



Date: March 4, 2014

Committee: Energy Development & Transmission Committee

Presenter: Mike Wamboldt, PE, Project Manager

Subject: North Dakota Oil & Gas Impact Study 2014-2019 Phase 1 Update

Phase 1 Update:

Data Gathering Process

- Review recent and relevant studies and identify key data relevant to Bakken and study area
 - 28 Studies reviewed
 - We have prepared a matrix that identifies key take-a-ways, commonalities and any updates since the studies came out
 - Waiting for data updates
- NDSU and EERC have begun their research—their work will primarily be needed for Phase 3 of the study
 - NDSU has begun their research on potential near and long term population effects pertaining to the development
 - EERC has begun their research into near-term CO2 EOR potential and its likelihood
- Review and assess current global trends and future environmental policy
- Sought industry input
 - Informally through day-to-day business
 - Met with the NDPC regulatory committee
 - Requested their insights on key, upcoming state and federal environmental policy
 - Will be meeting with ND Dept. of Health to have a similar discussion

Forming Key Indicators

- Through the data gathering process we've identified key indicators to watch throughout the course of the study. A couple notable points are:
 - The list may narrow or expand depending on what proves to be most relevant over time
 - There may be holes in the data that we are looking at today, for example:
 - Data that is important to watch, but that has not been tracked long enough to show a valuable trend
 - Information that we'd like to know, but is not presently being tracked
 - Information that is interesting to note, but requires further analysis and monitoring:
 - Industry
 - Environment
 - People
- There are many "Wildcards," or game-changers that we are keeping our eye on right now. Issues or upcoming decisions that could have a dramatic effect on the direction of development.

Phase 2

- Information received to date has been compiled in a DRAFT baseline assumptions. Phase 2 of the study will be to validate these conditions and assumptions.
- Next Meeting: Phase 2 Update at April Committee Meeting

North Dakota
Oil & Gas Industry Impacts Study
2014-2019

Phase 1 Update



Phase 1 Update

- ◇ Data gathering Phase
 - ◇ Review state and national studies relevant to Bakken
 - ◇ NDSU and EERC research on-going
 - ◇ Met with Industry and NDPC Regulatory Committee
 - ◇ Review and assess global trends and future policy
 - ◇ Identify key indicators

Disclaimer

The following information is representative of data being tracked for the study but not all inclusive of the variables that will be used in the forecast model.

