APEX MINING CO., INC.
Masara, Maco Compostela Valley Province

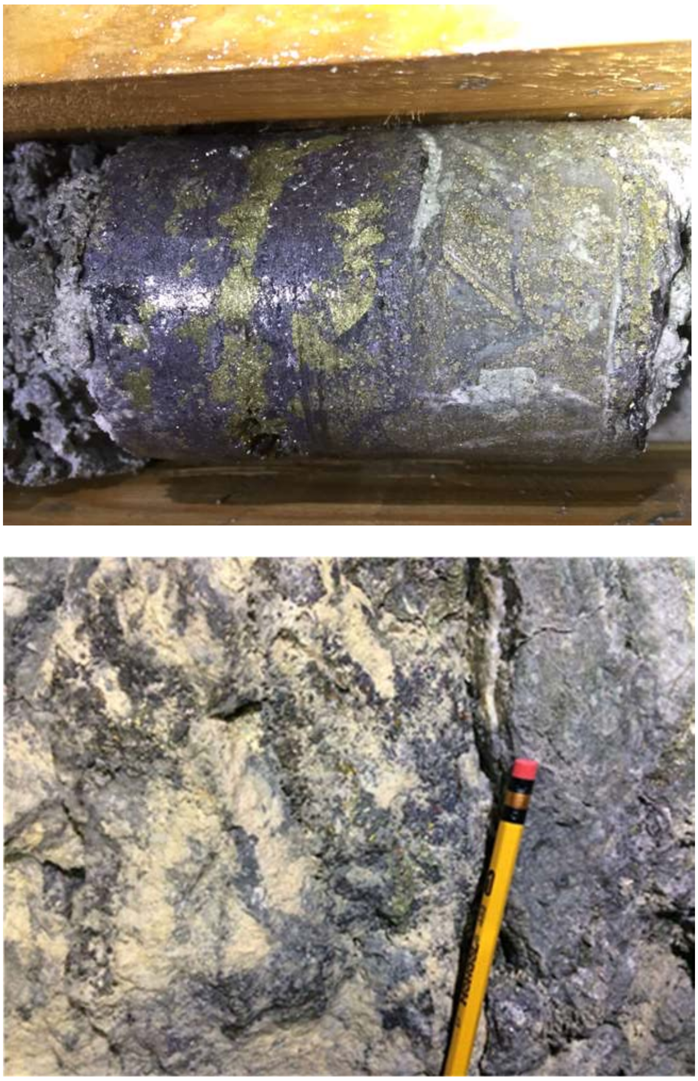


Figure 1-1: Massive Sulphides of the Sandy North Vein

2017 UPDATE ON THE MACO GOLD PROJECT

Compostela Valley, Philippines

Prepared for:
Apex Mining Company Inc.

CP involved
Rolando E. Pena
BS Geo
Registered Geologist, Lic. No. 068
CP Exploration Results and Mineral Resource Estimation, PMRC/GSP
CP Reg. No. 07-08-08

December 2016

2.0 CERTIFICATE AND CONSENT OF THE CP

2.1 Certification and Consent

I, ***Rolando E. Peña***, do hereby certify:

- That I am an Independent Consultant in reporting Exploration and Mineral Resource Results, hired as Consultant by Apex Mining Company for the purpose of reviewing the content of the Technical Report titled "2017 Resource Estimate Update of the Gold Veins within the Maco Mine" dated December 2016.
- That I am presently not connected with any company.
- I graduated and hold the following degree(s):
  - B.S. Geology (1962)
  - M.S. Geology (1998)
- I have worked as a geologist with the Bureau of Mines/Mines and Geoscience Bureau for a total of 22 years. My stint in the Bureau of Mines included mineral investigation of mineral deposits, and resource estimation. Since retirement from government service in 2006, I have undertaken resource evaluation and estimation as a consulting geologist for various companies. I am aware of the definition of 'Competent Person' as defined in the Philippine Mineral Reporting Code (PMRC) and certify that by virtue of my education, training, related work experience as well as affiliations with mining professional organizations, that I fulfill the requirements for a 'Competent Person' set out by the Philippine Mineral Reporting Code.
- I have Professional License and PTR to Legally Practice my Profession in the Philippines
  - Geologist Professional Regulation Commission No. 068
  - PTR No.4022677 issued on 1-27-2017 at Quezon City
- I am a Member of the Accredited Professional Organization Geological Society of the Philippines (GSP) - active member as per GSP receipt 6651
- I am an accredited "Competent Person" (CP) by the Geological Society of the Philippines, in accordance with the PMRC in regard to Reporting Exploration Results and Mineral Resources. My Registration and Seal No. Is 07-08-08, valid up to March 2019 as per GSP receipt No. 6650
- I have no fiduciary interest in Apex Mining Company which engaged me to review the exploration results and resource estimation of Maco Mines.
- For the Technical Report, I am an independent reviewer applying all the required guidelines set out in the Philippine Mineral Reporting Code in the conduct of the review and evaluation
- I have read the guidelines spelled out in the Philippine Mineral Reporting Code and certify that this review has been prepared in accordance with the Code. I give consent to the filing of the Technical Report with the Philippine Stock Exchange and other regulatory authorities and any publication by them for regulatory and disclosure purposes, including electronic publication in the public company files on their websites accessible by the public of the Technical Report.

2.2 Scope of work of each CP involved

Rolando Peña is the registered CP-Geology involved in the project. His scope of work is to review and audit the work of the Maco Geology and Technical Services Team.

2.3 Reliance on other experts indicating therein objective, nature and coverage

There has been a reliance on work carried out by the Maco geological technical services team. All work that has been undertaken by the team in connection with the preparation of this report has been reviewed by the undersigned CP. The CP certified report can only be as good as the data provided that was used to make it.

REPUBLIC OF THE PHILIPPINES
CITY OF TAGUM
MANDALUYONG CITY

SUBSCRIBED AND SWORN to before me this AUG 1 1 2017 in MANDALUYONG CITY ________________, Philippines, affiant personally appeared to me and exhibited his PRC Registered Geologist License No. 068 as proof of his identity.

Doc. No. 176;
Page No. 36;
Book No. 170;
Series of 2017.

ATTY. JOSE B. DULNUAN
NOTARY PUBLIC
FOR THE CITY OF MANDALUYONG
Until December 31, 2017
COMMISSION NO. 0189-16
IBP Lifetime No. 01 Pasig City, 4-27-2017
PTR NO. 69252527, 1-3-17, Cainta, Rizal
ROLL NO. 26304
MCLE COMP. NO. 171, 6-15-16
VALID UNTIL 04-14-2019
D-22-AB GUEVENT PH. II, 52 D.M.
GUEVARA ST., MANDALUYONG CITY
Tel No. 532-8858, 5334664
Email Add: jbdulnuan@gmail.com

2.4 Signature(s) of the CP(s)

Rolando E. Pena

PRC Registered Geologist No. 068.

PMRC Competent Person Registration No. 07-08-08
Geological Society of the Philippines

3.0 EXECUTIVE SUMMARY

APEX Mining Company Inc. contracted Rolando E. Peña (Registered Geologist No. 068; CP - Geology No. 05) to review and audit the resource estimation prepared by the Apex Technical Services Team, and to certify compliance of the said estimate with the Philippine Mineral Reporting Code.

The Maco Mine is within the Southern Pacific Cordillera, identified as a magmatic arc terrane bounded by the left-lateral Philippine Fault to the west and the Philippine Trench to the east. The regional geology is characterized by a Cretaceous-Paleogene volcanic basement comprising the Barcelona Formation, overlain by the Eocene sedimentary sequence identified as the Tagabakid Formation. The Early-Middle Miocene Agtuuganon Limestone unconformably overlies the sequence. Quartz diorite bodies of the Cateel Quartz Diorite have been mapped to intrude these stratigraphic units. The geology is capped by the Pliocene-Pleistocene Amacan Volcanic Complex.

The andesitic basement rocks mapped within the tenement, locally identified as the Masara Formation, could be correlated to the regional Barcelona formation, while the Miocene diorite intrusives might be coeval to the Cateel Quartz Diorite. Young dacitic and andesitic units of the Amacan Volcanic Complex are widespread in the Maco mine. Gold veins in the tenement are hosted by the older andesite and diorite units limiting the age of mineralization to older than the Amacan Volcanic Complex. Mineralization is characterized by multiple stages with the oldest being hydrothermal breccias with massive sulfides composed mostly of chalcopyrite, galena, and sphalerite as matrix. Later stages of quartz-sulfide and Mn- and Mg-carbonate vein mineralization have been identified.

Exploration within the tenement relies mainly on detailed geologic mapping aided by geochemical soil sampling and various geophysical surveys to identify areas with potential for mineralization. Gold veins are usually outcropping within the area which allows for delineation through trenching. Since the publication of the previous exploration results and mineral resources report, significant geologic work has been carried out to prove the occurrence of four newly identified vein systems within the tenement, with a cumulative strike length of >2,000m. These are the PJAC-St. Benedict, Kaurangan, Aknit-Biocadan, and MST2-SDN2 vein systems. The said prospects are programmed for drilling in order to confirm mineralization and the grades that would be encountered at depth.

The Maco gold deposit consists of at least five major gold-bearing vein systems identified based on structural setting from which, channel samples and drill hole intercepts were estimated in the study. To ensure a suitable check, only data collected prior to December 31, 2016 were considered. The study used Ordinary Kriging, a geostatistical estimation technique wherein variogram models are utilized in assigning weights to samples. Nested variograms with two ranges were modelled along strike for all estimated veins, which indicates that gold grade correlation operates at two different scales. Topcuts for different resource categories were statistically determined from the grade distributions of each vein. Tonnage was calculated using the global specific gravity and the volume of the modelled vein solids that remained after removal of the mined out portions. Resources were classified into measured if a block was estimated by samples in at least four directions within the shorter range, indicated if estimated by at least two samples within the shorter range, and inferred if estimated by at least two samples within the longer range of the variogram.

The mine is currently producing approximately 4,200 ounces of gold per month at a milling rate of 1,800 tons per day. The milling rate increased by 300 tpd as compared to the 1,500 tpd milling rate in 2016. This is part of the planned expansion to a 3,000 tpd milling rate. Given this long-term plan for the mine, resources were estimated using two cutoff grades corresponding to the current and planned production rates. The current cutoff grade was estimated using the following base case assumptions, calculated using the 2016 year to date averages at a 1,500 tpd milling rate:

- Mining cost: $ 35/t
- Milling cost: $ 25/t
- Overhead cost: $ 14/t
- Mill Recovery: 80%

Assuming a gold price of $1,200 per ounce, a cutoff grade of 3 g/t Au was used for resource estimation. For the case wherein production ramps up to 3,000 tpd, due to the larger divisor for the overhead costs and the fixed mining and milling costs, a lower cutoff grade was used. Considering that underground development accounts for a major portion of the mining costs, which would then be paid for by a larger tonnage, resources with grades above 1.5 g/t Au are considered to have reasonable prospects for eventual economic extraction.

The current global resource as of December 2016 is estimated at 428,800 ounces of gold (2,470,000 tons at 5.4 g/t Au) using a cutoff grade of 1.5 g/t Au. The resource is comprised of:

At 1.5 g/t cutoff	Tonnage (000 tons)	Grade (g/t Au)
Measured	430	6.5
Indicated	910	5.4
Sub-total	**1,340**	**5.8**
Inferred	1,130	4.9
Total	**2,470**	**5.4**

Using a cutoff of 3.0 g/t Au the estimated resource is 367,500 ounces of gold (1,610,000 tons at 7.1 g/t Au) which is comprised of:

At 3.0 g/t cutoff	Tonnage (000 tons)	Grade (g/t Au)
Measured	310	8.2
Indicated	590	7.2
Sub-total	**900**	**7.5**
Inferred	710	6.6
Total	**1,610**	**7.1**

The company previously reported a global resource of 2,560,000 tons at 5.6 g/t (at 1.5 g/t cutoff), with a total of 840,000 tons classified as Measured and Indicated. In comparison, the study reported a combined 500,000 ton increase in Measured and Indicated resources.

For vein-type deposits where it is common to find new ore bodies from both brownfields and greenfields exploration within the mineralized area, a mine life of about 2 to 3 years as inferred from the resources defined in this study provides ample time to identify and delineate new veins which would replace the resources being depleted by production. Considering the planned increase in production to 3,000 tpd, additional efforts should be put into exploration and underground development so as to ensure that it is at pace with production.

4.0 CONTENTS

5.0 INTRODUCTION

5.1 Who commissioned the report preparation and to whom it should be submitted

Apex Mining Corporation Inc. (a listed Company on the Philippines Stock Exchange) has commissioned this report.

5.2 Purpose for which the report was prepared

This report was prepared in compliance with the requirement of the Philippine Stock Exchange (PSE) to submit a PMRC-compliant report on exploration results and mineral resources.

5.3 Scope of Work or Terms of Reference

Apex Mining has title to several properties located in the municipalities of Maco and Mabini in Compostela Valley Province in southeastern Mindanao covered by **MPSA-225-XI-2005** and **MPSA-234-XI-2007**. Exploration Results reported cover only gold veins with sufficient geological work such as to delineate the extents to an acceptable degree of confidence. The Mineral Resource Estimate is only concerned with gold mineralization of eighteen veins with face sample data delimited within the Apex claims at Maco Mines. The identified porphyry copper deposits within the tenement were not accounted for in this report. Inactive gold veins with old workings were also not included in the resource estimate due to lack of data. In order to meet deadlines and to ensure a suitable check, only data collected prior to January 1st of 2017 has been considered.

5.4 Duration of the preparation, including field visits and verification

Work on the Technical Report started with database validation and reconstruction by the end of December 2016, immediately followed by wireframe creation for vein and void models in January. Resource estimation began by March and report writing commenced as soon as initial results were available. By early May, the report was already being peer reviewed and finalized. The Apex geology team includes underground geologists, grade control geologists, exploration geologists, project and senior staff who have all worked for Apex Mining Co., Inc. for at least 12 months.

5.5 Members of the technical report preparation team

Alex C. Diambrang, Jr.	***Senior Geologist***
Josel P. Retardo	***Mine Planning Engineer Manager***
Darwin Edmund L. Riguer	***Geologist***
Isaac Norman D. Rivera	***Jr. Geologist***
Marivic U. Collado	***GIS Manager***
Edgar C. Biego	***GIS Administrator***
Luz V. Barnachea	***GIS Administrator***
Maritess R. Tuscano	***QA/QC Officer***

5.6 Host company representative

Host Company representative is Mr. Josel P. Retardo and Mr. Alex C. Diambrang, Jr.

5.7 Compliance of report with PMRC

The report follows the format outlined in the PSE Implementing Rules and Regulations for the 2007 Philippine Mineral Reporting Code (PMRC). The mineral resource classification outlined in the PMRC was also adopted in the report.

6.0 RELIANCE ON OTHER EXPERTS

The undersigned CP has relied on the data provided by technical personnel with expertise on various fields related to geological and exploration aspects, as well as resource estimation. They constitute the Geology and Technical Services Team of Apex Mining Company, Inc. All work done by them that is connected to the preparation of the report has been reviewed by the undersigned CP. This Report, certified by the undersigned CP, can only be as good as the data provided that was used to make it.

7.0 TENEMENT AND MINERAL RIGHTS

7.1 Description of mineral rights

7.1.1 Location of area (Barangay, Municipality, Province)

MPSA 225-2005-XI is located in barangays Teresa and Masara, Maco, Compostela Valley Province, while **MPSA 234** which is composed of six different parcels located within the following barangays of the Municipality of Maco and some portions at the Municipality of Mabini, Province of Compostela Valley: Parcel-I is located at Barangay Tagbaros and some portions at Barangay Mainit; Parcel-II is located entirely at Barangay Mainit; Parcel-III is located at Barangays Masara, Mainit, and New Leyte; while Parcel-IV is located at Barangay Teresa with small portions at barangays Elizalde and New Barili and some portions to the south is located within the Municipality of Mabini; Parcel-V is located entirely within the Municipality of Mabini; and Parcel-VI's northern portion is within Barangay New Barili, Municipality of Maco with the southern portion at the Municipality of Mabini.

7.1.2 Coordinate locations as per MGB

MPSA 225-2005-XI is defined by the corner points with the following technical descriptions:

Corner	Latitude	Longitude
1	7°23’00.81”	126°01’14.76”
2	7°23’10.58”	126°01’14.76”
3	7°23’10.58”	126°02’13.46”
4	7°23’00.81”	126°02’13.46”
5	7°23’00.81”	126°02’18.35”
6	7°23’11.16”	126°02’28.72”
7	7°22’22.82”	126°03’17.13”
8	7°22’21.48”	126°03’15.80”
9	7°22’21.48”	126°03’21.67”
10	7°21’42.41”	126°03’21.67”
11	7°21’42.41”	126°02’42.55”
12	7°21’48.41”	126°02’42.55”
13	7°22’17.36”	126°02’13.45”
14	7°21’32.92”	126°02’13.45”
15	7°21’32.92”	126°01’53.89”
16	7°21’42.69”	126°01’53.89”
17	7°21’42.69”	126°02’03.67“
18	7°22’02.22”	126°02’03.67”
19	7°22’02.22”	126°01’44.11”
20	7°22’31.52”	126°01’44.11”

21	7°22’31.52”	126°01’24.54”
22	7°23’00.81”	126°01’24.54”

The six (6) individual parcels that comprise MPSA-234-2007-XI are specifically bounded by the geographic coordinates with the following technical descriptions:

PARCEL- I

Corner	Latitude	Longitude
1	7° 24’ 00.00”	126° 00’ 30.00”
2	7° 24’ 30.00”	126° 00’ 30.00”
3	7° 24’ 30.00”	126° 01’ 00.00”
4	7° 24’ 00.00”	126° 01’ 00.00”

PARCEL- II

Corner	Latitude	Longitude
1	7° 24’ 00.00”	126° 01’ 17.28”
2	7° 24’ 19.53”	126° 01’ 17.28”
3	7° 24’ 19.49”	126° 01’ 33.56”
4	7° 24’ 01.80”	126° 01’ 33.56”
5	7° 24’ 00.00”	126° 01’ 30.00”

PARCEL- III

Corner	Lattitude	Longitude
1	7° 23’ 10.58”	126° 01’ 55.33”
2	7° 23’ 32.51”	126° 01’ 33.50”
3	7° 23’ 42.27”	126° 01’ 33.52”
4	7° 23’ 42.25”	126° 01’ 43.30”
5	7° 23’ 32.48”	126° 01’ 43.28”
6	7° 23’ 15.71”	126° 02’ 00.00”
7	7° 24’ 01.74”	126° 02’ 00.00”
8	7° 24’ 01.71”	126° 02’ 12.69”
9	7° 24’ 21.24”	126° 02’ 12.74”
10	7° 24’ 21.23”	126° 02’ 19.45”
11	7° 23’ 30.00”	126° 02’ 19.33”
12	7° 23’ 30.00”	126° 03’ 00.00”
13	7° 23’ 14.34”	126° 03’ 00.00”
14	7° 22’ 57.28”	126° 02’ 42.84”
15	7° 23’ 11.16”	126° 02’ 28.72”
16	7° 23’ 00.81”	126° 02’ 18.35”
17	7° 23’ 00.81”	126° 02’ 13.46”
18	7° 23’ 10.58”	126° 02’ 13.46”

PARCEL- IV

Corner	Lattitude	Longitude
1	7° 22’ 30.00”	126° 00’ 00.00”
2	7° 23’ 00.00”	126° 00’ 00.00”

3	7° 23’ 00.00”	126° 00’ 34.73”
4	7° 23’ 10.58”	126° 00’ 34.75”
5	7° 23’ 10.58”	126° 01’ 14.76”
6	7° 23’ 00.81”	126° 01’ 14.76”
7	7° 23’ 00.81”	126° 01’ 24.54”
8	7° 22’ 31.52”	126° 01’ 24.54”
9	7° 22’ 31.52”	126° 01’ 44.11”
10	7° 22’ 02.22”	126° 01’ 44.11”
11	7° 22’ 02.22”	126° 02’ 03.67”
12	7° 21’ 42.69”	126° 02’ 03.67”
13	7° 21’ 42.69”	126° 01’ 53.89”
14	7° 21’ 32.92”	126° 01’ 53.89”
15	7° 21’ 32.99”	126° 01’ 44.20”
16	7° 21’ 13.45”	126° 01’ 44.15”
17	7° 21’ 13.64”	126° 00’ 25.91”
18	7° 22’ 12.23”	126° 00’ 26.04”
19	7° 22’ 12.23”	126° 00’ 30.00”
20	7° 22’ 30.00”	126° 00’ 30.00”

PARCEL- V

Corner	Lattitude	Longitude
1	7° 20’ 30.00”	126° 02’ 42.68”
2	7° 21’ 42.41”	126° 02’ 42.55”
3	7° 21’ 42.41”	126° 03’ 21.67”
4	7° 21’ 23.00”	126° 03’ 21.95”
5	7° 21’ 23.02”	126° 03’ 12.20”
6	7° 21’ 13.25”	126° 03’ 12.18”
7	7° 21’ 13.23”	126° 03’ 21.96”
8	7° 20’ 30.00”	126° 03’ 21.80”

PARCEL- VI

Corner	Lattitude	Longitude
1	7° 20’ 05.33”	126° 00’ 00.00”
2	7° 22’ 00.00”	126° 00’ 00.00”
3	7° 22’ 00.00”	126° 00’ 06.46”
4	7° 20’ 05.32”	126°00’06.204”

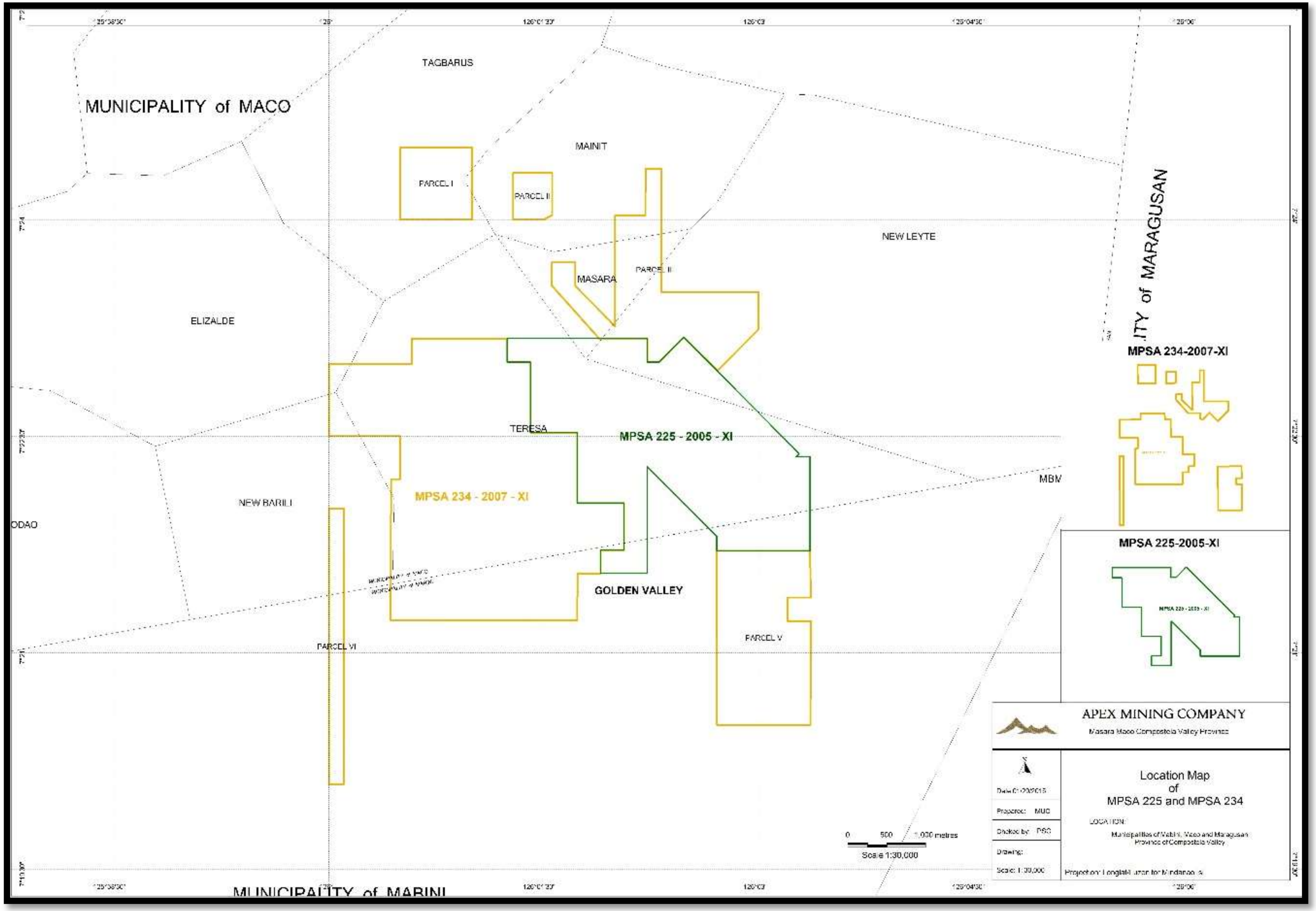


Figure 7-1: Tenement Map

7.1.3 Number of claims and hectares covered
MPSA 225-2005-XI contract area covers **six hundred seventy nine and two hundredths (679.02) hectares.** Most of the MPSA 234-2007-XI area is within the Municipality of Maco and this covers a total of 1,194.97 hectares and some portions within the adjoining Municipality of Mabini which covers a total of 363.56 hectares. The total area of **MPSA 234-2007-XI** is **one thousand five hundred fifty eight and fifty three hundredths (1,558.53) hectares,** comprising of six (6) individual parcels with the following respective areas:

Parcel 1 = 84.799 hectares
Parcel 2 = 29.625 hectares
Parcel 3 = 233.123 hectares
Parcel 4 = 883.681 hectares
Parcel 5 = 258.876 hectares
Parcel 6 = 68.423 hectares

TOTAL = 1,558.527 hectares

7.1.4 EP/MPSA/FTAA mode of agreement
The leases are under an MPSA mode of agreement.

7.1.5 Type of permit or agreement with government
The type of agreement with the government is as an MPSA.

7.2 History of mineral rights
The mining property originally existed as contiguous load claims comprised of 75 Declaration of Locations (DOLs) of nine hectares each and a number of claim fractions of various shapes and sizes with a total area of 679.02 hectares. The claims, named ASA-24, et al, were originally staked for gold, copper, silver and other metallic minerals under the Philippine Bill of 1902. Prior to the MPSA Contract approval, the area was covered by Mining/Lode Lease Contract Nos. V- 83; V-95; V-96, V-97, V- 124 and V-125 that were issued in 1994 to Apex Mining Company, Inc. The MLCs were subsequently applied for Mineral Production Sharing Agreement by Apex in 1998, initially denominated as **APSA-242-XI.** An amendment was filed by Apex for the same APSA in January 2005. The application was finally approved by the Philippine Government through its Department of Environment and Natural Resources Secretary last December 15, 2005, denominated as MPSA 225-2005-XI.

MPSA 234-XI-2007 was originally applied for MPSA in 2005 denominated as **APSA-248-XI**. It is composed of six individual parcels located adjacent to and around the MPSA-225-2005-XI. The application for MPSA was approved in June 2007 which was designated as MPSA-234-2007- XI.

7.3 Current owners of mineral rights
Apex Mining Company Ltd. owns 100% of the mineral rights on the basis of an MPSA agreement with the Philippine Government.

7.4 Validity of current mineral rights (date of validity of rights at the date of reporting)
The Mineral Production Sharing Agreement is valid for a 25- year term and renewable for another 25 years. The leases are issued under the Mining Act of 1995 (Republic Act No. 7942). Surface rights are held with the government and the mining leases are issued as cooperative agreements between the people of the Philippines and the Company. MPSA No. 234-2007-XI expires in June 2032 and MPSA No. 225-2005-XI expires in 2030.

7.5 Agreements with respect to mineral rights.

Apex Mining Company is a holder of two Mineral Production Sharing Agreements with the government which were approved in 2005 and 2007.

7.6 For clarification of the net revenue that may be derived from the project, the following are included:

7.6.1 Royalties, taxes, advances and similar payments paid or to be paid by the company to the mineral rights holder, joint venture partner(s), government, Indigenous People, local government, and others.

Table 7-1: License Royalties and Encumbrances

Origin	Royalty	Act
Excise Tax	2%	Mining Act 1995
MOA with local people	1% plus provision of scholar ships, health program, infrastructure and other social programs	IRPA 1997

7.6.2 Receivables and payable sums to the company and mineral rights holder. There are no other receivables or payables as the company has 100% mineral rights on the property.

8.0 GEOGRAPHIC FEATURES

8.1 Location and Accessibility

MPSA 225 and 234 contract areas are bounded by longitudes 126° 00' 00" to 126° 03' 21.8"E and latitudes 7° 20' 05.33" N to 7° 24' 30" N. It is some 950 aerial kilometres south-southeast from Manila and about 53 aerial km northeast of Davao City across Davao Gulf. From Manila, the area can be reached fastest and most conveniently by taking one of the daily commercial flights to Davao City then, from Davao, by land through the concrete-sealed Pan Philippine (Maharlika) Highway, driving up north over a distance of some 74 km to the town of Mawab, Compostela Valley Province. From the Mawab highway junction, a 26-km road combination of concrete and gravel that heads east- to southeastward following the Hijo-Masara river valley upstream. The Maco minesite is nestled at the upper reaches of Masara River within the adjoining barangays of Masara and Teresa in the Municipality of Maco, Compostela Valley Province.

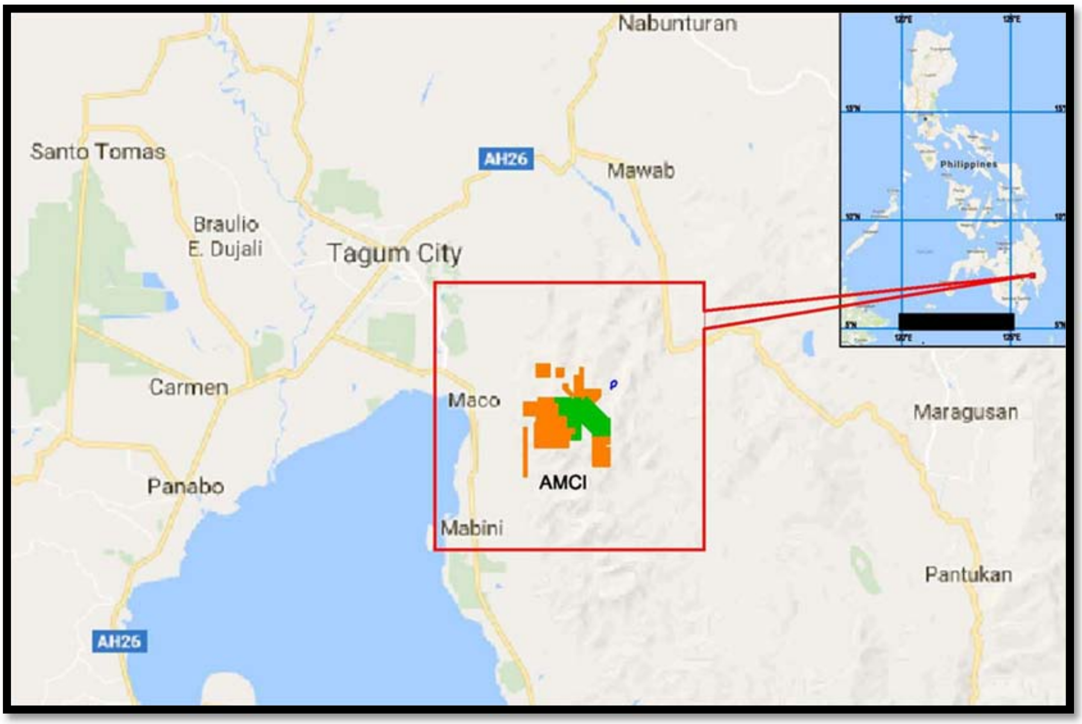


Figure 8-1: Location Map

8.2 Topography, physiography, drainage and vegetation

The contract areas occupy a generally rugged terrain with elevations ranging from about 500 to around 1300 meters above sea level. The terrain is characterized by deeply incised, V-shaped river channels with dendritic to radial drainage patterns in an early mature stage of geomorphologic development. Some geomorphologic features in the area indicate some structural controls.

The area is situated at the headwater portions of Masara River, the most dominant drainage system in the municipality of Maco. At its upstream portion, Masara is fed by its major tributaries consisting of Lumanggang, Bunlang, Malumon, Pag-asa-Kanarubi, Buena Tigbao, Wagas and Makausok creeks which drains the Contract area in a distinctly dendritic pattern. Masara River is one of the biggest tributaries of Hijo River, a major river system in Compostela Valley Province and Davao del Norte that drains also the municipalities of Mawab and Tagum. The Hijo River drains into the northern part of Davao Gulf.

Most of the areas within the tenement have been subjected to commercial timber operations in the past and most of the hard wood species are now gone. What thrives now on the mountain slopes are predominantly secondary- growth trees, locally named as buyo-buyo along with a lush tropical shrubbery with diverse species of vines and grasses that form the present vegetation cover.

Traditional swidden farming (slash and burn) is practiced by the indigenous Mansaka mountain tribe along with migrants from the lowlands. These resulted in scattered patches of clearings on the mountain slopes that are planted to rice, corn, coffee, coconut, bananas and other seasoned crops.

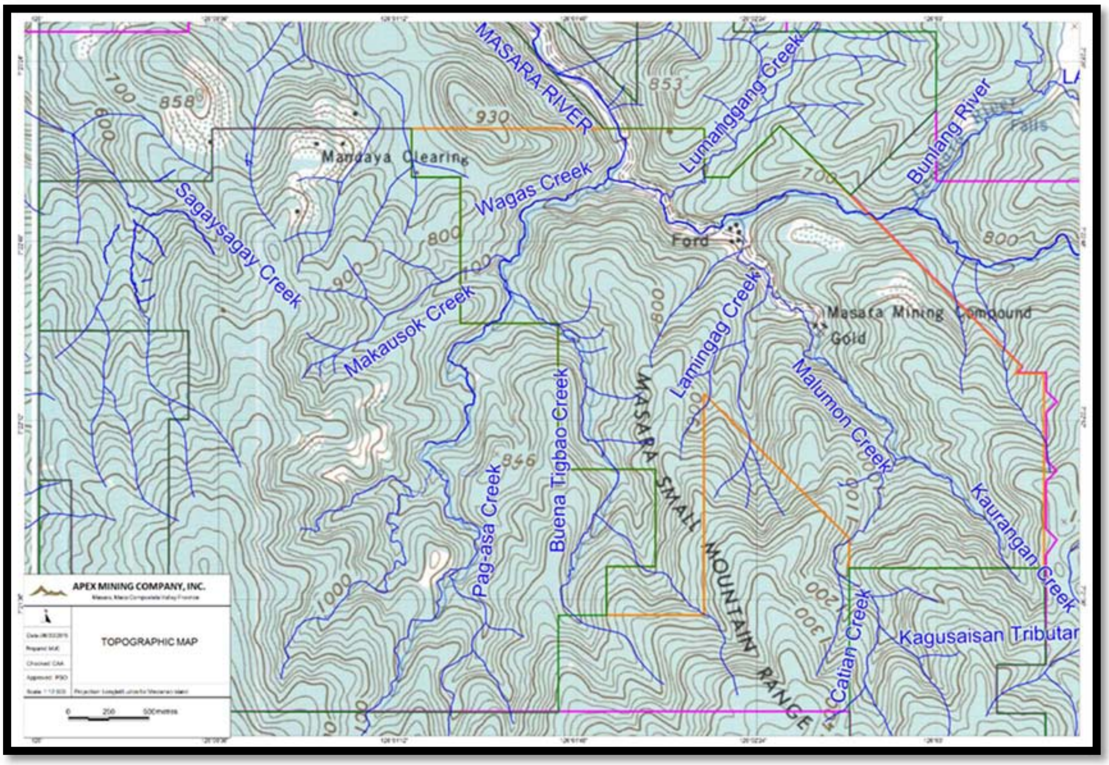


Figure 8-2: Topographic map showing tributaries of Masara River

8.3 Climate & population

8.3.1 Climate

The climate in Compostela Valley, as in the rest of Davao del Norte, Davao Oriental provinces and the Caraga Region, is classified as Type IV, following the Modified Corona's Classification used by Philippine Atmospheric, Geophysical and Astronomical Administration (PAGASA). Type IV is characterized by no clearly-defined dry season with rains experienced almost throughout the year. However, the highest rainfall, equivalent to the monsoon season, is usually experienced from October to February with the rest of the year relatively dry. The average annual rainfall determined in the general area based from rainfall records provided by the local PAGASA monitoring station is about 3,300 mm.

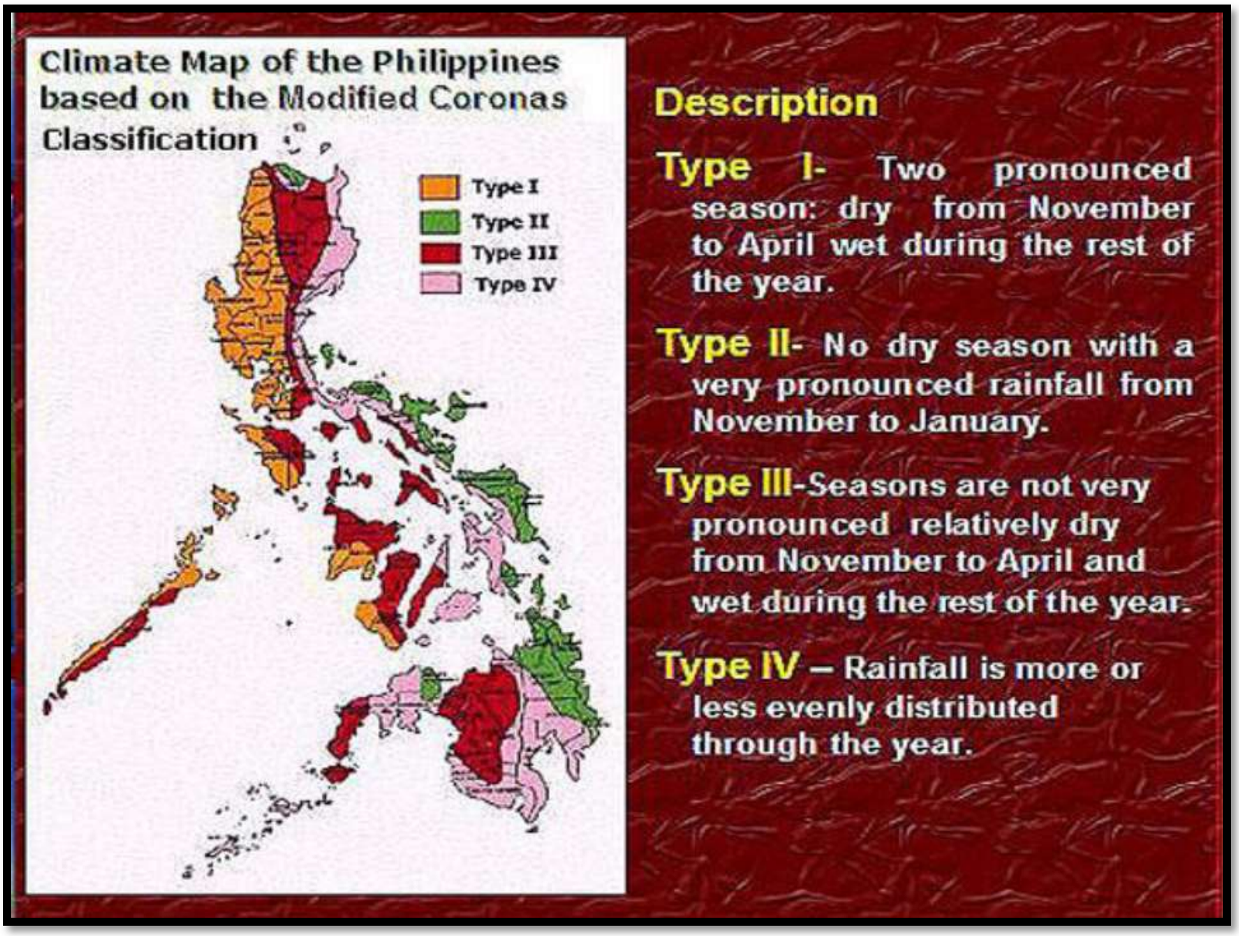


Figure 8-3: Climate Map of the Philippines (from http://www.pagasa.dost.gov.ph)

8.3.2 Population

8.3.2.1 Birth and Date Rates

Table 8-1: Crude Birth and Death Rates Municipality of Maco, Compostela Valley Province, 2000 to 2016

Year	Population	Birth		Death	
		No.	Rate/1000	No.	Rate/1000
2000	65,181	1,169	17.93	137	2.10
2001	66,936	1,036	15.48	140	2.09
2002	68,478	1,486	21.70	218	3.18
2003	70,056	1,402	20.01	122	1.74
2004	71,671	1,430	19.95	197	2.75
2005	73,322	1,545	21.07	334	4.56
2006	75,012	1,523	20.30	217	2.89
2007	70,906	1,627	22.95	247	3.48
2008	71,736	1,571	21.90	246	3.42
2009	72,575	1,326	18.27	285	3.93
2010	73,424	1,511	20.58	286	3.90
2011	79,283	1,339	16.88	287	3.61
2012	73,029	1,770	21.20	325	3.90
2013	74,490	1,685	20.00	270	3.20

2014	75,257	1,630	21.70	125	1.70
2015	81,277	526	6.47	325	3.99
2016	76,676	474	6.18	197	2.57

8.3.2.2 Morbidity and Mortality Rate

As far as the causes of morbidity and mortality incidence are concerned, acute respiratory tract infection is consistently the principal cause of morbidity in the municipality. Pneumonia ranked first as the leading cause of mortality (Table 8-2)

Table 8-2: Morbidity Rate and Number of Mortality per Cause Municipality of Maco, Compostela Valley Province, 2012- 2016

Morbidity	No.	Mortality	No
Acute Respiratory Infection	5,354	Pneumonia	101
Cerebrovascular Disease	194	Hypertensive Disease	46
Systemic Viral Infection	379	Malignant Neoplasm	17
Diarrhea and Gastroenteritis	1,404	Fetal Death in Uterus	2
Wounds (all forms)	768	PTB	21
Parasitism (all forms)	138	Ischemic Heart Disease	63
PTB	48	Unknown	91
Bronchitis	94	Transport Accident	19
Pneumonia	400	Other Form of Heart Disease	20

Source: Municipal Health Office. Maco

8.4 Land Use

The present land use of the area is generally subsistence-type agricultural or swidden farming with patches of the mountain slopes cleared of forest cover and planted to rice, corn, coffee, cacao and various seasoned crops by the indigenous Mansaka tribe as well as by various settlers from the lowlands. The area has also been a traditional host to mining activities with Apex, North Davao and Hijo mines as the biggest mining operators in the district until about two decades ago when, due to low metal prices and other adverse factors, North Davao and Hijo mines were forced to shut down operations. Apex also barely survived the economic downturn. With the slowdown of large-scale mining, small-scale gold mining activities remained active in some parts of the Contract area which further intensified in recent years with the unprecedented rise in the price of gold in the world market. Most parts of the Contract Area are within the timberland classification with some portions classified as alienable and disposable.

8.5 Socio Economic Environment

There are 15 public schools offering purely primary courses, 15 public elementary schools, three (3) public secondary schools and two (2) private schools offering secondary courses. There are no private nor public schools offering college courses except for vocational/technical courses on computer offered by the Maco Institute of Technology which is located in Maco town proper. The computer courses are part of TESDA-assisted educational program. The Maco Municipality operates a Main Public Health Center located at Barangay Binuangan along with 12 satellite barangay health centers located at various barangays. The Local Government Unit (LGU) at present has a part-time physician holding clinic and medical consultations at Barangay Masara at certain days of each week. The clinic serves the 15 upland barangays of Maco situated along the stretches of the Hijo and Masara river valley. Probably because of its proximity to Tagum City, the capital of Davao del Norte which has a number of more advanced medical facilities, there are only few private health clinics found in the town of Maco. There are only five (5) private clinics (one with 12-bed capacity) and one (1) private dentist, nine (9) medical practitioners and nine (9) nurses, all situated in the town proper.

8.6 Environment features

The Masara mineralization has been correlated with caldera systems which have been recognized to be inherent geological and geo-morphological features of the district. The most prominent of these is the Lake Leonard caldera located to the east of Masara near the boundary with the adjoining North Davao tenement, where a crater lake, called Lake Leonard (named after Leonard Kniazzeff, a pre-war American prospector of Russian descent who first documented it), remains one of the most unique geomorphological/ environmental features in the generally rugged landscape that characterized most of eastern Mindanao Cordillera. This Lake Leonard National Park is a water-filled caldera and is the only National Park close to the MPSA contract areas of Apex.

9.0 PREVIOUS WORK

9.1 History of Previous Work

The following is the chronology of previous resource estimates done by Competent Persons (CP) over the Masara area together with the summary of each work:

- ***2015 RESOURCE ESTIMATE OF THE GOLD VIENS WITHIN THE MACO MINE***
  By: ROLANDO PENA
  AUGUST 2015

  Scope of Work
  The scope of work is to review and audit the work of the Maco Geology and Technical Services Team.

  Summary
  The current exploration program is based on capturing historical data and creating a project wide GIS, a 3D geological model for the mine operations and vein systems and detailed surface mapping in the mine area. A surface and underground drilling program was started in late 2009 to extend known resources and to test the depth potential of vein and alteration systems identified through surface mapping and trenching and to verify previous work. The known porphyry copper systems are currently not being explored.

  The Mine is currently producing approximately 3,000 ounces of gold per month with about 1,500 tons per day mined and milled, mainly from from Sandy and Bonanza veins. The current global resource for the fifteen epithermal veins with face sample data as of August 2015, is estimated at 457,900 ounces (2,560,000 tonnes at 5.6 g/t Au).This is a 527,000 ton decrease on the Febuary 2010 estimate with the production outpacing the resources that were replaced from continuing mine exploration and development. The resource is comprised of 213,000 tonnes at 8.7 g/t Au in the Measured category, 505,000 at 8.4 g/t Au Indicated and 1,842,000 at 4.4 g/t Inferred. The categorization is deemed within acceptable limits as set forth in the PMRC guidelines.

- ***2015 REPORT FOR ECONOMIC ASSESSMENT AND ORE RESERVE ESTIMATION OF THE GOLD VEIN DEPOSITS OF MACO MINES IN MACO, COMPOSTELA VALLEY PROVINCE, MINDANAO ISLAND, PHILIPPINES***
  By: RAUL B. CEZAR
  AUGUST 2015

  Scope of Work
  The scope of work is to review and audit the work of the Maco Geology and Technical Services Team.
  Summary
  This report is a public release report on the economic assessment and ore reserve estimation of Maco Mines owned by Apex Mining Co., Inc. under a new management. It is designed to fully inform shareholders and the investment market of the Mineral Resources, Ore Reserves and of the current activities and future plans of Apex Mining Co. for the Maco Mines. This report follows on from the declared Mineral Resources of 2,560,000 tonnes at 5.6 g/t Au containing 457,900 ounces of gold within acceptable limits as set forth in the

PSE – IRR PMRC guidelines. This is contained in the Technical Report signed by the PMRC-CP for Exploration results and Mineral Resource Estimation, Rolando E. Peña, in the 2015 Resource Estimate of the Gold Veins within the Maco Mine dated August 2015.

The total combined proven and probable reserves are 1,210,000 tonnes grading 7.86 g/t gold, accounting for a total of 305,800 in-situ ounces of gold and 244,600 recoverable ounces of gold. The ore reserve is derived from, and not additional to, the declared Mineral Resource.

- ***2010 RESOURCE ESTIMATE OF THE GOLD VEIN DEPOSITS OF MACO MINES IN MACO, COMPOSTELA VALLEY PROVINCE, MINDANAO ISLAND PHILIPPINES***
  By: TOMAS D. MALIHAN
  FEBRUARY 2010

Scope of Work
The scope of work was to oversee, review and audit the work of the Maco Geology team.

Summary
The exploration concept is based on an Arc Low Sulphidation model (Corbett 2004) for the Bonanza and Sandy Veins (main system currently mined at Maco Mine) and Arc High Sulfidation for the Sagay Sagay area.

The exploration program is based on capturing historical data and creating a project wide GIS, a 3D geological model for the mine operation and vein system and detailed surface mapping in the mine area. A surface and underground drilling program was started late 2009 to extend known resources and to test the depth potential of vein and alteration system identified through surface mapping and trenching and to verify previous work. The known porphyry copper systems are currently not being explored.

The global resource for the known epithermal veins and their splits as of February 2010, is estimated at 585, 600 ounces (3, 087, 000 tonnes at 5.9gpt Au). This is a 268,000 tonnes increase on the January 2009 estimate with the full 14, 000 ounces of production being able to be replace from continuing mine exploration and development. The resource is comprised of 694, 000 tonnes at 6.6 gpt Au in the Measured category, 1,435,000 at 5.9 gpt Au Indicated and 958, 000 at 5.5 gpt Inferred.

- ***2010 REPORT FOR ECONOMIC ASSESSMENT AND ORE RESERVE ESTIMATION OF THE GOLD VEIN DEPOSITS OF MACO MINES IN MACO, COMPOSTELA VALLEY PROVINCE, MINDANAO ISLAND, PHILIPPINES***
  By: Marcelo Bolaño
  April, 2010

  Scope of Work
  The scope is to oversee, review and audit the work of the Maco Technical Services Team.

  Summary
  The report follows on the declared Mineral Resources of 3.087 million tonnes at 5.9 g/t Au containing 585,600 ounces of gold within acceptable limits as set forth in the PSE – IRR PMRC guidelines. This is contained in the Technical Report of the PMRC-CP for Geology, T.D. Malihan, in his 2010 Resource Estimate of the Gold Vein Deposits of Maco Mines in Maco, Compostela Valley dated February, 2010.

  A total combined proven and probable reserves are 1,110,000 tonnes grading 6.30 g/t gold, accounting for a total of 224,830 in-situ ounces of gold and 193,353 recoverable ounces of gold. The ore reserve is derived from, and not additional to, the declared Mineral Resource.

- ***APEX Mining Inc. Internal Resource Estimate***
  By: Scott McManus
  ASVI Contractor
  December 2011

  Scope of Work
  The scope is to report an internal resource estimate for the Maco Gold Project of Apex Minerals Ltd. The report is intended only for internal company usage and not intended for any public reporting or for use for any kind of investment advice.

  Summary
  Resource Estimate for the Dons area;
  Indicated 2,100,000 tonnes at 6.1 ppm Au
  Inferred 690,000 tonnes at 5.5 ppm Au
  * At block cut off 1.5ppm Au
  Resource Estimate for the Maligaya area;
  Measured 1,100,000 tonnes at 5.0 ppm Au
  Indicated 410,000 tonnes at 4.4 ppm Au
  Inferred 2,740,000 tonnes at 4.2 ppm Au
  * At block cut off 1.5ppm Au

- ***RE-ESTIMATION OF THE 2011 RESOURCE OF MACO MINES LOCATED IN MACO, COMPOSTELA VALLEY PROVINCE, SOUTHEASTERN MINDANAO ISLAND, PHILIPPINES***
  By: TOMAS D. MALIHAN
  RAMON A. L. FLORES
  MARCH 2012

Scope of Work
The scope of work is to review, audit and, if found in order, certify the work of Apex's Technical Staff and its consultant who prepared the resource estimates.

The CPs have relied mainly on the exploration data gathered by the technical staff and consultants of Apex including geological reports, plans, sections and statistical studies to arrive at the various resource estimates.

Summary
A surface and underground drilling program was started in late 2009 to extend known resources and to test the depth potential of vein and alteration systems identified through surface mapping and trenching, and to verify previous work.

The vein systems of the mine since 2006 up to 2011 have reportedly produced approximately 830,000 tonnes of gold averaging 5.01 g/t Au.

Re-estimation of the resource declared by Apex for Maco Mine used the geostatistical technique wherein the top cuts were determined for each vein's cumulative frequency histogram of assay values. Further, variogram ranges were used to classify resources: measured for those veins with both 1m composited face samples and drillhole intercepts and within the interpreted variogram range along strike; indicated up to twice of the variogram range as supported by geological continuity; and for inferred, the resource envelope of MacManus (2012) is used; all within the Apex supplied wireframe/ geological solid model. Each vein's average of specific gravity measurements were utilized, and if not available, the global average specific gravity was used. Ordinary Kriging was used to estimate 2.5x2.5x5m blocks, a size deemed suitable by Mine Operations staff. In this regard, the methodology adopted here appears to be more accurate than previous ones. Measured resources are marked both by composited face and drillhole samples. This was further modified due to geological considerations.

The Mine's categorized resources for the 16 major vein systems /41 individually considered epithermal veins (where the vein and their splits' solids/wireframes are available) were determined. The pre-mining, undiluted resource in situ estimates are shown below:
At 3g/t Au cutoff, the total undiluted pre mining, in-situ resource is comprised of:
140,000 tonnes at 8.4 g/t Au as measured;
1,650,000 tonnes at 9.7g/t Au as indicated; and
3,100,000 tonnes at 5.6 g/t Au as inferred.

At 1.5g/tAu cutoff, the total undiluted pre mining, in-situ resource is comprised of:
190,000 tonnes of 6.7 g/t Au as measured;
2,240,000 tonnes of 8.1 g/t Au as indicated; and
3,270,000 tonnes of 4.7 g/t Au as inferred.

