

APPENDIX

G

PRELIMINARY OPTIONS
ASSESSMENT

Preliminary Flood Modification Options

Option ID	Option Name	Option Type	Sub-Catchment	Description	Number of Properties with WL Reductions			Number of Overfloor Buildings with WL			Benefits Summary	Technical Feasibility	Costs	Recommendation for Detailed Option
					20% AEP	5% AEP	1% AEP	20% AEP	5% AEP	1% AEP				
FG1	Henry Lawson Drive	Drainage Upgrade	George Hall	Replace 0.45mx0.9m grated inlet with 1.2mx1.2m grated inlet pit added in existing easement of ponding area in residential property Replace short section of 0.45m diameter pipe with 0.6m diameter pipe to match downstream size	3	3	3	2	3	4	Low - Localised moderate WL decreases in all events on 3-4 properties	Medium - Minor works with SydneyWater sewer in the area and works on private property in existing easement.	Low - Works only include new inlet pits and short length of pipe adjustment	No - Localised benefits mostly affecting front yards
FG2	Georges Hall Public School	Detention Basin	George Hall	Raise berm along property boundary to 25.0m AHD (2 metres max height and 55m long), with an 8m wide overflow weir at elevation 24.5m AHD Move existing inlet pit (0.9mx0.9m) to downstream of basin to drain low point on neighbouring property. Add a second 0.9mx0.9m inlet into base of basin.	3	4	14	2	3	6	Low - Localised major WL decreases in 5yr & 20yr events on 3-4 properties, more properties benefit in 100yr	Low - Large basin to be constructed within public school grounds with SydneyWater sewer in the area	Medium - Mostly earthworks for basin berm and pipe alterations for new basin discharge and inlet.	No - Low feasibility with works in school property with only localised benefits
FG3	Keswick Reserve	Detention Basin and Drainage Upgrade	George Hall	For Keswick St to the south, add a 0.25m high diversion bund in the roadway (7-8 metre ramp section on both sides to make it trafficable) Existing concrete easement is lowered by 0.3 - 0.5 metres to convey the additional surface runoff from the Keswick St diversion to the detention basin. Detention basin placed in east, non-vegetated side of Keswick Reserve with invert of 10.7m AHD (1-2 metres cut), west side berm added to invert 12.2m AHD, with an 5m wide overflow weir at invert 11.6m AHD. Add inlet pit (0.9mx0.9m) to base of basin (10.7m AHD) connecting to existing drainage network through 0.45m pipe with 9.7m AHD invert.	6	3	4	7	3	4	Very Low - Localised minor WL decreases in all events on 3-6 properties	Very Low - Large basin to be constructed in public park with SydneyWater sewer in the area. Drainage easement to be lowered and significant road works required to create diversion	High - Earthworks for basin berm, loss of playground, .	No - High cost, very low feasibility and only localised benefits. Could consider Keswick St diversion only
FG4	Rex Road	Drainage Upgrade	George Hall	Two 0.3m high elevated side levels for Rex Road to slightly retain flows within road reserve and keep out of downstream properties. New 1.2mx1.2m grated inlet pit added in existing easement of ponding area in residential property	7	4	1	3	4	1	Low - Localised major WL decreases in 5yr & 20yr events on 4-7 properties, negligible benefit in 100yr	High - Only requires two berms along the edges of existing road. Only concern is driveway slopes. Adding inlet pit in backyard over existing pipe and within existing easement.	Low - Minimal earthworks for two berms in road reserve and one inlet pit	Yes - Localised benefits for minor works
