Day Cummins Ltd

Flood Risk Assessment

Ms A. Taylor

Proposed Replacement Dwelling,
Vale View, Egremont

Date: 5th Octoberber 2021

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Introduction:

This flood risk assessment has been prepared as part of the full planning application for a proposed replacement dwelling within the site of the former No. 3, Mill House, Vale View.
The proposed development has been designed to take into account the new flood defences, to the riverside boundary, as well as predicted water levels for 100yrs_20%Climate change.

This assessment will look at the implications of the proposed residential development,specifically;

- Why sequential test of alternative sites has not been undertaken.
- The risk to the development should there be a flood. Identifying how flood risk on the site will be managed, with consideration to the 100year lifetime of a domestic property.
- Consider the consequences for people living on the site, identify safe access and egress routes.
- Identify management of the surface water off the site.

The purpose of this assessment is to;

- Minimise the risk of damage to the property by including flood resistance measures.
- Ensure the safety of residents, as far as is practicable with consideration to the site's limitations.
- Mitigate the developments potential in increasing flood risk.

The Site:

Historically the site, No. 3, Mill House, Vale View, included a four-story end of terrace house, containing 4 flats, with domestic garden, vehicle access and garage.
In August 2012, following a period of extreme and sustained heavy rainfall, (during the wettest UK summer on record at the time) with the surrounding fields too saturated to absorb any new rainfall and the adjacent river weir damaged, the rear elevation of No. 3, Mill House, Vale View, collapsed into the river Ehen. The property was demolished soon after and in 2013 the Environment Agency undertook works to repair to the weir and construct a defence wall; from the end of the neighbouring terraced house, along the full length of the site's riverbank boundary, the length of the adjacent site and under/beyond the South Street Road bridge.
The site is now identified on the Environment Agency's Flood Maps for Planning, as being in Flood Zone 3: areas benefitting from flood defences. As such a sequential test of alternative sites is required however, with the site now benefiting from flood defences, the applicant wishes to re-provide their family home on the land that it previously occupied and still remains within their ownership.

Flood Risk:

The extent of flooding from rivers or the sea is identified as medium risk while the extent of flooding from surface water is identified as high risk on the Governments Flood Warning information services map but it is understood that the site has not flooded since the defences were completed in 2013.

Drawings provided by the Environment Agency detail the new defence wall and indicate a typical water level of 37.000m and a flood defence level 39.700m, approximately 1200mm higher than the ground level of the site.

Referring to the Environment agency figures from node EHEN03_2855, adjacent to the proposed dwelling position, the following return period and associated water levels are predicted;

Ehen2015_D_75 yr	39.48m
Ehen2015_D_100 yr	39.67m
Ehen2015_D_20%CC 100yr	40.08m

Other nodes in close proximity provide similar readings for the same periods but the highest levels, taken from nodes EHEN03_2901 & 2902 (located behind the existing riverside terrace properties along Vale View) give a 20%CC 100yr level of 40.27mm.

Flood Resistance measures:

Following early discussions with the Environment Agency the positioning of the proposed dwelling on the site was determined to;

- Maintain a gap, between the new structure and the river wall, to ensure structural independence, as well as allowing enough room for inspections and maintenance when required.
- Provide sufficient space for machine access so, that the rip rap at the toe of the wall adjacent to the weir can be replenished in the future.

Providing this access space for general maintenance and repair will assist in ensuring that the Flood defences continue to protect the site and surrounding community.

The design of the two-storey dwelling has evolved so that the main bedroom and living accommodation are now at first floor level providing, if necessary, a safe haven or retreat, should a flood event occur. Further bedrooms, bathroom and utility accommodation are located at ground floor but, it is proposed that the internal ground floor level be set 570mm above the external ground level, to accommodate the difference between the flood defence wall and the highest predicted flood level of 40.27mm.

The raised ground floor will protect the building in the event of inundation, ensuring that there is minimal, if any, disruption internally. The construction of the floor, combined with low-level external openings, will allow floodwater to flow beneath and through the sub floor void. A suspended concrete floor slab or wide span floor beams (with grouted joints), finished with cementitious tanking compounds to the internal floor and lapped up the internal walls, will prevent damage from any water rising in the void below and, should flood waters actually rise above the height of the proposed internal floor level, flood doors will be installed to prevent ingress through openings.

As a two-storey proposal, raising the ground floor will not take the ridge height higher than that of the neighboring end of terrace nor that of the house previously on the site, ensuring that the proportions of the proposal will be appropriate for the surrounding context.

