northern beaches council

10 September 2024

Mr Clayton Barr, MP
Chair
Joint Select Committee on the NSW Reconstruction Authority
Parliament House
Macquarie Street
SYDNEY NSW 2000

[redacted]

Dear Mr Barr,

Response to Question taken on Notice – Statutory Review of the NSW Reconstruction Authority Act 2022

I refer to the question taken on notice during the evidence provided by Northern Beaches Council before the Joint Select Committee on Friday 23 August 2024, as below:

Question Taken on Notice

> ***Ms LIZA BUTLER:*** *When you are looking at that cost of $200 million, are you doing any comparisons with the cost of how much, if you didn't do that, natural disasters would cost?*
>
> ***BEN FALLOWFIELD:*** *I haven't got the detail in front of me and I may need to get back to you on that. But those mitigation actions all go through what's called the multi-criteria analysis. It does look at the benefits associated with undertaking those mitigation works.*
>
> ***Ms LIZA BUTLER:*** *If you could provide that and take that as a question on notice, I'd really appreciate that, because that would be a great comparison.*
>
> ***BEN FALLOWFIELD:*** *Absolutely.*

Response

The NSW Flood Risk Management Manual and its related guidance materials establishes the framework, inter alia, to identify and evaluate the potential benefits (or disbenefits) that proposed mitigation measures may have on reducing flood damages to the community.

A core component of this process is to determine the Average Annual Damages (AAD) which are calculated using a probability curve to quantify flood damage to residential and commercial properties within a floodplain would receive on average during a single year.

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Each proposed flood risk management option is initially evaluated based on its potential to reduce Average Annual Damage (AAD) relative to the cost of implementation, which is expressed as the Benefit-Cost Ratio (BCR). This ratio provides a comparison between the cost of implementation and maintenance of a mitigation action relative to the potential cost savings associated with reduction of damages, where the BCR is:

- greater than 1 - the economic benefits are greater than the cost of implementing the action.
- less than 1 but greater than 0 - there is still an economic benefit from implementing the measure, but the cost of implementing the measure is greater than the economic benefit;
- equal to zero - there is no economic benefit from implementing the measure; and
- less than zero - there is a negative economic impact of implementing the measure.

However, the BCR is not the only determinant in establishing the prioritisation of options. The framework also includes provision for the quantitative analysis of a wide range of economic, social and environment considerations via a Multi-Criteria Assessment (MCA), as summarised in the Table 1 below.

The BCR is factored into the Economic category of the MCA as described in the Scoring System detailed in Appendix A, with a practical example of an applied MCA for Narrabeen Lagoon provided in Appendix B.

Table 1 – Multi-Criteria Assessment Categories

Economic	Social	Environment
Benefit Cost Ratio (BCR)	Reduction in Risk to Life in PMF	Compatibility with Surface Water Quality Objectives
Capital and Operating Costs	Reduction in Risk to Life in 1% AEP event	Fauna/Flora Impact
Reduction in Risk to Property	Reduction in Social Disruption	Potential disturbance of Acid Sulfate Soils
Feasibility	Community Support	
Protection of Vulnerable Development and Critical Infrastructure	Compatible with Policies and Plans	

To clarify Council's evidence at the Inquiry, although the entire Northern Beaches flood risk management program has identified over $200 million in flood management actions, not all of these are included within the adopted Implementation Plans. Some options may be excluded if they do not meet the criteria for BCR or MCA score of greater than one, or if they are omitted based on the outcomes of engagement with the flood committee, community, and other key stakeholders.

High priority flood modification projects within Council's adopted Implementation Plans identify a total capital cost of $23.5 million, the potential return on investment for these projects is estimated to be $99 million. This results in an overall BCR of 4.14, meaning that for every $1 spent, the projects are expected to generate more than $4 in benefits. Such a positive BCR indicates that the projects are economically viable and beneficial in the long run, justifying the initial capital investment in flood risk management initiatives.

