

O&G ACTIVITY FORECASTS

HISTORICAL TRENDS APPROACH APPLIED TO WRAP FUTURE YEAR EMISSION INVENTORIES

December 19, 2023

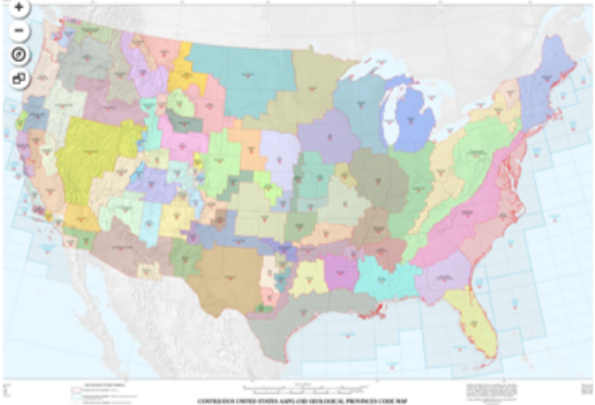
John Grant, Amnon Bar-Ilan

SUMMARY OF APPROACH

Project: WRAP Oil and Gas Workgroup (OGWG)
 Projected Emissions from Baseline Year Emissions Inventory, Projected Emissions from Baseline Year Emissions Inventory ([FINAL REPORT](#))

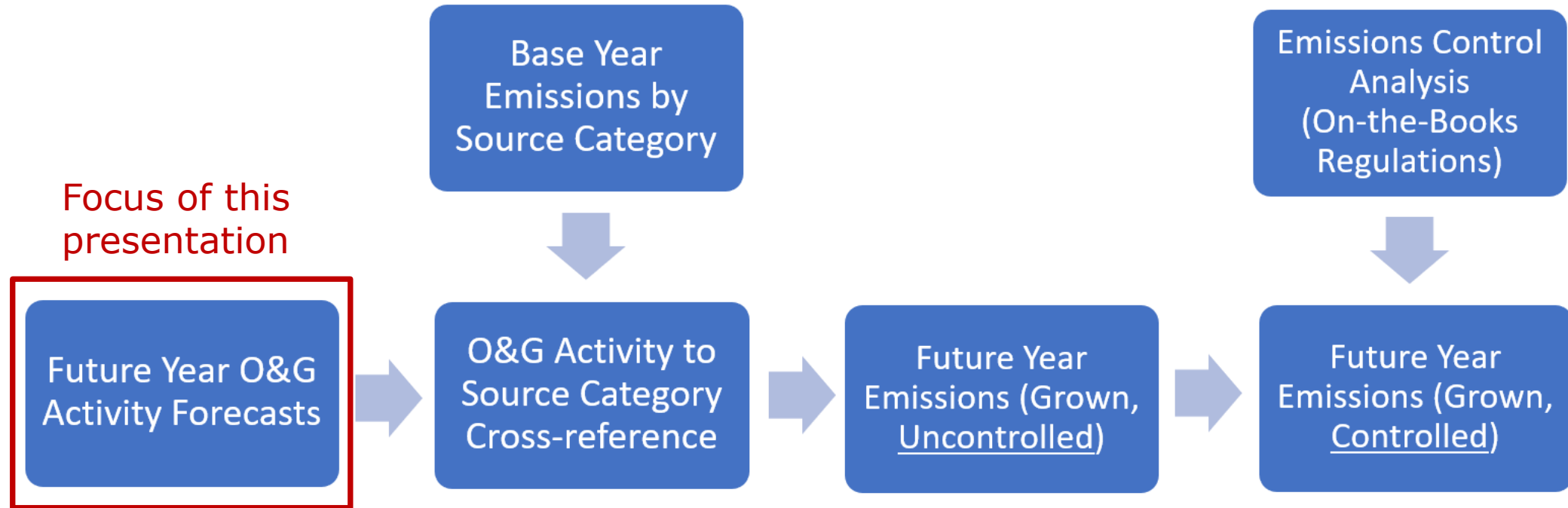
- Other Previous WRAP Projects with Future Year Forecasts**
- Phase III
 - IWDW-WAQS
 - Williston & Great Plains Basins
 - San Juan & Permian Basins
 - OGWG WRAP-Region-wide

