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Record
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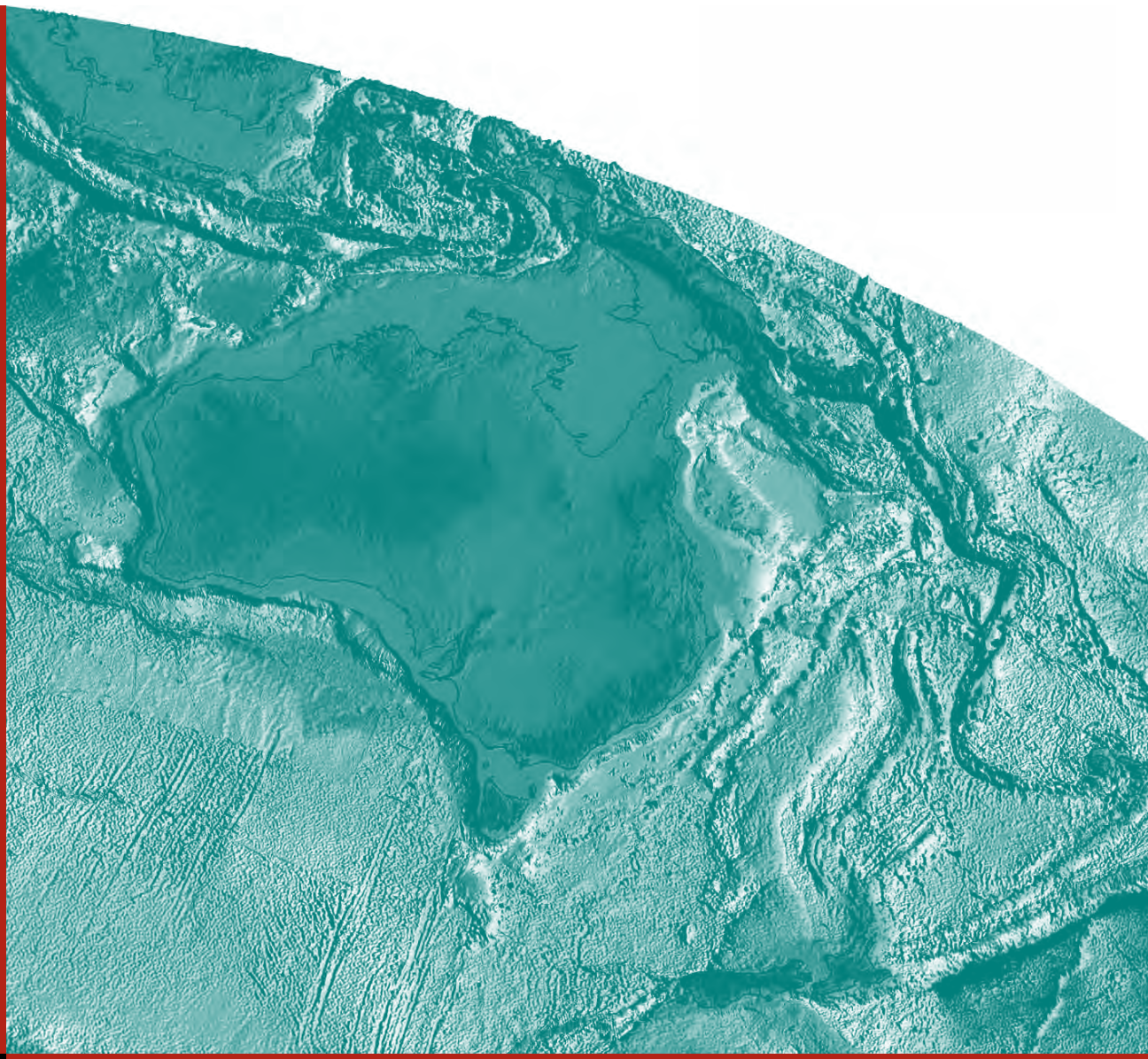
GeoCat # 70478



National Geochemical Survey of Australia: Field Data

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by

Michelle Cooper[1], Patrice de Caritat[1], Gary Burton[2], Roger Fidler[3], Geoff Green[4], Emily House[5], Colin Strickland[6], Joseph Tang[7] and Andrew Wygralak[8]

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8. Northern Territory Geological Survey

Department of Resources, Energy and Tourism
Minister for Resources and Energy: The Hon. Martin Ferguson, AM MP
Secretary: Mr Drew Clarke

Geoscience Australia
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ISSN 1448-2177
ISBN 978-1-921781-01-8 (Print)
ISBN 978-1-921672-99-6 (Web)
ISBN 978-1-921781-00-1 (CD/DVD)

GeoCat # 70478

Bibliographic reference: Cooper, M., Caritat, P. de, Burton, G., Fidler, R., Green, G., House, E., Strickland, C., Tang, J., Wygralak, A. 2010. National Geochemical Survey of Australia: Field Data. Geoscience Australia, Record 2010/18, 93 pp.

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Executive Summary

From 2007 to 2009, the National Geochemical Survey of Australia (NGSA) project collected sediment samples from 1315 sites located in 1186 catchments (~10 % of which were sampled in duplicate) from across Australia.

Overbank sediments were chosen as the sampling medium, with a near-surface sample (Top Outlet Sediment, TOS, from 0-10 cm below the surface) and a bottom sample (Bottom Outlet Sediment, BOS, ~10 cm interval between approximately 60-80 cm below the surface) being collected. The sample sites were selected to be near outlets or spill points of large catchments, so that overbank sediments there could reasonably be assumed to represent well-mixed, fine-grained composite samples of all major rock and soil types present in the catchment.

In this report, detailed descriptions of sample sites, sediment samples and bulk parameters determined in the field (texture, moist and dry colour, field pH) are presented. This information is complemented by a series of laboratory measurements and analyses reported elsewhere.

This report documents the complete field dataset and discusses the pH and soil colour data that were collected in the field. At the time of writing, field pH and colour are the only datasets available for all sites. Maps have been presented showing the spatial distribution of these data in both TOS and BOS samples. These data will be the basis of further interpretive work.

Introduction

A 5-year Onshore Energy Security Program (OESP) was announced in 2006 to enable Geoscience Australia to deliver high quality pre-competitive geoscience information relating to onshore energy prospectivity (Johnson, 2006). The National Geochemical Survey of Australia (NGSA), which is part of this programme (Baldwin, 2007), collected transported regolith (sediment) samples from across the Australian continent and determined their inorganic chemical composition. The NGSA will provide the only nation-wide, internally consistent geochemical dataset with state-of-the-art detection limits. It aims to:

- Help calibrate and ground-truth the airborne radiometrics coverage of Australia (including addressing mother-daughter disequilibrium in the uranium-decay chain);
- Fill gaps in the existing airborne radiometric and geochemical coverages of Australia with quality data;
- Permit multi-element characterisation and ranking of radiometric anomalies (e.g. differentiation of uranium signatures from 'hot' granites, black shales or palaeochannels); and
- Provide fundamental data to enable first-order characterisation of geothermal hot-spots.

As such, the NGSA project (http://www.ga.gov.au/minerals/research/national/geochemical/index.jsp) supports and adds value to a number of other OESP projects, particularly the Australia-Wide Airborne Geophysical Survey project (http://www.ga.gov.au/minerals/research/national/radiometric/index.jsp; Minty *et al*., 2009a) and the Geothermal Energy project (http://www.ga.gov.au/minerals/research/national/geothermal/index.jsp). Additionally, the NGSA results will have wider applications in mineral exploration for other commodities and natural resource management.

By its completion in 2011, the NGSA will deliver:

- A geochemical dataset that is national in scope, internally consistent and acquired through the application of state-of-the-art methods and instrumentation;
- A web-delivered geochemical atlas of Australia for some 60+ elements/parameters showing for the first time what the concentrations of these elements are in surface materials and how they vary spatially; and
- Reports and papers on energy resource prospectivity and other implications.

Samples have been collected from 1186 catchments (or 1315 sites, including duplicates), which together cover over 6 M km^2 or ~80% of Australia at the average sample density of 1 site per 5500 km^2. Approximately 200 catchments in South Australia and Western Australia could not be sampled during this project due to access limitations. Collaboration with State and Northern Territory geoscience agencies was critical for the completion of the project particularly regarding the sampling phase.

Field procedures were reported in Lech *et al.* (2007) and sample preparation protocols were documented in Caritat *et al*. (2009). In this report we present data collected in the field.

Background to the Project

The NGSA project aims to provide pre-competitive data and knowledge to support exploration for energy resources in Australia. In particular, it will improve the existing knowledge of the concentrations and distributions of energy-related elements such as uranium (U) and thorium (Th) at the national scale.

The project is underpinned by a series of pilot geochemical surveys carried out in recent years by Geoscience Australia and the Cooperative Research Centre for Landscape Environments and Mineral Exploration (CRC LEME) to test robust and cost-effective protocols for sample collection, preparation and analysis. Examples of these are the Riverina (Caritat *et al.*, 2005; Caritat *et al.*, 2007), the Gawler (Caritat *et al.*, 2008a) and the Thomson (Caritat and Lech, 2007; Lech and Caritat, 2007) pilot geochemical surveys. Selected results from these pilot projects have been summarised in Caritat *et al.* (2008b).

The current national project, briefly described below, is being conducted in collaboration with all the State and the Northern Territory geoscience agencies.

RATIONALE

The national geochemical survey was initiated because of the absence of a complete geochemical coverage for Australia and because such a data layer is an important complement to national-scale geological and geophysical datasets (Caritat *et al.*, 2008c).

The distribution of geochemical data available at the commencement of the survey through the national repository (OZCHEM database) is shown in Figure 1. The map shows that there are vast areas of the country (>60 %) that lack any geochemical information. Where geochemical data are available, they are often not comparable as a result of:

- Inconsistent sampling material (e.g. rocks of various types and/or degree of alteration, mineralisation or weathering);
- Inconsistent sample preparation methods (e.g. total analyses *versus* partial digests with weak acids);
- Differences in instrumentation used, leading to variable lower limits of detection between datasets (e.g. older *versus* state-of-the-art instruments);
- Lack of metadata on data quality (e.g. instrument calibration, bias, precision, sample type description, replicates, etc.); and
- Variable suite of elements analysed (e.g. sometimes a very limited suite such as gold (Au) only or Au + copper (Cu)).

Although a significantly improved nation-wide, levelled coverage of airborne gamma-ray spectrometric (radiometric) data (Minty *et al.*, 2009a,b) became available (Figure 2) during the course of the NGSA project, field calibration of radiogenic elements potassium (K), Uranium (U) or Thorium (Th) is perhaps not as systematic as is desirable and the question of disequilibrium in the radiogenic decay chain is poorly constrained as a result. It is hoped the NGSA data, in combination with the new radiometric coverage, will yield insights into this problem.

Some regional geochemical surveys have been carried out in parts of Australia (e.g. Morris *et al.*, 1998; Cornelius *et al.*, 2008; the pilot geochemical surveys mentioned above), but no national coverage exists. The modern concept of regional geochemical surveys was first developed in the 1960s, and it has since proven to be a reliable tool for mineral exploration at various scales (Garrett *et al.*, 2008; Smith and Reimann, 2008).

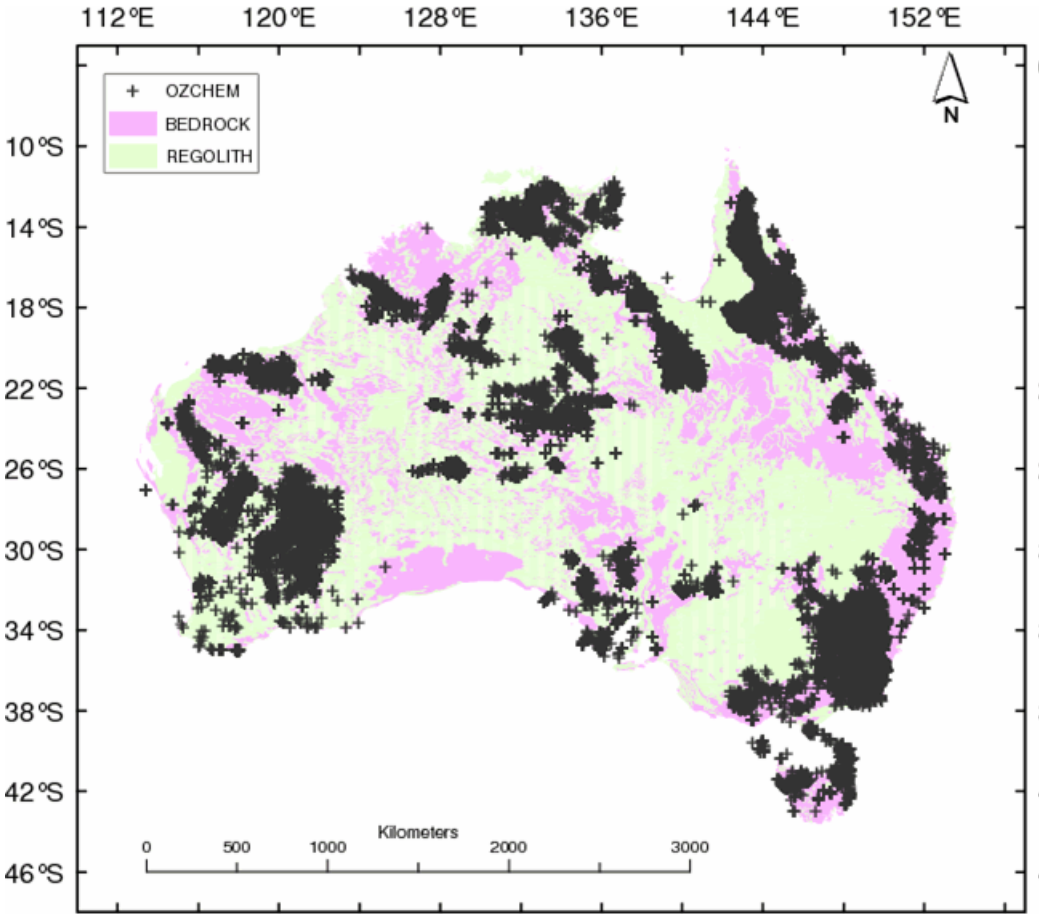

Figure 1. Distribution of whole rock geochemical data in Australia (plus signs) extracted from the OZCHEM national database as at June 2006, overlain on bedrock and regolith coverage.

OBJECTIVES

The objectives of the NGSA project are to:

- Collect transported regolith samples at the outlet of large catchments covering >90 % of Australia using an ultra low sampling density approach;
- Prepare and analyse the samples to extract the maximum amount of geochemical information (60+ elements/parameters) using internally consistent, state-of-the-art techniques;
- Populate the national geochemical database with the resulting new data; and
- Compile an atlas of geochemical maps for use by the mineral exploration industry to identify areas of interest in terms of energy-related resources and other mineral commodities, which can then be the focus of targeted exploration efforts.

STRATEGY

The sampling method has been adapted to Australian landscape and climate conditions (e.g., importance of aeolian landforms in some areas, climate ranging from tropical to arid). It has been fine-tuned and field-tested during the Riverina, Gawler and Thomson pilot projects (e.g. see Caritat *et al.*, 2008b). The cost of a national survey was kept reasonably low by applying an ultra low sampling density approach (generally accepted to mean between 1 site/1000 km^2 and 1 site/10,000 km^2).

The strategy adopted for the national geochemical survey is briefly described below. More detail can be found in 'The National Geochemical Survey: Field Manual' (Lech *et al.*, 2007)

Figure 2. Ternary image (K-red, eU-blue, eTh-green) of Australia derived from the new levelled National Radioelement Database (Minty et al., 2009b)

Sampling medium

Catchment outlet sediments (similar to floodplain sediments in most cases) were sampled at two depths (0-10 cm below the surface as well as a 10 cm interval at a depth of between ~60 and 80 cm). The term 'catchment outlet sediment' is deliberately chosen because it is more general than 'floodplain sediment' to allow for those cases where aeolian influence is important in the regolith formation process.

Sampling sites

Initially 1385 catchments covering 91% (or about seven million km^2) of Australia across all States and Territories were targeted for sampling (Figure 3). Five catchments were assigned a second sampling site (i.e., target site) due to their size and topography so in total, it was expected that 1529 samples (1390 catchments + 10 % of which are sampled in duplicate) would be collected. Most catchments were sampled near their outlet, while those exhibiting internal or poorly defined drainage were sampled at, or as close as possible to, their lowest point. Lech *et al.* (2007) give details of the method for determining sampling sites. Catchments smaller than 1000 km^2 (mostly coastal) and small islands were not included in the survey. The resulting distribution of catchment outlet sites targeted for sampling is shown in Figure 4 and translates to an average sampling density of around 1 site/5500 km^2.

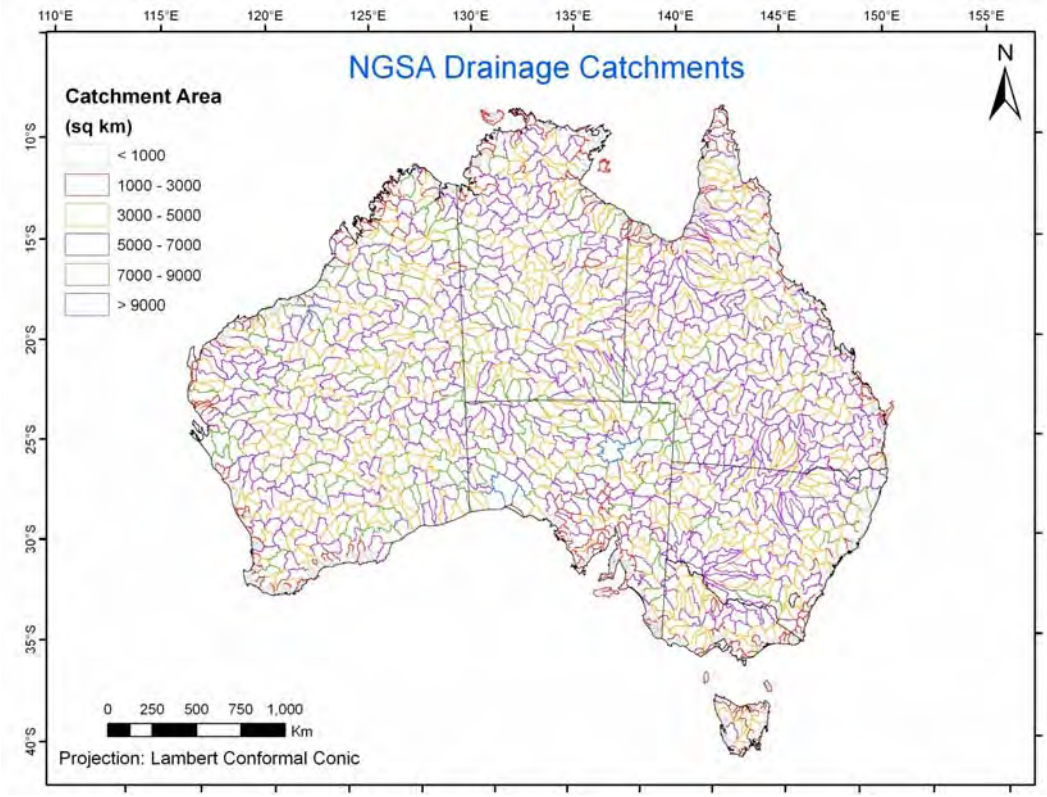

Figure 3. Distribution of catchments for the National Geochemical Survey of Australia.

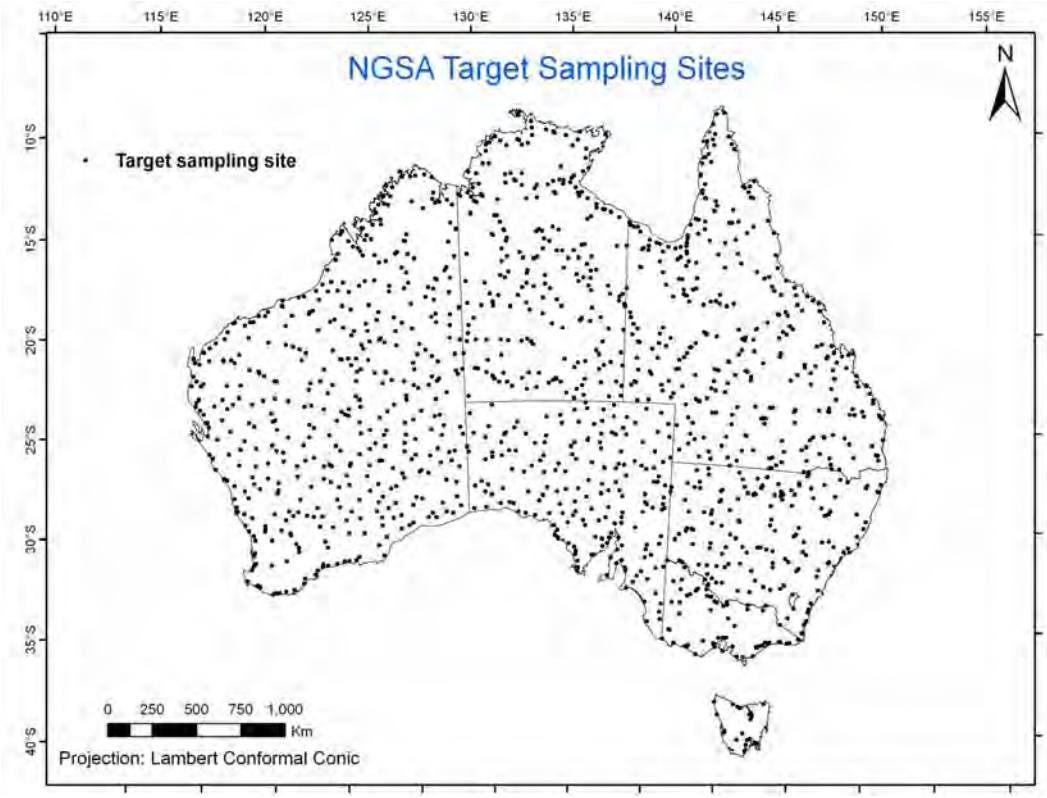

Figure 4. Distribution of initial target sampling sites for the National Geochemical Survey of Australia.

Sample collection

A detailed Field Manual was compiled (Lech *et al.*, 2007) and all sampling equipment and consumables were centrally purchased. Despite best efforts to access all the target sites, only 1186 catchments could be sampled before the deadline for field work was reached. Of these 1186 catchments, 124 were sampled in duplicate (on average 365 m away from the original site), and five of the largest catchments were sampled at two widely separated locations (on average 79 km apart), yielding a total of 1315 sampled sites (Figure 5). At each site, a Top Outlet Sediment (TOS) sample was collected from 0-10 cm (below the root zone, if applicable), and a Bottom Outlet Sediment (BOS) sample was collected from a depth of usually between 60 and 90 cm. To reduce natural soil heterogeneity, every sample collected was a composite either from a shallow soil pit (TOS) or from at least three auger holes or, rarely, a pit (BOS) at a given site (see Lech *et al.*, 2007, for more information). An average of 9 kg of sediment was collected per sample.

Sample collection was carried out by the State and Northern Territory geoscience agencies following a hands-on, in-field training period with the Geoscience Australia NGSA team. At each locality a detailed site description, field pH, and dry (if possible) and moist Munsell® soil colours were recorded and several digital photographs were taken. All information was recorded digitally to facilitate subsequent uploading into databases. Details of the data collected are discussed in later in this report.

Sample preparation

All samples were sent to Geoscience Australia for processing. A bulk split (~50 %) of each sample was archived for future investigations. The remainder was dried, riffle split and dry sieved to <2 mm and <75 µm fractions. The <2 mm fraction was mechanically ground for some analyses, while the finer fraction was not. The sample preparation protocols were discussed in detail in the NGSA Sample Preparation Manual (Caritat *et al*., 2009).

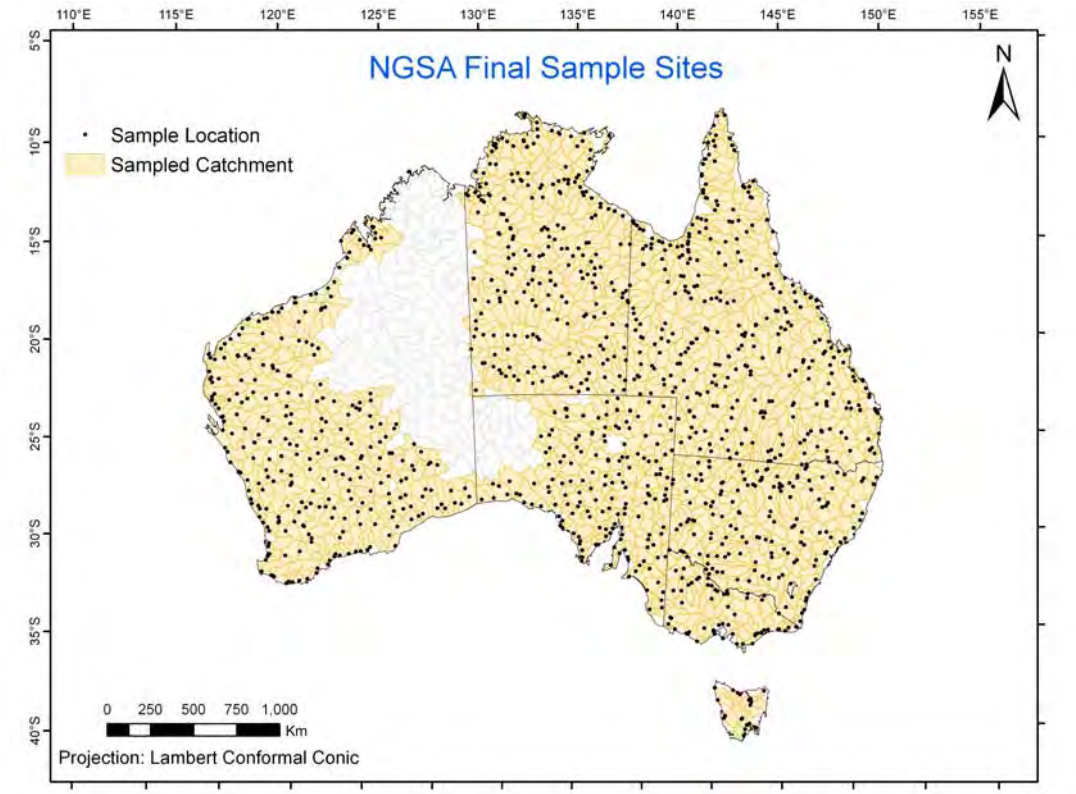

Figure 5. Final distribution of catchments sampled for the National Geochemical Survey of Australia (1186 catchments, or 86 %, completed).

Sample analysis

The analysis philosophy from the outset was to apply a multi-element approach on two grain-size fractions prepared by two digestion methods, in order to maximise the amount of geochemical information delivered. At the time of writing, sample analysis is nearing completion for 60+ elements/parameters using X-ray fluorescence (XRF) and (reaction cell) inductively coupled plasma-mass spectrometry (ICP-MS) at Geoscience Australia. The ICP-MS analyses are carried out on a total digest (HF + HNO_3) of fragments of the XRF beads (Pyke, 2000). Other parameters being recorded at Geoscience Australia are pH 1:5 (soil:water), electrical conductivity (EC) 1:5 (soil:water), and laser particle size analysis (LPSA). Analyses for selected elements not available at Geoscience Australia (e.g. Au, fluorine (F), selenium (Se), and platinum group elements (PGEs)) took place externally. Additional digests/analyses (e.g. after *aqua regia* digestion, ligand-based extractions, near visible-infrared spectroscopy) were also carried out externally. Details of the sample analysis protocols are discussed in discussed in detail in the NGSA Analytical Methods Manual (Caritat *et al*., 2010)

Quality assessment/quality control

Sample numbers were randomised to minimise regional bias, help separate false from true anomalies and obtain meaningful estimates of the variance of duplicates. Field duplicates, analytical duplicates, internal standards and certified reference materials have been introduced at regular intervals in the analytical streams. Care was also taken throughout the project to minimise contamination, cross-contamination and mislabelling risks.

Data analysis

The production of national-scale geochemical maps will be carried out and they will be released as a web-based atlas. Reports providing preliminary interpretations and including graphical and statistical analysis will be prepared and released on Geoscience Australia's website.

Timeline

Following planning in the first half of 2007, fieldwork, including initial training, began in mid-2007 and concluded in late 2009. Figure 5 shows the final distribution of catchments actually sampled for NGSA at the end of fieldwork (December 2009). Sample preparation started in early 2008 and concluded in December 2009. Sample analysis started late-2008 and is scheduled to finish in mid-2010. Data analysis and reporting are planned to take place in 2010 and early 2011. The project concludes on 30 June 2011.

Field Data

DATA COLLECTION

Every field team was provided with a digital field data entry template in the form of an Excel spreadsheet, comprising several worksheets, to record all field data using drop-down lists where appropriate. The digital copy of the field data collected can be found in Appendix 1 (digital). Table 1 shows the column headings under which data was collected. A summary of the key information for each sample site can be found in Appendix 2.

Appendix 3 contains the detailed column descriptions, column formats and data entry validations that were provided to each field team. For extended definitions of landform type, geomorphic process and land use types refer to Appendices 4, 5 and 6.

For each site fundamental information was recorded. This included the randomised SiteID pre-allocated to the site, corresponding duplicate SiteID if applicable, the Target Site being sampled, spatial location and the date. All NGSA sample IDs start with the year 2007, even if collected in a later year (see Lech *et al*., 2007). Allocation of site numbers was randomised to avoid regional bias and distinguish real anomalies from false ones.

Further geomorphological descriptions of the selected sites were then recorded primarily using categories provided in the template's look up lists (Appendix 7). These included recording the name of the watercourse (if present), landform types and the land use types for both the site and the catchment. Possible sources of contamination were also recorded.

Top Outlet Sediments (TOS) and Bottom Outlet Sediments (BOS) were both screened for radiation using the radiation monitor provided in the field kit. Samples with measured values of > 5 µSv/hr were not collected. Field parameters such as Munsell colour (moist and dry) and field pH were recorded along with the sample collection depths and the number of holes augered. Mottles, segregations and coarse lithic fragments were characterised in the field with details such as composition, abundance, size and shape recorded (Appendix 3).

Finally photos were taken of each sampling site and of the surrounding landscape. Field photos are not included in this data release.

QUALITY CONTROL/QUALITY ASSURANCE (QA/QC)

A number of steps were taken by the NGSA project to allow quantification of the quality of these data at the end of the project. A quality statement will be made when results are reported.

Quality Assurance/Quality Control (QA/QC) for the entire project was conducted in various ways to quantify bias and precision. During fieldwork, sample duplicates were collected (one every 10 sites) to determine to what extent sample collection, preparation and analysis methods were repeatable (sampling and analytical precision). Samples were presented to the laboratories in a randomised order, unrelated to the order in which they were collected (as much as practically feasible). In the laboratory, duplicates (splits), internal project standards, exchanged project standards and international Certified Reference Materials, CRMs were covertly inserted into the analytical suites for in-house and external analyses to help quantify analytical precision and bias (Details in Caritat *et al.* 2010).

Table 1: Field data table column headings. Explanations and look-up lists are in Appendices 3, 4, 5, 6 and 7.

FIELD DATA TABLE COLUMN HEADINGS	
Site ID	TOS Mottles Size
Duplicate Site	TOS Segregations Abundance
Target SiteID	TOS Segregations Type
Latitude	TOS Segregations Composition
Longitude	TOS Segregations Size
Elevation	TOS Lithic Fragment Abundance
Date Sampled	TOS Fragment Composition
Site Time	TOS Fragment Size
State	TOS Fragment Shape
Mapsheet	BOS SampleID
Property Name	BOS Sample Type
Watercourse	BOS Top Depth
Landform Type	BOS Base Depth
Primary Geomorphology Type	BOS Radiation Screen
Secondary Geomorphology	BOS Field pH
Landuse Type - Site	BOS Munsell Colour Dry
Landuse Subtype - Site	BOS Munsell Colour Moist
Landuse Type - Catchment	BOS HCl Effervescence Test
Landuse Subtype - Catchment	Induration
Contamination	Depth Induration
Field Data Entered By	Number Holes Augered
Comments	BOS Mottles Abundance
TOS SampleID	BOS Mottles Size
TOS Sample Type	BOS Segregations Abundance
TOS Top Depth	BOS Segregations Type
TOS Base Depth	BOS Segregations Composition
TOS Radiation Screen	BOS Segregations Size
TOS Field pH	BOS Lithic Fragment Abundance
TOS Munsell Colour Dry	BOS Fragment Composition
TOS Munsell Colour Moist	BOS Fragment Size
TOS HCl Effervescence Test	BOS Fragment Shape
TOS Mottles Abundance	

The main QA/QC issues that arose regarding sample collection were:

- Contamination, including cross-contamination;
- Sample data mix-up/mis-recording; and
- Incorrect testing

Sample collectors were requested to be mindful of potential forms of contamination such as sunscreen (e.g., Zn), watches, jewellery such as rings (e.g., Au, Ag) or from wearing gloves (e.g., natural leather) while handling the sampling material. Surface samples were collected using the white plastic scoop provided (rather than the steel shovel) and digging equipment was ‘conditioned’ at each site by using soil from that site to remove all remnants of soil from the previous site.

Field data was cross-checked on receipt by Geoscience Australia to ensure that mis-recorded data (e.g., Numerical errors in location co-ordinates) was identified and rectified.

Finally selected qualitative data (e.g., unusual or outlying pH values) were checked and occasionally retested after the sample had arrived back at Geoscience Australia.

Field duplicates

Sampling error is commonly the largest source of uncertainty in any geochemical survey (e.g. Stanley, 2003) and it is important to be aware of its magnitude. Although errors may appear large at first glance (soils are a heterogenous medium), they must be compared to differences between sites that are in adjoining catchments or at great distances from one another within a study area. If the local geochemical variability is (much) smaller than the regional one, smooth and meaningful geochemical data will ensue; the opposite results in 'noisy' maps.

Field duplicates were collected from 124 catchments (10% of the total). Duplicate samples were collected on average 365 m away from the first sample using exactly the same procedures. The random allocation of sample site numbers means that duplicate samples will not be analysed sequentially in the laboratory, minimising laboratory bias.

SOIL pH DISTRIBUTION

pH provides information that can be related to element mobility and stability within regolith materials. It can be correlated with various chemical and environmental factors that influence soils and plants. It must be recognised, however, that soil pH can vary markedly within a short distance.

Soil pH was recorded in the field for both TOS and BOS samples (Appendix 1). These data were released in April 2010 in the form of four maps (Caritat and Cooper, 2010) and are presented here in Figures 7, 8, 9 and 10. The saturated paste method used to determine the soil pH provides only a preliminary assessment of pH, as it relies on matching the colour of the soil after reaction with a universal indicator to a chart with half pH unit intervals (Figure 6). The colour scheme chosen to represent the pH values follows the actual pH chart of the soil pH field kit, including the similarity of the colours at high pH end of the scale.

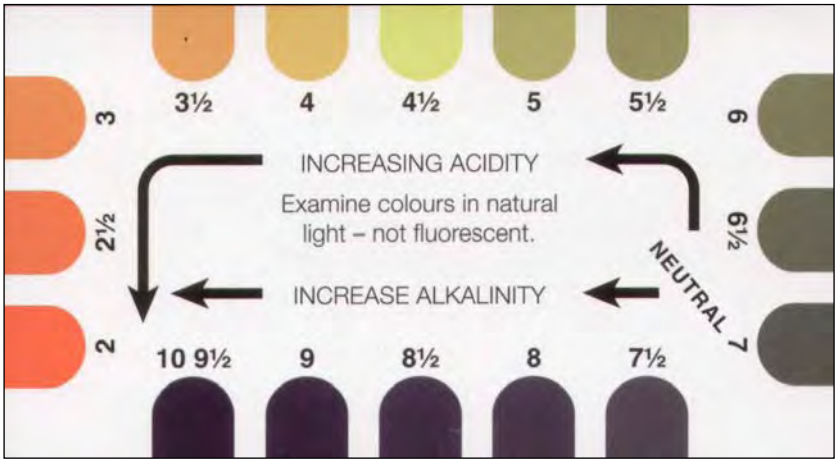

Figure 6. Soil pH colour identification chart as used in field data collection

Figures 7, 8, 9 and 10 represent pH in two ways: one shows the value of soil pH at the point where it was measured, the other colours the whole catchment according to the pH value obtained near its outlet to produce a 'mosaic' map. The mosaic representation of pH data does not imply that the whole catchment will have the pH value shown; indeed it clearly will not as soil pH is strongly influenced by parent material, weathering processes, rainfall and evaporation etc. In the case of pH, the purpose of the mosaic maps is to more easily distinguish differences between sampling sites.

Soils across Australia range from strongly alkaline (pH = 10, the maximum pH unit distinguishable by the field test) to very strongly acid (pH = 4). These maximum and minimum values were recorded for both TOS and BOS. In general TOS samples were more alkaline in the south and west of Australia than they were in the north and east (Figures 7 and 8). BOS samples were frequently more alkaline than their corresponding TOS sample (Figures 9 and 10). This trend may be explained by the leaching of minerals and base cations from surface soil into deeper soil horizons and can also be linked to the parent materials from which the soil was formed.

Field pH is a different, though not totally unrelated, measurement to lab pH measurements based on various water or chemical extracts. In the laboratory, the pH of a 1:5 (soil:water) solution is being measured for both TOS and BOS samples. Comparison of these two datasets will be made but a strong correlation is unlikely due to the differing methods employed.

