

January 17, 2018

Via Email

Oil and Gas Work Group Members
c/o Tom Moore
Western States Air Resources Council-Western Regional Air Partnership
3 Caliente Rd #8
Santa Fe, NM 87508

Re: Western Regional Air Partnership Oil and Gas Workgroup Emission Inventory Road Map (Revised)

Dear Members of the Oil and Gas Workgroup:

Thank you for soliciting our response to the Western Regional Air Partnership (WRAP) Oil and Gas Workgroup (OGWG) Road Map Scope of Work (SOW). We understand that the analyses described in the Road Map SOW are necessary to meet air quality planning needs for regional haze as well as ozone and other air pollution indicators. We are pleased to have the opportunity to develop oil and gas (O&G) emission inventory and related analyses for the WRAP OGWG.

Ramboll (formerly Ramboll Environ) is a premier global consultancy. We work with clients to help resolve their most demanding environmental and human health issues. We have earned a reputation for technical and scientific excellence, innovation and client service. Our independent, science-first approach ensures that our strategic advice is objective and defensible. We apply integrated multidisciplinary services and tailor each solution to our client's specific needs and challenges.

Ramboll develops regional and project level O&G emission inventories, provides expert analysis of O&G inventories, and develops regional-scale air quality modeling studies to evaluate air quality issues associated with O&G development. Our inventory and modeling efforts form a critical basis for the current understanding of potential air quality impacts associated with some of the more active O&G plays and basins. Upon request, we would be happy to provide relevant project summaries, resumes for key personnel, and work samples.

Phase 1 Scope of Work

The OGWG Road Map SOW identifies three principal tasks:

- Task I: Identification and Review of Oil & Gas Specific Projection Methodologies and Work Products
- Task II: Base Year and Future Year Oil & Gas Emissions Inventories
- Task III: Identification and Review of Member Agency Oil & Gas Programs and Emissions Management

The Road Map SOW describes subtasks as well as anticipated deliverables and schedule. The technical scope described herein is for Ramboll to develop a workplan by which work described in the OGWG Road Map SOW would be completed.

We understand that the focus of the Road Map SOW is emissions from upstream and midstream O&G sources. Downstream emissions will not be considered unless specific case(s) warrant special consideration. We have reviewed the list of O&G emission sources included in the Road Map SOW Attachment A. This list captures the primary emission sources associated with upstream and midstream O&G activities. We note that truck traffic associated with upstream activities is included in the list. The inclusion of truck traffic in O&G emission inventories is inventory specific; for example Intermountain West Data Warehouse (IWDW) emission inventories and the National Emission Inventory (NEI) do not include truck traffic whereas the Colorado Air Resource Management Modeling Study (CARMMS) does include truck traffic. We also note that emissions associated with wellpad construction are not included in the list, but these sources have been included in some studies (e.g. CARMMS). As part of Task 1b we will identify source categories associated with each O&G inventory and will specifically note whether truck traffic and/or construction activity emissions are included.

Per discussions with OGWG members, we understand that the highest priority technical item is projection methodology review and development. As part of Phase 1 of this study, we propose to perform (1) a screening analysis of projection methodologies implemented in other studies, and (2) a screening level review of existing O&G specific work products. Based on the results of these screening level analyses we will compile a detailed workplan for completing all of the work described in the Road Map SOW. We have also identified an optional task to perform a screening level review of emission control analyses to inform development of alternative control analyses methodology.

Task 1a. Review potential projection methodologies. Ramboll will identify documentation for emission projections listed in the OGWG SOW (I.a.ii). From each emission inventory projection, Ramboll will compile a brief summary of emission forecast and controls methodology. We will note important features of each projection methodology in a manner that will allow for comparison of key points across all methodologies for parameters critical to projected emissions accuracy (e.g. basin specificity, forecast source specific granularity, inclusion of local, state, and/federal controls). We will also summarize the strengths and weaknesses of each methodology.

Historical O&G activity data is typically a required input for developing O&G activity projections and is typically obtained from state databases (e.g. Colorado Oil and Gas Conservation Commission [COGCC], Colorado Oil and Gas Information System [COGIS]), U.S. Energy Information Administration (EIA), or a proprietary product (e.g. IHS Enerdeq). The WRAP region covers several states. Because each state releases historical O&G activity data in a different format, the use of a proprietary product would allow for a uniform data source across states and greater efficiency than gathering data from individual state databases. Ramboll will work with OGWG committee members to determine whether IHS Enerdeq and/or another proprietary product are available for use in this study. If IHS Enerdeq and/or another proprietary product is available, the workplan would describe the quality assurance steps that we would take to ensure the accuracy of product data relative to state databases. If IHS Enerdeq and/or another proprietary product is not available, the workplan would describe the steps required to obtain historical O&G activity data from state databases.

The results of Task 1a inform workplan development (Task 1c) for Road Map SOW Tasks II.b and II.c.

Task 1b. Identify and Review Existing Oil and Gas Specific Work Products. Ramboll will identify the latest O&G emission inventories available for the WRAP region including 2014 base year inventories that Ramboll compiled for WESTAR-WRAP (1) for the Intermountain West states for inclusion in the Intermountain West Data Warehouse and (2) for the Greater San Juan and Permian Basin O&G Inventory Project. OGWG members would be queried for any additional emission inventory studies to include in this task. Since O&G emissions for Alaska and California were not included in either of the aforementioned WESTAR-WRAP projects, OGWG member agencies in those states would be asked to provide information on the most recent emission inventories compiled in those states. *To the extent feasible within project resources*, Ramboll will identify the following for each inventory:

1. Inventory method summary
2. Data gaps
3. Emission factor uncertainties
4. Non-point versus point sources
5. Pollutants available.

The results of Task 1b will be used to inform workplan development (Task 1c) for Road Map SOW Task II.

Task 1c. Detailed Workplan for Completing the OGWG Road Map SOW. We will compile a detailed workplan that describes how the OGWG Road Map SOW will be completed. The findings of Task 1a and 1b will inform workplan development. The workplan will prioritize tasks/subtasks and include optional tasks as warranted. The workplan will specifically include the following components (1) a master timeline which identifies progress milestones, (2) detailed cost estimates for all tasks, and (3) a complete list of deliverables to be developed.

Task 1d. Review potential control methodologies. With input from OGWG members, Ramboll will compile a comprehensive list of local, state, and federal regulations applicable to developing a controls analysis for O&G emission inventory forecasts in the WRAP region. We will note features important to the controls analysis for each regulation (e.g. applicable pollutants, geographical area(s) and source categories; applicability to existing, new, and/or modified sources). We will summarize approaches taken to apply controls analyses as described in emission inventory forecast documentation identified in Task 1b, noting strengths and weaknesses of each approach. Finally, we will suggest methodology for efficiently applying alternative controls analyses to future year emission inventory forecasts. Task 1d will inform workplan development (Task 1c) for Road Map SOW Tasks II.b and II.c.

Task 1e. OGWG Planning Support. Since provision of the original proposal, the OGWG has requested Ramboll assistance with the OGWG planning process. Ramboll would attend up to six OGWG conference calls and, to the extent feasible within Task 1e resources, draft simple text that builds on this proposal to support OGWG planning efforts.