U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF MARS
1:500,000 GEOLOGIC SERIES
MANGALA VALLES REGION
MTM –5/152 AND –10/152 G, 1993
MAP I–2294 (SHEET 2 OF 2)

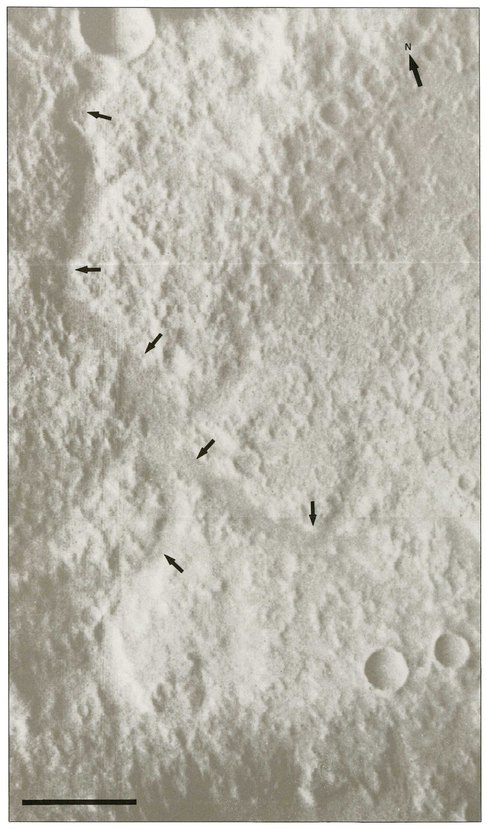


Figure 2. Channels (arrows) filled by floor material of degraded channels (unit **Nchd**); channels incised in knobby plateau material (unit **Nplk**), which contains pits. Scale bar=5 km; Viking Orbiter image 459S01 centered at lat 7.4° S., long 155.1°.

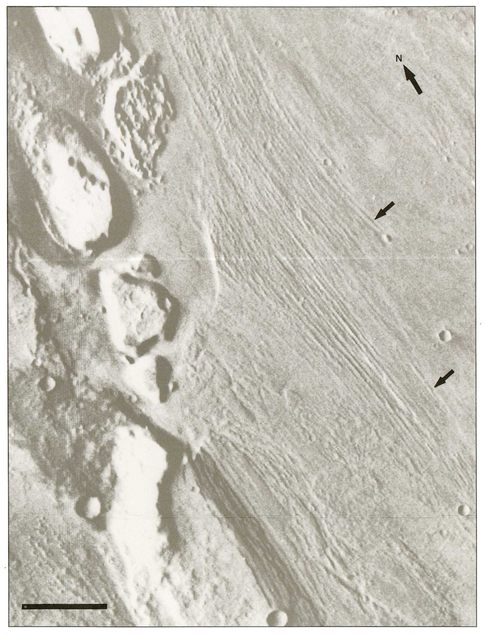
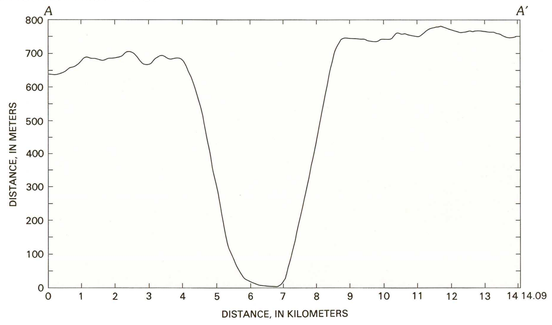
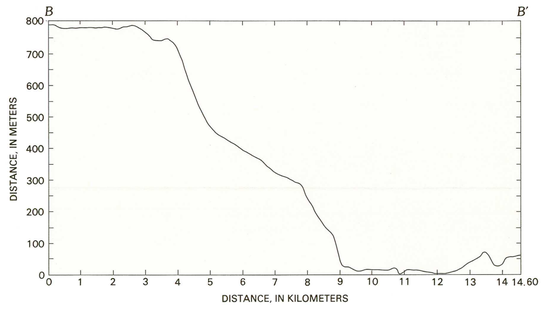


Figure 5. Longitudinal grooves (arrows) of younger channel-floor material of Mangala Valles assemblage (unit **Amch**). Their origin is controversial (see text). Scale bar=5 km; Viking Orbiter image 449S29 centered at lat 10.8° S., long 151.5°.





