

Mr. Hannan, P.E., CFM
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March 12, 2014

2. **Comment:** Please provide documentation of how the flow is entering and exiting the channel in the golf course.

Response: The channel overflows at Gessner Drive and enters the golf course on the western boundary of the golf course and Gessner Drive. The flow re-enters Brickhouse Gully through a concrete overflow structure approximately 175 feet south of where Brickhouse Gully crosses Clay Road.

3. **Comment:** Please provide documentation that there is a defined flow path through the new channel in the golf course.

Response: Attached is an exhibit from the City of Houston Geographic Information Systems (GIMS) website showing sheetflow patterns in the LOMR revision area. The exhibit shows there are well-defined sheetflow paths down Gessner and through the golf course lake system. As discussed in the response to comment 2 above, flow enters the golf course channel on the western boundary of the golf course with Gessner Drive.

4. **Comment:** The corrected effective model shows flow in the E115-09-00 channel adjacent to the golf course but the area has not been mapped in the floodplain. Please end your cross section at the high berm dividing the golf course and E115-09-00 or show the mapped flood area for E115-00-00.

Response: Agree. The high berm of the golf course separates the floodplain from E115-00-00 from the floodplain of E115-09-00 which is mapped as a backwater from E115-00-00 further downstream. We have adjusted our cross-sections accordingly.

5. **Comment:** Please provide a topographic workmap certified by a registered professional engineer that shows boundary delineations of the post-project floodplains and floodway, boundary delineations of the effective floodplains and floodway, cross sections, flow line, contours, scale, and north arrow.

Response: We will revise our LOMR workmap to include boundary delineations of the effective floodplain and floodway and cross-sections. The other elements were included in previously submitted LOMR Work Map.

6. **Comment:** Our review revealed that changes were made to the manning's n in the left overbank on E115-00-00 near the golf course. Please justify.

Response: Manning's n values have been reverted back to the effective values for the left overbanks in the revised model. Some of the differences in manning's n were adjustments based on actual conditions. Some of the changes may have been in error. The majority of the left overbank areas are ineffective, however, and do not have a significant effect on the model output.

7. **Comment:** Please revise the following GIS shapefiles:

a. S_BFE

- i. FIDs 11 and 15 should be extended to span Zone AE
ii. Field BFE_LN_ID should be left blank

May 22, 2014

Mr. Ataul Hannan, P.E., CFM
Harris County Flood Control District
Engineering and Construction Division
9900 Northwest Fwy.,
Houston, Texas 77092

Re: Response to Comments for LOMR for Brickhouse Gully;
City of Houston
Brickhouse Gully (E115-00-00)

Dear Mr. Hannan:

Below are our responses to the third HCFCF courtesy review comments to the LOMR for Brickhouse Gully dated April 4, 2014.

1. **Comment:** Previous coordination reveals that you have created a 1D/2D analysis to model this area. Please provide information from the analysis showing that flow is reasonable similar to the flow used in the HEC-RAS model for the split at the golf course.

Response: The previously created 1D/2D analysis XPSTORM model was used to show the general direction of overland flow leaving Brickhouse Gully. Peak flows in this model were not calibrated to peak flows in the steady HEC-RAS model due to the complexity of running the XPSTORM model with bridges.

A simplified 1D/2D XPSTORM model was made in response to this comment in order to verify the magnitude of flows leaving Brickhouse Gully and overflowing down Gessner Drive. The following data and parameters were used to develop the XPSTORM model:

- HEC-RAS cross sections from immediately upstream of Gessner Drive (HEC-RAS cross section 31967.0) to immediately upstream of Talina Way Drive (HEC-RAS cross section 31559.8) were input into the XPSTORM model.
- An SCS Typ II distribution hydrograph was used in the XPSTORM model. Rainfall depths were adjusted in the hydrologic parameters of the XPSTORM model in order to generate peak flows that were representative of the peak flows in HEC-RAS for the 10-year, 50-year, 100-year, and 500-year storm events. XPSTORM models for each rainfall event are attached.
- A stage-discharge relationship was developed in HEC-RAS based on running a series of flows in the Brickhouse Gully hydraulic model and checking the water surface elevation upstream of Talina Way Drive. This relationship was used as the tail water condition in the simplified XPSTORM model which terminates at Talina Way Drive.

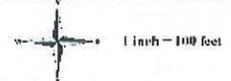


Overflow enters
golf course on
western boundary
of golf course at
Gessner Drive

Overflow Leaves
at Gessner
Drive

Well-defined flow
path through
golf course.

