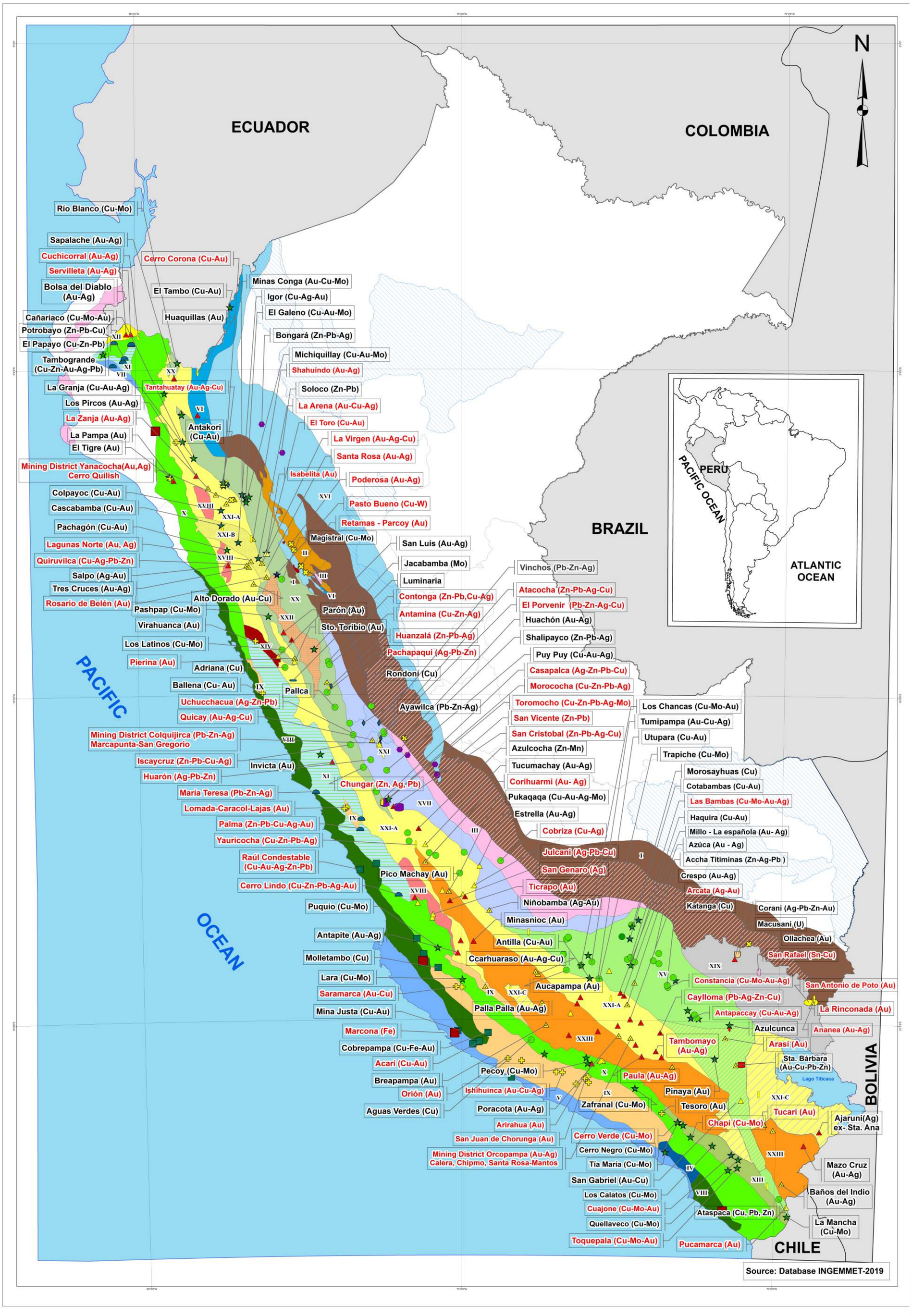
SECTOR ENERGÍA Y MINAS
INGEMMET
INSTITUTO GEOLÓGICO, MINERO Y METALÚRGICO

METALLOGENIC MAP OF PERU: MINING OPERATIONS AND PROJECTS



Description of the Metallogenic belts

I. Au in Ordovician and Silurian-Devonian meta-sedimentary rocks
It is located along the Eastern Cordillera of Peru. Host rocks area composed of slate and schist from the lower Paleozoic. Ore structures are composed of quartz-gold veinlets and lenticular layers maily controlled by NW-SE thrust faults. Ananea, La Rinconada, Capac, Orcco, and Untuca are among the main deposits. Upon latest surveys (Haeberlin, 2002; Chew et al., 2005; Cardona 2006), this belt would extend to the North (6°). This has been inferred from the fact that the Marañon Complex (6°-10°-30') can be subdivided into three geological units, according to their history the sedimentation and metamorphism: Lower Ordovician,Upper-Ordovician-Silurian and Carboniferous. Precambrian ages only correspond to some isolated segments of migmatites (Cardona, 2006).

II. Carboniferous-Permian orogenic Au-Pb-Zn-Cu deposits
It is located in the Eastern Cordillera in northern Peru. The mineralization is associated with calco-alkaline granitoids of the Carboniferous, belonging to the Pataz Batholith, which intrudes Lower Paleozoic metamorphic rocks. The mineralized structures are located in NW-SE shear zones, apparently developed since the Eohercinian tectonism. These mineralized structures show the geometry of veins and mantles. La Poderosa, Horizonte, Retamas, and Parcoy deposits are well known in this belt. Mineralization ages are between 315 and 286 M.y.

III. Permian Porphyry-skarns Cu-Mo-Zn and Intrusion related Au-Cu-Pb-Zn deposits
It extends along the west flank of the Eastern Cordillera of central Peru, to the north of the Abancay deflection. It has a NW-SE direction and is controlled by Satipo-Pangoa-San Francisco and Cerro de Pasco-Ayacucho fault systems. The mineralization is hosted in shales and limestones of the Carboniferous, with