MERTHYR TYDFIL
County Borough Council
Cyngor Bwrdeistref Sirol
MERTHYR TUDFUL

MTCBC Flood Risk Management Plan Summary

December 2015

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FLOOD RISK MANAGEMENT PLAN SUMMARY

Purpose of Flood Risk Management Plans in Managing Flood Risk

What is a Flood Risk Management Plan (FRMP)

Flooding remains a key threat to communities across Wales and managing this risk through careful planning is important to minimise the risk to communities. Flood risk management planning allows Lead Local Flood Authorities (LLFAs) to develop a better understanding of risk from all sources of flooding and agree priorities to manage that risk.
This FRMP has been developed with this in mind and sets out how Merthyr Tydfil County Borough Council (MTCBC) will, over the next 6 years, manage flood risk in the communities most at risk and to maximise the environment benefit. In doing so, this FRMP takes forward the objectives and actions set out in our Local Flood Risk Management Strategy (LFRMS).

This FRMP also aims to achieve some of the objectives set out in the Welsh Government's National Flood and Coastal Erosion Risk Management Strategy, which provides the national framework for flood and coastal erosion risk management in Wales through four overarching objectives:

- Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion.

- Raising awareness of and engaging people in the response to flood and coastal erosion risk.

- Providing an effective and sustained response to flood and coastal erosion events.

- Prioritising investment in the most at risk communities

What is included in this FRMP

The information included in MTCBC FRMP includes the components set out in the Flood Risk Regulations 2009. Most of this information has been gathered and updated through this first cycle, and has been drawn from the findings of our Preliminary Flood Risk Assessment (PFRA) and the objectives and measures we identified and set out in our LFRMS.

This FRMP sets out appropriate objectives for the management of flood risk within the areas covered by the plan. The objectives focus on reducing the adverse consequences of flooding for human health, the environment, cultural heritage and economic activity.

To do so, the FRMP highlights the areas most at risk from flooding by surface water and ordinary watercourse in MTCBC. It draws conclusions from these risks and sets out the measures we will take over the next six years to mitigate these risks and make our communities more resilient.

Due to the nature of flooding and current funding situation, we have also looked at measures to reduce the likelihood of flooding using non-structural measures and covering all aspects of flood risk management, including raising awareness of flooding and better understanding of local flooding issues. All the measures identified in this plan have been classed in four categories:

- Prevention
- Protection
- Preparedness
- Recovery and Review

Legislative Context

Flood Risk Regulations 2009

Under the Flood Risk Regulations 2009 (The Regulations), LLFAs are responsible for producing FRMPs for Flood Risk Areas that were identified in the Preliminary Flood Risk Assessments.

Natural Resources Wales (NRW) is responsible for producing FRMPs at a river basin district level for communities at risk of flooding from main rivers and the sea. LLFAs are required to produce local FRMPs to manage flood risk from surface water, ground water and ordinary watercourses.

The Regulations set out a six year cycle with timescales for the publication of 3 key outputs as listed below:

- Preliminary Flood Risk Assessment - Dec 2011 – complete
- Hazard and Risks Maps Dec – 2012 – complete
- Flood Risk Management Plans - Dec 2015

Following the publication of the FRMP in December 2015 the second iteration of the six year cycle will commence in 2016.

Preliminary Flood Risk Assessment (PFRA)

The PFRA is a high level screening exercise that compiled information on significant local flood risk from past and predicted future floods, based on readily available information. The scope of the PFRA was to consider flooding from surface runoff, ground water and ordinary watercourses, and any interaction these sources have with main rivers with the aim of identifying flood risk areas as set out under the European Flood Directives.

Production of flood hazard and flood risk maps for Flood Risk Areas

In 2013 the Environment Agency, working with NRW and LLFAs, produced the updated Flood Map for Surface Water.
The updated map represents a significant improvement on the previous surface water flood maps, both in terms of method and representation of the risk of flooding.

Flood and Water Management Act

The Flood and Water Management Act was introduced in April 2010 in England and Wales. It was intended to implement Sir Michael Pitt's recommendations following the widespread flooding of 2007. The act was also intended to clarify roles and responsibilities between Risk Management Authorities (RMAs).

Under the Act, the Welsh Government was required to produce a National Strategy for Flood and Coastal Erosion Risk Management, and MTCBC to produce a Local Flood Risk Management Strategy (LFRMS) which was completed and published in June 2013.

Water Framework Directive (WFD)

The Water Framework Directive 2000 is a European Union directive which commits member states to achieve good qualitative and quantitative status of all water bodies by 2015.

