



Smithsonian  
*National Air and Space Museum*

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Dear Michael and John:

The MSL Landing Site Steering Committee met on Tuesday, May 4<sup>th</sup> 2010, to further discuss the two candidate landing sites that were deemed of sufficient merit to warrant collection of additional orbital data to assist in evaluation of their science and safety characteristics. Those two sites are: NE Syrtis, which includes a diverse assemblage of minerals straddling the Noachian-Hesperian boundary (16.7N, 76.9E); and East Margaritifer Terra, where there are exposed phyllosilicate and putative chloride deposits (5.6S, 353.5E). The meeting included excellent presentations and discussion of the science potential and initial safety evaluations of the sites that took good advantage of the excellent high spatial and spectral resolution data sets obtained by MRO and Odyssey.

The Steering Committee was asked to evaluate both sites relative to the following two questions: 1) on the basis of science alone, is either of the sites as, or more, compelling than the existing four sites (Eberswalde, Gale, Holden, Mawrth); and 2) on the basis of science and existing information on safety/characterization, should either of the sites be added to the existing four sites?

The Steering Committee was well represented during the meeting, with 14 of 16 members present. In addition, one additional member that was unable to participate in the meeting was able to provide input on the merits of the sites. With respect to question 1 related to science, all but two of the Steering Committee members felt that the NE Syrtis site was as or more compelling than the existing sites. The East Margaritifer site was also viewed as potentially interesting, but only five Steering Committee members described it as being as or more compelling than any of the existing four sites given the current state of knowledge.

At the NE Syrtis site, the Steering Committee was impressed by the well exposed rock sequence that spans the Noachian-Hesperian boundary. The abundant and varied aqueous mineralogy that is observed within and nearby the landing ellipse likely represents diverse geologic settings and was probably formed *in situ*. The exposed section may represent some of the most pervasive and continuously habitable zones on Mars, namely shallow subsurface environments where liquid water persisted longer than it did in surface environments.

At the East Margaritifer Site, there was some agreement on the high science potential and inclusion of this site as a non “go to” site, but questions were raised regarding the depositional setting and stratigraphic context of the putative chloride and phyllosilicate deposits. It was not clear that these questions could be resolved using orbital data sets alone, perhaps making it difficult to develop testable hypotheses relative to MSL mission objectives.

Preliminary results related to the safety of the sites detailed several concerns at the sites that were related mostly to eolian ripples and some potential landing hazards at East Margaritifer and 1 km slopes and other scarps/landing hazards at NE Syrtis. Although it is possible that some movement of the target ellipses at either site could be performed without reducing their science potential, this would not result in a sufficient reduction in landing hazard risk level to make either site acceptable. In view of this, all but one member of the Steering Committee responded “no” to question 2 (involving convolution of science and safety), thereby indicating that neither site should be added to the existing four sites.

It seems inescapable that many of the candidate landing sites that have comparable ellipse sizes and that offer the greatest potential to address questions related to habitability in the Noachian and Early Hesperian eras on Mars will exhibit the kinds of landing hazards that disqualified the highly regarded NE Syrtis site. The Steering Committee felt that future landing capabilities should enable access to sites offering such rich and diverse sets of science targets and that the MEP technology program should make it a priority for this to be possible in time for the 2018 launch opportunity.

Please let us know if you have any questions regarding these recommendations.

On behalf of the MSL Landing Site Steering Committee,



John Grant



Matt Golombek