Flow re-enters
Briarhouse Gully
through concrete
overflow structure



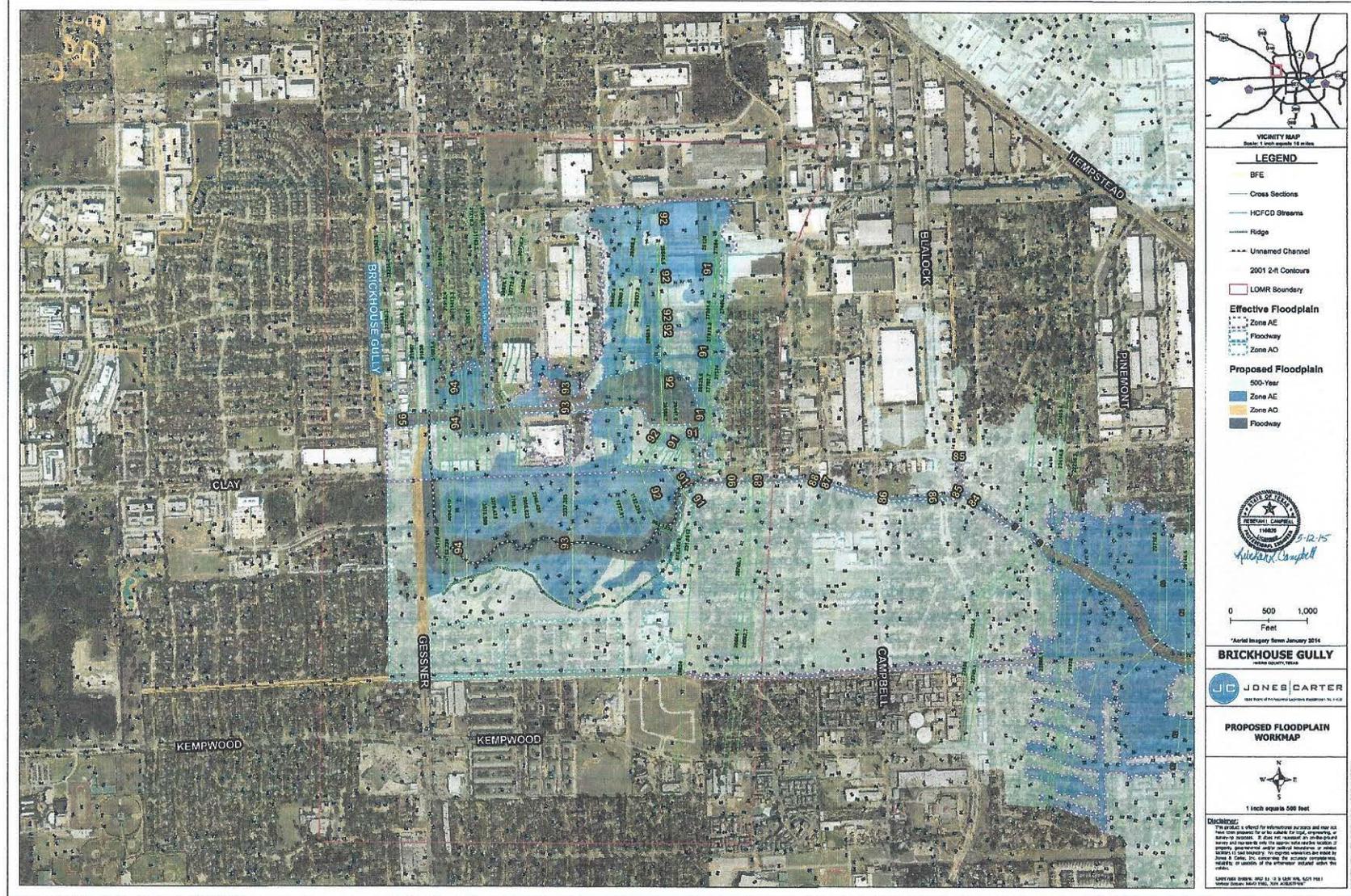
CITY OF HOUSTON
 Department of Public Works and Engineering
 Geographic Information & Management System (GIMS)
THIS MAP IS PROVIDED AS THE BEST INFORMATION AVAILABLE. THE CITY DOES NOT WARRANT THE ACCURACY OF THIS INFORMATION.



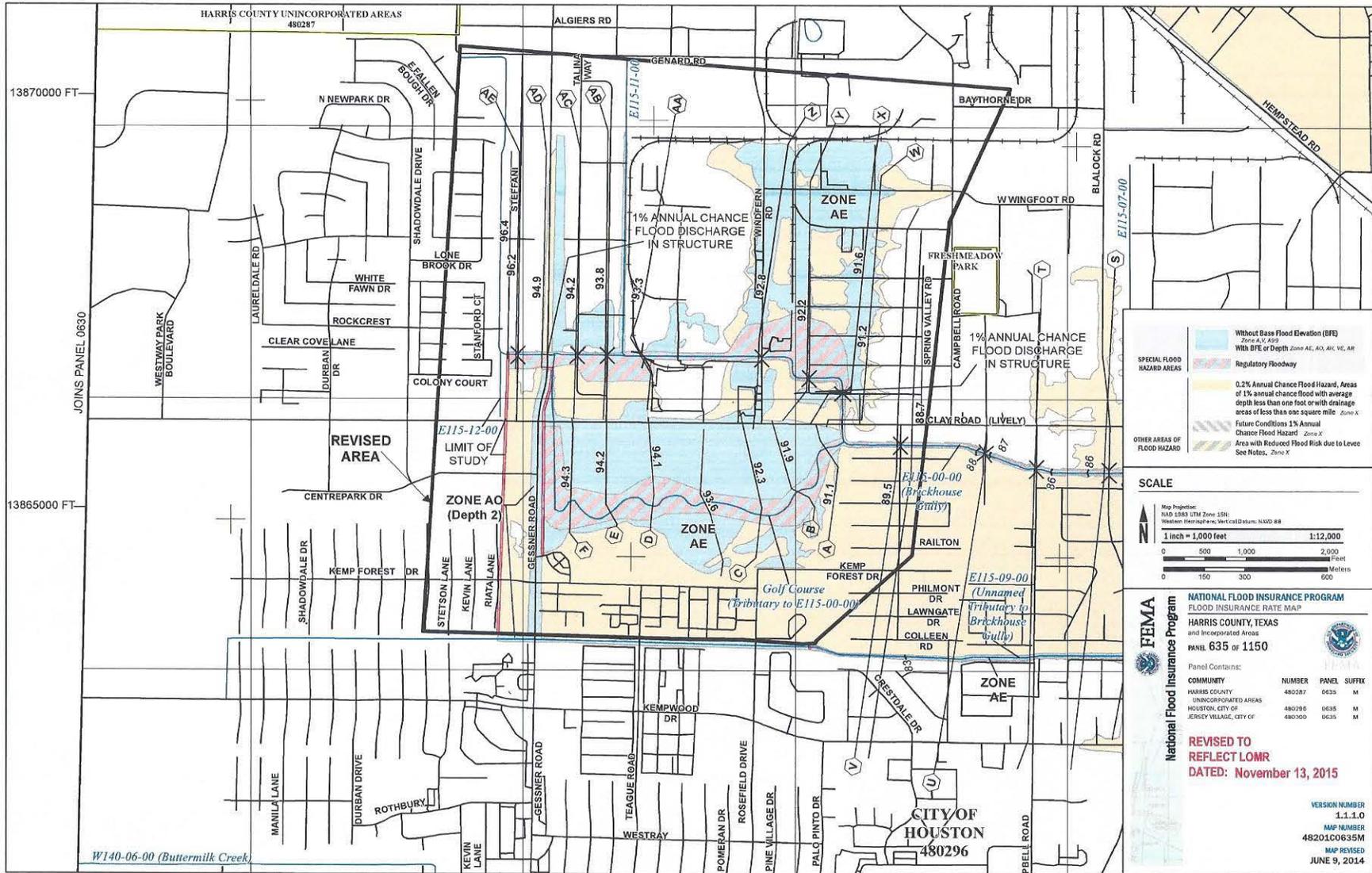
<http://www.gims.houstontx.gov/gims/DisplayPlot.html?Image=bb84661e08547c799721b9e9f8ee147.png&Scale=100&stop2=true>

