MASTER ACTION PLAN

Group	ID	Action			Priority Ranking	Cost			Benefit	Potential Funding Source	Timing			Action Type	Comments	Responsibility			Other Stakeholders	EU Related?	Review		Location		Linkages	
		What?	How?	Where?		Investigation / Feasibility	Capital	Other			Timeframe	Start Date	Approx. Duration			Lead Organisation	LLFA Dept.	Primary Support			Frequency	Next Review Date	CDA ID	Policy Area ID	Related Action IDs?	Related Partners' Action IDs?
Local Actions - General Flood Risk Management	1	Take forward actions set out in the SWMP with partners and other flood risk management authorities (if any)	Continue to run a Flood Management Group within ECC and liaise with CCC and others as necessary	Study Area Wide	High	-	-	-	Co-ordinated delivery of local flood risk management across the catchment	ECC, partners, CCC, others	Ongoing	2013	Long	FMA		ECC and CCC	FWM Team	Steering Group, partners, CCC, others	Environment Agency, Anglian Water, Network Rail	No	Annually	2014	N/A	N/A	N/A	N/A
	2	Seek opportunities to integrate fluvial and surface water flood risk reduction measures	Review and monitoring of policy implementation and in partnership with EA	Study Area Wide	High	-	-	-	Mid-long term reduction in flood risk and improvement in water quality	Private developer	Ongoing	2013	LDF Plan Period	Policy		ECC and CCC	FWM Team	All other LLFA Departments and CCC Departments		No	Annually	2014	N/A	N/A	N/A	N/A
	3	Look for opportunities to reduce flood risk to critical transport infrastructure whilst upgrading the existing drainage network in partnership with Anglian Water, Highways Authority and Network Rail	Discussion with relevant officers of ECC & CCC	Study Area Wide	High	-	-	-	Refine understanding of risk to critical infrastructure. Prioritise localised drainage improvements	Highways Authority, AW and Network Rail	Medium	2013	1-2 years	I / F / D, FMA		ECC	Highways	Essex Highways and Anglian Water	Anglian Water, Network Rail,	No	Annually	2014	N/A	N/A	N/A	N/A
	4	Ensure current emergency response to catchment-wide surface water flooding is appropriate	Liaise with Emergency Planning forum	Study Area Wide	High	-	-	-	Emergency response based on best available information	ECC and CCC	Short	2013	1 year	I / F / D		ECC and CCC	Resilience Team	Local Resilience Forum	Network Rail	No	N/A	N/A	N/A	N/A	N/A	N/A
	5	Determine extent of i) residential use of at-risk basements [if any], ii) groundwater boreholes and iii) geological conditions, and decide if a risk from flooding exists.	No basements are identified in the EA NRD however this should be confirmed with local knowledge. If basements are identified then use predicted extent of 75year flood to enable determination.	Study Area Wide	High	-	-	-	Better understanding of scope of flooding impact, and improving identification of solutions and funding	ECC and CCC	Medium	2013	1 year	I / F / D		ECC and CCC	FWM Team	Development Control	Local Residents, ECC	No	Annually	2014	N/A	N/A	20	N/A
	6	Consider retrofitting flood resilience and resistance measures to areas at risk of flooding in local topographic low points and basement properties where there is a history (and likely future risk) of groundwater ingress	No basements are identified in the EA NRD however this should be confirmed with local knowledge. If identified then impermeable membranes, additional drainage should be investigated. Determine risk of flooding in areas at topographic low points (i.e. does a pumping scheme assist in reducing risk)	Study Area Wide	Medium	-	-	-	Reduction in the impact of flooding	Property Level Flood Protection (Defra), FDGiA	Long	2013	10 years	FMA		ECC and CCC	FWM Team	Building Control	Local Residents, ECC	No	Annually	2014	N/A	N/A	20	N/A
