

SECTION 2 CDC REGULATION AND CRITERIA

2.1 AREA OF REGULATION

The Regulatory Zone is the jurisdictional geographic area of the upper Trinity River Corridor where the CDC Process and requirements apply. The Regulatory Zone is equivalent to the Trinity River Corridor Federal Emergency Management Agency (FEMA) 100-year floodplain of the Clear Fork, West Fork, Elm Fork, East Fork and main stem of the Trinity River. The limits of the Regulatory Zone extend upstream of tributaries, such as Village Creek, Mountain Creek, and Denton Creek, and is determined from the backwater from the Clear Fork, West Fork, Elm Fork, and main stem of the Trinity River.

Insert vicinity map of CDC area here

For a more detailed map depicting the Regulatory Zone go to Appendix XX or go to the Trinity CDC website at <http://trinityrivercdc.com/map.php> for a map that also includes the locations of existing CDC permits.

The CDC Process is required for any proposed public or private development located within the Regulatory Zone, minus areas of Specific Prior Development. An Applicant may refer to the current effective Flood Insurance Rate Maps (FIRMs) located at the FEMA Flood Map Service Center (MSC) website (<https://msc.fema.gov>), view on the FEMA National Flood Hazard Layer Viewer website (<https://msc.fema.gov/nfhl>) or contact the local CDC/Floodplain Administrator if assistance is needed in making this determination. There are factsheets and tutorials at the FEMA MSC website to help instruct users on how to retrieve the data and understand the flood hazard information.

A CDC may also be required for a development activity that is located outside of the Clear Fork, West Fork, East Fork, Elm Fork, and main stem of the Trinity River Special Flood Hazard Area (SFHA) boundary depicted on the FIRM but is within a tributary such as Village Creek, Mountain Creek, and Denton Creek. This is determined assuming a backwater ponding level pool produced from the 100-year SFHA water surface elevation from Clear Fork, West Fork, Elm Fork, East Fork, and main stem Trinity River.

2.2 DEVELOPMENT ACTIVITIES

A development activity is defined as "any manmade change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation, drilling operations, storage of equipment or materials, or significant changes to vegetative cover." To ensure consistency with Texas Commission on Environmental Quality (TCEQ) requirements, a development activity also includes "any levee or other improvement."

A development activity by a city or county within the Regulatory Zone is also subject to CDC requirements and other applicable local, state, and federal regulations. To avoid conflicts between adopted policy and city or county ordinances, a CDC application submitted for a public project is considered the same as any other CDC application. When a city or county proposes a project within its own jurisdiction, the CDC/Floodplain Administrator of that city or county issues or denies the CDC permit for the project. Even when ruling on itself, the city or county must complete the CDC Process as described in Section 3.

2.3 EXEMPTIONS AND VARIANCES

CDC Applicants may request an Exemption or Variance to the CDC Process. If an Applicant proposing a development activity that is located partially or completely within the Trinity River Corridor can show in writing, through the completion of Part 1 of the CDC Application, that the activity meets any of the conditions in Section 2.3.1 below, then the CDC/Floodplain Administrator may deem the project exempt from the CDC permitting requirements. Variances from the standard processes or criteria may be considered on a case-by-case basis as described in Section 2.3.2.

2.3.1 Exemptions to the CDC Process

Applicants may request an Exemption if the proposed development activity falls into any of the following categories:

- Maintenance, repair, or identical replacement of existing infrastructure
- Outfall structures where the outfall has been permitted under the Federal NPDES or State TPDES program
- Intake structures

- Discharge of material for backfill or bedding for utility lines, provided that no significant change occurs in pre-existing bottom contours and excess material is removed to a disposal area out of the Regulatory Zone
- Bank stabilization activities provided that no significant change occurs in pre-existing bottom contours and excess material is removed to a disposal area out of the Regulatory Zone
- Small-scale projects that cause minimal change in ground surface elevation and no decrease in hydraulic conveyance and valley storage for the 100-year flood. This is intended to include projects that generally do not result in changes to ground contours, such as sidewalks, open fencing, and underground pipe installation.
- Temporary construction-related activity. (Note: See Section 2.5.9 regarding “Significant Temporary Construction”.)
- Specific Prior Development. The existing development projects as defined in the Glossary of this Manual and listed in Appendix B.3 (also referred to as Grandfathered Projects).

