SANTA BARBARA COUNTY

AIR POLLUTION CONTROL DISTRICT

POLICIES AND PROCEDURES

Policy No. 6100.072.2016 (Div Pol Yr) Draft _____

Supersedes No. 6100.072.1998 (Div Pol Yr) Final x

Date: August 25, 2016 Pages 19

Topic: Using Correlation Equation Methodology to Estimate Mass ROC Emissions at O&G Facilities

Distribution: Engineering Division Staff

ADVISORY

Effective August 25, 2016, the District is no longer allowing the use of the correlation equation emission estimate methodology to assess fugitive hydrocarbon emissions from piping components (e.g., valves, flanges, connections, seals) for permitting, compliance, toxics, inventory and/or planning purposes.

Those projects that previously used this calculation methodology will be grandfathered and may continue to use the methodology for current and future permitting, compliance, toxics, inventory and/or planning purposes according to the requirements specified in this policy. If the project was limited to part of a facility, then only that portion of the facility and any subsequent modifications to that portion of the facility may continue to utilize this calculation methodology.

Except as noted below, no changes to the policy have been made.

Notwithstanding the policy statement that "*…once a CE Method tier is chosen, the source cannot revert to the component-leakpath method…*", the District will allow existing projects that have utilized the correlation equation calculation methodology to switch over to the component leak path calculation methodology via a modification to the facility's Permit to Operate. The switch will not be treated as a project subject to Regulation VIII (New Source Review).

This change was made in conjunction with the August 2016 revisions to Regulation VIII in order to provide greater simplification and predictability to the permitting and related District programs.

GENERAL

APPLICABILITY AND PURPOSE. This policy and procedure (P&P) applies to the calculation of fugitive hydrocarbon (FHC) mass emissions at oil and gas production/processing (O&G) facilities using the correlation equation methodology (CE Method). It provides guidance on quantifying fugitive Reactive Organic Compound (ROC) emissions at O&G facilities using detailed component counts and the CE Method. These emissions can be used for determining potential to emit (PTE), Emission Reduction Credits (ERCs) and NEI (net emission increase) of fugitive ROC.

BACKGROUND. The method outlined in this P&P for estimating mass ROC emissions is an alternate method to that provided in P&P 6100.061 (*Determination of Fugitive Hydrocarbon Emissions at Oil & Gas Facilities Through the Use of Facility Component Counts).* For existing facilities where detailed component counts have not been required, please refer to P&P 6100.060 (*Calculation of Fugitive Hydrocarbon Emissions at Oil and Gas Facilities by the CARB/KVB Method*) for guidance on calculating fugitive hydrocarbon emissions.

DISCUSSION OF CE METHOD. In November of 1995, USEPA published the "1995 EPA Protocol" (U.S. EPA document EPA-453/R-95-017, *Protocol for Equipment Leak Emission Estimates*). This document was based primarily on recent studies at refineries, marketing terminals and O&G facilities in the United States. Components at these facilities were screened using OVA Model 108s ("OVA"), and the screening values were recorded. Many components were then "bagged" to quantify total hydrocarbon mass emissions, and four tiers of factors and equations relating the measured emissions to the screening values were developed. The four tiers, in order of increasing refinement, are:

- Tier 1: Average Factors;
- Tier 2: Screening Value Range Factors;
- Tier 3: Default Zero Factors, Correlation Equations, and "≥10K" Factors; and,
- Tier 4: Unit Specific Default Zero Factors, Correlation Equations, and "≥10K" Factors.

In general, a more refined method requires more data and provides more reliable fugitive hydrocarbon emission estimates.

The data used to develop the 1995 EPA Protocol emission factors were defined, collected and counted using a specific methodology that differs significantly from the procedures now being used in Santa Barbara County to satisfy the requirements of current APCD Rules and Regulations and Policies and Procedures. Therefore, to calculate fugitive emissions from leaking equipment using the CE Method, components must be categorized and counted consistent with the component identification and counting methodology addressed in this P&P.

Following the publication of the 1995 EPA Protocol, several air districts, CAPCOA representatives, the California Air Resources Board, USEPA and representatives of several oil industry companies met and conferred to discuss the document. Numerous refinements and technical adjustments were made to the EPA document by CAPCOA and ARB and provided in guideline form to all participants. This P&P further implements the guidelines, and defines measures acceptable to Santa Barbara County APCD for using the CE Method. The factors and/or equations used in this P&P represent revisions to the 1995 EPA Protocol acceptable to the APCD.

DEFINITIONS.

Component: A "component" includes but is not limited to any connector, flange, open-ended line, pump seal, valve, fitting, compressor seal, hatch, instrument, sight glass, meter, pressure relief device, or diaphragm. Examples of different component categories are detailed in this P&P under "Component Categories." Components are different from component-leakpaths in that there may be numerous "component-leakpaths" for each "component."

"≥10K" Component: A component with FHC that cause the monitoring instrument to equal or exceed its maximum useful range of 10,000 ppm. Because of this, no precise instrument screening value can be obtained for the component and it is referred to as a "≥10K" component.

"<10K" Component: A component with fugitive hydrocarbon emissions that cause the monitoring instrument to respond at less than its maximum useful range of 10,000 ppm. This includes components for which the monitoring instrument cannot distinguish the component's emissions from background. Also included are bellows seal valves – accessible, inaccessible and unsafe to monitor – for which OVA readings have been shown to be indistinguishable from background either in service or in a bench test approved by the APCD. NOTE: No component is assigned an emission factor of zero when using the CE Method.

Component Categories:

Compressor Seals/Pump Seals: Compressor/pump seals are located at the interface of the compressor/pump shaft and housing and other joints of the compressor/pump. A compressor/pump is defined as a device that raises, transfers or compresses fluids by suction or pressure or both. Compressors/pumps are used to transport fluids by the addition of energy. Compressor/pump seals are limited to the dynamic seal interface surrounding the rotating or reciprocating shafts. Polished rod stuffing boxes are included in this category. All associated components such as connectors, flanges, and valves are counted in their respective categories.

Connectors: Connectors are threaded components and tubing fittings of all sizes. Connectors generally have an outside diameter of three inches or less but may be larger. Each connector interface, regardless of size, counts as one component. Each threaded connector of processing lines to a valve is considered a connector. Unions are included in this category. A piece of pipe with one end connected to a valve and the second end open to the atmosphere is considered an "open-ended line," not a connector. (See open-ended lines.)