	7	Determine whether services (e.g. power, telecommunications) are resilient to surface water flooding	Discuss the overall resilience of services with relevant companies	Study Area Wide	Medium	-	-	-	Community resilience to flooding	Service providers	Medium	2013	3 year	CP, FR		ECC and CCC	FWM Team	Resilience Forum		No	Annually	2014	N/A	N/A	N/A	N/A
	8	Installation of additional road gullies or alternative drainage systems to reduce standing water depth and duration	As part of highways improvement programme include additional construction task of installing additional gullies or alternative drainage systems where feasible and required. Consultation with Anglian Water may be required.	In relevant CDAs across the catchment	Medium	-	-	-	Reduction in the probability of flooding	ECC/CCC/Developer contributions / other?	Medium	2013	Ongoing	FMA		ECC	FWM Team	Anglian Water and ECC Highways	CCC	No	Annually	2014	N/A	N/A	N/A	N/A
	9	Determine areas within the catchment which are appropriate for retrofitting bioretention basins and carparking pods	Desktop study to determine feasibility of incorporating these SUDs	Study Area Wide	Medium	-	-	-	Will assist in reducing runoff volumes and improving quality of water discharging to watercourses	Developer contributions / other?	Medium	2013	1-2 years	I / F / D		ECC	FWM Team		Environment Agency	No	Annually	2014	N/A	N/A	N/A	N/A
Policy	10	Developments across the catchment to include at least one 'at source' SUDS measure, resulting in a net improvement in water quantity or quality discharging to sewer	Development Control Review and Monitoring of policy implementation	Study Area Wide	High	-	-	-	Mid-long term reduction in flood risk and improvement in water quality	Private developer	Ongoing	2013	LDF Plan Period	Policy		CCC	Planning Strategy		Environment Agency, ECC	No	Annually	214	N/A	N/A	11 and 14	N/A
	11	All developments across the catchment (excluding minor house extensions less than 50m^2) which relate to a net increase in impermeable area are to include at least one 'at source' SUDS measure (e.g. water butt, rainwater harvesting tank, bioretention planter box etc). This is to assist in reducing the peak volume of runoff discharging from the site	Development Control Review and Monitoring of policy implementation	Study Area Wide	High	-	-	-	Mid-long term reduction in the probability of flooding	Private developer	Ongoing	2013	LDF Plan Period	Policy		CCC	Planning Strategy	Environment Agency?	Environment Agency, ECC	No	Annually	2014	N/A	N/A	10, 13 & 14	N/A
	12	Proposed 'brownfield' redevelopments of more than one property or area greater than 0.1 hectare are required to reduce post-development runoff rates for events up to and including the 1 in 100 year return period event with an allowance for climate change (in line with NPPF and UKCIP guidance) to 50% of the existing site conditions. If this results in a discharge rate lower than the Greenfield conditions it is recommended that the Greenfield rates (calculated in accordance with IoH124) are used.	Development Control Review and Monitoring of policy implementation	Study Area Wide	High	-	-	-	Mid-long term reduction in the probability of flooding	Private developer	Ongoing	2013	LDF Plan Period	Policy		CCC	Planning Strategy	Environment Agency?	Environment Agency, ECC	No	Annually	2014	N/A	N/A	10 and 12	N/A
	13	Developments located in Critical Drainage Areas (CDAs) and for redevelopments of more than one property or area greater than 0.1 hectare require a betterment to Greenfield runoff rates (calculated in accordance with IoH124). It is recommended that a SUDS treatment train is utilised to assist in this reduction.	Development Control Review and Monitoring of policy implementation	Study Area Wide	High	-	-	-	Mid-long term reduction in the probability of flooding	Borough and Private developer	Ongoing	2013	LDF Plan Period	Policy		CCC	Planning Strategy	Environment Agency	Environment Agency, ECC	No	Annually	2014	N/A	N/A	10 and 13	N/A