Historical Trends Approach Overview

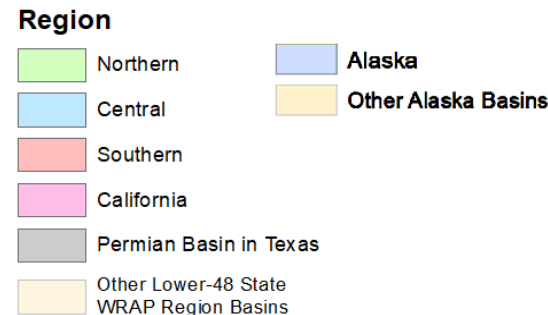
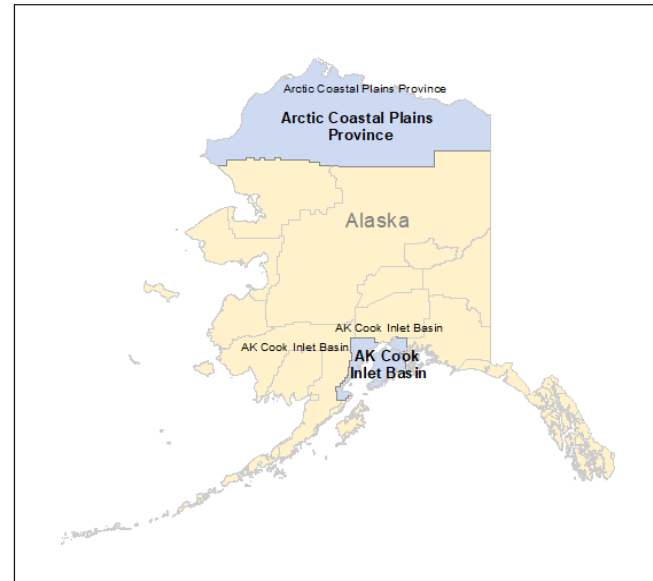
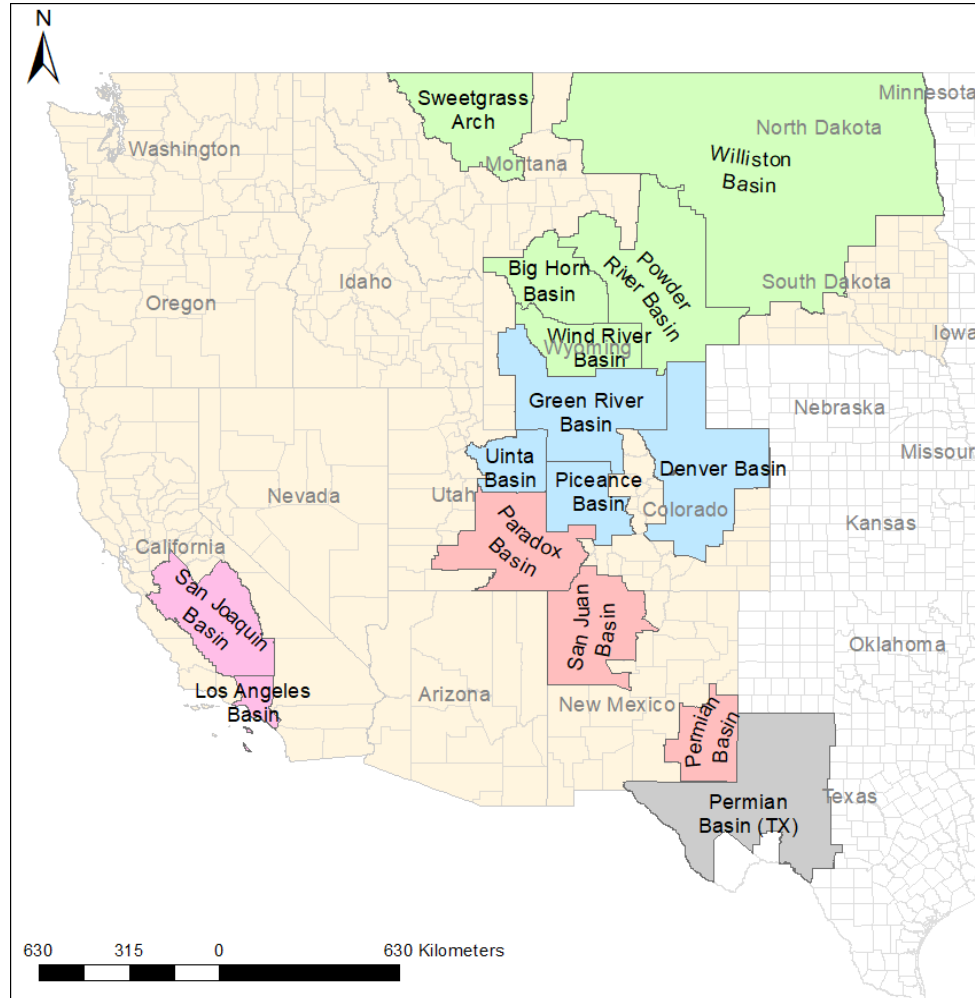
Parameter	Historical Trends
Purpose	To forecast emissions during specific time frames for use in air quality planning
Forecast Basis	Recent historical trends
Geographic region	Basin or sub-basin ¹⁴ 
Forecast Data Availability	Oil Wells <ul style="list-style-type: none"> • Oil production* • Associated gas production* • Active Oil Well Count* Gas Wells <ul style="list-style-type: none"> • Condensate production* • Primary gas production* • Active Gas Well Count* Coalbed Methane Wells <ul style="list-style-type: none"> • Natural gas production* • Active Gas Well Count* All Wells <ul style="list-style-type: none"> • Spud Count*