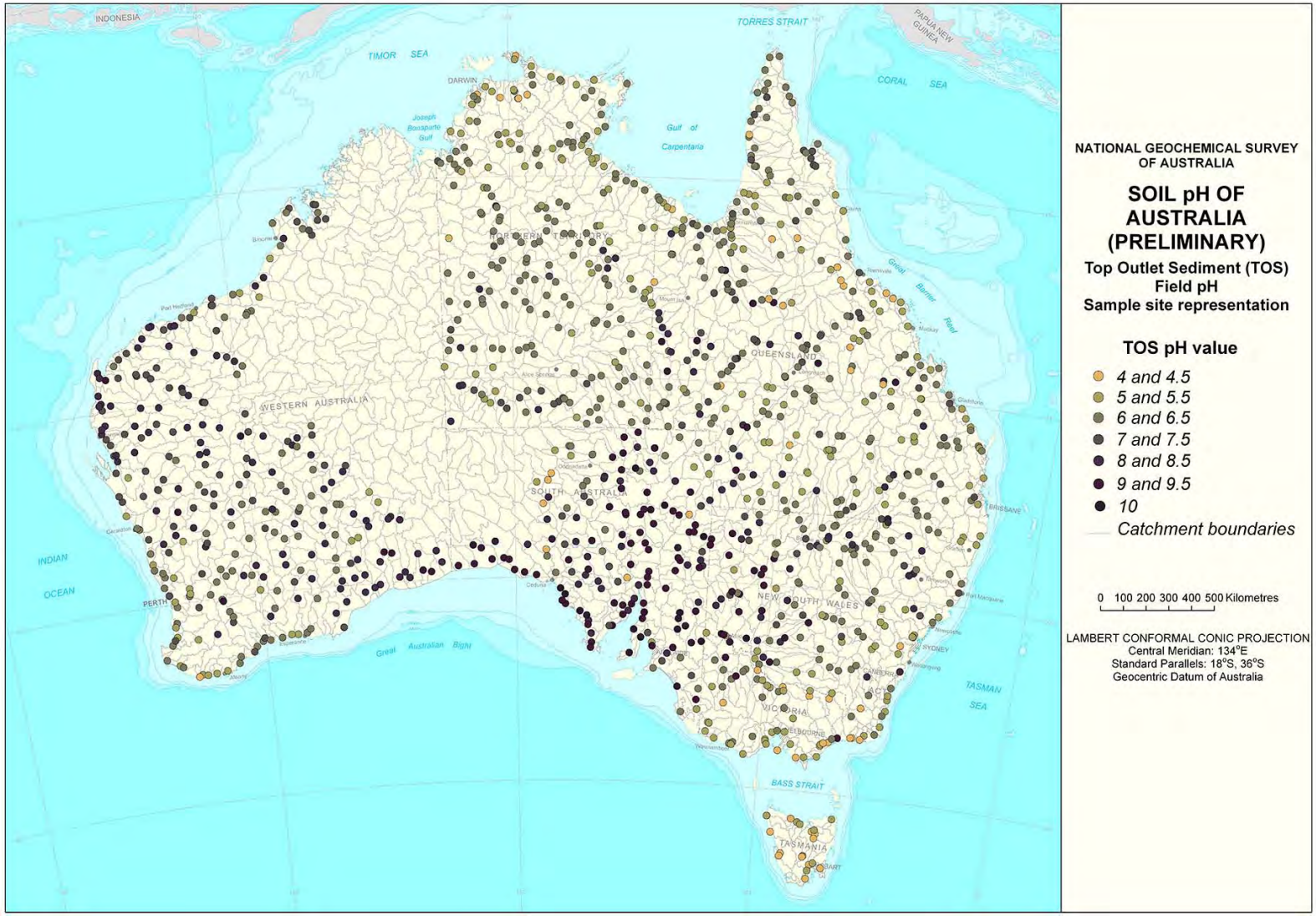

Figure 7. Soil pH of Top Outlet Sediment (TOS). Data represented by points at the site of sample collection.

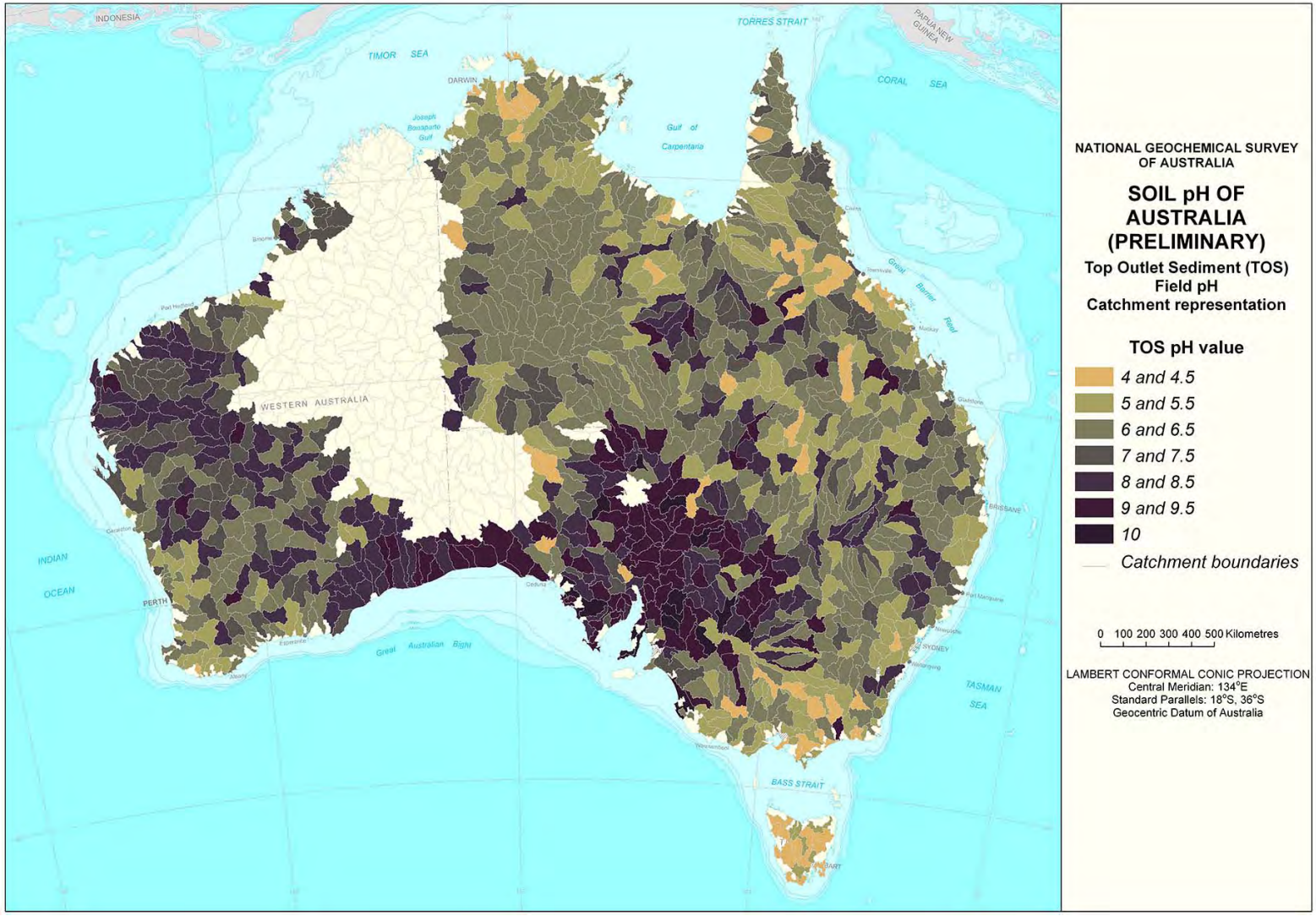

Figure 8. Soil pH of Top Outlet Sediment (TOS) extrapolated from sampling point to whole catchment.

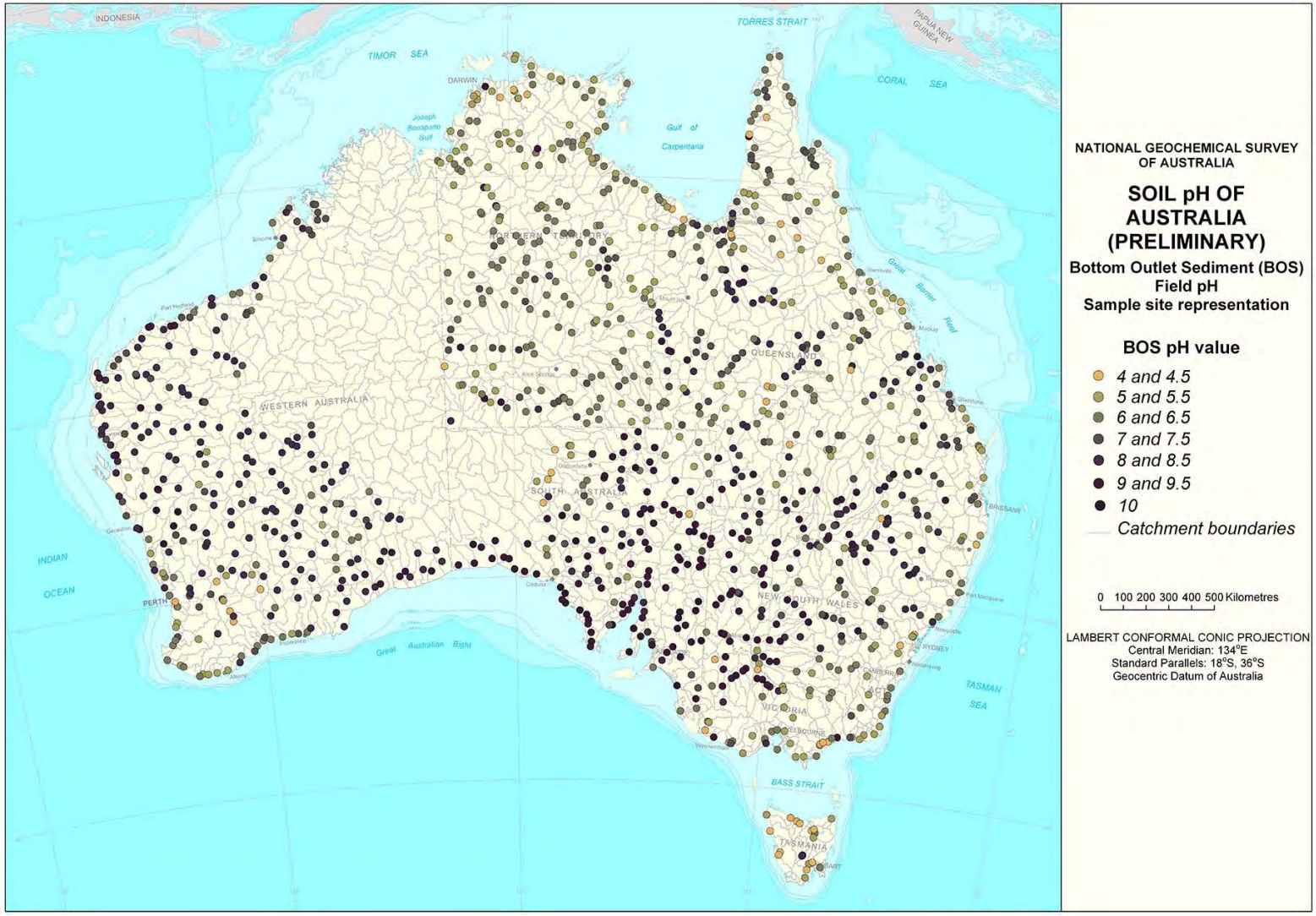

Figure 9. Soil pH of Bottom Outlet Sediment (BOS). Data represented by points at the site of sample collection.

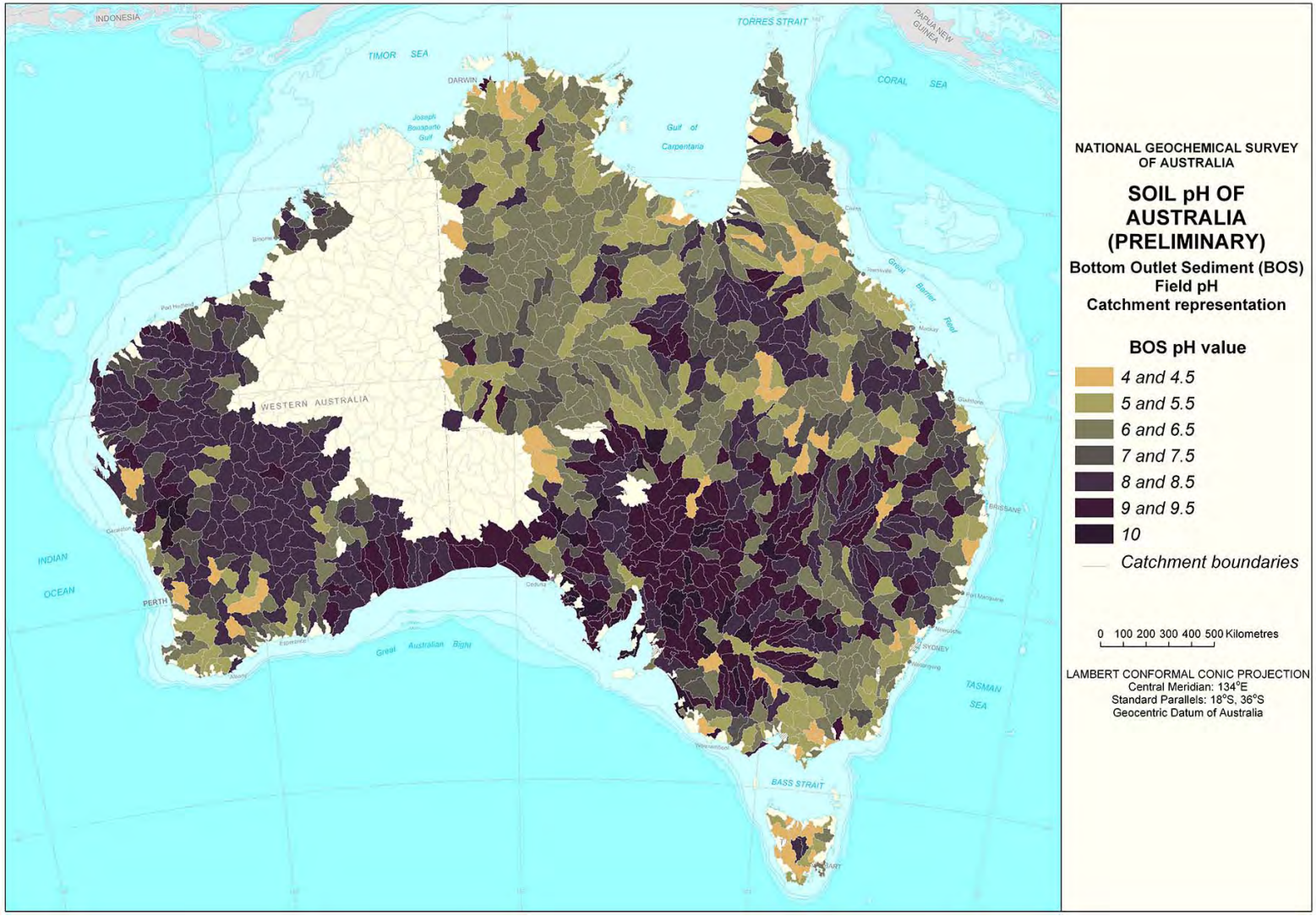

Figure 10. Soil pH of Bottom Outlet Sediment (BOS) extrapolated from sampling point to whole catchment.

SOIL COLOUR DISTRIBUTION

Soil colour is important as it may provide information about mineral content, soil moisture and oxidation state. Organic matter imparts a dark brown to black colour to the soil while a bright/light colour may be related to an eluvial horizon, where minerals have been leached out. Iron oxides and hydroxides give indication of redox conditions as oxidised Fe^{3+} may give soil a yellow or reddish colour while the presence of reduced Fe^{2+} may lead to neutral grey or bluish-green soils. In arid and semi-arid environments surface soils may be white due to evaporation of water and deposition of soluble salts. Colour may also be influenced by the soil's parent material.

Soil colour was determined in the field for both TOS and BOS samples (Appendix 1) using a Munsell™ soil color chart (Munsell Color Company, 1975) according to standard protocols outlined by Northcote (1979). Moist and dry colours were recorded on the digital entry spreadsheet as hue, value and chroma (e.g. 7YR5/4).

Soil colour data is presented in Figures 11, 12, 13, 14, 15, 16, 17 and 18. Munsell™ soil colours have been used in these maps. The large number of colours represented has necessitated a separate legend, shown in Figure 19. Like the pH maps, Figures 11 to 18 map soil colour in two ways: one shows the colour of the soil at the point where it was measured, the other colours the whole catchment according to the soil colour obtained near its outlet to produce a 'mosaic' map. Again it must be noted that colour may vary significantly over short distances so caution should be used when extrapolating soil colour data and making inferences about the colour of soil elsewhere in the catchment. In the case of soil colour, the purpose of the mosaic maps is to more easily distinguish differences between sampling sites.

As not all samples were dry at the time of collection, the dry soil colour maps contain gaps. The soil colour of these 'missing' samples will be recorded at Geoscience Australia and be provided with the final dataset.

There is a large variety in soil colour across Australia. Dark brown soils are common along the mountain ranges of eastern Australia, areas potentially rich in organic material, while samples from central Australia show the classic red soils which the area is well known for. As expected colour intensifies when samples are moist and in many instances it also intensifies with depth.

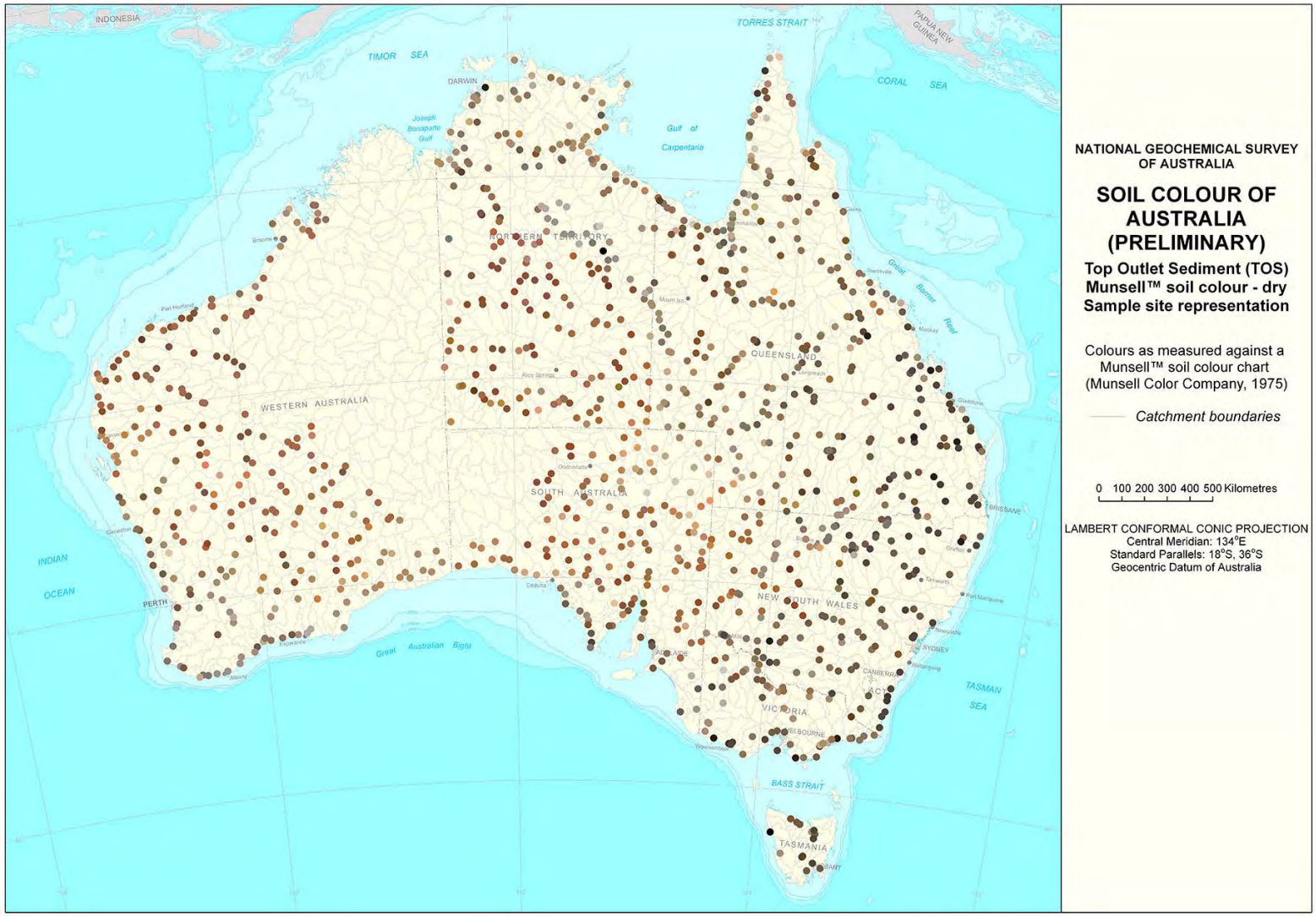

Figure 11. Munsell™ soil colour of dry Top Outlet Sediment (TOS). Data represented by points at the site of sample collection. Legend shown in Figure 19.

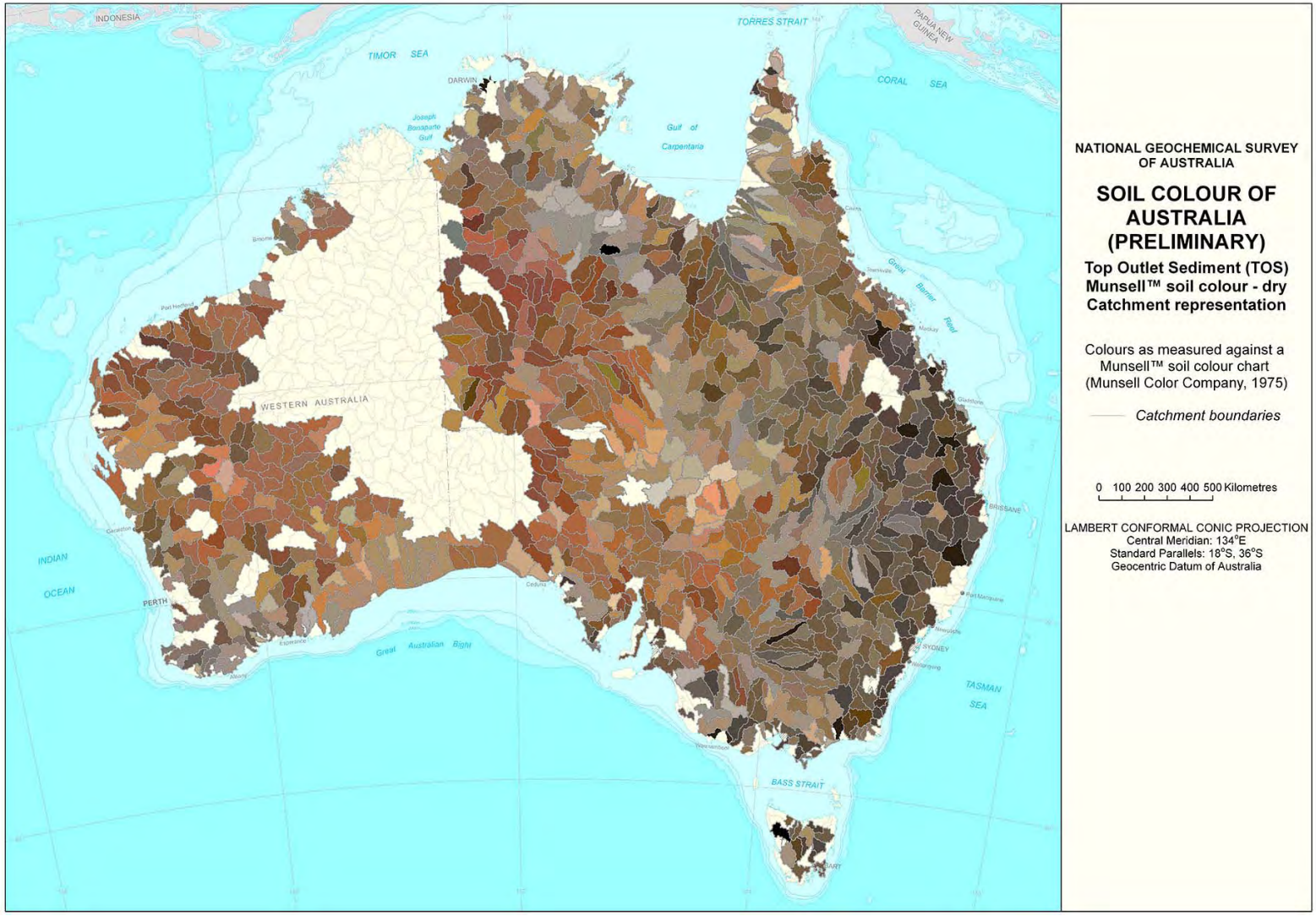

Figure 12. Munsell™ soil colour of dry Top Outlet Sediment (TOS) extrapolated from sampling point to whole catchment. Legend shown in Figure 19.

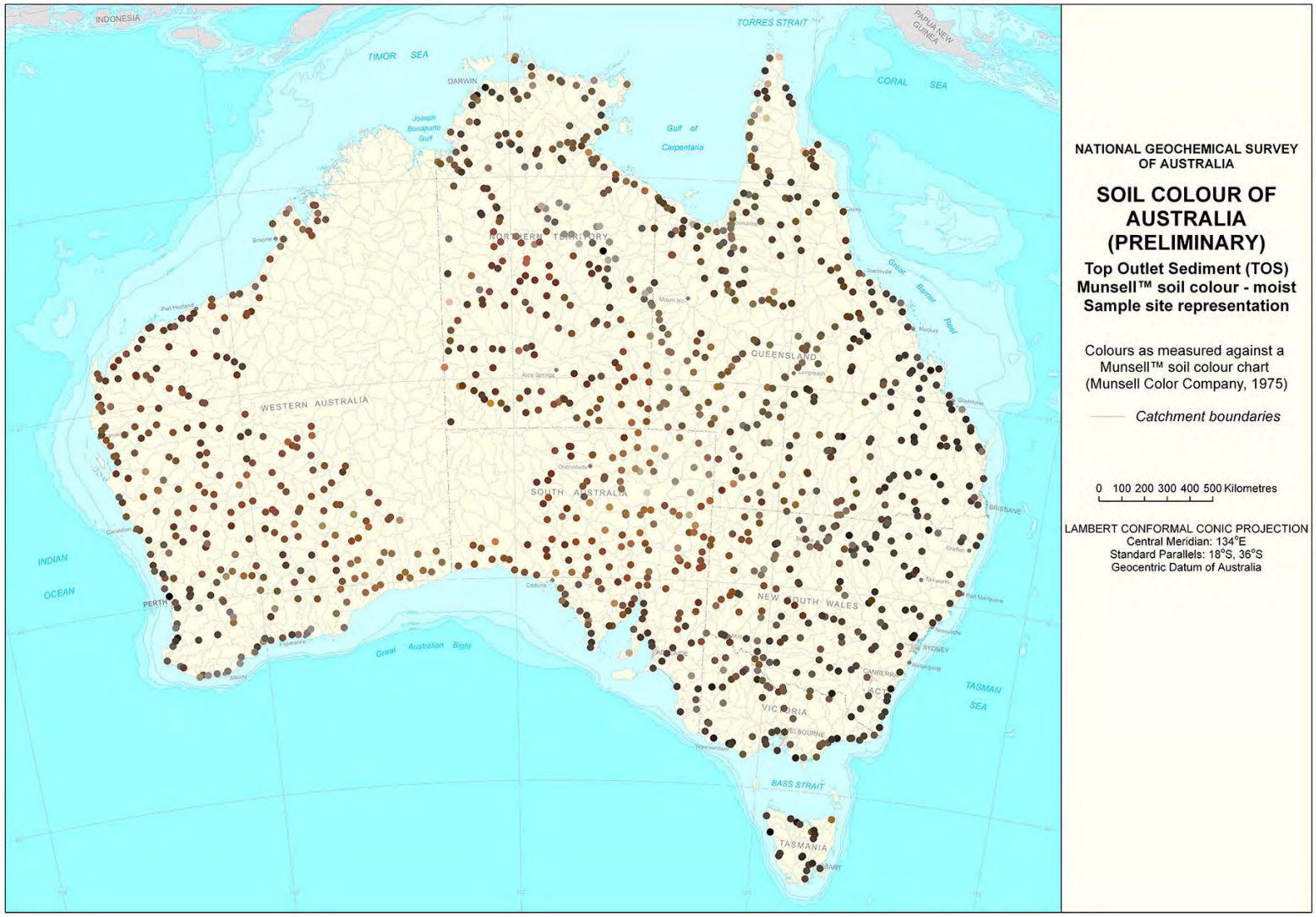

Figure 13. Munsell™ soil colour of moist Top Outlet Sediment (TOS). Data represented by points at the site of sample collection. Legend shown in Figure 19.

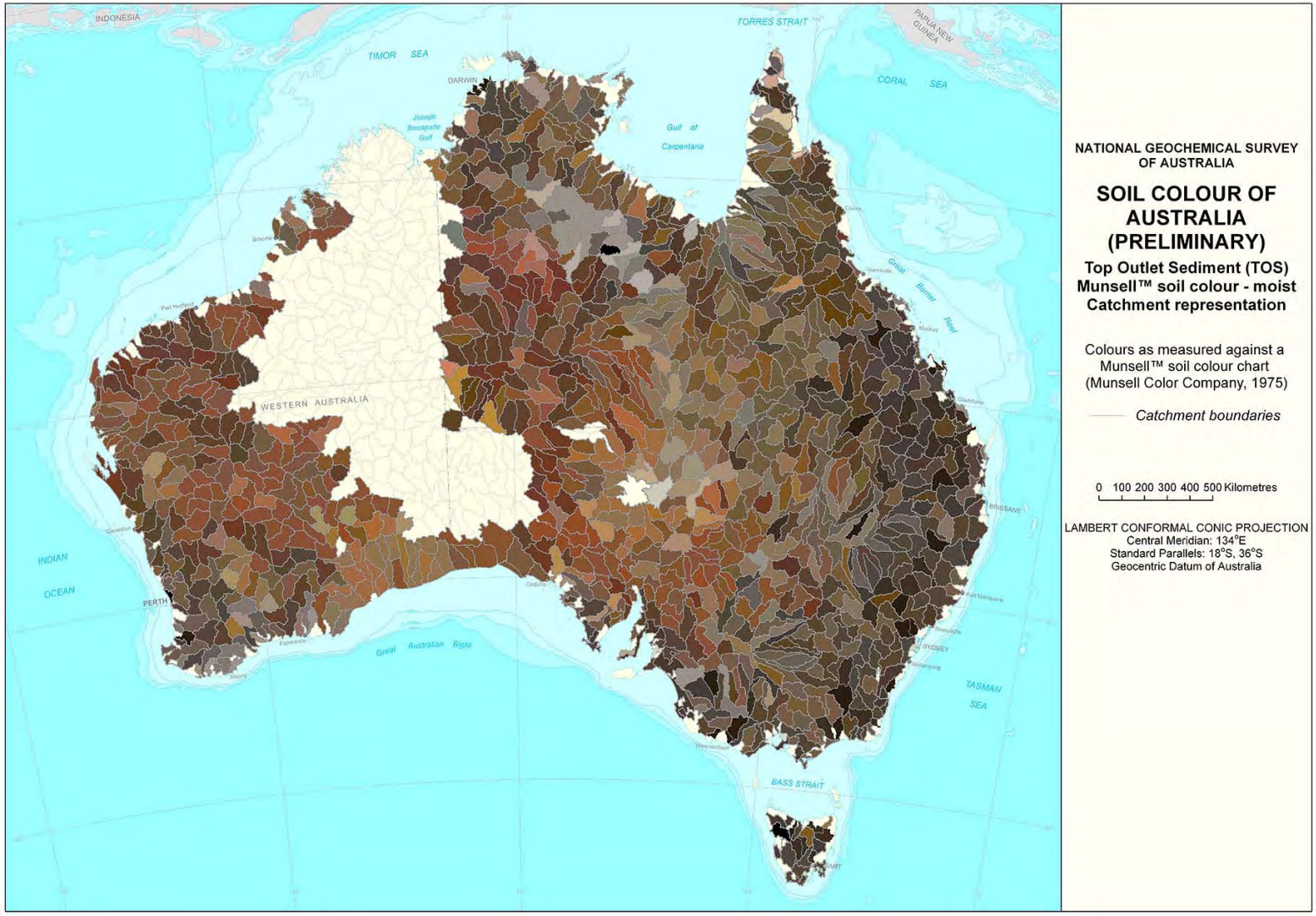

Figure 14. Munsell™ soil colour of moist Top Outlet Sediment (TOS) extrapolated from sampling point to whole catchment. Legend shown in Figure 19.

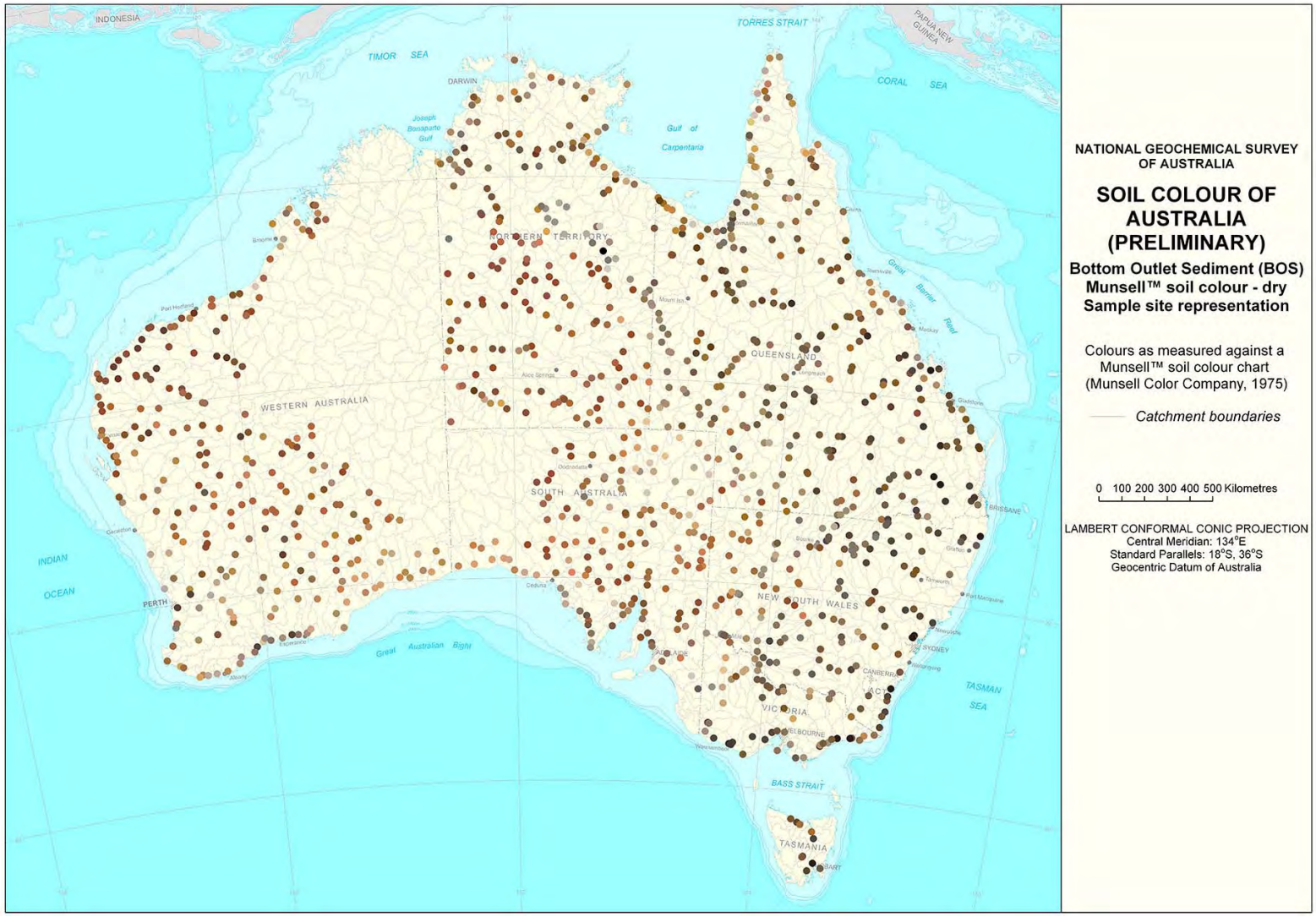

Figure 15. Munsell™ soil colour of dry Bottom Outlet Sediment (BOS). Data represented by points at the site of sample collection. Legend shown in Figure 19.

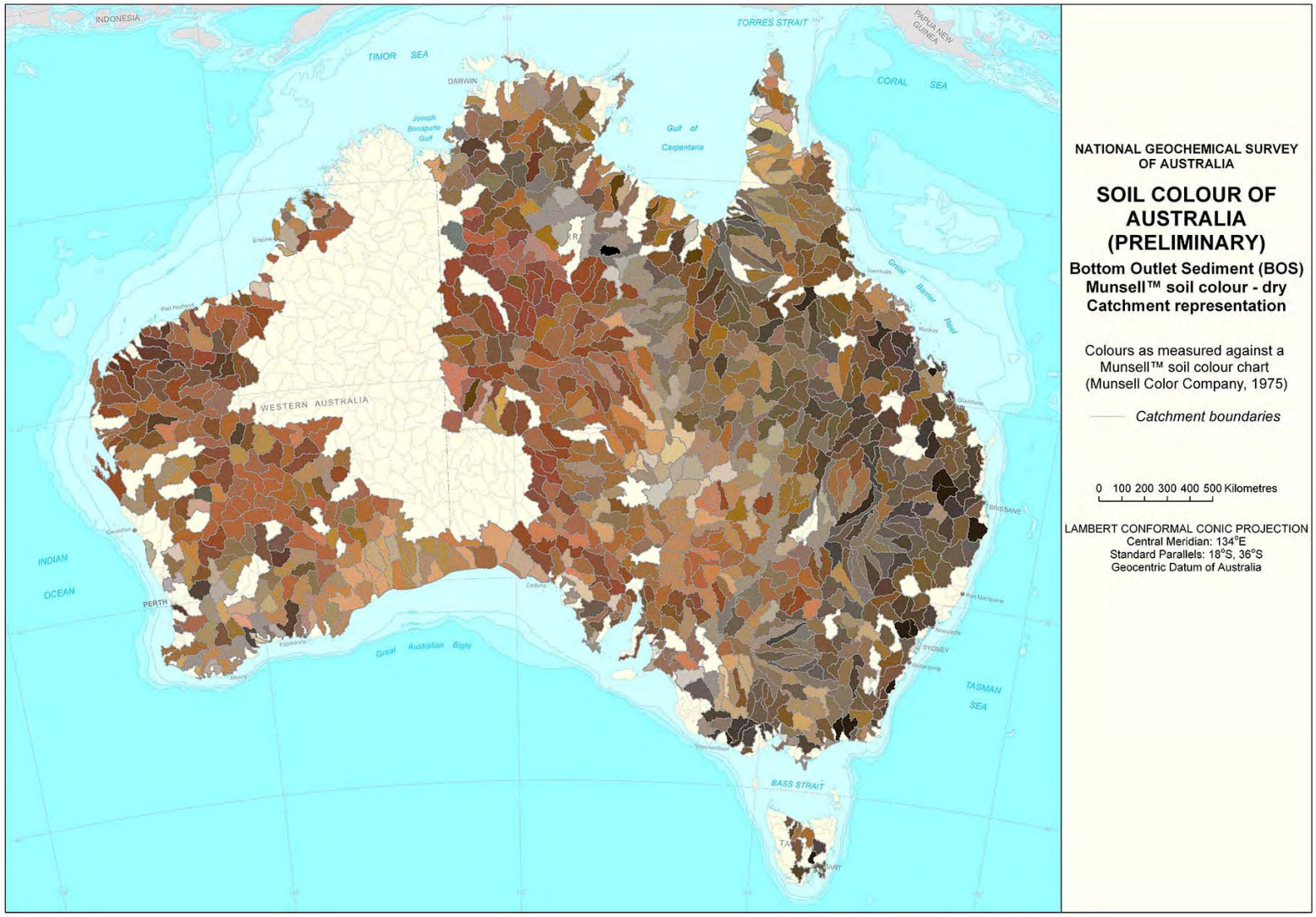

Figure 16. Munsell™ soil colour of dry Bottom Outlet Sediment (BOS) extrapolated from sampling point to whole catchment. Legend shown in Figure 19.

