



**COORDINATING RESEARCH COUNCIL, INC.**

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**October 7, 2013**

In reply, refer to:  
CRC Project No. E-101

Dear Prospective Bidder:

The Coordinating Research Council (CRC) invites you to submit a written proposal to provide services for "Review of EPA's MOVES2013 Model" (CRC Project No. E-101). A description of the project is presented in Exhibit A, "Statement of Work."

Please indicate by letter, fax, or email by **October 21** if you or your organization intends to submit a written proposal for this research program. CRC will answer technical questions regarding the Request for Proposal if they are submitted in writing. CRC will then return written answers to all of the bidders, along with a copy of the original questions.

A CRC technical group composed of industry representatives will evaluate your proposal. CRC reserves the right to accept or reject any or all proposals.

The reporting requirements will be monthly progress reports and a summary technical report at the end of the contractual period. The reporting requirements are described in more detail in the attachment entitled "Reports" (Exhibit B).

The proposal must be submitted as two separate documents. The technical approach to the problem will be described in part one, and a cost breakdown that is priced by task will be described in part two. The cost proposal document should include all costs associated with conducting the proposed program. The technical proposal shall not be longer than 10 pages in length.

CRC expects to negotiate a cost-plus fixed fee or cost reimbursement contract for the research program.

Contract language for intellectual property and liability clauses is presented in Exhibit C and in Exhibit D, respectively.

Important selection factors to be taken into account are listed in Exhibit E. CRC evaluation procedures require the technical group to complete a thorough technical evaluation before considering costs. After developing a recommendation based on technical considerations, the costs are revealed and the recommendation is modified as needed.

Electronic copies of the technical and cost proposals should be submitted to:

Dr. Chris Tennant  
Coordinating Research Council  
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The deadline for receipt of your proposal is **November 1, 2013**.

Yours truly,

Chris Tennant  
Deputy Director

## **EXHIBIT A**

### **Statement of Work - Request for Proposal**

#### **CRC Project E-101**

#### **Review of EPA's MOVES2013 Model**

##### **Background**

The MOtor Vehicle Emissions Simulator (MOVES) model was designed by the U.S. Environmental Protection Agency (EPA or “the Agency”), Office of Transportation and Air Quality (OTAQ), to provide estimates of highway and non-road mobile source emissions inventories ranging from the micro-scale level (individual projects or roadways) to the macro-scale level (county, state, and nationwide inventories). MOVES2010, released in December 2009, replaced MOBILE6 for use by state and local air quality and transportation planning agencies to aid the development of State Implementation Plans (SIPs), Transportation Conformity Analyses (TCAs) and other purposes. Recently issued updates of MOVES (MOVES2010a and MOVES2010b) incorporate minor revisions to the model, and occur mostly in the areas of model performance and mobile source air toxics.

The next major revision of MOVES (code-named MOVES2013) designated for use in SIPs and TCAs is currently timed to occur with the release of the final Tier 3 rulemaking, and is officially expected by the end of 2013. This version of the model will incorporate: (a) substantial updates in fuel adjustment factors and vehicle emissions rates based on recent EPA test programs, data analyses and the emissions standards and fuel specifications embodied in the Tier 3 rulemaking; (b) the impacts of recently finalized regulations such as the greenhouse gas rules for MY 2017-2025 light-duty vehicles and for MY 2014-2018 heavy-duty vehicles; (c) updated vehicle population and activity data, heavy-duty vehicle emissions rates, and cold temperature test data; (d) improved speciation of VOC and PM emissions; (e) a draft version of the NONROAD model; and (f) other updates designed to improve functionality, performance as well as ease of use with air quality models. The Agency has been pursuing the development of MOVES2013 with guidance from a workgroup of stakeholders charged to provide input to the EPA via the Mobile Sources Technical Review Subcommittee (MSTRS) and the Federal Clean Air Act Advisory Committee.

As outlined in the Statement of Work below, the objective of the present effort is to critically assess MOVES2013. The Coordinating Research Council (CRC) has in the past worked cooperatively with the EPA to independently review, evaluate and validate earlier versions of the MOVES and its predecessors (i.e., the MOBILE model).<sup>1</sup> In the most recent such effort, the EPA made a draft version of the MOVES model available for CRC review prior to its official public release.<sup>2</sup> However, the Agency has indicated that timing and resource constraints will prevent it from doing so with MOVES2013. Given the potential likelihood that the timing of the public

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<sup>1</sup> See the list of references and resources at the end of this Statement of Work for a selection of reports relating to recent studies of MOVES sponsored by CRC and others.

