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Supplementary material for

Feasibility of handheld mid-infrared spectroscopy to predict particle size distribution: influence of soil field condition and utilisation of existing spectral libraries

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Fig. S1 DRIFT spectra of the <2 mm EP soils #1 scanned on the benchtop (*PE*) spectrometer with the bright and dark SiC background reference disks, and the handheld (*ExoScan*) spectrometer with the dark background disk.

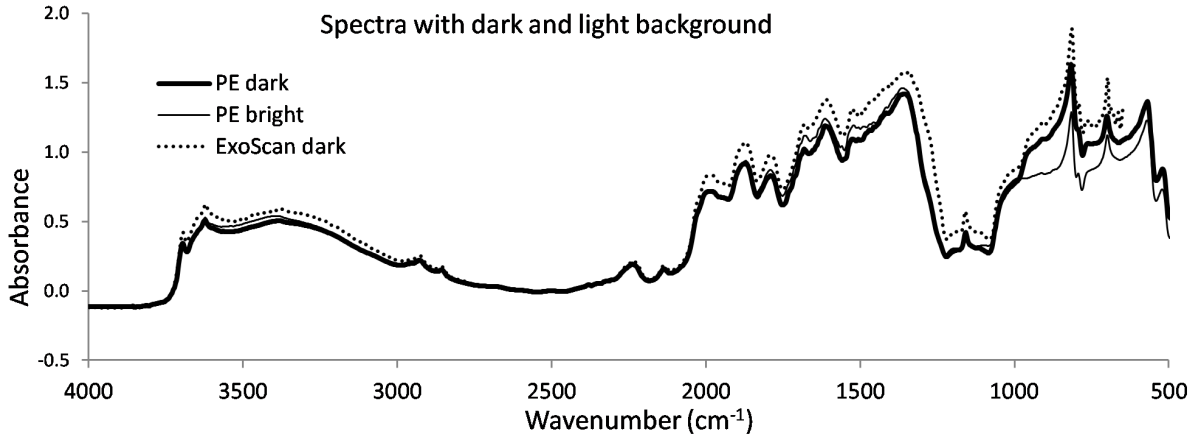

Fig. S2: Examples of the differences in *PE* and *ExoScan* spectral intensities across the MIR spectral range for <2 mm sieved samples #15, #20, #22, #26 and #28, and the ratios of intensities between the two types of spectra.

