Minutes of the Multi Agency Flood Defence Meeting on Wednesday the 3rd of July 2013 in Lydney Town Council Chambers at 10.30am

PRESENT: Cllr Christine Jones, West Dean Parish Council
Dave Kent, Clerk to West Dean Parish Council
Robert Frankton, Lydney Park Estate
Peter Adams, Dean Forest Railway
Cllr Brian Pearman, Lydney NDP/Planning Committee Co-optee
Jayne Smailes, CEO Lydney Town Council
Dave Street, Lydney NDP
Martin Young, Environment Agency
Chris Johns, Forest of Dean District Council
Brian Watkins, Gloucestershire Highways

IN ATTENDANCE: Alison Crawshaw, NDP Admin Assistant (Minute Taker)

APOLOGIES: Cllr Bob Berryman (Mayor Lydney Town Council) Chris Bull (Dean Forest Railway), David Graham (Gloucestershire County Council)

1.	**WELCOME & INTRODUCTIONS** Cllr Brian Pearman chaired the meeting and welcomed everyone. Introductions were made around the table.	**ACTIONS**
2.	**NOTES OF LAST MEETING (10th April 2013)** Notes of the previous meeting were accepted as a true record. Point of Information - SUDS stands for Sustainable Urban Drainage System **[Item 4 was taken before Item 3 in the meeting but the minutes reflect the agenda order]**	
3.	**LYD MODELLING** Martin Young of The Environment Agency (EA) entered the meeting and gave an overview of the River Lyd modelling exercise that the EA had undertaken (Appendix One). The harbour has three lock gates and one tidal defence gate. The modelling exercise assessed the impact the gates would provide in preventing flooding. Consultants looked the effect they would get with a low tidal range (the most optimal level for the paddles to discharge). The results showed opening the sluice gates provided a 200mm improvement up to the boating lake, but beyond this any benefit would be marginal. Opening the gates initially relives a deluge of flood water but then after the initial easing no further benefit is gained. In a flood	

	scenario 60 tonnes a second of water comes down the River Lyd. The Upper Forge and New Mills modelling exercise was taken as the impact of the harbour gates affecting these areas. The flow coming from West Dean area had not been taken into consideration in this modelling exercise. Martin Young will look into previous schemes to see what elements had been taken into consideration.	**MARTIN YOUNG**
	Martin Young will add the lock numbers to the map in order to aid the equipment identification process.	**MARTIN YOUNG**
	New options need to be sought to deal with the capacity of water and it would be prudent to budget any costs this will occur over a five year period. The EA can provide an options appraisal which would seek to provide engineers options to improve the River Lyd's flooding risk.	
	EA gets funded from Government via DEFRA and there is money available for flood defences. FoDCC did apply for flood defence aid previously and Chris Johns will forward the priority number to LTC and also confirm Lydney's Flood Risk status.	**CHRIS JOHNS**
	All areas affected by the River Lyd should be included in discussions eg. Parkend and the extended water courses adjoining the River Lyd.	
	Internal water above damp proof course is classed as flooding but it is not clear if sewage coming back into house is classed as flooding. Martin Young to confirm on this as will increase Lydney's numbers of houses at risk.	**MARTIN YOUNG**
	Chris Johns has understood the trench clearing at rear of Lakeside has been completed by MMC Development, but Chris Johns will check and if they have not he will contact them and if needed, he will serve an Enforcement Notice.	**CHRIS JOHNS**
	It was agreed that voluntary work groups will be assembled (if possible) to clear the upper reaches of the water course. As riparian owners, land owners who have blocked water course they will be asked to clear it. If this is not done in a timely fashion, photos of the obstructions should be taken and enforcement notices sent suggested Peter Adams. Chris Johns stated FoDDC has money available to help with assembling voluntary groups/aid with clearance operation.	**LTC**

