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The Prospecting and Prediction in the Deep and Periphery of Shirenzhang Tungsten Deposit in Guangdong

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Shirenzhang tungsten deposit is located in the south of Shixing County, Shaoguan City, Guangdong province, about 20km from Shixing. It's an important part of the famous South China tungsten metallogenic domain^[1]. The mineralization belt is 850m long and 300m wide, and the explored 56 ore-veins extend 70~1130m. Its occurrence is $210^{\circ}\sim 240^{\circ} \angle 75^{\circ}\sim 82^{\circ}$ (Fig.1, refer to Fig.3). Ore types are wolframite-quartz vein, and the distribution of tungsten veins is strictly controlled by the granite body. The major metal mineral is wolframite, while local concentration minerals are cassiterite, arsenopyrite, chalcopyrite and molybdenite etc.. The main gangue mineral is quartz, sometimes are feldspar, beryl, fluorite, tourmaline and muscovite etc.

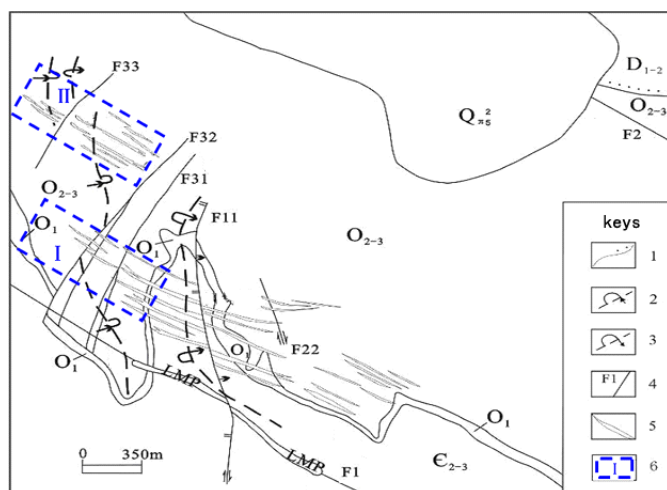


Fig.1 Geological and forecasting sketch map of Shirenzhang mining area

D-Devonian System; O-Ordovician System; ϵ -Cambrian System; Qn^2_5 -Dongkoushan quartz porphyry; LMP- Lamprophyre vein; F1-Wutongwo fault; F2- Dongkoushan fault; 1- geological boundary and discordant boundary; 2- overturned syncline; 3- overturned anticline; 4- fault; 5- tungsten ore vein; 6- potential areas of mineralization prediction and number

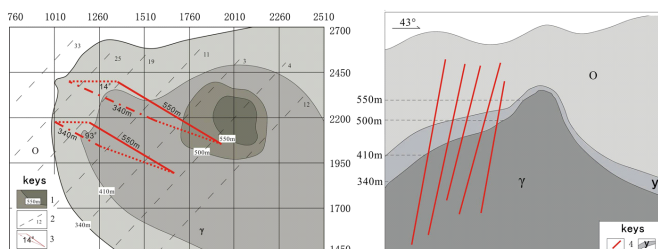


Fig.2 Horizontal projection and Longitudinal section map of hidden granite in Shirenzhang mining area

1-level and number; 2-prospecting line and number; 3-ore-vein horizontal projection; 4-tungsten veins; 5- Greisen; γ -Granite; O-Ordovician System;

1 The occurrence characteristic of hidden granite

According to the mine production data collection, based on the different levels of the granite outcropped area projection map, it can be clearly seen that the underground hidden granite presenting wide at the bottom and narrow at the top, like the stock. Its occurrence is asymmetric, steeper in the north east. The rock shows intrusion trend from the southwest to northeast. Under its influence, tungsten vein has lateral trend towards the southwest side (Fig.2), and the mine expose the reality that tungsten veins are mainly developed in the granite of the southwest wing.

2 Tungsten veins spreading regularity

By using mine production materials and drawing projection map with different levels, different sections of tungsten veins and 14# vein distribution range (Figure 3), showing that tungsten ore veins has lateral trend from southeast to northwest. Mine production stopes clearly reveal that, from upper level to down level, the main production vein obviously has southeast to northwest lateral regularity, and the rich-ore areas are mainly distributed along the metamorphic rock and granite body