	14	Implement Policy relating to Best management practises in relation to Water Quality and a reduction in pollutant loads (investigate using the water quality computer software [MUSIC or similar])	Development Control Review and Monitoring of policy implementation	Study Area Wide	High	-	-	-	Mid-long term reduction in the probability of flooding	Borough and Private developer	Ongoing	2013	LDF Plan Period	Policy		CCC	Development Control	Environment Agency	Environment Agency, ECC	No	Annually	2014	N/A	N/A	N/A	N/A
Maintenance	15	Ensure drainage systems are operating at capacity - maintenance of gullies	Review existing gully clearance/ maintenance schedules and if necessary revise/prioritise CDAs	Study Area Wide	High	-	-	-	Flooding isn't exacerbated	Essex Highways	Ongoing	2013	Long	FMA		Essex Highways	Highways	Street Cleansing	Anglian Water	No	Quarterly	2014	N/A	N/A	N/A	N/A
	16	Gully Cleaning - Improving 'Visibility' - Targeted based on risks identified in SWMP	Clearly identify gullies prone to flooding (possibly painted yellow)	CDA Specific	Medium			£25k+	Improved maintenance regimes. May promote residents and ground sweeping teams to maintain them	Essex Highways	Medium		1 year	FMA		Essex Highways	*Operations*	Transport and Highways	ECC	No			All CDAs			
	17	Gully Cleaning - Enforcement Powers - Targeted based on risks identified in SWMP	Encourage gully cleansing contractors to use powers to enforce movement of parked cars to ensure all gullies are regularly cleared.	CDA Specific	Medium			<£25k	Improved maintenance regimes	Essex Highways	Medium		1 year	FMA		Essex Highways	*Operations*	Transport and Highways	ECC	No			All CDAs			
	18	Gully Cleaning - Timing of Cleansing Rounds - Targeted based on risks identified in SWMP	Coordinate timing of gully cleansing rounds to ensure that they do not coincide with school opening and closing times and other	CDA Specific	High			<£25k	Improved maintenance regimes	Essex Highways	Short		3 months	FMA		Essex Highways	*Operations*	Transport and Highways	ECC	No			All CDAs			
	19	Clear Blocked Gullies - Targeted based on risks identified in SWMP	Focus attention on the maintenance of gully pots in the identified Critical Drainage Areas (CDAs) which are considered to be high risk	CDA Specific	High		Unknown		Reduction in the probability of flooding	Essex Highways	Short		1 year	FMA		Essex Highways	*Operations*	Transport and Highways	ECC	No			All CDAs			
	20	Ensure drainage systems are operating at capacity - maintenance of Anglian Water sewers. Anglian Water to recommend SWMP findings to AMP programme, if flooding identified as drainage serviceability issue.	May require mapping of existing drainage infrastructure. Review existing maintenance schedules and if necessary revise/prioritise CDAs	Study Area Wide	High	-	-	-	Flooding isn't exacerbated	Anglian Water	Ongoing	2013	Long	FMA		Anglian Water	FWM Team	ECC Highways and CCC	Anglian Water	No	Quarterly	2014	N/A	N/A	N/A	N/A
	21	Maintain ditches and balancing ponds on Borough owned land	Review existing maintenance schedules and if necessary revise/prioritise area of historic blockage (may require public consultation)	Study Area Wide	High				Flooding isn't exacerbated	CCC	Ongoing	2013	Long	FMA		CCC	FWM Team	CCC	Anglian Water and Environment Agency	No	Quarterly	2014	N/A	N/A	N/A	N/A
	22	Create a clear policy for enforcement of maintenance on high risk ordinary watercourses / ditches by riparian owners	Implement powers as allowed by FWMA for LLFAs	Study Area Wide	High				Flooding isn't exacerbated	ECC	Ongoing	2013	Long	FMA		ECC	FWM Team	Environment Agency		No	Quarterly	2014	N/A	N/A	N/A	N/A
