

February 6, 2024

Bob Murphy
MurCal, Inc
41343 12th Street
Palmdale, CA 93551

Re: Interim Certification for the MurCal SNGEC Add-on Emission Control System for District Rule 4702 Compliance
Certification Number: C-1233632

Dear Mr. Murphy:

The District reviewed two emissions source tests conducted on a 275 hp Cummins model GTA855 rich-burn, spark-ignited internal combustion engine (District Permit C-5521-11) and a 256 hp Cummins model GTA855P1 rich-burn, spark-ignited internal combustion engine (District Permit C-6927-40), each of which were equipped with a MurCal SNGEC emission control system consisting of the following components:

- Compliance Controls (FW Murphy) AFR (1 R, 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 October 13, 2023 source test results submitted by Michael Saltzman of Saltzman Auto Electric indicate that the MurCal SNGEC Add-on Control System consisting of the components proposed above is capable of reducing emissions to less than or equal to the following standards for Rich-Burn internal combustion engines used exclusively in agricultural operations listed in Table 5 of Rule 4702:

- NO_x: 11 ppmvd @ 15% O₂
- CO: 2000 ppmvd @ 15% O₂
- VOC: 90 ppmvd @ 15% O₂

Therefore, the District determines that the MurCal SNGEC Add-on Control System satisfies the requirements for Interim Certification as specified in the latest version of the District Policy SSP 1830 District Rule 4702 (Internal Combustion Engines) Certification Procedure (<https://ww2.valleyair.org/media/wkndwxdb/ssp-1830.pdf>).

Samir Sheikh
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: (661) 392-5500 FAX: (661) 392-5585

I. Interim Certification:

Based on the initial source test results, the District grants Interim Certification to the MurCal SNGEC Add-on Control System, and hereby considers it certified to comply with the requirements of Section 9.0 of District Rule 4702. The MurCal SNGEC Add-on Control System may be used on the following **rich-burn, spark-ignited internal combustion engines used exclusively in agricultural operations** (as defined in District Rule 4702) to comply with the requirements of Table 5.1 of District Rule 4702:

- **IC Engines rated up to 400 bhp fueled only with natural gas with exhaust flow rates and exhaust temperatures in the ranges specified by the catalyst supplier in the applicable catalyst sizing sheets or other documents to satisfy the Rule 4702 emission limits above.**

A. Engine Owner/Operator Responsibilities:

Please be advised that the MurCal SNGEC Add-on Control System's Interim Certification status for compliance with the requirements of District Rule 4702 is contingent upon the operator maintaining compliance with following conditions, which will be included on any necessary operating permits or equipment registrations:

- *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 MurCal 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 authorized by MurCal, or work under the direct and personal supervision of an individual physically present at the work site who is authorized by MurCal.*
- *The engine shall be equipped with an operational non-resettable elapsed time meter or other APCO-approved alternative.*
- *The engine shall only be fired on California Public Utility Commission (PUC) regulated natural gas.*
- *The engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer, MurCal, or their authorized installer.*
- *During periods of operation, the owner/operator 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).*

- *The MurCal SNGEC System shall be equipped with an engine exhaust temperature sensor, and shall be configured to automatically alert the operator in the event that the engine's exhaust temperature falls outside of the range recommended for the system.*
- *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 least once in each calendar month that the engine operates. If the pre-catalyst exhaust temperature is not within the SNGEC System's recommended range, 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 verify 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.*

- *For engines equipped with an emission control system operating under an interim certification, the NO_x and CO emissions shall be monitored at least once every 12 months using a District-approved portable analyzer until the system receives final certification from the District. Monitoring conducted as part of routine maintenance and repair actions may be used satisfy this requirement, provided that no more than 12 months elapses between monitoring actions. Should the 12-month deadline fall during a period of non-operation, the engine shall be monitored within 30 calendar days of recommencing operation.*
- *If either the NO_x or CO concentrations corrected to 15% O₂, as measured by the portable analyzer, exceed the allowable emission concentration, the owner/operator 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 owner/operator 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 owner/operator may stipulate a violation has occurred, subject to enforcement action. The owner/operator must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the owner/operator may fully comply with Rule 1100 in lieu of 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, 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.*
- *NO_x emissions from this IC engine shall not exceed XX ppmvd-NO_x @ 15% O₂ (equivalent to XX g-NO_x/bhp-hr).*
- *PM₁₀ emissions from this IC engine shall not exceed XX g-PM₁₀/bhp-hr.*
- *Emissions from this IC engine shall not exceed either 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 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 date and engine hour meter reading of each catalyst module inspection, washing, and replacement; 4) the monthly pre-catalyst exhaust temperatures monitoring data; 5) the date and time of each alert due to engine exhaust temperature falling outside of the recommended range and a description any corrective actions taken to return the engine's exhaust temperature to an acceptable level; 6) fuel purchase records; and 7) portable analyzer calibration records and results.*
- *Documentation shall be maintained of the recommended pre-catalyst exhaust temperature range specified for the SNGEC System.*