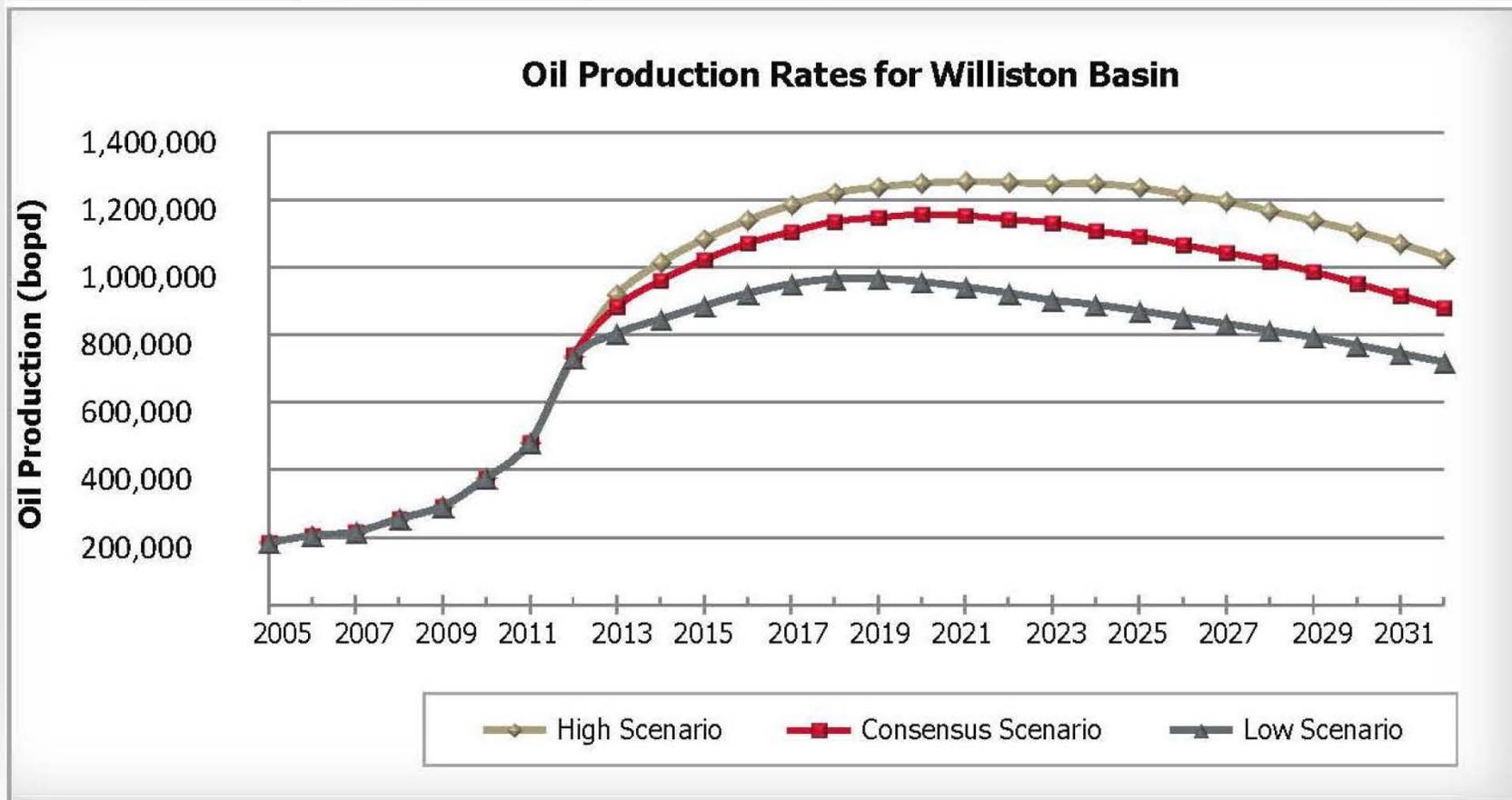
Data is either publicly available from existing reports or tracked internally by KLJ.

The data does NOT represent conclusions or assumptions.