mantle and vein geometries. The most representative deposits in this belt are Cobriza and Huachón, associated to granitoids with ages between 270 and 255 Ma. In the Puno Altiplano and within the NW-SE faults domain of the Urcos-Sicuani-Ayaviri system, the W-Au deposit San Judas Tadeo is found isolated with an estimated mineralization age of 255.5 M.y. (Clark et al, 1990)

IV. Middle Jurassic Porphyry Cu-Mo
It is extended along the coast of southern Peru. This belt is structurally controlled by the Ica-Islay-Ilo NW-SE faults system and minor faults NE-SW and N-S trending (Acosta et al., 2008). Tia Maria and La Llave are the most important deposits and mineralization age are between 155 and 166 M.y.

V. Late-middle Jurassic Cu-Fe-Au (IOCG) deposits
It is located along the Coastal Cordillera, within the domain of the Coastal Basal Complex of the Pre-Cambrian. Its main structural control is the Ica-Islay-Ilo NW-SE fault system. These are NW-SE transcurrent regional faults that have controlled mineralization for some hundreds of kilometers (Acosta & Santisteban, 2007), such as the Treinta Libras Fault in Marcona (Injoque J., 2002). The most important deposits in this belt are Marcona, with iron mineralization (154 ± 4 - 160 ± 4 M.y; 164-150 M.y, Injoque et al., 1988; Vidal et al. 1990), Mina Justa with Cu mineralization (164± 4-150± 4 M.y, Moody et al. 2003), and Rosa María with Cu-Au veins (~160-145 M.y, Clark et al., 1990). The mineralization age of this belt is between 164 and 145 Ma (Acosta, 2006a, b; Acosta et al., 2008).

VI. Late Jurassic porphyry and skarns Cu-Au
It extends along the northeast of Peru, within the tectonic Olmos-Loja domain and it is limited by regional N-S faults, mainly thrust faults. Host rocks are carbonate and volcanic sequences of the Jurassic age. The Cu-Au mineralization is related to intrusive stocks from upper Jurassic, with ages around 153 Ma. The most well-known deposits are found in Ecuador, which are Nambija, Napintza, Cumay, Guaysini and Frutos del Norte deposits.

