MINERAL RESOURCES TASMANIA

Laboratory Report

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MRT Sand Project Lot 5 Clay and Fine Sediment Analysis – East and Southeast Coast Sands

An unpublished Mineral Resources Report for:
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SUMMARY

As part of the Mineral Resources Tasmania Sand Sampling Program, 16 siliceous sands were submitted for testing. The testing regimen was determined by T. Holmes based on industry requirements, with the samples assessed for clay and fine silt proportions by settling method (AS 1141.33:2015). There was variability in colour, with samples ranging from off-white to pale cream-yellow, tan, to grey and black. The samples were predominantly medium to fine grained sands, with a majority of samples containing at least trace organic matter and a minority having coarse sand to gravel/cobbles present.

Of the samples tested, all except one (C113883; 13%) had a C value <10%, indicating a low proportion of clay and fine silt in the majority of samples. While dry sieving Particle Size Distribution results are not available for comparative discussion, the results of the AS 1141.33 testing indicate a low proportion of clay and fine silt for most of the samples.

1. INTRODUCTION

Clay and fine silt determination by the settling method AS 1141.33:2015 was requested on 16 samples of predominantly fine to medium grained, silica rich sands by T. Holmes as part of the Mineral Resources Tasmania (MRT) Sands Resource Program. While being reasonably visually consistent, there were variations across the samples. These variations were predominantly in colour (indicative of clay and/or iron oxides), grain angularity and organic content.

2. SAMPLE PREPARATION

Samples were dried to a constant mass, photographed and sub-sampled for testing. The testing regimen was determined by T. Holmes based on industry requirements and building on existing datasets. A ~100 g riffle split subsample of each fine aggregate was used for AS 1141.33 testing.

3. SAMPLE DESCRIPTIONS

The samples were predominantly fine to medium grained, silica rich sands, with some variability across the samples. The variations were predominantly in colour (white to off-white, pale cream-yellow, tan and grey black), grain size and angularity, indicative of variable amounts of clays, oxidation state and organic matter, while some samples exhibited a gap-graded gravel and cobble component. See Table 1 and Figures 1 to 30 for full sample details.

Table 1. *Southeast Coast MRT Sand Project Sample Lot 5*

Sample No.	Site	Description	mE, gda94	mN, gda94	Process
C113879	Bangor	Grey polylithic fine grained beach sand - Lithology: Sand (soil)	578202	5252253	Clay/Silt Settling
C113880	Bangor	Cream coloured fine grained beach sand - Lithology: Sand (soil)	577043	5252242	Clay/Silt Settling
C113881	Bangor	Cream to light yellow fine grained beach sand - Lithology: Sand (soil)	576332	5252572	Clay/Silt Settling
C113882	Bangor	Cream to light brown fine grained dune sand - Lithology: Sand (soil)	575472	5253384	Clay/Silt Settling
C113883	Bangor	Light grey fine grained dune sand - Lithology: Sand (soil)	571277	5253042	Clay/Silt Settling
C113884	Bangor	Light grey fine grained beach sand - Lithology: Sand (soil)	572825	5255561	Clay/Silt Settling
C113885	Maria	Light grey fine grained beach sand - Lithology: Sand (soil)	587375	5285479	Clay/Silt Settling
C113886	Cockle Creek	Light grey fine grained beach sand - Lithology: Sand (soil)	491207	5174577	Clay/Silt Settling
C113887	South Bruny Island	Light brown fine grained sand - Lithology: Sand (soil)	525539	5205316	Clay/Silt Settling
C113888	Adventure Bay	Light grey fine grained beach sand - Lithology: Sand (soil)	526468	5199496	Clay/Silt Settling
C113889	Adventure Bay	Light brown fine grained beach sand - Lithology: Sand (soil)	527988	5198267	Clay/Silt Settling
C113890	Allonah	Light brown fine grained beach sand - Lithology: Sand (soil)	519547	5203298	Clay/Silt Settling
C113891	Cloudy bay	brown fine grained dune sand - Lithology: Sand (soil)	519883	5190441	Clay/Silt Settling
C113892	Bruny island neck	Lighe brown fine grained beach sand - Lithology: Sand (soil)	526698	5206716	Clay/Silt Settling
C113893	North Bruny Island	Light brown fine grained dune sand - Lithology: Sand (soil)	529338	5211574	Clay/Silt Settling
C113894	North Bruny Island	Cream coloured fine grained dune sand - Lithology: Sand (soil)	531581	5212494	Clay/Silt Settling

