February 16, 2017

Dr. Michael Meyer,
Lead Scientist, Mars Exploration Program
Planetary Science Division,
Science Mission Directorate
NASA Headquarters
300 E Street SW
Washington, DC 20546

Dear Michael:

This letter summarizes the outcomes and findings of the third Mars 2020 Landing Site Workshop held in Monrovia, CA, from February 8-10, 2017. The meeting was very well attended, with ~240 present the first day and ~200 present on days two and three of the workshop. Participants included members of the science community and the Mars 2020 project and instrument science teams on all three days of the workshop. The workshop was broadcast using Adobe Connect and attracted an additional ~50 participants/day, though remote attendees did not participate in assessment of the candidate landing sites.

The workshop objective was strongly focused on discussion of the science merits of the eight candidate landing sites (Table 1) that remained under consideration. The goal of the workshop was to provide a community assessment of five science criteria (Table 2). This assessment provides input to the Mars 2020 project to be considered together with other factors (e.g. engineering, operations, planetary protection, potential for returned sample science discoveries) in developing a list of ~3-4 sites remaining under consideration.

Workshop presentations were grouped into an introductory session summarizing current mission status and engineering assessments and were followed by sessions grouping various candidate sites. The website marsnext.jpl.nasa.gov now displays the workshop program, the five scientific selection criteria used for voting, and workshop presentations. The final session on the morning of the third day was devoted to summary discussion and community assessment of the sites. Additional time was provided for discussion at the end of each session and all discussion sessions were lively and involved. We recognize and sincerely appreciate the considerable time and effort made by participants in preparing what were uniformly excellent presentations for the workshop.

The assessment was made using an online "ballot" submitted to Google Forms and subsequently tabulated in near real-time. Workshop participants were instructed to assess each site relative to each criterion using values of one (lowest) to five (highest). We want to recognize Jacob Adler at ASU for his work in creating the assessment tool. Summary results were presented as color plots (red low, yellow intermediate, green high) portraying

the average and standard deviation of each site relative to individual criteria (Figure 1) and as a summary of the average score for all five criteria for each site (Figure 2).

The summary plots (Figures 1 and 2) reveal that two of the candidate sites (Jezero crater and NE Syrtis) were consistently assessed higher relative to criteria one and two and were as high or nearly as highly ranked as any other sites relative to criteria three and four. By contrast, two of the candidate sites (Holden crater and SW Melas) were consistently assessed the lowest relative to criteria one and two and were ranked lower or nearly as low as any other site relative to criteria three and four.

Assessment of the remaining four sites (Columbia Hills, Eberswalde crater, Mawrth Vallis, and Nili Fossae) revealed them to be intermediate to the other sites and received fairly similar values relative to each criterion. Nevertheless, Nili Fossae was assessed slightly lower relative to criteria one and four, all four intermediate sites were nearly the same value for criterion two, and Eberswalde crater was slightly higher for criterion three.

We continue to appreciate the opportunity for the science community to contribute to the Mars 2020 landing site selection process. It is clear that the workshops bring broad expertise into assessment of the candidate landing sites and result in energetic discussion of the relative merits of candidate landing sites. We look forward to NASA's continued support of these activities as they are geared towards helping to ensure that mission science objectives can be achieved.

Sincerely,

John Grant

Matt Golombek
Co-Chairs, Mars 2020 Landing Site Steering Committee
On behalf of the Mars 2020 Landing Site Steering Committee

Table 1. Eight Remaining Candidate Landing Sites for Mars 2020 Mission. Ellipse center point, elevation and ellipse size with the long axis oriented east-west.

Landing Site	Lat (degN)	Long (degE)	Approx Elevation (km)	Approx Buffered Ellipse Axes (km)
Colombia Hills	-14.5478	175.6255	-1.93	9.6 x 8.7
Eberswalde	-23.7749	-33.5147	-1.49	8.6 x 7.7
Holden	-26.6130	-34.8167	-2.18	9.5 x 8.1
Jezero	18.4386	77.5031	-2.64	10.7 x 8.3
Mawrth	23.9685	-19.0609	-2.24	11.9 x 9.8
NE Syrtis	17.8899	77.1599	-2.04	11.1 x 8.2
Nili Fossae	21.0297	74.3494	-0.65	9.7 x 7.7
SW Melas	-9.8132	-76.4679	-1.92	9.7 x 8.7

Table 2: Criteria Used to Assess Candidate Sites at 3rd 2020 Landing Site Workshop

Criterion 1:

The site is an astrobiologically relevant ancient environment and has geologic diversity that has the potential to yield fundamental scientific discoveries when it is a) characterized for the processes that formed and modified the geologic record; and b) subjected to astrobiologically relevant investigations (e.g., assessment of habitability and biosignature preservation potential). (scoring: 1=lowest potential, 5=highest potential)

Criterion 2:

A rigorously documented and returnable cache of rock and regolith samples assembled at this site has the potential to yield fundamental scientific discoveries if returned to Earth in the future. (scoring: 1=lowest potential, 5=highest potential)

Criterion 3:

There is high confidence in the assumptions, evidence, and any interpretive models that support the assessments for Criteria 1 and 2 for this site. (scoring: 1=lowest confidence, 5=highest confidence).

Criterion 4:

There is high confidence that the highest-science-value regions of interest at the site can be adequately investigated in pursuit of Criteria 1 and 2 within the prime mission. (scoring: 1=lowest confidence, 5=highest confidence).

Criterion 5:

The site has high potential for significant water resources that may be of use for future exploration—whether in the form of water-rich hydrated minerals, ice/ice regolith or subsurface ice. (scoring: 1=lowest potential, 5=highest potential)
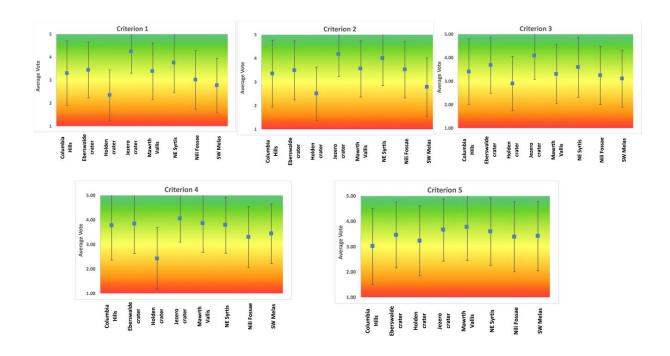
Figure 1. Summary assessment of all eight candidate sites (average and standard deviation) relative to each of the five criteria. Red/1 is the lowest, Yellow/3 is intermediate, and Green/5 is high.

Average Vote	Columbia Hills	Eberswalde crater	Holden crater	Jezero crater	Mawrth Vallis	NE Syrtis	Nili Fossae	SW Melas
Criterion 1	3.3	3.4	2.3	4.2	3.4	3.7	3.0	2.8
Criterion 2	3.4	3.5	2.5	4.2	3.6	4.0	3.5	2.8
Criterion 3	3.4	3.7	2.9	4.1	3.3	3.6	3.5	3.1
Criterion 4	3.8	3.9	2.4	4.0	3.9	3.8	3.3	3.4
Criterion 5	3.0	3.5	3.2	3.7	3.8	3.6	3.4	3.4

Figure 2. Summary of the average score for all five criteria for each site. Red/1 is the lowest, Yellow/3 is intermediate, and Green/5 is high.