San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

May 13, 2024

Nicholas Bender
Water Associates LLC
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Bakersfield, CA 93308

Re: Interim Certification for the Water Associates NOxHound Add-on Emission Control System for District Rule 4702 Compliance
Certification Number: C-1233744

Dear Mr. Bender:

The District has updated the previous interim certification approval for the Water Associates NOxHound Add-on Emission Control System, dated February 6, 2024, to reflect the recent name change of the model of the approved Miratech three-way catalysts used with the NOxHound System from MeC-Beast to APEX. The updated conditions now include reference to the Miratech APEX catalysts. There have been no other changes to the applicable requirements for the NOxHound System.

The District reviewed the emissions source tests conducted on a 200 bhp Cummins model GTA855 rich-burn, spark-ignited internal combustion engine (District Permit S-4849-3), a 200 bhp Cummins model GTA855 rich-burn, spark-ignited internal combustion engine (District Permit S-6706-8), a 380 bhp Cummins model KTA19GC rich-burn, spark-ignited internal combustion engine (District Permit Exempt Equipment Registration (PEER) S-5779-1) and a 600 hp CAT model 137-12 rich-burn, spark-ignited internal combustion engine (District PEER S-8849-1), each of which were equipped with a **Water Associates NOxHound** emission control system consisting of the following components:

- Altronic EPC50 air/fuel ratio controller,
- Miratech Model MeC-Beast MECB-TW-RO-1000-0000-350, MECB-TW-RO-1200-0000-350, or MECB-TW-RO-19.50-0000-350 three-way catalyst system
- Two (one pre-catalyst and one post-catalyst) Zirconia exhaust gas oxygen sensors, and
- Two Type K thermocouples

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The October 12, 2023 and November 16, 2023 source test results submitted by Jesus Cuevas of Water Associates indicate that the Water Associates NOxHound Add-on Control System consisting of the components listed 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:

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

Therefore, the District determines that the Water Associates NOxHound 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).

I. Interim Certification:

Based on the initial source test results, the District grants Interim Certification to the Water Associates NOxHound Add-on Control System, and hereby considers it certified to comply with the requirements of Section 9.0 of District Rule 4702. The Water Associates NOxHound 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 600 bhp fueled only with natural gas with exhaust flow rates and exhaust temperatures in the ranges specified by the catalyst supplier.**

A. Engine Owner/Operator Responsibilities:

Please be advised that the Water Associates NOxHound 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 Water Associates NOxHound System shall consist of an Altronic EPC50 air/fuel ratio controller, a Miratech MeC-Beast MECB-TW-RO-XXXX-XXXX-XXX or Miratech APEX APX3-TW-RO-XXXX-XXXX-XXX three-way catalyst system, two Type K thermocouples, and two (one pre- and one post-catalyst) Zirconia exhaust gas oxygen sensors. (Note: the " XXXX-XXXX-XXX " will be replaced by the specific identifier of the catalyst required for the specific engine)*

- *The Water Associates NOxHound System shall be 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 NOxHound System shall be authorized by Water Associates, or work under the direct and personal supervision of an individual physically present at the work site who is authorized by Water Associates.*

- *The engine shall be equipped with an operational non-resettable elapsed time meter or other APCO-approved alternative.*

- *This IC engine shall be fired on Public Utility Commission (PUC) regulated natural gas only.*

- *The engine shall be operated and maintained in proper operating condition as recommended by the engine manufacturer, Water Associates, 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 oxygen sensors shall be replaced every 2,000 hours of operation or when the EPC-50 controller indicates that an alarm code has been triggered for the sensor, whichever occurs earliest. Whenever an oxygen sensor is replaced, the Water Associates NOxHound System shall be calibrated, prior to resuming normal engine operation, according to the procedures outlined by equipment manufacturer.*

- *The catalyst module housing and elements shall be visually inspected at least once every calendar quarter. The catalyst shall be washed at least once every 8,000 hours of operation and replaced at least every 24,000 hours of operation.*

- *The thermocouples shall be replaced according to the manufacturer recommendations but at least every 36,000 hours of engine operation. Whenever the thermocouples are replaced, the Water Associates NOxHound System shall be calibrated, prior to resuming normal engine operation, according to the procedures outlined by Water Associates.*

- *The pre-catalyst exhaust temperature shall be monitored and recorded during 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, the Water Associates NOxHound System shall be calibrated or repaired, as necessary.*

- *After the Water Associates NOxHound 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 Water Associates NOxHound 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 NOx 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 NOx 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 NOxHound System, along with portable analyzer calibration records and results.*

- *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 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 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; 5) fuel purchase records; and 6) portable analyzer calibration records and results.*

- *Documentation shall be maintained of the recommended pre-catalyst exhaust temperature range specified for the Water Associates NOxHound 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 Water Associates NOxHound System operates according to its certification requirements.*

B. Water Associate's Responsibilities:

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

- As part of every Authority to Construct (ATC) or Permit-Exempt Equipment Registration (PEER) application submittal, Water Associates shall provide the applicant with a copy of the Miratech 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 NOxHound System (alternatively, Water Associates may supply a certification that proper operation of the NOxHound 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 NOxHound System installers who are qualified in the installation, operation, adjustment, calibration, and maintenance of the NOxHound System.

- Prior to the installation, verify that the available fuel supply pressure will satisfy the criteria for proper operation of the NOxHound 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 Water Associates NOxHound 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 Water Associates NOxHound 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 200 bhp Cummins model G855 engine located at Skyview Dairy, near Wasco, CA (Permit S-4849-3); the 200 hp Cummins model G855 engine located at Skyview Dairy, near Shafter, CA (Permit S-6706-8); the 380 bhp Cummins model KTA9GC located at Lester Neufled & Son, near Wasco, CA (PEER S-5779-1); and the 600 bhp CAT model 137-12 located at North Kern Water Storage District, near Shafter, CA (PEER S-8849-1)

Please be advised that, in order to maintain its Interim Certification status and also to receive a final District Certification, the *Water Associates NOxHound Systems* installed on the 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 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 at least two installations of the *Water Associates NOxHound Add-on Control System* have successfully completed both initial certification testing and 5,000 hours of ongoing certification testing, the *Water Associates NOxHound Add-on 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 Initial Certification granted in this letter is contingent upon the *Water Associates NOxHound Add-on Control System* successfully completing the Final Certification requirements as specified in the latest version of the above-mentioned District Policy SSP 1830. If the *Water Associates NOxHound 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 *Water Associates NOxHound Add-on Control System* to be installed without the proper District permit if the engine is subject to District Permitting requirements. There are two permitting scenarios for agricultural internal combustion engines greater than 50 bhp:

- District Authority to Construct (ATC) Permits, 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 must be taken, is 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 (NOx) 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 the Water Associates NOxHound 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 NOx 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 Water Associates NOxHound 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/.

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

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