Water Resources and the Oil and Gas Boom: Impacts to States and Tribes

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Agenda

- Intense consumption of water resources
  - Bakken formation
  - The GW-SW hydrologic connection

- Impacts to States and Tribes
  - Federal, state, and tribal authority
  - Upper MRB States vs. lower MRB States
  - Indian reserved water rights

- A way forward?
  - Corps water supply contracts and studies
Intense Consumption

- Hydraulic fracturing generally requires between 2.3 and 3.8 million gallons per well
  - 1 to 1.5 million gallons are required to drill a Bakken formation well
  - 50,000 to 100,000 gallons of water are needed to drill non-oil shale wells
- Given projected growth thru 2019, Bakken wells could require as much as 51,000 AF
Intense Consumption

- **GW Mining**
  - Pressure head declines of 1-2ft/yr in the Fox Hills Aquifer indicate the rate of extraction is exceeding the rate of recharge

- **Collateral Demands**
  - In addition to the wells, water supply systems must provide water to the thousands of workers and their families living in developing areas
Intense Consumption

- Character of use
  - Although oil and gas development uses relatively less water than agriculture or municipal uses, much of the water injected underground is either not recovered or is unfit for further use.
Intense Consumption

- Conflicts in use
  - Texas: major drought in 2011 prompted water agencies to reconsider sales to natural gas companies
    - Companies offered local farmers $9,500 to $17,000 per million gallons
  - Colorado: companies successfully bid on unallocated water in 2012 that had previously been claimed by farmers
    - Concerns raised about impacts to agriculture
Intense Consumption

- Conflicts in use
  - Pennsylvania: in 2011 the Susquehanna River Basin Commission temporarily suspended 11 withdrawal permits for natural gas companies due to low stream levels
Intense Consumption

- The groundwater (GW)-surface water (SW) hydrologic connection
  - Extensive GW use can reduce SW flows
    - GW recharges SW flows
    - SW flows recharge GW
Impacts to States and Tribes

- Federal authority
  - Flood Control Act of 1944
    - Vests responsibility for operating MR System for multiple uses in U.S. Army Corps of Engineers (Corps)
      - Flood control, navigation, irrigation, power, water supply, water quality control, recreation, and fish and wildlife
Impacts to States and Tribes

- Federal and State Authority
  - Flood Control Act of 1944
    - O’Mahony-Milliken Amend.:
      - downstream navigation is subordinate to beneficial consumptive uses in the upstream, western MRB
  - As a practical matter, the total navigation tonnage and market value on MR are at record lows
Impacts to States and Tribes

- State Authority
  - *In re Operation of the System*: Corps’ duty to balance dominant and secondary purposes preempted North Dakota from imposing water quality standards
  - Natural flow, state constitutional argument
    - Isn’t North Dakota entitled to a portion of those navigable waters that would be present in the absence of the System?
Impacts to States and Tribes

- State Authority
  - Public trust doctrine
    - Under the equal footing doctrine, State owns the beds of navigable waters up to the ordinary high watermark, and holds them in trust for the public.
    - Imparts a duty to protect traditional trust interests like navigation, but also bathing, swimming, recreation and fishing, as well as irrigation, industrial and other interests.
Impacts to States and Tribes

- State Authority
  - Public trust doctrine
    - Requires a comprehensive state plan for developing State’s natural resources, including the MR
    - In issuing water permits for development, the State Engineer must examine the potential effect of the appropriation on the State’s present water supplies and the State’s future needs
Impacts to States and Tribes

- Tribal Authority
  - Tribes, as separate sovereigns with exclusive authority within their boundaries
    - Broad civil authority to regulate on-reservation actions affecting political integrity, economic security, and the health and welfare of members
    - EPA treats “tribes as states” for purposes of implementing nearly all major pollution control programs
Impacts to States and Tribes

- Supply uncertainty
  - Climate change: a new climatological "normal"
    - Increased fluctuation of dry/wet periods:
      - 1988 Drought/1993 Flood
      - 2011 Flood/2012 Drought
    - Increased intensity in precipitation events:
      - 2011 Missouri River Flood
Impacts to States and Tribes

