



NSW Education Standards Authority

2021 HIGHER SCHOOL CERTIFICATE EXAMINATION

Geography

General Instructions

- Reading time – 5 minutes
- Working time – 3 hours
- Write using black pen
- Calculators approved by NESA may be used
- A Stimulus Booklet is provided with this paper

Total marks: 100

Section I – 20 marks (pages 2–7)

- Attempt Questions 1–20
- Allow about 35 minutes for this section

Section II – 40 marks (pages 9–20)

- Attempt Questions 21–25
- Allow about 1 hour and 10 minutes for this section

Section III – 40 marks (page 21)

- Attempt TWO questions from Questions 26–28
- Allow about 1 hour and 15 minutes for this section

Section I

20 marks

Attempt Questions 1–20

Allow about 35 minutes for this section

Refer to the Stimulus Booklet

Use the multiple-choice answer sheet for Questions 1–20.

Refer to Source *A* on page 1 of the Stimulus Booklet to answer Question 1.

- 1** What challenge of living in a mega city in the developing world does this photograph best illustrate?
- A. Housing
 - B. Employment
 - C. Traffic congestion
 - D. Water and power supplies

Refer to Source *B* on page 1 of the Stimulus Booklet to answer Question 2.

- 2** What type of photograph is Source *B*?
- A. Ground
 - B. Satellite
 - C. Oblique aerial
 - D. Vertical aerial
- 3** Which term is defined by ‘the ability to meet present needs without compromising future needs’?
- A. Continuity
 - B. Interdependence
 - C. Succession
 - D. Sustainability

Refer to Source *C* on page 1 of the Stimulus Booklet to answer Question 4.

4 Which region is expected to have the greatest number of new mega cities by 2030?

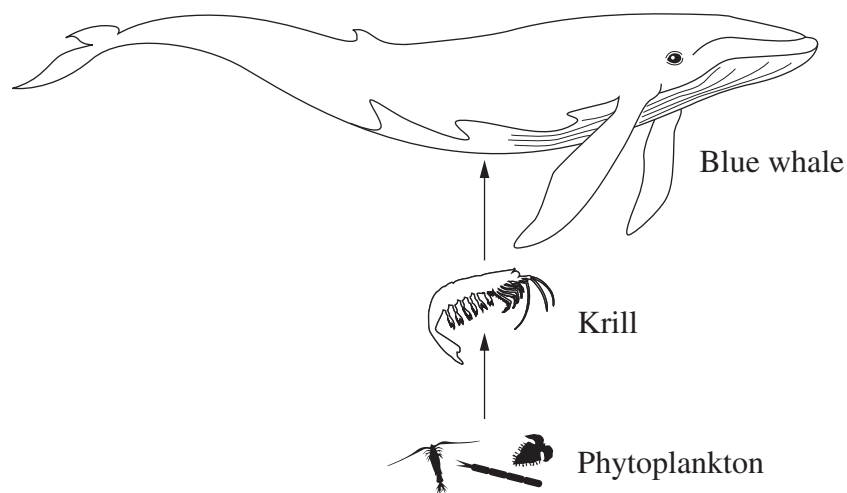
- A. Africa
- B. Europe
- C. Asia-Pacific
- D. The Middle East

Refer to Source *D* on page 1 of the Stimulus Booklet to answer Question 5.

