
Community and Stakeholder Engagement Report: Stage 2

Public exhibition of draft Greendale Creek Flood Study

Consultation period: 29 March 2023 to 7 May 2023

Contents




1.	Summary.....	2
1.1.	Key outcomes	2
1.2.	How we engaged	2
1.3.	Who responded.....	3
2.	Background.....	4
3.	Engagement objectives	4
4.	Engagement approach.....	4
5.	Findings	5
	Appendix 1 Verbatim community and stakeholder responses	9

1. Summary

This report outlines the outcomes of Stage 2 of community and stakeholder engagement of the draft Greendale Creek Flood Study. This included public exhibition, which was conducted between 29 March 2023 and 7 May 2023. Stage 1 was conducted in August 2019 at the commencement of the project and included the distribution of a survey/questionnaire to residents in the study area to inform them about the study and to obtain information about historical flooding.




The primary concerns for the community were how the study was going to affect insurance premiums, house prices and future development potential. All requests from respondents for removal of individual properties were investigated by the consultant and as a result, some changes were made to the flood model and flood extents. For the 37 submissions, 12 lots were removed from the Flood Planning Area and 2 were removed from the Probable Maximum Flood extent.

1.1. Key outcomes

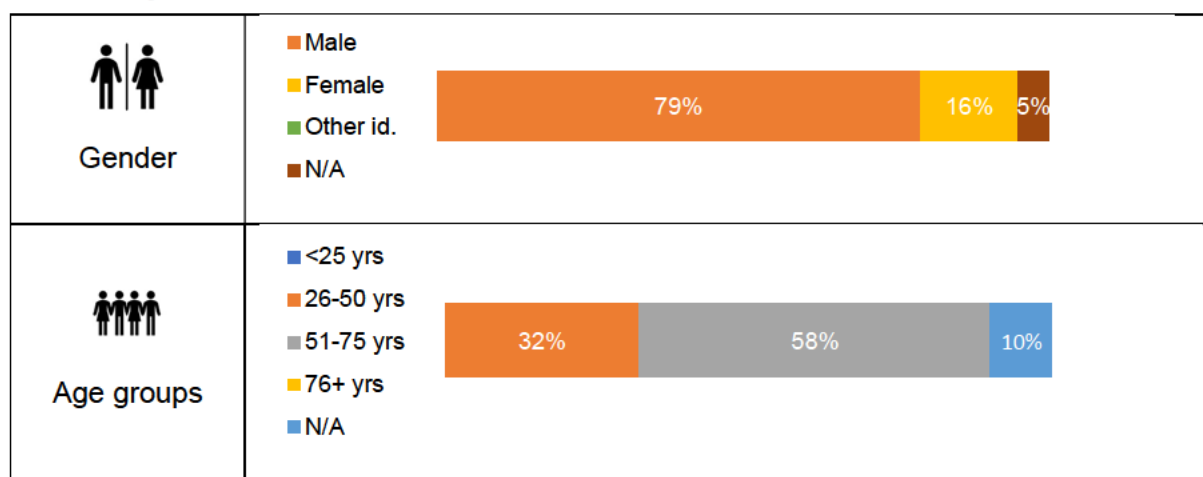
 Total unique responses	37	
 How responses were received	Online submissions: Written responses (email/letter): Phone responses:	Completions: 28 Number: 8 Number: 1
 Feedback themes	Insurance Property Price Impact on development Drainage	Overland flow flooding / lagoon flooding Flood tagging March 2022 storm event

1.2. How we engaged

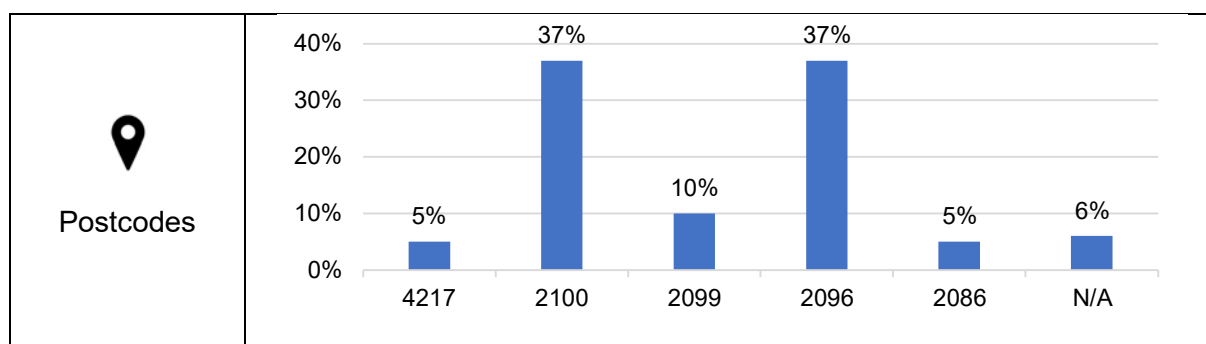
 Have Your Say: visitation stats	Visitors: 981	Visits: 1,414	Average time onsite: 2mins 21secs
 Social media	1 Facebook post		Reach: 1,400

 Print media and collateral	Letters sent Collateral availability: Service Centres	Number: 2,402 Number: 4
 Electronic direct mail (EDM)	Community Engagement (fortnightly) newsletter: 2 editions Council (weekly) e-News: 3 editions Stakeholder email: 1	Distribution: Approx. 24,000 subscribers Distribution: Approx. 61,500 subscribers Distribution: 52
 Face-to-face sessions	Community meetings: 4 days	Appointments: 74
 Key stakeholder engagement	Meeting: Friends of Curl Curl Lagoon	Attendance: 2

1.3. Who responded¹



¹ Demographic data was gathered by request only. The data represented only includes those respondents who provided this detail.



2. Background

Northern Beaches Council is responsible for the identification of flood prone land in the Local Government Area (LGA). We are committed to increasing our community's awareness of flooding so that people are better able to understand and plan for the flood risks they may face.

We have prepared the draft Greendale Creek Flood Study that outlines how flood waters move through the Greendale Creek catchment and flow down to Curl Curl Lagoon. The study area includes parts of the suburbs of Beacon Hill, Brookvale, Curl Curl, Freshwater and North Curl Curl. The catchment is affected by flooding due to rainfall runoff, and in the lower parts from rising lagoon flood waters. The results of the study will update the flood information currently used by Council for planning.

3. Engagement objectives

Community and stakeholder engagement aimed to:

- build community and stakeholder awareness of participation activities,
- provide accessible information so community and stakeholders can participate in a meaningful way,
- identify community and stakeholder concerns, local knowledge and values.

4. Engagement approach

Community and stakeholder engagement for the public exhibition of the draft Greendale Creek Flood Study was conducted between 29 March 2023 and 7 May 2023, and consisted of a series of activities that provided opportunities for community and stakeholders to contribute.

The engagement was planned, implemented and reported in accordance with Council's [Community Engagement Strategy](#) (2022).

A project page² was updated on our have your say platform with information provided in various ways to allow for as much accessibility as possible.

The consultation was primarily promoted through our regular email newsletter (EDM) channels and social media. Residents affected by the draft Flood Planning Area and draft PMF extent were directly notified via mail.

² https://yoursay.northernbeaches.nsw.gov.au/Greendale_Creek_Flood_Study

To help residents better understand what the draft study might mean for them, one-on-one meetings with Council staff and the consultant were offered where people could discuss and ask questions.