Should you require any further information or assistance in this matter, please contact me on [redacted]

Yours faithfully,

[redacted]

Ben Fallowfield
Resilience & Emergency Management Co-ordinator /
Local Emergency Management Officer

northern beaches council

Appendix A – Multi-Criteria Assessment – Scoring System – Narrabeen Lagoon Flood Risk Management Study

Category	Criteria	Description of Criteria Assessment	Score				
			-2	-1	0	1	2
Economic	Benefit Cost Ratio	The cost effectiveness of the scheme, i.e. the tangible return on investment	0 to 0.2	0.2 to 1	1	1 to 1.5	>1.5
	Capital and Operating Costs	Consideration of the initial capital costs and ongoing operation costs to Council	Extreme >$10 million	High $2 million - $10 million	Medium $500,000 - $2,000,000	Low $200,000 - $500,000	Very Low < $200,000
	Reduction in Risk to Property	Based on reduction in AAD, it establishes the tangible benefit of an option	Major increase in AAD (>$20,000)	Slight increase in AAD (<$20,000)	No Improvement	Slight decrease in AAD (<$20,000)	Major decrease in AAD ($>20,000)
	Feasibility	Establishes the feasibility of options based on constructability, and bureaucratic difficulties such as land acquisition and agreements with external agencies	Very unlikely to be feasible	Unlikely to be feasible	May or may not be feasible	Likely to be feasible	Very likely to be feasible
	Protection of Vulnerable Development and Critical Infrastructure	Assesses the flood risk implications for existing vulnerable developments and critical infrastructure in the floodplain (as identified in **Section 5.4.5**)	High negative impact	Slight negative impact	No impact	Some benefit	Considerable benefit
Social	Reduction in Risk to Life in PMF	The impact on risk to life for the most extreme flood event, which is the design event for emergency response	Widespread or significant increase in risk to life	Localise or slight increase in risk to life	No change in risk to life	Localised or slight reduction of risk to life	Widespread or significant reduction of risk to life
	Reduction in Risk to Life in 1% AEP event	The impact on risk to life for the flood planning event, which is the design event for most structural options	Widespread or significant increase in risk to life	Localise or slight increase in risk to life	No change in risk to life	Localised or slight reduction of risk to life	Widespread or significant reduction of risk to life
	Reduction in Social Disruption	Social disruption of flooding has been based on reduction in road overtopping, with emphasis on regional roads, and access roads for isolated communities (as outlined in **Section 7.5**)	Major increase in social disruption (road overtopping increased by >0.2m)	Slight increase in social disruption (road overtopping increased by <0.2m)	No change to social disruption	Slight reduction of social disruption (road overtopping reduced by <0.2m)	Major reduction of social disruption (road overtopping reduced by >0.2m)
	Community Support	Guided by option ranking outcomes from the community questionnaire (**Table 4-1**)	Very unlikely to be supported	Unlikely to be supported	Neutral	Likely to be supported	Very likely to be supported
	Compatible with Policies and Plans	The compatibility with both former Warringah Council's and Pittwater Council's policies and plans	Amendment required to either Council's current policies or plans	Slightly incompatible with Council's current policies or plans	Slightly incompatible with Council's current policies or plans, but could be grounds for reviewing policies or plans	Compatible with both Council's policies and plans	In line with and supported by Council's current policies or plans
Environment	Compatibility with Surface Water Quality Objectives	Impacts to quality of catchment inflows or reduction in water exchange with ocean and freshwater inputs	High negative impact	Slight negative impact	No impact	Some benefit	Considerable benefit
	Fauna/Flora Impact	Likely impacts on Threatened Ecological Communities and Threatened Species based on recorded locations identified in **Section 2.5**	High negative impact	Slight negative impact	No impact	Some benefit	Considerable benefit
	Acid Sulfate Soils	The likely disturbance of the range of classes of Acid Sulfate Soils as identified in **Section 2.4.3**, with emphasis on earthworks, particularly excavation.	Any work within Class 1 ASS area. Any excavation work within Class 2. Excavation >1m within Class 3. Excavation >2m within Class 4.	Surface works within Class 2 ASS. Excavation <1m or surface works within Class 3. Excavation <2m or surface works within Class 4.	Works not within areas identified as PASS	N/A	N/A

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Appendix B - Multi-Criteria Assessment Summary - Narrabeen Lagoon Flood Risk Management Study