FG5	Harden Reserve	Detention Basin	George Hall	For Amaroo Ave, add a 0.25m high diversion bund in the roadway, and 0.35m high bund for Harden Cres (7-8 metre ramp section on both sides to make it trafficable) Add a 0.2m high bund along the property frontages downstream on Harden Crescent to retain flows in the road reserve Detention basin berm increased in height to 17.5m AHD instead of existing level 16.8m AHD. No change to base of the existing basin. No change to pit and pipe network. If the basin were to be converted into a WQ treatment basin, the inlet could be elevated to provide extended detention depth in the base of the basin, however this has not been modelled.	28	29	22	17	22	18	Medium - Widespread moderate WL decreases in all events.	High - Retrofit of an existing basin with only change to increase berm height. Requires road works for speed bump to divert flows	Medium - Mostly earthworks for basin berm and roadworks for speed bumps	Yes - Widespread benefits with retrofit of existing basin
FG6	Pollock Reserve	Detention Basin	George Hall	For Anembo Ave, Amaroo Ave and Barlow Place, add a 0.3m high berms on the low side of the road reserve to better contain flows in road. To address additional ponding in road reserve, add 3m lintel with 0.45mx0.9m inlet pits at Anembo Ave, Amaroo Ave and Barlow Place connecting into existing 0.6m trunk drainage pipe through new 0.375m pipe connections Detention basin Pollock Reserve with invert of 18.0m AHD (1-2 metres cut), west side berm added to invert 20m AHD, with an 5m wide overflow weir at invert 19.7m AHD. This 0.6m pipe is proposed to daylight into the lowered basin invert allowing water quality treatment of low flows from the drainage network. The basin will be drained by a 0.6m diameter pipe with a pit inlet of 18.5m AHD to allow extended detention of 0.5m for WQ treatment.	23	15 (-1)	23 (-3)	15	19	22 (-2)	Medium - Widespread moderate WL decreases in all events.	Medium - Major earthworks with SydneyWater sewer in the area and loss of public playground.	Medium - Mostly earthworks for lowering basin and adding berm wall	No - Major benefits occur in the downstream road reserve with benefits further downstream. FG5 Harden Reserve has similar benefits downstream with lesser scope of works involved.
FG7	Amaroo Reserve	Drainage Upgrade	George Hall	For south Bambil Street, add a 0.2m high diversion bund on the west edge of the roadway, and 0.3m high bund for the east edge and Rex Road frontage to retain flows in the road reserve Add a new trunk drainage line from Bambil St to the south to the existing culvert outlet location in Amaroo Reserve. The new trunk drainage line will divert flows from part of the existing stormwater network for Amaroo Ave. Details of the proposed trunk drainage line are included in the figure below. All 13 inlet pits (5 duplicates in model) are assumed to be 4.2m lintels with 0.45mx0.9m pit:	35	37	39	30	35	38	High - Widespread major WL decreases in all events	Low - New pit and pipe network proposed along Amaroo Ave with existing pit and pipe network and Sydney Water to be avoided	High - Significant lengths of new large diameter pipes and additional inlet pits	Yes - High benefits for flood risk key area on Amaroo Ave