* O&G activity forecasts available with spud type detail (vertical, horizontal, directional) in recent WRAP OGWG forecasts

BACKGROUND: TYPICAL FUTURE YEAR INVENTORY DEVELOPMENT PROCESS FOR THE O&G SECTOR

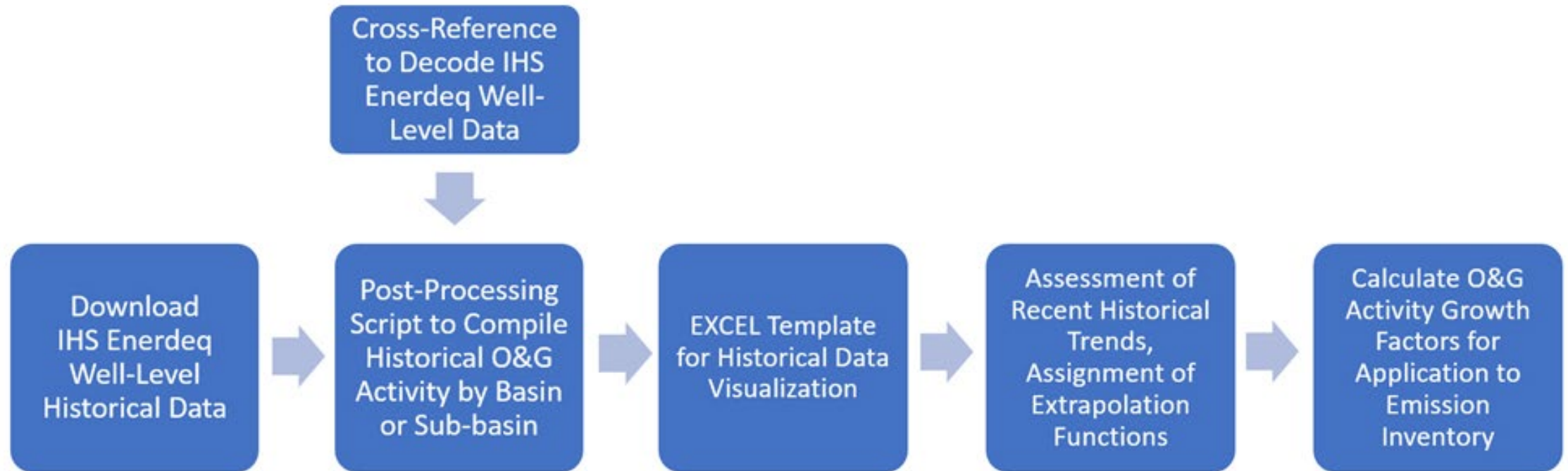


OIL & GAS WORK GROUP BASIN-LEVEL PROJECTIONS



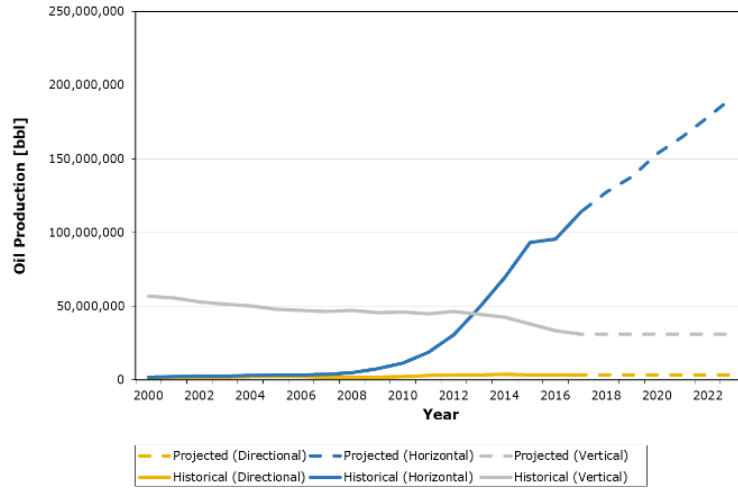
- Ramboll developed historical trends forecasts with input from