
ANALYSES
ASSAYS 21 Au Py-Gr. (en duplicata), 21 Ag

Echantillon	Au g/t	Ag g/t
CV-01	1.56	18
	1.56	
CV-02	3.08	5
	3.16	
CV-03	<0.10	<1
	<0.10	
CV-04	1.76	4
	1.60	
CV-05	4.48	17
	4.40	
CV-06	1.52	4
	1.44	
CV-07	2.64	5
	2.68	
CV-08	6.80	4
	6.40	
CV-09	4.00	17
	3.96	
CV-10	1.28	11
	1.20	
CV-11	40.00	49
	40.08	

ANALYSTE / ASSAYER
L. - D. Melnbardis

C.P. / P.O. BOX 550 148, AVENUE PERREAULT VAL D'OR (QUÉBEC) J9P 4P5 TÉL.: (819) 824-4337
FAX.: (819) 824-4745

LABORATOIRE D'ANALYSE BOURLAMAQUE LTÉE.
BOURLAMAQUE ASSAY LABORATORIES LTD.

CERTIFICAT D'ANALYSES
CERTIFICATE OF ANALYSIS

No. 83784 Pg 2/2

CLIENT Systèmes Geostat International Inc.
PROJET / PROJECT Pierre-Jean Lafleur
ÉCHANTILLONS / SAMPLES Pulpes
REÇU DE / RECEIVED FROM Chimitec

VAL D'OR (QUÉBEC) Le 11 novembre 2005
ANALYSES / ASSAYS 21 Au Py-Gr. (en duplicata), 21 Ag

Echantillon	Au g/t	Ag g/t
CV-12	5.80	8
	6.53	
CV-13	1.40	5
	1.87	
CV-14	0.52	4
	0.52	
CV-15	6.48	7
	6.40	
CV-16	3.67	12
	3.93	
CV-17	1.60	27
	1.08	
CV-18	1.80	3
	1.73	
CV-19	5.84	5
	5.60	
CV-20	1.20	2
	1.08	
CV-21	3.73	27
	3.67	

ANALYSTE / ASSAYER
L. - D. Melnbardis

C.P. / P.O. BOX 550 148, AVENUE PERREAULT VAL D'OR (QUÉBEC) J9P 4P5 TÉL.: (819) 824-4337
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CERTIFICATE OF ANALYSIS

No. 83784D

CLIENT Systèmes Geostat International Inc.
PROJET
PROJECT Pierre-Jean Lafleur
ÉCHANTILLONS
SAMPLES Pulpes
REÇU DE
RECEIVED FROM Chimitec

VAL D'OR (QUÉBEC) Le 11 novembre 2005
ANALYSES
ASSAYS 2 Ag

Echantillon	Ag g/t
CV-10	11
CV-20	2

ANALYSTE / ASSAYER
L. - D. Meinbardis

ALS Chemex
EXCELLENCE EN ANALYSE CHIMIQUE
ALS Canada Ltd.
212 Brooksbank Avenue
North Vancouver BC V7J 2C1
Téléphone: 604 984 0221 Télécopieur: 604 984 0218 www.alschemex.com

À: SYSTEME GEOSTAT INTERNATIONAL INC.
10 BOUL DE LA SEIGNEURIE E.
SUITE 203
BLAINVILLE QC J7C 3V5

Finalisée Date: 7-NOV-2005
Compte: SYSGEO

CERTIFICAT VO05093360

Projet:
Bon de commande #:
Ce rapport s'applique aux 21 échantillons de roche concassée soumis à notre laboratoire le Val d'Or, QC, Canada de 28-OCT-2005.
Les résultats sont transmis à:
PIERRE-JEAN LAFLEUR

PRÉPARATION ÉCHANTILLONS

CODE ALS	DESCRIPTION
WEI-21	Poids échantillon reçu
LOG-22	Entrée échantillon - Reçu sans code barre
SPL-21	Échant. fractionné - div. riffles
PUL-32	Pulvériser 1 000 g à 85 % < 75 um
BAG-01	Entreposage pulp de ref.
SND-01	Expéditer à un autre laboratoire
LOG-24	Entrée pulpe - Reçu sans code barre

PROCÉDURES ANALYTIQUES

CODE ALS	DESCRIPTION	INSTRUMENT
Ag-AA61	Trace Ag - direction quatre acides	AAS
Au-GRA22	Au 50 g fini FA-GRAV	WST-SIM

À: **SYSTEME GEOSTAT INTERNATIONAL INC.**
ATTN: PIERRE-JEAN LAFLEUR
10 BOUL DE LA SEIGNEURIE E.
SUITE 203
BLAINVILLE QC J7C 3V5

Ce rapport est final et remplace tout autre rapport préliminaire portant ce numéro de certificat. Les résultats s'appliquent aux échantillons soumis. Toutes les pages de ce rapport ont été vérifiées et approuvées avant publication.

Signature:

ALS Chemex
EXCELLENCE EN ANALYSE CHIMIQUE
ALS Canada Ltd.
212 Brooksbank Avenue
North Vancouver BC V7J 2C1
Téléphone: 604 984 0221 Télécopieur: 604 984 0218 www.alschemex.com

A: **SYSTEME GEOSTAT INTERNATIONAL INC.**
10 BOUL DE LA SEIGNEURIE E.
SUITE 203
BLAINVILLE QC J7C 3V5

Finalisée Date: 7-NOV-2005
Compte: SYSGEO

CERTIFICAT D'ANALYSE VO05093360

Description échantillon	Méthode élément unités L.D.	WEI-21 Poids reçu kg 0.02	Au-GRA22 Au ppm 0.05	Ag-AA61 Ag ppm 0.5
CV-01		0.54	1.38	17.4
CV-02		0.72	3.59	6.6
CV-03		0.36	<0.05	<0.5
CV-04		0.45	1.61	4.3
CV-05		0.54	5.01	13.9
CV-06		0.47	1.57	4.1
CV-07		0.34	2.75	4.6
CV-08		0.47	7.93	3.4
CV-09		0.44	4.02	15.8
CV-10		0.29	1.43	10.5
CV-11		0.43	36.4	75.0
CV-12		0.29	5.21	3.3
CV-13		0.47	2.16	4.5
CV-14		0.44	0.57	3.4
CV-15		0.20	6.03	6.7
CV-16		0.34	4.33	12.7
CV-17		0.32	2.02	26.4
CV-18		0.25	1.42	2.8
CV-19		0.25	6.03	3.6
CV-20		0.33	0.95	1.4
CV-21		0.41	4.47	25.5