Flanges: A flange is a projecting rim on a pipe or piping component used to attach it to another flanged piping detail or component. Flanges are bolted connections generally having an outside diameter greater than 3 inches, but may be smaller. Each bolted connection of processing lines to a valve is considered a flange and should be counted as one component. However, bolted body connections of a valve are considered part of the valve and should not be counted as a flange. Body flanges on meters and filters, and hatches on tanks and vessels, are not counted as flanges; they are included in the "Other" category.

Open-Ended Lines (also called "open-ended valves")**:** An open-ended line is the end of any valve that can be opened to the atmosphere (e.g., sample connections, drains, bleed valves). If a

piece of pipe is attached to the end of a valve, but no pressure build-up can occur in the pipe, the system is considered an open-ended line and not a connector or flange. The open end of a pressure relief device is not counted as an open-ended line. When two valves are installed in series and both are closed (creating a double seal) the open end of the second valve is not counted as an "open-ended line"; this system is counted as 2 valves, plus associated flanges and connectors. An outlet line sealed with a plug or cap is not considered an open-ended line. The plug or cap is a connector or a flange.

Others: This category includes all component types that are not connectors, flanges, open-ended lines, compressor seals/pump seals, or valves. "Others" includes but is not limited to diaphragms, drains, dump arms, hatches, instruments (e.g., pressure gauges, thermocouples if not sealed, sensing elements), sight glasses, and pressure relief devices.

Valves: A valve is a device that regulates or isolates the flow in a pipe, tube, or conduit by means of an external actuator. Only valves that have visible actuators are counted. Each valve is counted once regardless of the number of leak paths such as body flanges, bonnet flanges or plugs that are a part of the valve. Smaller drain valves or vent valves attached to larger valves are counted as separate valves. Check valves and pressure relief devices are not counted as valves; they are included in the "Others" category. Each connector or flange of a valve to a processing line is counted as a connector or flange and is not considered part of a valve.

Component Accessibility Groups:

- **Accessible** means any component which is not inaccessible or unsafe to monitor;
- **Inaccessible** means any component located over fifteen (15) feet above ground when access is required from the ground, or any component located over six (6) feet away from a platform when access is required from the platform.

- **Unsafe to Monitor** means any component installed at a location that would prevent the safe inspection or repair of components as defined by Occupational Safety and Health Act (OSHA) standards or in provisions for worker safety found in 29 Code of Federal Regulations (CFR) 1910.

Correlation Equation and/or Factor: An equation or factor that relates fugitive hydrocarbon mass emission rates (typically in units of kilograms/hour-component, pounds/day-component, or pounds/year-component) to screening values in parts per million by volume. Correlation equations and factors are used to calculate emissions of individual components based on instrument screening values at each component.
NOTE: No component is assigned an emission factor of zero when using the CE Method.

Default Zero Factor: An emission factor to be used for components that give instrument screening values no higher than the background reading. Default zero factors do not apply to CE Method Tiers 1 or 2; they are applicable only to CE Method Tiers 3 and 4.

Emission Factor: The average mass fugitive emission rate for components in a specific screening value range. The factor is multiplied by the number of components to calculate fugitive emissions.

Fugitive Hydrocarbon Emissions: The term "fugitive" refers to unintentional emissions of hydrocarbon gases or liquid from components such as valve stems, connections, and shaft seals. Occasional or

continuous releases of emissions through stacks or vents, whether intentional, accidental, or the result of a shutdown, start-up or emergency procedure are not considered fugitive emissions.

High Volume Collection System: A leak quantification technique that uses a high flow of air to capture fugitive hydrocarbon leaks. The hydrocarbon fraction in the air/hydrocarbon mixture is determined using a portable hydrocarbon monitor. This technique and equipment are descried in USEPA document EPA-600/R-95-167 (*Evaluation of the High Volume Collection System (HVCS) for Quantifying Organic Vapor Leaks*).

Oil and Gas Production/Processing Facility: A facility at which crude petroleum and natural gas production, handling and/or processing take place, as defined in the Standard Industrial Classification Manual as Industry No. 1311, Crude Petroleum and Natural Gas.

Organic Vapor Analyzer (OVA): An EPA Reference Method 21-compliant portable hydrocarbon monitoring instrument that utilizes the principle of hydrogen flame ionization for detection and measurement of organic vapors.

Project: As used in this P&P, "Project" shall be as defined and described in APCD Rule 801 and associated staff reports and FAQs.

ROC and THC: Total hydrocarbons (THC) include methane, ethane, propane, and any other organic molecule containing carbon. Reactive Organic Compounds (ROC) are defined in APCD Rule 102.

ROC/THC Ratios: CE Method factors and equations in this P&P are for total hydrocarbons. APCD P&P 6100.061 provides ROC/THC ratios acceptable to the APCD. The ratio is applied to the calculated THC value to derive ROC for the facility in question.

Screening Value (SV): A component's highest THC concentration reading during a discrete monitoring event measured according to Method 21 by a calibrated OVA or equivalent instrument.

Service:

Gas/Light Liquid: Included in this category are all components containing or in contact with hydrocarbon process streams which are:

- In a gaseous state at operating conditions, or
- Liquids with API gravity ≥ 20 degrees, or
- Combined gas/liquid streams in which the liquid has an API gravity ≥ 20 degrees, or
- Liquid streams of undetermined API gravity.

Oil: Included in this category are all components containing or in contact with hydrocarbon process streams which are not Gas/Light Liquid. This includes process streams of mixtures of oil and gas where the oil has an API gravity <20 degrees.

Totally Enclosed (or Contained) Component: Components requiring disassembly of a sealed device or cover to inspect the component. Typical examples are: pressure relief devices that relieve to a closed vent system; compressor seals within sealed flanged covers (the flanged covers are monitored components, unless they operate in vacuum service); welded connections. (Additional information is contained in

RCD P&P II.V.1 page 8).

Vacuum Service: Equipment that operates at all times at an internal pressure which is at least 1 inch water column below ambient pressure.

EXAMPLES OF COMPONENTS COUNTED AND NOT COUNTED.