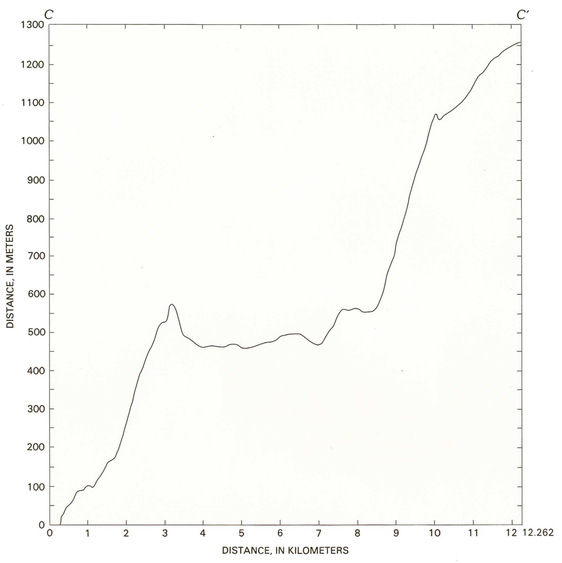


Figure 8. Photoclinometric profiles located on figure 7; vertical exaggeration X10. *A–A′*, profile across channel and east furrow unit of Mangala Valles assemblage (unit **Amfe**). *B–B′*, profile across crater rim, crater-fill materials, and east furrow unit. *C–C′*, profile across crater-fill materials and crater rim.

Figure 11. Southern Amazonis Planitia east of map area at lat 4.5° S., long 148.2°, where ridges in young lobate plains material (unit A_{P2}) are stacked against east side of knob. Scale bar=5 km; Viking Orbiter image 457S16.

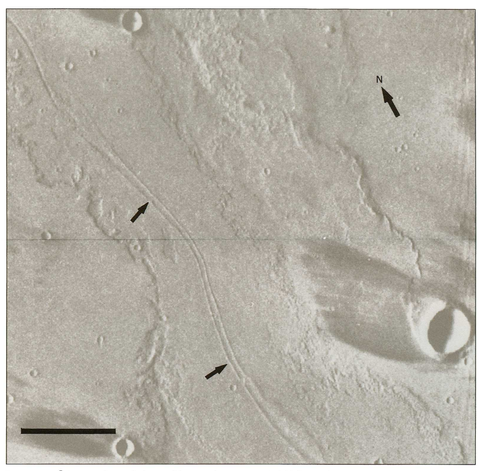


Figure 3. Narrow, leveed channel (arrows) in unit 3 of old lobate plains material of Mangala Valles assemblage (unit $AHmp_3$). Scale bar=5 km; Viking Orbiter image 450S31 centered at lat 10.7° S., long 150.4°.

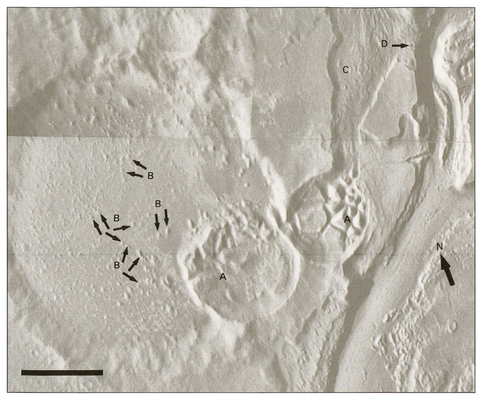


Figure 6. Chaotic areas (A) composed of deposits capped by resistant unit 2 of old lobate plains material of Mangala Valles assemblage (unit $AHmp_2$). Arrows at B point to blocks of debris (blocky unit of Mangala Valles assemblage, unit **Amb**) confined within impact crater. Debris deposit at C is cut by channel on its east edge (arrow at D). Scale bar=5 km; Viking Orbiter images 457S05 and 457S07; figure centered at lat 6.1° S., long 151°.

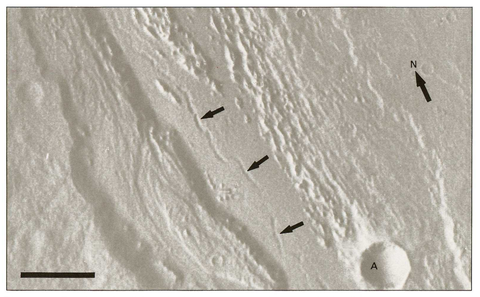


Figure 9. East branch of Mangala Valles; arrows mark narrow "ribbon" channel incised into east furrow unit of Mangala Valles assemblage (unit **Amfe**). No ejecta from crater (A) are observed on channel floor. Scale bar=3 km; Viking Orbiter image 457S05 centered at lat 6.7° S., long 151°.

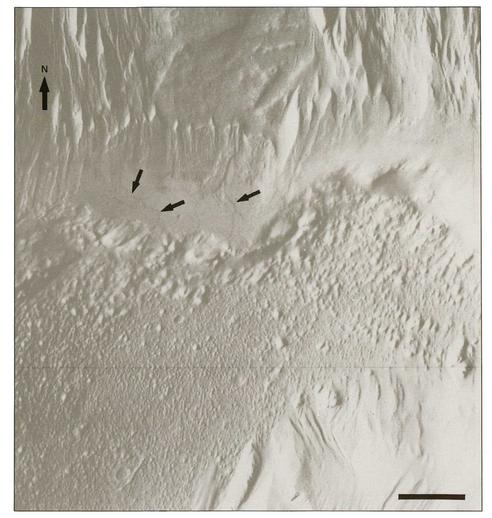


Figure 12. Upper member of Medusae Fossae Formation (unit Amu) in southern Amazonis Planitia showing ridged surface probably formed by wind erosion. Note exhumed, lobate scarps (arrows) of outcrop of resistant material surrounded by upper member. Scale bar=5 km; Viking image 730A18 centered at lat 2.7° S., long 153.5°.

