Management Plan for Antarctic Specially Protected Area No. 174

STORNES, LARSEMANN HILLS, PRINCESS ELIZABETH LAND

Introduction

Stornes (69°25’S, 76°6’E) is the largest peninsula in the Larsemann Hills, on the south-eastern coast of Prydz Bay, Princess Elizabeth Land, East Antarctica. Stornes is located within Antarctic Specially Managed Area (ASMA) No. 6 Larsemann Hills, which was designated under Measure 2 (2007). In the original Larsemann Hills ASMA Management Plan, Stornes was designated a restricted zone.

Stornes appears to be geologically unique in the development of the borosilicate minerals boralsilite, prismatine and grandidierite, and of the phosphate mineral wagnerite. These mineral assemblages are considered highly significant in both their variety and areal extent, and the richness of extremely rare granulite-facies borosilicate and phosphate mineralogy is notable. The ASPA is primarily designated to protect the outstanding geological features of this area, specifically the rare mineral occurrences and the highly unusual host rocks in which they occur. Such protection will also maintain the overall geological integrity and context of these rare mineral occurrences for future study, and for preserving the possibility of discovery of new mineral species and occurrences.

Stornes is also one of only two locations on the East Antarctic margin where fossiliferous sediments contain evidence of the palaeoenvironment at a time of reduced ice volume some 4 million years ago.

The Area is located in relatively close proximity to continually-occupied stations and its geological values are therefore susceptible to damage from over-sampling or unauthorised removals; and disturbance from field research and logistical activities, including the use of vehicles and the establishment of infrastructure. ASPA designation assists in ensuring that this geologically significant location is protected for future studies of the palaeoenvironment of Antarctica.

Designation of Stornes as an ASPA also recognises the desirability of protecting this infrequently visited and relatively minimally impacted peninsula as a reference site for future comparison with other parts of the Larsemann Hills where several research stations are located.

Description of values to be protected

Geological values

Stornes is unique on account of the presence of a diverse suite of borosilicate minerals (five species) and phosphate minerals (nine species). The relatively rare borosilicates prismatine and grandidierite are found abundantly in spectacular crystals and segregations over a wide area, while the ferromagnesian fluorphosphate wagnerite forms spectacular nodules locally and microscopic grains regionally.

Stornes is the discovery (or type) locality for three new mineral species: the boron mineral boralsilite and the phosphate minerals stornesite-(yttrium) and tassieite. In addition, wagnerite occurs as two different polytypes (that is, having the same chemical formula but different crystal structure); indeed the first discovery of wagnerite showing polytypism was in specimens from the Larsemann Hills. Furthermore, the boron minerals grandidierite, prismatine and dumortierite, as well as wagnerite, are present in unusual abundance or as large crystals in the Larsemann Hills; few localities elsewhere in the world can compare. It is the spectacular development of these minerals and boralsilite, one of the few recently described minerals to be readily visible to the naked eye, which makes these rare minerals vulnerable to damage.

Scientific values

The borosilicate and phosphate assemblages at Stornes are considered scientifically significant both in their variety and origin. A major question being addressed in ongoing research is what geologic processes concentrated boron and phosphorus to such an extent.

Sediments on north-eastern Stornes (at approximately 69°25’S 76°0’E) contain abundant well preserved foraminifera, diatoms and fragmentary molluscs which allow determination of age and palaeoenvironment at a time (4 Ma) when Antarctic ice volume was reduced. This location represents one of only two recorded sites in East Antarctica displaying sediment from this time interval. The sediments are thin and friable and thus require protection from human disturbance which may jeopardise future scientific investigations.

The ice sheet on Stornes has almost no connection with the Antarctic plateau. Its size (about 2 km in diameter), position and isolation make it an accessible and interesting object for glaciological research in the Larsemann Hills. Modern surveying techniques allow observations of this kind. As a comparatively small body of ice, the glacier does not have much inertia and as such it will rapidly respond to and indicate climate change. Studies of this site combined with glaciological monitoring observations undertaken in other oases, will generate new knowledge in the region.