- ***MACO RESOURCE ESTIMATE***
  By: ASVI TECHNICAL SERVICES GROUP LIMITED
  October 2012

Summary

Previous estimates have been completed for the Maco but they are not directly comparable to the current estimate due to the inclusion of different mineralized structures. Until 2009, estimates were mainly based on long section polygonal estimation. An estimate in 2011 appears to be the first estimate based on three-dimensional modeling of vein volumes and contemporary block modeling techniques.

Data available as at April 2012 for resource estimation consists of:

- Dons face samples: Face sample data collected during earlier phases of mining recovered by site geologists from hand drawn plans.
- Maliagaya face samples: Face samples in structures currently being mined.
- Crew drilling: The previous mine operator (Crew Gold Corporation) carried out surface diamond drilling in the Malumon and Dons areas in 2006 and 2007
- Apex Dilling: Apex carried out surface and underground drilling in the Maligaya area during 2010 and 2011

Apex provided AMC with a single wireframe for each ArcCode interpreted from all available data including underground sampling, drilling, surface mapping and compilation of structural geology. AMC used the wireframes and the true width of the structures indicated by sampling and drilling to produce separate hanging wall and footwall wireframes for each ArcCode.

The volume model was developed with the dual aim of representing the mineralized volume accurately and creating volume model parent cell dimensions at an appropriate size for grade estimation. It was initially developed with 5 meter x 5 meter cells that had a single cell of variable width across the vein. The model prototype was reset into a parent cell of 20 meter x 20 meter x 20 meters for estimation.

Estimation of the accumulation and the width was carried out using ordinary kriging using estimation parameters determined from the variography study. The accumulation and width were estimated into parent cells such that each sub-cell of a parent cell has the same values.

AMC reviewed the bulk density data (6,730 determinations) by ArcCode and assigned the average bulk density of each ArcCode to the corresponding vein. A global bulk density of 2.65 t/m3 was assigned to veins with no bulk density data.

All estimates for Dons veins have been classified as Inferred Resource because the provenance of the data is uncertain.

Veins with face sampling on close-spaced levels have been classified as Measured Resource. Halos around Measured Resource and veins with face sampling on wider-spaced levels have been classified as Indicated Resource.

Halos around Indicated Resource have been classified as Inferred Resource but it has not always been extended to the limits of estimation where the available data are very wide spaced.

- ***ESTIMATION OF THE 2012 GOLD RESOURCES OF MACO MINES LOCATED IN MACO, COMPOSTELA VALLEY PROVINCE, SOUTHEASTERN MINDANAO ISLAND, PHILIPPINES***
  By: Ramon A. Flores
  Fernando G. Sajona,
  Darrel S. Ablaza
  Tomas D. Malihan
  September 2013

Scope of Work

The CPs have relied mainly on the exploration data gathered by the technical staff and consultants of Apex including geological reports, plans, sections and statistical studies to arrive at the resource estimates. This report, therefore, could only be as good as the data provided “as-is” to the CP. The objective of this work is to present a PMRC-compliant Resource Estimation Report in the Philippine Stock Exchange-prescribed format that meet the guidelines set by PMRC

Summary

An estimation of the resource used the geostatistical technique wherein the top cuts were determined for each vein’s cumulative frequency histogram of assay values. Further, variogram ranges were used to classify resources: measured for those veins with both 1m composited face samples and drillhole intercepts and within the interpreted variogram range along strike at 50m; indicated up to twice of the variogram range or at >50 to 100m as supported by geological continuity; and for inferred, the resource envelope beyond 200m to <=down dip of the vein and greater than 100m to <=200m the variogam range were used. Each vein’s updated average of specific gravity measurements was utilized, and if not available, the global average specific gravity was used. Ordinary Kriging was used to estimate 2.5x2.5x5m blocks, a size deemed suitable by Mine Operations staff and supported by variography. In this regard, the methodology adopted appears to be more accurate than previous ones. The Mine’s categorized resources for the 5 major vein systems, and the pre-mining, undiluted resource in situ estimates are shown below:

At 3g/t Au cutoff, the total undiluted pre mining, in-situ resource is comprised of:
412,000 tonnes at 6.90 g/t Au as measured;
80,000 tonnes at 3.58g/t Au as indicated; and
90,000 tonnes at 4.12 g/t Au as inferred.

COMBINED WEIGHTED TOTAL: 582,000 tonnes at 6.01g/t Au
(Measured + Indicated + Inferred)

At 1.5g/tAu cutoff, the total undiluted pre mining, in-situ resource is comprised of:
631,000 tonnes of 5.43 g/t Au as measured;

160,000 tonnes of 3.08 g/t Au as indicated; and
90,000 tonnes of 4.12 g/t Au as inferred.

COMBINED WEIGHTED TOTAL: 881,000 tonnes at 4.87g/t Au
(Measured + Indicated + Inferred)

9.2 Conclusions of each of the previous workers

Table 9-1 presents a summary of the previous global resource estimates made for the Masara mines, while the methodology and the codes to which these estimates are compliant to are indicated in Table 9-2.

Table 9-1: Conclusions of previous workers

	Number of veins included in the resource	**Global Resource Tonnage**	**Grade (g/t Au)**
Rolando Pena	12 major and splits	2.5Mt	5.6 @ 1.5g/tCutoff
Malihan and Flores 2012	41 major and splits	6.6Mt	5.9 @1.5g/tCutoff
MacManus 2011	46 major and splits	7.0Mt	5.0 @1.5g/tCutoff
Malihan, 2010	14 major veins	3.1Mt	5.9 @3.0g/tCutoff
Apex, 2009	14 major veins	2.8 Mt	5.7g/t
Crew, 2007	14 major veins	10.4Mt	6.1g/t
Snowden, 2006	14 major veins	5.7 Mt	6.3g/t
MGB, 2004	11 major veins	6.1 Mt	7.8g/t
Apex, 2002	11 major veins	5.9 Mt	7.1g/t
Howe, 1995	11 major veins	2.6 Mt	6.2g/t
LMMCL, 1994	12 major veins	4.3 Mt	5.9g/t

Table 9-2: Methodologies and codes used in previous estimates

Year	Author(s)	Reserve or Resource	Methodology	Applicable Code used to classify	Notes
2015	Rolando Pena	Resource	Ordinary Kriging, Geostatistical	PMRC	
2015	Raul Cezar	Reserve	Ordinary Kriging combined with block filtering	PMRC	
2012	Malihan and Flores	Resource	Geostatistical	PMRC	41 Slected Veins, updated SpGr. per vein; strike,dip and plunge considered as with QAQC
2011	McManus	Resource	Inverse Distance		Geological Model Update
2009	TMalihan	Resource	Review of TSantos	PMRC	Classifies and provides a report stating the 2009 Resource to be PMRC-compliant
2009	TSantos	Resource	Long Section, Polygonal method (Avg Grade per Block)	Categories used are based on USGS 1980 code but reportes as NI 43-101-compliant by Crew gold and PMRC compliant by Apex to respective Stock exchange	Very conservative with most of the resource being readily converted to reserve. Reviewed by TDMalihan, Cp Geology. Not compliant as no report presented.
2007	SMJensen and Petersen	Resource	Long Section, Polygonal method (assigned Grade per block with payability penalty)	Code is not specified but reported as BI 43-101-compliant Crew gold	Conservative but then some inferred blocks go beyond the scope of the methodology stated to bulk out Inferred resources. Report is not suitable for a compliant format.
2006	SDominy	Resource	Long Section, Polygonal method (assigned Grade per block with payability penalty)	NI 43-101	
2004	MGB	Reserve	Long Section, Polygonal method (Avg Grade per Block)	Claims to be JORC-compliant but Snowden says it is not	
2001	Apex	Resource (stated as reserve)	Long Section, Polygonal method (assigned Grade per block with payability penalty)	Roughly USGS 1980	SG 2.45 t/m3
1995	ACA Howe	Reserve + Resources	Long Section, Polygonal method (Avg Grade per Block)	USGS 1980	SG 2.5 t/m3

10.0 HISTORY OF PRODUCTION

10.1 Production History of Apex Mines (Excluding MPSA 234)

From 1976 to 1989, Apex extracted **573,022 ounces** of gold from about 3.5 Mmt of gold ores.

In 1991, operations were forced to stop due to festering labor disputes aggravated by prolonged depressed gold prices, Apex carried out only limited to small scale mining operations until 2000 when mining activity was finally suspended.

In 2003, Apex entered into separate operating agreements with three mining contractors, Goldridge Mining Corporation, Viclode Mining Corporation and Mintricor Inc. Apex obtained a percentage of the contractor's gold production as per the contract agreement.

Operation was revived in 2005 under Crew Gold which managed the mine until October 2009. During the period, Apex produced a total of **45,929 oz of Au and 150,707 oz of Ag.**

ASVI (Mindanao Gold) took over operations in November 2009 until Monte Ore Resources and Energy Inc. came over in January 2013. Under ASVI, Apex produced a total of **79,570 oz of Au and 386,141 oz of Ag.**

From January 2013 up to December 2016, Apex under Monte Oro produced a total of **153,309 oz of Au and 848,432 oz of Ag.**

10.2 Areas mined within the Tenement Area

During the mid-1970s to 1980s, copper ore were mined from Kurayao and Wagas areas while gold was produced from several vein systems within the area, mostly from Hope, Dons, and the Wagas – Masarita vein systems.

When Crew Gold took over in 2005, development and mining were concentrated in the Maligaya and Malumon areas wherein the Bonanza, Masara and Sandy vein systems are the major gold ore sources.

At present, development and mining are focused on the Maligaya, L870, L700, and Barabadan areas. The vein systems that are currently producing are Bonanza Hanging Wall Split (BHWS), Sandy North (SDN), Sandy, Masarita II, Wagas, and Maria Inez.

10.3 General description of mining, ore beneficiation, concentrate, mineral product market

Several mining methods have been used throughout the years of mining operations in the Masara District. The first two decades of mining employed the conventional shrinkage method. In the late 2000s, ore was primarily extracted through cut-and-fill. In areas where the vein is thin, conventional mining was carried out like modified shrinkage. By the middle of 2010, longhole mining was introduced. Other mining methods, such as the modified shrinkage method, were used where applicable.

Ore then goes through primary and secondary crushing before proceeding to a two-stage milling- rod mill and ball mill. After grinding, the ore goes through the thickeners followed by gold and silver recovery through cyanide leaching and adsorption to activated carbon in the CIL tanks. The loaded carbon will then undergo stripping and the precious metals deposit onto steel wools. After which, recovered sludge will then be refined by smelting. The final product is doré which usually contains 14-20% Au, 75-80% Ag and 1-5% other elements.

10.4 Tonnage mined and metals sold

10.4.1. Tonnes mined and milled at Maco

Month/ Year	Tonnes Mined				Tonnes Milled	Mill Head	
	Ore	Au, g/t	Waste	Total		Au	Ag
December 2006	13,129	4.07	66,379	79,508	1,529	4.29	18.72
2007	78,077	3.83	228,609	306,686	84,965	3.17	13.59
2008	166,971	4.59	85,642	252,613	171,760	4.59	20.99
2009	148,417	5.88	52,048	200,465	151,320	5.09	32.69
2010	214,650	5.24	117,678	332,328	192,586	4.92	30.78
2011	208,849	4.99	165,499	374,348	202,581	4.73	32.01
2012	234,033	3.90	139,840	373,873	233,096	3.80	22.40
2013	289,015	4.78	253,350	542,365	280,451	3.66	22.70
2014	258,596	6.01	286,282	544,878	234,928	3.89	21.85
2015	438,424	5.61	266,057	704,481	316,147	5.42	34.39
2016	514,327	6.06	203,111	717,438	452,948	4.68	29.98
Total	**2,564,488**	**5.30**	**1,864,495**	**4,428,983**	**2,322,312**	**4.48**	**27.27**

Table 10-1: Tonnes mined and milled at Maco

10.4.2. Apex Mill Production

Month/ Year	Bullion, Au oz	Bullion, Ag oz
December 2006	133.9	439.1
2007	7,228	21,790
2008	21,618	60,179
2009	20727	79,968
2010	25,659	113,007
2011	26,256	146,294
2012	23,877	116,071
2013	26,797	151,830
2014	26,521	151,203
2015	43,139	227,417
2016	54,681	309,623
Total	178,817	840,781

Table 10-2: Tonnes mined and milled at Maco by Apex Mill production

11.0 REGIONAL AND DISTRICT GEOLOGY OF MASARA GOLD DISTRICT

The Masara District is part of the Mindanao Pacific Cordillera, which is principally a magmatic arc terrane with an ophilolitic segment in the north, subdivided into three sections, namely, (1) Northern Pacific Cordillera; (2) Central Pacific Cordillera; and (3) Southern Pacific Cordillera (MGB, 2010). The Masara District belongs to the Southern Pacific Cordillera (Fig. 11-1). Two prominent structures bound the Mindanao Pacific Cordillera, namely, the Philippine Fault to the west and the Philippine Trench to the east. Intrusive and extrusive igneous rocks in the Pacific Cordillera are associated with subduction of the Philippine Sea Plate that dates back to Eocene time. The Pliocene-Holocene volcanic rocks in the north and south indicate the development of a Late Neogene magmatic arc associated with the reactivation of subduction of the Philippine Sea Plate of which the surface manifestation is the Philippine Trench east of Mindanao.

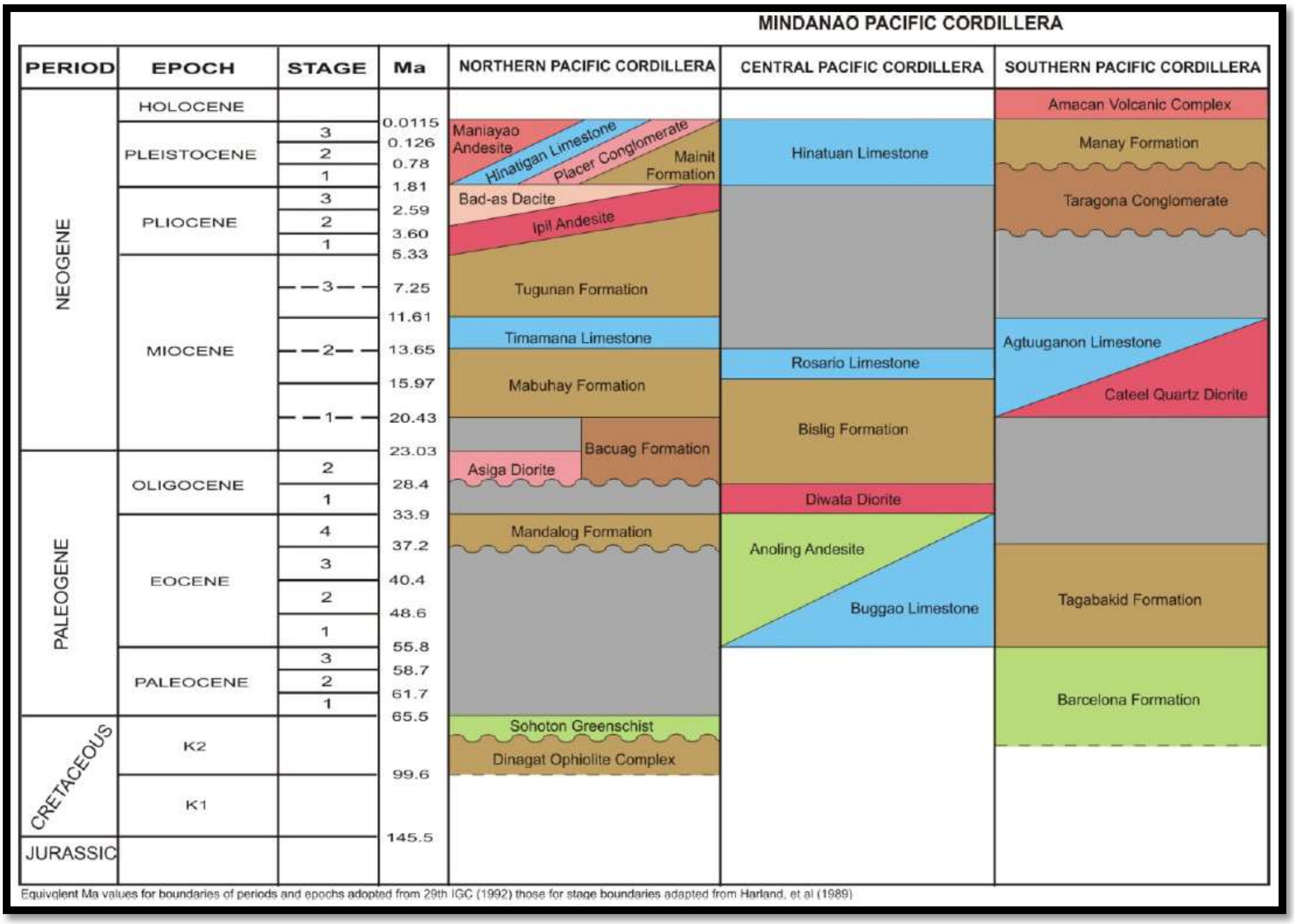


Figure 11-1: Stratigraphic columns of Mindanao Pacific Cordillera

11.1 Stratigraphy

The basement of the Pacific Cordillera is manifested by occasional windows of metamorphic and ultramafic rocks, including amphibolite schists in New Bataan and serpentinite along the western side of the Maragusan Valley. These could be correlated with the Pujada Ophiolite (MGB, 2010). Malicdem and Peña (1966) also described serpentinites and serpentinized ultramafic rocks and amphibolite schists along fault zones in the Masara area in Davao. Immediately north of the Calapagan-Marayag Valley are slates. In the Taragona area, metasedimentary rocks consist of well-indurated sandstones with bioturbation and slump features. Cretaceous limestones were recognized in Hijo River and Mati. Samples of gray colored limestones from the Hijo River and from Mati contain Late Cretaceous (Senonian to

Campanian) foraminiferal assemblage (Quebral, 1994). No formal names have been proposed for these rock units.

Cretaceous – Paleogene volcanic flows, pyroclastics and clastic rocks comprise the **Barcelona Formation**, which was mapped by Malicdem and Pena (1976) as Pre-Tertiary Volcanic and Sedimentary Rocks in the Masara District. It consists mainly of volcanic flows and flow breccias intercalated in places with graywacke, metaclastic rocks and tuff. The volcanic rocks are essentially andesitic in composition, although spilitic,keratophyric and basaltic varieties are nonetheless present.

The Eocene **Tagabakid Formation** is a sedimentary sequence that was introduced in MGB (2010) to designate the sandstone-mudstone-limestone in Mati, Taagabakid, Hitangan and Taragona areas in Davao Oriental described by Quebral (1994). Limestone at the Hijo Mine along Hijo River, which hosts gold mineralization has been dated Eocene (Quebral, 1994). This Formation is represented in the Masara District by the Paleogene Sedimentary Rocks mapped by Malicdem and Pena (1966).This unit is described as a sequence of clastic rocks with local lenses of limestone and intercalations of andesitic flows and tuff. The conglomerate which forms the base of this unit contains cobbles and pebbles of the older volcanic and metamorphic rocks.

The Early – Middle Miocene **Agtuuganon Limestone** in Compostela Valley is represented in the Masara District by the Miocene Limestone mapped by Malicdem and Pena (1966). The limestone lies in an arcuate belt that extends from the north to the southeast and roughly outlines trace of the nose of a broad southwest plunging anticline. Along Maraot River and towards the highest peak in the area, Upper Miocene limestone occurs with thin beds of shale, sandstone and conglomerate and contains reworked Lower Miocene fossils. Sedimentation and limestone formation were not continuous throughout the Miocene and a possible break is indicated between Middle Miocene and Upper Miocene.

The **Cateel Quartz Diorite** which intrudes Cretaceous – Paleogene rocks in the region is represented in the Masara District by several small bodies (apophyses?) and dikes of quartz diorite confined within the truncated core of the broad southwest plunging anticline. Quartz diorite bodies possibly apophyses and dikes in the Hope-Theresa-Pagasa area are generally fine grained while those exposed along Tagbarus River and Malumon Creek are medium grained.

The **Amacan Volcanic Complex**, consisting of andesitic to dacitic domes plugs, flows and pyroclastic rocks was named after the volcanic rocks at the Amacan Mine near Lake Leonard in Davao. A sample of carbonized wood from volcanic ash around the Lake Leonard area gave a 14C date of 1,800 years (MGB, 2010). Other volcanic rocks, however, as in the Masara area, could be older, probably coeval to the Pliocene- Pleistocene volcanic in Surigao Gold District, such as Ipil Andesite, Bad-as Dacite and Maniayao Andesite which are associated to gold mineralization. In Masara District, these include the dike rocks described by Malicdem and Pena (1966) as well as Pliocene- Pleistocene volcanic and pyroclastic rocks occurring as plug-like forms and fissure eruptions.

11.2 Structural Geology

The Pacific Cordillera in eastern Mindanao stands between two major structural features, namely, The Philippine Trench and the Philippine Fault. The Philippine Trench is the trace of the west verging subduction of the Philippine Sea Plate (PSP) beneath eastern Mindanao. The onset of subduction of the PSP during the Neogene is believed to have been induced by the collision of the Philippine Mobile Belt with the Palawan- Mindoro microcontinent during Late Miocene (MGB, 2010). The history of subduction of the PSP, however, goes back to the Paleogene period, as manifested by the Eocene- Oligocene magmatic arcs in eastern Philippines, including Sierra Madre in northern Luzon, the Bicol region, Samar-Leyte and eastern Mindanao. Subduction ceased as a result of the collision-accretion of Benham Rise against eastern Luzon at the close of Paleogene or earliest Neogene (Peña, et al, 2010). Thus, the present subduction of the PSP is a reactivation of an ancient process as a result of another collision-accretion.

West of the Pacific Cordillera is the Philippine Fault, which extends all the way to northern Luzon. Although the Philippine Fault only brushes past the western flank of the Cordillera, its NW-SE splays invade sections of its mountain ranges. The stresses generated by the subduction of the PSP also caused faulting across the Mindanao Pacific Cordillera in the form of thrust faults and normal faults. These stresses also brought about folding in the sedimentary units in eastern Mindanao, forming synclines and anticlines oriented NW to NE.

Locally, gold mineralization is controlled by strike-slip faults parallel to the Philippine Fault or splay structures off the rift fault and dilational structures which developed orthogonally to the main structures as a result of strike slip movements on structures parallel to the PFZ. The Masara District, which includes the known Masara-Hijo-Amacan copper-gold deposits, is situated in what appears to be a dilational jog of the Philippine Fault within caldera structures.

11.2.1 Faults

The faults observed in the Masara Mine Area are categorized into: (1) north northwest, (2) northeast, (3) east-west, and (4) northsouth systems. The first two systems are wrench faults while the last two are gravity faults. All the faults are steeply dipping. Faults of the north-northwest system are essentially left-lateral. Some of the effects produced by wrench faulting are drag folds, slaty cleavage and cataclasis. Faults of the north-east system are evidently right-lateral and tend to abut against the faults of the north-northwest system.

11.2.2 Folds

Folding in the area involved pre-Tertiary to Miocene rocks. Fold axes generally trend northeast and north-south. The northeast-trending folds include the truncated southwest plunging anticline and a small southwest plunging syncline.

Other folds trend almost north-south with small deviations to either east or west. They are relatively smaller and their axes average 1.5 kilometers long.

11.2.3 Dikes

The majority of the quartz diorite dikes in the area trend northeast and only a few strike northwest. On the other hand, most of the "Engineering" andesite porphyry dikes strike northwest and only a few strike northeast. The two systems are almost normal to each other and suggest a set of fractures which controlled the emplacement of the dikes. Many of the "Peanut Brittle" andesite porphyry dikes strike northwest or north-northeast; a few trend almost north-south.

12.0 LOCAL GEOLOGY

12.1 Geological work undertaken by the company in the property including scale of mapping and laboratory tests undertaken for the samples

The geological work undertaken by AMCI of the mineral property includes detailed 1:1,000-scale of surface mapping, grid soil geochemical surveys, and laboratory tests undertaken for the collected samples conducted in 2015-2016 by the exploration group in MPSA 225 and MPSA 234. Prospects encompasses Kaurangan, Aknit-Biocadan, PJAC-St Benedict and MST2/SDN2.

The simplified geology shows NW-trending vein zone in Kaurangan, PJAC-St Benedict and MST2/SDN2, at least some 2,700 cumulative-meters in strike length dipping steeply to moderately towards the NE direction, and at least some 600 cumulative-meters in Aknit-Biocadan. These vein systems cut or are hosted in the diorite and andesite. All vein zones are open in both ends of the strike directions. Difficulty in surface mapping was encountered because of the thick tropical soil profile developed over the whole area, and rock exposures are limited to some stream outcrops and old road cut exposures.

12.2 Rock types and their geological relationships

The Maco geological setting is characterized by a suite of shallowly eroded volcanic, subvolcanic intrusive complex and sedimentary package. This regionally disposed dominantly massive andesitic and volcaniclastic country rock package (**Masara Formation** or MF) is cut by high-level intrusive (**Masara Intrusive Complex** or MIC) and a later sub-volcanic intrusive complex (**Amacan Volcanics** or AV) (**Figure 12-1**). The multi-phase intrusive suite is comprised predominantly of diorite, with subordinate stock-like bodies of andesite porphyry. The sub-volcanic complex is equally multi-phase with stock-like bodies of dacitic and basaltic-andesitic composition extensively widespread towards north, and apparently emplaced at a later phase than the intrusions

These volcanic, intrusive and sub-volcanic complex that host various vein-style gold mineralization has once been subaerially emergent and shallowly eroded.

An apparent erosional unconformity or paleosurface can be found in the western part of tenement along the contact of MF and the overlying presumably younger basal conglomerate. This paleosurface is now represented by a thin layer of poorly consolidated dominantly carbonaceous mudstone which underlies thick limestone capping. Together, the limestone and its basal clastic sediment package forms part of the district-wide **Tagbaros Formation** (ML).

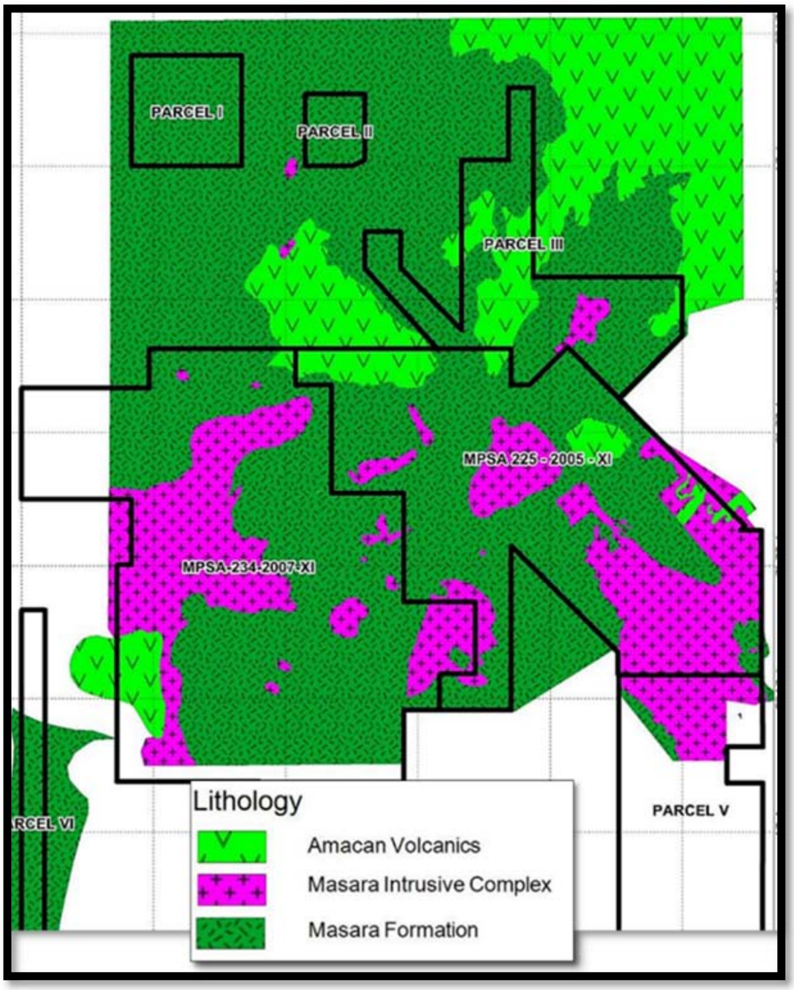


Figure 12-1: Geologic Map of the Tenement

The following are descriptions of lithologic units encountered as gleaned from surface mapping:

Masara Formation

Andesite (AND)
Andesite is the oldest rock unit known to occur in the area. It is massive in outcrop, basically a fine-grained hornblende andesite, generally aphanitic with embedded small (mm size) hornblende and plagioclase feldspar phenocrysts. It is hard and greyish in color when fresh. Darker coloured units have been observed and may be basaltic andesite in composition. This unit outcrops mostly within the tenement.

Masara Intrusive Complex

Diorite (DIO)
Diorite is a dominantly fine- to medium-grained equigranular phaneritic, occurring as small (a couple of hundred meters) bodies in outcrop. When unaltered, it is generally greyish in color, becoming darker when propylitized and lighter when argillized. It distinctively contains hornblende crystals unlike feldspar porphyry. Weathered and argillized diorite is generally soft and friable within all prospects. In some areas, mapped dioritic bodies texturally grade into coarser grained hornblende biotite diorite rock type.

Andesite Porphyry (ANY)
Andesite Porphyry is a textural variant of DIO, and thus both are possibly co-magmatic and co-eval. ANY has more than 30% of these (1 to 5mm in size) light-colored euhedral to subhedral phenocrysts lighter when argillized and greenish when chloritized. The notion that ANY and DIO are co-genetically one intrusion is substantiated by the difficulty in the field to identify which outcrop could be named ANY or DIO because they are visually similar and in some places phenocrystic contents vary slightly in just a few meters. A ballpark estimate is then used when complexities occur on which outcrop is to be named for which rock name. In previous drill cores, however, it is much easier to distinguish between the two but, as with outcrops, phenocrystic contents vary in minor terms. As with AND and DIO, ANY lithologies also exhibit variable intensities of argillization, and are also hosts to veins and mineralized structures in the area.

Amacan Volcanics

Feldspar Porphyry (PHY)
Feldspar Porphyry is still aphanitic but very distinctively porphyritic, with at least 30% phenocrysts, most of which are large euhedral feldspar crystals (greater than 5mm to as much as 15 mm in size). It may be regarded as another coarser textural variant of ANY, but its distinction in the field lies in the amount of larger feldspar phenocrysts, similar to the Mabuhay Andesite Porphyry or the Birds-Eye Porphyry in the Surigao district. There are a number of evidences that suggests PHY (Feldspar Porphyry) is a disparate and younger intrusive than the co-genetic DIO-ANY (diorite- andesite porphyry) bodies. Among these are those outcrops having PHY cut veins, lithologies exhibit very weak alteration to fresh rock. PHY is equivalent to “Alipao Andesite” as invoked by RWG-UP-NIGS.

Dacite Porphyry (DAP)
Dacite Porphyry appears to have a fine- to medium-grained phaneritic groundmass of hornblende, quartz and feldspar. Phenocryst is mainly euhedral to subhedral feldspar of up to 15 mm in size. Similar to PHY, DAP is quite altered to fresh.

12.3 Description of various geological structures and their trends
The major structural features defined within Apex’s MPSA area and its general vicinity consist of: 1) NW-trending, steep NE-dipping left lateral strike slip faults correlated with and representing the local segments of the Philippine Fault System; 2) a large Valles-type caldera or volcanic center, the periphery of which is defined by a ring fracture zone; 3) a north-south system of gravity faults, and; 4) a less dominant set of second order northwest-northeast conjugate faults. Post-ore thrust faults are fairly well-distributed central to the area; toward the area’s perimeter, the thrust fault generally dips away from the volcanic center.

A few minor sub-parallel sets of folds with northerly to north-northwesterly axes are also found at Masara proper as well as west to southwest of the Apex tenement. The NW-trending fault system is most dominant near the caldera center and its structures are generally disposed in a parallel fashion, if not overprinted by an inner set of major auriferous quartz veins. Some of the gold-bearing veins and the known porphyry copper-gold deposits follow the conjugate northeasterly faults and the peripheral ring fracture system.

13.0 MINERALIZATION IN THE PROPERTY

13.1 Overview of the mineralization

At least four types of mineralization have been identified within the Apex property. These are the (1) sub-epithermal Au-base metal veins (2) porphyry-related Cu-Au mineralization; and (3) skarn mineralization.

13.1.1 Au-Ag-Base Metal Veins

At least ten of the known vein systems are classified as Au-base metal veins, namely; Bonanza-Bonanza Hanging Wall Split-Masara, Sandy-Sandy North, Manganese, Jessie, Maria Inez, St. Francis, Don Calixto, Fern, Masarita-Masarita 2 and Wagas. These were classified as sub-epithermal veins due to the high base metal sulfide content (30-80%) and are associated with propylitic- and skarn-altered host rock as observed in the underground headings instead of the characteristic argillic alteration for low sulfidation mineralization.

Mineralization within the Masara Gold District is structurally controlled by series of faults directly associated with the Philippine Fault Zone. Vein mineralization is characterized as fault-controlled massive sulfide breccia which were later overprinted or bounded by quartz, carbonates and Mn-rich carbonate veins exhibiting crustiform-colloform, vuggy or cockade textures.

These veins strike NW to WSW and dip steeply to the northeast. Dip deflection however is also observed for the steeply dipping veins. Vein mineralization generally persists for several kilometers with vein widths ranging in some high grade portions from 1.0-5.0m.

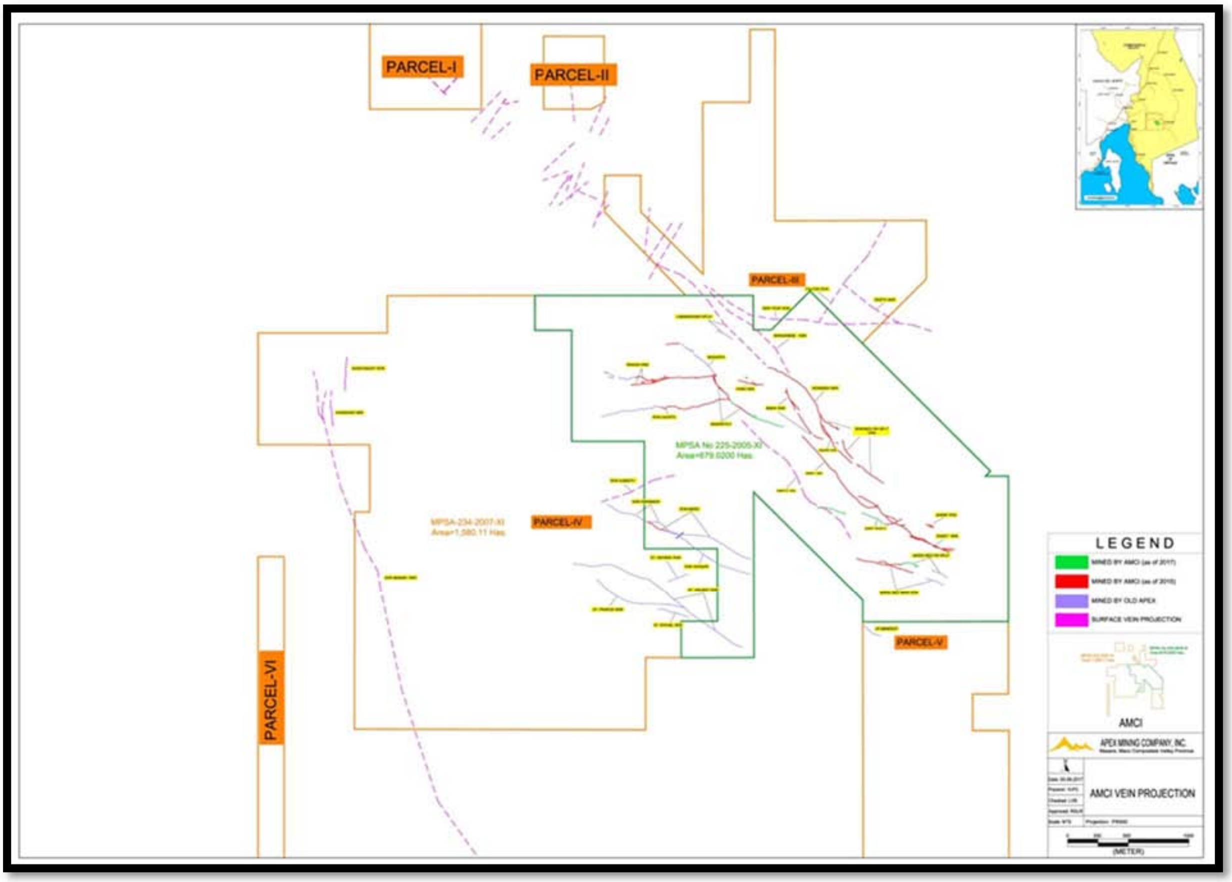


Figure 13-1: Tenement Map showing the surface projections of the identified vein systems

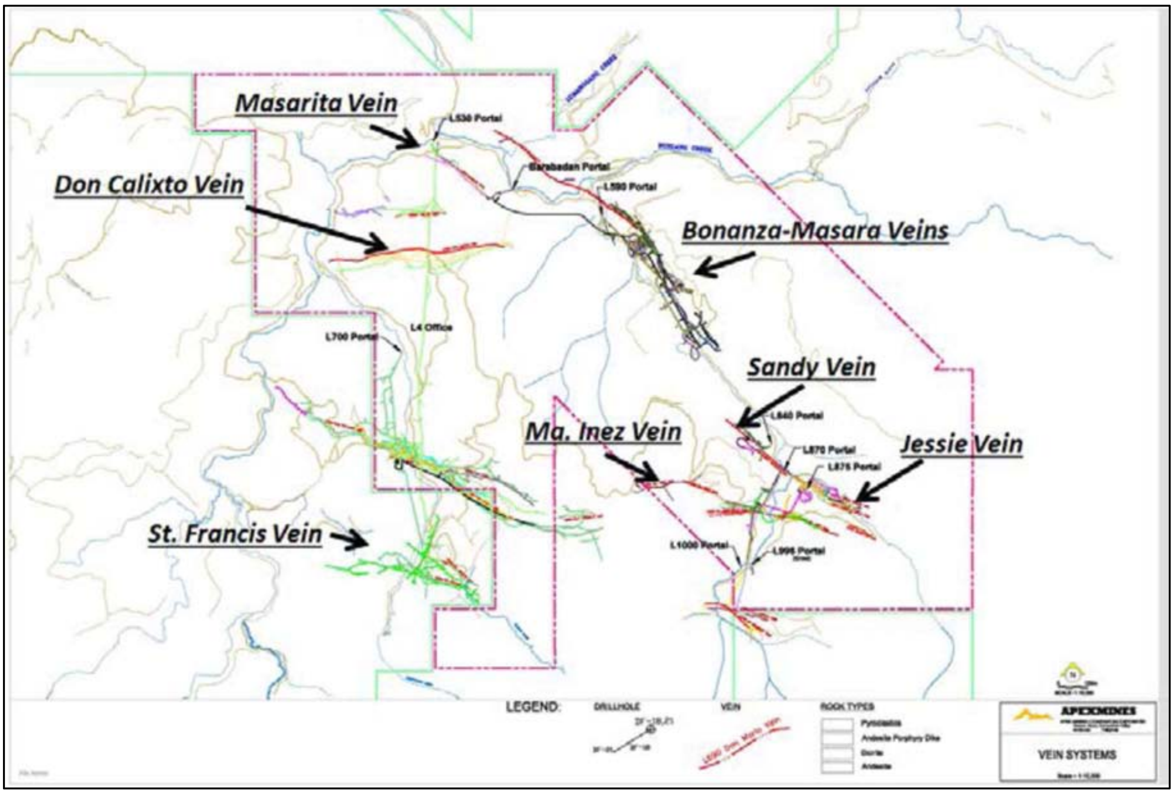


Figure 13-2: Gold-silver-base metal vein systems

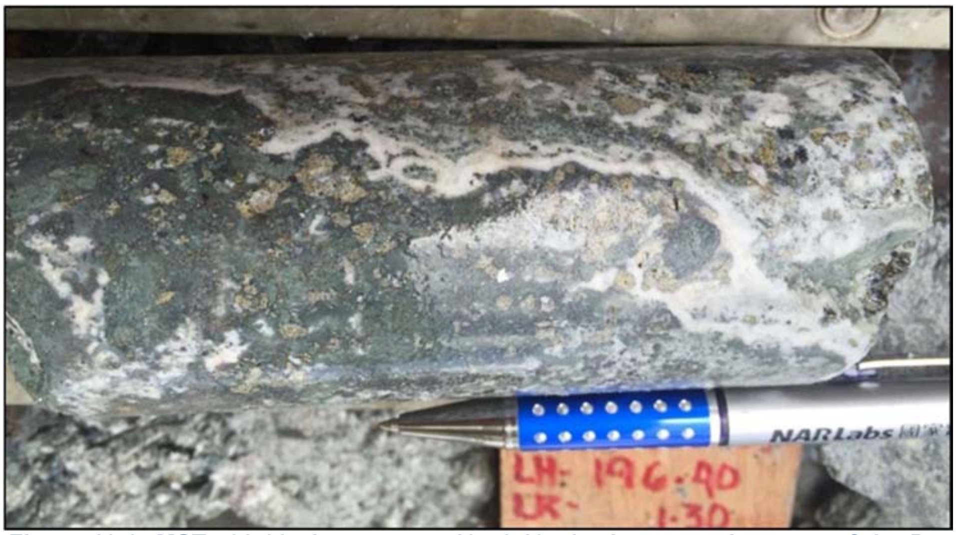


Figure 13-3: MST-590-005 intercept at 194.1-195.1m interpreted as part of the Don Calixto vein characterized by multiphase base metal-carbonate mineralization

Figure 13-4: ASA-785-012 intercept at 330.7m showing crustiform-colloform banded quartz+rhodonite+rhodochrosite+sulfide vein and late stage vuggy carbonate veins with bladed texture

Figure 13-5: ASA-590-004 intercept displaying multi-phased breccia with angular to sub-angular sulfide-rich clasts and quartz-calcite-rhodochrosite veins

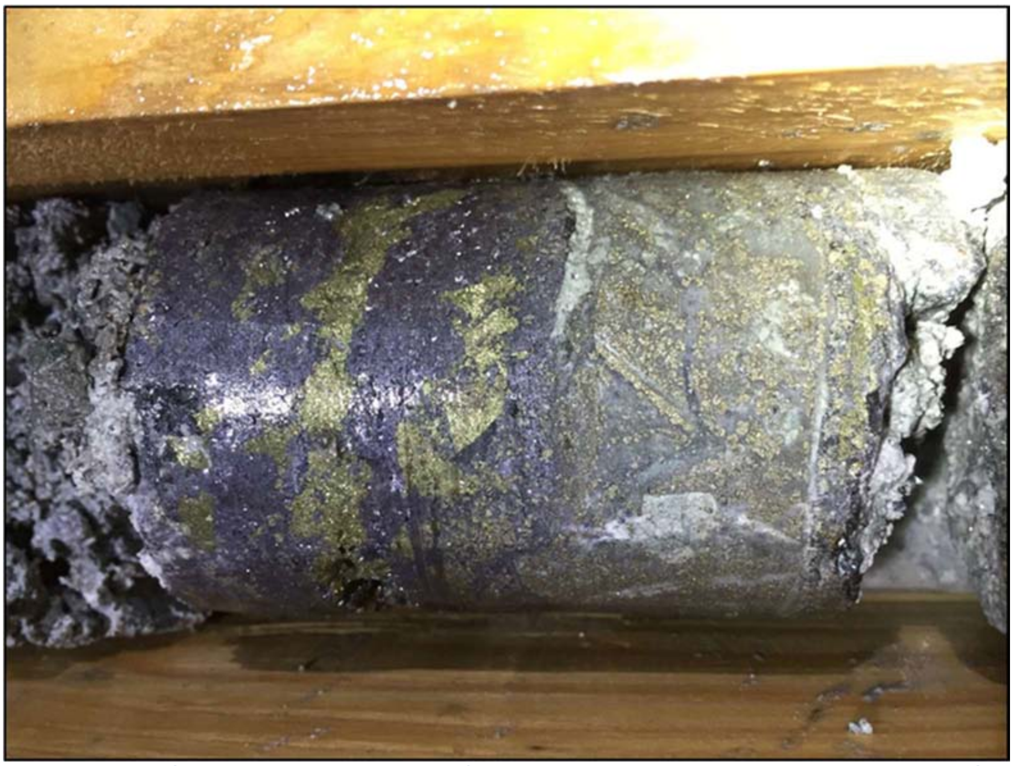


Figure 13-5: (Cover Photo) Massive sulfide (gn+py+cpy) vein breccia intercept in MST-590-008

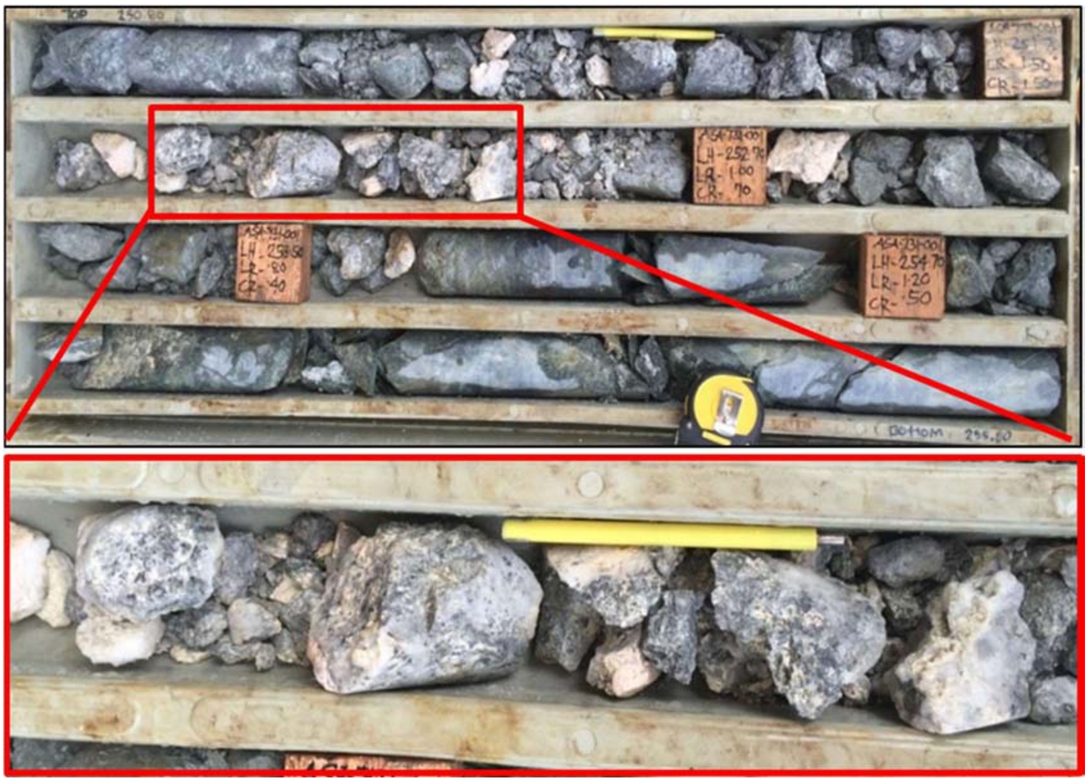


Figure 13-6: Vuggy, quartz-carbonate-rhodochrosite vein breccia intercept in ASA-731-001 with sp-gn-py-cpy.

Figure 13-7: Quartz-carbonate vein breccia intercept in MST-560-004 at 117.4-117.7m. Carbonate veins show colloform-crustiform banding

Figure 13-8: Vuggy quartz+carbonate vein in ASA-545-003 at 116.9-117.1m

Figure 13-9: Vuggy quartz+pyrite+chalcopyrite vein with angular diorite clasts in ASA-590-020 at 56.8-57.8m. Sulfides occur along vein selvages.

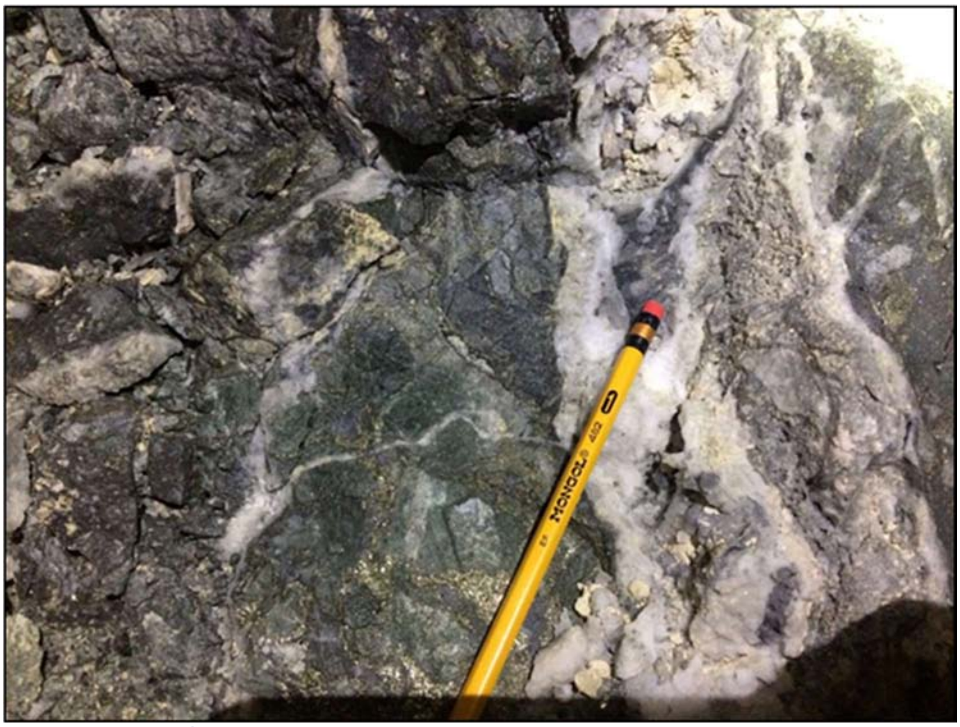


Figure 13-10: Carbonate+quartz vein breccia with py+cpy disseminations and patches exposed underground at heading Level 560 SDNS ODE 102S position

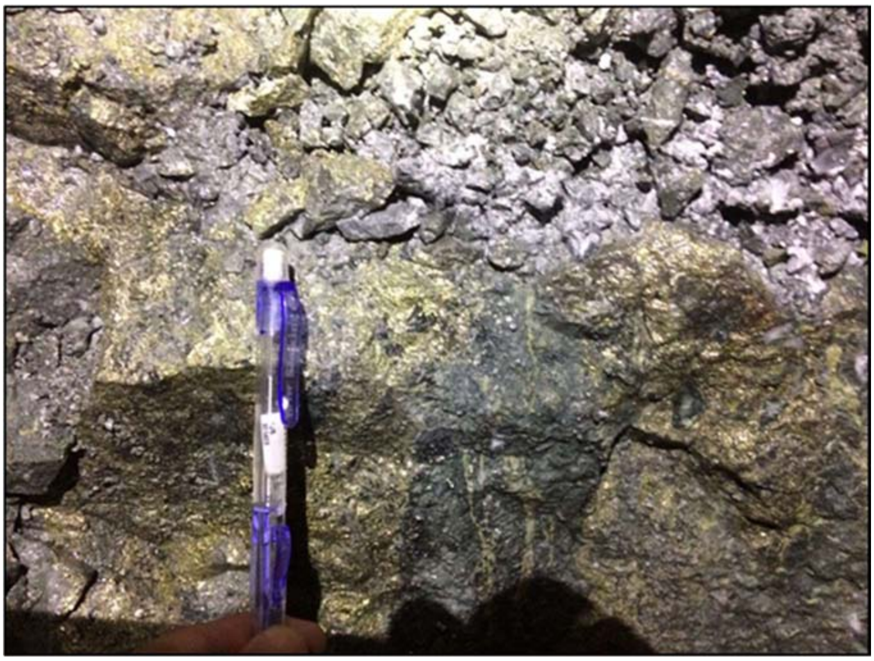


Figure 13-11: High Au grade massive sulfide (py-cpy) vein hosted by propylitic-altered andesite at Level 490 BNZ ODE

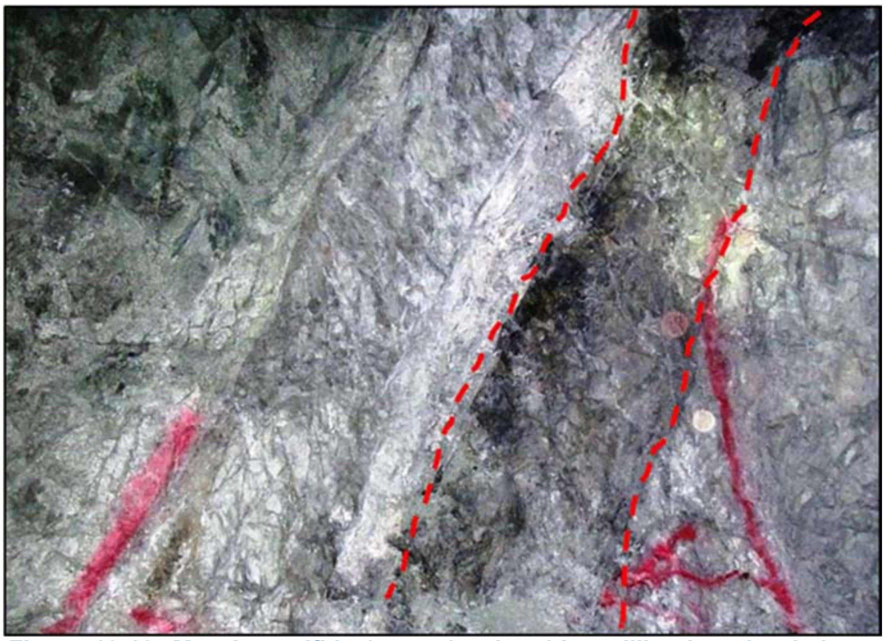


Figure 13-12: Massive sulfide (py-cpy) vein with argillic alteration halo at Level 680 SDN ODE

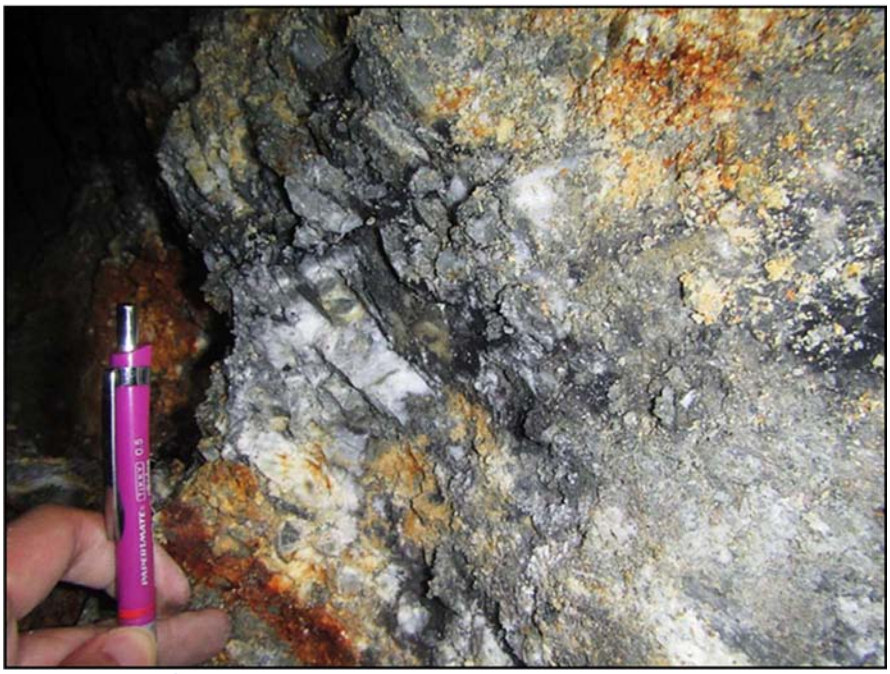


Figure 13-13: Grey and white chalcedonic quartz veins associated with black sulfide veinlets exposed at Level 545 MST2 ODW 52N position

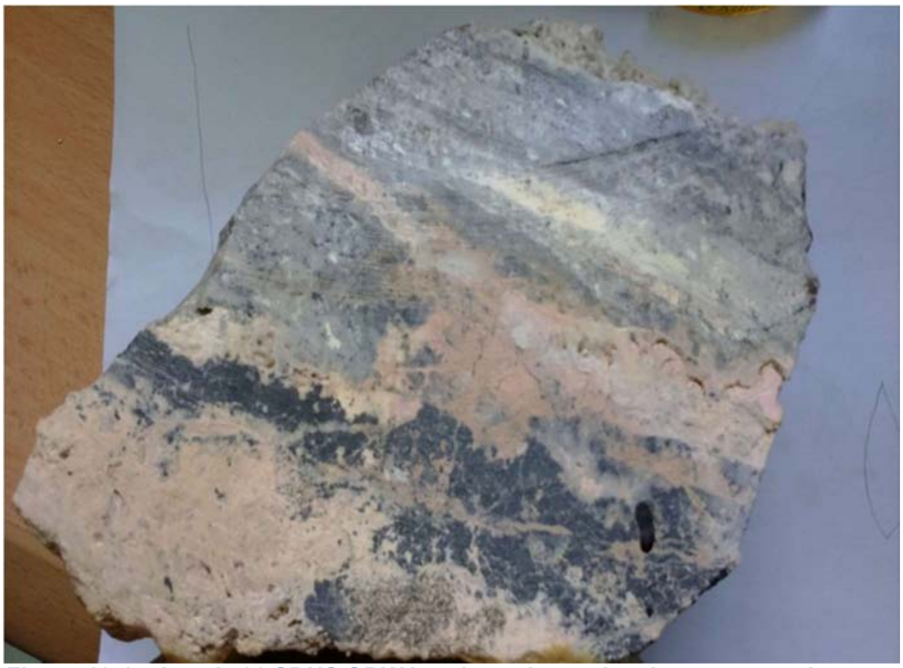


Figure 13-14: Level 590 SDNS ODW hand specimen showing quartz-carbonate-galena crustiform-colloform bands. Incorporated silicified diorite clasts with relict feldspar laths and disseminated cpy-py.

