

July 17, 2017

Bob Murphy
President
MurCal
41343 12th Street West
Palmdale, CA 93551

**Re: Revised Final Certification of Stationary Natural Gas
Emission Compliance System for District Rule 4702
Compliance**
Certification Number: C-1121059

Dear Mr. Murphy:

The District is issuing a revised Final Certification under District Rule 4702 (Internal Combustion Engines) for the Stationary Natural Gas Emission Compliance (SNGEC) System described below.

The District reviewed the information provided in your application and the emissions data for internal combustion (IC) engines equipped with the SNGEC add-on emission control system consisting of the following components:

- Compliance Controls (FW Murphy) AFR (1R, 9R or 64R) air/fuel ratio controller,
- Johnson-Matthey Model Modulex B or Modulex C 3-way catalyst,
- Zirconia HEGO type oxygen sensor(s),
- Manifold Absolute Pressure (MAP) sensor, and
- Two Type K thermocouples

The initial source tests and extended use portable analyzer monitoring information submittal indicates that the SNGEC System described above is capable of satisfying the following District Rule 4702 requirements for agricultural, rich-burn, spark-ignited IC engines:

- Reducing exhaust emission levels to less than or equal to all of the following limits, corrected to 15% exhaust oxygen content: 90 ppmvd-NO_x, 2,000 ppmvd-CO, and 250 ppmvd-VOC.

The SNGEC System described above is now considered to be "District Rule 4702 Certified" for any natural gas-fueled, rich-burn, agricultural IC engine for which it has been individually designed.

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Executive Director/Air Pollution Control Officer

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A copy of this letter and information on the District's Rule 4702 Compliance Program can be found at: <http://www.valleyair.org/busind/comply/certified-equipment.htm>.

I. Engine Owner/Operator Responsibilities:

Please be advised that the SNGEC System Certification status for compliance with the requirements of District Rule 4702 is contingent upon the operator maintaining compliance with the conditions shown below, which will be included on any necessary permits or equipment registrations. In addition to other conditions required by Rule 4702 or any other District Rule or regulation, the following conditions apply to engines equipped with the SNGEC System:

- NOx emissions from this IC engine shall not exceed XX ppmvd-NOx @ 15% O2 (equivalent to XX g-NOx/bhp-hr).
- PM10 emissions from this IC engine shall not exceed XXX g-PM10/bhp-hr.
- Emissions from this IC engine shall not exceed any of the following limits: XXX ppmvd CO @ 15% O2 (equivalent to XXX g-CO/bhp-hr) or XXX ppmvd-VOC @ 15% O2 (equivalent to XXX g-VOC/bhp-hr).
- The add-on emission control system (hereinafter referred to as the "SNGEC System") shall consist of a Compliance Controls (FW Murphy) Model AFR (specify 1R, 9R or 64R) air/fuel ratio controller, a Johnson-Matthey Modulex B or Modulex C three-way catalyst system, two (one pre- and one post-catalyst) Type K thermocouples, a Manifold Absolute Pressure (MAP) sensor, and two (one pre- and one post-catalyst) Zirconia HEGO type oxygen sensors.
- The SNGEC System shall be installed, maintained and operated according to the component manufacturer's recommendations and shall be in place and operating at all times during engine operation.
- A person performing installation of or maintenance specific to the SNGEC System shall be certified by MurCal, or work under the direct and personal supervision of an individual physically present at the work site who is certified.
- This engine shall be equipped with an operational non-resettable elapsed time meter or other APCO-approved alternative.
- This engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer, MurCal, or their certified installer.

- During periods of operation, the permittee shall monitor the operational characteristics of the engine as recommended by the manufacturer or emission control system supplier (for example: check engine fluid levels, battery, cables and connections; change engine oil and filters; replace engine coolant; and/or other operational characteristics as recommended by the manufacturer or supplier).
- This IC engine shall be fired on Public Utility Commission (PUC) regulated natural gas only.
- The oxygen sensors shall be replaced when the "health" percentage on the AFR controller shows 50% or less. Whenever the oxygen sensors are replaced, the SNGEC System shall be calibrated, prior to resuming normal engine operation, according to the procedures outlined by MurCal.
- The catalyst module housing and elements shall be visually inspected at least once every calendar quarter. The catalyst shall be washed according to the manufacturer recommendations at least every 8,000 hours and replaced at least every 16,000 hours of operation.
- The thermocouples shall be replaced every 36,000 hours. Whenever the thermocouples are replaced, the SNGEC System shall be calibrated, prior to resuming normal engine operation, according to the procedures outlined by MurCal.
- The MAP sensor shall be replaced every 16,000 hours of engine operation. Whenever the MAP sensor is replaced, the SNGEC System shall be calibrated, prior to resuming normal engine operation, according to the procedures outlined by MurCal.
- The pre-catalyst exhaust temperatures shall be monitored and recorded at initial system calibration and at least once in each calendar month that the engine operates. If the pre-catalyst exhaust temperature is not between the manufacturer's recommended range of 900 °F and 1,250 °F, the SNGEC System shall be calibrated or repaired, as necessary.
- After the SNGEC System is calibrated or repaired in response to the pre-catalyst temperature falling outside of the recommended range, a District-approved portable analyzer shall be used to determine that the NOx and CO emissions and O2 levels are at or below permitted levels. The pre-catalyst exhaust temperatures shall be monitored and recorded at that time and monthly monitoring of the pre-catalyst exhaust temperature shall resume as required in the previous condition.
- Within 30 days after installation of the SNGEC System, a District-approved portable analyzer shall be used to determine NOx and CO emissions and O2 levels. All emission readings shall be taken with the unit operating at conditions

representative of normal operations. The analyzer shall be calibrated, maintained, operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period.

