GEOLOGIC MAPPING OF THE MARS SCIENCE LABORATORY LANDING ELLIPSE: FINAL PREPARATION FOR SUBMISSION. F. J. Calef III[1], W. E. Dietrich[2], L. Edgar[3], J. Farmer[4], A. Fraeman[5], J. Grotzinger[3], M. C. Palucis[2], T. Parker[1], M. Rice[3], S. Rowland[6], K. M. Stack[3], D. Sumner[7], J. Williams[7], and the MSL Science Team, [1]Jet Propulsion Laboratory, Pasadena, CA, [2]University of Calif., Berkeley, CA., [3]Calif. Institute of Technology, Pasadena, CA, [4]Arizona State Univ., AZ, [5]Washington Univ. St. Louis, MO, [6]Univ. of Hawaii, HI, [7]Univ. of Calif., Davis, CA., [7]Univ. of New Mexico, NM.

Introduction: The MSL project "crowd sourced" a geologic mapping effort of the nominal landing ellipse in preparation for tactical and strategic mission operations [1]. Seven major geologic/geomorphic terrains are defined within the landing ellipse and to the edge of Aeolis Palus [2]: alluvial fan, smooth hummocky plains, bright-toned "rugged" terrains, flat-lying cratered plains/surfaces, "striated" light-toned outcrops, light-toned bedded-fractured surfaces, and cross-bedded 'washboard' unit. Initial stratigraphic models of these units have been proposed based on orbital observations and the traverse from Bradbury Landing to Pahrump Hills [3].

Geologic Unit Extent: Mapping within the landing ellipse to the Aeolis Palus/Murray Formation contact is complete. Peace Vallis fan is being included in the map despite being predominately outside the landing ellipse as it is considered a major contributor to the landing site geologic unit material.

Map Parameters: The final map will be published at 1:24000 at 40 x 40 inches. Minimal mapping area is set at 400^2 m (20 x 20 m) that is the approximate size of individual outcrops MSL has visited while remaining visible at the map scale. The projection will be Equidistant Cylindrical with center longitude = 0. A HiRISE visible basemap as well as digital elevation model (DEM) will be distributed before or with the release including a digital copy of the geologic units and contacts.

Geology: MSL has done contact science on all the major geologic units, except the Peace Vallis alluvial fan material, including drilling on the 'bedded-fractured' units in Yellowknife Bay and recently a sandstone unit overlying the complexly layered, fine-grained 'striated' unit. The rover has also reached what we believe is the 'wash-board' unit after climbing up to Marais Pass on our way towards Murray Buttes and up lower Mt. Sharp. A description from in-situ measurements will be provided for every major geologic unit, though some generalization will be necessary to fit the map scale. The geologic map contains 7 major units: a texturally smooth unit that makes up the Peace Vallis alluvial fan unit (AF) with many inverted channels that are several meters vertical, the bedded fracture unit (BF) with light-tone and sub-meter width fractures of variable length and spacing, several flat-lying more heavily cratered surfaces (CS), tonally-smooth though topographically hummocky plains unit (HP), bright-toned topographically variable 'rugged' unit (RT) composed of material that is not fractured, a light-toned 'striated' unit (ST) made up of crossbedded sandstones, and the 'wash-board' unit (WB) also containing cross-bedded sandstones, but potentially cutting into the Murray Formation. Units for eolian fill/bedforms and obvious continuous ejecta blankets that occasionally covered the major units were also designated, though they are minor components. HP terrain was distinguished as unique and separate from terrain that exists between the northern crater rim and the fan that can contain bright smooth fill in low-lying depressions, although the distinction between these terrains may be minor. RT terrain appears as outcrops on or up through the hummocky plains terrain as ridge or mesa outcrops. The majority of the HP terrain appears as a gravelly lag mixed with other centimeter-sized angular breccia fragments of unknown origin or as clast-supported conglomerates. Initial stratigraphic relationships have been proposed based on orbital mapping [3] and the terrains are in approximate stratigraphic order on the map legend. Stratigraphic refinements based on traverse observations at lower scales are expected in separate research efforts.

Future work: A separate funded MDAP mapping effort will take on the challenge of delineating geologic units of lower Mt. Sharp.

References: [1] Calef et al. (2013) LPSC2014, [2] Grotzinger et al. (2014) *Science* [3] Stack et al. (2013).

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