Components Counted: Some of the component types listed below are exempt from the monitoring requirements of the APCD's fugitive hydrocarbon control rule (Rule 331, a RACT-level rule), and therefore do not require routine monitoring under Rule 331. However, these component types were screened and used in developing CE Method average factors, screening value range factors, and default zero factors/correlation equations/"≥10K" factors. Therefore, the following components must be counted, screened and used in determining emissions via the CE Method:

- Components handling liquids which evaporate 1% or more ROC by weight at 150 degrees C;
- Components handling commercial natural gas (i.e., "a mixture of gaseous hydrocarbons, with at least 80 percent methane, and less than one percent ROC, on a weight basis, excluding methane, determined according to test methods specified in Section H" of APCD Rule 331);
- Components on liquid drain lines downstream of the second block valve;
- Components on discharge lines of pressure relief devices that discharge to the atmosphere (Note: the final discharge point will be considered as an open-ended line);
- All stainless steel tubing fittings (including those ≤ ½" in diameter) that meet any of the above-bulleted descriptions;
- Out-of-service components that meet any of the above-bulleted descriptions and which are not isolated in a way that ensures they are, and will remain, hydrocarbon free.

Components Not Counted: The following are examples of component types considered to contribute negligible emissions which are therefore exempt in the quantification of fugitive hydrocarbon emissions using the CE Method.

- Components operating in vacuum service;
- Components totally enclosed or contained such that there is no potential for VOC emissions to the atmosphere;

Components buried below ground or on those portions of offshore pipelines which are under water are also not counted.

COMPONENT IDENTIFICATION. Each component subject to the CE Method must be physically identified clearly and visibly as a CE Method component. Such components are to be listed in separate sections of I&M Plan inventories which show plant, P&ID number, tag number, component, size, service, accessibility group, and critical status. Quarterly or other reports of inspections shall show the above-noted information plus leak rates (ppm and drop-per-minute), date inspected, date of repair, days to repair, and reinspection data and results.

MONITORING INSTRUMENT SPECIFICATIONS. The following defines the specifications for monitoring instruments to determine the SVs for components:

- Only organic vapor analyzers (OVA) or other instruments which utilize the principle of hydrogen flame ionization for detection and measurement of organic vapors shall be used;

- No instrument shall be fitted with a dilution probe or with any device which may restrict flow;

- All monitoring equipment must be operated pursuant to the requirements of Method 21;

- All OVAs or other similar flame ionization equipment shall be calibrated according to Method 21 and the following:

    - the span gas shall be 10,000 ppmv methane in air (± 2% or better);
    - the zero gas shall be 0 ppmv methane in air (± 2% or better);
    - application of the span gas shall result in a response time of 4 seconds or less to 9,000 ppm.

COMPONENT SCREENING PROCEDURES. The component screening procedures used in quantifying emissions by the CE Method must duplicate those used by contractors during the 1995 EPA Protocol studies. Those methods generally follow Method 21 (see 40 CFR 60, Appendix A). Additional criteria included in this P&P that may be more stringent than those specified in Method 21 are required to ensure that the procedures used in creating the 1995 EPA Protocol are duplicated when implementing this P&P.

Basic screening instruction: Place the probe inlet of the monitoring instrument at the surface of the component interface where leakage could occur such that the probe contacts the surface and minimizes the space between the interface and the probe. For equipment with moving parts, the probe should be placed no more than 1 centimeter from the surface. Move the probe along the interface periphery allowing a sufficient amount of time for the instrument to respond while observing the instrument readout. During this step the probe must not be moved at a rate of greater than one linear inch per instrument response time and the movement must encompass the entire interface. If there is an increase in the meter reading, sweep back past the location at a slower movement rate and monitor the interface where leakage is indicated until the maximum meter reading is obtained. Leave the probe inlet at this maximum reading location for approximately two times the instrument response time. Record the highest reading. This procedure must also be repeated on all interfaces of a multiple interface component.

Background screening instruction: Background screening shall be performed as detailed in Method 21.

Component-specific screening instructions:

Flanges and Other Connectors - Monitor the entire circumference of the flange-gasket interface. Monitor the entire circumference of threaded connections, tubing fittings, and other types of non-permanent joints.

Open-Ended Lines or Valves - Place the probe inlet at the center of the opening to atmosphere; do not insert the probe inside the opening.

Pump and Compressor Seals - Monitor pump seals at the point where the shaft exits the seal. If the source is a rotating shaft, position the probe inlet within 1 cm of the shaft-seal interface. If the housing configuration prevents a complete check of the shaft periphery, sample all accessible portions. Sample all other joints on the pump or compressor housing where leakage could occur.

Valves - Monitor all of the area where the stem comes out of the packing gland. Monitor any body flanges, bonnet flanges, or grease/sealant injection fittings on the valve.

Others - Monitor these components (such as diaphragms, dump arms, instruments, meters) at all points of possible emissions. Additional screening instructions for specific "others" components follow:

Access Door Seals and Hatches - Place the probe inlet at the surface of the door seal interface and monitor along the periphery.

Pressure Relief Devices Vented to Atmosphere - The configuration of most pressure relief devices prevents sampling at the sealing seat interface. For those devices equipped with an enclosed extension, or horn, place the probe inlet at approximately the center of the exhaust area to the atmosphere.

Process Drains, Manhole Covers, and Vents - If open, place the probe inlet at approximately the center of the area open to the atmosphere. If covered, place the probe at the surface of the cover interface and monitor along the periphery.

Figures of different component types and the parts of those components to be monitored (screened) are included in Section IV (Figures) of this P&P.

II. CALCULATION of FUGITIVE MASS EMISSIONS

GENERAL. Sources shall calculate component mass emissions based on their initial in-period measured screening values (SV). That is, if the monitoring period is once per quarter, the source's first quarterly SV for a component shall determine the CE Method factor or equation to be applied to that component for the entire quarter. For example, for a source using SVRFs, if the source's first in-period SV for a component is ≥ 10K ppmv, the "≥ 10K" factor is applied, and that emission rate applies to that component for each day of the quarter. Similarly, if a component's first SV in the quarter is <10K ppmv, the "<10K" factor applies each day of the quarter. In each case ("<10K ppm" and "≥ 10K ppm"), SVs other than the source's initial in-period SV do not affect the source's calculated emissions for the monitoring period. Examples of SVs that do not affect calculated emissions are APCD SVs earlier or later in the monitoring period, and source SVs after repair.