- If the NO_x or CO concentration corrected to 15% O₂, as measured by the portable analyzer, exceeds the allowable emission concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than eight (8) hours after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after eight (8) hours, the permittee shall notify the District within the following one (1) hour, and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the excess emissions are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition.
- During the start-up inspection, the District shall be provided with written documentation that the emission control system is suitable for use on this engine and verify the engine's horsepower rating, exhaust flow rate, pre-catalyst exhaust temperature, oil consumption, general mechanical condition, and the available fuel supply pressure will satisfy the criteria for proper operation of the SNGEC System, along with portable analyzer calibration records and results.
- The operator shall maintain engine operating log records of: 1) the monthly engine hour meter reading; 2) the date and the engine hour meter reading at each oxygen sensor change, MAP sensor change, and thermocouples change; 3) the monthly pre-catalyst exhaust temperatures monitoring data; 4) the date and engine hour meter reading of each catalyst module inspection, washing, and replacement; and 5) fuel purchase records.
- All records shall be maintained and retained on-site for a minimum of five (5) years, and shall be made available for District inspection upon request.
- The District may revise and/or add requirements in the future as necessary to ensure the SNGEC System operates according to its certification requirements.

II. MurCal Responsibilities:

For each SNGEC System to be used in an agricultural operation, MurCal, or their approved installer, shall fulfill the following requirements:

- As part of every Authority to Construct (ATC) or Permit-Exempt Equipment Registration (PEER) application submittal, MurCal shall provide the applicant with a copy of the Johnson-Matthey catalyst sizing data sheet indicating the catalyst size and expected emissions, and a certification that the available fuel supply pressure will satisfy the criteria for proper operation of the SNGEC System (alternatively, MurCal may supply a certification that proper operation of the SNGEC System is independent of fuel supply pressure). The engine-specific emission factors, that include a compliance margin, shall be based on the catalyst sizing. Proposed emission factors shall not exceed any applicable rule or regulation standard. This information, and the name of the installer, shall be submitted as part of the application.
- Provide the District with a list of certified SNGEC System installers who are qualified in the installation, operation, adjustment, calibration, and maintenance of the SNGEC System.
- Prior to the installation, the available fuel supply pressure will satisfy the criteria for proper operation of the SNGEC System.
- Prior to the installation, verify that the engine operator, who is subject to District Permitting requirements, has applied for and received a District ATC.
- Prior to the operation, verify that the engine operator, who is subject to District Rule 2250 PEER requirements, has applied for a District PEER.
- Provide the operator and installer with a written copy of the MurCal SNGEC System warranty and warranty procedures and an operations and maintenance manual with operator-specific and installer-specific adjustment and calibration procedures, routine maintenance procedures, and trouble-shooting procedures.
- Provide the operator and installer with thorough training on control system calibration, operation, adjustment, maintenance, troubleshooting, and warranty procedures.
- Provide the District with any updates to either the previously supplied certification documents or to the list of certified installers as they become available.

III. Additional Information:

This Certification **does not** allow the SNGEC System to be installed without the proper District permit if the engine is subject to District Permitting requirements. All agricultural internal combustion engines greater than 50 bhp are required to have one of the following:

- District ATC Permits, or
- District PEER.

The appropriate scenario depends on the particular agricultural facility's total potential emissions. Each scenario, as well as which actions must taken, is discussed below:

ATC Permits:

If the agricultural operation at which the spark-ignited engine is located has nitrogen oxide (NO_x) or volatile organic compound (VOC) emissions in excess of 5 tons/year, that facility is subject to District permitting requirements and must therefore submit an application for an ATC permit. The client must first obtain an ATC permit before they can install your SNGEC System. If you have a client whose facility is subject to District permit requirements and is interested in your system, have them submit an application for an ATC permit to allow installation of your system as soon as possible. Engines that are subject to permitting requirements cannot be modified in any way without first obtaining an ATC permit authorizing the modification.

PEER:

If the agricultural operation at which the spark-ignited engine is located has nitrogen oxide (NO_x) or volatile organic compound (VOC) emissions less than or equal to 5 tons/year, that facility qualifies for the District's PEER program and must therefore submit a PEER application in order to operate. For these facilities, the client can install a SNGEC at any time without prior District approval, but they must submit a PEER application for the engine prior to first operation of the new or modified engine.

If you have any questions regarding this matter, please contact John Yoshimura of Permit Services at (559) 230-5900.

Sincerely,

Arnaud Marjollet
Director of Permit Services


Errol Villegas
Permit Services Manager
AM/jy

cc: District Compliance Dept.