5 Which urban centre is expected to show the *least* relative change in population between 2009 and 2025?

- A. Delhi
- B. Tokyo
- C. Mumbai
- D. Mexico City

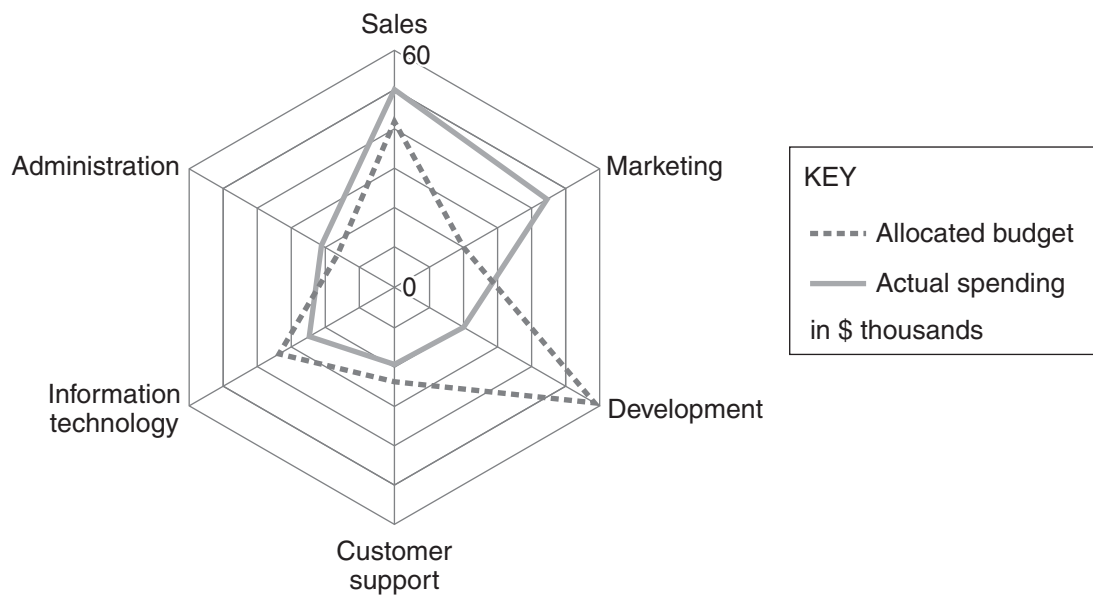
6 A simple Antarctic food chain is shown.



Which row of the table shows the likely results of the removal of large amounts of krill from the Antarctic ecosystem?

	<i>Phytoplankton</i>	<i>Blue whale</i>
A.	Decrease	Decrease
B.	Decrease	Increase
C.	Increase	Decrease
D.	Increase	Increase

- 7 The graph shows the allocated budget and actual spending of an economic enterprise.



Approximately how much did the economic enterprise allocate for spending on customer support?

- A. \$20 000
- B. \$25 000
- C. \$35 000
- D. \$42 000
- 8 An environmental agency is researching the impact of agriculture on a creek. Water quality is measured over a one week period at one end of the creek.

Which line of the table best describes the type of data obtained and the reliability of the research?

	<i>Data</i>	<i>Reliability</i>
A.	Primary	Low
B.	Primary	High
C.	Secondary	Low
D.	Secondary	High

Refer to Source *E* on page 2 of the Stimulus Booklet to answer Questions 9–11.

- 9** What is the general aspect of the slope in AR 2659?
- A. NE
 - B. SE
 - C. SW
 - D. NW
- 10** What is the approximate area of land parcel D 93870 centred on GR 257591?
- A. 0.4 km²
 - B. 0.7 km²
 - C. 1.2 km²
 - D. 1.5 km²
- 11** What is the average gradient of the slope between the spot height in AR 2558 and the spot height in AR 2659?
- A. 1 : 0.022
 - B. 1 : 22
 - C. 1 : 45
 - D. 1 : 18 000

Refer to Source *E* on page 2 and Source *F* on page 3 of the Stimulus Booklet to answer Question 12.