ID	Description	Economic					Social					Environment			Score	Rank	Structral / Non-structural Rank
		Benefit Cost Ratio	Capital and Operating Costs	Reduction in Risk to Property	Feasibility	Protection of Vulnerable Development and Critical Infrastructure	Reduction in Risk to Life in PMF	Reduction in Risk to Life in 1% AEP Event	Reduction in Social Disruption	Community Support	Compatibility with Policies and Plans	Impact on Water Quality and Flows	Impact on Fauna/Flora	Disturbance of Acid Sulfate Soils			
FM1	Ocean Street Bridge Extension	-1	-1	2	0	1	0	1	1	0	1	0	0	1	1.13	13	S-8
FM2	Reconstruction of Ocean Street Bridge to be above the 1% AEP Flood Level	-2	-2	2	1	1	1	1	2	0	1	0	0	1	1.33	12	S-7
FM3	Entrance Bed Rock Removal	-1	-2	2	0	1	0	2	1	-2	-2	0	0	0	-0.20	23	S-17
FM4	Extraction of entrance shoals upstream and downstream of the entrance bridge	2	-1	2	2	2	0	2	2	2	2	0	0	0	3.00	1	S-1
FM4a	Dry Earth Sand Winning with Beach Cut and Cover Pipeline	2	-1	2	0	2	0	2	2	-2	0	-1	-1	0	0.73	17	S-11
FM5	Ocean Street Bridge Extension & Upstream and Downstream Shoal Dredging	-1	-1	2	0	1	0	1	1	-2	-2	0	0	1	0.13	22	S-16
FM6	Alkira Circuit Drainage Upgrade	-1	1	1	2	1	1	1	2	2	2	0	0	0	2.40	4	S-4
FM7	Willandra Road Reserve Culvert Upgrade and Lowering / Detention Basin	-1	0	1	1	0	0	1	2	1	1	0	-1	-1	0.53	18	S-12
FM8	Willandra Road Culvert Upgrade and Vegetation Removal	-1	0	1	1	0	0	1	2	1	1	0	-1	-1	0.53	18	S-12
FM9	Waroon Road Levee	2	1	1	2	0	0	1	1	1	2	0	2	0	2.87	2	S-2
FM10	Wabash Avenue Levee	2	1	1	2	0	0	1	1	1	2	0	2	0	2.87	2	S-2
FM11	Tatiara By-pass Overland Flowpath	2	0	2	1	0	0	1	2	1	1	0	0	-1	1.67	9	S-6
FM12	Basin at Narrabeen RSL, Pipe Diversion along Tatiara Cres and Nareen Parade to Open Channel	-1	-1	2	1	0	0	1	2	1	1	0	0	-1	0.87	16	S-10
FM13	Pittwater Road & Wakehurst Parkway Raising / Levee	-2	-2	-2	-2	0	-1	-1	-1	-2	-1	0	0	0	-2.80	24	S-18
FM14	Ponderosa Parade Drainage Upgrade	1	0	1	2	0	0	1	2	2	2	0	0	0	2.20	5	S-5
FM15	Garden Street Levee	2	-1	2	1	2	0	2	2	-2	-1	0	0	-1	1.07	14	S-9
FM16 and FM17	Pittwater Road Levee Bank and Lakeside Levee	-1	-2	2	1	2	0	2	2	-2	-1	0	0	-1	0.27	20	S-14
FM18	East Bank Levee	-1	-2	2	1	2	0	2	2	-2	-1	0	0	-1	0.27	20	S-14
EM1	Local Evacuation Measures	0	2	0	2	0	1	1	0	2	2	0	0	0	2.00	6	NS-1
EM2	Public awareness and education	0	2	0	2	0	1	1	0	2	2	0	0	0	2.00	6	NS-1
EM3	School Education Programs	0	2	0	2	0	1	1	0	1	1	0	0	0	1.60	10	NS-4
EM4	Flood Markers and Signage	0	2	0	2	0	1	1	0	0	1	0	0	0	1.40	11	NS-5
EM5	Flood Warning Systems	0	2	0	2	0	1	1	0	1	2	0	0	0	1.80	8	NS-3
FPL1	Flood Planning Level Revision	0	2	0	1	1	1	2	0	0	-2	0	0	0	1.00	15	NS-6

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