Residents were invited to book a one-on-one 15 minute appointment with Council staff and representatives of the consulting firm WMAwater to discuss the study and its implications. Four sessions were held:

- Wednesday 5 April 2023, 4 pm – 7 pm at the Curl Curl Sports Centre
- Thursday 13 April 2023, 11.30 am – 3 pm at the Curl Curl Sports Centre
- Wednesday 26 April 2023, 9.30 am – 4 pm at the Curl Curl Sports Centre
- Saturday 29 April 2023, 9.30 am – 1 pm at the Brookvale Community Centre South Hall

People who attended community meetings were also encouraged to provide a written submission on the draft study via the Your Say platform. A QR code linking directly to the project page was provided. Contact details for the project team were provided and people who could not attend a one-on-one session meeting were invited to contact the project team to discuss.

Written feedback on the draft study was captured through an online submission form embedded into the Your Say project page. An open-field comments box provided community members a space to share their feedback. Email and written comments were also invited.

5. Findings

The primary concerns for the community were how the study was going to affect insurance premiums, house prices and future development potential. There were numerous requests to be removed from the floodplain and based on subsequent investigation, some changes were made to the flood model and flood extents.

The recurring concerns raised included:

- Concern about how the identification of a property as flood affected, or about how the study in general may affect house insurance premiums.
- Concern about how the identification of a property as flood affected, or about how the study in general may affect house prices.
- Concern about how the identification of a property as flood affected affects current or future redevelopment plans.
- Queries about how a property could be flood affected when it is much higher than Curl Curl Lagoon. The overland flow approach of the study was explained in this case. Some queries also related to the fact that flooding was due to inadequate drainage. The design of the stormwater network for frequent events was explained and that in large events overland flow is to be expected. The follow up question was typically “what is Council going to do about the flooding issues”. It was explained that the next stage of the NSW Flood Program is to conduct a Floodplain Risk Management Study to investigate flood risk mitigation options.
- Requests to be removed from the Flood Planning Area. Several residents provided photographs or other information to indicate features that may affect overland flows. Where appropriate, the modelling was correspondingly updated, resulting in minor and highly localised changes to overland flow behaviour and in some cases resulting in the property no

longer being identified as flood affected. In some other cases, it was identified that only a minor portion of the lot was affected. The selection criteria for flood affectation were reviewed in detail and it was considered reasonable that properties with minor affectation of the Flood Planning Area be removed. Additional filtering criteria at the lot level was applied to ensure a consistent approach for all properties across the catchment.

Several community members also raised the recent March 2022 storm event. This event took place in the same month that the draft report was presented to Council with a request for Public Exhibition, and as such it has not been considered in this Study. In general, comments were made regarding:

- The fact that a property was not affected by the March 2022 storm event, however, is still identified as flood-affected. In this case it was explained that the storm event was most likely smaller than a 1% AEP event in this vicinity.
- Confirmation of the flood modelling results, with observations from the March 2022 storm event aligning with the flood modelling results that were mapped. Where people noted flood inundation, this was mapped as such in the design flood events.

Table 1: Issues, change requests and other considerations

Theme	Issues, change requests and other considerations raised	Council's response
Insurance	Concerns about how the study may affect house insurance premiums	<p>Flood studies are not completed for, or on behalf of insurance companies. They are a legal requirement for councils to complete as part of our responsibilities to help manage flood risk in the community.</p> <p>The insurance industry relies on its own assessment of flood risk which may include flood study mapping, historical flood information, terrain data and insurance claims data. Individual insurers assess flood risk differently and may consider property-specific information such as floor levels and building materials. A more resiliently built home would suffer less damage during a flood event.</p>
Property price	Concerns about how the study may affect property prices	<p>Individual property prices are based on many factors. The extent to which a property's value is affected once it has been identified as flood affected is impossible to determine. While the notification may affect one potential buyer's decision to purchase a property, it may have no impact for another. Studies show that an actual flood event, rather than notation on a planning certificate, is more likely to influence property values. Ultimately, it is the market that determines the value.</p>

Theme	Issues, change requests and other considerations raised	Council's response
		Identifying properties through this process can help owners to plan around flood risk and allow them to proactively make their properties more flood resilient.
Development	Concerns about the impact on current or future redevelopment plans	Flooding can cause significant damage to property and risk to life. Being aware of the flood risk means that development can be planned around it, to enable adequate protection and to ensure that flooding is not made worse for others.
Overland flow flooding / lagoon flooding	Queries about how a property could be flood affected when it is much higher than Curl Curl Lagoon	<p>Most flooding in the catchment is from overland flow flooding rather than from the backwatering from the lagoon.</p> <p>After heavy rainfall, once the soil becomes saturated and the stormwater pipes are at capacity, excess water will begin to flow overland, downhill toward the Greendale Creek and/or Curl Curl Lagoon.</p> <p>Overland flow flooding is typically shallow, however it can still cause significant damage to properties.</p>
Drainage	Comments that flooding is due to inadequate drainage, with follow up question typically "what is Council going to do about the flooding issues?"	<p>Northern Beaches Council has a design standard of the 5% AEP (1 in 20 chance of occurring in any year) for all stormwater infrastructure, although some older pipes have a lower capacity.</p> <p>In large storm events, it is typically not a 'failure' of the stormwater system that causes flooding – it generally performs as it was designed to. It is that the runoff is in excess of the capacity of the system. No local stormwater system is designed for large storm events – the required pipes would just be too large to be feasible. The system is designed to cater for a particular event, with overland flow paths carrying flows in excess of this.</p> <p>It is recognised that blockage can exacerbate flooding. A sensitivity analysis on blockage was undertaken as part of this study. We have a maintenance program to clear blockages and undertake blockage prevention measures such as street sweeping periodically. Priority is typically given to flood-prone areas, particularly whenever a major storm event is forecast to minimise the risk of blockages occurring.</p>

Theme	Issues, change requests and other considerations raised	Council's response
		The next stage of the NSW Flood Program is to conduct a Floodplain Risk Management Study to investigate what can be done to reduce flood risk.
Flood tagging	Requests to be removed from the Flood Planning Area.	<p>Instances where information provided by residents regarding on site features with the potential to affect overland flows have been investigated and where appropriate, the modelling has been correspondingly updated. This resulted in minor and highly localised changes to overland flow behaviour and in some cases resulted in the property no longer being identified as flood affected.</p> <p>In some other cases, it was identified that only a minor portion of the lot was affected. The selection criteria for flood affectation were reviewed in detail and it was considered reasonable that properties with minor affectation of the Flood Planning Area be removed. Additional filtering criteria at the lot level was applied to ensure a consistent approach for all properties across the catchment.</p>
March 2022 flood	Concerns about why a property is identified as flood affected when it was not affected by the March 2022 storm event	The March 2022 storm event was smaller than a 1% AEP event for most if not all of the Greendale Creek catchment.