	Action Points from last meeting still outstanding:- - Chris Johns to follow up on whether the use of grey water is part of planning considerations at FoDDC for the future. - It is not possible to draw up myth buster plan until plan is known - FoDDC to establish when culverts last cleared/monitored. Brian Watkins to follow up re GCC - FoDDC to establish engineering costs once plan established.	**CHRIS JOHNS** **FoDDC** **BRIAN WATKINS** **FoDDC**
4.	**LYD MAP & RIPARIAN OWNERSHIP** Lydney Town Council had produced a map of the River Lyd watercourse from Whitecross to Lydney docks which was displayed in the meeting. The meeting studied the maps and added riparian ownership details where possible. Peter Adams, Dean Forest Railway and Robert Frankton, Lydney Park Estate will forward more detailed maps of their riparian ownership to Lydney Town Council. The maps will be re-drafted with the addition of the aforementioned details and Lydney Park Estate and Dean Forest Railway will be asked to re-check the maps before they are laminated Jayne Smailes to check how much PEAR charge for maps so that West Dean can consider purchasing. Request to LTC add to system flow.	**PETER ADAMS** **ROBERT FRANKTON** **LTC** **JAYNE SMAILES**
5.	**SEVERN ESTUARY FLOOD RISK MANAGEMENT STRATEGY CONSULTATION** Gloucestershire County Council is consulting on the DRAFT Local Flood Risk Management Strategy (known as the 'Local Strategy'), which sets out the plans for managing local flood risk. The consultation close on the 12th of August 2013. Lydney has not been included in the priority list of areas to be included in the Local Strategy. GCC to be requiested to provide reasoning/figures.	
6.	**ACTIONS:** - Invite Severn Trent Water, Forest Commission and Lynbrook Parish Council to the next meeting - Peter Adams, Dean Forest Railway and Robert	

	Frankton, Lydney Park Estate will forward more detailed maps of their riparian ownership to LTC. - Brian Watkins to confirm when culverts last cleared - Chris Johns to follow up on whether grey water will form part of future planning considerations at FoDDC - Chris Johns to check MMC Development; has watercourse been cleared? - LTC to re-draft River Lyd maps with riparian ownership included once aforementioned info has been received. - voluntary work groups will be assembled to clear the upper reaches of the water course. - Martin Young to confirm if sewage coming back into house is classed as flooding - Chris Johns will confirm the priority/list number that FoDDC Flood Defence Aid application and confirm Lydney's Flood Risk status. - Martin Young to identify the lock numbers at Lydney Docks onto a map and send to LTC - Martin Young to research previous schemes/assessments to confirm which water courses have been taken into consideration. - GCC to provide reasoning's/figures re: Severn Estuary Flood Risk Management Risk	
7.	**DATE OF NEXT MEETING** Wednesday 11th September 2013 at 10.30am in Lydney Town Council Chambers.	

Appendix One

Lydney Locks Assessment
Briefing Note

To: Martin Young, Environment Agency
From: Jane Tingay, Capita Symonds
Date: 24th April 2013
Re: Lydney Locks Assessment

Capita Symonds were commissioned by the Environment Agency to assess whether opening the sluice gates at Lydney Locks would provide a reduction in flood risk to properties adjacent to the Boating Lake in Lyndey, Gloucestershire.

This assessment has been completed using the existing River Lyd ESTRY TUFLOW model. Model version lyd_10m_4m_def_100F_MeadLane_defended_CTC_9.35m.tcf has been adopted which includes the Mead Lane Defence set at a level of 9.35mAOD.

A review of the existing model shows that the following method has been used to represent the structures at the entrance:

1. Flood gate upstream of the lock - The gate has been modelled using a culvert unit, the height and width of the culvert have been defined by the channel dimensions at the gate. The culvert only allows flow from upstream to downstream (unidirectional). A blockage factor of 90% has been applied to the culvert which means that the flow area of the culvert has been reduce.