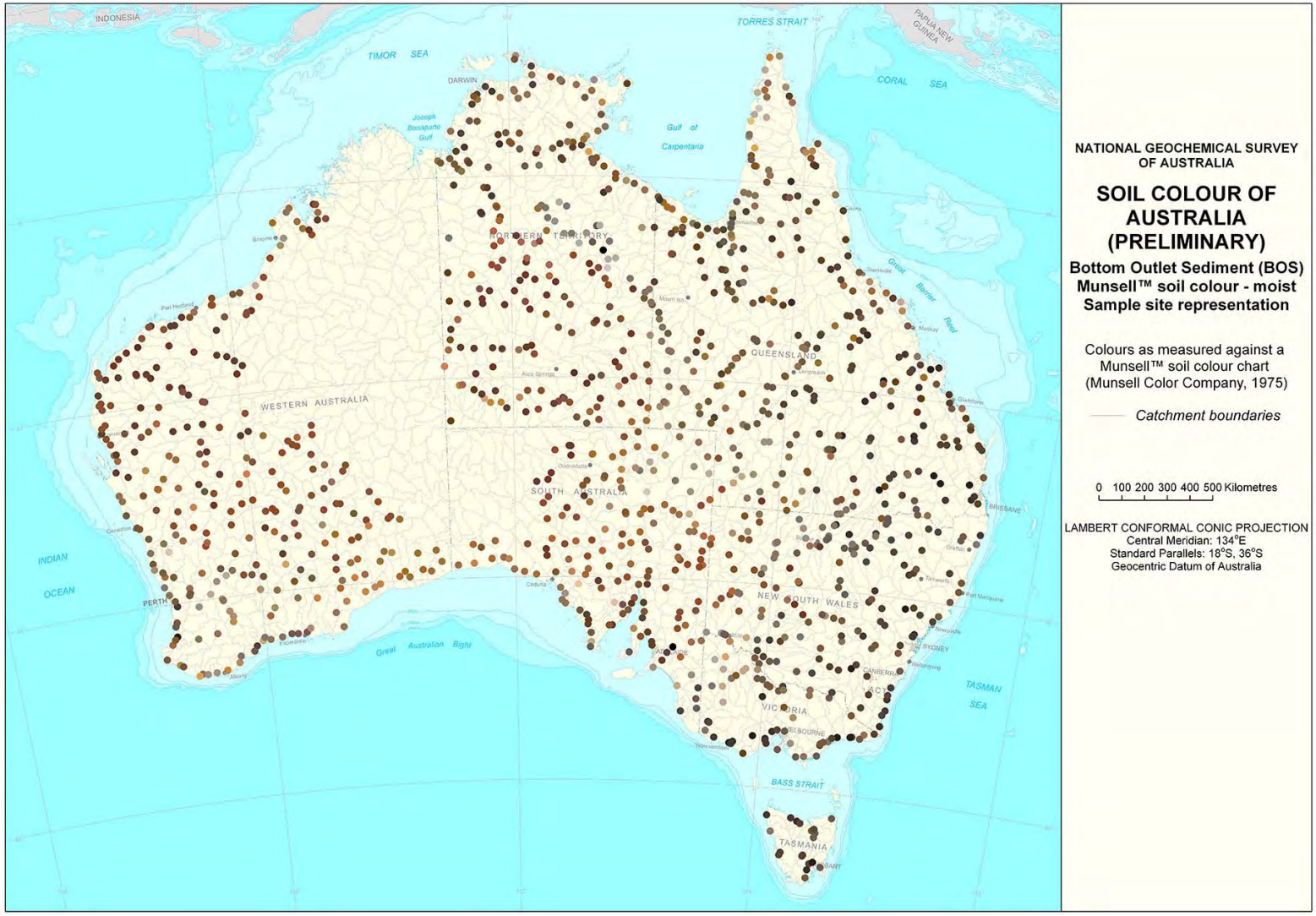

Figure 17. Munsell™ soil colour of moist Bottom Outlet Sediment (BOS). Data represented by points at the site of sample collection. Legend shown in Figure 19.

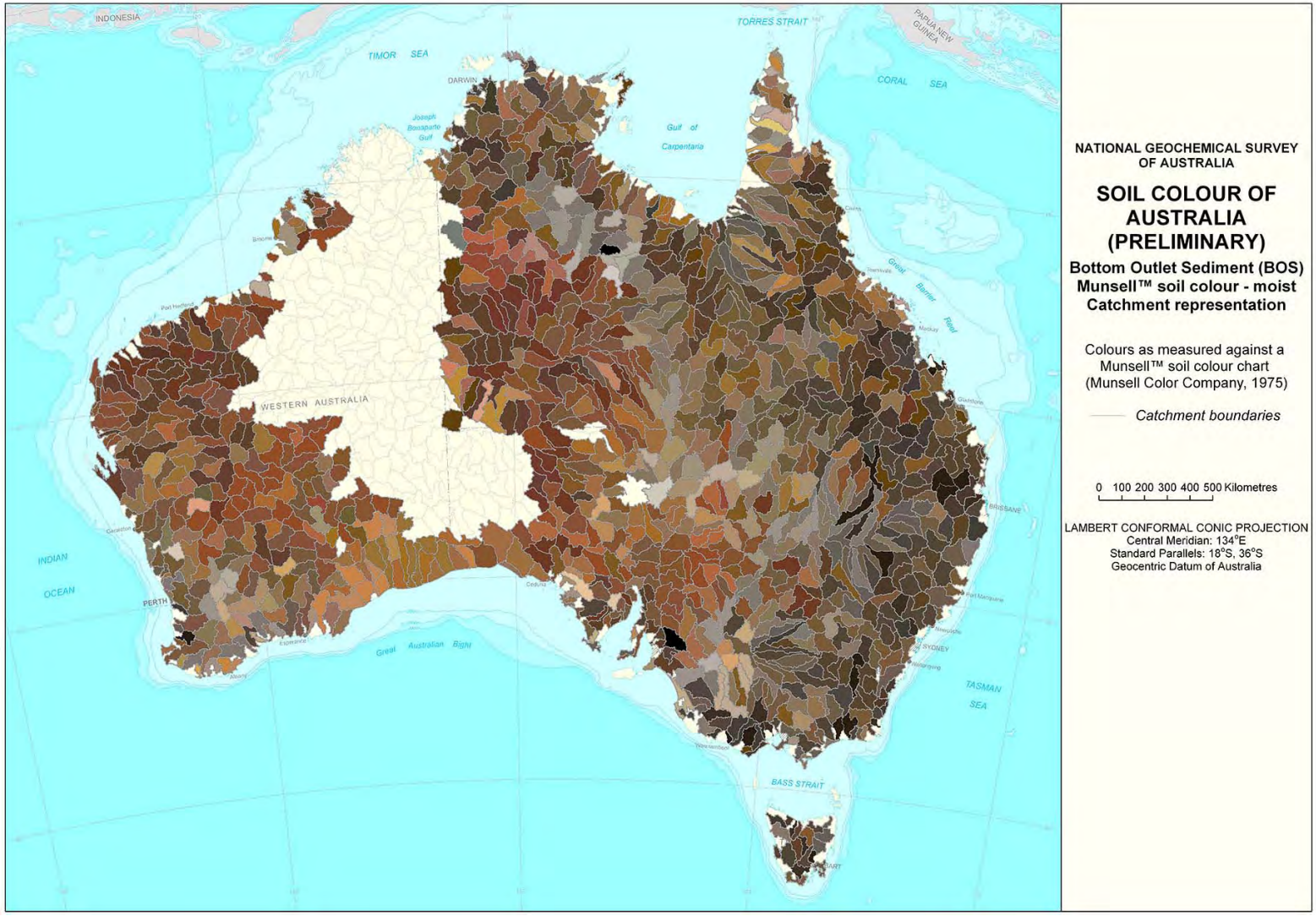

Figure 18. Munsell™ soil colour of moist Bottom Outlet Sediment (BOS) extrapolated from sampling point to whole catchment. Legend shown in Figure 19.

Figure 19. Legend for soil colour maps. Colours from Munsell™ Soil Color Charts (Munsell Color Company. 1975).

Acknowledgements

The authors are extremely grateful to all members of the field sampling teams from each State/Northern Territory: Paul Flitcroft, Trevor Hegvold (Geological Survey of New South Wales), Katherine Brownlie, Stacey Curtis, Tania Dhu, Adrian Fabris, Claire Fricke, Georgina Gordon, Tiphaine Lavigne, Josine Parsons, Steve Sutton, Antony Whiting, Tania Wilson, Ben Uppill (Primary Industries and Resources of South Australia), Shane Heawood (Mineral Resources Tasmania), Ken Sherry, Rachel Roberts (GeoScience Victoria), Richard Langford, Paul Morris, Amanda Thomson, (Geological Survey of Western Australia), Phil Boyle, Stanley Briggs, Dominic Brown, Philip Burrows, Leonard Cranfield, Terry Denaro, Glenys Diprose, Courteney Dhnaram, Melanie Fitzell, Dudley Fulton, Janice Harley, Jimmy Lam, Mark Livingstone, David McIntyre, Jack Skinner, Jack Ryle (Geological Survey of Queensland), Darren Bowbridge, Simon Fanning, Rod Maier, Clarke Petrick (Northern Territory Geological Survey). Thanks also go to Megan Lech and Andrew McPherson from Geoscience Australia for conducting the field training sessions in Western Australia and South Australia.

Without the permission of landowners to access and sample sites on private properties, this project would not have been possible and we express our gratitude to them here. This project was funded by the Australian Government through the Onshore Energy Security Program and Geoscience Australia. Gary Burton publishes with the permission of the Director, Geological Survey of New South Wales, Industry & Investment NSW. Geoff Green publishes with the permission of the Director, Mineral Resources Tasmania. Emily House publishes with the permission of the Director, GeoScience Victoria. Colin Strickland publishes with the permission of the Director, Geological Survey of Western Australia. Andrew Wygralak publishes with the permission of the Director, Northern Territory Geological Survey.

References

Baldwin, B., 2007. Zeroing in on Australia's onshore energy and minerals, *Department of Industry Tourism and Resources Media Release, 2 March 2007*. Available at: http://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/GYKM6/upload_binary/gykm63.pdf;fileType=application%2Fpdf#search=%22Zeroing%20in%22

Bureau of Rural Sciences. 2007. Australian land use and management (ALUM) classification. [Web Page]http://adl.brs.gov.au/mapserv/landuse/index.cfm?fa=classification.class&tab=class(last accessed 16 May 2007).

Caritat, P. de and Lech, M.E., 2007. Thomson Region Geochemical Survey, Northwestern New South Wales. *Cooperative Research Centre For Landscape Environments And Mineral Exploration Open File Report*, **145**, 1021 pp. + CD-ROM. Available at: http://crcleme.org.au/Pubs/OFRSindex.html

Caritat, P. de, Lech, M.E., Jaireth, S., Pyke, J. and Fisher, A., 2007. Riverina Region Geochemical Survey, Southern New South Wales and Northern Victoria. *Cooperative Research Centre For Landscape Environments And Mineral Exploration Open File Report*, **234**, 843 pp. + CD-ROM. Available at: http://crcleme.org.au/Pubs/OFRSindex.html

Caritat, P. de, Lech, M.E. and Kernich, A., 2008a. Gawler Region Geochemical Survey, South Australia. *Cooperative Research Centre For Landscape Environments And Mineral Exploration Open File Report*, **211**, 987 pp. + CD-ROM. Available at: http://crcleme.org.au/Pubs/OFRSindex.html

Caritat, P. de, Lech, M.E. and McPherson, A.A., 2008b. Geochemical mapping 'down under': selected results from pilot projects and strategy outline for the National Geochemical Survey of Australia. *Geochemistry: Exploration, Environment, Analysis*, **8**, 301-312.

Caritat, P. de, Minty, B. and Raymond, O., 2008c. New national geoscience datasets in Australia: geology, geophysics and geochemistry. *Explore (Newsletter for the Association of Applied Geochemists)*, **141**, 1-2, 4-8, 10-11.

Caritat, P. de, Cooper, M., Lech, M., McPherson, A. & Thun, C., 2009. National Geochemical Survey of Australia: Sample Preparation Manual. *Geoscience Australia Record*, **2009/08**, 28 pp. Available at: https://www.ga.gov.au/products/servlet/controller?event=GEOCAT_DETAILS&catno=68657

Caritat, P. de and Cooper, M., 2010. Soil pH of Australia (Preliminary), Top Outlet Sediment (TOS) field pH - Sample site representation, *1:10 000 000 scale map*, Geoscience Australia, Canberra, Australia)

Caritat, P. de, Cooper, M., Pappas, W., Thun, C., Webber, E. 2010. National Geochemical Survey of Australia: Analytical Methods Manual. *Geoscience Australia Record* **2010/15,** 22 pp.

Chorley, R.J., Schumm., S.A. and Sugden, D.E. 1984. *Geomorphology*. Methuen. 605 pp.

Cornelius, M., Robertson, I.D.M., Cornelius, A.J. and Morris, P.A., 2008. Geochemical mapping of the deeply weathered western Yilgarn Craton of Western Australia, using laterite geochemistry. *Geochemistry: Exploration, Environment, Analysis*, **8**, 241-254.

Cresswell, I.D. and Thomas G.M. (eds.). 1997. *Terrestrial and Marine Protected Areas in Australia*. Environment Australia Biodiversity Group, Canberra.

Davies, J.L. 1980. *Geographical Variation in Coastal Development*. Longman, London. 212 pp.

Davies, J.L. 1969. *Landforms of Cold Climates*, ANU Press, Canberra, 200 pp.

Eggleton, R.A. (ed.). 2001. *The regolith glossary: surficial geology, soils and landscapes*. CRCLEME, Floreat, Western Australia.

Fairbridge, R.W. 1968. *The Encyclopedia of Geomorphology*. Encyclopedia of Earth Sciences Series, Volume III. Reinhold Book Corp., New York.

Garrett, R.G., Reimann, C., Smith, D.B. and Xie, X., 2008. From geochemical prospecting to international geochemical mapping: a historical overview. *Geochemistry: Exploration, Environment, Analysis*, **8**, 205-217.

Johnson, J., 2006. Onshore Energy Security Program underway. *AusGeo News*, **84**. Available at: http://www.ga.gov.au/ausgeonews/ausgeonews200612/onshore.jsp

Lech, M. and Caritat, P. de, 2007. Regional geochemical study paves way for national survey – Geochemistry of near-surface regolith points to new resources. *AusGeo News*, **86**. Available at: http://www.ga.gov.au/ausgeonews/ausgeonews200706/geochemical.jsp

Lech, M.E., Caritat, P. de and McPherson, A.A., 2007. National Geochemical Survey of Australia: Field Manual. *Geoscience Australia Record*, **2007/08**, 53 pp.

Mabbutt, J.A. 1977. *Desert Landforms*. ANU Press, Canberra. 340 pp.

McDonald, R.C., Isbell, R.F., Speight, J.G., Walker, J. and Hopkins, M.S. 1990. *Australian soil and land survey field handbook*. 2nd Edition. Inkata Press. 198 pp.

Minty, B.R.S., Franklin, R., Milligan, P.R., Richardson, L.M. and Wilford, J., 2009. Radiometric Map of Australia (First Edition), scale 1:5 000 000. Geoscience Australia, Canberra. Available at: http://www.ga.gov.au/minerals/research/national/radiometric/

Minty, B., Franklin, R., Milligan, P., Richardson, M. & Wilford, J., 2009b. The radiometric map of Australia. *Exploration Geophysics*, **40**, 325-333.

Morisawa, M. 1985. *Rivers*. Longman, London. 222 pp.

Morris, P.A., Coker, J. and Faulkner, J.A., 1998. Geochemical Mapping of the Mount Egerton 1:250 000 sheet. *Department of Minerals and Energy, Geological Survey of Western Australia. Regolith Geochemistry Explanatory Notes*.

Munsell Color Company. 1975. *Munsell Soil Color Charts*. Munsell Color Co. Inc. Baltimore, USA.

Northcote, K. 1979. *A factual key for the recognition of Australian soils*, 4th Edition. Rellim Technical Publications, Pty, Ltd, Coffs Harbour. p. 26-29.

Ollier, C.D. 1984. *Weathering*. 2nd Edition, Longman.

Ollier, C.D. 1988. *Volcanoes*. Blackwell, Oxford.

Pain, C., Chan, R., Craig, M., Gibson, D., Kilgour, P. and Wilford, J. 2003. Draft RTMAP regolith database field book and users Guide. 2nd Edition. *CRCLEME Report* **138**.

Pyke, J., 2000. Minerals laboratory staff develops new ICP-MS preparation method. *AGSO Research Newsletter*, **December 2000**, 12-14. Available at: http://www.ga.gov.au/pdf/Corp0026.pdf

Selby, M.J. 1982. *Hillslope Materials and Processes*. Oxford University Press. 264 pp.

Smith, D.B. and Reimann, C., 2008. Low-density geochemical mapping and the robustness of geochemical patterns. *Geochemistry: Exploration, Environment, Analysis*, **8**: 219-227.

Appendices

Note: Data presented in Appendices One and Two are as they were received from the States/Northern Territory with only minor edits done. As such they may still contain gaps and minor errors.

APPENDIX 1: DIGITAL APPENDIX CONTAINING ALL FIELD DATA

APPENDIX 2: TABLE OF SELECTED FIELD DATA FOR EACH SITE

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190001		TS0866	-12.655	142.272	90	9/08/08	QLD	Weipa	Myall Creek-Mission River	alluvial terrace
2007190002		TS0869	-13.120	141.985	70	9/08/08	QLD	Aurukun	Watson River	alluvial terrace
2007190003	2007190213	TS0321	-22.702	114.898	69	2/04/08	WA	Yanrey Special	Yannarie River	flood plain
2007190004		TS0339	-22.736	116.122	141	3/05/08	WA	Wyloo	Ashburton River	alluvial terrace
2007190005	2007191059	TS1137	-27.823	153.002	25	29/08/07	QLD	Brisbane	Logan River	alluvial terrace
2007190007		TS0375	-24.117	118.382	389	10/05/08	WA	Mount Egerton	Ashburton River	flood plain
2007190009		TS1183	-29.547	148.581	180	4/02/08	NSW	Moree	Barwon River	flood plain
2007190010		TS0716	-17.165	131.413	148	10/04/08	NT	VRD	Horse&Bullock Creeks	alluvial plain
2007190011		TS1149	-28.346	146.842	154	31/10/07	QLD	Cunnamulla	Nebine Creek	alluvial plain
2007190012		TS1022	-22.980	145.247	211	31/03/08	QLD	Muttaburra	Aramac Creek	alluvial plain
2007190013		TS0856	-25.849	135.245	162	7/05/08	NT	McDills	Finke River	flood plain
2007190014		TS1338	-35.752	143.660	87	22/10/07	VIC	Kerang	Avon River	flood plain
2007190015		TS1036	-23.534	149.707	63	25/10/07	QLD	Duaringa	Mackenzie River	alluvial plain
2007190016		TS0552	-30.857	119.927	342	3/07/07	WA	Jackson	Lake Walton	playa plain
2007190017		TS0279	-20.719	120.924	160	7/06/08	WA	Yarrie	Unnamed irregular drainage	irregular dunefield
2007190018		TS0554	-30.963	118.796	310	6/12/07	WA	Jackson	Lake Baladjie	flood plain
2007190019		TS1294	-34.876	150.498	28	30/11/07	NSW	Wollongong	Shoalhaven River	flood plain
2007190021		TS1134	-27.641	142.781	89	8/06/08	QLD	Eulo	Wilson River	flood plain
2007190022		TS1172	-29.128	149.001	186	5/02/08	NSW	Moree	Gil Gil Creek	flood plain
2007190023		TS1018	-22.874	138.761	137	3/04/08	QLD	Glenormiston	Pituri Creek	flood plain
2007190024		TS0212	-16.812	122.900	14	13/06/08	WA	Pender	Unnamed flood plain	flood plain
2007190025		TS0997	-22.312	149.474	16	19/10/07	QLD	Saint Lawrence	St Lawrence Creek	alluvial terrace
2007190028		TS0576	-31.813	123.854	142	22/01/08	WA	Zanthus	Noondiana Swamp	flood plain
2007190029		TS0559	-31.157	125.680	159	29/01/08	WA	Naretha		peneplain
2007190031		TS1200	-30.191	147.714	156	15/04/08	NSW	Walgett	Wanourie Creek	flood plain
2007190032	2007190632	TS1317	-38.088	144.279	32	5/10/07	VIC	Port Philip	Moorobool River	alluvial plain
2007190033		TS0845	-24.997	131.461	456	2/04/09	NT	Lake Amadeus	Lake Amadaus	stagnant alluvial plain
2007190034		TS0377	-24.144	118.482	397	10/05/08	WA	Mount Egerton	Ashburton River	alluvial terrace
2007190035	2007190876	TS0968	-20.402	147.351	76	7/08/07	QLD	Bowen	Burdkin River	alluvial terrace

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190036		TS1111	-26.315	143.169	143	31/05/08	QLD	Eromanga	Kyabra Creek	alluvial plain
2007190038		TS0764	-19.830	135.394	243	7/10/07	NT	Alroy		floodout
2007190039	2007190984	TS0515	-27.533	115.217	222	16/11/07	WA	Ajana	Murchison River	alluvial plain
2007190041		TS0967	-20.639	142.631	166	1/10/07	QLD	Richmond	Flinders River	alluvial plain
2007190042		TS1367	-38.012	143.645	133	3/03/08	VIC	Colac	Woady Yalok	flood plain
2007190043		TS0581	-31.637	124.932	148	24/01/08	WA	Naretha		peneplain
2007190044		TS1030	-23.349	141.510	115	4/04/08	QLD	Brighton Downs	Diamantina River	anastomatic plain
2007190048		TS0310	-21.728	117.257	312	9/05/08	WA	Pyramid	Fortescue River	flood plain
2007190050	2007191481	TS0273	-20.520	118.496	23	5/04/08	WA	Roebourne	Turner River	alluvial plain
2007190051		TS1122	-27.017	149.665	264	2/11/07	QLD	Surat	Dogwood Creek	alluvial plain
2007190052		TS0620	-34.072	119.550	-2	19/02/08	WA	Bremer Bay	Fitzgerald River	flood plain
2007190053		TS1276	-33.672	148.542	293	4/09/07	NSW	Bathurst	Lachlan River	alluvial plain
2007190054		TS0140	-33.306	139.760	101	3/07/08	SA	Chowilla		stagnant alluvial plain
2007190055		TS0670	-14.652	132.018	88	20/09/07	NT	Katherine	Katherine River	alluvial terrace
2007190056		TS1343	-35.983	144.933	110	24/10/07	VIC	Moira lakes	Murray River	flood plain
2007190057		TS1224	-31.363	143.575	85	8/11/07	NSW	Wilcannia	Paroo Overflow	flood plain
2007190058		TS0627	-34.935	117.473	10	17/01/08	WA	Mount Barker	Hay River	flood plain
2007190059		TS0043	-30.948	136.035	131	14/07/08	SA	Kingoonya		pediplain
2007190062		TS1235	-32.100	144.219	103	3/04/08	NSW	Louth	Sandy Creek	flood plain
2007190063		TS0760	-19.768	129.322	300	25/07/08	NT	Tanami		aeolian sheet
2007190064		TS1370	-37.982	147.410	22	2/04/08	VIC	Bairnsdale Special	Tom Creek	flood plain
2007190065		TS0942	-19.241	139.960	0	18/09/07	QLD	Dobbyn	Gunpowder Creek	alluvial plain
2007190066		TS0272	-20.320	119.259	30	9/06/08	WA	Port Headland	De Gray River	flood plain
2007190067	2007191121	TS0561	-31.234	121.962	293	9/12/07	WA	Widgiemooltha	Lake Lefroy area	flood plain
2007190068		TS1271	-33.486	148.270	273	4/09/07	NSW	Forbes	Lachlan River	alluvial plain
2007190069		TS0982	-21.444	145.821	294	16/10/07	QLD	Buchanan	Mogga Creek	alluvial plain
2007190070		TS0109	-26.760	137.520	13	9/08/09	SA	Poolowanna		lacustrine plain
2007190071	2007190289	TS0586	-32.052	118.166	245	4/12/07	WA	Corrigin	Salt River	flood plain
2007190072		TS0093	-27.711	137.658	-6	8/09/09	SA	Noolyeana	Warburton River	longitudinal dunefield
2007190073		TS0598	-32.573	118.451	265	11/12/07	WA	Corrigin	Unnamed salt lakes	flood plain
2007190074	2007190389	TS0110	-26.749	134.465	237	12/09/09	SA	Abminga	Hamilton Creek	alluvial plain
2007190075		TS0361	-23.777	117.814	314	9/05/08	WA	Turee Creek	Ashburton River	flood plain
2007190076		TS0304	-21.771	115.406	31	6/05/08	WA	Onslow	Cane River	alluvial terrace
2007190077		TS1189	-29.731	149.318	200	12/05/08	NSW	Moree	Moomin Creek	flood plain
2007190078		TS1272	-33.541	144.376	92	24/01/08	NSW	Booligal	Umbrella Creek	flood plain
2007190079		TS1060	-24.504	139.596	92	24/05/08	QLD	Machattie	King Creek	alluvial plain
2007190081		TS0789	-21.110	134.492	376	26/05/08	NT	Barrow Creek	No defined watercourse	stagnant alluvial plain
2007190082		TS0034	-31.468	129.313	112	18/06/09	SA	Coompana		pediplain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190083		TS1232	-30.277	147.561	123	14/04/08	NSW	Walgett	Macquarie River	flood plain
2007190084		TS0820	-23.944	137.276	145	11/05/08	NT	Hay River	Hay River	alluvial terrace
2007190086		TS0596	-32.761	115.906	15	14/01/08	WA	Pinjarra	Murray River	flood plain
2007190087		TS0966	-20.572	148.605	17	8/08/07	QLD	Proserpine	Andromache	alluvial terrace
2007190089		TS1006	-22.422	148.695	136	18/10/07	QLD	Saint Lawrence	Isaac River	alluvial plain
2007190090		TS1335	-35.477	141.990	63	18/10/07	VIC	Ouyen	Outlet Creek	alluvial plain
2007190091	2007191053	TS1099	-25.890	147.817	454	20/05/08	QLD	Eddystone	Maranoa River	flood plain
2007190092		TS1096	-25.688	150.972	216	25/07/07	QLD	Mundubbera	Hawkwood-Auburn River	anastomatic plain
2007190093		TS1333	-35.389	143.072	61	17/10/07	VIC	Paigne	Lalbert Creek	flood plain
2007190094		TS0855	-25.703	135.778	115	7/05/08	NT	McDills	Interdunal depression	aeolian landforms
2007190095		TS0074	-28.801	133.532	167	7/09/09	SA	Giles		pediplain
2007190096		TS0715	-17.045	134.017	212	24/05/08	NT	Beeteloo	Newcastle Creek	alluvial plain
2007190097		TS0440	-28.746	124.032	341	28/03/08	WA	Rason	Lake Rason	stagnant alluvial plain
2007190098		TS0096	-27.687	136.831	6	11/08/08	SA	Oodnadatta	Macumba River	flood plain
2007190099		TS0654	-12.771	130.745	9	21/09/07	NT	Darwin	Annie River	alluvial plain
2007190101		TS0573	-31.629	115.730	25	6/07/07	WA	Perth	Lake Noweragup	longitudinal dunefield
2007190103		TS0919	-17.857	141.134	7	22/09/07	QLD	Normanton	Norman river	anastomatic plain
2007190104		TS0040	-31.207	131.450	61	21/06/09	SA	Nullarbor		pediplain
2007190105		TS1140	-27.636	148.740	213	1/11/07	QLD	Surat	Balonne River	alluvial terrace
2007190106		TS1228	-31.490	142.186	145	31/03/08	NSW	Broken Hill	Coogee Lake	flood plain
2007190107	2007190913	TS0048	-30.693	134.281	105	5/11/09	SA	Tarcoola		peneplain
2007190108		TS1161	-28.686	143.247	112	8/06/08	QLD	Bulloo	Titheroo (Wangamurra) Creek	alluvial terrace
2007190110	2007191182	TS1354	-37.719	148.477	18	2/04/08	VIC	Bairnsdale Special	Snowy River	flood plain
2007190111		TS1114	-26.923	142.086	109	5/06/08	QLD	Barrolka	Whitula Creek	flood plain
2007190112		TS1270	-33.148	149.504	502	11/03/08	NSW	Bathurst	Coombing Oakey Creek	depositional plain
2007190113		TS0948	-19.814	146.028	277	7/10/07	QLD	Townsville	Burdekin River	alluvial plain
2007190114	2007191045	TS1095	-25.687	151.780	150	24/07/07	QLD	Maryborough	Burambha River	flood plain
2007190115		TS0149	-31.715	138.216	103	18/05/09	SA	Parachilna	Hookina Creek	alluvial plain
2007190116		TS0708	-16.270	137.088	10	17/07/08	NT	Robinson River	Robinson River	alluvial terrace
2007190117		TS1027	-23.661	139.875	108	5/04/08	QLD	Springvale	King Creek	flood plain
2007190118	2007191552	TS0656	-12.959	132.383	6	19/09/07	NT	Alligator River	South Alligator River	alluvial plain
2007190119		TS0770	-20.532	131.065	300	25/07/08	NT	Mt Solitaire		aeolian landforms
2007190121	2007191545	TS0070	-29.052	133.290	168	6/09/09	SA	Tallaringa		pediplain
2007190122		TS1262	-33.075	145.589	141	24/01/08	NSW	Cargelligo	unidentified	flood plain
2007190123		TS0788	-21.293	132.770	420	30/07/08	NT	Mount Peake		meander plain
2007190124		TS1355	-37.174	145.569	160	17/04/08	VIC	Warburton	Goulburn River	alluvial plain
2007190125	2007191532	TS0961	-20.481	140.590	0	18/09/07	QLD	Cloncurry	Cloncurry Riyer	alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190126		TS1090	-25.646	149.792	176	16/10/07	QLD	Taroom	Dawson River	alluvial plain
2007190127		TS0122	-36.278	140.813	92	14/05/08	SA	Naracoorte		flood plain
2007190128		TS1242	-32.540	144.795	107	3/04/08	NSW	Louth	unknown	flood plain
2007190129		TS0583	-31.814	126.558	87	26/01/08	WA	Madura		peneplain
2007190130		TS0442	-28.875	122.114	392	26/03/08	WA	Laverton	Lake Carey	flood plain
2007190131		TS0019	-32.669	134.305	1	2/05/09	SA	Streaky Bay		rises
2007190132		TS0834	-24.985	137.608	72	10/05/08	NT	Simpson Desert North	Interdunal depression	aeolian landforms
2007190134		TS0162	-30.166	137.750	96	21/05/09	SA	Andamooka	Mulgaria Watercourse	bar plain
2007190135		TS0319	-22.104	118.284	394	8/05/08	WA	Mount Bruce	Fortescue River	flood plain
2007190136		TS1379	-41.504	147.059	131	7/02/08	TAS	North East	South Esk R	alluvial plain
2007190137		TS0763	-20.140	132.359	420	29/07/08	NT	Lander River		aeolian landforms
2007190138		TS0975	-21.002	146.424	203	11/10/07	QLD	Charters Towers	Campaspe River	flood plain
2007190139		TS0492	-26.678	122.905	441	29/02/08	WA	Kingston	Bonython Creek	flood plain
2007190141		TS0446	-28.936	123.272	418	28/03/08	WA	Rason	Unnamed drainage	flood plain
2007190142		TS0577	-31.613	122.447	273	13/12/07	WA	Widgiemooltha	Unnamed salt lakes	flood plain
2007190144		TS1085	-25.517	152.644	53	24/07/07	QLD	Maryborough	Mary River	flood plain
2007190145	2007191105	TS0039	-31.247	130.898	71	20/06/09	SA	Nullarbor		pediplain
2007190146		TS0803	-22.851	129.233	320	1/06/08	NT	Lake Mackay		flood plain
2007190147		TS0420	-26.052	121.934	459	28/02/08	WA	Kingston	Charles Wells Creek	flood plain
2007190148		TS1199	-30.312	141.065	81	28/05/08	NSW	Cobham Lake	Lake Wallace Creek	flood plain
2007190149		TS1304	-35.164	143.700	75	20/12/07	NSW	Swan Hill	Wakool River	flood plain
2007190150		TS0793	-21.834	135.516	362	16/05/08	NT	Elkedra	Bundey River	alluvial terrace
2007190151		TS0485	-26.498	121.628	488	28/02/08	WA	Kingston	Unnamed creek system	flood plain
2007190152		TS0556	-30.838	126.239	178	29/01/08	WA	Loongana		peneplain
2007190153		TS0614	-33.731	121.991	33	15/12/07	WA	Esperance	Brandy Creek	alluvial terrace
2007190154	2007190568	TS0864	-12.495	141.892	97	9/08/08	QLD	Weipa	Unnamed	alluvial terrace
2007190155	2007191031	TS1073	-24.977	138.736	62	23/05/08	QLD	Bedourie	Eyre Creek	alluvial swamp
2007190156		TS1202	-30.235	142.450	125	27/05/08	NSW	Cobham Lake	Allandy Creek	flood plain
2007190158		TS0734	-18.282	134.227	208	22/05/08	NT	Helen Springs	McKinlay Creek	alluvial plain
2007190159		TS0049	-30.659	130.031	136	19/06/09	SA	Cook		pediplain
2007190161	2007191413	TS0458	-29.357	121.876	353	26/03/08	WA	Edjudina	Lake Raeside	flood plain
2007190162		TS1332	-35.116	141.553	41	18/10/07	VIC	Ouyen		alluvial swamp
2007190163		TS0601	-32.912	115.823	12	15/01/08	Wa	Pinjarra	Harvey River	flood plain
2007190164		TS0026	-31.910	135.260	157	26/09/09	SA	Gairdner		pediplain
2007190165		TS0846	-25.226	131.712	484	17/04/08	NT	Eyres Rock		irregular dunefield
2007190166		TS0466	-29.529	123.143	392	27/03/08	WA	Minigwal	lake Minigwal	flood plain
2007190167		TS0399	-25.014	118.270	455	28/02/08	WA	Mount Egerton	Gascoyne River	alluvial plain

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2007190168		TS1281	-33.979	147.562	240	22/02/08	NSW	Forbes	Bland Creek	flood plain
2007190169		TS0649	-12.927	135.038	30	13/08/09	NT	Arnhem Bay	Goyder River	alluvial terrace
2007190170		TS0870	-13.628	141.701	75	15/08/08	QLD	Aurukun	Archer River	flood plain
2007190172		TS1339	-36.153	141.998	89	16/10/07	VIC	Horsham		flood plain
2007190174		TS0123	-35.777	140.461	83	26/03/09	SA	Pinnaroo		coastal dunes
2007190175		TS0068	-29.241	134.373	166	20/07/08	SA	Coober Pedy	Mabel Creek	bar plain
2007190176	2007191566	TS0483	-26.708	114.671	137	29/03/08	WA	Yaringa	n.a.	transverse dunefield
2007190177		TS0662	-14.007	134.437	5	16/08/09	NT	Urapunga	Wilton River	alluvial terrace
2007190178		TS0709	-16.429	130.934	50	9/04/08	NT	VRD	Wickham River	alluvial plain
2007190179		TS0107	-27.012	136.888	25	9/09/09	SA	Noolyeana		longitudinal dunefield
2007190181	2007191396	TS1209	-30.148	148.392	159	3/02/08	NSW	Walgett	Namoi River	flood plain
2007190182		TS1298	-35.031	147.107	127	18/12/07	NSW	Wagga Wagga	Murrumbidgee River	flood plain
2007190183	2007190471	TS0848	-25.296	133.100	398	18/04/08	NT	Kulgera		flood plain
2007190184		TS0832	-24.472	130.283	690	3/04/09	NT	Bloods Range	Lake Amadaus	stagnant alluvial plain
2007190185	2007191253	TS0340	-22.913	116.284	164	3/05/08	WA	Wyloo	Ashburton River	alluvial terrace
2007190187		TS0028	-31.812	133.862	80	21/07/09	SA	Childara		irregular dunefield
2007190188		TS0081	-28.429	136.847	-10	12/08/08	SA	Lake Eyre	Umbum Creek	stagnant alluvial plain
2007190189	2007191542	TS1283	-34.089	141.915	34	20/02/08	NSW	Mildura	Darling River	flood plain
2007190190		TS0414	-25.641	119.877	531	24/02/08	WA	Peak Hill	Lake Gregory	flood plain
2007190192		TS1248	-32.564	151.091	76	13/03/08	NSW	Singleton	Hunter River	flood plain
2007190193	2007190788	TS1305	-35.347	145.536	112	19/12/07	NSW	Jerilderie	Billabong Creek	flood plain
2007190194	2007190704	TS1229	-31.576	147.177	198	6/11/07	NSW	Nyngan	Bogan River	alluvial plain
2007190195		TS0029	-31.797	134.617	103	4/11/09	SA	Childara		longitudinal dunefield
2007190196		TS1264	-33.177	144.571	116	25/01/08	NSW	Booligal	Willandra Creek	flood plain
2007190197	2007190962	TS0217	-17.077	124.068	18	15/06/08	WA	Derby	Alexander River	flood plain
2007190198		TS1082	-25.465	140.886	99	27/05/08	QLD	Betoota	Farrars Creek	flood plain
2007190202		TS1128	-27.468	147.300	241	1/11/07	QLD	Homboin	Mungalbala Creek	alluvial plain
2007190203		TS0510	-27.430	116.825	346	29/04/08	WA	Murgoo	Sanford River	flood plain
2007190204		TS0762	-19.972	133.603	450	29/07/08	NT	Tennant Creek		aeolian landforms
2007190205		TS0972	-20.804	143.542	232	2/10/07	QLD	Richmond	Flinders River	alluvial plain
2007190206		TS0290	-20.855	119.766	112	8/06/08	WA	Port Headland	Coongan River	alluvial terrace
2007190207		TS0604	-32.999	118.555	272	11/12/07	WA	Hyden	Unnamed salt lakes	flood plain
2007190208	2007191593	TS1052	-24.136	151.692	20	27/10/07	QLD	Bundaberg	Worthington Creek	alluvial plain
2007190209	2007191254	TS0759	-20.042	137.015	229	18/05/08	NT	Avon Downs	Ranken River	flood plain
2007190211		TS0911	-17.766	139.560	0	19/09/07	QLD	Burketown	Albert River	alluvial plain
2007190212	2007190747	TS0816	-23.579	131.136	690	1/04/09	NT	MT Liebig		meander plain
2007190213	2007190003	TS0321	-22.700	114.898	72	2/04/08	WA	Yanrey Special	Yannarie River	flood plain
2007190214		TS1203	-30.023	145.398	124	30/04/08	NSW	Louth	Warrego River	flood plain