Agencies for basins in Utah, New Mexico, Wyoming, Montana, North Dakota, and South Dakota

WRAP STUDY PROCESS AND APPLICATIONS

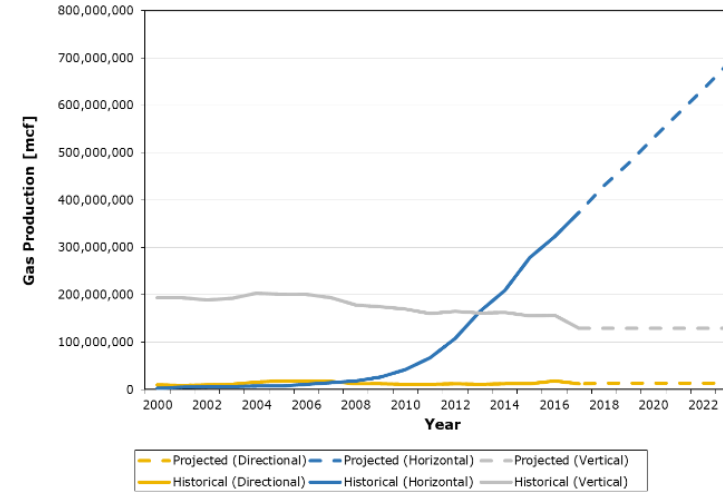


SAMPLE HISTORICAL TRENDS PROJECTIONS: PERMIAN BASIN (NEW MEXICO ONLY)

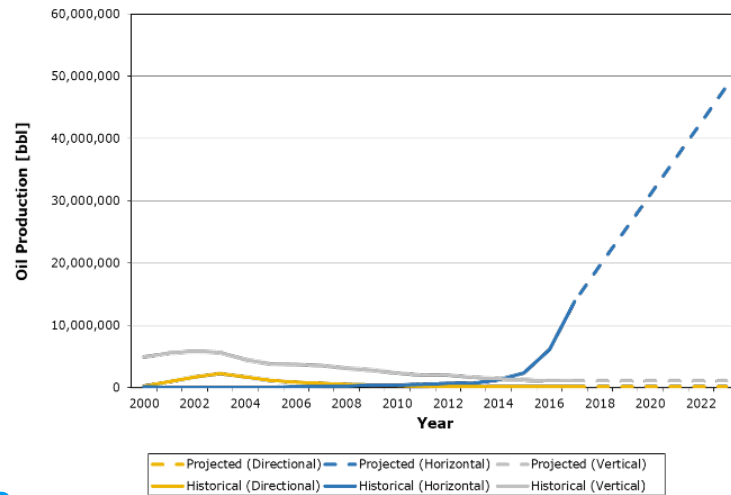
Oil Production - Permian Basin



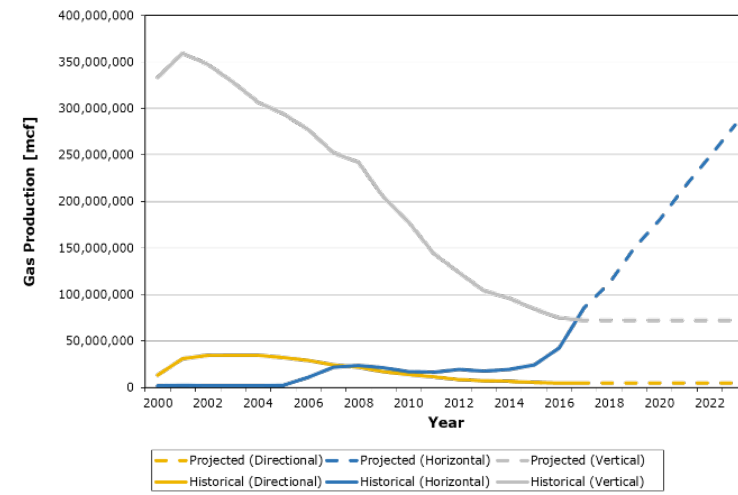
Associated Gas Production - Permian Basin



