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**Pabai & Anor v Commonwealth of Australia (VID622/2021) (Proceedings)**

**Federal Court of Australia**

**Supplementary Expert Report prepared for Phi Finney McDonald**

I have read, understood and complied with the Expert Evidence Practice Note (**GPN-EXPT**) of the Federal Court of Australia and agree to be bound by it. This document was provided to me with my Retainer Letter dated 28 April 2022.

**Professor David Karoly FAA (climate scientist), 7 November 2023**

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**Supplementary Expert Report by Professor David Karoly**  
University of Melbourne

**Instructions and Purpose of Report**

1. On 28 April 2022, I received my Retainer Letter from Phi Finney McDonald (**PFM**), who act for Pabai Pabai and Guy Paul Kabai (**Applicants**) in the Proceedings against the Commonwealth of Australia (**Respondent**).
2. Phi Finney McDonald has retained my services to act as an expert witness, on a pro bono basis, to impartially assist the Court on matters relevant to climate science by preparing this expert report and appearing as an expert witness in the Proceedings.
3. On 25 May 2023, I submitted my **Expert Report** to PFM. This was lodged with the Court on 26 May 2023.
4. On 3 November 2023, I received a Supplementary Letter of Instruction from PFM (attached at Annexure A to this Report). The Supplementary Letter of Instruction included a Brief of Materials (in Annexure A of the Letter) and a single supplementary question (in Annexure B of the Letter) that I have been asked to answer.

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**Supplementary Question: Basis of statements in your Expert Report**

Please explain the basis for the statements made in:

- a. paragraph 36;
- b. paragraph 37;
- c. paragraph 39;
- d. paragraph 40;
- e. paragraph 55; and
- f. the final two sentences in paragraph 62,

of your Expert Report dated 25 May 2023.

**Responses to the supplementary question**

5. The responses provided below address the supplementary question above included in Annexure B of the Supplementary Letter of Instruction.

**Question 1**

*Please explain the basis for the statements made in:*

- a. *paragraph 36;*
6. Paragraph 36 of my Expert Report describes the average annual rates of change of global total anthropogenic GHG emissions from the Baseline to 2019 and from 1990 to 2019. These rates of change were calculated from the GHG emissions data described in Paragraph 30 of my Expert Report and data presented in Reference 6 in my Expert Report. For example, the average rate of change of global total anthropogenic GHG emissions from the Baseline to 2019 is the magnitude of the change (59 Gt CO<sub>2</sub>-e in 2019, from Paragraph 30) divided by the period of time (119 years), leading to an average rate of change of about 0.5 Gt CO<sub>2</sub>-e per year.
7. The same calculation method, magnitude of change divided by the period of time, was used to calculate each of the rates of change in Paragraphs 36, 37, 39 and 40 in my Expert Report.
8. In reviewing Paragraph 30 and 36 to prepare this Supplementary Expert Report, I noticed an error in the second sentence of Paragraph 30 of my Expert Report. It currently reads “Global net anthropogenic GHG emissions rose by 21 Gt CO<sub>2</sub>-e per year from 1990 to 2019.” The two words ‘per year’ should be deleted. The correct sentence in Paragraph 30 of my Expert Report should be “Global net anthropogenic GHG emissions rose by 21 Gt CO<sub>2</sub>-e from 1990 to 2019.”

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*Please explain the basis for the statements made in:*

*b. paragraph 37;*

9. Paragraph 37 of my Expert Report describes the average annual rates of change of global total GHG concentrations from the Baseline to 2019 and from 1990 to 2019. These rates of change were calculated from the GHG concentration data described in Paragraph 32 of my Expert Report and data presented in Reference 4 in my Expert Report.

*Please explain the basis for the statements made in:*

*c. paragraph 39;*

10. Paragraph 39 of my Expert Report describes the average rates of change of global mean near-surface air temperature from the Baseline to the most recent decade 2011-2020 and from 1986-95 to the most recent decade 2011-2020. These rates of change were calculated from the global mean near-surface air temperature data described in Paragraph 34 of my Expert Report and data presented in Reference 5 in my Expert Report.

*Please explain the basis for the statements made in:*

*d. paragraph 40;*

11. Paragraph 40 of my Expert Report describes the average rates of change of global mean near-surface air temperature over land from the Baseline to the most recent decade 2011-2020 and from 1986-95 to the most recent decade 2011-2020. These rates of change were calculated from the global mean near-surface air temperature data over land described in Paragraph 35 of my Expert Report and data presented in Reference 5 in my Expert Report.

*Please explain the basis for the statements made in:*

*e. paragraph 55;*

12. The second clause in the statement in Paragraph 55 ‘... with similar magnitude increases for every half-degree increase of global temperature’ is open to a misinterpretation that only increases in regional precipitation are possible with increases in global temperature. This is incorrect. As noted in Paragraph 54, ‘Increases in global temperature do not lead to globally uniform increases in precipitation but generally lead to increases in the tropics and high latitudes, and decreases in the sub-tropics.’ Hence, the original statement in Paragraph 55 should be restated with one word changed (underlined), as: “The relationship between increases in global temperature and changes in mean regional precipitation is approximately linear, with similar magnitude changes for every half-degree increase of global temperature.”
13. The statement in Paragraph 55 of my Expert Report and the restated version in Paragraph 12 are based on Paragraphs 52, 54, and 57 and Figure 6 in my Expert Report, together with Reference 3 and Reference 5 in my Expert Report.

