Use of the National Drought Mitigation Center Drought Index in the Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d):

Past efforts to evaluate the potential effects of drought on water quality have relied to a great extent on anecdotal information (instream flow measurement data and local precipitation records) when available. This methodology uses the drought severity classification system developed by the National Drought Mitigation Center as a tool to make more informed decisions related to the potential for drought effects on surface water quality in the Integrated Report. The goal of this methodology is to not falsely list/delist water bodies where changes in water quality are due to drought.

Toward this objective, we propose to use the weekly drought index score (from the Drought Monitor map) for each monitoring station for every week during a given period of suspected drought as a method to evaluate the potential for drought effects on water quality. The data includes the weekly US Drought Monitor maps for the period of interest and the final output is an Excel spreadsheet with all the water quality monitoring stations and the weekly drought scores during the period of interest. In general, the process consists of adding all of the Drought Monitor data for the period of interest to a map document, along with the SWQM stations data, and then adding the drought score for the particular region to the table of the SWQM stations.

Specifically, the TCEQ assessor will follow the steps below to use the drought severity index in the Integrated Report:

- For water bodies where new impairments, concerns, and/or delistings have been identified, based on the analysis of results for sampling for water quality parameters:
    - Review Excel spreadsheets with the monitoring stations and the weekly drought severity index (DSI) during the period of interest for the assessment unit (AU) for which the impairment has been identified (Table 2);
    - Determine if any of the DSI values indicate that the geographic region surrounding the monitoring station/AU indicate the presence of drought conditions (e.g. values for the DSI D0 – D4);
    - Determine the temporal extent of drought conditions antecedent to the date of collection of water quality samples that exceed criteria, by reviewing the weekly values indicated by the DSI for the monitoring station (Figure 4);
    - Based on this review, if it is determined that the temporal extent and severity of drought indicated by the DSI could potentially affect instream water quality then the relationship between the water quality parameter of concern and the DSI will be examined by developing graphs that provide a visualization of this relationship (Figure 5) .

If, based on the above described review of the DSI data and instream water quality data, it appears that water quality samples are significantly affected by drought and the water body impairment will be placed in Category 4c.

When used in conjunction with other data (water quality, flow, knowledge of the local watershed, and other available resources) the Drought Severity Index should be a useful tool for assessors when evaluating water quality and the potential impacts of drought for the IR. This information could also be helpful to other data users in need of recent or long term drought histories for a specific monitoring station. The current proposal recommends that the DSI be used primarily as an indicator of surrounding drought conditions, as described above, rather than as an indicator of water quality or quantity. Recent analyses have revealed statistically quantifiable relationship between the DSI and water quality parameters indicating that for some streams and/or lakes in some regions the DSI seems to be correlated with instream water quality, but certainly not at every monitoring station in every region**. In other words, the Drought Score will not be used to determine available water or as a conclusive indicator of use attainment but to provide information on nearby drought conditions.** We will continue to investigate this relationship in an effort to further refine an approach for incorporating this information in use attainment decisions.