Stornes has been infrequently visited and is minimally impacted by human activities. ASPA protection also serves to establish a reference site for possible future comparison with other peninsulas within the Larsemann Hills which have been subject to notable alteration as a result of the establishment and operation of research stations. To this end, the ASPA encompasses as large an area of the peninsula as possible while accommodating the logistics that may be needed to service the research stations that were established before the ASPA and ASMA were designated.

1. Aims and objectives

Management of the ASPA aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary or inadvertent human disturbance through uncontrolled access and inappropriate collections of geological material;
- allow scientific research in the Area provided it is for compelling reasons which cannot be served elsewhere;
- preserve the Area as a reference area for future comparative studies, in particular with station areas in the Larsemann Hills; and
- allow visits for management purposes in support of the aims of the Management Plan.

2. Management activities

To protect the values of the Area:

- information about the ASPA, including copies of this Management Plan, shall be made available on vessels and at facilities operating in the region;
- personnel in the vicinity of, accessing or flying over the Area shall be specifically instructed, by their national program, as to the provisions and contents of the Management Plan;
- markers or signs erected within the Area for scientific or management purposes shall be secured and maintained in good condition and removed when no longer required;
- abandoned equipment or materials shall be removed to the maximum extent possible provided that doing so does not adversely impact on the values of the Area;
- national Antarctic programs operating in the Area shall work together to ensure the above aims are supported; and
- the Management Plan shall be reviewed no less than once every five years, and jointly updated by the Parties active in the Larsemann Hills (i.e. those participating in the ASMA Management Group).

3. Period of designation

Designated for an indefinite period.

4. Maps

Map A: Antarctic Specially Protected Area No. 174, Larsemann Hills, Princess Elizabeth Land.

Map B: Antarctic Specially Protected Area No. 174, Stornes, Larsemann Hills, Geology.

All map specifications: Horizontal Datum: WGS84; Projection: UTM Zone 43

5. Description of the Area

5(i) Geographical co-ordinates, boundary markers and natural features

General description

Stornes (69°25'S, 76°6'E) lies within the Larsemann Hills, a coastal ice-free area in southern Prydz Bay, East Antarctica. Stornes is located between Thala Fjord and Wilcock Bay and is 21.13 km^2 in area. The ASPA comprises the majority of Stornes, plus small unnamed promontories to the south-west (see Map B). The Area does not have a marine component.

Boundary coordinates for the Area are provided at Appendix 1.The Area boundary comprises the coastline (following the low tide mark) between a point on the western side of Thala Fjord at 76°8'29"E, 69°25'29"S (boundary point 1) to a point to the south of McCarthy Point at 76°3'22"E, 69°28'40"S (boundary point 25). The remainder of the boundary largely follows the southern limit of rock outcrops between the aforementioned points. An indentation from the coast on the eastern side of the peninsula accommodates the potential need for vehicle landings and access to the inland and Broknes when ice conditions do not allow the use of preferred landings and routes elsewhere in the Larsemann Hills.

Where possible the boundary uses natural features (e.g. coastline, contours and rock outcrops) for ease of on-ground navigation.

Geology

The Larsemann Hills area contains sedimentary and volcanic rocks that were laid down between 900 and 550 million years ago. Stornes is underlain by Proterozoic metasediments, deformed felsic orthogneisses, and early Palaeozoic granites and post-tectonic pegmatites. Proterozoic metasediments, collectively termed the Brattstrand Paragneiss, are exposed along a north-east trending corridor across central Stornes and an area to the south and east of Allison Ice Dome. The metasediments comprise a heterogeneous package of pelitic, psammatic and possible volcanogenic rocks that are characterised by unusual enrichment in boron (B) and phosphorous (P) and which host the rare B and P-bearing minerals found on Stornes. Precursor Brattstrand Paragneiss sediments were deposited (probably at ca. 950-1000 Ma) onto Mesoproterozoic crystalline 'basement' represented by the Søstrene Orthogneiss (ca. 1125 Ma), a layered felsic-mafic orthogneiss and which is best exposed on islands to the north and northeast of Stornes (e.g. McLeod Island, see Carson and Grew 2007). During an early Palaeozoic (ca. 530-515 Ma) high-grade tectonometamorphic event, the Brattstrand Paragneisses were tectonically transposed and interleaved with the felsic Blundell Orthogneiss (emplaced ca. 970 Ma), a widespread unit exposed on northern and southern Stornes. A number of granite bodies (e.g. Progress Granite) were also emplaced during the early Palaeozoic (ca. 520 Ma) high-grade tectonometamorphic event followed by the emplacement of minor planar post-tectonic felsic pegmatites.