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2007190215		TS0850	-25.395	135.377	150	9/05/08	NT	McDills		flood plain
2007190216		TS0035	-31.455	137.356	78	30/09/09	SA	Torrens	Pernatty Creek	longitudinal dunefield
2007190217		TS1062	-24.448	142.055	152	28/05/08	QLD	Connemara	Farras Creek	alluvial plain
2007190218	2007191348	TS0424	-28.347	125.390	318	4/04/08	WA	Neale	Unnamed drainage	longitudinal dunefield
2007190219		TS1109	-25.964	141.623	126	4/06/08	QLD	Canterbury	Gibber Creek	alluvial plain
2007190221		TS0665	-14.277	130.064	8	5/08/09	NT	Port Keats	Moyle River	alluvial terrace
2007190222		TS0570	-31.463	116.721	181	3/12/07	WA	Perth	Mortlock River North	flood plain
2007190223		TS0180	-27.693	138.281	8	11/08/09	SA	Gason	Warburton River	flood plain
2007190224		TS0007	-33.905	136.560	20	22/11/08	SA	Kimba		alluvial swamp
2007190225		TS1135	-27.989	143.837	124	29/10/08	QLD	Thargomindah	Bulloo River	alluvial plain
2007190226		TS1186	-29.654	148.584	180	4/02/08	NSW	Moree	Thalaba Creek	flood plain
2007190227		TS1158	-28.609	142.578	100	7/06/08	QLD	Bulloo	Bulloo River	alluvial swamp
2007190228		TS0142	-32.984	138.015	33	17/07/07	SA		Baroota Creek	alluvial plain
2007190229		TS0555	-31.228	119.680	328	3/07/07	WA	Southern Cross	Nil	playa plain
2007190230		TS0428	-28.288	118.318	427	22/02/08	WA	Kirkalocka	unnamed	alluvial plain
2007190231		TS0431	-28.355	116.659	321	17/11/07	WA	Yalgoo	Nil	alluvial plain
2007190232		TS1347	-36.171	144.747	101	23/10/07	VIC	Echuca	Campaspe River	flood plain
2007190233		TS0799	-22.240	137.112	233	15/05/08	NT	Tobermorey	Unnamed, poorly defined watercourse	alluvial terrace
2007190234		TS1146	-28.050	150.147	213	26/10/07	QLD	Goondiwindi	Weir River	alluvial plain
2007190235		TS0391	-24.700	115.309	180	1/03/08	WA	Kennedy Range	Lyons River	alluvial plain
2007190237		TS1047	-24.053	147.766	242	14/10/07	QLD	Springsure	Nogoa River	alluvial plain
2007190238		TS0504	-27.271	122.938	449	1/04/08	WA	Duketon	Lake Wells	flood plain
2007190239		TS0776	-20.732	133.490	410	30/07/08	NT	Lander River	Hanson River	alluvial terrace
2007190241	2007190978	TS1244	-32.399	150.372	171	12/03/08	NSW	Singleton	Goulburn River	flood plain
2007190242		TS0835	-24.829	134.190	343	19/04/08	NT	Finke	Hugh River	alluvial terrace
2007190243		TS1250	-34.056	141.795	42	19/02/08	NSW	Mildura	Greater Darling Anabranch	flood plain
2007190244		TS0433	-28.616	119.056	415	6/03/08	WA	Youanmi	Unnamed tributary to Lake Noondie	flood plain
2007190245		TS0439	-28.729	123.862	368	28/03/08	WA	Rason	Lake Rason	stagnant alluvial plain
2007190246		TS0702	-16.083	136.318	10	17/07/08	NT	Mount Young	McArthur River	alluvial terrace
2007190248	2007191198	TS0178	-28.064	139.279	8	26/10/08	SA	Kopperamanna	Cooper Creek	meander plain
2007190249		TS0528	-29.919	121.359	364	21/02/08	WA	Menzies	Lake Marmion	flood plain
2007190251		TS0031	-31.678	135.386	120	26/09/09	SA	Gairdner		alluvial plain
2007190252		TS0875	-14.624	144.247	77	6/08/08	QLD	Cape Melville	Desert Creek	alluvial terrace
2007190253		TS0158	-30.838	140.660	37	27/09/08	SA	Frome	Teilta(?) Creek	stagnant alluvial plain
2007190256	2007190875	TS0087	-28.134	136.787	3	12/08/08	SA	Lake Eyre	Neales River	alluvial swamp
2007190257		TS1349	-35.818	142.412	92	16/10/07	VIC	Ouyen		flood plain

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2007190258	2007191176	TS1174	-29.217	152.565	130	7/02/08	NSW	Grafton	Clarence River	flood plain
2007190259		TS1267	-33.349	145.882	161	6/09/07	NSW	Cargelligo	Lachlan River	flood plain
2007190261		TS0928	-18.540	144.115	449	6/10/07	QLD	Einasleigh	Einsliegh River	alluvial plain
2007190263		TS1256	-32.438	142.528	74	2/04/08	NSW	Menindee	Talyawalka Creek	flood plain
2007190264		TS0977	-20.993	146.295	214	12/10/07	QLD	Charters Towers	Cape River	flood plain
2007190265		TS0757	-19.641	136.050	225	9/10/07	NT	Alroy		floodout
2007190266	2007191458	TS0069	-29.172	136.326	53	17/07/08	SA	Billakalina	Francis Swamp	alluvial swamp
2007190267		TS0283	-20.951	117.441	16	4/04/08	WA	Roebourne	George River	alluvial plain
2007190268		TS1303	-35.349	146.284	127	19/12/07	NSW	Jerilderie	Urangeline Creek	alluvial plain
2007190269		TS0805	-22.859	131.552	550	30/05/08	NT	Mt Doreen		aeolian sheet
2007190271		TS1178	-29.330	142.521	102	27/05/08	NSW	Urisino	Twelve Mile Creek	flood plain
2007190272		TS0157	-30.848	138.167	93	19/05/09	SA	Copley	Warrioota Creek	alluvial plain
2007190273		TS1076	-25.179	143.260	139	29/05/08	QLD	Windorah	Barcoo River	alluvial plain
2007190274		TS1034	-23.558	141.361	105	4/04/08	QLD	Brighton Downs	Mayne River	anastomatic plain
2007190275		TS0538	-30.312	119.021	377	6/12/07	WA	Jackson	Hamersley Lakes	flood plain
2007190276		TS1185	-29.641	145.250	149	30/04/08	NSW	Yantabulla	Kerribree Creek	flood plain
2007190278		TS1187	-29.458	150.085	270	5/02/08	NSW	Moree	Gwydir River	flood plain
2007190279		TS1299	-35.124	147.543	200	18/12/07	NSW	Wagga Wagga	Murrumbidgee River	flood plain
2007190281		TS0368	-23.892	113.995	70	30/03/08	WA	WinningPool	Earrabiddy Creek	anastomatic plain
2007190282		TS0373	-24.107	116.455	356	1/03/08	WA	Mount Phillips	Lyons River	alluvial plain
2007190283		TS0827	-24.534	131.224	615	2/04/09	NT	Lake Amadeus	Lake Amadaus	stagnant alluvial plain
2007190284		TS1130	-27.236	151.198	337	26/07/07	QLD	Dalby	Condamine	flood plain
2007190285	2007190406	TS0981	-21.530	147.047	187	15/10/07	QLD	Mount Coolon	Suttor River	alluvial plain
2007190286		TS1219	-30.458	147.684	158	14/04/08	NSW	Walgett	Marthaguy Creek	flood plain
2007190287		TS0468	-29.551	115.813	251	18/11/07	WA	Perenjori	Yarra Yarra Lakes	playa plain
2007190288		TS0685	-14.940	132.418	142	12/07/08	NT	Katherine	Dry River	alluvial terrace
2007190289	2007190071	TS0586	-32.051	118.166	244	4/12/07	WA	Corrigin	Salt River	flood plain
2007190290		TS0725	-17.658	133.542	185	23/05/08	NT	Beeteloo	Newcastle Waters	flood plain
2007190291		TS0664	-14.053	135.867	7	17/08/09	NT	Roper River	Hart River	alluvial plain
2007190292		TS0407	-25.223	118.988	504	27/02/08	WA	Peak Hill	Gascoyne River	alluvial plain
2007190293		TS1057	-24.312	145.203	301	31/05/08	QLD	Blackall	Barcoo River	flood plain
2007190294		TS0108	-26.931	133.830	281	8/09/09	SA	Abminga	Alberga River	anastomatic plain
2007190296	2007190758	TS0773	-19.922	132.597	430	29/07/08	NT	Green Swamp Well		aeolian landforms
2007190298		TS1077	-25.056	140.179	93	25/05/08	QLD	Betoota	Umpadiboo Creek	flood plain
2007190299		TS1143	-28.568	144.259	120	28/10/08	QLD	Eulo	Werekilka Creek	alluvial plain
2007190301		TS0675	-14.681	134.575	16	16/08/09	NT	Urapunga	Wilton River	alluvial terrace
2007190302		TS0618	-33.888	119.864	28	19/02/08	WA	Newdegate	Fitzgerald River	flood plain
2007190303		TS1039	-23.653	151.054	11	24/10/07	QLD	Rockhampton	Munduran Creek	alluvial terrace

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2007190304		TS0507	-27.355	115.901	260	16/11/07	WA	Murgoo	Murchison River	alluvial plain
2007190305		TS0295	-21.291	116.148	47	3/04/08	WA	Yarraloola	Fortescue River	bar plain
2007190307		TS0891	-16.434	143.804	142	5/10/07	QLD	Walsh	Mitchell River	flood plain
2007190308		TS0752	-19.478	135.288	220	7/10/07	NT	Alroy		floodout
2007190309		TS0350	-23.376	117.039	247	7/05/08	WA	Turee Creek	Ashburton River	flood plain
2007190310		TS0269	-20.204	121.314	125	10/06/08	WA	Yarrie		stagnant alluvial plain
2007190311	2007191259	TS0542	-30.539	115.226	41	13/11/07	WA	Hill River	Nambung River	alluvial plain
2007190312		TS1088	-25.601	142.790	124	27/05/08	QLD	Windorah	Kyabra Creek	alluvial plain
2007190313		TS0661	-13.825	130.726	18	13/07/08	NT	Pine Creek	Daly River	alluvial terrace
2007190315		TS0275	-20.326	119.306	28	9/06/08	WA	Port Headland	Coongan River	flood plain
2007190316		TS0444	-28.837	114.826	48	14/11/07	WA	Geraldton	Greenough River	flood plain
2007190317		TS0221	-17.373	124.028	23	14/06/08	WA	Derby	May River	flood plain
2007190318		TS0882	-15.156	144.343	88	6/08/08	QLD	Cooktown	Nomanby River	alluvial terrace
2007190319		TS1384	-42.447	145.538	2	5/02/08	TAS	South West	Gordon River	alluvial swamp
2007190321		TS0727	-18.005	137.451	184	20/05/08	NT	Mount Drummond	Nicholson River	alluvial terrace
2007190322		TS0908	-17.407	143.800	215	10/10/07	QLD	Red River	Lynd River	flood plain
2007190323		TS0651	-12.800	132.734	5	19/09/07	NT	Alligator River	Nourlangie Ck	alluvial plain
2007190324		TS0585	-31.737	124.448	142	24/01/08	WA	Zanthus		peneplain
2007190325		TS1322	-38.354	142.496	18	4/03/08	VIC	Colac	Merri River	flood plain
2007190326		TS0167	-29.449	137.746	12	24/05/09	SA	Curdimurka	Kidnimpiri Creek	stagnant alluvial plain
2007190327		TS0473	-26.127	118.294	448	25/02/08	WA	Belele	Talgar River	alluvial plain
2007190328	2007191598	TS0244	-18.716	121.930	26	12/06/08	WA	Lagrange	Unnamed flood plain	flood plain
2007190329		TS0104	-27.097	135.508	106	10/08/08	SA	Oodnadatta	Alberga Creek	flood plain
2007190331		TS0154	-31.224	139.653	17	30/09/08	SA	Parachilna	Siccus River (Wilpena)	alluvial plain
2007190332		TS0278	-20.667	117.954	4	8/06/08	WA	Roebourne	Peawah River	flood plain
2007190333		TS0658	-13.153	130.541	-7	21/09/07	NT	Pine Creek	Reynolds River	alluvial plain
2007190334		TS1208	-30.313	145.619	121	29/04/08	NSW	Bourke	Yanda Creek	flood plain
2007190335	2007190692	TS1251	-32.692	145.157	133	4/04/08	NSW	Ivanhoe	Thule Creek	flood plain
2007190336		TS0346	-23.173	120.020	466	4/06/08	WA	Robertson	Fortescue River	flood plain
2007190337		TS0746	-18.662	134.848	208	22/05/08	NT	Helen Springs	Brunchilly Creek	stagnant alluvial plain
2007190338		TS0184	-27.048	140.680	41	24/10/08	SA	Innamincka	Montkeleary River	stagnant alluvial plain
2007190339		TS0329	-22.444	119.664	407	5/06/08	WA	Roy Hill	Fortescue Marsh	flood plain
2007190342	2007190989	TS0404	-25.147	116.934	370	29/02/08	WA	Glenburgh	Gascoyne River	alluvial plain
2007190343		TS0865	-12.555	143.159	15	14/08/08	QLD	Cape Weymouth	Pascoe River	alluvial terrace
2007190344		TS1013	-23.034	141.738	128	1/04/08	QLD	Brighton Downs	Diamantina River	flood plain
2007190345		TS0635	-11.298	132.304	10	10/08/09	NT	Cobourg Peninsula	Mewuwu Creek	alluvial plain
2007190346		TS1197	-30.077	147.562	154	15/04/08	NSW	Walgett	Big Warrambool Creek	flood plain
2007190347		TS0786	-21.063	137.979	189	19/05/08	NT	Sandover River	Bybby Creek	flood plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190348		TS0913	-17.593	143.186	171	5/10/07	QLD	Red River	Einsliegh River	alluvial plain
2007190349	2007191436	TS0282	-20.857	120.689	152	7/06/08	WA	Yarrie	Nullagine River	flood plain
2007190350		TS0119	-37.081	140.794	55	13/05/08	SA	Penola	near Mosquito Creek	drainage depression
2007190352	2007190611	TS1327	-38.698	145.881	15	14/04/08	VIC	Warragul Special	Tarwin River	flood plain
2007190354		TS0249	-19.449	121.582	22	11/06/08	WA	Munro	Unnamed flood plain	flood plain
2007190355	2007191257	TS0437	-28.693	120.942	365	3/03/08	WA	Leonora	Unnamed creek system	flood plain
2007190357	2007190856	TS0684	-15.045	135.210	11	16/07/08	NT	Mount Young	Towns River	alluvial terrace
2007190358		TS1278	-33.860	150.349	121	27/06/08	NSW	Sydney	Kedumba River	alluvial terrace
2007190359		TS0647	-12.910	131.668	23	18/09/07	NT	Darwin	Mary River	alluvial plain
2007190361	2007191094	TS0582	-32.167	125.361	111	25/01/08	WA	Culver		peneplain
2007190363		TS0814	-23.496	129.036	402	3/04/09	NT	MT Rennie	Lake MacDonall	stagnant alluvial plain
2007190364		TS1287	-34.170	142.994	62	19/02/08	NSW	Balranald	Willandra Creek	flood plain
2007190366		TS1218	-31.062	152.801	46	15/05/08	NSW	Hastings	Macleay River	flood plain
2007190367		TS0916	-17.947	140.181	4	20/09/07	QLD	Burketown	Punchball Creek	alluvial plain
2007190368		TS1253	-33.020	149.281	420	3/09/07	NSW	Bathurst	Macquarie River	alluvial plain
2007190369		TS0735	-17.982	137.968	95	20/05/08	NT	Calvert Hills	Nicholson River	alluvial terrace
2007190370		TS0277	-20.705	118.293	40	5/04/08	WA	Roebourne	Yule River	alluvial plain
2007190372		TS1288	-34.207	144.625	88	23/01/08	NSW	Hay	Lara Creek ? (unclear from map)	flood plain
2007190373		TS0800	-22.283	137.936	168	15/05/08	NT	Tobermorey	Gumhole Creek	alluvial terrace
2007190374		TS0892	-16.485	141.792	14	25/09/07	QLD	Galbraith	Staaten River	anastomatic plain
2007190375		TS0450	-28.894	116.386	273	17/11/07	WA	Yalgoo	Salt River	playa plain
2007190377		TS0690	-15.359	130.288	2	9/07/08	NT	Auvergne	Angalarri River	alluvial plain
2007190378		TS1293	-34.870	143.870	78	20/12/07	NSW	Balranald	Abercrombie Creek	alluvial plain
2007190379		TS0849	-25.395	132.550	453	17/04/08	NT	Kulgera		aeolian landforms
2007190381		TS1387	-42.780	147.088	5	4/02/08	TAS	South East	Derwent River	alluvial plain
2007190382		TS0990	-21.949	138.458	175	8/04/08	QLD	Urandangi	Georgina River	alluvial plain
2007190383	2007191416	TS1009	-22.401	145.129	224	1/04/08	QLD	Muttaburra	Thunderbolt Creek	alluvial plain
2007190384		TS0809	-22.938	132.823	571	13/04/08	NT	Napperby		aeolian sheet
2007190385		TS1079	-25.238	143.799	216	28/05/08	QLD	Windorah	Powell Creek	flood plain
2007190386		TS0299	-21.615	115.925	61	2/04/08	WA	Yarraloola	Robe River	alluvial plain
2007190387		TS0639	-12.363	136.709	14	14/08/09	NT	Gove	Giddy River	alluvial terrace
2007190389	2007190074	TS0110	-26.763	134.539	215	12/09/09	SA	Abminga	Hamilton Creek	alluvial plain
2007190390		TS0798	-22.019	133.984	497	26/05/08	NT	Alcoota	No defined watercourse	stagnant alluvial plain
2007190391		TS0187	-26.303	139.386	25	25/10/08	SA	Pandie Pandie	Diamantina	anastomatic plain
2007190392		TS0910	-17.463	141.189	7	22/09/07	QLD	Normanton	Walker Creek	anastomatic plain
2007190393	2007191050	TS1334	-35.397	143.649	79	17/10/07	VIC	Swan Hill	Murray River	flood plain
2007190394		TS1265	-33.034	146.645	191	5/09/07	NSW	Cargelligo	Lachlan River	flood plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190395		TS0565	-31.352	123.610	203	22/01/08	WA	Zanthus	Harris Lake	flood plain
2007190396		TS1243	-32.317	150.757	163	12/03/08	NSW	Singleton	Hunter River	flood plain
2007190398		TS0438	-28.749	122.193	399	26/03/08	WA	Laverton	Lake Carey	flood plain
2007190399		TS0711	-16.768	131.242	110	10/04/08	NT	VRD	Armstrong River	alluvial plain
2007190401		TS1083	-25.022	150.115	146	25/10/07	QLD	Eidsvold	Dawson River	alluvial plain
2007190402		TS0298	-21.343	119.352	182	6/06/08	WA	Marble Bar	Shaw river	alluvial terrace
2007190403		TS1120	-26.963	150.866	310	26/07/07	QLD	Chinchilla	Condamine	flood plain
2007190404		TS1068	-24.807	152.181	16	29/10/07	QLD	Bundaberg	Kolan River	alluvial terrace
2007190406	2007190285	TS0981	-21.531	147.048	179	15/10/07	QLD	Mount Coolon	Suttor River	alluvial plain
2007190407		TS1075	-25.897	138.852	39	24/05/08	QLD	Birdsville	Eyre Creek	alluvial plain
2007190408		TS0603	-33.315	115.837	10	5/07/07	WA	Collie	Collie River	flood plain
2007190410		TS0595	-32.327	124.899	125	25/01/08	WA	Culver		peneplain
2007190411		TS0356	-23.465	117.572	309	7/05/08	WA	Turee Creek	Turee Creek	flood plain
2007190412		TS0129	-34.699	139.494	35	3/06/08	SA	Adelaide	Marne River	flood plain
2007190413		TS0923	-18.165	139.136	32	20/09/07	QLD	Lawnhill	Archie Creek	alluvial terrace
2007190414	2007191386	TS1346	-36.038	144.309	87	23/10/07	VIC	Pyramid hill	Hope Creek	alluvial plain
2007190418		TS0558	-31.140	118.478	278	5/12/07	WA	Kellerberrin	Lake Campion	flood plain
2007190419	2007190974	TS0741	-18.577	136.116	208	10/10/07	NT	Brunette Downs	Brunette Ck	alluvial plain
2007190421		TS0611	-33.772	119.957	46	16/12/07	WA	Newdegate	Twertatup creek	flood plain
2007190422		TS1163	-28.976	144.411	129	28/10/08	QLD	Eulo	Paroo River	alluvial plain
2007190423		TS0168	-29.414	139.518	23	13/09/08	SA	Callabonna	MacDonnell Creek	alluvial plain
2007190424		TS0153	-31.392	140.718	70	26/09/08	SA	Curnamona		alluvial plain
2007190425	2007190768	TS1263	-33.157	147.451	220	5/09/07	NSW	Forbes	Goobang Creek	flood plain
2007190426		TS1237	-31.851	147.132	204	5/11/07	NSW	Nyngan	Bogan River	alluvial plain
2007190427		TS0004	-34.219	135.554	36	24/11/08	SA	Lincoln	Lake Malata	alluvial swamp
2007190428		TS0787	-21.181	136.172	294	16/05/08	NT	Elkedra	Elkedra River	alluvial terrace
2007190429		TS1269	-33.361	150.947	28	13/03/08	NSW	Sydney	MacDonald River	flood plain
2007190430		TS1142	-28.059	145.683	187	9/08/08	QLD	Cunnamulla	Warrego River	flood plain
2007190431		TS1212	-30.548	141.026	63	28/05/08	NSW	Cobham Lake	Packsaddle Creek	flood plain
2007190432		TS0489	-26.559	120.031	512	22/02/08	WA	Wiluna	West Creek	flood plain
2007190433		TS0883	-15.200	144.434	129	6/08/08	QLD	Cooktown	Normanby River	alluvial terrace
2007190434	2007191027	TS0593	-32.345	121.706	270	12/12/07	WA	Norseman	Picnic Lake area	flood plain
2007190435		TS1021	-22.973	149.241	100	18/10/07	QLD	Saint Lawrence	Mackenzie River	alluvial plain
2007190436		TS0610	-33.759	121.560	11	15/12/07	WA	Esperance	Dalyup River West	alluvial terrace
2007190437		TS0357	-23.624	117.587	286	8/05/08	WA	Turee Creek	Ashburton River	flood plain
2007190438		TS0900	-16.857	145.715	4	8/10/07	QLD	Cairns	Barron River	alluvial plain
2007190439		TS0130	-34.528	138.462	22	16/07/07	SA		Light River	flood plain
2007190441		TS0769	-20.452	137.838	205	19/05/08	NT	Avon Downs	Georgina River	flood plain

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2007190442		TS0854	-25.768	137.232	56	10/05/08	NT	Simpson Desert South	Interdunal depression	aeolian landforms
2007190444		TS1249	-32.493	149.269	391	11/03/08	NSW	Dubbo	Cudgegong River	flood plain
2007190445		TS0970	-20.699	141.493	122	27/09/07	QLD	Julia Creek	McKinlay River	flood plain
2007190446		TS0113	-26.372	136.915	34	8/08/09	SA	Poolowanna		longitudinal dunefield
2007190447		TS1132	-27.529	144.085	145	8/06/08	QLD	Toompine	Bulloo River	flood plain
2007190448		TS0808	-22.912	132.272	600	30/05/08	NT	Hamelton Downs	Lake Lewis	flood plain
2007190450		TS0589	-32.113	123.740	157	23/01/08	WA	Balladonia		peneplain
2007190451		TS1091	-25.681	142.175	110	27/05/08	QLD	Canterbury	Channel Country	alluvial swamp
2007190452		TS1312	-36.516	150.031	15	28/11/07	NSW	SJ/56-1 (Unnamed)	Murrah River	flood plain
2007190453		TS0901	-16.993	144.302	217	5/10/07	QLD	Mossman	Walsh River	alluvial plain
2007190454		TS0053	-30.544	131.061	116	20/06/09	SA	Ooldea		pediplain
2007190455		TS0964	-20.670	147.658	126	7/08/07	QLD	Bowen	Bowen River	alluvial terrace
2007190456		TS0462	-29.618	120.930	374	5/03/08	WA	Menzies	Tributary to Lake Ballard	flood plain
2007190457	2007191004	TS0124	-35.540	138.577	30	27/06/08	SA	Barker	Inman River	flood plain
2007190458	2007190774	TS0927	-18.561	140.719	29	21/09/07	QLD	Donors Hill	Flinders River	alluvial plain
2007190459		TS0600	-32.789	118.591	263	11/12/07	WA	Hyden	Unnamed salt lakes	flood plain
2007190461		TS0460	-29.479	125.171	207	9/07/08	WA	Plumridge	Plumridge Lakes	flood plain
2007190462		TS1356	-37.477	149.643	13	1/04/08	VIC	Mallacoota	Genoa River	alluvial plain
2007190463		TS0932	-18.900	144.987	415	6/10/07	QLD	Einasleigh	Burdkin River	alluvial plain
2007190465		TS0754	-19.630	135.672	222	7/10/07	NT	Alroy		floodout
2007190466		TS0022	-32.284	134.926	84	25/09/09	SA	Streaky Bay		peneplain
2007190467		TS0710	-16.516	137.531	7	17/07/08	NT	Robinson River	Calvert River	alluvial terrace
2007190468		TS0718	-17.264	133.456	218	24/05/08	NT	Newcastle Waters	Newcastle Creek	alluvial plain
2007190469		TS0143	-32.854	140.611	126	2/07/08	SA	Olary		erosional plain
2007190471	2007190183	TS0848	-25.296	133.102	411	18/04/08	NT	Kulgera		flood plain
2007190472	2007191312	TS0740	-18.619	135.405	206	21/05/08	NT	Brunette Downs	No defined watercourse	stagnant alluvial plain
2007190473		TS0160	-30.586	138.003	47	20/05/09	SA	Copley	Arrunha Creek	bar plain
2007190474		TS0653	-12.670	132.235	48	8/08/09	NT	Alligator River	West Alligator River	alluvial plain
2007190475		TS0518	-27.630	114.249	20	7/03/08	WA	Ajana	Murchison River	hills
2007190476		TS1126	-27.351	145.180	230	9/06/08	QLD	Toompine	Beechal Creek	alluvial plain
2007190477		TS1103	-25.683	149.805	182	16/10/07	QLD	Taroom	Juandah Creek	alluvial plain
2007190478		TS1056	-24.072	144.969	275	31/05/08	QLD	Blackall	Baroo River	flood plain
2007190479		TS0756	-19.409	132.630	450	29/07/08	NT	Green Swamp Well		flood plain
2007190481	2007191594	TS0691	-15.253	129.577	8	10/07/08	NT	Auvergne	Napp Spring Creek	alluvial plain
2007190483		TS1038	-23.636	143.877	172	29/03/08	QLD	Maneroo	Thomson River	flood plain
2007190484		TS0545	-30.656	122.534	315	8/12/07	WA	Kurnalpi	Lake Roe	flood plain
2007190485		TS1373	-40.953	148.017	22	8/02/08	TAS	North East	Ringarooma R	alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190486		TS1280	-34.126	149.019	409	26/11/07	NSW	Goulburn	Lachlan River	alluvial plain
2007190487		TS0783	-20.968	137.933	185	19/05/08	NT	Avon Downs	Georgina River	flood plain
2007190488		TS1350	-36.246	146.269	113	16/04/08	VIC	Wangaratta	Ovens River	flood plain
2007190490		TS0531	-29.871	121.987	338	21/02/08	WA	Edjudina	Lake Rebecca	flood plain
2007190491		TS1257	-33.137	142.556	77	21/02/08	NSW	Pooncarie	not known	flood plain
2007190492		TS0550	-30.835	128.312	148	28/01/08	WA	Forrest		peneplain
2007190493		TS1368	-37.927	141.280	21	6/03/08	VIC	Hamilton	Glenelg River	flood plain
2007190494		TS0980	-21.015	146.877	159	16/10/07	QLD	Buchanan	Suttor River	alluvial terrace
2007190495	2007191318	TS0020	-32.431	134.088	5	29/04/09	SA	Streaky Bay		coastal plain
2007190496		TS0974	-20.668	143.895	266	2/10/07	QLD	Richmond	Flinders River	alluvial plain
2007190497	2007190586	TS0723	-17.603	131.576	206	11/04/08	NT	Wave Hill	Cattle Creek	alluvial plain
2007190498		TS1145	-27.873	151.527	387	25/10/07	QLD	Ipswich	Condamine River	alluvial plain
2007190499		TS0422	-25.710	118.080	446	25/02/08	WA	Robinson Ranges	Murchison River	alluvial plain
2007190501		TS0136	-33.821	140.050	30	27/03/09	SA	Chowilla		depositional plain
2007190502		TS1054	-24.279	144.333	238	30/05/08	QLD	Blackall	Barcoo River	flood plain
2007190503		TS1007	-22.512	138.441	156	3/04/08	QLD	Glenormiston	Pituri Creek	flood plain
2007190505		TS0837	-24.980	133.994	322	19/04/08	NT	Finke	Finke River	alluvial terrace
2007190506	2007190631	TS1024	-23.217	139.574	120	5/04/08	QLD	Springvale	Georgina River	flood plain
2007190507		TS1184	-29.941	142.718	108	27/05/08	NSW	Urisino	Bootra Creek	flood plain
2007190508	2007191119	TS1028	-23.429	148.149	182	13/10/07	QLD	Emerald	Teresa Creek	alluvial plain
2007190509		TS0804	-22.761	129.759	300	1/06/08	NT	Lake Mackay		flood plain
2007190510		TS0186	-26.490	140.250	39	24/10/08	SA	Cordillo	Providence Creek	alluvial plain
2007190511		TS0926	-18.255	141.198	20	29/09/07	QLD	Croydon	Norman River	flood plain
2007190512		TS0062	-29.626	134.814	147	21/07/08	SA	Coober Pedy	Brumby Creek	flood plain
2007190513		TS1193	-29.975	148.148	172	4/02/08	NSW	Angledool	Barwon River	flood plain
2007190514		TS0858	-11.035	142.659	9	12/08/08	QLD	Orford Bay	Escape River	coastal lands
2007190515		TS1290	-34.646	143.563	55	20/12/07	NSW	Balranald	Murrumbidgee River	flood plain
2007190517		TS0519	-27.774	121.437	435	2/03/08	WA	Sir Samuel	Lake Darlot	flood plain
2007190518		TS0884	-15.379	142.026	11	2/10/07	QLD	Rutland Plains	Alice River	flood plain
2007190519		TS0860	-11.603	142.136	182	12/08/08	QLD	Jardine River	Jackson River	alluvial terrace
2007190522		TS0177	-28.482	139.987	25	26/10/08	SA	Strzelecki		longitudinal dunefield
2007190523		TS1175	-29.217	143.180	100	26/05/08	NSW	Urisino	Berawinnia Creek	flood plain
2007190524		TS0050	-30.616	137.339	32	5/08/08	SA	Andamooka	Andamooka Creek	alluvial plain
2007190525		TS1098	-25.826	139.476	64	24/05/08	QLD	Birdsville	Diamantina River	flood plain
2007190526	2007191599	TS1307	-35.894	150.064	21	29/11/07	NSW	Ulladulla	Moruya River	flood plain
2007190527	2007190609	TS1004	-22.612	140.563	164	5/04/08	QLD	Boulia	Hamilton River	anastomatic plain
2007190528		TS0315	-22.205	114.785	19	5/05/08	WA	Yanrey	Unnamed zone of multiple lakes and dunes	flood plain

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2007190529		TS0720	-17.291	133.139	218	24/05/08	NT	Newcastle Waters	No defined watercourse	stagnant alluvial plain
2007190531	2007190703	TS0969	-20.707	143.134	208	2/10/07	QLD	Richmond	Flinders River	alluvial plain
2007190532		TS1196	-30.009	146.355	131	17/04/08	NSW	Bourke	Bogan River	flood plain
2007190533		TS0474	-26.181	117.973	414	26/02/08	WA	Belele	Hope River	alluvial plain
2007190534	2007191522	TS1094	-25.677	149.219	247	16/10/07	QLD	Taroom	Dawson River	alluvial plain
2007190535		TS0255	-19.742	121.200	5	11/06/08	WA	Mandora	Salt Creek/Saunders Springs	flood plain
2007190536	2007190909	TS0847	-25.192	137.937	54	10/05/08	NT	Simpson Desert South	Interdunal depression	aeolian landforms
2007190537		TS1157	-28.603	150.372	227	27/10/08	QLD	Goondiwindi	Macintyre River	alluvial plain
2007190538		TS1152	-28.392	150.273	201	30/08/07	QLD	Goondiwindi	Commoron Creek	flood plain
2007190539		TS1191	-29.988	150.777	374	13/05/08	NSW	Inverell	Gwydir River	flood plain
2007190541		TS0396	-24.958	114.807	117	3/03/08	WA	Kennedy Range	Gascoyne River	alluvial terrace
2007190542		TS0945	-19.601	145.890	294	7/10/07	QLD	Townsville	Burdkin River	alluvial plain
2007190543		TS1156	-28.321	141.409	123	7/06/08	QLD	Tickalara	Not defined	irregular dunefield
2007190544		TS0896	-16.773	138.086	2	21/09/07	QLD	Mornington	Gold Creek	alluvial plain
2007190545		TS1306	-35.578	150.170	24	29/11/07	NSW	Ulladulla	Clyde River	flood plain
2007190546		TS1341	-35.694	142.617	86	16/10/07	VIC	Birchip		depression
2007190547		TS0522	-27.845	123.727	392	2/04/08	WA	Throssell	Unnamed drainage	stagnant alluvial plain
2007190548	2007191236	TS0934	-18.084	143.920	329	6/10/07	QLD	Georgetown	Einsliegh River	alluvial plain
2007190549	2007191507	TS0412	-25.516	123.036	437	29/02/08	WA	Herbert	Lake Buchanan.	irregular dunefield
2007190550		TS0930	-18.623	146.091	20	11/10/07	QLD	Ingham	Herbert River	flood plain
2007190551		TS1171	-29.058	153.334	54	7/02/08	NSW	Maclean	Richmond River	flood plain
2007190552	2007190675	TS0006	-33.911	136.413	34	23/11/08	SA	Kimba	Driver River	alluvial swamp
2007190553		TS1273	-33.453	150.904	40	14/03/08	NSW	Sydney	Doyles Swamp	flood plain
2007190554	2007190752	TS0673	-14.185	129.651	8	5/08/09	NT	Port Keats	Ingurmunal Creek	alluvial terrace
2007190555		TS0592	-32.061	125.624	85	25/01/08	WA	Culver		peneplain
2007190556		TS1320	-38.156	147.021	16	3/04/08	VIC	Bairnsdale Special	Latrobe River	alluvial plain
2007190557		TS0630	-34.888	118.001	10	17/01/08	WA	Mount Barker	Kalgan River	flood plain
2007190558		TS0936	-19.230	146.627	18	11/10/07	QLD	Townsville	Black River	flood plain
2007190559		TS0813	-23.583	136.620	232	14/05/08	NT	Hay River	Plenty River	alluvial terrace
2007190561		TS0084	-28.192	133.004	255	9/09/09	SA	Giles		longitudinal dunefield
2007190562		TS0782	-20.985	132.576	440	30/07/08	NT	Lander River	Lander River	alluvial terrace
2007190563		TS0657	-13.107	135.729	15	13/08/09	NT	Blue Mud Bay	Kooletong River	alluvial terrace
2007190564		TS0978	-21.365	138.274	185	6/04/08	QLD	Urandangi	Georgina River	alluvial plain
2007190565		TS0231	-17.939	123.743	20	16/06/08	WA	Derby	Minnie River/Fitzroy river	flood plain
2007190566		TS0455	-29.279	115.166	72	14/11/07	WA	Dongara	Irwin River	terraced land
2007190567		TS1195	-30.325	144.019	117	7/11/07	NSW	Louth	Paroo River	flood plain
2007190568	2007190154	TS0864	-12.497	141.892	65	9/08/08	QLD	Weipa	Unnamed	alluvial terrace

