THE ENVIRONMENTAL TECHNOLOGY VERIFICATION PROGRAM

U.S. Environmental Protection Agency

ETV Joint Verification Statement

TECHNOLOGY TYPE:	**DUST SUPPRESSANT**
APPLICATION:	**CONTROL OF DUST ON UNPAVED ROADS**
TECHNOLOGY NAME:	**PetroTac**
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The U.S. Environmental Protection Agency (EPA) has created the Environmental Technology Verification (ETV) Program to facilitate the deployment of innovative or improved environmental technologies through performance verification and dissemination of information. The goal of the ETV Program is to further environmental protection by accelerating the acceptance and use of improved and cost-effective technologies. ETV seeks to achieve this goal by providing high-quality, peer-reviewed data on technology performance to those involved in the design, distribution, financing, permitting, purchase, and use of environmental technologies.

ETV works in partnership with recognized standards and testing organizations; stakeholder groups, which consist of buyers, vendor organizations, permitters, and other interested parties; and with the full participation of individual technology developers. The program evaluates the performance of innovative technologies by developing test plans that are responsive to the needs of stakeholders, conducting field or laboratory tests (as appropriate), collecting and analyzing data, and preparing peer-reviewed reports. All evaluations are conducted in accordance with rigorous quality assurance (QA) protocols to ensure that data of known and adequate quality are generated and that the results are defensible.

The Air Pollution Control Technology (APCT) Verification Center, a center under the ETV Program, is operated by RTI International (RTI) in cooperation with EPA's National Risk Management Research Laboratory. The APCT Center has evaluated the performance of a dust suppressant product for control of dust on an unpaved road.

ETV TEST DESCRIPTION

A field test program was designed by RTI and Midwest Research Institute (MRI) to evaluate the performance of dust suppressant products. Five dust suppressants manufactured or distributed by three firms were tested in this program. The field test for SynTech Products Corporation's PetroTac was conducted at Fort Leonard Wood, Missouri (FLW). A July 2003 test/QA plan for the field testing was developed and approved by EPA. The test/QA plan describes the procedures and methods used for the tests. The July 2003 version of the test/QA plan was based on an October 2002 version and a subsequent test/QA plan addendum (dated February 19, 2003). The goal of each test was to measure the performance of the products relative to uncontrolled sections of road over a 1-year period. Field testing was planned quarterly over a 1-year period; however, some logistical difficulties related to winter weather and then maintenance activities on the roads of interest arose, and the test/QA plan was revised (Rev 3) to address those issues. Testing occurred per the test/QA plan for three roughly 6-month periods. Two of those test periods are summarized below and are considered most representative of product performance; the third testing period occurred after unexpected road maintenance, and those data may be seen in the verification report. The verification report also contains 90 percent confidence limits for the data collected during all of the test periods. Emissions measurements were made for total particulate (TP), particulate matter less than or equal to 10 micrometers (μm) in aerodynamic diameter (PM_{10}), and for particulate matter less than or equal to 2.5 μm in aerodynamic diameter ($PM_{2.5}$).

The host facility for the field test program, FLW, is a U.S. Army base. The test site used unpaved Roads P and PA in training area (TA) 236. Roads P and PA are the main access routes to TA 236 and are traveled by truck convoys, as well as traffic into and out of TA 236. PetroTac was applied to test section C, located on Road PA; test section F, located on Road P, was left untreated as the experimental control. Section 3.1 of the verification report provides a figure showing the test locations. Testing was conducted during October 2002, May 2003, and October 2003.

Table 1 presents test conditions for key parameters that may affect the performance of dust suppressants on unpaved roads.

Table 1. Summary of Test Conditions

Parameter	FLW, October 2003	FLW, May 2003
Initial application rate, l/m^2	3.0	3.0
Follow-up application rate, l/m^2	2.8	0.87
Time between application and testing, days	105	79
Precipitation during test week, cm	2.0	3.7
Precipitation during week before testing, cm	3.2	1.7
Precipitation between application and testing, total, cm	32	24
Soil moisture during test weeks, %—uncontrolled road	0.62–1.5	0.01–1.8
Soil moisture during test weeks, %—controlled road	0.49–0.71	0.38–0.43
Soil silt during test weeks, %—uncontrolled road	1.7–5.4	1.6–4.3
Soil silt during test weeks, %—controlled road	0.88–1.1	0.6–0.9

VERIFIED TECHNOLOGY DESCRIPTION

This verification statement is applicable to *SynTech Products Corporation's PetroTac*, which is an emulsion that bonds with road aggregate and cures to a water resistant surface. The material safety data sheet (MSDS) for PetroTac is retained in the RTI project files and may be requested from the company's Web site at http://www.syntechproducts.com//orderform/orderform.htm [accessed July 2005].

VERIFICATION OF PERFORMANCE

The overall reduction in particulate matter emissions achieved by the PetroTac dust suppressant compared to uncontrolled sections of road is shown in Table 2.

Table 2. Summary of Test Results

Test location and period	Average Control efficiency, %			Noted events
	TP	PM_{10}	$PM_{2.5}$	
FLW, October 2003	74	73	[a]	Rain events the day before test. [b]
FLW, May 2003	94	98	>90	Rain events the morning of test. [c]

[a] No emissions reduction was observed.
[b] All test sections were wet from rain the previous day. The uncontrolled section was heavily potholed and another section was used for the test. MRI used traffic to dry the road before testing.
[c] Rainfall in the morning meant that the uncontrolled section of the road was wet and another section was used for the test.

The APCT Center QA officer has reviewed the test results and quality control data and has concluded that the data quality objectives given in the generic verification protocol and test/QA plan have been attained. EPA and APCT Center QA staff have conducted technical assessments at the test organization and of the data handling. These confirm that the ETV tests were conducted in accordance with the EPA-approved test/QA plan.

This verification statement verifies the effectiveness of *SynTech Products Corporation's PetroTac* to control dust on unpaved roads as described above. Extrapolation outside that range should be done with caution and an understanding of the scientific principles that control the performance of the technologies. This verification focused on emissions. Potential technology users may obtain other types of performance information from the manufacturer.

In accordance with the generic verification protocol, this verification statement is valid, commencing on the date below, indefinitely for application of *SynTech Products Corporation's PetroTac* to control dust on unpaved roads.

Signed by Sally Gutierrez 9/25/2005

Sally Gutierrez, Director Date
National Risk Management Research Laboratory
Office of Research and Development
United States Environmental Protection Agency

Signed by Andrew Trenholm 9/16/2005

Andrew R. Trenholm, Director Date
Air Pollution Control Technology Verification Center