Appendix 1 Verbatim community and stakeholder responses



Number	Feedback (Double Click or expand cell to see all feedback)
1	<p>After meeting with the council last and one consultant present from organisation who completed this study last week, I have concerns regarding how up to date their information is and question the methods of their study.</p> <p>Their study has completely ignored any building about to change the course of any run off water, if it were even come across the hill from Greendale Creek. I live at [REDACTED] We have building works going on next door that are in no way taken into account. According to their ideas on water flow, the unit blocks that will be built next to us will be ok, but they will in fact completely block any water coming down the hill where our unit block is located. They will be in the path of water, along with all the other properties further up the hill.</p> <p>The consultants explained our building is more risk than others surrounding us because their software identified a depression along the north side of the building. I suspect their software picked up shadows that fall over that area. Last year we had the worst flooding in the history of the area, and the units on the side of the building had no issues. Our whole building had no issues from that rainwater. The suggested water flow would have to go over some rocks to get into the area they call a depression.</p> <p>The way the water is predicted to travel across a hill from Greendale Creek to our property and many around our property makes no sense. It is completely ridiculous to think Brookvale oval won't be covered in water, but our property halfway up a hill is high risk. And then no other properties around us are at the same risk level.</p> <p>What compensation will we receive to offset increases in insurance by labelling our property according to the study? Council allowed all the buildings that area to be built as they are after all. I have no concerns about any flood damage to our property, only increases in insurance and potential devaluation of property. Although one would hope that someone would look at our property and realise, like us, that the flood zoning label council is wanting to give us was completely strange and just plain silly.</p>
2	<p>Dear Council,</p> <p>With respect to [REDACTED], North Manly, please find attached survey with top of kerb and gutter levels outside our Lot. In our meeting with Council and Council's Consultant on 27 April 2023, it was explained that in an 1 in 100 year flood event, the stormwater drain outside our Lot would likely become blocked and the stormwater would flow over the kerb and into our property. With the existing street, gutter and kerb levels, we believe the stormwater would flow down the street rather than into our property. We request that the modelling be checked and confirmed using the survey provided.</p>

3	<p>Good morning</p> <p>Thank you for the opportunity to meet council representatives earlier last month. Unfortunately, the consultants were busy with other residents and we did not get a full opportunity to discuss this study in detail with them.</p> <p>We would like to raise our concerns that this study is based on an event in 2018, which has since been superseded by a far more significant event on March 8, 2022.</p> <p>No one from Council has approached us about the events that occurred that day and we therefore feel council's engineers and the consultants have not taken this most recent event and its implications fully into its consideration.</p> <p>Whilst we agree the risk of flooding from the lagoon is far less significant than originally thought, after experiencing the 2022 event, we disagree with the conclusion that "flooding" is coming from the southerly direction, which is characterised by residential housing.</p> <p>What we witnessed that day was a failure of the stormwater infrastructure throughout Freshwater, from Harbord Park and down through the houses between there and onto Holloway Place.</p> <p>There is a drain outside at the lowest point on Frank Gray oval that simply could not cope with the overflow water from the stormwater drainage system further up stream.</p> <p>In short, the water had nowhere to escape to, as it is plainly obvious from that day that the stormwater pipes are either insufficiently sized to cope with current and new development, poorly maintained and damaged or blocked, or most likely, a combination of all 3 of the above.</p> <p>To suggest this is a "flooding" event has serious implications for insurance claims made by local residents and is not a satisfactory outcome. This report should not be published in its present form, or council may open itself to liability claims, should another similar event occur and residents are refused insurance cover as a result.</p> <p>We would appreciate the opportunity to discuss this further with council representatives and/or the consultants responsible for this report.</p>
4	<p>Dear Team,</p> <p>Here is Feedback on inclusion of Carrington Parade (south of Gardere Avenue Roundabout), South Curl Curl, in the Flood Planning Zone.</p> <p>We have reviewed the study and request the removal of Carrington Parade (south of Gardere Avenue Roundabout) from the Flood Planning Zone. This is based on the following observations;</p> <ol style="list-style-type: none"> 1. There have been no observed and reported flood events in this area. The results are modelled only and therefore have an higher margin of error, and appear questionable considering point 4 below. 2. The area is a significant distance from the Lagoon, elevated above it and not impacted by its flood risk. Therefore should not be included in the study or reassessment 3. The flood study results impact on the road area only in nearly all cases, not the properties themselves alongside the road. Therefore tagging the properties (which are elevated above the road) in the flood zone creates unnecessary bureaucracy and expense for no planning benefit to residents.

	<p>4. The inclusion of this area of Carrington Parade appears incongruous and may represent a modelling error, considering the exclusion of properties from the Flood Planning Zone which are much closer to the lagoon and even alongside the lagoon, such as properties directly south of the Lagoon (north of Adams Street) and properties along the north side of the lagoon along Abotts road in North Curl Curl. Given observed flood events around these properties, they warrant inclusion in the zone; and request exclusion of the Carrington Parade area (south of Gardere Avenue Roundabout).</p> <p>Thankyou for your consideration.</p>
5	<p>Thank you for providing the opportunity to make a submission regarding the Greendale Creek Flood Study. The events of March 8, 2022 have certainly necessitated Northern Beaches Council to reflect and address the issues surrounding water damage as a consequence of heavy rain in our area. The damage done to properties in Bennett Street and more specifically Holloway Place in Curl Curl were a direct result of council's failure to clean and service the drainage that carries water to Greendale Creek. Residents were informed prior to that date that the drains would be cleared and serviced but the council failed to do so.</p> <p>Because of the damage to residential properties in my street, certain insurance companies are now rejecting Home & Contents Insurance for my property.</p> <p>The proposed management plan now indicates that the wording of our area within the plan will jeopardise any insurance company from providing the area's residents with cover. The enormity of such a classification will put excessive financial and emotional pressure on such homeowners.</p> <p>What we now know from the events of March 8 is that the drainage infrastructure is inadequate moving forward. I have been a homeowner for 24 years in Holloway Place, Curl Curl and during that time have seen zero impact of rising ocean, lagoon or Greendale Creek water levels. The only impact from water has been because of Northern Beaches Council's failure to reliably and regularly clear pipes to take water out to Greendale Creek. With the current council's lack of reliability and assuming future council will be the same, it will be necessary to provide additional larger pipes to take the water to Greendale Creek.</p> <p>I implore the council to address this situation so that residents are not faced with the prospect of facing millions of dollars in repair again. Furthermore, the council needs to consider the use of 'flood' in designating areas that could be impacted by water that are not as a result of natural rising ocean, lagoon or creek water levels.</p>
6	<p>Dear sir/ madam</p> <p>After viewing the information supplied, it appears as though the council has positioned us in a probable flood zone. I would like to know how this is possible, considering we live on the side of a hill which is at least 100 meters from Greendale Creek and 40 meters above the creek.</p> <p>In the 40 years I have lived here, despite some massive rain falls, there has never been an occasion when the headwaters of Greendale Creek have overflowed or even come close.</p> <p>I have attached a photo. Which will hopefully emphasise my point</p> <p>I would appreciate having an on-site meeting with someone regarding this issue.</p>
7	<p>I attended a meeting with the Flood Plane Planning Team on 29th April at Brookvale Community Hall South at 10:15 am. I indicated where the mapping in relation to my and my neighbours properties indicated the PMF occurred on an area that was away from Greendale Creek flood areas and on areas of steep slopes, with adequate flow paths to the creek below. I queried if this is an outlier based on assumptions made in the modelling.</p>

