RESTRICTED

EMERGENCY PLANNING
COASTAL / PLUVIAL / FLUVIAL FLOOD MODELLING FOR JERSEY

Model Authors	Date
[redacted]	AUGUST 2010

Next Review Due: TBA

PREPARING FOR EMERGENCIES

Emergency Planning Flood Map Modeling 2010 Important Observations

- Modeled in August 2010 By:
  - [redacted] – Assistant Emergency Planning Officer, Chief Ministers Dept.
  - [redacted] – Principal Metrological Officer, Met Office
  - [redacted] – Senior Civil Engineer, Transport & Technical Services Department
  - [redacted] – Drainage Records Manager & Duty Officer (TTSd), Transport & Technical Services Department
  - [redacted] – Hydrogeologist, Environment Department

- A mix of historic Island knowledge stretching back until at least the early 1970's by participants was used. This is significant as building developments in the Island surged after this time having an impact on flood mitigation infrastructure.
- With Pluvial/Fluvial flooding two categories of flooding types were identified, those that are current and known "Hotspots" for flooding, and those that were Historic Hotspots for this type of flooding until infrastructure or development was put in place to address the situation. This was decided to be used because should the infrastructure fail we have early warning that this "historic" area could flood again if infrastructure isn't fixed/addressed, and serves as a useful planning tool.
- A dynamic risk assessment with a scored criteria was listed for each pluvial/fluvial flood site (both for "current" and "historic"), the weighting of which is included at the header of the Pluvial/Fluvial flooding list table.
- Critical Roads and Infrastructure has also been identified to help with any emergency response, especially in the area of Traffic Management should major arteries become blocked.
- With Coastal Flooding the HR Wallingford Report EX5964 "The Effects of Climate Change on Jersey's Coastal Defence Structures" (Dec 2009) was used, in particular the map modeled by HR Wallingford in July 2009 in this report, shown as ***Fig A3.8 Low Lying land at risk of flooding if defences were to fail during an event with 5% likelihood of occurring in any one year and 0.5m sea level rise (1:20 year period still water level and 0.5m sea-level rise).*** Enlarged sections of this model are included in this report.
- The Geology Map of Jersey proved useful and very telling in terms of flood modeling, as the HR Wallingford model does roughly correlate in terms of certain areas of flood to the areas of the Island that have Alluvium Deposits, which is a geological form particularly susceptible to flooding in low lying areas as the permeation of water through this structure is not efficient. Relevant enlarged sections of this map are also included in this report with the Alluvium areas of appearing as a yellow/cream colour on the maps (they correlate well to the HR Wallingford maps)
- In terms of modeling using GIS. For Fluvial/Pluvial flooding knowledge of the supplying catchment areas to the flood site plus local knowledge observed at real flood incidents as well at Metrological advice shaped the position of the theoretical flood areas for this form of flooding. **THEY ARE ONLY EDUCATED GUESSES AND ARE NOT MATHMATICALLY MODELLED, TO BE USED AS AN IDENTIFYING GUIDE ONLY, IF USED TACTICALLY THOUGHT SHOULD BE GIVE TO INCREASING BOUNDARIES OR CORDONS AS PER CONDITIONS DICTATING AT THAT TIME.**
- For Coastal Flooding, a rough "tracing" of the HR Wallingford Model, with guides from the Alluvium Map were used again, due to the difficulty of plotting accurately on GIS the same warning as above must be applied to the Coastal Flooding Model as the Pluvial/Fluvial Model.
- For Costal Flooding mapping all Critical Infrastructure was too big a task therefore dynamic appraisal of Electricity, Telecoms, Water and Gas and other Special site should be identified quickly at an incident by comparing the GIS Map to other Critical Infrastructure records held.
- Building a mathematical or computer model to throw scenarios into would be the final step, at this stage external consultancy would be required.

