The History of Water at Lyot Crater, Mars: Possible Surface Manifestations of Ancient Groundwater and/or Recent Climate Change

Thesis

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Map Sheet 1: Geomorphological Map of Lyot Crater, Mars

**Introduction**

Crest of crater rim forms a roughly circular boundary. Fan deposits are located on the sides of the crater with a distinct bright rim. Crest of the rim is roughly circular.

**Legend**

- **Contours**
  - Contour (1000m)
  - Contour (200m)
- **Linear Features**
  - Channel
  - Gully
  - Crest of buried crater rim
  - Crest of crater rim
- **Contacts**
  - Certain
  - Approximate
  - Gradational
  - Fan Deposit Boundary

**Map Sheet**

**Surficial units**

<table>
<thead>
<tr>
<th>Unit Description</th>
<th>Additional Characteristics</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Tmu</td>
<td>Ancillor surface material</td>
<td>Material on bedrock, exposed in the crater walls and crater floor. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>E</strong> Ed</td>
<td>Ejecta deposits</td>
<td>Area of material surrounding smaller impact deposits. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>F</strong> Fd</td>
<td>Fan deposits</td>
<td>Material processed by wind forming dunes and sand fields. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>V</strong> Vd</td>
<td>Viscous flow features</td>
<td>Material forming a flow front on the surface. Depicted by shaded relief.</td>
</tr>
</tbody>
</table>

**Mantle units**

<table>
<thead>
<tr>
<th>Unit Description</th>
<th>Additional Characteristics</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S</strong> Smu</td>
<td>Smooth mantle unit</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>T</strong> Tmu</td>
<td>Textured mantle unit</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
</tbody>
</table>

**Pitted units**

<table>
<thead>
<tr>
<th>Unit Description</th>
<th>Additional Characteristics</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D</strong> Dmu</td>
<td>Dark pitted unit with inverted polygons</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>P</strong> Pmu</td>
<td>Pitted floor unit</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
</tbody>
</table>

**Crater units**

<table>
<thead>
<tr>
<th>Unit Description</th>
<th>Additional Characteristics</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>O</strong> Omu</td>
<td>Outer crater unit</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>R</strong> Rmu</td>
<td>Rugged floor unit</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>I</strong> Imu</td>
<td>Inner crater unit</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
<tr>
<td><strong>C</strong> Cmu</td>
<td>Central Crater unit</td>
<td>Material on the surface, exposed in the crater wall. Depicted by shaded relief.</td>
</tr>
</tbody>
</table>

**Stratigraphy**

- **Unit Description**: Material on the surface, exposed in the crater wall.
- **Additional Characteristics**: Depicted by shaded relief.
- **Interpretation**: Depicted by shaded relief.

**Legend**

- **Contours**: Contour (1000m) and Contour (200m).
- **Linear Features**: Channel, Gully, Crest of buried crater rim, and Crest of crater rim.
- **Contacts**: Certain, Approximate, Gradational, and Fan Deposit Boundary.

**Notes**

- Material on the surface, exposed in the crater wall. Depicted by shaded relief.
- Depicted by shaded relief.

**References**

- Al-clays have been detected in this region by Carter et al. (2015), Pan et al. (2017) and Pan and Ehlmann (2018) indicates the presence of chlorite-hydrated signature.
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