	<p>The flood team representatives agreed that it appeared to be strange and undertook to instigate the matter and report the findings back to me. It is requested that this area be removed from the PMF mapping.</p>
8	<p>To Whom it may concern, Thank you for taking the time to meet at the recent public exhibition. We see some mention of the [REDACTED] property at [REDACTED] Brookvale in the draft document. A concern for the group is the level of creek bank erosion that is worsted during high rainfall. This erosion will weaken the roots of the surrounding large trees. The creek banks are made up of dirty fill and rubbish that during erosion washes down stream. Also of concern, during the previous works on the pipe work, large boulders were placed in the creek to slow the water flow. Unfortunately due to the large volumes of water, the boulders have been washed down the creek and likely into the double pipe exiting the property. From [REDACTED] perspective, should any changes or upgrades be required the group's preference is to have the creek piped through the property. Thanks for providing the opportunity to provide feedback</p>
9	<p>I met with Michael from WMA Water and Patrick Stuart from Northern Beaches Council on Saturday 29th April 2023 at around midday. We discussed that it was incredibly important that the Greendale Creek Flood Study, and the usage and definition of Flood and flooding in the report, was not worded and defined in such a way that it would cause the residents of Holloway Place and Bennett Street to lose the ability to claim home and contents Insurance, in the event of overland flow or lack of capacity of stormwater assets. If this report ceases the ability for these residents to claim insurance on events similar to what occurred on 8th March 2022, it will have a catastrophic effect on these families.</p> <p>I would also like to set up a time meet with the Council's "Stormwater Integration Engineers" to understand the current level of maintenance on the stormwater infrastructure particularly in relation to the areas between Harbord Oval, Bennett street, Holloway Place and the Frank Gray ovals adjacent to and behind the Harbord Bowling Club.</p> <p>Prior to the 8th March 2022 Floods we were advised that these pipes were to be cleaned but this did not occur and unfortunately quite a number of houses received significant water damage. It would appear that the Stormwater pipes are not adequate or not adequately maintained, so to avoid a repeat of this situation it would be great to meet and discuss this.</p>
10	<p>I'm glad council has engaged in this study and i looks quite in depth. Just a question around when the study was done and the data sources used to inform it. It talks of there being limited data to rely on and a Flood event in Jun 2018 as some of the data sources.</p> <p>What about the past 3 years since the study was commissioned? Rather than relying outdated or modelled data, after 3 years of La Nina and flash flooding as well as lagoon flooding through 2020, 2021, 2022 isn't there recent and relevant data to be relied on?</p>

11	<p>One of many reports about lack of evidence on climate change .</p> <p>Andrew Bolt: Latest US climate study proves less warming than scientists predicted</p> <p>Many global warming predictions have already flopped, so why won't our politicians and media reveal the scientific data proves the "climate crisis" isn't real.</p> <p>What would Australia's media do if climate scientists checked their data on global warming and said: "Oops!"</p> <p>Oops, there's much less warming than we said.</p> <p>Well, we know exactly what they'd do because they're doing it now.</p> <p>They're ignoring the study last month by the US National Oceanic and Atmospheric Administration that says the warming over the past 40 years is actually just 0.09 degrees per decade.</p> <p>This stunning study hasn't been reported here and read by the politicians wasting billions to stop a "climate crisis" that turns out not to exist.</p> <p>You've probably already wondered why many global warming predictions flopped.</p> <p>Tim Flannery was wrong to say "even the rains that fall will not actually fill our dams".</p> <p>Al Gore was wrong to warn that Arctic could be ice-free by 2013.</p> <p>The University of East Anglia was wrong in 2000 to claim "children just aren't going to know what snow is."</p> <p>One reason is that the planet hasn't warmed as much as claimed by all of the climate models used by the United Nations' Intergovernmental Panel on Climate Change.</p> <p>Until now, NOAA, which runs the satellites measuring the world's temperature since 1979, has said the planet's mid-troposphere – the atmosphere to about 10km – is warming at an alarming 0.16 degrees every decade.</p> <p>But NOAA scientists have now rebuilt their program which crunches that satellite data. They've fixed how they merge data from different satellites and dealt with "calibration drifting errors" in the time of day measurements are taken.</p> <p>Result: a warming trend of just 0.092 per decade in the mid-troposphere, where the effects of global warming are most obvious, and measurements are less affected by the concrete and asphalt of cities.</p> <p>(The scientists say the entire troposphere warmed 0.142 degrees a decade.)</p> <p>This confirms what some experts have said for years.</p> <p>In 2020, prominent climate scientist John Christy and economist Professor Ross McKittrick said IPCC climate models have run "too hot".</p> <p>McKittrick, an expert on the economics of global warming, says this new data shows there is no crisis, and "the cure is worse than the disease".</p> <p>As he told me on Tuesday: "If it turns out that the warming that's connected to greenhouse gases is only ... a little more than a degree per century then we just can't justify the kinds of sacrifices that people are being asked to make."</p> <p>But how to make our politicians stop when even journalists won't report this science?</p>
12	<p>Warringah Council is the responsible authority to plan and carry out stormwater drainage management and construction works within the Greendale Creek catchment. This submission is made in response to Council's invitation to comment on the draft study.</p> <p>██████████ is a residential lot with building improvements. Its front boundary is located within 250 metres of the peak of</p>

Beacon Hill, the absolute highest elevation of the Greendale Creek Flood Study catchment.

The property owners of [REDACTED] have been notified that the subject property has been identified as being a flood risk zone and as such will be subject to a Flood Planning Level (FPL). The reason for the flood risk identification appears to be that council has exercised its discretion to identify McKillop Road and the 750mm diameter drainage pipe from the street pit adjacent to and then through [REDACTED] to Biralee Crescent, as a major drainage system. There is no passage for overland water flow above the line of the 750mm dia pipe due to walls, fences, raised lawn, landscaped areas and building improvements on the Biralee Crescent properties. The criterion that council appears to use to justify the major drainage classification appears to be the depth of water in the backup pond that would form in McKillop Road and on private properties during a 1 in 100 ARI storm. Water depths in excess of 0.3m generally are suggested by the NSW Government in its Floodplain Development Manual (FDM) as being potentially hazardous, consequently the drainage system associated with such depths can be classed as being major or local, at the council's discretion. It is suggested that in order to classify a drainage system as major, such a system would more correctly be associated with stormwater drainage flowing along an identifiable flow path in excess of 0.3m generally.

The floor level of [REDACTED] is approximately 500mm above the 1 in 100 year flood level. However a substantial area of McKillop Road and adjoining properties would be inundated by a 1 in 100 year storm and the road would become a hazardous place, with water depth up to approximately 1.0m at the lowest, gutter invert level outside [REDACTED]. The road would be impassable to traffic at the 1 in 100 year storm peak. The 750mm dia pipeline is undoubtedly undersized and laid at too flat a grade. The collection pit in McKillop Road feeding the 750mm outlet pipe is too shallow and would be the site of much water turbulence, since there are three pipes discharging into the pit, two of which are directly opposed to each other. The backup pond that a 1 in 100 year storm would create in and adjacent to McKillop Road is isolated from other areas of the Flood Study. There is no identifiable overland flow path or watercourse for excess stormwater that would connect the backup pond in McKillop Road, at the 1 in 100 year water level, to any lower elevation area within the Flood Study catchment.

