The commission is seeking comments on the proposed representative analysis. It is important to have accurate information when estimating emissions from Oil and Gas production and processing.

Explanation of Representative Analysis Criteria

The commission 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 raised in the rule comment period are (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 the allotted time frame. The commission agrees that these are valid concerns and has taken them into account for the rule adoption. The commission is allowing 180 days after well completion, start of operation, or implemented changes (whichever occurs first) for smaller, lower-emitting sites, which meet the emission limitations of Level 1, to be registered. The commission is allowing 90 days after well completion, start of operation, or implemented changes (whichever occurs first) for larger, higher-emitting sites, which meet the emission limitations of Level 2, to be registered.

It may still be seen as unreasonable for an applicant to determine which level of authorization is appropriate and be registered within either the 90 or 180 days specified in the rule. The commission, however, believes it is reasonable that an applicant can make a general projection as to whether the site emissions are within the PBR Level 1 or Level 2 limits, based on the type and amount of equipment. If site emissions are uncertain it is always an option to use the Level 2 PBR authorization and possibly register sooner than is necessary; the Standard Permit is also an option. It should be noted that even with these registration timelines stated in the rule, site specific analyses may be requested at any time by anyone with jurisdiction, including regional and local personnel.

The commission 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, it is critical that the representative sample must have originated from the same producing field and reservoir/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. Since it is not reasonable to assume that the same character of material is present throughout an entire reservoir, the commission is limiting the surface distance between a representative and actual site to 5 miles.

Second, the petroleum liquids being produced at the representative and the actual site must have a similar API gravity, within two degrees, as an indicator that they are of similar composition. API gravity is used throughout the industry to differentiate between heavy/light oil and condensate streams and can be easily obtained by the owner/operator. In addition to the requirement of the API gravity being within two degrees, both sites must also be of the same site type; the two site types are (1) an oil site (API gravity$\leq$40) with associated gases and (2) a

natural gas site with associated liquid hydrocarbons (API>40) or a dry (less than 2 bbl of liquid per MMscf of natural gas) natural gas site. The 40 degree API gravity cut-off was chosen for several reasons. In addition to it being a commonly used cut-off in industry literature, another reason is that an API gravity cut-off of 40 was used by the TCEQ Toxicology Department to determine the ESLs for crude oil and condensate that were used in the development of the PBR and Standard Permit limits. Another reason is that the Vasquez-Beggs correlation, which is a commonly used method of estimating flash emissions, is only valid up to an API gravity of 40.

Third, in order for the representative sample of a stream to give a reasonably accurate emissions estimate, the sample needs to be taken from a site that processes the stream in the same way as the actual site. The streams must be treated similarly at both sites because the output of one process may be in the inlet to another process. This means, for example, that at both the representative and actual sites there must be the same number and stages of separation, sweetening, and dehydration. Gas and liquids need to be separated in a similar manner since this can greatly affect the flash emissions due to the strong effect of changes in pressure and temperature on the vapor-liquid equilibrium. To further explain, this means if a sample is taken at a site with three separators, then it is only representative of other sites with three separators operated in the same manner. All separator operating pressures and temperatures must be similar, ±25 psi and ±50 °C, respectively. If two produced streams are from the same area in a formation, a difference in the depths most likely corresponds to a significant difference in the pressures. The trend understood by the commission is 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 with similar character, 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 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, however, a simple test such as a stain tube or dragger tube can be used. Sites with too high H_2S content cannot use these simpler types of test methods and will have to have a gas chromatography analysis.

<u>Representative Analysis Criteria</u>

A representative lab analysis of gas or liquid streams at an oil and gas site may be used in the following circumstances if all conditions are met: (1) the representative and actual streams sampled must be from the same producing field and reservoir/formation; (2) the representative and actual sites must be within 5 miles on the surface of each other; (3) the petroleum liquids being produced at the representative and the actual site must have a similar API gravity, within two degrees, as an indicator that they are of similar composition and both sites must also be of the same site type; the two site types are (a) an oil site (API gravity≤40) with associated gases

and (b) a natural gas site with associated liquid hydrocarbons (API>40) or a dry (less than 2 bbl of liquid per MMscf of natural gas) natural gas site; (4) the representative and actual sites must process streams in the same manner, i.e. there must be the same number and stages of separation, sweetening, and dehydration; and (5) all separator operating pressures and temperatures must be similar, ±25 psi and ±50 °C, respectively.

Representative analyses are not acceptable for H_2S content; site specific sampling is required. It is recommended that multiple similar sites to the actual site are reviewed and the site that yields the highest estimate of emissions be used as the representative site. This will insure that the actual site emissions are most likely less than the site actually sampled. It is also recommended that the representative analysis be as recent as possible, but no more than a few years old, in order to provide the most current and accurate data. It is very strongly encouraged that representative lab analysis reports state the field and reservoir/formation from which the sample is produced from. This is necessary in order to document that both the representative site and actual streams sampled are from the same producing field and reservoir/formation. At the time of sampling, it is suggested that this information is given to analytical lab personnel and asked to be reported in the analysis. It is also important to note that site specific analyses may be requested at any time by anyone with jurisdiction, including regional and local personnel.