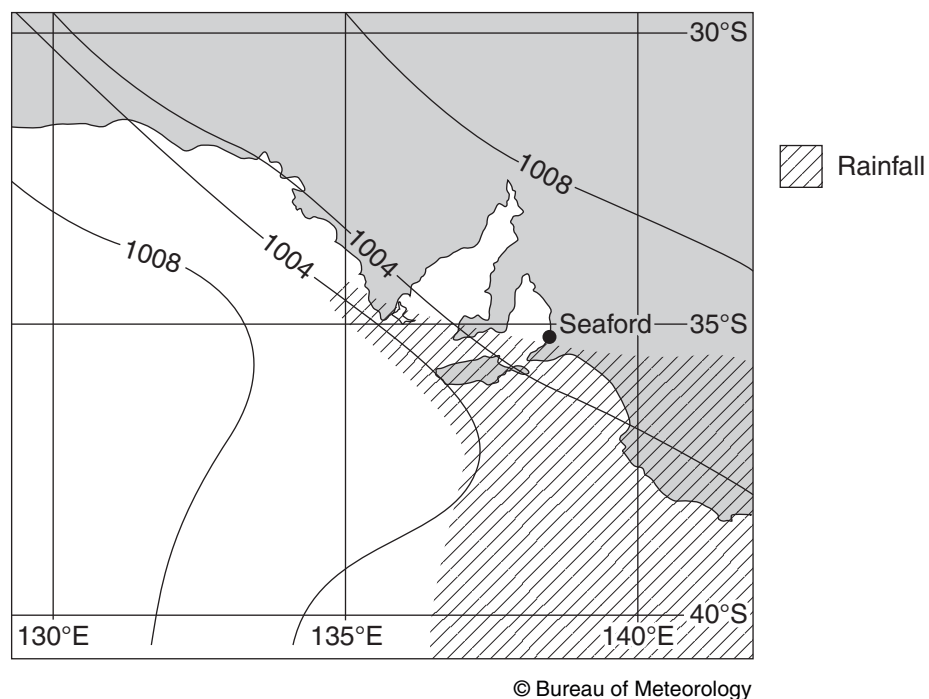
- 12** Which direction was the photographer facing when the photograph in Source *F* was taken?
- A. E
 - B. SE
 - C. SW
 - D. W

Refer to Source *E* on page 2 and Source *G* on page 3 of the Stimulus Booklet to answer Question 13.

13 What is the scale of Source *G*?

- A. 1 : 1 300
- B. 1 : 3 300
- C. 1 : 67 000
- D. 1 : 77 000

Refer to the following diagram to answer Questions 14–15.



14 What was the cause of the rain south of Seaford?

- A. Tropical cyclone
- B. Orographic effect
- C. High pressure ridge
- D. Low pressure trough

15 What is the wind direction at Seaford?

- A. ENE
- B. ESE
- C. WNW
- D. WSW

Refer to Source *H* on page 4 of the Stimulus Booklet to answer Questions 16–17.

16 Which combination of geographical concepts is being demonstrated in Source *H*?

- A. Ecosystems and biodiversity
- B. Environments and infrastructure
- C. Geographical issues and spatial exclusion
- D. Ecological dimension and spatial dimension

17 Approximately how many pieces of small plastics per km² were found at Location 7?

- A. 1200
- B. 1600
- C. 2400
- D. 2800

Refer to Source *I* on page 4 of the Stimulus Booklet to answer Questions 18–20.

18 The shortest distance along the coast from McMurdo station (US) to Casey station (Australia) is approximately

- A. 3000 km.
- B. 5000 km.
- C. 6000 km.
- D. 7000 km.

19 What is the direction from Casey station (Australia) to Dumont d’Urville station (France)?

- A. N
- B. NE
- C. E
- D. SE

20 What is the approximate location of Vinson Massif?

- A. 76°S, 86°W
- B. 76°S, 97°W
- C. 86°S, 86°W
- D. 86°S, 97°W

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Centre Number

Geography

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Student Number

Section II Answer Booklet

40 marks

Attempt Questions 21–25

Allow about 1 hour and 10 minutes for this section

Instructions

- Write your Centre Number and Student Number at the top of this page.
- Use the Stimulus Booklet and your knowledge of geography to answer Questions 21–25 in the spaces provided. These spaces provide guidance for the expected length of response.
- Show all relevant working in questions involving calculations.
- Extra writing space is provided at the back of this booklet.
If you use this space, clearly indicate which question you are answering.

