



INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

February 3, 2012

No.: US 021/12
File: BBF 4 Port of Entry

MEMORANDUM

Engineer Luis Antonio Rascón Mendoza
Principal Engineer, Mexican Section
International Boundary and Water Commission
Post Office Box 10525
El Paso, Texas 79995

Dear Engineer Rascón:

I am in receipt of your letter No. CEU 01538/11, dated December 13, 2011, which transmitted the technical comments generated by the Mexican Section during the review of the respective Drainage Report and associated two-dimensional models prepared by Michael Baker, Jr., for the erection of approximately 6.93 miles of security fence planned by the U.S. Department of Homeland Security (DHS) within the limits of the Rio Grande floodplain in Roma, Texas (Segment O-1, 1.81 miles), Rio Grande City, Texas (Segment O-2, 3.43 miles), and Los Ebanos, Texas (Segment O-3, 1.69 miles). These documents had been transmitted to your office by means of letter No. US 152/11, dated September 16, 2011, and concluded that the proposed fence segments would not cause significant deflection or obstruction of the normal flow of the Rio Grande or of its flood flows.

As you requested under referenced letter, the two Sections met at your office in Ciudad Juárez, Chihuahua, on January 25, 2012, to discuss the comments and/or concerns raised by the Mexican Section. Minutes of this meeting have been prepared by the U.S. Section and have been provided to Engineer Armando Reyes of your office via email dated February 2, 2012, for your review and recommended revisions. Listed below are each of your comments outlined in your letter No. CEU 01538/11, dated December 13, 2011, and the responses offered by the U.S. Section.

1. Mexican Section Comment:

We reiterate our opposition to the construction of the proposed fence in the Rio Grande floodplain given the impacts stated above. The location, alignment and design of the proposed fence represent a clear obstruction of the Rio Grande hydraulic area, since in the towns of Rio Grande City and Roma, Texas, the fence would occupy nearly all of the hydraulic area on the U.S. side, causing the deflection of flows toward the Mexican side. If you consider that, given the design characteristics, the fence obstructs 60-70% of the hydraulic area in a direction perpendicular to the flow, and if you add to that the effect of the current retaining trash and debris, the significant length that is located in the floodplain, and the position of the fence relative to the direction of flow, the fence constitutes a serious obstruction and deflection of the Rio Grande flows towards Mexico.

U.S. Section Response:

As explained by Dr. Unnikrishna during the meeting of January 25th, the water depths for the grid elements of fence Segment O-2 that are oriented perpendicular to the flow are between 7 feet and 12 feet and their velocities are less than 1 foot per second in both the existing and proposed conditions. The HEC-RAS models had a gate proposed at this location to prevent and/or reduce the amount of possible obstruction. However, in the FLO-2D analysis, the percent deflections were observed to be within the threshold limits. The low values of percent deflections resulted from the low velocities seen in these grid elements and due to the velocity vectors also indicating some flow across the fence through these grid elements. For fence Segment O-1, there is an opening in the fence midway that allows the water to flow behind it, reducing the percentage of deflections to below threshold limits. It should be noted that the Mexican Section's comment thus does not change the position of the U.S. Section that the proposed fence segments will not cause a significant obstruction or deflection to the flood flows of the Rio Grande in accordance with the 1970 Boundary Treaty.

2. Mexican Section Comment:

The decision to use the FLO-2D model when submitting projects located in the floodplain must first be agreed upon through the Commission. In that sense, we need to discuss the appropriateness of using it in the future for evaluating and submitting the projects in the Rio Grande floodplain, and how it would be implemented in that case.

U.S. Section Response:

A review of our current and existing historical files reveals, that there is no formal procedure for approving software by the Commission. As previously mentioned during the meeting of January 25th, the U.S. Section has reviewed HEC-RAS models for the fence segments beginning March 2008. The U.S. Section concluded that a two-dimensional modeling approach was required to properly evaluate the hydraulic impacts. The U.S. Section has modeled the Rio Grande Canalization Project and the Lower Rio Grande Valley using FLO-2D. Also, the U. S. Army Corps of Engineers has modeled the reach from American Dam to Fort Quitman, Texas, using FLO-2D in support of the Upper Rio Grande Water Operations Model (URGWOM). This software is being increasingly used by agencies such as the California Department of Water Resources, Maricopa County Flood Control District (Arizona) and Pima County Regional Flood Control District (Arizona), and around the world. Environmentalists prefer this software because it provides more realistic results than HEC-RAS when there are significant transverse components to the flow, floodplain storages and when there is need for a detailed spatial description of hydraulic parameters such as water surface elevations and flow velocities. The software enables the creation of a model that uses the full dynamic wave momentum equation and a central finite difference routing scheme with eight (8) potential flow