FL1	Whitemore Reserve	Detention Basin	Lansdowne	For Oak Drive add a 0.3m high berms on the low side of the road reserve to better contain flows in road Detention basin in Whitemore Reserve with invert of 10.5m AHD (1.3 metres cut), west side berm added to invert 11.35m AHD. To address additional ponding in road reserve, add two 3.6m lintel with 0.45mx0.9m inlet pits at Oak Drive connecting into new 0.45m diameter pipe to be continued west and then along existing drainage easement corridor to Whitemore Reserve The basin will be drained by 0.45m x 0.9m pit and a 0.6m diameter pipe with a pit inlet of 9.85m AHD.	13 (-1)	7 (-2)	3 (-3)	7	6 (-2)	3 (-2)	Low - Localised moderate WL decreases in all events. Localised WL increases that should be able to addressed in design refinement.	Medium - Major earthworks and new pipe along existing drainage corridor.	Medium - Earthworks for lowering basin and adding berm wall and adding pipe length from Oak Drive to basin	No - Limited downstream benefit with only localised improvements. Significant scope of works for such benefits
FL2	Wilton Reserve	Detention Basin	Lansdowne	For Wendy Ave, a berm in the road edge has been added to elevation 19.3m AHD (0.5m high) Lowering of Wendy Ave road to 18.7m AHD to divert flow north into Wilton Reserve and away from properties Diversion channel along reserve with 0.3m high berm and cut channel section to maintain flows away from residential properties Detention basin in Wilton Reserve with invert of 15.7m AHD (1-1.5 metre cut). The basin will be drained by 0.45m x 0.9m pit and a 0.45m diameter pipe into existing 1.2m dia trunk drainage.	12	28	23	12	23	20	High - Widespread major WL decreases in all events.	Low - Major earthworks and significant lowering for basin and altering of Wendy Ave terrain and diversion channel around properties. Sydney Water sewer near the basin	High - Mostly earthworks for lowering basin and adding diversion channel. Roadworks to divert flows	Yes - High benefits for high flood risk residential area with low feasibility and high cost
FL3	Jacaranda Drive	Drainage Upgrade	Lansdowne	For Athel Street, add a 0.3m high diversion bund on the west edge of the roadway Add a new trunk drainage line from Athel St to the east to the existing culvert outlet location in Jacaranda Reserve near Henry Lawson Drive. The new trunk drainage line will duplicate the existing 1.2m diameter pipe along Jacaranda Drive. Details of the proposed trunk drainage line are included in the figure below. All 5 duplicate pits in the model are assumed to match existing mostly 3.6m lintels with 0.45mx0.9m pits	21 (-2)	23 (-2)	24	16 (-1)	18 (-2)	17	High - Widespread major WL decreases in all events. Localised WL increases that should be able to addressed in design refinement.	Medium - New pit and pipe network proposed along Jacaranda Drive with existing pit and pipe network to be avoided	High - Significant lengths of new large diameter pipes and additional inlet pits	Yes - High benefits for high flood risk residential area with medium feasibility and high cost
FL4	Amber Reserve	Detention Basin	Lansdowne	Detention basin in Amber Reserve with invert of 22.5m AHD (2 metres cut), west side berm added to invert 24.0m AHD (24.2m AHD on the north side) The basin will be drained by 1.2m x 0.9m pit and a 0.45m diameter pipe with a pit inlet of 21.0m AHD.	1	6	9	0	1	3	Very Low - Localised minor WL decreases in all events on 3-6 properties	Medium - Earthworks and significant lowering for basin	Medium - Earthworks for lowering basin and adding berm wall	No - Very low benefits