Industry—Production



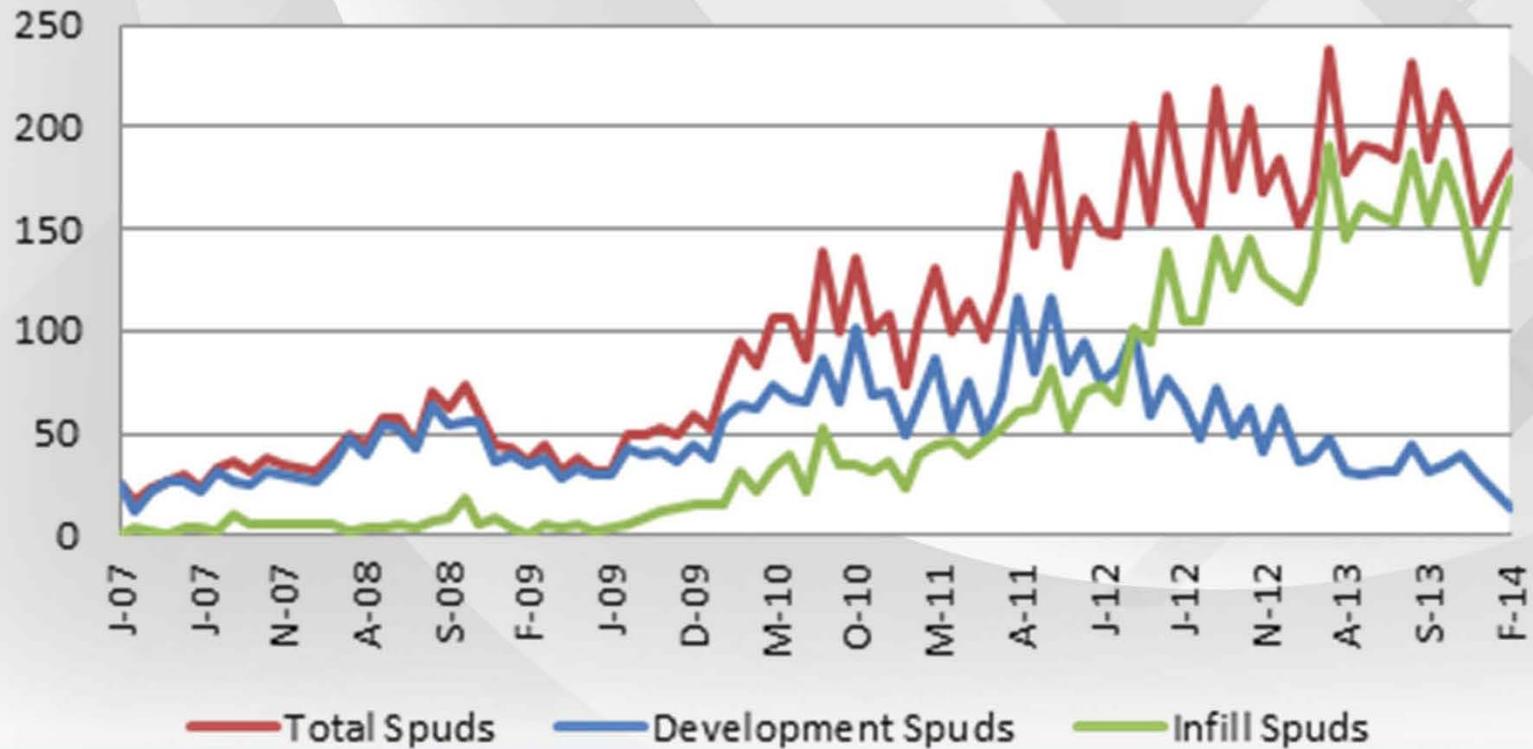
◇ Sources-NDTA





Industry—Drilling/Infill

Monthly D:I Totals (2007-2014)