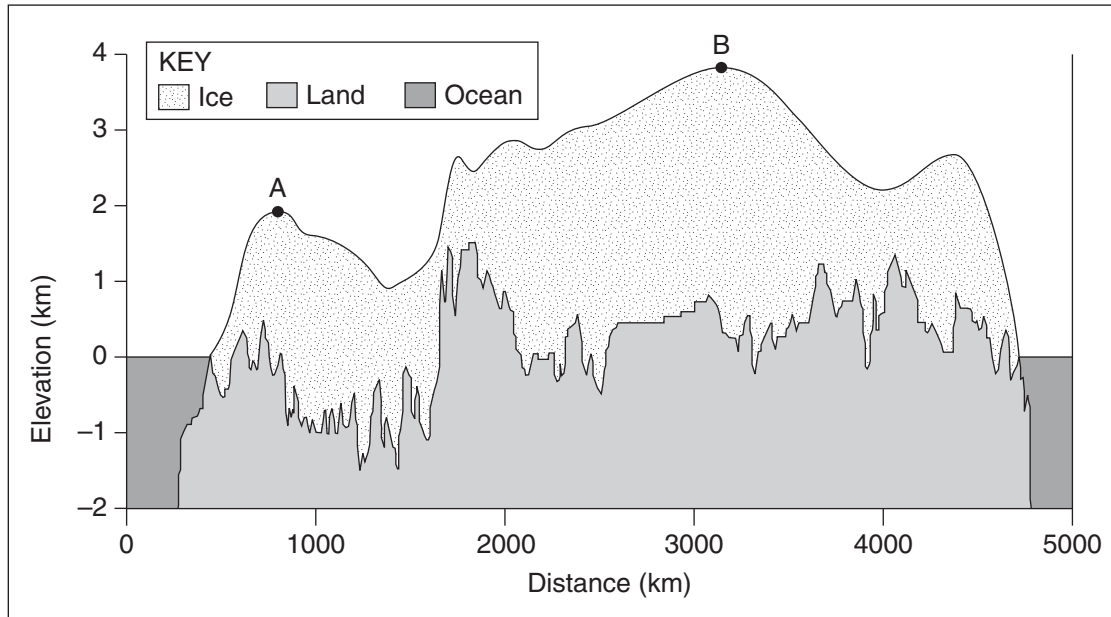
Please turn over

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Question 21 (4 marks)

The diagram shows a cross-section of the Antarctic ice sheet.



From the Exploration of Antarctic Subglacial Aquatic Environments: Environmental and Scientific Stewardship
With kind permission of Dr. John Hobbie

- (a) Calculate in kilometres the local relief on the ice sheet between point A and point B. 2

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- (b) Calculate the vertical exaggeration of the cross-section. 2

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Question 22 (12 marks)

Refer to Sources *E*, *F* and *G* on pages 2 and 3 of the Stimulus Booklet to answer parts (a)–(d).

A housing development is proposed for the site indicated in Source *F*.

- (a) Sources *E* and *G* are obtained using a Geographic Information System (GIS). 3

With reference to these sources, outline TWO benefits of using a GIS to study the proposed housing development.

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- (b) Justify TWO management strategies that could be used to minimise damage from the housing development process in Seaford to the ecosystems in the surrounding area. 3

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Question 22 continues on page 13

Question 22 (continued)

- (c) Describe how the completed housing development in Seaford may affect economic enterprises in the surrounding area. **3**

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- (d) Describe how the completed housing development may affect Seaford area's culture of place. **3**

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End of Question 22

Question 23 (8 marks)

- (a) Describe TWO traditional management strategies that can be used to manage ecosystems.

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- (b) Explain how variations in climate lead to a diversity of ecosystems. Use examples of ecosystems in your response.

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Do NOT write in this area.

Question 24 (8 marks)

- (a) Outline the spatial distribution of world cities.

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- (b) Compare the character of mega cities in the developing world with the character of world cities.

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Question 25 (8 marks)

Answer part (a) with reference to an economic enterprise you have studied.

Economic enterprise:

- (a) Explain how ONE locational factor affects ONE external linkage of this economic enterprise.

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Question 25 continues on page 17

Do NOT write in this area.

Question 25 (continued)

Answer part (b) with reference to an economic activity you have studied.

Economic activity:

- (b) Explain how ecological factors influence the nature and spatial patterns of this economic activity.

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End of Question 25

Section II extra writing space

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Geography

Section III

40 marks

Attempt TWO questions from Questions 26–28

Allow about 1 hour and 15 minutes for this section

Answer both questions in the Section III Writing Booklet. Extra writing booklets are available.

Your answers will be assessed on how well you:

- demonstrate geographical knowledge and understanding relevant to the question
 - communicate ideas and information using geographical terms and concepts appropriately
 - refer to case studies, illustrative examples and the Stimulus Booklet where appropriate
 - present a sustained, logical and cohesive response
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Question 26 (20 marks)

Analyse both the positive and negative effects of human activities on ecosystems.

Question 27 (20 marks)

‘Suburbanisation and consolidation have the greatest influence on shaping the development of large cities.’