All components for which mass emissions are to be calculated using the CE Method shall be screened, and each screening value shall be recorded and available to the APCD on request.

Note: For components monitored routinely at different nominal inspection frequencies than quarterly (e.g., monthly, annually) the same method applies.

SPECIFIC CE METHOD INSTRUCTIONS.

Tier 1: Average Factors. Not applicable at this time.

Tier 2: Screening Value Range Factors. This method uses each component's SV data to calculate the component's mass emission rate. There are two possible mass emission rates for each component, one for SV< 10K ppmv and the other for SV ≥ 10K ppmv.

Table SVRF-1 contains SVRFs for oil and gas production and processing facilities, categorized by component type, service type, and screening value ranges.

Use of Tier 2 (SVRFs) requires the following steps:

Step 1. Provide APCD-approved component counts for a project or source, according to guidance of this P&P. This count includes separating components into component categories (e.g., connectors, flanges, open-ended lines, compressor seals/pump seals, valves, others), service types (i.e., Gas/Light Liquid, and Oil), and accessibility groups (e.g., accessible, inaccessible, unsafe to monitor).

Step 2. Measure and record the source's initial in-period SVs of each component at or more frequently than is required by APCD Rule 331.

Step 3. For each component category, separate the SV data into two groups: one group for all components with SVs <10K ppm, and the other group for all components with SVs ≥ 10K ppmv

Step 4. Multiply the number of components in each SV group (component type/service type/screening value range) by the appropriate SVRF from Table SVRF-1 to obtain the sub-total of THC emissions from each SV group.

Step 5. Multiply the THC emissions from each SV group by the appropriate ROC/THC ratio from P&P 6100.061 to obtain the ROC emissions for each SV group.

Step 6. Add the sub-totals of THC emissions and ROC emissions from each SV groups to give total THC emissions and ROC emissions from the project or source.

An example emissions calculation and additional discussion on calculating emissions is provided in Table SVRF-2 as "Example Calculation of ROC Emissions from a New Project".

Tier 3: Default Zero Factors, Correlation Equations, and "≥10K" Factors. Not applicable at this time.

Tier 4: Unit Specific Default Zero Factors, Correlation Equations, and "≥10K" Factors. Not applicable at this time.

TABLE SVRF-1: OIL AND GAS PRODUCTION/PROCESSING FACILITIES

SCREENING VALUE RANGE EMISSION FACTORS [a, b]

Component Type	Service Type	< 10,000 ppmv THC Emission Factor (lb/comp-day) [c]	≥ 10,000 ppmv THC Emission Factor (lb/comp-day) [c]
Valves	Gas/Light Liquid	1.85E-03	7.33E+00
	Oil	1.01E-03	3.74E+00
Pump seals/ Compressor seals	Gas/Light Liquid	3.07E-02	3.80E+00
	Oil	7.40E-03	3.80E+00
Others	Gas/Light Liquid	1.27E-02	9.76E+00
	Oil	8.50E-03	5.03E-01
Connectors	Gas/Light Liquid	6.35E-04	1.37E+00
	Oil	5.29E-04	1.24E+00
Flanges	Gas/Light Liquid	1.48E-03	3.23E+00
	Oil	1.27E-03	1.38E+01
Open-ended lines	Gas/Light Liquid	1.27E-03	2.90E+00
	Oil	9.52E-04	1.17E+00

(a) Source: Fax transmittal from STAR Environmental, dated December 17, 1997, entitled *Comparison of Screening Value Range Factors for Oil and Gas Production Operations*, and APCD report, dated May 1, 1997, entitled *Review of the 1995 Protocol: The Correlation Equation Approach To Quantifying Fugitive Hydrocarbon Emissions At Petroleum Industry Facilities*. These factors were developed using the separated oil and gas production default zero factors and "≥10K" factors. The correlation equations for the petroleum industry were used for components with screening values between background and 9,999 ppmv, and reflect the technical corrections and adjustments discussed in Section III of the guidelines. (Values converted from kg/comp-hr to lb/comp-day for this table.)

(b) These factors are only valid for components at facilities that have APCD-approved I&M programs in place.

(c) These factors are for total organic compound emission rates (including non-ROCs such as methane and ethane). See P&P 6100.061 for ROC/THC ratios.

Table SVRF-2: Oil and Gas Production/Processing Facilities

Example Calculation of Fugitive ROC Emissions from a New Project

This example estimates fugitive ROC emissions from all components at a new onshore oil and gas processing plant in accordance with the the guidelines of this P&P. This calculation is used to determine the reasonable worst case Potential to Emit (i.e., leakers >=10K must provide sufficient cushion for compliance purposes). The components are grouped by service type, component type, accessibility group and screening value range. The number of components in each group is multiplied by the appropriate factor from Table SVRF-1 of this P&P to yield Total Hydrocarbon emissions for each of the two SV ranges. These are added to give total THC in lb/day; this is in turn is multiplied by the given ROC/THC ratios from P&P 6100.061 to yield ROC emissions.

