

MSL Landing Site Science Criteria – 3rd Workshop

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|--|-------------|-------------|-------------|-------------|--------------|-------------|-------------|
| Diversity | | | | | | | |
| 1) Multiple rock units obs. from orbit? | ● | ● | ● | ● | ● | ● | ● |
| 2) Well-defined strat./X-cutting relations? | ● | ● | ● | ● | ● | ● | ● |
| 3) Diverse mineralogy / systematic trends? | ● | ● | ● | ● | ● | ● | ● |
| 4) Diverse geomorphology / system. trends? | ● | ● | ● | ● | ● | ● | ● |
| Context | | | | | | | |
| 5) Geologic framework before landing? | ● | ● | ● | ● | ● | ● | ● |
| 6) Place MSL obs. into regional context? | ● | ● | ● | ● | ● | ● | ● |
| 7) Well-resolved chronology of rock units? | ● | ● | ● | ● | ● | ● | ● |
| Habitability | | | | | | | |
| 8) Min./Geomorph. evidence? | ● | ● | ● | ● | ● | ● | ● |
| 9) Indicators of water duration, pH, activity? | ● | ● | ● | ● | ● | ● | ● |
| Preservation | | | | | | | |
| 10) Timing of minerals wrt sedimentation? | ● | ● | ● | ● | ● | ● | ● |
| 11) Environment for preservation? | ● | ● | ● | ● | ● | ● | ● |

Diversity

- 1) Can multiple rock units be observed from orbit?
- 2) Do these units have well defined stratigraphic and/or cross-cutting relationships?
- 3) Are these units differentiated on the basis of diverse mineralogic features? Are systematic trends present?
- 4) Are these units differentiated on the basis of diverse geomorphic features? Are systematic trends present?

Context

- 5) How much of what will be observed by the rover can be placed into a geologic framework before landing?
- 6) Can local observations be placed into a more general regional context and, if this is possible, how confidently can this be done?
- 7) How well resolved is the relative chronology of the identified rock units?

Habitability

- 8) Does mineralogic/geomorphic evidence indicate a compelling habitable environment?
- 9) Can minerals or geomorphic features detected from orbit be used as reliable indicators of past: duration of water, water pH, water-rock ratio, water activity (salinity)? (GREEN = good for habitability)

Preservation

- 10) Are the observed mineral phases early and contemporaneous with sedimentation and/or rock alteration? Can this timing be reliably established?
- 11) Is the inferred habitable environment detrimental to the preservation of organic matter or other biosignatures (e.g. C,S isotopes, trace element enrichments) due to high water/rock ratio and/or oxidizing chemical reactions during diagenesis? (Red = detrimental)