◇ Sources-KLJ



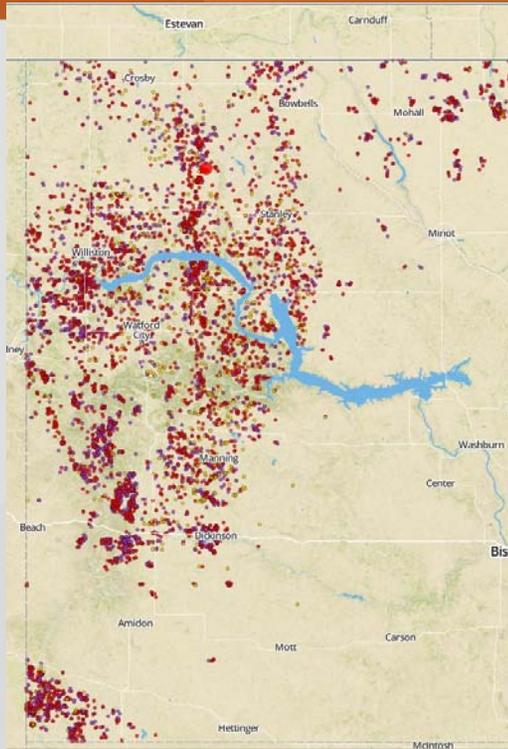


Industry—Technology





Environmental—Spills

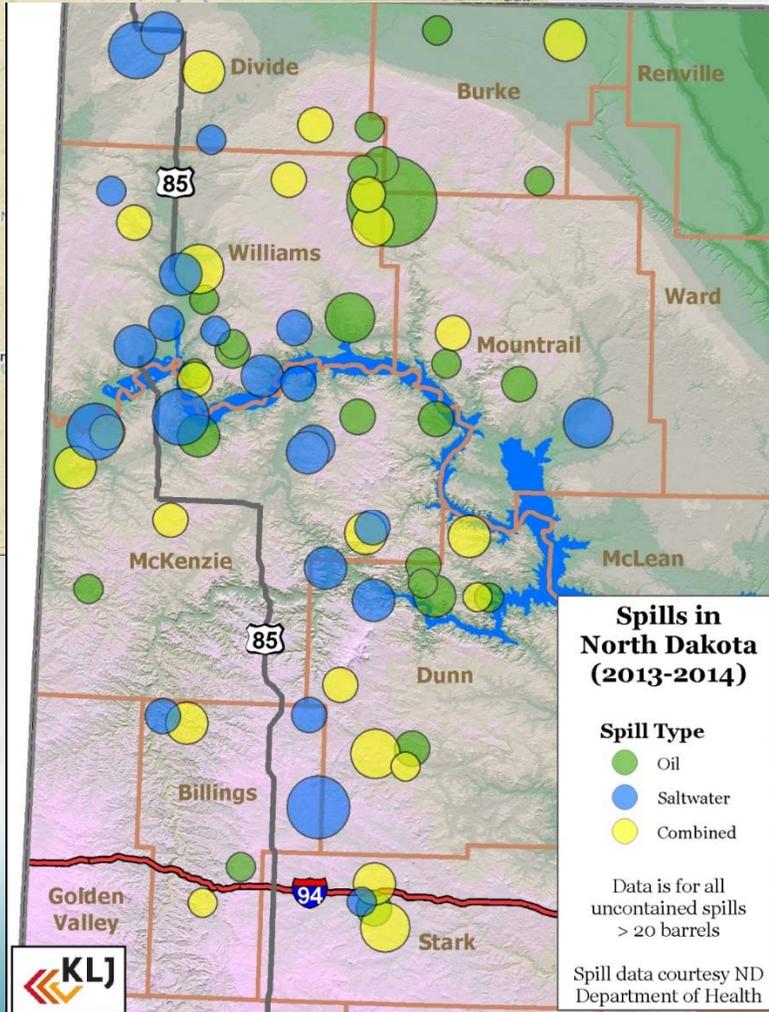


Spills on North Dakota Oilfields (2000-2013)

Spill Type

- OIL
- SALTWATER /BRINE
- OTHER

All spill data acquired from the North Dakota Department of Health - Data was acquired at the section level and incidents are accurate within 1 square mile.



Spills in North Dakota (2013-2014)

Spill Type

- Oil
- Saltwater
- Combined

Data is for all uncontained spills > 20 barrels

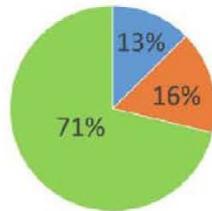
Spill data courtesy ND Department of Health

