ANNEX II
SUMMARY OF RECOMMENDATIONS OF THE COMMISSION

United Nations Convention on the Law of the Sea

Commission on the Limits of the Continental Shelf

SUMMARY OF RECOMMENDATIONS OF THE COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF IN REGARD TO THE SUBMISSION MADE BY THE REPUBLIC OF KENYA ON 6 MAY 2009*

Recommendations prepared by the Subcommission established for the consideration of the Submission made by Kenya

Adopted by the Subcommission on 8 November 2022

Approved by the Commission, with amendments, on 7 March 2023

* The aim of this Summary is to provide information that is not of confidential or proprietary nature in order to facilitate the function of the Secretary-General in accordance with paragraph 11(3) of annex III to the Rules of Procedure of the Commission (CLCS/40/Rev.1). This Summary is based on excerpts of the Recommendations and may refer to material not necessarily included either in the full Recommendations or this Summary.

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GLOSSARY OF TERMS

60 M formula line	The line delineated by reference to fixed points determined at a distance of 60 nautical miles from the foot of the continental slope
60 M formula point	Fixed point determined at a distance of 60 nautical miles from the foot of the continental slope
200 M line	The line at a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured
2,500 m isobath	A line connecting the depth of 2,500 metres
article 76	Article 76 of the Convention
article 76 margin	The continental margin established by a line at the maximum distance permissible in accordance with the provisions of paragraph 4(a)(i) and (ii) of article 76 when invoking the SOU
baselines	The baselines from which the breadth of the territorial sea is measured
BOS	The base of the continental slope
Commission	The Commission on the Limits of the Continental Shelf
Convention	The United Nations Convention on the Law of the Sea of 10 December 1982
depth constraint	The constraint line determined at a distance of 100 M from the 2,500 m isobath
distance constraint	The constraint line determined at a distance of 350 M from the baselines
DOALOS	Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations
FOS	Foot of the continental slope
Guidelines	The Scientific and Technical Guidelines of the Commission (CLCS/11 and CLCS/11/Add.1)
M	Nautical mile
Rules of Procedure	The Rules of Procedure of the Commission on the Limits of the Continental Shelf (CLCS/40/Rev.1)
Secretary-General	The Secretary-General of the United Nations
sediment thickness formula line	The line delineated by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the FOS
sediment thickness formula point	Fixed point at which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from that point to the FOS
SOU *or* Statement of Understanding	Statement of Understanding Concerning a Specific Method to be Used in Establishing the Outer Edge of the Continental Margin, contained in annex II to the Final Act of the Third United Nations Conference on the Law of the Sea
SOU margin	The continental margin established in accordance with the SOU

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I. INTRODUCTION

1 On 6 May 2009, the Republic of Kenya made a Submission to the Commission, through the Secretary-General,[1] containing information on the limits of the continental shelf beyond 200 M from the baselines from which the breadth of its territorial sea is measured, in accordance with article 76, paragraph 8, of the Convention.

2 The Convention entered into force for Kenya on 16 November 1994.

3 According to the Executive Summary of the Submission, Kenya applied the *Statement of Understanding Concerning a Specific Method to be Used in Establishing the Outer Edge of the Continental Margin*, contained in annex II to the Final Act of the Third United Nations Conference on the Law of the Sea for the purpose of establishing the outer edge of its continental margin.

4 On 11 May 2009, the Secretary-General issued Continental Shelf Notification CLCS.35.2009.LOS giving due publicity to the Executive Summary of the Submission in accordance with rule 50 of the Rules of Procedure.[2] Pursuant to rule 51 of the Rules of Procedure, the consideration of the Submission was included in the agenda of the twenty-fourth session of the Commission held from 10 August to 11 September 2009.

5 Pursuant to section 2 of annex III to the Rules of Procedure, a presentation of the Submission was made to the plenary of the twenty-fourth session of the Commission on 3 September 2009 by Wanjuki Muchemi, Solicitor General, Head of the Delegation; Juster Nkoroi, Chairperson, Task Force on Delineation of Kenya's Outer Continental Shelf; and Simon Njuguna, Geologist and GIS Specialist. The Delegation also included a number of scientific, legal and technical advisers.

6 In addition to elaborating on substantive points of the Submission, Mr. Muchemi indicated that Mr. Harald Brekke,[3] a member of the Commission, had assisted Kenya by providing scientific and technical advice with respect to the Submission.

7 The Commission took note of the contents of the following communications it received regarding the Submission and of the views expressed by the Delegation in connection with the communications.

8 In communication SRL-NOT-002-22.07.2009 dated 22 July 2009, Sri Lanka informed the Secretary-General of its position that the "principal State" referred to in paragraph 3 of the Statement of Understanding was Sri Lanka and that the application of the Statement of Understanding and the Commission's mandate to make recommendations thereunder was limited to States in the southern part of the Bay of Bengal, as reflected in paragraph 5 of the Statement of Understanding.

9 In communication XRW/00506/08/09 dated 19 August 2009, the Transitional Federal Government of the Republic of Somalia, inter alia, informed the

[1] The Submission was received by DOALOS as the secretariat of the Commission.
[2] See Continental Shelf Notification CLCS.35.2009.LOS at: http://www.un.org/Depts/los/clcs_new/submissions_files/submission_ken_35_2009.htm
[3] Mr. Brekke was a Member of the Commission from 1997 to 2002, from 2002 to 2007 and from 2007 to 2012.

Secretary-General that the delimitation of the continental shelf between the Somali Republic and the Republic of Kenya had not been settled and that this unresolved delimitation issue was to be considered a "maritime dispute" for the purposes of rule 5(a) of annex I to the Rules of Procedure. Accordingly, any action taken by the Commission shall, in accordance with the Convention, not prejudice matters relating to the delimitation of the continental shelf between the Republic of Kenya and the Somali Republic. Based on a Memorandum of Understanding between the Government of the Republic of Kenya and the Transitional Federal Government of the Somali Republic, signed on 7 April 2009, the Somali Republic reiterated its consent, in accordance with rule 5(a), to the examination of the Submission by the Commission.

10 The Delegation informed the Commission in this regard that there were no unresolved disputes relating to the Submission. With respect to Tanzania, the Delegation indicated that Kenya had concluded a Maritime Boundary Agreement with the United Republic of Tanzania on 23 June 2009, which applied to the territorial sea, exclusive economic zone, and continental shelf. The Delegation pointed out that the agreement was also applicable to the extended continental shelf, after its outer limits were established. Regarding the communication received from the Transitional Federal Government of the Republic of Somalia dated 19 August 2009, the Delegation indicated that provisional arrangements of a practical nature had been entered into, as contained in the Memorandum of Understanding signed on 7 April 2009, wherein the parties had undertaken not to object to the examination of their respective submissions and that, at an appropriate time, a mechanism would be established to finalize the maritime boundary negotiations with Somalia. In reference to the communication received from Sri Lanka dated 22 July 2009, and the indication that the "principal State" referred to in paragraph 3 of the Statement of Understanding was Sri Lanka, the Delegation indicated that, in the view of the Government of Kenya, the principles contained in the Statement of Understanding could apply whenever a State was able to demonstrate the existence of the special conditions envisaged therein. The Delegation noted in this regard that neither the Convention nor the Statement of Understanding made reference to a "principal State". The Delegation further noted that Sri Lanka did not object to the consideration of the Submission made by Kenya under annex I to the Rules of Procedure.

11 The Commission addressed the modalities for the consideration of the Submission and decided that, as provided for in article 5 of annex II to the Convention and in rule 42 of the Rules of Procedure, the Submission would be addressed by way of a subcommission to be established in accordance with rule 51, paragraph 4ter of the Rules of Procedure, at a future session. The Commission decided to revert to the consideration of the Submission at the plenary level at the time when the Submission was next in line for consideration as queued in the order in which it was received.

12 At its thirty-fourth session, the Commission took note of the contents of the following communications transmitted to the Commission regarding the Submission.

13 In communication OPM/IC/00./016/11/09 dated 10 October 2009, which was transmitted by the Permanent Mission of the Somali Republic to the United Nations to the Secretary-General in communication SOM/MSS/09/10 dated 2 March 2010, the Transitional Federal Government of the Republic of Somalia informed the Secretary-General that the Memorandum of

Understanding signed on 7 April 2009 was considered by the Transitional Federal Parliament of Somalia and that the members voted to reject its ratification on 1 August 2009. The Transitional Federal Government of the Republic of Somalia, therefore, requested the relevant offices of the United Nations to take note of the situation and treat the Memorandum of Understanding as “non-actionable”.

14 In communication MFA.TCA 12/34 VOL.XI/(101) dated 29 October 2013, the Republic of Kenya, inter alia, reiterated and affirmed its position to the Secretary-General with regard to the application of the Statement of Understanding, as stated in its communication dated 30 April 2009, which was made in reference to Continental Shelf Notification CLCS/1/2008.LOS dated 23 December 2008. The Republic of Kenya further indicated that the Statement of Understanding could apply whenever a State was able to demonstrate the existence of the special conditions envisaged therein.

15 In communications MOFA/SFR/MO/258/2014 and MOFA/SFR/MO/259/2014 dated 4 February 2014, the Somali Federal Republic, inter alia, informed the Secretary General that it objected to the registration of a purported Memorandum of Understanding between Somalia and Kenya dated 7 April 2009 with the Secretariat of the United Nations by the Republic of Kenya on 11 June 2009. With reference to the communication by the Transitional Federal Government of the Republic of Somalia dated 10 October 2009, the Somali Federal Republic noted that the Transitional Federal Parliament of Somalia had voted to reject the purported Memorandum of Understanding on 1 August 2009 and that it was, therefore, rendered “non-actionable”. The Somali Federal Republic indicated that the purported Memorandum of Understanding was deemed void and of no effect and requested all appropriate action to be taken to remove it from the registry of the Secretariat of the United Nations. The Somali Federal Republic further indicated that there existed a maritime dispute between the Somali Republic and the Republic of Kenya for the purposes of rule 5(a) of annex I to the Rules of Procedure and that it formally objected to the consideration of the Submission by the Commission. In this regard, the Somali Federal Republic noted that no provisional arrangements of a practical nature had been entered into by Somalia and Kenya, either under article 83 of the Convention or at all, that no memorandum of understanding was in force between them and that the Somali Republic had not given its consent to the consideration of the Submission by the Commission.

16 The Commission decided at its thirty-fourth session that, in the light of the communications from Somalia, dated 10 October 2009 and 4 February 2014, it was not in a position to proceed with the establishment of a subcommission. It took this decision in order to take into consideration any further developments that might occur throughout the intervening period during which States may wish to take advantage of the avenues available to them, including provisional arrangements of a practical nature provided for in annex I to its Rules of Procedure (CLCS/83, paragraph 18).

17 On 3 September 2014, Kenya made another presentation to the Commission of its Submission during the thirty-fifth session, in view of the partial change in the membership of the Commission since the twenty-fourth session.

18 The presentation was made by Githu Muigai, Head of the Delegation and Attorney General, and by Michael Gikuhi, Geophysicist and Member of the Task Force on Delineation of Kenya’s Outer Continental Shelf. The Delegation also

included Macharia Kamau, Permanent Representative of Kenya to the United Nations, and Koki Muli Grignon, Deputy Permanent Representative of Kenya to the United Nations, as well as a number of scientific, legal and technical advisers.

19 In addition to elaborating on substantive points of the Submission, Mr. Muigai noted that one member of the Commission, Mr. Simon Njuguna,[4] had provided Kenya with advice and assistance concerning the Submission.

20 With reference to paragraph 2(a) of annex I to the Rules of Procedure, Mr. Muigai observed that Kenya had yet to conclude a maritime boundary agreement with Somalia. He noted that provisional arrangements of a practical nature had been entered into, in accordance with article 83(3) of the Convention, as contained in a Memorandum of Understanding signed on 7 April 2009, whereby Kenya and Somalia had undertaken not to object to the examination of their respective submissions, as affirmed by the communication from Somalia dated 19 August 2009, while also referring to the communications from Somalia, dated 10 October 2009 and 4 February 2014. Mr. Muigai also noted that Somalia had instituted proceedings against Kenya at the International Court of Justice with regard to a dispute concerning maritime delimitation in the Indian Ocean. He observed in that respect that, pursuant to the Convention and the Rules of Procedure, the actions of the Commission would not prejudice matters relating to the delimitation of boundaries between States and that the Commission was not stopped from considering the Submission, notwithstanding paragraph 5(a) of annex I to the Rules of Procedure.

21 With respect to the legal basis for delineation of the continental shelf beyond 200 M, Mr. Muigai emphasized that Kenya's continental margin had exhibited special characteristics similar to those stipulated in paragraph 1 of the Statement of Understanding and that the application of article 76, paragraph 4(a), of the Convention would give rise to an inequity, as specified in paragraph 2 of the Statement of Understanding. He indicated that Kenya had applied that exception in establishing the outer edge of its continental margin and urged the Commission to establish a subcommission when the submission was next in line for consideration, as queued in the order in which it was received.

22 In considering the modalities of the consideration of the Submission, the Commission reiterated its decision to defer further consideration of the Submission and the communications from Kenya and Somalia (CLCS/85, paragraph 64).

23 Following this decision, the Commission took note of communication SOM/MSS/253/14 from the Permanent Mission of the Somali Republic to the United Nations, dated 2 September 2014 and received on 3 September 2014, wherein the Federal Republic of Somalia recalled its communications dated 4 February 2014 and the maritime dispute between Somalia and Kenya and reiterated its objection to the consideration of the Submission by the Commission pursuant to rule 5(a) of annex I to the Rules of Procedure. The Federal Republic of Somalia further indicated it had instituted proceedings against Kenya at the International Court of Justice regarding the maritime dispute. The Commission determined that no change in its decision was required.

[4] Mr. Njuguna has been a Member of the Commission from 2012 to 2017, and from 2017 to 2023.

24 At its thirty-eighth session, the Commission took note of the contents of the following communications transmitted to the Commission regarding the Submission.