	23	Review all natural assets to ensure the environmental integrity of the area(s) are not compromised by surface water runoff and any changes from development or flow regime	Undertake monitoring of areas(water quality, debris, flora/ fauna, etc)	Study Area Wide	High				Maintain environmental benefits	ECC and CCC	Ongoing	2013	Long	FMA		CCC/ECC	FWM Team	Environment Agency,		Yes	Quarterly	2014	N/A	N/A	N/A	N/A

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Local Actions - General CDA	24	Proposed developments in urban areas at risk of flooding in Critical Drainage Areas (CDAs) to contribute to measures to reduce surface water flood risk in the CDA.	Section 106, Community Infrastructure Levy, Development Control Policy	Study Area Wide	High	-	-	-	Mid-long term reduction in the probability of flooding	Private developer	Ongoing	2013	LDF Plan Period	Policy		CCC	Development Control	Building Control	Environment Agency, ECC	No	Annually	2014	N/A	N/A	N/A	N/A
	25	Seek to include SUDS retrofitting policies in Planning reform to enhance or replace conventional drainage systems in CDAs or elsewhere as opportunities arise	Review and monitoring of policy implementation	Study Area Wide	Low	-	-	-	Mid-long term reduction in flood risk and improvement in water quality	Private developer	Medium	2013	LDF Plan Period	Policy		ECC and CCC	Planning Strategy	Building Control		No	Annually	2014	N/A	N/A	N/A	N/A
	26	Use SWMP mapped outputs to require developers in areas at risk of flooding to demonstrate compliance with NPPF to ensure development will remain safe and will not increase risk to others, where necessary supported by more detailed integrated hydraulic modelling.	Development Control Policy	Study Area Wide	High	-	-	-	Mid-long term reduction in the consequences of flooding	Private developer	Ongoing	2013	LDF Plan Period	Policy		ECC/CCC	Planning Strategy	Building Control		No	Annually	2014	N/A	N/A	N/A	N/A
	27	Ensure any development falling within a Strategic Growth Area (or rural/open space plots) are designed to limit runoff to low predevelopment Greenfield runoff rates.	Development Control Policy	All Strategic Growth Areas	High	-	-	-	Long term reduction in flood risk in the GA	Private developer	Ongoing	2013	LDF Plan Period	Policy		CCC	Planning Strategy		Environment Agency, ECC	No	Annually	2014	N/A	N/A	N/A	N/A
	28	Investigate (confirm) whether flooding incidents have occurred in CDAs and other areas identified as being at risk of flooding	Review flooding reports, then conduct survey of local residents (e.g. mail drop, door knocking) to update database	CDA Specific	Medium	-	-	-	Validate model outputs, resident 'buy in'	ECC and CCC	Short	2013	1 year	I / F / D		CCC	FWM Team	Local Resilience Forum	Local Residents ECC	No	N/A	N/A	N/A	N/A	N/A	N/A
	29	Monitor flood risk related problems and manage future development to minimise impact on flood risk	Development control policy and monitoring of flood risk incident register	CDA Specific	Low / Medium	-	-	-	Proactive management of potential flood risk in areas of higher risk probability	ECC and CCC	Ongoing	2013	Ongoing	FMA		CCC	FWM Team	ECC Highways	ECC	No	Annually	2014	N/A	N/A	N/A	N/A
	30	Carry out more detailed studies including further investigation of the technical issues and consultation with local stakeholders	Site investigations and modelling	CDA Specific	High	-	-	-	Refine understanding in flood risk within the Borough	ECC and CCC	Short	2013	5 years	I / F / D		ECC	FWM Team	Highways and CCC	Environment Agency, Anglian Water	No	N/A	N/A	N/A	N/A	29	N/A
	31	Work proactively to monitor the condition of ordinary watercourses and associated culverts.	Assess condition of ordinary watercourses	Study Area Wide	High	-	-	-	Understanding of culvert condition and associated potential collapse risk	ECC/CCC	Ongoing	2013	Ongoing	FMA		ECC/CCC	FWM Team	EA	Local Residents	No	Monthly	2014	N/A	N/A	27	N/A