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190569		TS1274	-33.961	145.560	105	6/09/07	NSW	Cargelligo	Wah Wah Creek	alluvial swamp
2007190570		TS0537	-30.260	123.197	327	12/07/08	WA	Cundeelee	Ponton Creek	flood plain
2007190571		TS1164	-28.939	146.732	110	30/10/07	QLD	Cunnamulla	Widgeegoara Creek	alluvial plain
2007190572		TS0909	-17.502	142.358	90	16/10/08	QLD	Normanton	Einasleigh River	alluvial plain
2007190574		TS0721	-17.198	134.328	215	24/05/08	NT	Beeteloo	Newcastle Creek	alluvial plain
2007190575		TS0495	-27.216	124.411	375	2/04/08	WA	Throssell	Lake Throssell	stagnant alluvial plain
2007190576		TS0644	-12.479	131.085	22	18/09/07	NT	Darwin	Howard River	alluvial plain
2007190577		TS1104	-25.674	151.247	0	25/07/07	QLD	Mundubbera	Boyne River	alluvial terrace
2007190578		TS0838	-24.869	134.243	334	19/04/08	NT	Finke	Hugh River	alluvial terrace
2007190579		TS1301	-35.242	148.951	456	27/11/07	NSW	Canberra	Murrumbidgee River	alluvial plain
2007190581		TS0138	-33.540	139.702	92	3/07/08	SA	Chowilla		peneplain
2007190583	2007191063	TS0921	-18.045	138.856	33	23/09/07	QLD	Lawnhill	Gum Hole	anastomatic plain
2007190584		TS0950	-19.997	146.434	238	3/10/07	QLD	Townsville	Burdkin River	alluvial plain
2007190585		TS0996	-22.282	142.515	162	3/04/08	QLD	Winton	Workingham Creek	anastomatic plain
2007190586	2007190497	TS0723	-17.602	131.576	206	11/04/08	NT	Wave Hill	Cattle Creek	alluvial plain
2007190588		TS0288	-20.850	116.607	13	3/04/08	WA	Dampier Special	Maitland River	alluvial plain
2007190589		TS1377	-41.587	147.236	154	8/02/08	TAS	North East	South Esk R	alluvial plain
2007190591		TS0946	-19.456	141.820	100	7/10/08	QLD	Millungera	East Creek	alluvial plain
2007190592		TS0637	-11.437	132.258	11	10/08/09	NT	Cobourg Peninsula	Unnamed Creek	alluvial terrace
2007190593		TS0737	-18.358	132.239	400	27/07/08	NT	South Lake Woods		aeolian landforms
2007190596		TS0171	-29.247	138.212	11	7/08/09	SA	Marree	Clayton River	stagnant alluvial plain
2007190597		TS1179	-29.104	150.951	313	6/02/08	NSW	Inverell	Severn River	flood plain
2007190598		TS1371	-38.477	144.934	22	14/04/08	VIC	Port Philip Special	Main Creek	alluvial plain
2007190599		TS0009	-33.719	135.421	24	25/11/08	SA	Kimba		karst
2007190601		TS0829	-24.540	132.634	475	16/04/08	NT	Henbury	Palmer River	alluvial terrace
2007190602		TS0567	-31.330	118.011	252	4/12/07	WA	Kellerberrin	Unnamed system	flood plain
2007190604		TS0758	-19.617	131.440	400	26/07/08	NT	Tanami East		aeolian landforms
2007190605		TS1155	-28.577	150.821	304	26/10/07	QLD	Goondiwindi	Macintyre Brooks	flood plain
2007190606		TS0988	-21.861	146.672	200	8/10/07	QLD	Buchanan	Belyando River	alluvial plain
2007190609	2007190527	TS1004	-22.611	140.562	162	5/04/08	QLD	Boulia	Hamilton River	anastomatic plain
2007190610		TS0863	-12.389	142.177	73	9/08/08	QLD	Weipa	Wenlock River	alluvial terrace
2007190611	2007190352	TS1327	-38.697	145.884	10	14/04/08	VIC	Warragul Special	Tarwin River	flood plain
2007190613		TS1314	-36.708	149.895	49	28/11/07	NSW	Bega	Bega River	flood plain
2007190616		TS0047	-30.684	132.559	130	5/11/09	SA	Barton		longitudinal dunefield
2007190618	2007191166	TS1383	-42.475	146.723	87	9/02/08	TAS	South East	Ouse R	alluvial plain
2007190619		TS1165	-28.926	148.762	162	27/10/07	QLD	St George	Moonie River	alluvial plain
2007190621		TS0172	-29.241	137.904	6	23/05/09	SA	Curdimurka	Frome River	bar plain
2007190622		TS0089	-28.041	136.053	47	13/08/08	SA	Warrina	Peake Creek	flood plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190623		TS0739	-18.614	132.431	410	27/07/08	NT	South Lake Woods		floodout
2007190624		TS1015	-22.891	139.942	139	5/04/08	QLD	Boulia	Burke River	anastomatic plain
2007190625		TS0663	-14.228	135.576	12	17/08/09	NT	Roper River	Rose River	alluvial plain
2007190626		TS1064	-24.694	143.124	148	29/05/08	QLD	Jundah	Thomson River	alluvial plain
2007190627		TS1087	-25.694	140.753	91	28/05/08	QLD	Betoota	Browns Creek	flood plain
2007190628		TS0747	-19.139	134.608	238	22/05/08	NT	Tennant Creek	None	aeolian sheet
2007190629		TS1160	-28.892	149.049	153	27/10/07	QLD	St George	Barwon River	alluvial plain
2007190631	2007190506	TS1024	-23.217	139.575	121	5/04/08	QLD	Springvale	Georgina River	flood plain
2007190632	2007190032	TS1317	-38.088	144.279	28	5/10/07	VIC	Port Philip	Moorobool River	alluvial plain
2007190633		TS0001	-34.962	137.404	5	24/06/08	SA	Maitland		alluvial swamp
2007190634		TS0322	-22.386	114.051	37	31/03/08	WA	Yanrey Special	n.a.	alluvial plain
2007190635		TS0876	-14.323	144.440	74	7/08/08	QLD	Cape Melville	Unnamed	alluvial terrace
2007190636		TS0566	-31.297	115.560	32	18/02/08	WA	Perth Special	Moore River	alluvial terrace
2007190637		TS0646	-12.303	134.113	10	11/08/09	NT	Millingimbi	Liverpool River	alluvial terrace
2007190639		TS1364	-37.774	147.842	18	2/04/08	VIC	Bairnsdale Special	Tambo Upper River	alluvial plain
2007190641		TS1296	-35.012	148.154	236	17/12/07	NSW	Wagga Wagga	Murrumbidgee River	flood plain
2007190642		TS1019	-22.993	144.551	201	30/03/08	QLD	Muttaburra	Aramac Creek	flood plain
2007190643		TS0599	-32.646	123.984	143	23/01/08	WA	Balladonia		peneplain
2007190644		TS1107	-26.475	147.927	329	20/05/08	QLD	Mitchell	Maranoa River	flood plain
2007190645		TS1226	-30.855	147.055	182	28/04/08	NSW	Walgett	Bogan River	flood plain
2007190646		TS1069	-24.837	140.584	106	25/05/08	QLD	Machattie	Diamantina River	flood plain
2007190647	2007191525	TS0893	-16.527	143.472	114	5/10/07	QLD	Walsh	Mitchell River	alluvial plain
2007190648		TS0738	-18.562	131.578	370	27/07/08	NT	Winnecke Creek	Winnecke Creek	alluvial terrace
2007190650		TS0819	-24.014	135.434	294	21/04/08	NT	Alice Springs	Hugh River	alluvial terrace
2007190651		TS0575	-31.748	116.672	160	2/07/07	WA	Perth	Avon River	flood plain
2007190652		TS1365	-37.702	148.561	24	1/04/08	VIC	Mallacoota	Brodribb River	flood plain
2007190653		TS1319	-38.191	145.554	27	14/04/08	VIC	Warragul Special	Yallock Creek	flood plain
2007190654		TS0983	-21.622	138.308	154	6/04/08	QLD	Urandangi	Georgina River	alluvial plain
2007190655		TS0784	-21.036	130.761	330	31/05/08	NT	Mt Theo		aeolian sheet
2007190657		TS0699	-15.634	131.130	215	8/04/08	NT	Delamere	Victoria River	alluvial plain
2007190658		TS0280	-20.772	120.737	150	7/06/08	WA	Yarrie	Oakover River	flood plain
2007190659	2007190739	TS0609	-33.650	123.760	7	21/01/08	WA	Malcolm	Un-named creek system	flood plain
2007190661	2007191334	TS1125	-27.069	149.714	261	3/11/07	QLD	Surat	Condamine River	alluvial plain
2007190663		TS1220	-30.939	150.531	324	13/05/08	NSW	Manilla	Peel River	flood plain
2007190664		TS0569	-31.672	121.620	291	13/12/07	WA	Widgiemooltha	Unnamed salt lakes	flood plain
2007190665		TS0943	-18.614	141.306	31	29/09/07	QLD	Croydon	Norman River	flood plain
2007190666		TS0842	-24.996	130.993	847	2/04/09	NT	Lake Amadeus		aeolian sheet
2007190667		TS0877	-14.668	141.922	25	20/08/08	QLD	Holroyd	Edward River	meander plain

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2007190669		TS0986	-21.679	147.243	195	17/10/07	QLD	Mount Coolon	Diamond Creek	alluvial plain
2007190670		TS1072	-25.122	138.466	49	23/05/08	QLD	Birdsville	Eyre Creek	drainage depression
2007190671		TS1357	-37.578	141.385	54	5/03/08	VIC	Hamilton	Glenelg River	flood plain
2007190672		TS1041	-23.811	148.516	175	14/10/07	QLD	Duaringa	Comet River	alluvial plain
2007190673		TS0824	-24.278	129.655	824	3/04/09	NT	Bloods Range	Lake Neale	stagnant alluvial plain
2007190674		TS0674	-14.734	131.608	200	8/04/08	NT	Fergusson River	Flora River	alluvial plain
2007190675	2007190552	TS0006	-33.910	136.412	34	23/11/08	SA	Kimba	Driver River	alluvial swamp
2007190676		TS1215	-30.715	148.291	183	3/02/08	NSW	Walgett	Castlereagh River	flood plain
2007190677		TS1260	-33.289	143.614	82	21/02/08	NSW	Pooncarie	Willandra Creek	flood plain
2007190679		TS0979	-21.139	148.914	40	15/10/07	QLD	Mackay	Pioneer River	alluvial plain
2007190681		TS0957	-20.059	141.635	114	26/09/07	QLD	Julia Creek	Flinders River	flood plain
2007190682		TS0126	-34.932	139.220	19	15/05/08	SA	Adelaide	Reedy Creek	low hills
2007190683		TS0363	-23.754	114.391	66	30/03/08	WA	WinningPool	Minilya River	bar plain
2007190684		TS0777	-20.813	137.635	198	19/05/08	NT	Avon Downs	No defined watercourse	flood plain
2007190685		TS1247	-32.520	151.969	45	10/06/08	NSW	Newcastle	Karuah River	flood plain
2007190686	2007191430	TS0871	-13.441	142.313	50	16/08/08	QLD	Aurukun	Archer River	alluvial terrace
2007190687		TS1210	-30.268	147.220	131	15/04/08	NSW	Walgett	Marra Creek	flood plain
2007190688		TS0441	-28.813	121.075	364	3/03/08	WA	Leonora	Lake Raeside	flood plain
2007190689		TS1010	-22.625	149.652	19	19/10/07	QLD	Saint Lawrence	Styx River	alluvial terrace
2007190690		TS0629	-34.913	116.788	41	16/01/08	WA	Pemberton	Frankland River	alluvial terrace
2007190691		TS0471	-25.996	114.316	10	5/03/08	WA	Wooramel	unnamed watercourse	alluvial plain
2007190692	2007190335	TS1251	-32.692	145.157	118	4/04/08	NSW	Ivanhoe	Thule Creek	flood plain
2007190693		TS0634	-27.395	114.137	98	28/03/08	WA	Ajana	Lake Culcurdoo	drainage depression
2007190694		TS0090	-27.961	136.076	43	13/08/08	SA	Oodnadatta	Neales River	meander plain
2007190695	2007190924	TS0728	-18.171	133.492	206	23/05/08	NT	South Lake Woods	No defined watercourse	stagnant alluvial plain
2007190697		TS0730	-18.257	135.150	213	22/05/08	NT	Brunette Downs	Croswell Creek	alluvial plain
2007190698	2007190813	TS1297	-35.023	144.528	93	23/01/08	NSW	Deniliquin	Carroonboon Creek	flood plain
2007190699		TS1388	-42.871	147.700	3	9/02/08	TAS	South East	Carlton R	alluvial terrace
2007190701		TS0590	-32.122	118.208	229	4/07/07	WA	Corrigin	Nil	depositional plain
2007190702		TS0436	-28.768	114.723	44	15/11/07	WA	Geraldton	Chapman River	flood plain
2007190703	2007190531	TS0969	-20.707	143.134	219	2/10/07	QLD	Richmond	Flinders River	alluvial plain
2007190704	2007190194	TS1229	-31.576	147.177	195	6/11/07	NSW	Nyngan	Bogan River	alluvial plain
2007190705		TS0182	-27.356	138.096	-3	8/09/09	SA	Gason		longitudinal dunefield
2007190706		TS0287	-20.946	117.611	25	4/04/08	WA	Roebourne	Sherlock River	alluvial plain
2007190707		TS0606	-33.403	117.742	256	11/12/07	WA	Dumbleyung	Lake Dumbleyung	flood plain
2007190708		TS0895	-16.625	144.576	233	9/10/07	QLD	Mossman	Mitchell River	flood plain
2007190709		TS1313	-36.865	148.414	237	21/01/08	NSW	Tallangatta	Snowy River	alluvial terrace
2007190710		TS0578	-31.807	117.654	226	4/12/07	WA	Kellerberrin	Salt River	flood plain

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2007190711		TS0640	-12.127	133.692	19	11/08/09	NT	Millingimbi	Goomadeer River	alluvial terrace
2007190712		TS0918	-17.936	139.141	29	19/09/07	QLD	Westmoreland	Nicolson River	alluvial plain
2007190713		TS0750	-19.498	131.189	400	26/07/08	NT	Tanami East		aeolian landforms
2007190714		TS1055	-24.201	151.246	43	24/10/07	QLD	Monto	Boyne River	alluvial plain
2007190716		TS0176	-28.559	138.018	8	9/09/09	SA	Kopperamanna	Cooper Creek	longitudinal dunefield
2007190717		TS0549	-30.963	121.292	334	9/12/07	WA	Kalgoorlie	Brown Lake	flood plain
2007190721		TS1169	-29.851	146.441	139	16/04/08	NSW	Enngonia	Culgoa River	flood plain
2007190722		TS1351	-36.774	142.076	123	6/03/08	VIC	Horsham	Wimmera River	flood plain
2007190723		TS1326	-38.587	146.909	6	15/04/08	VIC	Warragul Special	Bruthen Creek	flood plain
2007190724		TS0781	-20.848	130.742	300	31/05/08	NT	Mt Theo		aeolian sheet
2007190725		TS1100	-25.789	146.599	407	20/05/08	QLD	Augathella	Warrego River	flood plain
2007190726		TS0608	-33.610	115.559	26	15/01/08	WA	Collie	Ludlow River	flood plain
2007190727		TS0785	-21.101	131.698	400	30/05/08	NT	Mt Theo		flood plain
2007190728		TS0086	-28.151	135.280	91	13/09/09	SA	Warrina	Arckaringa Creek	alluvial plain
2007190730		TS0621	-34.162	115.184	13	15/01/08	WA	Augusta	Blackwood River	alluvial terrace
2007190732	2007191450	TS1002	-22.303	144.698	229	31/03/08	QLD	Muttaburra	Towerhill Creek	flood plain
2007190733		TS0705	-15.481	135.400	10	15/07/08	NT	Mount Young	Limmen Bight River	alluvial terrace
2007190735	2007191549	TS1227	-31.596	143.478	92	8/11/07	NSW	Wilcannia	Darling River	flood plain
2007190737		TS1000	-22.319	142.533	161	3/04/08	QLD	Winton	Western River	anastomatic plain
2007190738		TS0831	-25.022	134.481	310	7/05/08	NT	Finke	Interdunal depression	aeolian landforms
2007190739	2007190659	TS0609	-33.649	123.760	4	21/01/08	WA	Malcolm	Un-named creek system	flood plain
2007190741		TS0170	-29.266	139.238	26	12/09/08	SA	Marree	Tooncatchyin Creek	alluvial plain
2007190742		TS0939	-18.850	141.195	43	25/09/07	QLD	Croydon	Stock Route/Spear Creek	flood plain
2007190743	2007190906	TS0165	-29.803	138.364	65	22/05/09	SA	Marree	Frome River	bar plain
2007190744		TS0121	-36.224	139.781	13	12/05/08	SA	Naracoorte		alluvial swamp
2007190746	2007191241	TS0174	-29.011	140.505	42	15/09/08	SA	Callabonna		pediplain
2007190747	2007190212	TS0816	-23.578	131.138	690	1/04/09	NT	MT Liebig		meander plain
2007190748		TS1223	-31.272	144.787	128	6/11/07	NSW	Barnato	Tambua Creek	alluvial plain
2007190750		TS0534	-29.946	123.699	322	11/07/08	WA	Minigwal		longitudinal dunefield
2007190751		TS0085	-28.115	133.511	239	10/09/09	SA	Murloocoppie		pediplain
2007190752	2007190554	TS0673	-14.184	129.651	15	5/08/09	NT	Port Keats	Ingurmunal Creek	alluvial terrace
2007190753	2007191299	TS1176	-29.297	145.023	151	30/04/08	NSW	Yantabulla	Cuttaburra Creek	flood plain
2007190754		TS0826	-24.263	129.786	826	3/04/09	NT	Bloods Range	Lake Neale	stagnant alluvial plain
2007190755		TS1266	-33.094	147.059	208	5/09/07	NSW	Forbes	Lachlan River	flood plain
2007190756		TS0810	-22.814	130.337	350	1/06/08	NT	Lake Mackay		source bordering dune
2007190757		TS0815	-23.465	137.830	152	14/05/08	NT	Hay River	Field River	alluvial terrace
2007190758	2007190296	TS0773	-19.923	132.596	440	29/07/08	NT	Green Swamp Well		aeolian landforms
2007190759		TS1261	-32.999	146.502	186	5/09/07	NSW	Cargelligo	Crowie Ck	alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190761		TS0033	-31.558	136.363	106	6/11/09	SA	Gairdner		longitudinal dunefield
2007190762		TS1118	-26.866	150.159	288	3/11/07	QLD	Chinchilla	Condamine River	alluvial plain
2007190763		TS0008	-33.876	135.401	20	25/11/08	SA	Kimba		karst
2007190764		TS0904	-16.988	138.311	30	22/09/07	QLD	Mornington	Lagoon Creek	alluvial plain
2007190766		TS0571	-31.621	126.824	125	26/01/08	WA	Madura		peneplain
2007190767		TS0914	-17.694	141.153	6	22/09/07	QLD	Normanton	Carron River	alluvial plain
2007190768	2007190425	TS1263	-33.157	147.452	220	5/09/07	NSW	Forbes	Goobang Creek	flood plain
2007190769		TS0551	-30.928	117.383	295	5/12/07	WA	Bencubbin	Cowcowing Lakes	flood plain
2007190770		TS0857	-17.472	130.816	320	27/07/08	NT	Wave Hill	Victoria River	alluvial terrace
2007190771		TS0032	-31.683	131.939	49	17/07/09	SA	Nullarbor		alluvial plain
2007190772		TS0907	-17.636	139.182	12	20/09/07	QLD	Westmoreland	Lily Creek	flood plain
2007190774	2007190458	TS0927	-18.561	140.719	30	21/09/07	QLD	Donors Hill	Flinders River	alluvial plain
2007190775		TS1238	-31.893	152.412	37	11/06/08	NSW	Armidale	Manning River	flood plain
2007190776		TS0427	-28.314	122.767	471	31/03/08	WA	Laverton	Unnamed drainage	flood plain
2007190778		TS1360	-37.559	149.149	98	1/04/08	VIC	Mallacoota	Cann River	flood plain
2007190779		TS1345	-36.125	144.981	102	24/10/07	VIC	Barmah	Goulbourn River	alluvial plain
2007190781		TS1316	-38.100	147.038	11	3/04/08	VIC	Bairnsdale Special	Thompson River	alluvial plain
2007190782		TS1279	-33.978	149.168	412	21/01/08	NSW	Bathurst	Abercrombie Creek	alluvial terrace
2007190783		TS0993	-21.928	146.926	206	8/10/07	QLD	Buchanan	Mistake Creek	alluvial plain
2007190785		TS0698	-15.325	129.089	8	10/07/08	NT	Auvergne	Keep River	alluvial plain
2007190787		TS1190	-30.275	144.102	125	7/11/07	NSW	Louth	Cuttaburra Channels?	flood plain
2007190788	2007190193	TS1305	-35.347	145.536	115	19/12/07	NSW	Jerilderie	Billabong Creek	flood plain
2007190789		TS0899	-16.518	143.308	106	4/10/07	QLD	Walsh	Lynd River	flood plain
2007190790		TS1292	-34.763	146.565	173	18/12/07	NSW	Narranderra	Murrumbidgee River	flood plain
2007190791		TS0995	-22.385	143.101	287	3/04/08	QLD	Winton	Jessemine Creek	anastomatic plain
2007190792		TS0862	-12.214	142.992	14	16/08/08	QLD	Cape Weymouth	Olive River	alluvial plain
2007190793		TS0508	-27.376	115.928	267	16/11/07	WA	Murgoo	Sanford River	alluvial plain
2007190794		TS1168	-28.737	147.114	134	30/10/07	QLD	Dirranbandi	Mungallala Creek	flood plain
2007190795		TS1066	-24.752	143.901	208	29/05/08	QLD	Jundah	Barcoo River	flood plain
2007190796		TS1284	-34.197	144.112	93	23/01/08	NSW	Hay	Lachlan River	flood plain
2007190798	2007191229	TS0652	-12.427	134.699	7	11/08/09	NT	Millingimbi	Blyth River	alluvial terrace
2007190799		TS0452	-29.177	124.621	317	28/03/08	WA	Plumridge	Unnamed salt lakes	flood plain
2007190802		TS1201	-30.197	149.502	221	12/05/08	NSW	Narrabri	Namoi River	flood plain
2007190803		TS0421	-25.753	114.202	6	5/03/08	WA	Wooramel	unnamed watercourse/claypans	stagnant alluvial plain
2007190805		TS0579	-31.846	119.999	388	10/12/07	WA	Boorabbin	Barker Lake system	flood plain
2007190806		TS1295	-34.841	148.365	256	17/12/07	NSW	Cootamundra	Murrumbidgee River	flood plain
2007190807		TS0105	-27.084	135.522	110	10/08/08	SA	Oodnadatta	Embolla/Stevenson Creek	flood plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190809		TS0015	-33.051	134.319	18	30/04/09	SA	Streaky Bay		coastal plain
2007190810		TS0587	-32.121	116.033	25	14/01/08	WA	Pinjarra	Canning River	flood plain
2007190811		TS1012	-23.054	141.650	122	1/04/08	QLD	Brighton Downs	Mackunda Creek	flood plain
2007190812		TS1359	-37.786	144.589	58	5/10/07	VIC	Melbourne	Werribee River	flood plain
2007190813	2007190698	TS1297	-35.023	144.528	81	23/01/08	NSW	Deniliquin	Carroonboon Creek	flood plain
2007190814		TS0023	-32.158	136.785	86	30/09/09	SA	Port Augusta	JD Creek	longitudinal dunefield
2007190816		TS0947	-19.557	141.014	67	26/09/07	QLD	Millungera	Cloncurry River	alluvial plain
2007190817		TS0742	-18.679	132.990	400	27/07/08	NT	South Lake Woods		aeolian landforms
2007190818	2007191157	TS0622	-34.266	119.403	9	19/02/08	WA	Bremer Bay	Gairdner River	alluvial terrace
2007190819		TS0448	-28.764	120.623	372	3/03/08	WA	Leonora	Lake Raeside	flood plain
2007190821		TS0905	-16.948	142.077	47	25/09/07	QLD	Galbraith	Pelican Creek	alluvial plain
2007190822		TS0591	-30.774	125.899	184	29/01/08	WA	Seemore		peneplain
2007190823		TS1380	-41.660	144.934	1	6/02/08	TAS	North West	Pieman R	alluvial plain
2007190825	2007191214	TS0976	-20.308	141.159	93	27/09/07	QLD	Julia Creek	Fullarton River	flood plain
2007190826	2007191052	TS0780	-20.902	129.349	310	31/05/08	NT	Highland Rocks		source bordering dune
2007190827	2007191440	TS0498	-27.199	119.954	499	23/02/08	WA	Sandstone	Un-named Creek	flood plain
2007190829		TS0265	-19.988	120.217	18	10/06/08	WA	Mandora	Unnamed flood plain	flood plain
2007190830		TS0954	-20.149	138.039	221	18/09/07	QLD	Mt Isa	Georgina River	flood plain
2007190831		TS0897	-16.819	141.322	7	24/09/07	QLD	Galbraith	Gilbert River	flood plain
2007190832		TS0060	-29.692	133.476	147	23/07/08	SA	Tallaringa		drainage depression
2007190833		TS0807	-22.934	136.784	240	14/05/08	NT	Tobermorey	Hay River	alluvial plain
2007190834	2007190889	TS0616	-33.829	120.794	2	15/12/07	WA	Ravensthorpe	Olfield River	Flood plain
2007190835		TS0038	-31.268	131.691	55	21/06/09	SA	Nullarbor		pediplain
2007190836		TS0330	-22.714	114.349	40	1/04/08	WA	Yanrey Special	n.a.	alluvial plain
2007190838		TS1180	-29.372	146.720	135	16/04/08	NSW	Enngonia	Culgoa River	flood plain
2007190839		TS1089	-25.447	151.667	70	25/07/07	QLD	Maryborough	Burnett River	alluvial terrace
2007190841		TS0999	-22.411	139.960	167	6/04/08	QLD	Boulia	Wills Creek	anastomatic plain
2007190842		TS0955	-19.543	140.856	71	26/09/07	QLD	Dobbyn	Dugald River	anastomatic plain
2007190843		TS1008	-22.651	150.461	15	17/11/08	QLD	Port Clinton	Shoalwater Creek	alluvial plain
2007190844		TS0003	-34.577	135.572	25	23/11/08	SA	Lincoln		alluvial swamp
2007190846		TS1101	-25.755	142.358	115	27/05/08	QLD	Canterbury	Cooper Creek	alluvial plain
2007190847		TS0128	-34.664	138.488	2	10/11/09	SA	Adelaide	Gawler River	flood plain
2007190848		TS0844	-25.202	135.691	157	9/05/08	NT	McDills	Unnamed creek	alluvial terrace
2007190849	2007191277	TS1151	-28.434	146.655	147	31/10/07	QLD	Cunnamulla	Warrambah Creek	flood plain
2007190850		TS0213	-16.736	123.909	38	15/06/08	WA	Yampi	Stewart River	alluvial terrace
2007190851		TS0147	-32.251	138.162	0	19/07/07	SA		Willochra Ck	alluvial plain
2007190852		TS0779	-21.020	130.103	280	31/05/08	NT	Highland Rocks		flood plain
2007190853	2007190939	TS0146	-32.272	137.754	14	18/07/07	SA			alluvial plain

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2007190854		TS0052	-30.535	135.539	129	15/07/08	SA	Kingoonya		pediplain
2007190855		TS0487	-26.608	118.166	431	26/02/08	WA	Belele	Hope River	anastomatic plain
2007190856	2007190357	TS0684	-15.046	135.210	15	16/07/08	NT	Mount Young	Towns River	alluvial terrace
2007190857		TS0825	-24.255	135.233	382	20/04/08	NT	Alice Springs		floodout
2007190858		TS0924	-18.139	141.168	26	29/09/07	QLD	Croydon	Belmore Creek	flood plain
2007190859		TS0289	-20.876	116.513	20	3/04/08	WA	Dampier Special	Yanyare River	flood plain
2007190861		TS0461	-29.545	116.714	278	20/02/08	WA	Perenjori	Mongers Lake	lacustrine plain
2007190862		TS0706	-16.161	136.757	13	17/07/08	NT	Robinson River	Wearyan River	alluvial terrace
2007190864		TS0464	-29.353	117.818	307	29/04/08	WA	Ningham	Warne River/Lake Moore	flood plain
2007190865	2007191183	TS0046	-30.744	136.905	67	4/08/08	SA	Andamooka	Coorlay Creek	alluvial plain
2007190866		TS0686	-15.102	133.076	162	20/09/07	NT	Larrimah	Elsey River	alluvial plain
2007190867		TS1032	-23.557	145.805	304	31/03/08	QLD	Jericho	Alice River	alluvial plain
2007190868		TS0678	-14.827	130.185	13	9/07/08	NT	Port Keats	Fitzmaurice River	alluvial plain
2007190870		TS0025	-31.988	137.209	90	21/08/09	SA	Torrens		erosional plain
2007190871		TS0613	-33.592	122.173	115	15/12/07	WA	Esperance		flood plain
2007190874	2007191297	TS0722	-17.409	130.774	330	27/07/08	NT	Wave Hill	Giles Creek	alluvial terrace
2007190875	2007190256	TS0087	-28.132	136.783	2	12/08/08	SA	Lake Eyre	Neales River	alluvial swamp
2007190876	2007190035	TS0968	-20.402	147.350	76	7/08/07	QLD	Bowen	Burdkin River	alluvial terrace
2007190877		TS0631	-34.984	116.630	14	16/01/08	WA	Pemberton	Deep Creek	flood plain
2007190878		TS1084	-25.589	152.700	0	24/07/07	QLD	Maryborough	Tinana Creek	flood plain
2007190879		TS0679	-14.715	132.081	102	20/09/07	NT	Katherine	King River	alluvial plain
2007190881		TS0513	-27.699	117.984	413	23/02/08	WA	Cue	Lake Austin	lacustrine plain
2007190882		TS0729	-17.752	131.534	192	11/04/08	NT	Wave Hill	Unnamed	anastomatic plain
2007190883		TS0477	-26.546	115.485	242	12/05/08	WA	Yaringa	Unnamed zone of multiple lakes and dunes	flood plain
2007190884		TS0714	-16.644	135.845	61	15/07/08	NT	Bauhinia Downs	McArthur River	alluvial terrace
2007190885		TS1340	-35.776	143.920	86	23/10/07	VIC	Kerang	Avon River	flood plain
2007190886		TS1328	-38.661	146.274	18	15/04/08	VIC	Warragul Special	Franklin River	flood plain
2007190887	2007191058	TS0659	-13.799	130.417	17	13/07/08	NT	Cape Scott	Water Door Creek	alluvial plain
2007190888		TS0010	-33.503	135.329	37	3/05/09	SA	Streaky Bay		rises
2007190889	2007190834	TS0616	-33.830	120.794	2	15/12/07	WA	Ravensthorpe	Olfield River	Flood plain
2007190890		TS0553	-31.202	119.294	317	3/07/07	WA	Southern Cross	Lake Koorkoordine	playa plain
2007190891		TS0794	-21.869	136.077	328	15/05/08	NT	Elkedra	Sandover River	alluvial terrace
2007190894		TS0560	-31.129	124.310	164	30/01/08	WA	Zanthus	Ponton Creek	flood plain
2007190895	2007190947	TS1188	-29.701	147.369	162	17/04/08	NSW	Angledool	Narran River	flood plain
2007190896	2007191441	TS0429	-28.266	117.389	360	24/02/08	WA	Kirkalocka	unnamed	alluvial plain
2007190897		TS1070	-25.370	151.084	163	25/07/07	QLD	Mundubbera	Burnett River	alluvial plain
2007190898		TS1127	-27.132	152.507	80	25/10/07	QLD	Ipswich	Brisbane River	alluvial terrace

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190901		TS0564	-31.351	120.209	389	10/12/07	WA	Boorabbin	Un-named dry lakes	flood plain
2007190902		TS1363	-37.710	144.838	30	1/10/07	VIC	Melbourne	Maryibinong River	flood plain
2007190903		TS0660	-13.583	135.697	12	16/08/09	NT	Blue Mud Bay	Walker Creek	alluvial terrace
2007190904		TS0268	-20.054	119.311	1	9/06/08	WA	Port Headland	Unnamed flood plain	flood plain
2007190905		TS0766	-20.201	133.871	430	30/07/08	NT	Bonney Well		aeolian landforms
2007190906	2007190743	TS0165	-29.803	138.365	60	22/05/09	SA	Marree	Frome River	bar plain
2007190907		TS0024	-32.156	135.857	127	28/09/09	SA	Yardea		low hills
2007190909	2007190536	TS0847	-25.192	137.937	57	10/05/08	NT	Simpson Desert South	Interdunal depression	aeolian landforms
2007190910		TS0778	-20.799	134.242	353	25/05/08	NT	Bonney Well	Wycliffe Creek	alluvial plain
2007190912		TS0994	-22.284	148.942	135	22/10/07	QLD	Saint Lawrence	Funnel Creek	flood plain
2007190913	2007190107	TS0048	-30.693	134.281	105	5/11/09	SA	Tarcoola		peneplain
2007190914		TS0511	-27.387	117.765	411	23/02/08	WA	Cue	Nalla Creek	alluvial plain
2007190915		TS0406	-25.193	115.511	178	2/03/08	WA	Glenburgh	Gascoyne River	alluvial plain
2007190916		TS0765	-20.109	132.990	430	29/07/08	NT	Lander River		aeolian landforms
2007190917		TS0334	-22.646	119.969	413	5/06/08	WA	Roy Hill	Fortescue River	alluvial terrace
2007190918		TS0125	-35.250	138.995	39	28/05/08	SA	Barker		alluvial plain
2007190919		TS0949	-19.558	147.103	23	6/08/07	QLD	Ayr	Logan River	alluvial terrace
2007190921		TS0935	-18.805	143.277	296	5/10/07	QLD	Georgetown	Gilbert River	alluvial plain
2007190922	2007191082	TS0127	-35.084	139.885	46	15/05/08	SA	Pinnaroo		low hills
2007190923		TS0469	-25.742	114.295	21	5/03/08	WA	Wooramel	Wooramel River	stagnant alluvial plain
2007190924	2007190695	TS0728	-18.171	133.492	203	23/05/08	NT	South Lake Woods	No defined watercourse	stagnant alluvial plain
2007190925		TS0906	-17.235	138.678	27	22/09/07	QLD	Westmoreland	Cliffdale Creek	alluvial plain
2007190926		TS1236	-31.829	145.277	177	6/11/07	NSW	Barnato	Sandy Creek	alluvial plain
2007190927	2007191444	TS1217	-30.752	152.192	167	14/05/08	NSW	Dorrigo	Macleay River	flood plain
2007190928		TS0480	-26.289	116.889	348	13/05/08	WA	Byro	Whela Creek	flood plain
2007190929		TS1182	-29.445	153.210	36	7/02/08	NSW	Maclean	Clarence River	flood plain
2007190930		TS0885	-15.503	142.538	55	3/10/07	QLD	Hann River	Crosbie Creek	flood plain
2007190931		TS0817	-23.835	130.379	559	3/04/09	NT	MT Rennie		aeolian dunes
2007190932		TS0341	-22.861	120.289	425	4/06/08	WA	Balfour Downs	Jigalong Creek	flood plain
2007190933		TS1106	-26.645	141.803	83	5/06/08	QLD	Barrolka	Cooper Creek	flood plain
2007190936		TS1113	-26.392	146.248	286	21/05/08	QLD	Charleville	Maranoa River	alluvial plain
2007190939	2007190853	TS0146	-32.272	137.754	12	18/07/07	SA			alluvial plain
2007190941		TS0861	-12.105	142.278	21	13/08/08	QLD	Weipa	Ducie River	alluvial terrace
2007190942		TS0225	-17.661	123.392	17	14/06/08	WA	Derby	Logue River	flood plain
2007190943		TS1213	-30.918	144.012	107	2/04/08	NSW	Louth	Paroo Overflow	flood plain
2007190945		TS1225	-31.447	152.740	39	11/06/08	NSW	Hastings	Hastings River	flood plain
2007190946		TS0791	-21.644	129.678	400	31/05/08	NT	Highland Rocks		flood plain