One of the requirements of the WFD is that Natural Resources Wales and the Environment Agency must produce and update a River Basin Management Plan for each district. MTCBC lies within the catchment for the River Severn and is included in the South East Valleys Management Catchment.

There is also a requirement for consultation between NRW and the EA and the LLFAs as the Flood Risk Management Plans and the River Basin Management Plans are developed.

Study Area

Administrative Area

Merthyr Tydfil County Borough Council (MTCBC) is a Unitary Authority situated within the valleys of South East Wales. The census of 2011 showed the population of MTCBC as 58,802 and the number of residential properties as 26,245. For the purpose of this FRMP, however, in order to comply with the requirements of the EA and NRW, we are using the National Receptor Database (NRD) with an average occupancy of 2.35 people per dwelling. The NRD lists 26,185 properties within MTCBC and using the multiplier of 2.35 this gives an estimated population of 61,534.

The Borough has an area of 11,189 hectares which is a mix of rural and urban land where the communities are generally built on the steeply sloping hillsides or within the valley basins.

List of features used in counts to assess flood risk

Natural Resources Wales and The Environment Agency produced a document "Flood Risk Maps – Risk of Flooding from Surface Water – Severn River Basin District" in which they provided details of the features to be considered when studying flood risk from surface water and ordinary watercourses.

The features have been divided into three categories namely Risk to People, Risk to Economic Activity and Risk to Natural and Historic Environment.

River Catchments within MTCBC

Surface water from the upper reaches of the catchment drains into the Taf Fawr to the west and the Taf Fechan to the east. The confluence of the two rivers is at Cefn Coed-y-cymmer and below that point the river is referred to as the Afon Taf.

The south eastern sector of the catchment drains into the Bargod Taf which joins the Afon Taf at Quakers Yard.

There are two main reservoirs located partly within MTCBC. The eastern half of the Llwyn Onn Reservoir lies on the Taf Fawr in the north west of the catchment and the Pontsticill Reservoir is fed by the Taf Fechan in the north east.

Flood Risk in MTCBC

Summary of types of flood risk present in MTCBC

Local flood risk is defined within the Act as being a flood risk from:

- Ordinary watercourses – all watercourses that are not designated Main River, and which are the responsibility of Local Authorities
- Surface runoff - rainfall or other precipitation which is on the surface or ground and has not entered a watercourse, drainage system or public sewer.
- Ground water - water that has percolated into the ground and may form underground ponds or streams, which may discharge above ground but lower down the catchment.
- The interface between main rivers and surface water flows.

Catchment Characteristics

The terrain within MTCBC is typical of all the valleys of South East Wales. The catchments consist of steep hillsides, which are generally formed of impermeable clay based material overlaying various rock strata with steep fast flowing rivers in the valley floor. This combination of characteristics leads to the catchments being very “flashy”, meaning that runoff from storms is almost instantaneous giving rise to high peak flows which generally subside very quickly in a time scale of minutes rather than hours or days. This is particularly relevant to surface water runoff and ordinary watercourses.

NRW has a supervisory duty on Main River Watercourses e.g. Afon Taf, under the requirements of the Water Resources Act 1991. Whilst main rivers tend to be larger and have greater catchment areas than the ordinary watercourses, within MTCBC they still respond rapidly to rainfall taking hours to achieve peak flows as opposed to days.

Flooding with MTCBC occurs through the various mechanisms as listed below:

- Groundwater
- Surface Water Runoff
- Highway Drainage
- Ordinary Watercourses
- Channels
- Combined Sewers
- River Flooding

Preliminary Flood Risk Assessment

The Preliminary Flood Risk Assessment (PFRA) process was carried out in order to establish the level of flood risk within each LLFA area. The process looked specifically at flooding from surface water, ground water and ordinary watercourses and the interface with flooding from main river. Main river flooding, however, still remains the responsibility of NRW.

In order to have a consistency of approach, the Department for the Environment Food and Rural Affairs (DEFRA) and the Welsh Government (WG) identified a number of key risk indicators and their thresholds to establish significant risk and to determine the existence of Flood Risk Areas.

The methodology was based on using the flood maps produced by the EA to identify 1km squares where flood risk exceeds a defined threshold. These squares are known as areas above Flood Risk Threshold (Blue Squares). The key flood risk indicators and their thresholds for a 1km square were set as follows:-

- a minimum of 200 people
- a minimum of 20 businesses
- 2 or more critical services

A cluster of blue squares is an indication that an area of concentrated flood risk has been identified. Where there are four or more touching blue squares within a 3km x 3km square the whole 3km x 3km square was considered as an area which could form part of an indicative Flood Risk Area.