The CDC Applicant may request an Exemption to the CDC Process in writing, by completing the CDC Application Checklist and Part 1 of the CDC Application form (see Appendix XX for the forms). The CDC Application Fee will not be required since no USACE Technical Review will occur. The CDC/Floodplain Administrator can require additional information during their review to determine if the Exemption is supported.

If an Exemption can be granted, then Part 2 of the CDC Application is not required. If the Exemption cannot be granted then the request will be denied and the applicant will be required to follow the full CDC application process. The CDC/Floodplain Administrator will submit the CDC Application for the Exemption to the NCTCOG CDC Tracking System website for a 30 day community comment period. After the comment period has ended then the CDC/Floodplain Administrator will complete the Final CDC Action/Findings Form. The local jurisdiction will maintain the CDC Application Package and Determination on file for future reference. This ends the CDC Process for the case of an Exemption. Please note that other local jurisdiction floodplain permitting requirements still apply. Also, the CDC Applicant should still contact the USACE and TCEQ to determine if the development activity is subject to other specific permitting requirements by those agencies.

2.3.2 Variances to the CDC Process

Applicants may request a Variance if the development activity does not meet the established Common Regional Criteria as detailed in Section 2.5 of this manual. CDC Variance requests are reviewed on a case by case basis. The CDC/Floodplain Administrator may issue a Variance under the following circumstances:

- When strict enforcement of the CDC Process would cause exceptional hardship, owing to circumstances unique to the individual property on which the Variance from the process is requested.
- When a public project is deemed to be in the “overall regional public interest”, as determined by the jurisdiction’s policy-making body, e.g. city council or commissioners’ court.

A hardship must be exceptional, unusual and specific to the property involved. It is not related to the individual personal circumstances of the CDC Applicant such as inconvenience, aesthetic considerations, physical handicaps, personal preferences, the disapproval of neighbor’s, homeowner association restrictions, or financial hardship. Additionally, the hardship related to the property should not have been caused by the CDC Applicant.

Variances should not result in additional threats to public safety, extraordinary public expense, or fraud or victimization of the public. The Variance should also be the minimum action necessary to afford relief from the Common Regional Criteria.

A CDC Applicant seeking a Variance must complete the full CDC Application and submit a complete hydrologic and hydraulic analysis indicating the results with respect to the Common Regional Criteria. Requirements are as follows:

- Complete the CDC Application Checklist and the CDC Application Part 1 and Part 2.
- Provide the CDC Application Fee for the Technical Review by the USACE once the CDC/Floodplain administrator review has been satisfied.

- Complete the local jurisdiction’s Variance Request Form, showing good and sufficient cause for why meeting the Common Regional Criteria would cause exceptional hardship or why the public project is in the “overall regional public interest”.
- Describe the proposed alternative approach to meet the overall intent of the CDC objectives.

The Variance Request review will follow the steps found in Section 3 of this manual. All CDC Applications for Variances are subject to Regional Review and Comment by the CDC Participants in addition to the USACE technical review.

Since the CDC is adopted as an element of the local jurisdiction’s National Flood Insurance Program (NFIP) floodplain ordinance, a CDC Variance is subject to that jurisdiction’s floodplain ordinance Variance procedures. Because a CDC Variance does not meet the purpose and intent of the CDC program, they should be granted only rarely.

2.4 PENALTIES FOR UNAUTHORIZED CONSTRUCTION

Failure to comply with the provisions of the policies and regulations within this CDC Manual will result in the penalties specified in the floodplain management ordinance or regulations of the local jurisdiction.

For further information regarding penalties for unlawful storm water management or development activities within the floodplain, please consult the appropriate local government for floodplain management ordinance requirements, as well as the following:

- Federal Emergency Management Agency
- Texas Commission on Environmental Quality
- U.S. Army Corps of Engineers Fort Worth District
- U.S. Environmental Protection Agency

2.5 COMMON REGIONAL CRITERIA

The CDC Common Regional Criteria for development in the Regulatory Zone of the Trinity River are based on year 2055 watershed conditions. The CDC Applicant must provide sufficient detailed

information in the CDC Application to document Common Regional Criteria compliance. The burden of proof of compliance is the responsibility of the CDC Applicant.