In the north-east of the Area, the basement rocks are overlain by a patchy discontinuous layer of redeposited loose marine sediment with abundant fragmentary molluscs, well-preserved benthic foraminifera (Quilty *et al.*1990) and diatoms (McMinn and Harwood 1995) which provide the basis for the determination of age and palaeoenvironment. The fossils continue to provide data on past water temperature and age.

Glaciology

The peninsula includes a small glacier (approximately 2 km in diameter) that is separated from and has almost no connection with the Antarctic plateau. Its position, isolation and size make it a readily accessible and interesting object for glaciological research in the Larsemann Hills.

Vegetation

The terrestrial macroflora of the Larsemann Hills consists of at least 31 lichens, 6 mosses and 1 liverwort. No systematic studies have been undertaken on the terrestrial and lacustrine algae and cyanobacteria. However, in many areas of seasonal snow melt, extensive blackened areas can be seen where cyanobacteria and microscopic algae predominate. The availability of shelter from wind and wind-borne abrasives (snow, sand), and the local topographic features play a significant role in determining the distribution and abundance of the indigenous cryptogamic flora. In scattered moister sites, small moss beds occur. Sub-fossil moss (*Bryum pseudotriquetrum*) predating the last glacial maximum has been recovered from lacustrine deposits. The dominant lichen vegetation is found primarily on rocky slopes and outcrops but is nowhere particularly abundant. Floristically, the Larsemann Hills region is thought to be similar to many other outcroppings of the Ingrid Christensen Coast south from the Vestfold Hills and Rauer Islands.

Climate

A major feature of the climate of the Larsemann Hills area is the existence of persistent, strong katabatic winds that blow from the north-east most summer days. Day time air temperatures from December to February frequently exceed 4˚C and can exceed 10˚C, with the mean monthly temperature a little above 0˚C. Mean monthly winter temperatures are between –15˚C and –18˚C. Pack ice is extensive inshore throughout summer, and the fjords and bays are rarely ice-free. Precipitation occurs as snow and is unlikely to exceed 250 mm water equivalent annually. Snow cover is generally deeper and more persistent on Stornes than it is on Broknes to its east. This is due to north-easterly prevailing winds and the perennial sea ice held in by the islands offshore from Stornes.

Seals

Weddell seals (*Leptonychotes weddelli*) are numerous on the Larsemann Hills coast. Pupping has been observed from October onwards on the sea ice adjacent to small islands north-east of eastern Broknes, and in late December groups of moulting seals have been observed hauled out near the Broknes shore adjacent to the stations and in tide cracks in the fjords to the west. Aerial surveys during the moulting period have observed greater than 1000 seals, with multiple large groups (50–100 seals) hauled out in Thala Fjord and on rafted ice immediately to the west of Stornes, and numerous smaller groups amongst offshore islands and ice to the northeast of Broknes. Crabeater seals (*Lobodon carcinophagus*) and leopard seals (*Hydrurga leptonyx*) are also occasional visitors to the region.

Seabirds

Three species of seabird breed within the Larsemann Hills area (south polar skuas, snow petrels and Wilson’s storm petrels). Approximate numbers and locations of breeding pairs are documented for Broknes, and particularly eastern Broknes, but their distribution throughout the remainder of the area, including Stornes, is uncertain.

South polar skuas (*Catharacta maccormicki*) are present in the Larsemann Hills between mid-late October and early April, with approximately 17 breeding pairs nesting on Broknes and similar numbers of non-breeding birds present.

Snow petrel (*Pagodroma nivea*) and Wilson’s storm petrel (*Oceanites oceanicus*) nests are found in sheltered bedrock fragments, crevices, boulder slopes and rock falls, and are generally occupied from October until February. Approximately 850–900 pairs of snow petrels and 40–50 pairs of Wilson’s storm petrels are found on Broknes, with concentrations of snow petrels at Base Ridge and on rocky outcrops adjacent to the Dålk Glacier in the east and the plateau in the south.