Figure 13-14: Level 635 SDN ODE hand specimen exhibiting drussy, vuggy quartz+carbonates in massive sulfide (py-cpy-gn) vein

13.1.2 Porphyry Cu-Au Deposits

A cluster of Cu-Au porphyry prospects are situated within the central to western portion in Parcel IV of MPSA-234-2007-XI. The high grade Maco vein-type mineralization towards the east in MPSA-225-2005-XI were previously postulated to be spatially, temporally and genetically related to these porphyry deposits.

Currently identified prospects consist of (1) Pagasa, (2) Mapula, (3) Theresa, (4) Kurayao, (5) Kanarubi, and (6) Quiamonan. Vertical and lateral extents of these Cu-porphyry bodies were not well constrained due to the limited drilling campaigns targeting these areas. Out of the six prospects, only Mapula, Kurayao, Theresa and Pag-asa were previously drilled.

The porphyry-Cu mineralization in the tenement defines two arcuate belts which may be related to a collapsed caldera structure. These lineaments limit the western extent of the fault-controlled Au-bearing vein structures (Coller, 2011). The E-W fault-controlled veins (Don Alberto, Don Fernando, Don Mario, St. Francis and St. Vincent) however overlap with the porphyry-Cu mineralization.

Recent reprocessing and subsequent interpretation by CSRWG of magnetic data from the airborne survey by Thomson Aviation Pty. Ltd. over the AMCI tenement in 2012 revealed a broad magnetic low which encompasses majority of the abovementioned prospects. In addition, the delineated elliptical magnetic anomaly served to define the extent of the AMCI porphyry deposit down to a depth of 500 meters.

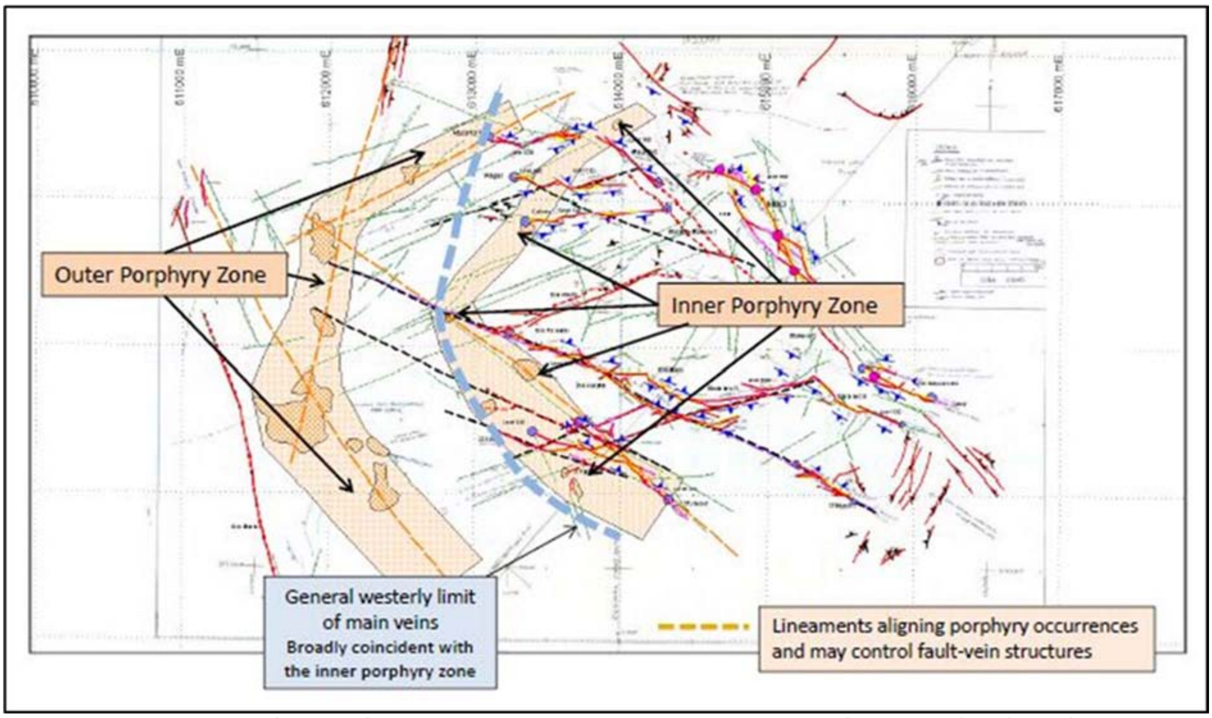


Figure 13-15: Porphyry Copper Gold Mineralization in relation to the Maco Gold modified from Coller (2011)

13.1.3 Skarn Mineralization

Localized skarn mineralization was noted within the tenement from surface exposures, underground headings and diamond drill hole intercepts.

Recent study (Esguerra, 2106) identified total of five skarn zones (Figure 13-17) and observed in close proximity to the Au-bearing veins. Skarn assemblages identified were (1) garnet skarn: garnet - diopside ± epidote ± tremolite ± calcite ± pyrite (2) magnetite skarn: magnetite ± pyrite ± garnet ± chalcopyrite, (3) epidote skarn: epidote - tremolite ± garnet ± sulfides and (4) pyrite skarn: pyrite - epidote ± magnetite ± chalcopyrite ± calcite.

Based on the recent work skarn mineralization although widespread, are non-contiguous and currently not considered potentially economical Au mineralization targets. Potential and economic viability of skarn mineralization within the AMCI tenement requires further evaluation.

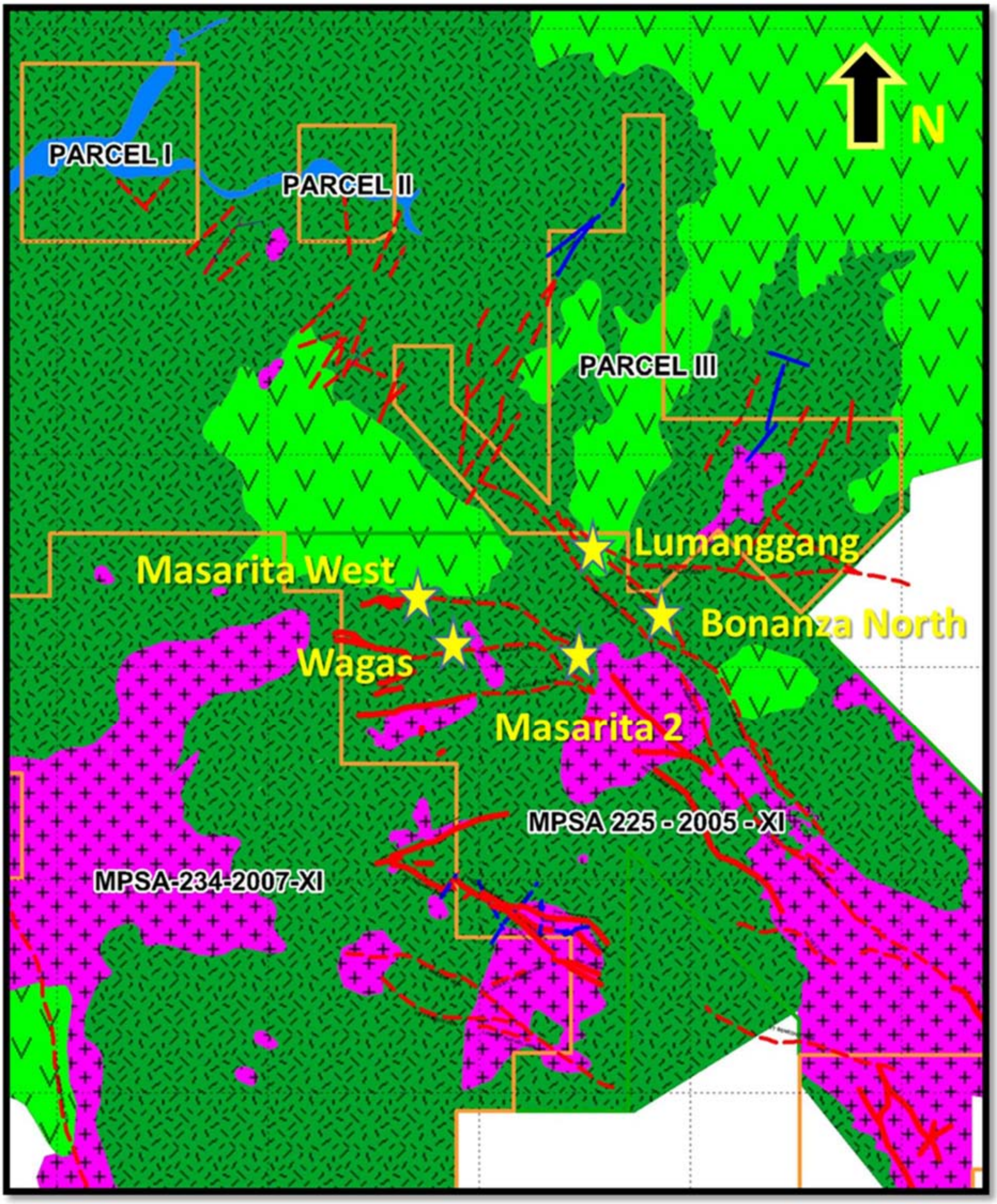


Figure 13-16: Geologic map showing spatial distribution of recently identified skarn zones (Esguerra, 2016).

Figure 13-17: Monomictic crackle breccia characterized by angular garnet skarn clasts set in vuggy, drussy quartz+calcite vein intercepted in DNC-530-104 at 85.4m

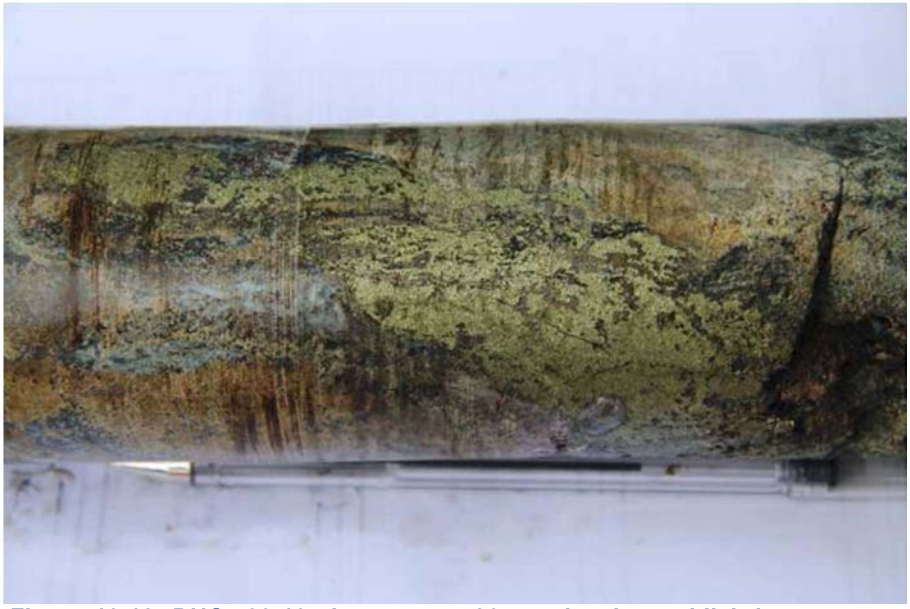


Figure 13-18: DNC-530-104 intercept at 86.4m showing reddish brown garnet skarn with semi-massive chalcopyrite

13.2 General style of mineralization along the Basemetal vein systems within the property

Gold mineralization within the district is multiphasal and generally comprised of massive sulfides, suflide- and silica-rich breccias, plus quartz, carbonate and Mn-rich carbonates and silicates occurring as either stockworks or exhibiting drussy, vuggy crustiform-colloform, cockade or colloidal textures.

High Au mineralization generally coincides with vein zones primarily composed of massive sulfides and sulfide-quartz breccias ranging <1.0-3.0m in width. Sulfide content percentage for these high grade zones are approximately between 30-80%. Sulfide minerals are comprised of pyrite, chalcopyrite, galena and sphalerite. Visual identification of bornite(?) and covellite(?) in vein hand specimens will have to be verified through ore microscopy. Gangue minerals are composed of quartz, carbonate and Mn-rich carbonates and silicates.

13.3 Length, width, and depth of mineralization

The existing NW-WNW trending AMCI vein systems have already been developed approximately 1,000m along strike with vein splits at least 100m in length. Vein widths range from 1.0-1.5m with swells reaching greater than 4.0m. Current mine development has established a vertical depth of approximately 400m (from Level 900 down to Level 545) for the Sandy Vein with potential for extending this below the existing mine levels. Mineralization of the existing AMCI vein systems remains open at depth.

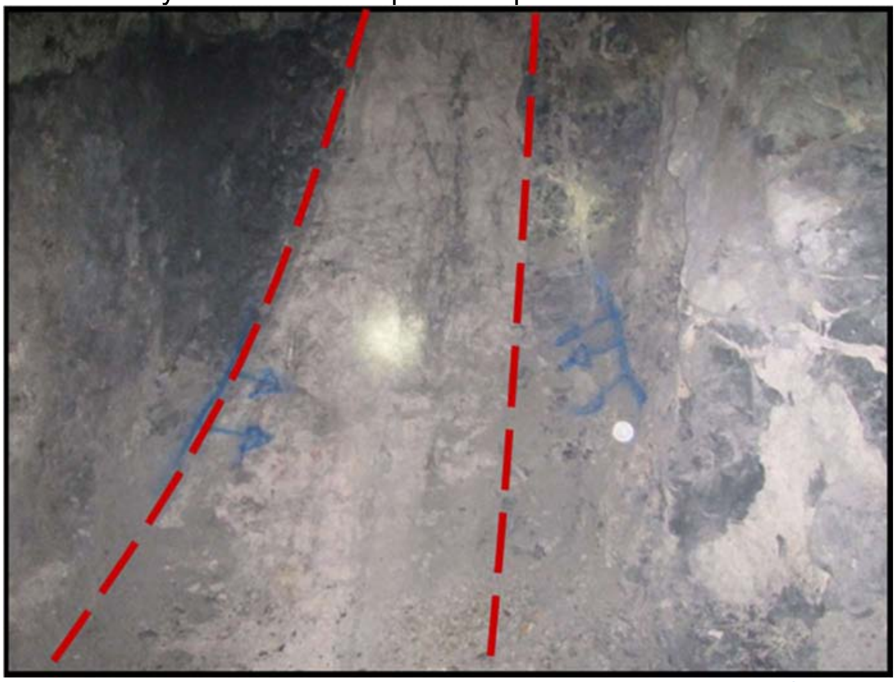


Figure 13-19: Approximately 1.2m wide carbonate+base metal sulfide vein exposed at Level 590 SDN ODE MV 134S position. The vein is composed of carbonates, galena-sphalerite stringers/lenses with minor rhodochrosite and disseminated py+cpy

Figure 13-20: Massive sulfide (py-cpy) - quartz breccia trending N57W 60NE exposed at Level 605 BHWS ODW 62S position

Figure 13-21: Multiphase vein zone exposed at Level 756 SDY ODE 142S position. The 3.5m wide vein zone is composed of sulfide-quartz breccia with late carbonates. Sulfides are comprised primarily of pyrite and chalcopyrite with minor galena and sphalerite.

13.4 Element grade levels and patterns

No recent comprehensive study was done on the grades of other elements and their possible relationship with each other. With regards to other base metals, galena appears to have a direct relationship with gold. Higher grade ore shoots are usually noted to contain appreciable galena within them. For the other base metals, the relationship with gold has not been clearly established.

Mercado et al (1987) noted some zoning patterns although not too well defined. Apparently, base metal concentration on topmost to intermediate levels—previously L+4 (L690) to L+7 (L780)—is higher, as manifested in massive replacement lenses of sphalerite, galena and chalcopyrite, than those in L+4 (L690) down to Level 0 (Elev. 555). These were observed in Masara, Don Joaquin and St. Francis veins.

13.5 Wall rock alteration and paragenesis

Results from X-ray diffraction analysis by CSRWG of samples collected in 2015 from the underground identified 3 alteration mineral assemblages, namely; sericitic, chlorite-sericite and propylitic. Samples taken from Level 780 SDN MV, Level 780 SDNS, Level 605 and Level 560 BHWS, Level 785 MAI HWS, Level 785 MAI ODW DXC 155E and Level 560 WGS 68W SL exhibited chlorite-sericite alteration. Sample taken from the hanging wall at Level 780 SDN MV showed sericitic alteration while the hanging wall sample taken at Level 780 SDNS exhibited propylitic alteration. As observed in the underground, the chlorite-sericite and sericitic alteration commonly occurs as alteration halos immediately adjacent to the mineralized veins and structures and may persist for 2.0-5.0m into the host rock. These alteration assemblages however only overprint and are secondary to the propylitic alteration observed in the eastern part of the AMCI tenement area covering the existing mine development.

14.0 EXPLORATION

14.1 Geological work done

A 1:1,000-scale detailed geologic mapping exercise was conducted in 2015-2016 by the exploration group in MPSA 225 and MPSA 234, which encompasses the prospects (**Figure 14-1**) of Kaurangan, Aknit-Biocadan, PJAC-St Benedict and MST2/SDN2. The assessment below is sourced on geological and alteration mapping with follow up trenching that generated targets for scout or resource drilling.

For the four prospects, some >2,000m cumulative strike-length of vein was inferred.

The explored areas possess varying styles of supergene and hypogene gold mineralization and is typical of intermediate-sulfidation epithermal gold system hosted in a volcanic, intrusive and subvolcanic complex. The mineralization appears to display polyphasal mineralization style from massive, veins/veinlets/stockworks, base-metal rich breccias and fault vein/breccia structures.

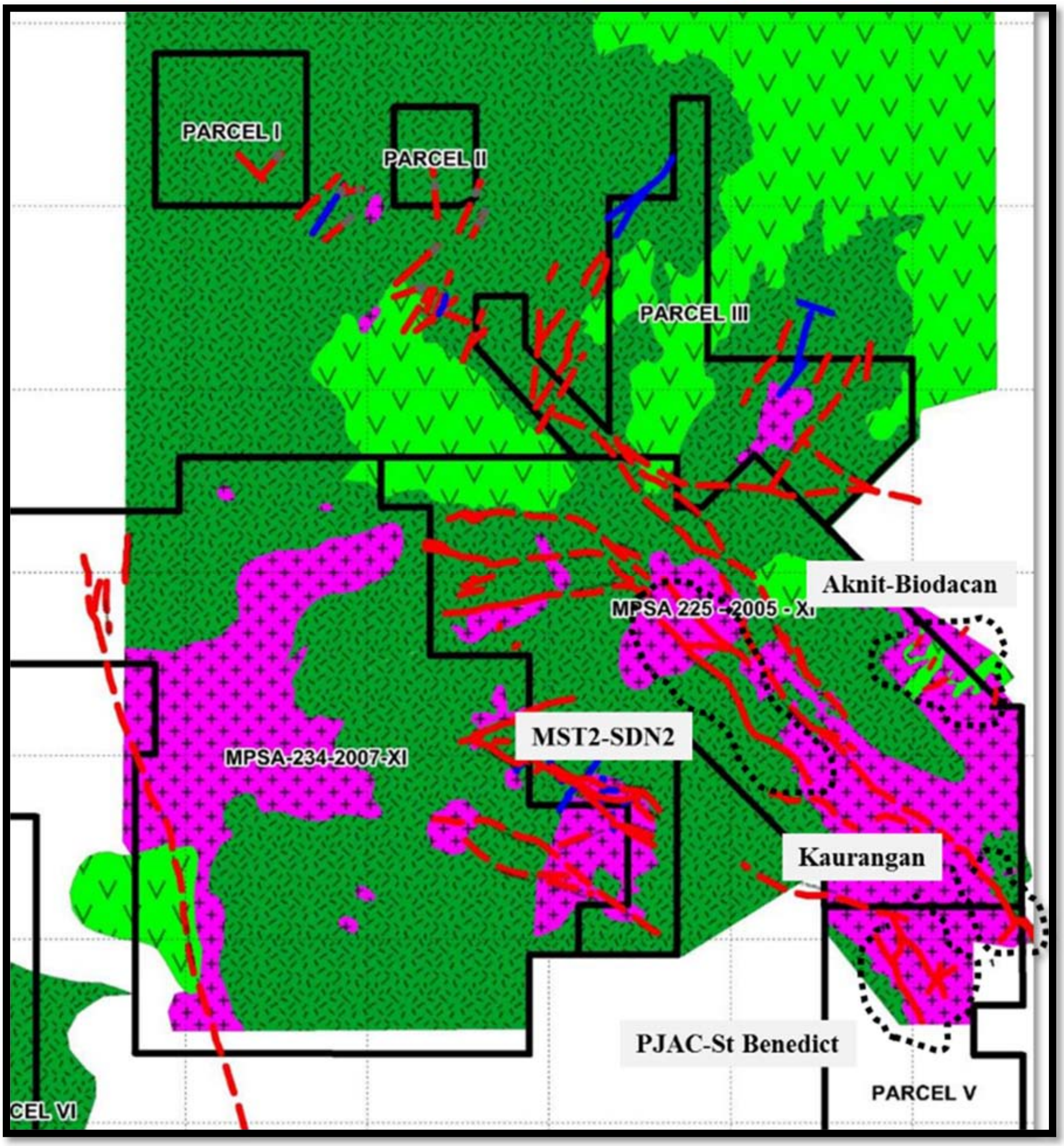


Figure 14-1: Location of the prospects within the tenement

14.1.1 Geological data generated from mapping and surface sampling

Surface exploration mapping activities generate valuable geological data useful for both mine planning and mine operations. The data consists of rock types, weathering, oxidation, color, grain size, structures, texture, alteration, veining and mineralogy. All these data are plotted on plan maps and sections to show all relevant geologic features such as:

- Visible boundaries of ore and any other significant mineralization
- Boundaries of major lithological units
- Position and orientation of major structures such as folds, faults, prominent joint sets and others
- Alteration patterns
- Major veins or vein sets
- Geotechnical data such as degree of fracturing, rock hardness and others as required by the engineers

Channel cut samples are collected across the mineralized zone, vein and alteration from outcrop, surface trench, and underground working. The sampling dimension is dictated by the mapped geology, structure and mineralogy and based on the individual geologic boundary that each feature would indicate to be a mineralization control. The usual sampling width, e.g., contact to contact of alteration zone or vein, is from at least 0.3 m to maximum 1.0 m continuous channel sampling from hanging wall to footwall.

Kaurangan

Kaurangan project is located southeast of L+910 Sandy Restoration run through by Kaurangan creek at the southeastern tip of MPSA 225 and Northeastern tip of MPSA 234 Parcel V.

The total defined strikelength with Kaurangan is 800m cumulative strikelength of which 166m trends NE-SW and the rest NW-SE (**Figure 14-2**). The NE-SW trending vein is presumed to connect with NE-SW trending veins in PJAC-St Benedict area.

In 2015, TSG launched months of geological mapping campaign that involved detailed mapping, trenching and data compilation to generate targets for drilling. These exercise resulted to some 868m overall cumulative strike length of epithermal Au±Ag vein system that stretched from 180S Pos to 210S Pos.

Andesite is the oldest rock unit known to occur in Kaurangan. This unit outcrops in the eastern portions of the mapped area. Andesite is cut by Diorite. When unaltered, it is generally greyish in color, becoming darker when propylitized and lighter when argillized.

The local hydrothermal alteration assemblage at Kaurangan consists of a clay-dominant argillic zone, chloritic and propylitic. Along with varying amounts of gangue quartz, minor calcite, and pyrite, the dominant alteration minerals are illite, smectite, chlorite, and epidote. Hypogene argillic alteration is dominated by low-temperature clays such as illite with subordinate kaolinite which occupy most of the mapping area. Minor amounts of smectite and possibly interlayered illite-smecite also occur.

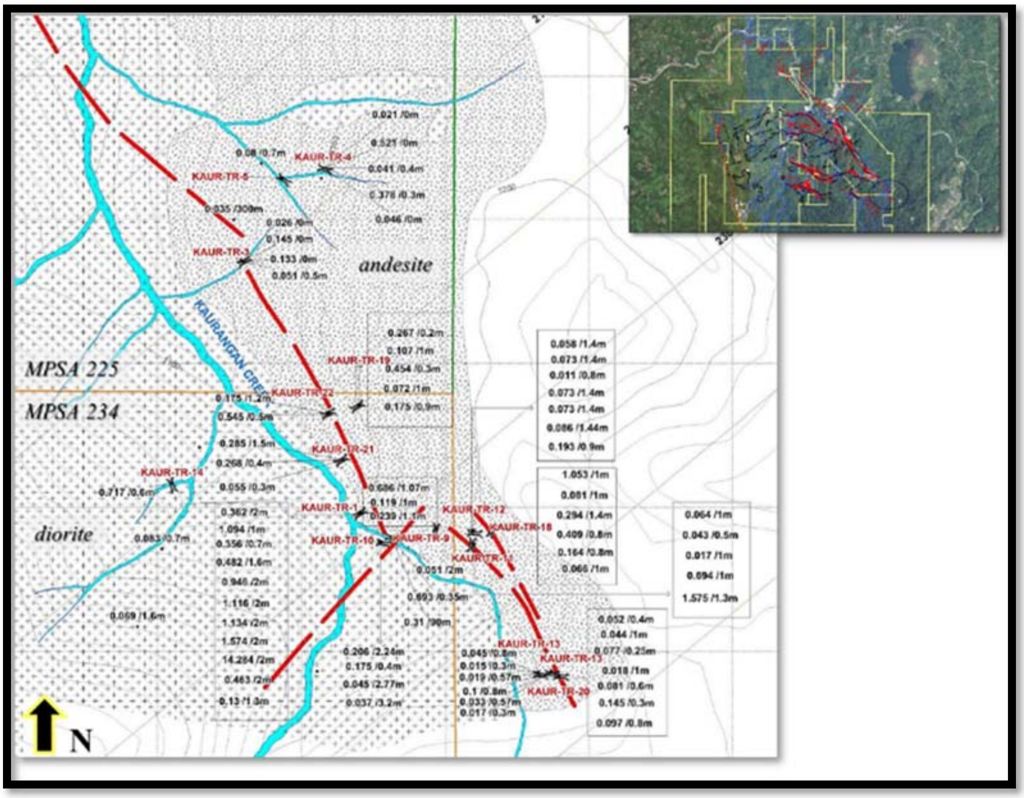


Figure 14-2: Simplified lithologic map of Kaurangan superposed with interpreted vein, trench and rockchip samples assay-width. Inset shows location of prospect in AMCI tenements

Supergene argillic alteration is also pervasive in Kaurangan where Fe-oxide minerals such as goethite, jarosite, hematite and manganese superposed hypogene argillic alteration. Kaurangan area exhibits varying style of supergene and hypogene Au mineralization styles. For supergene, these are elluvial supergene gold in soils along slopes, including weathered bedrock horizons. Hypogene mineralization at Kaurangan is typical of an intermediate-sulphidation epithermal gold-type system which appears to display multi-phase mineralization style variations from discrete auriferous, veins-veinlets-stockworks and fault vein-breccia structures (e.g., **Figure 14-3**.

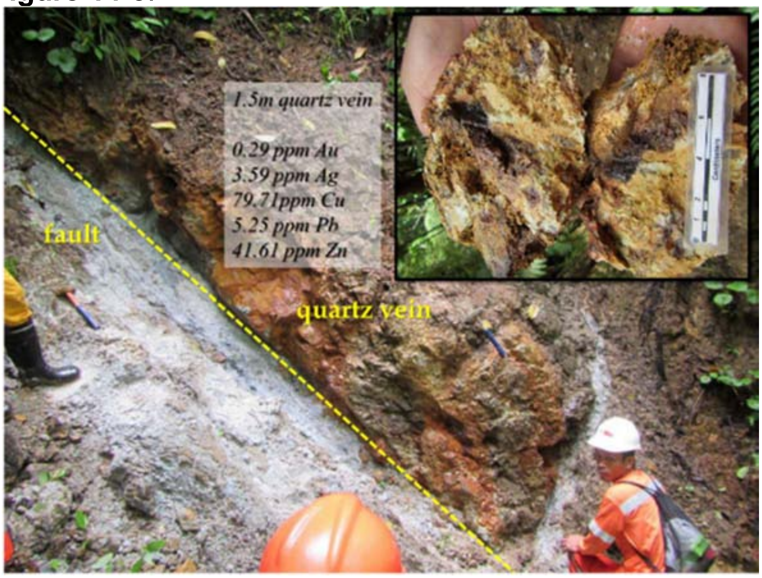


Figure 14-3: Kaurangan trench no. 21 with quartz vein and associated fault. Inset shows quartz vein breccia hand specimen

PJAC-St Benedict

PJAC-St Benedict vein system in located at the northwestern part of MPSA 235 Parcel V and is oblique to the known St. Benedict vein. The main mapping area is in Kagusaisan creek.There are two (2) interpreted non-contiguous NW striking veins of about 500 m each, and two 200-m NE striking vein.

Mineralization in PJAC is mainly quartz±carbonate vein that is poorly crusted with some associated with fault/shears. There are rare hypogene base-metal sulphides observed in outcrops or trenches aside from 15 cm pyrite vein in trench 3 (Kag-TR-03, **Figure 14-4**) Host rock is mainly propylitic (Chlorite±Smectite) Diorite in the north and propylitic (Epidote±Chlorite±Smectite) towards south.

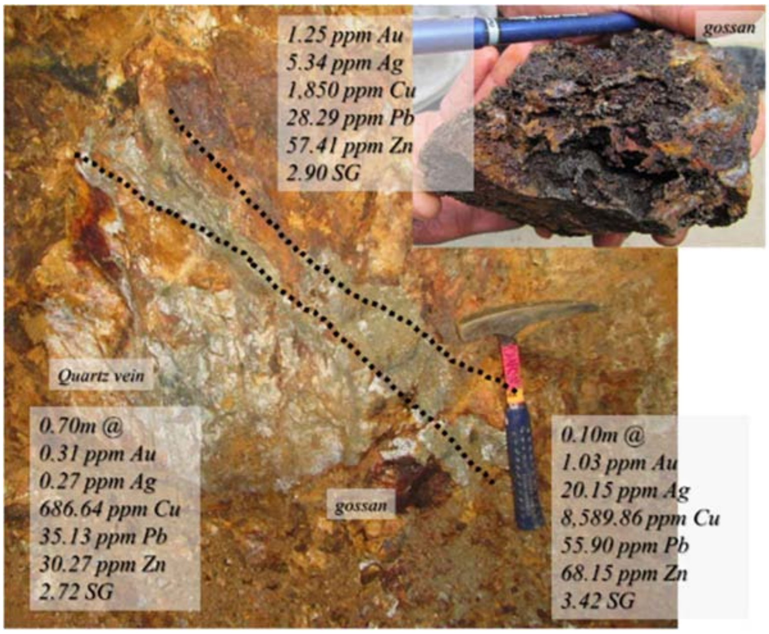


Figure 14-4: Vein further exposed via trenching in Kagusaisan mapping area

MST2/SDN2

The MST2/SDN2 vein system is located west of current Bonanza-Sandy vein system. The occurrence of MST2/SDN2 is not new and has actually been actively developed during the time of mapping on 2016. The main objective was to determine MST2/SDN2 strike extension at the surface of, at that time, at 10N Position in underground development.

MST2/SDN2 is grossly NW striking and NE dipping. From surface mapping, the strike length is inferred to reach up to 1,500 m. The vein system is hosted in Diorite at the extreme NW and SE extreme end and Andesite halfway (**Figure 14-5**). Alteration is commonly argillic (Illite±Kaolinite±Quartz).

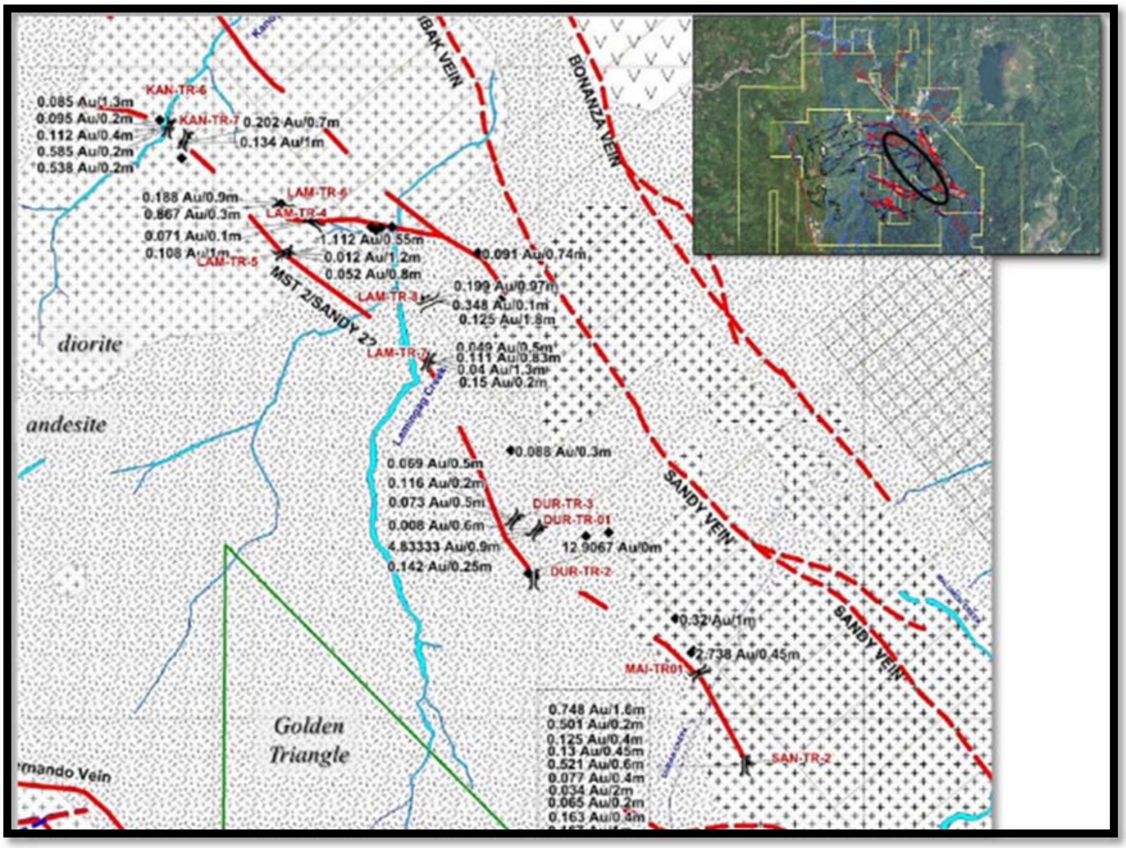


Figure 14-5: Simplified lithologic map of MST2/SDN2 superposed with interpreted vein, trench and rockchip samples assay-width. Inset shows location of prospect in AMCI tenements

Mineralization is mainly hypogene epithermal gold associated with Mn-rich fissure veins/veinlets and shears and faults. Distinct surface manifestation to MST2/SDN2 is Mn and mangano-calcite materials occurred as fragments within shears and faults (**Figure 14-6**).

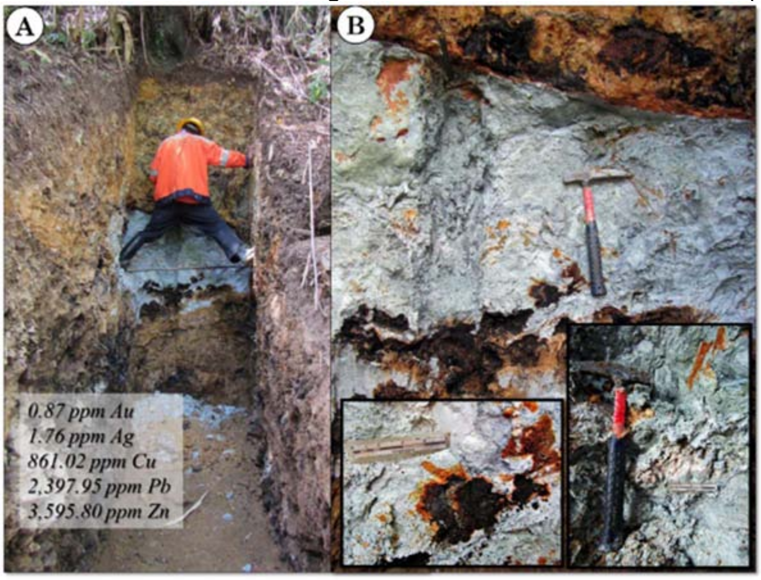


Figure 14-6: Mn and mangano-calcite materials as fragments in fault in Lamingag trench no. 6

Aknit-Biocadan

Aknit-Biocadan is composed of three separate vein prospects that include Lower Agasan, Upper Agasan and Aknit located at the eastern most part of MPSA 225. Strike of veins vary from NW, E-W and N-S. Inferred strike length of veins are 120 m (NW), 150 m (E-W) and 300 m (each for two N-S veins), with a total of 870 cumulative-m of vein.

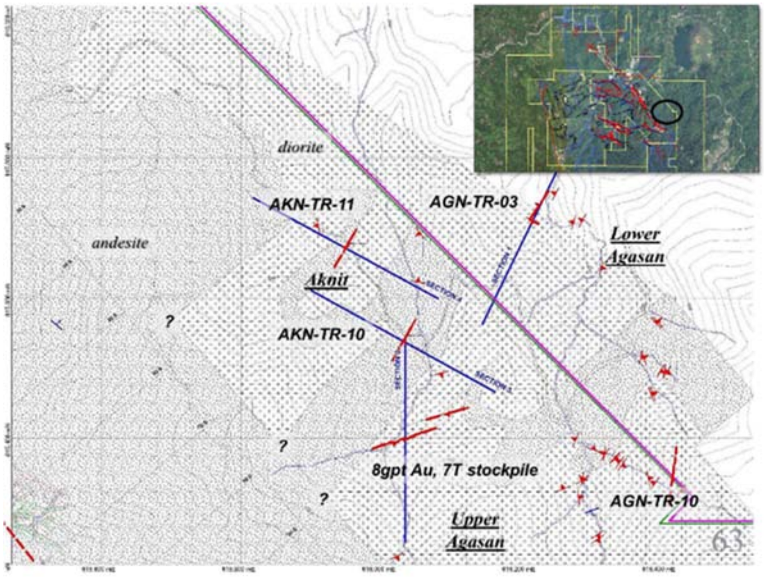


Figure 14-7: Simplified lithologic map of MST2/SDN2 superposed with interpreted vein, vein locations. Inset shows location of prospect in AMCI tenements

Veins are variably hosted in Diorite and Andesite. Argillic alteration observed during mapping work is widespread and occupies some 80% of the detailed mapping area with the rest related to chloritic alteration (Chlorite±Smectite). There are two modes of argillic alteration (Illite±Kaolinite±Quartz) occurrence: as (1) pervasive, and (2) selective or vein/structure envelope and associated with hypogene epithermal gold associated with base-metal minerals and quartz-carbonate in fissure veins/ veinlets, shears and fault veins (e.g., **Figure 14-8**), and hydrothermal breccias; and complex base-metal (copper-zinc-lead) rich-veins in fault-vein and hydrothermal breccias.

Figure 14-8: Quartz vein further exposed via trenching. Lower right picture pointed by arrow shows liberated gold

14.2 Surface sampling

14.2.1 Outcrop sampling

For outcrops, mostly measured channel cut sampling is conducted while grab sampling is seldom done and if ever, this is for indicative grades only. The intervals for sampling are marked out on the exposed mineralized zone, vein or rock exposure and based on the individually indicated geological boundary which indicates mineralization control.

Where mineralized structures are steeply-dipping, the appropriate sample is a horizontal channel along floor or wall (or wherever the best outcrop is). Where there is no certainty as to the attitude of mineralized zone, a sample consisting of both horizontal and vertical channels, composited over selected horizontal intervals, is used.

14.2.2 Trench sampling

The procedure for trench sampling is the same as for sampling any continuous rock or mineralized exposure as that in outcrop. Intervals for sampling are marked out on the exposed mineralized zone, vein or rock exposure based on their indicated geological boundaries that are considered to be mineralization controls.

Where mineralized structures are steeply-dipping, the appropriate sample is a horizontal channel along the trench wall. Where there is no certainty as to the attitude of mineralized zone, a sample consisting of both horizontal and vertical channels composited over selected horizontal intervals, is used.

14.3 Drilling and sampling

14.3.1 Type of drilling program

In recent years, Apex has undertaken two drilling campaigns. The first campaign was done in late 2005 to 2007 (under Crew Gold) while the second campaign started in late 2009 (under ASVI–Mindanao Gold).

In the 2005 campaign, a Resource Definition Diamond Drilling Program was implemented upon the approval of MPSA-225. The program concentrated on the delineation of the Masara-Bonanza-Sandy-Maria Inez veins which was followed from NW to SE over a strike length of approximately 2.5km along the Malumon River valley.

Several other vein systems were also targeted in this drilling program. This includes the Don Fernando-Don Joaquin system, Bibak vein, Jessie vein, St. Benedict, Masarita and St. Francis vein. Drilling in St. Francis vein area also aimed to check the porphyry mineralization of the area.

A total of 212 holes were drilled with 43,760 m of drillcores produced. The drill holes were mostly collared at the surface with only five collared underground. Surface holes normally started with PQ size which is reduced to HQ after about 100m. Further reduction to NQ size is also resorted to if necessary to reach the target depth.

The previous drilling program started late in 2009 with an underground Kempe rig primarily aimed to provide the mine operations advance information on the vein being developed. By January of 2011, another Kempe rig and an LM55 rig were deployed underground plus a surface rig commissioned for surface drilling. In early 2012, another LM55 underground rig was commissioned. All of the rigs, except the Kempe rigs, start drilling with HQ size cores, which are then reduced to NQ size when necessary. One surface rig is capable of air drilling for holes needing pre collars to at most 150m.

Based on 58 drillholes from 2011, an average of 94% recovery was computed. Based on drillcore diameters, the coefficient of variation (CV) denoting precision of recovery of smaller AQ holes was about +/-32%, more imprecise than the comparable CVs of larger HQ (+/-11%) and NQ holes (+/-12%). The average recovery of AQ holes amount to 84% recovery only while there is 97% and 96% average recovery for HQ and NQ holes. Out of 212 holes, 184 (87%)

had downhole surveys by Crew. Preliminary data of Apex holes reveal only 19% had been surveyed by downhole camera (n=78).

A total of 10 holes were driven on the five veins by Crew Minerals, with 9 out of 10 having downhole surveys. Majority of the holes are in the HQ and NQ range, although these may vary from PQ to BQ.

14.3.2 Drill site spacing, depth of drilling
Drillsite spacing for the 2005 Resource Definition Core Drilling Program was initially at 100m interval which was later on followed with in-fill drilling to reduce the drill spacing to 50m. Drilling depth was dependent upon the projected vein intercepts and ranged from about a hundred to three hundred meters.

During this drilling campaign, the following were some of the drilling statistics recorded:

- Lowest elevation reached by a drillhole (MS-01) was 328 ASL (MS-01)
- Deepest drillhole was recorded by SB-03 at 420.10 m
- Shallowest hole was 80.30m deep recorded by BV-03
- Average length per drillhole was 206.42 m
- Average dip/inclination is -58°

The drilling program is a combination of in-fill, resource definition and production support drilling. Targets are relatively shallow and spacing are generally designed at 25m to 50m intervals. Exploratory holes are usually drilled deeper depending on target structures.

During the ASVI drilling, there were drilling statistics being recorded:

- Lowest elevation reached by a drillhole (BNZ – 019) was 110 ASL
- Deepest drillhole was recorded by MPDH – 002A at 916.70m
- Average length per drillhole was 166.95m
- Average dip/inclination is -51.5°

14.3.3 Core logging
Drill cores are fast logged at the drill site for initial interpretation. Once delivered at the core house, the cores are photographed after which, detailed logging is conducted and the lithology, mineralization, alteration, core recovery and geotechnical characteristics are recorded. The core log sheet is encoded together with the assay results and other drillhole data in a database for geological modelling and mine planning. The specific gravity is determined in the assay laboratory.

14.3.4 Drill sample method and interval
The geologist determines the sample intervals after geological logging of the hole. Sampling interval is determined by a lithological or stratigraphic boundary or when a significant change in mineralization or alteration style occurs. If a vein will be sampled, the hanging and foot wall of the vein will also be sampled. The minimum sampling width for vein zones is 0.30m while the maximum width is 1.00m. For the wallrocks, maximum sampling interval is 2.0m.

The sampled cores are cut into half (or a quarter if the sample is a duplicate) with one half left in the core box as reference while the other half sent to the assay lab for analysis. This is only applicable to PQ-, HQ-, and NQ- size cores while for AQ size drill cores, the whole core is sampled and sent to the laboratory.

14.3.5 Drill core photographs

Drill cores are photographed upon arrival in the core house. Previous practice undertaken by Crew Gold is that they took photos only of wet core. During ASVI until todays' drilling campaign, cores were also photographed dry. Capturing dry core photos started in early 2010.

Photographs of dry cores aid the Engineering as significant fractures and veins may be hidden or obscured when cores are photographed wet. For geological purposes, however, wet photographs of cores bring out important geological features more clearly.

14.4 Exploration Geochemistry

14.4.1 Description of geochemistry survey type: drainage, soil, rock, vegetation, bog, etc.

The geochemical survey done in the Masara area, albeit scanty at best, was the detailed grid soil sampling covering the Maligaya-Malumon area conducted in 2006 under the watch of Crew Gold.

Soil sampling was done in middle of 2010 in MPSA-225 whereby 419 soil samples were collected in the area. Additional soil sampling by ASVI was also done in Parcels III and IV of MPSA-234.

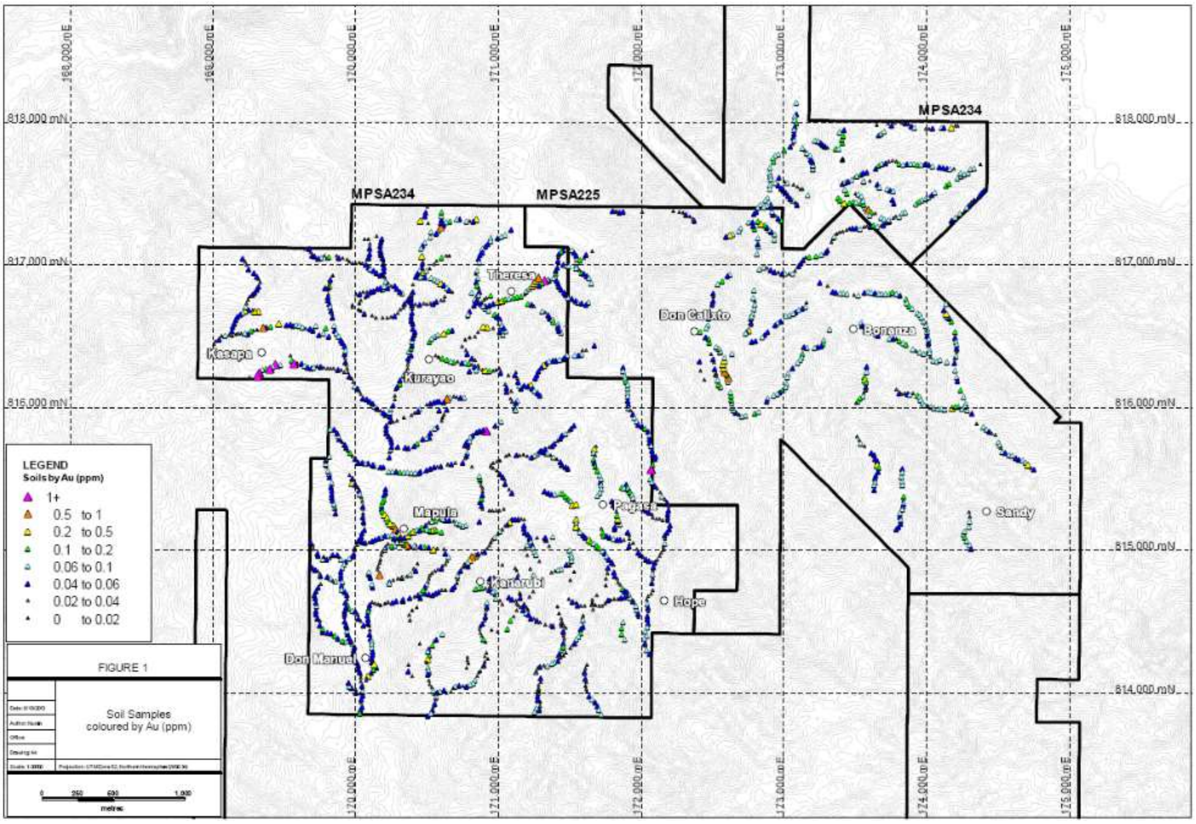


Figure 14-9: Map showing the ridge and spur sampling points and the Au grade

14.4.2 Description of sampling and analytical methods employed

In conjunction with IP Resistivity survey, the soil grid geochemical sampling method was simultaneously applied to test also the sulphide quartz vein systems and splits that are concealed under the study area. The end objective was to delimit any significant gold spatial dispersion patterns that could indicate the concealed gold-bearing veins or structures. Soil samples were collected at every 25m grid interval along the IP lines. All samples were analyzed only for gold using Fire Assay method. Geochemical results were plotted and compiled in a 1:2000 m scale base map.

