A GIS Makeover of a Classic Silver District; Real de Minas de Zacualpan, Mexico

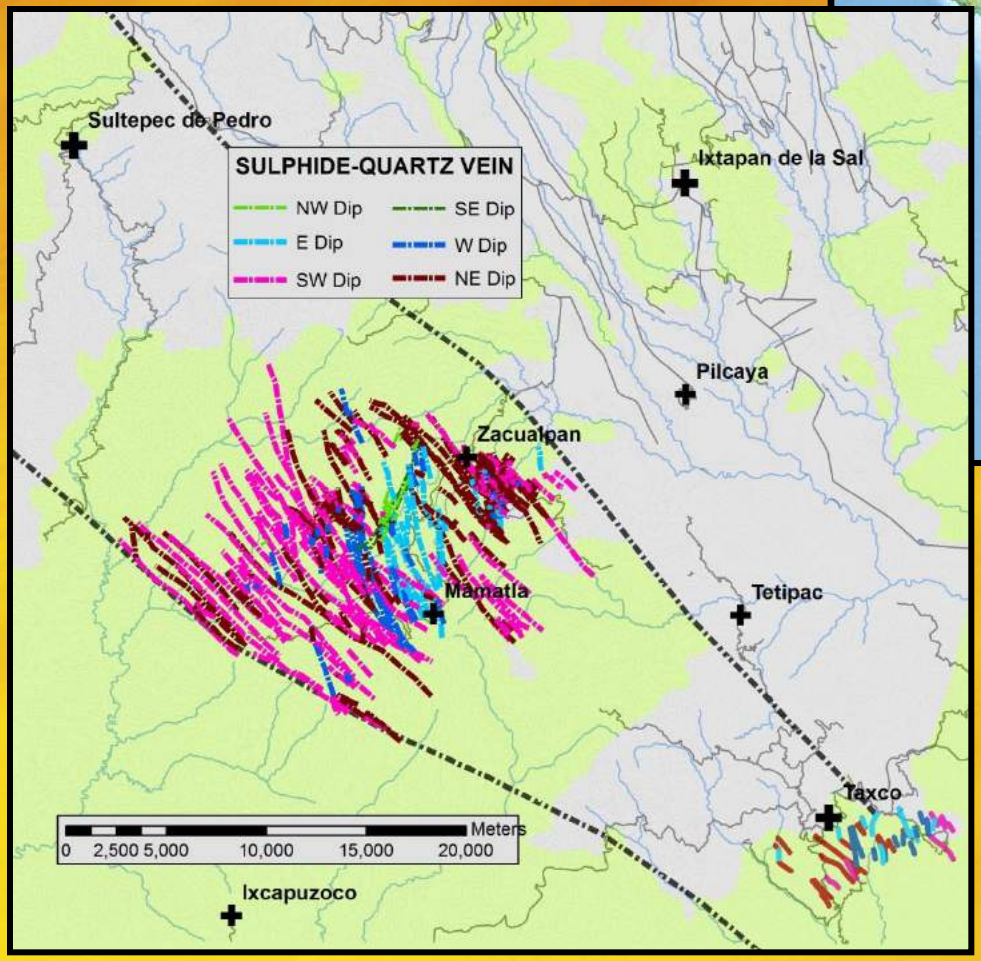
IMPACT SILVER CORP.

Brian V. Hall George A. Gorzynski

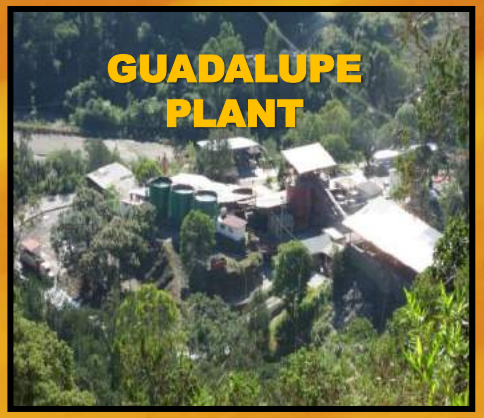
Agenda

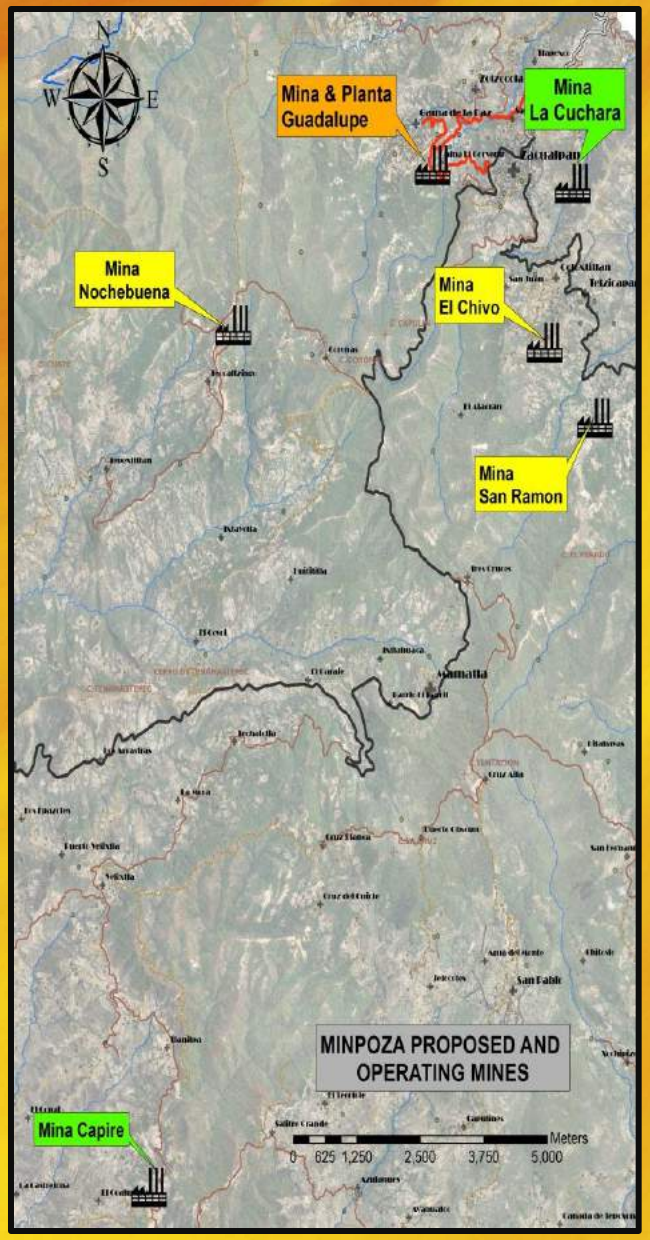
- Historical aspects of the Royal Mines of Zacualpan District
- The cataloging of old mine workings as one of our exploration methodologies
- District scale structural features
- Geological factors affecting the distribution of silver and gold within the Zacualpan District

Zacualpan Location Map



Current Operations



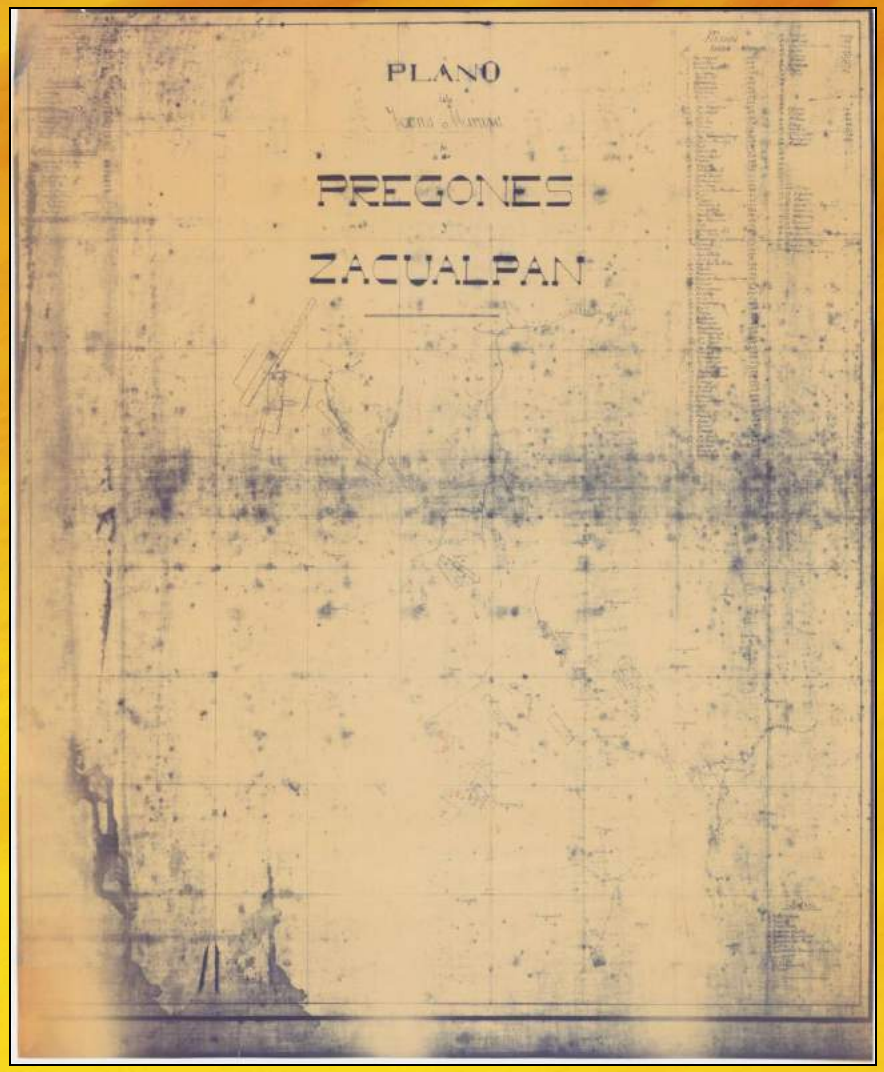


Pre-Hispanic Mining Centers in Latin America

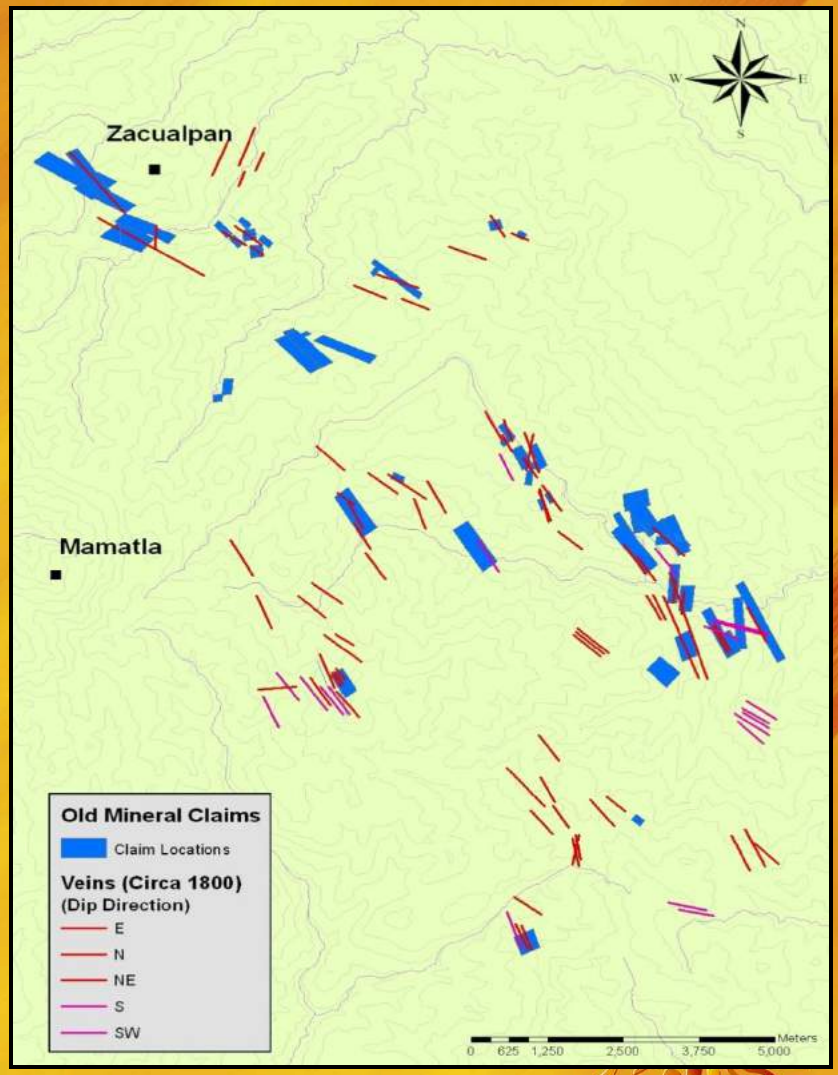
(From Cathro, R. J. , 2000)