Discuss this statement with reference to urban dynamics operating in ONE large city from the developed world.

Question 28 (20 marks)

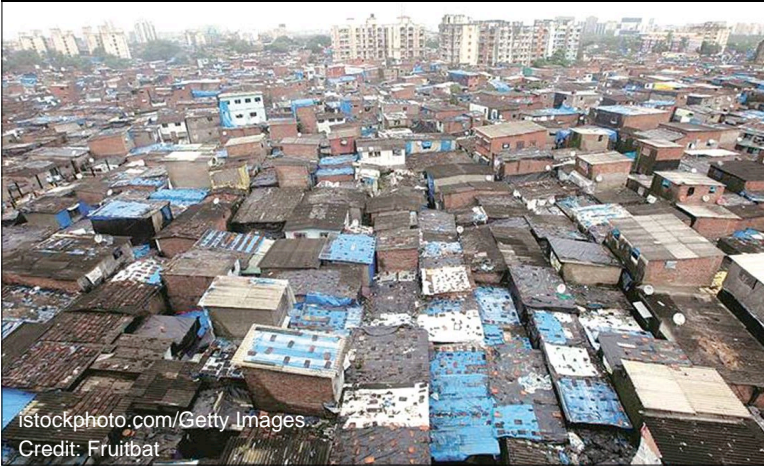
Evaluate the effects of global changes on ONE economic enterprise operating at a local scale.

End of paper

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Geography – Stimulus Booklet

Source A – A mega city in India



Source B – Central Park, New York



Source C – The world's mega cities – existing and expected

© The Visual Capitalists

Currently, there are
33 megacities on Earth...