14.4.3 Definition of background, threshold, and anomaly levels for the elements determined

There were no available records to show whether or not the assay results were treated and computed to define the background, threshold and anomaly levels for gold. The ranges of values are shown on the map for various color codes.

14.4.4 Application of synthesis and interpretive techniques (for single and multi-element) to bring out significant geochemical features related to mineralization

There were no indications whether or not statistical analysis was a preferred technique in the subsequent geochemical interpretation.

14.4.5 Description of geochemical anomalies detected

Several spatial distribution trends of soil gold values were indicated based on the geophysical and geochemical base map on a scale of 1:2000.

14.5 Applied Geophysics

14.5.1 Description of geophysical method used and objective of the survey

Several geophysical measurements, interpretation, and reprocessing were done. Magnetic susceptibilities of rock samples were measured to constrain interpretation for the reprocessing and interpretation of available airborne magnetic data. Ground penetrating radar (GPR) survey was conducted to provide direct image in shallow subsurface to determine subsurface configuration of veins/faults and bedrocks; and to assess configuration of loose material. These were altogether done by RushUrgent Working Group – National Institute of Geological Science of University of the Philippines Diliman (RWG-UP-NIGS).

Available geophysical data were also reprocessed and interpreted by RWG-UP-NIGS such as airborne magnetic data (Thomson Aviation Pty. Ltd.) and electrical resistivity and induced polarization (ER-IP) data (McPhar Geoservices) from the Maligaya-Malumon area. Outputs such as image filters from airborne magnetic data and pseudosections from ER-IP aimed to help identify signatures that would vector gold and copper mineralization.
Discussions below were lifted from various works done by RWG-UP-NIGS.

14.5.2 Description of equipment used, its limitations and the survey parameters adopted

Magnetic susceptibilities were measured using an handheld kappa meter. Radargrams were measured and produced through Zond 12-e Georadar equipped with three antenna frequencies (38, 75 and 1150 MHz).

14.5.3 Description on how survey was carried out (design of stations with respect to mineralization trends)

For magnetic susceptibility measurements, a total of 228 surface rock samples were measured scattered throughout MPSA 234 and MPSA 225.

For the GPR, the areas studied include Tagbaros, southeastern portion of the Sandy Restoration, L875 busbos, Lim-ao pit and eastern portion of Don Fernando. Survey lines vary from parallel to oblique to perpendicular to known surface manifestations of veins.

14.5.4 Description of interpretive tools used

14.5.4.1 Magnetic susceptibilities of rock samples

Four zones have been identified from the spatial distribution of the magnetic susceptibility values (**Figure 14-10**). Zone A is characterized by low magnetic susceptibility values and coincide with the mapped potassic alteration zone. High magnetic susceptibility values plot within Zone B. This zone also largely coincides with the chlorite-sericite zone. Zone C, which includes most of the epithermal veins, is characterized by relatively low magnetic susceptibility values. Zone D has high magnetic susceptibility values and largely coincide with the propylitic alteration zone. Zone A and Zone C, both with relatively low magnetic susceptibility values, have epithermal gold signature. Zone C hosts the northwest trending veins, while Zone A hosts the Sagay- sagay epithermal gold deposit. Zone B and D, on the other hand, are characterized by copper dominated mineralization, as seen in the field and in their magnetic signatures.

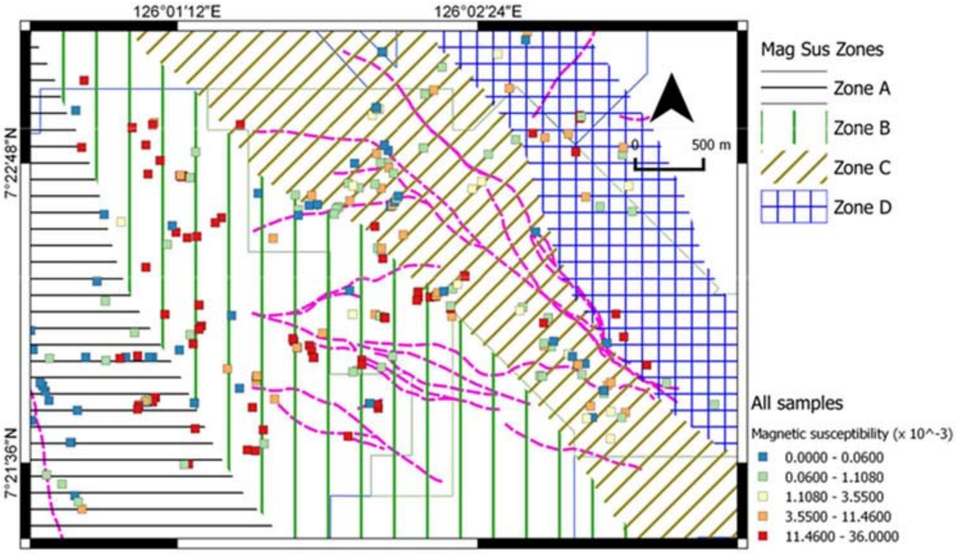


Figure 14-10: Magnetic susceptibilities zonation (Dimalanta, 2015)

14.5.4.2 Ground penetrating radar survey

The GPR surveys were conducted in five sites namely Tagbaros, Sandy Restoration, L875 Busbus, Lim-aw Pit and east of Don Fernando areas. Most of the radargrams show that the bedrock is characterized by strong, flat reflectors traversed by irregular joints. Localities with major deformation zones such as Lim-aw Pit and Tagbaros are characterized by deformations that persist at depths of 10 to 15 meters. Areas overlain with backfill material such as L875, Sandy Restoration and Don Fernando are characterized by near surface deformations that are constrained to at most 5 meters depth. A radargram obtained at Sandy Restoration was acquired on top of a slope collapse. This collapse was attributed to the downslope creep of loose materials probably due to water saturation. Similarities of the radargrams obtained from the Sandy Restoration and Don Fernando area, suggest that the collapse in L875 can be attributed to the instability of the subsurface caused by a fault adjacent to an old sink. Shallow deformation of the subsurface in L875 may have been a result of downslope creep of loose materials saturated with water which then experienced differential compaction. The interface between the bedrock and loose backfill materials, as well as zones of water saturation, could be distinguished as horizons where drastic changes in radar velocities occur.

14.5.4.3 Airborne magnetic data

Airborne magnetic data was reprocessed to generate 1VD and TD maps in addition to the RTE, residual and regional magnetic anomaly maps. Distinct anomalies distinguish the porphyry system from the epithermal system. A broad magnetic low in the RTE map characterizes the western side of the survey area where the porphyry targets are situated. This anomaly persists down to depths of 500 meters as noted in the regional magnetic anomaly map. The generated TD map reveals sharper, more defined linear anomalies. Some of the veins being worked on by AMCI correlate well with several of the northwest- and east-west linear magnetic anomalies. The extensions and trends of the veins can be pursued using the trends and extents of the linear magnetic anomalies as possible exploration guides.

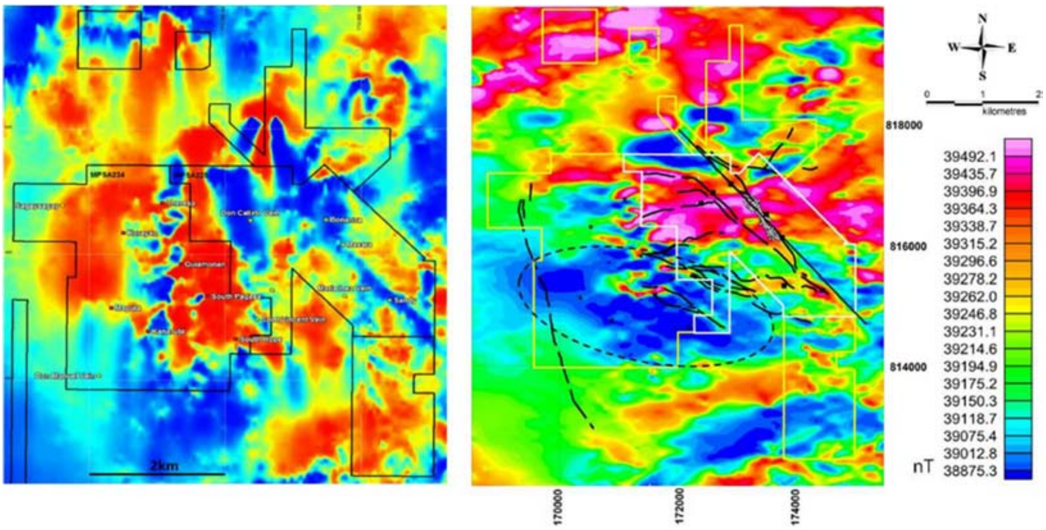


Figure 14-11: Regional magnetic anomaly map (left) reduced to pole (right)

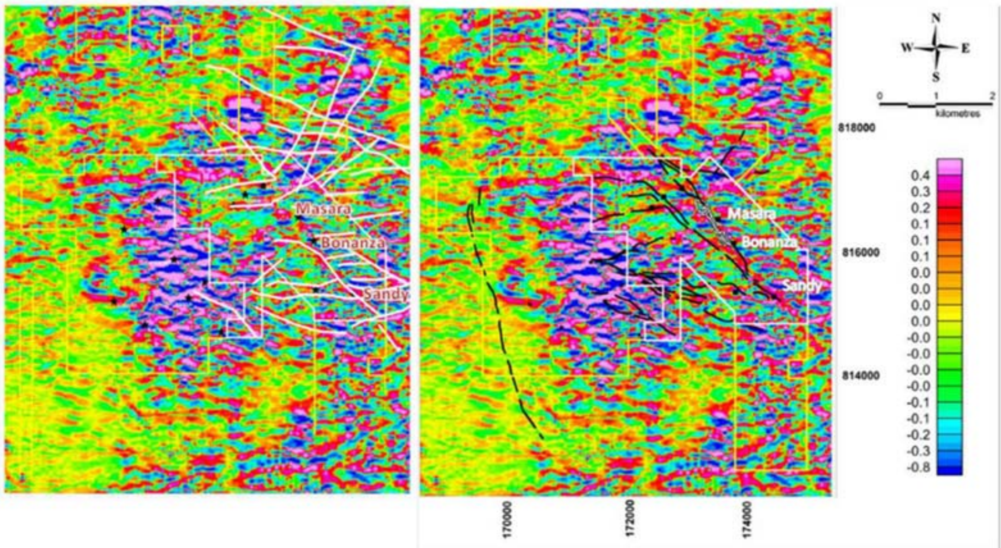


Figure 14-12: First-derivative maps generated from reprocessed airborne magnetic data (Dimalanta, 2015)

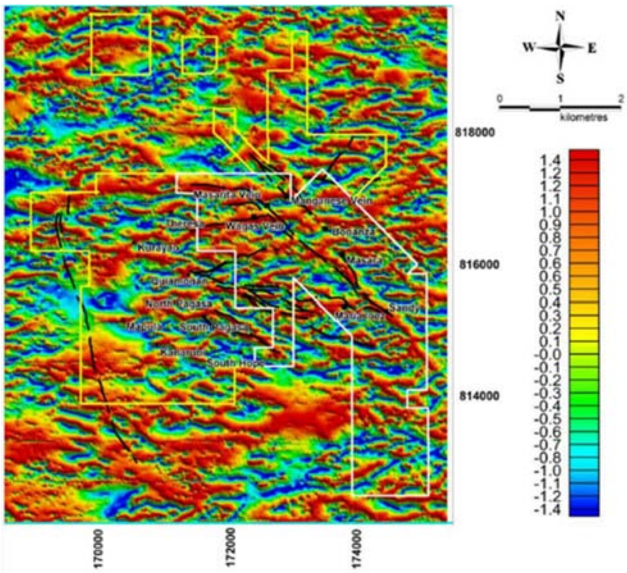


Figure 14-13: Tilt-derivative map generated from reprocessed airborne magnetic data (Dimalanta, 2015)

Euler deconvolution of aeromagnetic data generated solutions corresponding to the top of causative bodies in the tenement. A structural index of 2 was used to calculate the location and depth of linear magnetic sources. Detailed examination of the solutions provided insights on the configuration of linear structures, such as veins, faults and lithologic contact in the area. Euler solutions form linear clusters near the NW-trending Sandy and Bonanza veins, and along the east-west trending Masarita, Wagas and Don Calixto veins. Extracting Euler solutions along the strike of veins shows that the solutions extend down to depths greater than 200 m below the surface. These profiles show the possible extension of the veins beyond its currently explored length. Looking closely at the Euler solutions generated in the Sandy-Bonanza area, several east-west trending clusters of solutions seem to cut the northwest trending veins. Sections of Euler solutions show that these east-west trending solution clusters coincide with a change in the dip angle of the Bonanza vein at 600 m depth. These clusters may be attributed to a structure that may have caused the change in the dip angle, and may be related to the easterlies mapped to the west of the tenement. A northwest-trending cluster is also observed to the east of currently mapped veins. This cluster seems to diverge from the Sandy-Bonanza merging point, and may correspond to a southeastern extension of Bonanza vein. Sections showing the configuration of veins at depth indicate the presence of a vein at the area where the linear clusters persist. This vein, however, has not been projected to the surface.

Euler solutions within the vicinity of the Masarita, Wagas and Don Calixto veins suggest that the veins may have extensions further to the west. Similar signatures are also observed further to the east. Sections cutting across the three veins show that the dip directions and dip angles of the vein change throughout its length.

The configuration of known vein systems is consistent with the geometry of causative bodies as depicted by Euler deconvolution solutions. Linear clusters in other areas, such as in Sagay-sagay and to the east of Bunlang River, suggest the presence of possible veins, which could be good targets for further exploration.

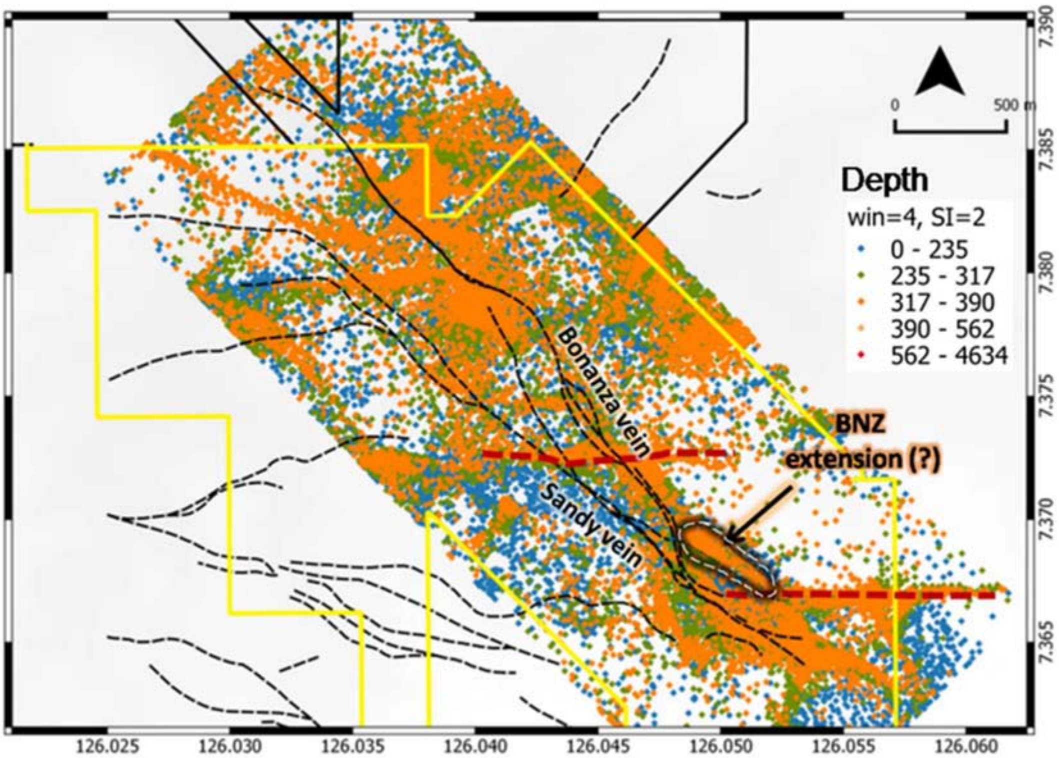


Figure 14-14: Euler deconvolution solutions map (Dimalanta, 2015)

14.5.4.4 Airborne radiometric data

In addition to the magnetic data acquired during the airborne survey, radiometric data was also reprocessed and interpreted.

The concentration maps of potassium, uranium and thorium may also be examined to determine if features specific to the porphyry target can be delineated. The veins in the eastern side of the mining claim are characterized by high potassium counts (pink-red). Distinct zones of high potassium counts can also be observed in the western side of the mining claim area, such as Mapula-Kurayao, Theresa, Pagasa, Don Joaquin and Sagay Sagay. The porphyry prospect area is also characterized by lower thorium and uranium counts (blue colors). Ratio maps (K/Th and K/U) were also generated and showed the same zones as the K concentration map.

14.5.5 Discussion of essential results of IP survey with respect to the objectives

The ER/IP data were collected by McPharGeoservices Philippines Inc. using a McPhar P660 unit with a dipole-dipole configuration and an electrode separation of 25 meters. Seven chargeability and resistivity pseudosections were produced. Three profiles were located in the Maligaya area, while four other profiles were placed in Malumon. All survey lines were placed at ~45° azimuth, oriented perpendicular to the NW-SE trending vein systems that are currently being mined for gold deposits. In the Malumon area, high chargeability and high resistivity zones are observed in the southwestern portion of the pseudosections. The high chargeability and high resistivity zones are coincident with the NW-SE trending linear feature on the magnetic tilt derivative map, which is also inferred as the mapped Sandy-Masara vein system. In the Maligaya area, the high chargeability zones with variable resistivities are associated with the Bonanza vein. Superposition of the ER-IP pseudosections onto the magnetic tilt derivative map reveals that the high chargeability zone is variably distributed over tilt derivative highs and lows. East-west trending structures identified in the magnetic tilt derivative map generally coincide with chargeability lows. However, measurement of the chargeabilities over these E-W trending structures did not persist through the depth at which high chargeabilities to the southwest were observed. It is therefore possible that a highly chargeable body associated with the E-W trending structures exists at depth and may be similar to the highly chargeable body beneath the NW-SE trending Sandy-Masara-Bonanza veins.

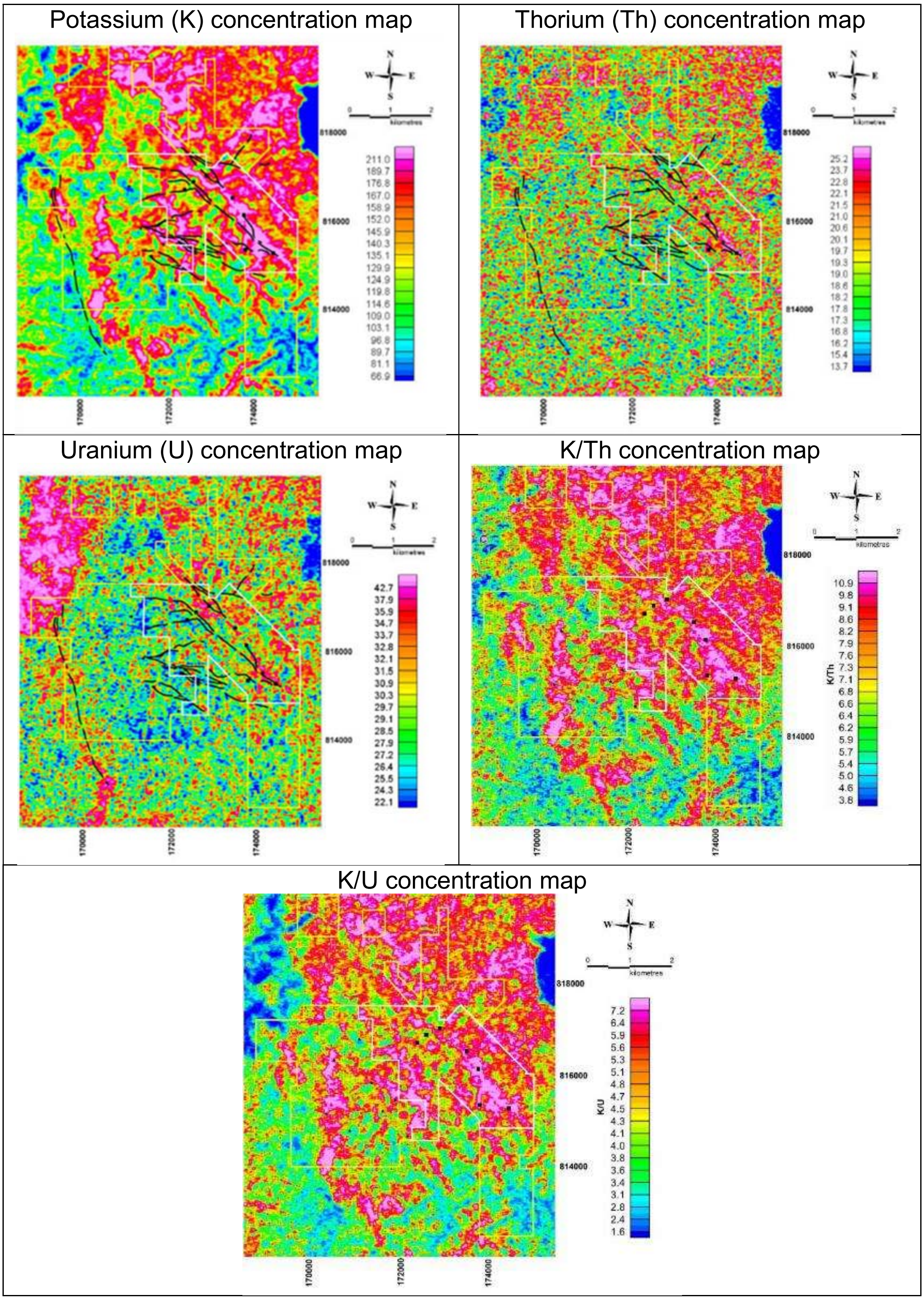


Figure 14-15: Radiometric anomaly maps

15.0 SAMPLE SECURITY, PREPARATION, AND ANALYSES

15.1 Security and Chain of Custody of Samples

Sampling at the site is always conducted under the supervision of a geologist. The samples are then delivered and turned over to the Maligaya Sample Preparation Laboratory, and eventually to the AMCI Assay Laboratory. The transfer and storage of samples are monitored by the QA/QC Department through the use of transmittals submitted every time sample custody changes hands. The sample dispatching flowcharts for mine, exploration, and drilling samples are shown in the figures below (Figures 1 & 2). Rejects and unused duplicates of mine samples are stored for 3 months before being sent to the mill for feeding while those of exploration and drilling samples are permanently stored in the core house for future reference.

15.2 Sample Preparation and Assay Facility

Samples from the drilling campaign conducted by Crew Gold (2005-2009) were sent to the McPhar Laboratory in Manila for sample preparation and analyses. An in-house assay laboratory was later on established by Crew Gold in the mine site. Under Monte Oro Resources & Energy Inc., a separate sample preparation laboratory was constructed and additional analytical equipment for the assay laboratory, such as a new Atomic Absorption Spectrophotometer, were acquired.

15.2.1 Sample Preparation Equipment

The Maligaya Sample Preparation Laboratory (MSPL) is equipped with the following:

1. **Drying Oven** – As metal contents are reported in dry weights, samples are dried before preparation.
   Drying process:
   a. The sample is loaded in a drying pan along with its sample tag.
   b. The pan is charged inside the oven at 160°C for mine samples and at 120°C for drill core samples.
   c. Mine samples are dried for 3-4 hours while exploration and drill core samples are dried for 6-8 hours.
   d. The drying pan is taken out using tongs or a trolley.
   e. After the sample is withdrawn, it is immediately sent for crushing to minimize moisture drawn from the atmosphere.

2. **Jaw Crusher** – A Jaw Crusher is used to rapidly reduce the size of samples prior to secondary crushing using the Boyd Crusher.
   Crushing process:
   a. The sample is loaded in a drying pan along with its sample tag.
   b. The pan is charged inside the oven at 160°C for mine samples and at 120°C for drill core samples.
   c. Mine samples are dried for 3-4 hours while exploration and drill core samples are dried for 6-8 hours.
   d. The drying pan is taken out using tongs or a trolley.
   e. After the sample is withdrawn, it is immediately sent for crushing to minimize moisture drawn from the atmosphere.

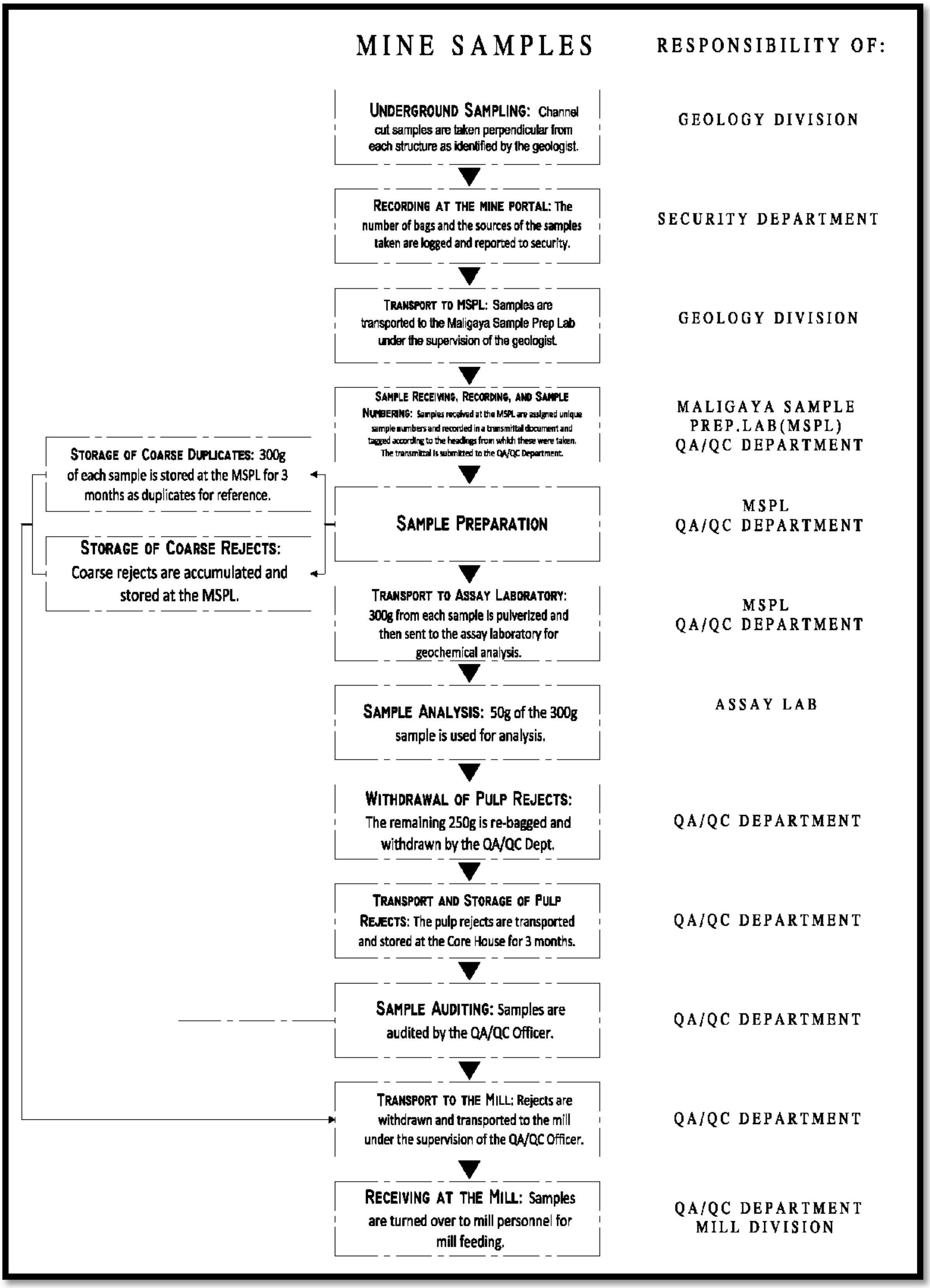


Figure 15-1: Sample dispatching flowchart for mine samples

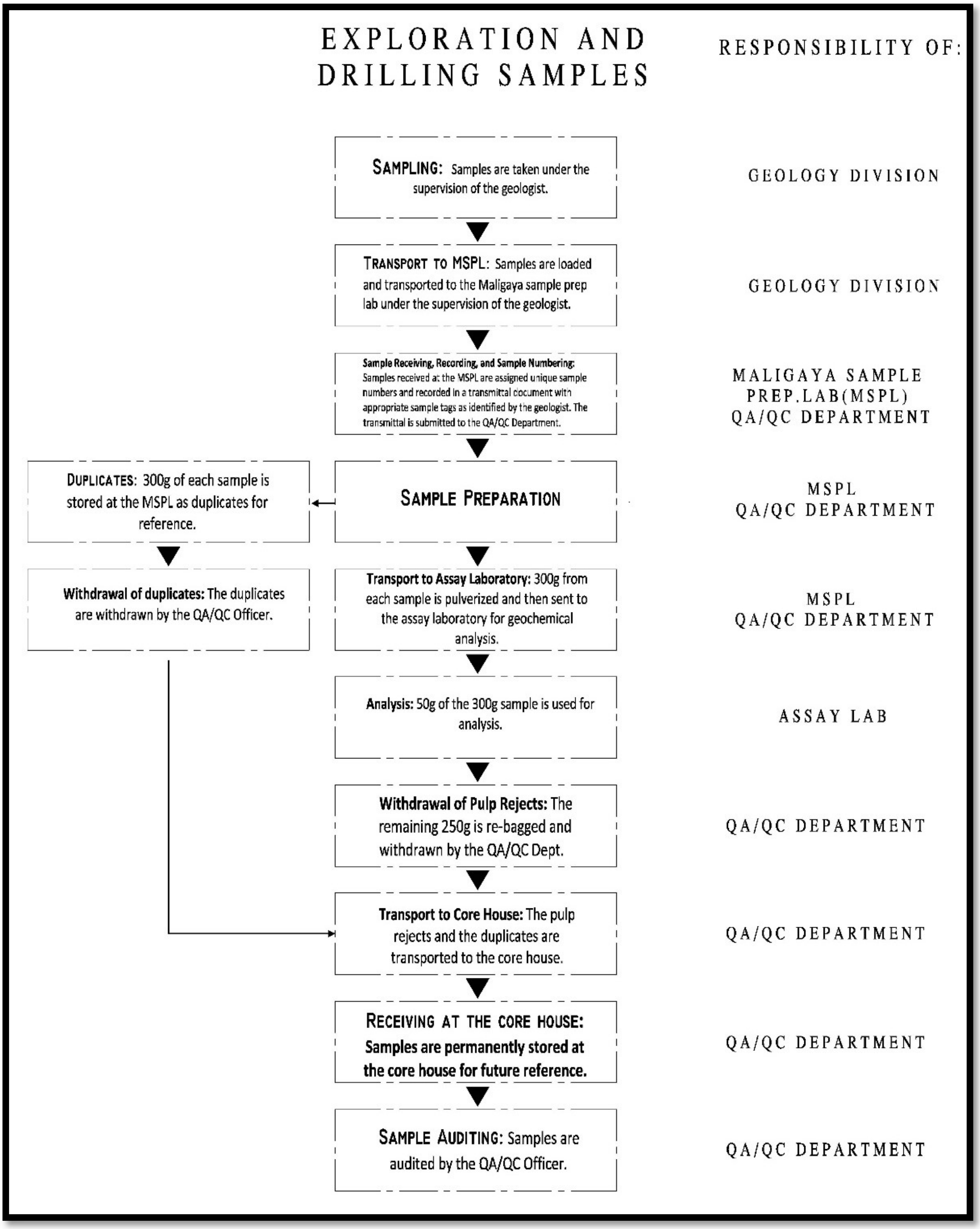


Figure 15-2: Sample dispatching flowchart for exploration and drilling samples

3. **Boyd Crusher** – The Boyd Crusher reduces the sample fragments to less than 2mm. It has two movable jaws, one top driven and one bottom driven, which allow for variation in output size and jaw wear.
   Crushing process:
   - **a.** The sample is loaded to the opening at the top of the Boyd crusher.
   - **b.** The Boyd crusher finely crushes the sample and then transfers the materials to the Rotating Sample Divider via a vibrator feeder.
   - **c.** The Rotary Sample Divider then splits the material into portions adjusted by the operator which collect in two trays at the bottom.
   - **d.** The portion for pulverizing is transferred to the original drying pan with the sample tag, while the other is kept as a duplicate.
   - **e.** A flushing sample (barren limestone) is fed to the Jaw Crusher, followed by cleaning using compressed air.
4. **Pulverizer** – A Rocklabs Ring Mill is used to pulverize the materials from the Boyd Crusher to a fine grind of 95% passing 200 mesh.
   Pulverizing process:
   - **a.** The sample is loaded in to the bowl (500g to a 1000g bowl).
   - **b.** A pneumatic airbag then presses the bowl.
   - **c.** The bowl rotates to grind the samples at a pre-set timer depending on the sample type (7 to 10 min.).
   - **d.** The pulverized sample is transferred to the drying pan.
   - **e.** Barren limestone samples are processed followed by cleaning using compressed air.

Figure 15-3: Sample Preparation Equipment: (A) Drying Oven (B) Jaw Crusher (C) Boyd Crusher (D) Pulverizer

15.3 Sample Preparation

The figure below shows the sample preparation procedure followed by the Maligaya Sample Preparation Laboratory.

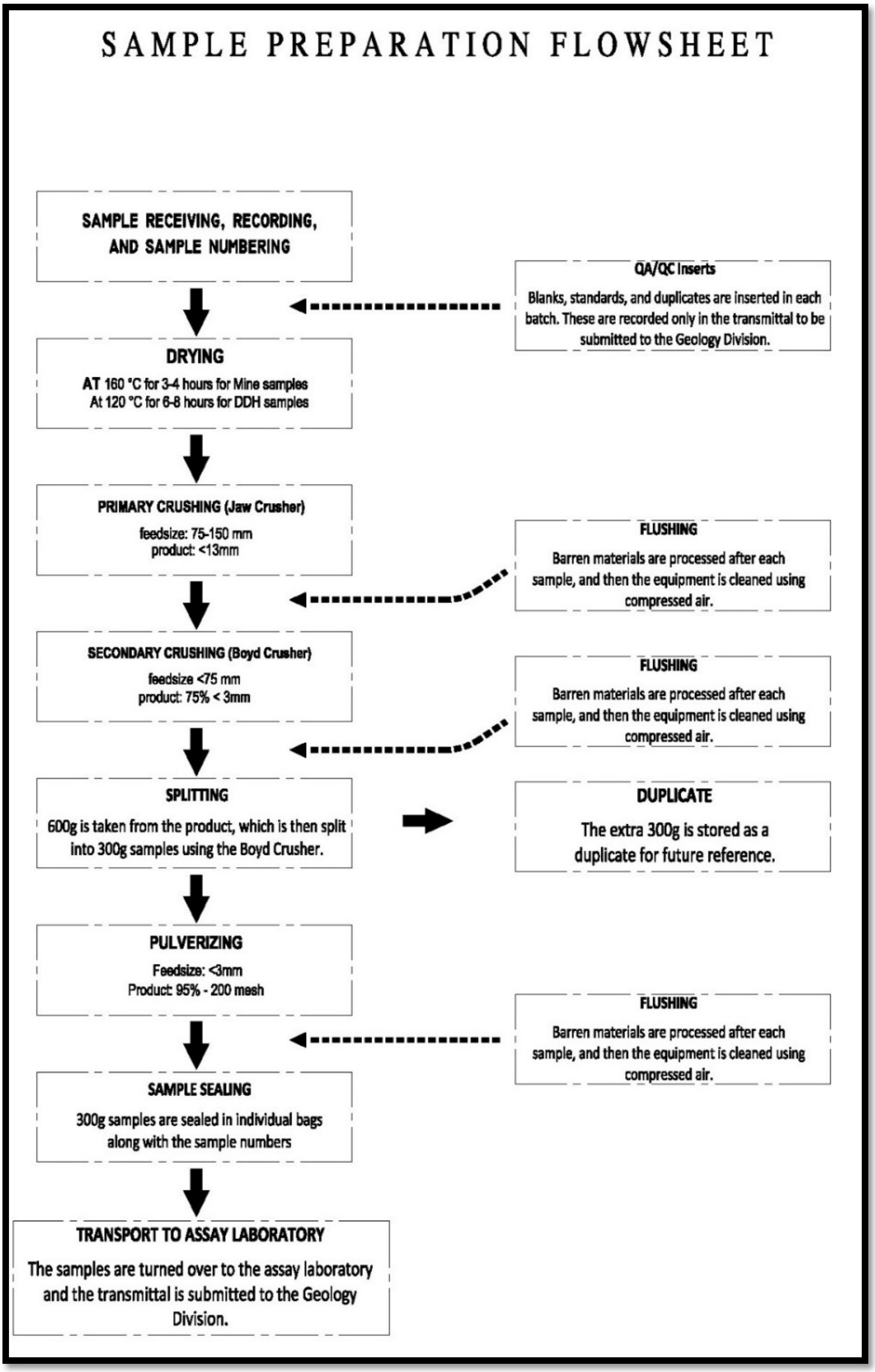


Figure 15-4: Sample Preparation Flowchart

15.4 Analytical Methods Used

The main analytical method used for gold is fire assay with a detection limit of 0.02 g/t. The other method utilized for base metals and low grade samples (Au and Ag less than 0.5 ppm) is AAS with a detection limit of 0.002 g/t for Au and 0.001% for base metals. The general procedure for fire assay is shown in the figure below.

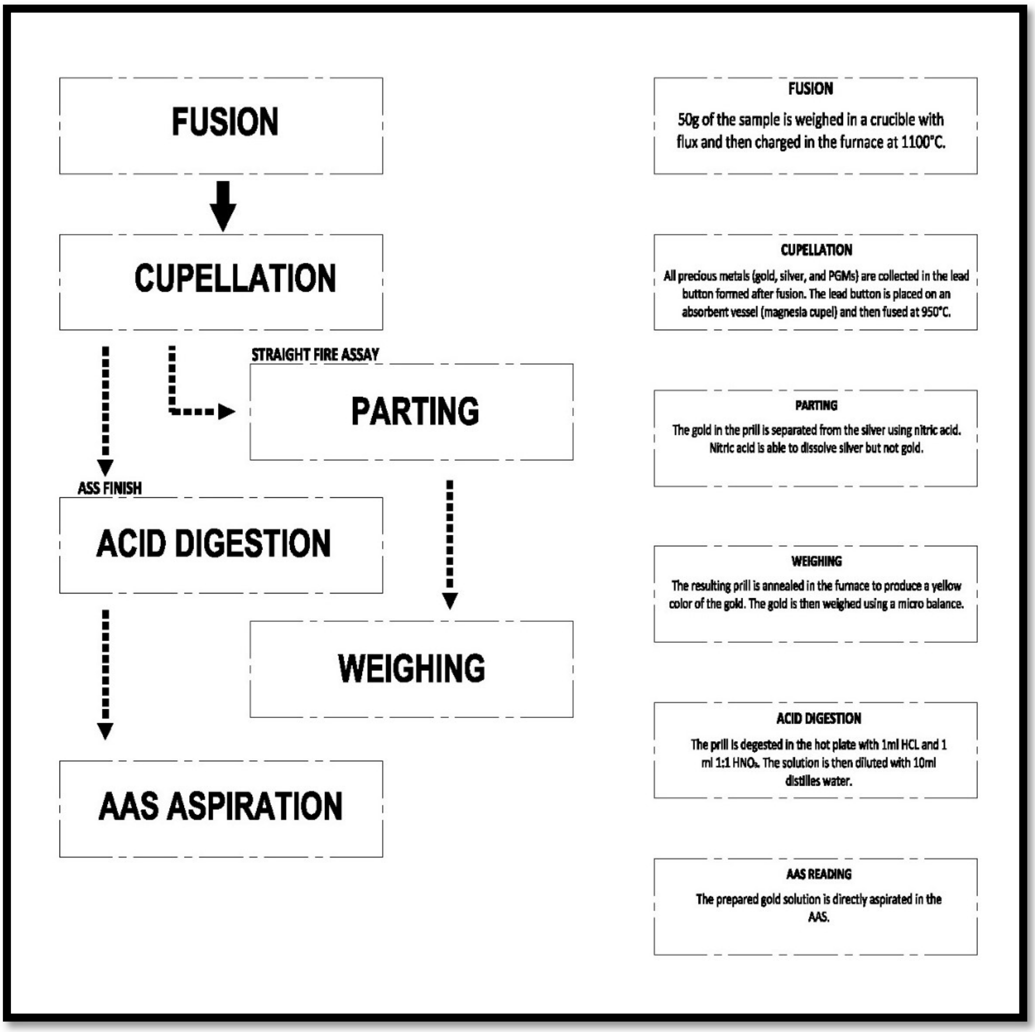


Figure 15-5: Fire Assay Procedure

The various stages in fire assaying are described as follows:

1. **Fusion –** The furnace is pre-heated for about 1 hour until the temperate of 1100ºC is attained. The sample is charged for about 60-90 minutes. The melt is poured into a mould and the lead which contains the precious metals (Au, Ag, PGMs) would sink to the bottom while the slag would form above. The product is then pounded to separate the slag from the lead. Once separated, the lead is shaped into a cube while the slag is sent as waste.

2. **Cupellation –** The lead button is placed on a magnesia cupel and then charged in the furnace at a temperature of 950 ºC for 45-60 minutes. The cupel absorbs the lead, leaving the precious metals called "prill/dore".

3. **Parting/Annealing –** The "prill/dore" obtained after cupellation is placed in a porcelain crucible. The dore is weighed in a microbalance. To separate silver from the gold, a parting

solution with 1 part nitric acid and 3 parts water is added to the crucible. Nitric acid dissolves silver but not gold. The silver solution is decanted in the container and the gold is washed with distilled water 3 times. The gold is dried in the hot plate and annealed in the furnace for 15 minutes.

4. **Finishing Technique**
   a. **Gravimetric Method (Part and weigh method)** – This is a conventional method for determining gold. The lower detection limit is 0.02g/t Au. Gold grades above 50g/t Au are re-analyzed with sufficient addition of Ag inquartation in order to obtain an adequate ratio of Au:Ag for dissolution.
   b. **Atomic Absorption Spectrophotometer (AAS) Finish** – This method is used for (low to very low grade) exploration samples. The lower detection limit is 0.002 g/t Au. Gold grades above 2 g/t Au are re-analyzed using a gravimetric finish in order to check the results.
   c. **Two Acid Digestion AAS Finish** – This uses a combination of HNO_3 and HCL, and is currently applied to silver and base metal (Cu, Pb, Zn) grade determinations. The solution is analyzed using AAS after the digestion process. The detection limit is 0.001% for Ag, Cu, Pb, and Zn.

15.5 Quality Assurance and Quality Control

The AMCI Assay Laboratory has appointed an Analytical Chemist with the main task of implementing the internal QA/QC program of the laboratory. The Geology Division also implements its own QA/QC, acting as an external entity to the assay laboratory, through a department in-charge of monitoring proper sampling procedures, dispatches, and analytical results. The department is run by a QA/QC officer reporting to the Grade Control and Resource Geologists.

15.5.1 Quality Control Procedures

1. **Certified Reference Materials (CRM)** – CRMs used both by the assay laboratory and the geology division are purchased from reputable commercial laboratories. Each CRM has a certificate of analysis indicating the mean grade and the tolerance limits to be used for evaluating the performance of each analytical procedure. The matrices and the grades of the CRMs in use were selected in such a way that they are similar to the samples being analyzed in AMCI.
    - One CRM is inserted in every batch of samples sent for analysis. To ensure that the analysts are blind to the mean grade, each CRM is assigned a unique control number recorded by the QA/QC officer and the name is erased. The results are then checked against the tolerance limits indicated in the certificates to check the accuracy of the analytical procedures.
2. **Blanks** – The AMCI Assay Laboratory uses certified blanks purchased from reputable external laboratories, while the geology division uses both certified and in-house blanks. Limestone samples are pulverized, homogenized, and then split and sealed into 300g samples. One batch of 25 samples is sent to the AMCI Assay laboratory and another batch to Intertek, a laboratory based in Manila, for fire assay. The results from both laboratories certify that the samples are barren, and may be used as blanks for QA/QC.
    - One certified blank is inserted in each batch of drilling and exploration samples, while internal blanks are used for mine samples. As the in-house blanks appear similar to regular samples, these are inserted at random locations within each batch to ensure that the analyst is not aware of which sample is barren. The sample number of the blank insert is reported in the transmittal to be submitted to the geology division. The assay results of the blank inserts are then used to monitor whether there are any cases of contamination.
3. **Duplicates** – A duplicate of one randomly selected sample in each batch is also inserted in each batch.
    - For the selected sample, 900g is taken instead of 600g. 300g is sealed as a duplicate, and the remaining 600g is pulverized and then split into two using the Rotary Sample Divider of the Boyd Crusher. The sample numbers of the original and the duplicate in each batch are recorded in the transmittal. Similar to blank inserts, the analysts are unaware of which samples are duplicates. The absolute relative deviations of the results of the duplicates are then used to evaluate precision.
4. **Grind Checks** – In order to ensure reproducibility of assay results, the pulverized samples are checked if 95% passes 200 mesh.
    - Two samples in every batch are screened using the procedure outlined below:

i. Weigh 100g of dry pulp.
ii. Wet sieve the pulp through the 200 mesh screen.
iii. Dry the oversize.
iv. Weigh the oversize.
v. Calculate the weight of the undersize by subtracting the weight of the oversize from the total.
vi. Calculate the percentage of the material passing 200 mesh by dividing the weight of the undersize with the total weight, multiplied by 100%.

5. **Flux Test** – This test is performed to check if the chemicals to be used for analysis are contaminated with gold.
    - One crucible in every batch is loaded with flux and then charged and treated as a normal sample.

15.5.2 Presentation and Analysis of Quality Control Data

The results of the various tests are statistically and graphically analysed on a monthly basis, weekly if there is sufficient data within the week, in order to identify outliers and notable trends. The results are communicated with all parties involved such that if peculiar results are identified, these may be properly investigated, and the causes of which resolved.

1. **Certified Reference Materials**

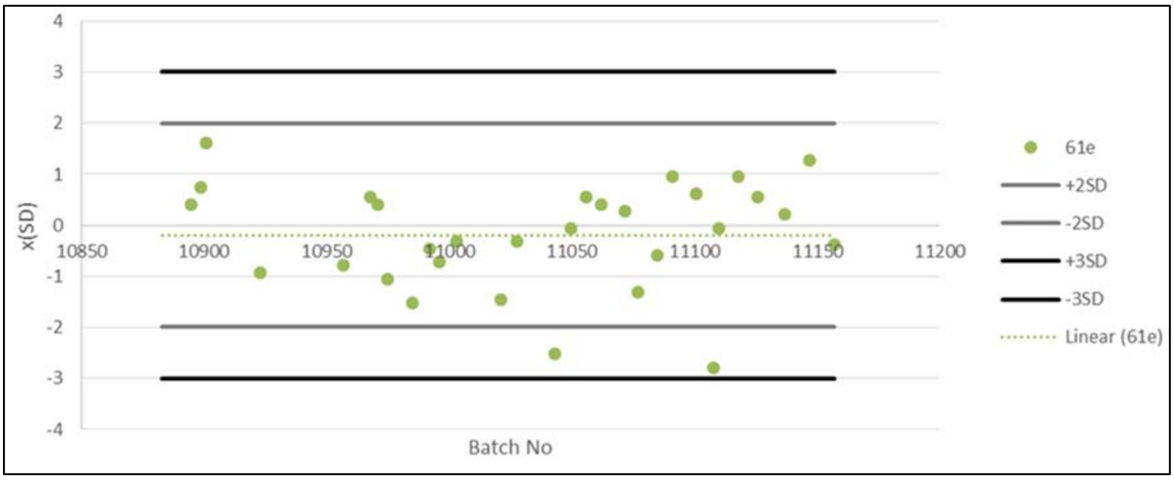


Figure 15-6: Scatterplot Used for the Analysis of CRM Assay Results

- The recommended value is the certified mean.
- The tolerance limits are calculated as ±2 and ±3 times the standard deviation indicated in the certificate provided by the supplier.

The deviations of the assay results from the certified mean value are calculated in terms of the multiples of the certified standard deviation. Results with absolute differences below 2 SD are ideal, while those between 2 SD and 3 SD are still acceptable but may prompt investigation if consistently obtained. A fitted trend line, supported by visual inspection of the scatterplot, is used to detect for bias. Data is further sorted per CRM and similar analyses are made. As CRMs with low, medium, and high grades are used, the accuracy for all grade ranges can be evaluated.

2. **Blanks**

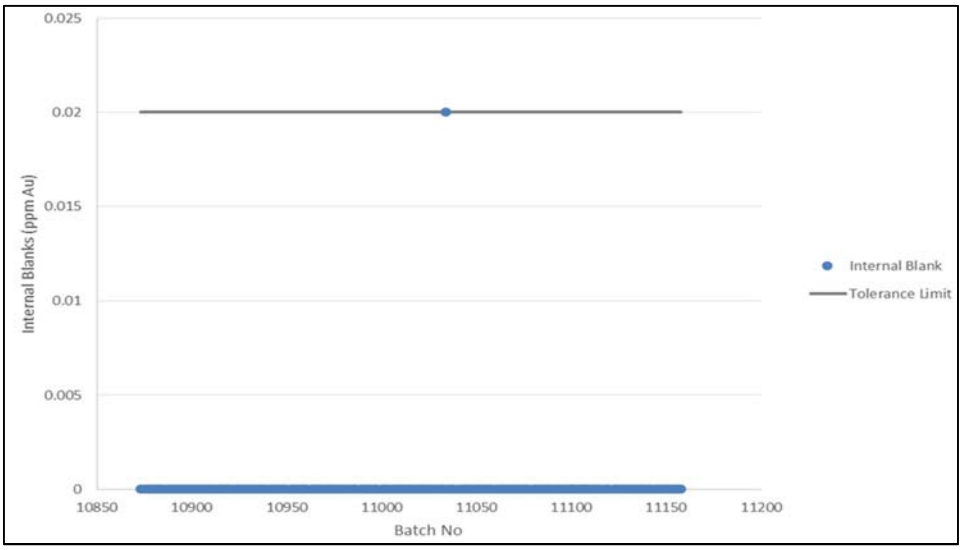


Figure 15-7: Scatterplot Used for the Analysis of Blank Inserts

Assay results of the blank inserts are plotted in sequence to easily identify possible occurrences of contamination. The tolerance limit for blanks is set at 0.02 ppm Au.

3. **Duplicates**

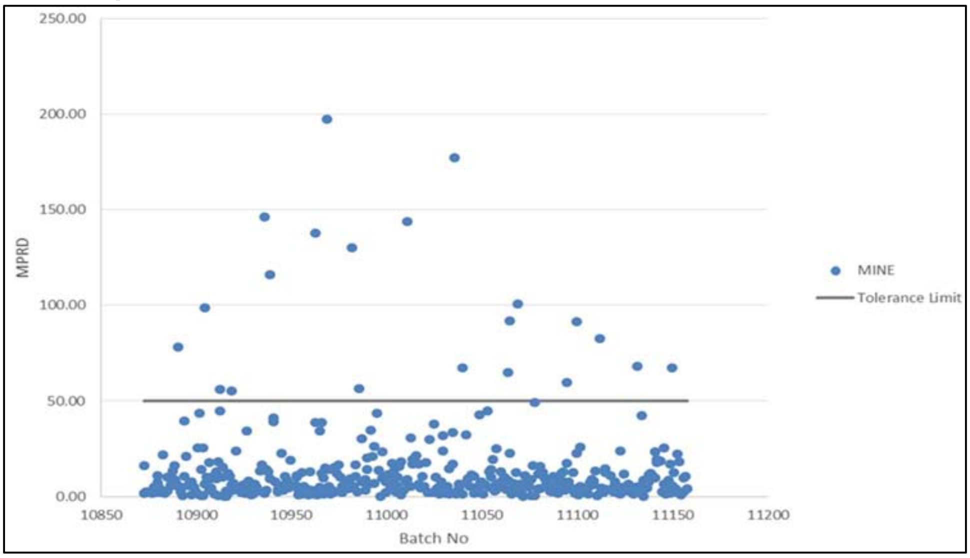


Figure 15-8: Scatterplot Used for the Analysis of Duplicate Pairs

Considering the highly variable nature of gold, precision is evaluated using the Mean Percentage Relative Deviation (MPRD). MPRD is calculated by dividing the difference of the original and duplicate sample grades by the mean, multiplied by 100%. The tolerance limits is set at 50% MPRD. The MPRD values are plotted per batch as shown below to make it easier to identify patterns.

