

Ian Roach

From: Ian Roach
Sent: 21 April 2011 14:09
To: 'john.wardle@environment-agency.gov.uk'
Cc: Mark Crussell; Bruce Braithwaite (bruce.braithwaite@mvvuk.co.uk);
'frank.newell@environment-agency.gov.uk'
Subject: EfW CHP Facility, North Yard, Devonport - Response to EA comments on FRA

John

Thank you for your letter of 6 April concerning our draft Flood Risk Assessment. Please see below the responses of my colleague Mark Crussell to your various points.

Regards

Ian

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cc - Day File

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From: Wardle, John [<mailto:john.wardle@environment-agency.gov.uk>]
Sent: 06 April 2011 09:33
To: Ian Roach
Subject:

Mr Ian Roach
Scott Wilson Ltd
Mayflower House (178) Armada Way
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Devon
PL1 1LD

Our ref: DC/2010/106926/06-L01
Your ref: d123356
Date: 06 April 2011

Dear Ian

PROPOSED ENERGY FROM WASTE COMBINED HEAT AND POWER FACILITY. DRAFT FRA. NORTH YARD, DEVONPORT (SX4469557215)

I refer to your letter and enclosures, regarding the above, which were received on the 10th March 2011.

We have reviewed your Flood Risk Assessment (FRA) and make the following comments in light of this assessment supporting a forthcoming planning application.

The assessment provides a clear understanding of flood zone extents for the site and its access and this is supported by the technical analysis, which is considered to be appropriate based on the scale and nature of the application.

From our review we have some questions regarding your technical analysis of flood extents, which are set out below:

- The fluvial flood outline provided in Appendix I1 indicates out of bank flows around the junction of Carlton Terrace and Western Mill Drive. We have reviewed the ground levels along Weston Mill Drive heading southwest using Lidar and they appear to slope down toward the junction of Wolseley Road. Is it possible that the fluvial flood extent is greater in this area than shown as once flows are out of bank the cannot flow re-enter the culverted section of watercourse? This question is also valid for the extents provided in Appendix I5.

This is a valid point. The issue lies with using a 1d model to simulate flow pathways, as the one flowing down Weston Mill Drive. A closer inspection of the model results and a review of ground levels suggest floodwaters would flow into the subway, before flowing down Weston Mill Drive. The model results indicate that the volume of water flowing into the subway during the fluvial Flood Zone 3 scenario (649 m³) and the tidal Flood Zone 3 including climate change scenario (820 m³), would be contained within the void provided by the subway (approximately 1200 m³). Therefore, no floodwaters would flow down Weston Mill Drive during these scenarios. With regards to the fluvial Flood Zone 3 including climate change event the flood extent has been extended south west along Weston Mill Drive similar to the fluvial Flood Zone 2 extent. As water would continue to flow down this road once the subway is inundated with flood water. These updates to the flood extent and depths maps have been included within the final FRA.

- The fluvial flood extents in Appendix I3 appear to show on connection for flood water from Wolesey Road to the adjacent open watercourse. We have undertaken a review of ground levels using Lidar and it appears that the flooded area to the southeast of the Camels Head access road is an area of ponding and water levels would pond in this area before spilling in to the open watercourse to the north. Does your analysis support this finding?

Following my telephone conversation with Frank Newell (8/04/2011) we have reviewed the model results focusing on the reservoir units (which are connected) which represent overbank spills at the upstream point of the Wolseley Road Culvert. The reservoirs also account for water that may drain back to the channel at an upstream or downstream point. The second reservoir, which represents the low lying land around Camel's Head Junction and Wolseley Road, has a spill unit connected to Camel's Head Creek. This spill unit does indicate flow returning to Camel's Head Creek during the fluvial Flood Zone 2 scenario and the fluvial Flood Zone 3 including climate change scenario. The flood extent and depth maps have been updated to reflect this within the final FRA.

