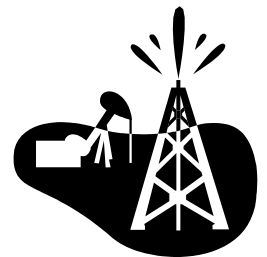


Defining the Upstream Oil and Gas Sector: Exploration, Production, and Natural Gas Gathering and Processing

**Western Climate Initiative – Oil & Gas Collaborative
Santa Fe, NM
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**Tom Moore
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- Ross & Associates for facilitation
- Technical WorkGroup members for expert review & frank advice
- [O&G GHG Reporting Protocol project webpage](#)

Oil and Gas “Upstream” sources & activities

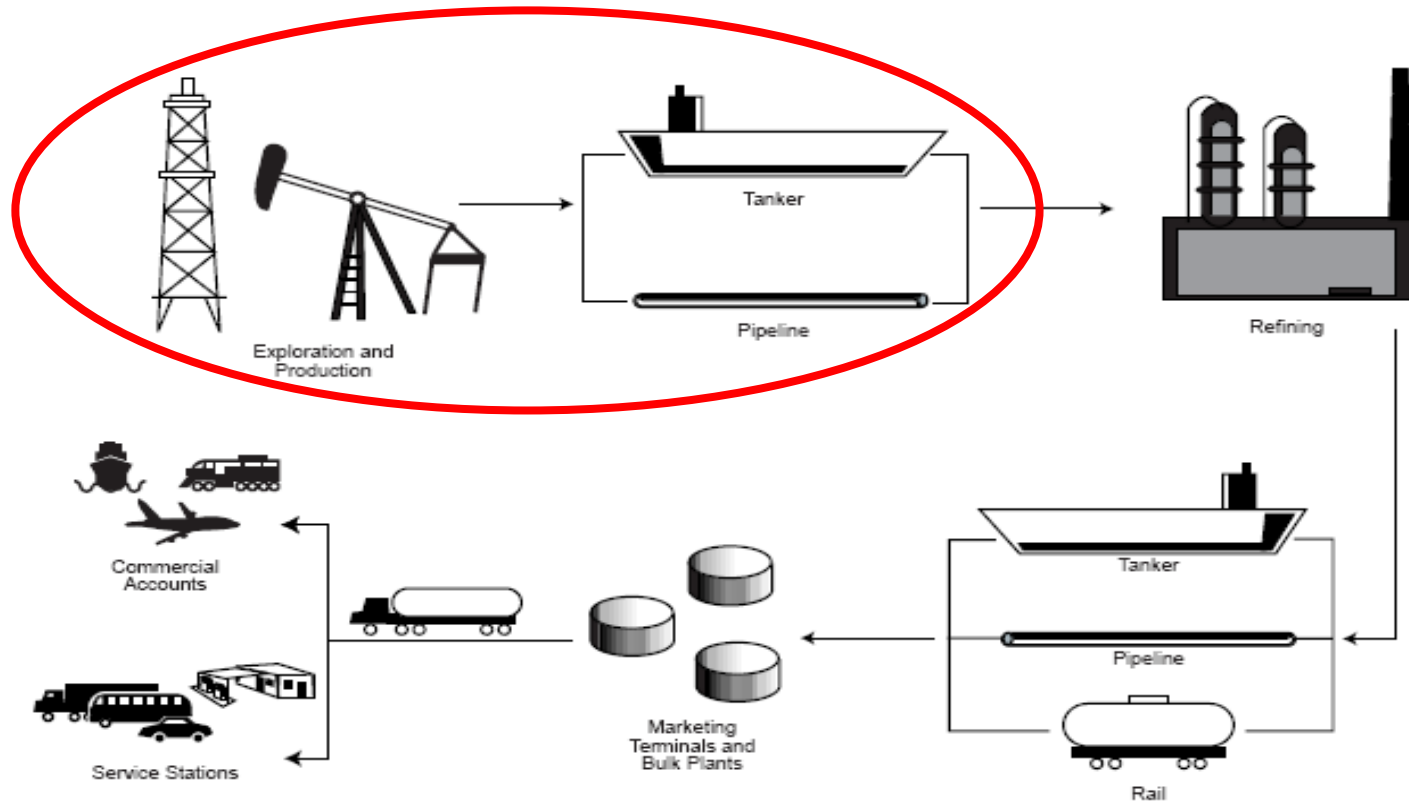


Figure 1—Major Emission Sources for an Integrated Oil Company

Figure 1—Oil and Gas Industry Schematic of GHG Emissions