- *The exhaust system shall be equipped with adequate sampling port(s) located downstream of the catalytic converter. The sampling port shall be located at least 2 duct diameters downstream of any bend, diameter change or stack obstruction.*
- *All records shall be maintained for a period of at least five years, and shall be made readily available for District inspection upon request.*
- *The District may revise and/or add requirements in the future as necessary to ensure the MurCal SNGEC System operates according to its certification requirements.*

B. MurCal's Responsibilities:

For each *MurCal SNGEC System* sold for use on an agricultural engine for the purpose of compliance with the requirements of District Rule 4702, MurCal (or an authorized representative) shall:

- 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, verify that 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 Permit-Exempt Equipment Registration (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.
- Using a District-approved portable analyzer, determine the NOx and CO exhaust emission concentrations and exhaust O2 concentrations from the engine equipped with the *MurCal SNGEC System* according to the methods specified for ongoing durability testing in the latest version of District Policy SSP 1830 (District Rule 4702 Certification Procedure). The portable analyzer results shall be maintained and submitted to the District.

II. Final Certification:

- A. Specific Requirements for the 275 bhp Cummins model GTA855 engine located at Morning Star Dairy, near Burrel, CA (Permit Unit C-5521-11), and the 256 bhp Cummins model GTA855P1 engine located at Maddox Farms, near Riverdale, CA (Permit Unit C-6927-40):

Please be advised that, in order to maintain its Interim Certification status and also to receive a final District Certification, the *MurCal SNGEC Systems* installed on the 275 bhp Cummins model GTA855 and the 256 bhp Cummins model GTA855P1 natural gas-fired engines mentioned above must each undergo additional ongoing testing within 200 hours before the end of each of the following operational intervals to verify that each will maintain compliance with the prescribed emission standards specified in the latest version of the above-mentioned District Policy SSP 1830:

- 2,000 hours of operation,
- 4,000 hours of operation, and
- 5,000 hours of operation.

This ongoing durability testing shall be conducted in accordance with the procedures specified in the latest version of District Policy SSP 1830 mentioned above.

B. General Requirements:

Once the District determines that two installations of the *MurCal SNGEC System* each have successfully completed both initial certification testing and 5,000 hours of ongoing durability certification testing, the *MurCal SNGEC Control System* may be issued a Final District certification. If granted, a Final District certification will be in the form of an approval letter from the District.

If the Final Certification for the system is not issued by three years after the date of approval of the interim certification (which may be extended to four years subject to District approval), the interim certification shall be considered to be void, the system will be treated as uncertified under District Rule 4702, and the engines equipped with the system will be subject to the applicable periodic source testing and monitoring requirements of District Rule 4702.

Please be advised that the validity of the Interim Certification granted in this letter is contingent upon the *MurCal SNGEC Control System* successfully completing the Final Certification requirements as specified in the latest version of the above-mentioned District Policy SSP 1830. If the *MurCal SNGEC System* fails to complete the Final Certification requirements, it cannot be used to satisfy the requirements of Section 9.0 of District Rule 4702.

III. Additional Information:

This Interim 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 Authority to Construct (ATC) Permit, or
- District Permit-Exempt Equipment Registration (PEER).

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

ATC Permits:

If the agricultural operation at which the spark-ignited engine is located has emissions equal to or greater than one-half of any of the major source thresholds specified in District Rule 2201 (e.g. nitrogen oxide (NO_x) or volatile organic compound (VOC) emissions equal to or greater than of 5.0 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, inform them to 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.

Permit-Exempt Equipment Registration (PEER):

If the agricultural operation at which the spark-ignited engine is located has emissions less than one-half of the major source thresholds for all pollutants specified in District Rule 2201 (typically NO_x and VOC emissions each less than of 5.0 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 System 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.

Permit and PEER application forms are available on the District's website at: <https://ww2.valleyair.org/permitting/application-forms/>.

Mr. Murphy
Page 8

If you have any questions regarding this matter, please contact Nick Peirce of Permit Services at (209) 557-6400.

Sincerely,

Brian Clements
Director of Permit Services



Nick Peirce
Permit Services Manager

CC: District Compliance Division
District Permit Services Division

Michael Saltzman
Saltzman Auto Electric
2157 S K St
Tulare, CA 93274