VII. Late Jurassic- Albian volcanogenic massive sulfides Cu-Zn-Au deposits
It is located on the northeast of Peru, in the South west sector of the Lancones basin, in a rift context (Tegart et al, 2000, Ríos 2004; Rodriguez et al, 2008). Mineralization is hosted by Middle Jurassic to Albian submarine volcanic rocks, with compositions from basalts to rhyolites, and tholeiitic geochemical affinity (Rios, 2004). Mineralization is related to magmatic dacitic activity. The main structural regional controls areNNE-SSW and WNW-ESE faults. Tambogrande is the main deposit, with two mineralization ages of 165 ± 17 (Re/Os, pirita, Ryan Mathur; en Rios, 2004) and 104 ± 2 M.y (U/Pb, Winter et al., 2002).

VIII. Lower Cretaceous Cu-Fe-Au (IOGG) deposits
This belt is divided into two parts. Trujillo-Mala-Paracas-Ocoña, and Locumba-Sama. Between Trujillo and Ocoña (8°-15°-30') the main mineralization controls are the NW-SE faults of the Casma basin, and the Ica-Islay-Ilo system, as well as minor NE-SW faults, related to magmatism between ~110 y 95 Ma. The main deposits in this segment are: Raul-Condestable (116.5-113 Ma: De Haller et al., 2002), Eliana (115±5 y 113±3 Ma: Vidal et al., 1990), Monterrosas (97-107 Ma: Vidal et al., 1990) Hierro Acari (<109±4 Ma; Atkin et al (1985) in Vidal et al., 1990). Between Locumba and Sama (17°-18°), the structural controls are formed by the extension of the Ica-Islay-Ilo NW-SE system and minor NW-SW faults. The most important deposits of this segment are Licona, Santiago and Valparaizo with inferred age of 105-100 Ma (Clark et al, 1990), also are found Cerro Pelado and Hierro Morrito. The mineralization age of this belt varies between 117 and 100 Ma (Acosta, J., 2006a, b; Acosta & Santisteban, 2007; Acosta et al, 2008).

IX. Late Cretaceous Intrusives-related Au-Pb-Zn-Cu deposits
It belt is segmented in three areas: Trujillo (Cerro Ballena, 9°30'-10°), Canta (Lomada-Caracol., Lajas; 11°-11°30') and Saramarca-Nazca-Ocoña (14°30'—17°). Quartz-gold-sulfide ore structures are hosted in Late Cretaceous granitoids from the Coastal Batholith. In Trujillo and Canta areas, structural controls consist of NW-SE, N-S and NE-SW secondary faults from NW-SE Conchao-Cocachacra and Tapacocha regional fault systems. In Saramarca-Nazca-Ocoña, ore structures are controlled by faults NW-SE, N-S and E-W trends that are part of Nazca-Ocoña corridor. Among the main deposits of this belt are Oriún, Caraveli, Ishihuinca, Calpa, Arirahua and San Juan de Chorunga (Acosta, J., 2006a,b; Acosta & Santisteban, 2007; Acosta et al., 2008) can be mentioned.

X. Upper Cretaceous Porphyry Cu -Mo
This belt extends discontinuously from Lancones basin to the south of Peru. In Lancones basin deposits are controlled by NE-SW trending faults. The mineralization are related to Late Cretaceous granitoids (~75 M.y.) and ore mineral deposits are Horquetas, Curi-Lagartos, Chancadora, Cascajo Blanco and others. In central and southern Peru the mineralization is related to Upper Cretaceous granitic intrusives of the Coastal Batholith and controlled by NW-SE Conchao-Cocachacra, Cincha-Lluta and Incapuquio faults systems and as well as N-S trending minor faults (Acosta et al., 2008). The important deposits of this sector include Marcahui, Durazno, Puquio, Cuco, Aguas Verdes, Lara, Tibillos, Zafranal and Angostura. Their ages of mineralization are ranged from 80 to 68 M.y.