The key flood risk indicator for establishing an indicative Flood Risk Area was set as - numbers of people at risk of being affected by flooding exceeding 5,000.

On the basis of the 22 blue squares identified by MTCBC, and the methodology defined above, MTCBC have identified a Flood Risk Area of 58 km^2. Only 20 of the blue squares within the MTCBC are located within the indicative Flood Risk Area

The Key Flood Risk Indicators for the MTCBC Flood Risk Area have been calculated as follows:-

Human health consequences	
Number of people (2.23 multiplier)	7,923
Other human health consequences	
Number of critical services flooded	26
Economic consequences – number of non-residential properties flooded	818

.
As part of the Preliminary Flood Risk Assessment process significant past flooding events within the borough were also considered.

To decide on the significance of an individual flood DEFRA, WG and NRW set key flood risk indicator which define a Flood Risk Area in Wales as having 5,000 people at risk or an individual 1km square where at least 200 people or 20 businesses or more than 1 critical service might be flooded to a depth of 0.3 metres and above by a rainfall event with a chance of 1 in 200 of occurring in any given year.

MTCBC as a LLFA has set the key flood risk indicator of people at risk of flood at a threshold of 200 (equivalent to 85 properties) to decide if a flood is of local significance.

A flood event of this magnitude is at least one level of consequence down from the national threshold but still represents a flood of considerable magnitude. Such a flood could occur at a very intense localised area such as a 1km square or cover the whole of the borough in a less intense rainfall event.

Two flood events were listed as being locally significant within Merthyr Tydfil County Borough Council. These were identified from reports prepared following major floods. The two floods are:-

- 4th December 1960 - Flooding covering the whole of the borough in which a total of 90 residential properties were flooded plus other commercial properties.
- 26th – 27th December 1979 - A total of 189 residential properties were flooded within Pentrebach, Troedyrhiw and Rhydycar plus a number of commercial properties. There were two fatalities as a result of a culvert collapse in Rhydycar.

Conclusions drawn from the Flood Risk Maps at a Borough Wide Level

Background

Production of flood data and maps

Under Part 3 of the Flood Risk Regulations 2009 (FRR 2009) Natural Resources Wales has the duty to prepare for each flood risk area, flood hazard and flood risk maps related to the risk of flooding from the sea, main rivers and reservoirs while Lead Local Flood Authorities (LLFAs), have the duty to prepare flood hazard and flood risk maps related to surface water flooding for the flood risk areas identified in the PFRAs.

Updated Flood Maps for Surface Water:

The information in the maps

The updated Flood Map for Surface Water assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year (annual probability of flooding is shown in brackets):

- 1 in 30 (3.3%)
- 1 in 100 (1%)
- 1 in 1000 (0.1%)

It provides the following data for each flooding scenario:

- Extent – The total extent of land affected.
- Depth – The depth of flood water.
- Velocity – The velocity of flood water.
- Hazard - a function of depth and velocity.
- Hazard rating = depth x (velocity + 0.5) + debris factor)
- Flow direction (2m) - Directional flow of flood water using a 2m grid.
- Flow direction (25m) - Directional flow of flood water using a 25m grid.

The risk maps have been generated from the updated Flood Map for Surface Water (uFMfSW) and the National Receptor Dataset (NRD). There are three types of map showing what is at risk of flooding:-

- Risk to People.
- Risk to Economic Activity.
- Risk to Natural and Historic Environment.

All three of these maps have been taken into account in the preparation of this FRMP.

Surface water flood map data

For the purpose of this Flood Risk Management Plan (FRMP), the Extent map has been used. The extent map is a combination of depth, hazard and velocity which is deemed to demonstrate most accurately, the potential extent of flooding for each rainfall event; 1 in 30 (High), 1 in 100 (Medium), and 1 in 1000 (Low).

For any one probability there are three sets of raw model outputs: the 1, 3 and 6 hour rainfall durations. Three sets of raw data for each rainfall event were combined to give a 'critical storm duration' dataset. The critical storm duration data was then processed to remove:

- Lowest hazard: anywhere with a hazard rating less than 0.575 (equivalent to 150mm of still water, 100mm of water at around 0.5m/s, 50mm of water at 2m/s)
- Flooded areas of less than $100m^{2.}$
- Islands of dry areas surrounded by water less than $50m^{2.}$

This process was repeated for the 1 in 30, 1 in 100 and 1 in 1000 year events, and the three extents published together to show areas at high, medium and low risk of flooding.