Zacualpan - 1890's and Today

This Map is Thought to be Over 200+ Years Old



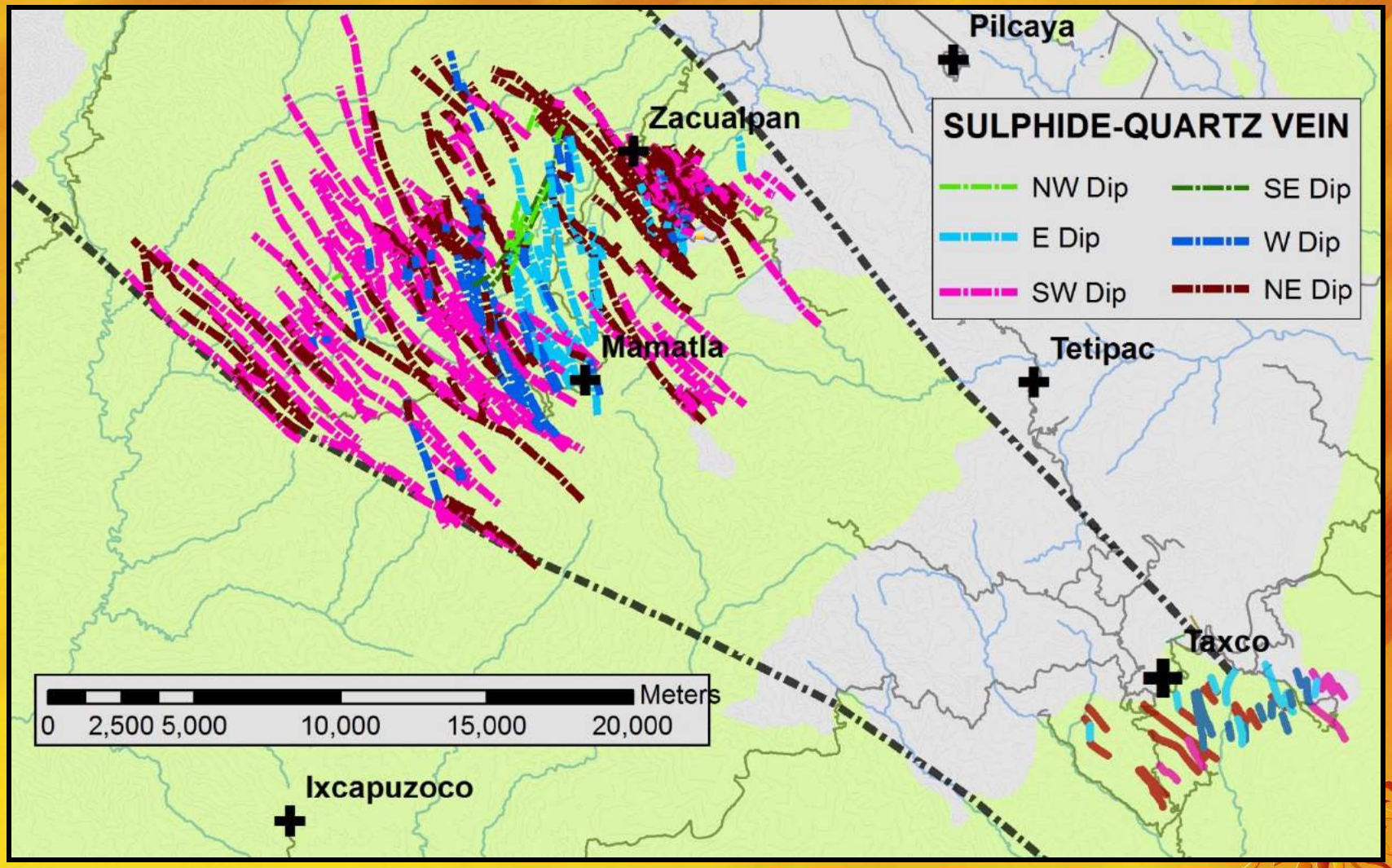
Before digitizing



After digitizing

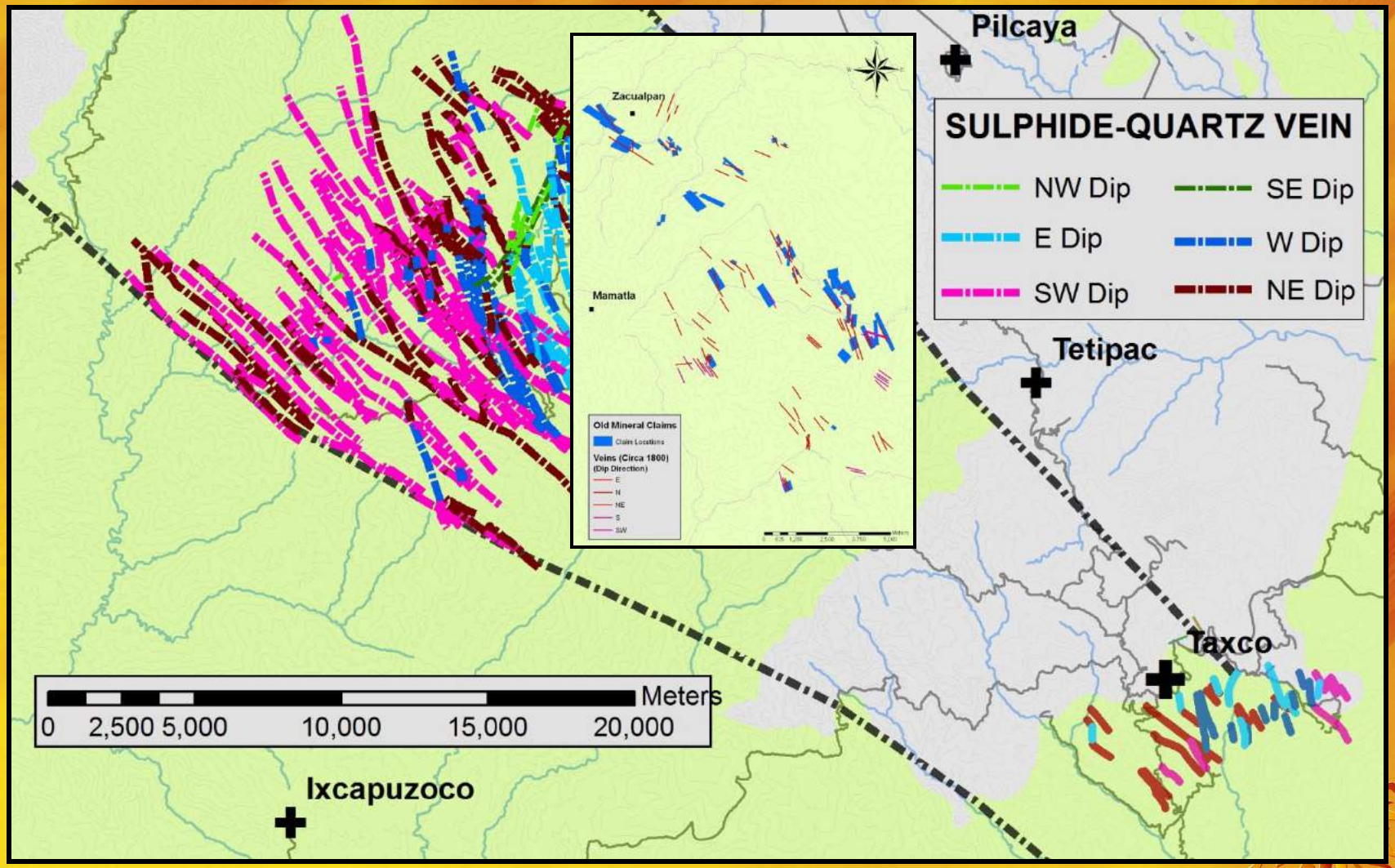
ZACUALPAN – TAXCO DISTRICTS

MAJOR VEINS



ZACUALPAN – TAXCO DISTRICTS

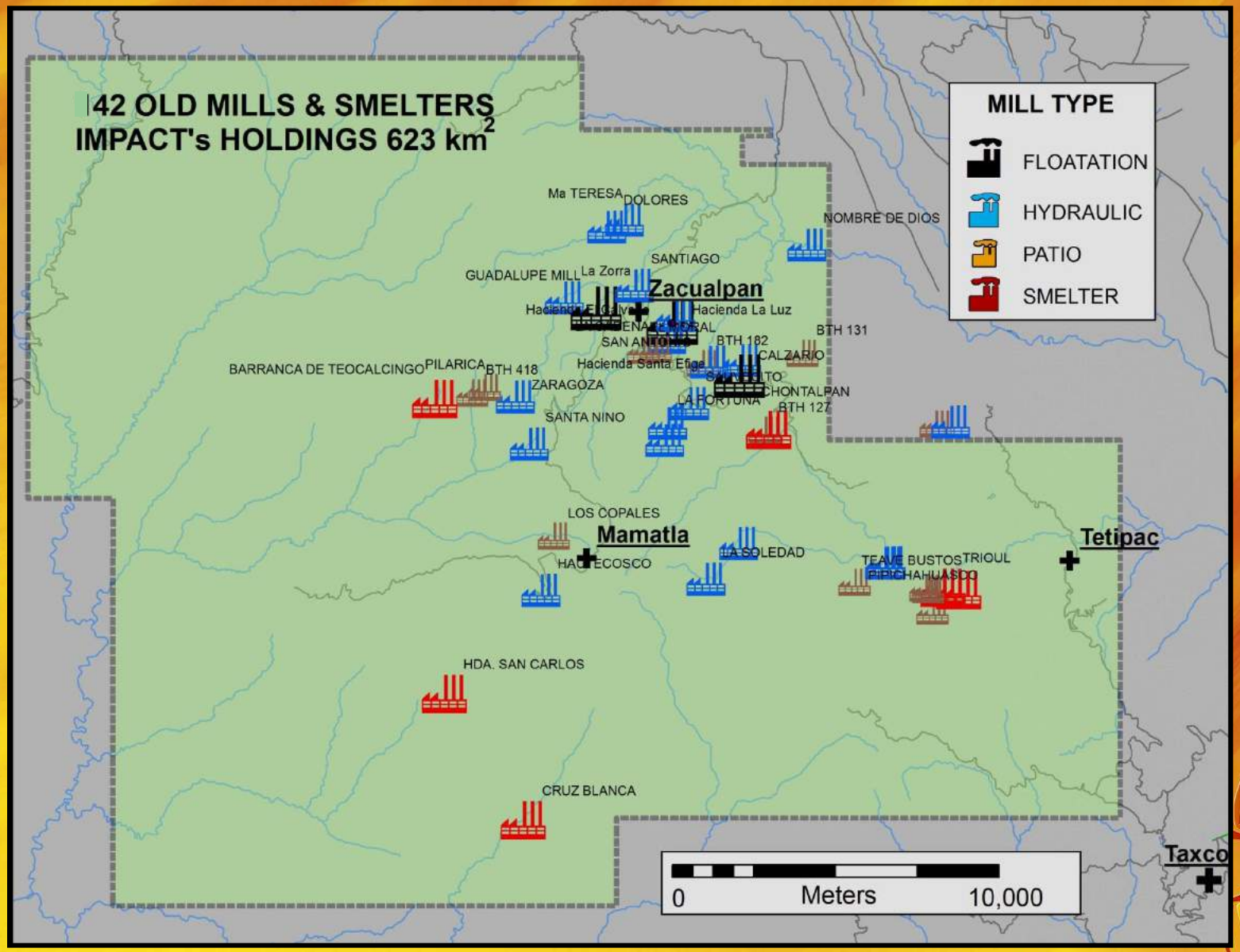
MAJOR VEINS WITH OLD MAP INCLUDED



Zacualpan's Old Mills and Smelters

ZACUALPAN – MAMATLA DISTRICT

OLD MILL & SMELTER LOCATIONS



OBRAS
(OLD MINE & EXPLORATION WORKINGS)

ZACUALPAN EXPLORATION DATABASE

- **In 2009, IMPACT Silver announced the successful launch of the GIS Database using the computer program ArcGIS**

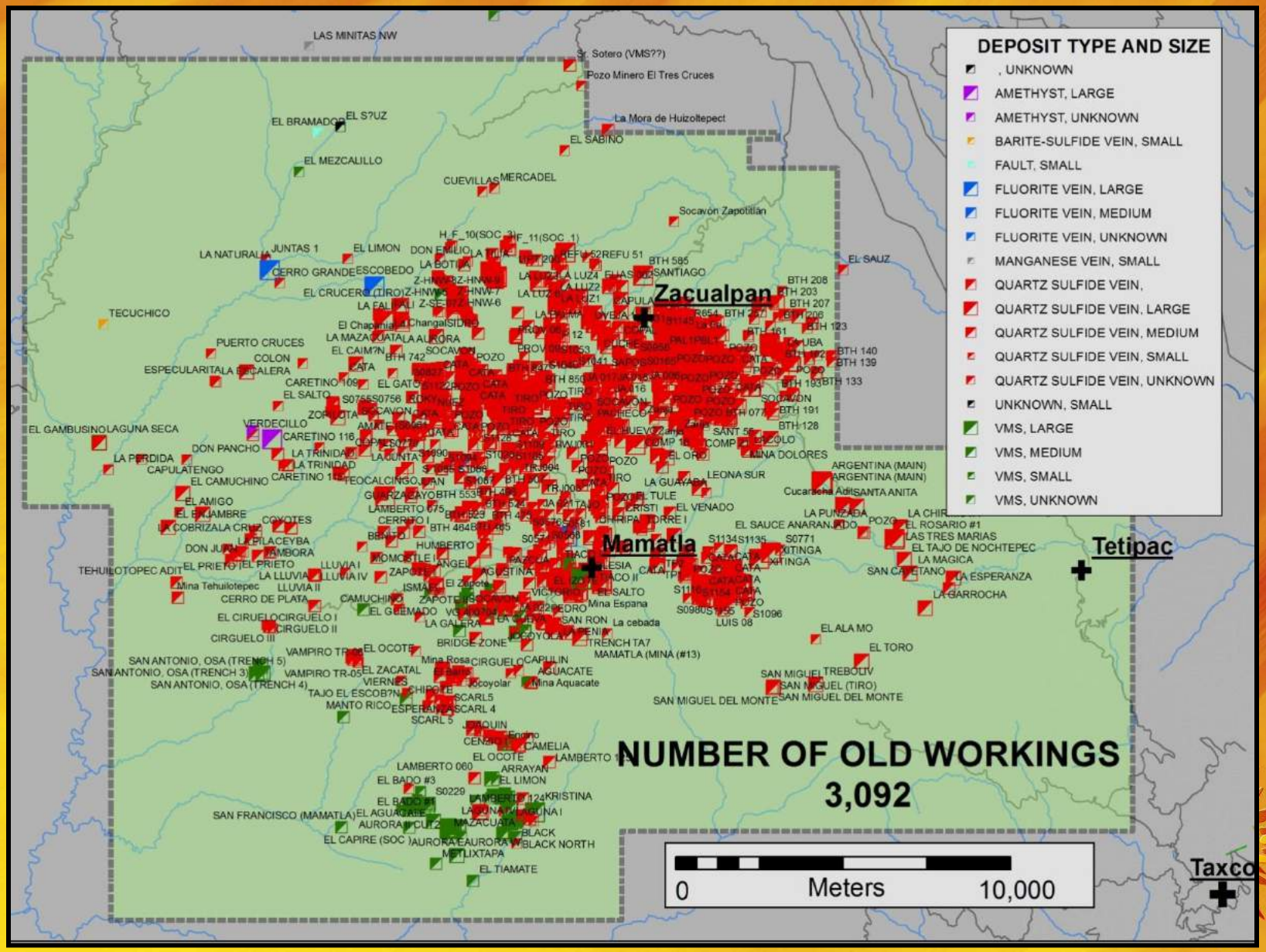
- **One aspect of ArcGIS is the ability to document 3,092 Historical Mine Workings, which continues to grow with the addition of ten each week**

- **It has been found that the most cost effective manner to find and document the silver-gold veins is to first locate the old workings, many of which date back to the Spanish Colonial times.**

- **The larger workings (120 documented to date) generally indicate areas of historic production, to which often any written records have been lost, whereas the smaller workings can be used to trace the veins such that detailed mapping and sampling can be conducted.**

ZACUALPAN – MAMATLA DISTRICT

OLD MINE AND EXPLORATION WORKINGS



ZACUALPAN – MAMATLA DISTRICT

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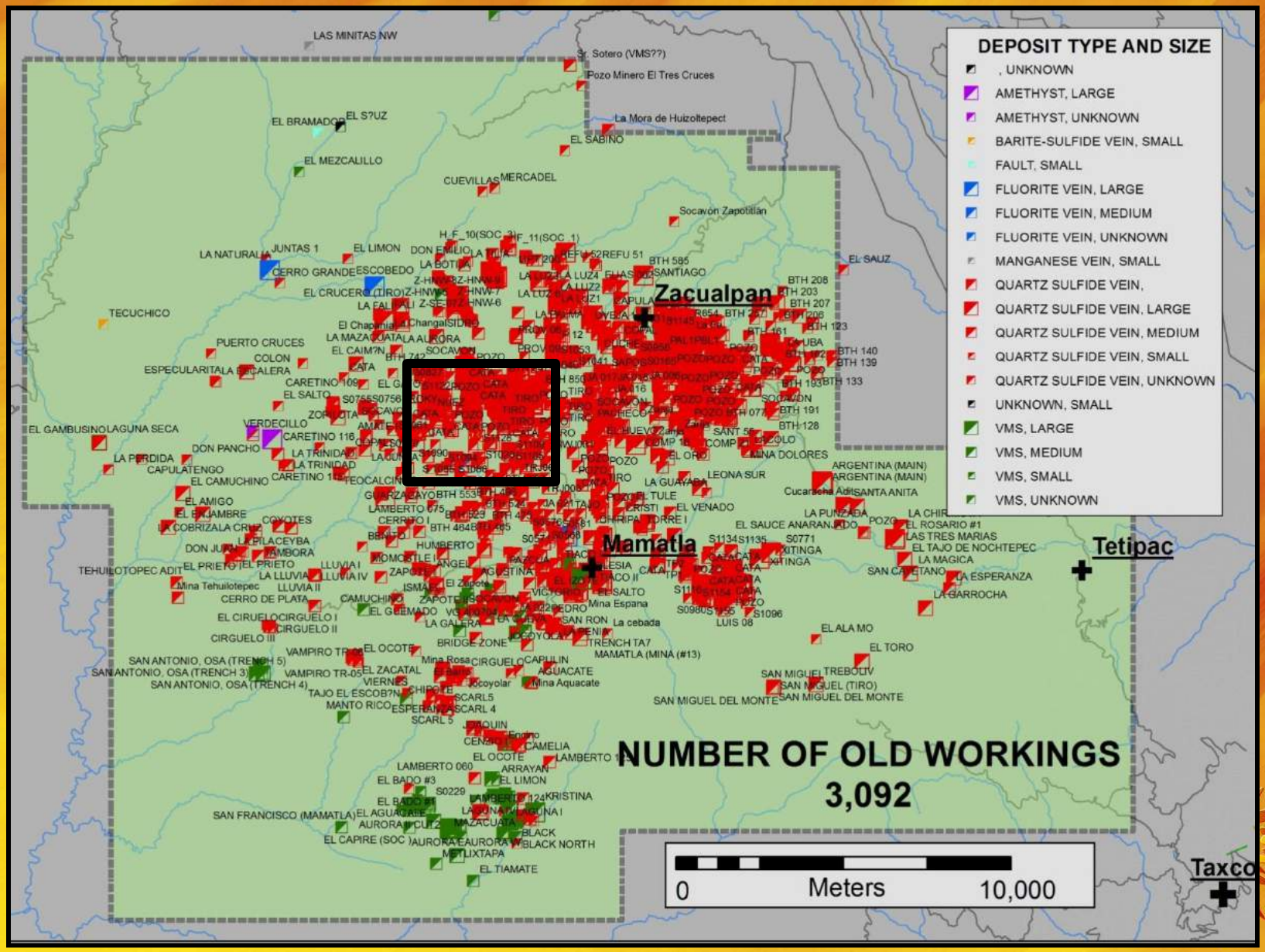
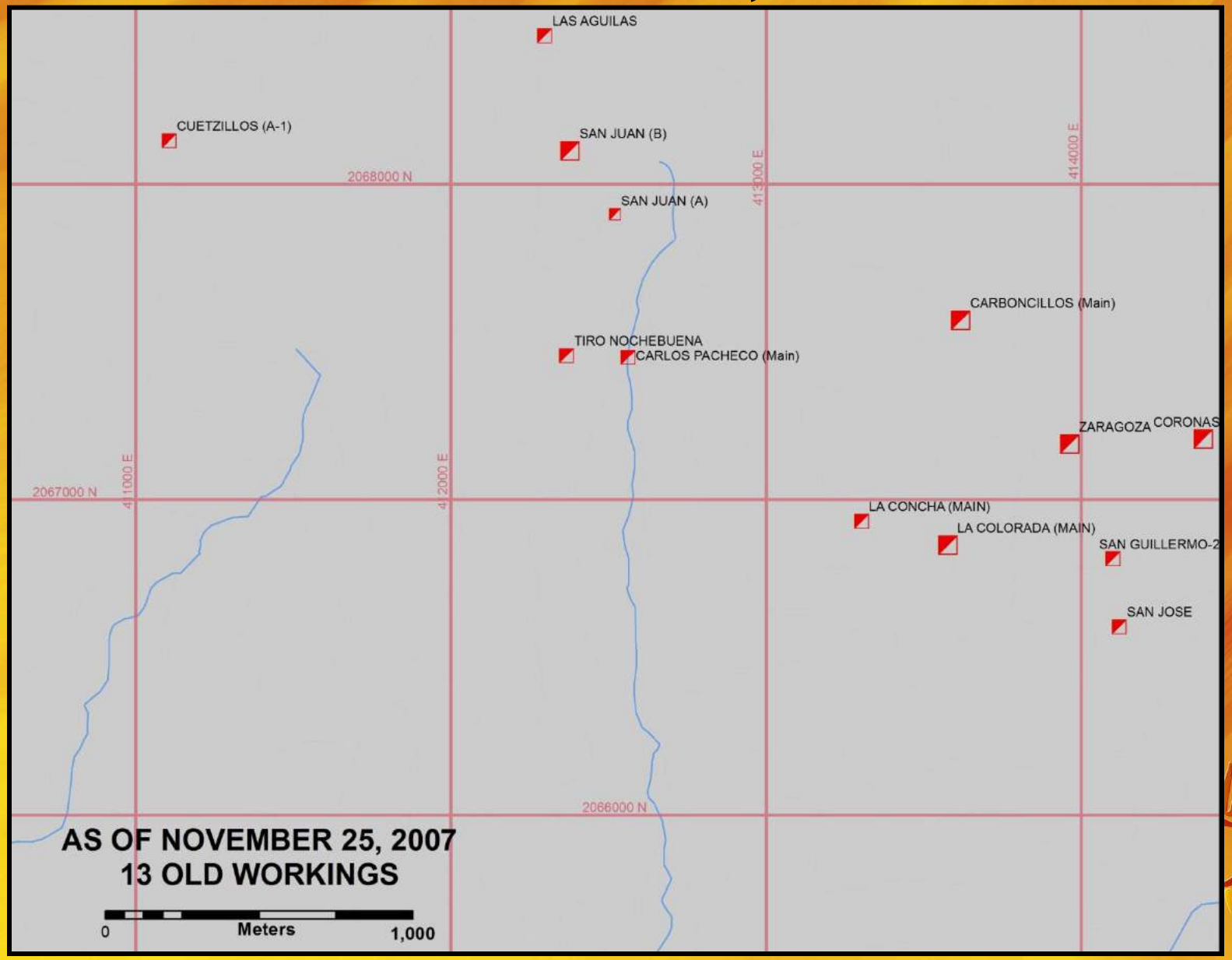


