

Attachment A – Scope of Work

Tasks to be completed by the Contractor:

Task 1 -- Develop Off-Road Engine Population and Emission Inventories to be Used in Designing the Hypothetical Retrofit Scenarios

The Contractor will develop realistic estimates of off-road engine population and diesel engine emission inventories to be used in calculating the number and type of diesel engines to be retrofitted under the hypothetical scenarios (see Task 3 below). The Contractor will make a best effort to provide data for sub-state areas selected by WRAP including areas encompassing the selected tribal lands. In developing these estimates, the Contractor will draw on its extensive experience in working with various models, including the EPA NONROAD Engine model. In developing inventories, the Contractor will utilize the report “Development of WRAP Mobile Source Emissions Inventories” and the EPA NONROAD Engine model, where appropriate. To supplement these sources, the Contractor, in cooperation with WRAP, will collect available information on equipment populations from public and private sector sources, including relevant trade associations, the three tribes selected for the test application, and the U.S. EPA. Equipment population information collected from all sources will then be consolidated into a database for carrying out the hypothetical retrofit scenarios analysis.

Task 2 -- Select Candidate Emission Reduction Technology Options and Provide Cost Information on These Options

The Contractor will identify practical emission reduction technologies/products according to three categories: 1) those that have been verified as having an established emission reduction level by the EPA or CARB, 2) those that may be, or are in the process of being, verified by EPA or CARB, and 3) those that have not been nor are likely to be verified, yet provide convincing evidence of their ability to achieve measurable emission reductions. Products will be considered for their ability to reduce one or more of the emissions of PM and NO_x (note CO and VOCs can also be considered if desired by WRAP). Technologies/products to be considered include engine repower or rebuild, retrofit emission control devices, engine modification retrofit devices, and fuel-based strategies.

Once the model engine population and diesel engine emission inventory estimates are developed, the Contractor will assess and determine the feasibility of a given technology and the fuel quality requirements (i.e., sulfur content) for a specific application considering such factors as engine size (hp rating), application, and type of equipment. The Contractor will coordinate with WRAP at each stage of the process.

The Contractor will develop detailed cost information for each technology for the appropriate range engine horsepower categories and applications. The Contractor

will collect cost information from several sources including the retrofit technology vendors, independent private sector sources, and publicly available sources.

For each technology/product and non-road equipment application, the Contractor will describe the practical range of emission reduction and a product cost range based on assumptions regarding the number of off-road engines to which the technology will be applied (e.g., 100 engines, 1000 engines). The Contractor will also provide estimates of lifetime operating and maintenance costs. The potential emission reduction for the equipment sector will be estimated in order to provide a picture of how each technology/product/equipment sector application could be impacted. A summary of the results of this task will be displayed in the form of a table as described below.

Off-road Sector/ Equipment Type	Technology/ Product	Emission Reduction Range for Product*				Potential Emission Reduction for Sector/Equipment Population*				Product Unit Cost	Estimated Lifetime O&M Cost
		PM	NOx	VOC	CO	PM	NOx	VOC	CO		