Option ID	Option Name	Option Type	Sub-Catchment	Description	Number of Properties with WL Reductions			Number of Overfloor Buildings with WL			Benefits Summary	Technical Feasibility	Costs	Recommendation for Detailed Option
					20% AEP	5% AEP	1% AEP	20% AEP	5% AEP	1% AEP				
FM1	Miller Road Catchment	Drainage Upgrade	Miller Road	Bullock Reserve berm to 39.3m AHD (1m high) and Bullock Avenue 0.2m high berr Middleton Rd 0.3m high berm, Clack Rd 0.3m high berm and 0.2m high Middleton Rd near Woodville Miller Rd 0.3m high berm Fuller St East berm to 34.8m AHD (0.4m high) and road cut to 34.5m AHD (0.3m lower) Fuller St West berm to 30.2m AHD (0.3m high) and road cut to 29.9m AHD (0.6m lower)	27	29	33 (-3)	14	23	24 (-2)	Medium - Widespread moderate WL decreases in all events	Low - Minor eathworks to add berms along the side of roadways	Low - Minor berm eathworks on side of roadways	Yes - Widespread benefits with low cost works within road reserve. Will worsen flooding in road reserve
FV1	Alcoomie Reserve	Detention Basin	Villawood	Basin in Alcoomie Reserve with invert of 19.0m AHD (2 metres cut), north side berm added to 21.0m AHD (20.7m AHD spillway in centre that is 6m wide) 0.2m high berm across road to the south-west with slight lowering of grassed area to divert flows into the basin. The existing 1.2m diameter pipe to the east is to be diverted into the basin, with a 1.2m pipe outlet to the existing location with upstream invert of 19.3m AHD (0.3m depth of ponding) The existing 0.525m diameter pipe to the north is to be diverted into the basin, with a 0.525m pipe outlet to the existing location with upstream invert of 19.5m AHD (0.5m depth of ponding)	7 (-1)	17 (-2)	14 (-3)	7	10	9 (-1)	Low - Minor WL decreases in all events. Localised WL increases that should be able to addressed in design refinement.	Medium - Large basin to be constructed in public park. Existing drainage to be diverted into basin and outlets to be added. Roadworks to add speed bump to divert flows into basin.	Medium - Mostly earthworks for basin berm and roadworks for speed bumps	Yes - Provides flood benefits for downstream residential properties. Also has co-location WQ opportunities
FV2	Birmingham Ave	Channel Upgrade	Villawood	Channel lowered by 1.5 metres below existing ground with 3m wide base and 15m total width Remove existing twin 1.2mW x 0.75mH trunk drainage line in place of swale Connect the swale into the existing twin 1.05m dia. Pipes under Birmingham Ave	2	3	3	0	1	1	Negligible - Very localised benefits	Medium - Earthworks to create drainage channel and alteration to pipes under Birmingham Ave. Existing drainage easement	Medium - Earthworks to create drainage channel and headwall	No - Localised benefits with negligible flood improvments outside of the area of proposed works
FV3	Tucker Reserve	Detention Basin	Villawood	Basin in Tucker Reserve with invert of 40.5m AHD (2.2 metres cut) The existing 0.9m diameter pipe to the east is to be diverted into the basin, with a 0.9m pipe outlet to the existing location with upstream invert of 41.0m AHD (0.5m depth of ponding)	15	10	10	16	7	9	Medium - Localised major WL decreases and widespread minor in all events	Medium - Large basin to be constructed in public park. Existing drainage to be diverted into basin and outlets to be added. Native trees along reserve to be avoided	Medium - Mostly earthworks for basin berm and pipe alterations for new basin discharge and inlet.	Yes - Major localised benefits with relative feasibility and cost
FV4	Hume Highway	Detention Basin	Villawood	Basin in Hume Highway reserve with vertical walls and invert of 28.3m AHD (1.5 - 3.0 metres cut) Four existing pipes to the south are to be diverted into the basin, with a 0.675m pipe, 0.375m pipe, 0.825m pipe, and twin 1.05m pipes with four outlets into the basin Add two outlet pits on downstream end to drain basin with 0.675m pipe and twin 1.05m pipes, with inverts of 28.52m and 23.8m AHD respectively.	2	3	0	2	1	0	Negligible - Widespread very minor WL reductions in 5yr and 20yr events	Medium - Basin to be constructed in road corridor. Native trees to be removed. Existing drainage to be diverted into basin and outlets to be added.	High - Mostly earthworks for basin berm and pipe alterations for new basin discharge and inlet.	No - Negligible benefits