3/12/2014

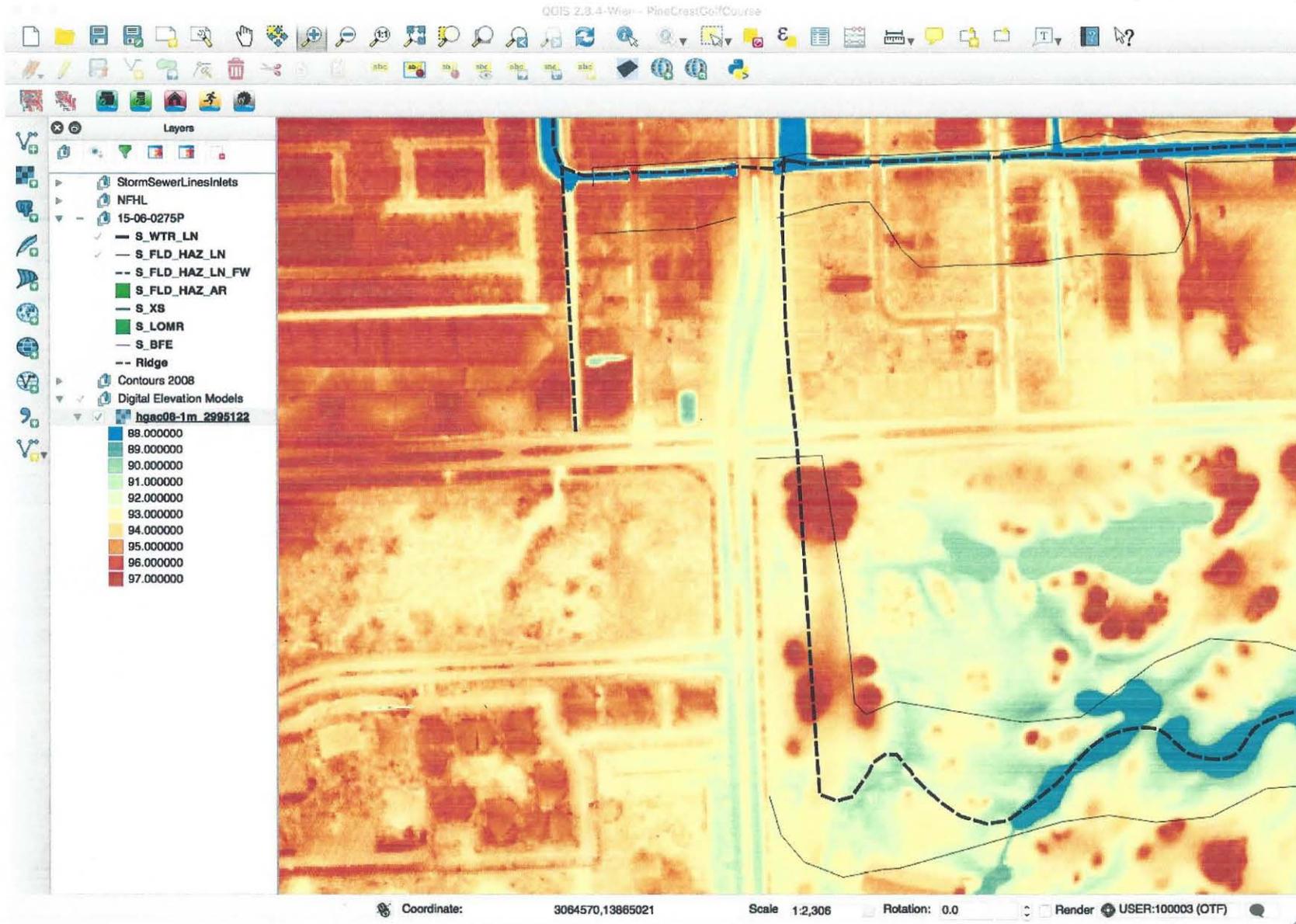
All annotation on image is as received from HCFCD. This is the only image found with overflow entering from Gessner as narrative states. Image was supplied as support to 2nd review response.