15.5.3 Statement of the CP on Quality Assurance and Quality Control

The Apex Resource Estimation Team and the company's consultants have demonstrated industry standard practices and continuing efforts in safeguarding the quality of samples, as well as in their preparation and analysis, to come up with a valid and verifiable data base utilized in resource estimation.

16.0 MINERAL RESOURCE ESTIMATE

16.1 Database Used

16.1.1 Face Samples

A total of 23,332 channel samples with an average length of 0.94m from 7,031 development faces were used in this study. The channels are usually oriented parallel to the ground and orthogonal to the vein. Samples were tagged per heading and also whether the samples represent the main vein, hanging wall, or foot wall. Face samples are assayed for gold, silver, copper, lead, and zinc in an in-house laboratory.

16.1.2 Drill Data

Drill hole intervals were tagged according to the veins intercepted, as interpreted by the geologists. A total of 228 drill hole intercepts were extracted from the database. As drilling programs were almost always oriented perpendicular to the vein projection, drill hole intercepts may also be taken to be oriented orthogonal to the vein. The average sampling interval for drill cores are also roughly 1m. Core samples are similarly assayed for gold, silver, copper, lead and zinc in an in-house laboratory.

16.1.3 Development Solids

Survey data gathered from the mine were used to generate lines representing the development drives (Figure 16-1A). These lines were then individually extruded to a set dimension depending on the mining method employed; 2m x 2.5m for conventional and 3m x 3.5m for mechanized (Figure 16-1B).

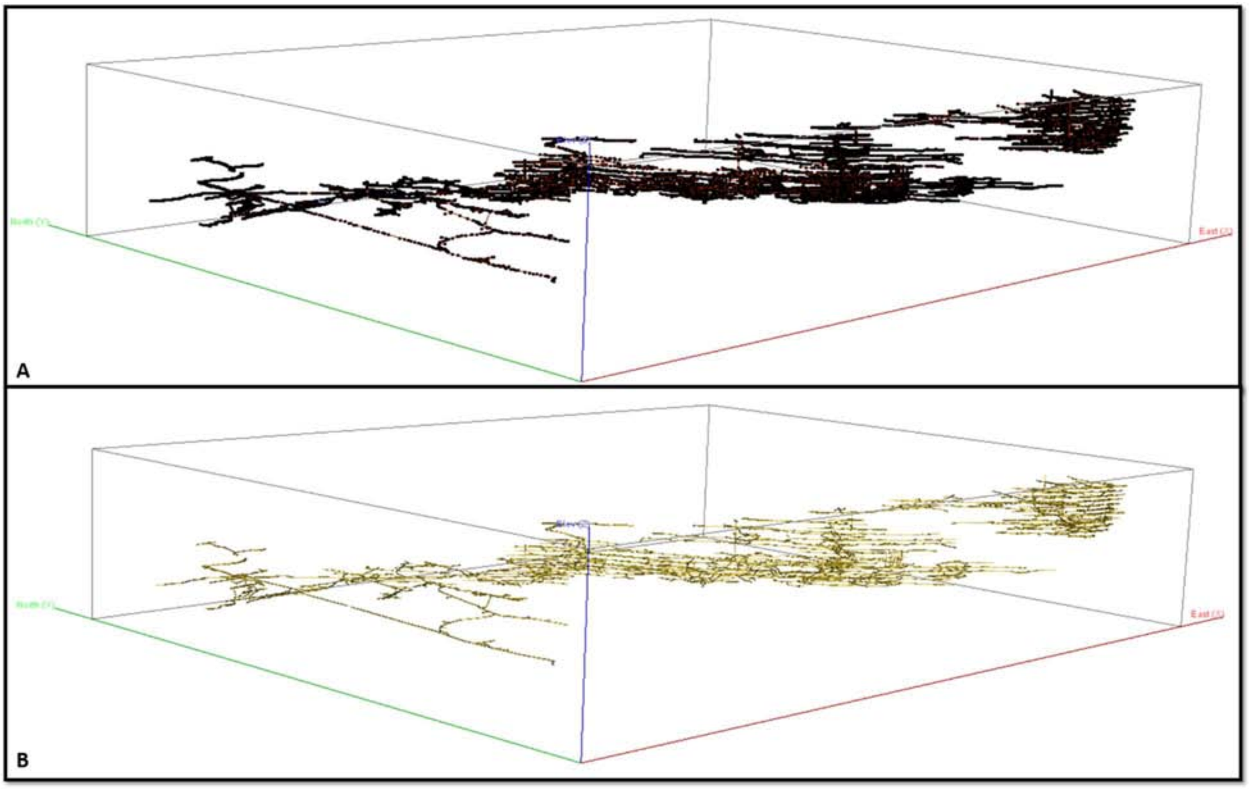


Figure 16-1: (A) Survey data as lines (B) Survey data extruded into solid development drives

16.1.4 Vein Solids

Vein solids were modelled through geologic interpretations guided primarily by channel samples. Samples were loaded to their surveyed 3D-space locations and displayed according to sample type. The geologist then digitized his interpretation on horizontal two-dimensional sections perpendicular to the vein, using the sample widths for vein thickness. (Figure 16-2A). Drill holes were used to guide modelling beyond the areas being developed (Figure 16-2B). Solids were then created from the polylines (Figure 16-2C). The resulting vein solids were validated using drive solids to check if the interpretations agree with field observations (Figure 16-2D).

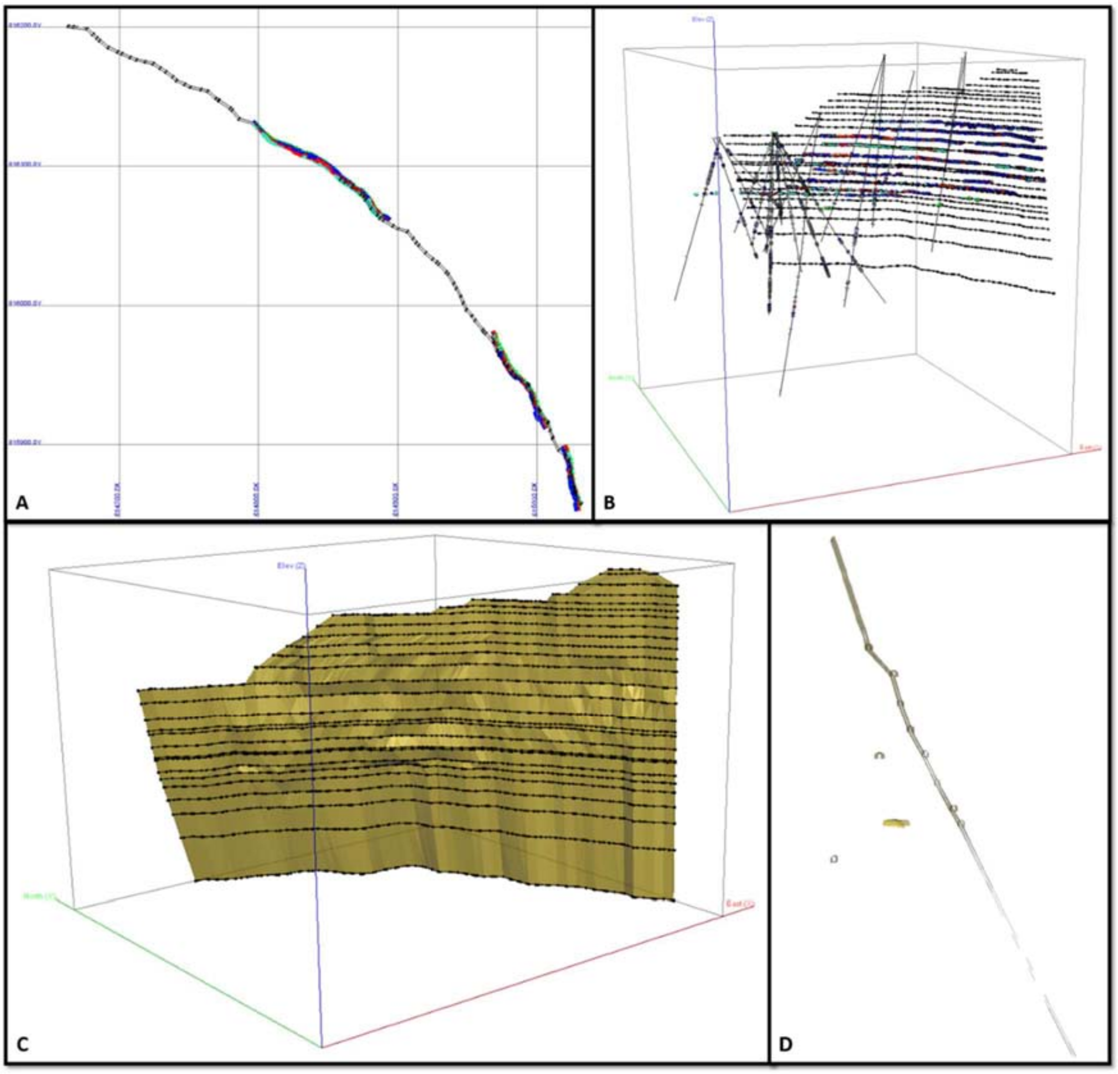


Figure 16-2: (A) Interpretation of a horizontal section of Bonanza vein guided by channel samples (B) Drillhole intercepts indicating vein extents (C) Vein solid created from interpreted horizontal sections (D) Vertical sections validated by development drives

On-vein development drives normally expose the entire vein, allowing measurement of the full thickness. However, the same case does not apply for the hanging wall and the footwall, as their exposure depends on the drive dimensions and azimuth. Therefore, instead of modelling thickness from sample widths, a conservative estimate of 0.5m for the thickness of the mineralized zones at the hanging wall and foot wall was used in this study. The surfaces of the vein solids that define the contacts with the hanging wall and the foot wall were used to create uniform width solids representing the mineralized portions of the wall rock.

16.1.5 Void Solids

Void solids represent the mined out portions of the vein. These were modelled using mined out vertical section plans created by the Mine Planning Group. The section plans were saved as lines (Figure 16-3A) and then extruded to create solids which overlap the vein (Figure 16-3B). The solids corresponding to the intersections were then taken to be the mined out portions (Figure 16-3C). A similar procedure was followed for the hanging wall and the foot wall.

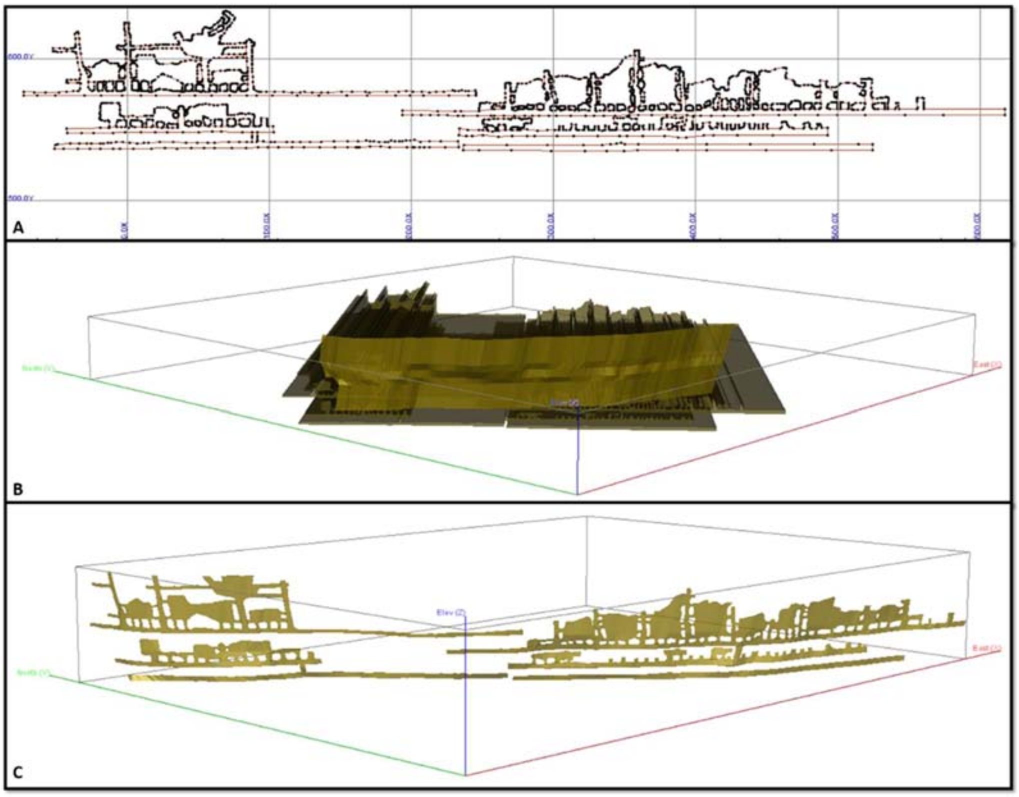


Figure 16-3: (A) Engineering interpretation of the mined out portions of Masarita 2 vein (B) Extruded void solids overlapping the vein solid (C) Intersection of the extruded solids and the vein solid

16.2 Integrity of Database

16.2.1 Software Used

The primary software used to produce the resource estimate is Geovia GEMS (http://www.geovia.com/ products/GEMS). The table below shows the software used to accomplish various tasks in the study.

Table 16-1: Software Used

Database Management/Editing	Software Used
Reports, Journals	Microsoft Word
Drill Data, Face Samples	Microsoft Excel
2D drawings, Survey Data	Autodesk AutoCAD
Block Model	Geovia GEMS
Technical Tasks	
Statistical/ Visual Data Analysis	Geovia GEMS
Solid/Domain Creation	Geovia GEMS
Variography	Geovia GEMS
Kriging	Geovia GEMS
Validation/ Reporting	Geovia GEMS

16.2.2 Database Compilation

The database used in this report is the same database used in the 2015 Resource Estimate, updated to include additional data gathered from August 2014 to December 2016. Multiple GIS personnel were tasked with updating the database. After encoding, the inputs were checked by the geologists and the QAQC administrator. The state of the database is deemed appropriate for this report.

16.3 Geological Interpretation and Domaining

The gold veins of the Maco deposit are mainly controlled by structures related to the Philippine Fault Zone. A detailed structural study of the Maco deposit assigned the gold veins to different structural settings, indicating different formational regimes. Other controls to ore deposition such as lithological and geochemical controls were noted in previous studies. Various depositional settings resulted in diverse ore textures and distinct grade distributions in each domain. Considering the nature of the deposit, estimation was done using domains corresponding to the different vein systems. Each vein was then further subdivided into the main vein, hanging wall, and foot wall.

16.4 Data Verification and Validation

16.4.1 Summarized Statistics and Other Analysis

Statistics of the global data set and of each domain were calculated. The histograms were also visually inspected in order to determine the overall distribution as well as to identify secondary distributions within each domain.

The histogram of the global data set shows that most samples have grades below 5 g/t Au (Figure 16-4A). However, this data set includes samples taken from the hanging wall and the foot wall. The figure also shows that the distribution is positively skewed with a high grade tail. In consideration of this high grade sub-population, topcuts were selected based on percentiles of the grade distribution in each domain instead of assigning a single value for all domains. Close inspection of the histogram reveals multiple peaks indicating the presence of secondary distributions, which stresses the need to subdivide the data into different domains (Figure 16-4B).

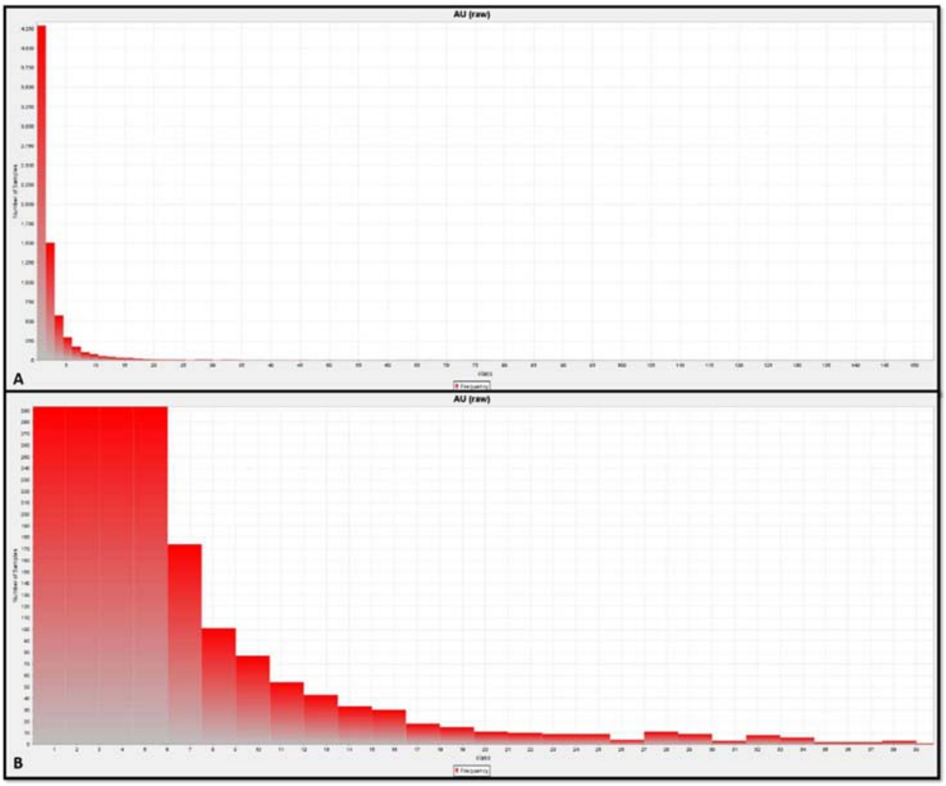


Figure 16-4: (A) Histogram of all data used in the study (B) Zoomed in histogram showing multiple peaks

Grade distributions for each domain were also analyzed (Figure 16-5A). Similar to that of the global data set, all of the individual distributions are skewed. Application of logarithmic transforms yielded bell curves, indicating that gold grades are lognormally distributed in each domain (Figure 16-5B).

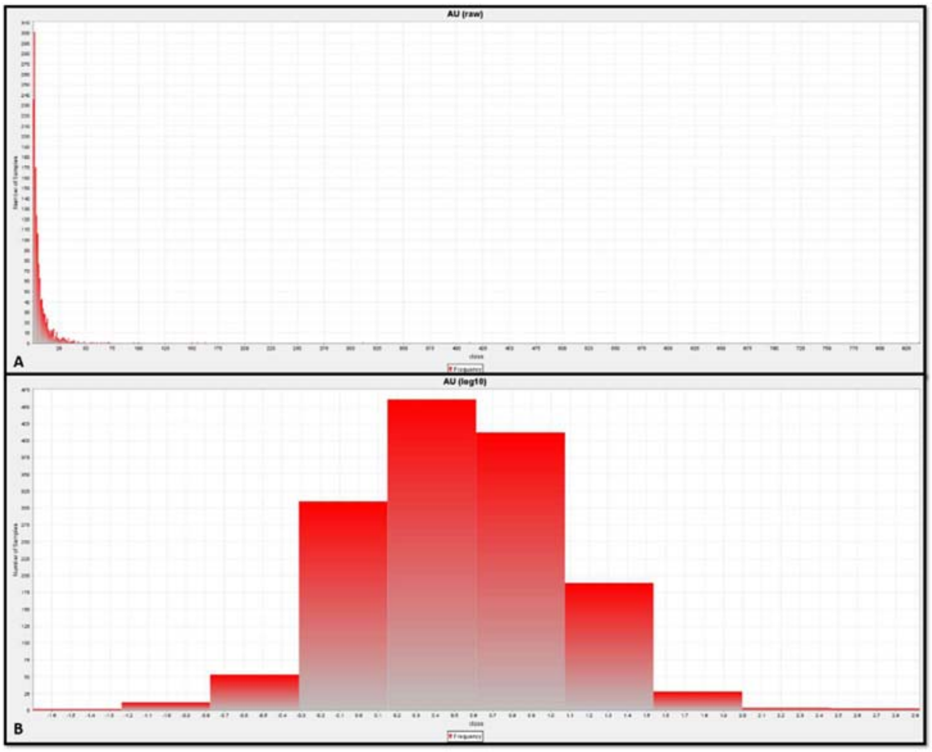


Figure 16-5: (A) Histogram of Bonanza Hanging Wall Split face samples (B) Log-transformed histogram showing a bell-shaped distribution

16.4.2 Analysis of Face Samples

Data imported from face samples include gold, silver, and copper grades. Tags indicating whether a sample corresponds to the main vein (MV), hanging wall (HW), or foot wall (FW) were also imported. Face samples were subdivided into separate veins, following the geological domains used for this study. Face samples were then further subdivided into main vein, hanging wall, and foot wall. The table below shows the statistics for the global data set and for each domain.

Table 16-2: Face Sample Statistics

	Sample #	Mean	Median	Variance	STDV	CoV
All Data	23,332	5.6	1.9	424.2	20.6	3.7
BBK MV	291	13.0	4.7	928.6	30.5	2.4
BBK HW	209	2.7	0.9	146.4	12.1	4.5
BBK FW	284	2.2	0.8	27.6	5.3	2.4
BHWS MV	1,005	10.2	4.2	430.7	20.8	2.0
BHWS HW	422	4.2	1.7	96.6	9.8	2.4
BHWS FW	670	3.4	1.6	36.9	6.1	1.8
BNZ MV	1,474	7.8	3.3	772.1	27.8	3.6
BNZ HW	867	2.4	1.3	19.1	4.4	1.8
BNZ FW	1093	2.2	1.3	25.9	5.1	2.3
MAI MV	309	7.1	2.7	142.6	11.9	1.7
MAI HW	201	2.8	0.9	46.5	6.8	2.5
MAI FW	244	1.5	0.7	5.0	2.2	1.5
MAS MV	1,161	12.8	5.6	764.9	27.7	2.2
MAS HW	622	4.1	1.6	208.4	14.4	3.5
MAS FW	912	3.3	1.5	38.4	6.2	1.9
MST2 MV	357	14.1	5.1	962.2	31.0	2.2
MST2 HW	181	4.3	1.4	80.6	9.0	2.1
MST2 FW	350	2.3	1.1	19.1	4.4	1.9
SDY MV	5,187	8.8	3.4	1,140.3	33.8	3.8
SDY HW	2,856	3.1	1.2	49.1	7.0	2.3
SDY FW	3,511	2.9	1.1	56.9	7.5	2.6
WGS MV	414	4.1	2.5	30.6	5.5	1.3
WGS HW	224	1.6	0.9	7.9	2.8	1.8
WGS FW	243	1.9	0.7	27.9	5.3	2.8

The statistical parameters calculated serve to validate the domains applied. As would be expected from the diverse geological characteristics of the Maco gold veins, the domains were found to have different grade distributions. Furthermore, the observed difference between the mean grades of the main vein as compared to the hanging wall and footwall stresses the need for further subdivision of samples. This was also applied in order to avoid underestimation of the main vein grades due to the addition of low grade wall rock samples, and also to avoid overestimation of the hanging wall and the foot wall due to the presence of high grade main vein samples. The coefficient of variation of some domains remained high even after subdividing the data set. This is due to the existence of high grade and low grade zones within the vein. However, domains corresponding to grade zonations were not applied in this study since it would drastically reduce the number of samples in the resulting domains.

16.4.3 Analysis of Drill Data

Only assay results of vein intercepts in each drill hole were included in the database. Hence, all drill hole intervals were tagged into the main vein. The table below shows the statistics of drill data per vein.

Table 16-3: Drill Data Statistics

	Sample #	Mean	Median	Variance	STDV	CoV
BIBAK	3	17.7	5.6	308.0	17.5	1.0
BHWS	24	12.9	8.3	96.8	9.8	0.8
BONANZA	12	34.8	5.1	7,103.1	84.3	2.4
MARIA INEZ	12	10.9	10.6	16.7	4.1	0.4
MASARA	37	28.9	8.6	3,147.0	56.1	1.9
MASARITA 2	12	3.8	2.9	8.9	3.0	0.8
SANDY	128	15.1	7.0	741.1	27.2	1.8

16.5 Cutoff Grade Used in Estimation

Two cutoff grades were used in estimation, corresponding to the current milling rate of around 1,500 to 1,800 tpd and the planned rate of 3,000 tpd.

At a mining and milling rate of 1,500 tpd, the cutoff used by operations is 3.0 g/t Au. This was calculated using the following parameters based on the 2016 averages:

- Mining cost: $ 35/t
- Milling cost: $ 25/t
- Overhead cost: $ 14/t
- Mill Recovery: 80%

The long-term plan for the Maco Mine includes an increase in production rate to 3,000 tpd, twice that of the rate in 2016. This rate would result to a larger divisor for fixed mining and milling costs. Underground development, which accounts for a major share of the mining costs, and capital expenses would then also be paid for by a larger tonnage brought about by the expansion. Also considering the possibility of favorable changes in gold prices in the future, mineralized blocks with grades above 1.5 g/t Au are deemed to have potential for eventual economic extraction.

16.6 Mineral Resource Estimation Method Used

16.6.1 Block Model

Four independent block models were used to house the resource estimates (Figure 16-6). Parameters for each block model can be found in the table below (Table 16-4). Three variables per block were computed in order to calculate for the resource estimate: tonnage, grade, and resource classification. These three variables were computed for the main vein, hanging wall, and foot wall in each block model.

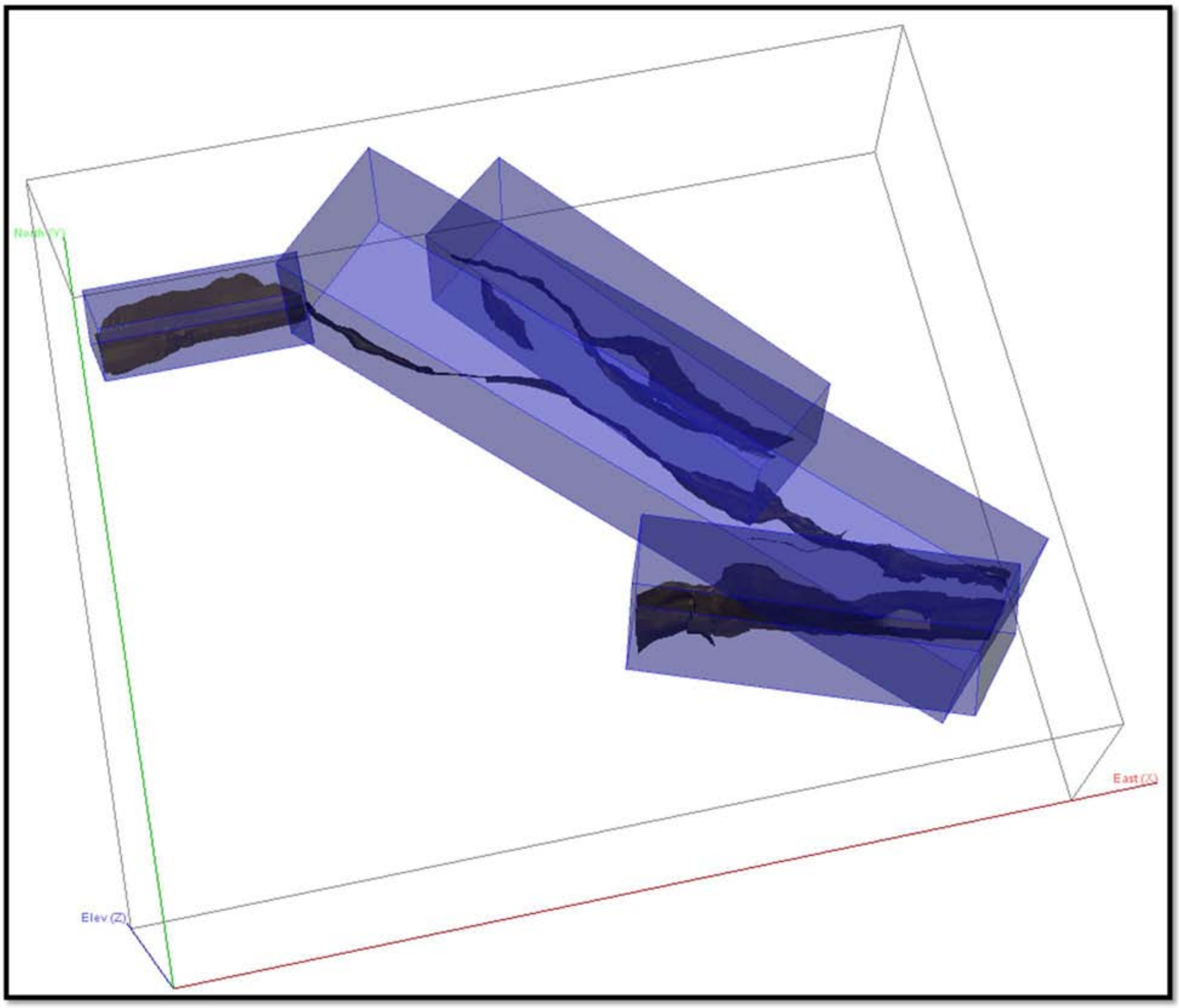


Figure 16-6: Four Block Models (Transparent Blue Boxes)

Table 16-4: Block Model Parameters

		Origin				
	Rotation	x	y	z		
Maligaya	40.0	615,450	815,130	798		
Sandy	45.0	615,860	814,300	966		
Maria Inez	70.0	615,995	814,335	1,130		
Wagas	0	613,460	816,020	750		
	Number of Blocks			Block Size		
	column	row	level	column	row	level
Maligaya	190	675	113	2.0	2.0	4.0
Sandy	255	1,250	120	2.0	2.0	4.0
Maria Inez	110	560	190	2.0	2.0	4.0
Wagas	350	100	68	2.0	2.0	4.0

16.6.2 Tonnage Computation Methodology

Although the block models overlap, the vein solids themselves do not. Limiting each block model to only compute for tonnage where there were veins allowed the software to combine the block model cumulatively without double counting material. This was done through capturing the percent of each block inside a particular wireframe as shown below (Figure 16-7). Percent mineralization was then adjusted for the voids within the respective vein to account for the mined out material. Density was assumed to be constant for all blocks at 2.6 tons per cubic meter. Tonnage was then computed per block using the formula below.

$$Tonnage\ per\ Block = Volume * Density * (Percent\ Mineralization - Voids)$$
$$Tonnage\ per\ Block = (2 * 2 * 4) * 2.6 * (Percent\ Mineralization - Voids)$$
$$Tonnage\ per\ Block = 41.6 * (Percent\ Mineralization - Voids)$$

	>= Lower Bound	< Upper Bound	Colour
	0.00000	0.00010	RGB 0 0 255
	0.00010	25.00000	RGB 0 147 0
	25.00000	50.00000	RGB 255 255 0
	50.00000	75.00000	RGB 255 104 32
	75.00000	100.00000	RGB 255 0 0

Figure 16-7. Percent Mineralization minus Voids Color Legend (%)

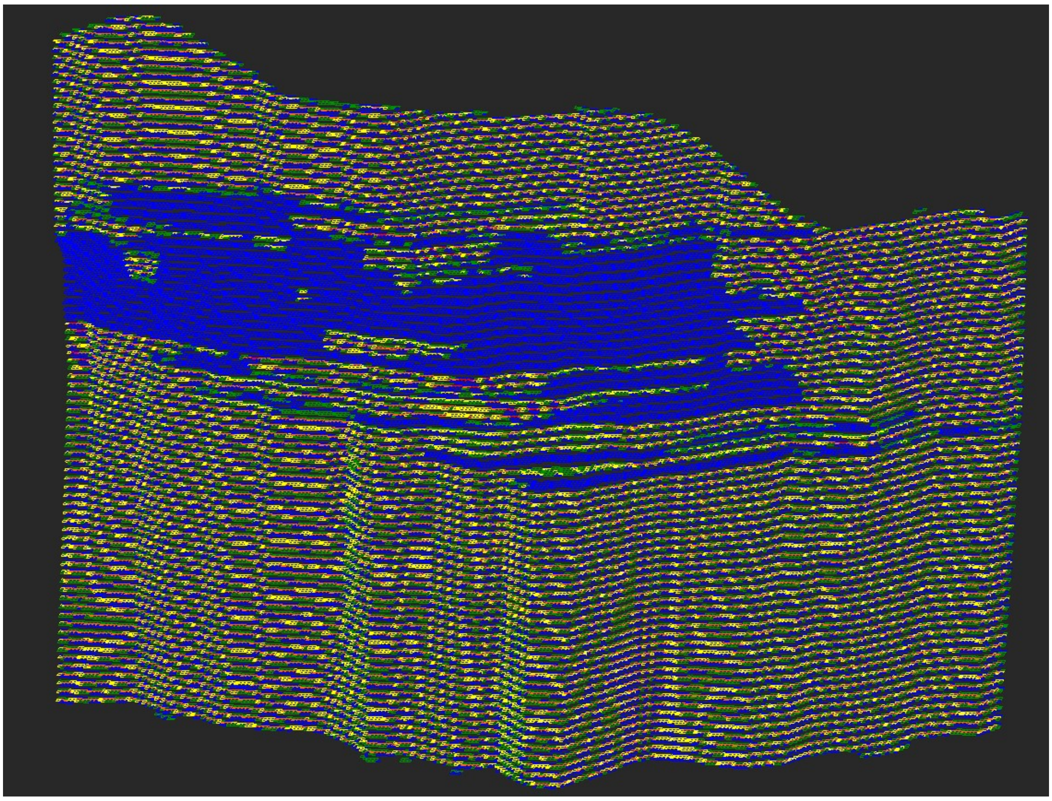


Figure 16-8. Percent Mineralization minus Voids for Bonanza

16.6.3 Data Transformation and Topcuts Applied

Due to the skewed distribution and the presence of extremely high grades in the data set, a significant amount of data transformation was applied to avoid bias in estimation. No changes were made in the database as transformations were only applied during variography and high grades were cut by the program only during estimation. Topcuts applied were determined from the percentiles of each domain. This was to ensure that the selected high grade limits would reflect the nature of each domain. Data above the 95th percentile were treated as outliers in variography. In addition, since the grade distribution in all domains were determined to be lognormal, logarithmic transformation was applied. Topcuts used in grade estimation varies depending on resource classification. Measured resources were estimated using a topcut corresponding to the 97.5th percentile, 95th for indicated, and 90th for inferred.

Table 16-5: Percentiles of MV domains

	97.5th	95th	90th
All Data	32.5	20.3	12.0
BBK MV	93.1	48.7	31.9
BHWS MV	59.3	36.7	23.6
BNZ MV	33.4	24.5	16.5
MAI MV	39.8	29.4	20.8
MAS MV	78.2	46.2	25.4
MST2 MV	78.5	48.0	32.4
SDY MV	44.5	28.3	17.6
WGS MV	22.4	14.3	8.7

16.6.4 Variography

Variograms were modelled to determine the range of influence for each domain. Variances at certain separation distances were calculated and saved as experimental variograms, shown by the jagged black line (Figure 16-9). The x axis represents separation distances (lag) between two points, while the y axis represents the variances at these lags. Experimental variograms were calculated along sixteen directions on the XY plane. From which, the user selects the direction of maximum continuity.

After the direction of maximum continuity has been chosen, the user then interprets the experimental variogram and fits a model (Figure 10 – red) by adjusting the variogram parameters. Using these fitted parameters, an equation which represents the model is generated by the software. This equation is used by the program to calculate gamma (h) for any given lag distance.

The green line represents the sill which corresponds to the maximum variance for the domain. The sill minus gamma represents correlation of two points at a certain lag. It is this correlation that the program uses to determine the weights to be assigned to samples within the search neighborhood in kriging.

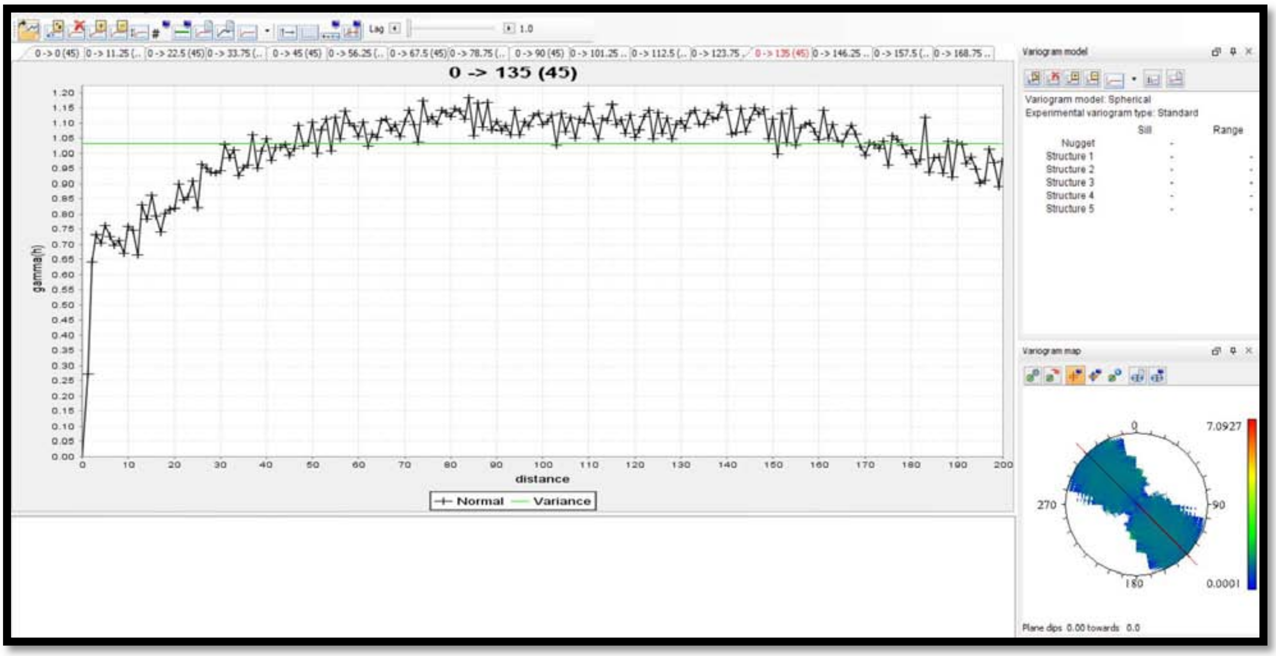


Figure 16-9: Experimental Variogram for Bonanza MV 135 degrees

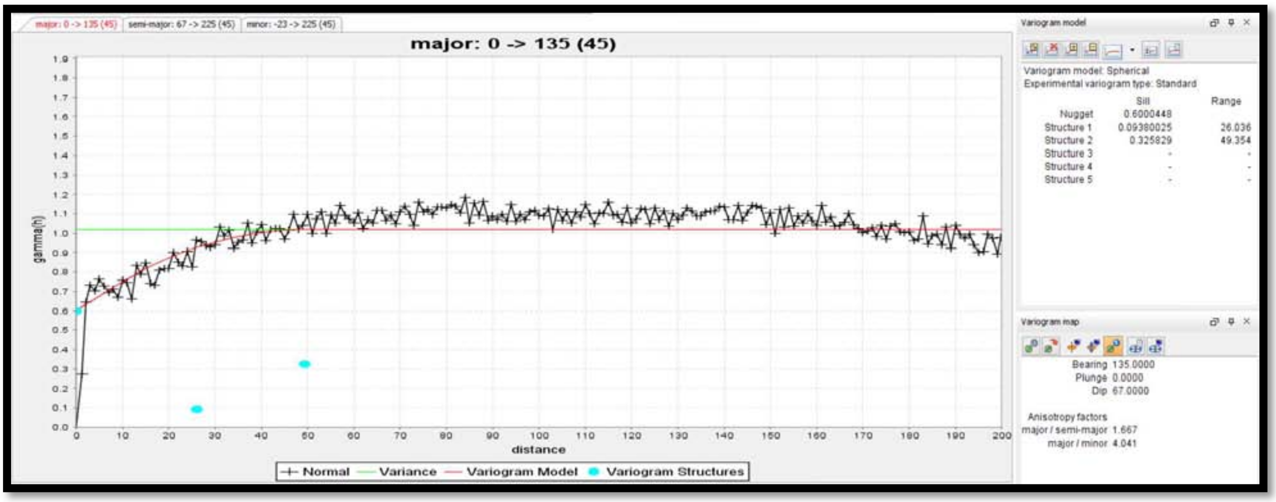


Figure 16-10: Variogram for Bonanza MV 135 degrees

All variograms for main vein domains were modelled with two ranges (nested structure), meaning that there are two scales of variability. Nested structures are often due to more than one control to ore deposition, operating at different scales. The parameters of the variogram models are shown in the table below, while the variogram models may be seen in Appendix A.

Table 16-6: Variogram Parameters

	Sill 0	Range 1	Sill 1	Range 2	Sill 2
BIBAK MV	0.8	14.8	0.1	34.1	0.1
BIBAK HW	0.7	10.3	0.3	-	-
BIBAK FW	0.7	13.6	0.3	-	-
BONANZA MV	0.6	23.1	0.2	47.2	0.2
BONANZA HW	0.7	13.4	0.1	29.8	0.2
BONANZA FW	0.7	12.6	0.1	26.7	0.2
BNZ HWS MV	0.7	0.1	0.2	27.7	44.0
BNZ HWS HW	0.5	17.8	0.3	49.0	0.3
BNZ HWS FW	0.7	14.9	0.1	26.1	0.2
MASARA MV	0.7	17.5	0.1	44.5	0.2
MASARA HW	0.8	12.0	0.2	-	-
MASARA FW	0.8	16.5	0.2	-	-
MARIA MV	0.5	18.6	0.1	47.2	0.4
MARIA HW	0.5	14.7	0.1	36.0	0.4
MARIA FW	0.5	19.8	0.2	47.4	0.3
MASARITA 2 MV	0.6	20.0	0.1	40.0	0.3
MASARITA 2 HW	0.4	8.5	0.6	-	-
MASARITA 2 FW	0.9	7.1	0.1	-	-
SANDY MV	0.6	20.8	0.2	45.1	0.2
SANDY HW	0.8	21.0	0.1	48.8	0.1
SANDY FW	0.8	10.7	0.1	30.5	0.1
WAGAS MV	0.4	17.2	0.2	49.2	0.4
WAGAS HW	0.5	18.4	0.5	-	-
WAGAS FW	0.6	9.9	0.4	-	-

16.6.5 Grade Computation Methodology

Gold grades were estimated per block using ordinary kriging. This geostatistical method calculates the weights to be applied to each sample in such a way that the minimum estimation variance is obtained. A total of four kriging passes were run, each with a different search ellipse. The requirements in order for a block to be estimated in each pass are shown in the table below.

Table 16-7. Kriging Passes

Pass	Search Ellipse	Minimum Octants	Topcut
1st	Range 1	4	97.5th
2nd	Range 1	1	95th
3rd	Range 2	1	90th
4th	No limit	1	75th

16.7 Mineral Resource Categories Used

Blocks within each vein were classified into one of three classes (measured, indicated, inferred) depending on which kriging pass was able to estimate the block. Blocks with samples within the shorter range of the variogram surrounding the block from at least four directions were classified as Measured. Those that do not meet this criteria but with at least two samples within the shorter range of the variogram were classified as Indicated. While blocks with at least two samples within the longer range were classified as Inferred. Blocks not estimated in the first three passes were estimated using the two closest samples in the same domain and were not classified. The results of the fourth kriging pass are only for exploration purposes, hence only classified resources were included in this report.

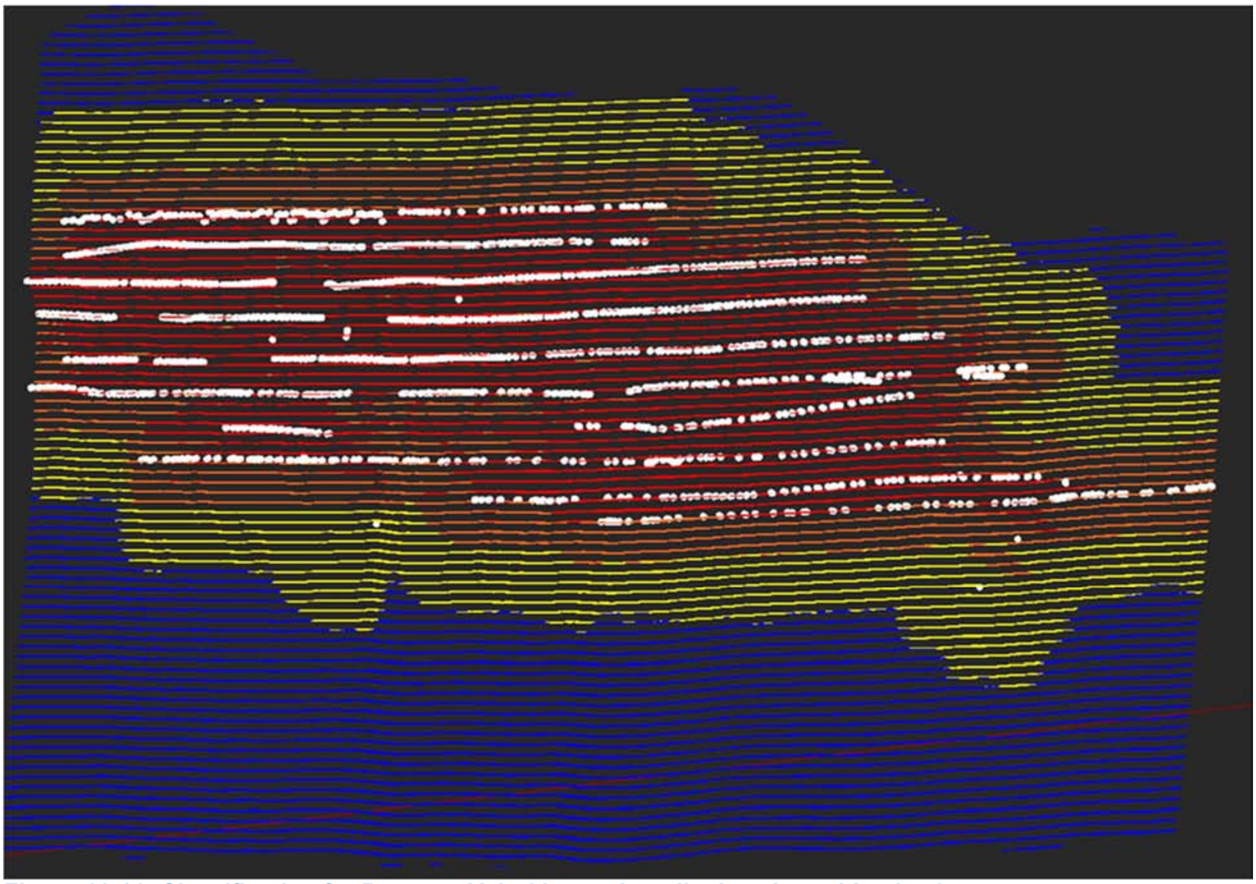


Figure 16-11: Classification for Bonanza Vein (data points displayed as white dots)

16.8 Mineral Resource Estimates

The remaining mineral resources for the gold veins estimated in this study were reported using two cutoff grades. The actual cutoff grade used by operations varies per area due to utilization of different mining methods. For this study, an average cutoff grade of 3.0 g/t Au was used. Table 1 below reports the mineral resources estimated for each class at this cutoff.

Table 16-8. Reported Resources at 3.0 g/t Au cutoff

At 3.0 g/t cutoff	Tonnage (000 tons)	Grade (g/t Au)
Measured	310	8.2
Indicated	590	7.2
Sub-total	**900**	**7.5**
Inferred	710	6.6
Total	**1,610**	**7.1**

The long-term plan for the mine includes construction of an additional mill complex along with other facilities that would increase the production rate to 3,000 tpd. This is in consideration of the inactive vein systems to be opened in the future after acquisition of additional equipment and construction of the needed facilities. Due to the larger divisor for fixed costs brought about by a higher production rate, material above 1.5 g/t Au have reasonable prospects for eventual economic extraction. The mineral resources reported at this cutoff grade is shown in the table below.

Table 16-9. Reported Resources at 1.5 g/t Au cutoff

At 1.5 g/t cutoff	Tonnage (000 tons)	Grade (g/t Au)
Measured	430	6.5
Indicated	910	5.4
Sub-total	**1,340**	**5.8**
Inferred	1,130	4.9
Total	**2,470**	**5.4**

17.0 CONCLUSIONS

Given an estimated resource of 1.61 million tons at an average grade of 7.1 g/t gold (3.0 g/t cutoff), at the current mining rate of 1,800 tons per day, resources estimated in this study will support a mine life of 2.5 years. Considering the case wherein production ramps up to 3,000 tons per day which would lower the cutoff to 1.5 g/t, the mine life would be 2.3 years based on the reported resources. For vein-type deposits such as in the case of the Maco mine, this mine life provides ample time for both surface and underground exploration to find new deposits and to delineate extensions of previously identified vein systems that would replace resources depleted by production. This is demonstrated in this report since in the span of about two years, from the time when the 2015 report was released, more than 2,000m of cumulative strike length, as reported in the exploration results, has been delineated by surface exploration. This is equivalent to almost twice the currently known strike length of the Sandy vein system which is currently the major ore source of the Maco Mine. In addition, underground drilling and development were also able to continuously provide additional resources through delineation of new splits and also through extensions of the previously identified systems. Ideally, the mine should be able to maintain a balance between exploration, both surface and underground, and production. Therefore in the case wherein production ramps up to 3,000 tons per day, additional efforts in exploration would be needed so as to replace the resources being depleted.

18.0 RECOMMENDATIONS

- The planned increase in production rate to 3,000 tpd should be accompanied by additional exploration programs both underground and on the surface such that replacement of resources would be at the same pace as production.
- There are more than ten veins within the tenement that were not declared in this report but were operated in the past. These include the dons and the saints systems to the southwest of the tenement and a number of veins to the northeast. These are currently inactive since operations is focused mainly on the NW trending Bonanza and Sandy vein systems but it is recommended to conduct geological work in these areas such that these may be included in future resource estimates.

Rolando E. Peña

PRC Registered Geologist No. 068
PMRC Competent Person Registration No. 07-08-08
Geological Society of the Philippines

19.0 REFERENCES

Angeles, C. A. (2011). Geological Comments on the Maco Property of Apex Mining Company, Inc. Compostela Valley, Philippines: Internal Report.

Badgley, P. L. (1959) – Structural methods for the exploration geology: NY, Harper, 250 p. BMG-MNR, 1986. Geology and Mineral Resources of the Philippines Volume II Mineral Resources: 463 pp.

Coller, D. (2011). Tectonics and Structural Controls of the Masara Gold System, East Mindanao, South Philippines. Compostela Valley, Philippines: Internal Report.

Corbert, G. 2004. "Epithermal Au-Ag – The Magmatic Connection Comparisons between East and West Pacific rim". Proceedings of the Ishihara Symposium: Granites and Associated Metallogenesis

De Sitter, L. V., (1956) – Structural Geology: NY, McGraw Hill, 552 p.

Dominy, S.C. 2006 "Masara Gold Project, Philippines: Independent Review and Resource Estimate" Consultants report, Snowden Mining Associates, London for Crew Gold.

Gervasio, F.C. (1966). A study of tectonics of the Philippine Archipelago, Phil. Geol., v20 no 2pp. 51-75.

Jensen, S. M. and Petersen, J. S., 22 May 2007. Technical Report on the April 2007 Resource Estimate for the Masara Gold Operations, the Philippines.

Langlands, J.G. and Lewis, A.M. (1995). "Masara Gold Mine Project Philippines: Assessment and Recalculation of Ore Reserves".Consultants report by A C A Howe International for London Fiduciary Trust PLC.

Lodrigueza, L.A. and Estoque, J.C. (1976). "Geological Report Of The Masara Gold and Copper Deposits" Apex Exploration and Mining, Internal Report.

Malicdem and Peña, (1967) – Geology of the Copper-Gold Deposits of the Masara Mine Area, Mabini, Davao. *Proc. 2nd Geological Convention and 1st Symposium on the Geology of the Mineral Resources of the Philippines and Neighboring Countries*, Geol. Soc. Phil. 2 251-259.

Malihan, T. D. 2009 "Certification: Resource Estimate Review of Maco Mines" Consultant Report to Apex Mines.

Malihan, T. D., 21 April 2009. A Review of the 2009 Resource Estimate of the Gold Vein Deposits of the Maco Mines in Maco, Compostela Valley Province, Mindanao Island, Philippines.

Mercado A.C., Estoque J., Lodrigueza L., Rebillon F., 1987. Geology and Ore Deposits of Masara, Davao del Norte, Philippines. Paper presented to Pacific Rim Congress '87.

Mitchell, A.H.G. and Leach.T.M., 1991. Epithermal gold in the Philippines: Island Arc metallogenesis, geothermal systems, and geology. Academic Press Limited, 457 pages

Osbucan, A. B. and Caupers, D. 2008 "Maco gold project – Feasibility Study Volume 1" Apex Mining internal report.

Osbucan, A. B. and Caupers, D. 2008 "Maco gold project – Feasibility Study Volume 2" Apex Mining internal report.

Philippine Mineral Reporting Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The PMRC). 1 July 2007.

Philippines 1995 "An Act Instituting a New System of Mineral Resources Exploration, Development, Utilization, and Conservation" Laws Republic Act No. 7942 http://www.mgb.gov.ph/lpbt.aspx?ptyid=1&title=Republic Act Philippines 1997 "An Act to recognized, Protect and Promote the Rights of Indigenous Cultural Communities/Indigenous Peoples, Creating a National Commission on Indigenous Peoples, Establishing Implementing Mechanisms, Appropriating Funds Therefore, and For Other Purposes" Laws Republic Act No. 8371 http://www.mgb.gov.ph/lpbt.aspx?ptyid=1&title=Republic Act

Pubellier, M., R. Quebral, C. Raingin, B., 1996 : The onset of movement on the Philippine Fault in eastern Mindanao; A transition from a collision to a strike slip movement. Tectonics, V.15, No. 4, pp 713-726

Santos, T. 2009 "2009 MACO Resource Estimate" No Report, set of Vertical long sections (ACAD) and associated spreadsheets. Apex Mining, Maco. Sheppard, W. A. (2011). A geological review of the Maco Mine, Mindanao, Southern Philippines. Compostela Valley, Philippines: AMCI Internal Report.

