COLORADO
Air Pollution Control Division
Department of Public Health & Environment

Guidance for Oil & Gas Operating and Maintenance Plans
(APCD-300 Series)

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Part 1: O&M Plan Overview and Process

The Oil & Gas Unit of the Air Pollution Control Division (division) developed templates for Operating and Maintenance Plans (O&M Plans) to communicate the minimum requirements for emission units and emissions control equipment maintenance, monitoring, and recordkeeping at synthetic minor and major stationary source oil and gas facilities in Colorado (Reference: Regulation No. 3, Part B, Section III.G.7). The O&M Plan describes operating and maintenance practices intended to ensure that the emission unit(s) and emissions control device(s) operate satisfactorily such that actual emissions do not exceed permitted limits.

In general, an O&M Plan is required for an emission unit (e.g., storage tank, separator, engine, etc.) at a synthetic minor or major stationary source when the construction permit for the emission unit includes permitted emissions limits reflecting emissions reductions achieved by operating an emissions control device. An emission unit-specific O&M Plan is not required for emission units covered by General Permit, because the General Permit already includes O&M requirements.

If an emission unit at a synthetic minor or major stationary source is not controlled, then an O&M Plan is not required for that specific uncontrolled emission unit.

If a facility is synthetic minor for any pollutant, then all controlled emission units with a construction permit at that facility require an O&M Plan (e.g., if a facility is synthetic minor for VOC, then emissions units permitted under a construction permit with controls for NOx and/or CO but not VOC still will require an O&M Plan.)

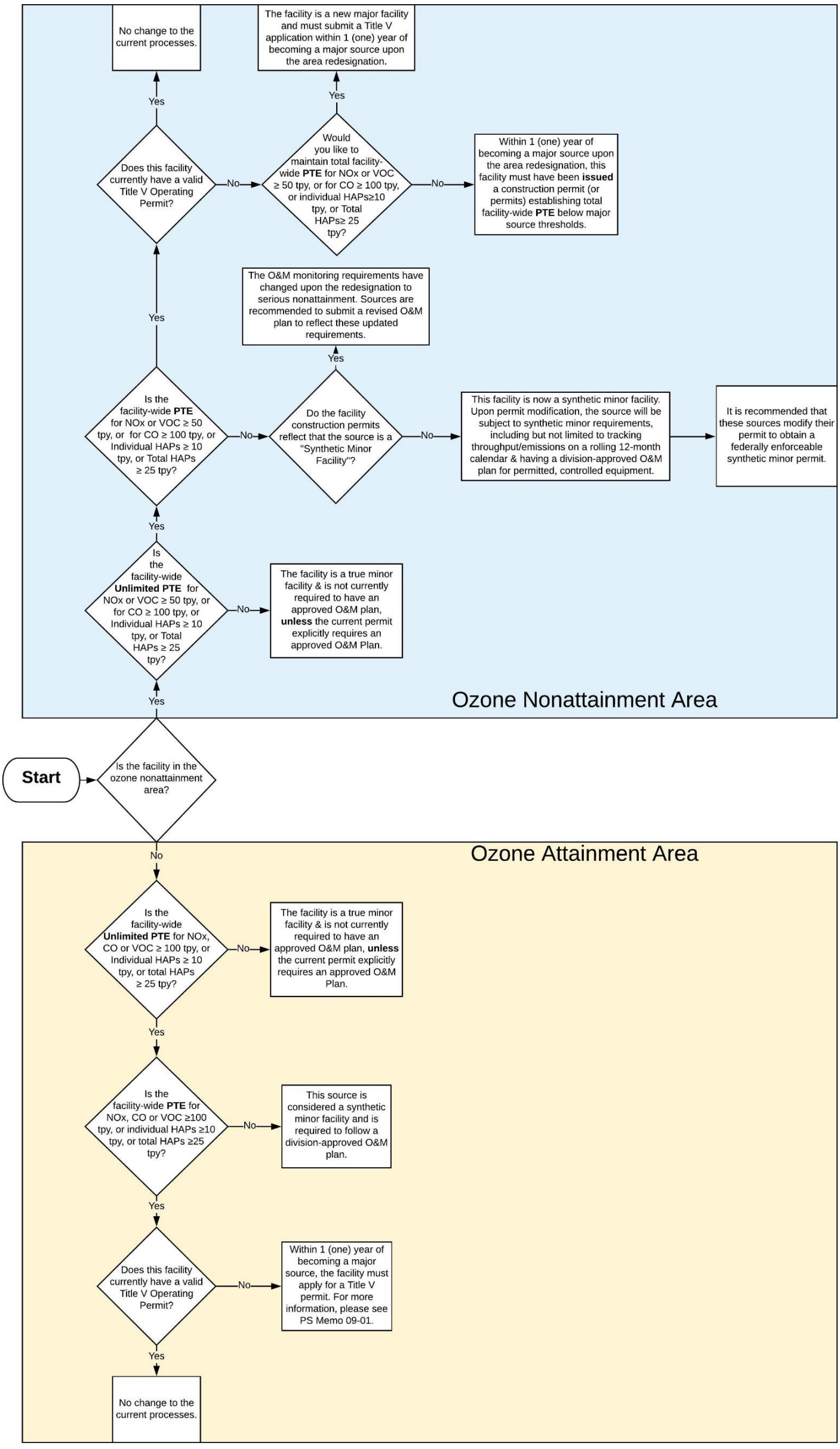
If the facility is a minor source (as defined by Regulation No. 3, Part A, Section I.B.), then an O&M Plan is not required for any emissions units at the facility.