The CDC Applicant must use the CDC Model to evaluate the impacts of the proposed project. The CDC Model may be obtained from the Trinity River CDC website (<http://trinityrivercdc.com/get-model.php>). The CDC Applicant and the CDC/Floodplain Administrator may request additional supporting hydrologic or hydraulic information from the USACE Fort Worth District Water Resources Branch.

The proposed project hydrologic and hydraulic information, submitted as part of the CDC Application for compliance with the Common Regional Criteria, must be representative of a project close to a 100 percent level of design and one that the proposed project plans and specifications will be directly based upon.

All CDC applications must comply with the following CDC Common Regional Criteria, unless granted an Exemption or a Variance:

- No increase in the 100-year flood water surface elevations (within 0.04 feet) and no significant increase in the Standard Project Flood water surface elevations are allowed.
- The maximum allowable valley storage decrease for the 100-year flood and Standard Project Flood are 0.0% and 5.0%, respectively.

2.5.1 Water Surface Elevations

No increase in the 100-year flood water surface elevations (within 0.04 feet) and no significant increase in the Standard Project Flood water surface elevations are allowed.

It is expected that every effort will be made to limit increases in the SPF water surface to at or near zero. The significance of any increases will be at the discretion of the USACE and the CDC/Floodplain Administrator.

The current CDC Model (Pre-Project Model) establishes a baseline condition that will be used to compare the proposed project condition model (With-Project Model) with respect to the CDC Common Regional Criteria. There may be conditions where additional cross-sections are necessary to adequately represent a proposed project, due to the cross-section spacing, location,

and alignment of the cross-sections in the CDC Model. If additional cross-sections are used in the With-Project model, additional Pre-Project cross-sections should also be developed in the same locations and incorporated into the CDC Model, thereby creating a ‘Revised CDC Model’. This Revised CDC Model shall be used as the Pre-Project conditions model for comparison to evaluate the With-Project hydraulic impacts. If a Revised CDC Model is developed, then a comparison of results of the Revised CDC Model with the original CDC Model shall be submitted (in addition to the With-Project comparison results). The method of developing the additional cross-sections is at the applicant’s discretion but shall be described in the application package. Hydraulic calculations shall be provided for a distance upstream of the project sufficiently to identify the full impacts of the project.

The evaluation of a proposed project with respect to the Common Regional Criteria shall be based on the submitted “as-designed” condition with the inherent assumption that the project will be constructed, operated, and maintained in perpetuity as designed. If no maintenance will be performed on the project to preserve the original design parameters (vegetation roughness, grading, etc.), then this future non-maintained project condition shall be considered the “as-designed” condition and shall be noted in the CDC Application, supporting documentation, and computer model.

2.5.2 Valley Storage

The maximum allowable valley storage decrease for the 100-year flood and Standard Project Flood are 0.0% and 5.0%, respectively.

General. The following is a discussion of the process of computing valley storage impacts of proposed floodplain development projects. The determination of valley storage impacts consists of the comparison of two conditions: Pre-Project and With-Project (sometimes referred to as Post-Project). The computation of valley storage in the CDC Process can be divided into two parts, On-Site and Off-Site. The maximum allowable valley storage decrease, stated as the percent change, is computed with respect to the Pre-Project (existing conditions) amount of valley storage On-Site (within the boundary of the proposed project tract). The intent of the Common Regional Criteria is to identify the specific valley storage impact of an individual proposed project, therefore the impact must be evaluated with respect to the original available On-Site (entire tract) valley

storage, not the disturbed area within the project tract, the hydrologic routing reach, the entire river reach, or an area that includes land on the opposite side of the river from the subject tract.

Pre-Project On-Site valley storage. The first step in the determination of valley storage impact is the computation of Pre-Project On-Site valley storage. It is recommended that specialized terrain software or other detailed methods be used to compute On-Site valley storage, since the HEC-RAS model may not fully account for valley storage in a specific project tract. The choice of method for valley storage computation is at the discretion of the Applicant’s engineer. However, assistance in determining the most appropriate method is available from the CDC/Floodplain Administrator and/or the USACE Water Resources Branch.

