

3.2 Result of Analysis

Result of CSAMT is shown in Figure-3.2 to Figure-3.4. Figure-3.2 shows result of one-dimensional analysis, and Figure-3.3 and Figure-3.4 show two dimensional analysis result. G site and I site with hilly topography were analyzed by both one and two-dimensional analysis. Result of two-dimensional analysis is preferable for these sites. In interpretation of the CSAMT exploration results, criterion below are applied;

- Electric resistivity of Quaternary is less than 30 Ω m
- Electric resistivity of Tertiary is less than 50 Ω m
- Electric resistivity of Cretaceous is more than 50 Ω m

Of course, values of resistivity of geological formations are different even within the same formation, depending on content of clayey material and whether dry or saturated. Therefore, It is impossible to decide only one resistivity value for one specified formation. However, according to the existing geophysical results, it seems possible to apply criterion above for the Study Area. In this Study, criterion above is applied for interpretation of the CSAMT results. The result of CSAMT is explained below focusing on depth of Cretaceous Formations.

A area (No.1, 3, 4)

This area is located in the center - the south of Bogotá Plain, where Cretaceous Group is expected to distribute considerably deep covered by thick Quaternary formations. According to the CSAMT result, superficial part of the ground (upper than GL-250m) has wide variable resistivity, and formation with low resistivity of less than 10 Ω m is continuously distributes from GL-250 to at least GL-1,200m. This formation seems Tertiary and Quaternary. Therefore, it is assumed that Guadalupe Group distributes at least deeper than GL-1,200m.

B area (No. 2, 5)

This area is located in the center of the Bogotá Plain, where Cretaceous Group is expected to distribute the deepest of the Bogotá Plain covered by thick Quaternary formations. According to the CSAMT results, formation with resistivity of around 10 Ω m continuously distributes from the ground surface up-to GL-400m, then again the formation with low resistivity of around 10 Ω m continuously distributes from GL-400m to GL-1,000m. These formations seem Tertiary and Quaternary. Therefore, it seems that Guadalupe Group distributes at least deeper than GL-1,000m.

C area (No.14, 15)

This area is located in the down-stream of Subachoque River where Quaternary distributes on the ground surface. According to CSAMT results, formation with high resistivity of 18-97 Ω m distributes continuously from GL-100m to deeper than GL-1,000m. This formation seems to be Quaternary at the top and after Guadalupe Group.

D area (No.6, 7, 8, 9)

In this area, it is expected that Guadalupe Group distributes near the ground surface. According to CSAMT results, formation with high resistivity of 150 Ω m distributes between ground surface and GL-200m. This formation seems Guadalupe Group.

E area (No.10, 11, 12, 13)

This area, located in Chicu River Basin, is near where Cretaceous Group is outcropping. According to CSAMT results, formation with high resistivity of more than 50 Ω m distributes from deeper than GL-200m. This formation seems Guadalupe Group. It is notable that

observed resistivity of this area is higher than those of the other area. Some points have extremely high resistivity of more than 1,000 $\Omega\cdot\text{m}$, and resistivity values have big difference point by point.

F area (No.20, 21, 22)

This site is located in the middle-stream of Bogotá River, where Alluvial plain spreads wide. According to CSAMT result, high resistivity formation of more than 80 $\Omega\cdot\text{m}$ distributes with thickness of more than 1,000m. This formation seems Guadalupe Formation. Both side of this valley is Cretaceous Formation. Existing geological map shows that sinking of Cretaceous formation related to fault activity formed this valley. CSAMT result shows that sinking depth seems around 250m, not so deep as shown in the geological map.

G area (No.16,17,18,19,)

This area is located in the middle-stream of Subachoque River, where Guadalupe Group is expected to distribute near the ground surface. According to CSAMT result, formation with high resistivity of 200 $\Omega\cdot\text{m}$ distributes from GL-100 ~ GL-400m in both side of Subachoque River plain. This formation seems Quaternary Tilata Formation. Underlying formation with resistivity of 5 -50 $\Omega\cdot\text{m}$ seems Guadalupe Formation. Upper part of Quaternary and Tertiary, from GL-100m to -300m, shows high resistivity of 10 ~ 100 $\Omega\cdot\text{m}$. This part seems sand and gravel. Fault may exist in hills running the right bank side of Subachoque River (see Figure-3.3). Formation of the west side of the faults show extremely low resistivity of less than 10 $\Omega\cdot\text{m}$. This fault causes uncontinuity of resistivity in this site.