Please note that O&M requirements – particularly for frequency of monitoring – are different for facilities in the Denver Metro and North Front Range 8-hour ozone nonattainment area, when compared to the rest of the state.

The flowchart on the next page may be used to determine if the controlled emission unit(s) at a facility are required to operate under an O&M plan. If you require additional clarification as to the need for an O&M Plan for emissions units at your facility, please call (303) 692-3150 and ask to speak to a permit engineer in the Oil & Gas Unit, or email your questions to cdphe_oandm@state.co.us.

This flowchart may be used to determine if the controlled emission unit(s) at a facility are required to operate under an O&M plan. The flowchart uses the following terms:

- **PTE (Potential to emit)** is the maximum capacity of a stationary source to emit a pollutant under its physical and operational design as defined by Regulation 3, Part A, I.B.37. A facility's federally enforceable emission limits (i.e. permitted limits) determine the PTE of a facility (per Regulation 3, Part A, I.A).
- **Unlimited PTE** is the maximum capacity of a stationary source to emit a pollutant without the consideration of emission control devices or operational limitations.



TEMPLATES

Division-produced templates are available for many common oil and gas emission units. The templates are available on the CDPHE website in APCD forms series 300.

The division has produced templates for natural gas-fired reciprocating internal combustion engines, condensate storage tanks, produced water tanks, crude oil storage tanks, gas/liquid separators, glycol dehydration systems, fugitive component equipment leaks, amine sweetening systems, hydrocarbon liquid loadout, process/emergency flares, and pneumatic pumps. **All new and modified O&M Plans for these source categories must use the most recently published division-developed template**.

The only exception to submitting an O&M Plan without using the most recently published division-developed O&M Plan template would be for emission units for which a division template does not exist.

If an existing source is permitted and operating under a previously approved company-developed O&M Plan or an older division-developed template (pre-2016), the operator may continue to use that previously approved O&M Plan. Upon modification of the O&M Plan and/or construction permit, if a new division-developed template is available the operator will be required to use the new format.

Do not modify the structure and/or form standard language of the division templates. The templates contain available space to allow for description of unique or site-specific details. Operators may also attach additional pages if needed to describe site-specific details.

APPROVAL PROCESS

If required, O&M Plan(s) must be submitted with the permit application or the application will be considered incomplete. If you do not complete the permit application in a timely manner, the application will be denied and APEN filing fees will not be refunded.

The division will review and approve the O&M Plan(s) during the permit application review process, and a construction permit will be issued with a requirement to follow the approved O&M Plan. If the O&M Plan is deemed incomplete or insufficient, the division will contact the operator to make amendments or corrections.

If the standard O&M requirements, monitoring parameters, or monitoring frequencies are infeasible due to facility location or seasonal restrictions, then in Section 5 of the O&M Plan you may request a variance from the requirements by clearly describing (1) the proposed changes to the standard requirements, and (2) the reasons for deviating from the standard requirements. A reviewing division engineer will evaluate the request.