Stepped access is proposed to the front and rear entrances. The external ground along part of the front elevation, will be graded to provide necessary level access.
Gated vehicle access will be provided through the proposed garden wall, via the existing dropped kerb and pedestrian access from the pavement will be via a second gate, further along the Southern boundary, leading to the front door.

Evacuation Route:

Residents of the new dwelling will subscribe to the Environment Agency flood warning system. In the event of a flood warning, the residents will evacuate the dwelling and make their way towards flood zone 1. As identified on the Environment agencies flood map, the closest location in flood zone 1 is approximately 100m to the East, along Vale View.

Should residents become stranded they should move to the safe haven of the first floor level and contact the emergency services to make them aware of the situation.

Drainage & Surface water management:

The former dwelling and majority of existing adjacent dwellings have rainwater pipes that discharge across the pavement and into the road. To the riverside elevation the rainwater pipes discharge directly into the river.

The foundations of the new defence wall will prevent surface water from discharging into the river so, it is proposed that surface water will connect into the main combined sewer. If required by UU, attenuation systems with hydro-breaks will be incorporated, to limit the flow rates into the combined system. Non-return chambers will be included into the foul drainage design to prevent backflow into the proposed dwelling.
The finish of all 'hard-standing' will be permeable and the remainder of the site laid to lawn/planted, to minimise levels of surface water run-off.

Conclusion:

With the introduction of the flood defences and repairs to the weir, the site has become more viable for the replacement of the former dwelling, demolished in 2012.

Notwithstanding the general site defences, using the Environment Agencies predicted water levels, this assessment has looked that the floor levels, construction, evacuation routes and drainage of the proposed development, identifying that should a flood event occur in the 100 yr lifetime of the domestic property, the design is such that it minimises the risk of damage to the property, ensures the safety of the residents and would not increase the potential of flooding.

Appendix:

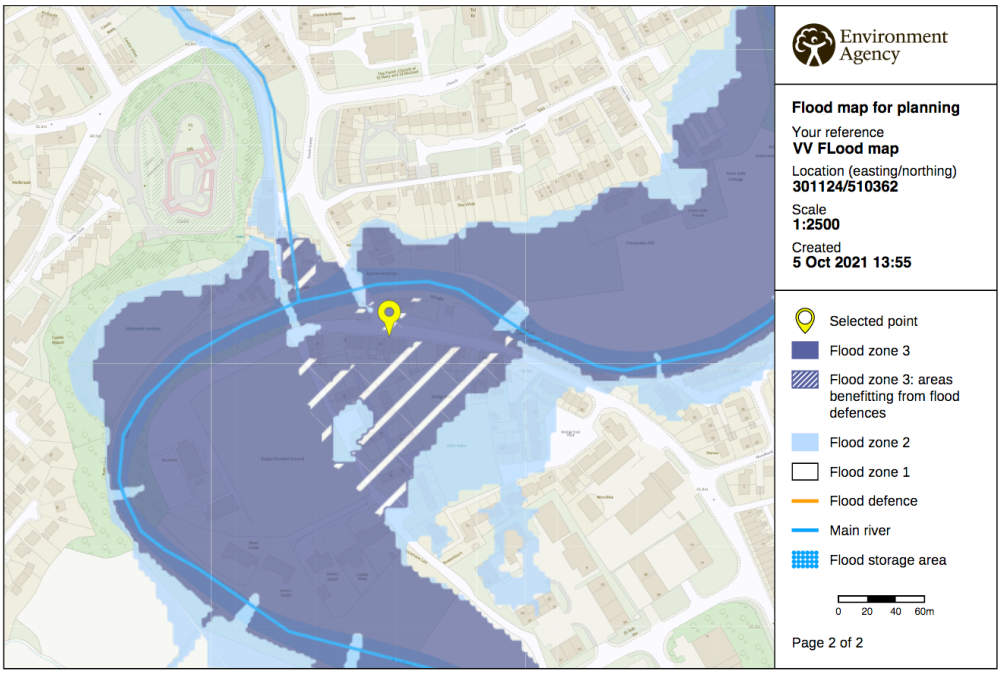


Image: Flood Zone Map - https://flood-map-for-planning.service.gov.uk

Image: Extent of Flooding from surface water - https://check-long-term-flood-risk.service.gov.uk