Despite the apparent suitable exposed nesting habitat, no Adelie penguin (*Pygoscelis adeliae)* breeding colonies are found at Stornes, possibly due to the persistence of sea ice past the hatching period. Birds from colonies on nearby island groups (between the Svenner and Bolingen Islands) visit during summer to moult.

Environmental domains and biogeographic regions

Stornes is one of very few ASPAs designated primarily for the protection of geological values (i.e. ASPA 125 Fildes Peninsula, ASPA 147 Ablation Point, ASPA 148 Mount Flora and ASPA 168 Mount Harding), and the only ASPA designated primarily to protect mineral occurrences. Based on the Environmental Domains Analysis for Antarctica (Resolution 3 (2008)) Stornes is located within Environment D - East Antarctic coastal geologic. With reference to the Antarctic Conservation Biogeographic Regions identified in Resolution 6 (2012), Stornes is located within the East Antarctica Biogeographic Region.

5(ii) Access to the Area

A section of the eastern boundary of the ASPA approximates a route to the plateau that may be taken by vehicles landed near boundary point 1 (see Map B and coordinates at Appendix 1) on the western side of Thala Fjord. Vehicles travelling to the plateau along this boundary may, between boundary points 3 and 12, deviate to the west if essential to avoid hazards to navigation. Any such deviations will not extend beyond 200 m of the boundary line and must be restricted to crossings of snow or ice. Vehicles may not enter the Area for any other reason.

There are no specified helicopter or boat landing sites or access points, and no marked walking routes within the Area. Landings and overflights are permitted and where possible are to avoid routes over the lakes.

5(iii) Location of structures within and adjacent to the Area

There are no permanent structures within the Area.

The Area is approximately 1.6 km to the south-west of Bharati station (India) and approximately 9.3 km to the south-west of Eastern Broknes, on which Zhongshan station (China), Progress station (Russian Federation) and Law-Racovita-Negoita (Australia and Romania) are located.

A Russian hut is sited at 69°25'27"S, 76°08'25"E on the Thala Fjord side of Stornes, outside the ASPA (see Map B).

5(iv) Location of other protected areas in the vicinity

The Area is contained entirely within ASMA 6, Larsemann Hills, East Antarctica (69°30’S, 76°19’58”E).

ASPA 169, Amanda Bay, Ingrid Christensen Coast, Princess Elizabeth Land, East Antarctica (69°15'S, 76°49’59.9"E.) is located approximately 27 km to the north-east.

5(v) Special zones within the Area

There are no special zones within the Area.

6. Terms and conditions for entry permits

6(i) General permit conditions

Entry into the Area is prohibited except in accordance with a permit issued by an appropriate national authority. Conditions for issuing a permit to enter the Area are that:

- it is issued for compelling scientific reasons which cannot be served elsewhere, or for reasons essential to the management of the Area;
- the actions permitted are in accordance with this Management Plan;
- the activities permitted will give due consideration via the environmental impact assessment process to the continued protection of the scientific values of the Area;
- the permit shall be issued for a finite period; and
- the permit shall be carried when in the Area.

6(ii) Access to, and movement within or over, the Area

Vehicles are prohibited within the Area other than as described at Section 6(ii); all movement within the Area should be on foot.

Pedestrian traffic should be kept to the minimum necessary to undertake permitted activities and every reasonable effort should be made to minimise disturbance to sediments, vegetation, outcrops and other features of scientific and environmental value.

All landings and aircraft movements in the vicinity of the Area should avoid disturbance to any concentrations of wildlife. The operation of aircraft over the Area should be carried out, as a minimum requirement, in compliance with the 'Guidelines for the Operation of Aircraft near Concentrations of Birds' contained in Resolution 2 (2004). Landings in the area should be minimised.

6(iii) Activities which are, or may be conducted within the Area, including restrictions on time and place

Activities which may be conducted in the Area include:

- scientific research which cannot be undertaken elsewhere and that will not jeopardise the values for which the Area has been designated, or the ecosystems of the Area;
- glaciological monitoring and
- essential management activities, including monitoring.