ACTIVATION

After issuance of a construction permit (or commencement of operation in accordance with Regulation No. 3 Part A Section II.D.1.lll), operators must comply with the requirements of the O&M Plan(s) for the permitted emission units. Operators must keep a copy of each approved O&M Plan (either onsite or at a local field office) to be available to the division upon request. An approved O&M Plan, referenced by submittal date, will be associated with construction permit for the affected emissions unit(s) until the permit is modified or cancelled, or you modify the O&M Plan.

If an operator of an E&P site commences operation in accordance with Regulation No. 3 Part A Section II.D.1.lll, the operator shall adhere to the requirements of the O&M Plan submitted with the initial permit application until the division approves the O&M Plan or requires adjustments prior to permit issuance.

MODIFICATION

To modify an O&M Plan without opening a permit for modification, you may submit (by hard copy or email to cdphe_oandm@state.co.us) a revised plan for division review and approval using the division-provided O&M Plan template forms. Note that a change to operating and maintenance activities which results in a change to emissions profiles or emissions quantities likely requires a permit modification (and an APEN submittal) instead of a modification to the O&M Plan.

The division does not grant conditional approval of O&M Plans or modifications upon receipt. When a modification to an O&M Plan is submitted, the operator shall continue to adhere to the existing approved O&M Plan until the modified O&M Plan is approved by the division.

When a revised O&M Plan is approved outside of a permit action, the division will issue an approval letter which must be retained with the revised O&M Plan document and associated permit. When an O&M Plan is revised along with a permit modification, issuance of the modified permit signifies division approval of the O&M Plan, either as submitted with the permit application or as subsequently revised during permit application review.

In the division's O&M Plan templates, certain parameter monitoring frequencies are tied to the level of permitted emissions at the facility. **If a facility's permitted emissions limit changes (which may result in a change in O&M requirements), the previously approved O&M Plan remains in effect until the date that a modified O&M Plan is approved by the division.**

If you require any further assistance or clarification, please call (303) 692-3150 and ask to speak to a permit engineer in the Oil & Gas Unit, or email questions to cdphe_oandm@state.co.us.

Part 2: Template Forms Description and Guidance

The following guidance is generally applicable to most O&M Plan templates; guidance specific to emissions units and/or control equipment is contained in Part 3 of this guidance document.

SECTION 1 – SOURCE IDENTIFICATION

In Section 1 of the template, operators will provide general identifying information about the facility and the emission unit. Some information requested in this Section may not be known at the time of permit application submittal (i.e., Permit Number and AIRS Point ID) if the application is requesting permits for new emissions units. Only fill out those fields for which data is known and leave other fields blank. For "Facility Location:" enter the location information provided on the first page of the APEN.

A single O&M Plan document may be submitted for similar emission units at the same stationary source facility (e.g., same make/model, or same function) if each emission unit is controlled and monitored in the same manner. For example, if a facility operates two separate and independent condensate storage tank batteries - and emissions from both of those tank batteries are controlled and monitored in the same manner - then a single O&M Plan covering both tank batteries is acceptable, even if they are not controlled at a common control device.

SECTION 2 – MAINTENANCE SCHEDULES

This section contains requirements for emissions unit maintenance that are not explicitly required in the permit or elsewhere in the O&M Plan. General examples of these maintenance activities include oil changes, belt replacement, pump maintenance, grit cleanout, painting/surface coating upkeep, etc. Whether you opt for the manufacturer-recommended or an individually-developed maintenance program, you must keep maintenance records for a period of five (5) years.

SECTION 3 – RECORDKEEPING REQUIREMENTS

Synthetic minor and major stationary sources are required to maintain maintenance and monitoring records required by O&M Plans for a period of five (5) years.

If a permit modification changes the facility classification from synthetic minor to true minor, the records required by the O&M Plan still must be retained for five (5) years after the issuance of a modified permit that reflects the newly true minor status of the facility.

If applicable Federal NSPS, NESHAP, or MACT requires a longer record retention period, the operator must comply with the longest record retention requirement.

SECTION 4 – MONITORING REQUIREMENTS

The table(s) in Section 4 list the monitoring requirements for emissions control equipment that may be in use for the emission unit. Check the appropriate boxes that correspond to the emissions control equipment associated with the emission unit covered by the O&M Plan.