XI. Upper Cretaceous - Paleocene Volcanogenic Massive Sulfide Pb- Zn -Cu deposits
It consists of two sub- provinces, the first one in the central part of the Lancones basin in northwestern Peru, and the second on the west flank of the Western Cordillera between La Libertad and Ica (9°-13°). In Lancones Basin these deposits are hosted in felsic calc-alkaline volcanic rocks (Rios, 2004) of volcano sedimentary sequences age Albian - Cenomanian. In this sector are recognized deposits as El Papayo, Cerro Colorado and Potrobayo whose structural controls are minor faults with NE- SW, E-W and NNE- SSW trending, that make up the deformation zone of deflection Huancabamba are known. Between La Libertad and Ica , Romero (2007) difference - Paleocene Cretaceous calc-alkaline volcanic sequences, previously attributed as Casma Group, but now called Maastrichtian-Danian basin, type margins back arc basin (Romero et al., 2008). This basin hosts type volcanogenic massive sulfide Pb -Zn -Cu deposits (kuroko type), whose regional controls on mineralization are NW-SE faults belong the Tapacocha-Conchao- Cocachacra system. Where Maria Teresa, Aurora Augusta, Leonila - Graciela (Perubar), Cerro Lindo, Palmas and Balducho are the most relevant deposits. The mineralization ages are ranged from 68 to 62 M.y.

XII. Late Cretaceous -Paleocene Au-Ag epithermals
It is located in the central sector of the Lancones basin, northern Peru. The mineralized structures are quartz-gold veins, towards NE-SW direction and hosted by Albian-Cenomanian volcanic rocks. The Au-Ag deposits are associated with the Late Cretaceous -Paleocene granitoids of the area (Injoque et al, 2000; Rios, 2004). Among the most representative deposits are Bolsa del Diablo, Potrero, Suyo, and Pilares.

XIII. Cu-Mo porphyry and Paleocene-Eocene intrusives-related polymetallic deposits
It extends in the west flank of the Western Cordillera of southern Peru and clusters are the largest tonnage Cu-Mo deposits of the area. The Intrusive related mineralization present diontic, granodioritic and monzonitic compositions, whose emplacements are controlled by the NW-SE Incapuquio faults system. This belt records two metallogenic epochs with Cu-Mo mineralization (Acosta et al., 2008). The first ones are represented by Cerro Verde and Toquepala deposits during the Paleocene epoch (62 to 55 Ma). The second is the Eocene (54 to 52 M.y.), characterized by deposits as Cuajone and Quellaveco. Distal porphyry Cu-Mo systems in the sedimentary sequences are presented the ore structures Cu-Pb-Zn vein and bodies geometries, similar to Ataspaca.

XIV. Eocene intrusives-related Au-Cu-Pb-Zn deposits
It has two segments, one is located to the north in the Ancash region (9° - 10°) and the other one to the South, between Huancavelica and Ayacucho regions (14° - 15°). The mineralized structures are formed by quartz-gold-sulfide veins N-S, E-W, and NW-SE trends. Veins are related to Eocene tonalite and granodiorite stocks, emplaced in the western limit of the Cenozoic volcanic domain of the Western Cordillera and the Coastal Batholith. The main structural control is the Conchao-Cocachacra fault system, in the northern part of this belt where the main deposits are La Cantera, Virahuanca, Tres Minas and Chuncas. To the South, veins are controlled by the Cincha-Lluta fault system, and El Encanto, Zorro Plateado, Jatun Pata, Melchorita deposits are located.

XV. Cu-Mo (Au-Zn) porphyry-skarn and Eocene-Oligocene intrusive-relatived Cu-Au-Fe deposits
This is located between the Western Cordillera and the High Plateau of the regions of Ayacucho, Apurimac, Cusco, and Puno. The mineralization are associated with dioritic to granodioritic granitoids that belong to Eocene–Oligocene Batholith Andahuaylas-Yauri under transpressional conditions (Carlotto, 1999 and Perello et al, 2003) and controlled by Urcos-Sicuani-Ayaviri, Cusco-Lagunillas-Mañazo, Abancay-Andahuaylas-Totos-Chinchero-Licapa and Abancay-Condorama-Caylloma faults systems. Intermediate to acid intrusive are associated with Cu-Mo (Au) mineralization and the contact with carbonate sequences Albian-Turonian developed skarn bodies Cu- Zn. The mafic intrusives are related to Fe- Cu-Au mineralization, presented as bodies in contact with Turonian-Albian carbonate sequences and Au-Cu veins in the intrusive.
The main deposits are Tintaya, Katanga, Las Bambas, Cotabambas, Morosayhuas, Antapacay, Haquira, Los Chancas, Antilla, Trapiche, and others. The ages of mineralization are recorded from 42 to 30 M.y. Locally in this belt there is copper mineralization "Red Bed" type, hosted in San Jerónimo Group red beds (Loza, 2004) as Tambomachay, Ushpa, Tipon and Anta deposits.