25 In communication 586/14 dated 24 October 2014, the Republic of Kenya, inter alia, indicated that, prior to filing the Submission, Kenya had negotiated arrangements of a practical nature with the Transitional Federal Government of the Republic of Somalia in accordance with article 83(3) of the Convention, as contained in the Memorandum of Understanding signed on 7 April 2009. With reference to the communication from the Somali Federal Republic dated 4 February 2014 (MOFA/SFR/MO/258/2014), wherein Somalia informed the Secretary-General that the Memorandum of Understanding dated 7 April 2009 should be removed from the registry of the United Nations as it was declared null and void, Kenya indicated that this attempt by the Federal Republic of Somalia to reverse this common understanding and agreement was undertaken unilaterally and without consultation or the consent of Kenya. Kenya further reiterated its position in respect of objections to consideration of submissions by the Commission, namely, that these were unnecessary actions because the Convention pronounced that the actions of the Commission were without prejudice to delimitation of the outer limits of the continental shelf, as reiterated by Kenya in several open international fora, including the Meetings of State Parties to the Convention. Kenya indicated that the action by the Commission of skipping consideration of the submissions on the basis of an objection stemming from unresolved delimitation between States was not founded in the Convention and stated that the Commission, therefore, should consider the Submission as soon as was practical. Kenya further stated that it objected to the actions by the Somali Federal Republic and remained committed and was continuing to pursue more legitimate avenues to have the delimitation of the maritime boundary amicably resolved, most preferably through a bilateral agreement with the Somali Federal Republic. Kenya also noted that bilateral diplomatic negotiations at the highest levels possible were ongoing with a view to resolving the matter expeditiously and with a view to continuing peaceful cooperation, security and stability in the region.

26 The Commission also took note of communication, dated 7 July 2015, from the Federal Republic of Somalia. In the light of this communication, the Commission determined that it was in a position to proceed with the establishment of a subcommission to consider the Submission. The Subcommission for the consideration of the Submission made by Kenya was established on 3 August 2015 during the plenary of the thirty-eighth session of the Commission. The following members of the Commission were appointed as members of the Subcommission: Lawrence Folajimi Awosika, Galo Carrera, Martin Vang Heinesen, Mazlan Bin Madon, Jair Alberto Ribas Marques, Isaac Owusu Oduro and Yong Ahn Park. The Subcommission elected Mr. Park as its Chair and Messrs. Awosika and Marques as its Vice-Chairs.

27 Regarding the application of the Statement of Understanding and the communications from Sri Lanka dated 22 July 2009 and from Kenya dated 29 October 2013, the Commission concluded that there was a difference of views as to the interpretation and applicability of the provisions relating to its implementation among States. It also acknowledged that States, not the Commission, interpreted the Convention. While recalling its need to be kept informed about any further developments on this matter and bearing in mind the definition of its mandate contained in paragraph 1(a) and (b) of article 3 of

annex II to the Convention, the Commission instructed the Subcommission to consider the Submission on a scientific and technical basis under the provisions of article 76 of the Convention and the Statement of Understanding.

28 The five-year term of office of the 21 members of the Commission elected in 2012 expired on 15 June 2017. On 14 June 2017, during the twenty-seventh Meeting of States Parties, 20 members were elected to the Commission for a five-year term. During the subsequent forty-fourth session of the Commission, the following members were appointed to the Subcommission: Lawrence Folajimi Awosika, Martin Vang Heinesen, Mazlan Bin Madon, Jair Alberto Ribas Marques, Marcin Mazurowski, Domingos de Carvalho Viana Moreira and Yong Ahn Park. The Subcommission subsequently elected Mr. Heinesen as its Chair and Messrs. Awosika and Marques as its Vice-Chairs.

29 On 8 December 2021, the thirty-first Meeting of States Parties was resumed for the purpose of conducting a by-election to fill the vacancy resulting from the passing of Mr. Marques. The States Parties elected Antonio Fernando Garcez Faria as a member of the Commission. At its fifty-fourth session the Commission appointed Mr. Garcez as a member of the Subcommission. The Subcommission subsequently elected Mr. Madon as a Vice-Chair.

30 Following its establishment, the Subcommission met during the thirty-ninth session to commence its consideration of the Submission and to conduct a preliminary analysis of the Submission pursuant to paragraph 5.1 of annex III to the Rules of Procedure. On 19 October 2015, the Delegation submitted a revised Main Body and Supporting Scientific and Technical Data.

31 At the fortieth session, the Subcommission commenced the main scientific and technical examination of the Submission pursuant to paragraph 9 of annex III to the Rules of Procedure. The main scientific and technical examination continued until the forty-second session when, on 25 October 2016, the Subcommission provided a comprehensive presentation of its views and general conclusions arising from the examination of the Submission in accordance with paragraph 10.3 of annex III to the Rules of Procedure. Thereafter, Kenya provided the Subcommission with additional data and information.

32 Subsequently, the Subcommission continued its examination of the Submission from the forty-first through fifty-sixth sessions during which it received additional data and information from the Delegation.

33 During the fifty-sixth session, on 31 October 2022, the Subcommission provided the Delegation with a presentation of its views and general conclusions arising from the examination of the additional data and information received since the forty-second session. This presentation was an update to the presentation provided on 25 October 2016 pursuant to paragraph 10.3 of annex III to the Rules of Procedure. On 3 November 2022, the Delegation provided its response to the 10.3 presentation by the Subcommission, pursuant to paragraph 10.4 of annex III to the Rules of Procedure.

34 The Subcommission adopted its Recommendations on 8 November 2022 and submitted them to the Commission on 9 November 2022 for consideration and approval.

35 The Subcommission made a presentation to the Commission on the substance and rationale for its Recommendations on 1 February 2023. The Delegation

subsequently made a presentation to the Commission on 1 February 2023 in accordance with paragraph 15.1bis of annex III to the Rules of Procedure.

36 The Commission prepared these Recommendations, which were approved on 7 March 2023, taking into consideration article 76, the Statement of Understanding, annex II to the Convention, the Guidelines and the Rules of Procedure.

37 The Recommendations of the Commission are based on the scientific and technical data and other material provided by the Delegation in relation to the implementation of article 76 and the Statement of Understanding. The Commission makes these Recommendations to the Republic of Kenya in fulfilment of its mandate as contained in article 76 and in articles 3 and 5 of annex II to the Convention.

38 The Recommendations of the Commission only deal with issues related to article 76, the Statement of Understanding and annex II to the Convention and shall not prejudice matters relating to delimitation of boundaries between States with opposite or adjacent coasts, or prejudice the position of States which are parties to a land or maritime dispute, or the application of other parts of the Convention or any other treaties.

39 The Commission makes Recommendations to coastal States on matters related to the establishment of the outer limits of their continental shelf in accordance with article 76, paragraph 8, of the Convention. Pursuant to this provision, the limits of the continental shelf established by a coastal State on the basis of these Recommendations shall be final and binding.

40 Throughout the examination of the Submission, the Subcommission requested and received support from DOALOS.

II. CONTENTS OF THE SUBMISSION

A. The Submission

41 The Submission, received on 6 May 2009, contained three parts: an Executive Summary; a Main Body which is the analytical and descriptive part; and Supporting Scientific and Technical Data.

42 On 19 October 2015 Kenya submitted a revised Main Body and supporting materials. In a letter to the Subcommission on 21 October 2015, Kenya stated that the revised Main Body and supporting materials were deemed as the primary source of information that superseded those submitted previously on 6 May 2009.

B. Communications and additional material

43 In the course of the examination of the Submission, the Delegation submitted additional materials, including responses to questions and requests for clarification from the Subcommission.

III. EXAMINATION OF THE SUBMISSION BY THE SUBCOMMISSION

A. Examination of the format and completeness of the Submission

44 Pursuant to paragraph 3 of annex III to the Rules of Procedure, the Subcommission verified the format and completeness of the Submission.

B. Preliminary analysis of the Submission

45 Pursuant to paragraph 5 of annex III to the Rules of Procedure, the Subcommission undertook a preliminary analysis of the Submission, in accordance with article 76 and the Guidelines and determined that:

(a) the test of appurtenance has been satisfied by Kenya as sediment thickness point 1%Sed01, related to FOS 1, is located beyond 200 M from the baselines. Detailed examination of the FOS and sediment thickness points is presented in sections 2.1 and 3.1, respectively;

(b) the outer limits of the continental shelf submitted by Kenya (Figure 1) were determined by the formulae line established by reference to the outermost fixed points at each of which the thickness of sedimentary rocks was not less than 1 km in accordance with the Statement of Understanding, and the distance constraint;

(c) the constructed outer limits contained straight lines not exceeding 60 M;

(d) it did not intend to recommend the advice of specialists, in accordance with rule 57, or the cooperation of relevant international organizations, in accordance with rule 56, be sought; and

(e) additional time would be required to review all the data and to prepare its Recommendations during future sessions.

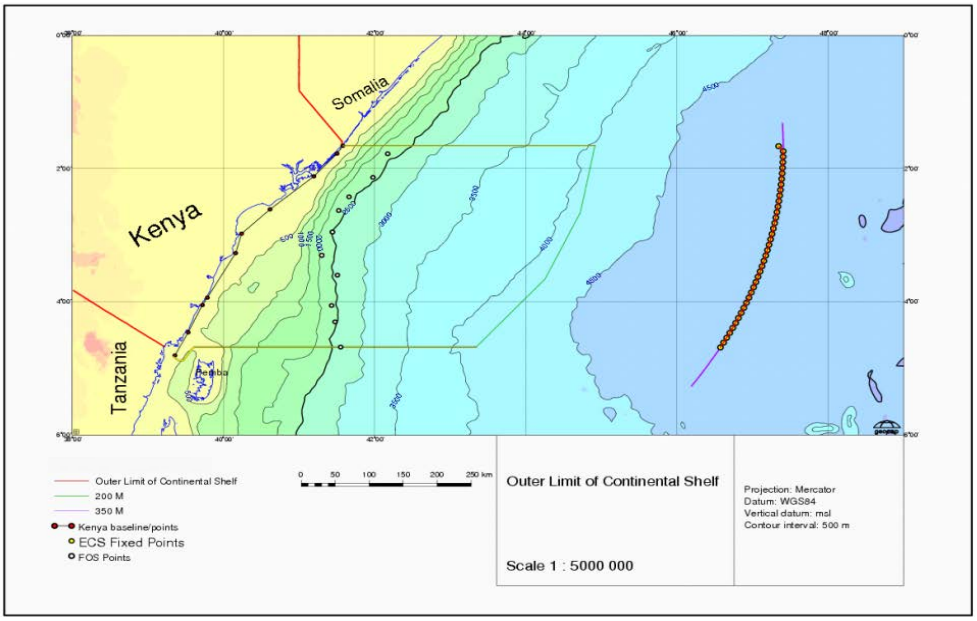

Figure 1*. Outer limits of the continental shelf as submitted by Kenya (Main Body, Map 8.1, modified by the Subcommission)

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* The illustrative maps marked by an asterisk are prepared by the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations, upon the request of the Subcommission established to consider the Submission made by Kenya on the basis of the submitted information. The designation employed and the presentation of material on these maps does not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

C. Main scientific and technical examination of the Submission

46 Pursuant to paragraph 9, section IV of annex III to the Rules of Procedure, the Subcommission conducted an examination of the Submission based on the Guidelines and the Statement of Understanding and evaluated the following:

(a) the data and methodology employed by Kenya to determine the location of the foot of the continental slope;

(b) the data and methodology used to demonstrate the fulfilment of the scientific and technical requirements in accordance with the Statement of Understanding;

(c) the data and methodology used to determine the formula line delineated by reference to the outermost fixed points at each of which the thickness of sedimentary rock should not be less than 1 km;

(d) the data and methodology used to determine the constraint line at a distance of 350 M from the baselines;

(e) the delineation of the outer limit of the continental shelf by means of straight lines not exceeding 60 M in length with a view to ensuring that only the portion of the seabed that satisfied all the provisions of article 76 of the Convention and the Statement of Understanding was enclosed;

(f) the estimates of the uncertainties in the methods applied, with a view to identifying the main source(s) of such uncertainties and their effect(s) on the Submission; and

(g) whether the data submitted were sufficient in terms of quantity and quality to justify the proposed limits.

47 In conducting its examination of the Submission, the Subcommission:

(a) proceeded with a detailed examination of the data and information supporting the establishment of the outer edge of the continental margin in accordance with the Statement of Understanding;

(b) sought clarification and additional data from the Delegation, as necessary;

(c) presented preliminary views and conclusions to the Delegation; and

(d) made comprehensive presentations of its views and general conclusions to the Delegation, at advanced stages of the examination of the Submission, as provided for in paragraph 10.3 of annex III to the Rules of Procedure.

IV. RECOMMENDATIONS OF THE COMMISSION

1. Geographical and geological description of the region

48 The Kenyan continental margin is located in the Western Somali Basin (WSB) in the north-western part of the Indian Ocean (Figure 2). The margin is influenced by tectonism and sedimentation related to the evolution of the WSB, in which sediment thickness in excess of 8 km has been reported (Coffin and Rabinowitz, 1982, 1987).

49 The WSB originated by continental rifting during the Middle Jurassic (ca. 170-165 Ma) (Geiger et al., 2004), followed by break-up and southward drifting of Madagascar from Africa until the Early Cretaceous (ca. 125-120 Ma) when it

reached its present-day position (Phethean et al., 2016; Sauter et al., 2018; Vormann and Jokat, 2021).

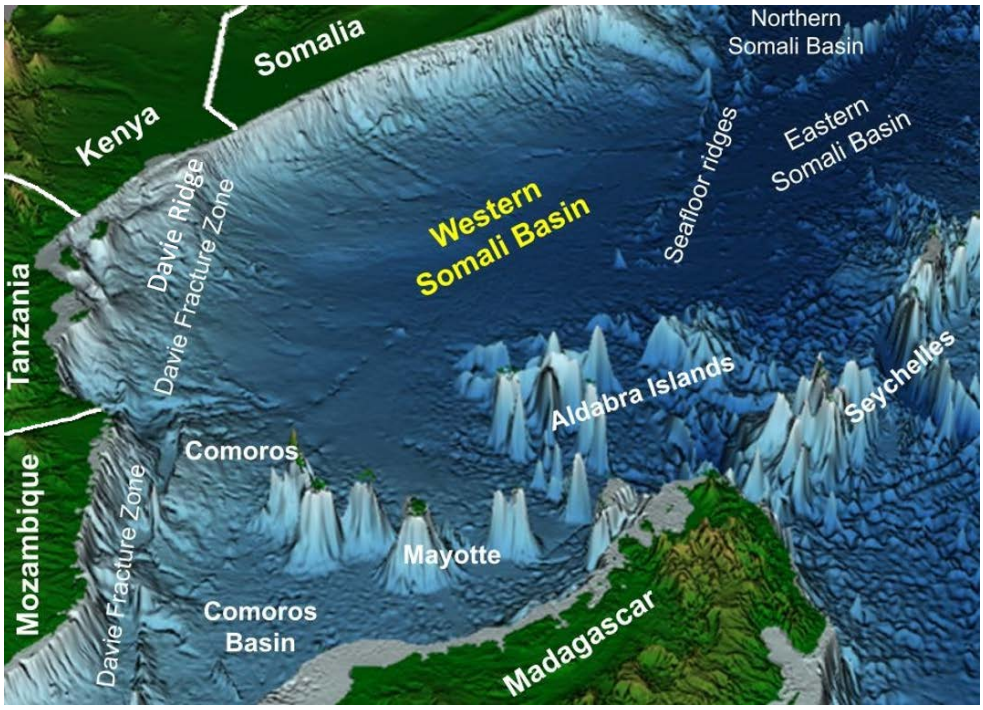


Figure 2*. Main physiographic features in the region of the Submission.