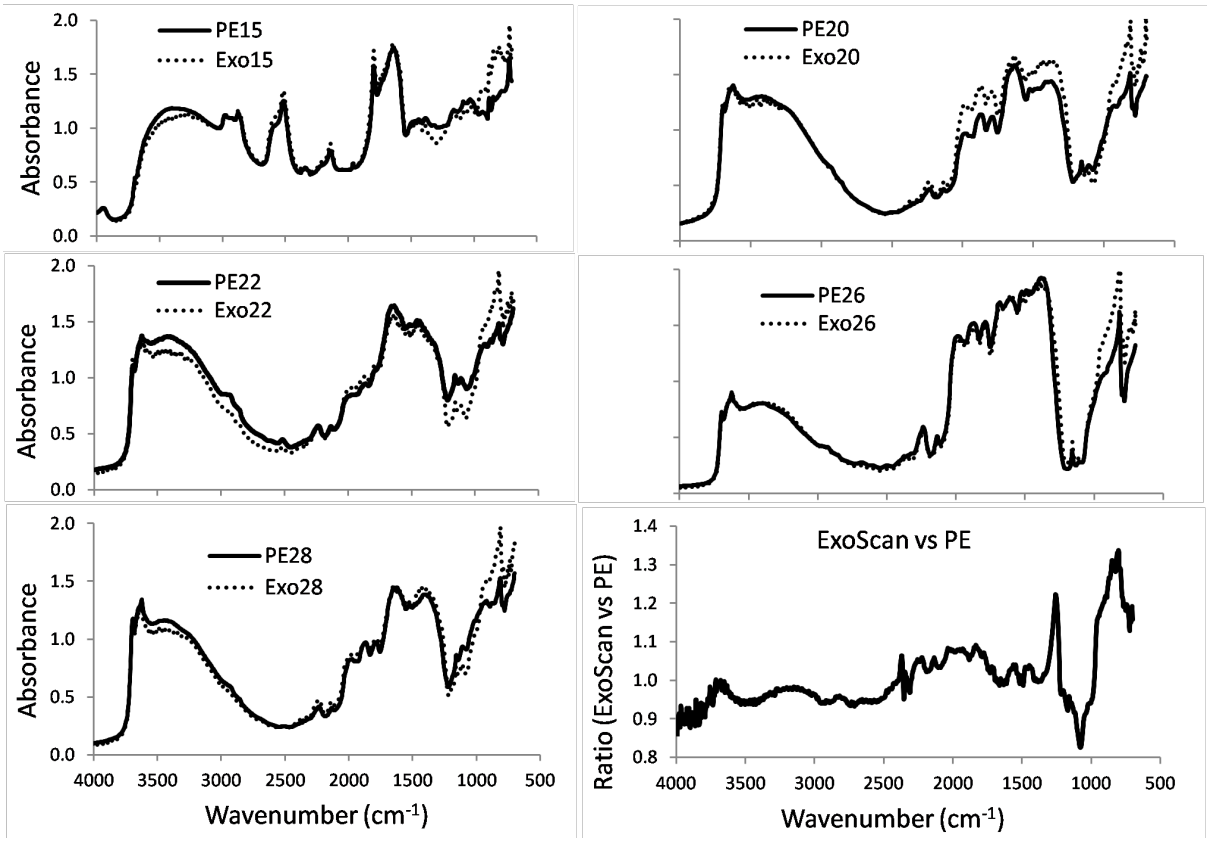

Fig. S3: Comparison of PDS processed *PE* and raw *ExoScan* spectral intensities across the MIR spectral range for <2 mm sieved samples #15, #20, #22, #26 and #28.