2. Lock gates 2 & 3 – The lock has been modelled using a culvert unit which is set to only allow flow from downstream to upstream. Consequently no water is able to flow out of the system (from upstream to downstream) essentially modelling the locks as closed.

3. Outer tide gate - has been modelled the same way as Lock Gates 2 & 3. Flow over each of the locks is modelled using weirs; the flood gate weir height is at 10.25mAOD and with the lock gates 2 & 3and tidal gate at 7.3mAOD.

The representation of the structures has been checked against drawings provided by the Environment Agency. Extracts of these drawings are shown in Figure 1a and 1b. These drawings were also used for determining dimensions for this assessment (as detailed below).

Figure 1a – Location Plan (extract from Lydney Harbour Operation and Maintenance Manual, pg 3.6)

Figure 1b – Location Plan (extract from Lydney Harbour Operation and Maintenance Manual, pg 3.7)

For this assessment the following gate configuration was used:

1. Flood gate upstream of the lock – The blockage factor was removed; consequently the flood gate was modelled as completely open.

2. Lock gates 2 & 3 – The unidirectional element has been removed allowing water to flow in both directions allow passage of flow in both directions. The dimension of the culvert was modified to represent the sluice gates (2 openings of 0.9m by 0.5m, these dimensions have been extracted from the drawings).

3. Outer tide gate open – The unidirectional element has been removed allowing water to allow passage of flow in both directions and representing the gate as completely open.

In addition to the lock sluice gates there is an outfall from the canal basin to the River Severn located on the right bank upstream of the flood gate. In the adopted model this is represented by a 10m wide weir at a level of approximately 7.2mAOD which spills into a rectangular culvert (1.49m high by 4m wide). The culvert is modelled as 90% blocked within the existing model. An additional simulation has been completed to assess if removing the blockage from the outfall in conjunction with the sluices would reduce the flood risk at the Boating Lake properties.

The assessment has been completed for a fluvial 100yr flood event with a nominal downstream boundary water level applied to the model such that flow leaving the Lyd is not restricted. Two downstream boundaries have been considered to assess the sensitivity of the flow through the sluices to the downstream boundary water level. An approximate MHWN tidal curve (peak level of 4.0mAOD) and also fixed level of 0.0mAOD have been modelled however both boundaries provide very similar results upstream of the locks.

The existing model assumes an initial water level of 7.17mAOD within the canal upstream of the locks and a River Severn tidal water level set within the outer harbour and at the downstream boundary.

Flow is able to weir over of the locks at a level 7.3mAOD hence there is very little flood storage within the canal at the beginning of the model simulation in the existing modelled scenarios. To assess if there is any potential benefit to the upstream

properties in reducing the canal water level prior to a flood event an additional simulation was completed assuming a zero initial water level within the canal basin (this assumed water level is lower than would be feasible, but provides an indication whether any flood risk benefit could be achieved by draining the canal prior at a flood).

The following conclusions have been found through this assessment:

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Opening the sluices lowers the peak water level experienced in the canal upstream of the locks by approximately 200mm, reducing the modelled flood extent downstream of the A48.

However the properties adjacent to the boating lake (upstream of the A48) do not experience any significant benefit, there is a predicated decrease in the water level by <0.02m, that does not change the flood extent.

Lydney Locks Assessment

Briefing Note

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Approx. 21m3/s of flow reaches the locks at peak during the 100yr event; with the sluices open 7m3/s passes through the sluices, the remaining 14m3/s is shown to weir over the lock (flow is able to weir over the lock gates at a level of 7.3mAOD).

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The flow reaching the locks is approx. 1/3 of the total flow past the A48.

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Removal of the blockage from the side culvert would further decrease the water level experienced upstream of the locks (approx. 450mm) but again this will not significantly benefit properties upstream of the A48 (water level decrease >0.04m).

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Lowering the IWL in the canal shows no impact during the 100yr event simulation as the available storage is used up prior to the peak of the event.