Counts

The MTCBC counts were generated in accordance with the revised EA methodology using data from a variety of sources.

Counts included in this FRMP

All counts were generated using GIS software, a combination of the surface water flood maps and reference data. Each category includes a count for 3 flood risk scenarios; P30 (High), P100 (MEDIUM) and P1000 (Low).

Risk to people and properties

- Number of people in areas at risk of flooding; depth => 0mm and => 50% wetted perimeter. (number)
- Number of residential properties at risk of internal flooding; depth => 200mm and => 50% wetted perimeter. (number)
- Number of services in areas at risk of flooding; depth => 0mm and =>50% wetted perimeter. (number)

Risk to economic activity

- Non-residential properties in areas at risk of flooding; depth => 0mm and => 50% wetted perimeter. (number)
- Airports (number)
- Primary/Trunk Roads (length)
- Main Line Railways (length)
- Agricultural land – Grades 1, 2 and 3 (Area)

Risk to Natural and Historic Environment

- Bathing Waters. (number)
- Environmental Permitting Regulations (EPR) Installations. (number)
- Special Areas of Conservation (SAC). (Area)
- Special Protection Areas (SPA). (Area)
- Ramsar Sites. (Area)
- World Heritage Sites. (Area)

- Sites of Special Scientific Interest (SSSI). (Area)
- Parks and Gardens. (Area)
- Scheduled Ancient Monuments. (Area)
- Listed Buildings (Number)
- Licensed Abstractions (LA). (Number)
- Sites of Interest for Nature Conservation (SINC). (Area)

Measure Counts

MTCBC conducted a series of counts in order to quantify the potential reduction in flood risk as a result of implementing specific measures.

Counts were conducted by identifying areas susceptible to flood risk then calculating the numbers of residential, commercial and critical properties directly affected by a P30, P100 and P1000 rainfall event using depth => zero and =>50% wetted perimeter as the search criteria.

These counts will be used to prioritize the implementation of the measures identified in this FRMP.

Community areas most at risk from surface water flooding within MTCBC

For the purpose of flood risk analysis, MTCBC has been divided into fifteen Community Areas as listed below. Eleven of the Community Areas are within the Flood Risk Area and details of the flood risk area.

Community Areas have been based on Ward boundaries but in order to identify the flood risk more precisely, some of the wards have been divided into smaller Community Areas as follows:

- Cyfarthfa Ward becomes the two Community Areas of Gellideg and Heolgerrig.
- Merthyr Vale Ward becomes the two Community Areas of Aberfan and Merthyr Vale.
- Plymouth Ward becomes the three Community Areas of Abercanaid, Troedyrhiw and Pentrebach.
- Vaynor Ward becomes the two Community Areas of Vaynor and Cefn Coed-y-cymmer.
- In addition the three wards of Gurnos, Park and Penydarren have been combined to form one Community Area of Merthyr (North) and the Town Ward has been renamed Merthyr (South).

How we currently manage flood risk in MTCBC

Procedures, Measures and Powers

Flood risk in MTCBC is managed through:-

- Operational procedures which have been developed over years through good custom and practice.
- Measures which were included in the Local Flood Risk Management Strategy.
- Powers given to all LLFAs through the Flood and Water Management Act 2010 and the Land Drainage Acts 1991 and 1994.
- As MTCBC is also the Highways Authority there are Powers under the Highways Act 1980.

Operational Procedures

The main operational procedures used to manage flood risk in MTCBC are listed below

- Routine cleaning of gullies on a rota system.
- Emergency cleaning of blocked gullies which have been notified to MTCBC Highways Department by members of the public.
- Routine inspection and cleansing of intake grids to culverts and critical watercourses on a rota system.
- Emergency inspection and clearance of critical grids prior to and during periods of intense rainfall.
- Emergency cleansing of grids which have been notified to MTCBC Drainage Department by members of the public.

Measures contained within the LFRMS.

Measures contained within the LFRMS which are currently being used by MTCBC to manage and reduce flood risk are listed below and the detailed measures have been included in the in Appendix 2 of this report.