H area (No.23, 24, 25, 26)

This site is located in Alluvial Plain near the hills of Cretaceous Formation, where Teusaca River joins Bogotá River. According to CSAMT result, formation with resistivity of 13 ~ 25 $\Omega\cdot\text{m}$ distributes deeper than GL-100m. This formation seems Guadalupe Formation. Resistivity of Guadalupe Formation of this site becomes 11 ~ 42 $\Omega\cdot\text{m}$ from GL-400m to the deep part of the ground.

I area (No.28, 29, 30, 31)

This site is located in on valley bottom plain of the uppermost-stream of Bogotá River. Tilata Formation of Quaternary distributes on the ground surface, under which Tertiary and Cretaceous are expected to distribute. According to CSAMT result, formation with low resistivity of 50 $\Omega\cdot\text{m}$ continues to deep part of the ground. Formation with resistivity of 20-50 $\Omega\cdot\text{m}$ distributes deeper than GL-400m. This formation seems Guadalupe Formation. Geological structure by fault activity is recognized in both sides of valley, which consists of Quaternary and Tertiary (see Figure3.4). The faults become boundary of extremely low resistivity formation.

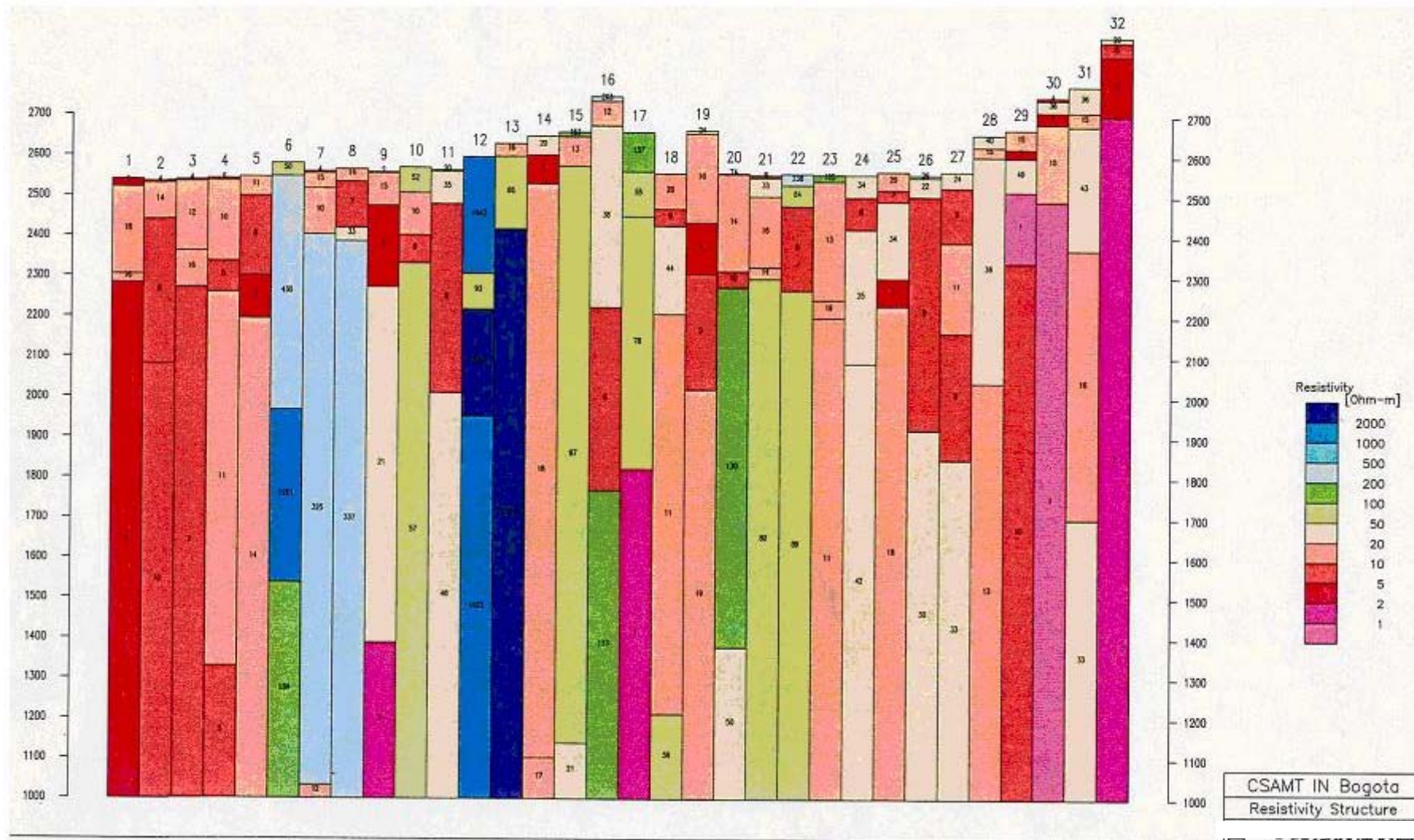


Figure-3.2 Result of One-dimensional CSAMT Analysis (All Area)