<sup>2</sup> See Reference #1

release of MOVES2013 may slip into 2014, the following Statement of Work includes a “Task 0” wherein the contractor is asked to provide a very brief scoping assessment to CRC based on insights gained from a review of materials presented to the FACA MOVES2013 Model Review workgroup as well as versions of the model available in the Tier 3 rulemaking public docket.

### **Statement of Work**

#### **Task 0: Scoping Assessment**

The contractor shall conduct a brief review of materials presented to the FACA MOVES2013 Model Review workgroup as well as versions of the MOVES model available in the Tier 3 rulemaking public docket. This task is to be conducted prior to EPA’s public release of the official version of MOVES2013. The objective is to gain insight on key areas that may (or may not) require a re-adjustment of the focus of the work planned in Tasks 1 and 2. A summary of the findings of the scoping assessment shall be communicated to CRC within 3 weeks of the date of contract signature. In consultation with CRC, the contractor shall then determine the need for (and scope of) changes to the effort planned for Tasks 1 and 2 below.

#### **Task 1: Review and critically evaluate the methodologies and data used in MOVES2013 to estimate exhaust and evaporative emissions, particularly those related to fuel factor effects.**

The contractor shall review, document and critically assess the changes made between MOVES2010b and MOVES2013 to the model methodologies and inputs to facilitate the estimation of criteria pollutants. Areas of interest include (but are not limited to):

- Calculation of Tier 3 exhaust basic emission rates
- Treatment of start versus running exhaust emissions (including the application of updated fuel adjustment factors: sulfur, RVP, other)
- Updated evaporative and permeation emissions rates (including, in particular, an assessment of multi-day diurnal emission factors, running losses, and evaporative leak rates)
- Modifications made to facilitate the modeling of mid- and high-level ethanol blends.

Please note that a number of the above issues and areas of interest have previously been addressed in varying degrees in the reports included in the reference list. CRC expects the successful bidder to build upon those studies (and others in the public domain) rather than recreate them.

#### **Task 2: Exercise the MOVES Model**

The contractor shall develop a protocol to exercise MOVES2013 and demonstrate the ability of the model to represent real world emissions impacts associated with changes in the values of selected model parameters. Specifically, the contractor shall:

**2.1** Evaluate the exhaust and evaporative emissions (criteria pollutants and toxics) effects of changes in the fuel factors represented in MOVES2013 (include all fuel parameters) and validate these effects with data from actual test programs.

## **2.2 Provide sensitivity analyses to evaluate the robustness of MOVES2013 predictions to changes in selected model inputs**

The contractor should conduct the above two subtasks using model input data for at least three US urban areas selected (with the concurrence and approval of CRC) to represent a wide variation in fuel property, climate, vehicle population and I/M program characteristics. Example urban areas include Atlanta, Chicago and Salt Lake City). In addition, the contractor should plan to capture seasonal variation by conducting the evaluations and analyses in this task for two months of the year: January and July.

In developing the cost proposal for this project, bidders are asked to show the costs for Task 2 by urban area and season.

The output of this task should include an identification of areas of the model needing improvement and calculations of concern.

### **Task 3: Provide recommendations to CRC**

The contractor shall provide recommendations to CRC for future work and changes/updates (if/where needed) regarding the MOVES model as quickly as they are identified to permit immediate communication from CRC to EPA. Indicate whether any of the identified concerns are expected to compromise the use of MOVES by States or other entities, from the perspective that the results may lead to incorrect conclusions or direction.

### **Task 4: Reporting**

The results of this evaluation should be documented in a draft report to CRC. Comments received on the draft report would be addressed prior to issuing a final report. The contractor should expect two rounds of review. Monthly progress reports would also be submitted by the contractor.

### **Contractor Qualifications:**

Bidders require a good working knowledge of MOVES.

