

Memorandum

Northwest Hydraulic Consultants
16300 Christensen Road, Suite 350
Seattle, WA 98188
206.241.6000
206.439.2420 (fax)

DATE:	August 30, 2012	NHC PROJECT: 21672
TO:	Paul Levesque, Tillamook County Aaron Palter, Port of Tillamook Bay	
FROM:	Vaughn Collins, P.E.	
SUBJECT:	Response to FEMA request for additional data	

This memorandum documents the data provided in response to the email from Lujana Richardson dated August 15, 2012. The items requested are copied from the email and shown in blue italic font, followed by our response and documentation.

While the use of HAZUS is acceptable, adequate documentation needs to be provided to support the values used in the analysis. Furthermore, while the BCA guidance accepts the content values, it does not reference any information on inventory values. There are concerns with double counting between contents and inventory. HAZUS estimates agricultural inventory at 8% of annual sales which has a standard value of \$126 per SF; however, this is not a BCAR standard and needs to be supported with documentation.

In order to fully evaluate the Benefit-Cost Analysis, per the BCA Guidance, the following supporting documentation needs to be provided for the data and values used in the BCA.

1) Content and Inventory Values: In order to support the Content and Inventory values, provide documentation justifying the values used in the analysis and that the values are not double counted.

The previously submitted BCA documents the sources and methods used to validate the flood damage assessment. The following data documentation files are attached:

- NFIP Claims Data for Tillamook County (spreadsheet)
- Proof of Loss Claims for 3 commercial structures (pdf)
- Segment of Tillamook County 1996 Flood Study documenting Agricultural Damages (pdf)
- Structure Data and Damages (spreadsheet)

We are unsure as to how damages may have been “double counted”: Damages were computed using HAZUS, BCAR and a spreadsheet for displacement/disruption costs using standard FEMA values. Structure, contents, inventory (where applicable), displacement and disruption costs were calculated

individually and uniquely for each building. The attached building spreadsheet contains the key inputs and outputs used for this.

The validity of the content and inventory values used can only be evaluated on an aggregate level, as the available historic damages are only available at this level. There is no information available to separate historic inventory losses from contents or other losses for agricultural structures. We note that section 6.3.1 of the BCA report documents that Tillamook County farms on an individual and per acre basis are significantly more valuable than the national average on several metrics. Furthermore, it is during flood season that inventory such as feed and equipment are stored within the structures and hence at maximum value. Please refer to our response to question 3 for further discussion of this issue.

2) Depth –Damage Functions: While Depth –Damage Functions (DDFs) from HAZUS are acceptable, there are no HPR files, reports, or print outs of the analysis to verify the DDFs used in the loss calculations.

The HPR file from the HAZUS model and a readme file are attached.

3) Building classification: In determining building classification, documentation and photographs need to be provided to verify the building classification and building replacement value, which is a requirement per FEMA BCAR Guidance. In the analysis submitted, all buildings on agricultural property are classified as AG1, and therefore are subject to the same standards in determining building replacement, content and inventory values. This determination may not be appropriate, as some of the buildings may have much lower building replacement values based on the construction type, and others likely would not have inventory due to the use of the building. Therefore, provide information, photographs, and other documentation supporting the AG1 classification and corresponding building replacement value.

The methods used are documented in section 5 of the March 2012 Benefit Cost Analysis and March 23, 2012 Final Appeal document, section 3.1. Data provided herein includes:

- Tillamook County Assessor Building Photographs
- Elevation Certificates
- Structure Data and Damage Spreadsheet containing BRVs.

Building Replacement Values

Building Replacement Value (BRV) was set at Tillamook County Assessor values. The Assessor bases these values on regular assessments including site visits and so the value reflects building construction type, age and other relevant factors. We note that Assessor values typically run 10-30% lower than true BRV. We are confident the BRV values used are accurate, up-to-date, and conservative.

Inventory and other damages

First, it should be noted that only buildings classified as agricultural structures by the Tillamook County Assessor were given the AG1 designation: for instance, single-family residences on agricultural lands were classified as residential structures.

Given the purpose and function of the farm buildings in the project area using the AG1 classification is clearly the most appropriate to use. On an individual building basis, it is highly unlikely that any building

exactly matches the structure, contents, inventory, displacement or disruption damage functions of the AG1 classification. However, as historic damages are only available on an aggregated level, there is no way to compare individual buildings for contents and inventory. There is no realistic way of breaking down the historic damages into the sum components that would enable an analysis of whether or not inventory DDFs are high, or that any other DDFs are too high or too low.

What can and has been compared are aggregated damages. The BCA concludes that the sum of the various components of damages calculated by the default DDFs in HAZUS is in line with the historic damage data available. In other words, even if some agricultural structures do not have inventory, the inventory DDFs are too high, and some structures should have been classified as other types of structures the overall damage model parameters, along with the aggregate reduction in inventory damages applied to calibrate the model, balance out the sum total of damages. This is documented in sections 6 and 7 of the BCA report.

4) Building Location: Provide information on the location of the buildings in the project area and within the various flood hazards and the corresponding flood depth within the building. Provide a summary of the First Floor Elevations (FFE) for each building, the adjacent grade elevations, and corresponding flood elevation for the various return periods.

The requested data are contained in the Tillamook Structures Data and Damages spreadsheet, and within the GIS flood depth grids and building point shapefiles contained within the HAZUS HPR file. Tillamook Buildings Plates 1-3 show the digitization and numbering of buildings used in the analysis.