Council has options when deciding how best to manage the hazardous storm conditions that the existing, inadequate drainage system creates in McKillop Road. The easiest option appears to be to label the site a major drainage system and to label the private properties as flood prone. Should the council decide in future to improve the conditions at the 750mm pipe entrance it could redirect pipes that drain into the pit and construct a junction pit to reduce water turbulence and force more water into the 750mm pipe. This would have the possible outcome of slightly worsening water inundation issues downstream and may therefore be unfavourable. The best option should be sought: it may require construction of a new pipeline with inlet pits along McKillop Road for approximately 100m to the extensive road reserve space near Warringah Road where there is sufficient space for a retention facility to be constructed, before feeding back into the existing drainage system.

Since the collection pit outside [REDACTED] is within 250m of the top elevation of the whole Greendale Creek Flood Study area, with only a comparatively short distance to traverse until good grade for stormwater disposal is obtained, significant drainage improvement is available for council to achieve at reasonably low expense. Drainage problems in lower,

	<p>comparatively flat areas with linking overland flow paths to adjoining lower areas are much more difficult to solve. The drainage problem in McKillop Road and immediate surrounds is an isolated, local drainage issue capable of causing distress, damage and hazard to local residents and motorists using McKillop Road, yet is relatively easily resolved by council in a constructive, practical manner.</p> <p>The course of action being proposed in this draft flood study is an almost complete abnegation of the council's duty of care for its residents and the community. It is an attempt to neither plan nor properly manage stormwater drainage issues, but instead proposes to take no practical action to alleviate the current problems. The outcome of doing nothing practical is a material risk to residents and the community; the mere identification of the area as a flood risk zone is an unfair penalty on affected property owners in terms of reduced property value and increased premium for building insurance.</p> <p>If council is prepared to take practical steps in future to alleviate the McKillop Road drainage issue such that it is classed as local, not major drainage, then the current, very questionable concept that McKillop Road and properties at the top elevation of the Flood Study could be identified as a flood risk zone can be eliminated. Council is well able to notify residents in the future, before any practical works are undertaken, that a 1 in 100 year storm level has been determined, what the consequences of that level of water may be and that significant drainage rectification works are planned and scheduled. Council is also well able to require floor levels of future dwellings be above the 1 in 100 year level if new dwellings are built before drainage rectification is done.</p> <p>In lieu of the council identifying in the Flood Study the section of McKillop Road as a flood risk zone, the area could be identified as an area where local drainage problems exist, but where drainage improvement works will be scheduled to resolve those problems. The 1 in 100 year storm levels in McKillop Road and within private properties should be provided to property owners, with council able to set habitable floor levels for new dwellings.</p> <p>We respectfully request that:</p> <ol style="list-style-type: none"> 1. the proposed identification of [REDACTED] as a flood risk area in the draft Greendale Creek Flood Study be removed; and 2. council undertakes to plan and schedule suitable construction of pipeline and retention works within the public road reserve of McKillop Road in order to eliminate the hazardous backup ponding of stormwater in McKillop Road and adjoining private properties; and 3. affected property owners be notified by council of the current 1 in 100 year storm level and council's commitment to reduce that level by future practical drainage works.
13	<p>I live at [REDACTED] Beacon Hill now for about 27 years. During this time we have never had storm water build up on the road and enter our housing area.</p> <p>The only exception was recently on March 27 2023 when a very heavy rain fell, this was a Tuesday and the street had put out the trash bins so they sat in the gutter. Some of these bins were moved in the gutter & fell over and emptied their rubbish into the drain grates & the water built up in the street briefly once neighbours unblocked the drain... no water rose above the gutter ..</p>

	<p>I am concerned by this 1 in a hundred year option you want to use, as land value could go down & also insurance may increase for no reason ..</p> <p>Also the area on your map showing where water will run appears wrong as a lot of the rain will flow to Willandra road not McKillop road.....</p> <p>..Not happy about it ... also never received the previous 2019 info paper</p>
14	<p>Hi,</p> <p>I'm the owner of [REDACTED] and have owned the property for 30 years.</p> <p>Following up a call I had today with Michael and Christina.</p> <p>I pointed out there are privately built hydraulic structures, 1-2 m walls, at the rear of my property that are understandably not in the current hydraulic runoff modelling. See attached image.</p> <p>This would greatly reduce any flow from properties on Austin Ave to properties on Pitt Road.</p> <p>Can you please update the flow models accordingly and let me know the revised flow over my property.</p> <p>Also, can you please advise the impact on your flow model if I filled in the front portion of my properties yard with gravel / soil to slightly raise the elevation. Would this remove the property from the flood prone rating ?</p> <p>Thanks</p>
15	<p>The 1:100 year flood event would have little impact on the sea level and that there are areas that are listed as within the flood impact area that would not be impacted in the coastal zone.</p> <p>If the flood study is also including climate change impacts on sea level rise, king tides and storm surges should be specified and relevant predicted levels provided in the flood study.</p> <p>When in history has the beach flooded? Yet the map shows these areas as flood risk areas.</p>
16	<p>I noticed that a small area on McKillop Road Beacon Hill has the light blue shade on the map. I have lived at number [REDACTED] for over 31 years and only seen the flood about 3 times it always seems to happen on garbage days when residents put their bins in the gutter and not on footpath so when the bins fall over the rubbish blocks the drains. If there is a heavy downpour the rain drains away quickly and we have a lot downpours in the last couple of years.</p>
17	<p>Re: Impact of Greendale Creek Flood Study on [REDACTED]</p> <p>Expected outcome based on meeting with council on 05/04/23 is for this property to be excluded.</p> <p>Awaiting council feedback confirming exclusion.</p>
18	<p>This is totally irrelevant given that on 8 March 2022 the flooding that was experienced in Stirgess Avenue was from blocked stormwater drains - not the lagoon.</p> <p>These drains running behind the properties in Stirgess Ave flood every time there is even a small amount of rain. The Council needs to maintain these to mitigate our flood risk rather than worrying about the lagoon which is highly unlikely to flood close to the houses in Stirgess Ave.</p>

19	It seems quite strange that our property at one of the highest points in Beacon Hill [REDACTED] has been identified as a flood zone. This will simply adversely impact our insurance premiums and we request to understand why our address has been included
20	<p>I write on behalf of [REDACTED] is asking why as the owner of [REDACTED] did we get the attached letter.</p> <p>As per your map online, it would seem [REDACTED] is not in the study area and if [REDACTED] is in the study area one would suggest that neighbouring property [REDACTED] Pittwater Road would also receive this letter. He believes that as owner of [REDACTED] we have been included in error and if this is the case could councils records please be corrected and that is [REDACTED] is not included in any flood study.</p>
21	<p>We act for the [REDACTED], the owner of [REDACTED] Brookvale (the Site).</p> <p>On behalf of our clients, we engaged [REDACTED] to review the Draft Greendale Creek Flood Study (Flood Study). [REDACTED] findings regarding the Flood Study are attached for Council's information and action.</p> <p>[REDACTED] found that:</p> <ol style="list-style-type: none"> 1. Several buildings surrounding the Site have not been modelled correctly or modelled at all. <p>In our view, such inaccuracies undermine the credibility of the Flood Study findings.</p> <ol style="list-style-type: none"> 2. The Flood Study did not rely on the most recent LIDAR data; and 3. Several of the maps have been georeferenced incorrectly. <p>Accordingly, the Flood Study cannot be relied on by Council and should not be used as the basis of flood mapping and identifying flood prone properties given the inaccuracies, errors and old data.</p> <p>The identification of flood affected properties has serious implications for future development and property owners. Therefore, it is essential that such identification is accurate and beyond doubt.</p> <p>In our view, Council cannot and must not accept the findings of the Flood Study. The Flood Study, and underlying data, requires significant work to address the inaccuracies and errors in the current Flood Study.</p> <p>A reply from Council officers to this submission and [REDACTED] findings would be appreciated given the issues raised above.</p> <p>Attachment:</p> <p>[REDACTED] have been engaged on behalf of [REDACTED] to review the WMAwater (2022) 'Greendale Creek Flood Study Draft' (the draft flood study) with respect to the flood conditions and impact at [REDACTED] Brookvale (the site). At the time of writing the draft flood study is on public exhibition by Northern Beaches Council (Council). This letter is intended to form part of the submission to Council in response to the public exhibition of the draft flood study.</p> <p>[REDACTED] have undertaken a preliminary review of the draft flood study with a particular focus on the site, and identified several issues with the flood modelling approach:</p>