Source: American Petroleum Institute: *Toward a Consistent Methodology for Estimating Greenhouse Gas Emissions from Oil and Natural Gas Industry Operations*. Page 4.

Geographic Scope and Source Types addressed in developing work on Upstream Reporting Protocols to date

- North America
- All O&G source activities upstream of:
 - Oil refineries (GHG reporting covered by ARB regulation)
 - Gas sale pipeline transfer points (CCAR/WRI/TCR protocol)
- Types of O&G E&P
 - Conventional Oil & Gas
 - Unconventional Gas
 - Tight Sands Gas
 - Gas Shale
 - Coalbed Methane Gas
 - Oil Sands
 - Oil
 - Offshore
 - Enhanced Oil Recovery
 - Oil Sands

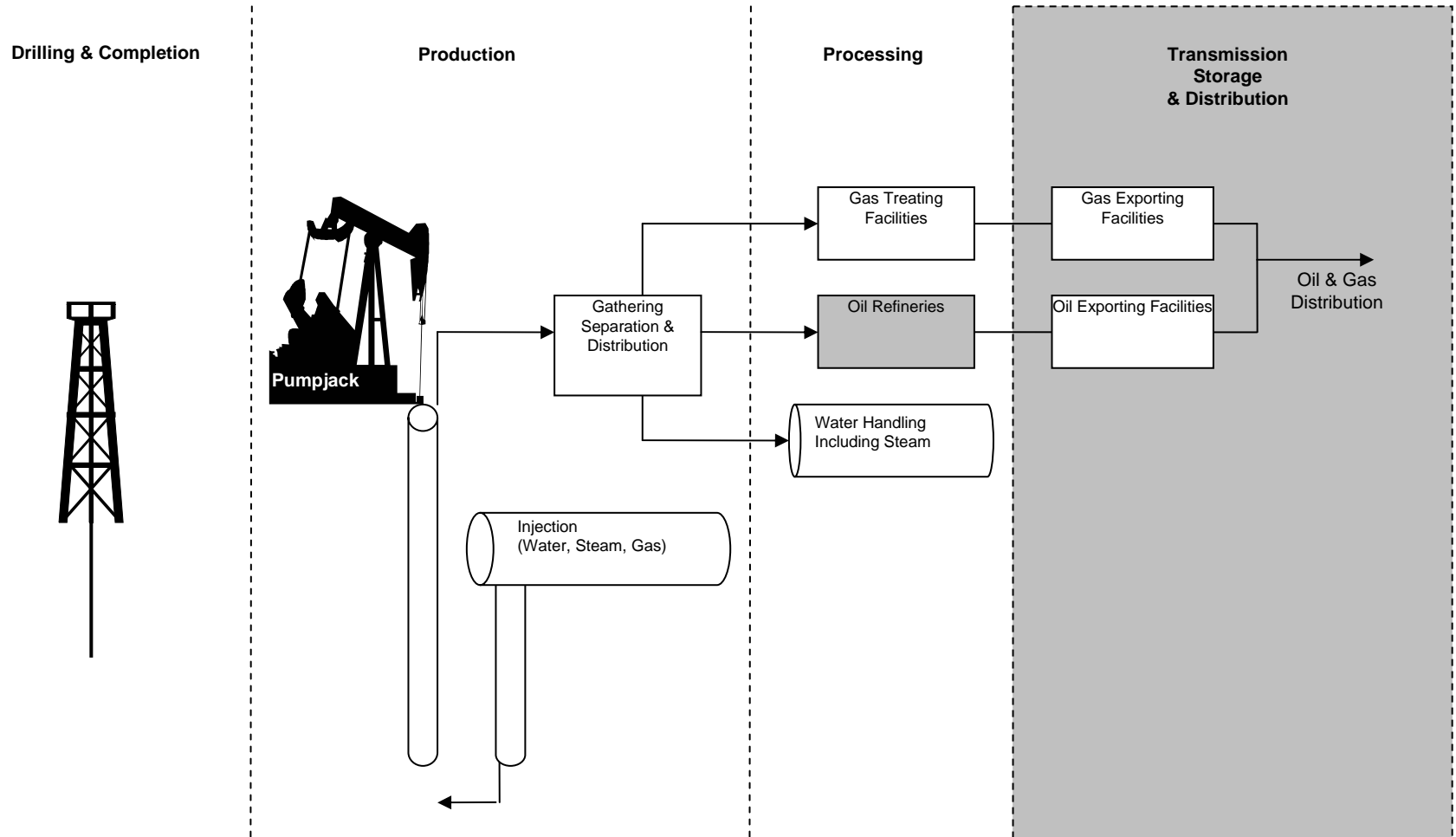
Emissions Inventory Sources addressed in Protocol work to date