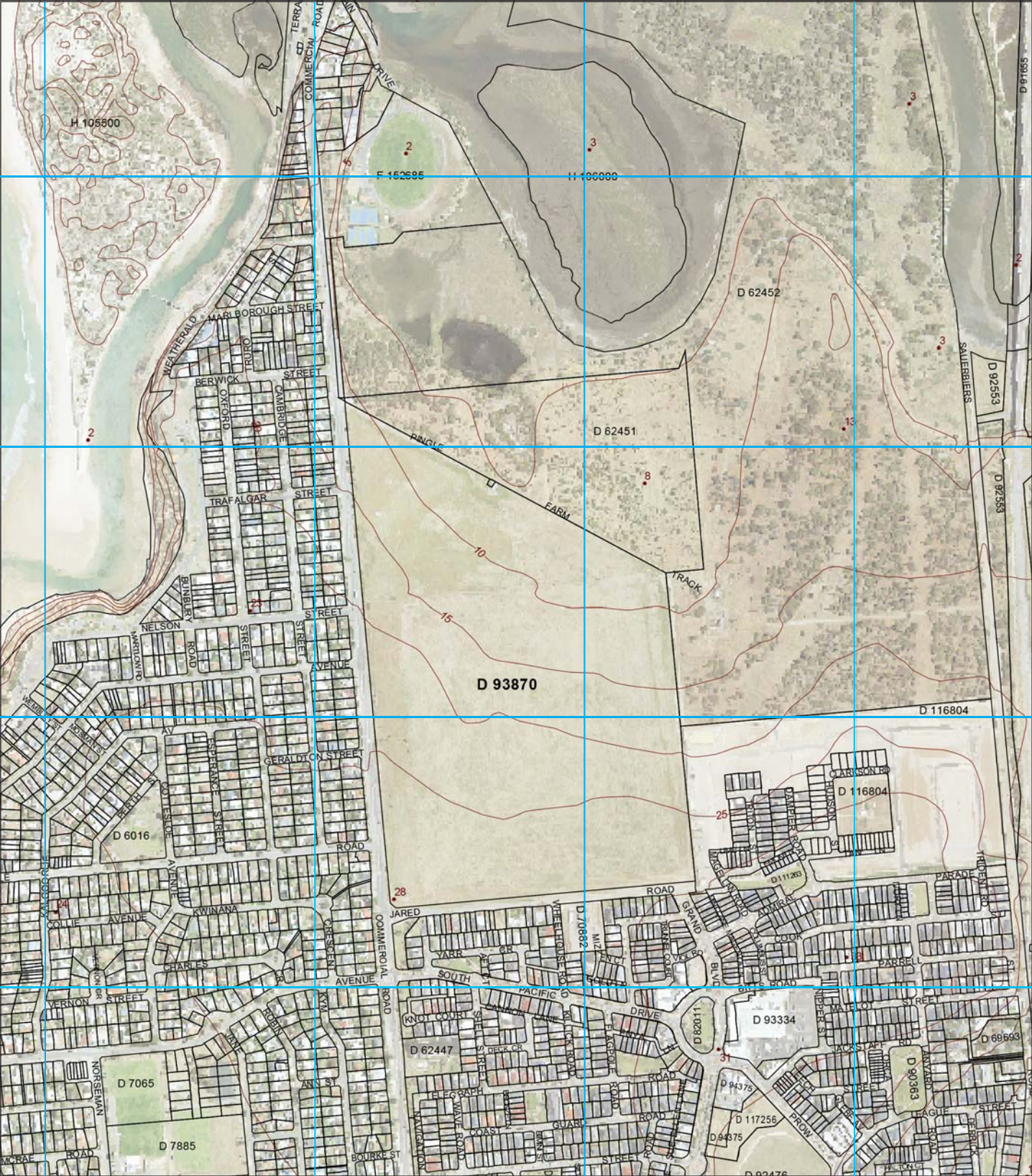


Source D – Population of urban centres

Courtesy of Population Education



Source E – Seaford area cadastral map extract



Legend

D 34932

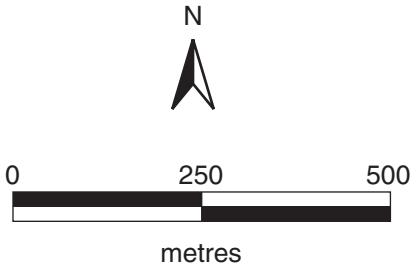
Legal land parcel

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Spot height

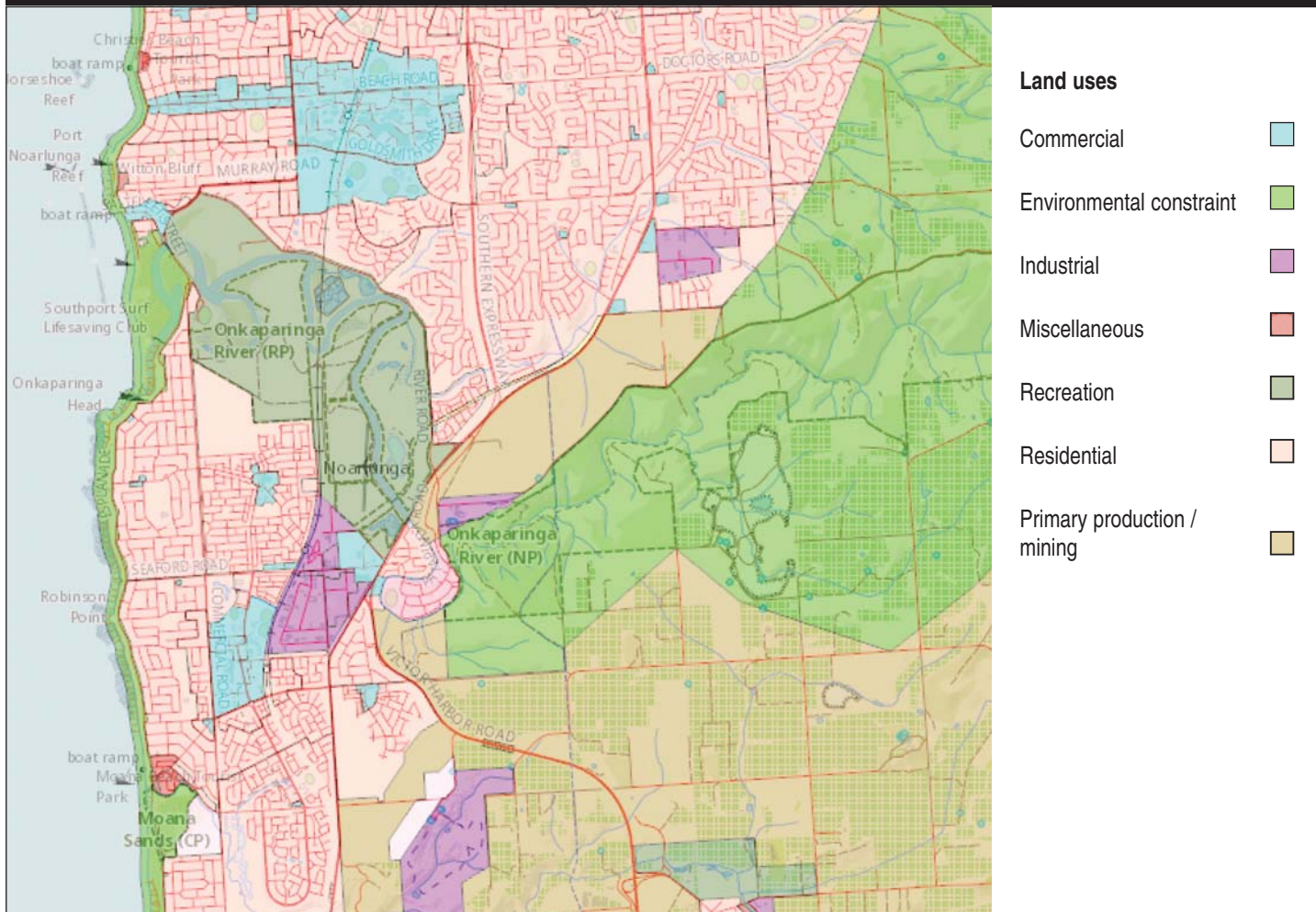
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Contour