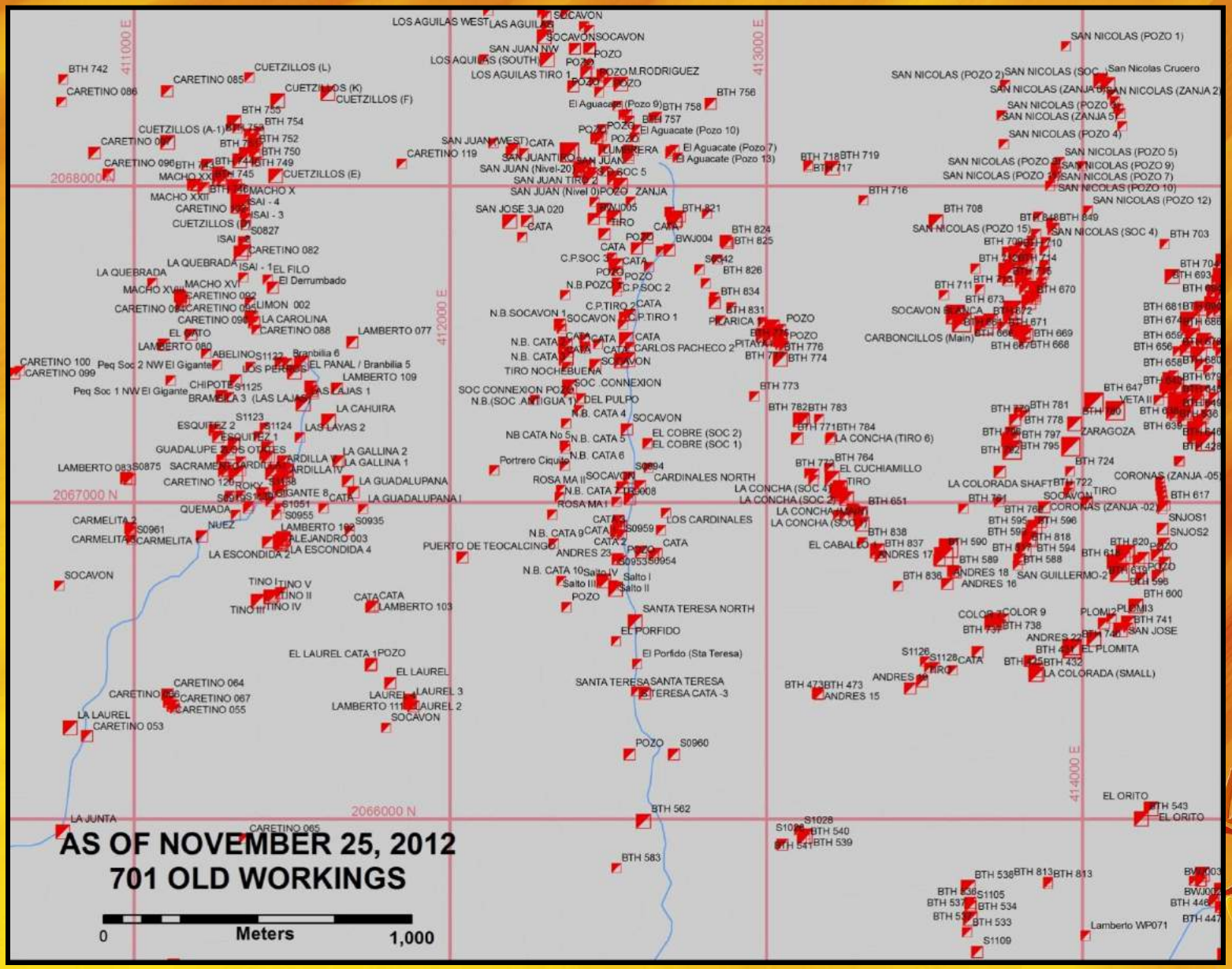
NOCHE BUENA AREA

Obras – Nov. 25, 2007



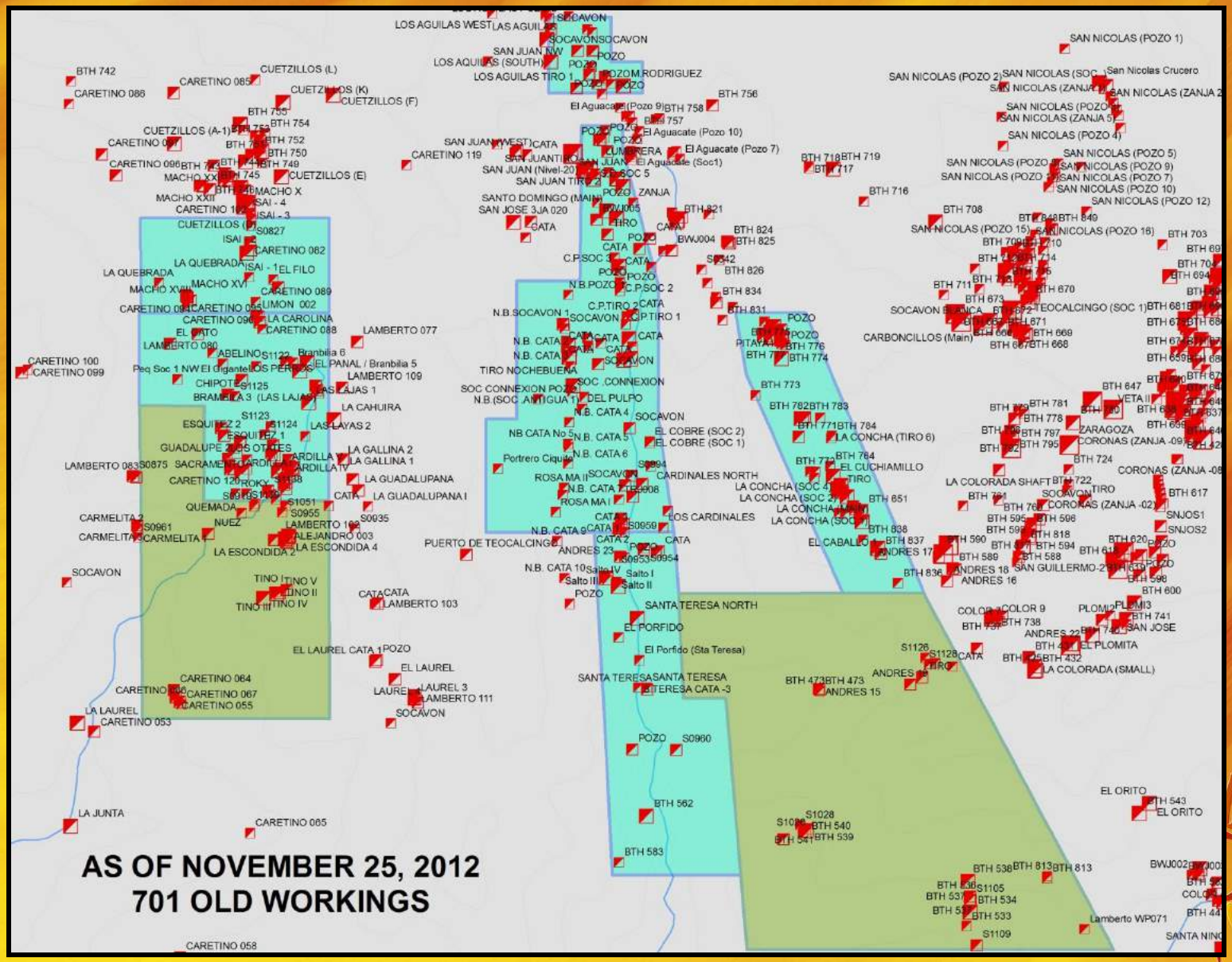
NOCHE BUENA AREA

Obras – Nov. 25, 2012



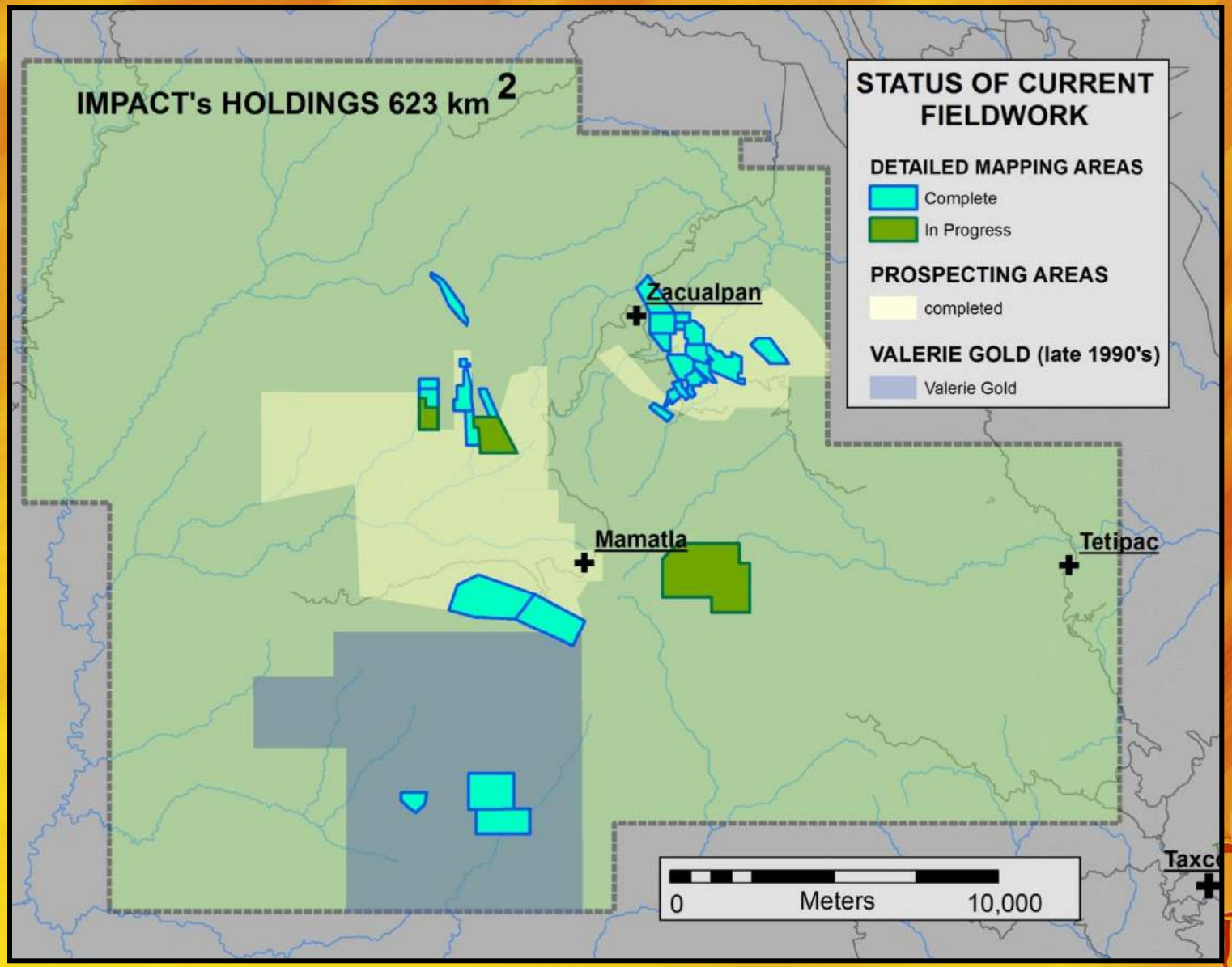
NOCHE BUENA AREA

Obras & Mapping Areas – Nov. 25, 2012

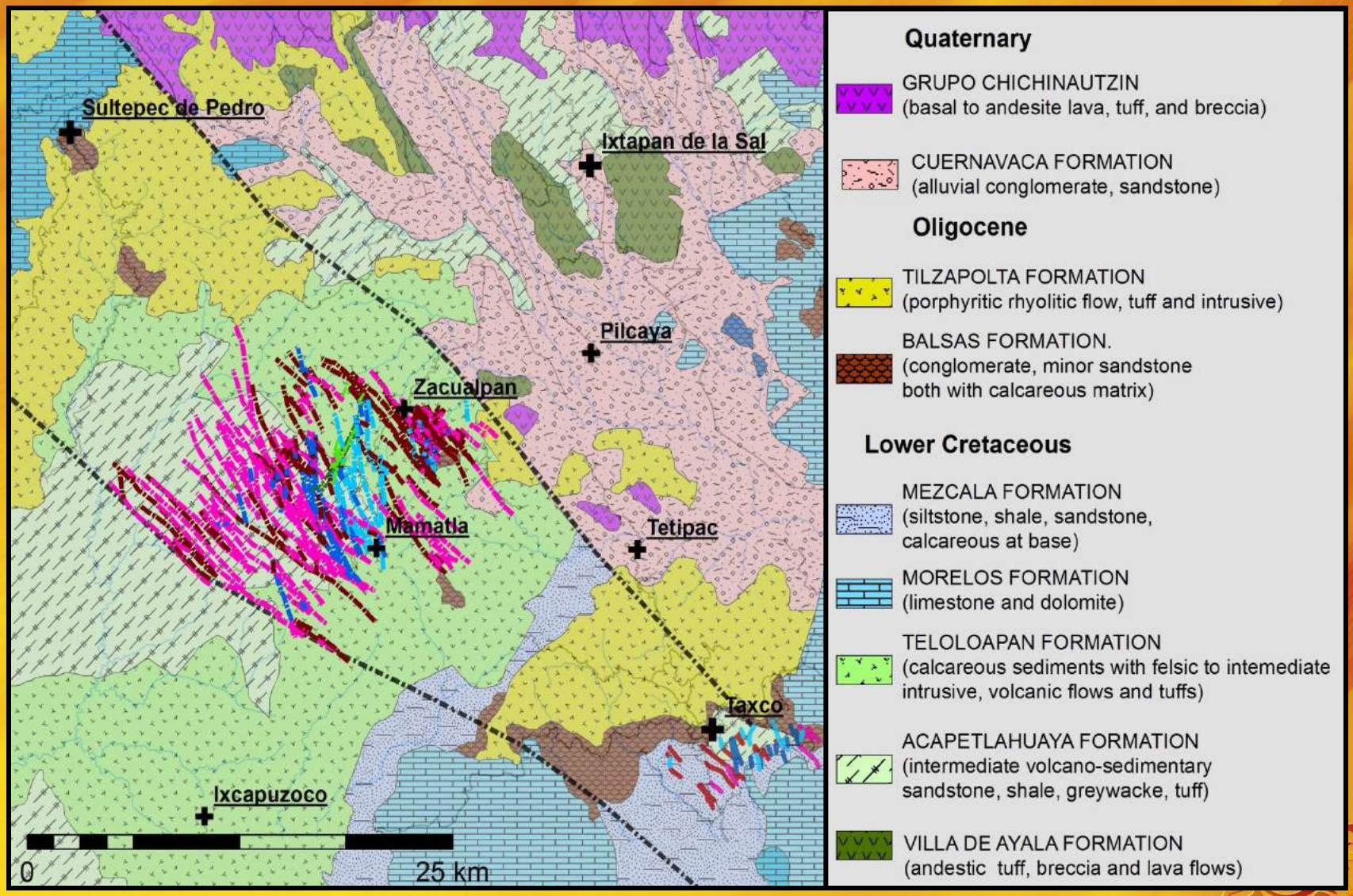


STATUS OF CURRENT FIELDWORK

As of Nov. 25, 2012



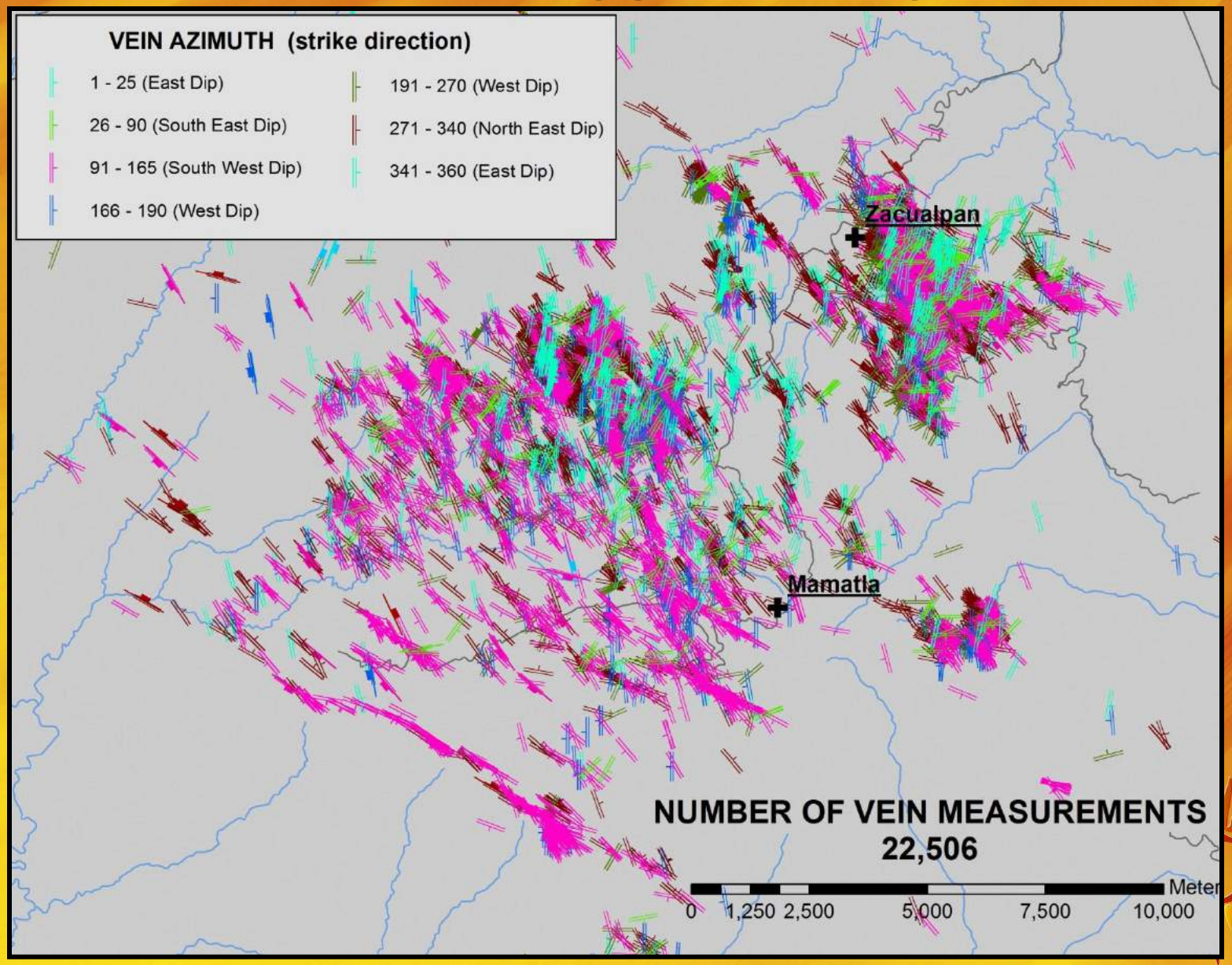
REGIONAL GEOLOGY



Cuernavaca Geology Mapsheet **E4-6** (Rivera C.E., De La Teja S. M.A., Miranda H., A., Lemus B. O., and Motolinia G. O.)

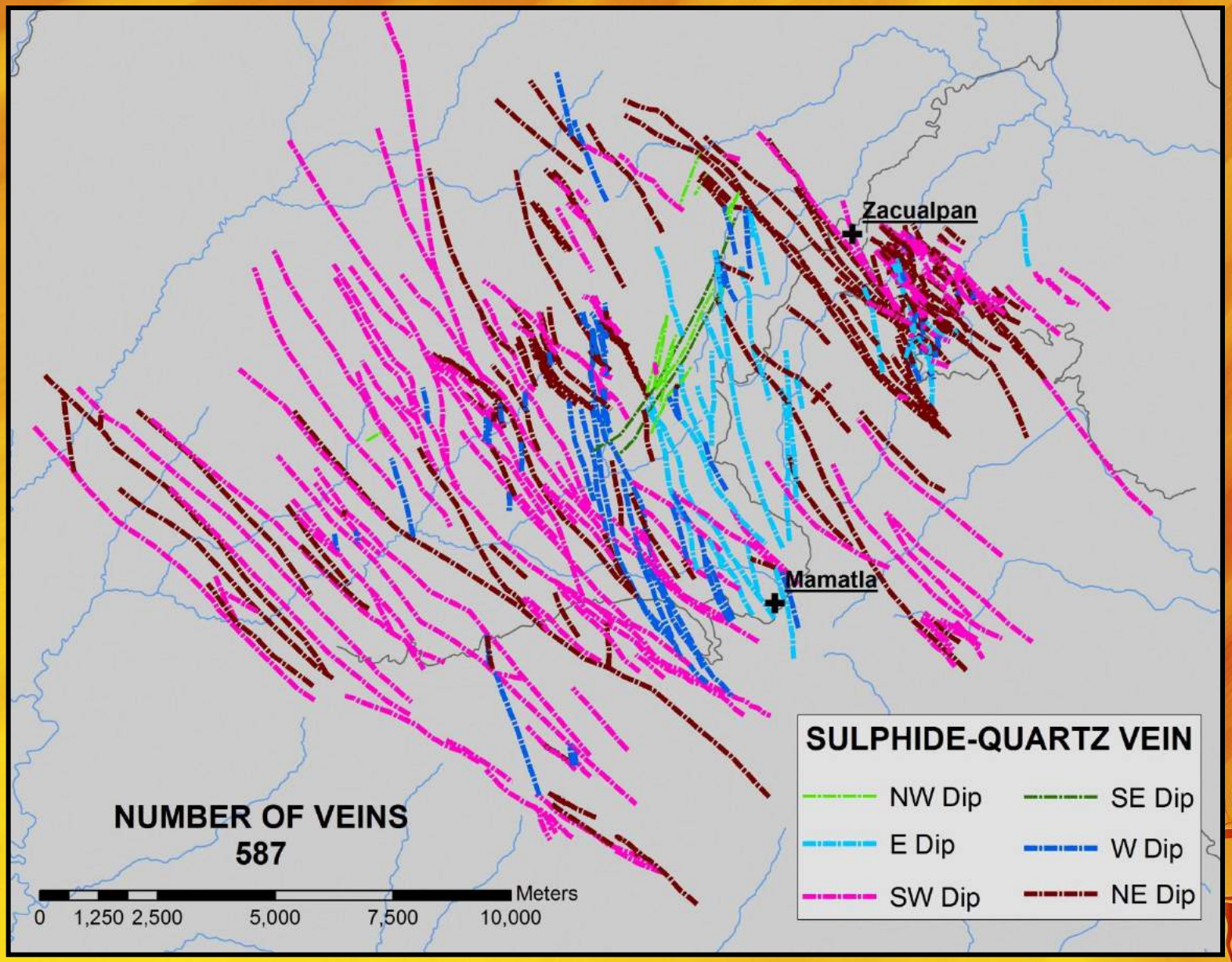
ZACUALPAN VEINS

VEIN MEASUREMENTS



ZACUALPAN VEINS

DIP DIRECTION



DISTRICT SCALE OBSERVATIONS

THE NORTH-SOUTH STRIKING VEINS HAVE A VERTICAL SENSE OF DISPLACEMENT

THE NORTHWESTERLY STRIKING VEINS TEND TO HAVE A LATERAL SENSE OF DISPLACEMENT

WITH THE OVERALL STRESS REGIME BEING
"TRANSPRESSIONAL SHEAR"