Where geological sampling is involved this should, as a minimum standard, be in accordance with the following principles:

- Sampling should be done with the minimum disturbance practical.
- Sampling should be kept to the minimum necessary to achieve the research.
- Enough material/specimens should be left to allow future workers to understand the context of the material.
- Sample site should be left free of markings (paint, labels etc).
- Specimens should be retained in a recognised repository after the project finishes.
- Details of the GPS location of collection sites, volume/weight and type of material collected, and where the removed material will be housed, should be detailed in permit reports. A copy of these details should also be provided to the ASMA 6 Larsemann Hills Management Group to facilitate the review of the management plan and to enable the Management Group to provide advice to other Parties regarding the existence of materials in geological repositories, with a view to minimising unnecessary new or additional sampling.

6(iv) Installation, modification, or removal of structures

No structures are to be erected within the Area, or scientific equipment installed, except for compelling scientific or Area management reasons. Installations/structures may only be retained for a pre-established period, as specified in a permit.

All markers, structures or scientific equipment installed in the Area must be clearly identified by country, name of the principal investigator or agency, year of installation and date of expected removal.

All such items should be free of organisms, propagules (e.g. seeds, insect eggs) and non-sterile soil, and be made of materials that can withstand the environmental conditions and pose minimal risk of contamination of the Area.

Installation (including site selection), maintenance, modification or removal of structures and equipment shall be undertaken in a manner that minimises disturbance to the values of the Area.

Any new installations/structures are not to duplicate any existing installations/structures.

Permanent structures or installations are prohibited with the exception of survey markers.

6(v) Location of field camps

To minimise impacts associated with human activity, camping in the ASPA should be avoided. If camping is unavoidable, existing campsites should be used where possible. Sites previously used include northern central Stornes (at 69°24’13.1”S, 76°6’10.6”E) where there is a flat apron of alluvium between two small freshwater lakes, and on Priddy Promontory (at 69°25’39.9”S, 76°1’56.2”E) where there is a narrow beach adjacent to a tidal pool.

6(vi) Restrictions on materials and organisms that may be brought into the Area

The deliberate introduction of animals, plant material, micro-organisms and non-sterile soil into the Area shall not be permitted.

Precautions shall be taken to prevent the accidental introduction of animals, plant material, micro-organisms and non-sterile soil from other biologically distinct regions (within or beyond the Antarctic Treaty area); the biosecurity provisions for ASMA 6 Larsemann Hills apply to the ASPA.

Fuel or other chemicals shall not be stored in the Area unless specifically authorised by permit condition. They shall be stored and handled in a way that minimises the risk of their accidental introduction into the environment.

Materials introduced into the Area shall be for a stated period only and shall be removed by the end of that stated period.

6(vii) Taking of, or harmful interference with, native flora and fauna

Taking of, or harmful interference with, native flora and fauna is prohibited except in accordance with a permit issued in accordance with Annex II to the Protocol on Environmental Protection to the Antarctic Treaty. Where taking or harmful interference with animals is involved this should, as a minimum standard, be in accordance with the *SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica.*

6(viii) Collection or removal of anything not brought into the Area by the permit holder

Material may only be collected or removed from the Area as authorised in a permit and should be limited to the minimum necessary to meet scientific or management needs. Upon completion of their study, all geological samples shall be housed in an appropriate educational facility or national geological survey to allow access by others, thus minimising the quantity of samples taken from the Area. Records of samples and sampling sites are to be maintained by the appropriate national authority.

Material of human origin likely to compromise the values of the Area, which was not brought into the Area by the permit holder or otherwise authorised, may be removed unless the impact of the removal is likely to be greater than leaving the material *in situ*. If such material is found the appropriate national authority must be notified.

6(ix) Disposal of waste

All wastes, including all human wastes, shall be removed from the Area.

6(x) Measures that may be necessary to continue to meet the aims of the management plan

Permits may be granted to enter the Area to:

- carry out monitoring and Area inspection activities, which may involve the collection of samples or data essential for analysis or review;
- erect or maintain signposts, structures or scientific equipment; and
- carry out protective measures.

Any specific sites of long-term monitoring shall be appropriately marked on site and on maps of the Area. A GPS position should be obtained for lodgement with the Antarctic Data Directory System through the appropriate national authority.