Sillitoe, R. and GappiJr.. I., November 1984. Philippine Porphyry Copper deposits: Geologic Setting and Characteristics. CCOP Technical Publication 14. Bangkok, 89 pages

Subong, E, Arriola, E and McManus, S. 2009. "Maximum Continuity and Search Ellipse Parameters for Apex Mine, Maco, Mindanao, Philippines". ASVITSG and APEX mining internal Report.

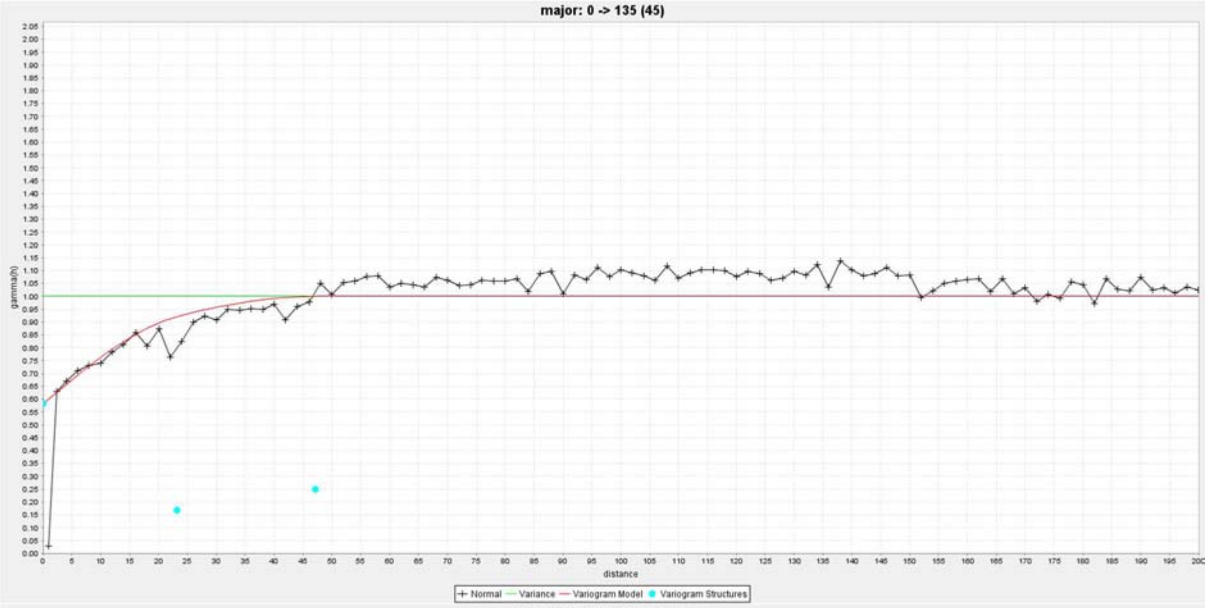
The Philippine Stock Exchange., 10 December 2009. Implementing Rules and Regulations for the Philippine Mineral Reporting Code.

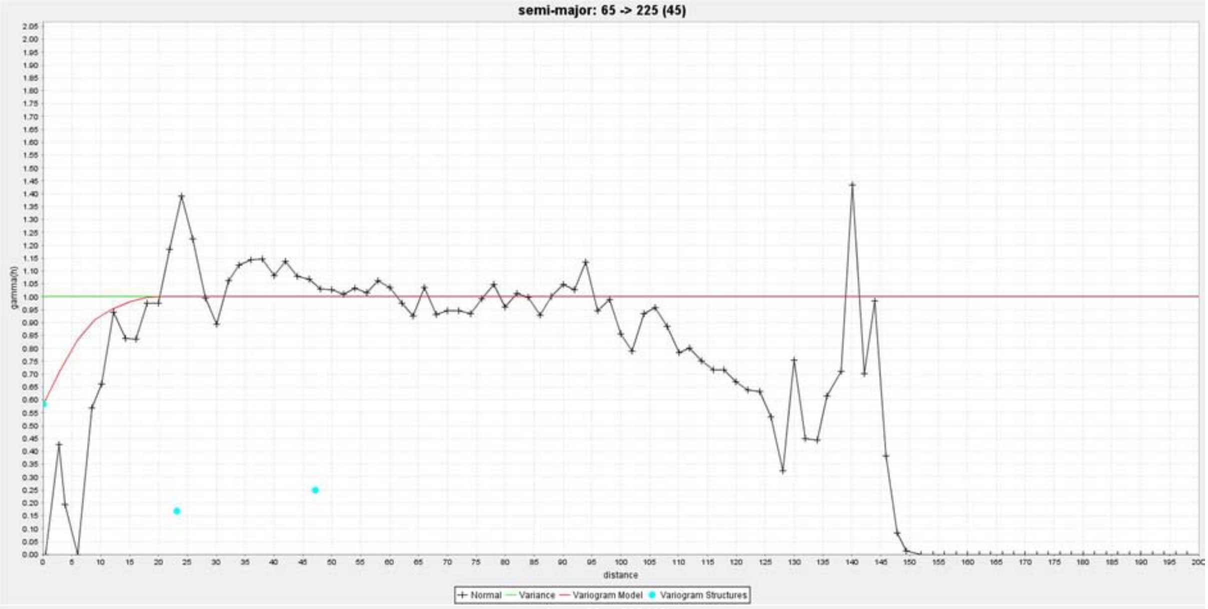
Ward, H. J., (1958) – Albite porphyries as a guide to gold ore, Econ. Geologist v. 53. Pp. 754-756.

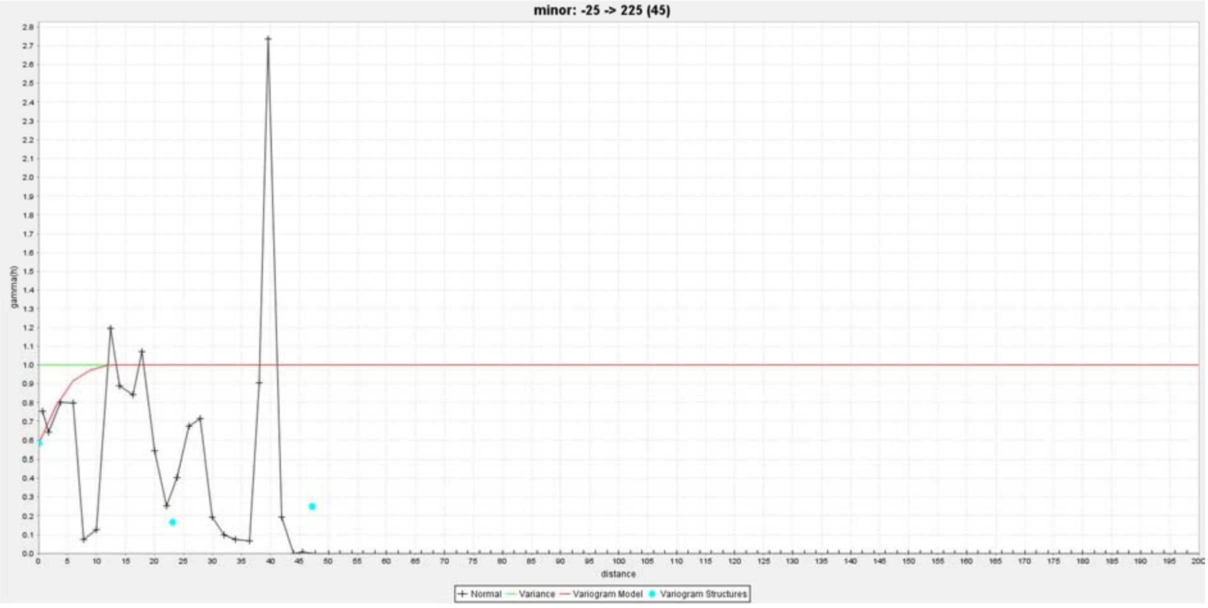
20.0 APPENDIX

VARIOGRAM MODELS

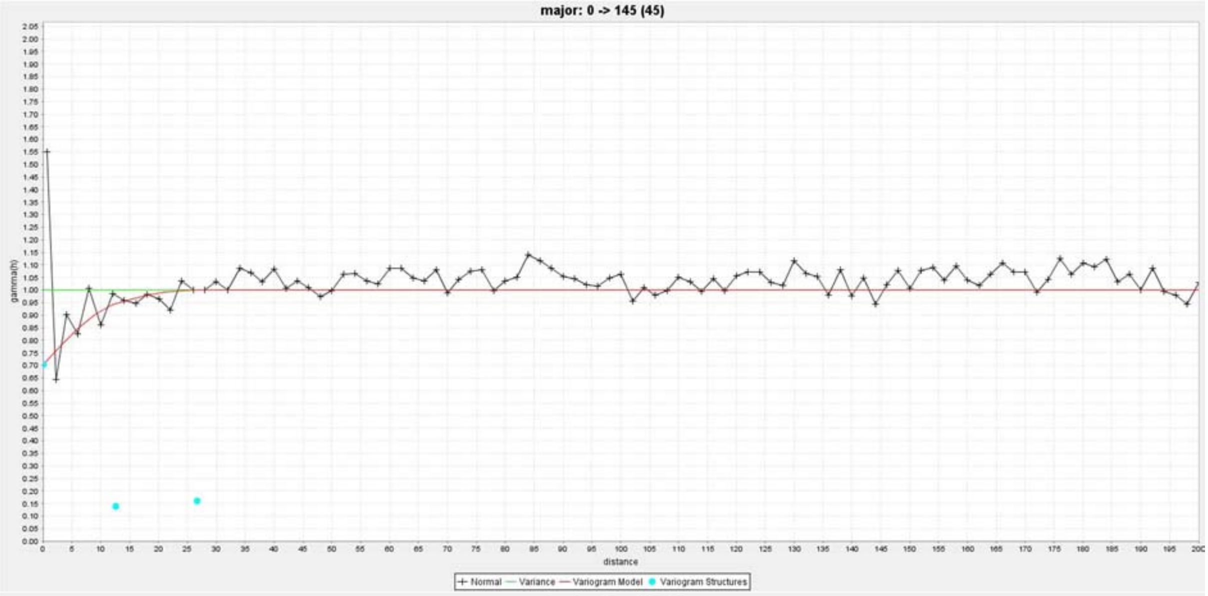
BONANZA MV

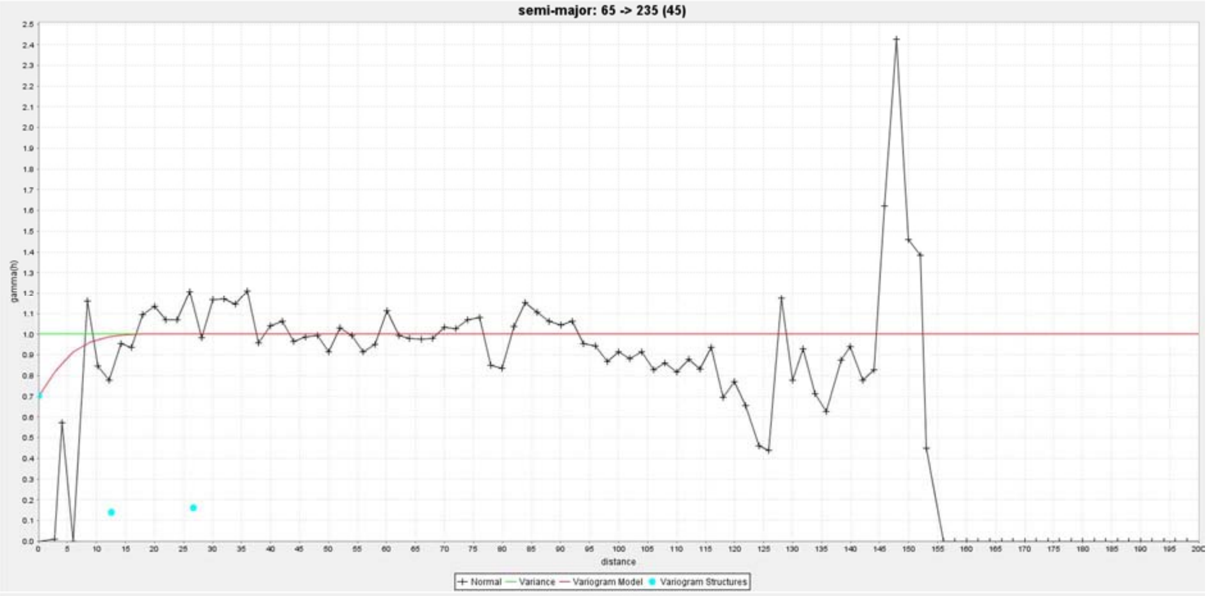

major: 0 -> 135 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

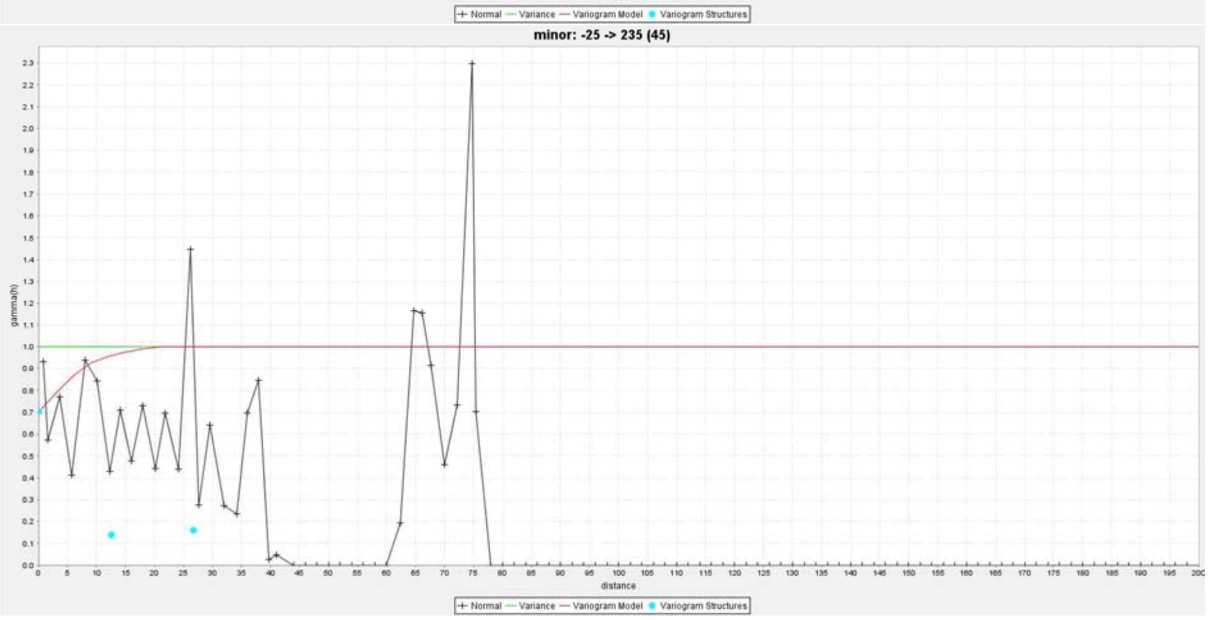

semi-major: 65 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -25 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

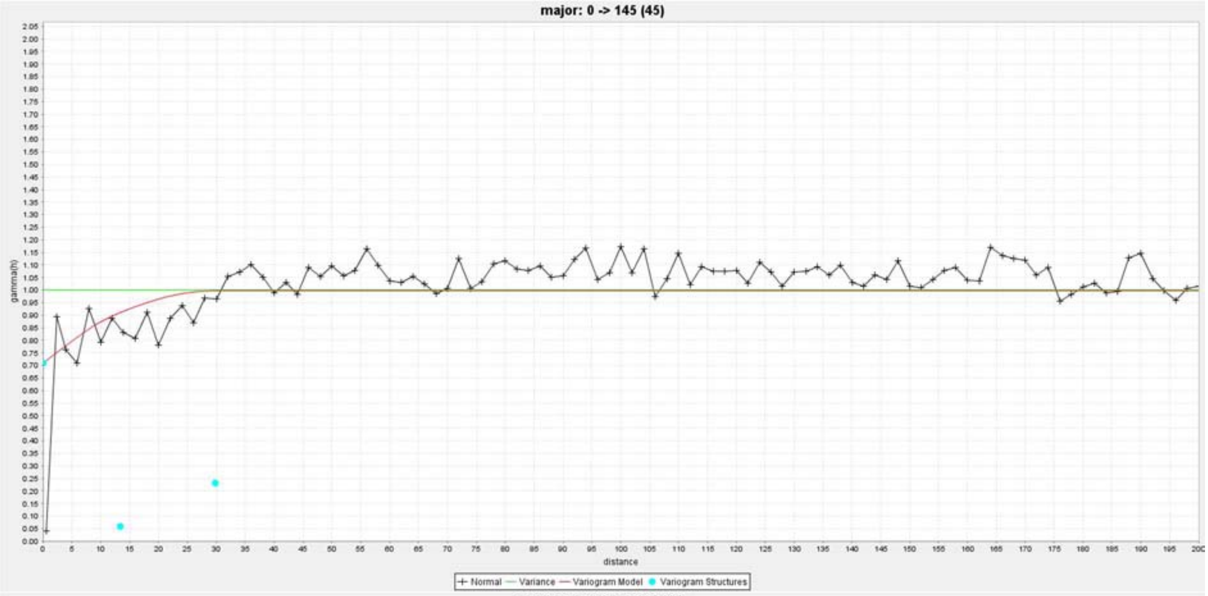
BONANZA FW

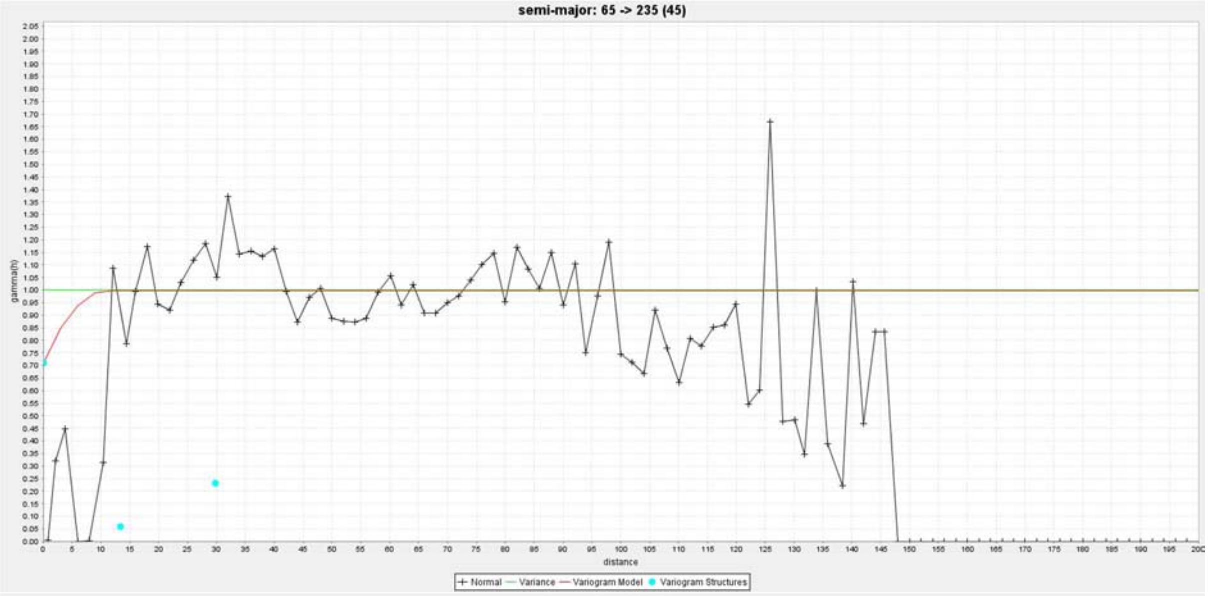

major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

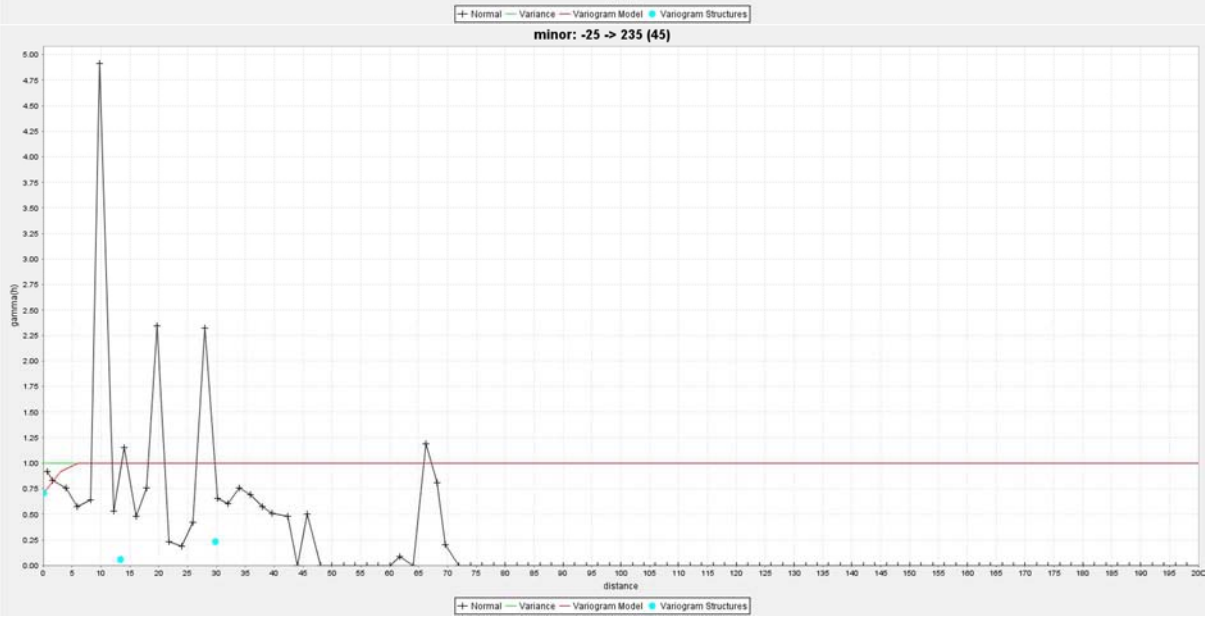

semi-major: 65 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -25 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

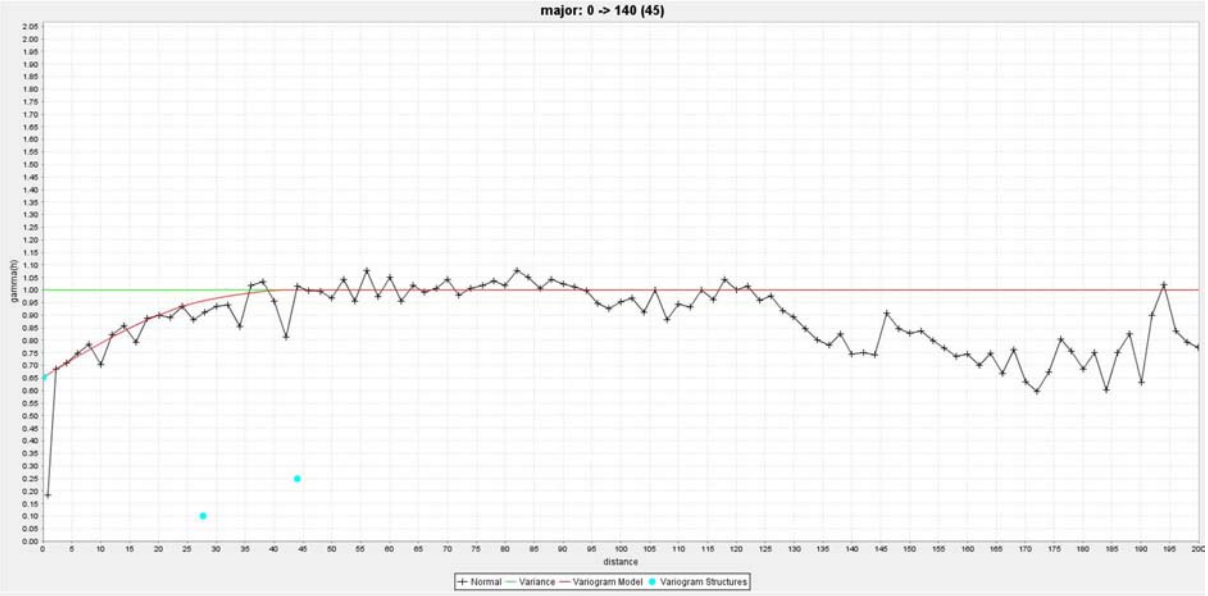
BONANZA HW

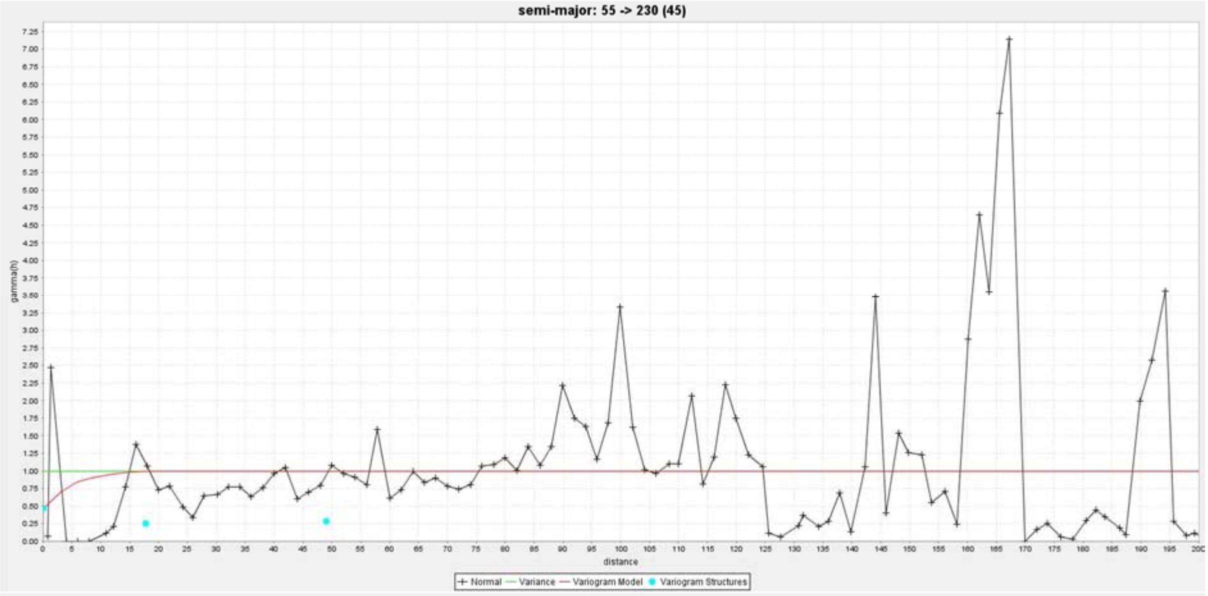

major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

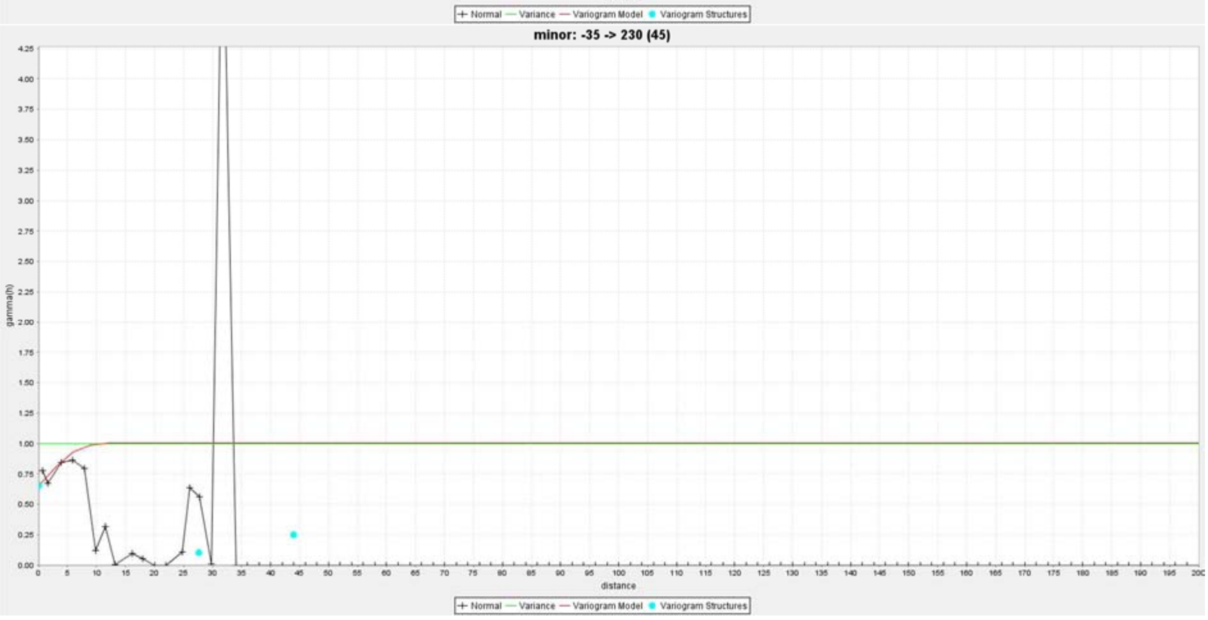

semi-major: 65 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -25 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

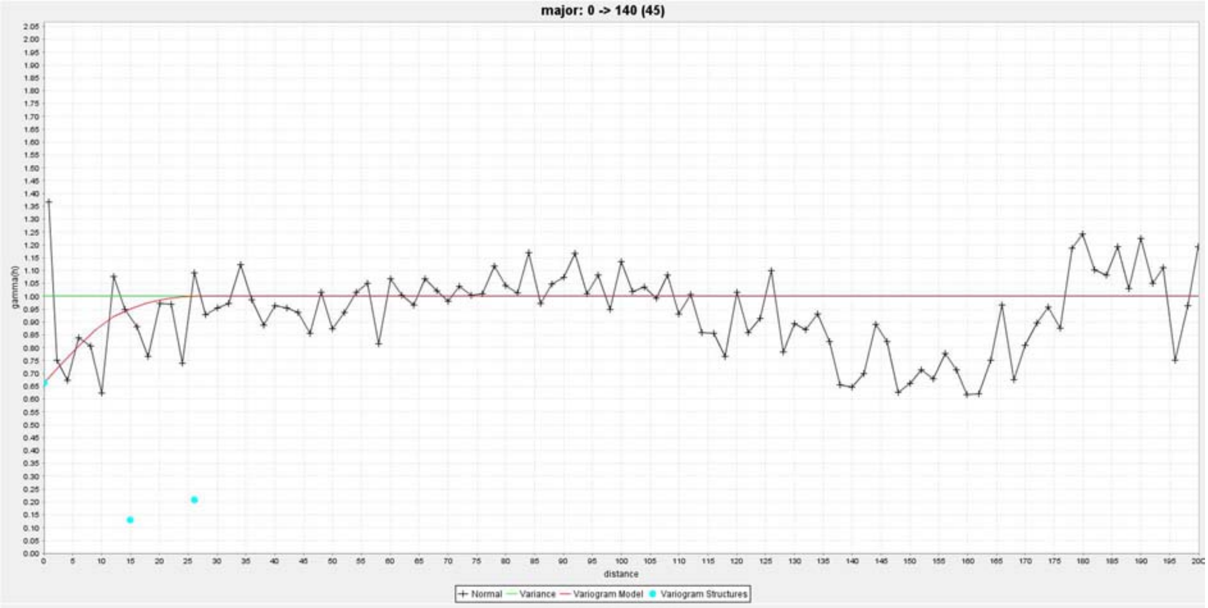
BONANZA HWS MV

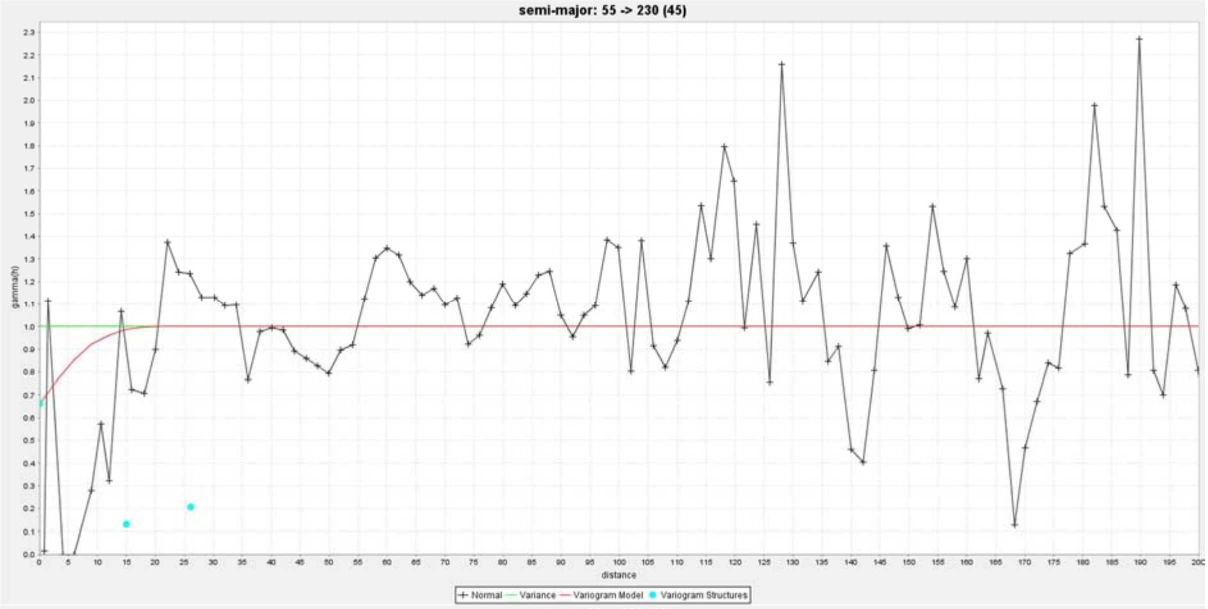


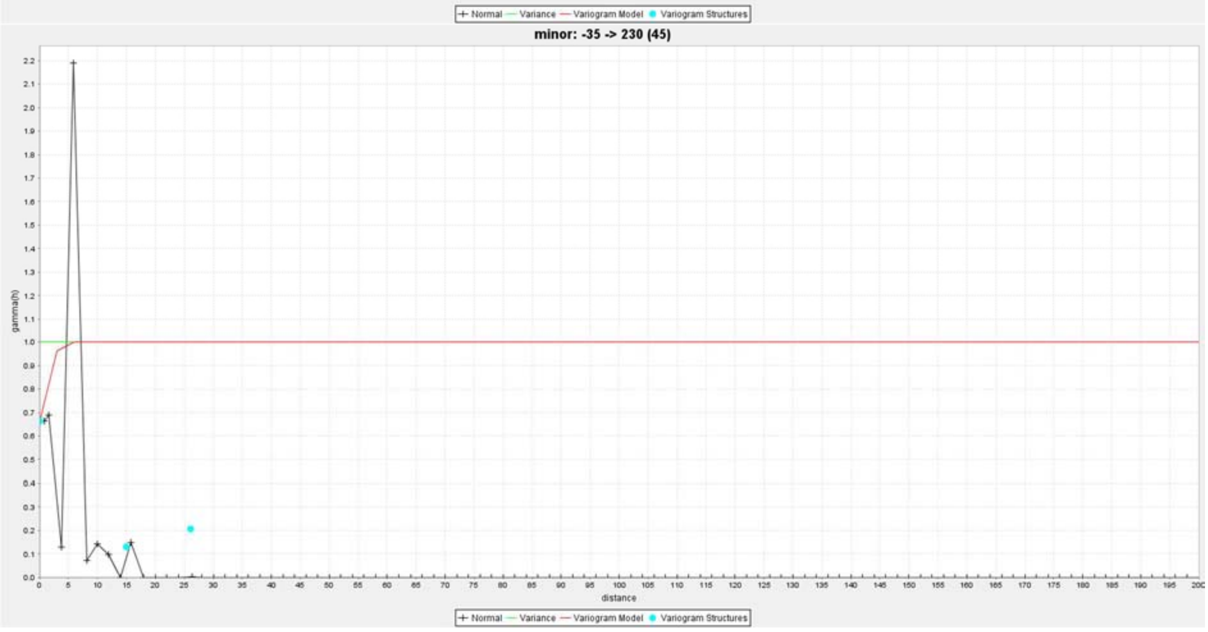




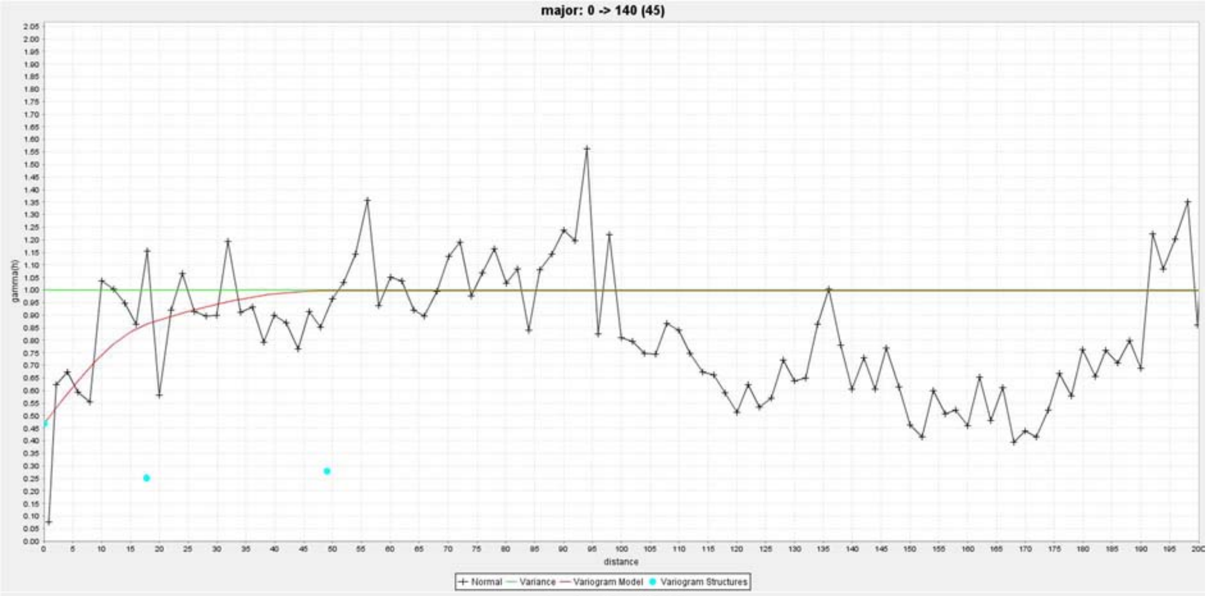
BONANZA HWS FW

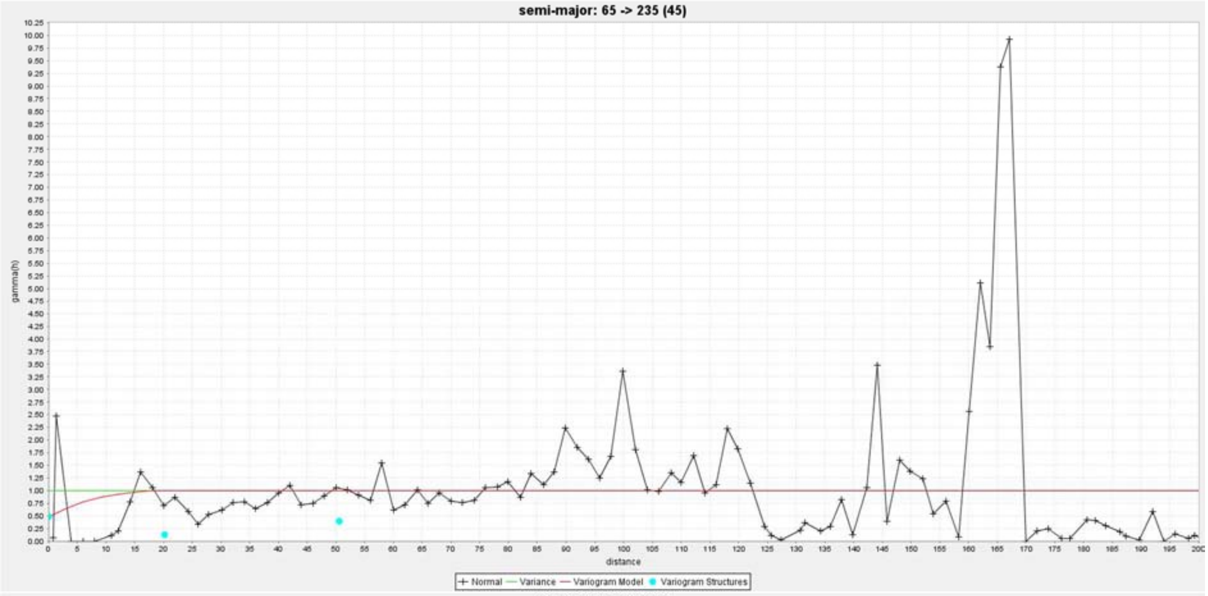


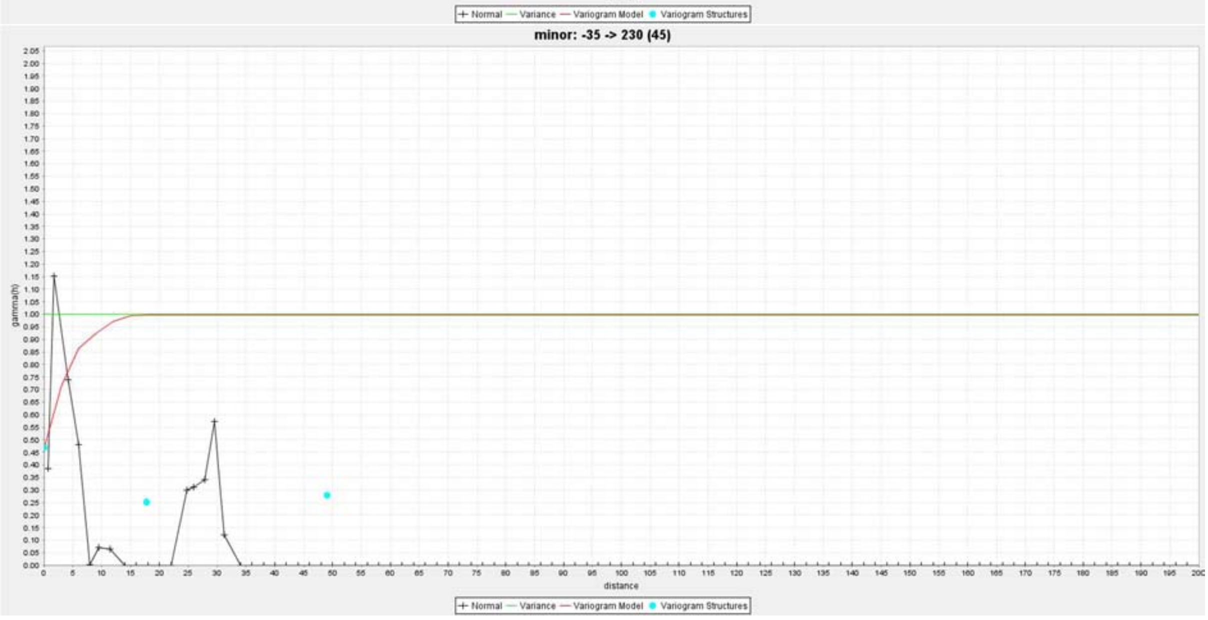




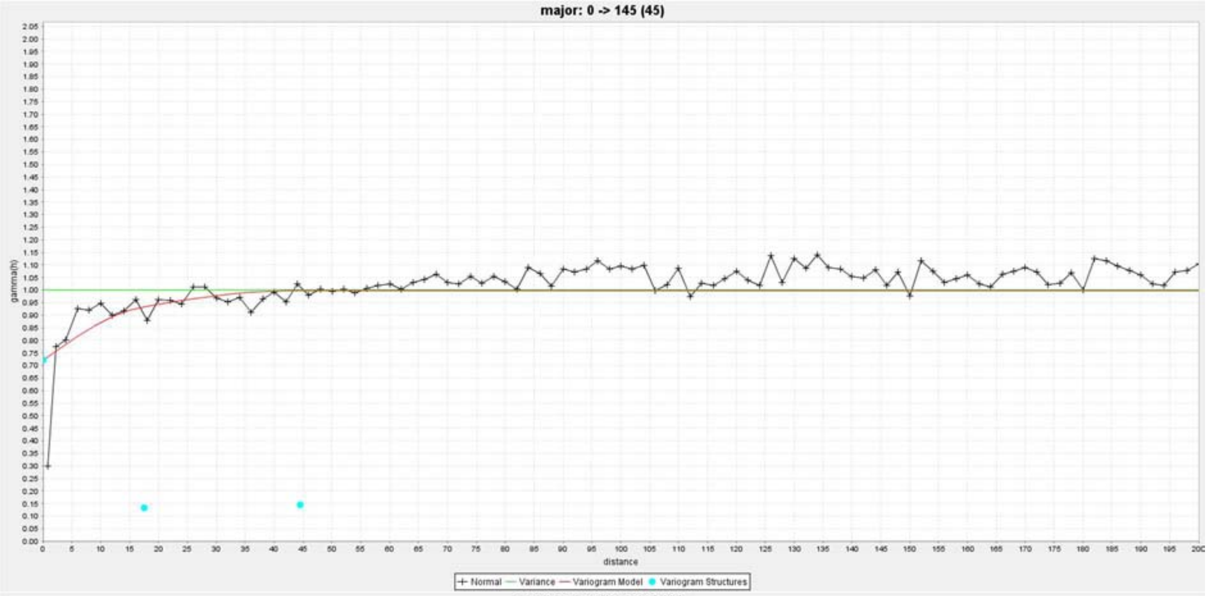
BONANZA HWS HW

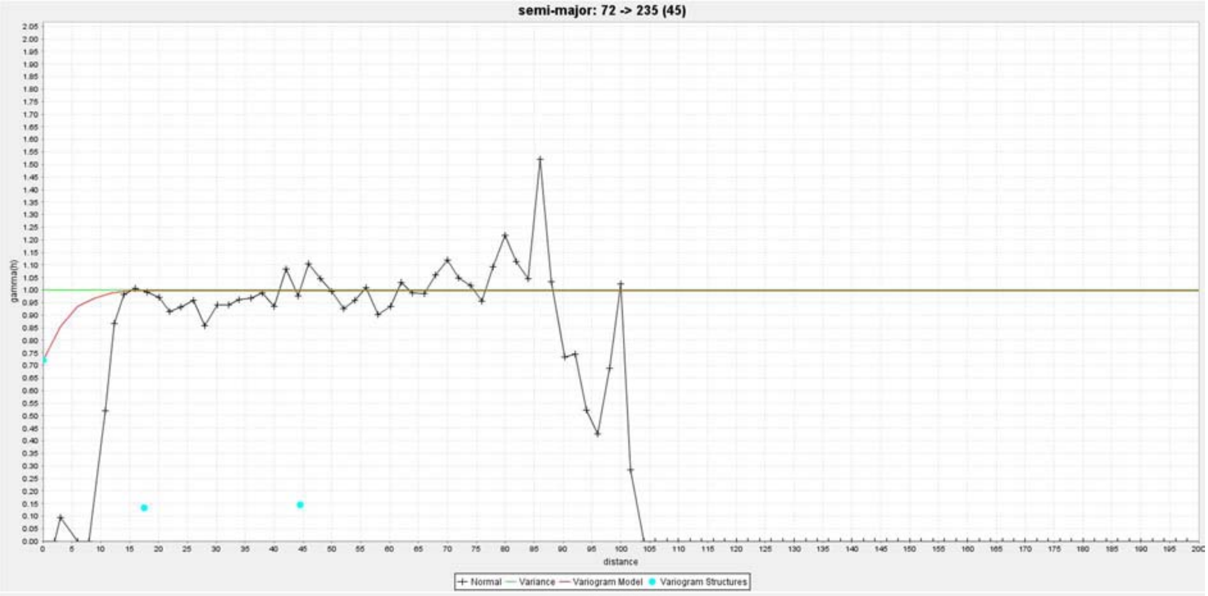


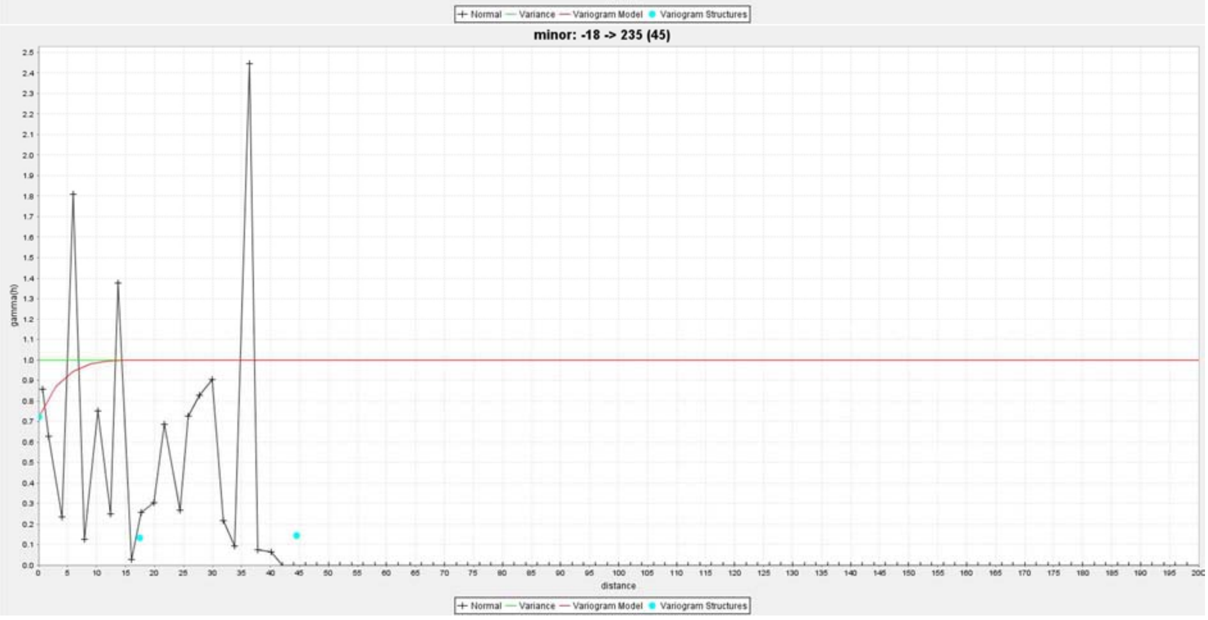




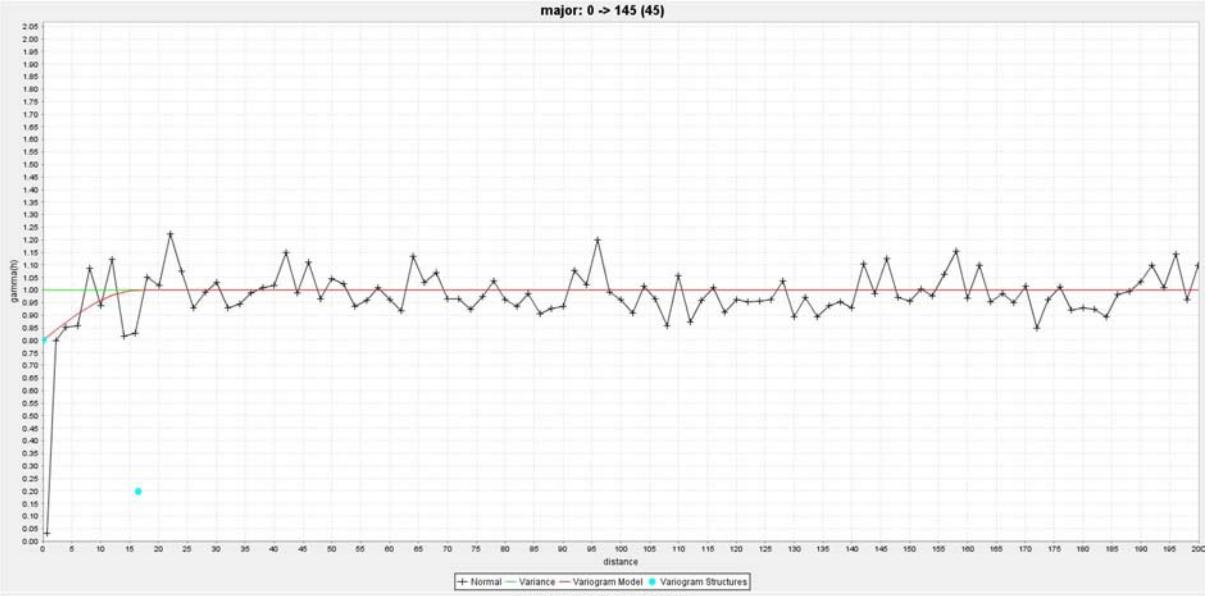
MASARA MV


major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

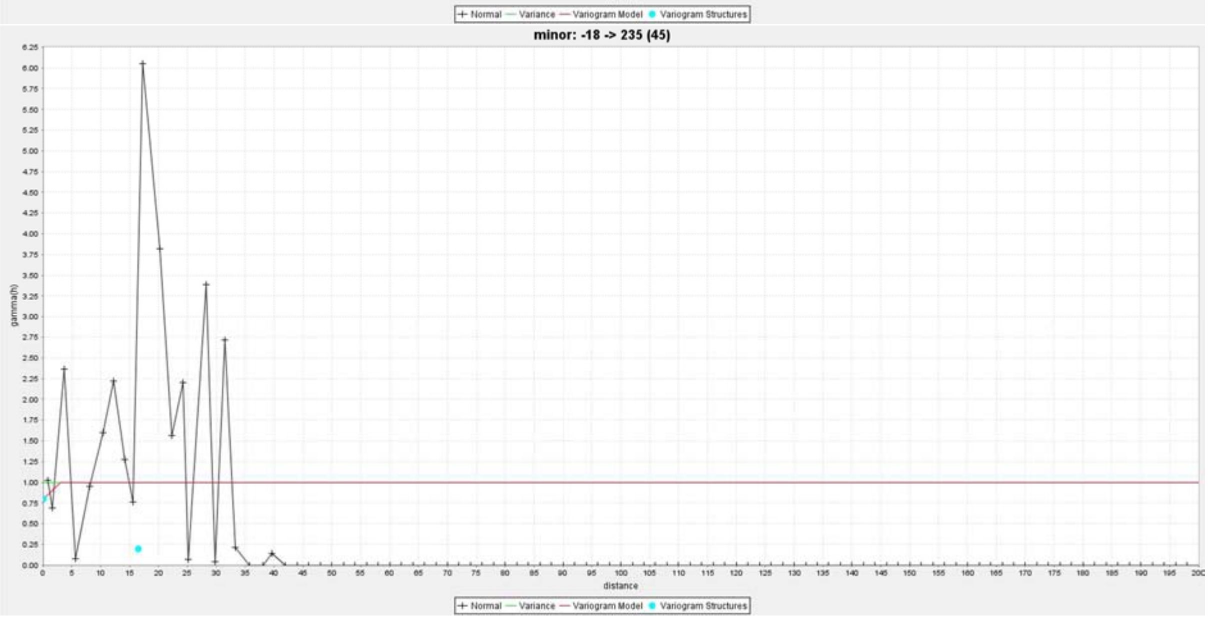

semi-major: 72 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -18 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