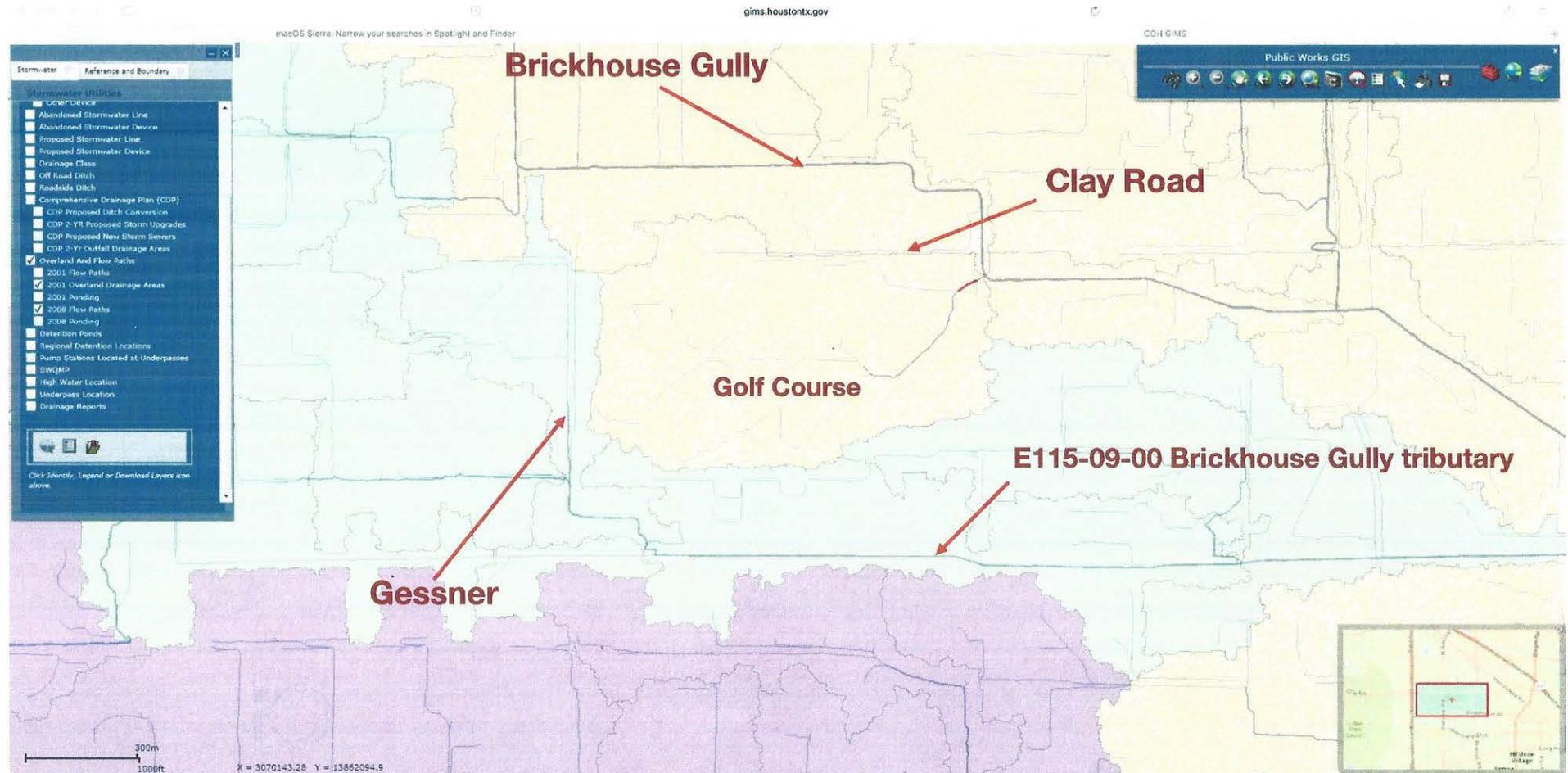
Signed topographic work map showing impossible flow path.



