

# WISCONSIN TOWNS ASSOCIATION MEETING

FRAC SAND MINING AND  
PROCESSING

WHY? WHERE?

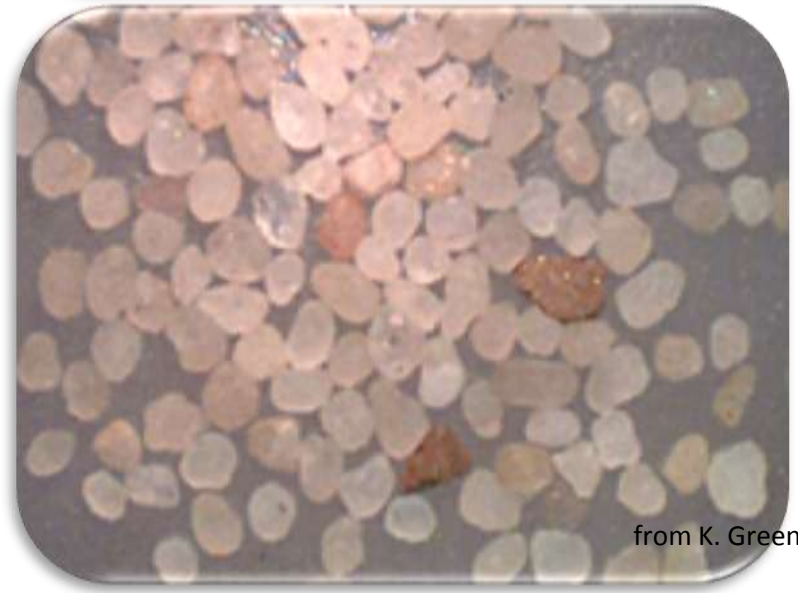
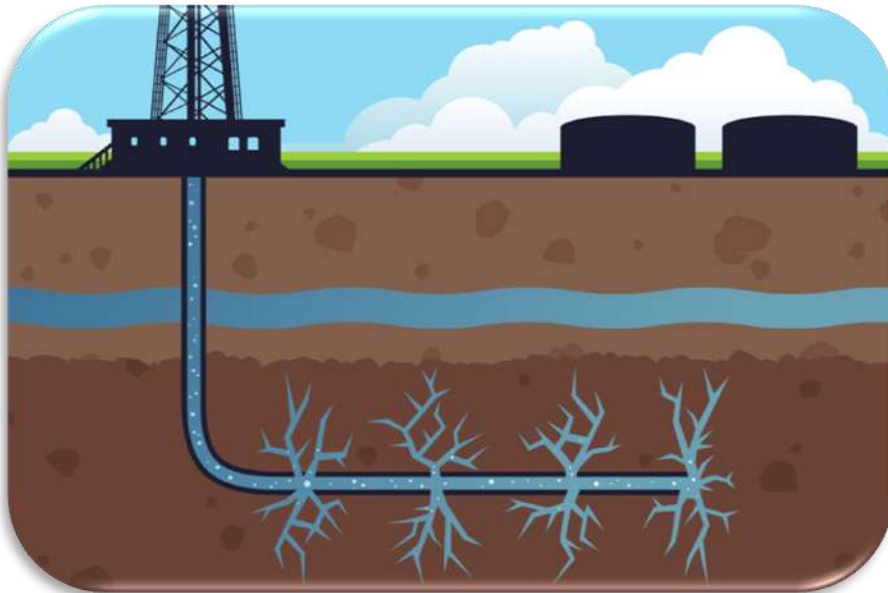
December 1, 2011

January 12, 2011



# Old Methods – New Applications: Directional Drilling & Hydrofracking a well

*Horizontal drilling combined with hydrofracking increases well yield. Fluid pressure fractures the rock, sand grains keep the fractures open*



# What is Frac Sand?



- Quartz sand
- Highly rounded
- High compressive strength

Most desirable if:

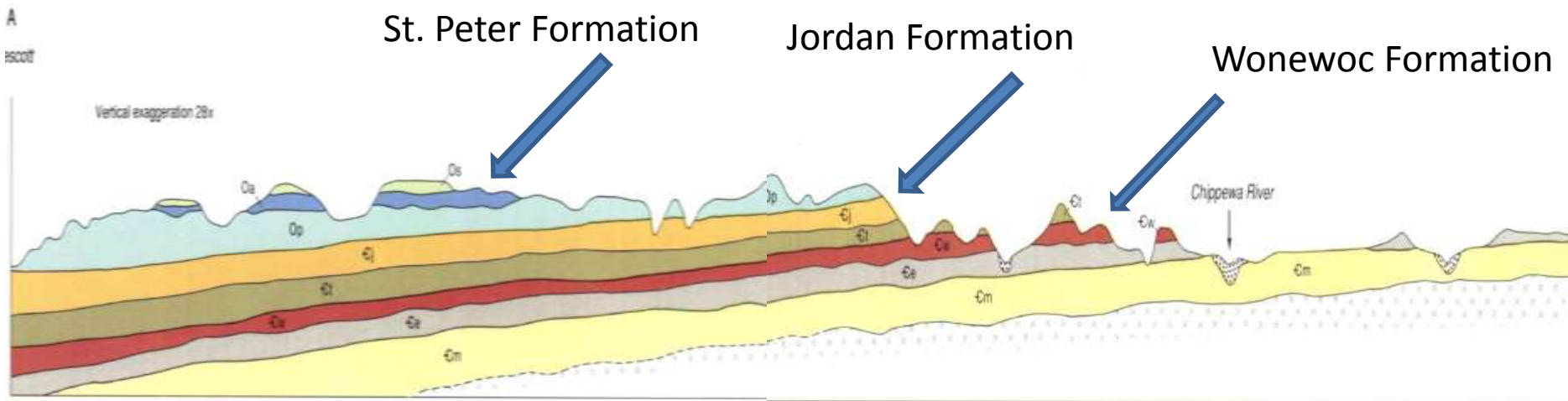
- Easily recoverable
- Minimal processing steps (costs), quartzite cement?
- Ability to get from mine to oil/gas drilling sites easily (close to transportation routes- i.e. train)