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2007190947	2007190895	TS1188	-29.701	147.369	155	17/04/08	NSW	Angledool	Narran River	flood plain
2007190948		TS0821	-23.934	135.849	283	21/04/08	NT	Alice Springs	Illogwa Creek	alluvial terrace
2007190949	2007191504	TS0021	-32.448	136.005	136	28/09/09	SA	Yardea		low hills
2007190950		TS0830	-24.118	136.890	157	11/05/08	NT	Simpson Desert North	Plenty River	alluvial terrace
2007190951		TS0423	-28.176	115.702	256	17/11/07	WA	Yalgoo	Greenough River	flood plain
2007190952		TS0588	-31.584	127.660	116	26/01/08	WA	Eucla		peneplain
2007190953		TS0557	-30.938	116.051	184	12/11/07	WA	Moora	Moore River North Branch	flood plain
2007190954		TS0607	-33.518	116.807	214	4/07/07	WA	Collie	Arthur River	flood plain
2007190955		TS0134	-34.151	138.261	20	17/07/07	SA		Wakefield River	alluvial plain
2007190958		TS0953	-20.228	148.495	7	8/08/07	QLD	Bowen	Gregory River	alluvial terrace
2007190959		TS0541	-30.300	115.197	59	13/11/07	WA	Hill River	Hill River	flood plain
2007190962	2007190197	TS0217	-17.078	124.067	18	15/06/08	WA	Derby	Alexander River	flood plain
2007190963		TS0696	-15.670	129.896	16	10/07/08	NT	Auvergne	West Bzines River	alluvial plain
2007190964		TS1331	-34.984	142.060	61	18/10/07	VIC	Mildura	Swale of dune	longitudinal dunefield
2007190966		TS0224	-17.347	124.367	48	16/06/08	WA	Derby	Lennard River	flood plain
2007190967		TS0041	-31.177	135.341	132	4/11/09	SA	Kingoonya		low hills
2007190968	2007191437	TS1148	-28.035	141.910	63	7/06/08	QLD	Tickalara	Elizabeth Creek	flood plain
2007190969		TS1258	-32.945	141.452	50	20/02/08	NSW	Menindee	Turkey Plain Creek	flood plain
2007190970	2007191245	TS1372	-41.049	144.675	1	6/02/08	TAS	North West	Arthur R	alluvial plain
2007190971		TS0677	-14.738	134.047	49	12/07/08	NT	Urapunga	Roper River	alluvial plain
2007190972		TS1255	-32.681	141.678	77	1/04/08	NSW	Menindee	Pine Creek	flood plain
2007190973		TS0430	-28.362	119.589	413	6/03/08	WA	Youanmi	Unnamed tributary to Lake Noondie	flood plain
2007190974	2007190419	TS0741	-18.576	136.116	208	10/10/07	NT	Brunette Downs	Brunette Ck	alluvial plain
2007190975		TS0453	-29.382	126.292	190	29/03/08	WA	Jubilee	Unnamed drainage	alluvial plain
2007190976		TS0401	-25.045	117.587	411	28/02/08	WA	Robinson Ranges	Gascoyne River	alluvial plain
2007190978	2007190241	TS1244	-32.400	150.371	182	12/03/08	NSW	Singleton	Goulburn River	flood plain
2007190979		TS0962	-20.402	141.335	100	27/09/07	QLD	Julia Creek	Eastern Creek	flood plain
2007190982		TS1286	-34.033	144.826	106	23/01/08	NSW	Hay	Mirrool Ck	flood plain
2007190984	2007190039	TS0515	-27.532	115.218	220	16/11/07	WA	Ajana	Murchison River	alluvial plain
2007190985		TS0795	-21.652	136.649	277	15/05/08	NT	Sandover River	Swamp	alluvial swamp
2007190986	2007191592	TS0796	-22.237	134.557	486	26/05/08	NT	Alcoota	Sandover River	alluvial terrace
2007190989	2007190342	TS0404	-25.147	116.933	368	29/02/08	WA	Glenburgh	Gascoyne River	alluvial plain
2007190990	2007191537	TS0894	-16.533	142.057	20	25/09/07	QLD	Galbraith	Staaten River	alluvial plain
2007190991		TS1289	-34.335	146.578	182	6/09/07	NSW	Narranderra	Mirrool Ck	alluvial plain
2007190992		TS1058	-24.331	147.444	300	15/10/07	QLD	Springsure	Nogoa River	alluvial plain
2007190993		TS1376	-41.192	146.252	4	7/02/08	TAS	North West	Forth R	alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007190994		TS0731	-17.975	135.576	213	21/05/08	NT	Walhallow	Croswell Creek	alluvial plain
2007190995		TS0139	-33.340	138.065	32	17/07/07	SA		Broughton River	alluvial plain
2007190996		TS0841	-24.835	130.729	462	2/04/09	NT	Lake Amadeus	Lake Amadaus	stagnant alluvial plain
2007190997		TS0530	-29.718	125.256	200	29/03/08	WA	Plumridge	Unnamed drainage	stagnant alluvial plain
2007190998		TS0880	-14.976	141.799	3	2/10/07	QLD	Holroyd	Lightning Creek	flood plain
2007190999		TS1154	-28.556	147.407	144	31/10/07	QLD	Dirranbandi	Wallam Creek	alluvial plain
2007191001		TS0920	-17.993	145.930	11	10/10/07	QLD	Innisfail	Tully River	flood plain
2007191002		TS0768	-20.447	130.642	310	25/07/08	NT	Mt Solitaire		floodout
2007191003		TS0337	-22.729	115.698	105	4/05/08	WA	Wyloo	Henry River	alluvial terrace
2007191004	2007190457	TS0124	-35.541	138.577	30	27/06/08	SA	Barker	Inman River	flood plain
2007191005		TS0951	-19.929	147.844	27	6/08/07	QLD	Ayr	Elliott River	alluvial terrace
2007191006		TS0326	-22.339	119.241	403	5/06/08	WA	Roy Hill	Fortescue Marsh	flood plain
2007191007	2007191551	TS1031	-23.106	149.868	41	23/10/07	QLD	Duaringa	Fitzroy River	alluvial plain
2007191008		TS0753	-19.320	131.641	320	26/07/08	NT	Birrindudu		aeolian landforms
2007191011		TS0971	-20.803	142.263	137	1/10/07	QLD	Julia Creek	Alick Creek	flood plain
2007191012		TS1378	-41.438	147.171	3	7/02/08	TAS	North East	North Esk R	alluvial plain
2007191013		TS0692	-15.295	134.101	65	18/08/09	NT	Hodgson Downs	Hodgson River	alluvial plain
2007191014		TS1282	-34.050	141.068	26	20/02/08	NSW	Mildura	Murray River	flood plain
2007191015		TS1071	-24.938	152.203	24	29/10/07	QLD	Bundaberg	Burnett River	alluvial terrace
2007191016		TS0688	-15.287	135.527	16	16/07/08	NT	Mount Young	Nathan River	alluvial terrace
2007191018		TS0405	-25.059	113.971	15	3/03/08	WA	Carnarvon Special	unnamed watercourse/claypans	stagnant alluvial plain
2007191019		TS0929	-18.225	139.900	19	20/09/07	QLD	Donors Hill	Alexandra River	alluvial plain
2007191021		TS0347	-23.293	113.921	12	31/03/08	WA	Minilya Special	n.a.	alluvial plain
2007191022		TS1222	-30.917	141.914	143	29/05/08	NSW	Cobham Lake	Noonthorangee Crek	flood plain
2007191023		TS0694	-15.612	135.840	43	15/07/08	NT	Mount Young	Rosie Creek	alluvial terrace
2007191024		TS1067	-24.399	148.585	209	15/10/07	QLD	Baralaba	Comet River	alluvial plain
2007191025		TS0426	-28.263	120.093	403	6/03/08	WA	Leonora		flood plain
2007191027	2007190434	TS0593	-32.345	121.706	257	12/12/07	WA	Norseman	Picnic Lake area	flood plain
2007191028	2007191531	TS0938	-19.015	138.725	137	19/09/07	QLD	Camooweal	Gregory River	flood plain
2007191029		TS1246	-32.298	148.624	284	11/03/08	NSW	Dubbo	Macquarie River	flood plain
2007191030		TS1177	-29.526	143.219	117	26/05/08	NSW	Urisino	Feeder Creek	flood plain
2007191031	2007190155	TS1073	-24.977	138.736	54	23/05/08	QLD	Bedourie	Eyre Creek	alluvial swamp
2007191032		TS0214	-16.753	123.995	17	15/06/08	WA	Yampi	Robinson River	flood plain
2007191035		TS0987	-21.820	145.262	263	1/04/08	QLD	Tangorin	Torrens Creek	alluvial plain
2007191036		TS0175	-28.766	140.889	80	15/09/08	SA	Strzelecki		pediplain
2007191037		TS1233	-31.828	148.849	341	3/02/08	NSW	Gilgandra	Castlereagh River	flood plain
2007191038		TS0749	-19.236	136.378	211	8/10/07	NT	Alroy	Buchanan Ck	alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191039		TS1003	-22.908	138.862	135	3/04/08	QLD	Glenormiston	Georgina River	flood plain
2007191042		TS0597	-32.642	120.578	321	20/01/08	WA	Lake Johnston	Lake Johnston	plain
2007191043		TS0227	-17.738	123.645	17	14/06/08	WA	Derby	Fitzroy River	flood plain
2007191044		TS0903	-17.191	141.729	47	25/09/07	QLD	Normanton	Smithburne River	flood plain
2007191045	2007190114	TS1095	-25.686	151.780	173	24/07/07	QLD	Maryborough	Burambha River	flood plain
2007191046		TS0886	-15.707	142.619	50	3/10/07	QLD	Hann River	Alice River	flood plain
2007191047		TS0543	-30.529	121.203	352	8/12/07	WA	Kalgoorlie	Black Flag Lake area	flood plain
2007191050	2007190393	TS1334	-35.396	143.650	81	17/10/07	VIC	Swan Hill	Murray River	flood plain
2007191051	2007191331	TS1045	-24.085	143.132	166	28/05/08	QLD	Jundah	Vergemont Creek	alluvial plain
2007191052	2007190826	TS0780	-20.902	129.348	310	31/05/08	NT	Highland Rocks		source bordering dune
2007191053	2007190091	TS1099	-25.891	147.818	441	20/05/08	QLD	Eddystone	Maranoa River	flood plain
2007191056		TS0681	-14.972	129.841	2	10/07/08	NT	Port Keats	Unnamed watercourse	alluvial plain
2007191057		TS0449	-29.755	119.737	407	5/03/08	WA	Barlee	Lake Giles	flood plain
2007191058	2007190887	TS0659	-13.798	130.417	25	13/07/08	NT	Cape Scott	Water Door Creek	alluvial plain
2007191059	2007190005	TS1137	-27.823	153.001	32	29/08/07	QLD	Brisbane	Logan River	alluvial terrace
2007191061		TS1147	-27.992	147.488	192	1/11/07	QLD	Homboin	Wallam Creek	alluvial plain
2007191062		TS0415	-25.508	120.235	529	25/02/08	WA	Nabberu	Lake Nabberu	flood plain
2007191063	2007190583	TS0921	-18.046	138.857	45	23/09/07	QLD	Lawnhill	Gum Hole	anastomatic plain
2007191065		TS1230	-31.462	143.137	102	8/11/07	NSW	Wilcannia	No Name	alluvial plain
2007191066	2007191379	TS0156	-31.123	139.562	24	2/10/08	SA	Curnamona	Balcoracana Creek	pediment
2007191067		TS1231	-31.775	145.227	192	6/11/07	NSW	Barnato	Buckwaroon Creek	alluvial plain
2007191068		TS0736	-18.384	129.418	350	25/07/08	NT	Tanami East	Sturt Creek	alluvial terrace
2007191069		TS0898	-16.886	138.152	28	21/09/07	QLD	Mornington	Settlement Creek	flood plain
2007191070		TS0027	-31.898	132.964	5	20/07/09	SA	Fowler		peneplain
2007191071		TS0745	-18.936	135.859	223	9/10/07	NT	Brunette Downs	Boree/Kennedy Ck	alluvial swamp
2007191073		TS1166	-17.296	141.179	7	24/09/07	QLD	Normanton	Fitzmaurice Creek	flood plain
2007191074		TS1167	-15.368	141.959	9	2/10/07	QLD	Rutland Plains	Mitchell River	flood plain
2007191076		TS0626	-34.650	118.626	25	17/01/08	WA	Bremer Bay	Willyun Creek	alluvial terrace
2007191077		TS0801	-22.441	129.320	320	1/06/08	NT	Lake Mackay		source bordering dune
2007191078		TS0922	-18.204	138.684	65	27/09/07	QLD	Lawnhill	Lawn Hill Creek	flood plain
2007191079		TS1310	-36.066	150.051	23	29/11/07	NSW	SJ/56-1 (Unnamed)	Tuross River	flood plain
2007191082	2007190922	TS0127	-35.085	139.885	49	15/05/08	SA	Pinnaroo		low hills
2007191084		TS0840	-25.051	136.762	103	10/05/08	NT	Simpson Desert South	Interdunal depression	aeolian landforms
2007191085		TS1170	-29.023	149.074	196	5/02/08	NSW	Moree	Barwon River	flood plain
2007191087		TS0998	-22.222	146.556	220	8/10/07	QLD	Galilee	Belyando River	alluvial plain
2007191088		TS0619	-33.876	120.227	1	16/12/07	WA	Ravensthorpe	Jerdacuttup River	Flood plain
2007191089		TS0098	-27.605	137.461	2	8/09/09	SA	Noolyeana	Kallakoopah Creek	longitudinal dunefield

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2007191090		TS1173	-29.409	146.651	151	16/04/08	NSW	Enngonia	Bow Creek	flood plain
2007191091		TS1162	-29.175	151.395	329	30/08/07	QLD	Inverell	Dumaresq	alluvial terrace
2007191092	2007191211	TS1323	-38.290	142.675	76	4/03/08	VIC	Colac	Hopkins River	flood plain
2007191093		TS1234	-32.397	142.426	73	2/04/08	NSW	Menindee	Darling River	flood plain
2007191094	2007190361	TS0582	-32.167	125.360	113	25/01/08	WA	Culver		peneplain
2007191096		TS1300	-34.945	143.478	72	20/12/07	NSW	Balranald	Wakool River	flood plain
2007191097		TS0183	-27.062	138.778	9	25/10/08	SA	Gason	Warburton River	meander plain
2007191098		TS1020	-22.975	146.723	278	19/10/08	QLD	Galilee	Belyando River	flood plain
2007191099		TS0071	-29.005	135.414	111	18/07/08	SA	Billakalina	Engenina Creek	flood plain
2007191101		TS0952	-20.000	141.797	125	30/09/07	QLD	Julia Creek	Saxby River	flood plain
2007191102		TS0873	-14.240	141.659	7	16/10/08	QLD	Holroyd	Holroyd River	meander plain
2007191103		TS0836	-24.854	135.829	180	9/05/08	NT	Hale River	Hale River	flood plain
2007191105	2007190145	TS0039	-31.246	130.898	72	20/06/09	SA	Nullarbor		pediplain
2007191107		TS0525	-28.035	121.645	427	2/03/08	WA	Laverton	Lake Irwin	flood plain
2007191109		TS0135	-33.970	139.677	29	4/07/08	SA	Chowilla	Burra Creek	alluvial terrace
2007191110		TS1353	-36.451	143.979	139	23/10/07	VIC	Serpentine	Loddon River	flood plain
2007191111		TS0102	-27.191	136.421	53	11/08/08	SA	Oodnadatta	Macumba River	flood plain
2007191112		TS0790	-21.496	133.468	450	26/05/08	NT	Mount Peake	Hanson River	alluvial plain
2007191113		TS1336	-35.490	142.947	56	17/10/07	VIC	Tyrrell	Tyrrel Creek	flood plain
2007191114		TS0615	-32.422	122.621	273	14/12/07	WA	Ravensthorpe	Unnamed salt lakes	flood plain
2007191115		TS0680	-14.878	134.563	13	16/07/08	NT	Urapunga	Hodgson River	alluvial terrace
2007191116		TS0743	-18.595	133.195	390	27/07/08	NT	South Lake Woods		aeolian landforms
2007191117		TS0568	-31.295	128.557	122	28/01/08	WA	Eucla		peneplain
2007191118		TS1275	-33.763	147.515	228	4/09/07	NSW	Forbes	Barmedman Ck	flood plain
2007191119	2007190508	TS1028	-23.428	148.149	180	13/10/07	QLD	Emerald	Teresa Creek	alluvial plain
2007191121	2007190067	TS0561	-31.234	121.962	292	9/12/07	WA	Widgiemooltha	Lake Lefroy area	flood plain
2007191122		TS0540	-31.006	124.643	172	30/01/08	WA	Seemore		flood plain
2007191123		TS0937	-19.022	138.764	141	18/09/07	QLD	Camooweal	O'Shannassy River	alluvial plain
2007191125		TS1291	-34.117	141.992	50	19/02/08	NSW	Mildura	Murray River	flood plain
2007191126		TS0359	-23.631	113.986	10	1/05/08	WA	Winning Pool	Lyndon River	flood plain
2007191128		TS1063	-24.504	151.923	18	29/10/07	QLD	Bundaberg	Baffle Creek	alluvial plain
2007191129		TS1136	-27.755	142.264	73	8/06/08	QLD	Durham Downs	Wilson River	flood plain
2007191130		TS0548	-30.842	118.267	300	5/12/07	WA	Bencubbin	Un-named system	flood plain
2007191132		TS1207	-30.249	145.938	114	29/04/08	NSW	Bourke	Mulga Creek	flood plain
2007191134	2007191282	TS0533	-29.907	115.996	242	19/02/08	WA	Perenjori	unnamed claypans	alluvial plain
2007191135		TS0331	-22.518	116.605	279	2/05/08	WA	Wyloo	Duck Creek	alluvial terrace
2007191136		TS0940	-19.105	145.691	342	7/10/07	QLD	Townsville	Burdkin River	alluvial plain
2007191138		TS0152	-31.393	140.015	70	30/09/08	SA	Curnamona		drainage depression

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2007191139		TS0755	-19.525	133.597	400	29/07/08	NT	Tennant Creek		aeolian landforms
2007191141		TS0063	-29.563	134.160	145	22/07/08	SA	Coober Pedy	Wilding Claypan	Alluvial Swamp
2007191142		TS0887	-15.887	143.482	138	4/10/07	QLD	Hann River	Palmer River	flood plain
2007191143		TS0014	-33.089	137.029	157	29/09/09	SA	Whyalla		pediplain
2007191144		TS0623	-34.401	118.726	22	17/01/08	WA	Bremer Bay	Pallinup River	flood plain
2007191145		TS0133	-34.476	140.368	35	3/06/08	SA	Renmark		low hills
2007191147		TS0868	-13.363	141.823	60	8/08/08	QLD	Aurukun	Watson River	coastal lands
2007191149		TS0733	-18.278	134.532	207	22/05/08	NT	Helen Springs	Attack Creek	stagnant alluvial plain
2007191152	2007191578	TS0761	-19.877	130.320	300	25/07/08	NT	Tanami		aeolian landforms
2007191154		TS1050	-23.964	149.868	93	26/10/07	QLD	Duaringa	Don River	alluvial terrace
2007191155		TS0005	-34.026	137.587	14	25/06/08	SA	Maitland		alluvial swamp
2007191156		TS0141	-33.220	140.509	87	4/06/08	SA	Chowilla		peneplain
2007191157	2007190818	TS0622	-34.266	119.402	7	19/02/08	WA	Bremer Bay	Gairdner River	alluvial terrace
2007191158		TS1241	-32.111	147.463	221	5/11/07	NSW	Narromine	Bogan River	alluvial plain
2007191159		TS0516	-27.567	119.566	477	23/02/08	WA	Sandstone	Lake Mason	flood plain
2007191161		TS0419	-25.739	120.871	528	26/02/08	WA	Nabberu	Lake Teague/Lake Nabberu	flood plain
2007191165		TS0332	-22.596	114.104	6	1/04/08	WA	Yanrey Special	n.a.	alluvial plain
2007191166	2007190618	TS1383	-42.476	146.723	87	9/02/08	TAS	South East	Ouse R	alluvial plain
2007191167		TS0012	-33.334	135.010	16	1/05/09	SA	Streaky Bay		rises
2007191168	2007191195	TS1252	-32.502	142.083	77	1/04/08	NSW	Menindee	Stephens Creek	flood plain
2007191169		TS0941	-19.217	145.426	363	6/10/07	QLD	Clarke River	Clarke River	alluvial plain
2007191172		TS0371	-23.707	113.898	6	1/05/08	WA	Minilya	Lake Macleod	flood plain
2007191173		TS0732	-18.158	131.292	370	27/07/08	NT	Winnecke Creek	Cattle creek	alluvial terrace
2007191174		TS0056	-30.275	136.935	85	6/08/08	SA	Andamooka		peneplain
2007191175		TS0802	-22.811	131.144	500	30/05/08	NT	Mt Doreen	Lake Bennett	floodout
2007191176	2007190258	TS1174	-29.217	152.565	126	7/02/08	NSW	Grafton	Clarence River	flood plain
2007191178		TS0958	-19.921	147.228	47	7/08/07	QLD	Ayr	Burdkin River	alluvial terrace
2007191179		TS0617	-33.067	123.450	139	21/01/08	WA	Malcolm		flood plain
2007191181		TS0036	-31.414	130.058	82	18/06/09	SA	Coompana		pediplain
2007191182	2007190110	TS1354	-37.720	148.476	18	2/04/08	VIC	Bairnsdale Special	Snowy River	flood plain
2007191183	2007190865	TS0046	-30.744	136.905	70	4/08/08	SA	Andamooka	Coorlay Creek	alluvial plain
2007191184		TS1141	-27.894	149.566	262	26/10/07	QLD	Surat	Moonie River	alluvial plain
2007191186		TS1124	-27.284	148.904	229	2/11/07	QLD	Surat	Balonne River	alluvial plain
2007191187		TS1023	-23.140	146.684	296	9/10/07	QLD	Jericho	Native Companion Creek	alluvial plain
2007191188		TS0447	-29.157	119.002	404	5/03/08	WA	Barlee	Lake Barlee	flood plain
2007191189		TS1042	-23.706	141.097	91	4/04/08	QLD	Brighton Downs	Diamantina River	anastomatic plain
2007191190		TS0960	-20.111	148.151	34	6/08/07	QLD	Bowen	Don River	alluvial terrace
2007191192	2007191339	TS0397	-24.818	113.811	18	3/03/08	WA	Carnarvon Special	Gascoyne River	alluvial terrace

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191193		TS1309	-35.959	149.133	717	27/11/07	NSW	Canberra	Murrumbidgee River	alluvial plain
2007191194		TS0628	-34.958	117.041	16	16/01/08	WA	Mount Barker	Kent River	alluvial terrace
2007191195	2007191168	TS1252	-32.503	142.083	74	1/04/08	NSW	Menindee	Stephens Creek	flood plain
2007191197		TS1029	-23.421	148.672	144	14/10/07	QLD	Duaringa	McKenzie River	alluvial plain
2007191198	2007190248	TS0178	-28.067	139.274	7	26/10/08	SA	Kopperamanna	Cooper Creek	meander plain
2007191199		TS0512	-27.445	124.265	371	2/04/08	WA	Throssell	Lake Throssell	stagnant alluvial plain
2007191201		TS0843	-25.066	133.789	348	18/04/08	NT	Finke		flood plain
2007191202		TS1108	-26.416	145.998	289	20/05/08	QLD	Charleville	Langlo River	alluvial plain
2007191203		TS1315	-37.152	149.859	26	28/11/07	NSW	Mallacoota	Towamba River	alluvial plain
2007191204		TS0973	-20.814	146.770	162	12/10/07	QLD	Charters Towers	Cape River	flood plain
2007191206		TS1385	-42.545	145.481	2	5/02/08	TAS	South West	Birches Inlet	alluvial swamp
2007191207		TS1065	-24.515	149.767	102	25/10/07	QLD	Baralaba	Mimosa Creek	alluvial plain
2007191208		TS0065	-29.465	137.076	-11	8/08/08	SA	Curdimurka	Margaret Creek	erosional plain
2007191209		TS1131	-27.708	152.682	7	27/07/07	QLD	Ipswich	Warrill creek	flood plain
2007191210		TS1329	-38.730	143.232	15	3/03/08	VIC	Colac	Gellibrand River	flood plain
2007191211	2007191092	TS1323	-38.291	142.674	76	4/03/08	VIC	Colac	Hopkins River	alluvial plain
2007191212		TS1240	-32.184	148.739	284	12/03/08	NSW	Dubbo	Talbragar River	flood plain
2007191214	2007190825	TS0976	-20.309	141.159	90	27/09/07	QLD	Julia Creek	Fullarton River	flood plain
2007191215	2007191281	TS1033	-23.557	148.141	182	13/10/07	QLD	Emerald	Nogoa River	alluvial plain
2007191216	2007191385	TS0775	-20.315	136.104	243	6/10/07	NT	Frew River		floodout
2007191218		TS0671	-14.658	134.362	15	16/08/09	NT	Urapunga	Roper River	alluvial terrace
2007191219		TS1119	-27.497	141.984	92	5/06/08	QLD	Durham Downs	Cooper Creek	anastomatic plain
2007191221		TS1318	-38.144	144.277	25	4/10/07	VIC	Port Philip	Barwon River	alluvial plain
2007191222		TS0676	-14.791	134.919	9	16/07/08	NT	Urapunga	Roper River	alluvial plain
2007191223		TS0859	-11.104	142.284	88	11/08/08	QLD	Jardine River	Jardine River	alluvial terrace
2007191224		TS0713	-16.444	131.068	81	11/07/08	NT	Victoria Riv. Downs	Victoria River	alluvial plain
2007191225		TS0163	-30.081	140.019	11	1/10/08	SA	Frome	Hamilton Creek	alluvial plain
2007191226		TS0572	-31.658	128.053	101	27/01/08	WA	Eucla		peneplain
2007191227		TS0881	-15.136	141.809	7	2/10/07	QLD	Rutland Plains	Coleman Riverr	flood plain
2007191228		TS1074	-25.064	141.358	99	26/05/08	QLD	Canterbury	Farrars Creek	alluvial plain
2007191229	2007190798	TS0652	-12.428	134.699	12	11/08/09	NT	Millingimbi	Blyth River	alluvial terrace
2007191230		TS0544	-30.877	115.651	112	16/07/08	WA	Moora	Caren Caren Brook	flood plain
2007191231		TS1198	-30.042	142.013	119	28/05/08	NSW	Cobham Lake	Evelyn Creek	flood plain
2007191232		TS0584	-31.954	120.776	318	13/12/07	WA	Boorabbin		flood plain
2007191233		TS0683	-14.918	133.752	71	18/08/09	NT	Urapunga	Strangways River	alluvial plain
2007191234		TS1205	-30.269	142.792	130	27/05/08	NSW	White Cliffs	Yancannia Creek	flood plain
2007191236	2007190548	TS0934	-18.084	143.920	296	6/10/07	QLD	Georgetown	Einsliegh River	alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191237		TS0624	-34.447	115.777	1	15/01/08	WA	Pemberton	Donnelly River	flood plain
2007191238		TS0985	-21.951	144.284	236	30/03/08	QLD	Tangorin	Landsborough River	flood plain
2007191239		TS1092	-25.807	145.581	363	21/05/08	QLD	Augathella	Langelo River	flood plain
2007191241	2007190746	TS0174	-29.017	140.497	44	15/09/08	SA	Callabonna		pediplain
2007191243		TS0965	-20.581	142.922	191	2/10/07	QLD	Richmond	Stawell River	flood plain
2007191244		TS1053	-24.312	138.830	98	26/05/08	QLD	Bedourie	Mulligan River	flood plain
2007191245	2007190970	TS1372	-41.049	144.671	1	6/02/08	TAS	North West	Arthur R	alluvial plain
2007191246		TS0115	-26.167	137.533	23	10/08/09	SA	Poolowanna		longitudinal dunefield
2007191247		TS0697	-15.592	133.197	168	12/07/08	NT	Larrimah	Birdum Creek	alluvial plain
2007191248		TS0002	-34.782	135.529	9	24/11/08	SA	Lincoln		karst
2007191249		TS0500	-27.091	118.746	461	24/02/08	WA	Sandstone	unnamed claypans	lacustrine plain
2007191250		TS1159	-28.918	146.878	136	31/10/07	QLD	Cunnamulla	Nebine Creek	alluvial plain
2007191251		TS0478	-26.214	122.122	434	1/03/08	WA	Kingston	Wongawol/Bango Creeks	alluvial plain
2007191252		TS0018	-32.922	134.159	3	28/04/09	SA	Streaky Bay		coastal dunes
2007191253	2007190185	TS0340	-22.914	116.284	163	3/05/08	WA	Wyloo	Ashburton River	alluvial terrace
2007191254	2007190209	TS0759	-20.043	137.016	221	18/05/08	NT	Avon Downs	Ranken River	flood plain
2007191255		TS1016	-23.040	140.338	155	5/04/08	QLD	Springvale	Hamilton River	anastomatic plain
2007191256		TS1381	-41.757	147.186	142	7/02/08	TAS	North East	Macquarie R	alluvial plain
2007191257	2007190355	TS0437	-28.692	120.942	367	3/03/08	WA	Leonora	Unnamed creek system	flood plain
2007191258		TS0236	-18.252	122.413	26	12/06/08	WA	Lagrange	Unnamed flood plain	flood plain
2007191259	2007190311	TS0542	-30.539	115.227	49	13/11/07	WA	Hill River	Nambung River	alluvial plain
2007191261		TS0076	-28.767	135.156	114	19/07/08	SA	Warrina	Giddinna Creek	bar plain
2007191262		TS0853	-25.685	129.213	634	2/04/09	NT	Peterman Ranges	Lake Amadaus	stagnant alluvial plain
2007191263		TS1325	-38.381	142.597	13	4/03/08	VIC	Colac	Hopkins River	alluvial plain
2007191264	2007191486	TS0811	-23.385	136.450	250	14/05/08	NT	Hay River	Plenty River (W channel)	alluvial terrace
2007191266		TS1139	-27.798	148.506	208	28/10/07	QLD	Surat	Maranoa River	alluvial plain
2007191267		TS0044	-30.887	133.418	119	23/09/09	SA	Barton		longitudinal dunefield
2007191269		TS1086	-25.491	149.763	199	16/10/07	QLD	Taroom	Palm Tree Creek	alluvial plain
2007191270		TS0648	-12.237	134.048	25	11/08/09	NT	Millingimbi	Muralidbar Creek	alluvial terrace
2007191272		TS0179	-27.720	140.783	48	14/09/08	SA	Innamincka	Cooper Creek	floodout
2007191273		TS0643	-12.617	132.209	22	8/08/09	NT	Alligator River	Wildman River	alluvial plain
2007191274		TS1138	-28.159	145.036	163	9/06/08	QLD	Eulo	Paroo River	flood plain
2007191275	2007191590	TS0463	-29.464	126.178	149	29/03/08	WA	Jubilee	Unnamed drainage	flood plain
2007191276		TS1302	-35.037	144.192	80	22/01/08	NSW	Deniliquin	Billabong Creek	flood plain
2007191277	2007190849	TS1151	-28.436	146.656	155	31/10/07	QLD	Cunnamulla	Warrambah Creek	flood plain
2007191278		TS1144	-28.333	148.840	187	28/10/07	QLD	St George	Moonie River	alluvial plain
2007191279		TS0539	-30.232	124.435	244	9/07/08	WA	Cundeelee		aeolian sheet
2007191281	2007191215	TS1033	-23.557	148.144	181	13/10/07	QLD	Emerald	Nogoa River	alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191282	2007191134	TS0533	-29.908	115.995	247	19/02/08	WA	Perenjori	unnamed claypans	alluvial plain
2007191283		TS1361	-37.736	145.210	57	1/10/07	VIC	Melbourne	Yarra River	flood plain
2007191284		TS1080	-25.798	146.428	395	20/05/08	QLD	Augathella	Nive River	flood plain
2007191285		TS0726	-17.953	135.707	216	21/05/08	NT	Walhallow	Puzzle Creek	alluvial plain
2007191286		TS0536	-30.133	124.752	196	10/07/08	WA	Seemore		aeolian sheet
2007191287		TS0636	-11.708	132.919	10	10/08/09	NT	Cobourg Peninsula	Murgenella Creek	alluvial plain
2007191289		TS0164	-30.064	140.240	5	1/10/08	SA	Frome	Yandama Creek	alluvial plain
2007191291		TS0501	-27.137	123.474	443	1/04/08	WA	Throssell	Lake Wells	flood plain
2007191292		TS1254	-32.755	151.730	28	13/03/08	NSW	Newcastle	Hunter River	flood plain
2007191293	2007191518	TS1150	-28.317	143.134	141	8/06/08	QLD	Bulloo	Bulloo River	alluvial plain
2007191294		TS1048	-23.961	149.846	76	26/10/07	QLD	Duaringa	Dawson River	alluvial plain
2007191295	2007191498	TS0185	-26.773	138.294	9	11/08/09	SA	Pandie Pandie		longitudinal dunefield
2007191296		TS0602	-32.941	120.345	270	12/12/07	WA	Lake Johnston		flood plain
2007191297	2007190874	TS0722	-17.410	130.774	328	27/07/08	NT	Wave Hill	Giles Creek	alluvial terrace
2007191298		TS1129	-27.394	145.218	224	9/06/08	QLD	Toompine	Paroo River	alluvial plain
2007191299	2007190753	TS1176	-29.294	145.023	143	30/04/08	NSW	Yantabulla	Cuttaburra Creek	flood plain
2007191301		TS0435	-28.777	125.768	242	5/04/08	WA	Neale	Unnamed drainage	flood plain
2007191302		TS0037	-31.313	134.465	121	4/11/09	SA	Childara		longitudinal dunefield
2007191303		TS1102	-25.760	147.873	449	20/05/08	QLD	Eddystone	Merivale River	flood plain
2007191304		TS1123	-27.085	141.173	117	5/06/08	QLD	Durham Downs	Pudlapatchie Creek	flood plain
2007191305		TS0054	-30.481	133.688	121	25/07/08	SA	Tarcoola		drainage depression
2007191306		TS1046	-24.023	144.853	257	30/05/08	QLD	Blackall	Alice River	flood plain
2007191307		TS1374	-41.080	145.924	4	7/02/08	TAS	North West	Emu R	alluvial plain
2007191308		TS1324	-38.268	144.347	17	4/10/07	VIC	Port Philip	Thompson Creek	flood plain
2007191309		TS1389	-43.014	147.011	33	10/02/08	TAS	South East	Huon R	alluvial plain
2007191310		TS0013	-33.291	137.295	5	22/11/08	SA	Whyalla		pediment
2007191311		TS0931	-18.437	140.873	19	21/09/07	QLD	Donors Hill	Saxby River	flood plain
2007191312	2007190472	TS0740	-18.619	135.406	204	21/05/08	NT	Brunette Downs	No defined watercourse	stagnant alluvial plain
2007191313		TS0828	-24.121	137.943	103	11/05/08	NT	Simpson Desert North	Interdunal depression	stagnant alluvial plain
2007191314		TS0767	-20.551	132.126	430	30/07/08	NT	Lander River	Lander River	alluvial terrace
2007191316		TS0425	-28.212	114.320	12	15/11/07	WA	Geraldton	Hutt River	flood plain
2007191317		TS0169	-29.380	139.982	7	25/10/08	SA	Callabonna	Strzelecki Creek	aeolian dunes
2007191318	2007190495	TS0020	-32.432	134.088	12	29/04/09	SA	Streaky Bay		coastal plain
2007191319		TS0017	-33.012	136.630	190	27/09/09	SA	Whyalla	Lake Gilles	alluvial swamp
2007191321		TS1194	-29.530	146.113	151	1/05/08	NSW	Enngonia	Ledknapper Creek	flood plain
2007191322		TS0751	-19.256	132.667	420	29/07/08	NT	Green Swamp Well		aeolian landforms
2007191323		TS0851	-25.706	137.889	31	10/05/08	NT	Simpson Desert	Interdunal depression	aeolian landforms

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
								South		
2007191324		TS1211	-30.645	145.053	111	3/04/08	NSW	Louth	Kerrigundi Creek	flood plain
2007191325		TS0459	-29.422	120.520	379	5/03/08	WA	Menzies	Lake Ballard	flood plain
2007191328		TS0144	-32.802	137.575	23	21/11/08	SA	Port Augusta	Myall Creek	pediplain
2007191329		TS0668	-14.296	131.869	75	20/09/07	NT	Fergusson River	Fergusson River	alluvial terrace
2007191330		TS1268	-33.442	150.868	39	14/03/08	NSW	Sydney	Colo River	flood plain
2007191331	2007191051	TS1045	-24.085	143.132	168	28/05/08	QLD	Jundah	Vergemont Creek	alluvial plain
2007191333		TS1382	-42.506	146.693	92	9/02/08	TAS	South East	Derwent River	alluvial plain
2007191334	2007190661	TS1125	-27.070	149.713	249	3/11/07	QLD	Surat	Condamine River	alluvial plain
2007191335		TS0520	-27.821	118.382	413	22/02/08	WA	Cue	unnamed claypans	stagnant alluvial plain
2007191336		TS1105	-26.340	144.309	202	21/05/08	QLD	Quilpie	Bulloo River	alluvial plain
2007191337		TS0650	-12.656	135.311	29	13/08/09	NT	Arnhem Bay	Gulbuwangay River	alluvial terrace
2007191338		TS1277	-34.229	143.526	62	18/02/08	NSW	Balranald	Box Creek	flood plain
2007191339	2007191192	TS0397	-24.819	113.809	19	3/03/08	WA	Carnarvon Special	Gascoyne River	alluvial terrace
2007191341		TS0150	-31.641	139.454	81	30/09/08	SA	Parachilna	Siccus River (Wilpena)	drainage depression
2007191344		TS0823	-24.348	136.628	172	11/05/08	NT	Simpson Desert North	No clearly defined watercourse	lacustrine plain
2007191345		TS0888	-15.979	142.504	64	3/10/07	QLD	Hann River	Mitchell River	flood plain
2007191346	2007191429	TS0852	-25.611	134.799	225	7/05/08	NT	Finke	Finke River	alluvial terrace
2007191347		TS0393	-24.773	120.184	566	25/02/08	WA	Bullen	Beyondie lakes	flood plain
2007191348	2007190218	TS0424	-28.347	125.390	317	4/04/08	WA	Neale	Unnamed drainage	longitudinal dunefield
2007191350		TS1011	-22.814	141.954	135	1/04/08	QLD	Mackunda	Cadell Creek	flood plain
2007191351		TS0161	-30.230	140.699	45	28/09/08	SA	Frome	Coonee Creek	sand plain
2007191352		TS0481	-26.296	122.317	444	1/03/08	WA	Kingston	Miningarra Creek	alluvial plain
2007191353		TS0546	-30.698	115.585	148	13/11/07	WA	Moora	Minyulo Brook	flood plain
2007191354		TS0959	-20.255	143.108	260	1/10/07	QLD	Richmond	Stawell River	alluvial plain
2007191355		TS1348	-36.262	147.242	11	16/04/08	VIC	Tallangatta	Mitta Mitta River	flood plain
2007191356		TS0687	-15.475	129.756	5	10/07/08	NT	Auvergne	Bullo River	alluvial plain
2007191357		TS0482	-26.455	114.163	17	5/03/08	WA	Yaringa	unnamed watercourse/claypans	coastal lands
2007191358		TS0792	-21.734	135.611	354	16/05/08	NT	Elkedra	Unnamed creek	alluvial terrace
2007191359		TS1391	-15.895	136.319	11	6/08/08	NT	Mount Young	Batten Creek	alluvial terrace
2007191361		TS1078	-25.069	143.004	134	29/05/08	QLD	Windorah	Thomson River	alluvial plain
2007191362		TS0712	-16.509	136.043	43	15/07/08	NT	Bauhinia Downs	MaArthur River	alluvial terrace
2007191363		TS0529	-29.529	126.704	215	5/04/08	WA	Jubilee	Lake Colville	flood plain
2007191364		TS0963	-19.894	140.155	0	18/09/07	QLD	Dobbyn	Leichhardt River	alluvial plain
2007191365		TS0042	-31.157	133.459	118	22/07/09	SA	Fowler		longitudinal dunefield
2007191366		TS0532	-29.851	115.154	44	14/11/07	WA	Dongara	Eneabba Creek	stagnant alluvial plain

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2007191367		TS1366	-37.830	147.580	15	2/04/08	VIC	Bairnsdale Special	Mitchell River	flood plain
2007191368		TS0744	-18.749	131.295	380	26/07/08	NT	Winnecke Creek	Winnecke Creek	alluvial terrace
2007191369		TS0336	-22.666	115.679	103	4/05/08	WA	Wyloo	Ashburton River	alluvial terrace
2007191370		TS0051	-30.583	134.797	123	25/07/08	SA	Tarcoola		drainage depression
2007191371		TS0641	-12.667	131.349	8	18/09/07	NT	Darwin	Adelaide River	alluvial plain
2007191372	2007191445	TS0625	-34.520	115.914	65	16/01/08	WA	Pemberton	Warren River	alluvial terrace
2007191373		TS0131	-34.335	137.931	47	25/06/08	SA	Maitland		low hills
2007191374		TS1330	-34.360	142.212	52	19/10/07	VIC	Mildura	Swale of dunes	longitudinal dunefield
2007191375		TS1115	-26.840	144.311	212	8/06/08	QLD	Quilpie	Bulloo River	alluvial plain
2007191376		TS0045	-30.788	130.404	105	19/06/09	SA	Cook		pediplain
2007191377		TS0416	-25.742	115.124	162	4/03/08	WA	Wooramel	Wooramel River	stagnant alluvial plain
2007191378		TS1344	-36.024	146.278	140	16/04/08	VIC	Wangaratta	Murray River	alluvial plain
2007191379	2007191066	TS0156	-31.122	139.563	22	30/09/08	SA	Curnamona	Balcoracana Creek	pediment
2007191381		TS0137	-33.595	137.982	31	11/11/09	SA	Whyalla		beach ridge
2007191382	2007191509	TS0496	-26.986	116.222	287	12/05/08	WA	Byro	Roderick River/Lake Wooleen	flood plain
2007191383		TS0890	-16.444	141.582	12	25/09/07	QLD	Galbraith	Staaten River	flood plain
2007191384		TS0372	-24.518	114.014	30	29/03/08	WA	Carnarvon Special	n.a.	erosional plain
2007191385	2007191216	TS0775	-20.315	136.104	240	6/10/07	NT	Frew River		floodout
2007191386	2007190414	TS1346	-36.037	144.309	91	23/10/07	VIC	Pyramid hill	Hope Creek	alluvial plain
2007191387	2007191600	TS0655	-12.968	130.761	29	7/07/08	NT	Darwin	Finniss River	alluvial plain
2007191390		TS1093	-25.919	144.567	259	21/05/08	QLD	Adavale	Blackwater Creek	flood plain
2007191391		TS0066	-29.384	137.053	-5	8/08/08	SA	Curdimurka	Dilinna Creek	peneplain
2007191392		TS0402	-25.026	115.864	223	2/03/08	WA	Glenburgh	Gascoyne River	alluvial plain
2007191393		TS0181	-27.472	140.094	35	23/10/08	SA	Innamincka	Cooper Creek	anastomatic plain
2007191394		TS0222	-17.369	123.186	27	14/06/08	WA	Derby	Frazer River	flood plain
2007191396	2007190181	TS1209	-30.147	148.391	164	3/02/08	NSW	Walgett	Namoi River	flood plain
2007191397		TS1362	-37.745	148.956	17	1/04/08	VIC	Mallacoota	Bemm River	flood plain
2007191398		TS0058	-30.096	136.136	104	16/07/08	SA	Kingoonya		stagnant alluvial plain
2007191399		TS0812	-23.083	132.938	583	13/04/08	NT	Hermansburg		aeolian sheet
2007191401		TS0155	-31.173	140.616	25	27/09/08	SA	Curnamona	Eurinilla Creek	rises
2007191402		TS0703	-15.321	135.340	3	16/07/08	NT	Mount Young	Cox River	alluvial terrace
2007191403		TS0016	-33.025	137.446	24	21/11/08	SA	Whyalla		peneplain
2007191404		TS1081	-25.337	140.238	87	27/05/08	QLD	Bedourie	Diamantina River	flood plain
2007191405		TS1153	-28.688	144.787	142	28/10/08	QLD	Eulo	Paroo River	alluvial plain
2007191406		TS0806	-22.806	132.603	570	13/04/08	NT	Napperby	Napperby Creek	alluvial plain
2007191407		TS0030	-31.789	132.400	21	20/07/09	SA	Fowler		peneplain
2007191408		TS0386	-24.640	113.845	21	30/03/08	WA	Carnarvon Special	Cardabia Creek	flood plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191409		TS0524	-28.088	123.358	418	1/04/08	WA	Rason	Unnamed drainage	stagnant alluvial plain
2007191410		TS0724	-17.799	133.834	183	23/05/08	NT	Beeteloo	No defined watercourse	stagnant alluvial plain
2007191411		TS1369	-38.025	147.175	11	3/04/08	VIC	Bairnsdale Special	Avon River	flood plain
2007191412		TS0771	-20.456	137.143	210	19/05/08	NT	Avon Downs	No defined watercourse	flood plain
2007191413	2007190161	TS0458	-29.356	121.877	343	26/03/08	WA	Edjudina	Lake Raeside	flood plain
2007191414		TS0992	-22.190	138.698	166	9/04/08	QLD	Glenormiston	Georgina River	anastomatic plain
2007191415		TS0311	-21.980	115.033	22	5/05/08	WA	Onslow	Ashburton River	flood plain
2007191416	2007190383	TS1009	-22.401	145.129	226	1/04/08	QLD	Muttaburra	Thunderbolt Creek	alluvial plain
2007191418		TS1390	-43.330	146.970	2	10/02/08	TAS	South East	Esperance R	alluvial plain
2007191419		TS0367	-24.025	115.674	260	1/03/08	WA	Mount Phillips	Lyons River	alluvial plain
2007191420		TS1239	-32.017	143.635	93	2/04/08	NSW	Manara	Emu Creek ?	flood plain
2007191421		TS1121	-27.107	149.063	234	2/11/07	QLD	Surat	Bungil Creek	alluvial plain
2007191422		TS0166	-29.785	140.281	29	22/10/08	SA	Callabonna	Tilcha Creek (Teiltja, Callabonna)	aeolian dunes
2007191423		TS0700	-15.765	130.034	30	8/04/08	NT	Auvergne	Baines River	alluvial plain
2007191425		TS0797	-22.027	129.363	350	31/05/08	NT	Highland Rocks		source bordering dune
2007191426		TS1017	-22.752	150.116	9	19/10/07	QLD	Port Clinton	Herbert Creek	alluvial plain
2007191428		TS0879	-14.911	144.214	55	6/08/08	QLD	Cape Melville	Normanby River	alluvial terrace
2007191429	2007191346	TS0852	-25.611	134.798	226	7/05/08	NT	Finke	Finke River	alluvial terrace
2007191430	2007190686	TS0871	-13.441	142.313	47	16/08/08	QLD	Aurukun	Archer River	alluvial terrace
2007191431		TS0872	-14.154	141.671	5	16/10/08	QLD	Holroyd	Kendall River	meander plain
2007191433		TS0638	-12.048	132.939	29	9/08/09	NT	Alligator River	Copper Creek	alluvial terrace
2007191434		TS1043	-23.989	151.120	20	24/10/07	QLD	Rockhampton	Calliope River	alluvial terrace
2007191435		TS1117	-26.752	153.075	0	23/07/07	QLD	Gympie	Mooloolah River	alluvial plain
2007191436	2007190349	TS0282	-20.858	120.689	152	7/06/08	WA	Yarrie	Nullagine River	flood plain
2007191437	2007190968	TS1148	-28.036	141.911	61	7/06/08	QLD	Tickalara	Elizabeth Creek	flood plain
2007191438		TS0465	-29.871	117.715	6	20/02/08	WA	Ninghan	Lake Moore	lacustrine plain
2007191439		TS0917	-18.018	140.564	12	20/09/07	QLD	Burketown	Creek	alluvial plain
2007191440	2007190827	TS0498	-27.198	119.954	498	23/02/08	WA	Sandstone	Un-named Creek	flood plain
2007191441	2007190896	TS0429	-28.267	117.388	354	24/02/08	WA	Kirkalocka	unnamed	alluvial plain
2007191442		TS0695	-15.611	132.625	165	12/07/08	NT	Larrimah	Western Creek	stagnant alluvial plain
2007191443		TS0944	-18.698	139.767	43	19/09/07	QLD	Donors Hill	Leichhardt River	alluvial plain
2007191444	2007190927	TS1217	-30.752	152.191	163	14/05/08	NSW	Dorrigo	Macleay River	flood plain
2007191445	2007191372	TS0625	-34.520	115.913	56	16/01/08	WA	Pemberton	Warren River	alluvial terrace
2007191446		TS0902	-17.163	138.479	24	22/09/07	QLD	Mornington	8 Mile Creek	flood plain
2007191447		TS0991	-22.228	142.407	160	3/04/08	QLD	Mackunda	Diamantina River	anastomatic plain
2007191448		TS0216	-16.964	122.775	21	13/06/08	WA	Pender	Bobby Creek	flood plain
2007191449		TS1014	-22.858	149.330	49	18/10/07	QLD	Saint Lawrence	Isaac River	alluvial terrace