The monitoring frequency depends on the total facility permitted emissions of criteria pollutants. Check the box under "Monitoring Frequency" that reflects the facility's total permitted emissions of the specified criteria pollutant. The monitoring frequencies listed in the table are **minimum** acceptable frequencies. Note that facilities in the Denver Metro and North Front Range 8-hour ozone nonattainment area may be required to monitor parameter(s) at a higher frequency.

If the monitoring requirements and frequencies listed in Section 4 are infeasible due to facility location or seasonal restrictions, use Section 5 of the O&M Plan to request a variance from the standard requirements by clearly describing (1) the proposed changes, and (2) the reasons for deviating from the

standard O&M requirements. The division engineer will evaluate the request and, if acceptable, provide approval.

The following paragraphs provide additional information about completing the O&M Plan for certain control options that may be applicable for your emission unit(s):

Elevated Open Flare: Please refer to PS Memo 15-03 for guidance pertaining to the use of an open flare to comply with Regulation No. 7, Section XVII. The use of an open flare must be approved by the division as an alternate control device prior to operation.

Visible Emissions Observation and Method 22 Options: The division does allow a visible emissions observation (e.g., presence or absence of smoke) as a screening tool to determine if a formal Method 22 observation is warranted. If this approach is used, follow the guidance in the O&M Plan pertaining to repair and recordkeeping as described in the footnote to Table 1.

VRU or Recycled / Closed Loop: If a vapor recovery unit or other recycling process is used to control emissions, provide a clear explanation of the parameters monitored, monitoring frequency, and the methods used to track and record throughput and downtime. It is important to describe how the system design ensures that emissions are routed to the appropriate system at all times, including when system pressures are low. It may be helpful to provide a diagram of the VRU or recycling layout, including the locations of flowmeter(s) and other monitoring locations.

SECTION 5 – ADDITIONAL NOTES AND O&M ACTIVITIES

Use this section to describe all additional operating and maintenance practices which are not already described in the previous sections, or if additional space was required for a previous section. Section 5 can also be used to present actual emission calculation methods, if required by the division engineer. Attach additional pages if necessary.

Part 3: Emission Unit-Specific Guidance

The following provides guidance pertaining to specific emission unit types, expanding upon the general guidance provided in Part 2 of this guidance document.

APCD-301: Natural Gas Fueled Reciprocating Internal Combustion Engines (RICE)

PORTABLE ANALYZER TESTING

RICE engines at synthetic minor and major stationary source facilities must be tested using a portable analyzer, at a frequency dependent upon the facility's location and total permitted emissions of NO_x or CO. In Section 4 of the O&M Plan, the requirements for portable analyzer testing are specified for the ozone nonattainment and attainment areas. All portable analyzer tests ***must*** be performed per division protocol, which is found at:
https://www.colorado.gov/pacific/cdphe/portable-analyzer-monitoring-protocol

Check the box which corresponds to the facility's location and permitted emissions of NO_x and CO. Then, according to the control type (e.g., non-selective catalytic reduction (NSCR), selective oxidation catalyst (SOC)), the table will specify the frequency of testing and any further testing conditions.

The schedule for portable analyzer testing shall begin upon engine startup. In other words, if an engine is to be tested quarterly, then the engine shall be tested twice within the first 180 days of operation, with the first test within the first 90 days of operation. An appropriate reference method test performed on the engine, as described in 40 CFR Part 60 Appendix A, may substitute for a portable analyzer test.

CONTROL EQUIPMENT MONITORING

The requirements for monitoring of engine control equipment depend on the design class of the engine (i.e., rich-burn or lean-burn) and the type of emissions control device(s) (e.g., NSCR, SOC, etc.). Complete the table in Section 4 for the type of engine you are describing in the O&M Plan. The frequency of monitoring depends on the facility's location and total permitted emissions of NO_x and CO; check the corresponding box in the table.

APCD-302: Glycol Dehydration Systems

CONTROL EQUIPMENT INFORMATION

In Table 1, use the "Still Vent" and "Flash Tank (if present)" checkboxes to report the different control devices associated with these emission units. You can check multiple boxes if more than one emissions control or recycling method is employed; explain the approach in Section 5.

APCD-303: Fugitive Component Leak Emissions

An O&M Plan for fugitive emissions is required when a control credit is granted for fugitive emissions, **and** the facility is not subject to NSPS or MACT requirements for fugitive emissions (e.g., NSPS KKK, NSPS OOOO, NSPS OOOOa). Select the appropriate monitoring requirements based on regulatory applicability.