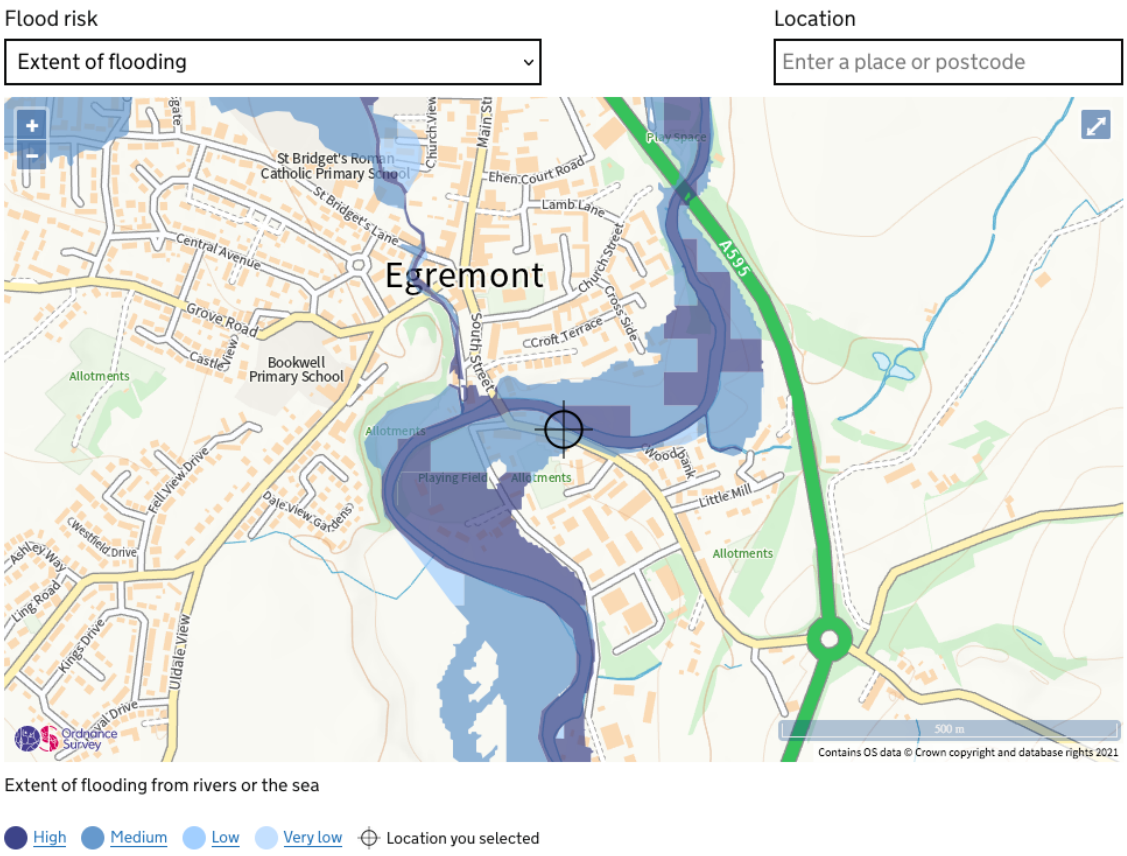


Image: Extent of Flooding from rivers or the sea - https://check-long-term-flood-risk.service.gov.uk