ZACUALPAN DISTRICT

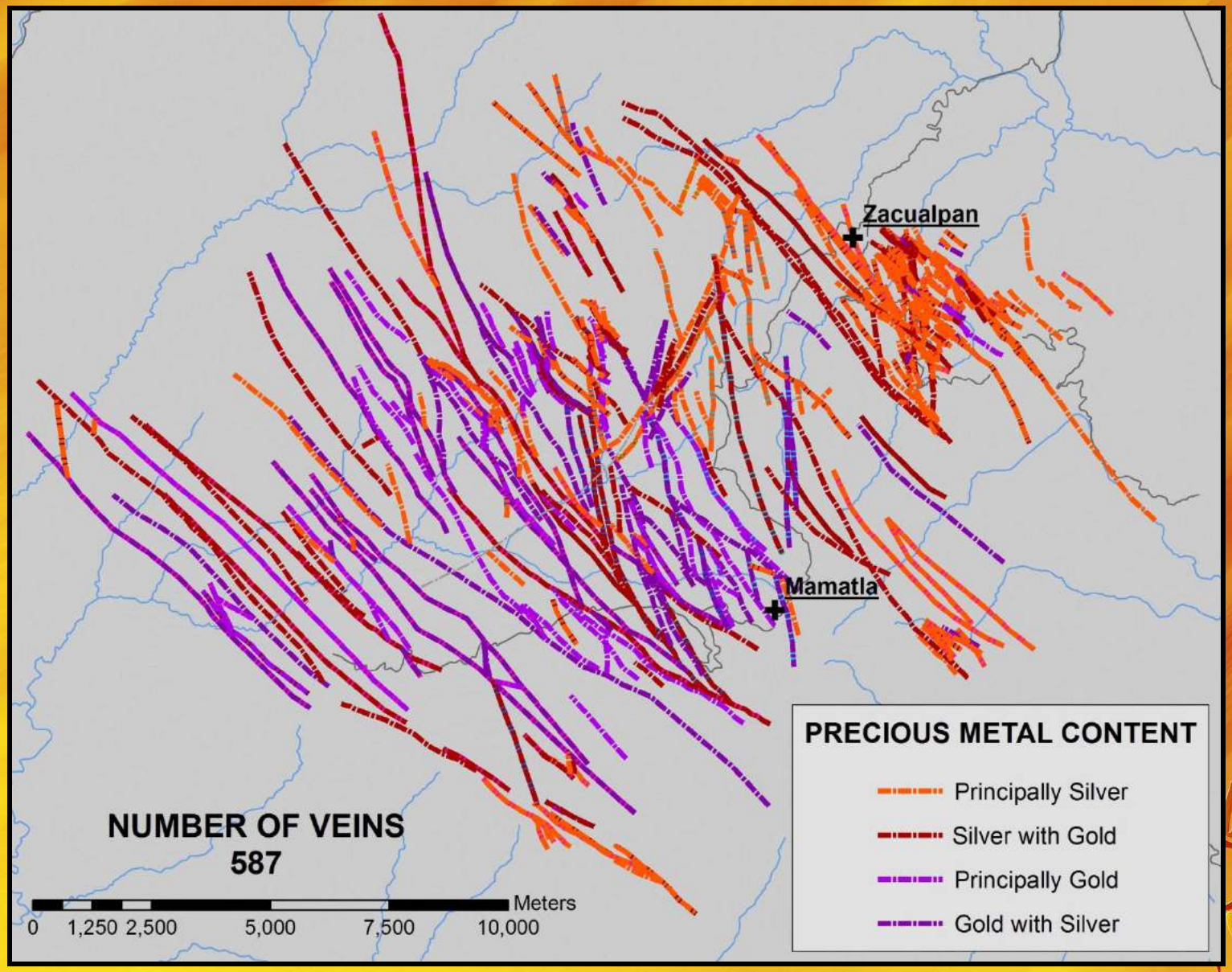
TYPES OF SILVER – GOLD VEINS

Epithermal
Silver-Lead-Zinc
Vein

Mesothermal
Gold-Copper-Arsenic
Vein

FACTORS AFFECTING THE DISTRIBUTION OF THE MESOTHERMAL vs EPITHERMAL VEINS AND THEIR GOLD – SILVER CONTENTS

STRUCTURAL SETTING

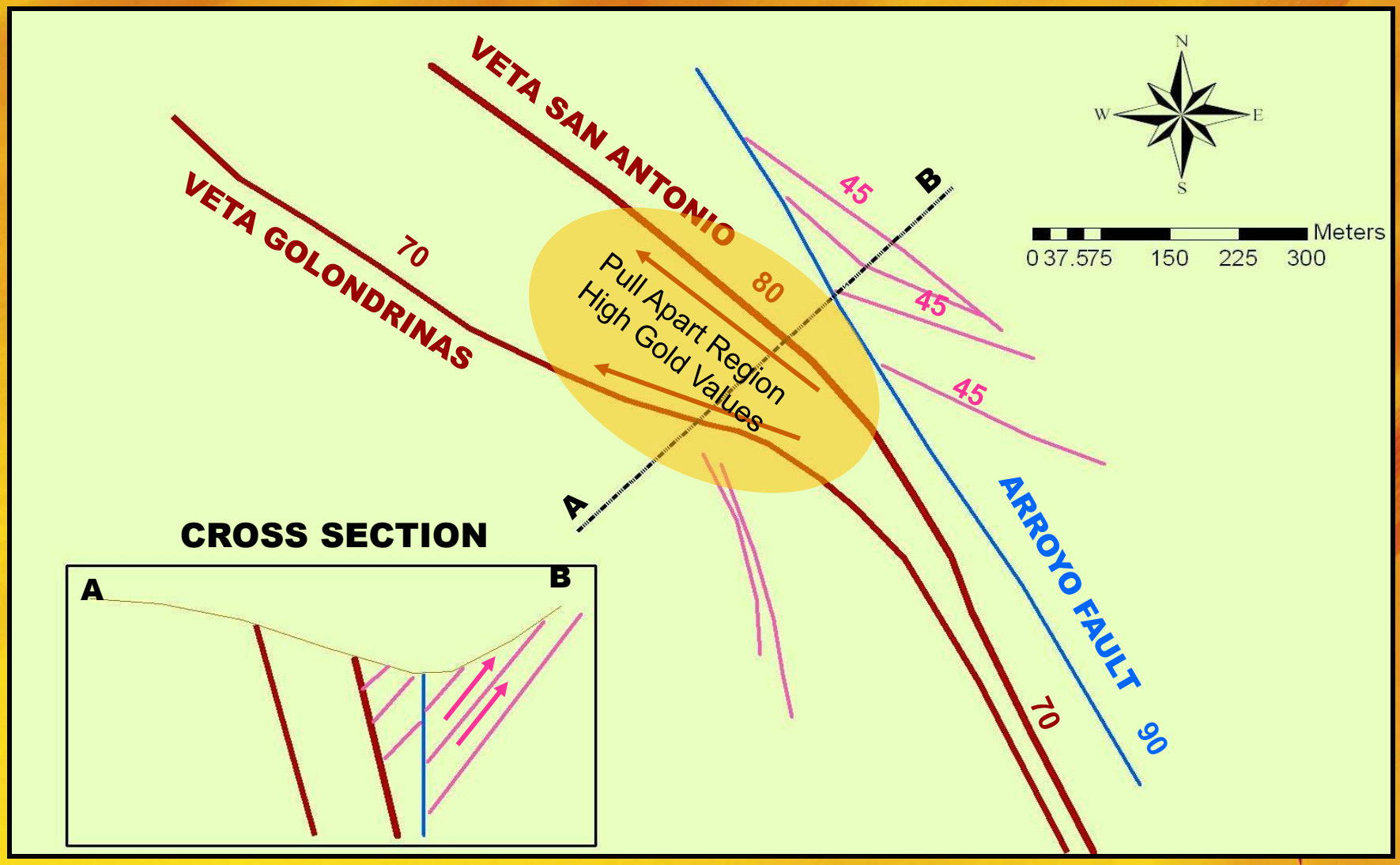


FACTORS AFFECTING THE DISTRIBUTION FOR THE SILVER – GOLD VEINS

- **A general bias toward the N-S Veins having a higher gold content, which in turn occupy structures having a vertical sense of displacement (“normal faults”)**

STRUCTURAL FEATURES WITHIN VEINS

EXTENSIONAL PULL-APART REGIONS BETWEEN VEINS CAN RESULT IN DEEPER CHANNELWAYS



MINOR STRUCTURAL FEATURES

VEIN MINERALOGY DIFFERING WITH STRUCTURAL SETTING OF VEIN

a) Colloform breccia, with hematite, b) geopetal breccia clasts with colloform textures, c) manganese oxide alteration, surrounding a sphalerite vein

FACTORS AFFECTING THE DISTRIBUTION FOR THE SILVER – GOLD VEINS

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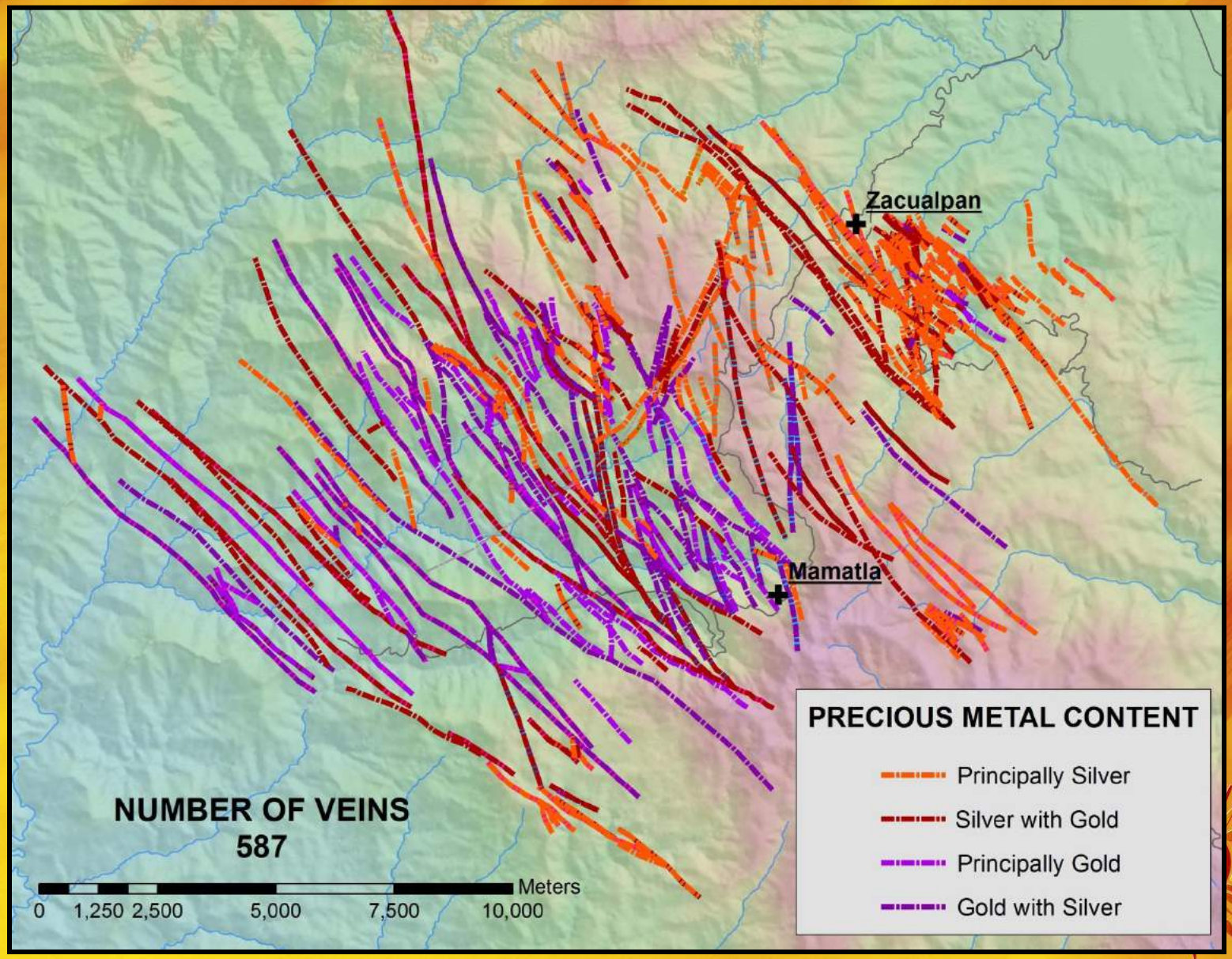
- **Different types of structures contain different metal contents with the extensional structures having deeper channel ways, which in turn result in enriched gold contents due to higher temperature solutions**

TOPOGRAPHY

VEINS IN RELATION TO COLOURED TOPOGRAPHY



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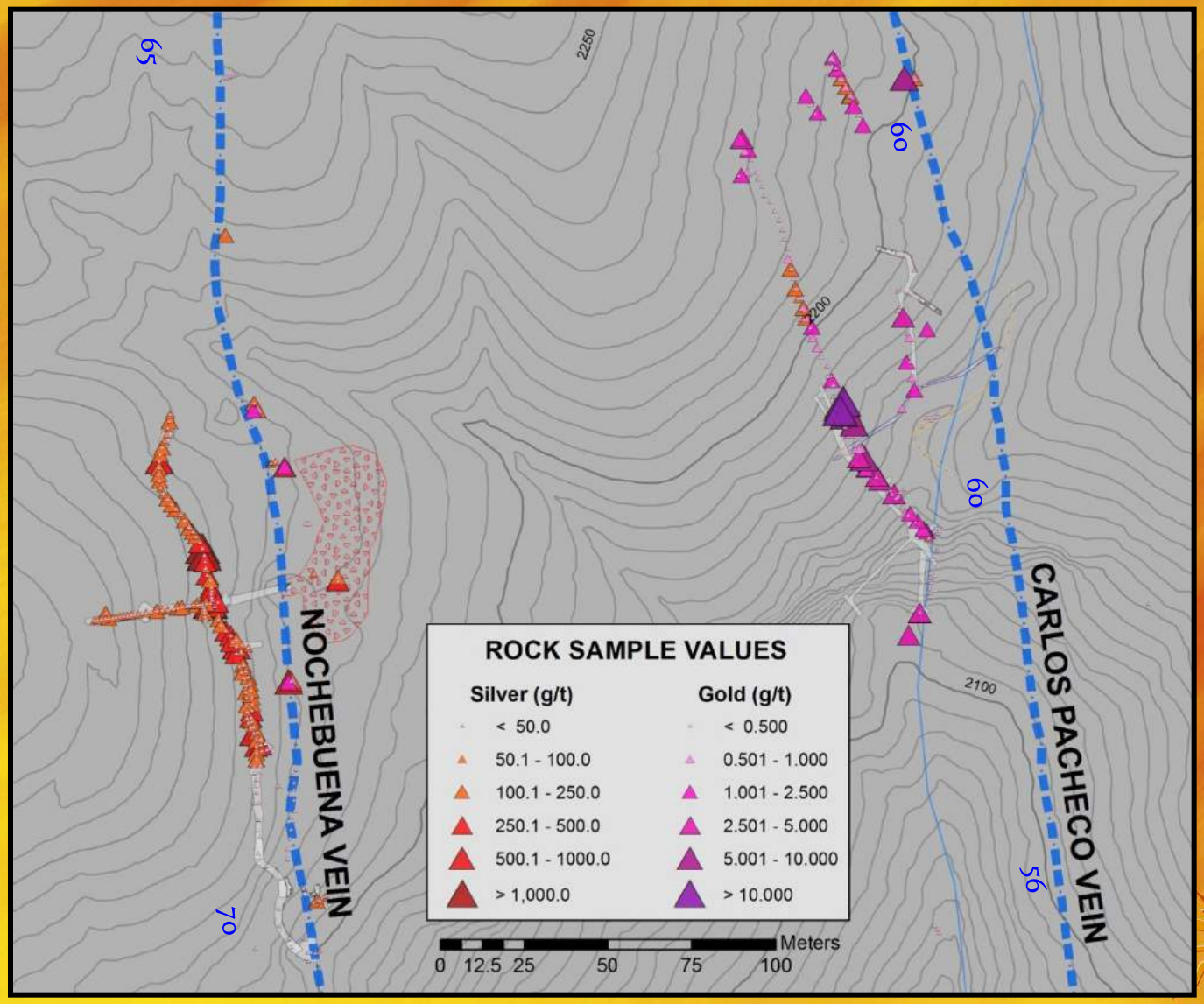
- **Topography does not appear to be significant**