XVI. Eocene – Miocene Mississippi Valley Type Pb Zn deposits
It is located along the Sub-Andean zone of central and northern Peru. The Pb-Zn mineralization are hosted in the Upper Triassic to Lower Jurassic dolostones rocks sequences of Pucara´s Group. This belt is controlled by Satipo – Pangoa-San Francisco fault system, NW-SE-trending, and thrusts faults put the eastern Cordillera in contact with the Sub Andean Zone. In this area is placed the following deposits: San Vicente, Piñon, Sillapata Huancrash-Aynamayo, Puntayacu, Pichita Caluga, Cascas, Ninabamba, Raymondi Sur, Tambo María, Pampa Seca, San Roque, Bolivar, Soloco y Bongará. It is also possible to find MVT deposits of Pb-Zn, but unlike the main belt, these deposits are distributed punctually in closed anticlines that disappear under younger rocks, in this sector is placed the Ulcumayo and Shalipayco deposits. The age mineralization of this deposit is assumed as Eocene or Miocene, related to the period of greatest deformation that affects this area, during the Andean evolution. (Mégard, 1987; Carlotto et al., 2005).

XVII. XVII. Oligocene Au-Ag epithermals
It extends along the west flank of the Cenozoic volcanic domain of the Western Cordillera. This belt is sub-divided into two segments. To the north, the Otuzco-San Pablo-Porculla segment (7°-8°30'), and to the South, the Huaytará-Tantará-Tupe segment (12°30'14°30'). The mineralization is controlled by NW-SE and E-W faults. To the north, the following deposits are found: Salpo, San Pedro, Paredones, Coshuro, Lucero, Los Pircos, Mishahuanca and others. Some of them are related to volcanic centers, such as Uromalqui (Salpo) San Pedro and Urillao-Ruhos (Rivera et al., 2004). To the South the main deposits are Antapite, Pampa Andino and Ticrapo. In both segments, the mineralized structures exhibit vein geometries with Au-Ag low sulfidation epithermal-type content (Quispe, 2006; Acosta & Santisteban 2007; Acosta et al., 2008). The mineralization ages are estimated between 31 and 25 M.y.

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XIX. Oligocene Miocene intrusive -related Sn – Cu – W deposits and Ag - Pb – Zn (Au) epithermal.
That is in the southwest of the Eastern Cordillera and in the Putina basin, southern Peru, limited by the Urcos – Sicuani -Ayaviri faults systems of NW-SE trending. The Sn –Cu -W mineralization are associated with peraluminous monzogranite to granodiorite stocks " type S " (Kontak and Clark, 2002), with strong chloritic alteration (Mlynarczyk et al. , 2003). These intrusive rocks extended to Cordillera Real in Bolivia with emplacement age of Oligocene to Miocene cutting Ordovician slates, schists and quartzites. The main deposit in Peru is San Rafael, but includes other smalls as Palca 11 and Santo Domingo. The mineralization age is between 25 and 22 My, but towards the Bolivian side, in the Cerro Rico deposit recorded the youngest age, 14 My (Zartman and Cunningham, 1995).
Also, associated with volcanic events of 25 ~14 My, there are Ag -Pb- Zn (Au) intermediate to low sulphidation epithermals deposits and Sb ore veins, where Corani is the most important ore deposit.