Pluvial \ Fluvial Flood Modelling:
High Risk Known Hot Spots: (Happening in Recent Times)

Population Density: 5 = High 4 = Medium-High 3 = Medium 2 = Medium-Low 1 = Low
Vulnerable Communities: Hospital = 5, Old Peoples Home = 4, School =3, High Buildings = 2 Low Buildings = 1

Known Hotspot	Supplying Catchment(s)	Method of Flooding	Pluvial Characteristics	Tidal Aspect	Notes	Vulnerable Communities	Population Density	Critical Infrastructure	Critical Road Networks
Nicholson Close	Grands Vaux	Overtopping, beaten infrastructure	Prolonged Rainfall (multiple heavy rain events)	Non-Tidal	Housing investigating stop logs (ref Feb 2010 event)	Risk: 3 School	Pop Density: 5	None	Restricted Access to affected area
Sandybrook	St Peters Valley, plus several tributaries in St. Peters Valley	Heavy Inundation, beaten infrastructure	Heavy Prolonged rainfall (1 x Heavy rain event)	Tidal	Would flood goose green on high tide, Sandybrook up to Tesson Mill	Risk: 4 Old peoples home	Pop Density: 4	JT Delivery Room Sandybrook S/s 374	Restricted Access to affected area
Millbrook	Waterworks Valley / Rue Du Trachy	Heavy Inundation, beaten infrastructure, Dual Catchments	Heavy Prolonged rainfall (1 x Heavy rain event)	Tidal	Harsco Hire Shop, Millbrook house	Risk: 1 Nothing Identified	Pop Density: 1-2	None	Closure of major artery (but Victoria Avenue still open)
Safeways	Valle Des Vaux	Beaten infrastructure	Prolonged Rainfall (multiple heavy rain events)	Non-Tidal	Lack of maintenance of private defenses	Risk 1	Pop Density: 3	Trinity Road S/s down the hill	Should not affect roads
Clos Lempriere	Samares	Catchment runoff, inadequate private infrastructure.	Heavy Prolonged rainfall	Non-Tidal	Wetland area.	Risk: 3 Housing Estate(s),	Pop Density: 3	Ernest Watson Close S/s 559 close by several other S/s by Le Marais	Housing Development(s) may be cut off.
St. Aubins	Mont Les Vaux and up Railway Walk	Catchment runoff, inadequate	Heavy Prolonged rainfall	Tidal	Still known to flood on high tides	Risk: 3 Parish Hall,	Pop Density:1	Gas Pressure Reduction Cabinet on	1 x Major Artery cut off.

		infrastructure. Now in Place Surface Water improvements, and impounding Pond(s) x 4			with heavy rainfall (Charing Cross Area)	Supermarket, St. Aubins Tunnel (Emergency Equipment)		Railway Walk opposite Cory Paints. St. Aubins Harbous S/s 601 nearby	

Pluvial \ Fluvial Flood Modeling:
Medium Risk Known Hot Spots: (Historic Hotspots Prior to Mitigation being put in place)

Population Density: 5 = High 4 = Medium-High 3 = Medium 2 = Medium-Low 1 = Low
Vulnerable Communities: Hospital = 5, Old Peoples Home = 4, School =3, High Buildings = 2 Low Buildings = 1

Known Hotspot	Supplying Catchment(s)	Method of Flooding	Pluvial Characteristics	Tidal Aspect	Notes	Vulnerable Communities	Population Density	Critical Infrastructure	Critical Road Networks
Gorey Village (Mid 1970's)	Queens Valley	Was due to Inadequate Infrastructure Now in place, Queens Valley could overtop but sewers and impounding should cope	1 x Heavy Short Duration rain events	Tidal	Queens Valley Reservoir Built 1993, RRB put in large sewers and impounding pond to mitigate	Risk: 4 Old Peoples Home	Pop Density: 5	Les Hoummets S/s 480 Gorey Village S/s 484 The Hamlet S/s 648 Potteries S/s 093 Le Rivage S/s 376	Village may be cut off
Le Bourg (La Rue Causie) Late 1960's early 1970's	Le Puits	Catchment runoff, inadequate infrastructure. Now in place, significant sewers in situ	Heavy Prolonged rainfall (1 x Heavy rain event)	Tidal		Risk: 1	Pop Density: 5	Crill Park S/s 575 Pontac S/s 337	Housing Development may be cut off.
St. Clements Church (Jambart	La Rue Laurens	Catchment runoff, inadequate infrastructure.	Heavy Prolonged rainfall (1 x Heavy rain	Non-Tidal	Clos Corvees and other lesser development	Risk: 1	Pop Density: 4	JT SDR by Caldwell Hall Jambart Lane	Housing Development(s) may be cut off.