Service Type **Component Type**	**Accessibility Group**[1]	**Number of Components Screened**			**SVRFs for THC (Table SVRF-1)** lb/comp-day		**THC Emissions by SVRF Range, and Total** lb/day			**ROC/THC Ratio**	**Total ROC Emissions**		
		<10K	>=10K	Total	<10K	>=10K	<10K	>=10K	total		lb/day	tpq	tpy
Gas/Light Liquid Service													
Valves	Access	1640	5	1645	1.85E-03	7.33E+00	3.034	36.650	39.684	0.31	12.30	0.56	2.25
	Inaccess	15	1	16	1.85E-03	7.33E+00	0.028	7.330	7.358	0.31	2.28	0.10	0.42
	USM		4	4		7.33E+00		29.320	29.320	0.31	9.09	0.41	1.66
	USM-Bellows[2]	6		6	1.85E-03		0.011		0.011	0.31	0.00	0.00	0.00
Others	Access	420	3	423	1.27E-02	9.76E+00	5.334	29.280	34.614	0.31	10.73	0.49	1.96
	Inaccess	3		3	1.27E-02		0.038		0.038	0.31	0.01	0.00	0.00
	USM		2	2		9.76E+00		19.520	19.520	0.31	6.05	0.28	1.10
Connectors	Access	7003	12	7015	6.35E-04	1.37E+00	4.447	16.440	20.887	0.31	6.47	0.30	1.18
	Inaccess	4	3	7		1.37E+00		4.110	4.110	0.31	1.27	0.06	0.23
Flanges	Access	2221	5	2226	1.48E-03	3.23E+00	3.287	16.150	19.437	0.31	6.03	0.27	1.10
	Inaccess	16	3	19	1.48E-03		0.024		0.024	0.31	0.01	0.00	0.00
	USM		11	11		3.23E+00		35.530	35.530	0.31	11.01	0.50	2.01
Open-ended Lines	Access	0		0	1.27E-03		0.000		0.000	0.31	0.00	0.00	0.00
Pump/Compressor Seals	Access	6	1	7	3.07E-02	3.80E+00	0.184	3.800	3.984	0.31	1.24	0.06	0.23
Subtotal: Gas/LL		**11334**	**50**	**11384**							**66.50**	**3.03**	**12.14**
Oil Service													
Valves	Access	1000	2	1002	1.01E-03	3.74E+00	1.010	7.480	8.490	0.56	4.75	0.22	0.87
	Inaccess	7	1	8	1.01E-03		0.007		0.007	0.56	0.00	0.00	0.00
	USM		2	2		3.74E+00		7.480	7.480	0.56	4.19	0.19	0.76
	USM-Bellows[2]	3		3	1.01E-03		0.003		0.003	0.56	0.00	0.00	0.00
Others	Access	200	2	202	8.50E-03	5.03E-01	1.700	1.006	2.706	0.56	1.52	0.07	0.28
	USM		1	1		5.03E-01		0.503	0.503	0.56	0.28	0.01	0.05
Connectors	Access	4000	5	4005	5.29E-04	1.24E+00	2.116	6.200	8.316	0.56	4.66	0.21	0.85
	Inaccess	12	1	13	5.29E-04		0.006		0.006	0.56	0.00	0.00	0.00
Flanges	Access	1900	2	1902	1.27E-03	1.38E+01	2.413	27.600	30.013	0.56	16.81	0.77	3.07
	Inaccess	9	1	10	1.27E-03	1.38E+01	0.011	13.800	13.811	0.56	7.73	0.35	1.41
	USM		2	2		1.38E+01		27.600	27.600				0.00
Open-ended Lines	Access	0		0	9.52E-04				0.000	0.56	0.00	0.00	0.00
Pump/Compressor Seals	Access	30	1	31	7.40E-03	3.80E+00	0.222	3.800	4.022	0.56	2.25	0.10	0.41
	Inaccess	1		1	7.40E-03		0.007		0.007	0.56	0.00	0.00	0.00
Subtotal: Oil		**7162**	**20**	**7182**							**42.20**	**1.93**	**7.70**
Total: Gas/LL + Oil		**18496**	**70**	**18566**							**108.70**	**4.96**	**19.84**

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NOTES:

1) Access = Accessible; Inaccess = Inaccessible; USM = Unsafe to Monitor
2) USM-Bellows: The "<10K" factor may be applied to bellows seal valves for which OVA readings have been shown to be indistinguishable from background either in service or in a bench test approved by the District. See Part I, *Definitions* in this P&P for "<10K" Components.

III. ISSUES AND IMPLEMENTATION

WHO CAN USE THE CE METHOD?

- **Existing Sources, New Projects:** The use of the CE Method is voluntary for all new projects: new projects may use the CE method, or the component-leakpath method. However, once a source uses the CE Method for any project at their source, including quantifying *de minimis* changes, all future projects must use the CE Method and they must use the same or higher CE tier. No mixing of the CE Method and the component-leakpath method is allowed for new projects. Also, no mixing of different CE Method tiers on a single project is allowed.

- **Existing Sources, Existing Equipment:** The use of the CE Method is voluntary for existing equipment. Sources previously permitted using fugitive emissions calculation methods other than the CE Method (e.g., as detailed in P&Ps 6100.060 and 6100.061) for existing equipment or quantifying *de minimis* changes may continue to use those methods, or they may apply the CE Method to the entire source via an application for an ATC permit. However, once a source uses the CE Method for existing equipment or in quantifying *de minimis* changes, all future projects - including quantifying *de minimis* changes - must use the CE Method and they must use the same or higher CE tier; no other calculation methods can be applied to future projects. Also, no mixing of different CE Method tiers on a single project is allowed.

- **New Sources:** Entirely new sources may choose between the component-leakpath method and the CE Method. However, once a CE Method tier is chosen, the source cannot revert to the component-leakpath method or to a lower CE Method tier at a later date.

PERMITTING. For a source choosing to implement the CE Method on a project or source, an application for an Authority to Construct permit is required. The application must define the Potential to Emit by estimating the emissions by service type/component category/accessibility group, per the example in Table SVRF-2. Notwithstanding the permitted emissions and how they are derived, the limits of APCD Rule 331 Table 1 apply.

In an application for permit for fugitive hydrocarbon components for which ROC emissions are calculated using the CE method, a source may want to use some "comfort factor" or "uncertainty factor" in defining and applying for the potential to emit (PTE): permits will show the total "gas/light liquid service" component ROC PTE emissions and the total "oil service" component ROC PTE emissions as distinct permitted limits not to be exceeded. Therefore, when determining the PTE for ROC from fugitive hydrocarbons, the APCD suggests that the source's application slightly overestimate the number of leakers[1] to ensure that the PTE is not exceeded during actual operations. Enforcement actions may be taken against ROC emissions which exceed either of these two permitted limits. In addition, new project emissions that are greater than those permitted may require additional Emission Reduction Credits and Offsets**.**

All relevant information pertaining to the use of the CE Method shall be incorporated into Inspection and Maintenance Plans required by Rule 331 and APCD permits (ATC and PTO) as if they were details required by Rule 331 or the I&M plans. This includes, but is not limited to, component counts, exemption request information, identification numbers for components, emission factors or equations. Similarly, project drawings, inventory lists and similar records which pertain to the implementation of the CE Method shall be kept current and submitted to the APCD in the same detail and on the same schedule as would be required if they were records required by Rule 331.