XX. Miocene Porphyry Cu-Mo (Au), skarns Pb-Zn-Cu (Ag), and polymetallic intrusion related deposits.
It is located in the Western Cordillera of the north and central Peru (5°-12°). This belt is controlled by the NW-SE thrust and fault system of the Chonta and Punre-Canchis-Magistral systems, the last one conforms to the Marañon fold and thrust belt (MTFB). In northern Peru, the faults strike change from WNW-ESE to N-S when they are near to Huancabamba deflection. This belt shows three magmatic events related to the mineralization: 22-20 My, 28-13 My and 10-5 My. Magmatic events are evidenced by the emplacement of calc-alkaline diorite granodiorite intrusive stocks. The first 22-20 M.y event is associated with Michiquillay and Aurora Patricia Cu-Mo porphyry-type deposits. The second event of 18-13 My contains Cu-Mo and Cu-Au porphyry-type mineralization which sometimes develops skarns and Pb-Zn-Ag replacement bodies when is in contact with carbonate rocks of the Cretaceous, such as Chungar, Iscaycruz, and other deposits.
The Cu-Mo deposits (18-13 My) are related to intermediate to acid intrusions, such as El Galeno, La Granja, Cañariaco, Paron and Magistral. Whereas the Cu-Au porphyries are associated with basic to intermediate intrusions, as it is the case of Minas Conga (El Perol and Chaihualgón), and Cerro Corona. Other porphyry systems similar to the previous ones are punctually shown in sectors where volcanic Miocene domain (belt XXI) have been erosioned, thus we can mention the Chamis, Colpayoc, Cascabamba, San José, La Arena, Alto Dorado, Pashpap, Los Latinos deposits, as well as the porphyry-epithermal transition deposit El Toro, and the Pb-Zn-Cu skarn deposit El Extraño. The third magmatic 10-5 event generates Cu-Mo (Au) porphyry-type deposits, such as Rio Blanco, in the North; Toromocho and Puy Puy in the center. The 15-5 My intrusive controlled by the domain of the system faults Chonta, Churín-San Mateo and the MTFB in contact with Cretaceous calcareous rocks (9°-12°30') exhibit skarns and Cu-Zn and Pb-Zn-Ag replacement bodies, such as Antamina, Huanzala, Pahsapaqui, Raura, Uzchuchacua, Huarón , Yauricocha, and others. They also generate veins and Pb-Zn-Ag replacement bodies, similar to Yauliyacu-Casapalca, Morococha, Mina Solitaria, and San Cristobal; this last one with ~6 My (Noble & McKee, 1999) age.

XXI. Miocene Au-Ag Epithermal and polymetallic deposit with epithermal overprint
It is widespread in the volcanic Cenozoic domain of the Western Cordillera. In the North (5°-9°30'), it controlled by NW-SE faults that change to WNW-ESE trend when getting closer to the Cajamarca deflection, and then N-S when getting closer to the Huancabamba deflection. In the center-north sector (10°-13° 30'), its main controls are Conchao-Cocachacra and Chonta NW-SE fault system, Cerro de Pasco-Ayacucho and La Oroya-Huancavalica N-S fault system, and Abancay-Andahuaylas-Totos-Chinchoraos-Licapa E-W fault system. The southern sector of this belt is controlled by Cincha-Lluta, Incapuquio, Abancay-Condoroma-Caylloma and Cusco-Lagunillas-Mañazo NW-SE faults systems. This belt assembles high, low and intermediate sulfidation epithermals Au-Ag (Pb-Zn-Cu) deposits. According to their mineralization ages, they can be sub-divided into two metallogenic epochs of 18-13 Ma and 12-8 My.
Quiruvilca, Pierina, Tamboraque, and Santa Rita are among the deposits hosted in volcanic rocks. Some deposits are related to volcanic centers, such as Quequenda (Alto Chicama), Quiruvilca, Alto Dorado, Matala, Macón and Alto Cruz-Ticas (Rivera et al., 2004). Au-Ag deposits of high sulfidation are located to the South such as Chipmo (Orcopampa), Poracota and possibly Arasi. Additionally, there are low sulfidation Au-Ag (Pb-Zn) epithermals, similar to Calera, Caylloma and Selene. In the metalogenic epoch of 12-8 Ma, in northern Peru there are Au-Ag deposits of Yanacocha, Tantahuatay, and La Zanja mining districts, as well as veins and Pb-Zn-Cu (Ag, Au) replacement bodies. In central Peru, the second Pb-Zn (Ag) mineralization pulse is located in Cerro de Pasco (12.4-10.9 Ma. Baugartner et al., 2006) and mineralization of the Colquijirca district (the first mineralization pulse corresponds to an epithermal overprint event). Between 12° and 13°30' latitude, in the NW-SE faults of La Oroya-Huancavelica system domain, the presence of Au-Ag epithermals in carbonate rocks of the Triassic-Jurassic of the Pucara Group stands out, such as Tucumachay. While in the influence of the NW-SE faults of the Chonta system and of the Huancayo-Julcani N-S fault there are Pb-Zn-Ag high and intermediate sulfidation epithermals such as Julcani, Palomo, San Genaro, Huachocolpa, Caudalosa Grande, Caudalosa Chica, and others. Far to South (|14°-16°) there are manly low sulfidation Au-Ag epithermals such as Ares, Shila, and Paula.
Within this Miocene epithermal belt we have mineral deposits hosted in Cretaceous rocks and polymetallic deposits with epithermal overprint.