Lane) 1970's		Now in place, significant sewers in situ	event)		added to population density			S/s 062	
Le Hocq 1970's	Le Rocquier	Catchment runoff, inadequate infrastructure. Now in place, impounding area and outfall	Heavy Prolonged rainfall (1 x Heavy rain event)	Tidal	Le Rocquier School built 1970's stream/culvert goes through school grounds	Risk: 3 School and Parish Hall.	Pop Density: 2-3	St. Clements School S/s 232 Le Rocquier School S/S 687 and 688 Priory Farm S/s 507	Road should be clear.
Rue Des Maupertuis	Samares	Catchment runoff, inadequate infrastructure. Now in Place Surface Water Infrastructure	Heavy Prolonged rainfall	Non-Tidal	Wetland area.	Risk: 1	Pop Density: 1	Samares S/s 018	No Issues
Georgetown 1970's	Urban, Fountain Lane	Catchment runoff, inadequate infrastructure. Now in Place Surface Water Infrastructure and Pumping Station and impounding pond	Heavy Prolonged rainfall (1 x Heavy rain event)	Tidal		Risk:1	Pop Density:5	Grasett Park S/s	2 x Critical Roads (Inner and Coast Roads) Housing Development(s) and East of Island may be cut off.
Rue Des Pres (Tennis Courts) 1970's	Urban, Swiss Valley, Radier Manor, Rue Des Pres Marsh	Catchment runoff, inadequate infrastructure. Now in Place Surface Water	Heavy Prolonged rainfall	Part - Tidal	Linked to Baudrette Surface Water Pumping Station. Rue Des Pres	Risk: 4	Pop Density:5	F.B. Fields S/s	1 x Critical Roads (Inner Road) Housing Development(s) may be cut off.

		Infrastructure and Pumping Station and impounding pond(s) x 4			major industrial hub affecting ability of continuity				
Town (long History)	Mont Millais, Wellington Hill, St. Saviours Hill, Grands Vaux, Valle Des Vaux	Urban and Catchment runoff, inadequate infrastructure. Now in Place Surface Water Infrastructure, Cavern and Pumping Station and impounding pond(s) x 3	Rain	Part-Tidal	See Town table for details	Risk: 5	Pop Density:5	Everything	Multiple Major Arteries cut off
First Tower (long history)	Bellozanne and Mont Cochon, Tower Road	Catchment runoff, inadequate infrastructure. Now in Place Surface Water improvements.	Heavy Prolonged rainfall	Tidal	STW / TTSd Bellozanne Site, pollution possibility (very remote)	Risk: 1	Pop Density:2	Not plotted on map	Major Arteries (Victoria Avenue and Inner Road) cut off.
Mont Huelin	Mont Huelin and St. Ouen	Inadequate Maintenance of Private Infrastructure	1 x Heavy rain event	Non-Tidal	Private, discharges to TTSd Flood Defense Works	Risk: 1	Pop Density: 1	L'Etacq S/s 035	No issues
Greve De Lecq	Le Mont De Ste Marie	Inadequate Maintenance of Private Infrastructure	Heavy Prolonged rainfall	Tidal	Private, discharges to TTSd Flood Defense Works	Risk: 1	Pop Density: 1	Greve De Lecq S/s 103 Plus cable to Guernsey	No issues
North Cote	Bouley Bay	Water Course Beaten.	Heavy Prolonged rainfall	Non-Tidal		Risk: 1	Pop Density: 1	None	No Issues

		Now in Place Surface Water improvements, TTSd maintain clearance							
Rozel	Cotes Du Nord	Inadequate Maintenance of Infrastructure	Heavy Prolonged rainfall	Non-Tidal	Several Agricultural Reservoirs in the Catchment	Risk: 1	Pop Density: 1	None	No Issues
Rozel Inn	Valle De Rozel	Inadequate Surface Drainage	Heavy Prolonged rainfall	Non-Tidal		Risk: 1	Pop Density: 1	None	No Issues
Amy's House (RNLI St. Catharine's)	St. Catherines Woods	Inadequate Maintenance of tide flap Now in place Ongoing Maintenance	Heavy Prolonged rainfall	Tidal	Le Maseline Reservoir in catchment.	Risk: 2	Pop Density: 1	RNLI Station	Potential cut off of access to St. Catherines Breakwater and the RNLI ILB Station.
Mont Des Landes	Mont Des Landes	Inadequate Surface Drainage Now in place surface water sewers and impounding pond.	Heavy Prolonged rainfall	Non-Tidal		Risk: 1	Pop Density: 1	None	No Issues