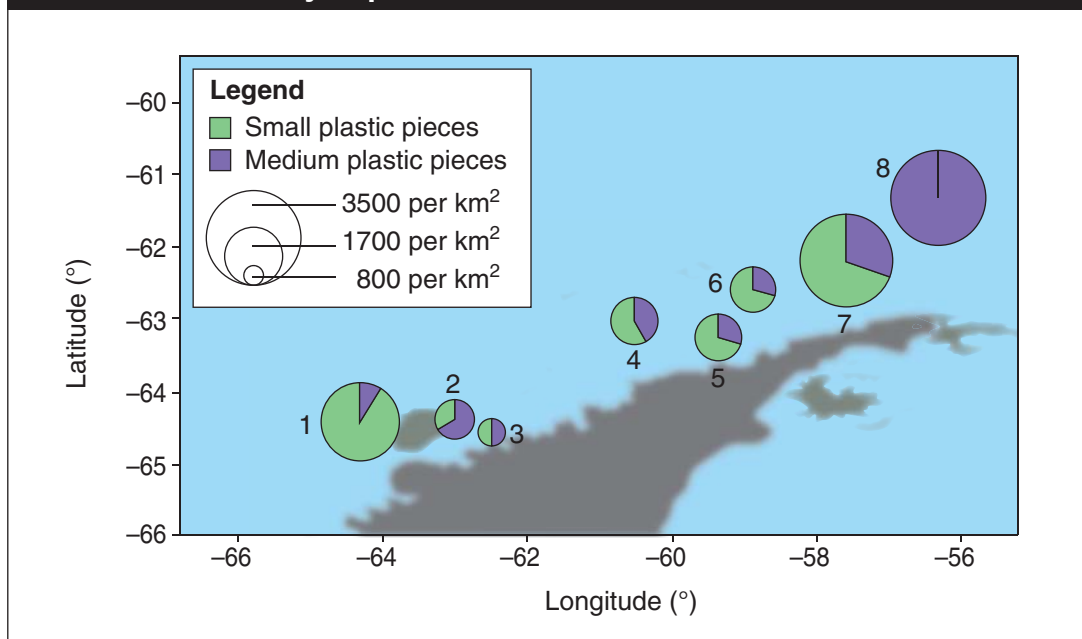




Source G – Seaford area land use layer over topographic map



Source H – Quantity of plastics found in Antarctic waters



Lacerda, A.L.d.F., Rodrigues, L.d.S., van Sebille, E. et al.
 Plastics in sea surface waters around the Antarctic Peninsula. Sci Rep 9, 3977 (2019).
<https://doi.org/10.1038/s41598-019-40311-4>

Source I – Scientific research stations in Antarctica

