





# Hillebrandt Bayou Technical Support Document

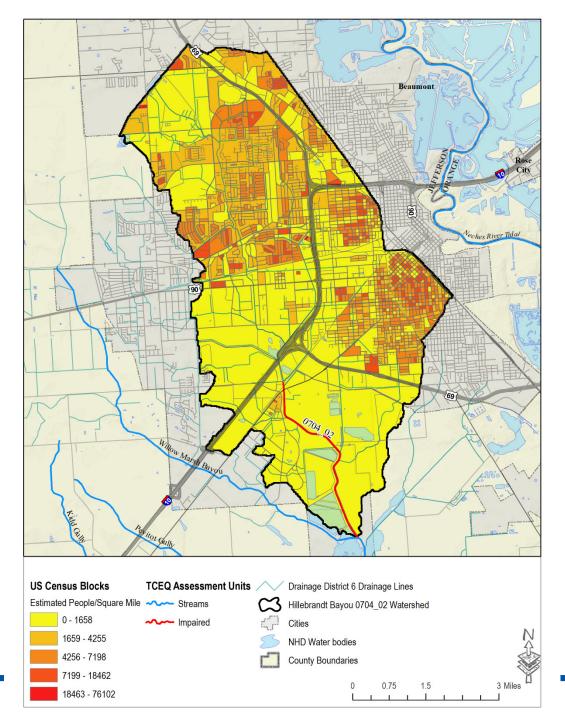
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### USC00410611 0704 02 Watershed SWQM-10687 SWQM-10686 SWQM-10685 Map area 1.25 5 Miles TCEQ Assessment Units / Drainage District 6 Drainage Lines Hillebrandt Bayou AU 0704\_02 Watershed Streams SWQM Monitoring Stations Impaired **NHD Water Bodies** ⊕ NOAA Co-op Weather Station County Boundaries

## Hillebrandt Bayou (AU 0704\_02) TMDL Watershed





### **Population**

- 2010 population 61,273 (estimated)
- 2070 population 97,617 (estimated)



# SSO Event Density TCEQ Assessment Units / Drainage District 6 Drainage Lines Hillebrandt Bayou 0704\_02 Watershed SSOs/square mile ---- Impaired County Boundaries

### Hillebrandt Bayou SSOs

• 404 reported incidents from 2005-2018



# 903 Area of Regulated Stormwater / Drainage Lines Hillebrandt WWTF **TCEQ Assessment Units** Hillebrandt Bayou 0704\_02 Watershed Streams County Boundaries

# Permitted Stormwater Area

• 35 square miles or 97% of the watershed



# **General Process for Developing Load Duration Curves**

### Develop Daily Flows

Plot Flow Duration Curve Develop Load Duration Curve

- Identify location of interest
- Use USGS daily streamflows if available
- Estimate daily streamflows using Drainage Area Ratio
- Calculate the percent exceedance for every daily mean streamflow value
- Plot flow values against the exceedance values
- Convert daily flow to allowable load (concentration times volume)
- Plot allowable load against exceedance values
- Overlay measured concentrations converted to daily loads



- No USGS stream gage to provide daily flows
- Drainage Area Ratio (DAR) method used to estimate the flow duration curve and daily streamflows
- Nearest streamgages are predominately rural watersheds, DAR modified to account for difference in land cover

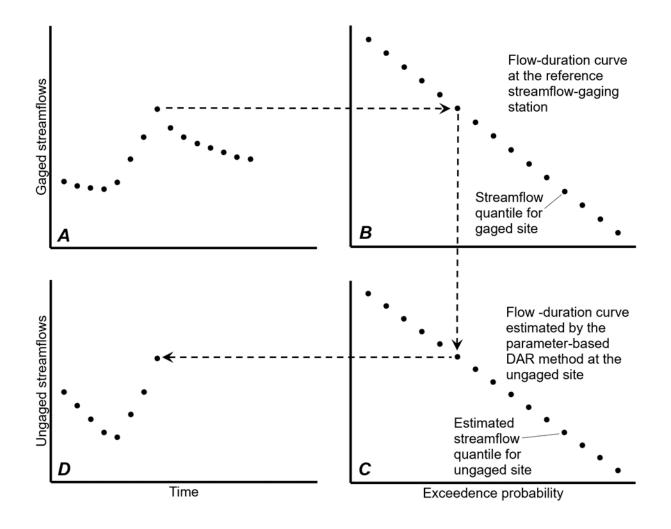


- Drainage Area Ratio Daily streamflow in an ungaged basin equals the daily streamflow in a nearby gaged basin, multiplied by the ratio of the drainage areas.
- For example if the ungaged basin is half the size of the gaged basin, the daily streamflow is approximately half



- Drainage Area Ratio Assumes ungaged watershed has similar hydrology and land cover as gaged watershed.
- Additional terms and parameters for developed area ratio and wetland area ratio
- Parameter optimization used to weight developed area and wetland area terms
- Streamflows are corrected for permitted discharges