The measures include the following:

- Sustainable and Strategic Development Planning
- Strategic Flood Risk Assessment (SFRA) / Strategic Flood Consequences Assessment (SFCA)
- Relocation
- Sustainable Drainage
- Flood Awareness
- Flood Warning
- Flood Forecasting
- Emergency Response Plans
- Community Flood Plans
- Land Management
- Resilience
- Resistance
- Restoration
- Environmental Enhancements
- System Asset Management Plans
- Defence/Structure Management
- Channel Construction and Maintenance
- Culvert Construction and Maintenance
- Investigation
- Local Property-level Flood Mitigation – Resilience
- Local Property-level Flood Mitigation – Resistance

How we prioritise our work

In order to satisfy the requirements of the National FCERM Strategy including their four overarching objectives a total of 17 detailed objectives were included in the MTCBC Local Flood Risk Management Strategy.

A total of 39 measures were included in the Strategy in order to implement the detailed objectives.

An Action plan was also included to prioritise the order in which the measures should be considered for implementation.

Who we work with to manage flood risk in MTCBC

The guidance provided by Welsh government for the development of the LFRMS included a list of the Flood Risk Management Authorities.

All of these organisations have been contacted as part of the consultation for this FRMP.

The Risk Management Authorities

Natural Resources Wales – including the former bodies

Lead Local Flood Authority in Wales
Those abutting MTCBC
Those authorities in the SEWFRMG

Water Company - Dŵr Cymru – Welsh Water

Additional Risk Partners
Internal Partners
- Planning Department
- Highways Department
- Emergency Planning

External Partners
- Flood Risk Management Wales (RFCC)
- Emergency Services
- Housing Associations
- National Flood Forum
- National Farmers Union
- Local Partnerships, forums, and community groups
- Royal Society for the Protection of Birds
- Land Owners and land/estate Managers
- Universities
- Developers Forum

National House Builders
National Parks Authorities
Network Rail
Parish and Town Councils
Local Resilience Forum
Association of Drainage Authorities (ADA)
Country Land and Business Association (CLA)
SWTRA – South Wales Trunk Road Agency
CADW

How this FRMP has been co-ordinated

Co-ordination and development of this FRMP has been achieved through regular meetings of the various groups as listed below:

- South East Wales Flood Risk Management Group attended by all LLFAs in South Wales, NRW, WLGA and DC/WW.
- Flood Risk Management Working Group attended by all LLFAs in South East Wales, WG, NRW and WLGA.
- Task and Finish Group attended by Swansea City Council and Neath and Port Talbot, Rhondda Cynon Taf and Merthyr Tydfil County Borough Councils.

Frequent meetings have taken place with WLGA

Meetings have also taken place with Dwr Cymru / Welsh Water

Internal collaboration has also been achieved through meetings with the Flood Risk Management Team.

Co-ordination with the Severn River Basin Management Plan

General

Under the Water Framework Directive (WFD), Environment Agency (EA) and Natural Resources Wales (NRW) have a duty to prepare River Basin Management Plans for each River Basin District. Wales is divided into three River Basin Districts as noted below.

- Dee situated in the north east of Wales which extends over the border into England
- Severn covering the central east and south east of Wales which also extend over the border into England
- Western Wales covering the whole of the western sector of Wales from Anglesey to the south coast.

Merthyr Tydfil County Borough is located within the southern part of the Severn River Basin, South East Valleys Catchment.

Severn River Basin Districts Overview

The Severn River Basin District is home to over 5.3 million people and covers an area of 21,590km2, with about one third of the district in Wales. The River Severn is the longest river in Britain and flows into the Severn Estuary. As well as the River Severn and its main tributaries the district includes the rivers of South East Wales, including the Wye, Usk and Taff, and those of the counties of Avon and Somerset that drain into the Severn Estuary.

The district has several major urban centres, including Bristol, Cardiff and Coventry. However, much of the river basin district is rural in character, particularly within the Welsh Borders. About 80% of the land is managed for agriculture and forestry. The key economic sectors in the district are business services, wholesale and distribution, public administration and health. Transport equipment and metals manufacturing are also important industrial sectors.

Summary of co-ordination of development and implementation of the FRMP with the River Basin Management Plan (RBMP) and the River Basin Flood Risk Management Plan (RBFRMP) for the River Severn.

Co-ordination with the Severn River Basin Management Plan

The draft Severn River Basin Management Plan, prepared jointly by the Environment Agency and Natural Resources Wales as a requirement of the Water Framework Directive, was published on the NRW website on 10 October 2014.

As part of the development on the RBMP a consultation process was carried out by NRW and EA. The consultation process commenced on 10th October 2014 and concluded on10th April 2015.