With-Project On-Site and Off-Site valley storage. The With-Project conditions model represents the proposed project tract and its resulting impact on water surface profiles and valley storage. Given the restraints of the water surface profile criteria (Section 2.5.1), the With-Project conditions model could possibly produce a decrease in the 100-year and SPF water surface profiles within, adjacent to, and upstream of, the proposed project (for example, due to additional conveyance on a project tract or a more efficient bridge structure). If the With-Project condition results in a reduction of the water surface profile, this reduction is classified as a valley storage loss. This is considered a loss in valley storage since the approved 100-year and SPF flows in the river corridor, shown in Appendix B.1 Tables 1A - 1D and incorporated into the CDC Model, were produced from the upper Trinity River watershed runoff model using computed reach-by-reach valley storage values. The 100-year and SPF flows are considered approved regional flows and therefore “fixed” - likewise the corresponding valley storage values are considered fixed values from which all future proposed projects are evaluated against.

For the With-Project conditions analysis, both On-Site and Off-Site valley storage must be determined. With-Project On-Site valley storage can be determined using the same methods as used to compute Pre-Project On-Site valley storage. The On-Site valley storage will represent the proposed changes to the project tract, such as grading and cut/fill. The Off-Site valley storage is determined by computing the impacts to all lands adjacent to, and upstream of, the project tract. If the proposed project results in a reduction in water surface profile (as compared to Pre-Project), then the upstream extent to which the impacts of the reduction is computed to is the location in which the With-Project water surface profile converges with the Pre-Project water surface profile.

This can be determined using the output table in the HEC-RAS program. The output table can also be used to obtain the Pre-Project valley storage at the convergence point, which will be compared to the With-Project value.

Note that if the With-Project conditions model produces no reduction in water surface profile, the only valley storage change is confined to the project tract, since there are no Off-Site impacts. Off-Site valley storage in this case would not need to be computed.

Computational procedure. The engineering efforts required for adherence to the Common Regional Criteria with respect to the water surface elevations and valley storage criteria is a balancing act of trying to satisfy both criteria at the same time. While a reduction in water surface profile may initially be considered as a positive impact, the negative impacts of this reduction to valley storage may be significant. The impact of a reduction in valley storage is increased peak flows. The challenge for the project design engineer is to achieve the required water surface criteria, while achieving the allowable valley storage reduction.

The allowable valley storage reduction is computed as follows:

- *Determine Pre-Project On-Site valley storage (this will be the denominator in the equation to compute percent change in valley storage)*
- *Determine With-Project On-Site valley storage*
- *Determine Pre-Project Off-Site valley storage (if needed)**
- *Determine With-Project Off-Site valley storage (if needed)**
- *Determine Valley Storage Net Change which equals the sum of the On-Site and Off-Site valley storage values.*
- *Determine Valley Storage Percent Change: Divide Valley Storage Net Change into the Pre-Project On-Site valley storage value. This will produce the percent change in valley storage (which could be a gain or loss).*

**Note that if the With-Project conditions model produces no reduction in water surface profile, the only valley storage change is confined to the project tract, since there are no Off-Site impacts.*

Required valley storage is generally provided within the proposed project site. However, compensatory valley storage may be provided at a separate site, outside of the proposed project site, but preferably in the vicinity of the original project site and within the hydrologic routing reach, subject to approval by the local CDC/Floodplain Administrator and the USACE. This valley storage compensation area will be evaluated with the same criteria as the original project site such that the valley storage compensation can be maintained in perpetuity. The valley storage site footprint shall be added to the original On-Site tract footprint to calculate the total tract area, which will be used to compute the percent reduction (or gain) in overall valley storage. The valley storage area will be subject to a full hydraulic evaluation in the same manner as the original project site if it is located in the active flow area. If the proposed valley storage area is located within a participating city or county jurisdiction other than the originating jurisdiction, then the CDC/Floodplain Administrator from the affected city or county must be notified and an approval granted by the affected CDC/Floodplain Administrator.