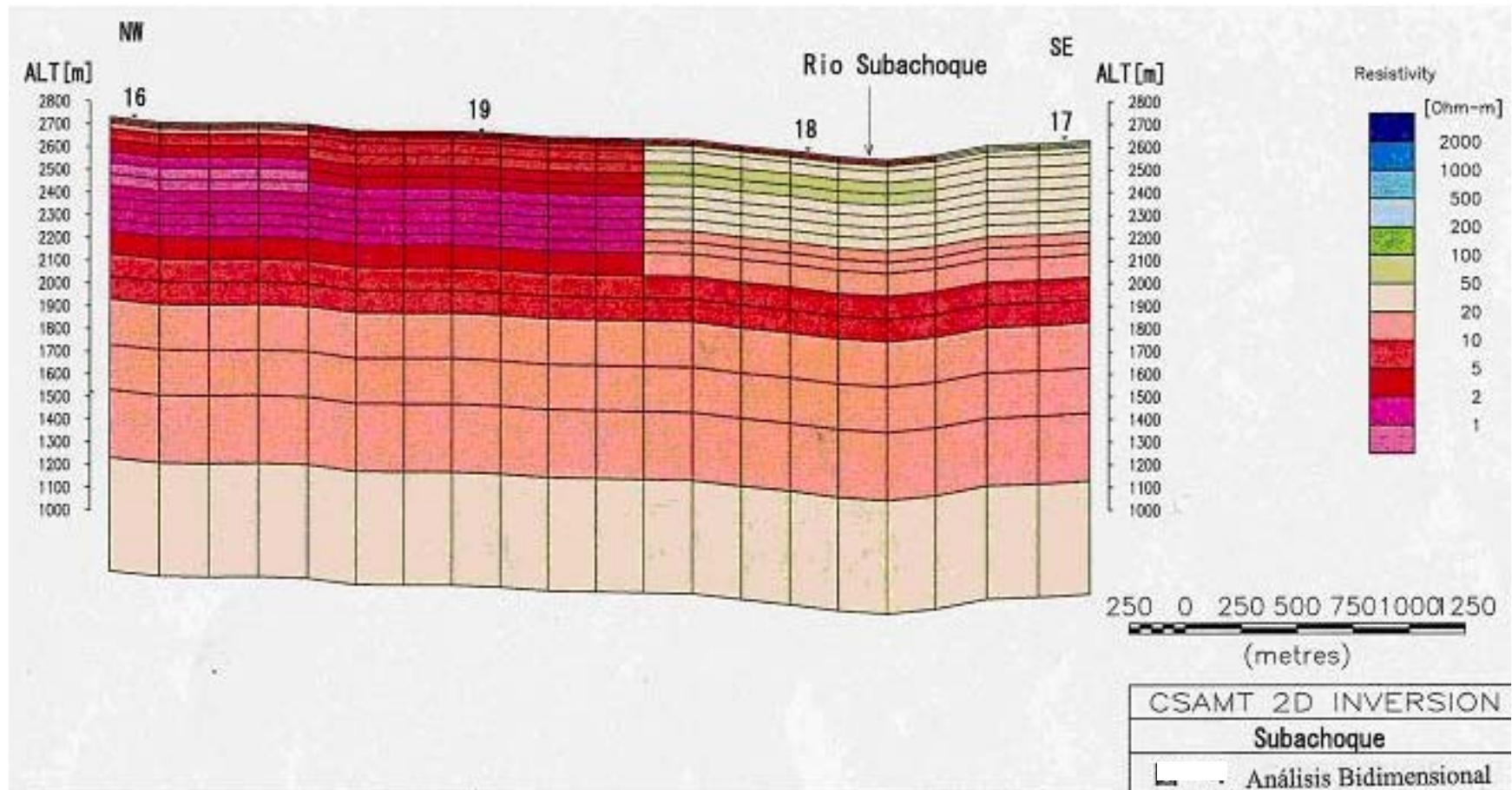


Figure-3.3 Result of Two-dimensional CSAMT Analysis (G Area)