[1] Again, the limits of Rule 331 Table 1 apply.

***DE MINIMIS* EMISSIONS.** The following requirements apply to the use of the CE Method for documenting compliance with the *de minimis* exemption provisions of Rule 202:

- Sources may continue to use the component-leakpath emission factors detailed in APCD P&P 6100.061.

- For *de minimis* projects using SVRFs, the source shall establish for each *de minimis* project written records that document the following:

  - the number of components by category, service type and accessibility group (e.g., "unsafe to monitor");

  - assumptions used to establish the potential to emit for the project such as the percentage of each component type using "<10K" factors and "≥10K" factors;

  - show calculations based on the above assumptions and other project variables;

  - records documenting compliance inspections for all components of each *de minimis* project. These records shall be maintained on site and made available to the APCD on request, and shall be kept for a minimum period of 3 years (Note: 5 years for sources subject to Part 70);

  - each *de minimis* project's emissions shall be added to the existing source *de minimis* totals to date to demonstrate compliance with the aggregate exemption limit threshold of rule 202.D.6 (24 lb/day).

- For *de minimis* projects using SVRFs, the "percentage leaking" function of each component category, service type and accessibility group as defined above for each de minimis project shall be incorporated as part of the APCD-approved I&M Plan so that it is enforceable. The "percentage leaking" function may not vary once established except by APCD-approved modification of the Plan.

- The affected components must be inspected consistent with Rule 331, permit requirements and this P&P. *De minimis* project emissions must be quantified to verify the *de minimis* status of each project and of the aggregate of all *de minimis* projects. (Emissions of the components shall be grouped both by project and by aggregate.)

COMPLIANCE. Compliance with the requirements of this P&P does not relieve a source from the requirements of APCD Rule 331 and the following:

- The use of soap screening is not authorized for determining leak rates (i.e., background, <10K ppm, or ≥10K ppmv) via the CE Method.

- The I&M Plan must be updated to reflect each project/permit using the CE Method.

- Compliance with permitted mass emission limits shall be based on operator inspection records. Any calculated value of mass ROC emissions (based on operator data) that exceeds a permitted emission limit (i.e., "Gas/Light Liquid" total daily, quarterly and annual ROC; "Oil" total daily, quarterly and annual ROC) is evidence that the source is not in compliance.

- Operator-reported inspection records will be reviewed by the APCD to assess compliance with mass emissions limits of two service groups: Gas/Light Liquid, and Oil. The source shall notify the APCD

in writing any time a mass emission limit (i.e., lb/hr, ton/quarter, ton/year) is exceeded for either of these two service groupings.

- The APCD reserves the right to monitor and record data for a representative sample of components. With this data, the APCD may extrapolate the calculated mass emission results to the entire component population to assess compliance with the permitted mass emission limits (lb/day, ton/quarter, ton/year).

Count Verification: The APCD will verify that the source's component count provides an accurate representation of the components installed. The APCD count must agree to within ± 5% of the source count. The APCD will base its verification of this limit by comparing APCD's component count vs. the source's count over either a limited portion of the new project, or over the entire new project.

Count Variation: The total component count for each project as documented by any quarterly inspection by or for the source operator will be deemed invalid if it differs from the project APCD-verified component count by more than 5%. This 5% variation is to allow for differences in counts and does not constitute an allowance for emissions growth via the installation of new components. For sources using both the component-leakpath method and the CE Method, the 5% variation shall apply to the total of each method's inventory.

Inaccessible components must be screened at least once per calendar year; components screened less than once per calendar year are considered "unsafe to monitor". Inaccessible components are counted in the appropriate component categories, and are assigned the appropriate equation or factor (e.g., when using SVRFs, either the "<10K" or "≥10K" factor) based on the source's most recent initial screening value (i.e., the first or subsequent – usually annual - screening value.)

Unsafe to monitor components are counted in the pertinent component categories and assigned appropriate "≥10K" factors. The only exception (i.e., bellows seal valves) is detailed in *Definitions*, "<10K" Components.

EMISSION FEES AND COST REIMBURSEMENT. Emission fees shall be assessed pursuant to the guidelines of APCD Rule 210.

For a source which utilizes the CE Method, the cost reimbursable provisions of APCD Rule 210 shall apply to any work associated with the CE Method, including but not limited to review of I&M plans, inspections, permit processing, *de minimis* exemptions and compliance determinations.

IV. FIGURES

The following figures are attached to this P&P for clarification of component categories and screening locations:

No.	Description
1.	Connector, Open-Ended Line, Valve
2.	Flanges, Valve
3.	Flange, Valve
4.	Connectors
5.	Connectors
6.	Flange, Valve

V. REFERENCES

U.S. EPA document EPA-453/R-95-017, issued November 1995, *Protocol for Equipment Leak Emission Estimates* (the "1995 EPA Protocol").

P&P 6100.060 (*Calculation of Fugitive Hydrocarbon Emissions at Oil and Gas Facilities by the CARB/KVB Method*)

P&P 6100.061 (*Determination of Fugitive Hydrocarbon Emissions at Oil & Gas Facilities Through the Use of Facility Component Counts).*

Draft *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* issued by CAPCOA (California Air Pollution Officers Association and CARB (California Air Resources Board) on September 5, 1997.