Insert Figure 2-1 for Project Site Layout Plan

Insert Figure 2-2 for Flow Chart – CDC Valley Storage Computation Process

(Valley Storage Examples will go to an Appendix)

2.5.3 Project Location/Analysis/Fee

Evaluation of proposed projects for water surface elevation and valley storage criteria will be based on the following guidelines with the ineffective and effective areas as defined in the CDC model:

- Located within both the 100-year and SPF effective flow areas:
 - Evaluation of the 100-year and the SPF water surface elevation is required
 - 100-year and SPF valley storage evaluation is required
 - CDC Application Fee \$6,000
- Located within both the 100-year and SPF ineffective flow areas:
 - No evaluation of the 100-year and the SPF water surface elevation is required
 - 100-year and SPF valley storage evaluation is required
 - CDC Application Fee \$4,000

- Project is located within a 100-year ineffective flow area but within the SPF effective flow area:
 - No evaluation of the 100-year water surface elevation is required
 - Evaluation of the SPF water surface elevation is required
 - 100-year and the SPF valley storage evaluation is required
 - CDC Application Fee \$6,000

The location of a project with respect to an ineffective flow area will be determined by the USACE with assistance of the local CDC/Floodplain Administrator.

2.5.4 Hydraulic Impacts to Velocities

Alterations of the floodplain may not create or significantly increase an erosive water velocity, on-site and off-site, including the main river channel, based on requirements of the permitting entity.

2.5.5 Proposed Projects within a Tributary

There may be instances where a proposed project located outside of the Clear Fork, West Fork, Elm Fork, East Fork, and main stem of the Trinity River SFHA boundary depicted on the FIRM, but within a tributary such as Village Creek, Mountain Creek, and Denton Creek, may be subject to CDC requirements. This is determined by assuming the 100-year water SFHA water surface elevation from the main river would pond upstream of the tributary at that constant elevation. If the proposed project is partially or entirely located within this ponding boundary, then a CDC is required. For these projects, generally the technical analysis would be a valley storage issue, as the project would likely be located outside of the main river conveyance area. The CDC Model would be used in the analysis - no separate tributary hydraulic model is required for the CDC permit. The requirement will be determined on a case-by-case basis. The Applicant should coordinate with the CDC/Floodplain Administrator for other floodplain modeling and permitting requirements.

Add a graphic of a tributary example here

2.5.6 Cumulative Impacts

The upstream, adjacent, and downstream effects of the proposed project will be considered. The proposed project will be reviewed with the assumption that adjacent projects have an equal opportunity to be constructed. The cumulative impacts of all projects must not exceed the Common Regional Criteria, as the goal of the CDC Model is to include permitted and completed projects to reflect cumulative effects of all permitted actions to aid the CDC/Floodplain Administrator in the considerations of future CDC applications.

2.5.7 Preservation of Adjacent Project Storage

The Applicant must respect the valley storage provided by adjacent projects by ensuring that their hydraulic connection to the river is maintained. If the proposed project blocks the hydraulic connection of the adjacent project, additional valley storage to offset the decrease caused by the blockage of the hydraulic connection is required.

2.5.8 Design Level of Flood Protection

The engineering analysis for a CDC will include the effects of the Applicant's proposal on the 100-year flood and Standard Project Flood and shall demonstrate meeting USACE, TWDB, and local criteria for pertinent flood events.

Levees. For new levees protecting urban development, the minimum design criteria for the top of levee is the SPF water surface elevation plus four feet, unless a relief system is designed and implemented that will prevent catastrophic failure of the levee system.

Buildings. For fills associated with building construction of habitable structures, the minimum finished floor elevation is the CDC 100-year flood elevation plus one foot. However, in some cases, city and county criteria exceeds this minimum, in which case the higher standard must be used in the design of the project.

2.5.9 Storage and Borrow Areas

The excavation of storage and borrow areas to elevations lower than the bottom elevation of the stream is generally hydraulically undesirable. The volume of such excavations above the elevation to which the area can be kept drained can be considered in the hydrologic storage computations. Refer to Section 2.5.2 Valley Storage regarding baseline flows. Excavation or fill that compromises channel stability shall not be allowed.

2.5.10 Significant Temporary Construction

There may be instances where the construction activity and/or the phasing associated with a proposed development project may have significant hydrologic and hydraulic impacts. In these cases the CDC Applicant shall be required to submit hydraulic and valley storage impacts representing these temporary impacts, as well as the proposed final project. Mitigation of adverse hydraulic and valley storage impacts due to these temporary construction activities may be required by the CDC/Floodplain Administrator.