50 Oblique rifting of the Kenya/Somalia and Madagascar conjugate margins resulted in predominantly strike-slip tectonics along the East African coast from Mozambique to Tanzania, along which a number of basins (e.g. Rovuma and Mandawa) developed (Figure 3). The transform margin gradually transitions into orthogonal rifting along the Kenya/Somalia coast in the north. Accordingly, Kenya considered its continental margin as a rifted passive margin in the north and a sheared or transform margin in the south.

51 The southward movement of Madagascar relative to Kenya/Somalia was accommodated along roughly north-south fracture zones, principally the Davie Fracture Zone (DFZ) (Coffin et al., 1986; Cochran, 1988; Coffin and Rabinowitz, 1988). The DFZ is assumed by some authors (Coffin et al., 1986) as a continent-ocean boundary (COB) while more recent studies (Seton et al., 2012; Phethean et al., 2016), based on gravity and magnetic data, suggest that oceanic crust occurs on both sides of the DFZ (Figure 3).

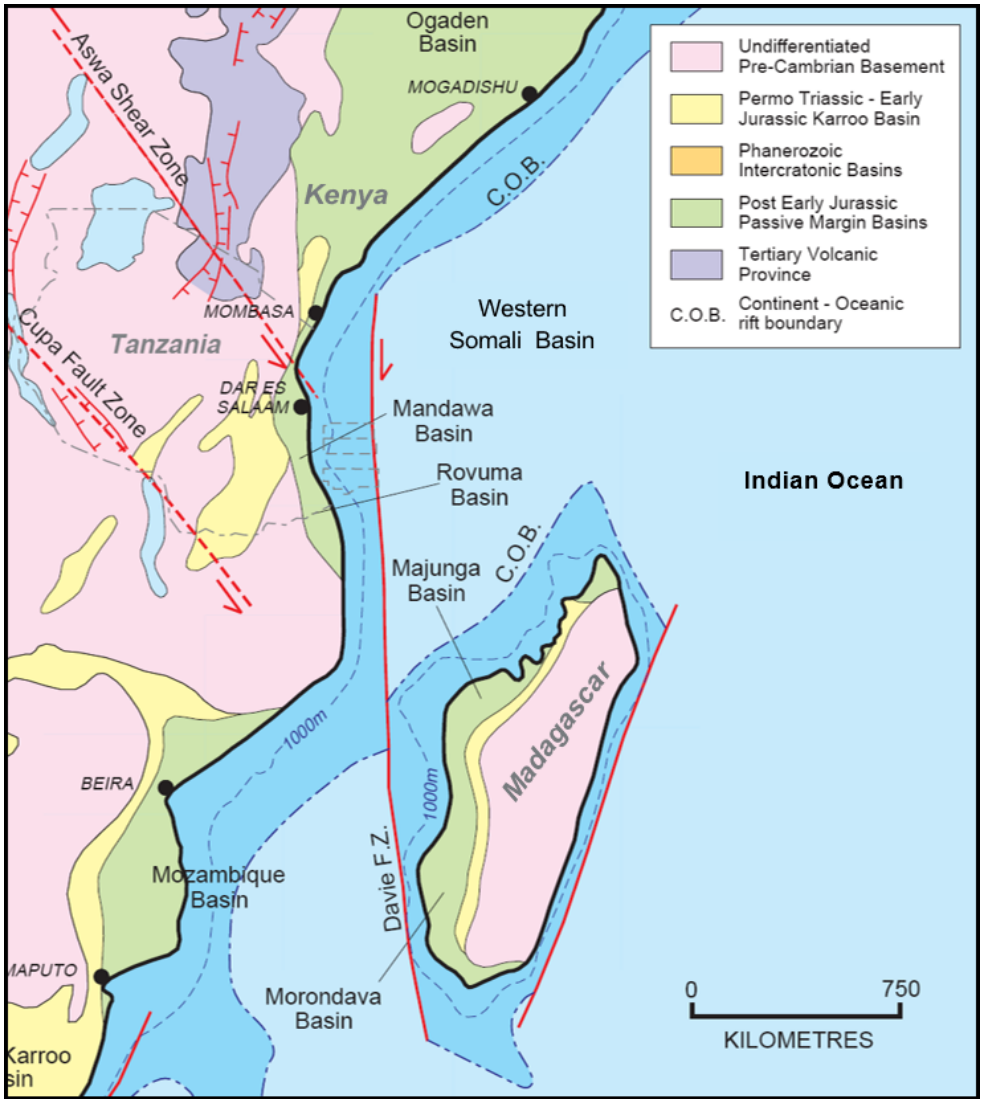


Figure 3*. Structural and geological components of Eastern Africa and the north-western part of the Indian Ocean (Main Body, Figure 3.15, modified by the Subcommission).

52 The DFZ is bathymetrically expressed as a north-south linear feature in the southern part of the Kenyan margin as the Davie Ridge.

2. The determination of the FOS (article 76, paragraph 4(b))

53 The FOS shall be established in accordance with article 76, paragraph 4(b).

2.1 Considerations

54 Kenya determined the location of the BOS and FOS based on morphological analysis of ETOPO2, and single and multibeam bathymetric data, supported by geological and geophysical evidence.

55 The Subcommission first considered the location of the BOS as identified by Kenya.

56 In the search for the BOS, Kenya utilized the two-step approach in accordance with paragraph 5.4.5 of the Guidelines. Using gradient band analysis of ETOPO2, Kenya identified the morphological components of the continental margin – shelf, slope and rise. The top of the rise was identified as the region where gradients range from 0.6° to 1° (brown area in Figure 4).

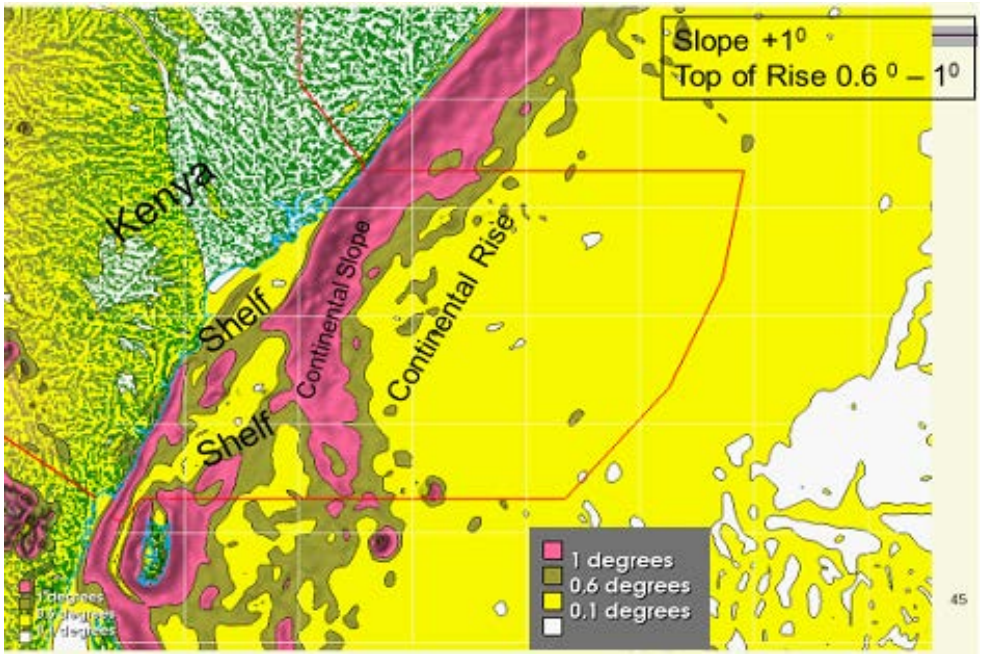


Figure 4*. Gradient band analysis by Kenya identifying the top of the rise as the region where gradients range from 0.6° to 1° (brown area) (2014_09_03_KEN_PRE_COM_002, slide 45, modified by the Subcommission)

57 Kenya also utilised single and multibeam bathymetric data to support the identification of the BOS (Figure 5).

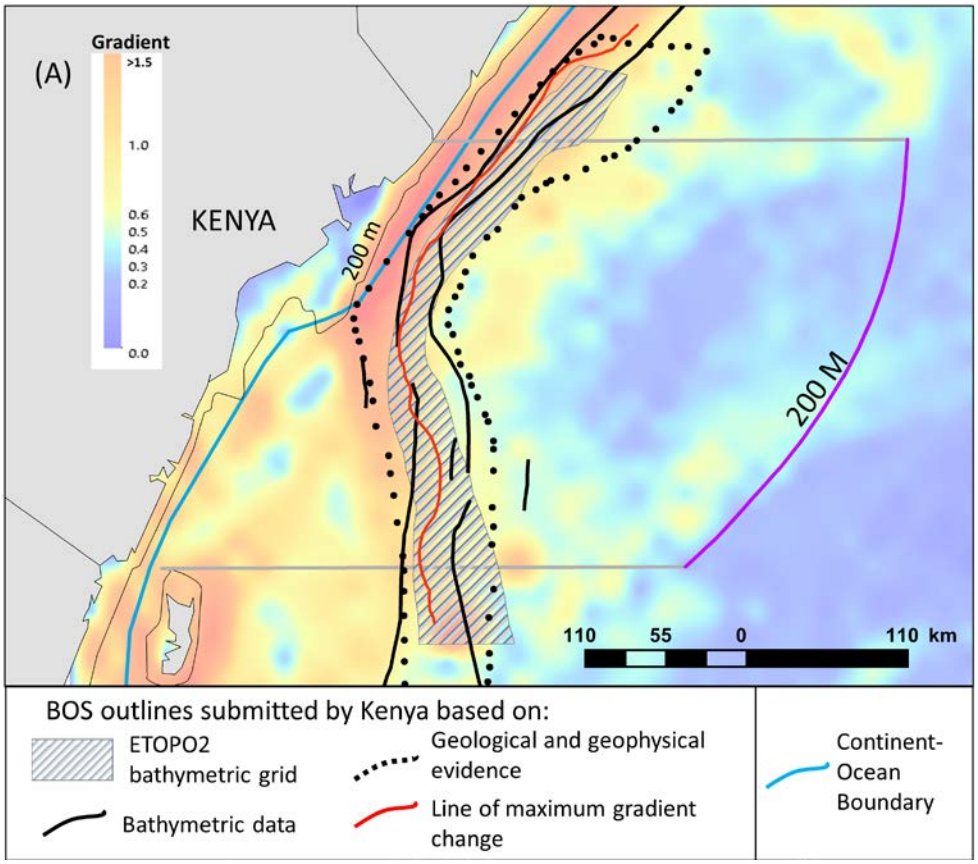
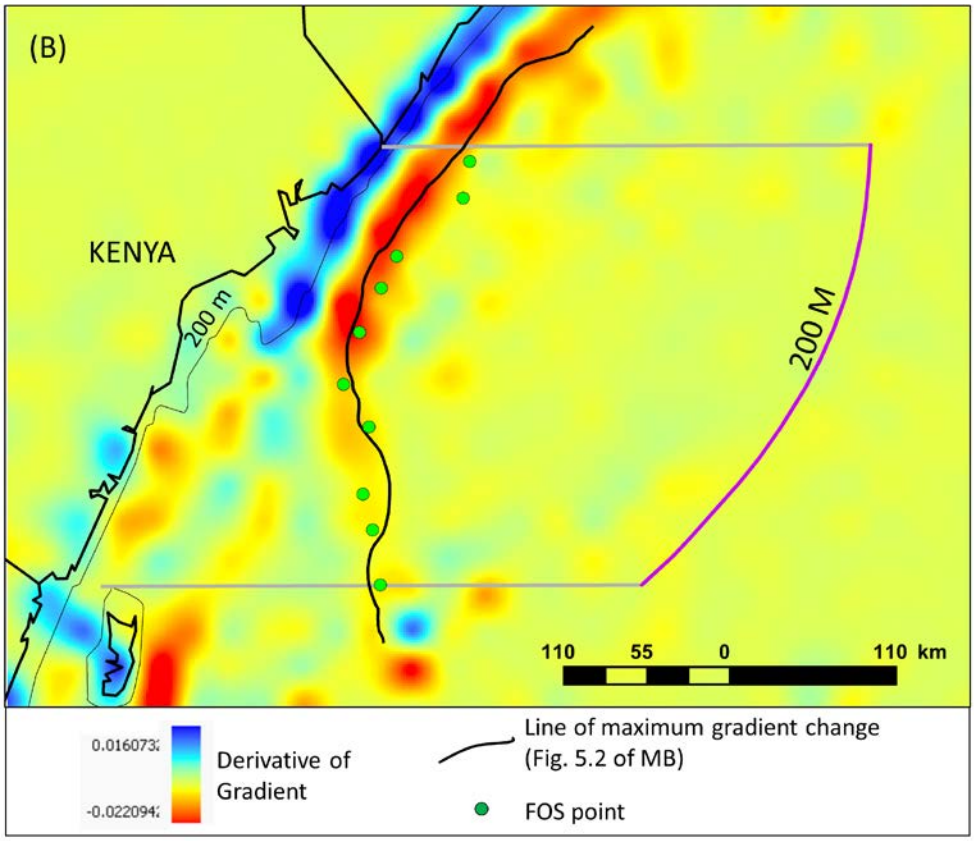


Figure 5*. (A) BOS region identified by Kenya based on various datasets, as submitted in the Main Body, compared to the COB from Seton et al. (2012). ETOPO2 is the 2006 version of the 2 arc-minute grid of land and ocean elevation from NGDC (2001). The bathymetric data used by Kenya are profiles from single- and multi-beam bathymetric data. The line of maximum gradient change is from Figure 5.2 in the Main Body based on the derivative of the gradient. The background is a gradient map generated from Smith and Sandwell bathymetry grid v9.1, 2007 (Smith and Sandwell, 1997).



(B) Derivative of the gradient generated from Smith and Sandwell bathymetric grid v9.1, 2007, showing the region of maximum gradient change (warm colours) seaward of the shelf (cool colours). Kenya presented the line of maximum gradient change as representing the approximate position of the BOS.

58 To support the morphological determination of the BOS, Kenya provided geological and geophysical data and information, including seismic, gravity and magnetic evidence for the location of the COB.

59 Based on the tectonic evolution of the WSB (Figure 3), and regional Bouguer anomaly from satellite-derived gravity data, Kenya argued that the COB in the rifted northern margin is within 70 km of the coastline and continues southward along the north-south oriented DFZ (Main Body, Figure 5.18).