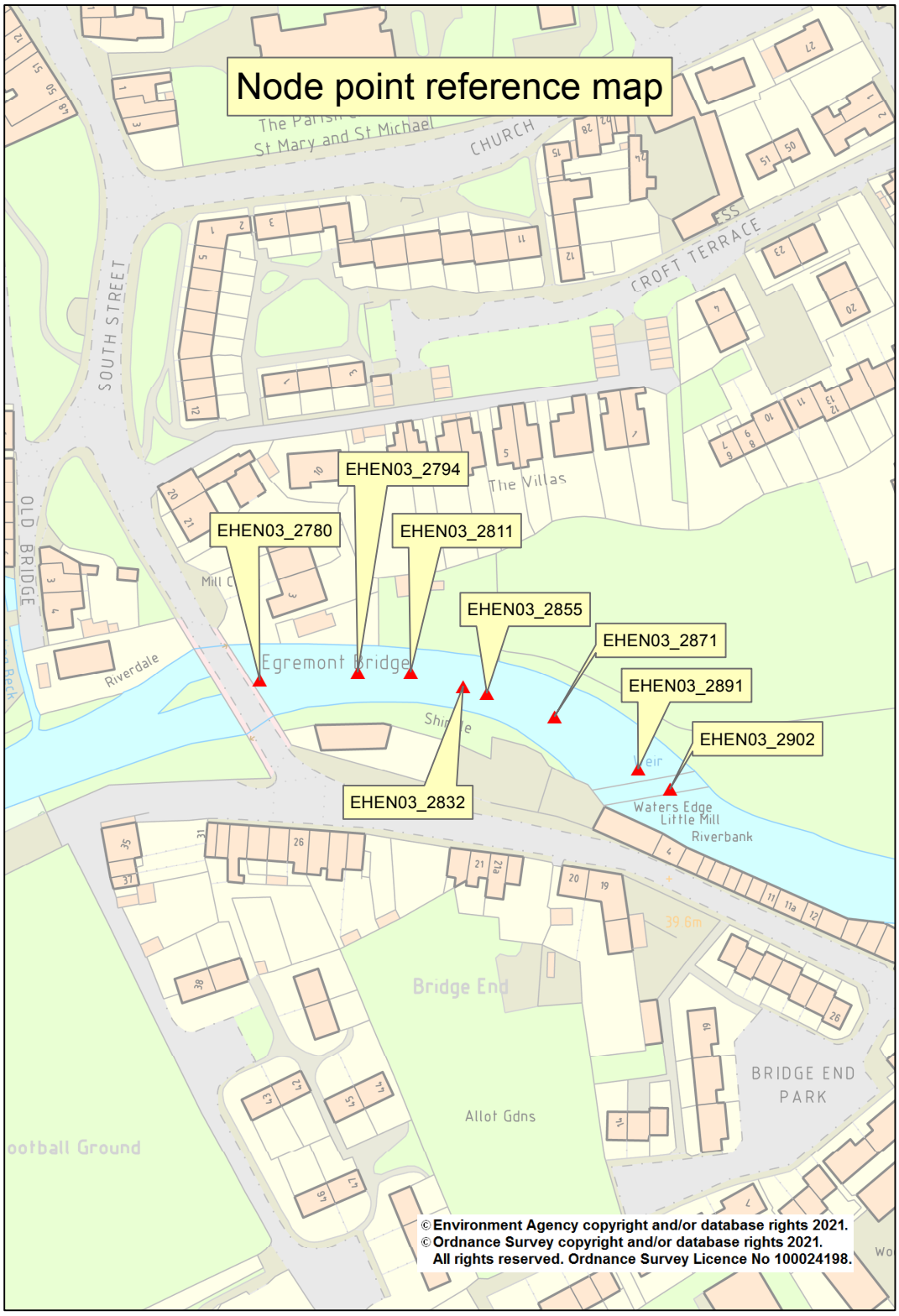
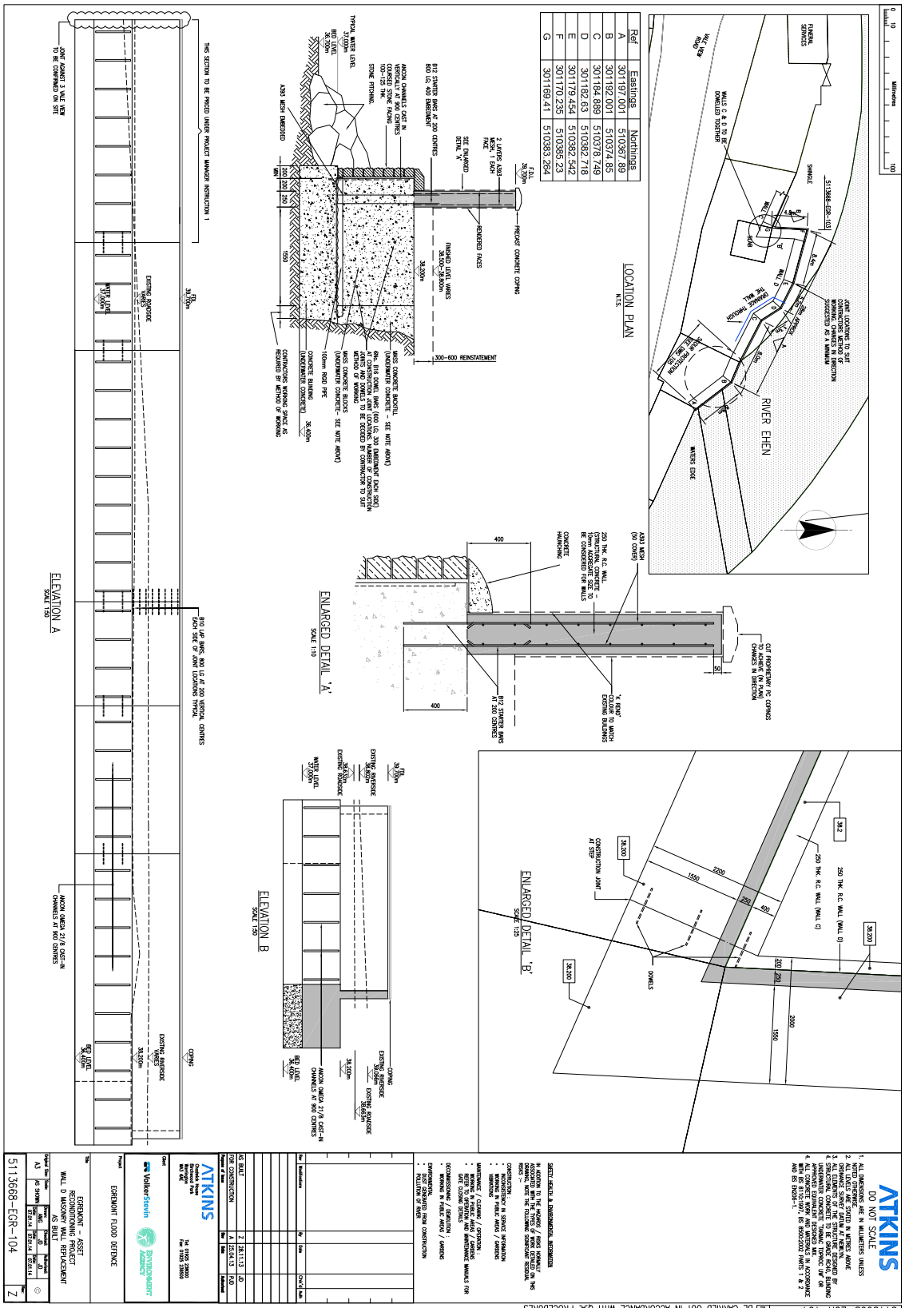