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*Please explain the basis for the statements made in:*

*f. the final two sentences in paragraph 62.*

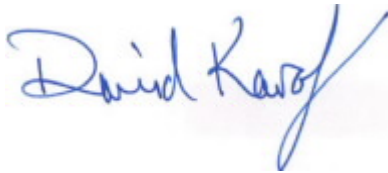
14. The final two sentences in Paragraph 62 of my Expert Report are based on Reference 8 in my Report. There is a typographical error in the reference listed at the end of the second last sentence in Paragraph 62, which should be to Reference 8 in my Expert Report. That reference is to the Summary for Policymakers of the IPCC 6<sup>th</sup> Assessment Report *Climate Change 2022: Impacts, Adaptation and Vulnerability*.

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## Declaration

I declare that:

- (a) my opinions in this report are based wholly or substantially on specialised knowledge arising from my training, study and experience;
- (b) the opinions stated in this report are genuinely held by me;
- (c) the factual matters stated in this report are, as far as I know, true;
- (d) I have made all the inquiries which I believe are desirable and appropriate; and
- (e) No matters of significance which I regard as relevant have, to my knowledge, been withheld.



Professor David Karoly FAA

7 November 2023

## PHI FINNEY MCDONALD

3 November 2023

**PRIVILEGED AND CONFIDENTIAL**

Professor David Karoly  
School of Geography, Earth and Atmospheric Sciences,  
University of Melbourne

By email: [REDACTED]

Dear Professor Karoly,

**Pabai & Anor v Commonwealth of Australia (VID622/2021)**

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**1. Supplementary Letter of Instruction**

1.1. We refer to:

- (a) our letter of retainer dated 28 April 2022 (**Retainer Letter**);
- (b) our letter of instruction dated 13 December 2022 (**Letter of Instruction**); and
- (c) your expert report dated 25 May 2023 (**Your Report**).

1.2. We confirm that you are retained by Uncle Pabai Pabai and Uncle Paul Kabai (**Applicants**) to act as an independent expert in the matter of *Pabai & Anor v Commonwealth of Australia*, VID622/2021 (**Proceeding**).

1.3. We confirm that the confidentiality obligations in respect of documents and information provided to you for the purpose of this engagement are governed by the terms of the Retainer Letter and the Deed of Confidentiality dated 16 May 2022.

1.4. We also remind you of the roles and duties of expert witnesses as set out in the Retainer Letter and ask that you refer to them as you prepare your expert report(s) in this proceeding. In particular, please take some time to reacquaint yourself with the following documents, which we provided to you with our original letter:

- (a) the Federal Court of Australia Expert Evidence Practice Note (**GPN-EXPT**), including the Harmonised Expert Witness Code of Conduct (the **Code**) at Annexure A of that Practice Note and the Concurrent Expert Evidence Guidelines (the **Guidelines**) at Annexure B (collectively, the **Practice Note**); and
- (b) Rule 23.13 of the *Federal Court Rules 2011* (Cth).

1.5. The purpose of this letter is to request that you prepare a supplementary written report providing your independent expert opinion in response to the questions outlined at Annexure B to this letter.

**2. Brief of Materials**

- 2.1. Set out at Annexure A is an index of the documents provided to you, which form your brief. If you would prefer to receive a copy of some or all of the Annexure A documents in hard copy, please do not hesitate to contact us with such a request.
- 2.2. If you consider that you require any additional documents or materials in order to complete your work, please request such materials from us.

**3. Your Opinion**

- 3.1. Once you have reviewed the material in your brief, we request that you provide a written report addressing the questions set out in Annexure B to this letter.
- 3.2. In answering the questions outlined at Annexure B please provide detailed reasons for your opinions, including the facts or assumptions that affect your reasoning and conclusions.

**4. Preparation of Your Report**

- 4.1. We would be grateful if you would set out the answers to the questions at Annexure B in a written report, having regard to the requirements set out in the Practice Note.
- 4.2. After you have had the opportunity to consider the questions at Annexure B, as well as the materials listed in Annexure A, we would be grateful if you could advise of any material not currently in your brief which you require to respond to any of the Annexure B questions.

If you have any questions, please do not hesitate contact me [REDACTED]

Yours faithfully,



Brett Spiegel  
Principal Lawyer  
**Phi Finney McDonald**

Encl.



**ANNEXURE A****Index to Brief**

<b>Tab No.</b>	<b>Date</b>	<b>Description of document(s) / category</b>
<b>A</b>	<b>EXPERT REPORT</b>	
A1.	25 May 2023	Expert Report of Professor David Karoly

**ANNEXURE B****Basis of statements in your expert report**

1. Please explain the basis for the statements made in:
  - a. paragraph 36;
  - b. paragraph 37;
  - c. paragraph 39;
  - d. paragraph 40;
  - e. paragraph 55; and
  - f. the final two sentences in paragraph 62,of your Expert Report dated 25 May 2023.