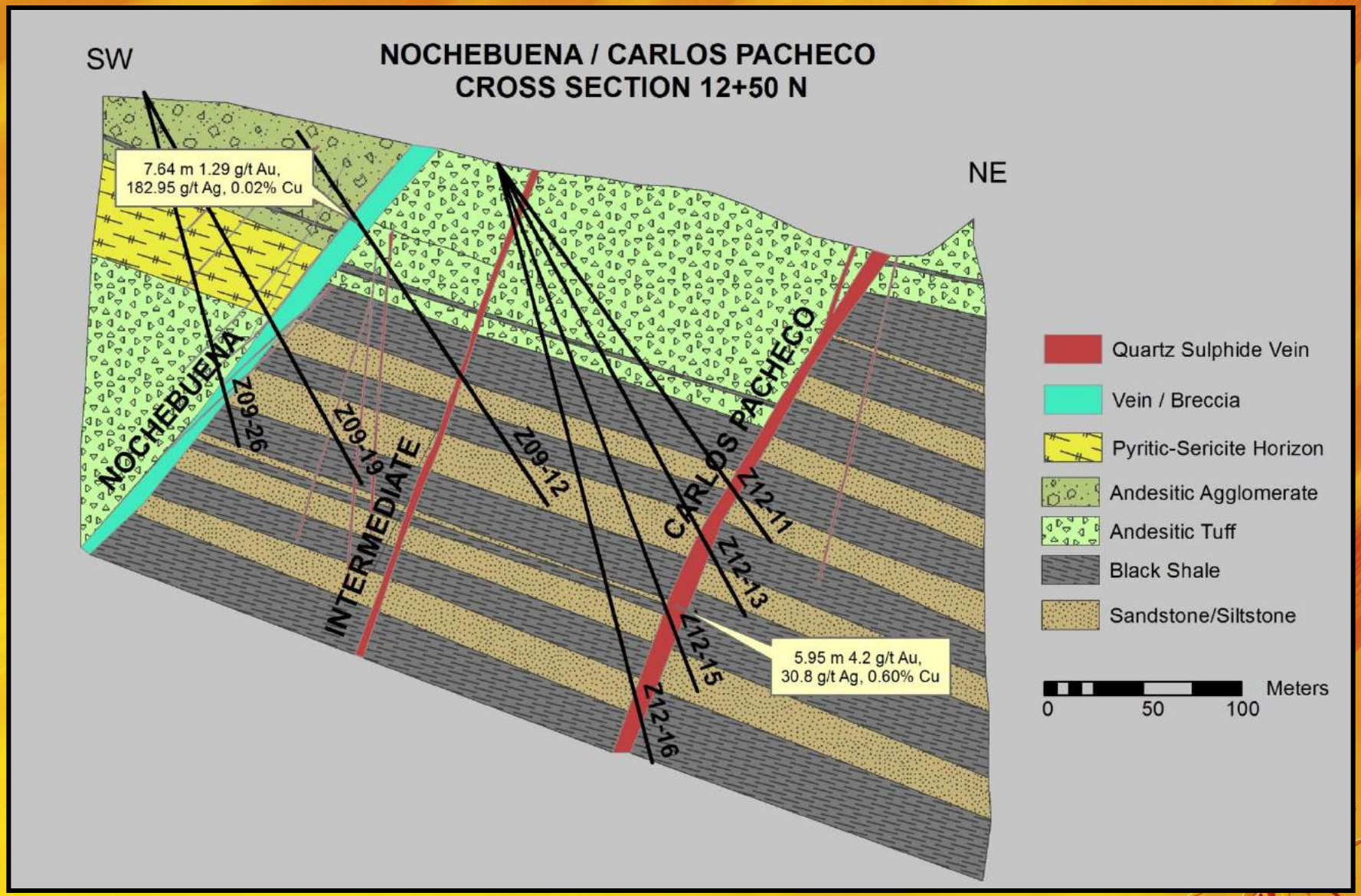
DEPTH OF VEIN EMPLACEMENT

NOCHEBUENA VS CARLOS PACHECO VEINS



DEPTH OF VEIN EMPLACEMENT

550 METERS OF STRATIGRAPHIC OFFSET



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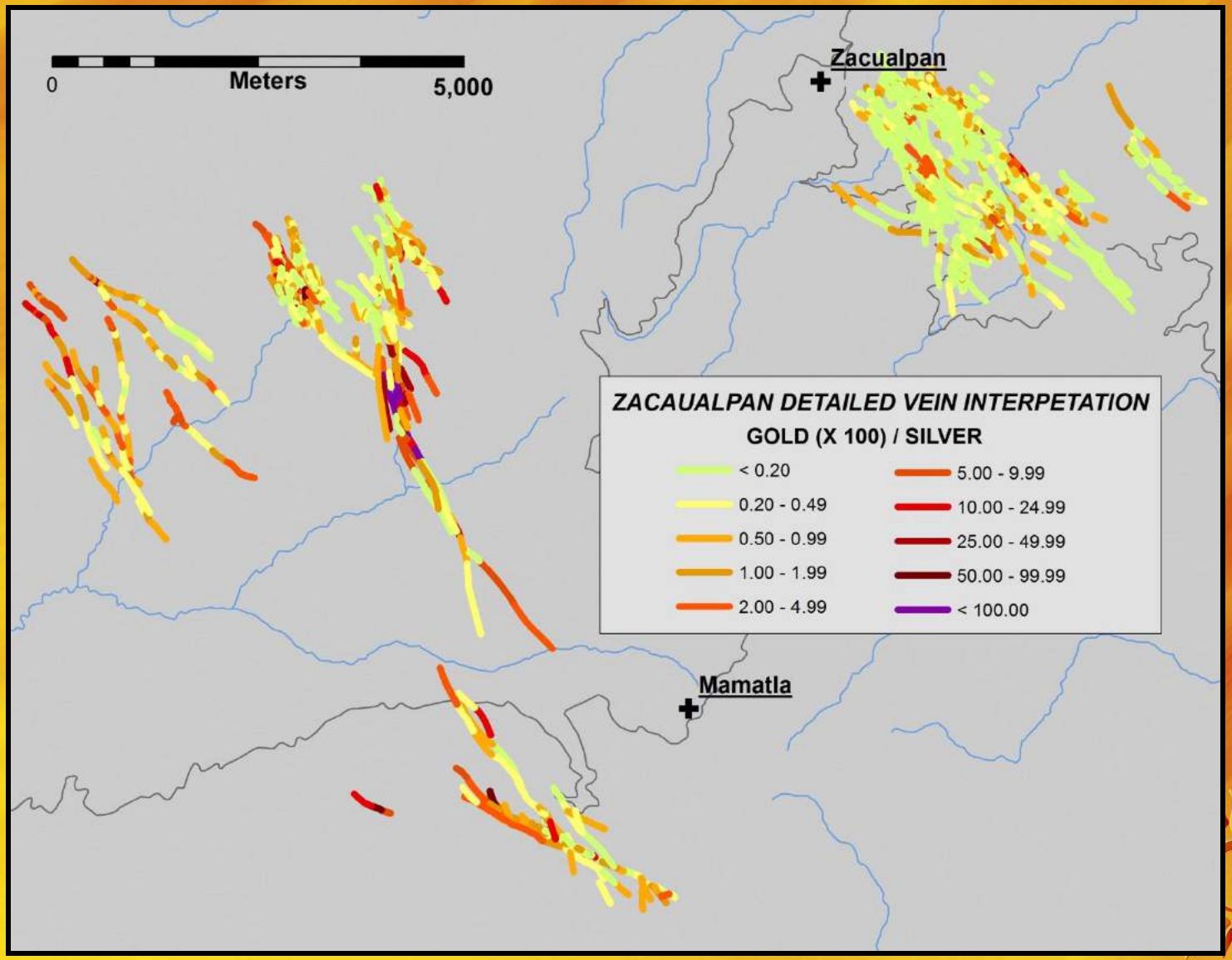
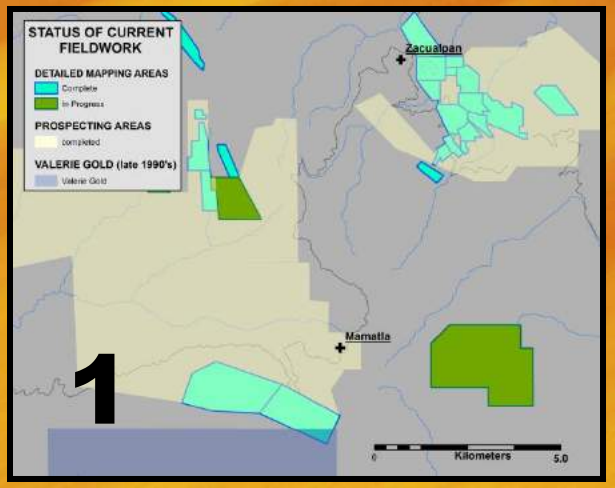
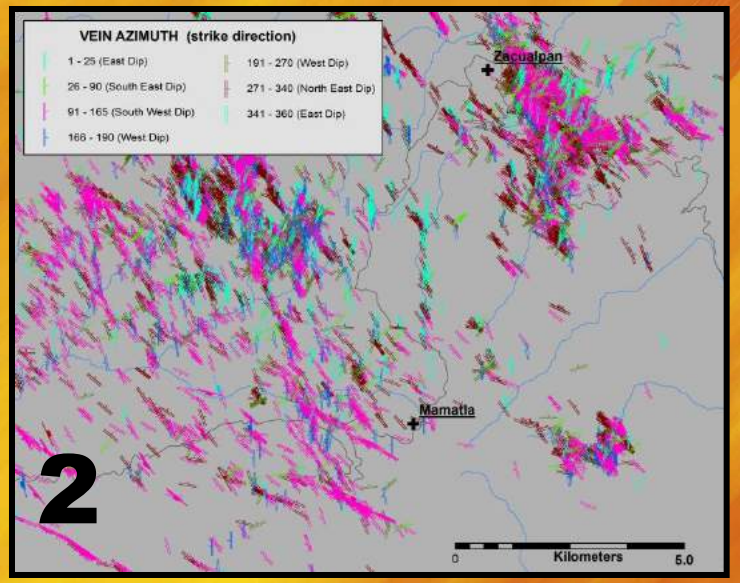
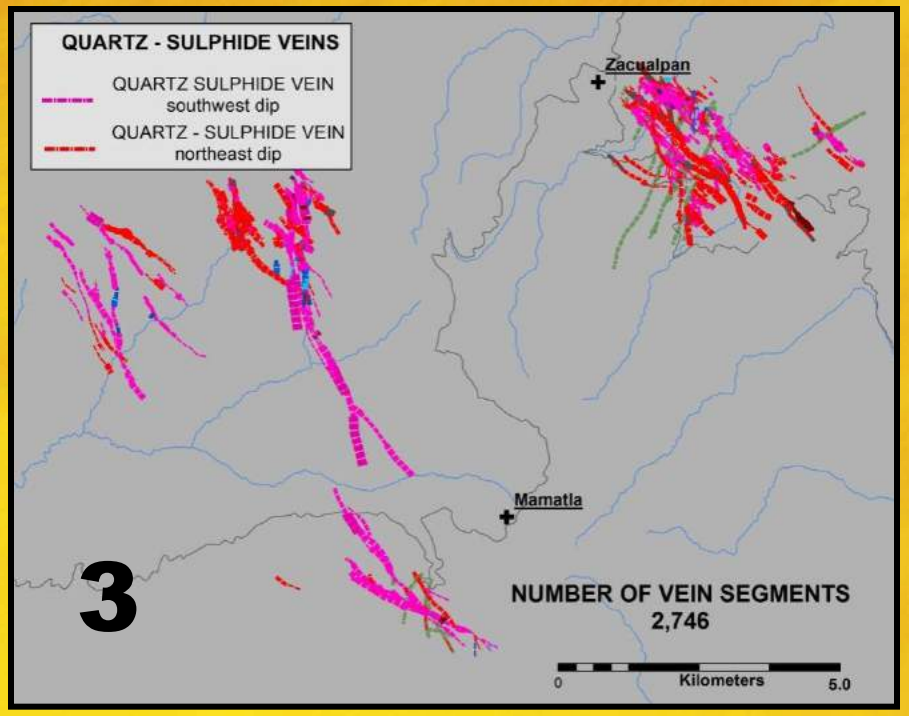
FELSIC INTRUSIONS OF THE TILZAPOLA FORMATION



CONSTRUCTION OF VEIN SEGMENT MAPS







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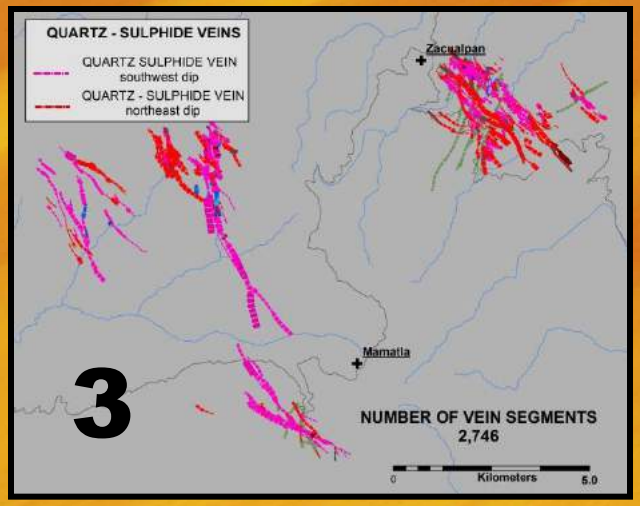
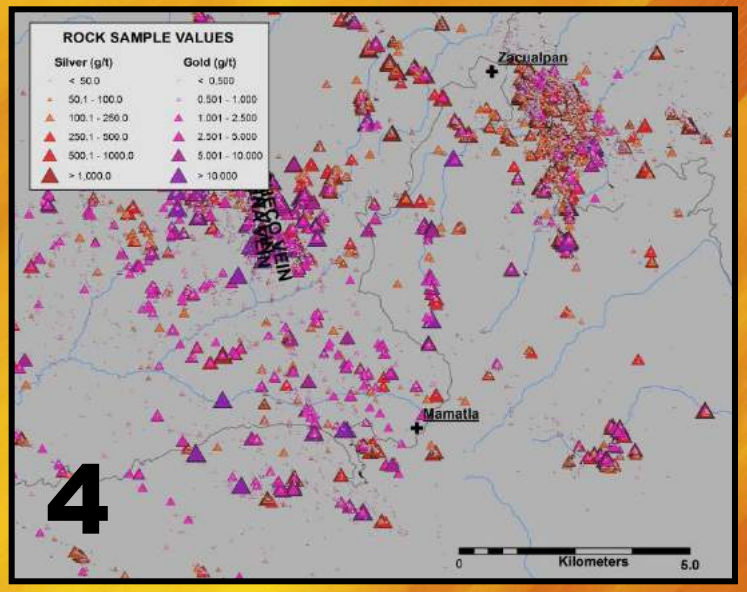
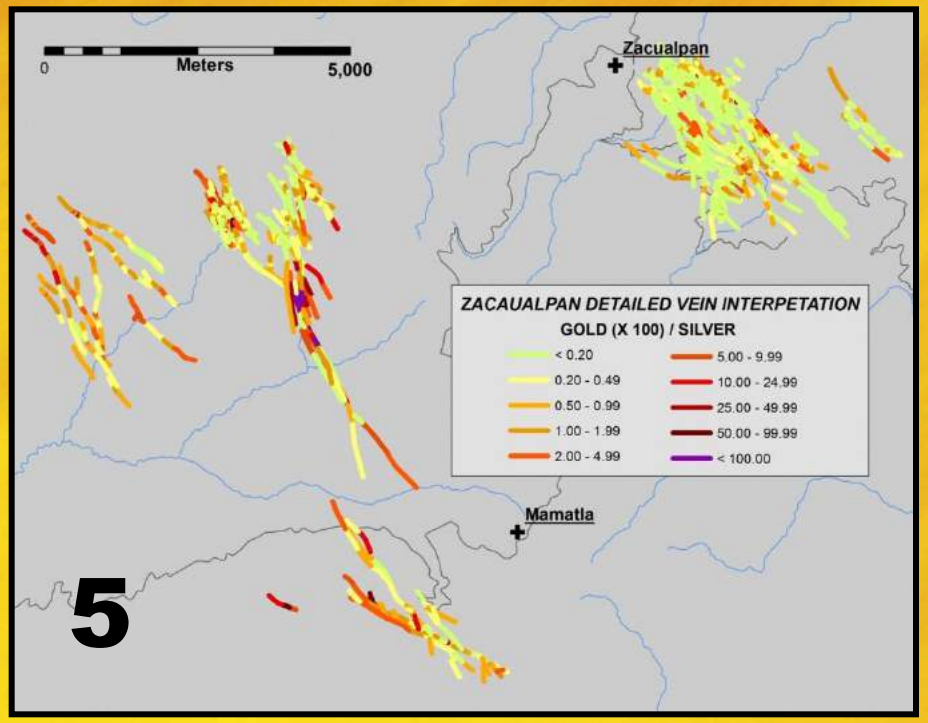
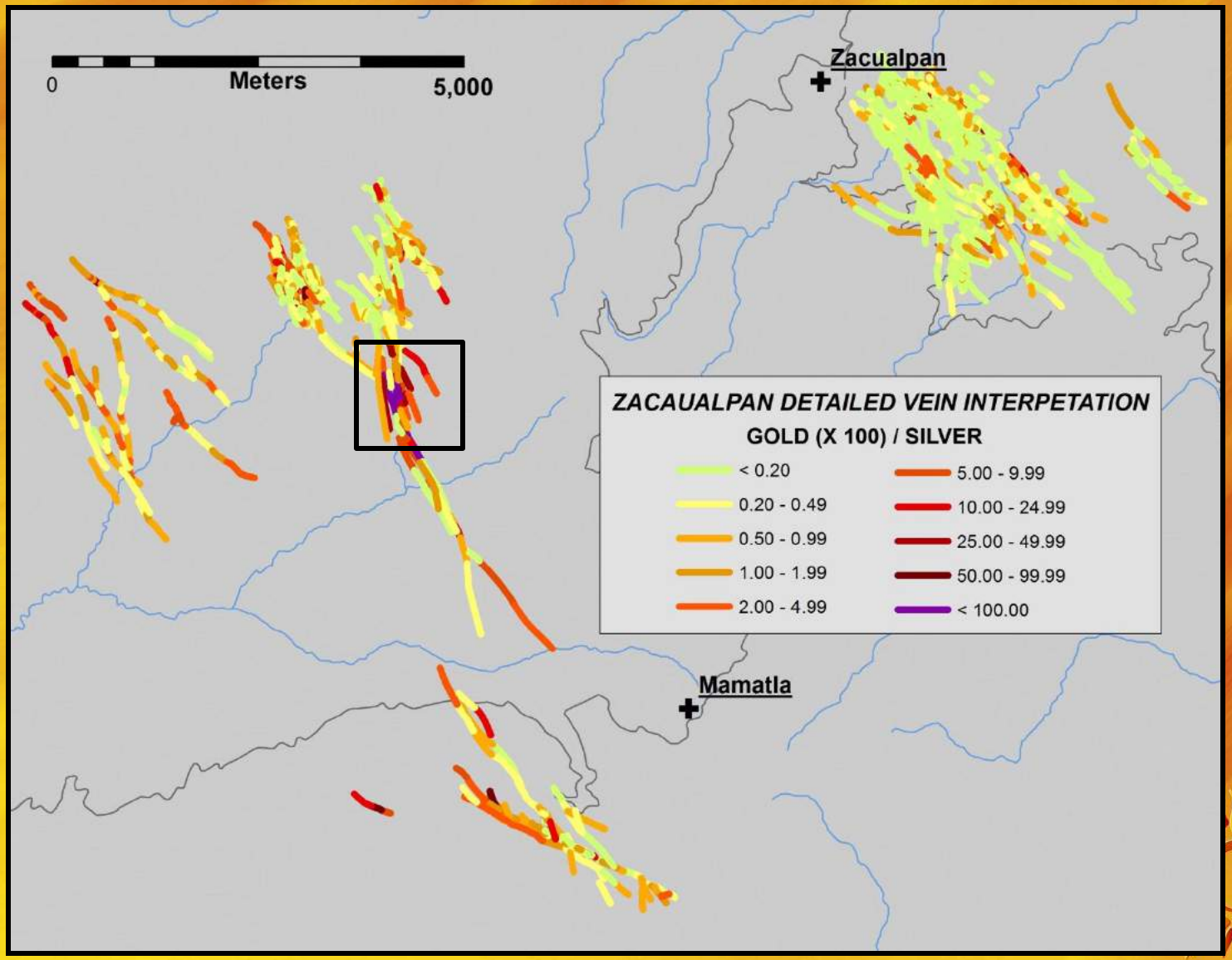