Impossible flow path shown on the LOMR



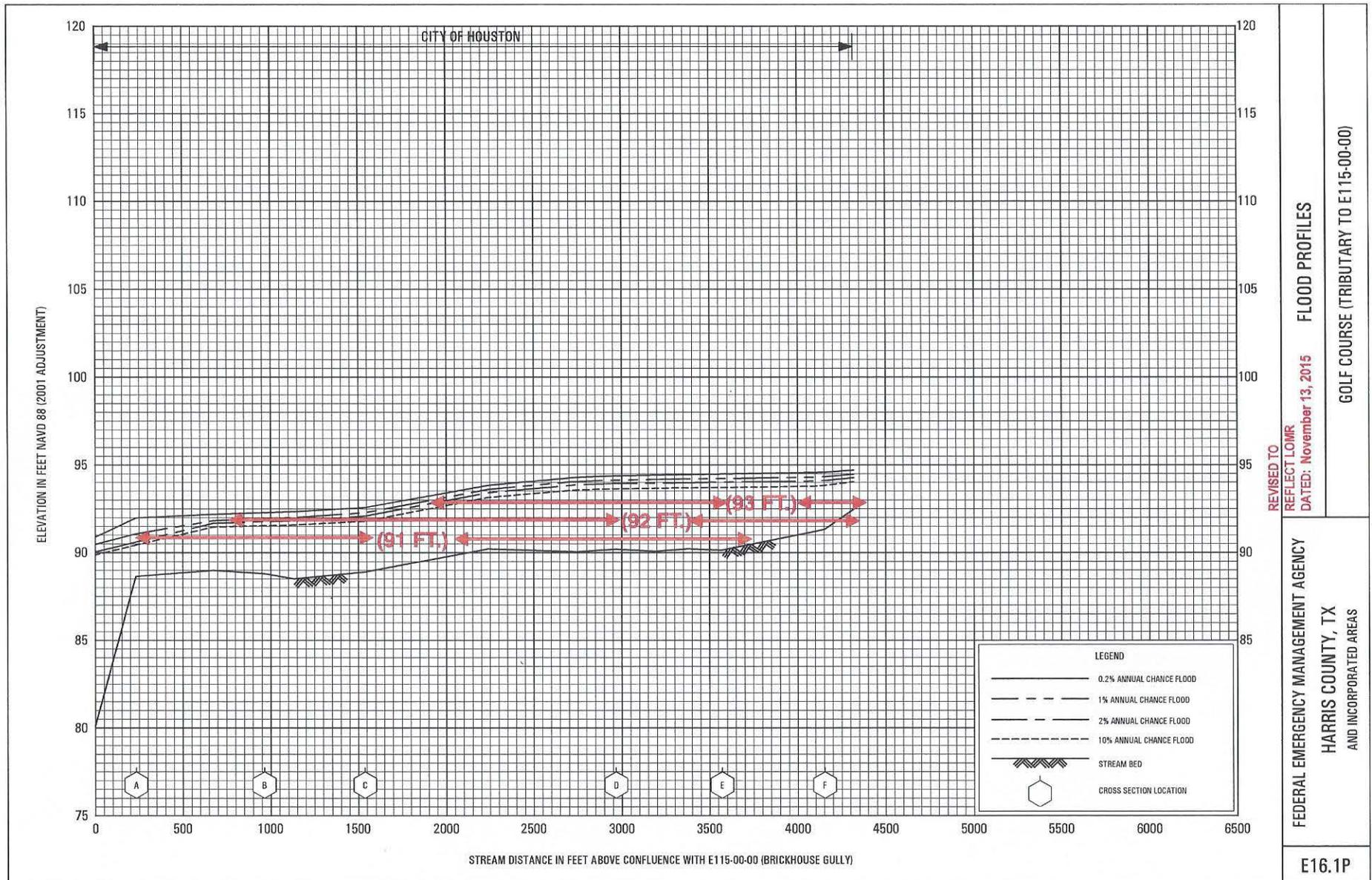
The impossible flow path shown on topographic work maps and the LOMR.



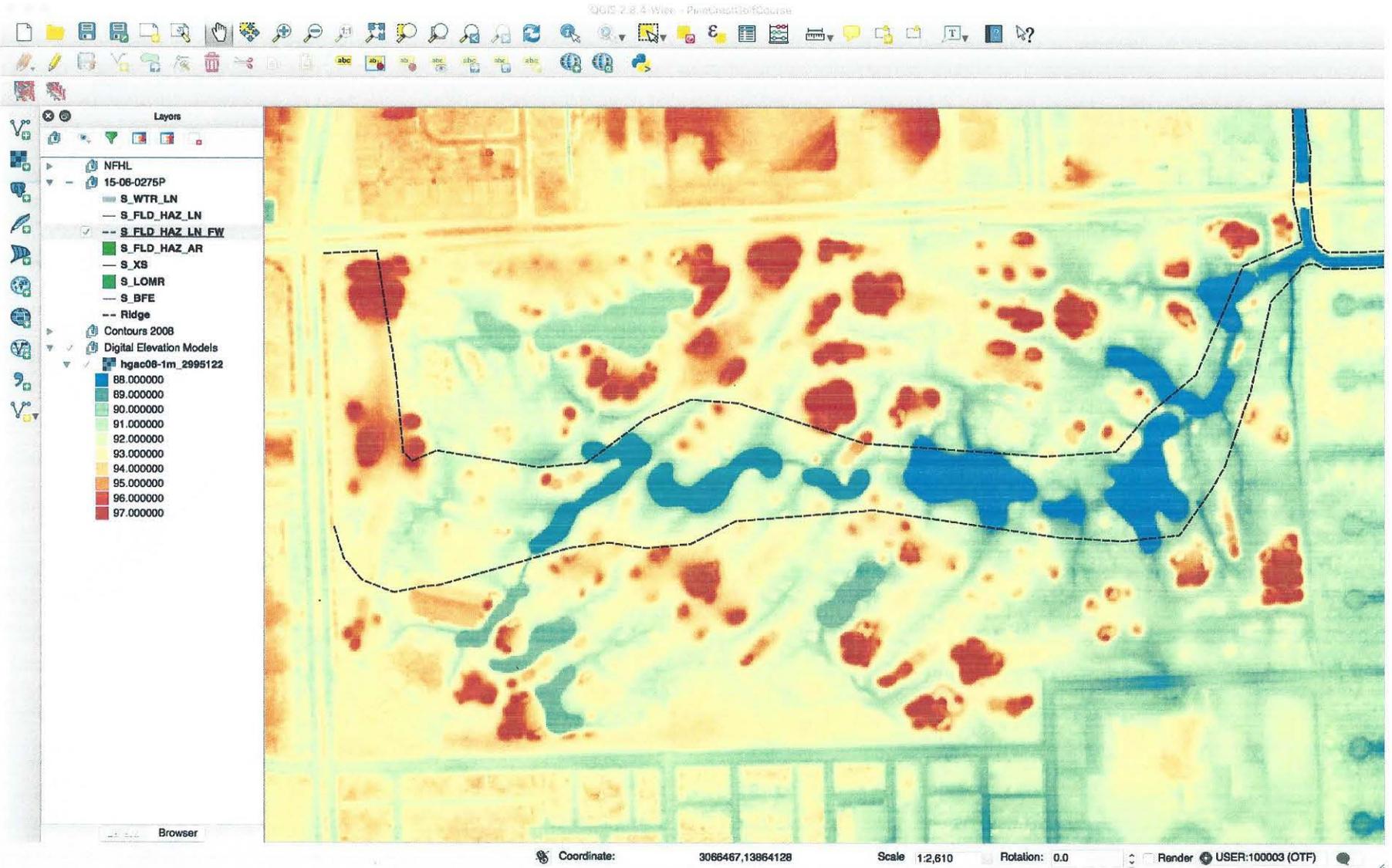
The LOMR arguments seem to conflict with City of Houston GIMS layers of Overland Drainage Areas and Sheet Flow. How does water enter the property from the west off Gessner? All of the Gessner sheet flow is shown going to the E115-09-00 tributary.