Environment Agency actions from the Lydney Town Council meeting of 10 April 2013.
Prepared by Martin Young

The existing flood risk for the properties adjacent to the boating lake is less than a 1% chance of occurrence in any one year and this is borne out by the existing hydraulic model. This risk is for internal property flooding and does not account for gardens flooding.

The EA agreed to get an external consultant to use this model to identify any additional benefits that could be gained by operating the harbour differently. In particular to test the value of opening the sluice paddles contained within each lock gate. The consultant went further than this and tested the improvement gained by completely opening the lock gates. Neither of these actions produced any meaningful improvement. The maximum gain on the 100 year flood was 2 centimetres on water already over 100 centimetres deep at Lakeside Gardens.

I have attached a copy of the consultant, Capita Symonds, report for circulation prior to the July town council meeting and have provided an explanation it.

Test scenario

The scenario given to the consultants to work to was to test the value in flood risk reduction of opening the sluice paddles that are built into all of the harbour lock gates. They were also instructed to set other variables to give the most favourable operating conditions to this arrangement. This included applying a low tidal range so as to ensure the best discharge that the sluices could achieve to be simulated.

Report explanation

The Capita Symonds report sets out how our existing mathematical model has been used to examine the operation of the sluice paddles contained within the lock gates at the Harbour. The model had been updated to include the new flood alleviation scheme at Mead Lane. They reviewed the model and explain how blockages and assumptions about the lock gates and tidal gate used to model the worst case scenario for Mead Lane scheme were removed. This was done to give the best case for operating the sluice paddles. They also applied favourable tidal data such that this would not restrict the discharge from the sluices.

They ran the model with the lock gates open and the basin drained to see if draining down prior to the arrival of a flood flow would reduce the flood risk upstream.