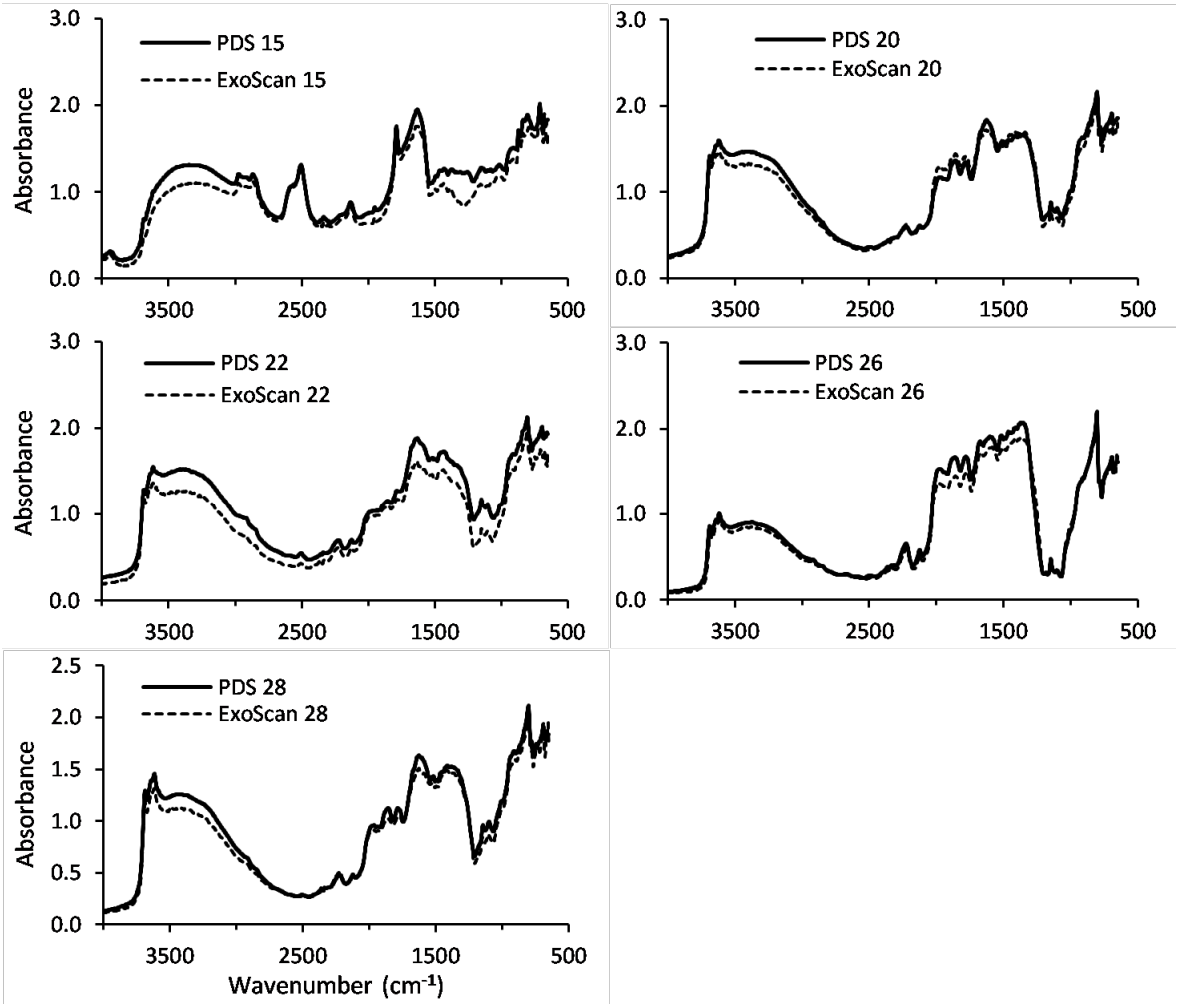

Fig. S4 Regression plots of clay by cross-validation versus reference clay for the <2 mm EP spectra scanned with the (a and c) benchtop, and (c and d) the handheld instrument. Plots for regressions, with outliers #11 and #17 omitted for the (b) benchtop and (d) for the handheld instruments, respectively.