directions to predict the progression of a flood wave over a system of square grid elements. The number of square grid elements is unlimited. The software can be used to perform hydrologic modeling, hydraulic modeling, urban flooding studies, sediment transport, mudflow and levee and dam breach failures. Given these wide-ranging features and applications by diverse agencies, it is difficult to dispute that modeling with FLO-2D software or other two dimensional software applications provide the most realistic scientific results. Currently, such applications are considered the "state of the art" in hydraulic modeling analysis.

3. Mexican Section Comment:

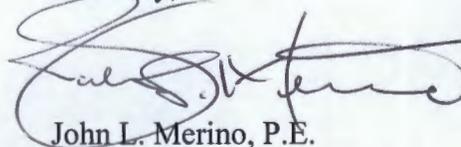
There is an urgent need for the Commission to define the way to address the strong pressure that is being applied in both countries to occupy the Rio Grande floodplain, and the impact that this has on the conveyance capacity, obstruction and deflection of flows in the Rio Grande, as well as the potential for a disaster to occur in the event of a flood as a result of occupying the floodplain, which would be the responsibility of the Commission.

U.S. Section Response:

We have demonstrated clearly through several hydraulic model analysis detailed to you on January 25th that in the case of the three (3) fence segments under consideration, there is negligible potential for river flow deflection or obstruction, as indicated by the FLO-2D model used in the determination of our final conclusion. The U.S. Section will of course remain open in the future, as it always has done in the past, to meet with the Mexican Section to consider how the Commission should mutually approach its mission, goals and objectives.

Unless the Mexican Section produces technical data (hydraulic models and a Drainage Report) in the next seven (7) working days that proves that the FLO-2D model is inaccurate regarding the O-1, O-2 and O-3 fence segments as mentioned above, the U. S. Section will move forward and notify DHS that it does not object to the erection of the fence segments proposed for the Rio Grande floodplain in Roma, Rio Grande City, and Los Ebanos, Texas. If you have any questions, please call me at (915) 832-4749, or have your designated engineer call Dr. Unnikrishna at (915) 832-4742.

Sincerely,



John L. Merino, P.E.
Principal Engineer

February 3, 2012

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Sincerely,

A handwritten signature in black ink, appearing to read "John L. Merino", written in a cursive style.

John L. Merino, P.E.
Principal Engineer

electronic bcc: WHA/MEX (Rachel Poynter); USEMBMEX SCI (Fleckner), Commissioner Drusina; R. Frisbee; PE Peña; PE Merino; FAO Mata and Malloy; PAO S. Spener; Legal S. Fitten; ESD Nunez/Dr. Unnikrishna; EMD G. Anaya; Realty O. Amaro & J. Corpus; Falcon M. Gomez; Mercedes R. Montero; O&M S. Franklin; DMS

JAN:yg

February 1, 2012

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segments o-1 thru o-3a_2_1.docx

ROUTING

	STAFF	INITIALS	DATE
	COMMISSIONER		
	PE - OPERATIONS		
3	PE - ENGINEERING	LLM	2-3-12
	CHIEF ADMIN OFFICER		
4	FOREIGN AFFAIRS	LM:AM	02/03/12
	HUMAN CAPITAL / HRO		
	LEGAL ADVISOR		
	PUBLIC AFFAIRS OFFICE		
	COMPLIANCE PROGRAMS		
	EEO OFFICE		
	CHIEF SECURITY OFFICER		
	AUDITOR		
	BUDGET DIVISION		
	ACQUISITION DIVISION		
	FINANCIAL SERVICES DIV.		
	O&M DIVISION		
2	ENGINEERING SERVICES DIV	JM	2/3/12
	WATER ACCOUNTING DIV		
	ENVIRONMENTAL MNGMT DIV		
	INFORMATION MNGMT DIV		
	SAFETY & HEALTH OFFICE		
	BOUNDARY & REALTY OFFICE		
	ASSETS MANAGEMENT OFF.		
1	Dr. Unni	AW	2/3/2012
5	Yvonne Garcia	YG	02/03/12
6	RECORDS MANAGEMENT		

REMARKS:

Hard copy delivered to Engineer Luis Antonio Rascón, MxIBWC