PRELIMINARY RESULTS OF A PETROGRAPHIC INVESTIGATION OF APOLLO 16 CORE 60014; A. Basu, Department of Geological Sciences, Indiana University, Bloomington, IN 47405; S.J. Wentworth, LESC, Houston, TX. 77058; D.S. McKay, NASA-JSC, Code SN 14, Houston, TX. 77058, U.S.A.

The double drive tube core 60014/60013 was obtained at Station 10' from near the Lunar Module at the Apollo 16 landing site. It is one of the three cores extracted from this area in the hope of discovering and establishing the continuity of layers, if any, in the lunar regolith [1]. Here we present a preliminary petrographic description of the core soils; comparison with the other cores will be done after both 60014 and 60013 have been studied. We selected six samples from different depths of 60014 for an optimum representation of this upper drive tube prior to the availability of FMR data.

Approximately 1g of the submillimeter fraction of each of the six soils were sieved in D.S McKay's lab at the Johnson Space Center (JSC) following standard procedures but only for the $>90\mu$m fractions, aliquots of which were then made into polished grain mounts (PGMs), also at the JSC facilities. The grain size distributions of the 90-1000μm fractions of the soils show little variation (Table 1; fig.1). This suggests that the soils might have nearly uniform maturity, as the FMR values indicate (unpublished data of R.V. Morris; courtesy of Morris and the JSC Curatorial Staff).

Table 2 shows a preliminary modal analysis of 2910 grains the PGMs of the 90-150μm and the 500-1000μm size fractions. We combined fragmental feldspathic breccias (FFBx) and (cataclastic) anorthositic rocks (An) into a single category. The distinction between the two become rather artificial in the submillimeter grain size range, although we are cognizant of the significance of FFBx [2]. For the same reason we have not subdivided various categories of crystalline matrix breccias; these include all melt matrix, poikilitic, recrystallized, and granulitic textured breccias [3]. We have tentatively identified a few grains as KREEP basalts; but we cannot be certain until we conduct chemical analyses. Orange and green glasses are rare and are found only in the 90-150μm fraction. A few yellow glasses are clast-free but several are clast-laden and are ropy in morphology. Colorless glasses are more common, and show a brownish tinge in the cryptocrystalline areas.

Agglutinates abundances (>30%; Table 2) suggest that the soils are submature on an average [cf. 4]. Abundances of agglutinates and crystalline breccias, in both the size fractions, show a negative correlation throughout the depth profile of the core (fig. 2). Because these two constituents sum to about 75% of the core material (Table 2), the negative correlation is probably an artifact of closure. The close correspondence between the abundances of single feldspars and FFBx suggests that the feldspars are derived mostly from FFBx. The low abundance of FFBx is compatible with the suggestion that the FFBx may be the subsurface material of the North Crater [2]. We did not find any mare basalt rock fragment. Like orange and green glasses, single pyroxene is more common in the finer sizes suggesting that an exotic mare component may be concentrated in finer fractions; this may be true for Apollo 16 soils in general [5].

REFERENCES: [1] Schwartz, C. (1991) LPSci XXII, pp. 1201-1202. [2] James, O.B. (1981) PLPSC 12th, pp. 209-233. [3] Stoffler, D. et al. (1979) PLPSC 10th, pp. 51-70. [4] McKay, D.S. et al. (1974) PLSC 5th, pp. 887-906. [5] Korotev, R. (1990) LPSci XXI, pp. 657-658.

PETROGRAPHY OF CORE 60014: Basu, A., Wentworth, S.J, and McKay, D.S.

Table. 1 Grain size distribution (60014)

Depth(cm)	0.75	4.25	12.25	20.25	25.75	28.1
Split#	2126	2127	2129	2131	2133	2134
size μm					Percent	
500-1000	9.0	7.9	6.7	8.9	7.4	8.7
250-500	10.9	10.4	11.7	10.4	12.0	11.7
150-250	9.7	9.2	10.0	9.2	10.0	9.8
90-150	11.3	11.4	10.6	10.4	11.9	11.6
<90	59.2	61.1	60.9	61.1	58.7	58.2

Table 2. Modal Analysis of 60014 core soils

Depth(cm)	0.75	4.25	12.25	20.25	25.75	28.1
	90-150μm fraction					
Split#	2159	2168	2177	2186	2196	2205
Aggl	31.2	40.8	35.0	39.9	35.0	31.6
RBx	7.0	7.9	10.6	11.4	5.4	5.2
FF/An	1.9	2.6	6.1	4.5	1.9	4.2
XBx	41.4	31.3	27.7	29.5	38.5	38.4
Fs	12.1	14.5	17.4	12.3	10.7	16.0
Px	1.6	1.0	1.3	0.0	1.9	1.3
OGl	0.6	0.0	0.0	0.0	0.3	0.0
GGl	0.0	0.0	0.0	0.3	0.3	0.0
YGl	0.6	0.3	0.6	1.0	2.5	1.0
CGl	1.6	1.6	1.0	1.0	1.9	1.0
KB?	0.3	0.0	0.3	0.0	0.0	0.7
Other	1.6	0.0	0.0	0.0	1.6	0.7
n_{grain}	314	304	311	308	317	307
	500-1000μm fraction					
Split#	2154	2163	2172	2181	2191	2200
Aggl	22.3	25.1	27.1	17.8	22.1	18.5
RBx	13.4	11.2	12.7	12.8	11.0	9.5
FF/An	3.9	0.6	0.6	3.3	1.4	3.5
XBx	49.2	55.9	53.0	56.7	60.0	63.0
Fs	6.7	3.9	2.4	7.8	4.1	4.0
Px	0.0	0.6	0.0	0.0	0.7	0.0
OGl	0.0	0.0	0.0	0.0	0.0	0.0
GGl	0.0	0.0	0.0	0.0	0.0	0.0
YGl	0.6	0.6	1.8	0.0	0.0	0.0
CGl	2.8	1.7	1.2	0.6	0.0	0.5
KB?	0.6	0.0	0.6	0.0	0.7	0.0
Other	0.6	0.6	0.6	1.7	0.0	1.0
n_{grain}	179	179	166	180	145	200