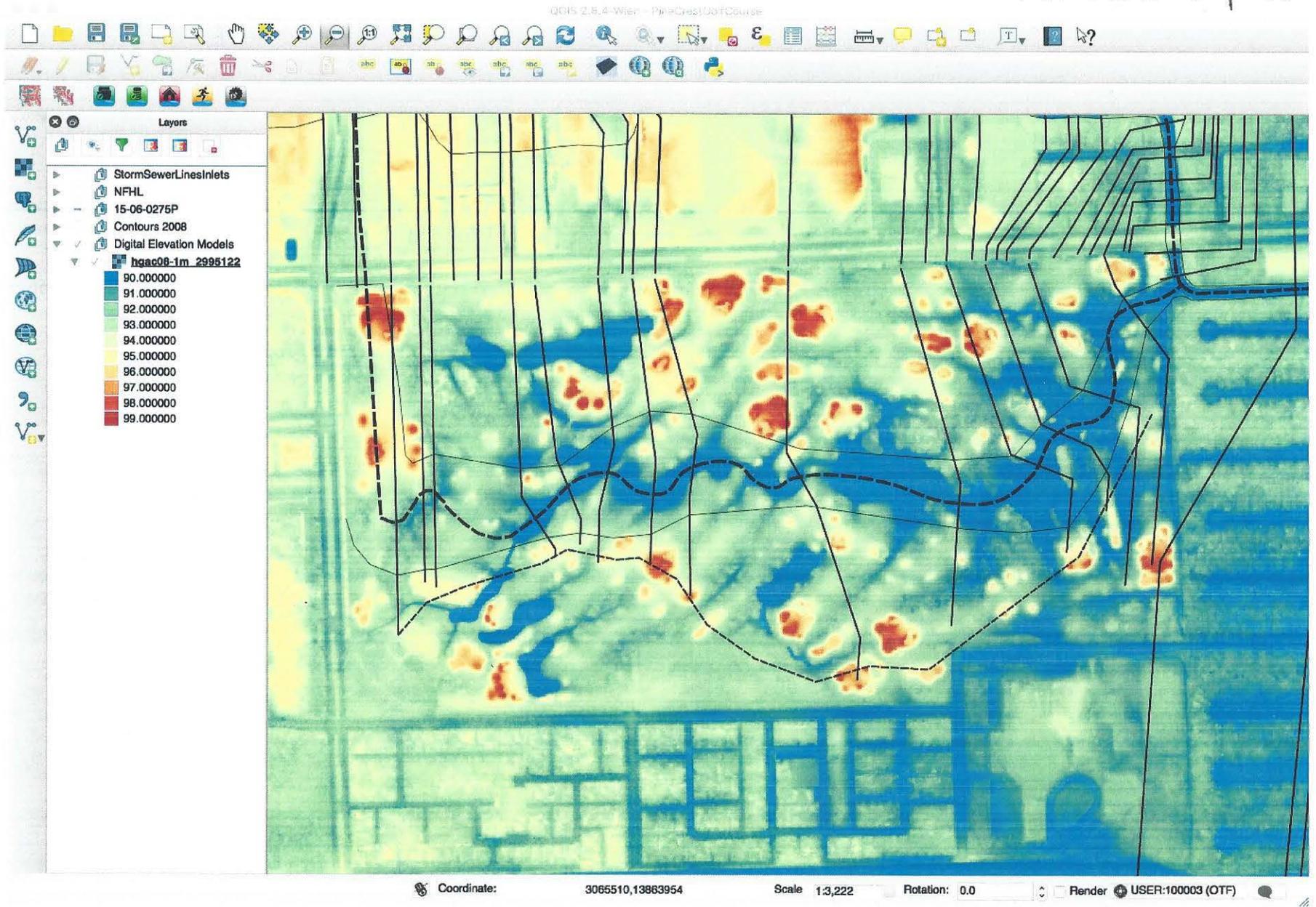
Property in 1989 before golf course.