To help maintain the ecological and scientific values of the Area visitors shall take special precautions against introductions. Of particular concern are microbial, animal or vegetation introductions sourced from soils from other Antarctic sites, including stations, or from regions outside Antarctica. To the maximum extent practicable, visitors shall ensure that footwear, clothing and equipment – particularly any camping and sampling equipment – is thoroughly cleaned before entering the Area.

6(xi) Requirement for reports

The principal permit holder for each visit to the Area shall submit a report to the appropriate national authority as soon as practicable, and no later than six months after the visit has been completed.

Such reports should include, as appropriate, the information identified in the visit report form contained in the *Guide to the Preparation of Management Plans for Antarctic Specially Protected Areas*. If appropriate, the national authority should also forward a copy of the visit report to the Parties that proposed the Management Plan, to assist in managing the Area and reviewing the Management Plan.

Parties should, wherever possible, deposit originals or copies of such original visit reports in a publicly accessible archive to maintain a record of usage, for the purpose of any review of the Management Plan and in organising the scientific use of the Area.

7. Supporting documentation

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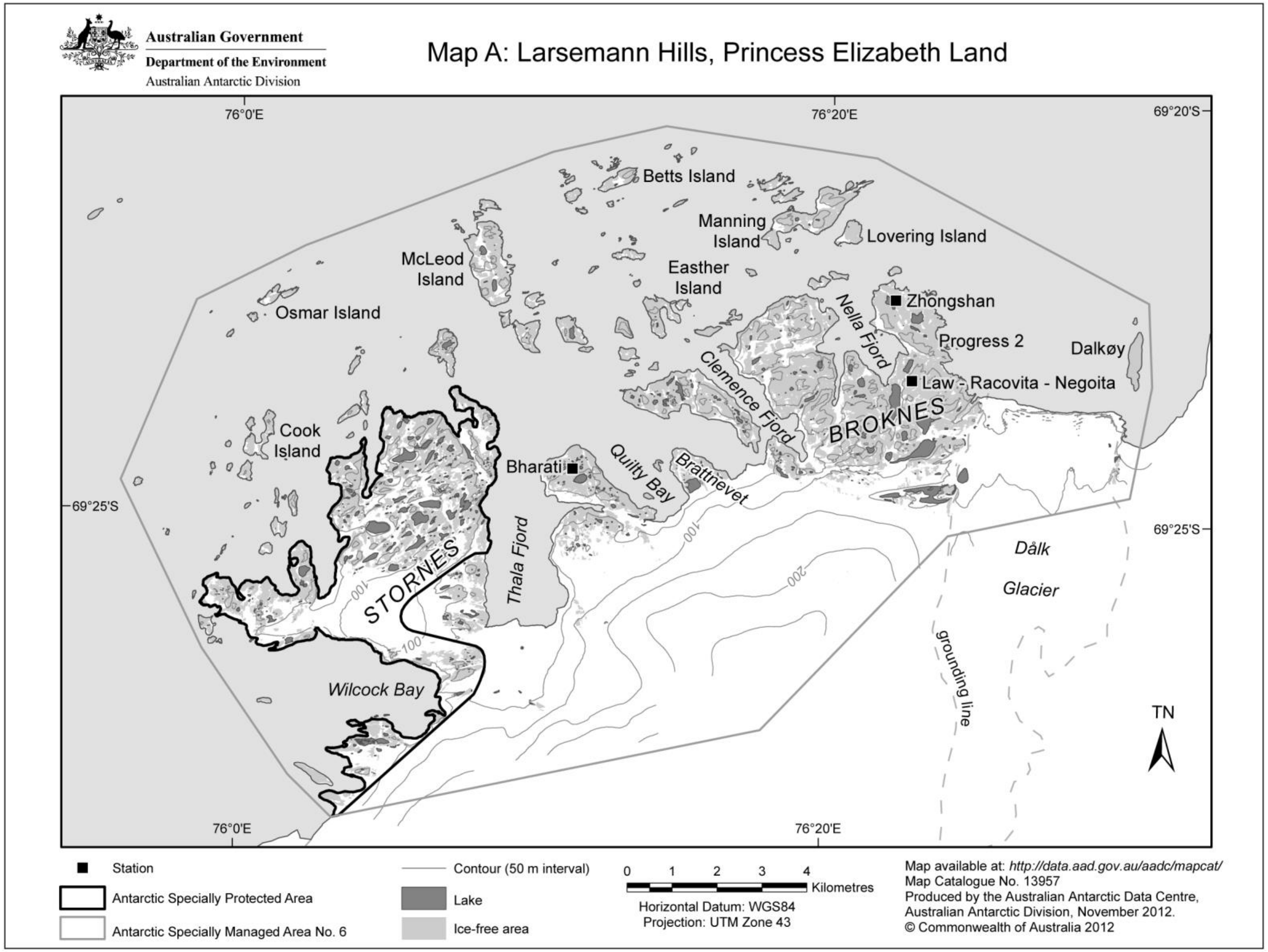
Appendix 1: Stornes, Antarctic Specially Protected Area No 174, boundary coordinates