	<p>1. Several buildings surrounding the site have not been modelled correctly or have not been modelled at all. Figure 1 and Figure 2 show examples of multiple buildings east of the site which have overland flow paths passing directly through their footprints. This is inconsistent with the representation of buildings elsewhere in the model domain.</p> <p>2. The flood study relied on 2013 LIDAR data, however more recent LIDAR data from 2020 is available.</p> <p>3. Several of the maps appear to have been georeferenced incorrectly, making it difficult to determine which properties should be identified as flood affected. The larger aeriels within the flood maps appear to be shifted approximately 25 m north when compared to the road and building locations, as well as the zoomed-in screenshot from Section 9.6.5 of the draft flood study, as shown in Figure 3 and Figure 4. The properties identified as flood affected (including the site) therefore cannot be relied upon.</p> <p>Based on this preliminary review, we expect that modifications to the flood model setup and mapping are required to allow an accurate determination of the flooding characteristics surrounding the site.</p>
22	<p>Submission 1 (13 Apr)</p> <p>I write following receipt of your letter dated 27th March 2023.</p> <p>My property is approximately 25 m above sea level and Greendale Creek, so I was somewhat surprised to be advised it is affected by some hypothetical flood level.</p> <p>Having perused the draft report, I am surprised that the Council has issued letters to residents on the basis of that report. It appears to be a jumble of largely meaningless data with no clear conclusions.</p> <p>I have booked a meeting on Saturday 29th April. I look forward to receiving some enlightenment at that meeting,</p> <p>Submission 2 (30 Apr)</p> <p>Thanks for the opportunity to chat with Council officers last Saturday.</p> <p>My conclusion is that I fail to appreciate that the study is beneficial to the community.</p> <p>It appears that the PMF is basically guesswork using unrealistic time frames for the calculation.</p> <p>From Googling the definition, the word conceivable is the basis of the calculation.</p> <p>I understand from the discussion that a catastrophic weather event would be required for that term to be applied to any area. One in a hundred thousand years was mentioned during the discussion, which is about the time that the human race [Homo Sapiens] has been on the planet.</p> <p>I would say that weather records may go back a few hundred years and in the case of Australia somewhat less.</p> <p>So how can such an extreme weather event be predicted without any meaningful data?</p> <p>It therefore seems to me that the Council should not be labelling areas such as Curl Curl with that term.</p> <p>In the case of my property 25 metres above Greendale Creek level, it would require a global disaster for it to be flooded. The majority of Sydney would be well under water.</p> <p>It is more conceivable that Curl Curl would be subject to a nuclear attack or occupation by a foreign power.</p> <p>I appreciate you take your work very seriously but I just do not see any value for the community in the outcomes of the study.</p>
23	<p>Today I attended an appointment with a Flood engineer as part of the Greendale creek study.</p>

	<p>She advised that [REDACTED] has been tagged as a one in a hundred flood risk. On looking at the mapping the impacts part of our property is the east facing side of the property, only by what looked to be centimeters where one cell encroached on the property. The cell under question was rated at 200ml risk from the neighbours side [REDACTED]. Our property is significantly higher than the neighboring property (pictures attached). The height of the boundary fence is 191cm from the [REDACTED] side and 164cm from the [REDACTED] side. [REDACTED] is 27cm higher than [REDACTED] which is higher then the 200ml risk explained by the flood engineer and the mapping.</p> <p>Technically based on the map shown by the engineers as part of this study, the fact the our property is higher and there was only one cell with a very small over lap (not impacting the house) we don't believe that we are under threat of natural flooding as request that the 'tag' be removed.</p> <p>In the interest of full disclosure we did an insurance claim for flooding on the 9 March 2022, which we understand was the result of neighbors behind us sand bagging their property and the water breaking through the bags. It was not a 'natural' occurrence.</p> <p>We appreciate your decision and please contact us should you require any further information.</p>
24	<p>(Duplicate of letter but referring to a neighbouring address)</p> <p>Northern Beaches Council is the responsible authority to plan and carry out stormwater drainage management and construction works within the Greendale Creek catchment. This submission is made in response to Council's invitation to comment on the draft study.</p> <p>[REDACTED] is a residential lot with building improvements. Its front boundary is located within 250 metres of the peak of Beacon Hill, the absolute highest elevation of the Greendale Creek Flood Study catchment.</p> <p>The property owners of [REDACTED] have been notified that the subject property has been identified as being a flood risk zone and as such will be subject to a Flood Planning Level (FPL). The reason for the flood risk identification appears to be that council has exercised its discretion to identify McKillop Road and the 750mm diameter drainage pipe from the street pit adjacent to and then through [REDACTED] to Biralee Crescent, as a major drainage system. There is no passage for overland water flow above the line of the 750mm dia pipe due to walls, fences, raised lawn, landscaped areas and building improvements on the Biralee Crescent properties. The criterion that council appears to use to justify the major drainage classification appears to be the depth of water in the backup pond that would form in McKillop Road and on private properties during a 1 in 100 ARI storm. Water depths in excess of 0.3m generally are suggested by the NSW Government in its Floodplain Development Manual (FDM) as being potentially hazardous, consequently the drainage system associated with such depths can be classed as being major or local, at the council's discretion. It is suggested that in order to classify a drainage system as major, such a system would more correctly be associated with stormwater drainage flowing along an identifiable flow path in excess of 0.3m generally.</p>

The floor level of [REDACTED] is approximately 500mm above the 1 in 100 year flood level. However a substantial area of McKillop Road and adjoining properties would be inundated by a 1 in 100 year storm and the road would become a hazardous place, with water depth up to approximately 1.0m at the lowest, gutter invert level outside [REDACTED]. The road would be impassable to traffic at the 1 in 100 year storm peak. The 750mm dia pipeline is undoubtedly undersized and laid at too flat a grade. The collection pit in McKillop Road feeding the 750mm outlet pipe is too shallow and would be the site of much water turbulence, since there are three pipes discharging into the pit, two of which are directly opposed to each other. The backup pond that a 1 in 100 year storm would create in and adjacent to McKillop Road is isolated from other areas of the Flood Study. There is no identifiable overland flow path or watercourse for excess stormwater that would connect the backup pond in McKillop Road, at the 1 in 100 year water level, to any lower elevation area within the Flood Study catchment.

