Notes from Coso reflection seismic interpretation session at WLA, Walnut Creek, July 7 & 8.

Original text in black by Frank Monastero circa August, 2005. Additional notes in blue by Jeff Unruh, 3/20/06.

Designating specific faults.

f_1 – Coso Hot Springs fault. At s.p. 135 on Line 106, this fault terminates against f_3 at a depth of -1750 meters (bsl). This fault is likely to be characterized by relatively high K because: (1) it is oriented at a high angle to the direction of maximum extension (d1); (2) it is a Holocene-active structure; and (3) it is presently leaking steam and fluids.

f_2 – ENE-striking, SSE-dipping fault on lines 106a and 106. At s.p. 130 on line 106, this fault terminates against the bdt a a depth of approximately –1750 meters (bsl). The interpretation of this fault is based on reflection data only and is highly uncertain. I recommend deleting it from the model.

f_3 – NNW-striking, steep NNE-dipping fault on line 109, s.p. 203, and line 106. Terminates into f_1 on line 106 at s.p. 133, and on line 109 at s.p. 221. This fault is probably intermediate in K. f3 is subparallel to the direction of maximum dextral shear, exhibits evidence for recent activity, and hydrothermal alteration has occurred along the structure. Probably not as high K as f1 because it is oblique to the direction of maximum extension (d1).

f_4 – ENE-striking, SSE-dipping, WNW of Sugarloaf on the NW side of the depression; outcrop fault on SW side of small dome (N67E, dip 75°SE). Structure contours drawn on f_4. On line 109 this fault terminates against the bdt at s.p. 183. On line 110 this fault terminates against the bdt at s.p. 180. Moderate to high K (oriented at a high angle to d1). Evidence for Pleistocene activity and hydrothermal alteration locally along surface trace.

f_5 – Antithetic to f_4, surfaces at s.p. 168 on line 110. On line 109 this fault terminates against f_4 at s.p. 130. On line 110 this fault terminates against f_4 at s.p. 139. Fault identified from interpretation of reflection data only. No known surface expression. Moderate to high K (if fault really exists).

f_{5a} – Antithetic to f_4, subparallel to f_5, surfaces at s.p. 145 on line 109 and s.p. 145 on line 110. On line 109 this fault terminates against f_4 at s.p. 120. On line 110 this fault terminates against f_4 at s.p. 130. Fault identified from interpretation of reflection data only. No known surface expression. Moderate to high K (if fault really exists).

f_{5b} – Antithetic to f_4, subparallel to f_5, surfaces at s.p. 133 on line 109 and s.p. 133 on line 110. On line 109 this fault terminates against f_4 at s.p. 115. On line 110 this fault terminates against f_4 at s.p. 120. Fault identified from interpretation of reflection data only. No known surface expression. Moderate to high K (if fault really exists).

Combination of f_4 and f_5 creates a graben (NE-SW oriented) in which occurs at least six domes and possibly includes Sugarloaf. f_{5a} and f_{5b} are small antithetic faults that are sub-parallel to f_5 (moving SE to NW). All three terminate into f_4 at depth.

f_6 – NW-striking, high-angle (near vertical) transfer fault (tear fault) NE of f_7. Don't know for sure what happens to it at depth on line 106. On line 110 it terminates against the bdt at s.p. 187. On line 111a it terminates against the f_9 at s.p. 115. Fault originally mapped by Whitmarsh (1997), but extension of fault trace SE to f9 and f8 is highly unlikely. Existence of f6 as shown is very uncertain. If fault really exists, then low K because it strikes at a high angle to the direction of maximum shortening (d3).

f_7 – NW-striking, high-angle (near vertical) transfer fault (tear fault) SW of f_6. On line 110 it terminates against the bdt at s.p. 203. Fault originally mapped as "uncertain" by Whitmarsh (1997). No surface expression of activity. If fault really exists, then low K because it strikes at a high angle to the direction of maximum shortening (d3).

f_8 – Runs through s.p. 180 on line 111. NNE-striking, WSW-dipping. Associated with pipeline fumarole. Dirt scarp. f_8 dies out on surface northeast of pipeline road. Appears in subsurface on line 111a at s.p. 140 because of the projection of the fault tip. It does not cut the surface on line 111a. Terminates against f_{10} at s.p. 118. On line 111 it terminates against f_{10} at s.p. 150. f8 is likely characterized by relatively high K because: it is oriented at a high angle to d1; it is a Holocene-active structure; and is presently leaking steam and fluids.

f_9 – s.p. 165 on line 111. NNE-striking, WSW-dipping. Farther to the NW of f_8, also a dirt scarp. On line 111a, this fault terminates at s.p. 110 at a depth of - 250 meters (bsl). On line 111 it terminates against f_{10} at s.p. 139. On line 115, the fault appears as two strands because the line is crooked. The two strands merge at s.p. 150. f9 is likely characterized by relatively high K

because it is oriented at a high angle to the direction of maximum extension (d1) and is a Holocene-active structure.

f_{10} – SE-dipping, NE-striking listric fault. Terminates f_8 and f_9 in the subsurface. Shows on lines 110, 111, and 111a. Soles out in the brittle-ductile transition. F_{10} does not appear on line 114 because it is cut out against f_{11}. Presence of f10 is highly uncertain. Moderate to high K (if it really exists) because it strikes at a high angle to d1.

f_{11} – Another of the NW-striking, high-angle (near vertical) faults similar to f_6 and f_7. Surfaces at s.p. 161 on line 113, and terminates against the bdt at s.p. 159. Fault originally mapped by Whitmarsh (1997). No surface expression of activity. If fault really exists, then it probably does not continue SE beyond the surface trace of f9. Probably characterized by low K because it strikes at a high angle to the direction of maximum shortening (d3).

f_{12} – Located in Coso Wash, NE-striking, NW-dipping, cuts travertine at HABR wings gate. Dirt scarp. Terminates against f_6 at s.p. 184 on line 106. f9 is likely characterized by relatively high K because it is oriented at a high angle to the direction of maximum extension (d1) and is a Holocene-active structure. Travertine along the fault probably is evidence for prior hydrothermal activity.

f_{13} – Terminates against f_9 at s.p. 149 on line 115. Fault identified from interpretation of reflection data only. No known surface expression. Moderate to high K (if fault really exists).

"A" horizon is brittle-ductile transition.