FV5	Orchard Road	Drainage Upgrade	Villawood	No changes to terrain are proposed Add a new trunk drainage line from south end of Orchard Road to the existing culvert outlet location to the open channel to the north. The new trunk drainage line will divert flows from part of the existing stormwater network for Orchard Road. Details of the proposed trunk drainage line are included in the figure below. All 6 inlet pits are assumed to be four 4.2m lintels with 0.45mx0.9m pits	38 (-2)	~90	~100	35 (-1)	~70	~90	High - Widespread moderate WL decreases in all events. Localised WL increases that should be able to addressed in design refinement.	Very low - Large pit and pipe network to be constructed with SydneyWater sewer in the area.	High - Significant lengths of new large diameter pipes and additional inlet pits	Yes - Despite scale of works required and high potential costs, the benefits for the large number of residential properties near Orchard Road is significant
FV6	Sir Thomas Mitchell Drive	Channel Upgrade and Drainage Upgrade	Villawood	The section under Sir Thomas Mitchell Road is proposed to be lowered by 0.9 metres as there is an existing vertical weir downstream of the bridge. So the bridge section and channel section immediately upstream would be lowered by 0.9 metres to tie in with downstream channel invert Gradually the channel lowering reduces heading upstream to the side channel up until Orchard Road culvert. For the main channel section the base has been widened to 7.5m (in existing based on surveyed shapes). For the side channel the base has been widened to 4m (in existing varied typically between 2.5-3.0 metres) Concrete lining is proposed for this length with roughness reduced to 0.018 (0.02 for main channel) from 0.04	6	8	11	3	6	13	Medium - Localised major WL decreases	Medium - Significant length of channel alteration and lowering of channel under road bridge	High - Channel lowering and concrete lining for large length of channel	Yes - Localised benefits and continuation of Bennett St Drain upgrades
FV7	Llewellyn Ave	Detention Basin	Villawood	Basin in park with invert of 14.5m AHD (1.5 metres cut) to be 0.5-1.0 metres above existing channel invert. Channel section on this side was lowered to match the proposed basin invert	4	0	0	0	0	0	Negligible - Widespread very minor WL reductions in 5yr and 20yr events	Very Low - Large basin to be constructed in public park with underground and overhead utilities in the area. Native trees to be removed	High - Utility movement, earthworks for basin lowering	No - Negligible benefits
FV8	Christina Ave	Channel Upgrade and Detention Basin	Villawood	For Christina Ave side channel upgrades: - The culvert under the railway line is proposed to be lowered by 0.6 metres - The twin 1.5 metre pipes under Christina Ave are also proposed to be lowered by 0.6 metres and increased to twin 2.1m diameter pipes - The channel section from Christina Ave to the confluence of channels is to also be lowered by 0.6 metres with the base of the channel widened through vertical side walls and a base width of 3.8 metres (existing base width is 0.9 metres) - For the main channel section the base has been widened to 7.5m (in existing based on surveyed shapes). - For the side channel the base has been widened to 4m (in existing varied typically between 2.5-3.0 metres) For Woodville Road basin: - Basin in vegetated area with invert of 11.7m AHD (3.0 metres cut) to be 0.5 metres above existing main channel invert, but roughly in line with north side channel invert - Channel sections for both the main channel (right bank) and north side channel (left bank) were lowered to match the proposed basin invert	5 (-3)	8	8	5	8	14	Medium - Widespread moderate WL decreases in all events. WL increases that would be difficult to address	Very Low - Lowering culvert under rail corridor requiring agreement from NSW Rail. Changing culverts under Christina Ave and channel edits. Highly contaminated vegetated area to be disturbed for detention basin	High - Channel lowering for large length of channel and under railway and Christina Ave. Basin earthworks with contaminated lands	Yes - Downstream impacts could be suitably removed and mitigated in later design stages. Potential benefits for the industrial area could be significant.