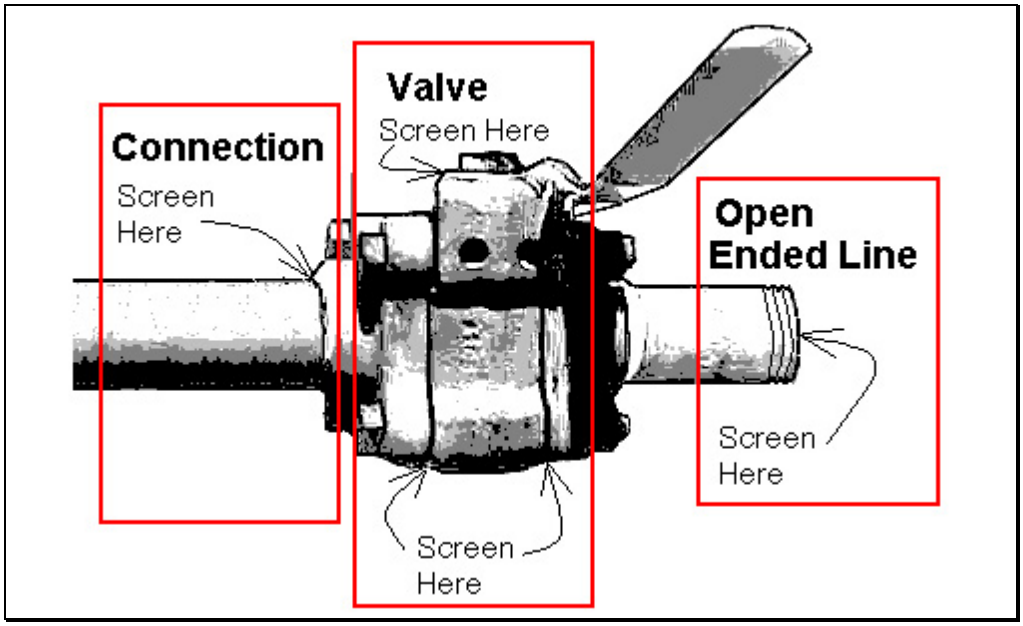


Figure 1

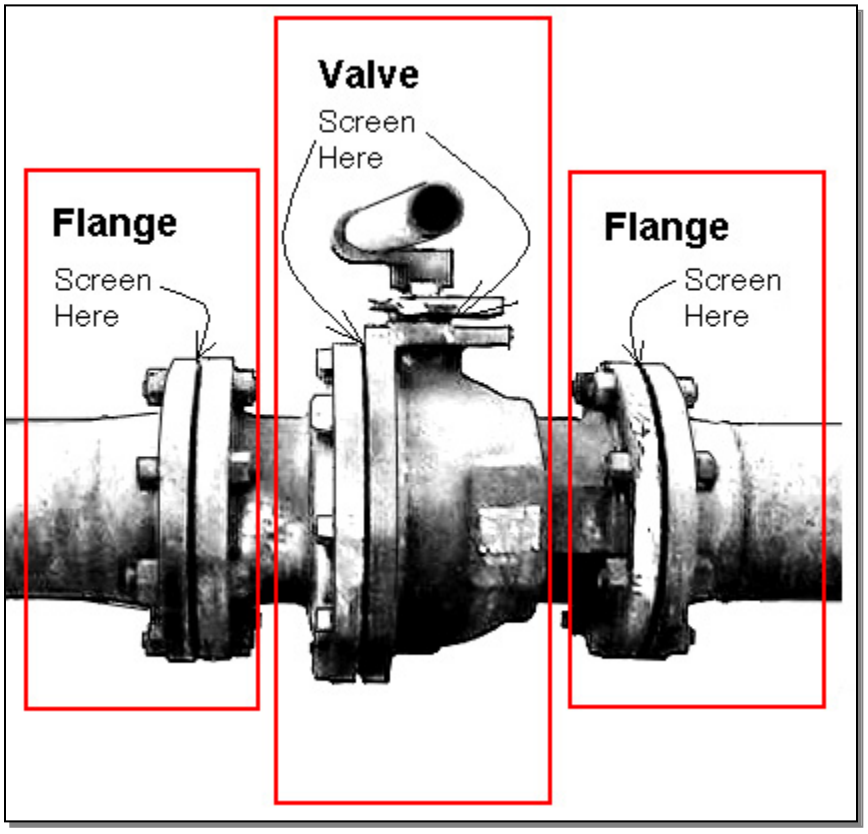
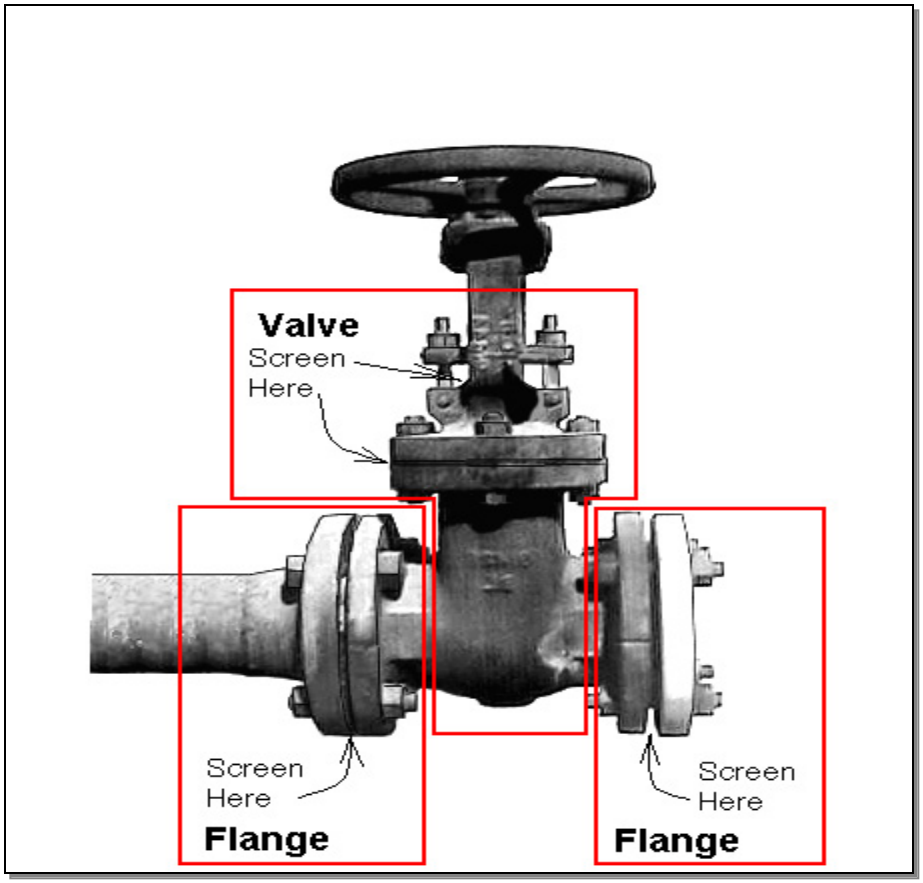