Council has options when deciding how best to manage the hazardous storm conditions that the existing, inadequate drainage system creates in McKillop Road. The easiest option appears to be to label the site a major drainage system and to label the private properties as flood prone. Should the council decide in future to improve the conditions at the 750mm pipe entrance it could redirect pipes that drain into the pit and construct a junction pit to reduce water turbulence and force more water into the 750mm pipe. This would have the possible outcome of slightly worsening water inundation issues downstream and may therefore be unfavourable. The best option should be sought: it may require construction of a new pipeline with inlet pits along McKillop Road for approximately 100m to the extensive road reserve space near Warringah Road where there is sufficient space for a retention facility to be constructed, before feeding back into the existing drainage system.

Since the collection pit outside [REDACTED] is within 250m of the top elevation of the whole Greendale Creek Flood Study area, with only a comparatively short distance to traverse until good grade for stormwater disposal is obtained, significant drainage improvement is available for council to achieve at reasonably low expense. Drainage problems in lower, comparatively flat areas with linking overland flow paths to adjoining lower areas are much more difficult to solve. The drainage problem in McKillop Road and immediate surrounds is an isolated, local drainage issue capable of causing distress, damage and hazard to local residents and motorists using McKillop Road, yet is relatively easily resolved by council in a constructive, practical manner.

The course of action being proposed in this draft flood study is an almost complete abnegation of the council's duty of care for its residents and the community. It is an attempt to neither plan nor properly manage stormwater drainage issues, but instead proposes to take no practical action to alleviate the current problems. The outcome of doing nothing practical is a material risk to residents and the community; the mere identification of the area as a flood risk zone is an unfair penalty on affected property owners in terms of reduced property value and increased premium for building insurance.

If council is prepared to take practical steps in future to alleviate the McKillop Road drainage issue such that it is classed as local, not major drainage, then the current, very questionable concept that McKillop Road and properties at the top elevation of the Flood Study could be identified as a flood risk zone can be eliminated. Council is well able to notify residents in the future, before any practical works are undertaken, that a 1 in 100 year storm level has been determined, what the consequences of

	<p>that level of water may be and that significant drainage rectification works are planned and scheduled. Council is also well able to require floor levels of future dwellings be above the 1 in 100 year level if new dwellings are built before drainage rectification is done.</p> <p>In lieu of the council identifying in the Flood Study the section of McKillop Road as a flood risk zone, the area could be identified as an area where local drainage problems exist, but where drainage improvement works will be scheduled to resolve those problems. The 1 in 100 year storm levels in McKillop Road and within private properties should be provided to property owners, with council able to set habitable floor levels for new dwellings.</p> <p>We respectfully request that:</p> <ol style="list-style-type: none"> 1. the proposed identification of [REDACTED] as a flood risk area in the draft Greendale Creek Flood Study be removed; and 2. council undertakes to plan and schedule suitable construction of pipeline and retention works within the public road reserve of McKillop Road in order to eliminate the hazardous backup ponding of stormwater in McKillop Road and adjoining private properties; and 3. affected property owners be notified by council of the current 1 in 100 year storm level and council's commitment to reduce that level by future practical drainage works.
25	<p>I am following up from an appointment on Wednesday 5th March when I met a local council staff member and a flood specialist in relation to my property [REDACTED].</p> <p>My property has been inaccurately marked as a medium flood risk (blue overlay to the mapping images). This flood modelling has not taken into account that my property boundary is adjacent to a significant storm water drain system running down the back of the Kilns (old brick works) development at 48 Consul Road. The storm drain has a retaining wall of over 8meters if not higher and my property boundary is beyond and above this water management system.</p> <p>We agreed at the meeting on 5th that council will send someone to do a site visit to adjust your modelling accordingly.</p> <p>I also fundamentally object to the PFM modelling that has been produced and marking my property as impacted by this. I am on a slopped property and water will run off. As it has previously. The PFM model is based in theoretical probabilities and beyond worst case scenarios. The result of which is a negative impact on the value of my property in order for council to say they have undertaken their duty of care to raise awareness of flood risk to residents. I don't believe this is fair nor reasonable.</p> <p>Please acknowledge the receipt of this email and I look forward to hearing back from you in the immediate future to arrange a site visit.</p>
26	<p>I sincerely hope that my details have been attached to this submission.</p> <p>I attended an appointment this evening and spoke to your representatives and they asked that I voice my opinion/objection to</p>

	<p>my property being zoned within your Flood Zone Plan.</p> <p>They were shown video of the rain and how it had effected my property in the horrendous rain of March 2022.</p> <p>I have resided in this house since 1998 and I believe there have been only 3 incidents that have had our street have issues with the water.</p> <p>Please pay close attention to the fact that the only reason our Place has had issues with water is when YOUR drain does not work efficiently.</p> <p>The first two events were when the said drain was blocked with debris of some description. However the March rainfall could not empty into Greendale Creek because it was high tide (so I was told) and the outlet was submerged and the only way for the water to go was to come back into our Place which resulted in the street and Council verge going underwater.</p> <p>Yes, the water did come up my driveway but not onto MY PROPERTY it stayed on your verge and then only on the corner closest to the drainage, went across my driveway and a few feet onto the land on the opposite side verge.</p> <p>This determination affects the value of my property and in my opinion is incorrect.</p> <p>Council needs to look seriously at the fact that your infrastructure is outdated/non existent or simply fails.</p> <p>The drainage in our street needs to contend with water running down Brighton from Harbord Road, into Bennett Street and around into Manuela - that's a lot of water for one ineffective drainage system to cope with. Water overflow in March ran through [REDACTED] into my backyard through the fencing then my garage and down my driveway into the flooded street. Finally when the rain stopped the water and water levels cleared reasonably quickly leaving only the debris on your verge.</p> <p>Council spent a lot of money on Reub Hudson Oval to address the drainage issues - didn't work, as soon as there is a spit of rain the entire Oval becomes a slosh pit.</p> <p>Council has refused to put a footpath in Bennett Street for the large amount of walkers & their dogs and Freshwater High students who ALL walk in the roadway (and the kids refuse to get off the road - you wait in your car) when the verge becomes waterlogged.</p> <p>By the way at the meeting for residents when Freshwater High was being talked about we were assured that Students would have absolutely no access from our (Bennett Street) side it was all to be Harbord Road entry only - that wasn't the truth.</p> <p>So to finish, until Council is serious and dredges Greendale creek, stops the pollution Brookvale businesses are putting into that system, figures a better way to allow stormwater to dissipate and puts in footpaths where they are desperately needed (to hopefully save even one life) and lastly removes the Flood Prone Zoning from my property as it is extremely unfair and not an actuality.</p> <p>I am more than happy to be contacted should you like verbal confirmation.</p>
27	<p>I have been on the website and looked at all the images.</p> <p>I realise that properties on curl curl pde have been identified as PMF and not FPL.</p> <p>This must be a mistake.</p> <p>These properties are 20 to 40 m above sea level.</p> <p>This is not PMF it is not even unlikely in fact it not even extremely unlikely it is just not going to happen</p> <p>Can these area p[lease be reviewed and reduced to what is PMF and [REDACTED] house removed from the list</p>