Section 4: General Leak Detection Program

Regulation Number 7, Section XVII.F requires a leak detection and repair program for all well production facilities and natural gas compressor stations; the General Leak Detection Program requirement in this section covers all other facilities.

APCD-304: Condensate Storage Tanks *(formerly Condensate & Mixed Liquid Storage Tanks)*
APCD-307: Produced Water Storage Tanks
APCD-308: Crude Oil Storage Tanks

STORAGE TANK EMISSION MANAGEMENT SYSTEM ("STEM")

In Section 4 of the O&M Plan template, there is a check-box option to confirm or deny the applicability of the requirements of Regulation No. 7, Section XVII.C. Those requirements include the operating, maintenance, and recordkeeping requirements of Regulation No. 7, Sections XVII.C.2. and C.3. (commonly known as your "STEM Plan".) The STEM Plan is company-specific and developed separately; the requirements of the STEM Plan are not duplicated in the O&M Plan.

It is anticipated that tanks at most synthetic minor and major facilities (i.e., facilities requiring O&M Plans) will have rolling twelve-month uncontrolled actual VOC emissions greater than the applicability threshold stated in Regulation No. 7, Section XVII.C., and thus a STEM Plan will also be required. If your storage tanks do require an O&M Plan but not a STEM Plan, then you must minimize leakage of VOCs to the atmosphere by adhering to the requirements listed in the second check-box option in Section 4 of the O&M Plan.

APCD-306: Amine Sweetening Systems

CONTROL EQUIPMENT INFORMATION

In Table 1, use the "Still Vent" and "Flash Tank (if present)" checkboxes to report the different control devices associated with these emission units. You can check multiple boxes if more than one emissions control or recycling method is employed; explain the approach in Section 5.

APCD-309: Separators

The term "separators" is intended to include two-phase separators, three-phase separators, high/low pressure separators, heater-treaters, vapor recovery towers, etc., and the associated air pollution control equipment.

MAINTENANCE SCHEDULES

If the separator has a pressure relief valve (PRV), you must inspect the PRV on a minimum annual basis, and maintain records of the inspections and any repairs for division review.

EMISSION UNIT INFORMATION

You are required to provide a diagram or plot plan of the configuration of the separator(s), control device(s), vapor recovery unit(s), and location of flow meters. This diagram will assist you and the division in understanding the calculation methods to determine the volume of gas vented from the separator and sent to the control device(s). This diagram is different from the facility-wide diagram required by the permit application; the permit application is not readily available to the operator or the division inspector. This diagram specific to the separator and control equipment is part of the O&M Plan and will be useful for reference by the operator and division inspector.

As the emissions calculation depends on the site-specific layout and configuration of the separator(s), control equipment, and potentially the overall facility, you are required to describe the calculation methods for determining the actual emissions from the separator(s), vapor recovery tower(s), and associated equipment. Please provide fully defined formulas for the emissions calculations, and state all assumptions.

Please be clear and specific about the sources of input data to the calculations, and describe how the input data is collected and recorded.

CONTROL EQUIPMENT INFORMATION

In Table 1, select the emissions control or recycling method used. If more than one emissions control or recycling method is used, select all applicable methods and provide an operational description in Section 5.

APCD-310: Process Flares or Emergency Flares

EMISSION UNIT INFORMATION

As the emissions calculation depends on the site-specific layout and configuration of emission units, control equipment, and potentially the overall facility, you are required to describe the calculation methods for determining the actual emissions from the process flare or emergency flare. Please provide fully defined formulas for the emissions calculations, and state all assumptions.

Please be clear and specific about the sources of input data to the calculations, and describe how the input data is collected and recorded.

APCD-311: Natural Gas-driven Pneumatic Pumps

Section 4: Monitoring Requirements

In this section, specify whether operating hours are to be tracked, and the method by which they will be tracked. If the pump(s) are permitted to operate for 8,760 hours per year, then tracking of operating hours is optional.

APCD-312: Hydrocarbon Liquid Loadout

This O&M Plan Template is intended to describe controlled loadout of liquids at ambient pressure. For controlled loadout of pressurized liquids, use Section 5 to describe the control process and any operation and maintenance practices that will be used.