Figure 1. *C113879. Grey polylithic fine grained beach sand.*

Figure 2. *C113880. Cream coloured fine grained beach sand*

Figure 3. *C113881. Cream to light yellow fine grained beach sand.*

Figure 4. *C113882. Cream to light brown fine grained dune sand.*

Figure 5. *C113883. Light grey fine grained dune sand .*

Figure 6*. C113884. Light grey fine grained dune sand.*

Figure 7. *C113885. Light grey fine grained beach sand.*

Figure 8. *C113886. Light grey fine grained beach sand.*

Figure 9. *C113887. Light brown fine grained sand .*

Figure 10. *C113888. Light grey fine grained beach sand.*

***Figure 11**. C113889. Light brown fine grained beach sand.*

***Figure 12**. C113890. Light brown fine grained beach sand.*

Figure 13. *C113891. brown fine grained dune sand.*

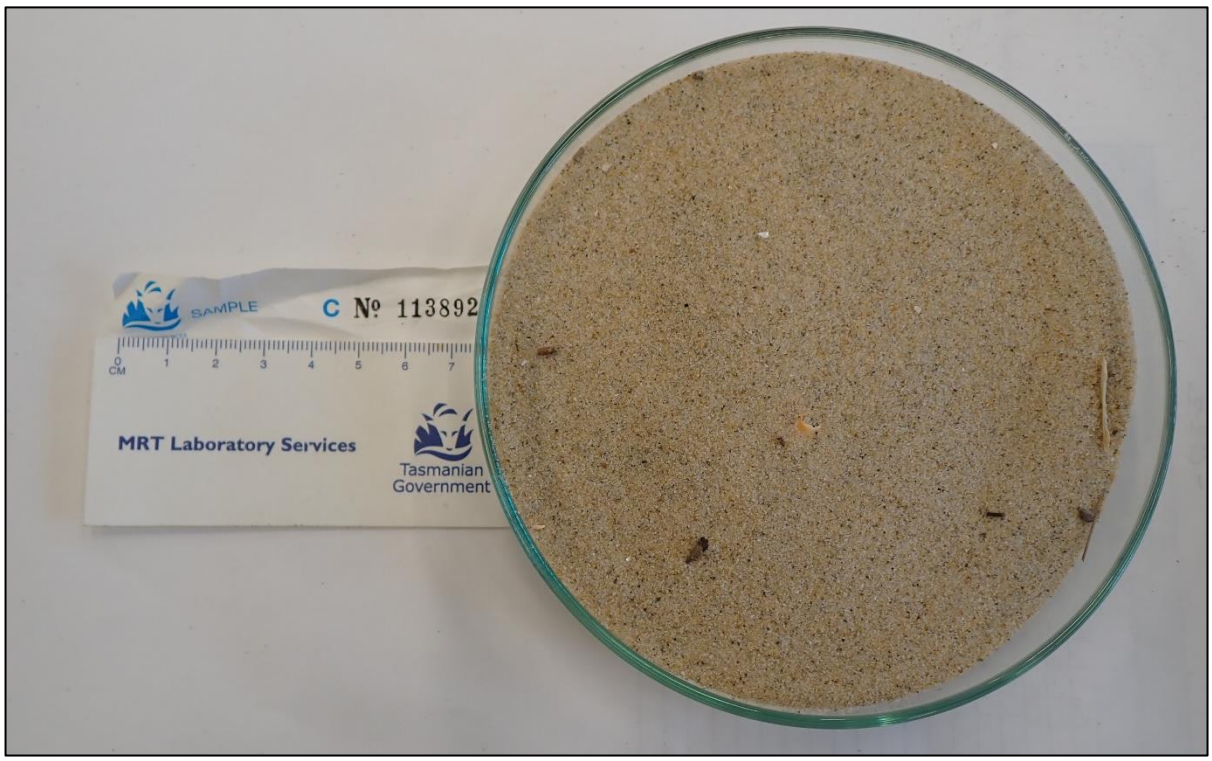

Figure 14*. C113892. Light brown fine grained beach sand.*

Figure 15. *C113893. Light brown fine grained dune sand.*

Figure 16*. C113894. Cream coloured fine grained dune sand.*

4. CLAY & FINE SILT SETTLING ANALYSIS

Clay and fine silt settling analysis was undertaken in accordance with AS 1141.33:2015 with results summarised below in Table 2. The standard specifies that where the separation of sediments is unclear results should be specified "indeterminate", however, where possible, estimated C (Ratio by volume of Clay & Fine silt to Sand) has been indicated. Almost all samples had at least a minor proportion of organic matter (predominantly fern roots) present, with higher proportion samples indicated in the comments.

Of the samples tested, all except one (C113883; C=13%) had a C value <10%. While dry sieving Particle Size Distribution (PSD) results are not available for these samples, the results of the AS 1141.33 testing indicate a low proportion of clay and fine silt for the majority of the samples tested.

Table 2. *Sand and Fine Silt & Clay Settling Data*

Sample Registration Number	Sand Volume - S (mL)	Clay & Fine Silt Volume - F (mL)	Ratio by volume of Clay & Fine silt to Sand - C (%)	Comments
C113879	93	0	0%	*F not 0 = ~<0.5*
C113880	100	0	0%	
C113881	98	1	0%	
C113882	102	0	0%	*F not 0 = ~<0.5*