2010 Emergency Planning Flood Modelling

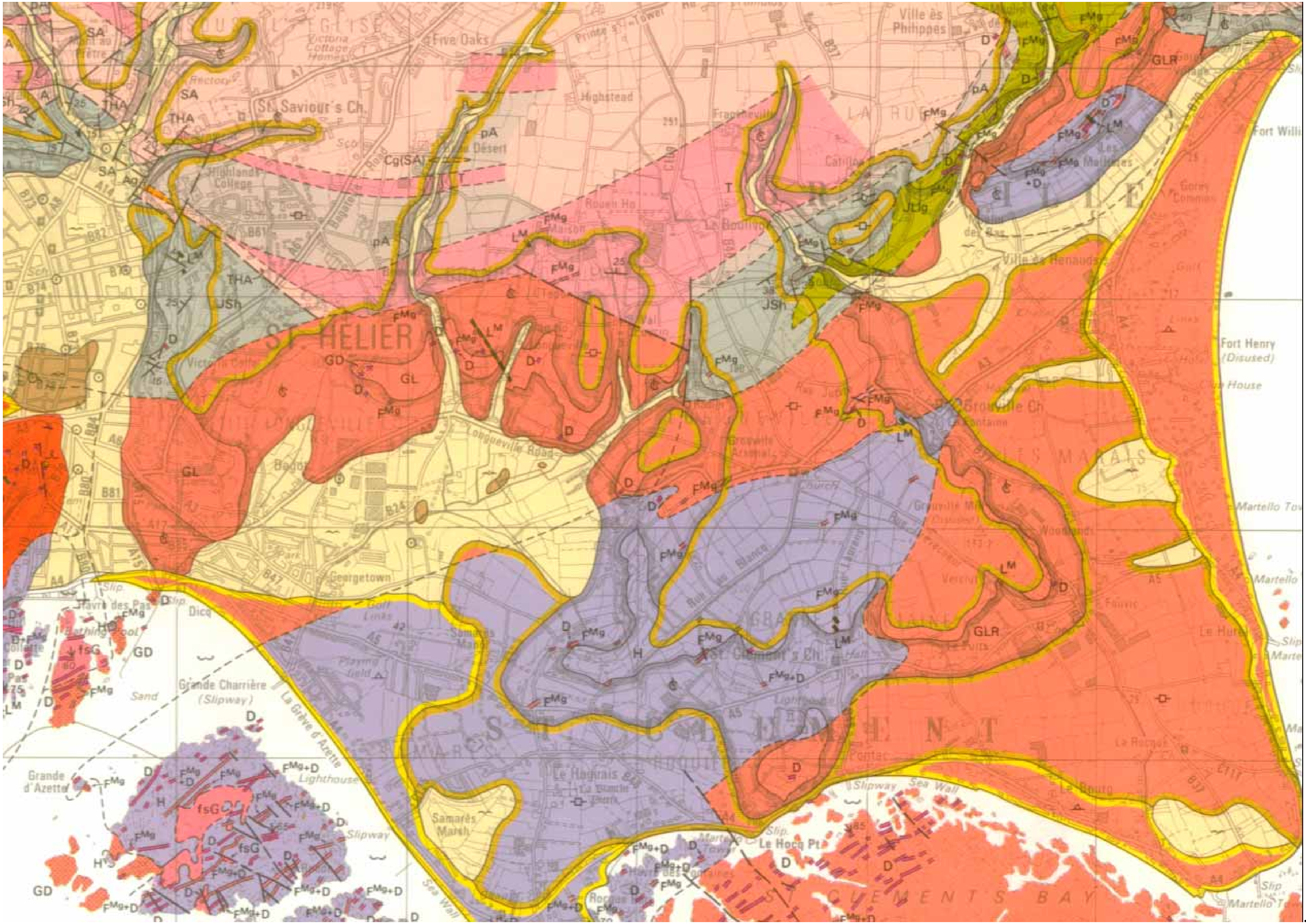
Key:

Coastal: **Magenta**

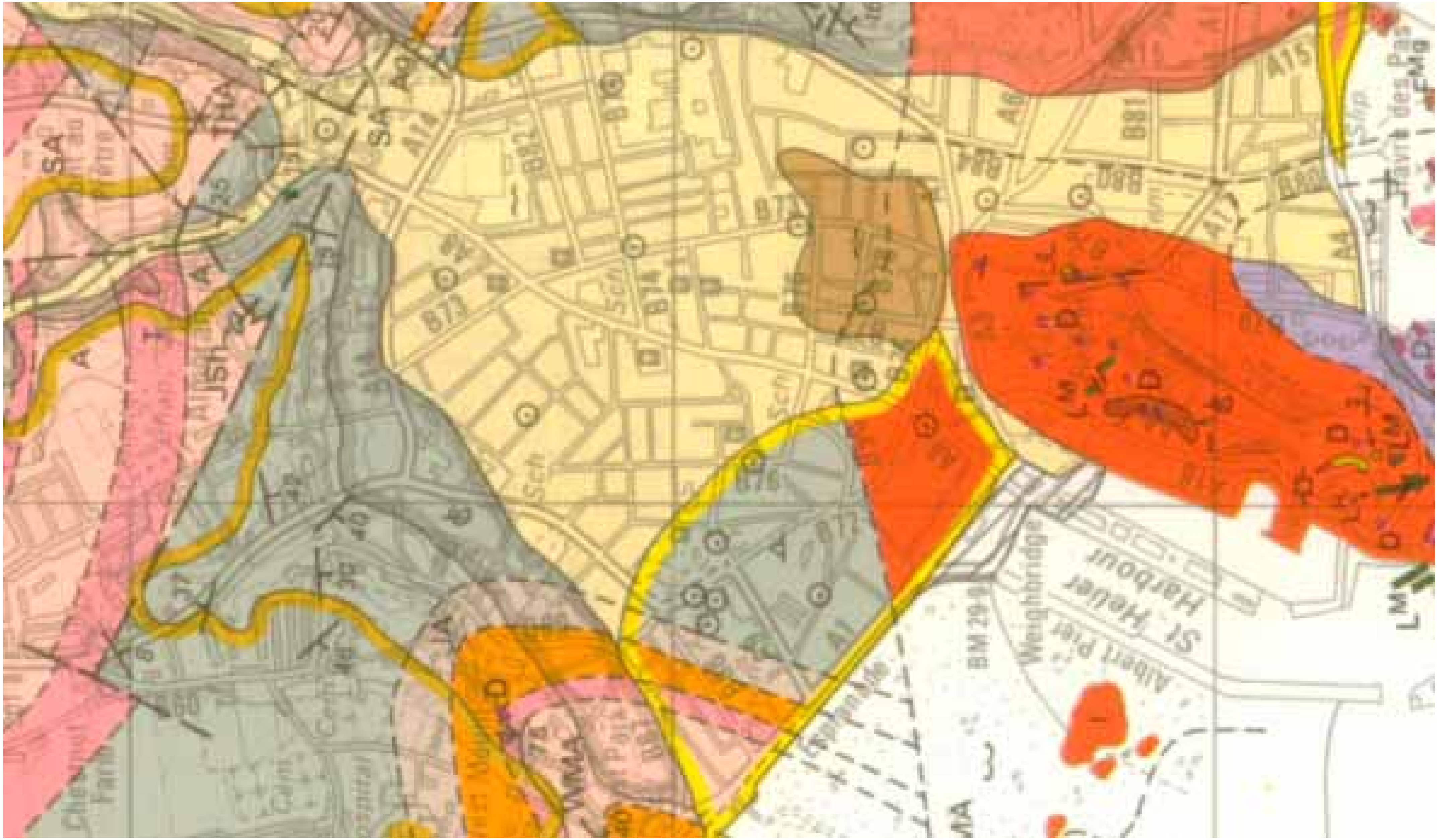
Pluvial/Fluvial Known Hotspots: **Blue**