60 Free-air and Bouguer gravity anomalies examined by the Subcommission indicate a sharp, probably faulted, boundary that coincides with the NE-oriented Kenya-Somalia coast (Figure 6). This sharp transition, also identified by vertical gravity gradients (Figure 7A), corresponds to a relatively narrow continent-ocean transition zone (COT) inferred from gravity models provided in the Submission, as well as in the literature (Pouliquen et al., 2017). The crustal thickness map (Figure 7B) also indicates the sharp boundary between continental and oceanic crust along the Kenyan coast.

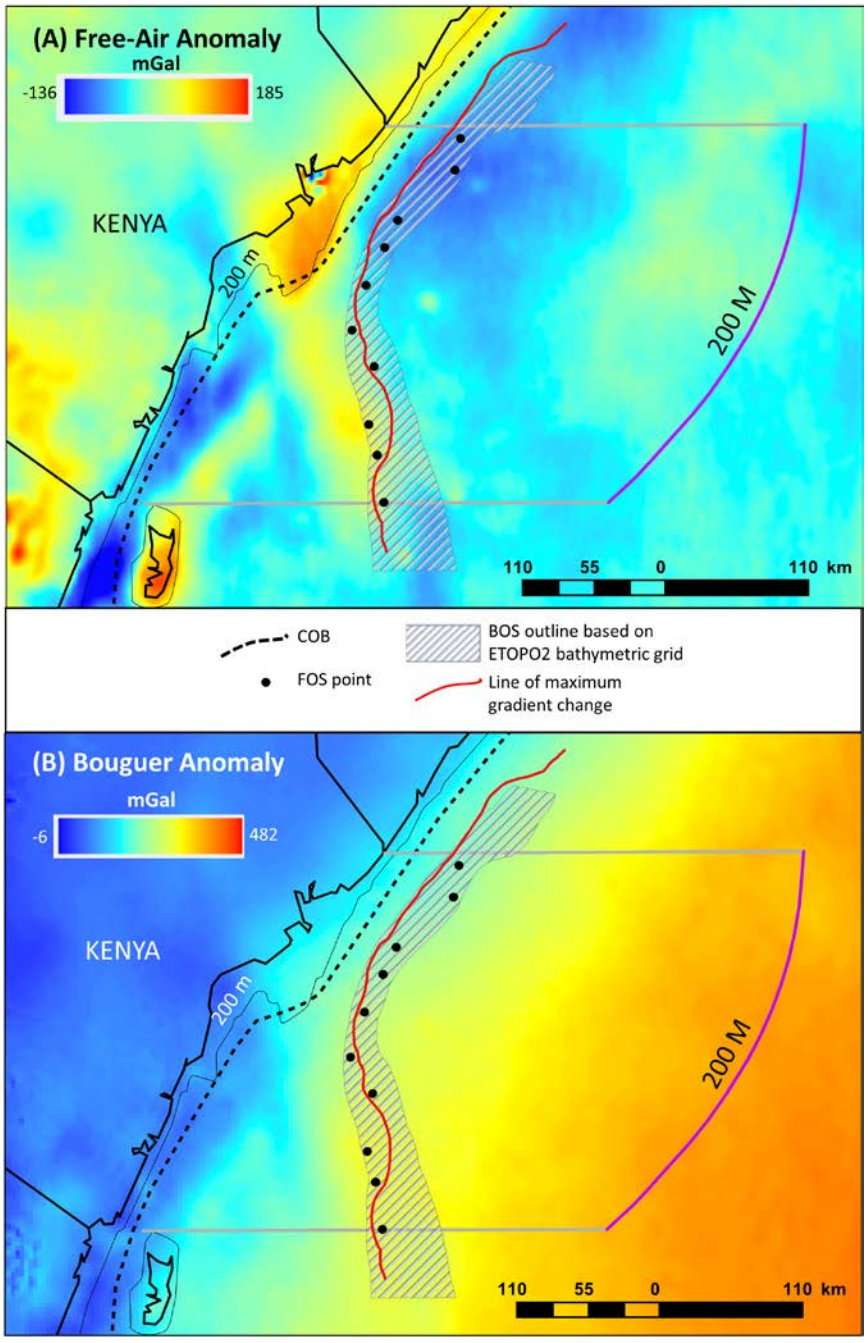


Figure 6*. Gravity anomalies indicate a sharp transition between continental and oceanic crust along the northern Kenyan and Somali coasts, indicative of the COB/COT, which appears to be offset by the transform fault zone along Davie Ridge. BOS and FOS points identified by Kenya are shown for reference. (A) Free-air anomaly map based on satellite-derived gravity grid of Sandwell and Smith v 30.1 (Sandwell et al., 2014). (B) Bouguer gravity anomaly map based on World Gravity Map (WGM 2012) (Bonvalot et al., 2012).

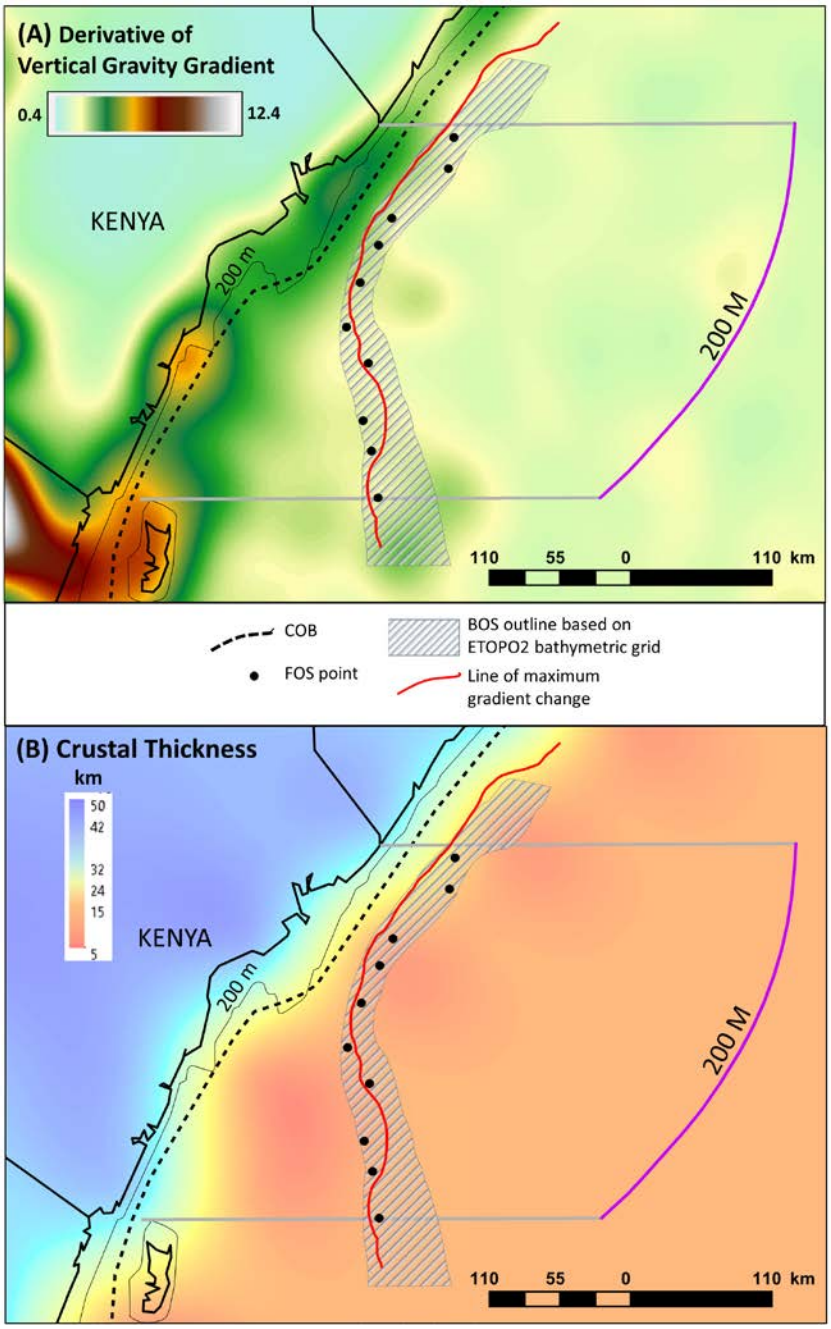


Figure 7*. (A) Derivative of the vertical gravity gradient from the Sandwell and Smith grid v 30.1 (Sandwell et al., 2014) showing a distinct zone of steep gravity gradients along Kenya-Somalia coasts, indicative of the COB. (B) Crustal thickness map based on the global grid of Szwillus et al. (2019) showing the sharp transition zone where the crustal thickness changes from continental (cool colours) to oceanic (warm colours). The BOS and FOS points identified by Kenya are shown for reference.

61 According to Seton et al. (2012, 2020), the COB/COT along the Somali and Kenyan coasts continues south-west across the Davie Ridge and along the coasts of Tanzania and Mozambique (Figures 6 and 7).

62 ENE-trending magnetic anomalies in EMAG2 data (Meyer et al., 2012) indicate oceanic crust spreading fabric, consistent with the N-S rifting of Madagascar from Somalia/Kenya. This fabric does not appear to continue west of the Davie Ridge, due to deeper oceanic basement and proximity to continental crust.

63 Multi-channel seismic (MCS) data indicate that the BOS region in the rifted northern margin is closely correlated with the COT, which is characterised by a zone of widespread salt diapirism as well as gravitationally induced toe-thrusts associated with a deepwater fold-thrust belt that was active during the Late Cretaceous to Early Miocene (Coffin and Rabinowitz, 1987; Cruciani and Barchi, 2016). As suggested by Cruciani and Barchi (2016), the seaward advance of the fold-thrust belt appears to be limited by the presence of Late Cretaceous volcanic intrusions that have been mapped on seismic data along a line that conforms approximately with the trend of the BOS (Figure 8).

64 In the transform southern margin, the BOS appears to have been deflected by Davie Ridge and continues south along its eastern flank (Figures 6 and 7).

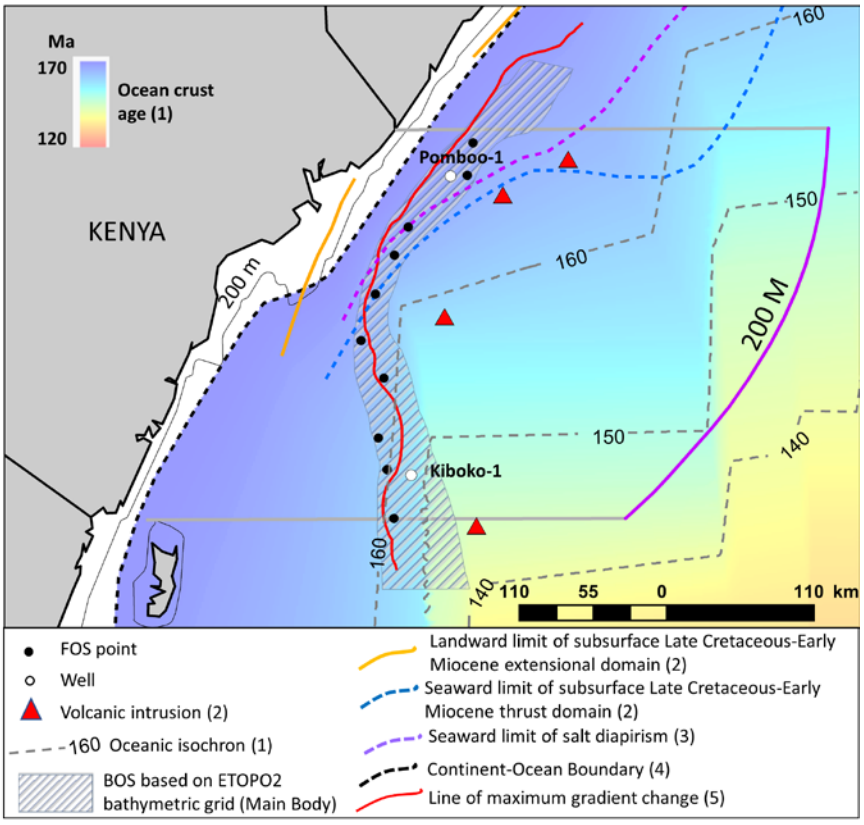


Figure 8*. Geological and geophysical elements supporting the location of the BOS/FOS, compiled by the Subcommission from the Main Body and published literature. References: (1) Seton et al., 2020. (2) Cruciani and Barchi, 2012. (3) Coffin and Rabinowitz, 1987. (4) Seton et al., 2012. (5) Figure 5.2 of Main Body.

65 Since the deepwater fold-thrust belt became inactive by the Early Miocene and is buried unconformably beneath a package of Cenozoic sediments, it does not have a bathymetric expression. The MCS data indicate that the undeformed wedge of Cenozoic sediments onlap onto the unconformity towards the BOS region and can be considered part of the rise.

66 Based on the data and information submitted by Kenya, the Subcommission agreed with the general location of the BOS (Figure 5) as identified by Kenya on morphology, supported with geological and geophysical data, and proceeded to verify the FOS points.

67 Kenya used profiles from a multibeam bathymetric grid to determine the location of FOS points 1 to 10 (Figure 9). Kenya used different averaging distances for the slope and rise within the BOS to verify stability of the location of the FOS. Each FOS point was determined as the point of maximum change in the gradient at the BOS.

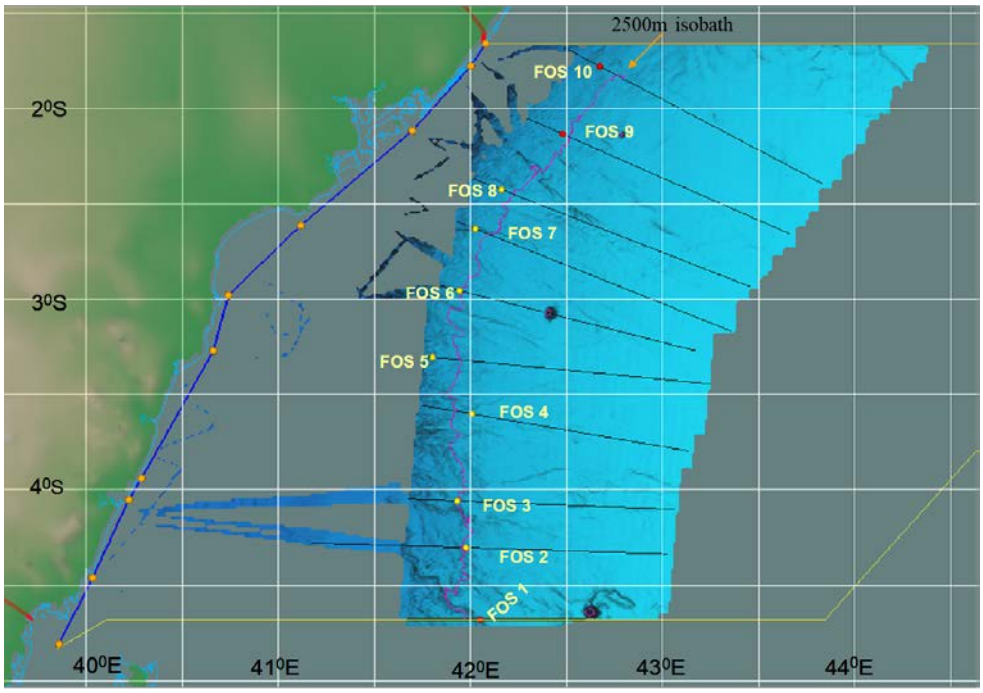


Figure 9. Multibeam bathymetric grid used by Kenya to generate profiles (black lines) on which FOS points 1 to 10 (yellow dots) were determined (2014_09_03_KEN_PRE_COM_002, slide 60).