Figure 2



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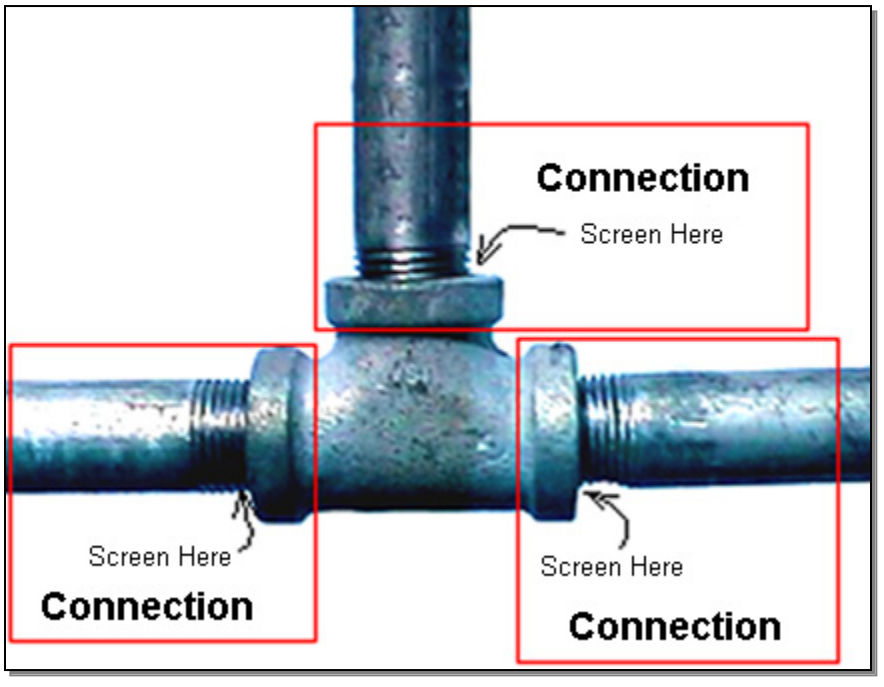

Figure 4

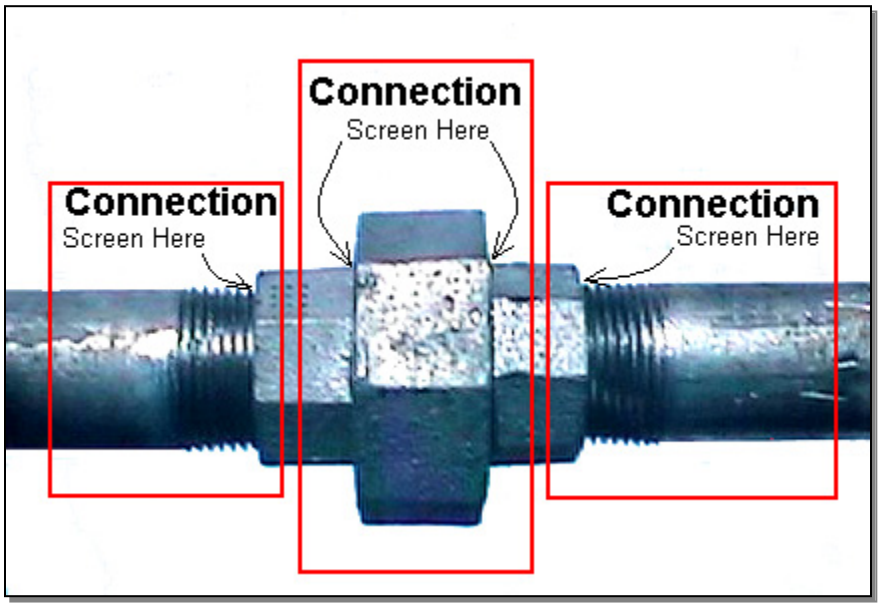
Connection
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Figure 5

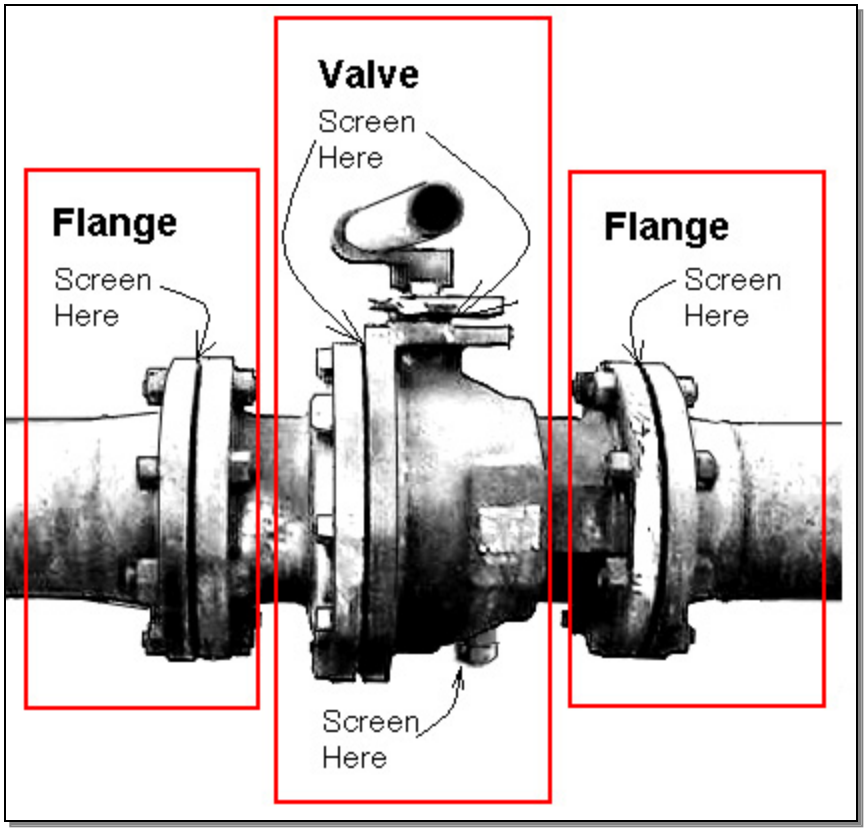
Valve
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Figure 6