# WHY WESTERN WISCONSIN?

## It's the Geology

West

East



# High Quartz Content Sandstone Formations



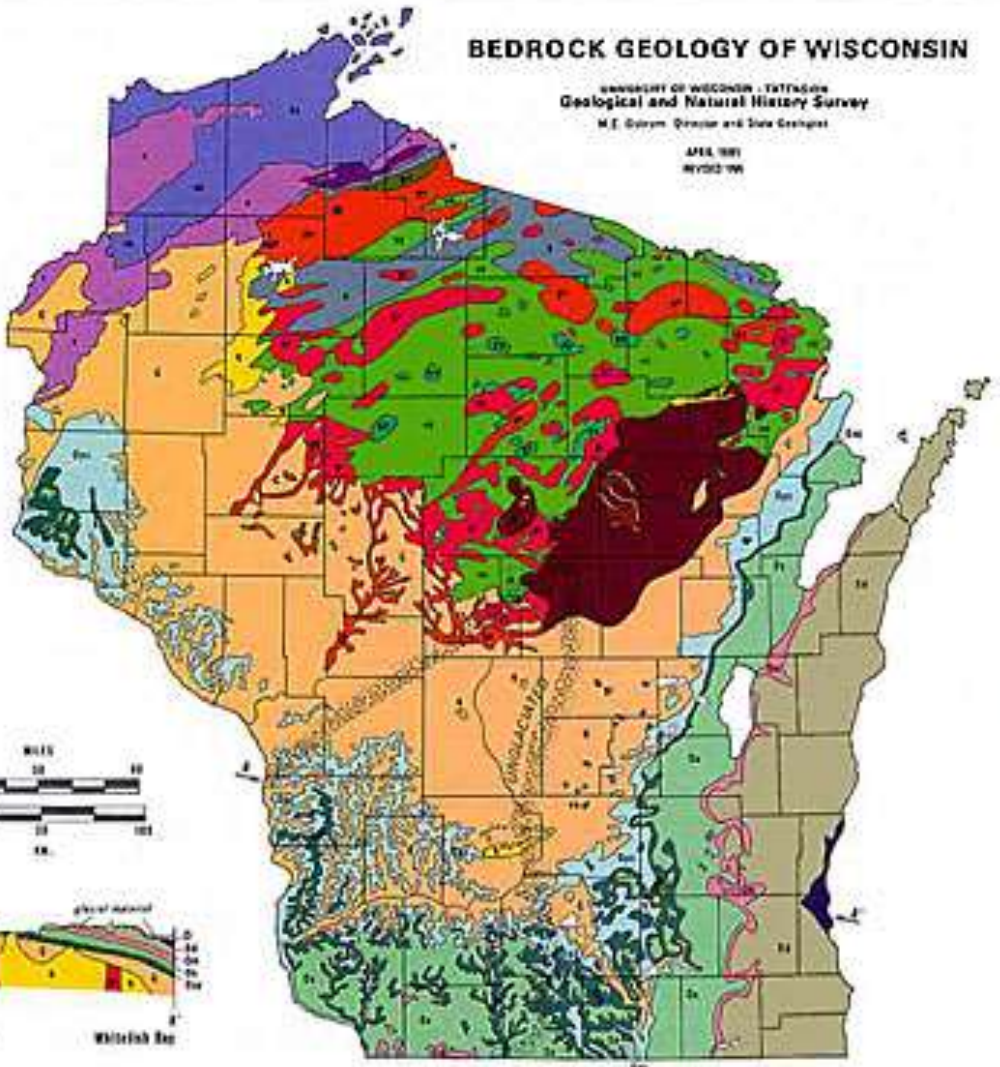
# BEDROCK GEOLOGY OF WISCONSIN

UNIVERSITY OF WISCONSIN - TERRACON  
 Geological and Natural History Survey  
 M. E. Gilroy, Director and State Geologist

APRIL 1991  
 WY002 96

## LEGEND

- BOUNDARIES**  
 - - - - - State boundaries
- PROTEROZOIC**
- NEOVISAN FORMATIONS**  
 - - - - - Granite and gneiss
- ILLINOIS FORMATIONS**  
 - - - - - Granite
- ORDOVICIAN FORMATIONS**  
 - - - - - **Os** Wisconsin Plover-shale and dolomite  
 - - - - - **Os** Ontario Greenstone belts with some limestone and shale  
 - - - - - **Os** Port Huron limestone with some limestone shales and conglomerates  
 - - - - - **Os** Plover de Chert Group-shales with some limestone and chert
- CAMBRIAN FORMATIONS**  
 - - - - - **C** Limestone with some dolomite and shales
- MIDDLE PROTEROZOIC ROCKS**  
 - - - - - **M** Complex of rocks:  
 1. limestone  
 2. marble to mafic lava flows  
 3. granite, gneiss and amphibolite  
 - - - - - **M** Port Huron Rocks:  
 1. mafic gneiss, granite and quartz  
 2. amphibolite and quartz
- LOWER PROTEROZOIC ROCKS**  
 - - - - - **L** Quartzite  
 - - - - - **L** Granite, gneiss and quartz  
 - - - - - **L** Amphibolite, schistose, quartzite, gneissite, and lava formation  
 - - - - - **L** Marble to mafic metamorphic rocks with some muscovite-bearing rocks  
 - - - - - **L** Meta-gneiss and hornblende gneiss
- LOWER PROTEROZOIC OR UPPER ARCHEAN ROCKS**  
 - - - - - **A** Metapelite rocks  
 - - - - - **A** Granite, gneiss and amphibolite