68 The Subcommission analysed the data and information submitted by Kenya and agreed with the location of FOS points 1 to 10.

2.2 Recommendations

69 Based on the consideration of the data and information provided in the Submission, the Commission concludes that FOS points 1 to 10, illustrated in Figure 9 and listed in Table 1 of annex I, fulfil the requirements of article 76 and the Guidelines. The Commission recommends that these FOS points should form the basis for the establishment of the 1 per cent sediment thickness fixed

points according to article 76, paragraph 4(a)(i), and the fulfilment of the relevant requirements in the application of the SOU.

3. The establishment of the outer edge of the continental margin

70 In establishing the outer edge of its continental margin, Kenya applied the method specified in the SOU.

71 By applying the SOU, Kenya submitted that its continental margin possesses the "special characteristics" described therein. Kenya further stated that, establishing the outer edge of its continental margin according to paragraph 4(a) of article 76 would result in an inequity, as more than half of its margin would be excluded thereby.

72 According to the SOU, notwithstanding the provisions of article 76, the outer edge of the continental margin may be established by straight lines not exceeding 60 M in length connecting fixed points, at each of which the thickness of sedimentary rock is not less than 1 km.

73 In its consideration of the application of the SOU, the Subcommission understood the following as the necessary scientific and technical requirements to be fulfilled by Kenya:

(a) Requirement 1 - the average distance at which the 200 m isobath occurs is not more than 20 M from the baselines (Figure 10);

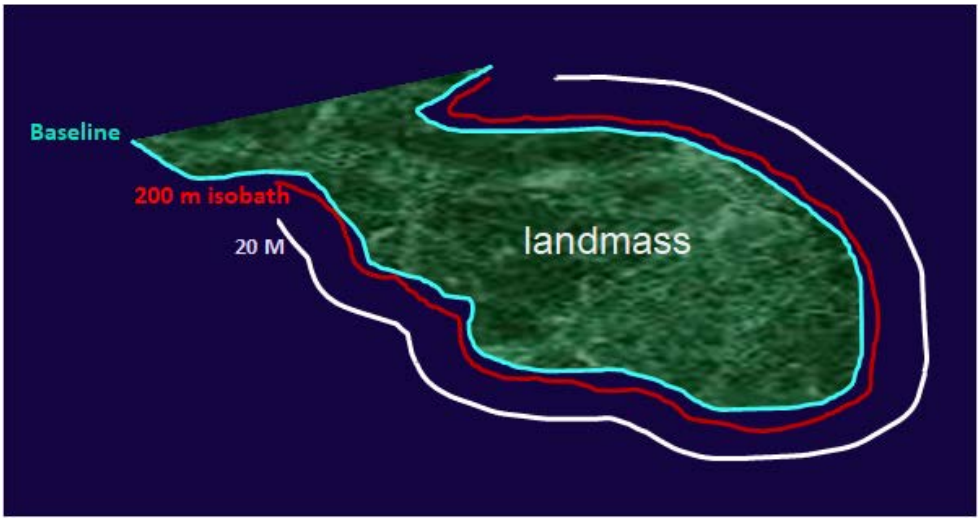


Figure 10*. Illustration of Requirement 1 – The average distance at which the 200 m isobath occurs is not more than 20 M from the baselines. Baselines in cyan, 200 m isobath in red and 20 M from the baselines in white.

(b) Requirement 2 - the greater proportion of the sedimentary rock of the continental margin lies beneath the rise (Figure 11);

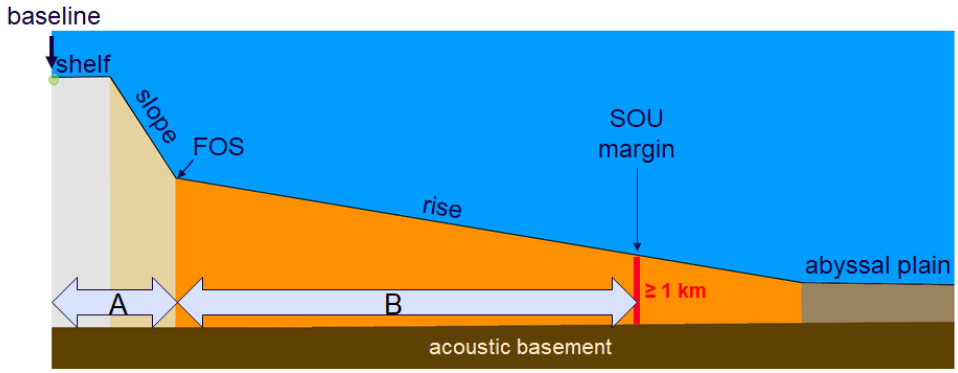


Figure 11*. Illustration of Requirement 2 – The proportion (volume) of sedimentary rock beneath the rise (B) is greater than that beneath the shelf and slope (A).

(c) Requirement 3 - the mathematical average of the thickness of sedimentary rock along a line established at the maximum distance permissible in accordance with the provisions of paragraph 4(a)(i) and (ii) of article 76 as representing the entire outer edge of the continental margin should not be less than 3.5 km (Figure 12);

(d) Requirement 4 - more than half of the margin would be excluded thereby (Figure 12); and

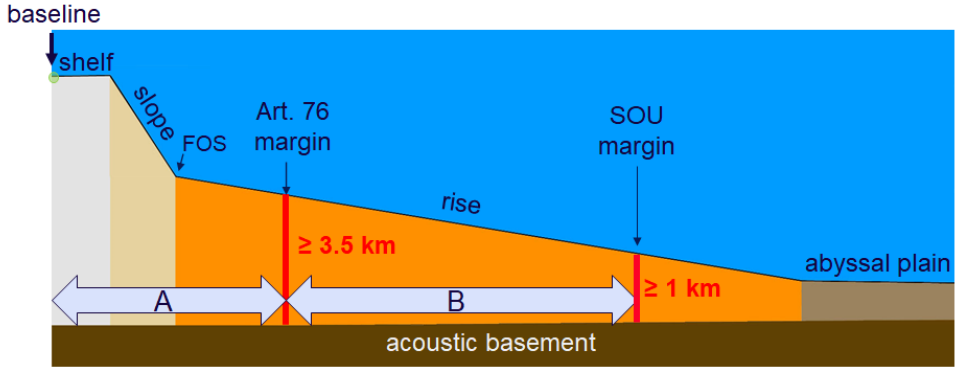


Figure 12*. Illustration of Requirement 3 – The average sediment thickness along the article 76 margin line is not less than 3.5 km; and Requirement 4 – Area B is greater than Area A.

(e) Requirement 5 - establish the outer edge of the continental margin by straight lines not exceeding 60 M in length connecting fixed points, defined by latitude and longitude, at each of which the thickness of sedimentary rock is not less than 1 km (SOU margin in Figures 11 and 12).

74 The Subcommission understands that the application of the SOU does not exclude the application of other relevant provisions contained in article 76.

3.1 The application of the SOU

Requirement 1 – Consideration and conclusions

75 Kenya submitted data and information on the baseline from which the breadth of its territorial sea is measured and on the 200 m isobath (section 4.2.1 of the Main Body). Kenya constructed the 200 m isobath using multibeam bathymetric data combined with ETOPO2. The Subcommission verified the construction of the 200 m isobath and determined that the average distance measured from the baseline is 6.4 M (Figure 13).

76 Consequently, the Subcommission agreed that Kenya fulfils Requirement 1.

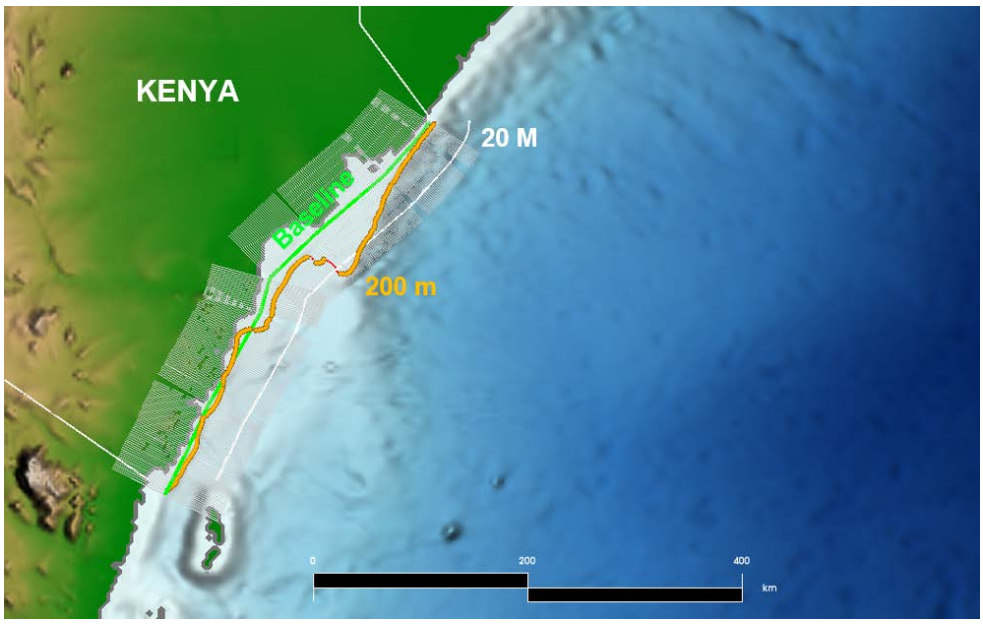


Figure 13*. Fulfilment of Requirement 1 by Kenya - Lines perpendicular to the baselines at 1 M intervals were used by the Subcommission in its verification. Baseline in light green, 200 m isobath in orange, 20 M from the baselines in white.

Requirement 2 – Consideration and conclusions

77 The consideration of Requirement 2 involved the calculation of the volumes of sedimentary rock beneath the shelf and slope, and beneath the rise (A and B, respectively, in Figure 11).

78 In the Submission, Kenya determined the 1 per cent sediment thickness fixed points according to paragraph 4(a)(i) of article 76 as the outer edge of the continental margin that represents the extent of the rise, for the purpose of demonstrating the fulfilment of Requirement 2. Kenya calculated the proportion of sedimentary rock in terms of the area of the shelf and slope versus the area of the rise for this purpose.

79 In the view of the Subcommission, for the purpose of the SOU, while the landward limit of the rise is defined by the FOS, its seaward limit is not the

article76 margin but is determined according to Requirement 5 (paragraph 73e), by fixed points at each of which the thickness of sedimentary rock is not less than 1 km (SOU margin in Figure 11).

80 Additional data and information regarding the SOU margin were submitted in the Main Body (Figure 14A), where Kenya had identified the outer edge points on multi-channel seismic lines that extend up to about 350 M from the baselines (Figure 14B).

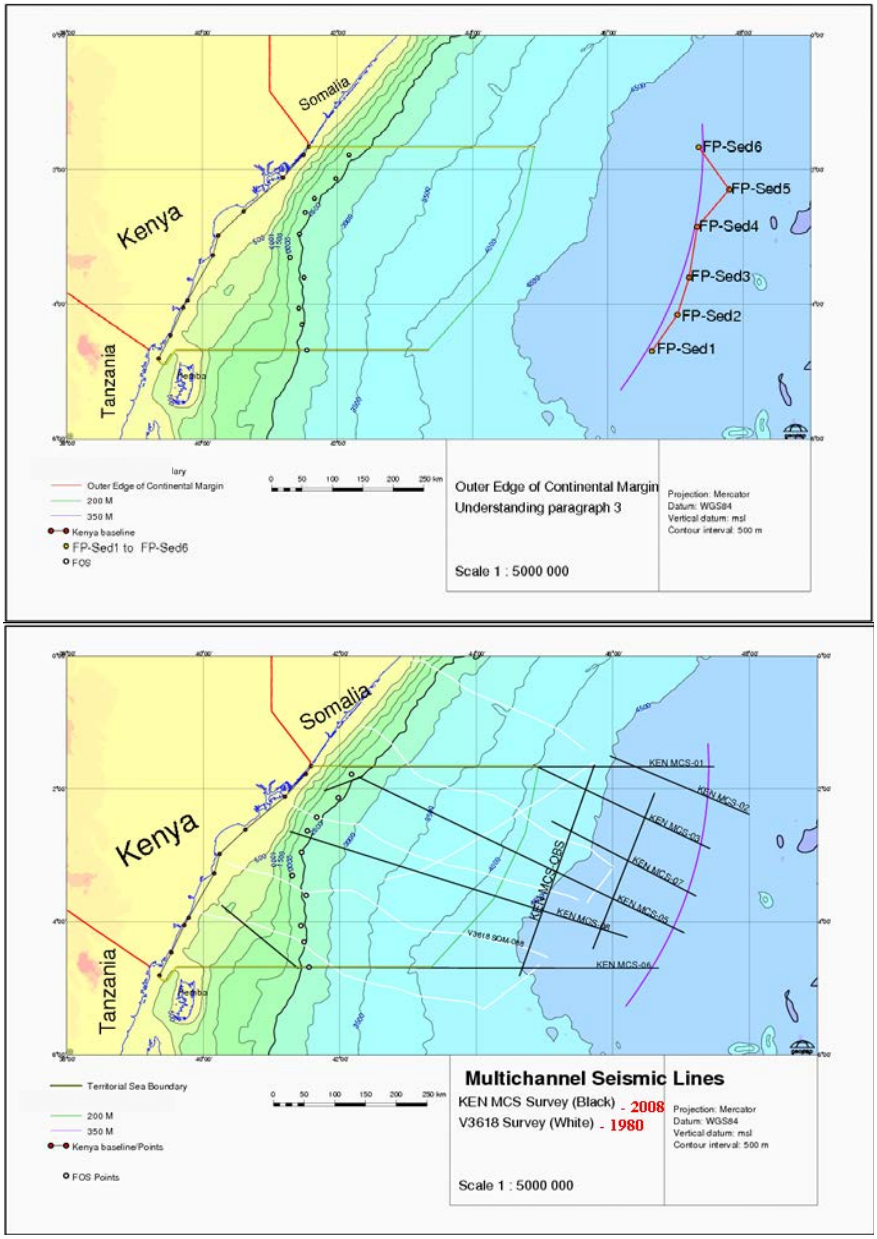


Figure 14*. (A) Sediment thickness fixed points at each of which the thickness of sedimentary rock is not less than 1 km (Map 7.1, Main Body). (B) Seismic lines used in the Submission (Map 10.4, Main Body).