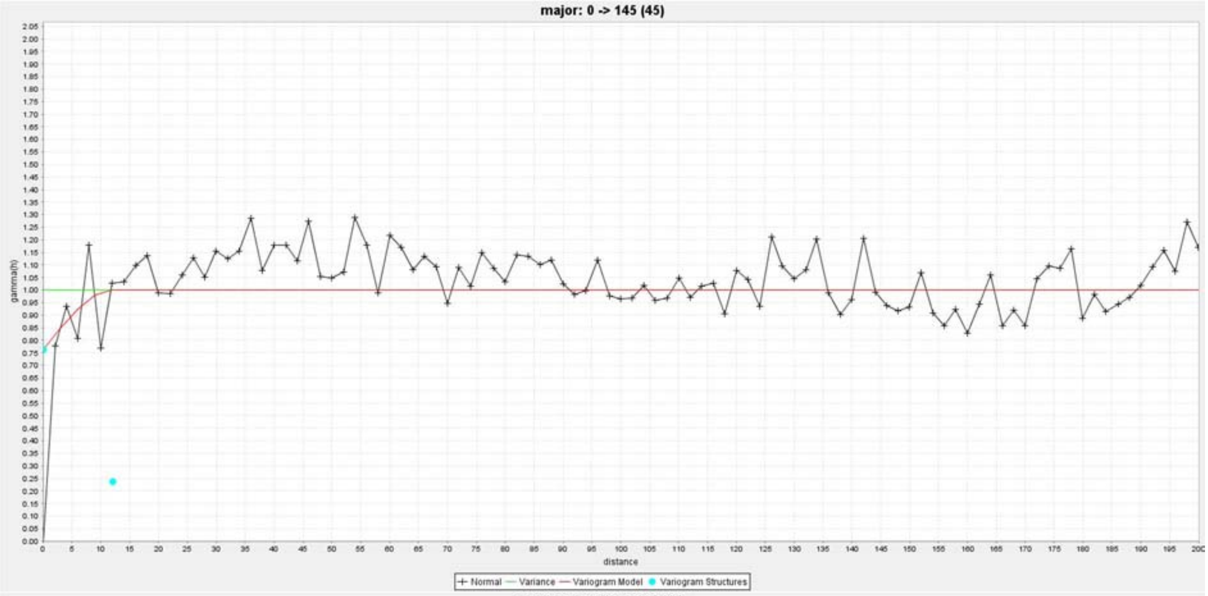
MASARA FW

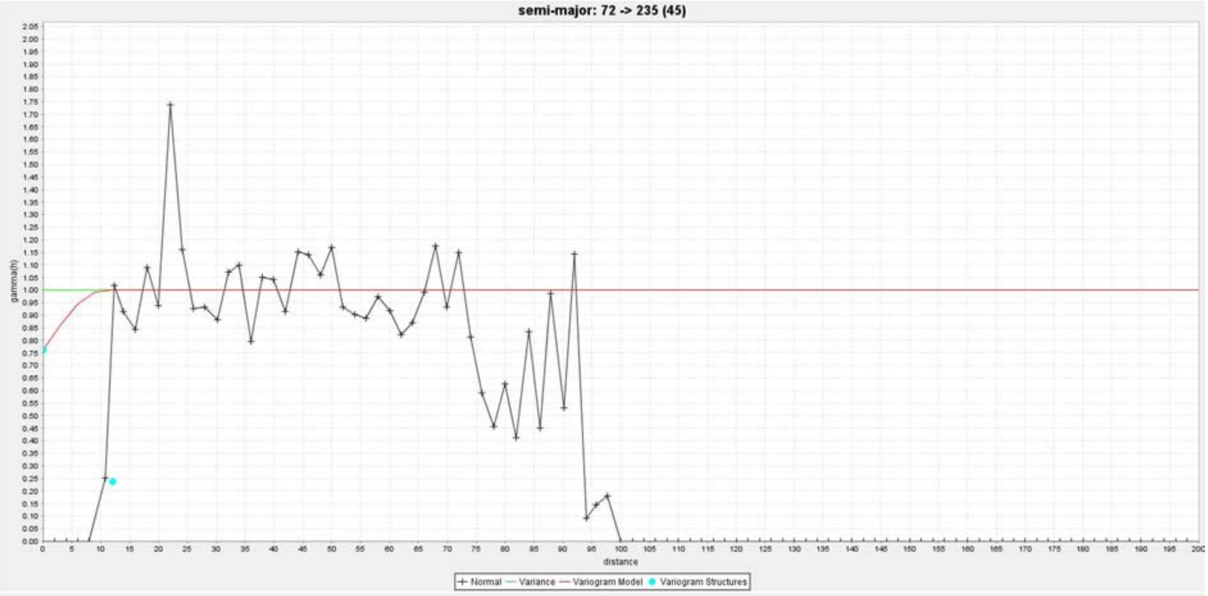

major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

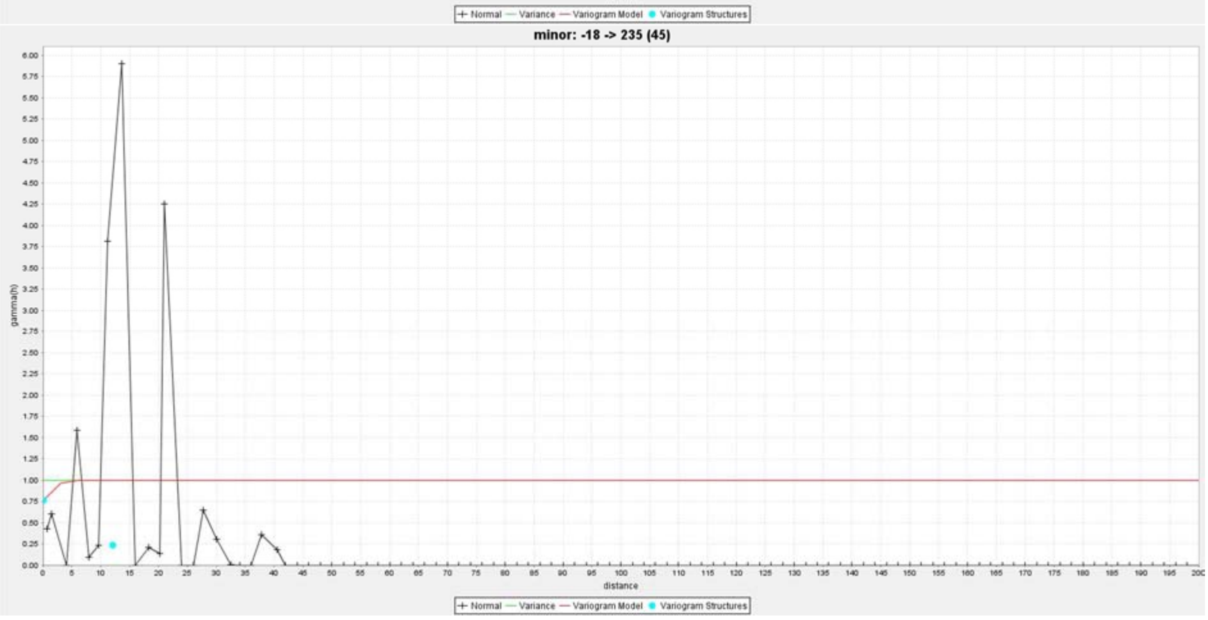

semi-major: 72 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -18 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

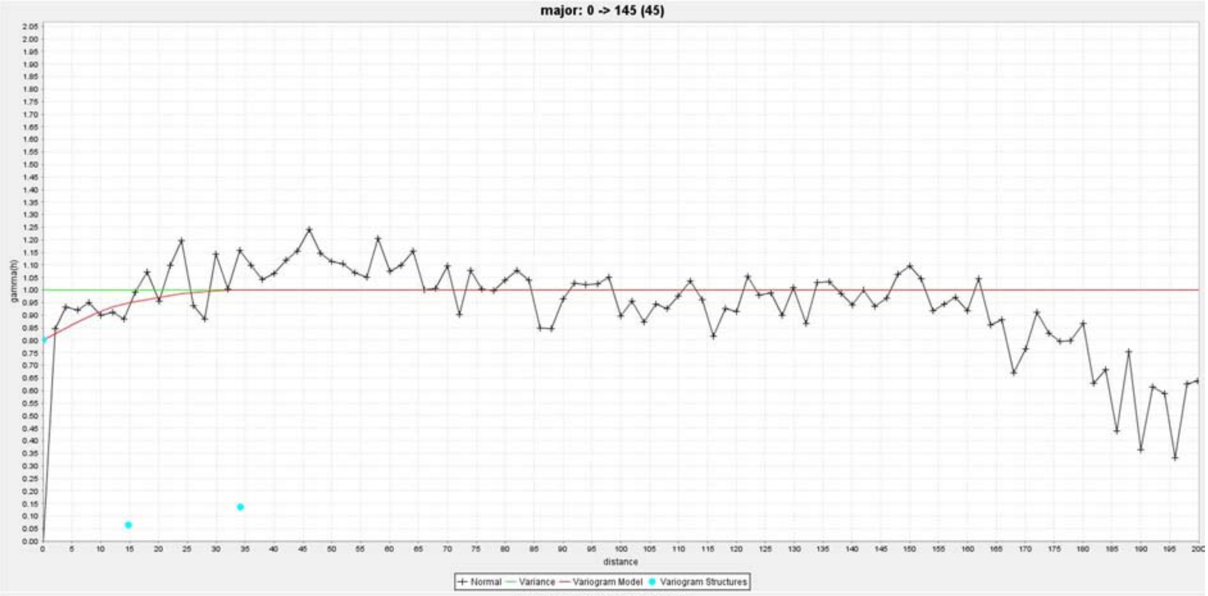
MASARA HW

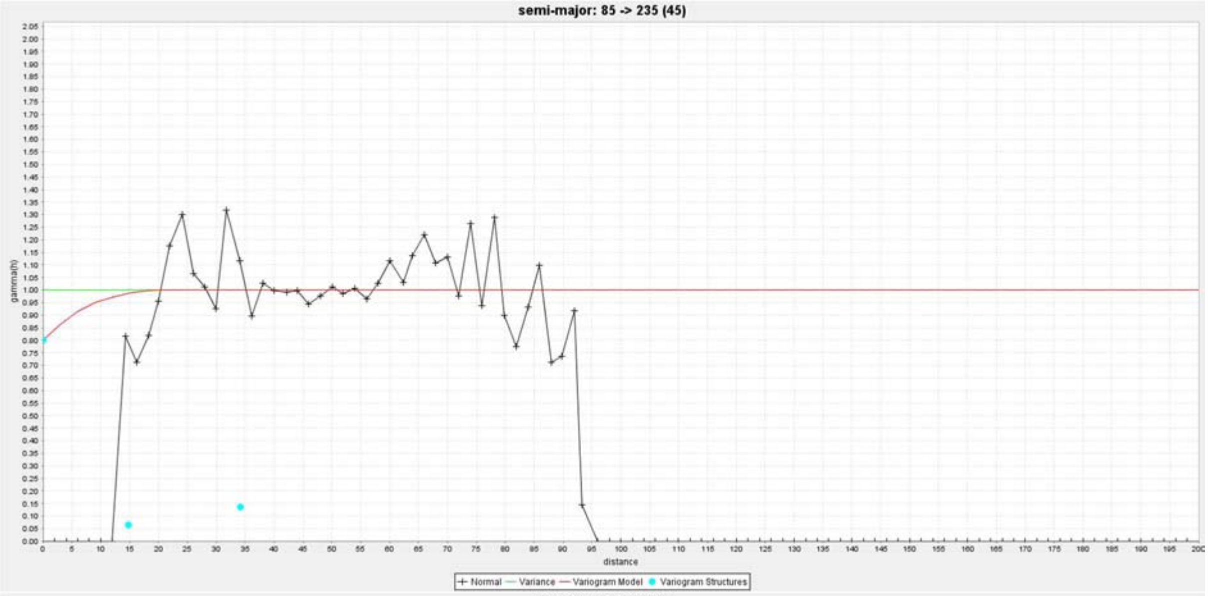

major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

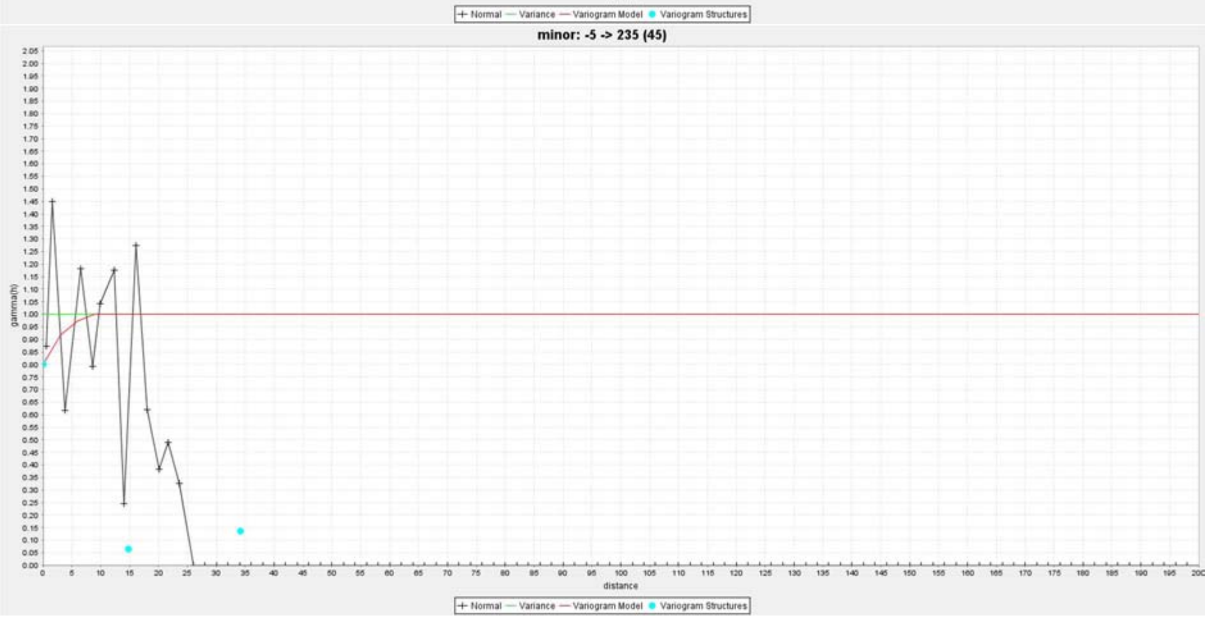

semi-major: 72 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -18 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

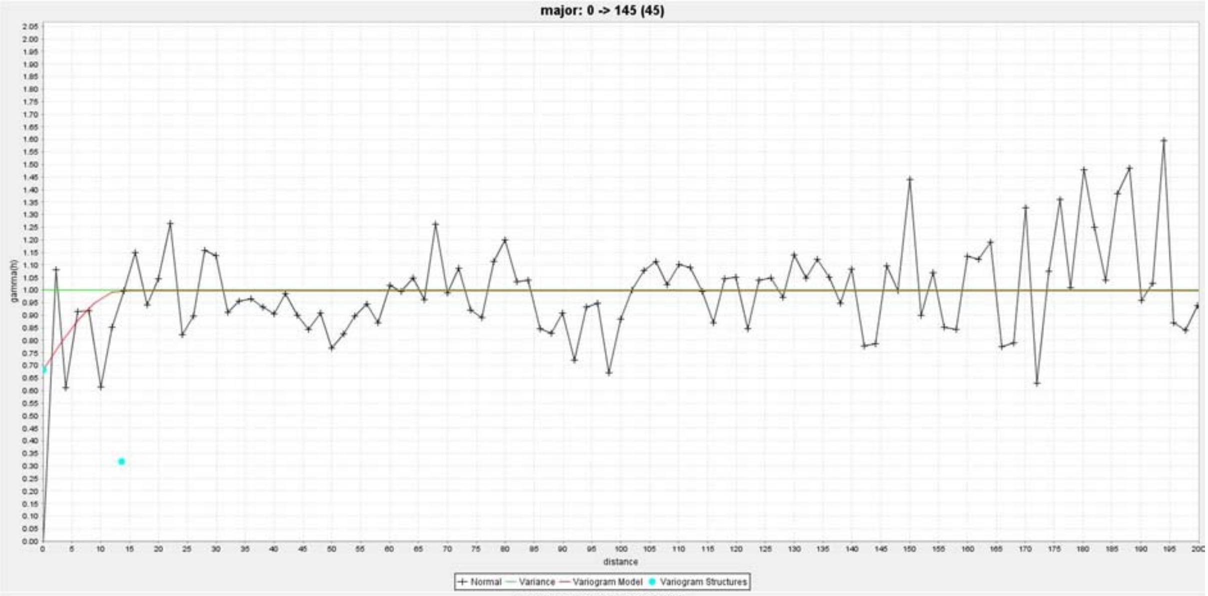
BIBAK MV

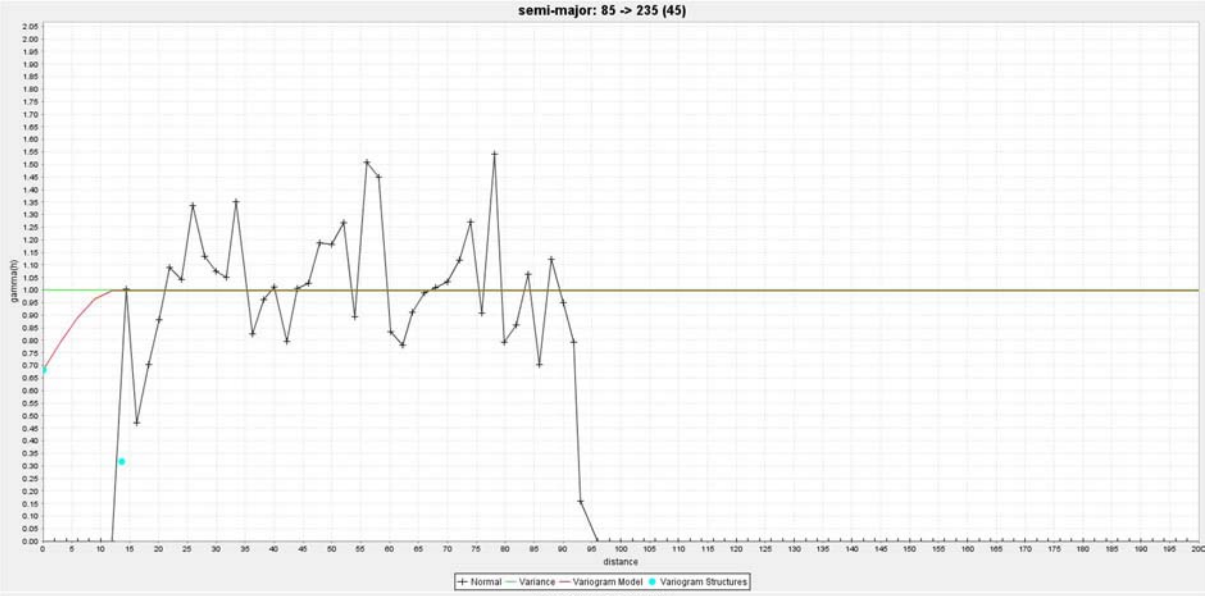

major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

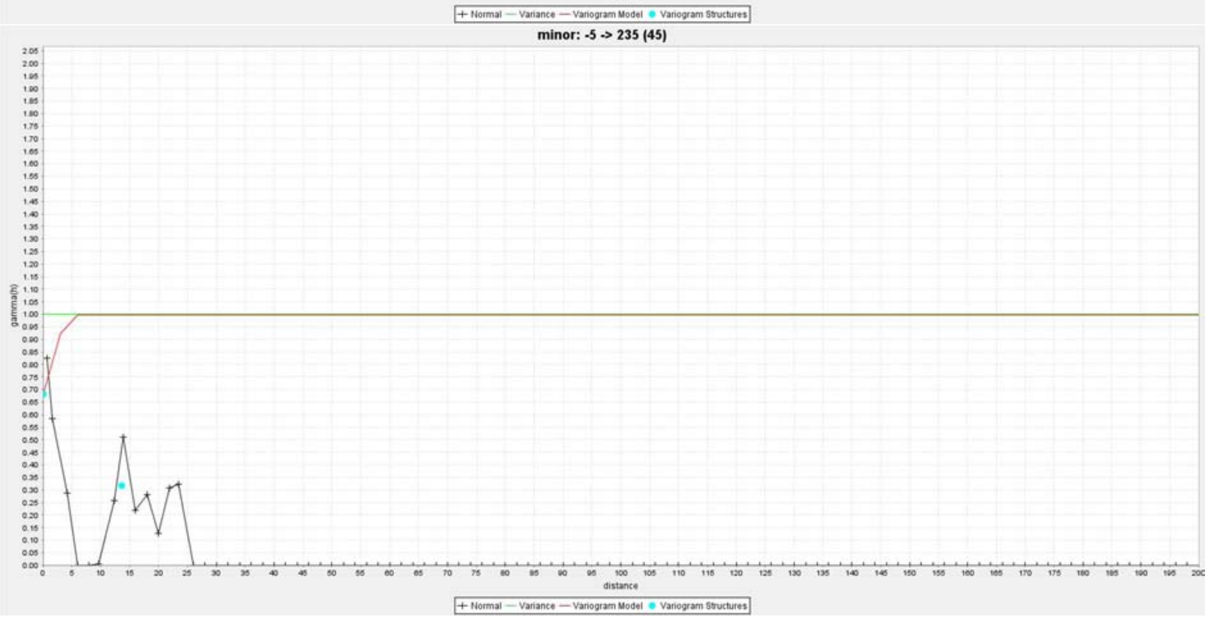

semi-major: 85 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -5 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

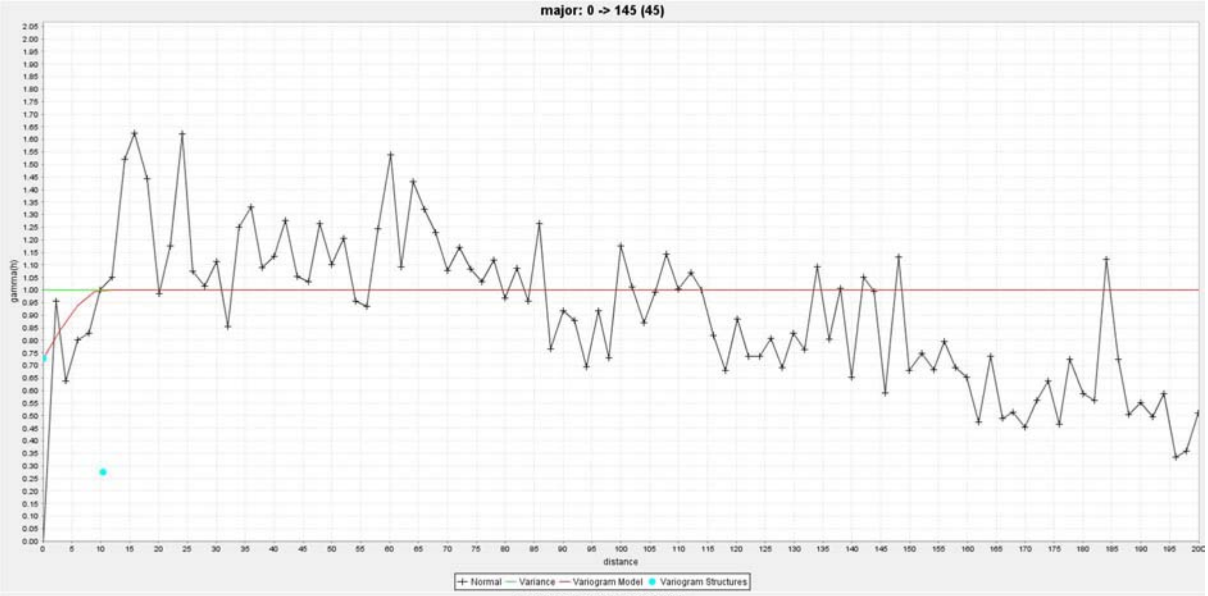
BIBAK FW

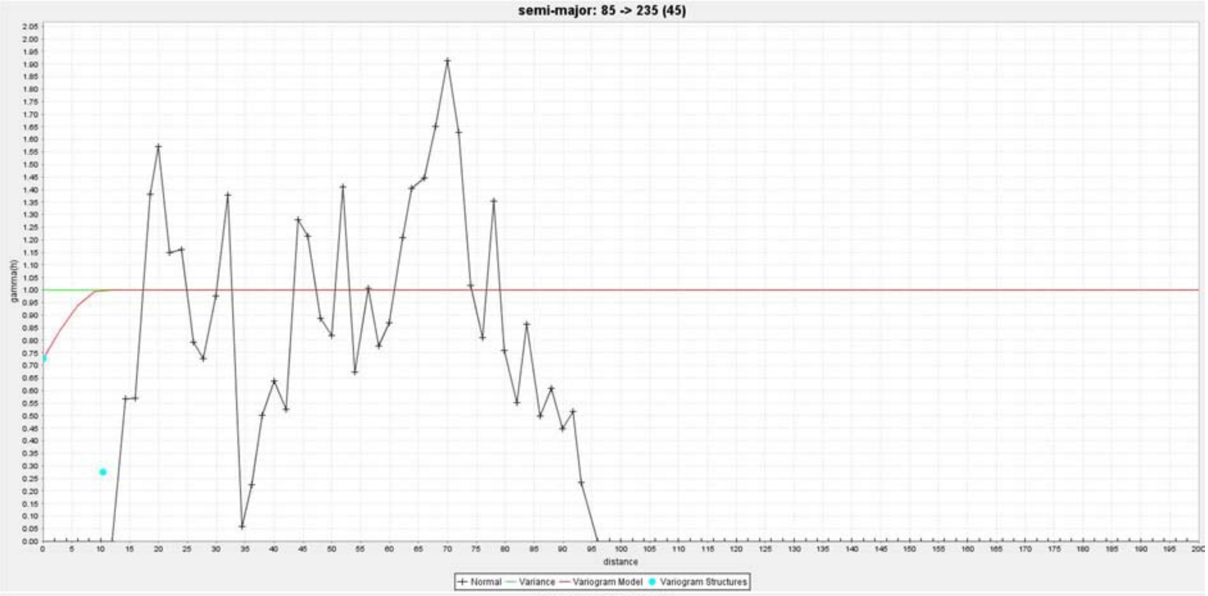

major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

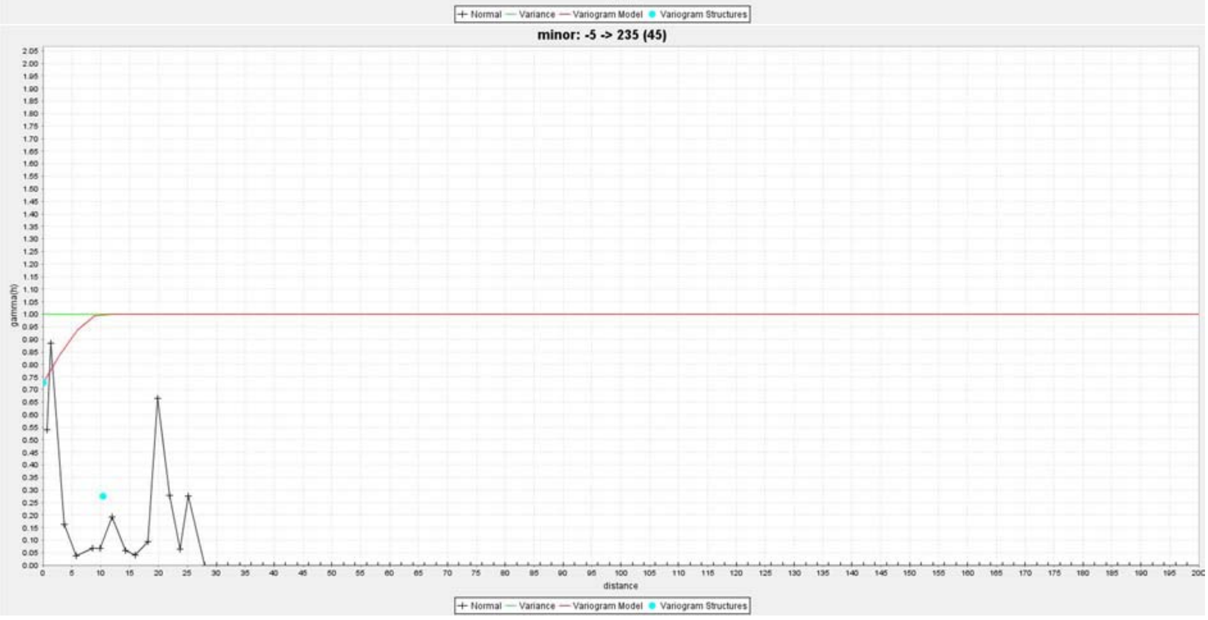

semi-major: 85 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -5 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

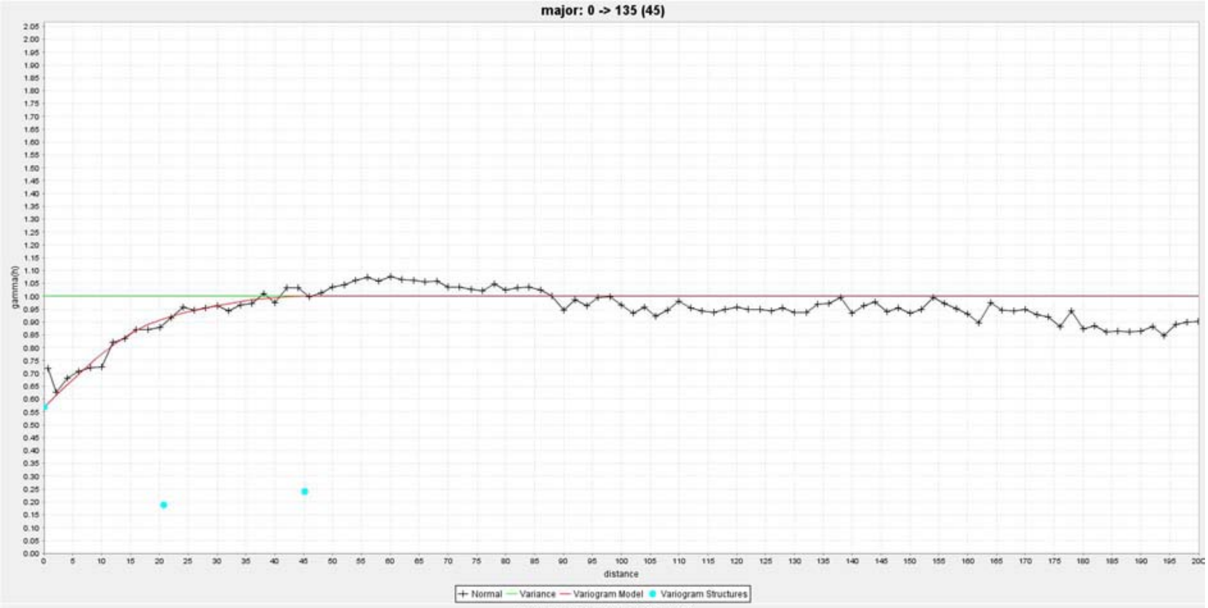
BIBAK HW

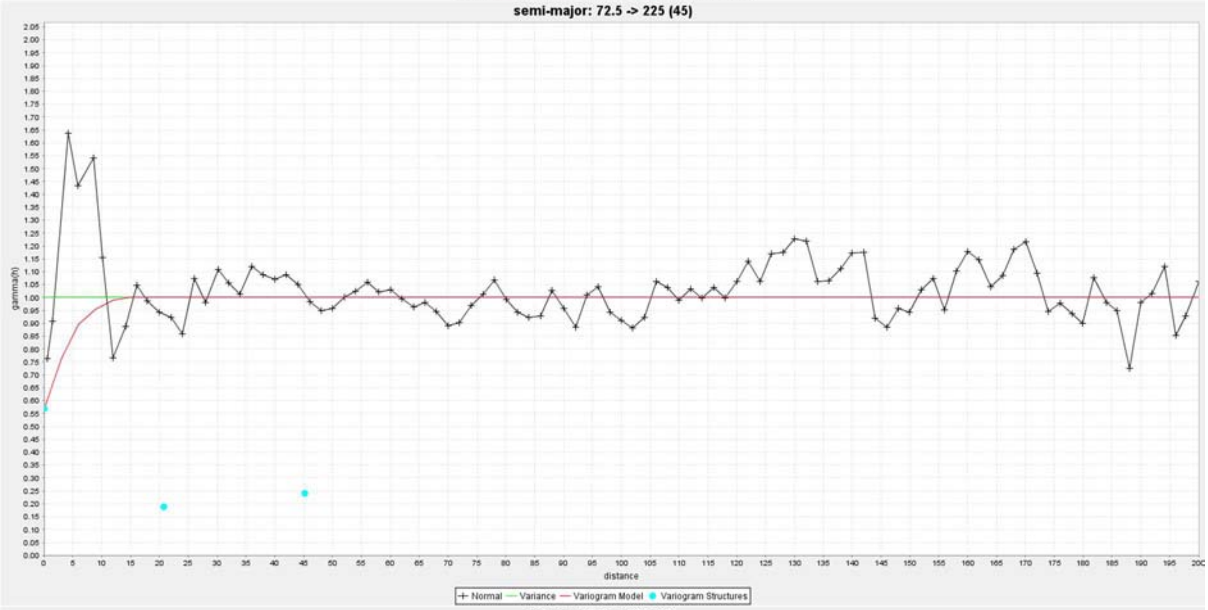

major: 0 -> 145 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

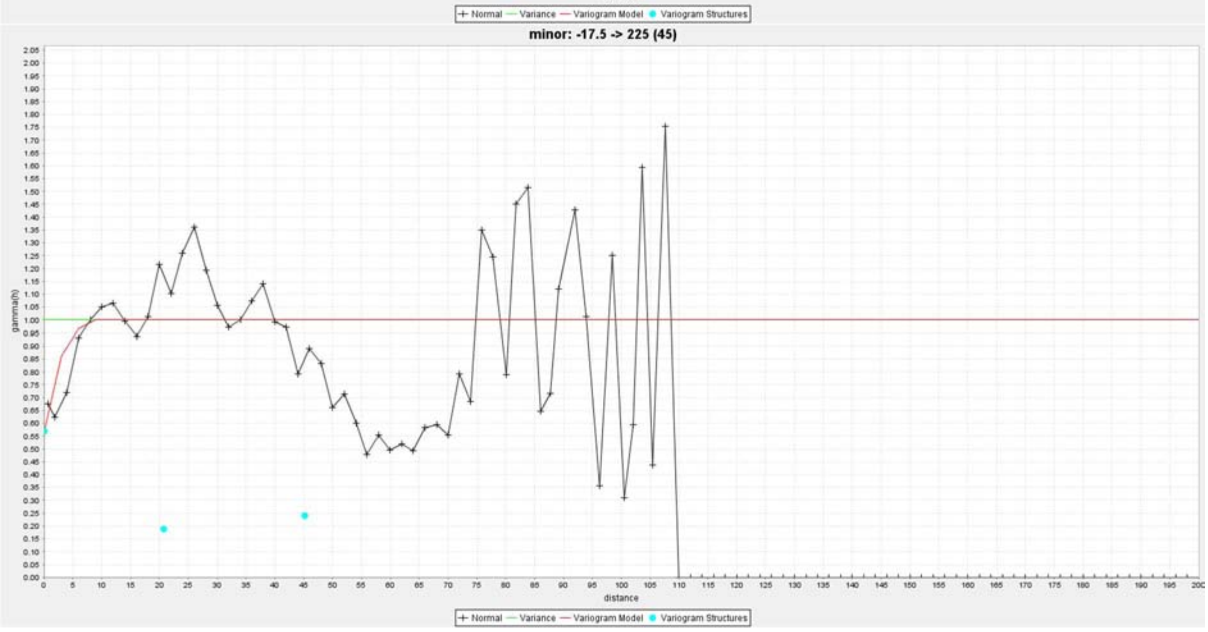

semi-major: 85 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -5 -> 235 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

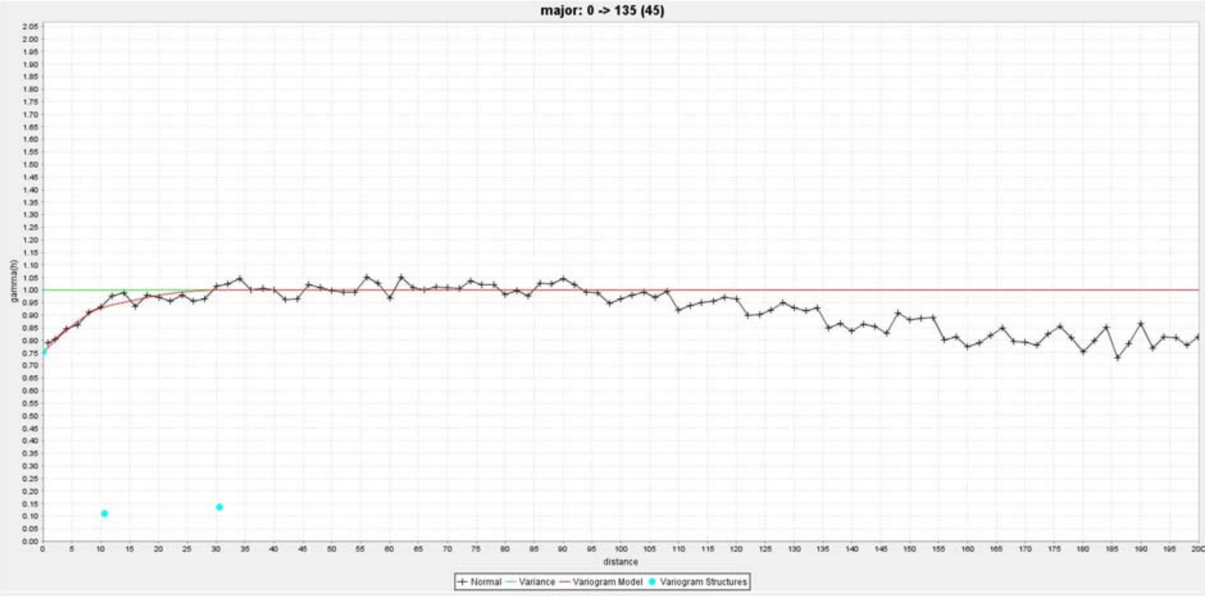
SANDY MV

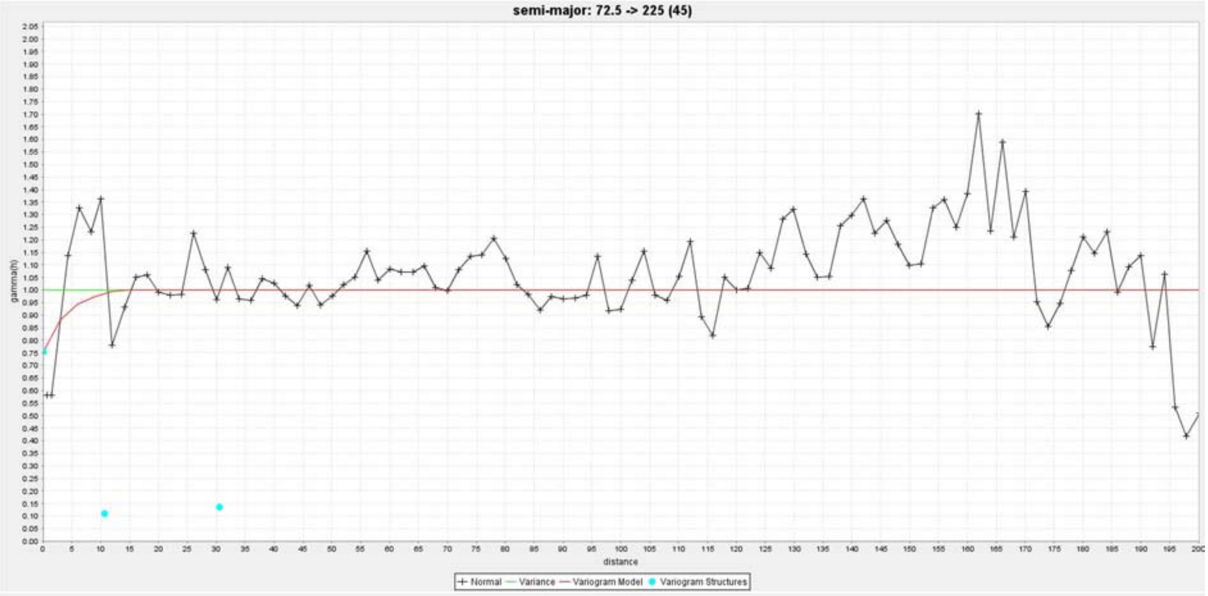

major: 0 -> 135 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

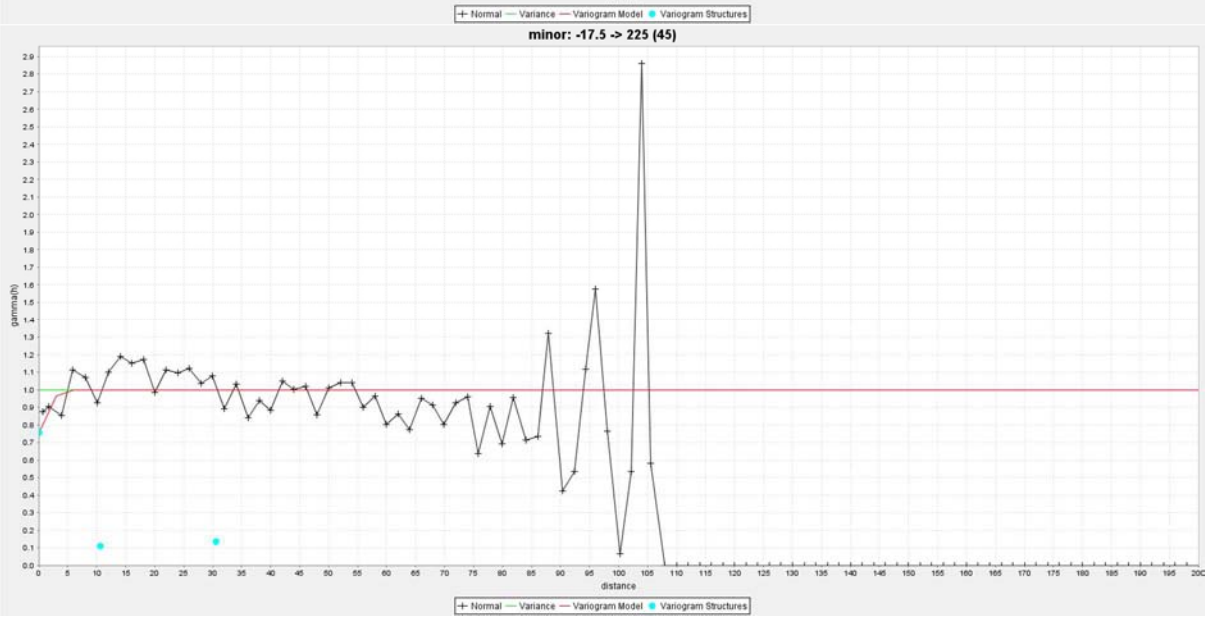

semi-major: 72.5 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -17.5 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

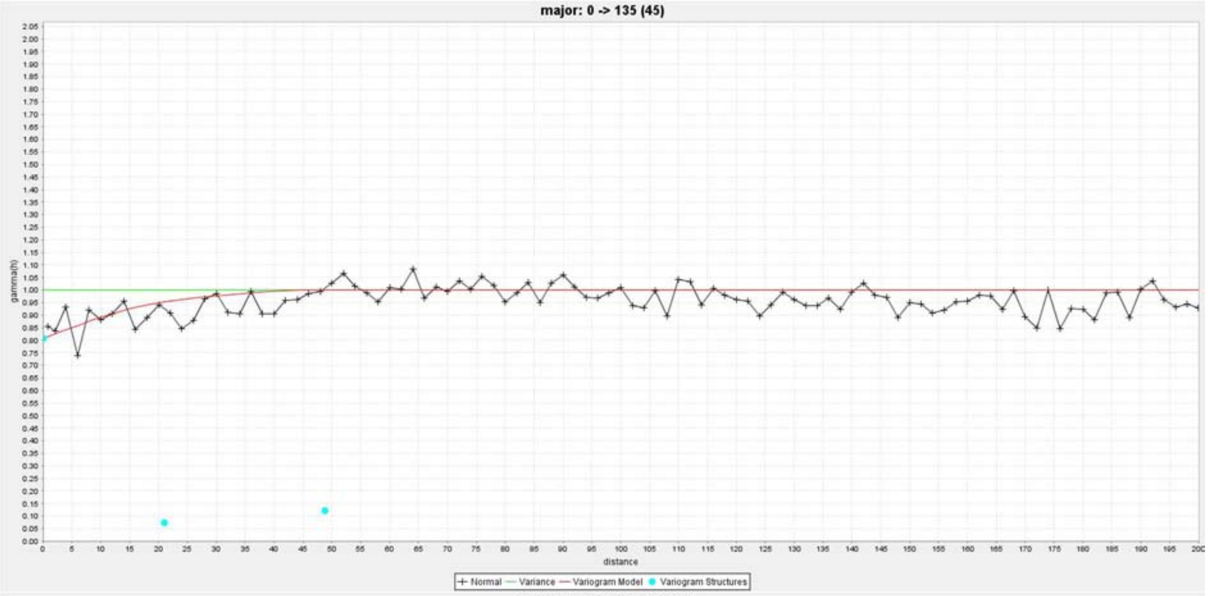
SANDY FW

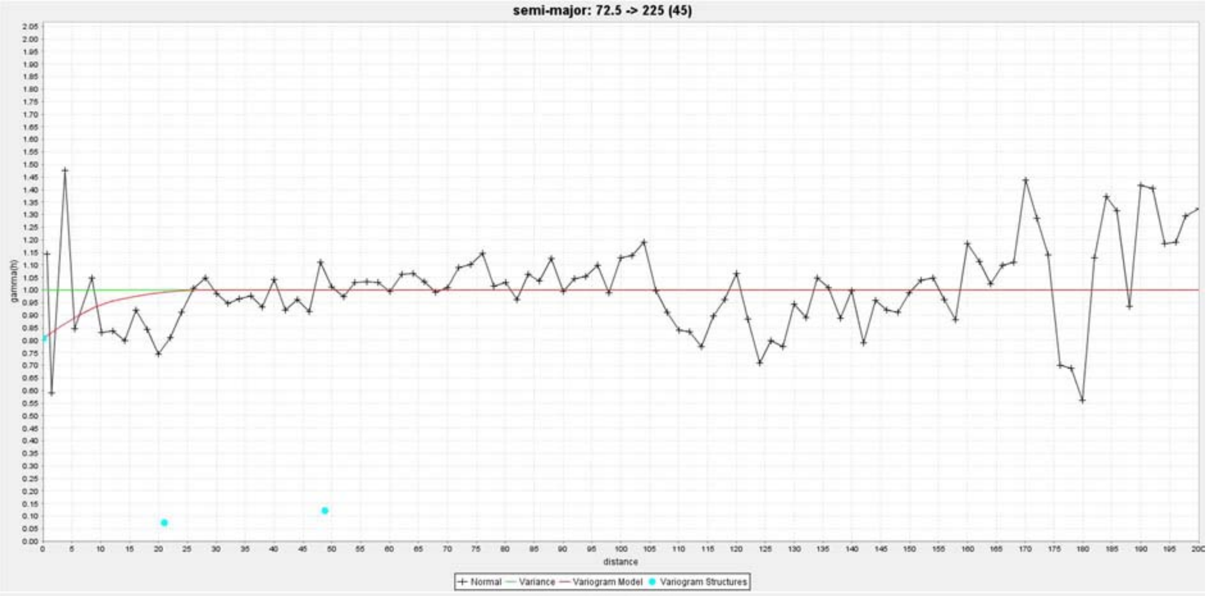

major: 0 -> 135 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

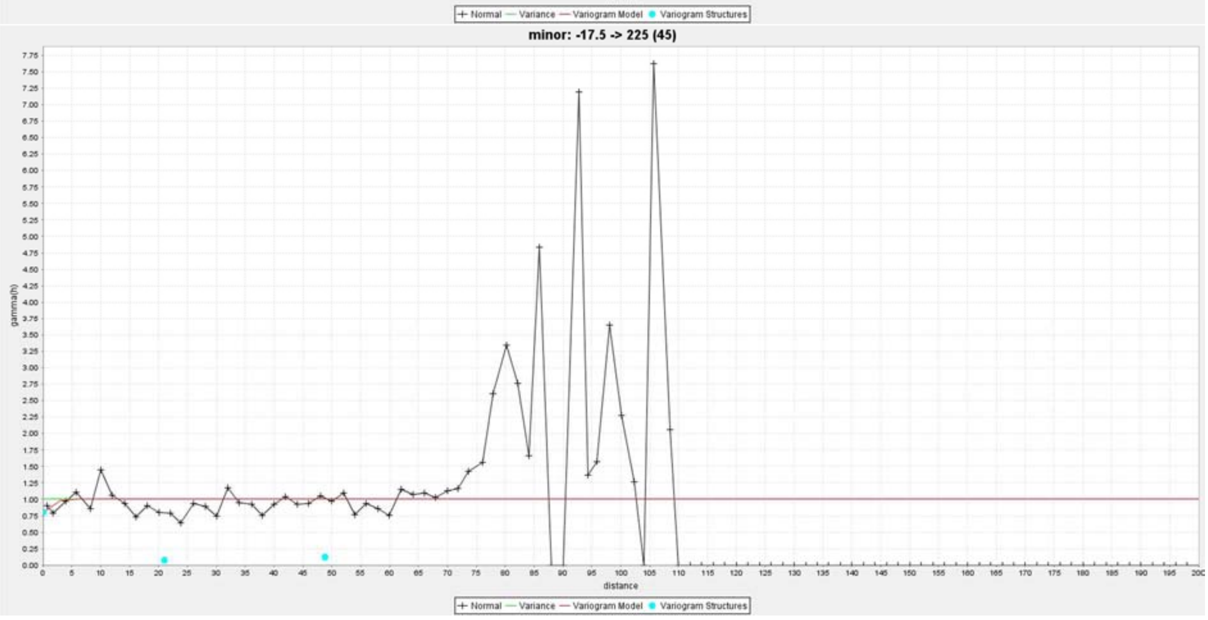

semi-major: 72.5 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -17.5 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