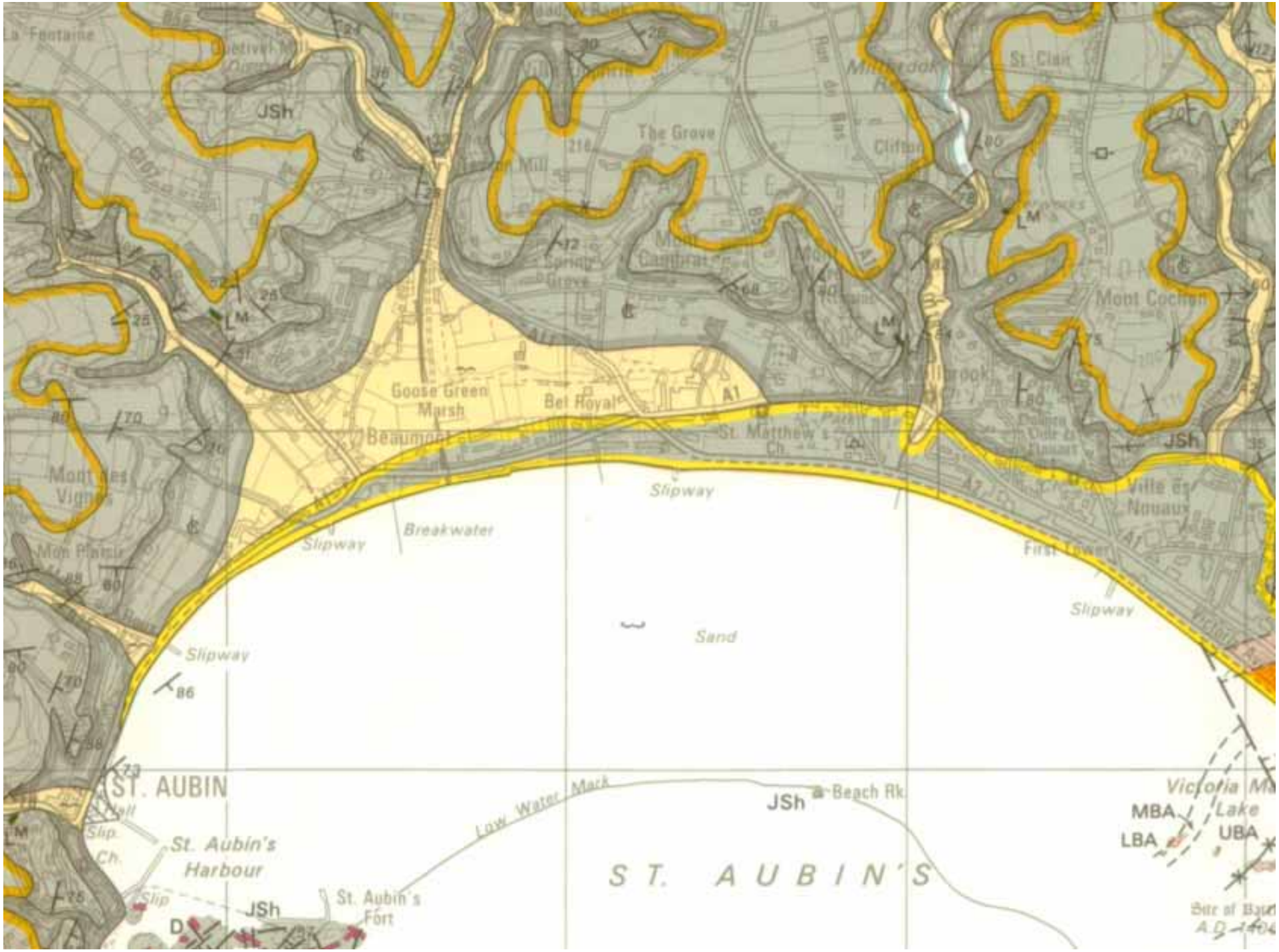
Pluvial/Fluvial Historic Incidents: **Green**

(Green circles indicate history but no further data)



Ville ès Philippes
Victoria Cottage Homes
Five Oaks
St. Saviour's Ch.
Highstead
Highlands College
Rouen Ho
ST. HELIER
Victoria College
Longueville Road
Georgetown
Havre des Pas
Dicq
Bathing Pool
Grande Charrière (Slipway)
Sand
La Grève d'Azette
Grande d'Azette
Lighthouse
Slipway
Golf Links
Playing Field
Samarès Marsh
Le Hocq Pt
St. Clement's Ch.
Grouville Arsenal
Grouville Mill (Disused)
Ville ès Renauds
Fort Henry (Disused)
Club House
Martello Tower
Le Hurel
La Rocque
Le Bourg
Sea Wall
ST. CLEMENT'S BAY


St Helier
Harbour
Albert Pier
Weighbridge


JSh
The Grove
Goose Green Marsh
Bel Royal
A1
St. Matthew's Ch.
Beaumont
Slipway
Breakwater
Slipway
Slipway
Slipway
Sand
ST. AUBIN
Low Water Mark
JSh
Beach Rk.
St. Aubin's Harbour
St. Aubin's Fort
JSh
S T. A U B I N ' S
MBA
LBA
Lake
UBA


Gorey
Harbour


St Catherine's
Bay