### **References and Resources:**

1. Air Improvement Resources, [\*Review of the 2009 Draft Motor Vehicle Emissions Simulator \(MOVES\) Model\*](#), prepared for the Coordinating Research Council, Project E-68a, November 2010
2. ENVIRON, [\*Analysis of EPA's Draft Plan for Emissions Modeling in MOVES and MOVES GHG\*](#), prepared for the Coordinating Research Council, Project E-68, May 2004
3. Sierra Research, *Assessment of the Emission Benefits of U.S. EPA's Proposed Tier 3 Motor Vehicle Emission and Fuel Standards*, prepared for the American Petroleum Institute, June 23, 2013, (available as "Attachment 13" [here](#))

4. Sierra Research, *Evaluation of MOVES2004*, prepared for the Alliance of Automobile Manufacturers, July 15, 2005
5. ENVIRON, [\*Evaluation of the US EPA MOBILE6 Highway Vehicle Emission Factor Model\*](#), prepared for the Coordinating Research Council, Project E-64, March 2004
6. EPA documents on the development of the MOVES2010b and predecessor versions of the MOVES model, available [here](#)
7. EPA FACA MOVES2013 Model Review Workgroup presentations, available [here](#)

## **EXHIBIT B**

### **REPORTS**

#### **MONTHLY TECHNICAL PROGRESS REPORTS**

The contractor shall submit a monthly technical progress report covering work accomplished during each calendar month of the contract performance. An electronic Microsoft® Word compatible file (<1 MB) of the monthly technical progress report shall be distributed by the contractor within ten (10) calendar days after the end of each reporting period. The report shall contain a description of overall progress, plus a separate description for each task or other logical segment of work on which effort was expended during the reporting period.

#### **FINAL REPORT**

The contractor shall submit to or distribute for CRC an electronic pdf-compatible copy transmittable via email) of a rough draft of a final report within thirty (30) days after completion of the technical effort specified in the contract. The report shall document, in detail, the test program and all of the work performed under the contract. The report shall include tables, graphs, diagrams, curves, sketches, photographs and drawings in sufficient detail to comprehensively explain the test program and results achieved under the contract. The report shall be complete in itself and contain no reference, directly or indirectly, to the monthly report(s).

Within thirty (30) days after receipt of the approved draft copy of the final report, the contractor shall make the requested changes and deliver to CRC thirty (30) hardcopies including a reproducible master copy of the final report. The final report shall also be submitted as an electronic copy in a pdf or pdf-convertible file format. The final report may be prepared using the contractor's standard format, acknowledging author and sponsors. An outside CRC cover page will be provided by CRC. The electronic copy will be made available for posting on the CRC website.

## **EXHIBIT C**

### **INTELLECTUAL PROPERTY RIGHTS**

Title to all inventions, improvements, and data, hereinafter, collectively referred to as (“Inventions”), whether or not patentable, resulting from the performance of work under this Agreement shall be assigned to CRC. Contractor X shall promptly disclose to CRC any Invention which is made or conceived by Contractor X, its employees, agents, or representatives, either alone or jointly with others, during the term of this agreement, which result from the performance of work under this agreement, or are a result of confidential information provided to Contractor X by CRC or its Participants. Contractor X agrees to assign to CRC the entire right, title, and interest in and to any and all such Inventions, and to execute and cause its employees or representatives to execute such documents as may be required to file applications and to obtain patents covering such Inventions in CRC’s name or in the name of CRC’s Participants or nominees. At CRC’s expense, Contractor X shall provide reasonable assistance to CRC or its designee in obtaining patents on such Inventions.

To the extent that a CRC member makes available any of its intellectual property (including but not limited to patents, patent applications, copyrighted material, trade secrets, or trademarks) to Contractor X, Contractor X shall have only a limited license to such intellectual property for the sole purpose of performing work pursuant to this Agreement and shall have no other right or license, express or implied, or by estoppel. To the extent a CRC member contributes materials, tangible items, or information for use in the project, Contractor X acknowledges that it obtains only the right to use the materials, items, or information supplied for the purposes of performing the work provided for in this Agreement, and obtains no rights to copy, distribute, disclose, make, use, sell or offer to sell such materials or items outside of the performance of this Agreement.



## **EXHIBIT D**

### **LIABILITY**

It is agreed and understood that \_\_\_\_\_ is acting as an independent contractor in the performance of any and all work hereunder and, as such, has control over the performance of such work. \_\_\_\_\_ agrees to indemnify and defend CRC from and against any and all liabilities, claims, and expenses incident thereto (including, for example, reasonable attorneys' fees) which CRC may hereafter incur, become responsible for or pay out as a result of death or bodily injury to any person or destruction or damage to any property, caused, in whole or in part, by \_\_\_\_\_'s performance of, or failure to perform, the work hereunder or any other act of omission in connection therewith.

## **EXHIBIT E**

### **PROPOSAL EVALUATION CRITERIA**

- 1) Merits of proposed technical approach.
- 2) Previous performance on related research studies.
- 3) Personnel available for proposed study – related experience.
- 4) Timeliness of study completion.
- 5) Cost.