It is anticipated as consultation continues additional measures and links will be identified by MTCBC to strengthen the links with the RBMP.

Co-ordination with the Severn River Basin Flood Risk Management Plan

The draft Severn River Basin Flood Risk Management Plan, prepared jointly by the Environment Agency and Natural Resources Wales as a requirement of The Flood Risk Regulations 2009, was published on the NRW website on 10 October 2014.

As part of the development on the RBFRMP a consultation process was carried out by NRW and EA. The consultation process commenced on 10th October 2014 and concluded on 31st January 2015. MTCBC responded to the consultation by completing and returning the questionnaire which came as part of the consultation.

It is anticipated as consultation continues additional measures and links will be identified by MTCBC to strengthen the links with the RBFRMP.

MTCBC Flood Risk Management Objectives

Summary of Welsh Government National FCERM Strategy

At the request of Welsh Government MTCBC has developed a Local Strategy for the Management of Flood Risk in the Borough. This document, which was prepared during 2012, was approved by WG and published in June 2013.

As part of this process a list of objectives were agreed and the relevant section of the Strategy is given below.

Flood Risk Management Objectives

1 **Social:**
Reduce distress (No. of people exposed to flooding).
Reduce community disruption (No. of residential and commercial properties).
Reduce risk to life (No. of people exposed to depth x velocity of flow).
Reduce disruption to critical infrastructure (or maintain operation of).

2 **Economic:**
Reduce economic damage (e.g. Annual Average Damages AAD).
Reduce cost of management (note: a risk management outcome for use in appraisal).

3 **Environmental:**
Reduce damages to Natura 2000 / SSSIs / BAP sites (or improve sites).
Improve naturalness (reduce modification of channels / waterbodies).
WFD objectives: improve water quality / ecological status (or not deteriorate) – hydromorph and diffuse pollution issues.

MTCBC Objectives from Local Strategy

In considering the high level objective for the management of local flood risk within Merthyr Tydfil County Borough Council four options were considered, as listed below:-

High Level Strategy Options

- Do Nothing
- Maintain Flood Risk Management at Current Levels
- Maintain
- Reduce Flood Risk

The Local Flood Risk Management Strategies guidance document produced by the WG, advised that high level strategic objectives should be developed around the reduction of potential adverse consequences of flooding for

- human health
- the environment
- cultural heritage
- economic activity

MTCBC has adopted this approach to ensure that the objectives of their Local Strategy are consistent with those required under the Flood Risk Regulations 2009.

In order to comply with these objectives and requirements of the National Strategy Merthyr Tydfil County Borough Council has set its high level strategy as follows:

> "Endeavour to reduce Flood Risk in all of the areas identified as being subject to significant flood risk".

This high level objective is also the focus for the FRMP. It has been used to determining what measures should be included for implementation over the first six year cycle so that significant progress will be made towards attainment of this objective.

MTCBC Detailed Objectives

Merthyr Tydfil County Borough Council has set the following detailed objectives as part of the Local Flood Risk Management Strategy. These objectives are Specific, Measurable, Achievable, Reasonable and Time Constrained.

All objectives will be implemented using the most up to date and relevant information available.

All the detailed objectives listed below were developed for the LFRMS and no amendments or additions have been made to those included in the Strategy. The objectives have been used to determine which measures should be implemented within this FRMP in order make significant progress towards achieving the MTCBC high level objective.

Overarching Objective 1

Reducing the impacts on individuals, communities businesses and the environment;

- Reduce distress by reducing the number of people exposed to the risk of flooding.
- Reduce community disruption by reducing the number of residential and commercial properties affected by the risk of flooding.
- Reduce risk to life by reducing the number of people exposed to risk of flooding of significant depth and velocity.
- Reduce disruption to critical infrastructure or prepare plans to allow the operations to be maintained.
- Protect and improve Sites of Special Scientific Interest (SSSIs) and Sites of Importance for Nature Conservation (SINCs).
- Contribute to the delivery of Merthyr Tydfil Biodiversity Action Plan.
- Minimise Damage to known Historic Assets.

Overarching Objective 2

Raising awareness of and engaging people in the response to flood

- Provide systems to give early warning of potential flooding to individuals and communities.
-
- Provide efficient systems for the management and maintenance of surface water assets.
- Reduce economic damage.
- Endeavour to reduce cost of management.

Overarching Objective 3

Providing an effective and sustained response to flood events

- Improve naturalness including the creation/restoration/protection of natural channels and water bodies with minimal modifications.
- Protect and where possible Improve water quality.
- Provide Flood Risk Management Plans for each area subject to flood risk.
- Ensure that measures are sustainable.