Approximate. Negative impact numbers in brackets

Negligible, Very Low, Low, Medium,

Very Low, Low, Medium, High

Very Low, Low, Medium, High

No, Yes

Notes:

WL - Peak Water Level or Flood Level

Option Count:	
No	9
Yes	11

Preliminary Property Modification Options

Option ID	Option Name	Description	Recommendation for Detailed Option
PM1	Voluntary House Raising (VHR)	House raising is a measure designed to reduce the incidence of over-floor flooding of existing buildings through works funded by Council, and with assistance from the NSW Office of Environment and Heritage (OEH). The Guidelines for voluntary house raising schemes (OEH, 2013a) sets out ineligibility criteria for house raising under the Voluntary House Raising (VHR) scheme and include the following: - Properties which are already benefiting substantially from other floodplain mitigation measures, such as houses already protected by a levee, and those that will be under future plans. - Properties that would not achieve a positive benefit through damage reduction relative to cost (i.e. benefit-cost ratio less than 1). Consideration may be given to lower benefit-cost ratios where there are substantial social and community benefits, or where the VHR is compensatory work for the adverse impacts of other mitigation works. The scheme should involve raising residential properties above a minimum design level, generally the council's flood planning level (FPL), and comply with the council's relevant development control requirements. This option is not applicable for properties which are "slab on ground" construction.	Yes - Properties along Georges River, based on Georges River flooding to be recommended for house raising.
PM2	Flood Proofing	Flood proofing involves undertaking structural changes and other procedures in order to reduce or eliminate the risk to life and property, and thus the damage caused by flooding. Flood proofing of buildings can be undertaken through a combination of measures incorporated in the design, construction and alteration of individual buildings or structures subject to flooding. It is primarily suited to industrial or commercial properties. Examples of proofing measures include: - All structural elements below the FPL shall be constructed from flood compatible materials; - All structures must be designed and constructed to ensure structural integrity for immersion and impact of debris up to the 100 years ARI flood event. If the structure is to be relied upon for shelter-in-place evacuation then structural integrity must be ensured up to the level of the PMF; and - All electrical equipment, wiring, fuel lines or any other service pipes and connections must be waterproofed to the FPL. The NSW SES Flash Flood Tool Kit (SES, 2012) provides businesses with a template to create a flood-safe plan and to be prepared to implement flood proofing measures.	No - Current DCP provisions should address future development.
PM3	Voluntary Purchase (VP)	Voluntary purchase is the optional purchase of pre-selected properties funded jointly by Council and the State Government. It would free both residents and emergency services personnel from the hazard of future floods by removing the risk, and is achieved by the purchase of properties and the removal and demolition of buildings. Properties could be purchased by Council at an equitable price and only when voluntarily offered. Such areas would then need to be re-zoned under the LEP to a flood compatible use, such as recreation or parkland, or possibly redeveloped in a manner that is consistent with the flood hazard. Voluntary House Purchase is funded by Council with assistance from the State Government. However, due to the relatively expensive nature of such a program, limited availability of Government and/or Council funding can be a major constraint to undertaking Voluntary House Purchases. Typically, only a small number of properties within a floodplain can be considered for Voluntary Purchase, however more can be assisted if funding is available.	Yes - Properties in the study area to be considered for house purchase.
PM4	Land Swap	An alternative to voluntary purchase is the consideration of a land swap program whereby Council swaps a parcel of land outside of the flood prone area, such as an existing park, for a parcel of flood prone land with the appropriate transfer of any existing facilities to the acquired site. After the land swap, Council would then arrange for demolition of the building and have the land re-zoned under the LEP to open space. Since a detailed floor level survey has not been undertaken and over floor flooding has been estimated based on a desktop assessment, it is recommended that Council undertake a detailed floor level survey to validate if properties identified for voluntary purchase are suitable for land swap	No - Further analysis to be documented, however from high level review conducted to date no properties are immediately apparent for being suitable for a scheme of this type.
PM5	Council Redevelopment	This option also provides an alternative to the Voluntary Purchase scheme. While Council would still purchase the worst affected properties, it would redevelop these properties in a flood compatible manner and re-sell them with a break even objective.	No - Further analysis to be documented, however from high level review conducted to date no properties are immediately apparent for being suitable for a scheme of this type.
PM6	Stormwater System Maintenance	Vegetated road sides result in significant leaf and branch drop which build up over time and often results in drainage inlet pits blocking rapidly when runoff events occur. This can lead to concentrated and uncontrolled overland flows occurring downslope of these inlets thereby increasing surface flows through streets and private properties. It is recommended that regular street sweeping is undertaken to reduce the potential for the inlets to become blocked and subsequently reduce the frequency of uncontrolled overland flows on streets and through private properties. In addition to regular street sweeping which reduces the potential for inlet pits to become blocked, it is also recommended that stormwater pits in areas subject to flooding are cleaned on a more frequent basis. Suction machines can be used to remove silt and rubbish from the pits.	No - Current program of stormwater maintenance should be sufficient. Works unlikely to be covered by Flood funding.