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191450	2007190732	TS1002	-22.303	144.698	228	31/03/08	QLD	Muttaburra	Towerhill Creek	flood plain
2007191451		TS1375	-41.268	146.419	15	7/02/08	TAS	North West	Mersey R	alluvial plain
2007191452		TS0833	-24.811	132.286	519	17/04/08	NT	Henbury		aeolian landforms
2007191453		TS0839	-24.658	130.620	457	2/04/09	NT	Lake Amadeus	Lake Amadaus	stagnant alluvial plain
2007191454		TS1216	-30.770	150.632	370	14/05/08	NSW	Manilla	Namoi River	flood plain
2007191456		TS0493	-26.743	120.269	497	22/02/08	WA	Wiluna	Lake Way	flood plain
2007191457		TS0693	-15.447	130.354	4	9/07/08	NT	Auvergne	Victoria River	alluvial plain
2007191458	2007190266	TS0069	-29.171	136.325	52	17/07/08	SA	Billakalina	Francis Swamp	alluvial swamp
2007191460		TS1311	-36.508	148.823	765	27/11/07	NSW	Bega	Snowy River	alluvial plain
2007191462		TS0472	-26.099	116.616	331	13/05/08	WA	Byro	Murchison River	flood plain
2007191463		TS1025	-23.193	144.383	187	29/03/08	QLD	Longreach	Thomson River	flood plain
2007191466		TS0707	-16.300	129.699	53	6/08/09	NT	Waterloo	Baines River	alluvial plain
2007191467		TS0145	-32.364	139.040	241	19/07/07	SA			flood plain
2007191468		TS0286	-21.050	117.133	69	4/04/08	WA	Pyramid	Harding River	alluvial terrace
2007191469		TS0120	-36.706	140.741	91	14/05/08	SA	Naracoorte	Morambro Creek	flood plain
2007191470		TS0717	-17.209	131.447	142	10/04/08	NT	VRD	Camfield River	alluvial plain
2007191471		TS0822	-24.553	133.233	395	16/04/08	NT	Henbury	Finke River	alluvial terrace
2007191472		TS0262	-19.962	120.506	41	10/06/08	WA	Mandora	Unnamed flood plain	flood plain
2007191473	2007191510	TS0563	-30.924	127.451	170	28/01/08	WA	Madura		peneplain
2007191475		TS1337	-36.162	141.483	119	16/10/07	VIC	Horsham	Yanac Creek	flood plain
2007191476		TS1037	-24.361	139.471	117	24/05/08	QLD	Bedourie	Eyre Creek	flood plain
2007191479		TS0701	-15.367	134.153	64	18/08/09	NT	Hodgson Downs	Arnold River	alluvial terrace
2007191480		TS0645	-12.427	132.968	17	9/08/09	NT	Alligator River	East Alligator River	alluvial plain
2007191481	2007190050	TS0273	-20.520	118.496	27	5/04/08	WA	Roebourne	Turner River	alluvial plain
2007191482		TS0148	-31.949	138.166	132	18/07/07	SA		Willochra Ck	alluvial plain
2007191484		TS0956	-20.086	141.131	85	26/09/07	QLD	Julia Creek	Williams River	anastomatic plain
2007191485		TS1192	-29.945	146.430	137	17/04/08	NSW	Enngonia	Barwon River	flood plain
2007191486	2007191264	TS0811	-23.384	136.450	251	14/05/08	NT	Hay River	Plenty River (W channel)	alluvial terrace
2007191487		TS1044	-24.168	141.091	91	25/05/08	QLD	Connemara	Diamantina River	alluvial swamp
2007191489		TS1358	-37.603	141.445	52	5/03/08	VIC	Hamilton	Wannon River	flood plain
2007191490		TS0925	-18.201	142.874	180	4/10/07	QLD	Georgetown	Gilbert River	alluvial plain
2007191491		TS0605	-33.427	115.712	4	5/07/07	WA	Collie	Preston River	alluvial terrace
2007191492		TS0642	-12.240	135.399	18	13/08/09	NT	Arnhem Bay	Unnamed Creek	alluvial terrace
2007191493		TS1181	-29.388	152.487	106	6/02/08	NSW	Grafton	Mann River	flood plain
2007191494		TS1386	-42.705	147.267	26	9/02/08	TAS	South East	Jordan R	alluvial plain
2007191495		TS0666	-14.430	135.125	18	17/08/09	NT	Roper River	Phelp River	alluvial terrace
2007191496		TS0475	-25.943	122.363	444	28/02/08	WA	Stanley	Brockman Creek	alluvial terrace
2007191497		TS0772	-20.576	137.665	185	19/05/08	NT	Avon Downs	Ranken River	flood plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191498	2007191295	TS0185	-26.773	138.295	14	11/08/09	SA	Pandie Pandie		longitudinal dunefield
2007191499		TS0220	-17.334	122.170	15	13/06/08	WA	Broome	Unnamed drainage	flood plain
2007191501		TS0689	-15.412	129.195	29	10/07/08	NT	Auvergne	Sandy Creek	alluvial plain
2007191503		TS0389	-24.750	116.260	295	14/07/08	WA	Mount Phillips	Gascoyne River	flood plain
2007191504	2007190949	TS0021	-32.448	136.005	132	28/09/09	SA	Yardea		low hills
2007191505		TS0082	-28.348	135.090	102	13/09/09	SA	Warrina	Lora Creek	alluvial plain
2007191506		TS0574	-31.659	116.721	160	3/12/07	WA	Perth	Mortlock River	flood plain
2007191507	2007190549	TS0412	-25.515	123.037	437	29/02/08	WA	Herbert	Lake Buchanan.	irregular dunefield
2007191509	2007191382	TS0496	-26.986	116.222	287	12/05/08	WA	Byro	Roderick River/Lake Wooleen	flood plain
2007191510	2007191473	TS0563	-30.924	127.452	169	28/01/08	WA	Madura		peneplain
2007191511		TS0011	-33.451	137.048	90	22/11/08	SA	Whyalla	Salt Creek	alluvial plain
2007191512		TS0672	-14.562	135.005	25	17/08/09	NT	Roper River	Lagoon Creek	alluvial plain
2007191513		TS1352	-36.802	145.083	124	24/10/07	VIC	Nagambie	Goulburn River	alluvial plain
2007191514		TS1026	-23.308	150.446	13	20/10/07	QLD	Rockhampton	Fitzroy River	alluvial terrace
2007191515		TS0874	-14.618	143.895	78	7/08/08	QLD	Ebagoola		alluvial terrace
2007191516		TS1035	-23.616	143.846	170	29/03/08	QLD	Maneroo	Darr River	flood plain
2007191517		TS0092	-27.849	133.661	245	10/09/09	SA	Wintinna		longitudinal dunefield
2007191518	2007191293	TS1150	-28.317	143.135	138	8/06/08	QLD	Bulloo	Bulloo River	alluvial plain
2007191519		TS0912	-17.962	140.835	16	21/09/07	QLD	Burketown	Flinders River	alluvial plain
2007191520		TS0984	-22.089	140.112	197	6/04/08	QLD	Boulia	Burke River	alluvial plain
2007191521		TS0159	-30.723	139.524	11	2/10/08	SA	Frome	Big John Creek	alluvial plain
2007191522	2007190534	TS1094	-25.678	149.219	247	16/10/07	QLD	Taroom	Dawson River	alluvial plain
2007191523		TS1245	-32.360	142.165	86	1/04/08	NSW	Menindee	Yancowinna Creek	flood plain
2007191524		TS0132	-34.405	140.846	24	1/07/08	SA	Renmark		alluvial swamp
2007191525	2007190647	TS0893	-16.528	143.472	115	5/10/07	QLD	Walsh	Mitchell River	alluvial plain
2007191526		TS0818	-23.836	134.673	398	20/04/08	NT	Alice Springs	Todd River	alluvial terrace
2007191528		TS1112	-26.296	143.385	151	31/05/08	QLD	Eromanga	Kyabra Creek	alluvial swamp
2007191529		TS1204	-30.755	144.065	102	7/11/07	NSW	Louth	Paroo Overflow	flood plain
2007191530		TS0476	-25.890	123.029	433	29/02/08	WA	Herbert	Kinke Lakes	flood plain
2007191531	2007191028	TS0938	-19.017	138.725	129	18/09/07	QLD	Camooweal	Gregory River	flood plain
2007191532	2007190125	TS0961	-20.480	140.589	0	18/09/07	QLD	Cloncurry	Cloncurry Riyer	alluvial plain
2007191533		TS0467	-29.742	117.799	310	20/02/08	WA	Ninghan	Lake Moore	lacustrine plain
2007191534		TS0103	-27.144	134.553	197	11/09/09	SA	Wintinna	Alberga River	alluvial plain
2007191535		TS0118	-37.219	139.999	7	13/05/08	SA	Penola		flood plain
2007191536		TS0915	-17.837	139.745	9	20/09/07	QLD	Burketown	Leichhardt River	alluvial plain
2007191537	2007190990	TS0894	-16.533	142.057	21	25/09/07	QLD	Galbraith	Staaten River	alluvial plain
2007191539		TS0667	-14.323	132.413	0	19/09/07	NT	Katherine	Katherine River	alluvial terrace

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191540		TS1206	-30.313	146.079	141	29/04/08	NSW	Bourke	Mulga Creek	alluvial plain
2007191541		TS1097	-25.687	152.820	0	24/07/07	QLD	Maryborough	Big Tuan Creek	flood plain
2007191542	2007190189	TS1283	-34.088	141.915	43	20/02/08	NSW	Mildura	Darling River	flood plain
2007191543		TS1040	-23.680	138.733	97	4/04/08	QLD	Springvale	Mulligan River	flood plain
2007191544		TS0502	-27.216	121.101	470	2/03/08	WA	Sir Samuel	Lake Maitland	flood plain
2007191545	2007190121	TS0070	-29.054	133.293	164	6/09/09	SA	Tallaringa		pediplain
2007191546		TS0173	-29.044	138.840	14	12/09/08	SA	Marree	Cooryanna Creek	flood plain
2007191547		TS1051	-24.109	143.353	158	28/05/08	QLD	Jundah	Thomson River	alluvial plain
2007191548		TS0933	-18.672	141.712	67	25/09/07	QLD	Croydon	Clara River	anastomatic plain
2007191549	2007190735	TS1227	-31.597	143.476	85	8/11/07	NSW	Wilcannia	Darling River	flood plain
2007191550		TS1259	-33.029	143.632	84	21/02/08	NSW	Pooncarie	unknown	flood plain
2007191551	2007191007	TS1031	-23.107	149.870	44	23/10/07	QLD	Duaringa	Fitzroy River	alluvial plain
2007191552	2007190118	TS0656	-12.957	132.393	6	19/09/07	NT	Alligator River	South Alligator River	alluvial plain
2007191553		TS1061	-24.928	138.636	82	23/05/08	QLD	Bedourie	Mulligan River	flood plain
2007191554		TS0454	-29.062	117.277	288	29/04/08	WA	Ningham	Mongers Lake	flood plain
2007191555		TS0682	-14.934	133.143	119	20/09/07	NT	Katherine	Roper Creek & Waterhouse River	alluvial plain
2007191556		TS0562	-31.851	127.026	99	26/01/08	WA	Madura		peneplain
2007191557		TS1059	-24.496	145.201	288	29/05/08	QLD	Blackall	Ravensbourne Creek	flood plain
2007191558		TS1049	-24.194	140.931	93	25/05/08	QLD	Machattie	Spring Creek	alluvial plain
2007191559		TS0594	-32.244	117.039	205	3/12/07	WA	Corrigin	Avon River	flood plain
2007191560		TS0580	-31.907	115.963	5	6/07/07	WA	Perth	Swan River	flood plain
2007191561		TS1214	-30.666	150.056	261	14/05/08	NSW	Manilla	Namoi River	flood plain
2007191564		TS1116	-26.654	146.177	277	20/05/08	QLD	Charleville	Angellala Creek	alluvial plain
2007191566	2007190176	TS0483	-26.709	114.671	137	29/03/08	WA	Yaringa	n.a.	transverse dunefield
2007191567		TS0774	-20.062	135.957	233	7/10/07	NT	Frew River		floodout
2007191569		TS0669	-14.363	131.558	53	13/07/08	NT	Fergusson River	Daly River	alluvial terrace
2007191570		TS1005	-22.479	144.654	222	31/03/08	QLD	Muttaburra	Cornish Creek	flood plain
2007191571		TS0409	-25.311	114.124	28	6/03/08	WA	Wooramel	unnamed watercourse/claypans	stagnant alluvial plain
2007191572		TS0612	-33.743	121.255	3	15/12/07	WA	Esperance	Lort River	Flood plain
2007191573		TS1110	-26.387	146.075	287	20/05/08	QLD	Charleville	Ward River	alluvial plain
2007191574		TS1221	-31.036	150.333	295	14/05/08	NSW	Tamworth	Mooki River	flood plain
2007191576		TS0232	-17.979	122.563	5	12/06/08	WA	Broome	Unnamed flood plain	flood plain
2007191577		TS1001	-22.420	144.516	209	30/03/08	QLD	Muttaburra	Landsborough River	flood plain
2007191578	2007191152	TS0761	-19.872	130.321	315	25/07/08	NT	Tanami		aeolian landforms
2007191579		TS0748	-19.293	136.068	210	8/10/07	NT	Alroy	Playford River	alluvial plain
2007191580		TS0151	-31.476	140.571	73	26/09/08	SA	Curnamona		alluvial plain

SITE ID	DUPLICATE SITE	TARGET SITEID	LATITUDE	LONGITUDE	ELEVATION	DATE SAMPLED	STATE	MAPSHEET	WATERCOURSE	LANDFORM TYPE
2007191581		TS1342	-35.973	144.168	90	23/10/07	VIC	Pyramid hill	Bullock Creek	alluvial plain
2007191582		TS0889	-16.263	145.335	1	8/10/07	QLD	Mossman	Daintree River	flood plain
2007191583		TS0719	-17.166	133.283	220	24/05/08	NT	Newcastle Waters	Bucket Creek	alluvial plain
2007191584		TS1308	-36.031	147.353	188	22/01/08	VIC	Tallangatta	Murray River	flood plain
2007191585		TS0878	-14.696	143.990	78	7/08/08	QLD	Ebagoola	Moorhead Creek	alluvial terrace
2007191586		TS0867	-12.793	143.294	19	14/08/08	QLD	Cape Weymouth	Lockhart River	alluvial terrace
2007191587		TS0547	-30.879	123.636	254	30/01/08	WA	Cundeelee	Ponton Creek	flood plain
2007191588		TS0989	-21.875	145.232	261	1/04/08	QLD	Tangorin	Torrens Creek	alluvial plain
2007191589		TS0451	-29.273	116.426	260	19/02/08	WA	Perenjori	Weelhamby Lake	lacustrine plain
2007191590	2007191275	TS0463	-29.464	126.179	150	29/03/08	WA	Jubilee	Unnamed drainage	flood plain
2007191591		TS1321	-38.173	141.722	22	5/03/08	VIC	Portland	Fitzroy River	floodplain
2007191592	2007190986	TS0796	-22.238	134.556	496	26/05/08	NT	Alcoota	Sandover River	alluvial terrace
2007191593	2007190208	TS1052	-24.135	151.692	21	27/10/07	QLD	Bundaberg	Worthington Creek	alluvial plain
2007191594	2007190481	TS0691	-15.252	129.577	15	10/07/08	NT	Auvergne	Napp Spring Creek	alluvial plain
2007191595		TS1133	-27.557	152.796	16	27/07/07	QLD	Ipswich	Brisbane	alluvial terrace
2007191596		TS1285	-34.178	150.304	138	26/06/08	NSW	Wollongong	Wollondilly River	flood plain
2007191598	2007190328	TS0244	-18.715	121.930	23	12/06/08	WA	Lagrange	Unnamed flood plain	flood plain
2007191599	2007190526	TS1307	-35.894	150.063	11	29/11/07	NSW	Ulladulla	Moruya River	flood plain
2007191600	2007191387	TS0655	-12.844	130.620	0	4/08/09	NT	Darwin	Finniss River	alluvial terrace

Note for appendices 3-6: Where appropriate the classifications used are from the *RTMAP regolith database field book and users guide* (Pain *et al.* 2003) and the *Australian Soil and Land Survey Field Handbook* (McDonald *et al.* 1990). These sources are now well established as authoritative for land and soil surveys.

APPENDIX 3: EXPLANATION OF COLUMNS FOR THE FIELD DATA TABLE

Modified from the table provided to sample collectors in the NGSA Field Manual (Lech *et al.* 2007).

FIELD	DESCRIPTION	FORMAT	VALIDATION
Site ID	As above	Concatenation of year, projectID & site	nil
Duplicate Site	If the site taken is a duplicate. Record the Site ID which this duplicate relates to.	Must be 9 digits long	nil
Target SiteID	Target number assigned to the GA prescribed sampling site. In the format: 4-digit number with TS as the prefix	TSxxxx	6 characters long
Latitude	Latitude of the sample site captured in GDA94	6-digit negative numeric	value between -44 & -9
Longitude	Longitude of the sample site captured in GDA94	8-digit positive numeric	value between 108 & 156
Elevation	Elevation above mean sea level	Numeric (metres)	nil
Date Sampled	The date of sampling	date is in dd/mm/yyyy format	must be between 01/02/2007 & 01/02/2010
Site Time	Time of arrival at sample site in 24-hour notation. NB: This will help with re-labelling of photos.	Text with format hh:mm	nil
State	State or Territory where site is located	Use lookup provided	nil
Mapsheet	Name of 1:250K map sheet on which the site is located e.g., Bourke, Robinson Ranges	limited to 50 characters	cannot exceed 50 characters
Property Name	The name of the station, national park, etc. where the sample was collected.	limited to 50 characters	cannot exceed 50 characters
Watercourse	Name of creek, river, etc. by which the sample was taken. e.g., Bogan River, Mulga Creek. Do not complete if there is no water course nearby.	limited to 50 characters	cannot exceed 50 characters

FIELD	DESCRIPTION	FORMAT	VALIDATION
Landform Type	Obtained from the RTMAP classification scheme (See Appendix 4). NB: This is site specific and not related to the entire catchment. The dominant landform type within a 75 m radius around the sampling site, i.e., as it would be mapped for a 1:25,000 regolith landform map.	Use lookup provided	nil
Primary Geomorphology Type	The dominant geomorphic process derived using the RTMAP classification scheme. These processes form/modify landform units. (See Appendix 5). NB: This is *site specific* and not related to the entire catchment. The dominant landform type within a 75 m radius around the sampling site, i.e., as it would be mapped for a 1:25,000 regolith landform map.	Use lookup provided	nil
Secondary Geomorphology	Use if more than one active geomorphic process evident at site. Described as per Primary Geomorphology Type	Use lookup provided	nil
Landuse Type - Site	The dominant landuse type *for the sample site*. NB: If cropping or livestock selected from Landuse Type - Site lookup then add more details in the Landuse Subtype - Site column.	Use lookup provided	nil
Landuse Subtype - Site	Detailed landuse *for the sample site*. This is used if cropping or livestock is selected from Landuse Type - Site. If unknown, leave blank.	Use lookup provided	nil
Landuse Type - Catchment	The dominant landuse type *for the entire catchment*. NB: If cropping or livestock selected from Landuse Type - Catchment lookup then add more details in the Landuse Subtype - Catchment column.	Use lookup provided	nil
Landuse Subtype - Catchment	Detailed landuse *for the entire catchment*. This is used if cropping or livestock is selected from Landuse Type - Catchment lookup. If unknown, leave blank.	Use lookup provided	nil
Contamination	Note any possible sources of contamination or disturbance, e.g., 100 m down slope of rubbish dump. Further scenarios are supplied in Appendix 1.	limited to 100 characters	cannot exceed 100 characters

FIELD	DESCRIPTION	FORMAT	VALIDATION
Field Data Entered by	The name of the person recording the information at the site of sampling.	Initial of given name & up to 7 letters surname e.g., pdecarit or amcphers or mlech	entry between 3 and 8 characters
Comments	Anything else that might be relevant about the field site that could later be useful when interpreting the geochemistry.	limited to 250 characters	cannot exceed 250 characters
Hole Type	Refers to the dominant method of digging the entire hole. This will generally be hand auger hole, power auger hole or soil pit. This field is a GA database requirement.	Use partial lookup provided	nil
TOS SampleID	Automatically transferred from locations worksheet. Site ID + "001" which recognises samples as the Top Outlet Sediment (TOS).	Concatenation of site ID and TOS identifier “001”	nil
TOS Sample Type	Mandatory for GA databases. Sample type for the TOS. Generally as the TOS is taken from a hole created by a shovel, it is a PIT/TRENCH SAMPLE. Definitions for GA’s sample type lookup are as follows: AUGER SAMPLE: Sample collected by hand or mechanical auger which enable samples to be taken at intervals down profile. For example regolith, soil or sediment. FLOAT: Sample taken of an isolated rock fragment, displaced from its original outcrop. Typically derived from weathering of bedrock. LAG: Deposit, commonly thin, or fragments larger than sand size, spread over the land surface. Its most common origin is as the coarse material left behind after fine material has been transported away by wind, or less commonly, sheet flow. PIT/TRENCH SAMPLE: Samples taken at depth from a regolith and/or soil profile. This includes profiles that are exposed by gullies, costeans, railway cuttings, trenches or rivers as well as those profiles dug as a pit.	Use the partial lookup provided	nil

FIELD	DESCRIPTION	FORMAT	VALIDATION
	SURFACE REGOLITH SAMPLE: Samples of regolith taken at the ground surface including soil material and organic matter. VEGETATION: Any part of a plant whether it be moss, grass, sedge, or the roots, bark, twigs or leaves of trees and shrubs.		
TOS Top Depth	Start depth for the TOS. Measured in metres and mostly starts at zero.	numeric to 2 decimal places	must be between 0 and 2 m
TOS Base Depth	End depth for the TOS sample in metres. Measured in metres and is generally 0.1 m.	numeric to 2 decimal places	must be between 0 and 2 m
TOS Radiation Screen	Has the sample been radiation screened using the "Monitor 4 Radiation Alert Monitor" provided? NB: If screening has not been done then samples cannot be accepted by Geoscience Australia due to OH&S requirements.	Y or N	
TOS Field pH	pH of the TOS sample. Use Inoculo™ Soil pH testing kit applying the methods described in Lech *et al*. (2007).	Use lookup provided	nil
TOS Munsell Colour Dry	TOS Munsell Colour determined on the raw sample. It should be on the dominant matrix colour (not the mottles). If soil is already moist (e.g., from rain), disregard this field. Use the method for colour determination as described in Lech *et al*. (2007).	Use lookup provided	nil
TOS Munsell Colour Moist	TOS Munsell Colour determined on the moistened sample. It should be on the dominant matrix colour (not the mottles). As per dry sample, use the method for colour determination as described in Lech *et al*. (2007).	Use lookup provided	nil
TOS Mottles Abundance	Mottles are the streaks, blotches or spots of subdominant colours found within a soil matrix (McDonald *et al.* 1990). A visual estimation for the TOS as a % can be determined using the visual guide for estimating the abundance of course fragments (Figure A4 in Lech *et al*. (2007).	Use lookup provided	nil

FIELD	DESCRIPTION	FORMAT	VALIDATION
TOS Mottles Size	The size of the mottles present in the TOS along their greatest dimension, unless they are streaks in which case the width is used.	Use lookup provided	nil
TOS Segregations Type	Segregations refer to discrete groups (like nodules and concretions) that have accumulated TOS due to concentration, generally by chemical or biological action. These are pedogenic in origin.	Use lookup provided	nil
TOS Segregations Composition	Record the composition of the segregations (concretions, pisoliths, nodules) that have accumulated in the TOS.	Use lookup provided	nil
TOS Segregations Size	Determine the size (fine-coarse) for the maximum dimension of equidimensional segregations (concretions, pisoliths, nodules) or the minimum dimension for linear features (tubules) in the TOS.	Use lookup provided	nil
TOS Segregations Abundance	A visual estimation in the TOS as a % can be determined using the figure provided in the NGSA Field Manual (Lech *et al*. 2007).	Use lookup provided	nil
TOS HCl Effervescence Test	The effervescence reaction test for the TOS determines whether the soil reacts to HCl and generates tiny gas bubbles. To perform effervescence test, put 2-3 drops of 1M HCl (carbonates) on a thumbnail size piece of soil. Quantifies the effervescence (release of tiny gas bubbles) for the TOS as follows: NO REACTION: no audible or visible effervescence SLIGHT REACTION: slightly audible but no visible effervescence MODERATELY REACTIVE: audible & slightly visible effervescence HIGHLY REACTIVE: moderate visible effervescence VERY HIGHLY REACTIVE: strong visible effervescence	Use lookup provided Use lookup provided	nil nil
TOS Lithic Fragment Composition	The dominant lithology of the coarse fragments/particles greater than 2 mm in size (McDonald *et al.* 1990) within the	Use lookup provided	nil

FIELD	DESCRIPTION	FORMAT	VALIDATION
	TOS horizon.		
TOS Fragment Abundance	The abundance of the coarse fragments/particles greater than 2 mm in size (McDonald *et al.* 1990) within the TOS horizon.	Use lookup provided	nil
TOS Fragment Size	The size of coarse fragments/particles greater than 2 mm in size (McDonald *et al.* 1990) within the TOS. The average maximum dimension of used to determine in which class the fragment belongs. The regolith clasts are not considered to be pedogenic in origin and are present within a soil/regolith profile. They include unattached rock fragments and other fragments like charcoal and shells.	Use lookup provided	nil
TOS Fragment Shape	Determine the shape of fragments within TOS using a visual guide. Coarse fragments/particles are greater than 2 mm in size (McDonald *et al.* 1990). The fragments are not considered to be pedogenic in origin and are present within a soil/regolith profile. They include unattached rock fragments and other fragments like charcoal and shells.	use lookup provided	nil
BOS SampleID	Automatically transferred from locations worksheet. Site ID + "002" which recognises samples as the Bottom Outlet Sediment (BOS)	Concatenation of site ID and BOS identifier “002”	nil
BOS Sample Type	Sample type for the BOS. Generally as the BOS is an AUGER SAMPLE or a PIT/TRENCH SAMPLE. Definitions for GA’s sample type lookup are as follows: AUGER SAMPLE: Sample collected by hand or mechanical auger which enable samples to be taken at intervals down profile. For example regolith, soil or sediment. FLOAT: Sample taken of an isolated rock fragment, displaced from its original outcrop. Typically derived from weathering of bedrock. LAG: Deposit, commonly thin, or fragments of larger than sand size, spread over the land surface. Its most common origin is as the coarse material left behind after fine material	Use the partial lookup provided	nil

FIELD	DESCRIPTION	FORMAT	VALIDATION
	has been transported away by wind, or less commonly, sheet flow. PIT/TRENCH SAMPLE: Samples taken at depth from a regolith and/or soil profile. This includes profiles that are exposed by gullies, costeans, railway cuttings, trenches or rivers as well as those profiles dug as a pit. SURFACE REGOLITH SAMPLE: Samples of regolith taken at the ground surface including soil material and organic matter. VEGETATION: Any part of a plant whether it be moss, grass, sedge, or the roots, bark, twigs or leaves of trees and shrubs.		
BOS Top Depth	Start depth for the BOS in metres. Usually between 0.60 - 0.80 m	numeric to 2 decimal places	must be between 0.2 and 2 m
BOS Base Depth	End depth for the BOS sample in metres. Usually between 0.75-0.90 m	numeric to 2 decimal places	must be between 0.3 and 2 m
BOS Radiation Screen	Has the sample been radiation screened using the "Monitor 4 Radiation Alert Monitor" provided? NB: If screening has not been done then samples cannot be accepted by Geoscience Australia due to OH&S requirements.	Y or N	
BOS Field pH	pH of the BOS sample. Use Inoculo™ Soil pH testing kit applying the methods described in Lech *et al*. (2007).	Use lookup provided	nil
BOS Munsell Colour Dry	BOS Munsell Colour determined on the raw sample. It should be on the dominant matrix colour (not the mottles). If soil is already moist (e.g., from rain), disregard this field. Use the method for colour determination as described in Lech *et al*. (2007).	Use lookup provided	nil
BOS Munsell Colour Moist	BOS Munsell Colour determined on the moistened sample. It should be on the dominant matrix colour (not the mottles). As per dry sample, use the method for colour determination as described in Lech *et al*. (2007).	Use lookup provided	nil

FIELD	DESCRIPTION	FORMAT	VALIDATION
Induration	Regolith material that has been hardened by heat, pressure, or the addition of a cementing agent not commonly contained within the original material e.g., development of hardpans or duricrust (Eggleton *et al.,* 2001).	use lookup provided	nil
Depth Induration	If induration is present, record the depth to the top of the induration.	nil	nil
Number Holes Augered	Enter the number of holes augered. This number should be greater than 3 as it makes the geochemical sampling more representative. (If a trench was dug then leave blank).	nil	nil
BOS Mottles Abundance	Mottles are the streaks, blotches or spots of subdominant colours found within a soil matrix (McDonald *et al.* 1990). A visual estimation for the TOS as a % can be determined using the visual guide for estimating the abundance of course fragments (Figure A4 in Lech *et al*. 2007).	Use lookup provided	nil
BOS Mottles Size	The size of the mottles present in the BOS along their greatest dimension, unless they are streaks where the width is used.	Use lookup provided	nil
BOS Segregations Type	Segregations refer to discrete groups (like nodules and concretions) that have accumulated BOS due to concentration, generally by chemical or biological action. These are pedogenic in origin.	Use lookup provided	nil
BOS Segregations Composition	Record the composition of the segregations (concretions, pisoliths, nodules) that have accumulated in the BOS.	Use lookup provided	nil
BOS Segregations Size	Determine the size (fine-coarse) for the maximum dimension of equidimensional segregations (concretions, pisoliths, nodules) or the minimum dimension for linear features (tubules) in the BOS.	Use lookup provided	nil
BOS Segregations Abundance	A visual estimation in the BOS as a % can be determined using the figure provided in the NGSA Field Manual (Lech *et al*. 2007).	Use lookup provided	nil

FIELD	DESCRIPTION	FORMAT	VALIDATION
BOS HCl Effervescence Test	The effervescence reaction test for the BOS determines whether the soil reacts to HCl and generates tiny gas bubbles. To perform effervescence test, put 2-3 drops of 1M HCl (carbonates) on a thumbnail size piece of soil. Quantifies the effervescence (release of tiny gas bubbles) for the BOS. NO REACTION: no audible or visible effervescence SLIGHT REACTION: slightly audible but no visible effervescence MODERATELY REACTIVE: audible & slightly visible effervescence HIGHLY REACTIVE: moderate visible effervescence VERY HIGHLY REACTIVE: strong visible effervescence	Use lookup provided Use lookup provided	nil nil
BOS Lithic Fragment Composition	The dominant lithology of the coarse fragments/particles greater than 2 mm in size (McDonald *et al.* 1990) within the BOS horizon.	Use lookup provided	nil
BOS Fragment Abundance	The abundance of the coarse fragments/particles greater than 2 mm in size (McDonald *et al.* 1990) within the BOS horizon.	Use lookup provided	nil
BOS Fragment Size	The size of coarse fragments/particles greater than 2 mm in size (McDonald *et al.* 1990) within the BOS. The average maximum dimension of used to determine in which class the fragment belongs. The regolith clasts are not considered to be pedogenic in origin and are present within a soil/regolith profile. They include unattached rock fragments and other fragments like charcoal and shells.	Use lookup provided	nil

FIELD	DESCRIPTION	FORMAT	VALIDATION
BOS Fragment Shape	Determine the shape of fragments within BOS using a visual guide. Coarse fragments/particles are greater than 2 mm in size (McDonald *et al.* 1990). The fragments are not considered to be pedogenic in origin and are present within a soil/regolith profile. They include unattached rock fragments and other fragments like charcoal and shells.	Use lookup provided	nil

APPENDIX 4: LANDFORM TYPES

The contents of this section are modified after "The Australian Soil and Land Survey Field Handbook" (McDonald *et al.* 1990).