C113883	86	11	13%	
C113884	102	0	0%	*F not 0 = ~<0.5*
C113885	96	0	0%	
C113886	102	0	0%	*Organic matter*
C113887	100	2	2%	*Organic matter*
C113888	102	0	0%	
C113889	100	0	0%	
C113890	100	0	0%	
C113891	102	3	3%	
C113892	102	0	0%	
C113893	102	2	2%	
C113894	92	8	9%	*Organic matter*

* Estimated clay and fine silt volumes, and ratios of clay and fine silt to sand

5. DISCUSSION AND CONCLUSIONS

Of the samples tested, all except one (C113883; 13%) had a C value <10%. indicating a low proportion of clay and fine silt for most of the samples tested. Most had a minor proportion of fine silt and clay, even where F <0.5.

As per the standard, there is no consistent relationship between the test result and the silt and clay fraction obtained by sieving. In general, however, the magnitude of the result of this test will be greater than the result passing the 75 µm sieve. Where the clay is more active or there is a higher proportion of it, the clay and fine silt is likely to remain trapped within the sediment column, reflected in the indeterminate separation. For the samples tested for this report, this did not appear to be an issue, with no unclear separation of sediments recorded.

The standard also recommends not using this type of analysis for fine aggregates with >10% of material passing the 75 µm sieve. PSD data was not available for this report. Without that, as a guide, samples with a higher C Value (>10%) should be treated with caution. It should be noted, no unclear separation of the sand from fine silt and clay was recorded for these analyses.

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DISCLAIMERS:

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LABORATORY DETAILS

MRT operates a laboratory facility at Mornington, Tasmania. In the interests of full disclosure, these laboratories do not have NATA accreditation. However, all tests are performed according to relevant Australian Standards cited in the report and subject to internal peer review processes. The analytical facilities at MRT are periodically compared against other similar laboratories in other jurisdictions with favourable results.