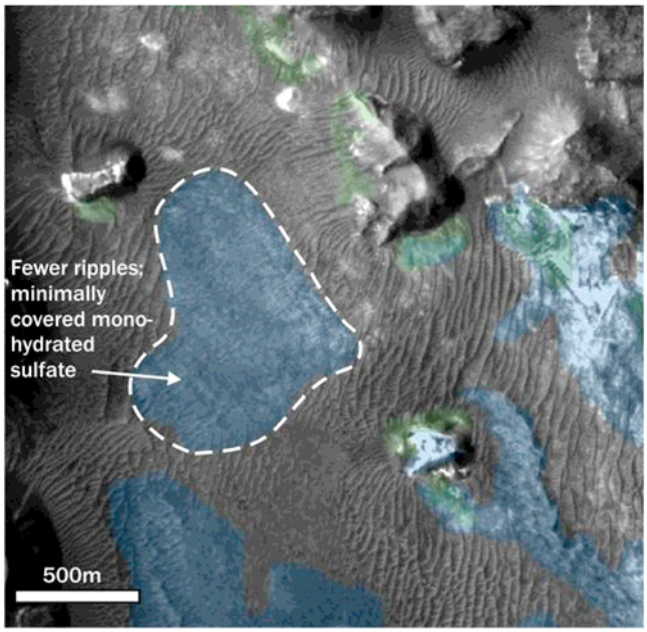

Figure 8. CTX mosaic over an area with strong 2.1 and 2.4 μm absorptions indicative of monohydrated sulfate. Blue shaded areas indicate the presence of monohydrated sulfate; green shaded areas indicate the presence of the ferric hydroxysulfate. Although most of the material that exhibits strong monohydrated sulfate signatures has a high albedo (Figure 7), the area enclosed by the dashed line does not, although some brighter material can be seen at the right edge. We interpret this to be an exposure of the monohydrated sulfate-bearing material in Figure 7 that is minimally covered with wind-blown sands.

induced slumping and sliding (Figure 9). Chaos bedrock can be seen as "kipukas" standing above and surrounded by these deposits in the southwest corner of Aram Chaos (Figure 2), and in certain places this material has been deeply eroded to reveal the basement chaos terrain [*Glotch and Christensen*, 2005]. The spectral signature of the light-toned cliffs is dominated by nanophase ferric oxides [*Morris et al.*, 2006a, 2006b; *Massé et al.*, 2008b], but minor absorptions at 2.1 and 2.4 μm indicate that the material also contains monohydrated sulfates [*Massé et al.*, 2008b].

[19] HiRISE images covering this unit (Figure 9) show that the exposed walls of this deposit are finely layered, with thicknesses similar to those inferred from the middle or monohydrated sulfate portion of the deposit. In fact, in CRISM observation FRT7FA4 up to twelve distinct layers are exposed within the monohydrated sulfate (middle) unit, forming a stair step pattern with some of the layers traceable to beneath the cliff-forming deposits.

4.2. Polyhydrated Sulfates, Hydrated Materials, and Hematite Deposits

[20] This second sedimentary unit is 75–100 m thick and is characterized by an absorption at 1.9 μm indicating the presence of one or more polyhydrated minerals and a plateau-like morphology. Compared to the monohydrated sulfates, the polyhydrated materials are darker and smoother and appear more indurated and resistant to weathering than the monohydrated deposits. Previous work in Aram Chaos with OMEGA data has shown that one of the hydrated minerals is most likely a polyhydrated sulfate based on an additional absorption at 2.4 μm [*Gendrin et al.*, 2005; *Noe Dobrea et al.*, 2008]. Examination of the locations where the 1.9 μm band depth is present in CRISM data over the plateau (Figure 10) shows that polyhydrated minerals are present, but that their locations are not ubiquitous throughout the region as mapped by OMEGA (Figure 2a).

[21] This unit also coincides spatially with the detection of crystalline hematite, identified from Thermal Emission Spectrometer data [*Christensen et al.*, 2001; *Glotch and Christensen*, 2005; *Noe Dobrea et al.*, 2008]. Using OMEGA data *Massé et al.* [2008b] showed that goethite, ferrihydrite, or schwertmannite may also be present in this unit along with hematite. These ferric oxides are not expected to be stable under present-day Martian conditions;

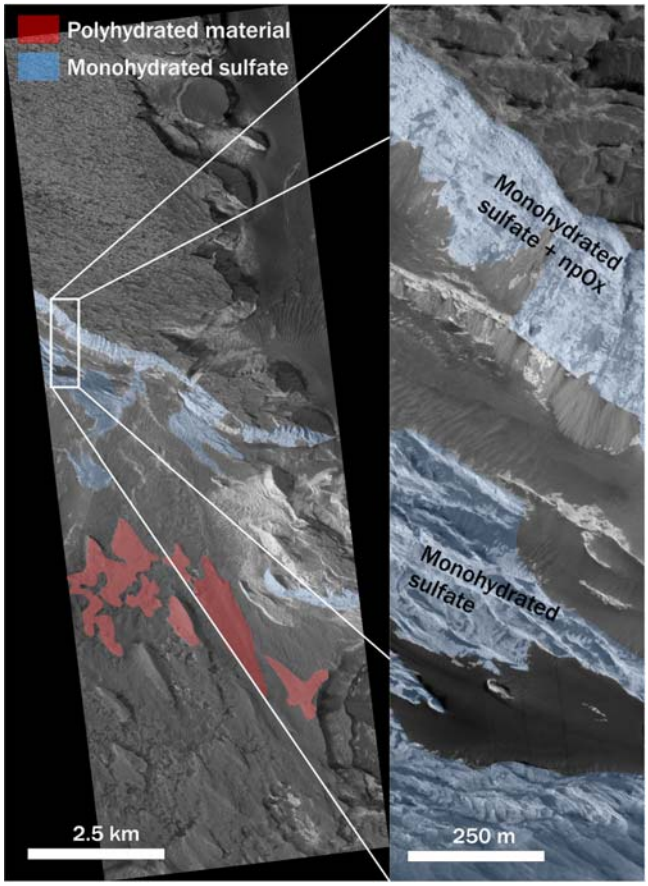

Figure 9. HiRISE image PSP_003406. The spectral signature of the walls is dominated by nanophase ferric oxides but also has faint absorptions at 2.1 and 2.4 μm indicating the presence of monohydrated sulfates. Locations of strong 2.1 and 2.4 absorptions (indicating the material is dominated by monohydrated sulfates) are shown here just below the cliff. The layered nature of both the monohydrated sulfate plus npOx material and the monohydrated sulfate material is visible in the blowup on the right. The outcrop of ferric hydroxysulfate in this area is not covered in this HiRISE observation.