- Gas Processing Plants
- Compressor Stations
- Wellhead Compressor Engines
- CBM Pump Engines
- Miscellaneous/Exempt Engines
- Drilling/Workover Rigs
- Salt-water Disposal Engines
- Artificial Lift Engines (Pumpjacks)
- Vapor Recovery Units (VRUs)
- Oil/Gas Well Heaters
- Hydrocarbon Liquid Storage Tanks
- Well Completions
- Fugitive Emissions
- Completion Venting
- Well Blowdowns
- Dehydration Units
- Amine Units
- Hydrocarbon Liquid Loading
- Landfarms
- Water Treatment/Injection
- Flaring
- Pneumatic Devices
- Produced Water Tanks
- Crude Oil Transportation

Sources included/not included in the Upstream O&G sector

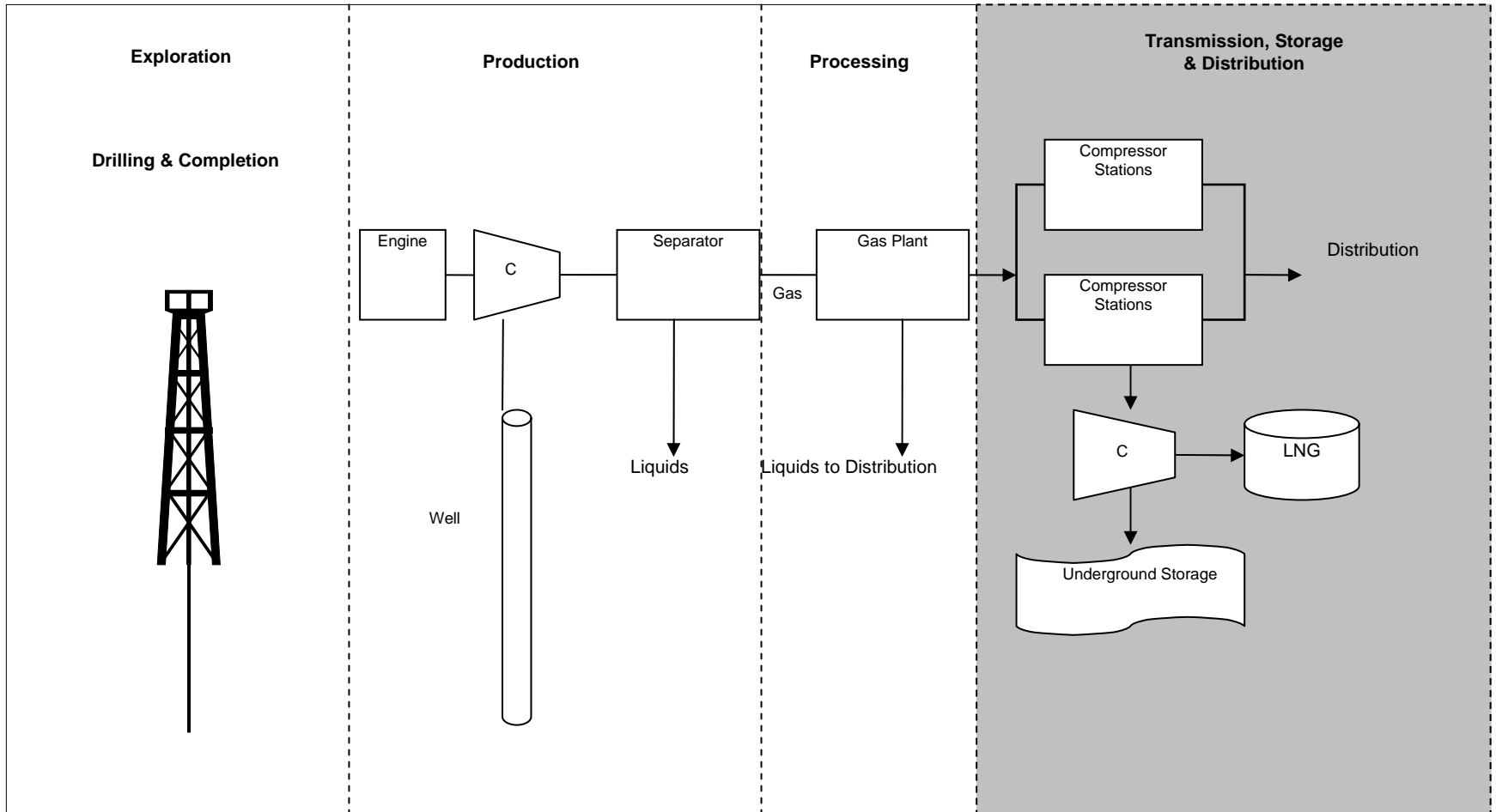
- Includes all emissions sources in the:
 - **Exploration and production (E&P) sector of oil & natural gas, as well as:**
 - **Gas gathering, collection, and processing** - through to the “tailgate” of Natural Gas Processing Plants
 - **Crude Oil Transportation** (including pipelines, trains, trucks, and marine vessels) to the “entry gate” of Oil Refineries
- ***Does not include:***
 - Oil refining and downstream distribution of petroleum products
 - Transmission, storage and distribution of natural gas downstream of the processing plant
- Includes ***all*** companies involved in any way in E&P, natural gas processing, and/or crude oil transportation, including:
 - Oil and Gas leaseholders
 - Support services contractors (e.g., drilling contractors)

Oil Industry Sector



Upstream O&G Protocols do not address oil operations shown in the shaded area.

Natural Gas Industry Sector



Upstream O&G Protocols do not address natural gas operations shown in the shaded area.

Facility Issue Addressed in Protocol work to date

- Definition of a facility/Aggregation of emissions:
 - **Proposed Solution:** Dispersed emission sources to be aggregated, at a minimum, to “production field” level:
 - *Production field is a well understood, broadly accepted concept within the industry*
 - *Production fields are precisely defined by state, province, or country*
 - Reporters are given the option of aggregating multiple fields together (particularly useful, e.g., for infrastructure common to more than one field)
 - Emissions from sources corresponding to standard definition of a facility (e.g., natural gas processing plants) must be reported by facility

Questions -