

Appendix 1. Draft introductory text that will be sent to 64 respondents via email:

NORA Oil and Gas Extraction Council Members and Partners,

Greetings. Included in this email is a link to a brief online questionnaire. This questionnaire seeks to understand which occupational safety and health issues are most critical in the oil and gas extraction industry based on your experiences. Your participation is voluntary, and I expect that it will take you no longer than 15 minutes to complete. The questionnaire does not collect personally identifiable information and the results will not be disseminated publically. Results from the questionnaire will be used to facilitate a discussion during our next NORA Oil and Gas Extraction Council meeting, and as the basis for developing a new NORA Oil and Gas Extraction Research Agenda.

Thank you very much for your time. If you have any questions about this questionnaire or the NORA Oil and Gas Extraction Council meeting, please call me.

Sincerely,

Ryan

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Appendix 2. Draft questionnaire

NORA Oil and Gas Extraction Council Questionnaire (DRAFT)

The purpose of this questionnaire is to collect information from partners to understand which occupational safety and health issues are most critical for future research and collaboration. This questionnaire asks you to identify the topics and issues that you believe are the highest priority in the U.S. oil and gas extraction (OGE) industry. The results from this survey will be used to facilitate discussions of these priorities, resulting in the NORA Oil and Gas Extraction Research Agenda. Your responses are confidential and will not be disseminated to the public.

1. Please review the **safety hazards** below and indicate which you consider to be Low, Medium, or High priority research areas for improving worker safety in the oil and gas extraction industry:

On the job roadway incidents
Well-site motor vehicle incidents
Commuting
Contact injuries (struck by/caught between/dropped objects)
Fires and explosions
Pressure-related events
Falls from height
Electrocutions
Heat/Cold Stress
Musculoskeletal disorders
Slips/trips
Pinch point injuries
Noise
Other: _____

2. Please review the list of **health hazards** below and indicate which you consider to be Low, Medium, or High priority for improving worker health in the oil and gas extraction industry:

Respirable Silica
Diesel Particulate Matter (DPM)
Hydrocarbon gases and vapors
Benzene
NORM
Hydrogen Sulfide
Dermal Exposures
Chronic Health hazards (i.e. cancer, respiratory disease)
Acute health hazards (i.e. hydrogen sulfide, hydrocarbon gases)
Other: _____

3. Please review the list of **cross-cutting issues** below and indicate which you consider to be Low, Medium, or High priority for improving worker safety and health in the oil and gas extraction industry:

- Making the business case/conducting cost-benefit analyses for health and safety
- Defining a set of leading indicators for the OGE industry
- Ensuring effective contractor management
- Establishing evidence-based lifesaving rules
- Increased use of Process Safety Management
- Increased use of Safety Management Systems
- Improving Safety Climate in the OGE industry
- Ensuring safety and health during the great crew change (retirement of older workforce and transition to younger workers)
- Improving emergency response
- Lock Out/Tag Out improvements
- Engineering Controls
- Improved use of multi-gas monitors
- Increased use of PPE (flame retardant clothes, respirators, hearing protection, etc.)
- Worksite wellness (i.e. smoking cessation, substance abuse prevention, nutrition)
- Evaluation of existing federal and state regulations and their effect on health and safety
- Assessing the existence and needs for recommended practices to address current safety and health hazards on the wellsite
- Improving health and safety of small companies
- Evaluation of industry-specific education and training programs
- Identifying the safest shift length and shift rotation situations
- Evaluation of geographic differences in safety and health hazards (e.g. weather, road infrastructure)
- Other: _____

4. Please rank (1 being most important) the top 2 research activities for reducing **silica exposures** in the oil and gas extraction industry (considering the new OSHA silica standard):

- Evaluation of existing engineering controls being used by industry
- Development of new engineering controls
- Surveillance for silicosis
- Ongoing exposure assessment during hydraulic fracturing
- Other: _____

5. Please rank (1 being most important) the 2 most critical **control technology** evaluation activities for improving worker safety and health in the oil and gas extraction industry:

- Silica controls
- Alternative produced fluid sampling strategies (without opening hatch)
- Permeation of drilling fluids into skin
- Drilling rig controls (i.e. pipe handling, automated tongs)
- “Smart” Lock-out/Tag-out controls (e.g. remote alerts)
- Remote monitoring of lone workers
- Other: _____

6. Please rank (1 being most important) the 3 **surveillance activities** for improving the type and quality of data collected in the oil and gas extraction industry:

Expand to include **long term health effects** (i.e. respiratory disease, cancer)
Identify and analyze work related **hospitalizations**
Track **Near Misses/High Potential incidents** voluntarily submitted by companies
Complete case reports with **in-depth investigations** of serious incidents
Collect **voluntarily submitted leading indicator** data
Collect **voluntarily submitted injury and illness** data

7. Please rank (1 being most important) the 3 **worker groups** that you consider the highest priority for improving worker safety and health in the oil and gas extraction industry:

Short service employees (new, inexperienced workers)
Hispanic workers
Non-English speaking workers
Temporary workers
Small contractor employees
Young workers
Aging workforce
Lone workers
Other: _____

8. Please rank (1 being most important) the 3 **motor vehicle safety issues** that you consider the highest priority for research and intervention.

Fatigue
Seatbelt use
Speeding
Journey management (minimizing road travel and associated risks, e.g.
weather)
Load securement
Distracted driving
Contractor management
Musculoskeletal injuries
Commuting
Other: _____

9. Please rank (1 being most important) the 2 types of motor vehicle **technologies** most in need of evaluation.

Fatigue/distracted driver detection
In-vehicle monitoring
Journey management technologies
Predictive analytics
Other: _____

10. Please review the list **communication products** below and select those most effective for disseminating research-based recommendations to safety and health professionals in the oil and gas extraction industry? (Select all that apply)

- Short videos
- Hazard Alerts
- Online training tools
- Apps (on the phone)
- Life-saving rules
- Virtual reality tools
- Scientific articles
- Trade journal articles
- Conference presentations
- Other: _____

11. Please review the list **communication products** below and select those most effective for disseminating research-based recommendations to workers in the oil and gas extraction industry? (Select all that apply)

- Short videos
- Hazard Alerts
- Online training tools
- Apps (on the phone)
- Life-saving rules
- Virtual reality tools
- Scientific articles
- Trade journal articles
- Conference presentations
- Other: _____