

# Assessment summary of options for managing the risks from lake flooding, sea level rise, and local nuisance flooding

Summary from Subcommittee of Marks Point and Belmont South Local Adaptation Plan Community Working Group

Possible management options to reduce the risk from future flooding and permanent tidal inundation	Subcommittee's assessment: ✓ = For further consideration ✗ = No further consideration			Main reason(s) for the Subcommittee's assessment against the criteria (suggested summary text based on workshop outcomes)
	Permanent inundation	Lake flooding	Local nuisance flooding	
<b>Management options in the draft Marks Point and Belmont South adaptation strategy</b>				
Build protective seawall or bank along the foreshore	✓	✗	✗	Will prevent tidal inundation from rising lake levels and will stop foreshore erosion.
Fill land	✓	✓	✓	Will be necessary to raise land up to or above level of protective seawalls to prevent inundation and maintain surface drainage.
Raise roads	✓	✓	✓	Road surfaces will need to be above levels of inundation and frequent flooding. Subgrade will need to be above groundwater levels. Roads, drains, and land filling will need to be coordinated. Major roads to be raised above flood levels to maintain emergency access.
Raise drains	✓	✗	✓	Will be necessary to retain sufficient fall in drains as the lake water levels increase.
Improved design and maintenance of drains	✗	✗	✓	Stormwater drainage is already poor so improvements will be necessary to maintain drainage as lake levels and groundwater levels rise.
Continue to construct new buildings above predicted flood levels	✗	✓	✗	Already a standard requirement in flood-prone areas.
Raise floor levels or move buildings to higher ground	✓	✓	✗	Some older houses may have to be raised in future if their floors are frequently flooded or are below surrounding fill levels.
<b>Additional option in the draft Marks Point and Belmont South adaptation strategy - if required in future</b>				
Build a levee around flood-prone areas	✗	✓	✗	Can protect properties from flooding if floor levels cannot be increased in time.

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<b>Management options that could assist the draft Marks Point and Belmont South adaptation strategy</b>				
Build flood detention basins in creek catchments	x	x	✓	Will have minimal effect on lake floods but may be useful in managing nuisance stormwater flooding downstream of the basins.
Install tide flaps or valves on stormwater outlets	✓	✓	x	Will have little effect in areas with small tidal range but flood flaps or gates on drains will be necessary if levees are used in flood protection. Solution for managing the effects of king tides.
Install rainwater tanks to reduce stormwater flows	x	x	✓	May reduce local stormwater runoff in small storms.
Direct more stormwater east towards the golf course and Belmont Lagoon	x	x	✓	May help reduce local nuisance stormwater flooding, but requires further investigation.
Set back new houses from the foreshore	✓	x	x	Acceptable if moved back on the same block at time of re-building. Allows access to install and maintain foreshore protection.
Encourage use of flood-resilient building materials and adaptable housing design in line with technological developments	x	✓	x	Can help reduce flood damage, but additional cost may be a barrier for some materials.
Avoid unadaptable slab-on-ground construction to allow for fill during the life of the asset	✓	✓	✓	Allows for future filling around and under homes. Allows homes to be raised more easily if necessary.
Review land use planning and development controls, in collaboration with the community, to ensure they are appropriate for the level of risk	✓	✓	✓	Allows planning controls to be reviewed once a Plan is in place, to reflect any changes in risk.
Re-routing of roads if required to maintain access to property and facilities	✓	x	x	Reconfiguration may be needed if there is insufficient room to raise roads to manage tidal inundation.

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Investigate use of water-resilient road surface and sub-grade materials such as no-fines	✓	✓	✓	May help maintain roads as lake levels and groundwater levels rise.
Require new infrastructure to be installed above predicted level of tidal inundation	✓	x	x	Necessary to ensure continued functioning of essential infrastructure such as sewer, water, electricity and communications.
Raise sewer access covers above frequent floods	✓	✓	✓	Simple measure to reduce the chance of sewer discharges into the lake.
Provide information about current and future risk on property certificates to alert owners and buyers	✓	✓	x	Provides prospective buyers and others with information about current and future risks, as required by law. Wording is reviewed to reflect changes in State law and policy, and changes in local hazards and risks.
Improve emergency warning and response	x	✓	x	Early warning will allow better flood preparation and evacuation if necessary.
Improve take-up of flood insurance and maintain insurance affordability	x	✓	x	Affordable flood insurance is necessary to support mortgage financing. Insurance can help recovery after flood events.
<b>Management options assessed as providing little or no benefit for the Marks Point and Belmont South adaptation strategy, or options already covered by another option</b>				
Limit new development in high risk areas and review land use planning to prevent increases in development intensity	x	x	x	Allows planning controls to be reviewed once a Plan is in place, to reflect any changes in risk.
Retain natural foreshores	x	x	x	Will not protect properties from tidal inundation or flooding.
Fill the lake to create new land	x	x	x	Will do nothing to protect existing properties from tidal inundation or flooding. Will have a significant environmental impact.
Build a weir or lock at the lake entrance	x	x	x	Isolating the lake from the ocean will have unacceptable effects on boating, fishing, and the environment. Will make flooding worse. Very expensive.
Excavate a second entrance to the lake	x	x	x	Will open the lake to greater impact from ocean tides and storm surges, increasing the effects of rising sea levels and increasing peak flood levels.

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Dredge Swansea Channel to improve flood drainage	x	x	x	Will open the lake to greater impact from ocean tides and storm surges, increasing the effects of rising sea levels and increasing peak flood levels.
Pump stormwater elsewhere - e.g. into mines	x	x	x	Will have little or no effect at peak of storms. Unlikely to be feasible. Expensive and pumps prone to failure.
Make all drains from concrete	x	x	✓	Included in "Improve design and maintenance of drains".
Dig silt away from drain outlets into the lake	x	x	✓	Included in "Improve design and maintenance of drains".
Buy out affected properties	x	x	x	Should not be necessary if a protect strategy is adopted. Big impact on affected owners.
Demolish houses at high risk	x	x	x	Should not be necessary if a protect strategy is adopted. Big impact on affected owners.
Find additional land to make up for land lost	x	x	x	Won't be required if a protect strategy is adopted.
Install composting toilets	x	x	x	Little or no impact on flood and inundation risk.
Plant more trees to reduce level of water table	x	x	✓	Will have little effect on water levels but may have other environmental benefits.
Re-establish seagrass in foreshore areas if it can retreat	x	x	x	Will migrate naturally.
Get used to it	x	x	x	Will not reduce exposure to risks from flooding and inundation hazards.
Remove information from property certificates and/or lower risk thresholds - let the owner take the risk	x	x	x	Information to prospective buyers and others must be provided by law.