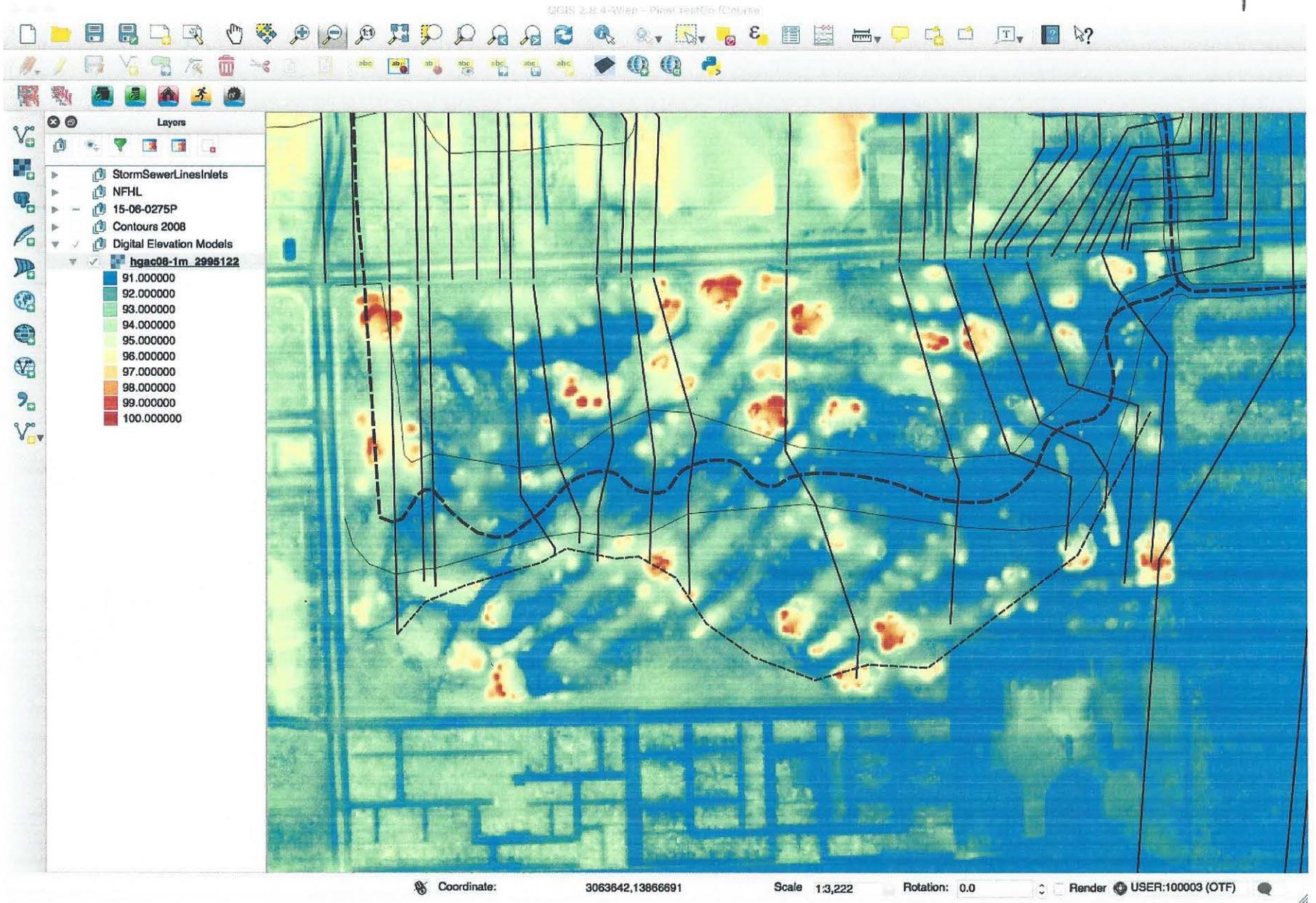
Golf Course Floodway profile - where is the model that connects the golf course to the alleged overflow from Brickhouse Gully?



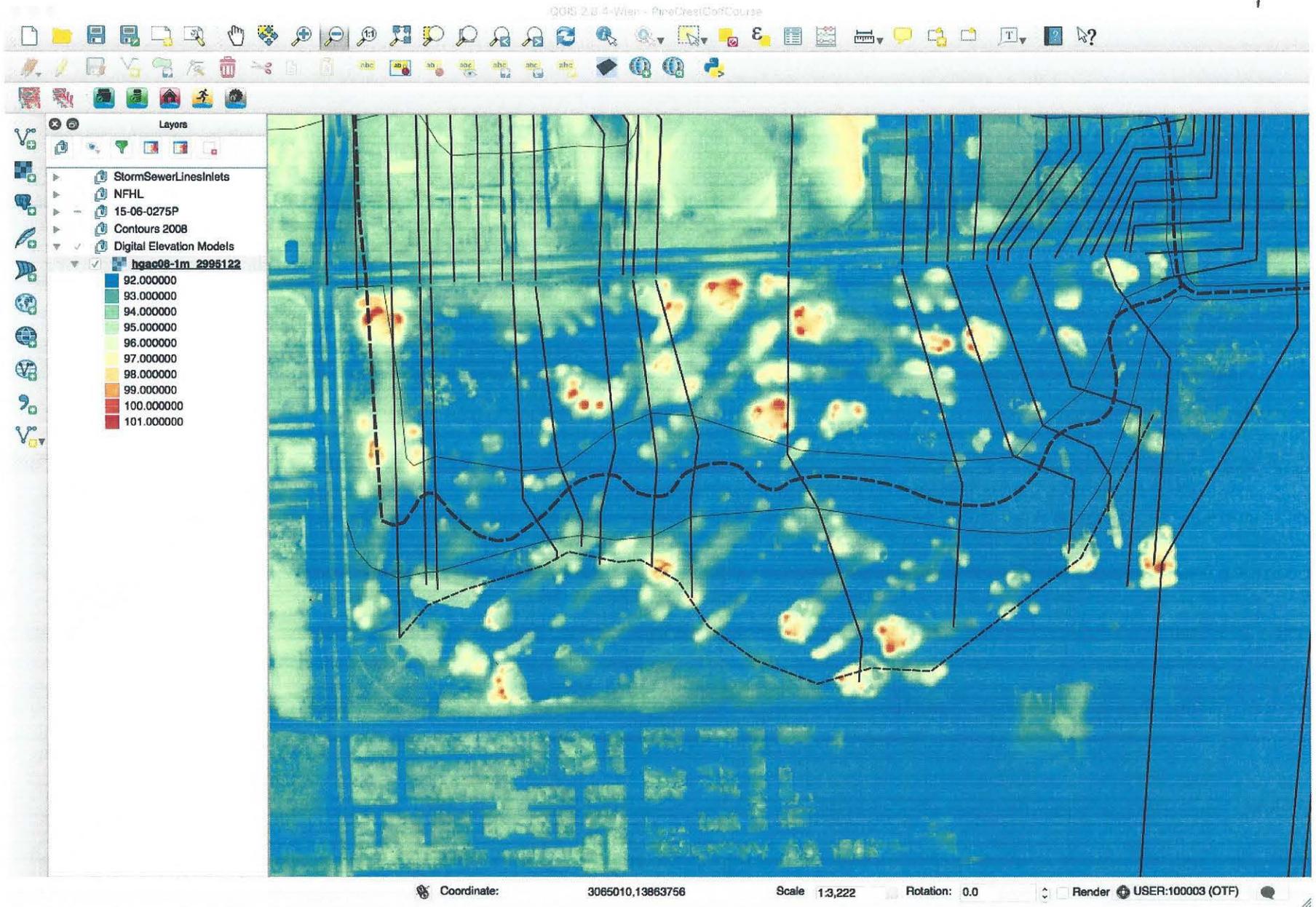
The proposed floodway.