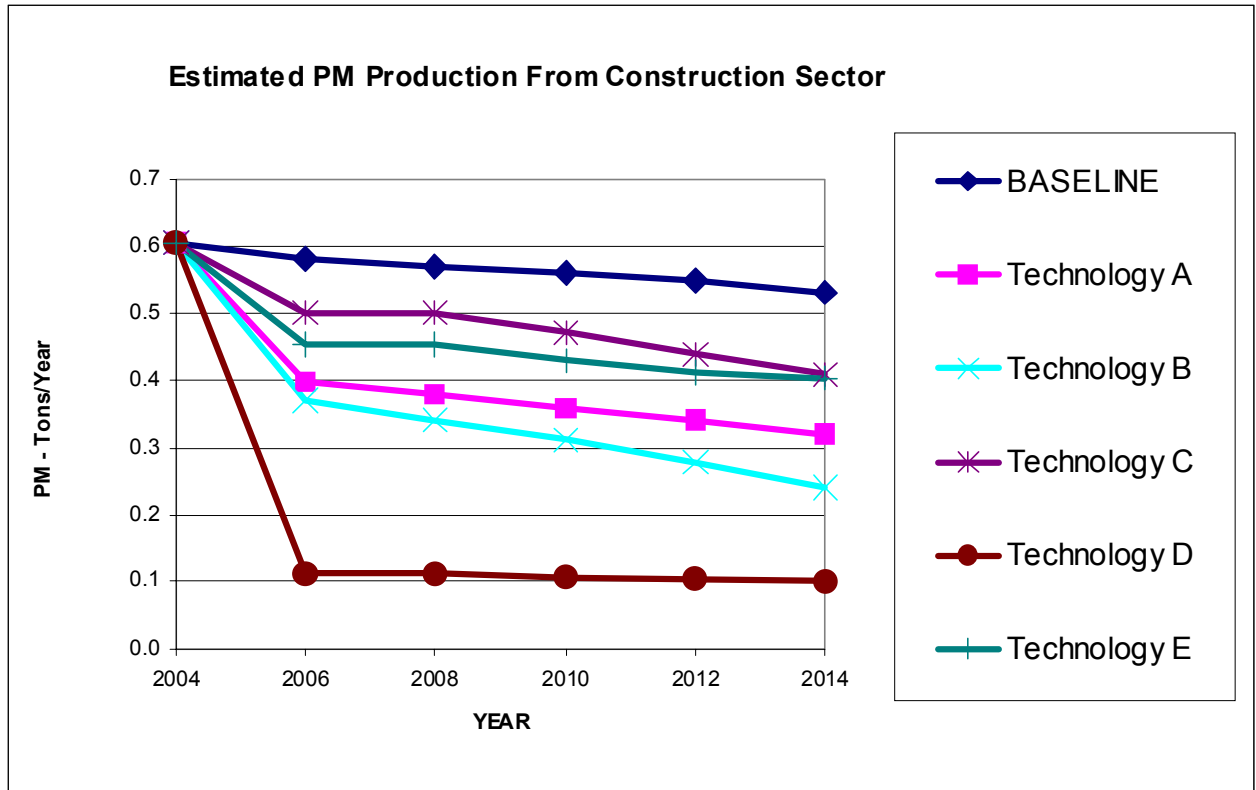
**VOC and CO to be added if desired by WRAP*

Task 3 -- Assist in Developing the Structure and Basis of the Hypothetical Retrofit Program Scenarios

The Contractor will draw on its experience in evaluating various approaches for developing models for retrofit programs, including mandatory programs such as the California Air Resources Board Diesel Fleet Rules, incentive-based programs using such concepts as matching funds, public contract bid specifications, emission off-set credits and others. The Contractor will develop a full range of possible program elements for both mandatory and incentive-based programs and then work with WRAP to select the program elements and select the engine fleet/technology mix to be used for the hypothetical scenarios.

Task 4 – Develop Estimates of Future Emission Reductions for Program Scenarios

The scenario development work performed in Task 3 is expected to identify the off-road sectors and equipment types that comprise the hypothetical program for further analysis. For each of these sectors, The Contractor will establish a baseline profile and estimated diesel emission reductions over a future 10-year time period. The emission reductions will be estimated for each of the technologies selected for the program scenarios resulting from the Task 3 program scenario selection process, in consultation with WRAP. Estimates of future baseline and the reductions associated with each selected technology will be developed for PM and NOx. Estimates of CO and VOCs will also be developed if desired by WRAP. A conceptual example of the results of this task is shown below.



As part of Task 4, The Contractor will identify a list of economic development benefits that potentially could accrue from the retrofit scenarios developed in Task 3.

Attachment B - DELIVERABLES AND SCHEDULE

The results of each task will be presented in individual task reports and submitted, as the tasks are completed, to WRAP staff for review and comment. Task results and WRAP review comments will be discussed at conference call meetings established about one week after the task reports have been submitted. A final report, consisting of a compilation of the results of all tasks, will be prepared and submitted at project conclusion.

Our estimated schedule (from date of Notice-to-Proceed) for task performance is as follows:

Task 1 – Off-road Equipment and Emission Inventories:	4 weeks
Task 2 – Emission Reduction Technology Options and Their Costs:	6 weeks
Task 3 – Hypothetical Program Scenarios:	8 weeks
Task 4 – Future Emission Reduction Estimates:	11 weeks

The schedule for completion of the project is subject to revision if scope of any task is expanded by the mutual agreement of WRAP and the Contractor. A final report will be developed as a compilation of task reports and submitted at the conclusion of the project.