81 The Subcommission considered these data and information at the thirty-ninth session and requested the Delegation to provide further information on the methodology of sediment thickness determination, velocity analysis and time-depth conversion for the submitted outer edge fixed points. These data were received by the Subcommission at the fortieth session. During the forty-first session, the Subcommission indicated to the Delegation that the data and information provided were insufficient to determine the fulfilment of Requirement 2.

82 At the forty-second session, Kenya provided eight revised outer edge fixed points, located well beyond 350 M, with supporting data and information (Figure 15). The data included single-channel seismic lines and sediment velocity data from sonobuoy refraction surveys.

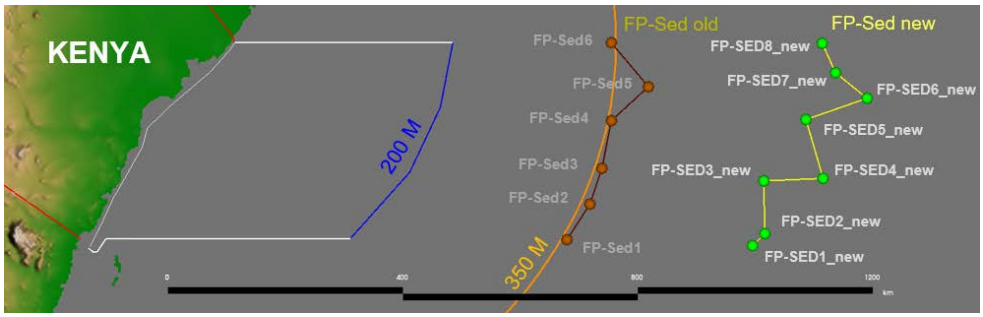


Figure 15*. Revised outer edge fixed points (FP-Sed1_new to FP-Sed8_new) submitted by Kenya in October 2016 to replace the original outer edge fixed points (FP-Sed old) contained in the Main Body of 2015, based on single-channel seismic data. Also shown in the figure are the 200 M and 350 M lines.

83 At the forty-third session, the Subcommission considered these additional data and information and concluded that the single-channel seismic lines did not support the determination of the outer edge fixed points. In particular, the resolution of the single-channel seismic data made it difficult to identify the top of the basement for the estimation of sediment thickness.

84 At the forty-sixth session, Kenya submitted data and information concerning a new set of 1 km sediment thickness fixed points (FPSED01 to FPSED07) determined using newly obtained single-channel seismic lines (Figure 16). The Subcommission also took note that the new single-channel seismic data set was meant to replace the previous data set submitted in October 2016.

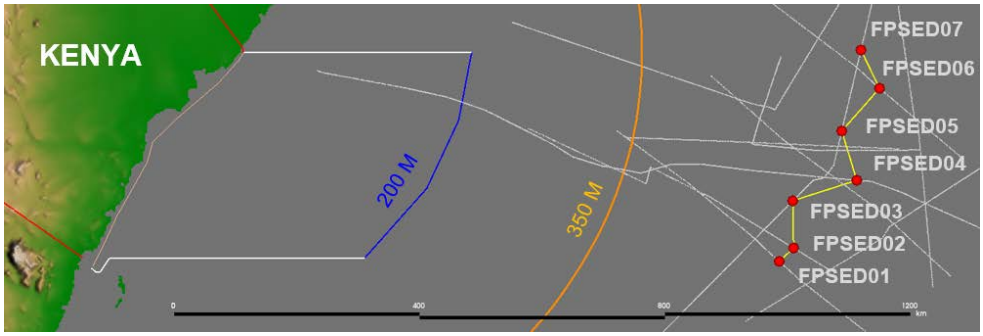


Figure 16*. Revised 1 km sediment thickness fixed points (red dots) determined on a new set of single-channel seismic lines (white lines) submitted by Kenya (2018_01_24_KEN_RPT_008). Also shown in the figure are the 200 M and 350 M lines.

85 In its consideration of these new outer edge fixed points, the Subcommission agreed with Kenya's approach in identifying the "unequivocal" base of the sedimentary layer as representing the top of the basement, as the requirement is that the thickness of sedimentary rock should not be less than 1 km. The Subcommission applied the following set of criteria to identify the base of the sedimentary layer:

(a) continuous or semi-continuous seismic reflections;

(b) mainly horizontal or semi-horizontal seismic reflections that are generally concordant with the seafloor;

(c) of sufficient amplitude to be recognised as seismic reflections; and

(d) sedimentary layers are not to be confused with multiples or other artefacts such as diffractions that are often present at the top of igneous basement.

The Subcommission considered that the deepest seismic reflection that satisfies these criteria can represent the base of the sedimentary layer.

86 Based on the above approach, the Subcommission agreed with the determination of the base of the sedimentary layer at two of the seven 1 km sediment thickness fixed points proposed by Kenya (FPSED06 and FPSED07). For the remaining points, the Subcommission was unable to identify with certainty the reflections that represent the base of the sedimentary layer.

87 For the estimation of sediment thickness, Kenya submitted velocity data from LeTourneau (1992). Using these velocity data, the Subcommission found that for FPSED06 and FPSED07 the sediment thickness is 904 m and 1,164 m, respectively. Consequently, at the end of the forty-sixth session the Subcommission concluded that only one of the seven sediment thickness fixed points submitted meets the criterion of 1 km thickness (FPSED07[2018], Table 2 of annex I).

88 The Subcommission, taking into account the Guidelines, paragraphs 8.2.4, 8.2.8 and 8.5.1, also considered the results of gravity inversion provided by Kenya, at the forty-seventh session, to support its sediment thickness estimation. Based on the satellite-derived gravity anomaly data of Sandwell et al. (2014), Kenya used gravity inversion to derive sediment thickness at the proposed fixed points.

According to Kenya, the sediment thickness estimated from inversion of gravity data corroborates with those obtained from the single-channel seismic data (2018_01_24_KEN_RPT_008).

89 The Subcommission noted that the results of the gravity inversion method as applied by Kenya presented an uncertainty of 30 per cent compared to those based on seismic data at the SOU margin, which requires a minimum of 1 km of sediments. On this basis, the Subcommission was of the view that the estimation of sediment thickness at the SOU margin in this region should be based principally on seismic data as per paragraph 8.2.4 of the Guidelines. Consequently, it sought further clarification from the Delegation regarding the remaining points.

90 In its communication to the Subcommission of 22 July 2019, pending the outcome of the consideration of the fixed points of the outer edge of the continental margin (SOU margin), Kenya submitted what it referred to as a "'provisional' SOU margin" using multichannel seismic data "solely for the purpose of demonstrating the fulfilment of the second SOU requirement". The proposed "'provisional SOU' margin" consists of six sediment thickness points PFPSED01 to PFPSED06 (Figure 17 and Table 4 of annex I).

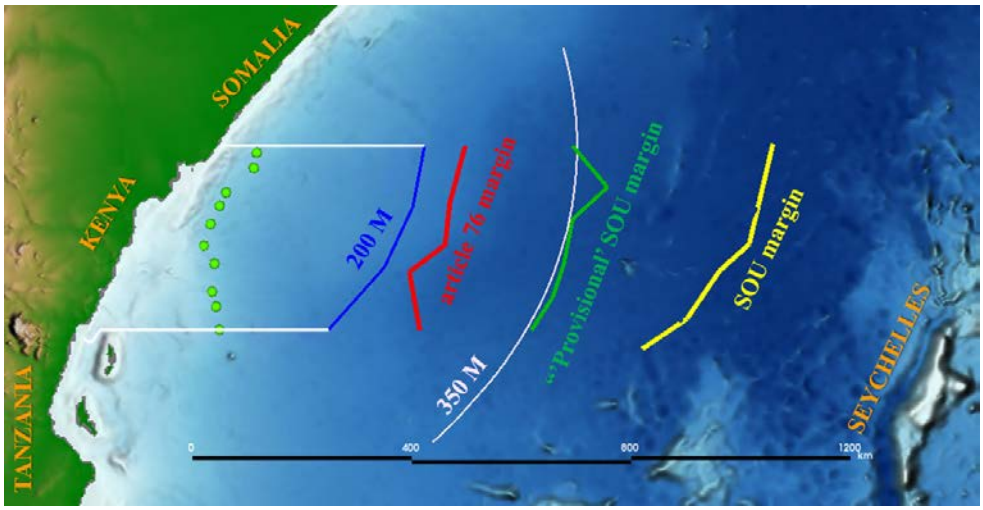


Figure 17*. "'Provisional' SOU margin" (green) as proposed by Kenya, in relation to other lines in the Submission: article 76 margin (red) and SOU margin (yellow) lines. Also shown in the figure are the FOS points (green dots) and the 200 M and 350 M lines.

91 At the end of the fifty-first session the Subcommission agreed to Kenya's proposal to use the "'provisional' SOU margin", provided that:

(a) the entire "'provisional' SOU margin" is located within the continental margin established in accordance with the SOU; and

(b) the greater proportion of the sedimentary rock of the "'provisional' SOU margin" lies beneath the rise.

92 With regard to the requests for clarification from the Subcommission during the forty-seventh through to the forty-ninth sessions, Kenya submitted data and information on re-processed KEN-MCS lines using the Pre-Stack Depth

Migration (PSDM) method to replace the original KEN-MCS data. With the reprocessed data, Kenya provided PSTM and PSDM seismic sections (in time and depth, respectively) together with velocity profiles along those lines.

93 The Subcommission verified that the sediment thickness at each of the provided "'provisional' SOU margin" fixed points have sediment thicknesses significantly greater than 1 km. The Subcommission also verified that the distance between consecutive sediment thickness fixed points did not exceed 60 M. Consequently, the entire "'provisional' SOU margin", defined by fixed points listed in Table 4 of annex I, was inferred to be located within the continental margin established in accordance with the SOU (as per paragraph 91a).

94 With respect to the volume calculation (as per paragraph 91b), the Subcommission considered the submitted seismic data and information during the fifty-first session:

(a) gridded depth of the seabed and the top of the basement from pre-stack depth migrated (PSDM) data; and

(b) gridded time horizons from the seabed to the top of the basement from pre-stack time migrated (PSTM) data.

95 The Subcommission observed that there were differences in the interpretation of seismic horizons including the top of the basement by Kenya on different seismic data sets. However, since these differences are relatively small except under the shelf and slope area, the Subcommission concluded that these did not have a significant effect on the volume calculations (Table 1).

SEISMIC LINES	Average difference in basement pick	
	Shelf & Slope	Rise
KEN-MCS01	30.00%	6.58%
KEN-MCS05	0.00%	0.79%
KEN-MCS06B	7.20%	3.37%
KEN-MCS07	N/A	1.3%
KEN-MCS08	0.00%	3.69%
AVERAGE	12.40%	3.14%

Table 1*. Average differences in the top of basement picks between the Subcommission and Kenya.

96 Using the submitted grids, the Subcommission calculated the volume of sediments by three methods:

(a) assuming a single layer of sediments between the seabed and the top of the basement using PSDM depth grids;

(b) assuming a single layer of sediments between the seabed and the top of the basement using PSTM time grids using a constant sediment velocity of 3000 m/s, as previously applied by Kenya; and

(c) assuming a multi-layered sedimentary section using PSTM time grids between the seabed and the top of the basement with interval velocities derived from the data provided.

97 By all these methods (Table 2A) and considering the associated uncertainties (Table 2B), the Subcommission verified that the calculated volume of rock beneath the rise is greater than that beneath the shelf and slope.

Volume calculations comparison		Subcommission		
	Kenya	(a)	(b)	(c)
Method	depth-grid	PSDM depth-grids	PSTM 3000 m/s	PSTM layered
Area A (shelf/slope)	480,877	559,102	456,844	504,060
Area B (rise)	848,328	920,321	958,528	885,378
Ratio B/A	1.76	1.65	2.10	1.76

Methodologies		Sediment Volume (km^3)		
		Shelf & Slope (A)	Rise (B)	Ratio (B/A)
Gridded surfaces	Kenya (Gridded)	480,877	848,328	1.76
	Subcommission (Gridded - layered velocity, method (c))	504,060	885,378	1.76
Difference in basement pick	Average (+ 12.4% Shelf & Slope / - 3.14% Rise)	566,563	857,577	1.51
	Maximum (+ 30% Shelf & Slope / - 6.58% Rise)	655,278	827,120	1.26

Table 2*. Verification of volume calculations by Subcommission (A) Using the three methods described in paragraph 96 (B) Using method (c) incorporating the uncertainties associated with the pick of the top of the basement.

98 Consequently, the Subcommission agreed that Kenya fulfils Requirement 2.

Requirement 3 - Consideration and conclusions

99 Kenya initially submitted seven 1 per cent sediment thickness fixed points 1%Sed01 to 1%Sed07 (Table 6.1 of the Main Body) to establish the outer edge of the continental margin according to the provisions of paragraph 4(a)(i) of article 76. The sediment thickness fixed points were determined by Kenya from FOS 1 and FOS 8 using multi-channel seismic lines. Velocity data from those lines and an ocean-bottom seismometer (OBS) survey line were used for sediment thickness calculation.

100 In its consideration of Requirement 3, the Subcommission investigated whether the submitted fixed points are at the “maximum distance permissible” from the FOS and whether the average sediment thickness along the line connecting those points is not less than 3.5 km.

101 In the view of the Subcommission, for those fixed points to be at the “maximum distance permissible”, an optimum set of FOS points would be required. Based on its analysis of the data and information, the Subcommission had concluded at the forty-first session, and presented to the Delegation on 2 August 2016, that FOS points 1, 9 and 10 are the optimum set of FOS points that would generate

the most seaward sediment thickness fixed points where the 1 per cent sediment thickness criterion is met (Figure 18).