Inundation at 90 feet. The proposed channel and ridge would not hold water.

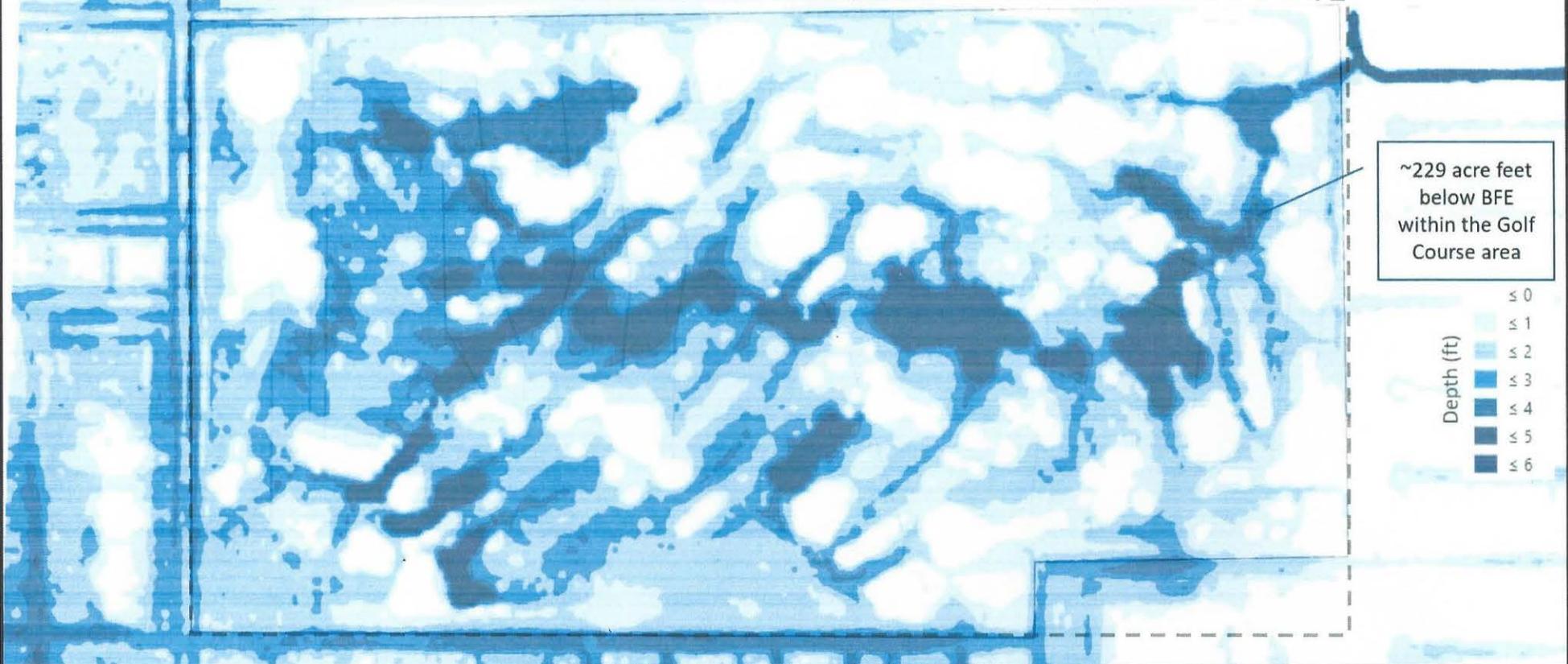


Inundation at 91 feet. The proposed channel and ridge would not hold water.



Inundation at 92 feet. The proposed channel and ridge would not hold water.

Pine Crest Golf Course – Dynamic Flood Depths at Base Flood Event (100 Year Flood)



**Pine Crest Golf Course: Flood Mitigation Potential
Base Flood Detention Volume Calculation***

Area (sq ft)	Acres	Acre ft	Average depth
5,420,745	124	-229	-1.8

* Volume Calculation based on the difference between the dynamic BFE flood water surface from LOMAR 0275 and LIDAR elevations from the HGAC08 survey.

Synopsis:

This highly-sculpted, golf course property accommodated approximately 229 acre feet of floodwater volume during a 100 year flood event. The developers are bringing in fill dirt, elevating the property and saving approximately 86 acre feet of detention volume. That leaves 143 acre feet of flood water volume which cannot be detained on the property. The surrounding properties will be forced to accommodate this extra flood water during the next 100 year flood event.

In addition, the new housing development will cover a high percentage of the area with impervious surface. This surface is not offset with any detention volume (as required in Fort Bend County), further increasing the flood risk to local residents.