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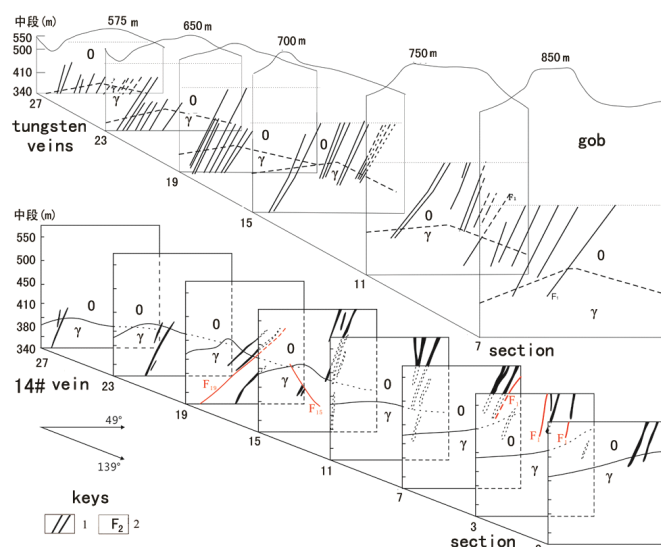


Fig.3 Shirenzhang tungsten vein and 14# vein three-dimensional longitudinal section map

1-tungsten vein; 2-fault and number; γ -Granite; O-Ordovician System;

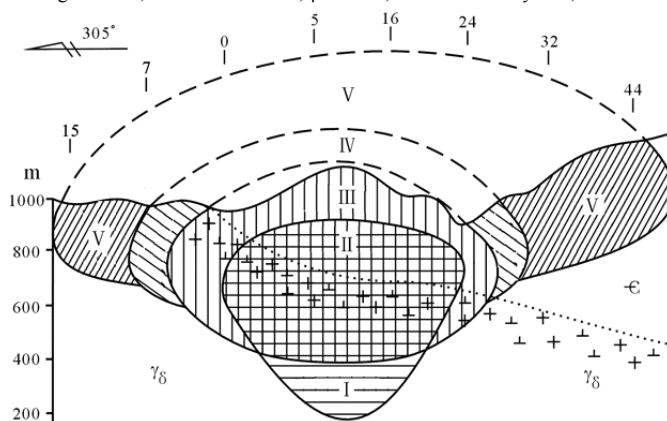


Fig.4 Lengthwise section of the ore veins in Meiziwo tungsten deposit

I - tip vein zone; II - big vein zone; III - thin vein zone; IV - veinlets vein zone; V - line vein zone

inside and outside contact zone. The statistics of vein-width and grade of 14# vein in different level, different sections shows the results which are fully consistent with the above.

3 Tungsten vein “five-levels” discussion

WANG Jincao etc.(2008)^[2] proposed Meiziwo tungsten vein has special geometry. In profile, from down to up, from the ore-vein, which involves single vein of tip and big vein zone, to the thin vein zone of simple branching composite vein, to the complicated branching vein of veinlets and line, the upper, the more complex constructions of veins is. The ore-vein (the main vein or its branch plus wall-rock width) is more wide, and branch veins are more, while the single vein width is smaller; in the structure of longitudinal section, vein-type tungsten deposit is nearly symmetric positive sector as “five level”

zoning (Fig.4), of which the big vein is located in the central sector, with closed coronal, and the upper appears complex tree branch. Some branches are natural pinch-out or branch and branch are composite pinch-out, and the middle of single vein arises compound branch, whose vein-width is stability; side single vein appears naturally pinch-out or unilateral branch pinch-out, double branch pinch-out; the deep portion may arise naturally pinch out.

The actual production revealed that Shirenzhang “five level” is not symmetric positive sector, but tungsten veins along with the west side deep mineralization of the hidden granite has lateral trend towards northwest. Obviously, deeper study of tungsten mineralization, granite spatial relations and “five level” tungsten spatial distribution rule, has important significance for the deep tungsten mineralization prediction.

4 Prospecting and prediction in deep and periphery mining area

Considering Shirenzhang tungsten mineralization is strictly controlled by granite or pitch direction of tungsten vein rock intrusion mode (rock occurrence). Whether it is mine production disclosure, or statistical studies showed that tungsten vein has lateral trend towards the southwest side, according to the study of Shirenzhang tungsten mine deep 3D geological model, combined with abnormal peak early Shirenzhang tungsten mine magnetic anomaly data and secondary halo zone distribution characteristics of tungsten, tungsten ore vein is all predicted to continue extending towards north west. Thus, the two prospecting areas (refer to Figure 1) has been put forward, in which area I is located in the deep west side of middle and south ore belt, mainly looking for deep concealed vein; area II in Huang Caoshan ore section has the low degree of study, and it's worthy of further work.

Key words: tungsten deposit, prospecting and prediction, Shirenzhang, Guangdong

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