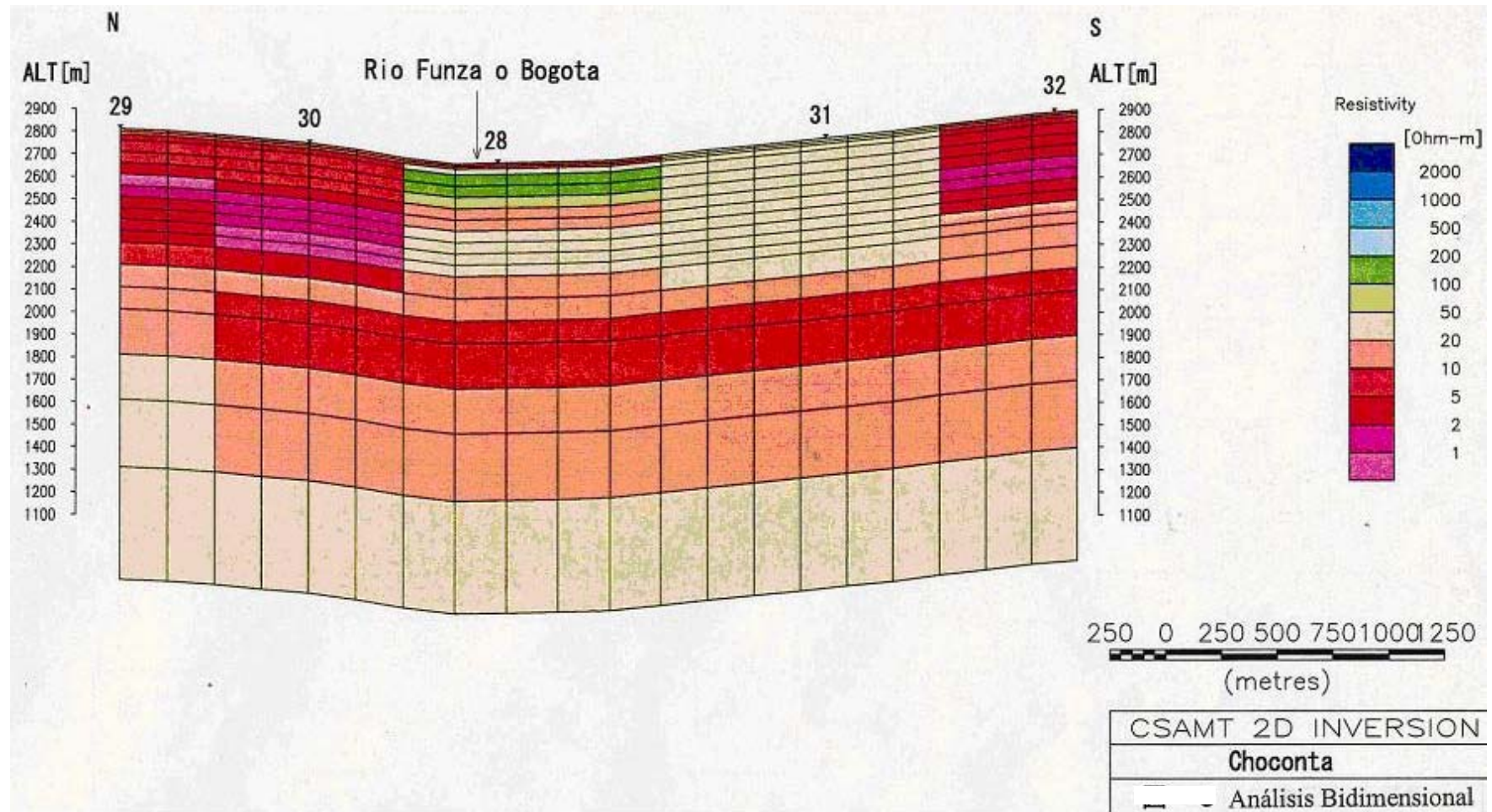


Figure-3.4 Result of Two-dimensinal CSAMT Analysis (I Area)

3.3 Conclusion of CSAMT Survey

According to the CSAMT results, the top of Guadalupe Group distributes at least deeper than GL-1,000m or GL-1200m in the center of Bogotá Plain. Then the top of Guadalupe Group distributes gradually nearer to the ground surface toward the border of the Study Area. This result corresponds to result of the existing study. In bottom of valleys of tributaries of northern part of the Study area, the top of Guadalupe Group distributes deeper than GL-200m or GL-300m.