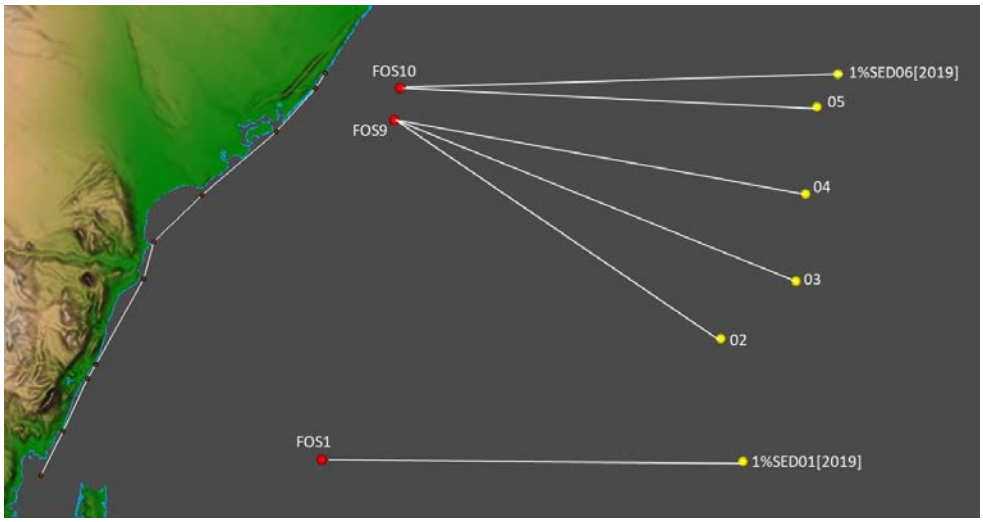


Figure 18. Revised 1% sediment thickness points (1%SED01 to 1%SED06), submitted by Kenya in 2019, connected by white lines to the optimal set of FOS points (FOS 1, 9, and 10). (2019_07_22_KEN_RPT_011, Figure 51)

102 Using these FOS points, the Subcommission found that the average sediment thickness calculated based on the sediment thickness fixed points submitted in the Main Body was less than 3.5 km (3.412 km). Consequently, at the forty-first session, the Subcommission concluded that Kenya did not fulfil Requirement 3.

103 At the forty-third session, Kenya submitted additional multi-channel seismic lines and new OBS velocity data (Makris et al., 2012). Kenya also submitted data and information from eight wells, including two from Deep Sea Drilling Project.

104 Based on the data from Kiboko-1 well (Figure 8) Kenya argued for the presence of a Jurassic high-velocity sediment layer (4,312 m/s) above the acoustic basement, considered to be the offshore equivalent of Jurassic limestones (Coffin et al., 1986). According to Kenya, the new OBS data indicated the presence of such a layer with velocities of 4,350-4,700 m/s and should be used for time-depth conversion.

105 The Subcommission considered these data and information from the forty-fourth to the fiftieth session, and sought clarification regarding the submitted 1 per cent sediment thickness fixed points, among others:

(a) the seismic pick representing the top of the acoustic basement, especially in the shelf and slope region where the seismic resolution is poor; and

(b) the velocity model used in time-depth conversion and the calculation of sediment thickness at the fixed points.

106 The Subcommission examined the new data and information, which included well logs, well completion reports, velocity survey reports, stratigraphic and lithological information, and made requests for clarifications on a number of issues relating to the revised velocity model.

107 At the fifty-first session, Kenya submitted revised 1 per cent sediment thickness fixed points 1%Sed01 to 1%Sed06 identified on multi-channel seismic lines (Figure 19 and Table 5 of annex I). In addition, Kenya submitted a revised velocity model based on the reprocessed PSDM seismic lines, KEN-MCS (2019). At each sediment thickness fixed point, a seismic section and interval velocities were provided.

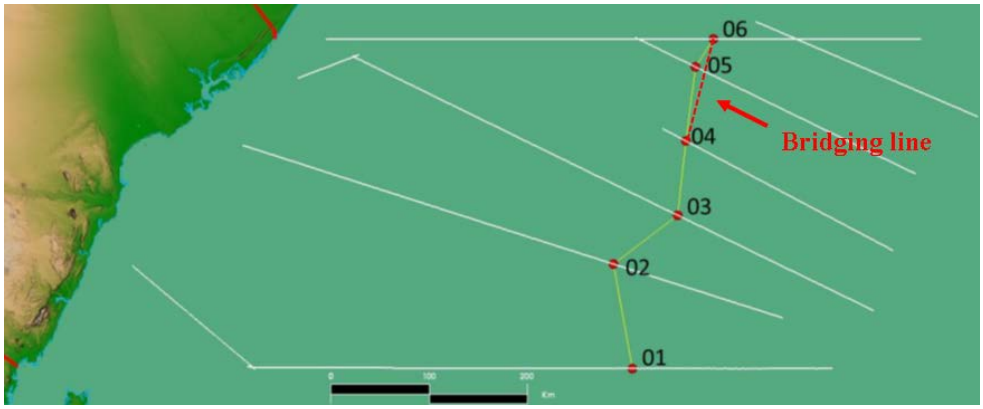


Figure 19*. The final article 76 margin line (yellow) as submitted by Kenya. The red-dashed line bridging points 04 and 06 generates the article 76 line at the maximum distance permissible, in accordance with the SOU. KEN-MCS seismic lines shown in white. (Figure modified from 2019_10_09_KEN_RPT_012, Figure 1)

108 The Subcommission examined the data and information provided and verified the methodology applied by Kenya in estimating the sediment thickness at the revised 1 per cent sediment thickness fixed points.

109 Based on its consideration of all the seismic data provided, the Subcommission agreed with the interpreted picks for the seabed and the top of the basement, as well as for the intermediate horizons on all the seismic lines on which the sediment thickness fixed points were determined. The Subcommission also verified the sediment thickness calculated at those fixed points and that the distance between each of the consecutive sediment thickness fixed points did not exceed 60 M.

110 The Subcommission observed that points 1%Sed04[2019] and 1%Sed06[2019] were less than 60 M (57.98 M) apart and could be bridged to generate an article 76 margin that is located further seaward (Figure 19).

111 By excluding point 1%Sed05[2019], the average thickness of sedimentary rock along the “line of maximum distance permissible” was not less than 3.5 km (3.649 km).

112 Consequently, the Subcommission agreed that Kenya fulfils Requirement 3.

Requirement 4 - Consideration and conclusions

113 It is the understanding of the Subcommission (paragraph 73d) that the fulfilment of Requirement 4 first requires that the outer edge of the continental margin (SOU margin) be established by straight lines not exceeding 60 M in length

connecting fixed points at each of which the sediment thickness is not less than 1 km, in fulfilment of Requirement 5.

114 As described in paragraphs 84 to 87, the Subcommission considered the submitted data and information regarding the outer edge of the SOU margin until the forty-sixth session and could agree to only one of the seven proposed outer edge sediment thickness fixed points.

115 At the fifty-fifth session, the Subcommission requested the Delegation to consider revising the outer edge fixed points.

116 On 30 September 2022, at the fifty-sixth session, Kenya submitted additional clarifications on, and data relating to, the fulfilment of Requirements 4 and 5 (see paragraphs 119 to 125). As requested by the Subcommission, the Delegation provided revised outer edge fixed points for the SOU margin (Requirement 5). The Delegation recalculated areas A and B to demonstrate that "more than half of the margin would be excluded" by the application of article 76.

117 After having considered and verified the revised outer edge sediment thickness fixed points in fulfilment of Requirement 5, the Subcommission calculated the areas based on the 5 sediment thickness points on the maximum distance permissible line and verified that area B (≈ 184,464 km^2) is greater than area A (≈ 178,813 km^2) (Figure 20).

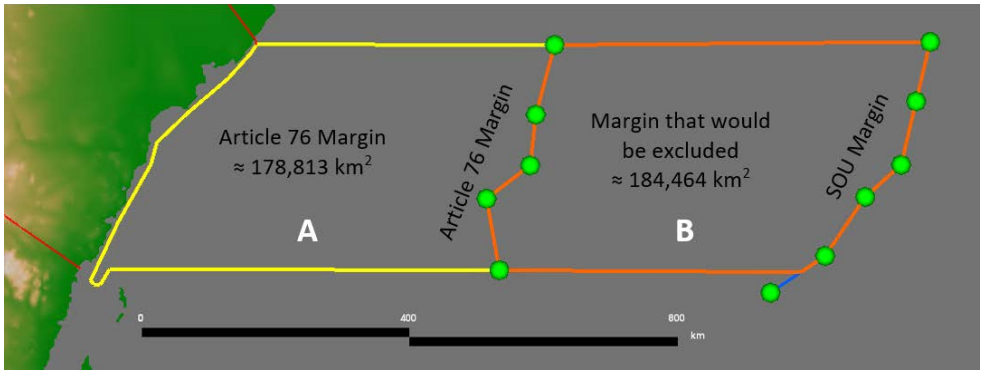


Figure 20*. Requirement 4 – By applying the article 76 margin, more than half of the margin would be excluded (B > A).

118 Consequently, the Subcommission agreed that Kenya fulfils Requirement 4.

Requirement 5 - Consideration and conclusions

119 Following the conclusion by the Subcommission at the forty-sixth session, that it could accept only one (FPSED07[2018]) of the seven sediment thickness fixed points (paragraph 87), discussions with the Delegation up to the fifty-fifth session were focused on the methodology and criteria by which the sediment thickness fixed points were determined using the single-channel seismic lines, in particular:

(a) the top of the basement pick representing the base of the sedimentary layer (see paragraph 85);

(b) average velocity for the calculation of sediment thickness; and

(c) the uncertainties associated with the sediment thickness calculation.

120 On 30 September 2022, Kenya submitted five revised sediment thickness fixed points, FPSED01[2022] to FPSED05[2022], determined on two single-channel seismic lines.

121 The sediment thickness fixed points were identified in several deep grabens (fracture zones) along the seismic lines (Figures 21 and 22). In support of each point, Kenya submitted data and information showing the horizontal extent of the graben in which a minimum of 1 km of sediment is present, estimated based on the velocity data mentioned in paragraph 107. Table 2 of annex I shows the sediment thickness at the outer edge fixed points.

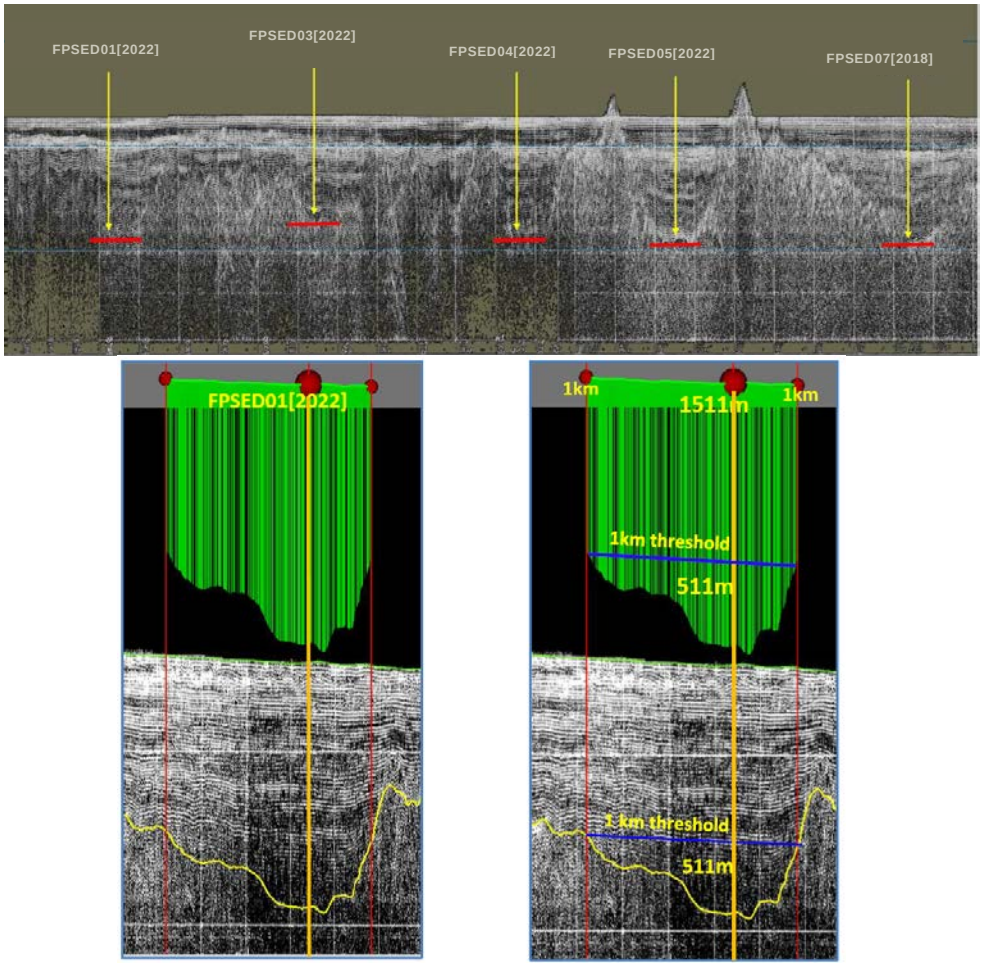


Figure 21. (A) Single-channel seismic line (WI343731-4s-edit) with deep grabens in which sediment thickness fixed points submitted by Kenya for the SOU margin were identified (yellow arrows). (B) Example at FPSED01[2022] showing > 1 km sediment thickness profile (green) associated with the fixed point. The red vertical lines mark the 1 km thickness threshold (blue horizontal line). The pick of the base of the sediment layer, at the fixed point, is 511 m below the 1 km threshold. (2022_09_30_KEN_RPT_014).

122 At the fifty-sixth session, the Subcommission examined the data and information on the 1 km sediment thickness fixed points submitted in 2022, and concluded that those fixed points, along with point FPSED07[2018] that was already accepted, fulfil the criteria (see paragraph 85) (Figure 22).

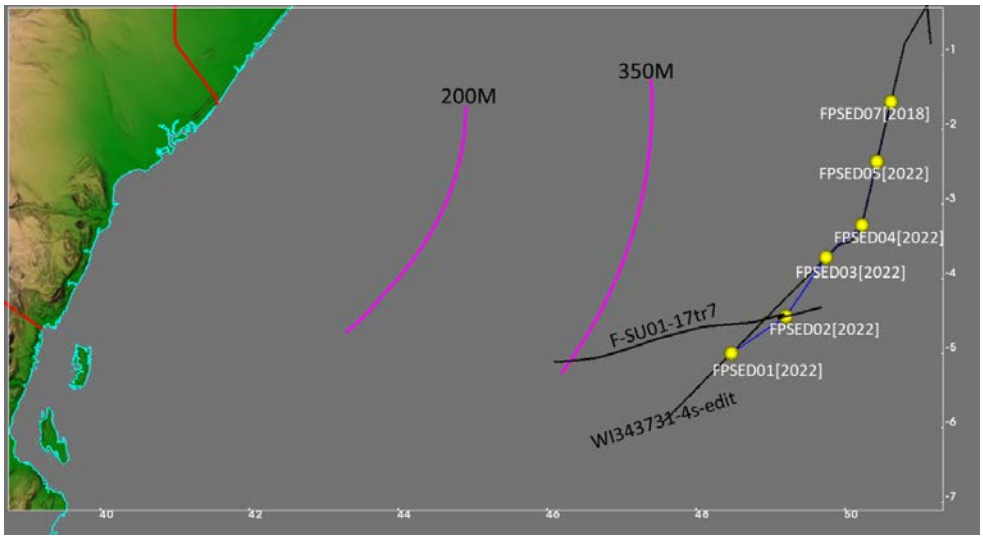


Figure 22. Outer edge fixed points (yellow dots) determined on single channel seismic lines (black) submitted by Kenya (2022_11_02_KEN_RPT_015)

123 The Subcommission then verified that the sediment thickness at those points is not less than 1 km and that the distance between each of the consecutive sediment thickness fixed points does not exceed 60 M (Figure 23).