XXI-A. Au and Ag epithermal deposits hosted in Cretaceous sedimentary rocks
In northern Peru (~7°30'), there are high sulfidation epithermal deposits hosted in silicidastic sequences of the Goyllarisquizga Lower Cretaceous with a mineralization age between 17 to 14 M.y. The most important deposits are Alto Chicama (Lagunas Norte), La Virgen, Santa Rosa, Rosario de Belén and Shahuindo.

XXI-B. Polymetallic deposits with epithermal overprint
In central Peru (10°30'-11°), the N-W faults of the Cerro de Pasco-Ayacucho system, control the Pocobamba Eocene basin (Ángeles, 1999) and at the same time, this controls the volcanic centers of Cerro de Pasco and Colquijirca. Therefore, the first Pb-Zn-Ag with epithermal overprint pulse is developed in the Cerro de Pasco district between 18 and 13 Ma (14.5-14.1 Ma, Baungartner et al, 2006). In the South (14°30), the hosted rocks are formed by Miocene Tacaza Group and the mineralization corresponds to Pb-Ag-Cu, Pb-Cu-Ag and Cu-Pb-Ag veins. Main occurrences are Pepita, Carmencito, C° Huarajuy and Don Felipe. Further South, (16° and 17°S) the mineralization is found between two corridors formed by the Incapuquio, Condoroma-Caylloma and Cusco-Lagunillas-Mañaza fault systems. The hosting rocks belong to Tacaza Group, Maure Group, and limestones of Ayavacas Formation. The mineralization is Cu-Pb-Zn type and the most significant mineral deposits are Tacaza, Santa Barbara, Berenquela, Mina Los Rosales, Quello Quello and San Antonio de Esquilache. The mineralization age is associated with intrusive of ages between 22 and 19 M.y (Quispe, 2004; Acosta & Santisteban, 2007; Acosta 2008).

XXII. Upper Miocene intrusive-related W-Mo-Cu deposits.
Located in the Western Cordillera (8 ° -10 °) from the north-central of Peru. The Cu-W mineralization are associated with granitoids from the Cordillera blanca whose place are controlled by the NW-SE and NS trending of Cordillera Blanca faults systems. The most representative deposits are Pasto Bueno, Mundo Nuevo, Nueva California, Lacabamba y Señor de la Soledad. The mineralized structures are vein geometries with variable contents of quartz-copper hubnerite - ferberite gray. The ages of mineralization is recorded between 9 and 6 My.

XXIII. Mio-Piocene epithermals Au-Ag
It extends along with the volcanic domain of the Western Cordillera of central-Southern of Peru (12° 30-18°). The Au-Ag mineralization is related to Mio-Pliocene magmatic activity. Its structural controls are NW-SE faults of the Chonta, Abancay-Conedoroma-Caylloma and Cincha-Lluta faults systems, as well as minor E-W faults. The mineralization ages of this belt are registered between 7 and 1 Ma, formed mainly by Au-Ag high sulfidation epithermals, with exception to the Ag-Au Arcata deposit (5.4 Ma, Candiotti et al, 1990) and the Recuperada intermediate sulfidation Pb-Zn-Ag deposit (6.4 Ma, Noble & McKee, 1999). The Au-Ag high sulfidation epithermals that are distributed in this belt are Tucari, Santa Rosa, Pucamarca, Pico Machay, Corihuarmi, Huamaranzo, Ccarhuaraso, Palla Palla, Baños del Indio and others (Quispe, 2004; Acosta & Santisteban, 2007; Acosta et al., 2008).