In addition information regarding the period of time the site entrance adjacent to Camel's Head Junction is inundated has been provided within the final FRA, this indicates the site entrance is inundated approximately 4 hours over the flood peak during the fluvial Flood Zone 2 scenario and approximately 3 hours over the fluvial Flood Zone 3 including climate change scenario. After which time dry access and egress would again be available to the site via the proposed route. It should be noted that alternative road and pedestrian dry access egress is available to the site at all times during all scenarios through the dockyard to the south.

We have previously accepted the hydrology used in your assessment and we maintain this position. For your information, since this acceptance we have released a new series of tidal flood levels. This report is available from the publications section of our website and can be located by typing SC060064 into the keyword part of the search.

The tidal water levels in this new report are lower than those used in your assessment. The decrease in levels can be attributed to a revised assessment technique using a national data set to determine the still water level. Local review of this new data has highlighted that the nature of the calculation of the 2002 data factored in to a small degree local setup and considered storms from a wide range of directions. The new data has considered less storm directions and has 'cleaned up' the data used in the assessment. As a consequence we now expect factors such as near shore wave height and wind set up to be considered on a site by site basis as additions to the still water level to determine a suitable tidal flood level. For the purpose of your assessment we are satisfied no changes are required if you continue to use the 2002 data as currently used in your report, however if you decide to use the revised levels we will require a separate assessment of near shore wave height and wind set up.

We will continue to use the previously accepted hydrology instead of adopting flood levels in the new report.

For your assessment to be acceptable to support a planning application we would appreciate a response to the questions we raise above and the incorporation of the following point. Hazard maps or hazard information should be provided on flood risk to the access for the following datasets: Flood Zone 3, Flood Zone 3 +climate change and Flood Zone 2. Hazard classification should be based on the information provided in the Defra research document FD2320 TR2. This information will allow the statements on safe access to be supported by appropriate analysis.

Indicative flood hazard information based on 'Flood Risk Assessment Guidance for New Developments: Phase 2, FD2320/TR2[1]' (specifically Table 13.1 of the document) has been shown for critical locations on the flood depth mapping provided in Appendix I of the final FRA.

The indicative flood hazard information takes into account flood depth and velocity to provide an indication of the likely hazard posed to people. Flood depth information is available from the ISIS 1D model (as shown in Appendix I), however the 1D model outputs do not include velocity information, this type of information is normally generated using a 2D model. Therefore, in liaison with the Environment Agency an alternative approach using Manning's equation has been agreed to assume an indicative velocity at each of the critical locations.

Based on the flood depth and the assumed velocity an average indicative flood hazard (based on the average depth) and the maximum indicative flood hazard (based on the maximum depth) within the flood extent at critical locations during the flood peak have been provided in Appendix I. The flood depth value and assumed velocity value, calculated using Manning's equation is also shown in Appendix I.

Overall we consider that the joint probability analysis undertaken for the site and its access provides us and the Local Planning Authority with a clear understanding of flood risk associated with the proposed development. As the site's access is partially in flood zone 2 and possibly flood zone 3 the forthcoming planning application will need to consider the sequential test. Your flood extents and flood hazard information will inform this test and will ensure all parties understand the flood risks affecting this development.

This additional modelling work demonstrates that the development is safe (Flood Zone 1) and would not lead to increased flood risk elsewhere. Mitigation measures proposed will ensure onsite access is located outside of the flood extent. Offsite access directly to the A38 is affected by flood waters during the extreme scenario considered (coinciding of two peak events), however the modelling demonstrates that with the exception of 4 hours over the flood peak dry access is achievable to the west along Wolseley Road. During this 4 hour period, if required,

alternative dry emergency access remains available via the dockyard to the south. Therefore the sequential test has been considered and the site should be considered as safe.

Yours sincerely

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Planning Liaison Officer

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[1] Available online: http://evidence.environment-agency.gov.uk/FCERM/Libraries/FCERM_Project_Documents/FD2320_3364_TRP_pdf.sflb.ashx