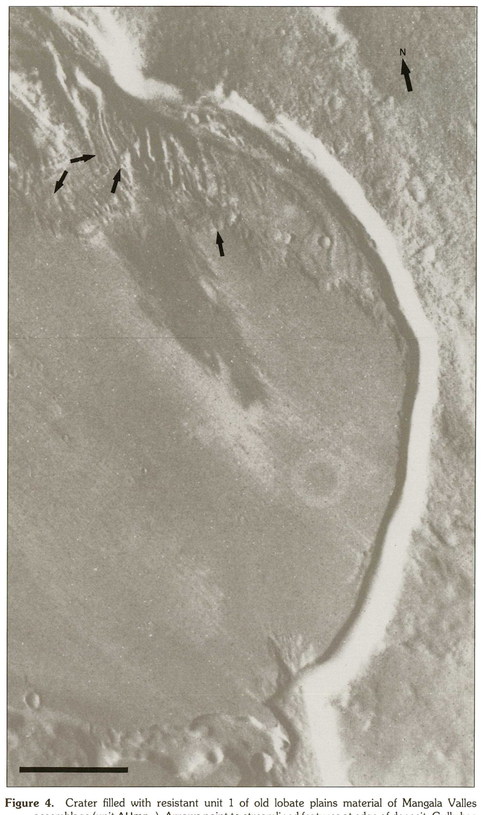


Figure 4. Crater filled with resistant unit 1 of old lobate plains material of Mangala Valles assemblage (unit $AHmp_1$). Arrows point to streamlined features at edge of deposit. Gully has replaced crater rim. Scale bar=5 km; Viking Orbiter image 458S08 centered at lat 6.2° S., long 151.7°.

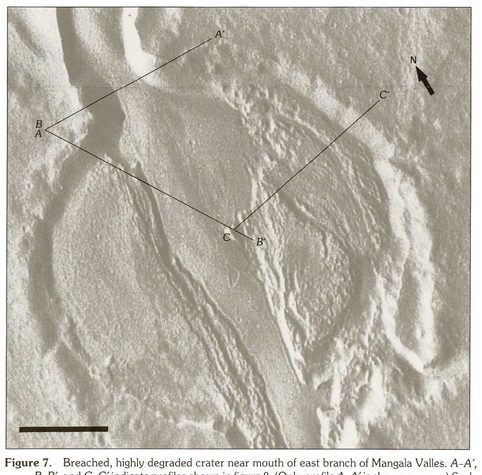


Figure 7. Breached, highly degraded crater near mouth of east branch of Mangala Valles. *A–A′*, *B–B′*, and *C–C′* indicate profiles shown in figure 8. (Only profile *A–A′* is shown on map.) Scale bar=5 km; Viking Orbiter image 458S13.

Figure 10. Mouth of east branch of Mangala Valles at edge of Amazonis Planitia. Arrows at A mark irregular pits on surface of east furrow unit of Mangala Valles assemblage (unit **Amfe**). Arrow at B marks raised rims of east furrow deposit against channel wall. Arrows at C mark ridge-and-trough topography behind flow margin of young lobate plains material (unit A_{P2}). Scale bar=5 km; Viking Orbiter image 459A18.

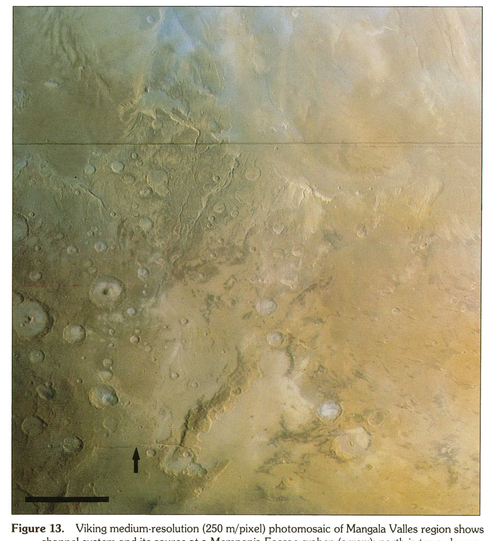


Figure 13. Viking medium-resolution (250 m/pixel) photomosaic of Mangala Valles region shows channel system and its source at a Memnonia Fossae graben (arrow); north is toward upper right; scale bar=100 km. Color processing by Annie Allison and Ella Lee.

GEOLOGIC MAP OF THE MTM –05152 AND –10152 QUADRANGLES, MANGALA VALLES REGION OF MARS

By

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1993