MODE OF ACTIVITY	LAND-FORMING AGENT	NAME	DEFINITION
alluvial deposition	flowing water	alluvial landforms	A complex landform pattern on valley floors with active, inactive or relict erosion and aggradation by channelled and over-bank stream flow.
		alluvial plain	A level, or gently sloping, or slightly undulating land surface produced by extensive deposition of alluvium, generally adjacent to a river that periodically overflows its banks; it may be situated on a flood plain, a delta, or an alluvial fan.
		flood plain	Alluvial plain characterised by frequently active aggradation by over-bank stream flow (i.e., by flooding more often than every 50 years) and erosion by channelled stream flow.
		anastomosing plain	Flood plain on which the stream channels join and divide, as do the veins on a leaf. Flood plain with slowly migrating, deep alluvial channels, usually moderately spaced, forming a divergent to unidirectional integrated reticulated network. There is frequently active aggradation by over-bank and channelled stream flow.
		bar plain	Flood plain having sub-parallel stream channels which both aggrade and erode so as to develop a generally corrugated surface with numerous bars. Flood plain with numerous rapidly migrating shallow alluvial channels forming a unidirectional integrated reticulated network. There is frequently active aggradation and erosion by channelled stream flow.
		covered plain	Flood plain with a number of alluvial channels which are widely-spaced (i.e., a little under a km), migrating, more or less parallel, and deep (i.e., width-depth ratio <20:1). Aggradation by over-bank stream flow occurs at least once every 50 years, providing further alluvial cover.
		meander plain	Flood plain aggraded and eroded by meandering streams. Flood plain with widely spaced, rapidly migrating, moderately deep alluvial stream channels that form a unidirectional integrated non-tributary network. There is frequently active aggradation and erosion by channelled stream flow with subordinate aggradation by over-bank stream flow.
		floodout	Flat inclined radially away from a point on the margin or at the end of a stream channel, aggraded by over-bank stream flow, or by channelled stream flow associated with channels developed within the over-bank part.
		stream channel	
		alluvial terrace	Former flood plain on which erosion and aggradation by channelled and over-bank stream flow is slightly active or inactive because of deepening or enlargement of the stream channel has lowered the level of flooding. A pattern that includes a significant active flood plain, or former flood plains at more than one level, becomes terraced land.

		stagnant alluvial plain	Alluvial plain on which erosion and aggradation by channelled and over-bank stream flow is slightly active or inactive because of reduced water supply, without apparent incision or channel enlargement that would lower the level of stream action.
		terraced land	Landform pattern including one or more terraces and often a flood plain. Relief is low or very low (9 – 90 m). Terrace plains or terrace flats occur at stated heights above the top of the stream bank.
		alluvial swamp	Almost level, closed or almost closed depression with a seasonal or permanent water table at or above the surface, commonly aggraded by overbank stream flow and sometimes biological (peat) accumulation.
coastal and marine activity	waves, tides, channel flow and wind	coastal lands	Level to gently undulating landform pattern of extremely low relief eroded or aggraded by waves, tides, overbank or channel flow, or wind. The landform pattern may be either active or relict.
		beach ridge plain	Level to gently undulating landform pattern of extremely low relief on which stream channels are absent or very rare; it consists of relict parallel linear ridges built up by waves and modified by wind.
		chenier plain	Level to gently undulating landform pattern of extremely low relief on which stream channels are very rare. The pattern consists of relict, parallel linear ridges built by waves, separated by and built over flats aggraded by tides or over bank stream flow.
		coral reef	Continuously active or relict landform pattern built up to the sea level of the present day or of a former time by corals and other organisms. It is mainly level, with moderately inclined to precipitous slopes below sea level. Stream channels are generally absent, but there may occasionally be fixed deep erosional tidal stream channels forming a disintegrated non-tributary pattern.
		marine plain	Plain eroded or aggraded by waves, tides, or submarine currents, and aggraded by deposition of material from suspension and solution in sea water, elevated above sea level by earth movements or eustasy, and little modified by subaerial agents such as stream flow or wind.
		tidal flat	Level landform pattern with extremely low relief and slowly migrating deep alluvial stream channels which form dendritic tributary patterns; it is aggraded by frequently active tides.
		coastal dunes	Level to rolling landform pattern of very low to extremely low relief without stream channels, built up or locally excavated, eroded or aggraded by wind. This landform pattern occurs in usually restricted coastal locations.
		coastal plain	Level landform pattern with extremely low relief either with or without stream channels, built up by coastal, usually tidal, processes.
		beach	Short, low, very wide slope, gently or moderately inclined, built up or eroded by waves, forming the shore of a lake or sea.

		delta	Flood plain projecting into a sea or lake, with slowly migrating deep alluvial channels, usually moderately spaced, typically forming a divergent distributary network. This landform is aggraded by frequently active over-bank and channelled stream flow that is modified by tides.
aeolian deposition	wind	aeolian landforms	Landform pattern built up or locally excavated, eroded or aggraded by wind. Mabbutt (1977) provides a useful summary of the variety of aeolian landforms found in arid climates.
		aeolian dunes	Low mounds, ridges, banks, or hills of loose, windblown granular material (generally sand, in some places volcanic ash), either bare or covered with vegetation, capable of being moved from place to place by wind but always retaining their own characteristic shape.
		longitudinal dunefield	Dune field characterised by long narrow sand dunes and wide flat swales. The dunes are oriented parallel with the direction of the prevailing wind, and in cross section one slope is typically steeper than the other is.
		transverse dunefield	Dune field characterised by long narrow sand dunes and wide flat swales. The dunes are oriented normal to the direction of the prevailing wind, and in cross section the windward slope is typically steeper than the lee slope.
		irregular dunefield	Dune field with a mixture of longitudinal and transverse dunes, as well as other more complicated forms.
		source bordering dune	A dune formed adjacent to the source of the wind blown material. Most commonly the source is a river or floodplain which supplies aeolian sediment during periods of low or no flow.
		lunette	Elongated, gently curved, low ridge built up by wind on the margin of a playa, typically with a moderate, wave-modified slope towards the playa and a gentle outer slope.
		aeolian sheet	A sheet of aeolian material, generally sand, formed when wind moulding of the surface is prevented either by vegetation, or more usually because the sand grains are too coarse. They are commonly associated with sources that give coarse sand grains, such as alluvial plains, or weathering of coarse-grained granite, as in the Yilgarn of Western Australia.
		climbing sheet	
erosion	water, gravity	erosional landforms	Landform pattern of very low to high relief and very gentle to steep slopes. The pattern is eroded by continuously active to slightly active or inactive geomorphic processes.
		erosional plain	Level to undulating or, rarely, rolling landform pattern of extremely low relief (< 9 m) eroded by continuously active to slightly active or inactive geomorphic processes.
		pediment	Gently inclined to level (< 1% slope) landform pattern of extremely low relief, typically with numerous rapidly migrating, very shallow incipient stream channels that form a centrifugal to diverging integrated reticulated pattern. It is eroded, and locally aggraded, by frequently active channelled stream flow or sheet flow, with subordinate wind erosion. Pediments characteristically lie down-slope from adjacent hills with markedly steeper slopes.

		pediplain	Level to very gently inclined landform pattern with extremely low relief and no stream channels, eroded by slightly active sheet flow and wind. Largely relict from more effective erosion by stream flow in incipient channels as on a pediment.
		peneplain	Level to gently undulating landform pattern with extremely low relief and sparse slowly migrating alluvial stream channels that form a non-directional integrated tributary pattern. It is eroded by slightly active sheet flow, creep, and channelled and over bank stream flow.
		etchplain	Level to undulating or, rarely, rolling landform pattern of extremely low relief, formed by deep weathering and then erosion of the resulting weathered regolith. Removal of the weathered material may be either partial or complete (see also Ollier 1984).
		rises	Landform pattern of very low relief (9 - 30 m) and very gentle to steep slopes. The fixed erosional stream channels are closely to very widely spaced and form a dendritic to convergent, integrated or interrupted tributary pattern. The pattern is eroded by continuously active to slightly active creep and sheet flow.
		residual rise	Landform facet of very low relief (9 - 30 m) and very gentle to steep slopes. This term is used to refer to an isolated rise surrounded by other landforms.
		low hills	Landform pattern of low relief (30 - 90 m) and gentle to very steep slopes, typically with fixed erosional stream channels, closely to very widely spaced, which form a dendritic or convergent integrated tributary pattern. There is continuously active sheet flow, creep, and channelled stream flow.
		residual low hill	Landform of low relief (30 - 90 m) and gentle to very steep slopes. This term is used to refer to an isolated low hill surrounded by other landforms.
		hills	Landform pattern of high relief (90 - 300 m) with gently sloping to precipitous slopes. Fixed, shallow erosional stream channels, closely to very widely spaced, form a dendritic or convergent integrated tributary network. There is continuously active erosion by wash and creep and, in some cases, rarely active erosion by landslides.
		mountains	Landform pattern of very high relief (> 300 m) with moderate to precipitous slopes and fixed erosional stream channels which are closely to very widely spaced and form a dendritic of diverging integrated tributary network. There is continuously active erosion by collapse, landslide, sheet flow, creep, and channelled stream flow.
		escarpment	Steep to precipitous landform pattern forming a linearly extensive, straight or sinuous inclined surface which separates terrains at different altitudes, that above the escarpment commonly being a plateau. Relief within the landform pattern may be high (hilly) or low (planar). An included cliff or scarp often marks the upper margin.
		badlands	Landform pattern of low to extremely low relief (< 90 m) and steep to precipitous slopes, typically with numerous fixed erosional stream channels which form a dendritic to parallel integrated tributary network. There is continuously active erosion by collapse, landslide, sheetflow, creep and channelled stream flow.

		drainage depression	Depression cut into a surface by erosional processes. This term should be used only in cases where a single depression or valley is incised into a plateau or other surface, and where the scale of mapping does not allow the depression to be subdivided into its component parts (e.g., rises, floodplain).
mainly depositional	water flow, gravity	fan	Level (< 1% slope) to moderately inclined complex landform pattern of extremely low relief with a generally fan-shaped plan form. The channels form a centrifugal to divergent, integrated, reticulated to distributary pattern.
		alluvial fan	Level (< 1% slope) to very gently inclined complex landform pattern of extremely low relief with a generally fan-shaped plan form. The rapidly migrating alluvial stream channels are shallow to moderately deep, locally numerous, but elsewhere widely spaced. The channels form a centrifugal to divergent, integrated, reticulated to distributary pattern. The landform pattern includes areas that are bar plains, being aggraded or eroded by frequently active channelled stream flow, and other areas comprising terraces or stagnant alluvial plains with slopes that are greater than usual, formed by channelled stream flow but now relict. Incision in the up-slope area may give rise to an erosional stream bed between scarps.
		colluvial fan	Very gently to moderately inclined complex landform pattern of extremely low relief with a generally fan-shaped plan form. Divergent stream channels are commonly present, but the dominant process is colluvial deposition of materials. The pattern is usually steeper than an alluvial fan.
		sheet-flood fan	Level (< 1% slope) to very gently inclined landform pattern of extremely low relief with numerous rapidly migrating very shallow incipient stream channels forming a divergent to unidirectional, integrated or interrupted reticulated pattern. Frequently active sheet flow and channelled stream flow, with subordinate wind erosion aggrade the landform pattern.
glacial activity	ice	glacial landforms	This term covers a wide range of landforms that are produced by glacial processes. In Australia most landforms of this type are all relict, with the exception of Heard Island. For more details, see Fairbridge (1968) or Davies (1969).
		depositional glacial landforms	This collective term includes features such as moraines of various kinds, as well as irregular landforms made up of glacial deposits. For more details, see Fairbridge (1968) or Davies (1969).
		erosional glacial landforms	Glacial erosion produces a variety of streamlined forms such as cirques and U-shaped valleys. For more details, see Fairbridge (1968) or Davies (1969).
solution	water	karst	Landform pattern of unspecified relief and slope (for specification use terms such as “Karst rolling hills”) typically with fixed deep erosional stream channels forming a non-directional disintegrated tributary pattern and many closed depressions without stream channels. It is eroded by continuously active solution and rarely active collapse, the products being removed through underground channels.
erosion, deposition	humans	made land	Landform pattern typically of very low or extremely low relief and with slopes in the classes level and very steep. Sparse, fixed deep artificial steam channels form a non-directional interrupted tributary pattern. The landform pattern is eroded and aggraded, and locally built up or excavated, by rarely active human agency.

rapid excavation	meteor impact	meteor crater	Rare landform pattern comprising a circular closed depression with a raised margin, it is typically of low to high relief and has a large range of slope values, without stream channels, or with a peripheral integrated pattern of centrifugal tributary streams. The pattern is excavated, heaved up and built up by a meteor impact and now relict.
erosional and depositional	water, wind	plain	Level to undulating or, rarely, rolling landform pattern of extremely low relief (< 9 m). Some types of plains are described under alluvial landforms, and some are also described under erosional landforms.
		depositional plain	Level landform pattern with extremely low relief formed by unspecified depositional processes.
		lacustrine plain	Level landform pattern with extremely low relief formerly occupied by a lake but now partly or completely dry. It is relict after aggradation by waves and by deposition of material from suspension and solution in standing water. The landform pattern is usually bounded by wave-formed cliffs, rock platforms, beaches, berms and lunettes that may be included or excluded.
		playa plain	Level landform pattern with extremely low relief, typically without stream channels, aggraded by rarely active sheet flow and modified by wind, waves, and soil phenomena. Playa plains are sediment sinks and are the lowest parts of the landscape.
		sand plain	Level landform pattern with extremely low relief, typically without stream channels, aggraded by active wind deposition and rarely active sheet flow.
		plateau	Level to rolling landform pattern of plains, rises or low hills standing above a cliff, scarp or escarpment that extends around a large part of its perimeter. A bounding scarp or cliff may be included or excluded; a bounding escarpment would be an adjacent landform pattern.
		plateau edge	The cliff, scarp or escarpment that extends around a large part of the perimeter of a plateau.
		plateau surface	The low relief surface of a plateau.
		unknown	
volcanic	volcanic eruption	volcano	Typically very high and very steep landform pattern without stream channels, or with erosional stream channels forming a centrifugal or radial tributary pattern. The landform is built up by volcanism, and modified by erosional agents.
		caldera	Rare landform pattern typically of very high relief and steep to precipitous slopes. It is without stream channels or has fixed erosional channels forming a centripetal integrated tributary pattern. The landform has subsided or was excavated as a result of volcanism.
		cone (volcanic)	Typically low to high relief and very steep landform pattern without stream channels, or with erosional rills forming a radial tributary pattern. The landform is built up by volcanism, and slightly modified by erosional agents.

		lava plain	Level to undulating landform pattern of very low to extremely low relief typically with widely spaced fixed stream channels which form a non-directional integrated or interrupted tributary pattern. The landform pattern is aggraded by volcanism (lava flow) that is generally relict; it is subject to erosion by continuously active sheet flow, creep, and channelled stream flow.
		ash plain	Level to undulating landform pattern of very low to extremely low relief typically with widely spaced fixed stream channels that form an integrated or interrupted tributary pattern. The landform pattern is aggraded by volcanism (ash fall) that is generally relict; it is subject to erosion by continuously active sheet flow, creep, and channelled stream flow.
		lava flow	A landform produced on the land surface by flowing magma. It is generally relict, and subject to erosion by continuously active sheet flow, creep, and channelled stream flow.
		lava plateau	A plateau aggraded by volcanism (lava flow) that is generally relict, and subject to erosion by continuously active sheet flow, creep, and channelled stream flow.

APPENDIX 5: GEOMORPHIC PROCESSES

The contents of this section are taken from "RTMAP" (Pain *et al.* 2003)

Geomorphic processes are those that form or modify landform units. They can refer to either present or past activity. This means that processes occurring now as well as those responsible for the evolution of a regolith terrain unit can be entered into the database. An active/relict (A/R) code is used to distinguish the two. Brief definitions are included here. For more detailed descriptions of these processes the user is referred to a textbook on geomorphology, such as Chorley *et al.* (1984). Other suitable references are given at various points.

GEOMORPHIC PROCESS	DEFINITION
Gravity	Any geomorphic process that acts mainly as a result of gravity. For more details see Selby (1982).
Vertical collapse	Collapse of large fragments of rock and/or soil, commonly from cliff faces. The collapsed materials accumulate where they fall, and may be acted on by other processes.
Particle fall	More-or-less free fall of small particles of rock and/or soil from or near vertical faces.
Creep	Slow movement of rock and/or soil particles down slope under the influence of gravity. Creep operates at rates of a few millimetres per year, with wetting and drying, shrinking and swelling, and freezing and thawing all contributing to the down slope movement of material.
Landslide	Translational movement of material along a shear plane under the influence of gravity. The moving material may be either a single coherent mass, or it may consist of a number of sliding fragments. In this type of movement, the material generally maintains its orientation relative to the land surface. The resulting deposit contains unbroken blocks or rafts of material.
Mudflow	Turbulent movement of material down slope under the influence of gravity. In this type of movement the moving mass tumbles, rolls and flows down slope. The resulting deposit is a mixture of material of all sizes, with no obvious orientation or indication of original structure.
Water	The movement and deposition of material through the agency of water. For more details see Morisawa (1985).
Channelled stream flow	Erosion, transport and deposition of material in stream channels. These commonly give well-sorted deposits that are confined to river channels, either modern or relict (channel deposits).
Over-bank stream flow	Erosion, transport and deposition of material on flood plains and other areas adjacent to rivers by water which has flowed out of a confined channel (over-bank deposits).
Sheet flow, sheet wash, surface wash	Erosion, transport and deposition of material by sheets of water flowing over the ground surface. This unconfined flow occurs on hill slopes and on low angle landform units. It commonly removes fine material, leaving coarser material behind as a lag deposit.
Waves	Erosion, transport and deposition of material by wave action either on the seacoast or along lake edges. For more details on coastal processes see Davies (1980).
Tides	Erosion, transport and deposition of material by movement of tidal currents.

GEOMORPHIC PROCESS	DEFINITION
Detrital deposition in still water	Deposition of detrital material from a body of standing water onto the floor of the basin. In terrestrial landscapes this occurs in lakes. Sources of detrital material include channel flow into the lake, and wave action along lake edges.
Rill/gully erosion	Linear erosion by water, producing steep sided channels. Rills are less than 0.3 m deep and gullies are more than 0.3 m deep.
Ice	Erosion, transport and deposition of material by moving ice. For more details see Davies (1969).
Frost	Freezing and thawing of water which leads to shattering and movement of rock fragments, and disturbance of soil material. Processes include solifluction, and the development of patterned ground.
Glacial erosion	Erosion and transport of material by glacial ice, giving rise to distinctive landforms such as U-shaped valleys and cirques.
Glacial deposition	Deposition of material from melting ice. The general term moraine refers to the deposits.
Wind	Erosion, transport and deposition of material by wind. For more details see Mabbutt (1977).
Wind erosion (deflation)	Erosion of material by the action of wind. This may involve entrainment of sand and dust particles, and their movement to other locations. It also includes the action of sand corrosion to produce ventifacts.
Sand deposition (wind)	Deposition of sand by wind to form various landform types including dunes and sand sheets.
Dust deposition (wind)	Deposition of dust being transported by wind in the atmosphere as suspended load. This process is responsible for deposition of loess. Where the dust is composed of clay pellets, it forms a special kind of loess, sometimes called parna in Australia.
Diastrophism; earth movements	Diastrophic movements are those that result directly or indirectly in relative or absolute changes of position, level or attitude of rocks forming the earth's crust. This includes uplift and faulting.
Volcanism	Volcanism refers to the group of processes generated by volcanic activity on the land surface (see Ollier 1988).
Lava flow	The flow of molten rock across the land surface.
Ash flow	The flow of volcanic ash material across the land surface. This includes nuée ardentes. The resulting deposits are sometimes called ignimbrites.
Ash fall	The fall of volcanic ash on to the land surface, typically leading to mantles of volcanic ash (tephra) over all parts of the landscape.
Biological agents	Formation or changes in the shape of landforms by animals or plants, for example, the development of coral reefs.
Human agents	Formation or changes in the shape of landforms by human activity.
Impact by meteors	Formation or changes in the shape of landforms by meteorite impact, typically to produce craters.

APPENDIX 6: LANDUSE LOOKUP DESCRIPTIONS

The descriptions below pertain to the land use lookup. They were modified from the Bureau of Rural Sciences (2007).

Class 1 - Conservation and Natural Environments

1.1.0 Nature conservation

Tertiary classes 1.1.1 - 1.1.6 are based on the Collaborative Australian Protected Areas Database (CAPAD) classification (Cresswell and Thomas 1997). Includes nature conservation areas (nature reserves, wilderness areas, nature parks), areas of managed resource protection (catchment areas, traditional indigenous lands) and areas of minimal land use (defence lands, stock routes, areas under rehabilitation or unused due to land degradation).

Class 2 - Production from Relatively Natural Environments

2.1.0 Grazing natural vegetation

Land uses based on grazing by domestic stock on native vegetation where there has been limited or no deliberate attempt at pasture modification. Some change in species composition may have occurred.

2.2.0 Production forestry

Commercial production from native forests and related activities on public and private land. **NB:** Environmental and indirect production uses associated with retained native forest (eg prevention of land degradation, wind-breaks, shade and shelter) are included in an appropriate class under 1. Conservation and natural environments.

Class 3 - Production from Dryland Agriculture and Plantations

3.1.0 Plantation forestry

Land on which plantations of trees or shrubs (native or exotic species) have been established for production or environmental and resource protection purposes. This includes farm forestry. Where planted trees are grown in conjunction with pasture, fodder or crop production, class allocation should be made on the basis of either prime use or multiple class attribution.

3.2.0 Grazing modified pastures

Pasture and forage production, both annual and perennial, based on significant active modification or replacement of the initial native vegetation. Land under pasture at the time of mapping may be in a rotation system so that at another time the same area may be, for example, under cropping. Land in a rotation system should be classified according to the land use at the time of mapping. Suggested tertiary classes for legume and grass pasture types can be fitted to the pasture attributes collected through the Australian Bureau of Statistics (ABS) Agricultural Census.

3.3.0 Cropping

Land under cropping at the time of mapping may be in a rotation system so that at another time the same area may be, for example, under pasture. Land in a rotation system should be classified according to the land use at the time of mapping. Cropping can vary markedly over relatively short distances in response to change in the nature of the land and the preferences of the land manager. It may also change over time in response to market conditions. Fodder production, such as lucerne hay, is treated as a crop as there is no harvesting by stock. At the tertiary level it is suggested that classes be based on commodities / commodity groups that relate to ABS level 2 agricultural commodity categories. Crops categories are: Cereals, beverage and spice crops, hay and silage, oil seeds, sugar, cotton, tobacco and legumes. **NB:** These are classified further using the Landuse Subtype categories in the digital data entry template.

3.4.0 Perennial horticulture

Crop plants living for more than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control. Suggested tertiary classes are based on the ABS commodities Level 2 categories that relate to horticulture. They are: tree fruits, oleaginous (oil) fruits, tree nuts, vine fruits, shrub nuts, fruits and berries, flowers and bulbs, and vegetables and herbs.

3.5.0 Seasonal horticulture

Crop plants living for less than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control. Suggested tertiary classes are based on the ABS commodities Level 2 agricultural commodity categories that relate to horticulture. They are: fruits, nuts, flowers and bulbs, and vegetables and herbs.

3.6.0 Land in transition

Areas where the land use is unknown and cannot reasonably be inferred from the surrounding land use. For example: degraded land (severely degraded land not undergoing active rehabilitation), abandoned land, land under rehabilitation, and land of no defined use.

Class 4 - Production from Irrigated Agriculture and Plantations

4.1.0 Irrigated plantation forestry

Land on which irrigated plantations of trees or shrubs have been established for production or environmental and resource protection purposes. This includes farm forestry e.g., hardwood production, softwood production.

4.2.0 Irrigated modified pastures

Irrigated pasture production, both annual and perennial, based on a significant degree of modification or replacement of the native vegetation. This class may include land in a rotation system that at other times may be under cropping. Land in a rotation system should be classified according to the land use at the time of mapping. Cropping/pasture rotation regimes are treated as land management practices. Pastures include: woody fodder plants, legumes, and sown grasses.

4.3.0 Irrigated cropping

Land under irrigated cropping. This class may include land in a rotation system that at other times may be under pasture. Land in a rotation system should be classified according to the land use at the time of mapping. Cropping/pasture rotation regimes are treated as land management practice. Crop types as per dryland cropping. NB: These are classified further using the Landuse Subtype categories in the digital data entry template.

4.4.0 Irrigated perennial horticulture

Irrigated crop plants living for more than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control. They are: tree fruits, oleaginous (oil) fruits, tree nuts, vine fruits, shrub nuts, fruits and berries, flowers and bulbs, and vegetables and herbs.

4.5.0 Irrigated seasonal horticulture

Irrigated crop plants living for less than two years that are intensively cultivated, usually involving a relatively high degree of nutrient, weed and moisture control. They are: fruits, nuts, flowers and bulbs, and vegetables and herbs.

4.6.0 Irrigated land in transition

Areas where irrigated production may have been carried out but land use is unknown and cannot reasonably be inferred from the surrounding land use. **NB:** Evidence or knowledge of irrigation use, or irrigation infrastructure, should be present. Land can be degraded, abandoned, under rehabilitation or have no defined use (irrigation).

Class 5 - Intensive uses

5.1.0 Intensive horticulture

Intensive forms of plant production e.g., glasshouses and shade houses.

5.2.0 Intensive animal production

Intensive forms of animal production (excludes associated grazing/pasture). Agricultural production facilities such as feedlots, piggeries etc may be included as tertiary classes. Production types are: dairy, cattle, sheep, poultry, pigs, aquaculture. **NB:** These are classified further using the Landuse Subtype categories in the digital data entry template.

5.3.0 Manufacturing and industrial

Factories, workshops, foundries, construction sites etc. This includes the processing of primary produce eg sawmills, pulp mills, abattoirs etc.

5.4.0 Residential

Residential includes urban (houses, flats, hotels etc), rural residential (peri-urban where agriculture is not primary source of income) and rural (areas with substantial amount of native vegetation with no agricultural development)

5.5.0 Services

Land allocated to the provision of commercial or public services resulting in substantial interference to the natural environment. Where services are provided on land that retains natural cover, an appropriate classification under (i) Conservation and Natural Environments should be applied (eg 1.1.7; 1.3). Services include: commercial (shops, markets etc), public (education and community services), recreation and cultural (parks, camping grounds, pools, museums, places of worship etc), defence facilities (unless significant natural cover is retained) and research facilities.

5.6.0 Utilities

Utilities such as electricity generation/transmission and gas treatment, storage and transmission.

5.7.0 Transport and communication

Includes airports/aerodromes, roads, railways, ports and navigation and communication uses (like radar stations).

5.8.0 Mining

Mines, quarries and tailings.

5.9.0 Waste treatment and disposal

Waste material and disposal facilities associated with industrial, urban and agricultural activities e.g., stormwater, landfill, incinerators and sewage.

Class 6 - Water

6.1.0 Lake

Feature relates to uses in 1. Conservation and Natural Environments, 2. Production from Relatively Natural Environments, and 5. Intensive Uses.

6.2.0 Reservoir/dam

Includes water storages, evaporation basins and effluent ponds.

6.3.0 River

Feature relates to uses in 1. Conservation and Natural Environments, 2. Production from Relatively Natural Environments, and 5. Intensive Uses.

6.4.0 Channel/aqueduct

Includes supply and drainage channel/aqueducts.

6.5.0 Marsh/wetland

Feature relates to uses in 1. Conservation and Natural Environments, 2. Production from Relatively Natural Environments, and 5. Intensive Uses.

6.6.0 Estuary/coastal waters

Feature relates to uses in 1. Conservation and Natural Environments, 2. Production from Relatively Natural Environments, and 5. Intensive Uses.

APPENDIX 7: DATABASE LOOKUPS

Original headings as used in Field Data Entry Sheets

SAMPLE_TYPE (subset)
AUGER SAMPLE
FLOAT
LAG
PIT/TRENCH SAMPLE
SURFACE REGOLITH SAMPLE
VEGETATION

Mottles_size
coarse (15 - 30mm)
fine (< 5mm)
medium (5 - 15mm)
megamottles (> 100mm)
very coarse (30 - 100mm)

HOLE_TYPE (subset)
Costean or trench section
Hand auger hole
Pit
Power auger hole
Soil pit

Mottles_abundance
common (10 -20%)
few (2 - 10%)
many (20 -50%)
no mottles
very few (< 2%)

LANDUSE
1.0.0 Conservation and Natural Environments

2.1.0 Grazing natural vegetation
2.2.0 Production forestry of natural vegetation

3.1.0 Dryland Plantation forestry
3.2.0 Dryland Grazing modified pastures
3.3.0 Dryland Cropping
3.4.0 Dryland Perennial horticulture
3.5.0 Dryland Seasonal horticulture
3.6.0 Dryland Land in transition

4.1.0 Irrigated plantation forestry
4.2.0 Irrigated modified pastures
4.3.0 Irrigated cropping
4.4.0 Irrigated perennial horticulture
4.5.0 Irrigated seasonal horticulture
3.6.0 Irrigated land in transition

5.2.0 Intensive animal production
5.3.0 Manufacturing and industrial
5.4.0 Residential
5.5.0 Services
5.6.0 Utilities
5.8.0 Mining

6.1.0 Lake
6.2.0 Reservoir/dam
6.3.0 River
6.5.0 Marsh/wetland
6.6.0 Estuary/coastal waters

LANDUSE_SUBTYPE
3.3.0 Dryland Cropping
- 3.3.1 Dryland cereals
- 3.3.2 Dryland beverage & spice crops
- 3.3.3 Dryland hay & silage
- 3.3.4 Dryland oil seeds
- 3.3.5 Dryland sugar
- 3.3.6 Dryland cotton
- 3.3.7 Dryland tobacco
- 3.3.8 Dryland legumes

4.3.0 Irrigated cropping
- 4.3.1 Irrigated cereals
- 4.3.2 Irrigated beverage & spice crops
- 4.3.3 Irrigated hay & silage
- 4.3. 4 Irrigated oil seeds
- 4.3.5 Irrigated sugar
- 4.3.6 Irrigated cotton
- 4.3.7 Irrigated tobacco
- 4.3.8 Irrigated legumes

5.2.0 Intensive animal production
- 5.2.1 Dairy
- 5.2.2 Cattle
- 5.2.3 Sheep
- 5.2.4 Poultry
- 5.2. 5 Pigs
- 5.2.6 Aquaculture

LANDFORM_TYPE

alluvial plain
flood plain
anastomatic plain
bar plain
covered plain
meander plain
floodout
alluvial terrace
stagnant alluvial plain
terraced land
alluvial swamp

coastal lands
beach ridge
chenier plain
coral reef
marine plain
tidal flat
coastal dunes
coastal plain
beach
delta

aeolian landforms
aeolian dunes
longitudinal dunefield
transverse dunefield
irregular dunefield
source bordering dune
lunette
aeolian sheet
climbing sheet

erosional landforms
erosional plain
pediment
pediplain
peneplain
etchplain
rises
residual rise
low hills
residual low hills
hills
mountains
escarpment
badlands
drainage depression

plain
depositional plain
lacustrine plain
playa plain
sand plain
plateau
plateau edge
plateau surface

fan
alluvial fan
colluvial fan
sheet-flood fan

glacial features
depositional glacial features

GEOMORP_PR

water
tides
waves
channelled stream flow
over-bank stream flow
sheet flow,sheet or surface wash
detrital deposition still water
rilling/gullying
subsurface solution/piping

wind
wind erosion (deflation)
sand deposition (wind)
dust deposition (wind)
biological agents; coral
diastrophism; earth movements
frost
glacial deposition
glacial erosion

gravity
vertical collapse
particle fall
creep
landslide
mudflow

impact by meteors

human agents

volcanism
lava flow
ash flow
ash fall

MUNSELL	10R3/3	10Y4/1	10YR7/6	2.5Y8/1	2.5YR7/1	5G6/2	5Y6/2	5YR5/8	
10B2.5/1	10R3/4	10Y5/1	10YR7/8	2.5Y8/2	2.5YR7/2	5G7/1	5Y6/3	5YR6/1	
10B3/1	10R3/6	10Y6/1	10YR8/1	2.5Y8/3	2.5YR7/3	5G7/2	5Y6/4	5YR6/2	
10B4/1	10R4/1	10Y7/1	10YR8/2	2.5Y8/4	2.5YR7/4	5G8/1	5Y6/6	5YR6/3	
10B5/1	10R4/2	10Y8/1	10YR8/3	2.5Y8/6	2.5YR7/6	5G8/2	5Y6/8	5YR6/4	
10B6/1	10R4/3	10YR2/1	10YR8/4	2.5Y8/8	2.5YR7/8	5GY2.5/1	5Y7/1	5YR6/6	
10B7/1	10R4/4	10YR2/2	10YR8/6	2.5YR2.5/1	2.5YR8/1	5GY3/1	5Y7/2	5YR6/8	
10B8/1	10R4/6	10YR3/1	10YR8/8	2.5YR2.5/2	2.5YR8/2	5GY4/1	5Y7/3	5YR7/1	7.5YR5/6
10G2.5/1	10R4/8	10YR3/2	2.5Y2.5/1	2.5YR2.5/3	2.5YR8/3	5GY5/1	5Y7/4	5YR7/2	7.5YR5/8
10G3/1	10R5/1	10YR3/3	2.5Y3/1	2.5YR2.5/4	2.5YR8/4	5GY6/1	5Y7/6	5YR7/3	7.5YR6/1
10G4/1	10R5/2	10YR3/4	2.5Y3/2	2.5YR3/1	5B2.5/1	5GY7/1	5Y7/8	5YR7/4	7.5YR6/2
10G5/1	10R5/3	10YR3/6	2.5Y3/3	2.5YR3/2	5B3/1	5GY8/1	5Y8/1	5YR7/6	7.5YR6/3
10G6/1	10R5/4	10YR4/1	2.5Y4/1	2.5YR3/3	5B4/1	5PB2.5/1	5Y8/2	5YR7/8	7.5YR6/4
10G7/1	10R5/6	10YR4/2	2.5Y4/2	2.5YR3/4	5B5/1	5PB3/1	5Y8/3	5YR8/1	7.5YR6/6
10G8/1	10R5/8	10YR4/3	2.5Y4/3	2.5YR3/6	5B6/1	5PB4/1	5Y8/4	5YR8/2	7.5YR6/8
10GB2.5/1	10R6/1	10YR4/4	2.5Y4/4	2.5YR4/1	5B7/1	5PB5/1	5Y8/6	5YR8/3	7.5YR7/1
10GB3/1	10R6/2	10YR4/6	2.5Y5/1	2.5YR4/2	5B8/1	5PB6/1	5Y8/8	5YR8/4	7.5YR7/2
10GB4/1	10R6/3	10YR5/1	2.5Y5/2	2.5YR4/3	5BG2.5/1	5PB7/1	5YR2.5/1	7.5YR2.5/1	7.5YR7/3
10GB5/1	10R6/4	10YR5/2	2.5Y5/3	2.5YR4/4	5BG3/1	5PB8/1	5YR2.5/2	7.5YR2.5/2	7.5YR7/4
10GB6/1	10R6/6	10YR5/3	2.5Y5/4	2.5YR4/6	5BG4/1	5Y2.5/1	5YR3/1	7.5YR2.5/3	7.5YR7/6
10GB7/1	10R6/8	10YR5/4	2.5Y5/6	2.5YR4/8	5BG5/1	5Y2.5/2	5YR3/2	7.5YR3/1	7.5YR7/8
10GB8/1	10R7/1	10YR5/6	2.5Y6/1	2.5YR5/1	5BG6/1	5Y3/1	5YR3/3	7.5YR3/2	7.5YR8/1
10GY2.5/1	10R7/2	10YR5/8	2.5Y6/2	2.5YR5/2	5BG7/1	5Y3/2	5YR3/4	7.5YR3/3	7.5YR8/2
10GY3/1	10R7/3	10YR6/1	2.5Y6/3	2.5YR5/3	5BG8/1	5Y4/1	5YR4/1	7.5YR3/4	7.5YR8/3
10GY4/1	10R7/4	10YR6/2	2.5Y6/4	2.5YR5/4	5G2.5/1	5Y4/2	5YR4/2	7.5YR4/1	7.5YR8/4
10GY5/1	10R7/6	10YR6/3	2.5Y6/6	2.5YR5/6	5G2.5/2	5Y4/3	5YR4/3	7.5YR4/2	7.5YR8/6
10GY6/1	10R7/8	10YR6/4	2.5Y6/8	2.5YR5/8	5G3/1	5Y4/4	5YR4/4	7.5YR4/3	N2.5/
10GY7/1	10R8/1	10YR6/6	2.5Y7/1	2.5YR6/1	5G3/2	5Y5/1	5YR4/6	7.5YR4/4	N3/
10GY8/1	10R8/2	10YR6/8	2.5Y7/2	2.5YR6/2	5G4/1	5Y5/2	5YR5/1	7.5YR4/6	N4/
10R2.5/1	10R8/3	10YR7/1	2.5Y7/3	2.5YR6/3	5G4/2	5Y5/3	5YR5/2	7.5YR5/1	N5/
10R2.5/2	10R8/4	10YR7/2	2.5Y7/4	2.5YR6/4	5G5/1	5Y5/4	5YR5/3	7.5YR5/2	N6/
10R3/1	10Y2.5/1	10YR7/3	2.5Y7/6	2.5YR6/6	5G5/2	5Y5/6	5YR5/4	7.5YR5/3	N7/
10R3/2	10Y3/1	10YR7/4	2.5Y7/8	2.5YR6/8	5G6/1	5Y6/1	5YR5/6	7.5YR5/4	N8/

FIELD_pH
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5
6
6.5
7
7.5
8
8.5
9
9.5
10
10.5
11
11.5
12

Induration (subset)
bauxitic induration
bauxitic, partially cemented
calcareous induration
calcareous, moderately cemented
calcrete
calcrete (bauxite)
clay hardpan
clay induration
completely cemented duricrust
duricrust
ferricrete
ferruginous hardpan
ferruginous induration
ferruginous, moderately cemented
gypcrete
gypseous induration
humic hardpan
humic induration
indurated material
massive ferricrete
moderately cemented duricrust
nodular ferricrete
partially cemented duricrust
silcrete
silcrete pods
silcrete sheet
siliceous hardpan
siliceous induration
siliceous, moderately cemented
silcrete pods
silcrete sheet
siliceous hardpan
siliceous induration
siliceous nodules
siliceous, moderately cemented

Segregations_abundance
common (10 - 20%)
few (2 - 10%)
many (20 - 50%)
no segregations
very few (< 2%)
very many (> 50%)

Segregations_composition
aluminous
argillaceous
calcareous
earthy
ferruginous
gypseous
manganiferous
organic
other
saline
unidentified

Segregations_size
coarse (6 - 20mm)
extremely coarse (> 60mm)
fine (< 2mm)
medium (2 - 6mm)
very coarse (20 - 60mm)

Segregations_type
concretions
fragments
nodules
pisoliths
tubules

segregations_effervescence
no reaction
slight reaction
moderately reactive
highly reactive
very highly reactive

effervescence reaction test
HCl
H2O2

coarse fragments_abundance
no coarse fragments (0)
very few (<2%)
few (2 - 10%)
common (10 - 20%)
many/moderate (20 - 50%)
abundant (50 - 90%)
very abundant (>90%)

coarse fragments_size
fine gravelly; small pebbles (2-6 mm)
medium gravelly; medium pebbles (6-20 mm)
coarse gravelly; large pebbles (20-60 mm)
cobbly; or cobbles (60-200 mm)
stony; stones (200-600 mm)
bouldery; or boulders (600 mm - 2 m)
large boulders (>2m)

coarse fragments in profile_shape

angular
subangular
subrounded
rounded
angular tabular
subangular tabular
subrounded tabular
rounded tabular
angular platy
subangular platy
subrounded platy
rounded platy

coarse fragments in profile_lithology

agglomerate
alkali feldspar granite
alkali feldspar syenite
amphibolite
andesite
anorthosite
aplite
arenite
argillite
arkose
basalt
basanite
biocarbonate
bomb, block tephra
breccia
calcrete
carbonatite
chalk
charcoal
charnockite
chert
chromitite
claystone
conglomerate
dacite
diamictite
diatomite
diorite
dolerite
dolostone
dunite
eclogite
evaporite
fanglomerate
ferricrete
flint
gabbro
gabbronorite
gneiss
gossan
grainstone
granite
granodiorite
granofels
granulite
grapestone
greenstone
greisen
greywacke
grus
harzburgite
hornblende gabbro
hornblendite
hornfels
ignimbrite
iron formation
ironstone
kimberlite
komatiite
lamproite
lamprophyre
latite
lherzolite
limestone
marble
marl
metasomatite
migmatite
monzodiorite
monzogabbro
monzogranite
monzonite
mudstone
mylonite
norite
obsidian
olivine hornblendite
ophiolite
opx alkali feldspar syenite
opx syenite
pegmatite
pelite
peralkaline rhyolite
peridotite
phosphorite
phyllite
plagioclase-bearing hornblendite
porcellanite
porphyry
psammite
pyroxene hornblende peridotite
pyroxene hornblendite
pyroxene peridotite
pyroxenite
quartz
quartz alkali feldspar syenite
quartz anorthosite
quartz diorite
quartz gabbro
quartz latite
quartz monzonite
quartz syenite
quartz trachyte
quartzite
quartzolite
quartz-rich granitoid
rhyodacite
rhyolite
sandstone
saprolite
schist
serpentinite
shale
shell
shoshonite
silcrete
siltstone
skarn
slate
sparagmite
spilite
syenite
tillite
tilloid
tonalite
trachyandesite
trachybasalt
trachydacite
trachyte
travertine
tuff
tuffite
turbidite
wehrlite