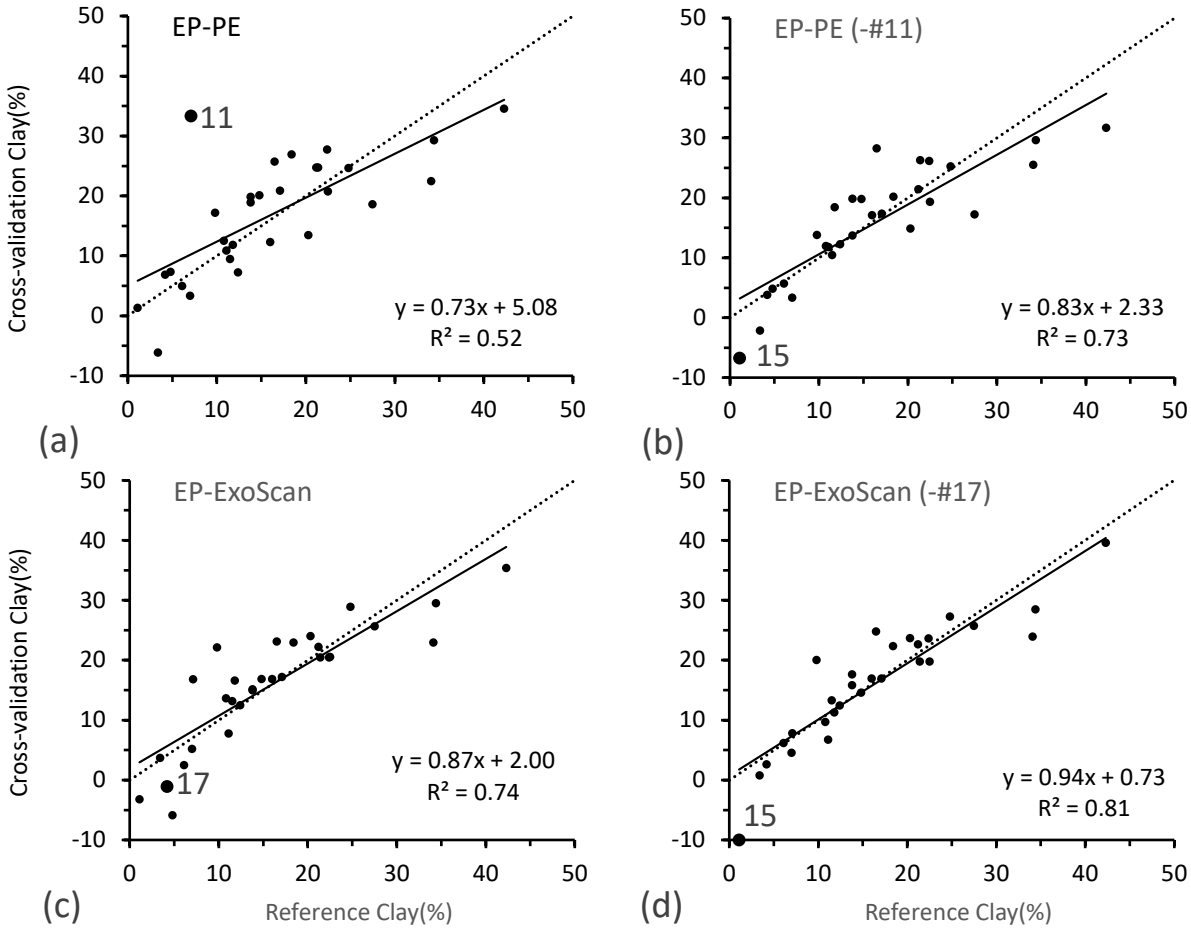

Table S1*:* Soils (NSW, ACU and EP) used for the calibration. Analytical data for soil *c*arbonate*,* clay silt and sand. Data are shown after carbonate has been removed.

Soil set		Carbonate (%)	Clay (%)	Silt (%)	Sand (%)
NSW	N	674	674	674	674
	Min %	0	0	1	1
	Max %	14	84	60	100
	Median %	0	22	18	50
	SD %	1.9	19	11	23
ACU	N	135	135	135	135
	Min %	0	1	0	4
	Max %	84	72	32	98
	Median %	1	22	7	49
	SD %	24	18	7	28
EP	N	30	30	30	30
	Min %	0	1	0	3
	Max %	96	39	12	94
	Median %	6	14	3	66
	SD %	24	10	4	22

Minimum (Min %),

maximum (Max %),

Median (%)

Standard deviations (SD %) for the soils used in this study.

Table S2*:* Locations and analytical data for the Eyre Peninsula sampling sites.