124 The Subcommission also verified sediment continuity from each of sediment thickness fixed points to the FOS.

125 Consequently, the Subcommission agreed that Kenya fulfils Requirement 5.

3.2 The outer edge of the continental margin

126 As the five requirements of the SOU had been fulfilled, the Subcommission agreed with the methodology by which the outer edge of the continental margin was established by Kenya (Figure 23).

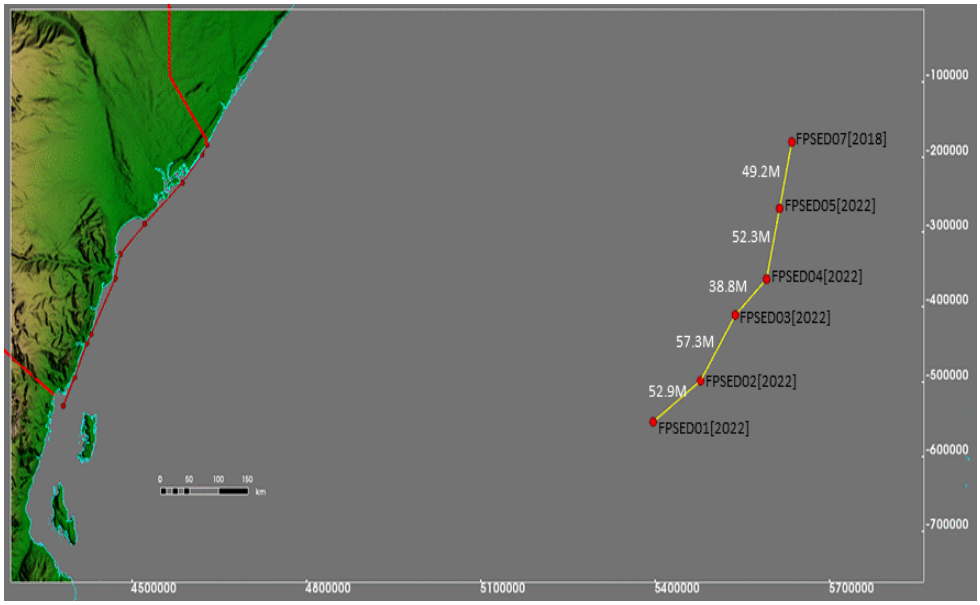


Figure 23. Outer edge of the continental margin of Kenya, established by fixed points (red dots) connected by straight lines (yellow) not exceeding 60 M. (2022_09_30_KEN_RPT_014, Figure 15)

3.3 Recommendations

127 In accordance with the SOU, Kenya established the outer edge of its continental margin beyond 200 M by straight lines not exceeding 60 M in length connecting six fixed points, defined by latitude and longitude, at each of which the thickness of sedimentary rock is not less than 1 km (Figure 23). The fixed points are listed in Table 2 of annex I to these Recommendations.

128 The Commission recommends, based on the submitted data and information, that these points be used as the basis for delineating the outer limits of the continental shelf, subject to the application of the relevant constraints.

4. The application of the constraint criteria (article 76, paragraphs 5 and 6)

129 The outer limits of the continental shelf shall not extend beyond the constraints as per the provisions contained in article 76, paragraphs 5 and 6. For the outer limits of its continental shelf, Kenya invoked only the distance constraint. Consequently, the fixed points comprising the line of the outer limits of the continental shelf of Kenya shall not exceed 350 M from the baselines.

4.1 The construction of the distance constraint line

130 The distance constraint line submitted by Kenya was constructed by arcs at 350 M distance from the baselines of Kenya. The Subcommission agreed with the methodology applied by Kenya in the construction of this constraint line.

131 The distance constraint line is located entirely landward of the outer edge of the continental margin of Kenya (Figure 24).

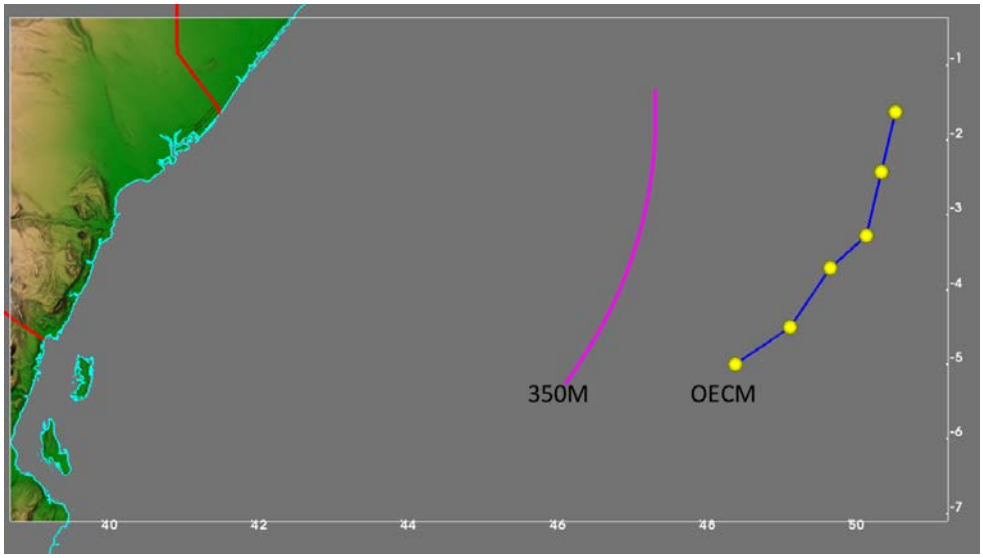


Figure 24. The distance constraint line (magenta) and the outer edge of the continental margin (blue) (2022_11_02_KEN_RPT_015)

4.2 Recommendations

132 Based on the submitted data and information, the Commission recommends the use of the distance constraint line as applied by Kenya to establish the outer limits of its continental shelf (Figure 24).

5. The outer limits of the continental shelf (article 76, paragraph 7)

133 The outer limits of the continental shelf beyond 200 M of Kenya are obtained by applying the distance constraint to the outer edge of the continental margin. Since the outer edge of the continental margin is located entirely seaward of the distance constraint, the outer limits should be delineated by fixed points not exceeding 350 M from the baselines of Kenya, connected by straight lines not exceeding 60 M in length.

134 The fixed points defining the outer limits of Kenya beyond 200 M are contained in Table 3 of annex I.

6. Recommendations for Kenya (article 76, paragraph 8)

135 Based on the submitted data and information, the Commission recommends that the outer limits of the continental shelf of Kenya beyond 200 M be delineated by straight lines not exceeding 60 M in length, connecting fixed points, defined by coordinates of latitude and longitude, not exceeding 350 M from the baselines of Kenya.

136 The establishment of the final outer limits of the continental shelf of Kenya may depend on delimitation between States. The Commission recommends, taking into consideration article 9 of annex II to the Convention, that Kenya proceeds to delineate the outer limits of the continental shelf, accordingly.

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ANNEX I
TABLES OF GEOGRAPHICAL COORDINATES OF: THE FOOT OF THE CONTINENTAL SLOPE POINTS, THE FIXED POINTS OF THE OUTER EDGE OF THE CONTINENTAL MARGIN BEYOND 200 M, AND THE FIXED POINTS OF THE OUTER LIMITS OF THE CONTINENTAL SHELF BEYOND 200 M AS RECOMMENDED BY THE COMMISSION, BASED ON THE SUBMISSION BY KENYA. ALSO INCLUDED ARE TABLES OF GEOGRAPHICAL COORDINATES OF: THE 'PROVISIONAL' OUTER EDGE OF THE CONTINENTAL MARGIN AND THE LINE DEFINING THE MAXIMUM DISTANCE PERMISSIBLE ESTABLISHED IN ACCORDANCE WITH THE STATEMENT OF UNDERSTANDING.

Table 1. Coordinates of the foot of the continental slope points (Datum: WGS 84)

FOS Point ID	Latitude (dd)	Longitude (dd)	Water Depth (m)
FOS 1	-4.6817165	41.5502395	2789
FOS 2	-4.30355	41.49706	2594
FOS 3	-4.058126	41.43077	2497
FOS 4	-3.596429	41.47224	2625
FOS 5	-3.304524	41.29672	2224
FOS 6	-2.946422	41.40705	2386
FOS 7	-2.644317	41.55566	2458
FOS 8	-2.426686	41.662	2412
FOS 9	-2.0259111	42.1177148	2553
FOS 10	-1.7739678	42.1631420	2305

Table 2. Coordinates of fixed points defining the outer edge of the continental margin beyond 200 M (Datum: WGS 84)

Point ID	Latitude (dd)	Longitude (dd)	Distance to next point (M)	Sediment thickness (m)	Seismic line ID
FPSED01[2022]	-4.9993093	48.4722647	52.9	1511	WI343731-4S-edit
FPSED02[2022]	-4.5048697	49.2056347	57.3	1104	F-SU01-17tr7
FPSED03[2022]	-3.7123881	49.7432297	38.8	1054	WI343731-4S-edit
FPSED04[2022]	-3.2797056	50.2256828	52.3	1207	WI343731-4S-edit
FPSED05[2022]	-2.4274292	50.4266934	49.2	1199	WI343731-4S-edit
FPSED07[2018]	-1.6263595	50.6155118	-	1164	WI343731-4S-edit

Table 3. Coordinates of fixed points defining the outer limits of the continental shelf beyond 200 M (Datum: WGS 84)

Point ID	Latitude (dd)	Longitude (dd)	Distance to next OLCS point (M)	Article 76 criterion
KEN-OCS-01	-1.6590386	47.4063956	0	350M
KEN-OCS-02	-1.6922627	47.4066092	2.0	350M
KEN-OCS-03	-1.7760019	47.4057218	5.0	350M
KEN-OCS-04	-1.8597198	47.4036498	5.0	350M
KEN-OCS-05	-1.9433994	47.4003932	5.0	350M
KEN-OCS-06	-2.0270238	47.3959526	5.0	350M
KEN-OCS-07	-2.1105761	47.3903287	5.0	350M
KEN-OCS-08	-2.1940392	47.3835224	5.0	350M
KEN-OCS-09	-2.2773963	47.3755349	5.0	350M
KEN-OCS-10	-2.3606303	47.3663676	5.0	350M
KEN-OCS-11	-2.4437245	47.3560220	5.0	350M
KEN-OCS-12	-2.5266619	47.3445001	5.0	350M
KEN-OCS-13	-2.6094257	47.3318039	5.0	350M
KEN-OCS-14	-2.6919991	47.3179357	5.0	350M
KEN-OCS-15	-2.7743653	47.3028980	5.0	350M
KEN-OCS-16	-2.8565076	47.2866936	5.0	350M
KEN-OCS-17	-2.9384092	47.2693254	5.0	350M
KEN-OCS-18	-3.0200535	47.2507967	5.0	350M
KEN-OCS-19	-3.1014239	47.2311109	5.0	350M
KEN-OCS-20	-3.1825037	47.2102718	5.0	350M
KEN-OCS-21	-3.2632766	47.1882830	5.0	350M
KEN-OCS-22	-3.3437260	47.1651489	5.0	350M
KEN-OCS-23	-3.4238356	47.1408737	5.0	350M
KEN-OCS-24	-3.5035889	47.1154620	5.0	350M
KEN-OCS-25	-3.5829697	47.0889186	5.0	350M
KEN-OCS-26	-3.6619619	47.0612485	5.0	350M
KEN-OCS-27	-3.7405492	47.0324570	5.0	350M
KEN-OCS-28	-3.8187156	47.0025495	5.0	350M
KEN-OCS-29	-3.8964453	46.9715318	5.0	350M
KEN-OCS-30	-3.9737221	46.9394097	5.0	350M
KEN-OCS-31	-4.0505305	46.9061894	5.0	350M
KEN-OCS-32	-4.1268545	46.8718773	5.0	350M
KEN-OCS-33	-4.2026786	46.8364799	5.0	350M
KEN-OCS-34	-4.2779872	46.8000042	5.0	350M
KEN-OCS-35	-4.3527649	46.7624569	5.0	350M
KEN-OCS-36	-4.4269964	46.7238456	5.0	350M

KEN-OCS-37	-4.5006674	46.6841793	5.0	350M
KEN-OCS-38	-4.5739595	46.6438188	5.0	350M
KEN-OCS-39	-4.6466652	46.6024142	5.0	350M
KEN-OCS-40	-4.6809304	46.5822063	2.4	350M

Table 4. Coordinates of fixed points defining the 'provisional' outer edge of the continental margin (Datum: WGS 84)

Point ID	Latitude (dd)	Longitude (dd)	Distance to next point (M)	Sediment thickness (m)	Seismic line ID
PFPSED01	-4.6966677	46.6580467	39	2060	KEN-MCS 06
PFPSED02	-4.1493561	47.0109319	35	2405	KEN-MCS 05
PFPSED03	-3.5994668	47.1944397	45	2039	KEN-MCS 07
PFPSED04	-2.8653462	47.3388564	46	1802	KEN-MCS 03
PFPSED05	-2.3429934	47.9040729	53	2010	KEN-MCS 02
PFPSED06	-1.6646899	47.3378737	-	1700	KEN-MCS 01

Table 5. Coordinates of fixed points defining the maximum distance permissible line established in accordance with the Statement of Understanding (Datum: WGS 84)

Point ID	Latitude (dd)	Longitude (dd)	Distance to next point (M)	Sediment thickness (m)	Seismic line ID
1%Sed01[2019]	-4.6963883	44.8359130	58	3,648	PSDM_KEN-MCS-6B
1%Sed02[2019]	-3.7364290	44.6631310	44	3,407	PSDM_KEN-MCS-08
1%Sed03[2019]	-3.2879765	45.2499105	41	3,758	PSDM_KEN-MCS-05
1%Sed04[2019]	-2.6047958	45.3252433	57.98	3,626	PSDM_KEN-MCS-07
1%Sed06[2019]	-1.6671673	45.5767176	-	3,808	PSDM_KEN-MCS-01