FELSIC INTRUSIONS OF THE TILZAPOLA FORMATION



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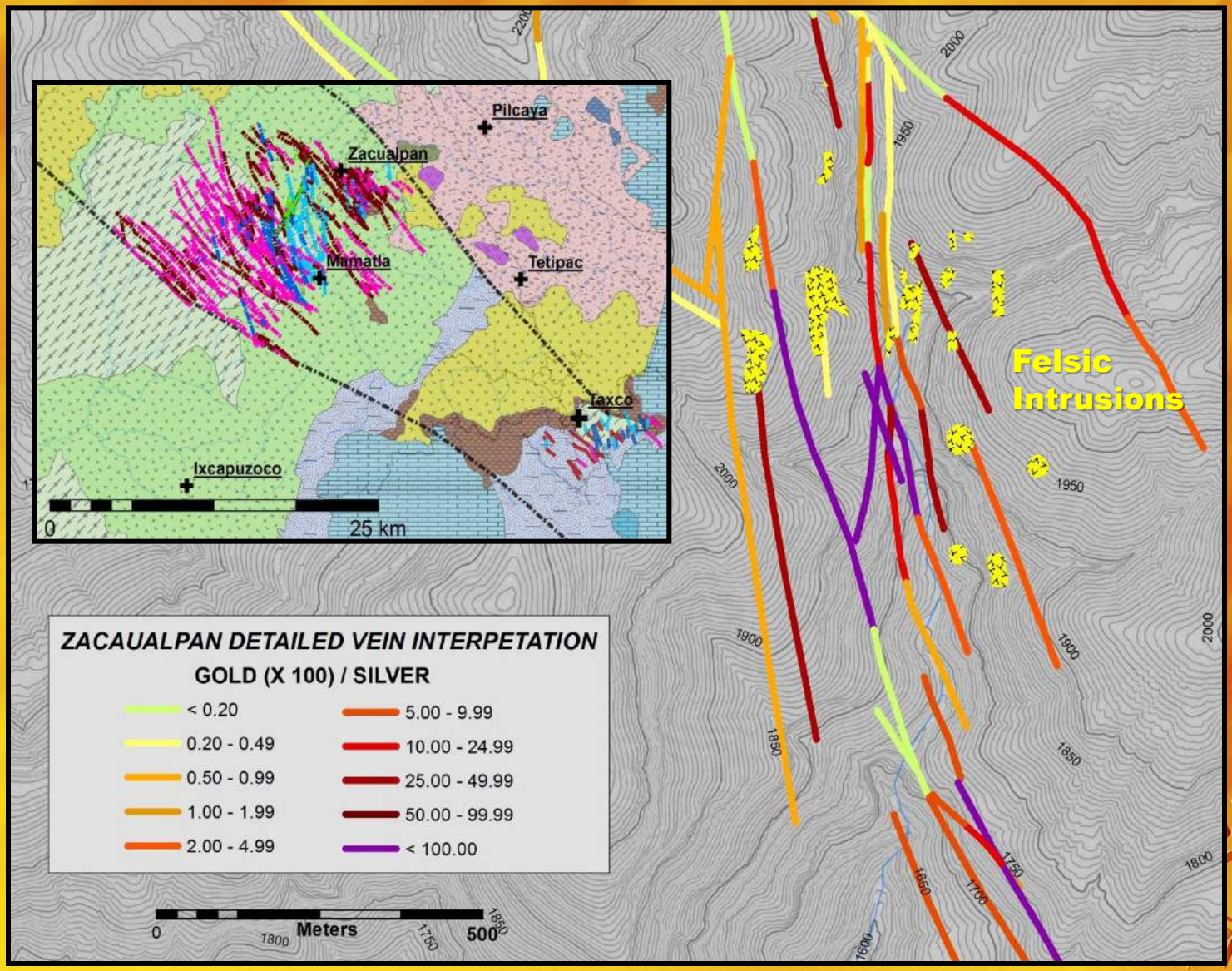
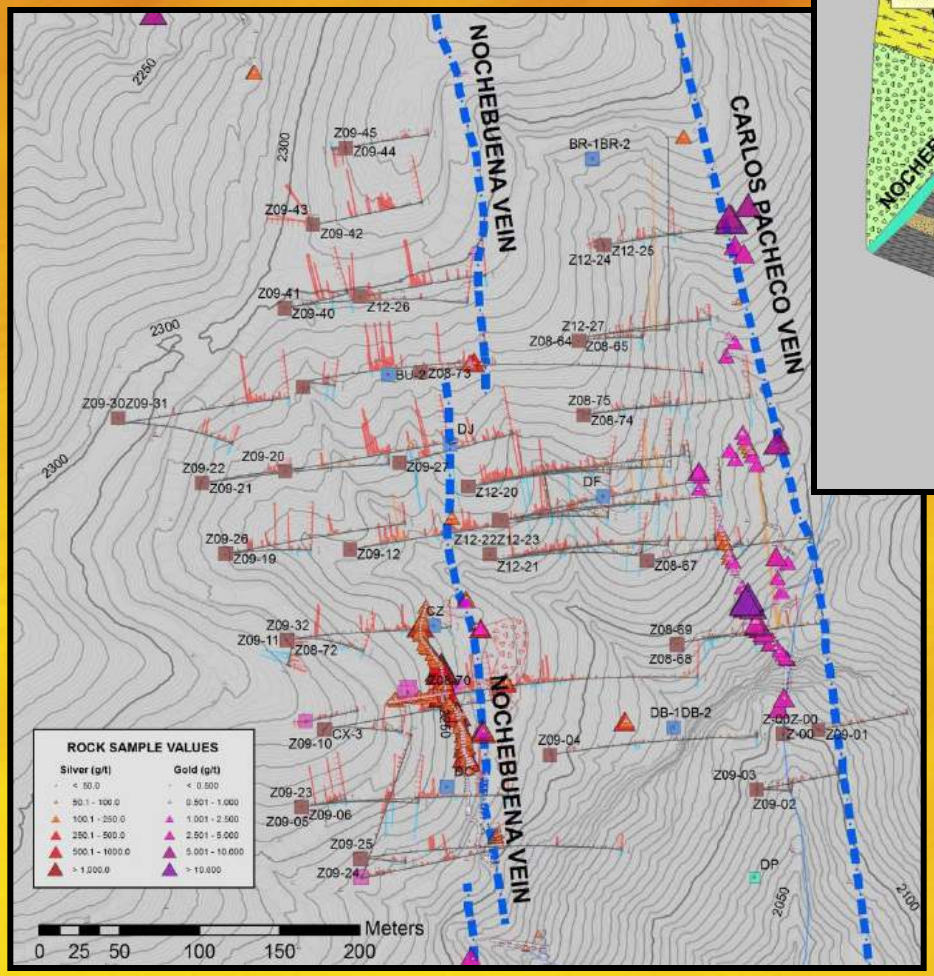
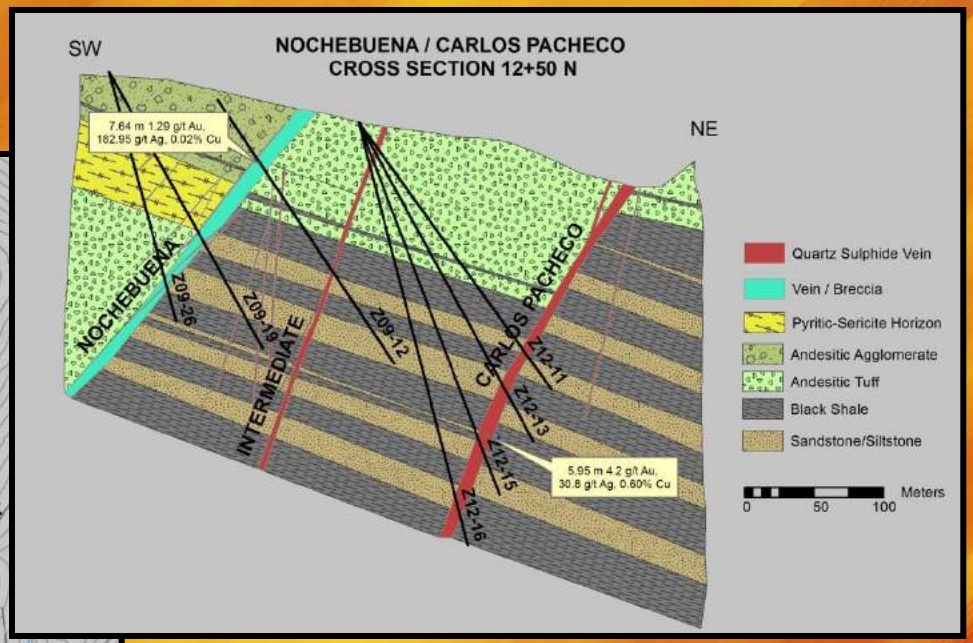


NOCHEBUENA VEIN

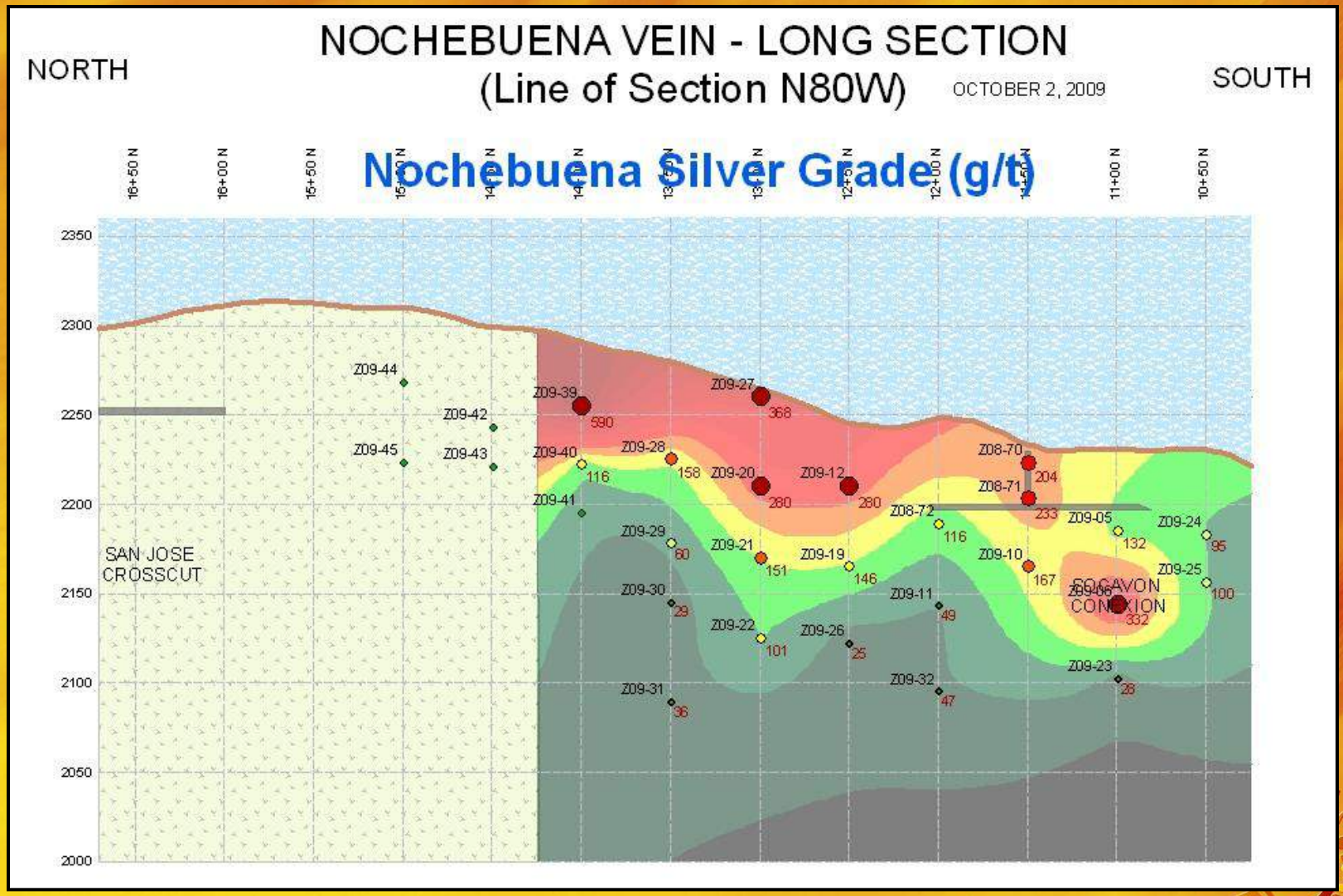
BRECCIA FEATURES





NOCHEBUENA VEIN

LONG SECTION - SILVER GRADES (g/t)



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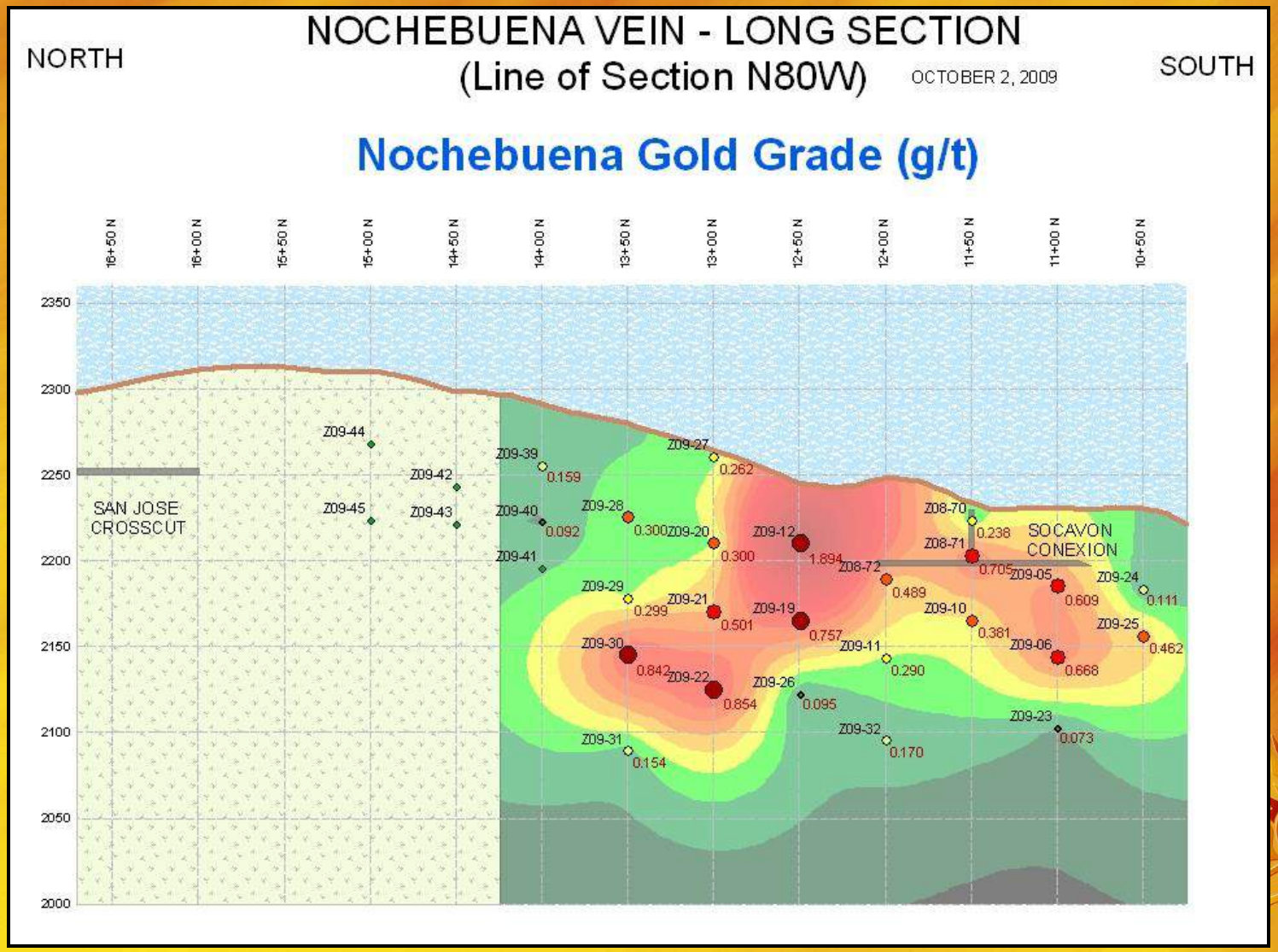
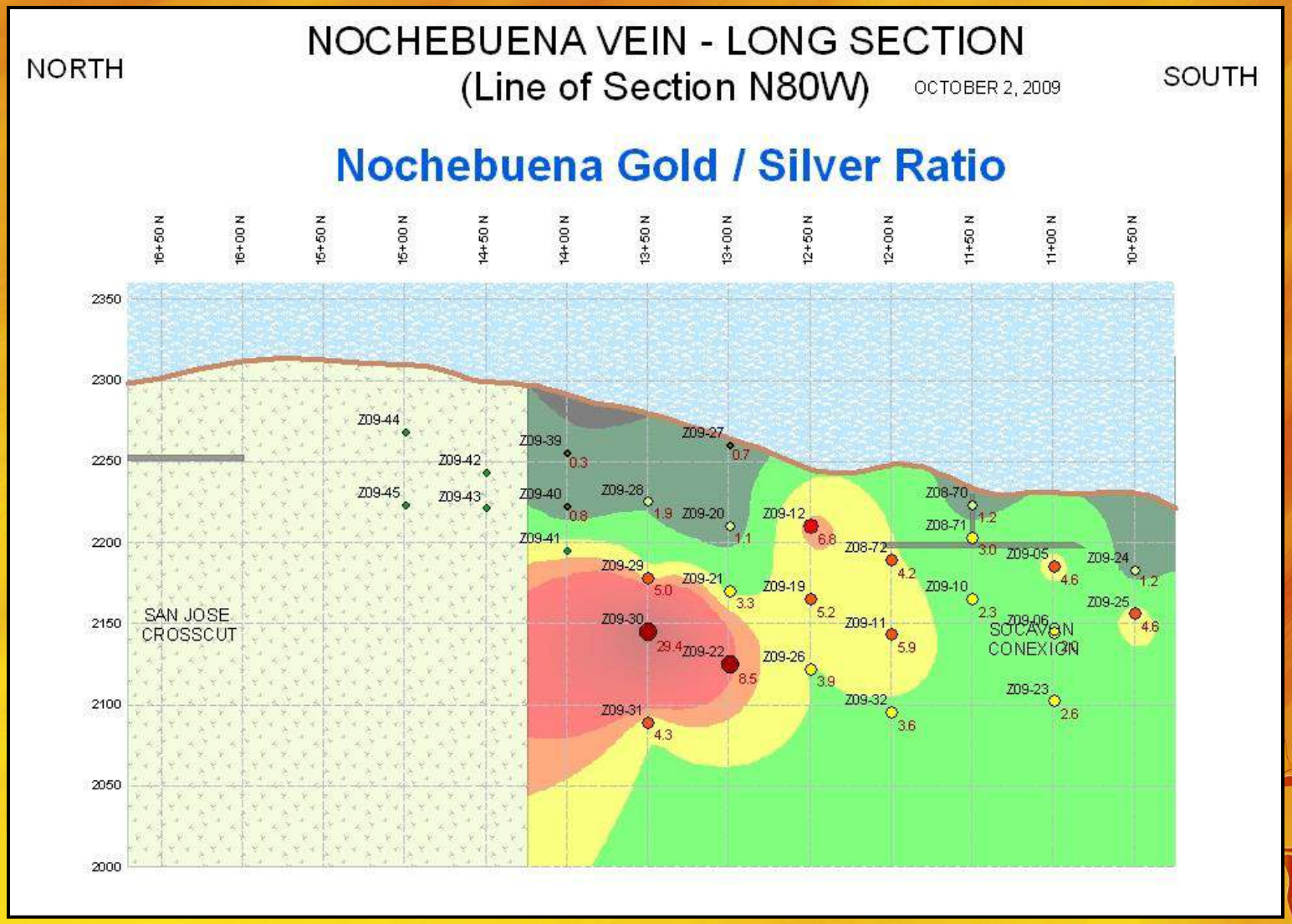


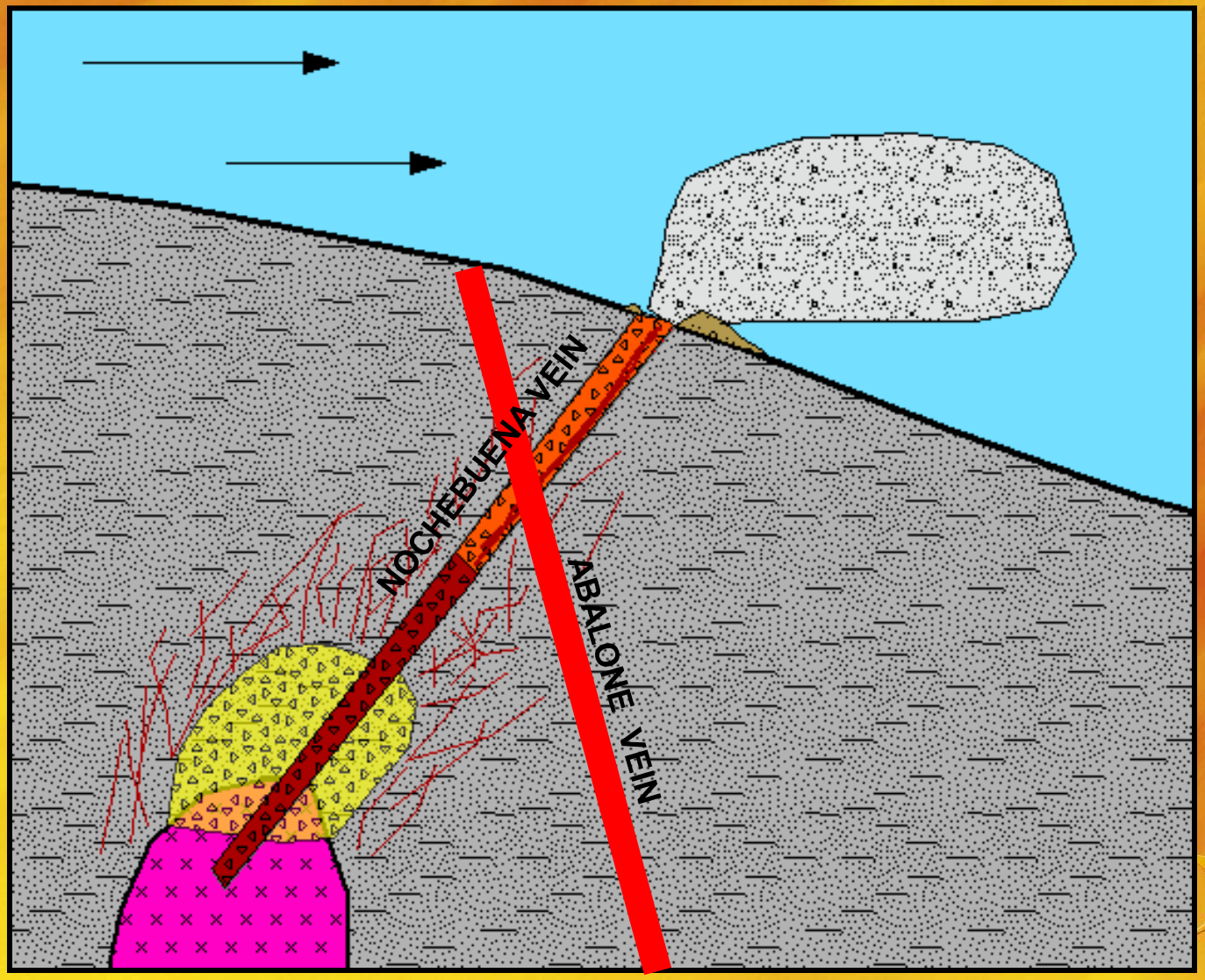
NOCHEBUENA VEIN

LONG SECTION – GOLD / SILVER RATIO



NOCHEBUENA VEIN

INTERSECTION OF NOCHEBUENA VEIN WITH SILVER-BEARING ABALONE VEIN



NOCHEBUENA VEIN

BRECCIA FEATURES

Z09-29 (North End)

