TCEQ REGULATORY GUIDANCE
Air Permits Division
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Representative Analysis Criteria

Purpose/Scope:

TCEQ recognizes the importance of using information that is as accurate as possible in estimating emissions from oil and gas production and processing sites.

Two issues have been raised:

1. It is impractical to request site-specific samples for pre-construction authorizations, and
2. For existing sites, it may be impossible for the analytical labs to process all the samples needed within short time frames. TCEQ agrees that these are valid concerns and has taken them into account.

Action:

Any liquid or gas sampling that may be deemed representative can be submitted to TCEQ for consideration. A description as to why the sample is representative, an explanation of how it is representative, and substantive data to demonstrate the claim must be provided.

Discussion:

TCEQ has established criteria for what constitutes a representative sample, which can be used in place of a site-specific sample for estimating emissions at an oil and gas site.

First, if the representative analysis is from a production or exploration site, it is critical that the representative sample has originated from the same producing reservoir or formation as the actual site stream. This geologic criterion is an appropriate limitation because it is likely that a reservoir will have the same basic material characteristics and components, at least within a certain area of a reservoir. If the representative sample is for a natural gas midstream site, then this is not a factor. Instead, the representative inlet sample stream must contain less than 10% volatile organic compounds (VOCs), as well as the represented sites.

Second, the petroleum liquids being produced at the representative and the actual site must have a similar American Petroleum Institute (API) gravity, within plus or minus three degrees, as an indicator that they are of similar composition.

API gravity is used throughout the industry to differentiate between heavy or light oil and condensate streams and can be easily obtained by the owner-operator. Three degrees take into account the amount of error that might be present from a grab sample taken at the site that is not correct for temperature and pressure. In addition to the requirement of the API gravity being within three degrees, both sites must also be of the same site type.

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The three site types are:

- an oil site with associated gases,
- a natural gas site with associated liquid hydrocarbons (API>40), and
- a dry natural gas site.

Justification should be provided explaining why the sites are of the same type.

Third, for the representative stream sample to give a reasonably accurate emissions estimate, the sample needs to be taken from a site that processes the stream in a similar manner as the actual site. Gas and liquids need to be separated, since this can greatly affect the flash emissions due to the strong effect of changes in pressure and temperature on the vapor-liquid equilibrium.

Since this is a critical portion of determining if a sample is representative, the processing or conditioning equipment or storage vessel immediately before where the sample is taken must be within ±20 psi pressure and ±20 degrees Celsius temperature of the processing or conditioning or storage vessel stream that is being represented. If two produced streams are from the same area in formation, a difference in the depths most likely corresponds to a significant difference in the pressures. TCEQ understands that shallower wells are at a lower pressure and will, therefore, have less potential flash emissions.

Even if a produced stream is from the same area and depth of a formation, the pressure and temperature can be affected by the way in which the stream is brought to the surface. For example, the casing that brings the produced stream to the surface can vary in width, which affects the temperature and pressure.

Representative analyses cannot be used in place of a site-specific sample for the hydrogen sulfide (H_2S) content of a stream. Each site is required to sample the H_2S content of all streams necessary for estimating H_2S emissions, since it can vary greatly within a field and reservoir. To minimize cost, a simple test such as a stain tube can be used. Sites and streams with too high H_2S content will have to use a different test method to determine site-specific H_2S emissions.

We recommend you review multiple sites similar to the actual site, and the site with the highest estimate of emissions be used as the representative site. This will ensure the actual site emissions are most likely fewer than the site sampled. It is also recommended that the representative analysis be as recent as possible, but no more than 2-3 years old, to provide the most current and accurate data.

The representative lab analysis reports should state the field and reservoir or formation from which the sample is produced from. This is necessary to document that both the representative site and actual site are in the same producing field and reservoir or formation. At the time of sampling, it is suggested that this information be given to analytical lab personnel and reported in the analysis. Upon request by the appropriate regional office or local air pollution control program with jurisdiction, a new analysis will need to be done.

If you have questions, please call the Rule Registrations Section of the Air Permits Division, at 512-239-1250.