◇ Sources-NDDH and KLJ

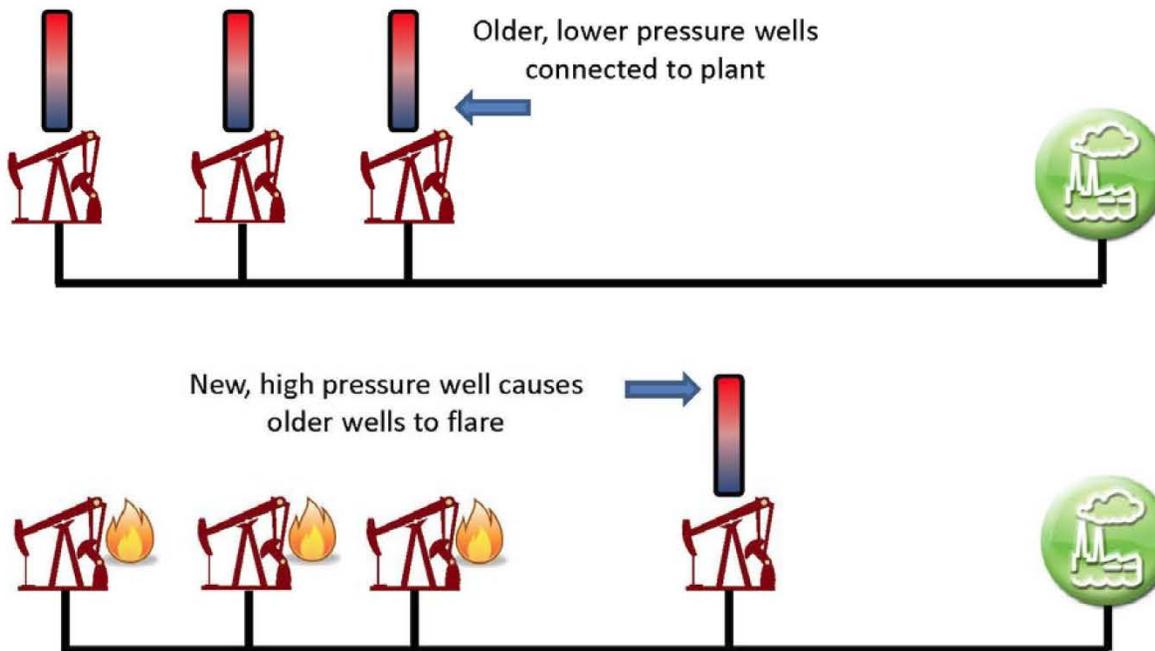




Environmental—Flaring



Capturing the 16% Additional Compression



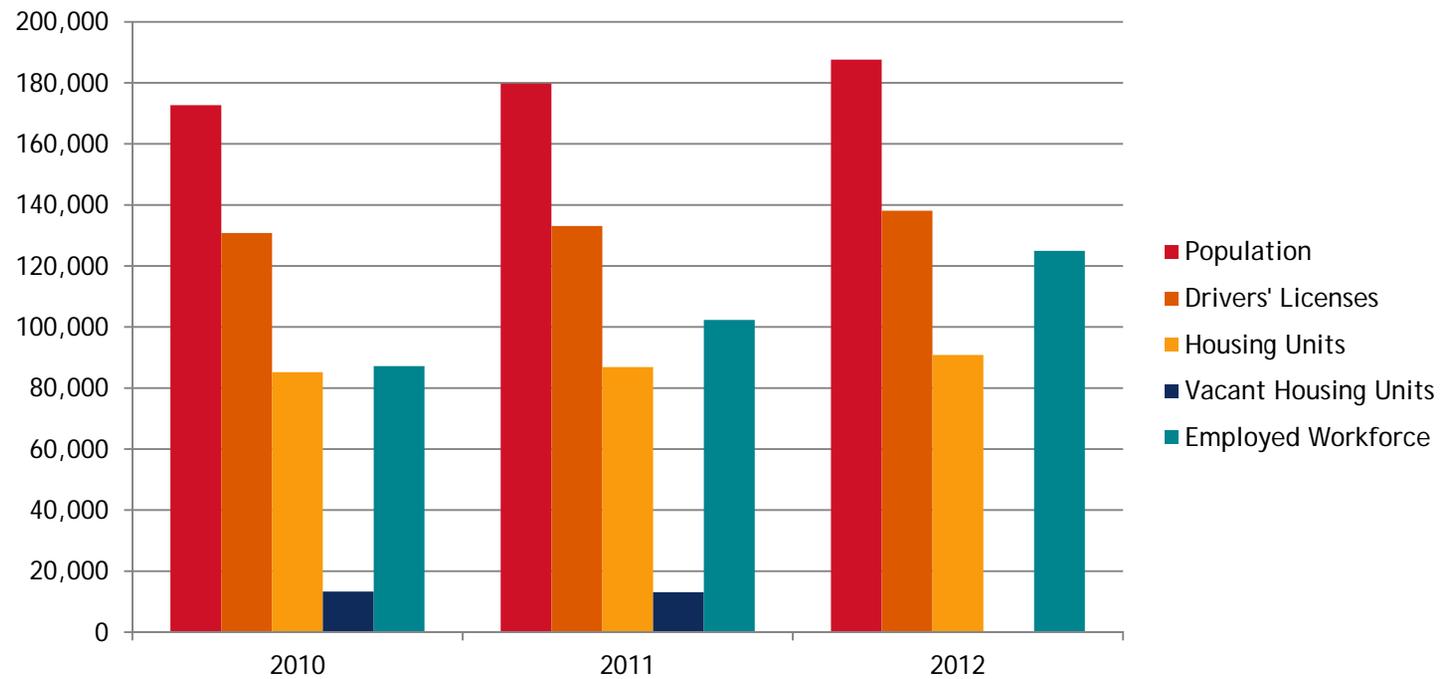
◇ Sources-NDPA





People—Snapshot

Snapshot of Growth in Study Area



- ◇ Present Phase 2 update at April Committee meeting