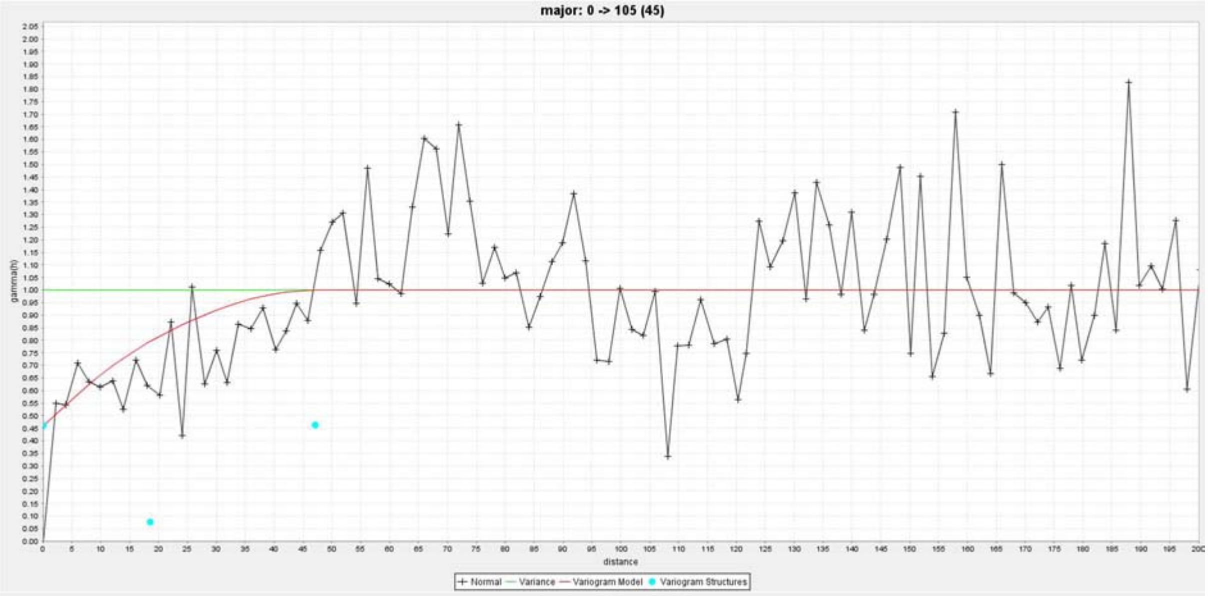
SANDY HW

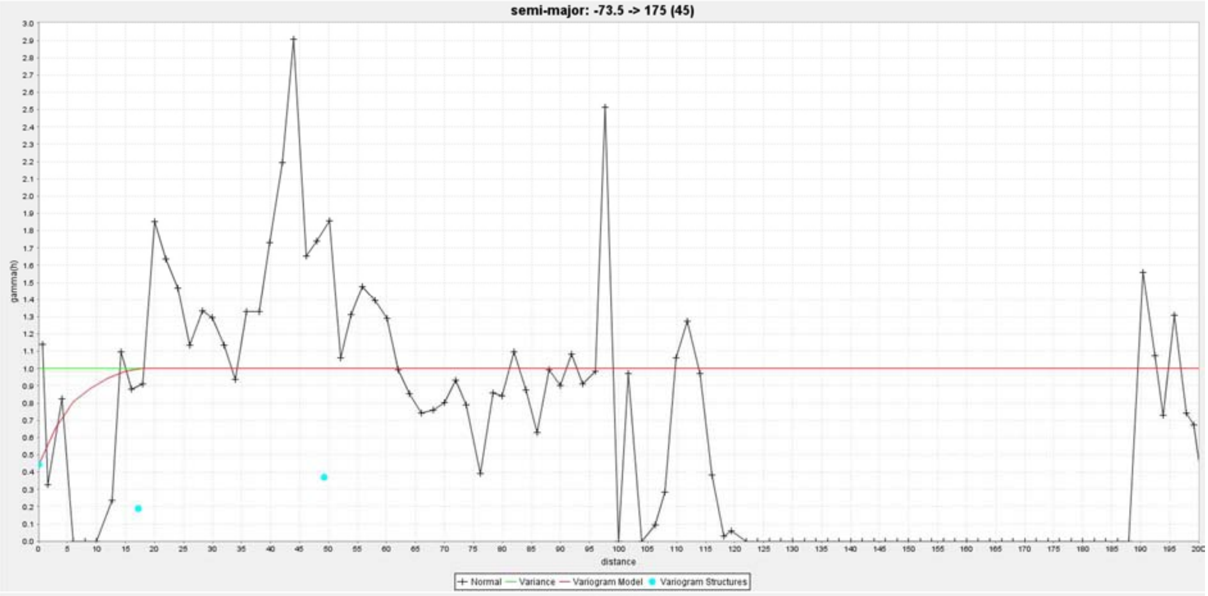

major: 0 -> 135 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

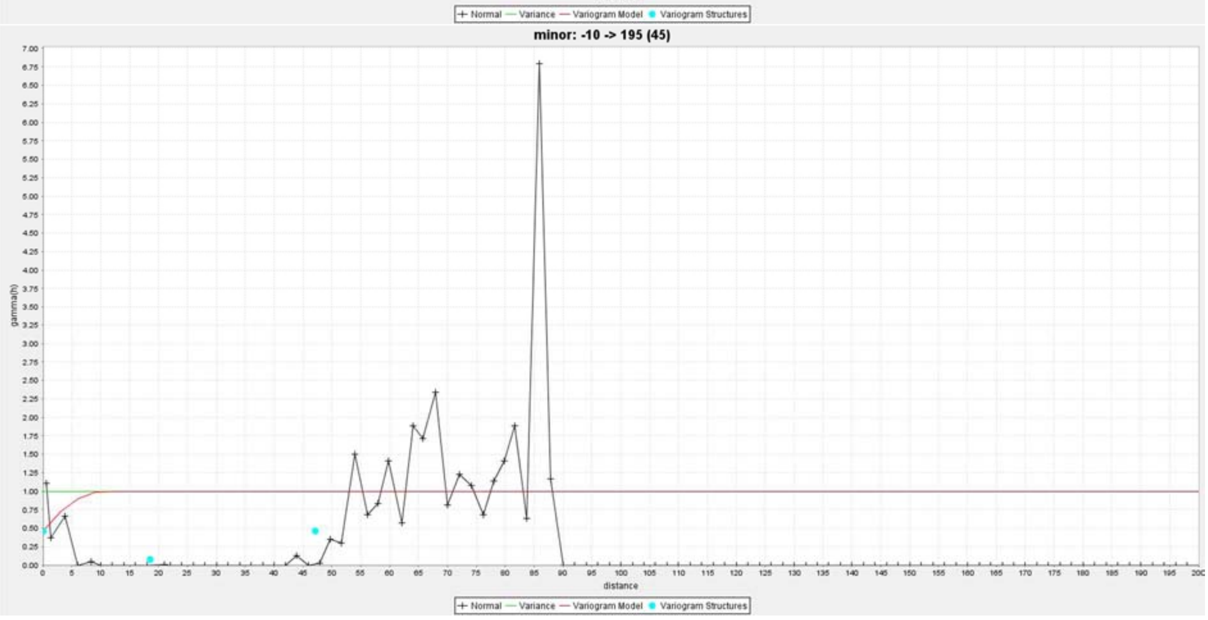

semi-major: 72.5 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -17.5 -> 225 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

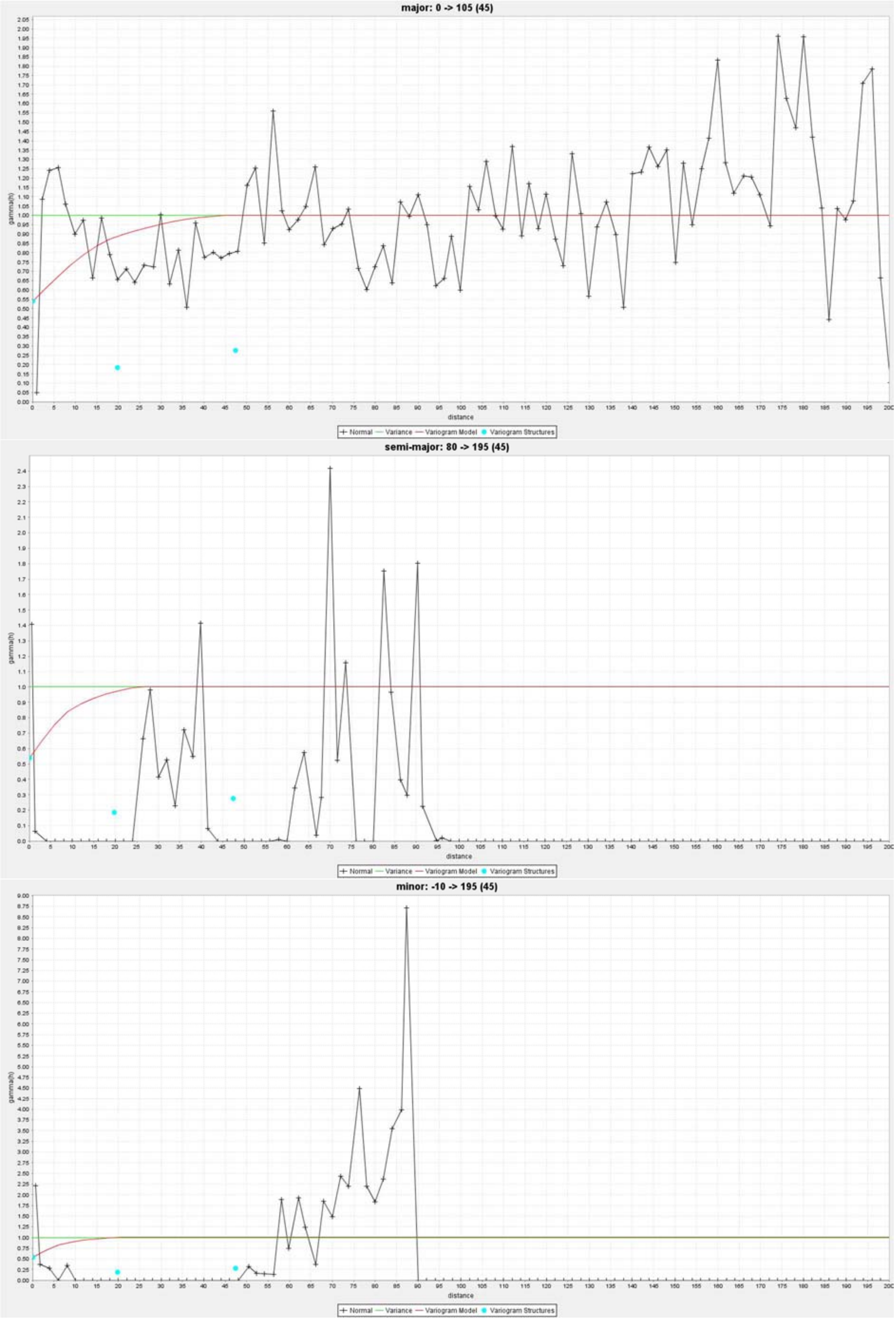
MARIA INEZ MV



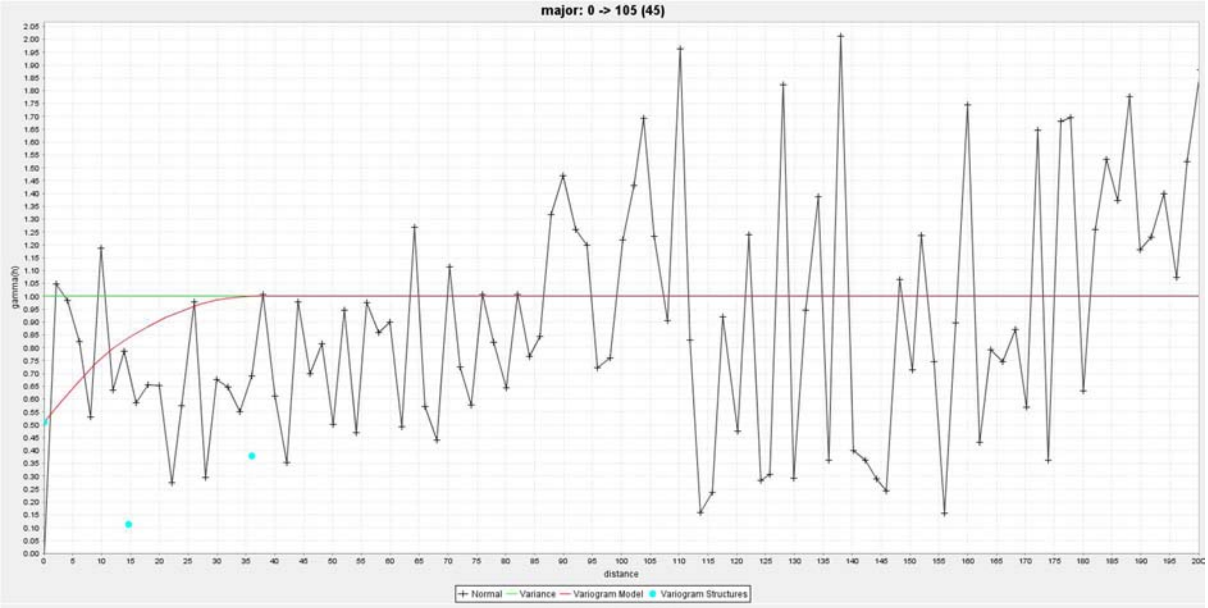


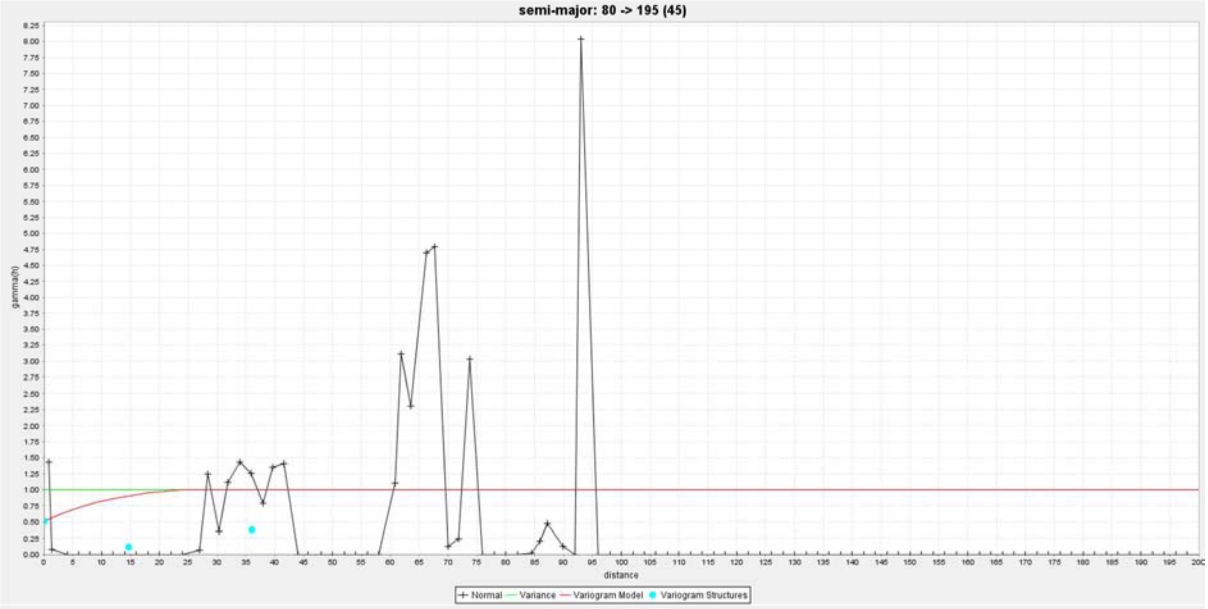


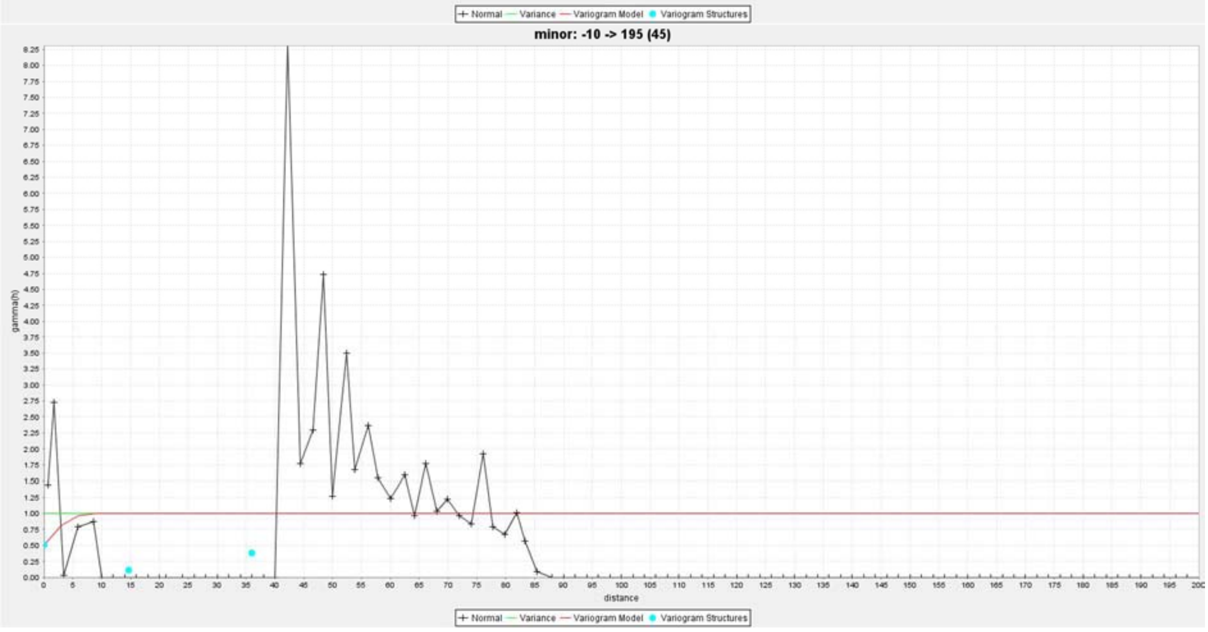
MARIA INEZ FW



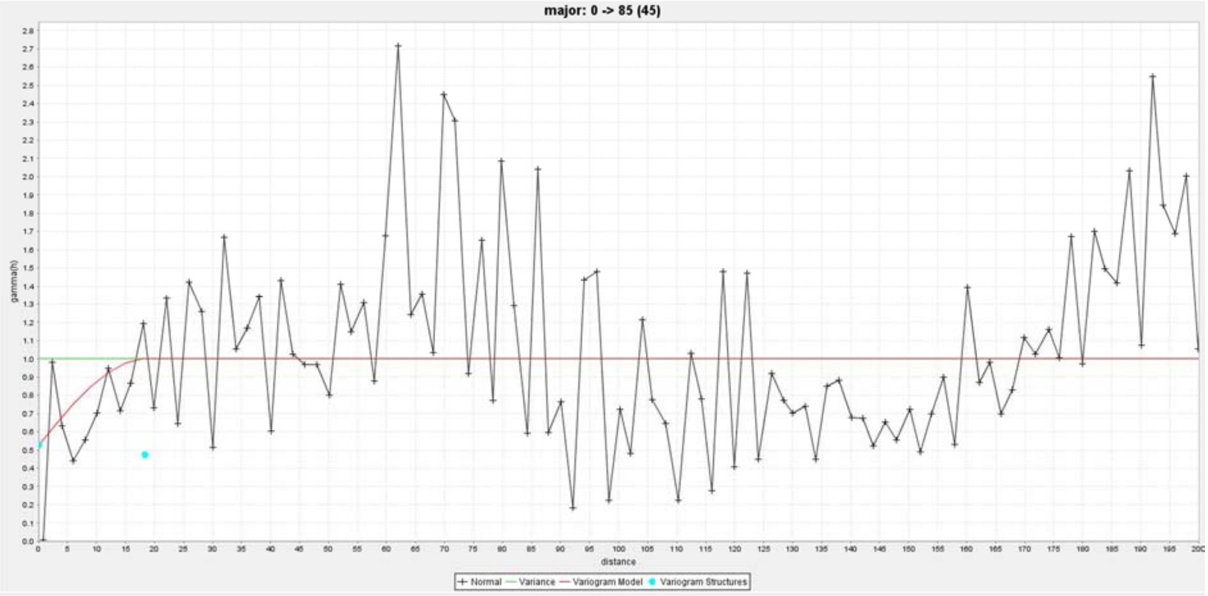
MARIA INEZ HW

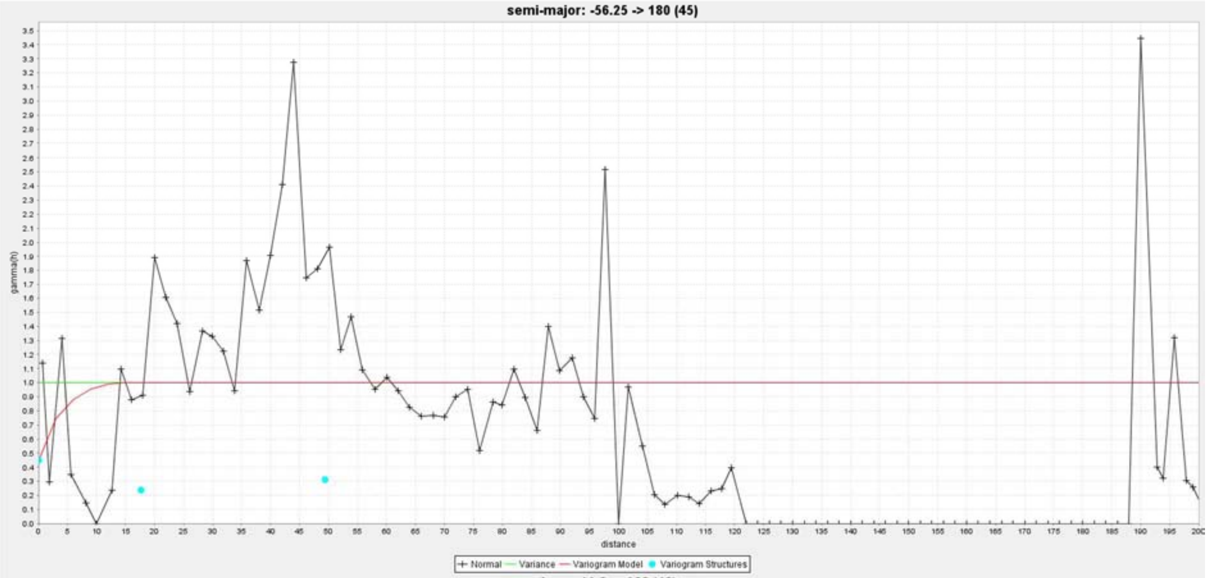


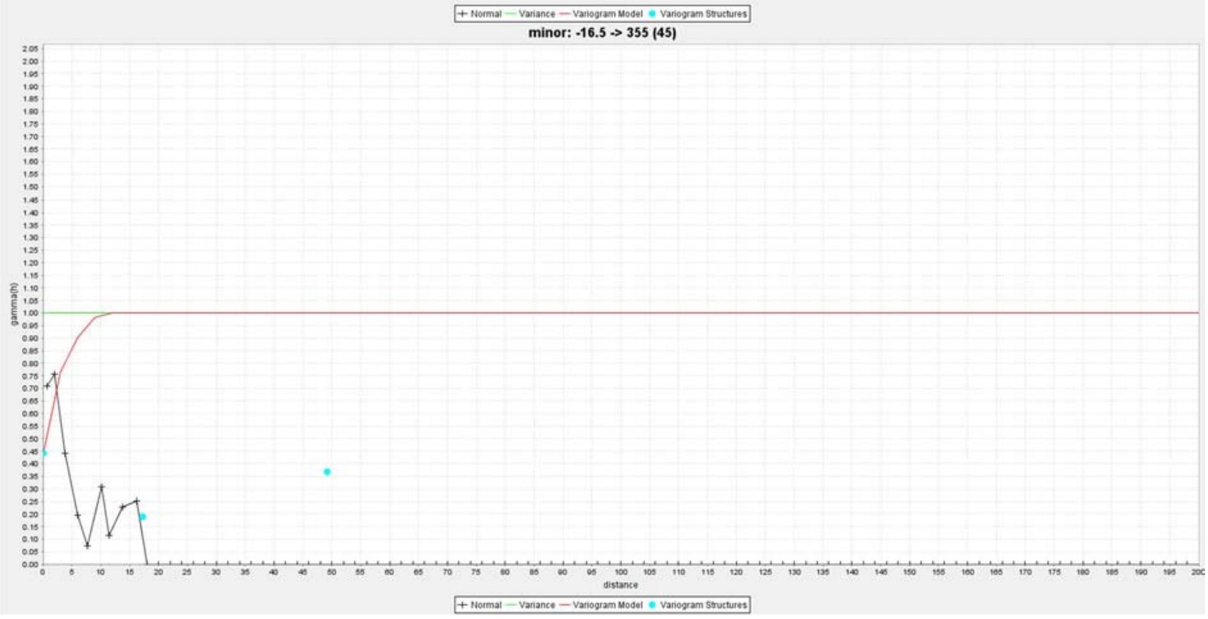




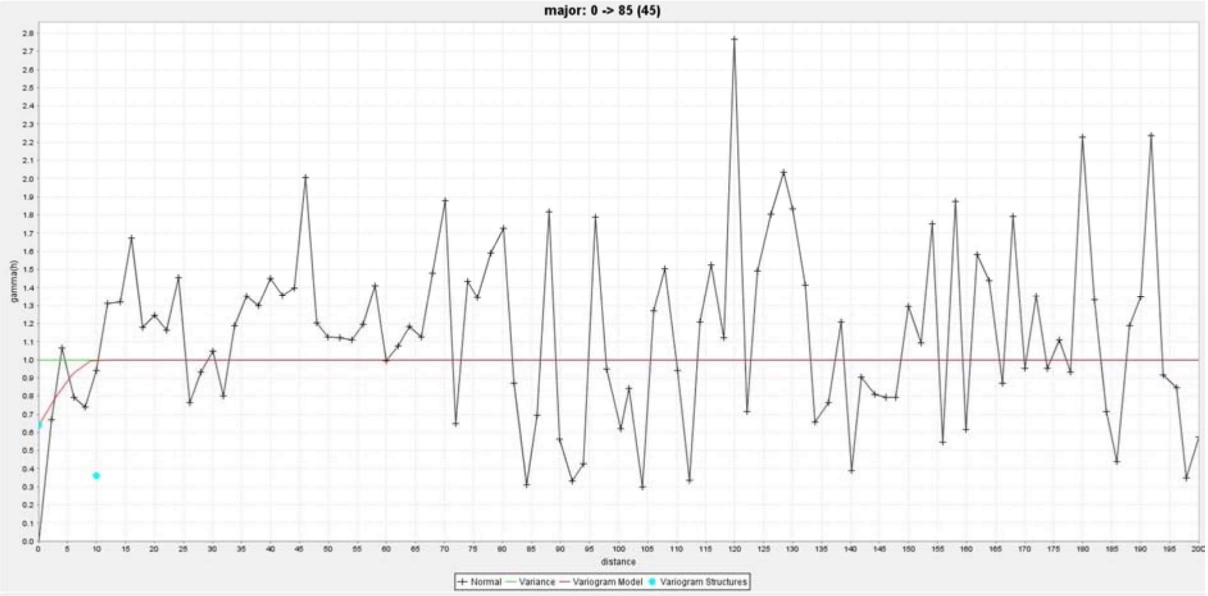
WAGAS MV

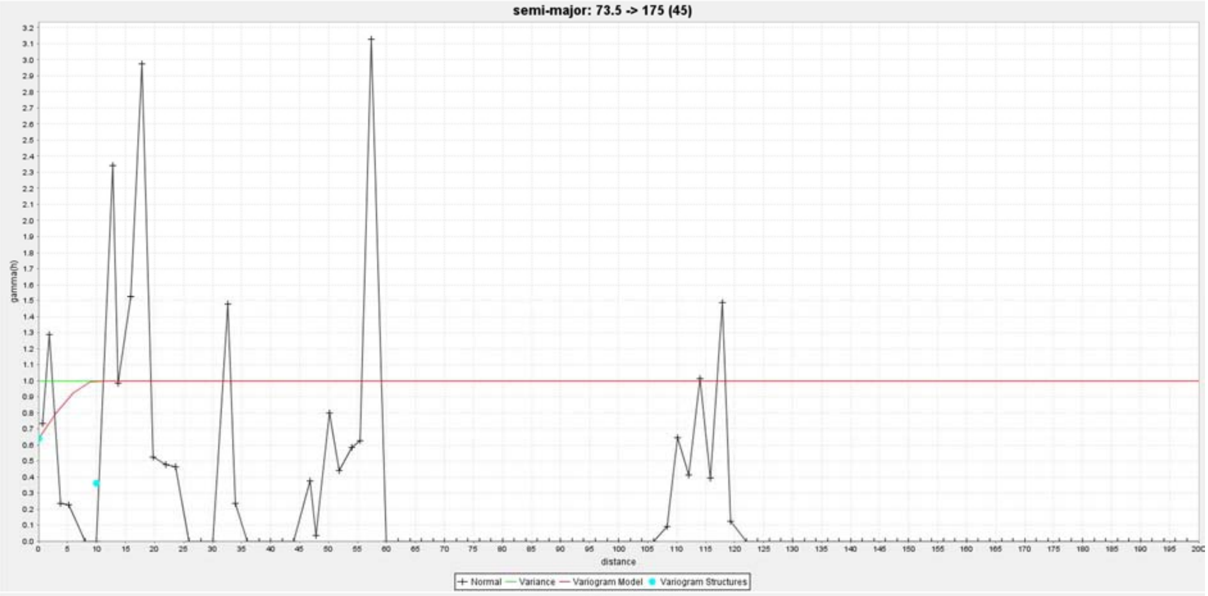

major: 0 -> 85 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

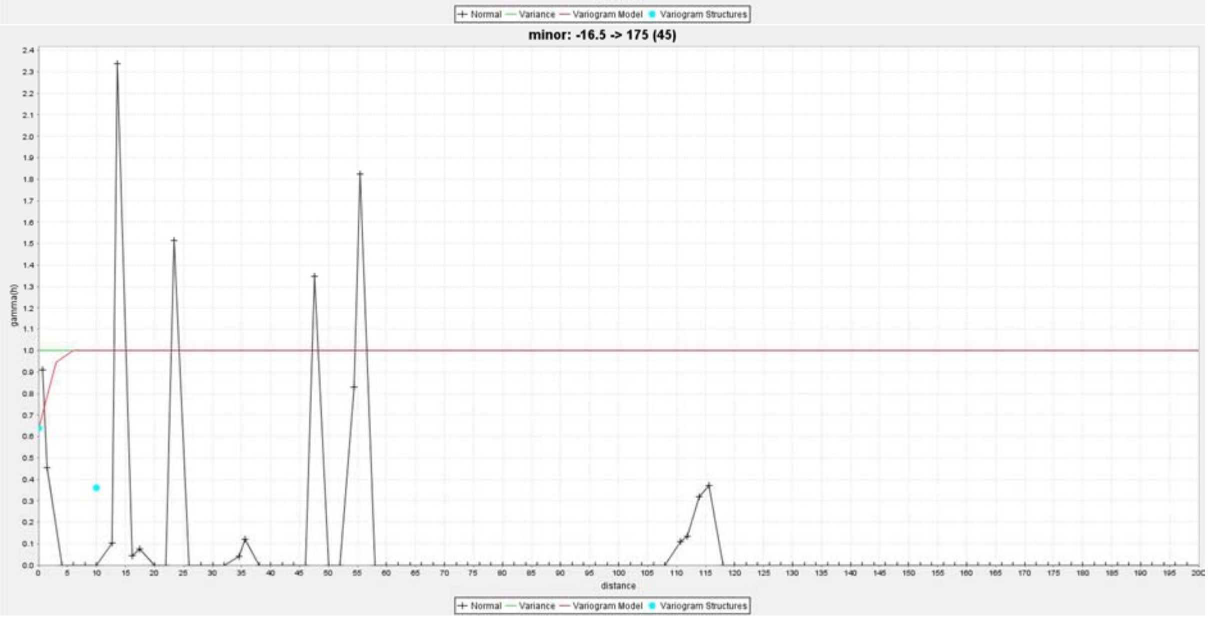

semi-major: -56.25 -> 180 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -16.5 -> 355 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

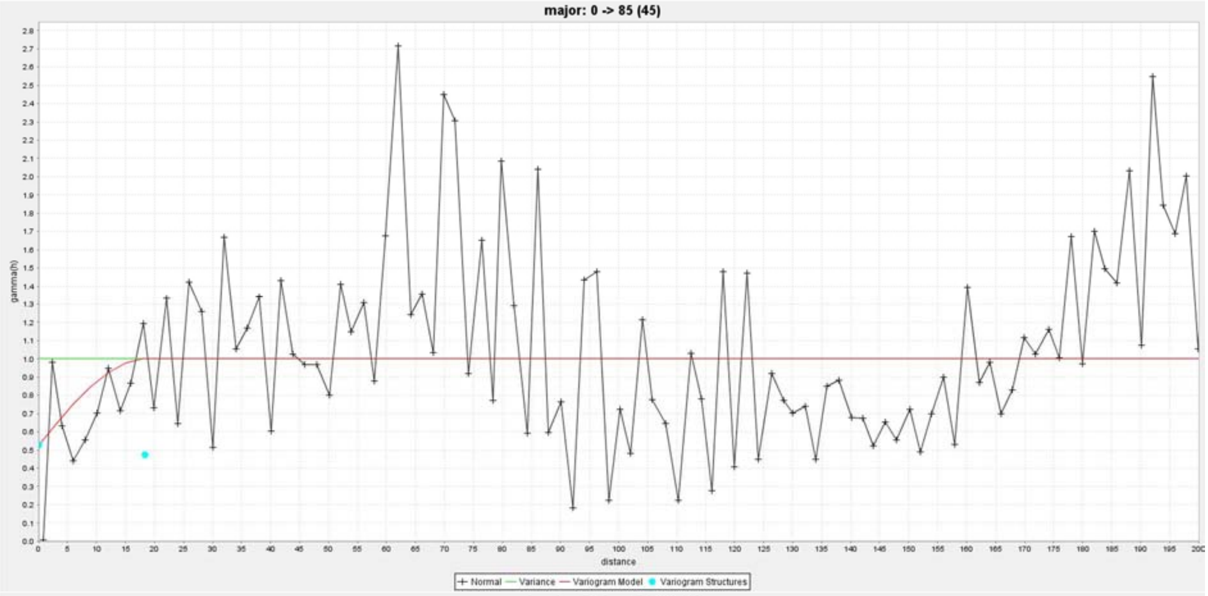
WAGAS FW

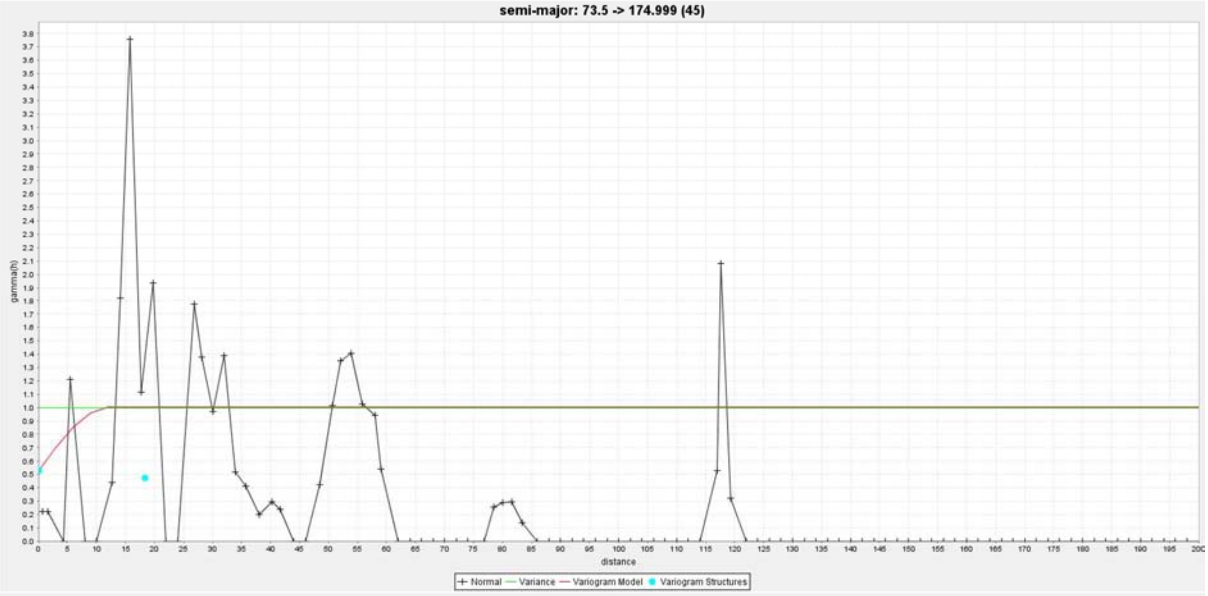

major: 0 -> 85 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

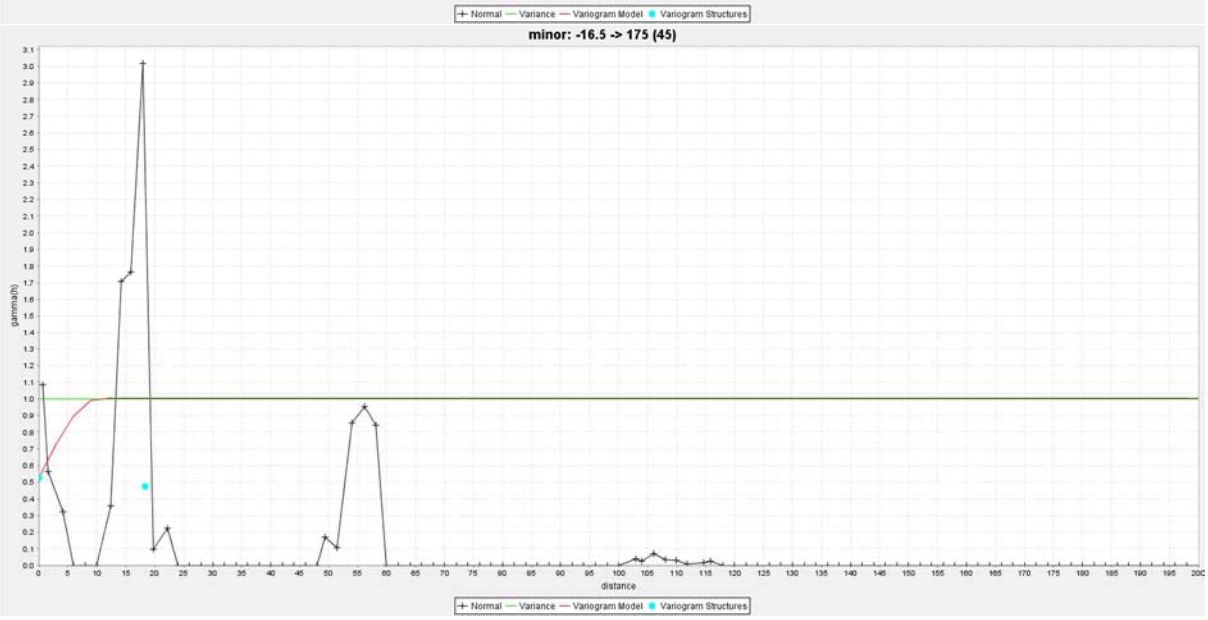

semi-major: 73.5 -> 175 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -16.5 -> 175 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

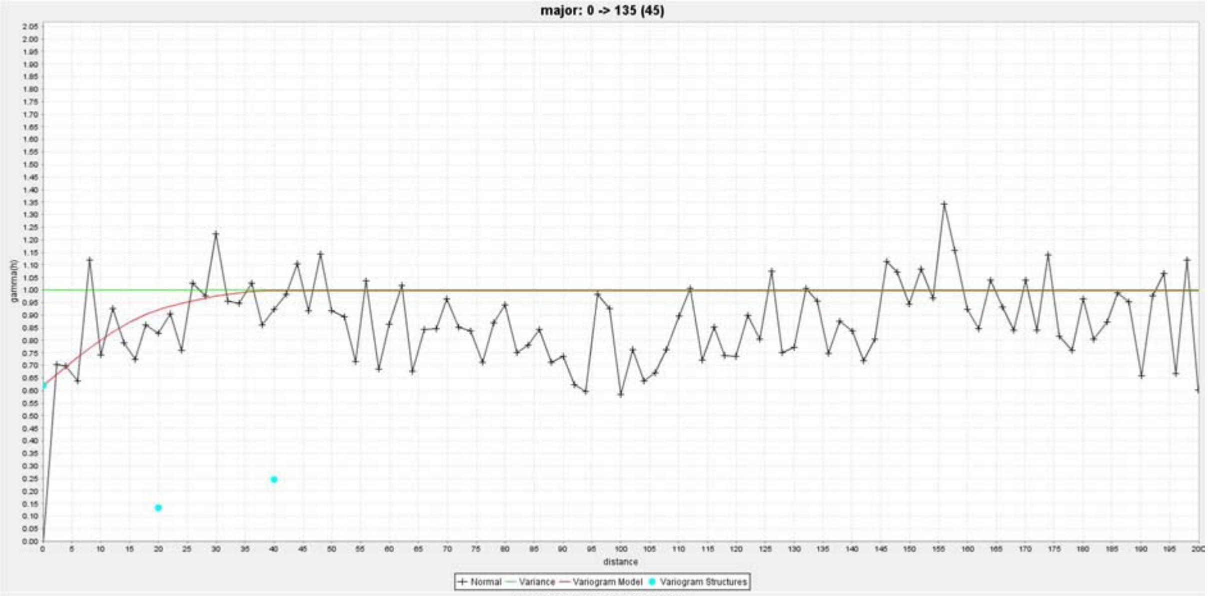
WAGAS HW

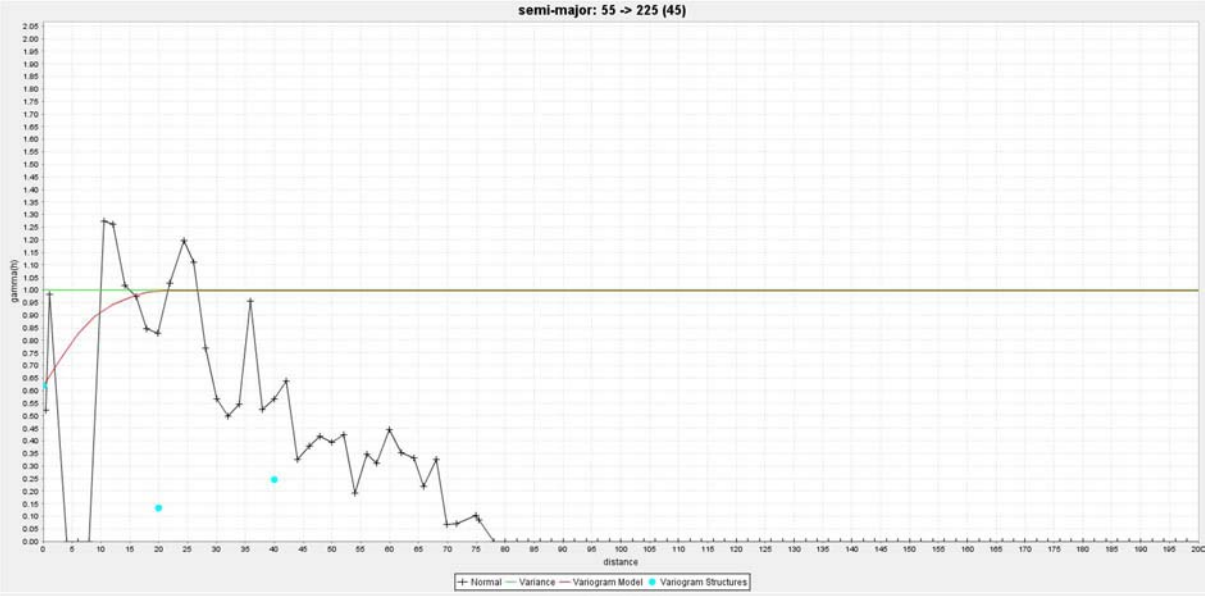

major: 0 -> 85 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

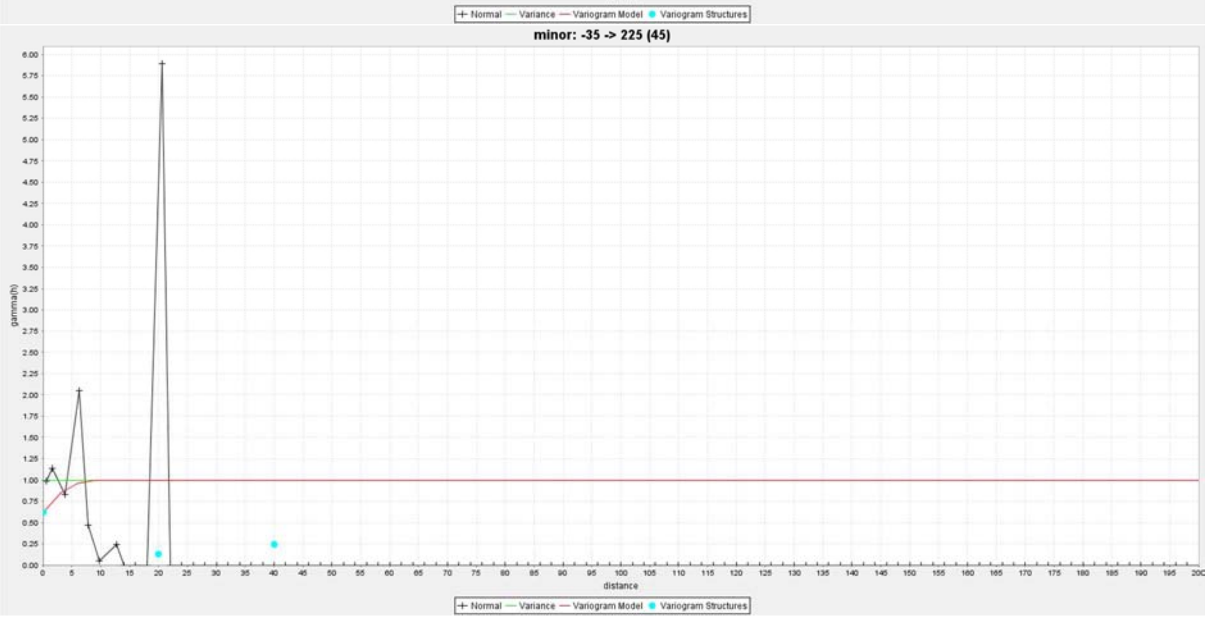

semi-major: 73.5 -> 174.999 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures


minor: -16.5 -> 175 (45)
gamma(h)
distance
Normal
Variance
Variogram Model
Variogram Structures

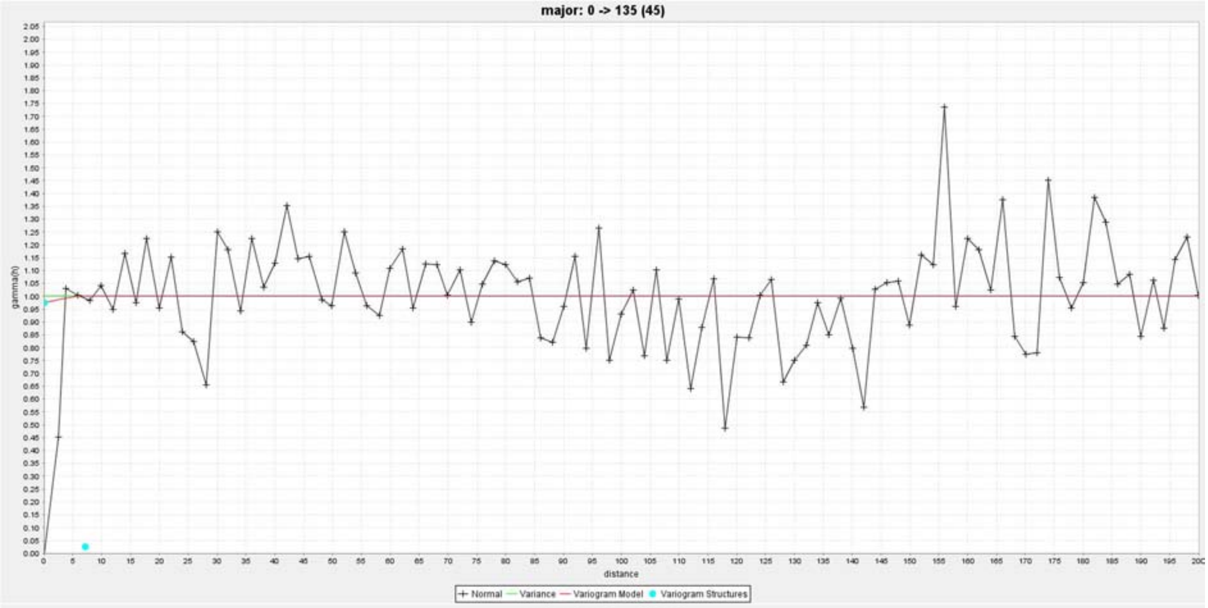
MASARITA 2 MV

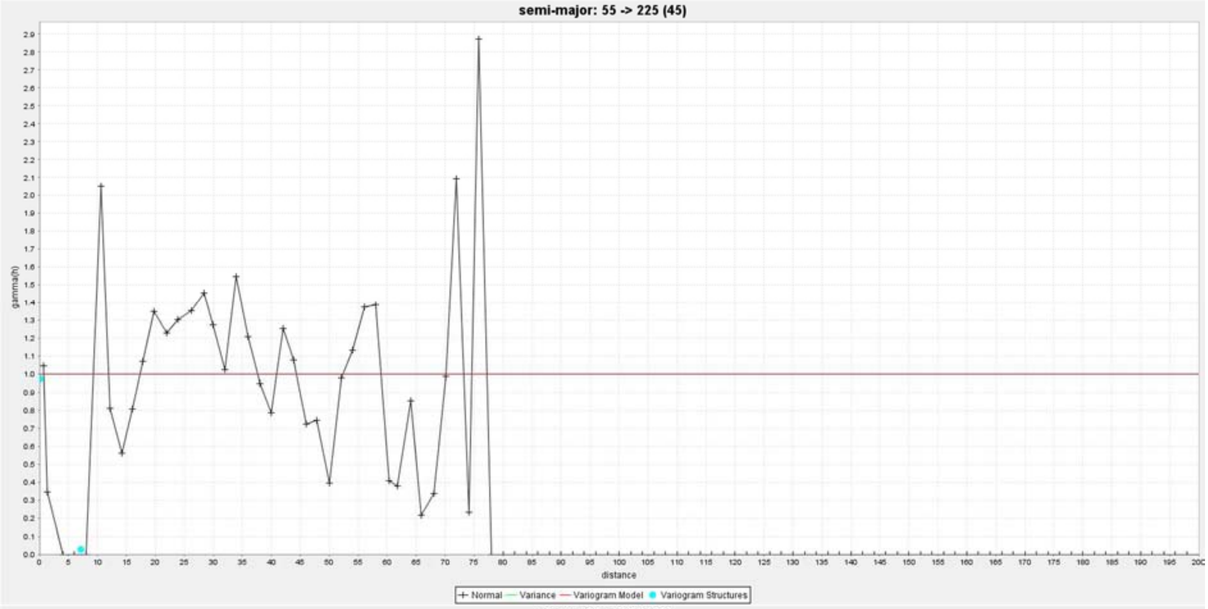


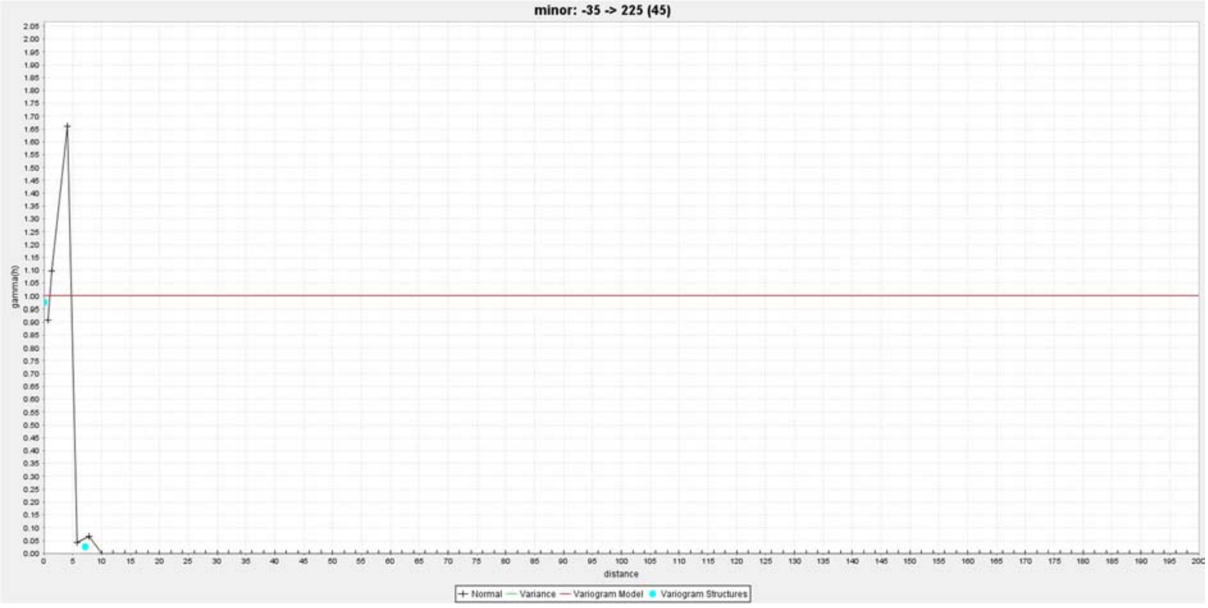




MASARITA 2 FW







MASARITA 2 HW