28	<p>I'm replying to your letter of the 27/3/2023, your ref. 2023/055942, Draft Flood Study. Just as well this study is still at draft stage. I'd like to suggest a slight amendment be made. My home, [REDACTED] is situated in a lovely, elevated position overlooking all of Brookvale. While my garage is down at street level, I know this to be well above Pittwater Road, Brookvale. I have to work quite hard for 5 minutes to ride my pushbike up the continuous incline from there to my home. Google Maps says I live at an altitude of 72 meters above sea level. So I fail to see any reason why you wrote to me, advising me that I live in a flood risk zone; (change to "above a flood risk zone"). Makes me wonder what qualifications one needs to be fit to draw a Flood Plan for our Council. Looks more like a random doodle with red pen. There would be no need for these ad-hock exercises if councils were prohibited from selling building blocks in flood zones in the first place. One thing I'm absolutely sure of. I'll sue Council for damages if my insurance company refuses to renew my Home and Contents policy on the basis of your Flood Study. Meanwhile I'll sleep untroubled, knowing that Dee Why Council Chambers will be an ocean reef before water laps at my front door.</p> <p>On another, much happier matter. Thank you for achieving the near impossible, getting rid of the boats permanently parked in Monash Crescent/ Holmes Ave, Clontarf. While it took a year of prodding those responsible into action, the result is what counts. I thank you on behalf of the many visitors now able to park their cars there.</p>
29	<p>Thank you for the opportunity to meet the North Beaches Council Flood team on April 29th at the Brookvale Community Centre, regarding the Greendale Creek Flood Study.</p> <p>My area of concern is the portion of Greendale Creek between Consul Road and Gulliver Streets in the upper part of the system. A number of matters were discussed with the team during the meeting. Apologies for the late submission, I had requested a higher resolution map from the Council, as the one the website was too pixelated when enlarged. Notwithstanding, the mapping issue, I can recap the issues of concern raised in the meeting.</p> <p>The flood mapping in this vicinity is out of date and incorrect. The reports states the modelling was prepared from a 2013 LIDAR set and since then a number of changes have occurred in this vicinity</p> <p>There have been a number of works undertaken in and around Councils assets by the Stain Augustines College (School) via the CDC process, that have changed the landform and flow regime in this area. This appears to have been via the use of incorrect planning pathways that have resulted in this error in the mapping as Council may not have been notified nor gave permission for the changes to the areas in, over and around their assets. To avoid further modifications being undertaken without the use of the correct approval pathways, I request the Council advise the School that any future works in and around this floodway and easement are undertaken using The Part 4 DA pathway, and not the CDC process.</p> <p>There have been significant works in the rear of the school over the floodway and Councils drainage easement, that have filled and flattened what was the former Greendale Creek and overland flow path above the easement (with basketball courts). This is greatly different to the 2013 model presented in the Current Greendale Creek Flood study and it appeared in the meeting on April 29th that the Council officer and the consultant modeller were not aware of these changes.</p> <p>In more recent years, there have been significant building works with the construction of the new Goold Building and patio area, including excess fill placed by the School on 33 Consul Road to facilitate those works in 2018/19. The School now owns Nos [REDACTED] both impacted by Council's stormwater assets and floodway over Greendale Creek. These works appear to have been undertaken via an incorrect CDC process. The approval to modify the flow regime of Councils system,</p>

and for those works to encroach over the easement, seem to have been undertaken without the asset owner's knowledge, and therefore approval. I request that Council confirm whether it has or hasn't given approval to modify the landform and flow regime in this vicinity.

The narrowing caused by the encroachment of the Goold Building and patio, as well as the filling on [REDACTED] has caused a restriction in the floodway that may back up waters behind and accelerate the flow velocity through this restriction. Refer to photograph below. The flood impacts described below, and in the mapping may in fact not pond any more on [REDACTED]. This will need to be confirmed via updated modelling.

These drainage modification works should have been undertaken via a Part 4 DA process, if in fact, Council assets and adjoining neighbours were to be impacted by modifications to the Council easement or flood regime.

Some background to assist can be found in the plans and reports referenced in withdrawn [REDACTED] submitted by the school include a drainage report undertaken by Cardno (now Stantec) showing the relocation of the centre of overland flow path into the common boundary between the school and [REDACTED]. Review of the top water level in this report shows a 300-400mm increase in flow level on [REDACTED] as a result of these works that were approved through the CDC process and not through a Council approval. This was also undertaken without the knowledge of the owner of [REDACTED] nor was permission granted. Whilst the flood affectation is noted, this report predated the completion of the Goold Building and filling of [REDACTED]. This report did not envisage the fill being left on [REDACTED] nor the filling in of the floodway by the Goold building patio, resulting in the existing restriction in Greendale Creek floodway.

Sometime in the mid 2000's minor landscape works were undertaken in the rear of [REDACTED] to flatten the area and drop the pre-existing levels by 600-800mm. The flattening the land adjacent the common boundary was undertaken not knowing that the school would also undertake modification works to raise and flatten the floodway and overland flow path, potentially forcing additional water from the school lands into the lower portion of [REDACTED] to an area that never would have flooded as shown on the current 2013 mapping in the study. The flood mapping in this vicinity of the current Greendale Creek Flood study does not represent the 2023 landform or flood regime and need to be updated before the report is finalised. Recommendation In response to the flood study report and these findings mentioned above we strongly recommend that Council undertake the following before the report is finalised.

1. Review the approval process, planning pathways and compliance matters to confirm whether Council did or didn't grant permission for these modifications.
2. Update the mapping and modelling to correctly represent the modified landforms and flow regime caused by the works undertaken via by the School via the cumulative CDC approvals and landform modification in this area.
3. Once the model is updated correctly under Item 2 above, undertake a review of the impacts with and without the storage area at the rear of [REDACTED] to replicate containment of the original creek flow regime within the school lands. If impacts are undetectable allow [REDACTED] to be restored to its original flood free flow regime and remove the flood affectation shown in the current study in the 1% AEP.
4. Confirm with the school and the neighbours that any further works proposed by the school in or around the pipe, easement and floodway between Consul Road and Gulliver Streets be undertaken via a Part 4 DA process and not through CDC works to ensure due process and transparency.
5. The School has been recently granted a DA to increase student numbers by 400 students. This floodway area was used to

	justify the minimum open space play areas for the students. Can Council please clarify that the dual use of this area for children's play, and for a high risk/high velocity floodway is appropriate.
30	Email - Please look at the PMF extent slightly encroaching [REDACTED], North Curl Curl
31	Email - Please have a look at [REDACTED] North Curl Curl. I have block fence along front boundary that also runs down western boundary to the start of the house.
32	Email - Please further investigate [REDACTED] Curl Curl. There is a block wall at rear of property.
33	Email - Can you please look at the isolated puddle that is modelled around the basement driveway at the front of [REDACTED] [REDACTED], Curl Curl. After speaking with Val we believe this may have merit to be removed.
34	Email - I am the owner of property at [REDACTED], Curl Curl. I couldn't be flood affected because of the geometry of the site and request that this property is investigated and possibly taken out of 1% AEP.
35	Email - Please review potential removal of extent on [REDACTED] North Curl Curl
36	Email - I am the owner of [REDACTED] Brookvale. Can you please visit me and reconsider the medium flood risk precinct and PMF extent at this property.
37	Phone call – Please review the medium flood risk mapping at [REDACTED] Brookvale

Document administration	
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Status	Final
Notes	Community and stakeholder views contained in this report do not necessarily reflect the views of the Northern Beaches Council or indicate a commitment to a particular course of action.