



Air Resources Board



Matthew Rodriguez
Secretary for
Environmental Protection

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Edmund G. Brown Jr.
Governor

February 25, 2014

Wilson Chu
Business Development Manager
Johnson Matthey – Stationary Emissions Control LLC
900 Forge Avenue
Audubon, Pennsylvania 19403-2305

Dear Mr. Chu:

This letter responds to a request by Johnson Matthey (JM) for a California Air Resources Board (ARB) emissions verification for the JM Locomotive Catalyzed Continuously Regenerating Trap (L-CCRT) diesel particulate filter (DPF) system. The JM L-CCRT is comprised of a diesel oxidation catalyst (DOC) upstream of a wall-flow DPF, which is close-coupled to minimize volume and coated with a platinum group metal.

This verification request is only for the use of the JM L-CCRT DPF system retrofitted onto the National Railway Equipment Company (NREC) three engine genset switch locomotive, or NREC locomotive model 3GS21. The NREC 3GS21 locomotive is powered by three Cummins QSK19 engines, with each engine capable of providing up to 700 horsepower (hp), and with all three engines operating is capable of providing up to 2,100 hp. The JM L-CCRT DPF system is retrofitted onto each of the three 3GS21 locomotive engines to achieve the desired emission levels.

ARB reviewed and approved the JM demonstration and test plan for the L-CCRT DPF system retrofitted onto UPY 2755, a Union Pacific Railroad NREC 3GS21 locomotive. As part of the demonstration, ARB staff considered the Southwest Research Institute (SWRI) emission test results performed at zero, 1,500, and 3,000 locomotive operating hours. All of the SWRI emission tests complied with U.S. Environmental Protection Agency (EPA) locomotive test procedures.

The U.S. EPA locomotive Tier 4 emission standard for particulate matter is 0.03 grams per brake horsepower-hour (g/bhp-hr). Based on the information above, ARB approves the JM L-CCRT, retrofitted onto an NREC 3GS21 locomotive model, with a PM emission level of 0.02 g/bhp-hr.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

Mr. Wilson Chu

Page 2

Please contact me at (916) 327-5981 or dito@arb.ca.gov or Harold Holmes, Manager, Rail Strategies Section at (916) 324-8029 or hholmes@arb.ca.gov if you should have any questions about this emissions verification.

Sincerely,



Douglas Ito, Chief
Freight Transport Branch

cc: See next page.

The following information was obtained from the records of the California Air Resources Board (CARB) regarding the emissions verification of the freight train operated by Union Pacific Railroad (UPRR) on 10/10/08. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal.

The following information was obtained from the records of the California Air Resources Board (CARB) regarding the emissions verification of the freight train operated by Union Pacific Railroad (UPRR) on 10/10/08. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal.

The following information was obtained from the records of the California Air Resources Board (CARB) regarding the emissions verification of the freight train operated by Union Pacific Railroad (UPRR) on 10/10/08. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal.

The following information was obtained from the records of the California Air Resources Board (CARB) regarding the emissions verification of the freight train operated by Union Pacific Railroad (UPRR) on 10/10/08. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal.

The following information was obtained from the records of the California Air Resources Board (CARB) regarding the emissions verification of the freight train operated by Union Pacific Railroad (UPRR) on 10/10/08. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal. The train was operated by UPRR and was loaded with coal.

Mr. Wilson Chu

Page 3

cc: Steve Clark,
Johnson Matthey
900 Forge Avenue
Audubon, Pennsylvania 19403-2305

Jose Rameriz,
Johnson Matthey
900 Forge Avenue
Audubon, Pennsylvania 19403-2305

Paul Anderson,
Johnson Matthey
900 Forge Avenue
Audubon, Pennsylvania 19403-2305

Mr. Glenn Passavant, Director
Nonroad Center
U.S. Environmental Protection Agency
2000 Plymouth Road
Ann Arbor, MI 48105

Mr. Dennis Johnson
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N. W., Mail Code: 6406J
Washington, D.C. 20460

Mr. Laurence P. Oeler
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Harold Holmes, Manager
Rail Strategies Section