- Supply uncertainty:
  - Agricultural development:
    - Because only 1/5\textsuperscript{th} of irrigable land is developed, MRB can expect increased water use in future
    - A corridor of biomass and biofuel crops in MRB floodplain
    - MRB responsible for 46\% of wheat, 34\% of cattle, and 22\% of corn in U.S.
Impacts to States and Tribes

- Supply uncertainty:
  - Indian reserved water rights
    - Outstanding reserved water rights of approx. 8.6 MAF/yr against a total average MR flow of 57 MAF/yr
  - Water marketing
    - Transferring water out of the MRB could impact that available for downstream uses
Impacts to States and Tribes

- Supply uncertainty:
  - Operation of the System for other downstream uses
    - Although navigation on the MR is a dominant purpose under Flood Control Act, it’s still an open question whether the Corps is required to operate the System for the benefit of navigation on the Mississippi River
Impacts to States and Tribes

- Effects on Water Quality
  - Aside from threats to aquifers from well casing breaches, withdrawals also impact GW quality through:
    - Mobilizing naturally occurring substances
    - Promoting bacterial growth
    - Causing land subsidence
    - Mobilizing lower quality water from adjacent areas
Impacts to States

- Upper MRB basin consumptive uses vs. lower basin need for flood control and navigation
  - Evacuating water from reservoirs early in year to accommodate runoff reduces that amount available later in the year for consumptive and navigation uses
- The issue of tribal water rights remains “open and unsettled” and could adversely impact state created water rights
Impacts to States

- Converting other types of water permits to industrial permits for oil and gas use
  - “Industrial” use is listed fifth in priority after domestic, municipal, livestock, and irrigation users
  - ND strongly discourages conversion of agricultural permits to any other use
  - A change in purpose of use is only authorized for a superior use
    - But exception for temporary permits
Impacts to Tribes

- Water resources development in Indian country
  - Oil and Gas Development
    - Fort Berthold sits atop approx. 300 BB barrels of shale oil
    - Supports self determination policy and, ultimately, tribal sovereignty
Impacts to Tribes

- Water resources development in Indian country
  - Domestic and municipal uses
    - Tribal reliance on GW for present and future consumptive uses
    - Majority of Indian and non-Indian communities rely exclusively on GW
    - Approx. 30% of land irrigated is served by GW
Impacts to Tribes

- Indian reserved water rights
  - Present-perfected: unlike rights perfected under state law in prior appropriation jurisdiction, they need not be applied to beneficial use before the right is certified
  - These rights are “the basis for their continued existence as a separate and distinct people”
Impacts to Tribes

- Indian reserved water rights
  - Quantification
    - Provides certainty of availability
    - But some tribal constituencies oppose quantification
      - Quantification might constitute concession that U.S. with supreme interest in water and Black Hills
      - May not take into account future development on reservation
Impacts to Tribes

- Indian reserved water rights
  - Quantification
    - But quantification does not necessarily entail an allocation of storage at Corps reservoirs under the Flood Control Act of 1944
Impacts to Tribes

- Indian reserved water rights
  - Application to GW
    - i.e., “the principal unresolved issue concerning the scope of waters subject to reserved rights”
    - But high court decisions in Arizona and Montana, and a federal court decision in Washington show a growing consensus that reserved water rights do extend to GW
A Way Forward?

- Corps water supply contracts under Flood Control Act of 1944
- Surplus Water Studies of MR System Reservoirs
- Litigation
  - N.D. and S.D. v. United States?
- Interstate or inter-sovereign compact
  - Establishing a tripartite, federal-state-tribal, commission to operate System and quantify reserved water rights
A Way Forward?

- Final Surplus Water Report for Garrison Dam/Lake Sakakawea Project
  - 100,000 AF/yr of surplus water available over 10yrs to meet M&I uses under Section 6, Flood Control Act of 1944
  - Surplus water agreement:
    - Max initial term 5yrs
    - Pricing: no charge during rule-making for national pricing policy
    - Easements needed over fed land
Corps approved the first surplus water supply agreement for Lake Sakakawea on February 6, 2013

- The agreement allows International Western of Southlake, Texas to withdraw surplus water at a site located in Williams County, N.D.
A Way Forward?

- Long-term contracts for M&I water supply storage at mainstem reservoirs
  - To be executed under the Water Supply Act of 1958
  - Corps is presently undertaking its MR Mainstem Water Reallocation Study to determine those amounts available for M&I uses on a permanent or long-term basis