	32	Work proactively with the EA to monitor the condition of Main Rivers, culverts and Defences.	Share condition assessment information and jointly review other information as it becomes available	Study Area Wide	High	-	-	-	Understanding of standard of defences	EA / ECC / CCC	Ongoing	2013	Ongoing	FMA		EA		ECC	Local Residents	No	Monthly	2014	N/A	N/A	26	N/A
	33	Engage Essex Highways to monitor any future flooding and assess the associated risk on all Major Roads	Maintain regular contact with relevant parties to share flood risk information	Study Area Wide	High	-	-	-	Understanding of local flood risk and potential impacts	Essex Highways	Ongoing	2013	Ongoing	FMA		ECC	Highways	Essex Highways		No	Quarterly	2014	N/A	N/A	32	N/A
Local Actions - depth >0.5m	34	Undertake a detailed feasibility study to confirm significant level of flood risk predicted by SWMP study and use as justification for possible FDGiA funding	Engage consultant to complete detailed study and work with EA to investigate FDGiA opportunities	Study Area Wide	High	£40k	TBC	TBC	Improved understanding of flood mechanisms and potential funding opportunities for mitigation solutions	FDGiA / ECC / EA	Short	2013	4 months	FMA		ECC	FWM Team	EA and CCC	Anglian Water, Local Residents	No	6months	Mid 2014	N/A	N/A	25	N/A
	35	Investigate large areas of deep (>0.5m) flooding - unless there is evidence to suggest that the risk has been mitigated, for example by high capacity drainage or pumping infrastructure.	Site investigations and modelling	Areas with ponding >0.5m	High	-	-	-	Refine understanding in high impact areas	ECC and CCC	Short	2013	5 years	I / F / D		ECC	FWM Team	CCC	Environment Agency, Anglian Water	No	N/A	N/A	N/A	N/A	N/A	N/A
	36	Work with Anglian Water to mitigate the water quality impacts related to sewer surcharges	Joint investigation of mitigation solutions that have multiple benefits	Study Area Wide	High	£15k	TBC	TBC	Partnership working with others to achieve multiple benefits for local flood risk mitigation and river water quality improvement	ECC / EA / Anglian Water / EU	Short	2013	4months	FMA		ECC	FWM Team	EA and CCC	Anglian Water	No	Quarterly	2014	N/A	N/A	N/A	N/A
Road / Underpass Risk Assessment	37	Carry out a flood risk assessment for roads highlighted to flood during extreme events e.g. major roads (A Roads) and determine if any contingency plans are required	This should include ascertaining the standard of protection currently provided and, if necessary, carrying out further investigation/ modelling to improve the level of understanding. Establish need for more detailed analysis and/or higher standard of protection.	Study Area Wide	Low	-	-	-	Refine understanding of flood risk on key routes	ECC/CCC	Medium	2013	6 months	I / F / D		ECC/CCC	N/A	Essex Highways		No	Annually	2014	N/A	N/A	N/A	N/A
	38	Carry out a flood risk assessment for pedestrian underpasses and provide signage for those at risk of flooding.	Review of topography and model results to determine risk to users	Study Area Wide	Low	-	-	-	Refine understanding of flood risk in pedestrian underpass	ECC/CCC	Medium	2013	6 months	I / F / D		ECC/CCC	N/A	Essex Highways		No	Annually	2014	N/A	N/A	N/A	N/A
Rail Assessment	39	Carry out a flood risk assessment of the flood risk to the Network Rail infrastructure within Chelmsford to confirm risk	In collaboration with Network Rail and assessment of the existing procedures and flood risk infrastructure should be	Network Rail infrastructure	Medium / High	£10k			Refine understanding of flood risk to rail infrastructure	Network Rail	Medium	2013	6 months	I / F / D		Network Rail	Emergency Planning / drainage teams	CCC	Environment Agency and ECC	No	Annually	2014	N/A	N/A	N/A	N/A