- Ensure that MTCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities.

Overarching Objective 4 Prioritising investment in the most at risk communities.

- Ensure that investment decisions for the implementation of flood risk management schemes are made on a consistent, defendable basis and are subject to cost benefit analysis.

Summary of the Process for the Selection and Prioritising Measures to Achieve Objectives

When considering the measures to be used to achieve the objectives the Action Plan listed below has been developed to decide on the priority to be given to each measure.

In addition those measures which satisfy multiple objectives will be given greater priority than those which satisfy only one.

Measures will also be given higher priority if the environmental effects are likely to improve biodiversity and they provide social improvements such as access to the public.

In considering each measure MTCBC has focused on

- Prevention
- Protection
- Preparedness
- Recovery and Review - including Climate Adaption.

The Welsh Government has also given the following seven high level themes which have been considered by MTCBC for the implementation of the Strategy:

- Development planning and adaptation.
- Flood forecasting, warning and response.
- Land, cultural and environmental management.
- Asset management and maintenance.
- Studies assessments and plans.
- High level awareness and engagement (to increase individual and community resilience).

- Monitoring (of the local flood risk issues).

MTCBC has identified a total of 39 detailed measures which will ensure the delivery of the detailed objectives.

The measures have been identified within four categories namely:

- Prevention of flooding.
- Preparedness for flooding.
- Protection against flooding.
- Recovery and Review.

Each measure has been given a time scale for implementation as follows:

- Short term 0 – 20 years.
- Medium term 20 – 50 years.
- Long term 50 – 100 years.

MTCBC – STRATEGY ACTION PLAN

- Inform and ensure residents are aware of the level of risk they are facing.
- Provide an early warning system to allow residents time to move to a safe area.
- Encourage the residents to produce their own Flood Plan to reduce danger to themselves and damage to their property and its contents.
- Provide systems to prevent floodwater entering properties at risk.
- Endeavour to reduce flood risk by reducing the volume of water being generated by the upstream catchment.
- Introduce new flood relief systems such as culverts or drainage ditches.
- Build new flood defences or raise the level of existing flood defences.

How we will manage flood risk at a local level

MTCBC – Flood Risk Area

Overview

Merthyr Tydfil County Borough Council (MTCBC) is a Unitary Authority situated within the valleys of South East Wales. It has a population of approximately 61,500 and an area of 11,189 hectares. The Borough is a mix of rural and urban communities generally built on the steeply sloping hillsides or within the valley basin.

Surface water from the upper reaches of the catchment drains into the Taf Fawr in the west and the Taf Fechan to the east. The confluence of the two rivers is at Cefn Coed-y-cymmer and below that point the river is referred to as the Afon Taf.

The south eastern sector of the catchment drains into the Bargod Taf which joins the Afon Taf at Quakers Yard.

The Borough lies within the upper reaches of the River Taf Catchment and is contained within the Severn River Basin.

At a communities scale the borough is drained through numerous ordinary watercourses and culverts. The surface water from the watercourses enters the drainage system through a large number of intakes, some with grids and some without.

These features have been recorded in our Geo Environ Database for drainage structures and are also shown on our Geographic Information System (GIS) package. Other culverts are likely to be found as investigations continue.

Where the drainage system, including the culverts carrying the surface water, is deemed to be significant the intakes have also been designated as significant. These intakes are inspected on a regular basis and when appropriate the intakes are cleared of debris and vegetation to prevent blockages leading to flooding. Significant intakes have been listed in tables for each community area below.

Some of the significant intakes have also been classified as critical. These are the intakes most likely to block and cause flooding during an intense storm. If intense rainfall has been forecast these intakes are inspected as priority, cleaned where necessary, and inspections continue during and immediately after significant rainfall. A total of 29 intakes have been classified as being critical.

From our experience at MTCBC, over a period of 25 years, the most likely source of flooding is from blocked grids at intakes to culverts and therefore there is considerable emphasis in this FRMP on this aspect of flood risk from surface water.

Measures and objectives to mitigate flood risk - Covering the whole Borough

All the measures listed below, for inclusion in this FRMP, were developed for the Flood Risk Management Strategy (FRMS). Some extra information has been added to give clarity for the implementation of the measure at specific locations.

MBC M01 Set up Flood Forum where appropriate and where there is local demand.
Look at innovative ways to raise awareness and community resilience in the most at risk areas.
Engage with community to establish community flood plan. Engage with householders to establish personal flood plans.