Boundary Point	Longitude	Latitude	Boundary Point	Longitude	Latitude
1	76°8'29"E	69°25'29"S	**15**	76°8'25"E	69°26'39"S
2	76°8'6"E	69°25'29"S	**16**	76°8'28"E	69°26'42"S
3	76°7'45"E	69°25'34"S	**17**	76°8'30"E	69°26'47"S
4	76°5'60"E	69°26'1"S	**18**	76°8'29"E	69°26'51"S
5	76°5'52"E	69°26'4"S	**19**	76°8'26"E	69°26'55"S
6	76°5'44"E	69°26'8"S	**20**	76°8'22"E	69°26'60"S
7	76°5'38"E	69°26'11"S	**21**	76°8'18"E	69°27'3"S
8	76°5'37"E	69°26'15"S	**22**	76°8'14"E	69°27'6"S
9	76°5'38"E	69°26'19"S	**23**	76°8'8"E	69°27'10"S
10	76°5'44"E	69°26'22"S	**24**	76°3'36"E	69°28'39"S
11	76°5'51"E	69°26'24"S	**25**	76°3'22"E	69°28'40"S
12	76°6'1"E	69°26'26"S	Then north-east following the coast line at the low tide mark to boundary point 1 (76°8'29"E, 69°25'29"S).		
13	76°8'12"E	69°26'36"S			
14	76°8'21"E	69°26'38"S			