No, Yes

Option Count:	
No	4
Yes	2

Preliminary Emergency Management Modification Options

Option ID	Option Name	Description	Recommendation for Detailed Option
EM1	Flood Prediction and Warning	The critical duration and response times for the study area floodplain limit the implementation of a flood warning system. The short duration flooding experienced in local systems is not well suited to flood warning systems. Severe weather warnings are likely to be the only assistance for these areas. Council may wish to consider developing an early warning alert system to provide registered residents and business owners with free severe weather alerts. By monitoring BoM weather warnings and other sources, Council could send alerts based on potentially dangerous weather events. The alerts would likely cover weather events such as: - Hail and severe thunderstorms; - Destructive winds and cyclones; and - Floods from a number of different sources including king tide, storm surge and tsunamis. Alerts could be sent by Email, SMS, Recorded message to a landline. As a minimum, Council should co-ordinate and contribute with the regional flood warning system currently being developed for Georges River.	Yes - Whether just contributing to the regional warning system being developed for Georges River, or implementing specific local warning systems
EM2	Review of Local Flood Planning and Information Transfer to NSW SES	Having a robust EM plan that can provide the basis for responding to various scales of flood threat and be altered to fit the particular circumstances of an event can assist with flood preparation, response and recovery. The review of local flood plans should also include: - A review of the current flood warning classifications (minor, moderate and major) for the location relative to the impacts on the community and any associated recommendations - Clarification of the scale of impacts and the scale of the emergency response required in relation to key events and the associated flood timings so this can inform decisions and logistics. For example, for a levee protected community, having a plan in place on how to respond to floods that do not threaten the levee, threaten to result in minor overtopping of the levee, and for extreme floods that overwhelm the levee and town, can provide flexibility - A review of other key information in the plan in light of the information in this study. The findings of this FRMS&P are an important source of catchment specific information for the NSW SES and Council. Details of flood risks at specific locations are important for planning of operational tasks and for the future review of the Flood Emergency Sub-Plan.	Yes - The Local Flood Plan is currently being developed by NSW SES with ongoing review by Council. Providing outcomes from the FRMS&P to NSW SES is essential.
EM3	Community Flood Awareness	Flood awareness is an essential component of flood risk management for people residing in the floodplain, it is important to maintain an adequate level of flood awareness during the extended periods when flooding does not occur. A continuous awareness program is required to ensure new residents are informed, the level of awareness of long-term residents is maintained, and to cater for changing circumstances of flood behaviour and new developments. This option would focus on education of the entire LGA with the objective to educate residents that may be in the floodplain at the time of flooding, or may attempt to enter floodwaters. There are a broad range of approaches that can be adopted, which all should be done in close consultation with NSW SES: - Develop FloodSafe Brochure and FloodSafe Toolkit; - Develop a post-flood data collection strategy; - Hold a FloodSafe launch event; - Develop a flood information package for new residents.	Yes - Recommended outcome of the FRMS&P
EM4	School Education Program	The SES has developed a tailored program for school children in primary schools. The program, includes teacher's resources, newsletters, activities and games, is designed to deliver knowledge and awareness of floods to young children. SES personnel are also available to visit schools to talk about flooding and flood response. Further details of these programs are available on the SES StormSafe website. Education of parents / carers relating to the flood affectation of the school and the emergency response procedures in place to ensure the safety of their children could be provided directly or through children in the form of brochures etc. Particularly for the Prospect Creek sub-catchments floodplain it should be reinforced to parents that as all schools have programs in place so they should never enter floodwaters in an attempt to reach their children at school.	No - SES / DoE requirement not Council
EM5	Flood Markers and Signage	While the above public programs can be effective in improving the long term awareness of flood risk, in the event of flooding these education programs can easily be forgotten. Therefore flood warning signage can be an effective tool to remind or inform residents of the risks associated with entering floodwaters, and to also provide practical information in the event of flooding such as recommended evacuation routes. Appropriate flood warning signs should be posted at all locations of significant flooding. These signs may contain information on flooding issues, or be depth gauges to inform residents of the flooding depth over roads and paths. Also evacuation route mapping could be provided on these signs to assist residents.	Yes - Recommended outcome of the FRMS&P
EM6	Flood Data and Debrief	A flood event provides an ideal opportunity to capture information on the flood and learn from it. It helps understand the event, the consequences for the community, successes and limitations in current management practices and how the community recovered. Information can be captured in coordinated community surveys. This information should be collated and a report produced to catalogue what has been captured and its availability and format. The data should be securely stored and made publicly available. The information can be used in both explaining this event to the community and in considering future flood risk, EM and land-use planning decisions within and potentially beyond this community	Yes - Recommended outcome of the FRMS&P. Post flood funding available from NSW DPE

No, Yes

Option Count:	No 1, Yes 5
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