MBC M02 Investigate feasibility for new flood warning service.
Develop new flood warning service.

MBC M03 Survey work identified within the LFRM Strategy

MBC M04 Derive hydrology for catchment.
Carry out inspection and survey of existing drainage system.
Build hydraulic model for existing intake and culvert.
Check design of existing drainage system.
Design of flood alleviation scheme, where necessary

MBC M05 Carryout investigation of sources of accumulations of surface water.
Investigate drainage paths to and from the area of flood risk.
Investigate alternative proposals for the reduction of flood risk.

Measures currently being used by MTCBC to manage Flood Risk.

These measures, covering the whole of MTCBC, were included in the LFRMS

MBC M06 Sustainable and Strategic Development Planning

MBC M07 Strategic Flood Risk Assessment (SFRA) / Strategic Flood Consequences Assessment (SFCA

MBC M08 Relocation

MBC M09 Sustainable Drainage

MBC M10 Flood Awareness

MBC M11 Flood Warning

MBC M12 Flood Forecasting

MBC M13 Emergency Response Plans

MBC M14 Community Flood Plan

MBC M15 Land Management

MBC M16 Resilience

MBC M17 Resistance

MBC M18 Restoration

MBC M19 Environmental Enhancements

MBC M20 System Asset Management

MBC M21 Defence/Structure Management

MBC M22 Channel Construction and Maintenance

MBC M23 Culvert Construction and Maintenance

MBC M24 Investigation

MBC M25 Local Property-level Flood Mitigation – Resilience

MBC M26 Local Property-level Flood Mitigation – Resistance

SEA and HRA

All the detailed objectives and measures contained in this FRMP were included in the Strategy and therefore the SEA, which was prepared for the Strategy, is still valid. It has not been considered necessary to review the SEA.
When preparing the Strategy the scoping for a full HRA concluded that no HRA was required and that remains the case for the FRMP.
No physical work will be constructed on site as part of this FRMP but the investigative work may highlight works which are necessary. Should that be the case a review of the SEA will be carried out on a site by site basis.

Public Consultation

MTCBC Flood Risk Partners

A six week period of consultation on the MTCBC Flood Risk Management Plan was carried out between Monday 5th January 2015 and Monday 16th February 2015.

The following Flood Risk Partners were contacted

- All Risk Management Authorities (RMAs)
- All MTCBC employees
- All Council Members
- Attempts were made to engage with members of the public using the following means:-
    a. The 200+ members of the MTCBC Viewpoint Citizens Panel
    b. Social media including Facebook and Twitter
    c. An eye catcher was placed on the MTCBC Webpage

Method of Consultation

The Draft Flood Risk Management Plan was published on the MTCBC webpage prior to the commencement of the consultation period. A questionnaire was also published, which all Flood Risk Partners were encouraged to complete.

A total of 19 people completed the questionnaire and an additional 7 email comments were received.

All comments received have been placed into a spreadsheet but no personal data has been included. Against each comment a response from MTCBC Flood Risk Management Team has been put into the spreadsheet and where appropriate the FRMP has been amended in line with the comments. The spreadsheet containing all comments and responses has been published on the MTCBC webpage.

Once the RFMP has been reviewed and accepted for publication it will be uploaded to the MTCBC webpage together with the Preliminary Flood Risk Assessment (PFRA), the Local Flood Risk Management Strategy (LFRMS) and Summary and the Strategic Environmental Assessment (SEA).

In addition printed copies of the FRMP together with the PFRA, the LFRMS and the SEA will be placed in all libraries and leisure centres and at the MTCBC Civic Centre.

Monitoring and Review

Natural Resources Wales must review this FRMP before publication.

The next review of the FRMP will be completed by 22nd June 2021 and subsequent reviews will be carried out at 6 year intervals.

Following the review MTCBC will prepare a revised FRMP which will take into account the following:-

- The impact of climate change on the occurrence of flooding.
- An assessment of the progress made towards implementing the measures contained in this FRMP.
- If measures have not been implemented a statement of reasons why those measures have not been implemented.

In the December of each year following completion of this FRMP the current position regarding the implementation of each measure listed will be monitored. Appropriate action will be taken where possible to complete the implementation in accordance with the time scale.

In order for this FRMP to be successful it is essential that significant additional funding be made available to MTCBC on top of the normal funding arrangements from Welsh Government. Failure to receive this additional funding could result in measures identified in this report not being implemented either in part or in full.