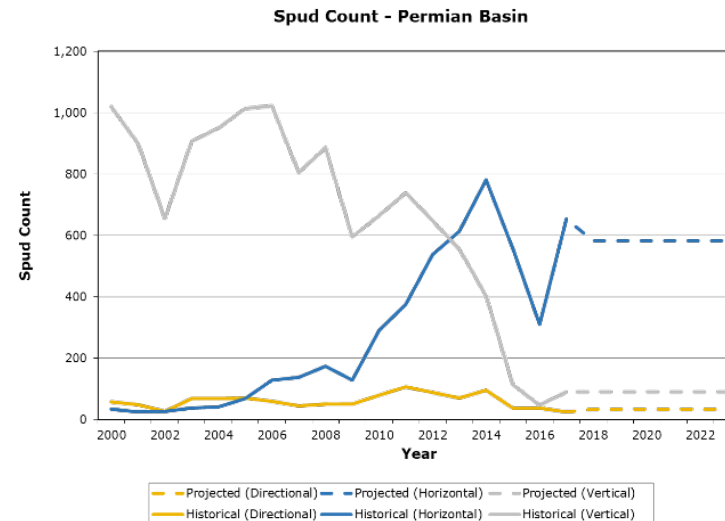
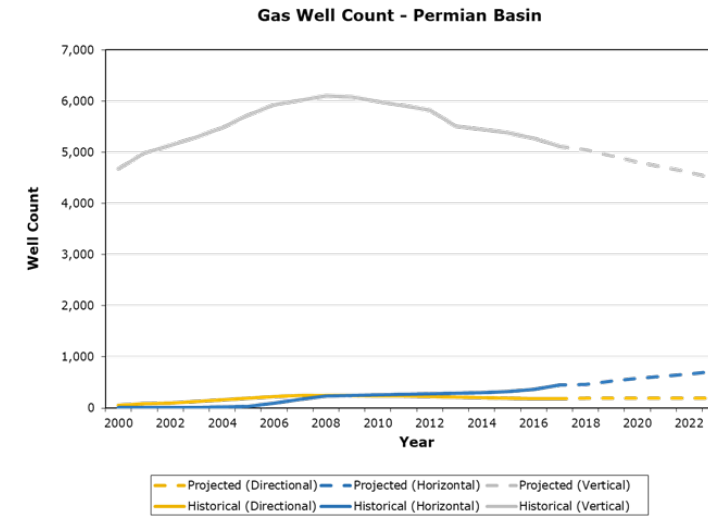
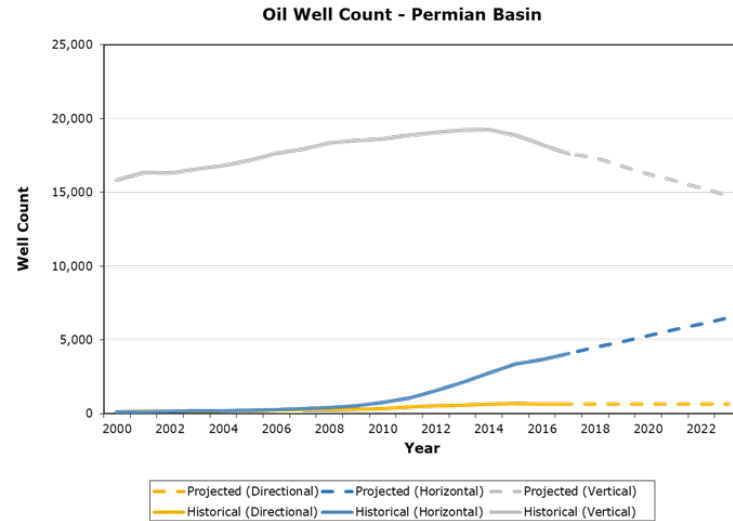
Condensate Production - Permian Basin



Primary Gas Production - Permian Basin



SAMPLE HISTORICAL TRENDS PROJECTIONS: PERMIAN BASIN (NEW MEXICO ONLY)



END