Z09-25 (South End)

North End

- **High Gold Grades**
- **> 50% Rhyolite Porphyry Clasts (angular)**
- **Few Soft Clasts**

South End

- **Low Gold Grades**
- **< 10% Rhyolite Porphyry Clasts (rounded)**
- **Large Soft Clasts**

FACTORS AFFECTING THE DISTRIBUTION FOR THE SILVER – GOLD VEINS

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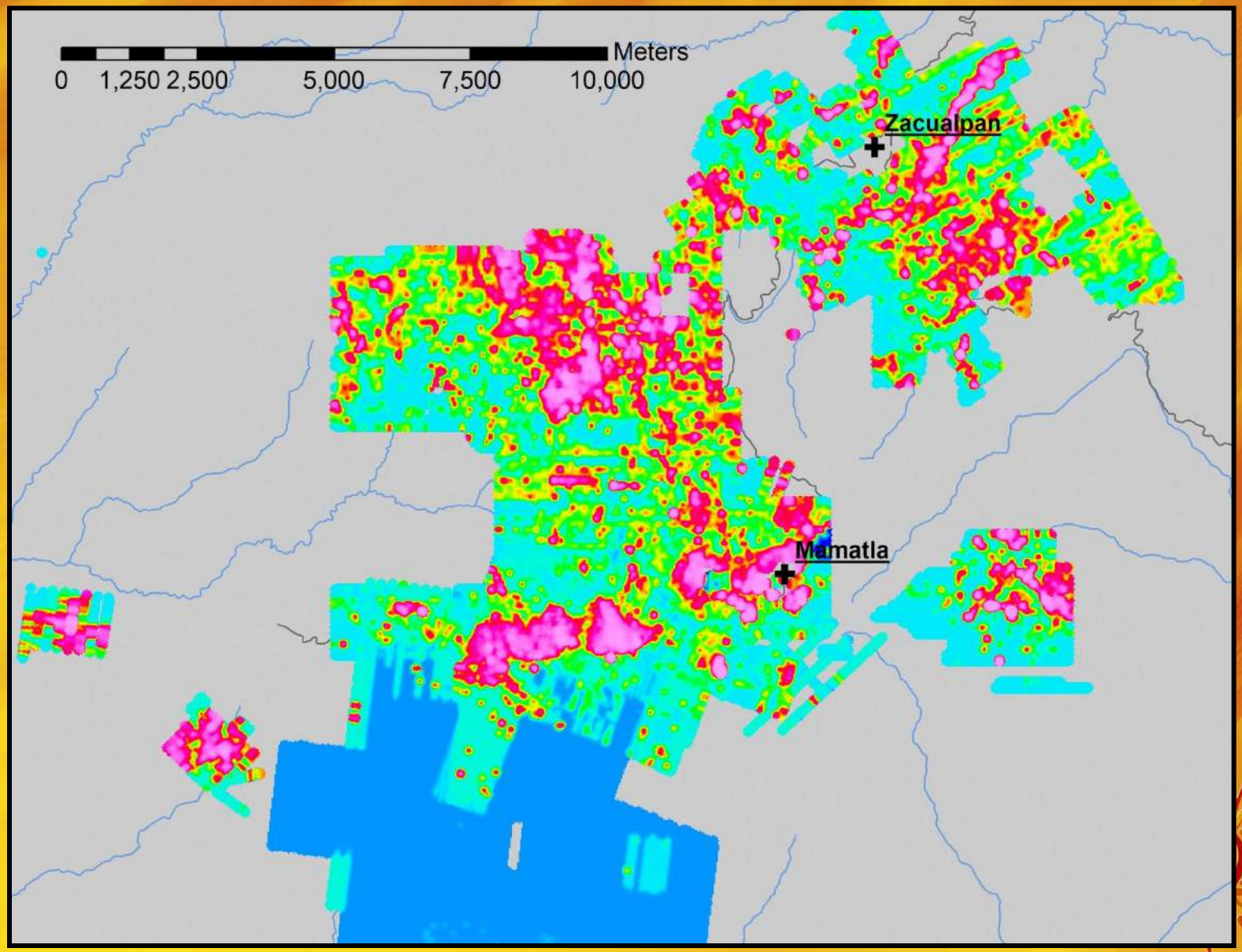
- Different types of structures contain different metal contents with the extensional structures having deeper channel ways, which in turn result in enriched gold contents due to higher temperature solutions
- Topography does not appear to be significant
- Depth of emplacement for the veins is important
- **The presence of Felsic Intrusions of the Tilzapola Formation is very important!**