They concluded that under the modelled conditions

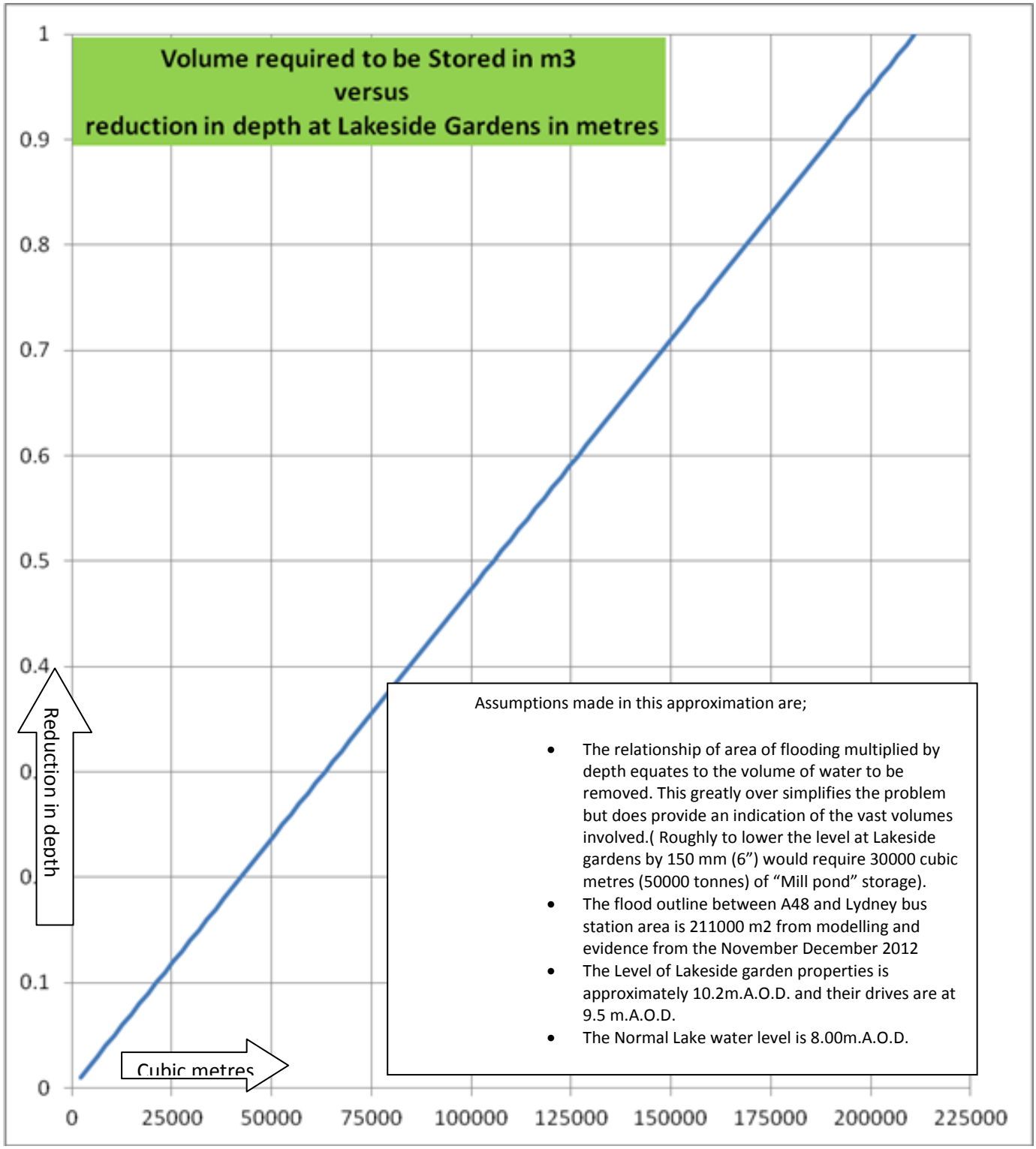
- Making optimistic assumptions about the pre-existing state of the river and tide the effects of opening the sluices would only reduce the level by a maximum of 2 centimetres at the boating lake. There would be no change to the extent of the flood outline.
- Of the flood flow passing the A48 road 2/3rds passes to the Severn through the side weir and its culvert. The remaining 1/3rd passes through the lock gate system.
- Of the 1/3rd passing through the locks 14m3/sec goes over the top and 7m3/sec flows through the sluice paddles.
  (The above two points identify the fairly insignificant amount that passes through the sluices even given all the advantageous conditions that have been applied. Only a maximum possible 7 out of a total of 63 m3/sec could be passed through the sluices)

- Removing the assumption contained in the previous modelling that the overflow weirs' culvert is 90 % blocked has a 4 centimetre improvement on water levels at the boating lake. In practice this culvert is routinely inspected and debris likely to cause a blockage is removed. The entrance to the weir and culvert s has also protected by a floating barrier which catches debris and prevents blockages forming.
- Fully opening the lock gates and draining down the impounded section upstream of the harbour prior to the arrival of flood flows to provide in channel storage capacity has no benefit. This is because the additional storage this provides is filled up before the flood peak flow arrives.

Other actions

- PUBLIC EDUCATION
  Also to help with the suggested plan to raise residents' awareness of flood risk and their responsibilities as owners of riverside properties I have included an electronic copy of a booklet prepared by the EA (Living on the Edge).

- With respect to FODDC request to investigate increasing upstream flood storage by excavating the ponds at Upper Forge Mill and New Mills. An approximation of the excavation volumes required has been made. This uses the modelled flood outlines and photographic evidence from recent events. This provides an indication to the volume of storage required and the scale of the proposition. To illustrate the scale of the proposition to store water at the peak of the 100 year hydrograph for the river Lyd the flow is greater than 60 cubic metres of water per second.
  (The attached graph shows the volume of storage necessary to produce a reduction in the water level at Lakeside).



Y axis in metres X axis in metres cubed.