

Deer Creek Flood Mitigation – Project Related Q&A

Q1 – How does the Deer Creek project mitigate flooding?

A1 – Increasing the capacity of the Deer Creek waterway (the creek together with its overbank area) allows floodwater to spread out in the project area rather than go higher and get deeper. Giving waterways more room to carry large floods is a great way to reduce flood elevations and damages.

Q2 – How was the capacity of the Deer Creek waterway increased?

A2 – The design used several techniques to help reduce flood elevations in the project area:

- Removing buildings from area of encroachment
- Providing storage to help level off peak flows
- Expanding overbank area to restore natural floodplain

(See Figure 1 – attached)

Q3 – Does the Deer Creek project change flooding characteristics beyond the limits of construction?

A3 – No, because the design reduces flood elevations by increasing the flow storage capacity along the length of the project the resulting impacts are within the project area, meaning the flood damage reduction happens in that reach of Deer Creek where the construction took place.

Q4 – Why, if the reduction in flood elevations occurs only in the project area, were the proposed changes to the flood maps upstream and downstream initially expected to extend further than what is now being shown?

A4 – The changes proposed to the flood maps when the project was designed used FEMA's old flood maps as the basis for determining the extent of the changes. But, even at the time of the project design those old flood maps were already known to be based on outdated flow information. The project was designed using flows and modeling developed by MSD that was widely acknowledged and accepted as the best available data at that point in time. The MSD flows were less than used for production of the old flood maps, but very close to those being used for the new FEMA flood maps.

Initially the post project flood elevations and boundaries were tied into the old flood maps with the transitions having to accommodate both the reduction in flood elevation from the mitigation project as well as the differences between FEMA's old model and the MSD model used for the project design. This resulted in lengthy transitions from the post project flood elevations and boundaries back to the old flood maps. A pre and post project comparison of flood elevations that uses the new flood map information—now the best available data—shows the project benefits contained in the project area. (See Figure 2 – attached)

The long transitions were a consequence of smoothing the differences between the old flood maps (with higher flow rates) and the model developed by MSD (with lower flow rates close to those being used for the new maps) and having to also reflect the reduction in flood elevations resulting from the completed project. Looking at the pre and post project flood elevations developed using either the MSD model or the new flood map model shows the project benefits are contained in the project area. Consequently, because the flows used for the MSD model and those developed for the new flood maps are close, when using the new FEMA flood model for the pre and post project comparison the transitions to tie in to the new 100-year base flood elevations (BFEs) and boundaries are rather short.

Q5 – Why are the CLOMR and LOMR not the same? *(see Q&A 4 for this explanation w/o acronyms)*

A5 – The CLOMR used what was at that time the best available data, a SWMM model developed by MSD more than 25 years ago. Conditions changed and the best available data now is that developed for the new FEMA flood maps. The flow and topographic data developed for the new FEMA flood maps was used in preparing the LOMR request that is required to be submitted upon project completion.

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For the CLOMR, the 100-year water surface elevations (base flood elevation (BFE)) pre and post project were compared to the old flood maps. For the LOMR, the pre and post project profiles are compared to the new FEMA flood maps soon to be released by SEMA as the preliminary maps for St. Louis County. Because there is a larger difference between the pre and post project water surface profiles using the old mapping data than there is using the new mapping data, the distance to tie back into the existing 100-year flood elevation and boundaries was longer on the old mapping than it is on the new.

In other words, the CLOMR mapping changes accounted for the reduction in flood elevations due to the change between the old FEMA mapping and the MSD model as well as the reduction in flood elevations achieved by the project. Since there is now new FEMA mapping that accounts for any changes between the old and new FEMA mapping, the LOMR only reflects the reduction in flood elevations resulting from the Deer Creek flood mitigation project.

Q6 – Did changes in the design result in changes to the effectiveness of the mitigation project?

A6 – No, and there were minimal changes to the FEMA approved design submitted for the CLOMR. Minor alterations in keeping with the overall project design made during construction did not impact the flood elevations or boundaries. The project was built in general accordance with the design plans, with minor modifications reflected on the As-Built drawings.

Q7 – Why are the flood elevations and boundaries in the project area a bit different than how they were shown during the project design phase?

A7 – Because the modeling methodology used by FEMA for producing flood maps in general, and for Deer Creek in particular, was changed between project design and construction completion. While the flows used for the project design are close to those used for the new FEMA flood maps, there is a new model for determining flood elevations. Recent storm events in the Deer Creek watershed allowed for that new model to be calibrated to, or checked against, the flood elevations that occurred during those events, meaning there is a high degree of confidence in the new model.

Q8 – Will there still be flooding on Manchester Road?

A8 – There could be, but it is unlikely that will happen except during the more severe storm events. Flood maps show what is likely to happen during a flood event resulting from certain conditions, but those may or may not be what exist at the time of a storm event. For example, the ground may be fully soaked and unable to absorb any more rainfall runoff, but the model might have been based on typical ground moisture, not completely saturated. Because of that, folks that regularly work with these models say, “While all models are wrong, some are useful”.

What’s important is that we have already seen how the project will handle extreme storms, having recently had several, and water from the creek did not back onto Manchester Road. Also, the flow in the creek was considerably lower than we have seen during lesser rain events in the past. There can be no doubt that this project reduces flood damage, enhance public safety, and improves the area.

So, although when the project was designed, it was expected the post project flood maps would show no water on the Manchester Road during the 100-year flood, that was determined using what is now an outdated model. The new model recently developed through SEMA for the Deer Creek watershed that is being used to update the FEMA flood maps shows water about 6-inches deep at the low point along the roadway, which is near Dorothy Avenue.

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Q9 – Will the FEMA flood maps be revised to show the benefits of the Deer Creek Mitigation Project?

A9 – Yes. Because the project construction was completed while the update to the FEMA flood maps was still underway, the new preliminary flood maps soon to be issued already have incorporated the project, which is now the existing condition, into that new modeling and mapping. Unfortunately, it's not unusual for it to take as much as 1-1/2 to 2 years after FEMA issues the preliminary maps before they become the current effective regulatory map adopted and used by communities to carry out their floodplain management duties as well as by FEMA to identify which of those properties with a federally backed loan are required to purchase flood insurance.

Q10 – Can the current effective FEMA flood maps be revised sooner than the new flood maps are adopted to recognize the project benefits and have those new elevations and boundaries used by the community and FEMA for regulatory purposes as soon as possible?

A10 – Yes. FEMA requires that upon completion of a project that will change the 100-year base flood elevations that steps be taken to revise the flood maps, including the submission of a Letter of Map Revision (LOMR) request. That request to revise the current effective flood maps has been prepared and submitted for FEMA such that the project benefits as they are shown on the new FEMA flood maps can be officially changed without having to wait until the preliminary maps are finalized and then adopted.