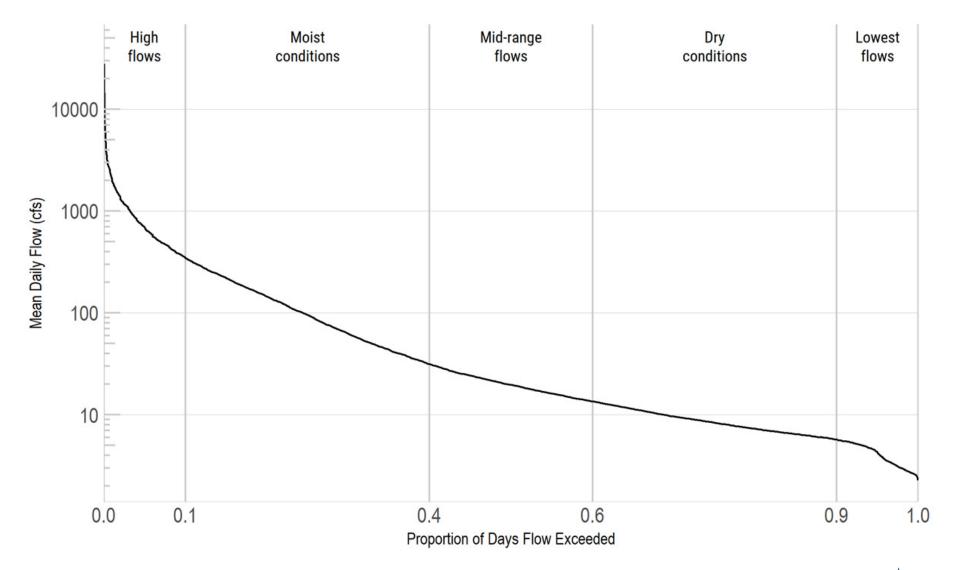




# ORANGE



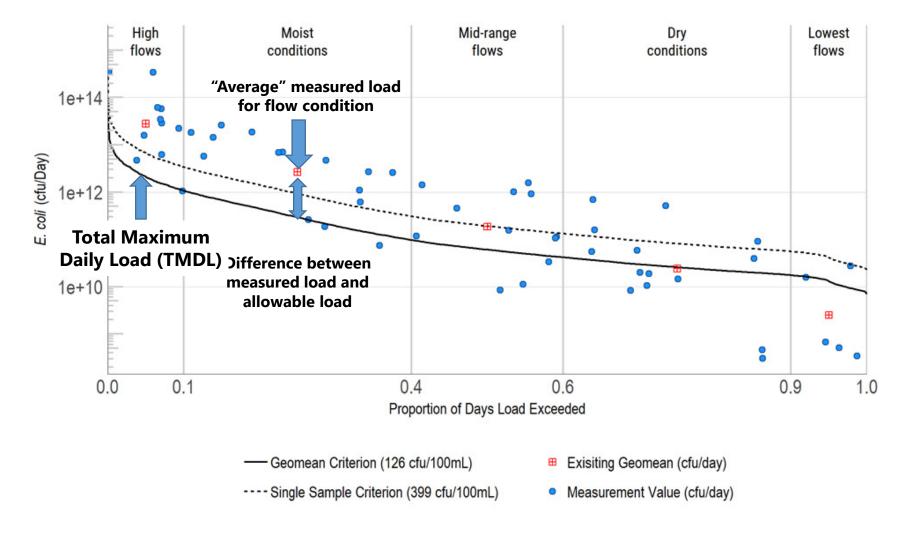
### Flow Duration Curve AU 0704\_02 - Station 10687





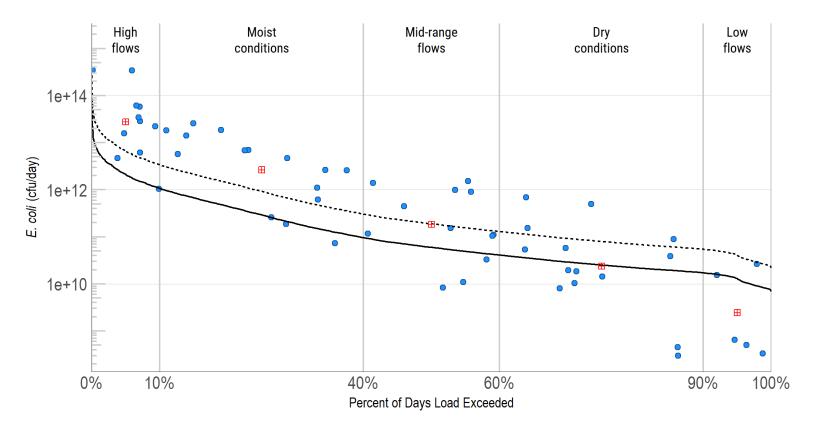
### **Hillebrandt Bayou Load Duration Curve**

Load Duration Curve AU 0704\_02 - Station 10687





### **Load Duration Curve – Hillebrandt Bayou**



- Geomean Criterion (126 cfu/100mL)
- Exisiting Geomean (cfu/day)
- ---- Single Sample Criterion (399 cfu/100mL)
- Measurement Value (cfu/day)







Thank You!

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