TERBY CRATER AS A PROPOSED LANDING SITE: MOC AND OMEGA VIEWS OF THE GEOLOGY AND SPECTRAL VARIABILITY IN AND AROUND TERBY CRATER. E.Z. Noe Dobrea, Malin Space Science Systems (P.O. Box 910148 – San Diego – CA 92191-0148; edobrea@msss.com).

Introduction: The primary scientific objective of MSL is "to assess the present and past habitability of the martian environments accessed by the mission." The landing sites are confined to the latitudes equatorwards of 60˚ and elevations below the MOLA +2 km elevation, making a vast number of interesting areas accesible. It is therefore important to identify a site that can be used to address the largest possible number of scientific questions regarding the past and present state of Mars, while at the same time meeting the primary scientific objective of the mission. In addition to being a site of exobiological interest, such a site should contain a large number of geologic features common to other areas of interest on the planet so as to provide a ground truth for the study of these areas. We therefore propose to land the MSL in Terby Crater at 28.0˚ S, 286.0˚ W.

Terby is a ~200 km crater centered near 285˚ W, 30˚ S, perched on the northern rim of Hellas Planitia. Its location at the boundary of the southern middle and low latitudes, as well as its proximity to Hellas situate, this crater at the nexus of many regions of contemporary research interest. We expect that the regions around Hellas will contain not only remnants of the ancient crust (and possibly mantle) material excavated by the Hellas impact, but also evidence for past hydrothermal activity resulting from the heat generated by the impact. The primary geologically interesting features in and around Terby include: light-toned layered outcrops, middle latitude features, and massifs on the plains north of Terby. We briefly discuss here the gelogy, and where possible, the spectral character of the above-mentioned regions.

Light-toned outcrops: The northern part of the interior of Terby displays a ~500 m deep subcircular depression, which itself is partly occupied and overriden by a set of large (~50 km) and thick (~1500 m), mesa-forming units. Both the walls of the depression and those of the mesa-forming units are light-toned and display layering (meters/layer), and dipping (~29 m/km [1]**)** at MOC resolution. Not all the outcrops manifest as cliff-forming units: the southern portion of these outcrops displays a shallow and easily transitable slope that extends over 3 km from edge of the poposed landing ellipse to the top of the mesa-forming unit. It is therefore tractable to sample most of the exposed stratigraphic sequence of the mesa-forming unit by driving up such shallow slopes.

Publically released OMEGA observations of these outcrops are still sparse. Nevertheless, the current coverage shows evidence for the presence of absorptions in the 2.2-2.4-μm region [2]. Additional work needs to be done in order to confirm this detection and to constrain the mineralogy.

Massifs and plains: Massifs, derived from either the Hellas impact or from a largely eroded overlying layer, manifest themselves about 40 km to the north and to the west of Terby. These massifs display light-toned outcroppings at MOC resolution of a different morphological nature than the light-toned outcrops inside Terby: they generally show up on the massifs' ridges, they do not form steep cliff walls, and they don't show evidence for layering. However, MOC coverage of these massifs is still spotty and additional observations are warranted. Similarly, the plains around Terby also show evidence for subsequent mantling by material that eventually formed light-toned outcrops in the walls of craters and in regions that have been stripped of mantling materials.

OMEGA coverage of the outcrops in the massifs also shows absorptions in the 1.8-1.9 μm region, interpreted to be a hydration feature (fig. 1).

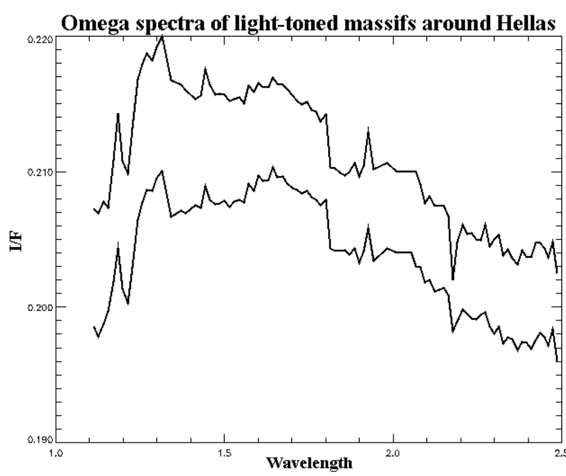

Figure 1 : OMEGA spectra of light-toned massifs around Terby. Note absorption in the 1.8-1.9 μm region.

References: [1] Wilson S.A. and Howard A.D. (2005) *LPS XXXVI*, Abstract #2060 [2] Ansan V. et al. (2005) *LPS XXXVI*, Abstract #1324.