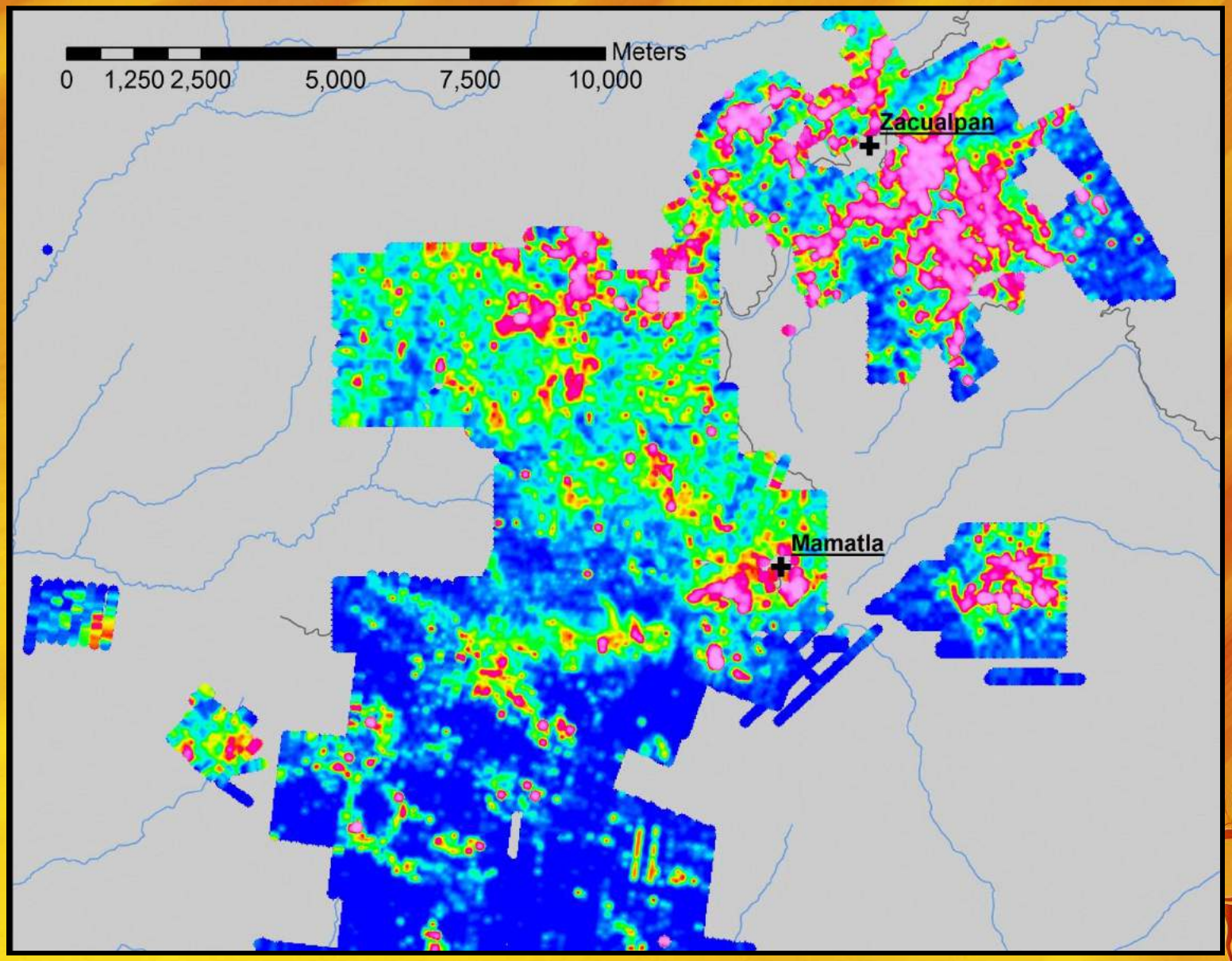
DISTRICT METAL ZONING

GOLD SOIL GEOCHEMISTRY



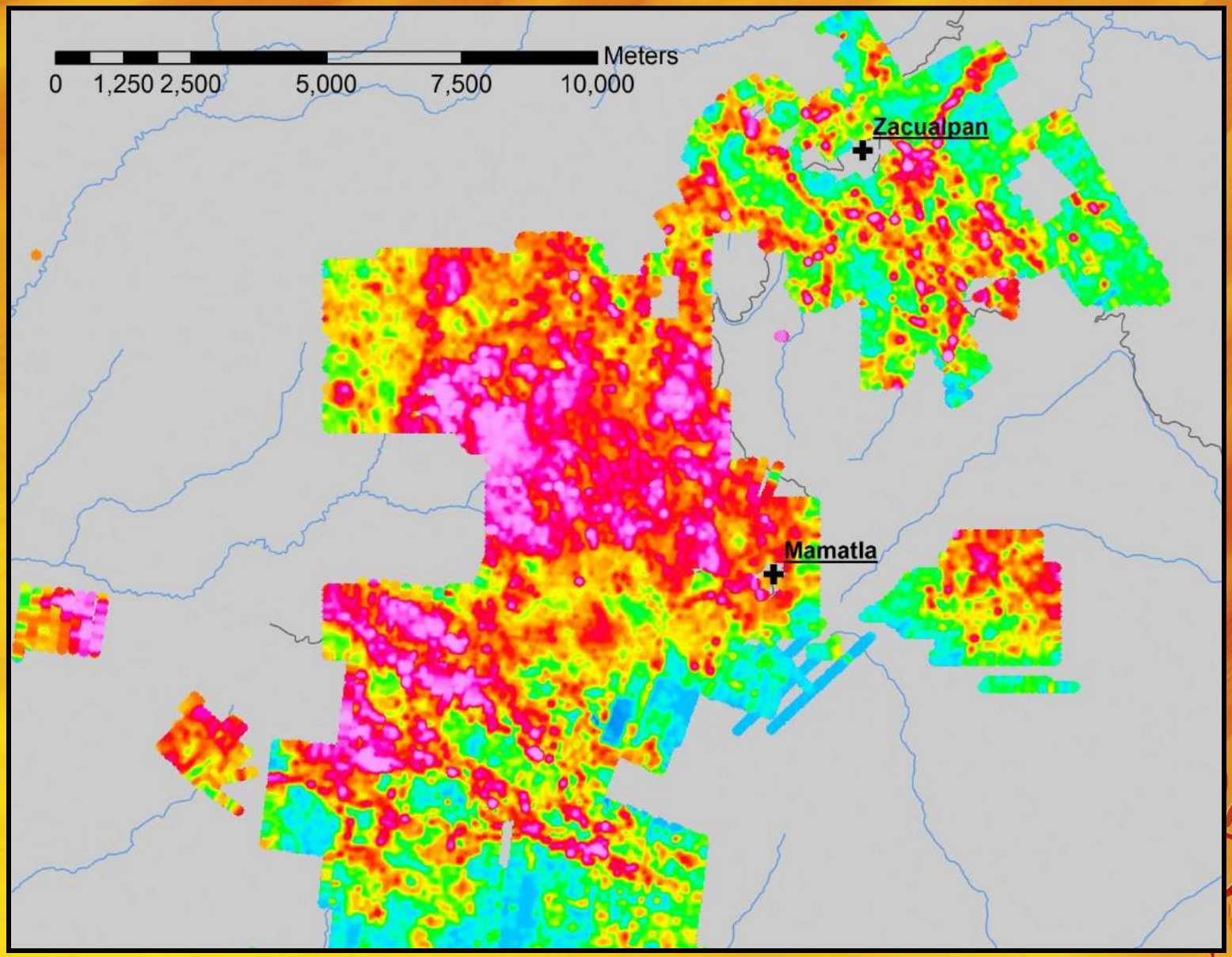
DISTRICT METAL ZONING

SILVER SOIL GEOCHEMISTRY



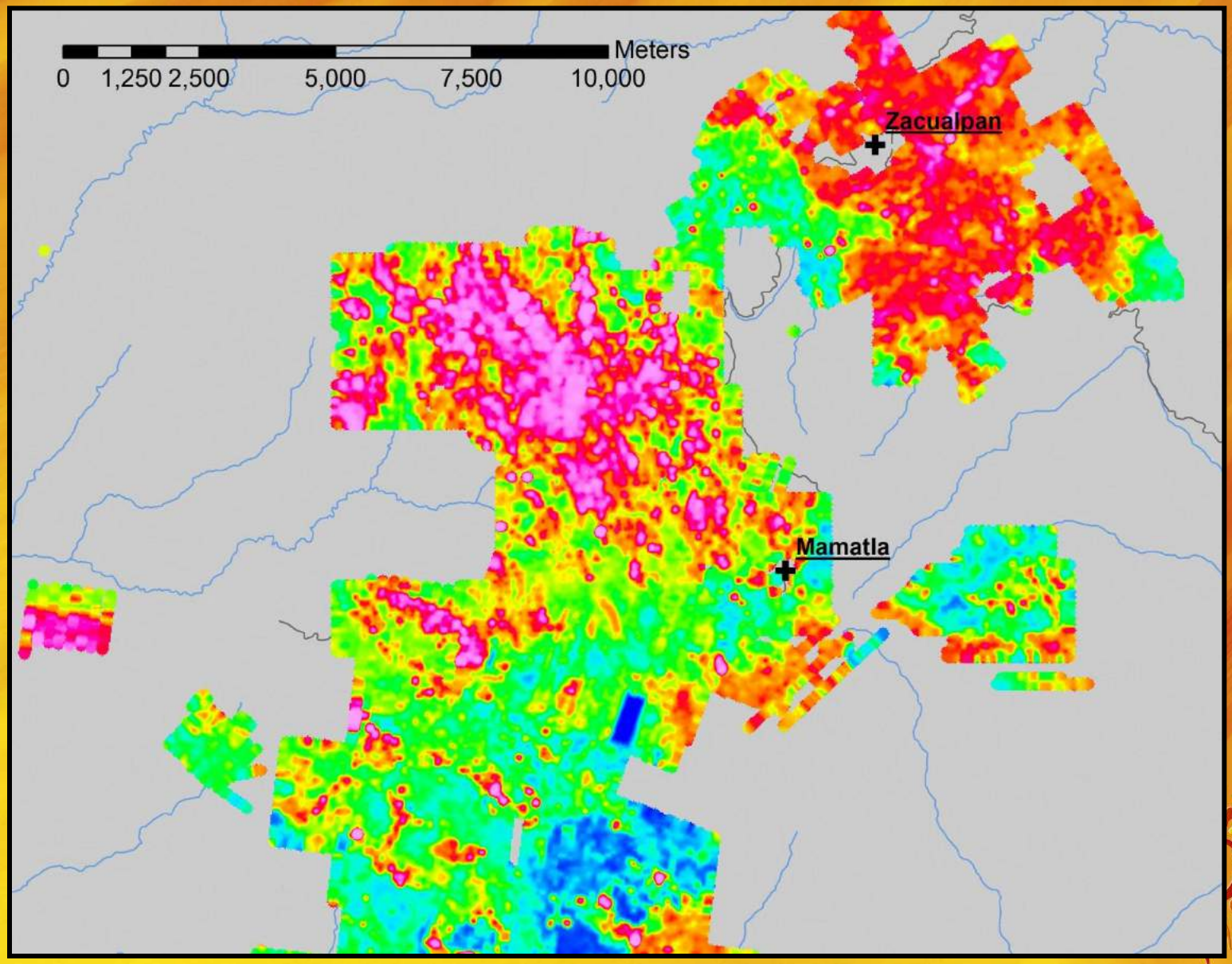
DISTRICT METAL ZONING

ARSENIC SOIL GEOCHEMISTRY



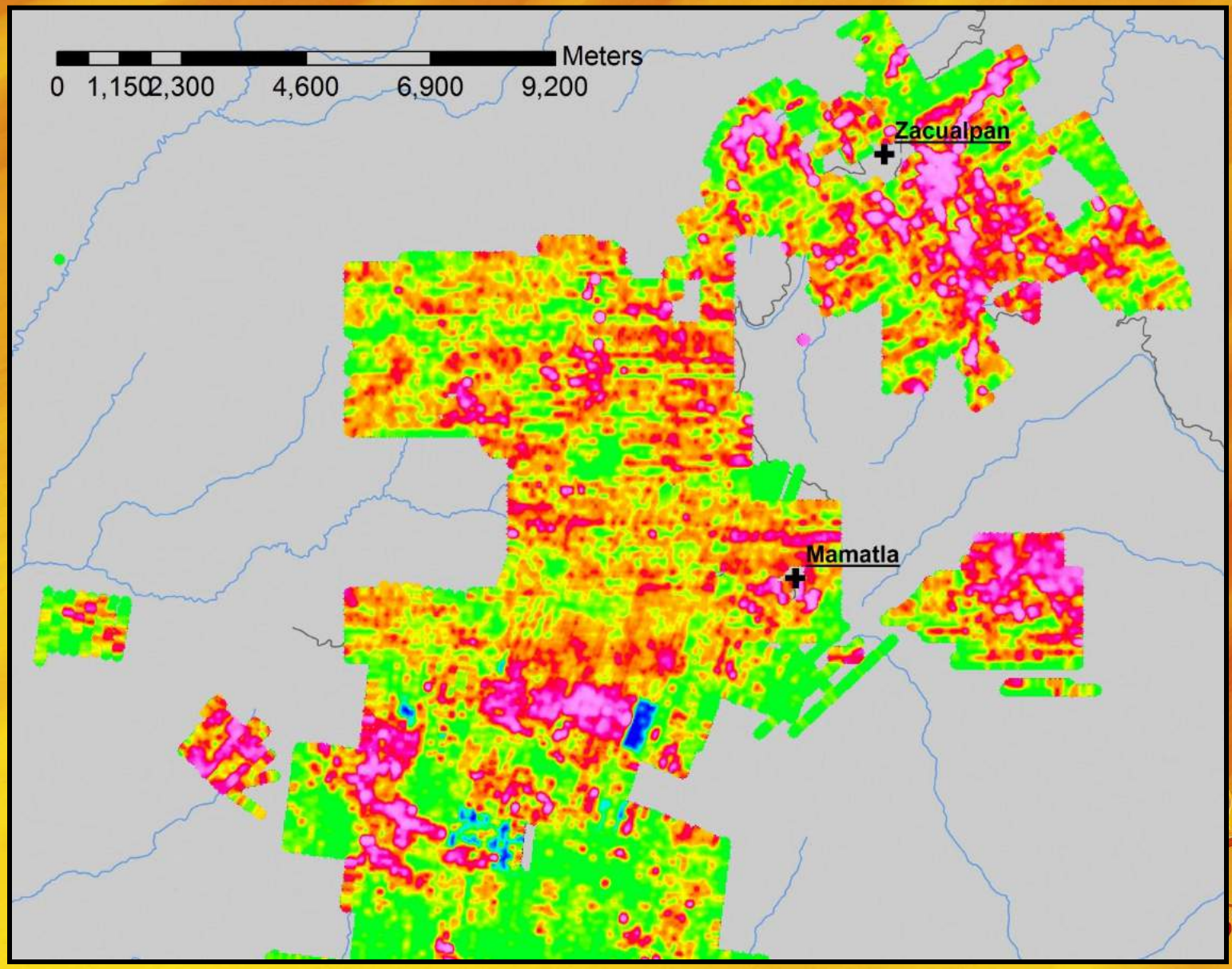
DISTRICT METAL ZONING

COPPER SOIL GEOCHEMISTRY



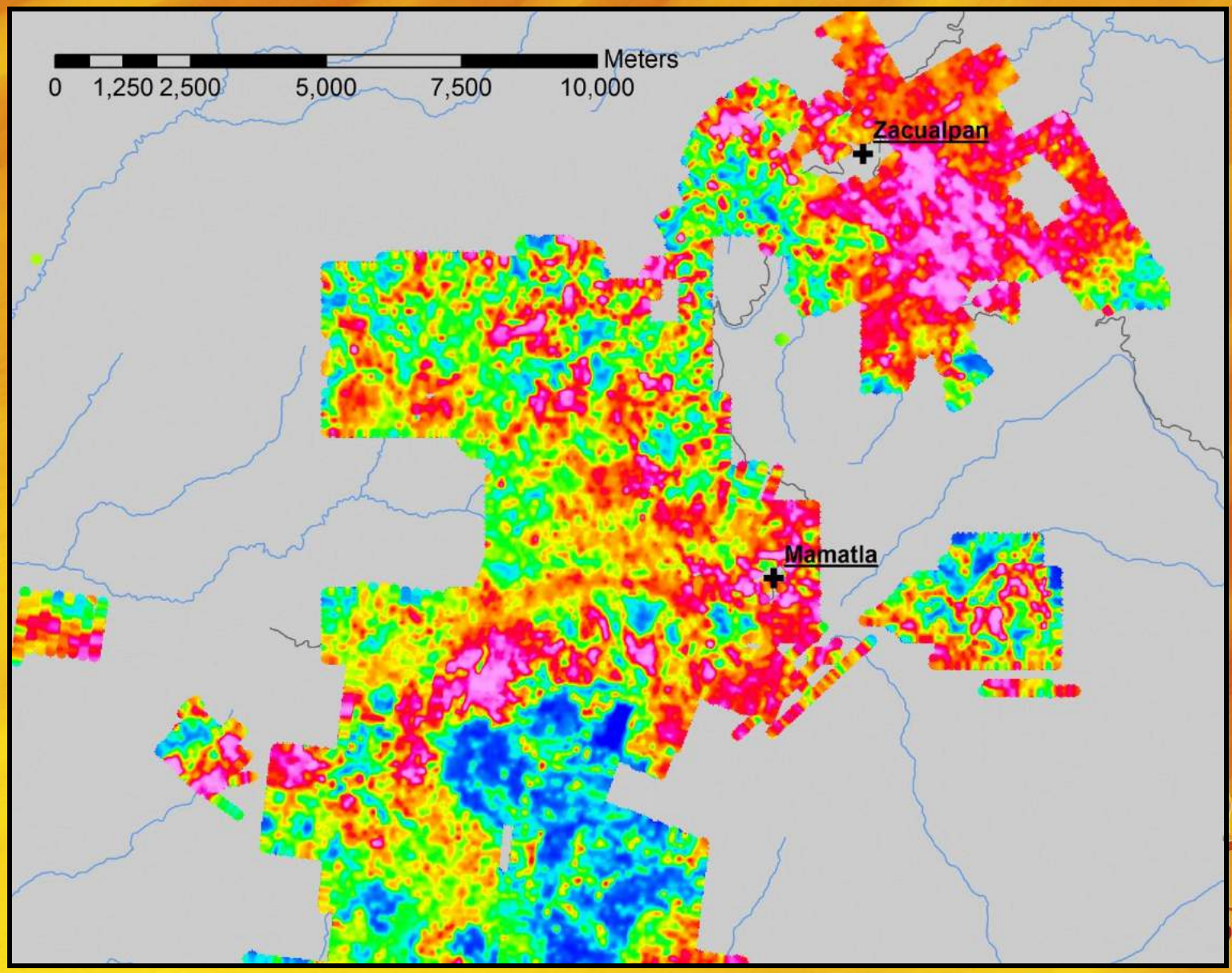
DISTRICT METAL ZONING

ANTIMONY SOIL GEOCHEMISTRY



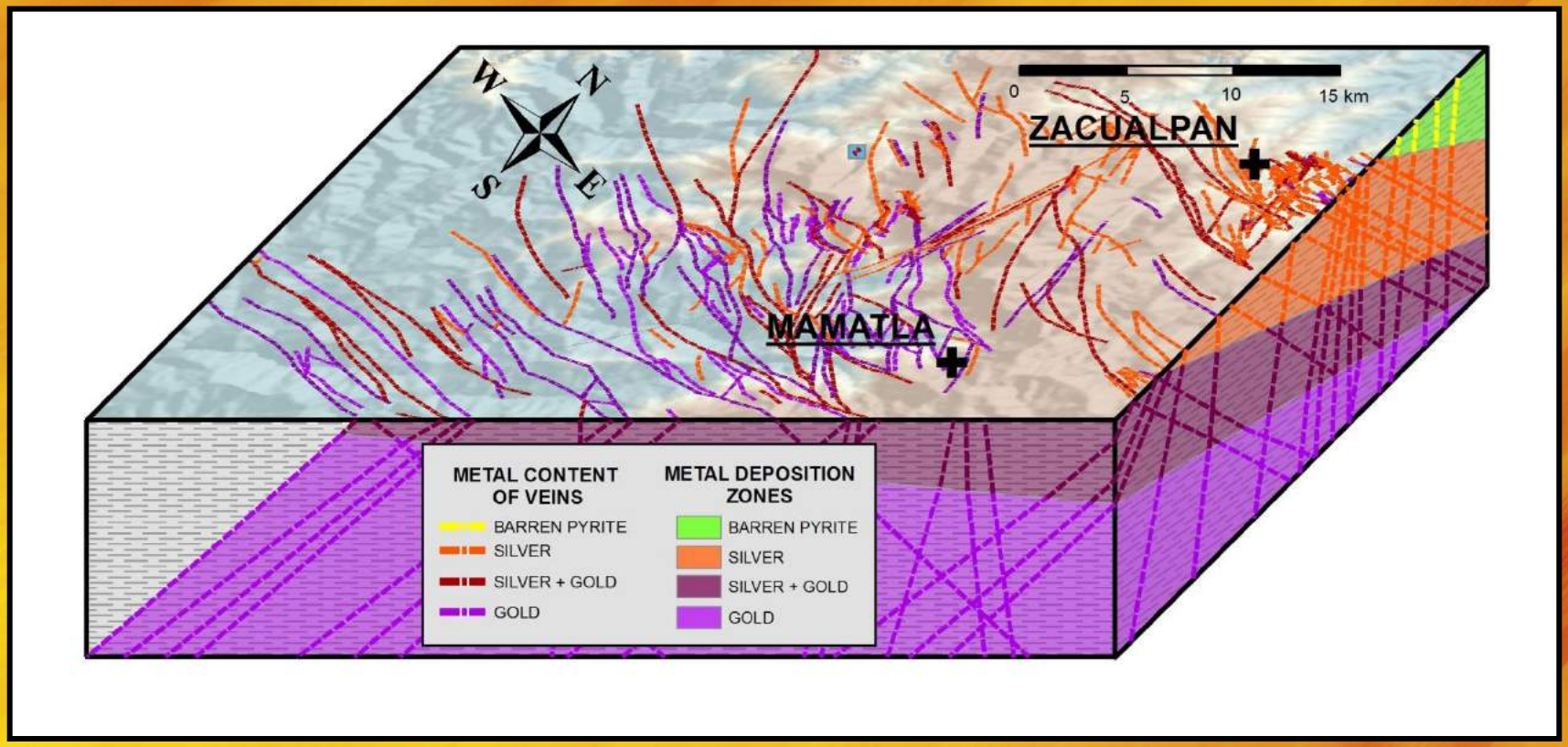
DISTRICT METAL ZONING

MANGANESE SOIL GEOCHEMISTRY



DISTRICT METAL ZONING

SOUTHEAST TILT OF THE ZACUALPAN DISTRICT POST VEIN-EMPLACEMENT



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- The presence of Felsic Intrusions of the Tilzapola Formation is very important!
- **A regional progression from SW to NE of Mesothermal Geochemistry (Au-As-Cu) to Epithermal Geochemistry (Ag-Sb-Mn) suggesting an overall tilt to the district is perhaps the most important factor**

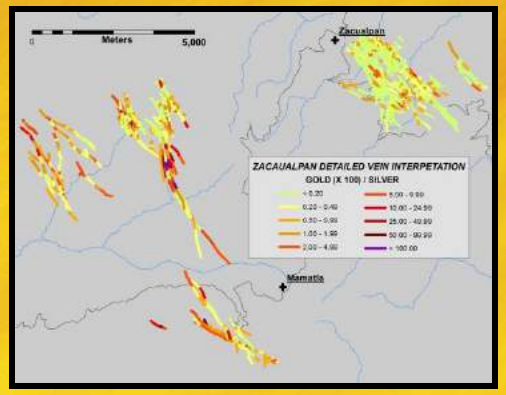
DRILLING SUCCESS RATE USING ArcVIEW

PREVIOUS SUCESS RATE

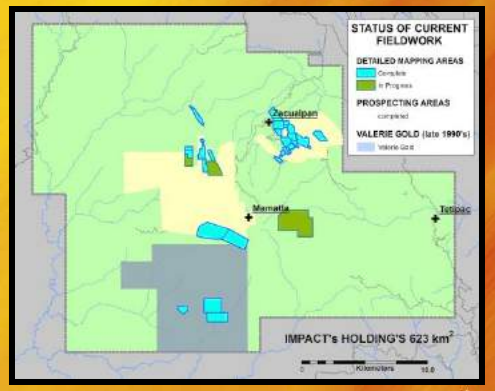
31%

DATA BASE DRIVEN SUCCESS RATE

(as of 2009)



61%



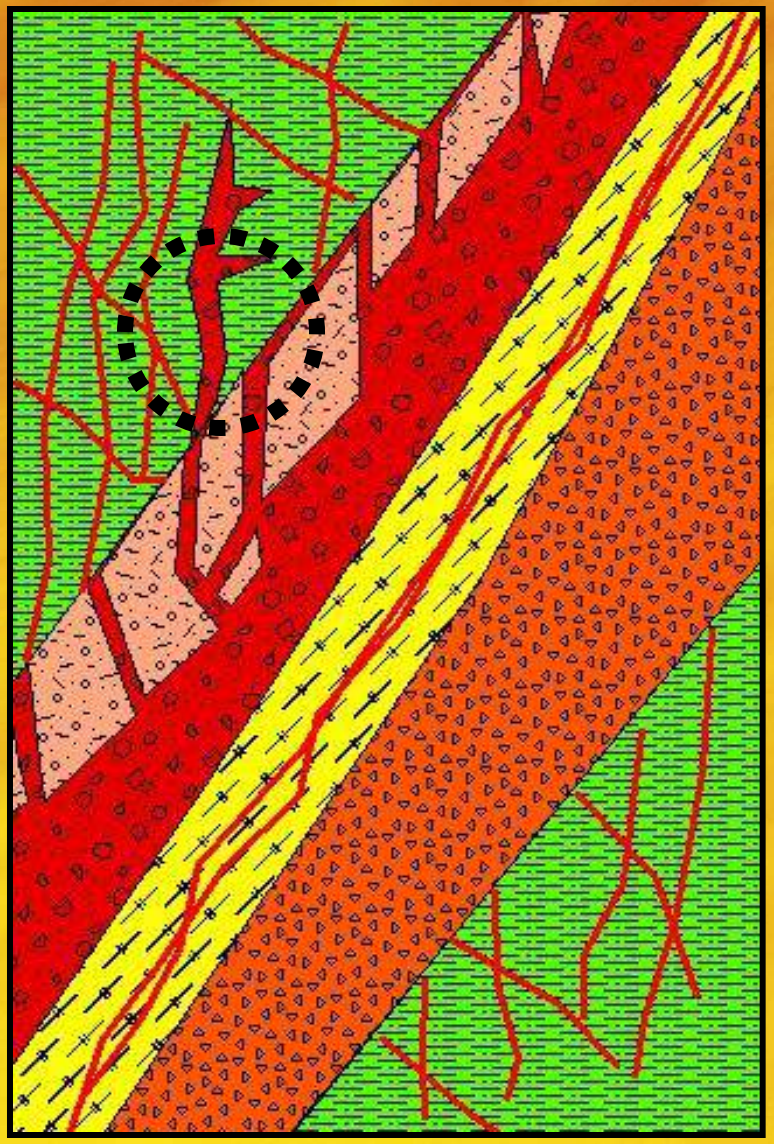
ECONOMIC INTERSECTION DEFINED AS

> 125 g/t Silver across 2.0 meters

The End

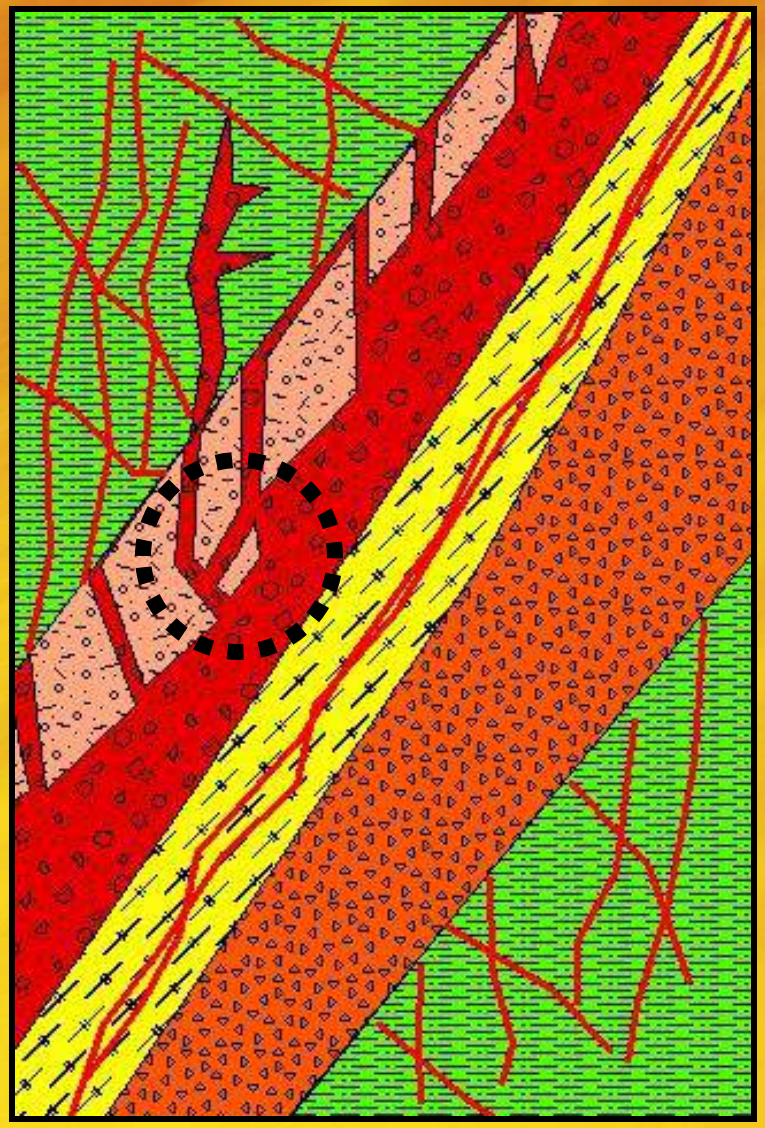
NOCHE BUENA VEIN

BRECCIA FEATURES



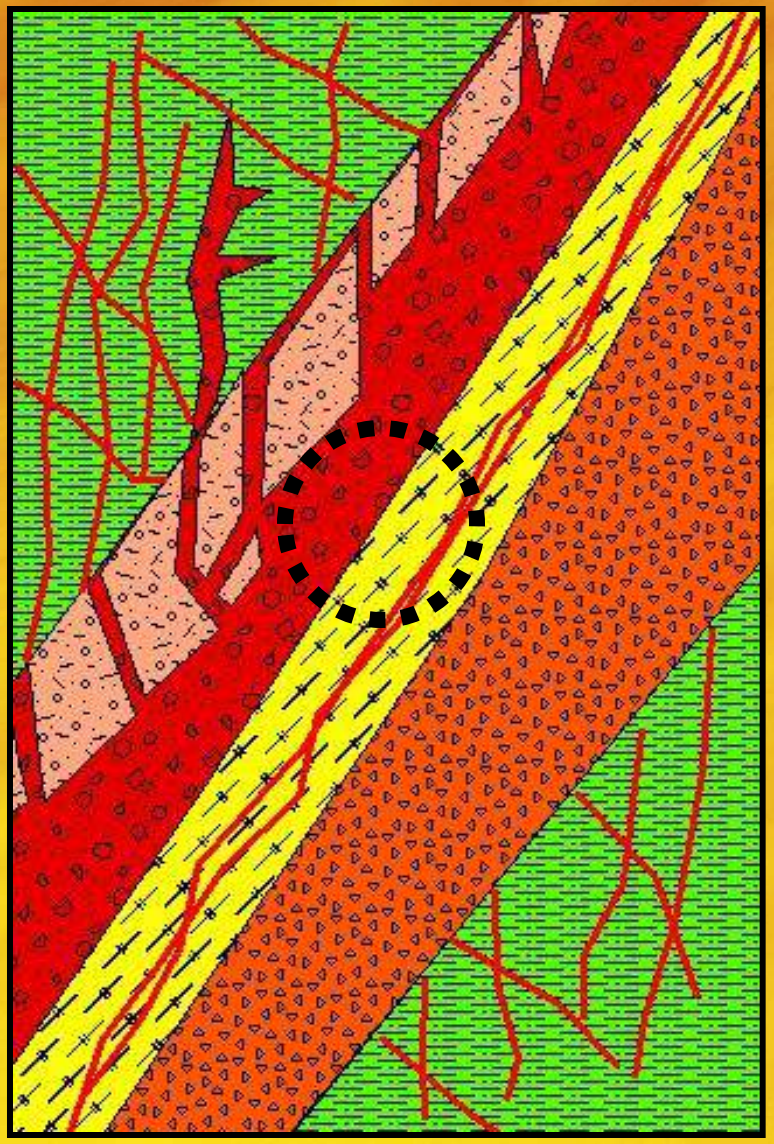
NOCHE BUENA VEIN

BRECCIA FEATURES



NOCHE BUENA VEIN

BRECCIA FEATURES



NOCHE BUENA VEIN

BRECCIA FEATURES