Location	S	E	Land use	TC (%)	CO_3 (%)	TOC (%)	Clay (%)	Silt (%)	Sand (%)	Soil type
Yalunda Flat	34º 21.422	135º 54.553	Natural	3.1	0	3.1	18.4	7.6	67.6	Tenosol
Yalunda Flat	34º 21.370	135º 54.650	Cereal							
Yalunda Flat	34° 21.407	135° 54.553	Cereal	1.3	0	1.3	34.1	11.4	51.6	Tenosol
Tumby bay	34° 23.687	136° 2.572	Cereal	2.1	3	1.8	22.4	4.2	66.8	Tenosol
Tumby bay	34° 27.152	135° 59.374	Cereal	5.2	11	3.9	27.5	7.8	45.5	Tenosol
Tumby bay	34° 27.154	136° 2.103	Cereal	1.0	1	0.9	21.2	5.3	71.0	Tenosol
Tumby bay	34° 27.153	136° 6.211	Cereal	4.4	22	1.7	16.0	3.8	55.5	Tenosol
Tumby bay	34° 27.258	136° 6.751	Natural							
Port Lincoln	34° 45.533	135° 50.313	Natural	5.7	24	2.9	24.8	3.0	40.7	Tenosol
Port Lincoln	34° 46.235	135° 49.291	Natural	1.5	0	1.5	11.8	7.1	78.0	Tenosol
Port Lincoln	34° 46.227	135° 49.333	Natural	0.7	2	0.4	7.1	7.8	82.8	Tenosol
Port Lincoln	34° 44.456	135° 49.306	Natural	11.8	86	1.4	4.8	2.0	10.8	Tenosol
Duck Ponds	34° 42.664	135° 47.506	Pasture	7.5	36	3.1	9.8	2.4	42.5	Tenosol
Wangary	34° 35.819	135° 34.938	Natural							
Coffin Bay	34° 36.504	135° 30.884	Natural	11.4	96	0.0	1.1	0.0	2.7	Tenosol
Wangary	34° 34.058	135° 30.462	Natural							
Moody	34° 01.943	135° 55.747	Cereal	0.4	0	0.4	4.2	0.3	94.5	Sodosol
Lock	33° 34.388	135° 45.355	Urban							
Lock	33° 34.453	135° 45.181	Urban	3.5	8	2.5	13.8	0.9	72.5	Sodosol
Lock	33° 34.533	135° 44.870	Cereal	0.6	0	0.6	20.3	0.9	76.4	Sodosol
Lock	33° 32.919	135° 44.713	Cereal							
Lock	33° 32.252	135° 44.067	Natural	3.2	3	2.9	21.4	1.4	68.6	Sodosol
Lock	33° 30.908	135° 42.030	Natural							
Ulyerra	33° 25.814	135° 38.640	Cereal	7.2	33	3.3	10.8	1.6	46.9	Sodosol
Ulyerra	33° 22.667	135° 38.894	Cereal	5.3	41	0.3	3.4	0.7	55.8	Sodosol
Warramboo	33° 17.120	135° 36.610	Cereal							
Warramboo	33° 14.213	135° 35.734	Cereal	0.7	0	0.7	7.0	0.1	91.1	Sodosol
Kyacutta	33° 09.290	135°33.657	Cereal							
Wudinna	33° 03.532	135° 28.075	Cereal	1.8	3	1.5	14.8	1.2	78.1	Sodosol
Wudinna	33° 01.843	135° 26.120	Cereal	0.6	0	0.6	12.4	2.4	83.6	Sodosol
Pygery	33° 01.780	135° 23.766	Cereal							
Yaninee	33° 00.784	135° 16.853	Pasture							

Yaninee	33° 00.935	135° 15.017	Cereal							
Yaninee	33° 00.975	135° 08.978	Cereal							
Mt Damper	33° 00.877	135° 05.865	Cereal	2.5	4	2.0	22.5	4.1	64.9	Sodosol
Mt Damper	32° 59.754	135° 02.337	Natural							
Minnipa	32° 56.258	135° 04.623	Cereal	1.2	3	0.9	11.5	0.7	82.5	Sodosol
Minnipa	32° 53.533	135° 06.986	Cereal	2.9	13	1.4	6.1	0.4	74.3	Sodosol
Minnipa	32° 51.724	135° 08.776	Canola							
Poochera	32° 41.042	134° 47.808	Cereal							
Cungena	32° 38.720	134° 45.528	Natural	2.2	12	0.8	17.1	5.6	63.4	Tenosol
Cungena	32° 36.786	134° 43.518	Cereal							
Cungena	32° 33.354	134° 40.357	Natural	4.7	30	1.1	11.1	2.3	52.8	Tenosol
Yantanabie	32° 29.586	134° 38.228	Cereal							
Yantanabie	32° 27.348	134° 35.278	Cereal							
Wirrulla	32° 24.719	134°32.145	Cereal							
Kimba	33° 07.866	136° 25.726	Natural							
Moseley	33° 07.466	136°34.961	Natural	3.6	7	2.8	34.4	13.2	40.5	Calcarosol
Barna	33° 06.523	136° 38.368	Natural							
Barna	33° 00.919	136° 49.550	Natural							
Iron Knob	32° 53.947	136° 57.721	Natural	5.0	39	0.3	16.5	3.9	39.2	Calcarosol
Iron Knob	32° 51.090	137° 00.992	Natural	2.2	7	1.4	42.3	12.6	33.7	Calcarosol
Iron Knob	32° 44.200	137° 07.302	Natural	0.4	0	0.4	13.8	7.0	77.8	Calcarosol
Mallala	34º 29.188	138º 37.011	Cereal							

Map coordinates (S-Northing, E-Easting)