METALLOGENIC BELTS

- XXIII — Miocene - Pliocene Au-Ag epithermal
- XXII — Upper Miocene intrusive-related W-Mo-Cu deposits
- XXI — Au-Ag epithermal Miocene deposits
- XXI-A — Au-Ag epithermal deposits hosted in volcanic rocks
- XXI-B — Au-Ag epithermal deposits hosted in Cretaceous sedimentary rocks
- XXI-C — Polymetalic deposits with epithermal overprint
- XX — Miocene Cu- Mo- Au porphyry, Pb- Zn- Cu -Ag skarn and intrusives- related polymetallic deposits
- XIX — Oligocene-Miocene intrusive-related Sn-Cu-W deposits and Ag-Pb-Zn (Au) epithermal
- XVIII — Oligocene Au-Ag epithermal
- XVII — Eocene Au-Ag epithermal and Eocene-Oligocene-Miocene polymetallic deposits
- XVI — Eocene-Miocene Mississippi Valley Pb-Zn deposits
- XV — Cu-Mo (Au-Zn) porphyry-skarn and Eocene-Oligocene intrusive-relatived Cu-Au-Fe deposits
- XIV — Eocene intrusives - related Au-Pb-Zn-Cu deposits
- XIII — Cu-Mo porphyry and Paleocene-Eocene intrusives-related polymetallic deposits
- XII — Upper Cretaceous - Paleocene Au - Ag epithermal
- XI — Upper Cretaceous-Paleocene Volcanogenic Massive Sulphide Pb-Zn-Cu deposits
- X — Upper Cretaceous Cu-Mo porphyry
- IX — Upper Cretaceous intrusives - related Au-Pb-Zn-Cu deposits
- VIII — Lower Cretaceous Fe-Cu-Au (IOCG) deposits
- VII — Upper Jurasic - Albian Volcanogenic Massive Sulphide Cu-Zn-Au deposits
- VI — Upper Jurassic porphyry and Cu-Au skarns
- V — Upper-Middle Jurasic Fe-Cu-Au (IOCG) deposits
- IV — Middle Jurassic Cu-Mo porphyry
- III — Permian intrusives - related U-W-Sn-Mo, Au-Cu-Pb-Zn and porphyry and skarns Cu-Ag deposits
- II — Carboniferous - Permian orogenic Au - Pb - Zn - Cu deposits.
- I — Gold in Ordovician and Silurian - Devonian meta - sedimentary rocks.

METALS

Au-Pb-Zn, Ag-Pb-Zn, Cu-Au-Fe, Cu-Mo-Au, Cu-Pb-Zn, Cu-Zn-Ag, Cu-W-Zn, Cu-Ag-Au, Zn-Pb-Ag, Zn-Cu-Au, Pb-Ag-Zn, Pb-Zn-Ag, Pb-Cu-Zn, Fe, Zn-Fe, Sn-Cu, Sb-Ag-Au, Mg, U

SYMBOLOGY

Hydrographic basin

Operation / Project — Mining unit status

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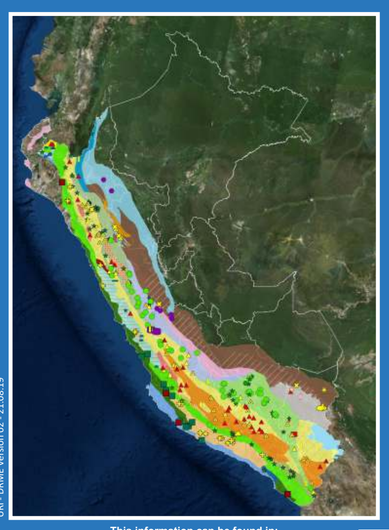
METALLOGENIC MAP OF PERU



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El Perú Primero