Image: Indication of node positions – Environment Agency

Node	Scenario (D = Defended U = undefended CC = Climate Change)	Return period (yrs)	Water level (mAOD)	Flow (cumecs)
Extract…				
EHEN03_2855	Ehen2015_D	75	39.48	129.94
EHEN03_2855	Ehen2015_D	100	39.67	137.31
EHEN03_2855	Ehen2015_D	200	39.96	149.14
EHEN03_2855	Ehen2015_D	500	40.32	167.82
EHEN03_2855	Ehen2015_D	1000	40.63	185.8
EHEN03_2855	Ehen2015_D_20%CC	100	40.08	154.82
Extract…				
EHEN03_2902	Ehen2015_D	75	39.7	106.82
EHEN03_2902	Ehen2015_D	100	39.87	111.08
EHEN03_2902	Ehen2015_D	200	40.15	120.06
EHEN03_2902	Ehen2015_D	500	40.5	134.57
EHEN03_2902	Ehen2015_D	1000	40.8	157.09
EHEN03_2902	Ehen2015_D_20%CC	100	40.27	124.99

Data: Extracts for referenced nodes from Levels and Flows Document – Environment Agency



Ref	Eastings	Northings
A	301197.001	510367.89
B	301192.001	510374.85
C	301184.899	510378.749
D	301182.63	510382.718
E	301179.454	510382.542
F	301170.235	510385.23
G	301169.41	510383.264

Drawing: Flood Defense wall adjacent to site – Environment Agency As Built information

Evacuation Plan – Roles & Responsibilities

The roles and responsibilities should be identified along with the procedures for evacuation. Scheduled below: illustrates the roles and responsibilities and as such this complete document is to be retained in an accessible location within the dwelling.

- Environment Agency:
    - Predicting flooding from statutory name rivers embassy including the location timing and magnitude.
    - Issuing the flood warnings to partner agencies and ensuring that the public are informed and warned.
    - Maintenance and operation of sea and river defences. Check defences and undertake essential repairs as required.
    - Monitor clear blockages of culverts and repair breaches in defence
    - Support the police and local authority by providing materials, equipment and manpower as far as resources and other duties permit. Nu-life advisory role in dealing with pollution issues following flooding.
- Local authority:
    - Providing support to the emergency services.
    - Mitigation of the effects of an emergency on people, including emergency feeding, accommodation and welfare
    - Coordination of the voluntary sector response.
    - Information Services to the public immediately.
    - Flood alleviation measures were possible.
    - Environmental health advice.
    - Coordination of the emergency services at a major flood event, as well as helping to save lives and protect property.
    - Establishment of cordons where practical to facilitate the works of the emergency services.
    - In conjunction with the other emergency services, to evacuate people from properties at risk, if necessary.
    - Collation and dissemination of casualty information.
- Fire and Rescue
    - Saving life and rescuing trapped persons.
    - Providing monitoring procedures in respect of health and safety of those persons operating within an established cordon.
    - Carry out essential damage control measures including pumping out floor water and salvage work.
    - Rendering humanitarian services in support of the local authority.