Australian Government
Department of the Environment
Australian Antarctic Division
Map A: Larsemann Hills, Princess Elizabeth Land
76°0'E
76°20'E
69°20'S
69°25'S
Betts Island
Manning Island
Lovering Island
McLeod Island
Easther Island
Zhongshan
Nella Fjord
Osmar Island
Progress 2
Dalkøy
Clemence Fjord
Law - Racovita - Negoita
BROKNES
Cook Island
Bharati
Quilty Bay
Brattnevet
STORNES
Thala Fjord
Dålk Glacier
grounding line
Wilcock Bay
TN
100
200
Station
Antarctic Specially Protected Area
Antarctic Specially Managed Area No. 6
Contour (50 m interval)
Lake
Ice-free area
0 1 2 3 4 Kilometres
Horizontal Datum: WGS84
Projection: UTM Zone 43
Map available at: http://data.aad.gov.au/aadc/mapcat/
Map Catalogue No. 13957
Produced by the Australian Antarctic Data Centre,
Australian Antarctic Division, November 2012.
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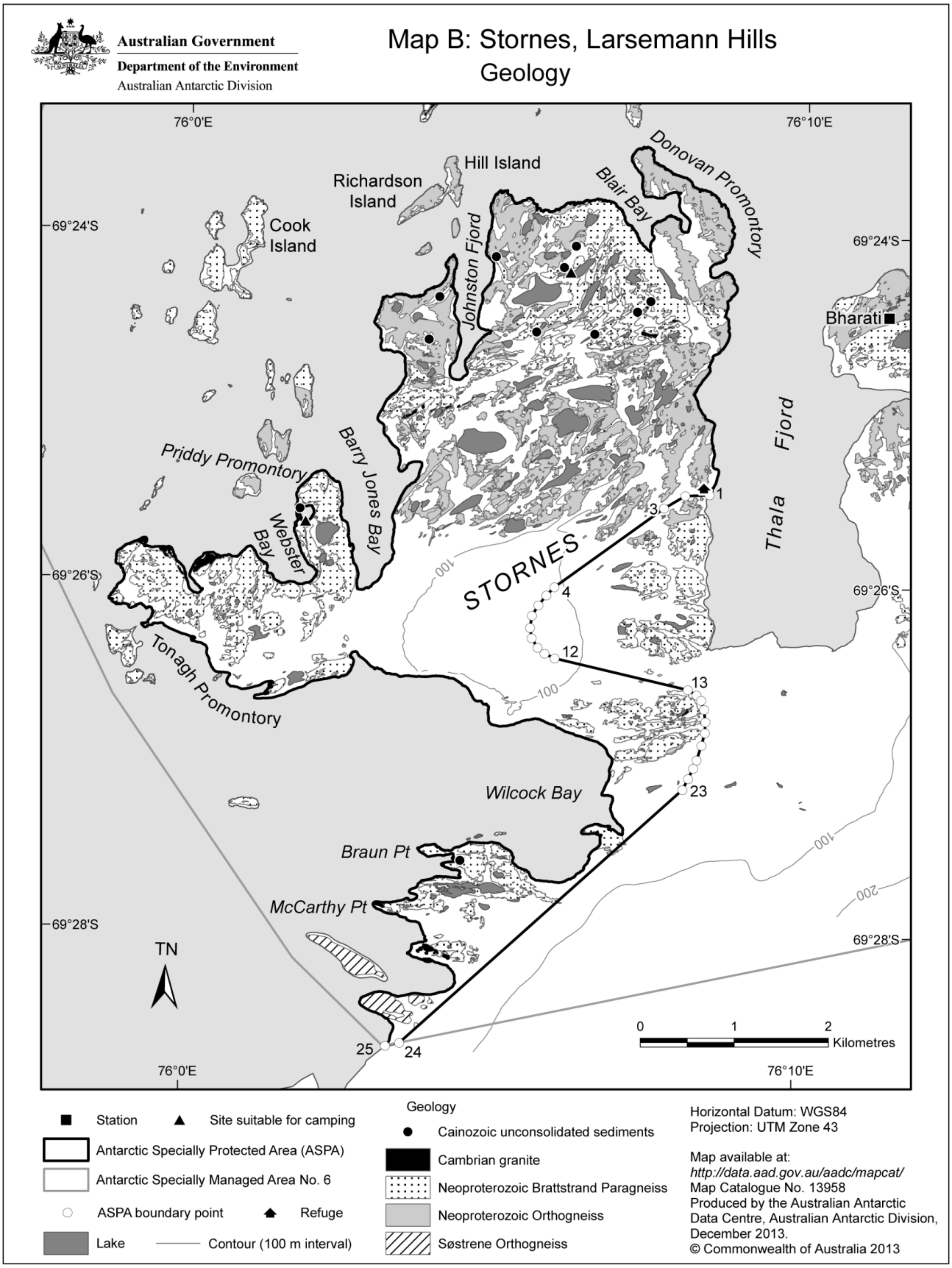
Australian Government
Department of the Environment
Australian Antarctic Division
Map B: Stornes, Larsemann Hills
Geology
76°0'E
76°10'E
69°24'S
69°26'S
69°28'S
Hill Island
Richardson Island
Cook Island
Johnston Fjord
Blair Bay
Donovan Promontory
Bharati
Thala Fjord
Priddy Promontory
Barry Jones Bay
Webster Bay
STORNES
Tonagh Promontory
Wilcock Bay
Braun Pt
McCarthy Pt
TN
1
3
4
12
13
23
24
25
100
200
0
1
2
Kilometres
Station
Site suitable for camping
Antarctic Specially Protected Area (ASPA)
Antarctic Specially Managed Area No. 6
ASPA boundary point
Refuge
Lake
Contour (100 m interval)
Geology
Cainozoic unconsolidated sediments
Cambrian granite
Neoproterozoic Brattstrand Paragneiss
Neoproterozoic Orthogneiss
Søstrene Orthogneiss
Horizontal Datum: WGS84
Projection: UTM Zone 43
Map available at:
http://data.aad.gov.au/aadc/mapcat/
Map Catalogue No. 13958
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