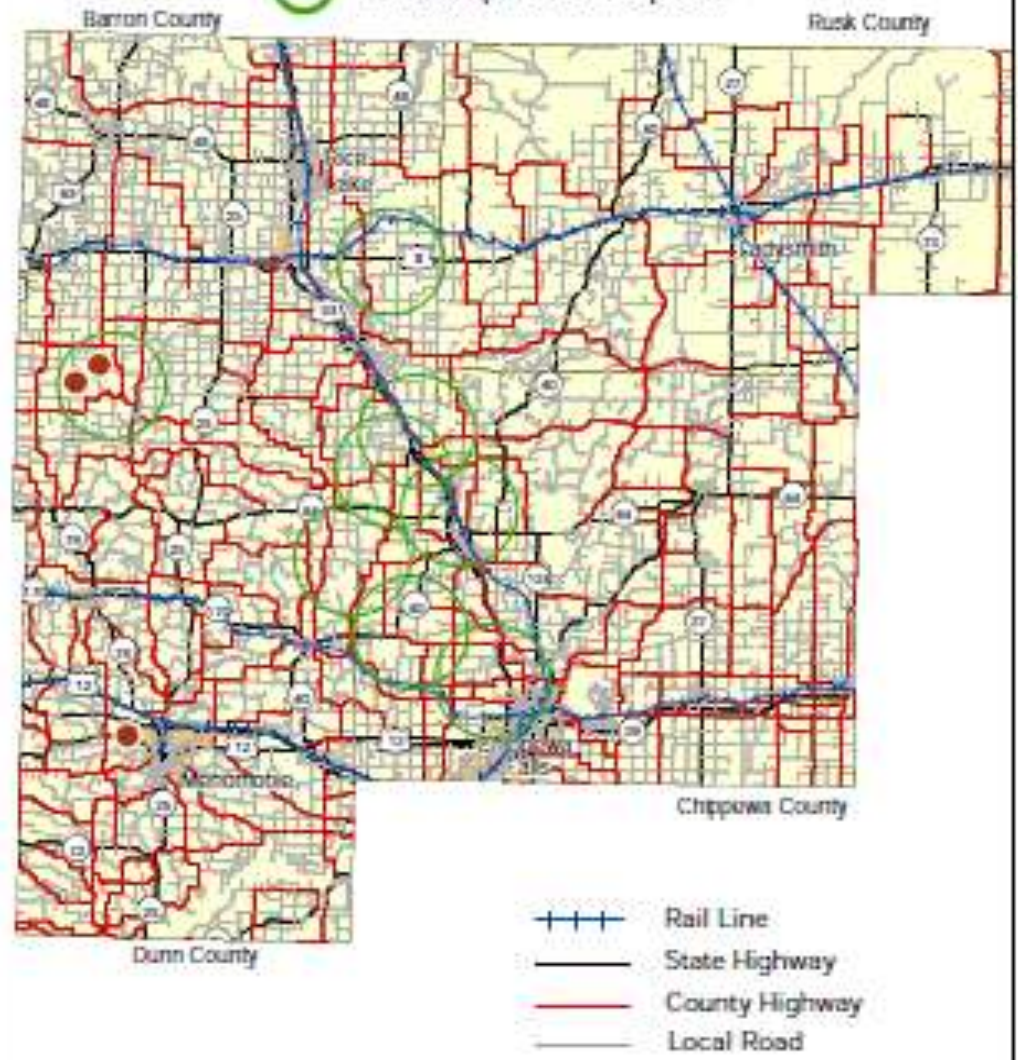
# ACTIVE AND PROPOSED MINE SITES

## 'Frac sand' deposits in Wisconsin



# Frac Sand Mining in Wisconsin Barron, Dunn, Rusk and Chippewa Counties

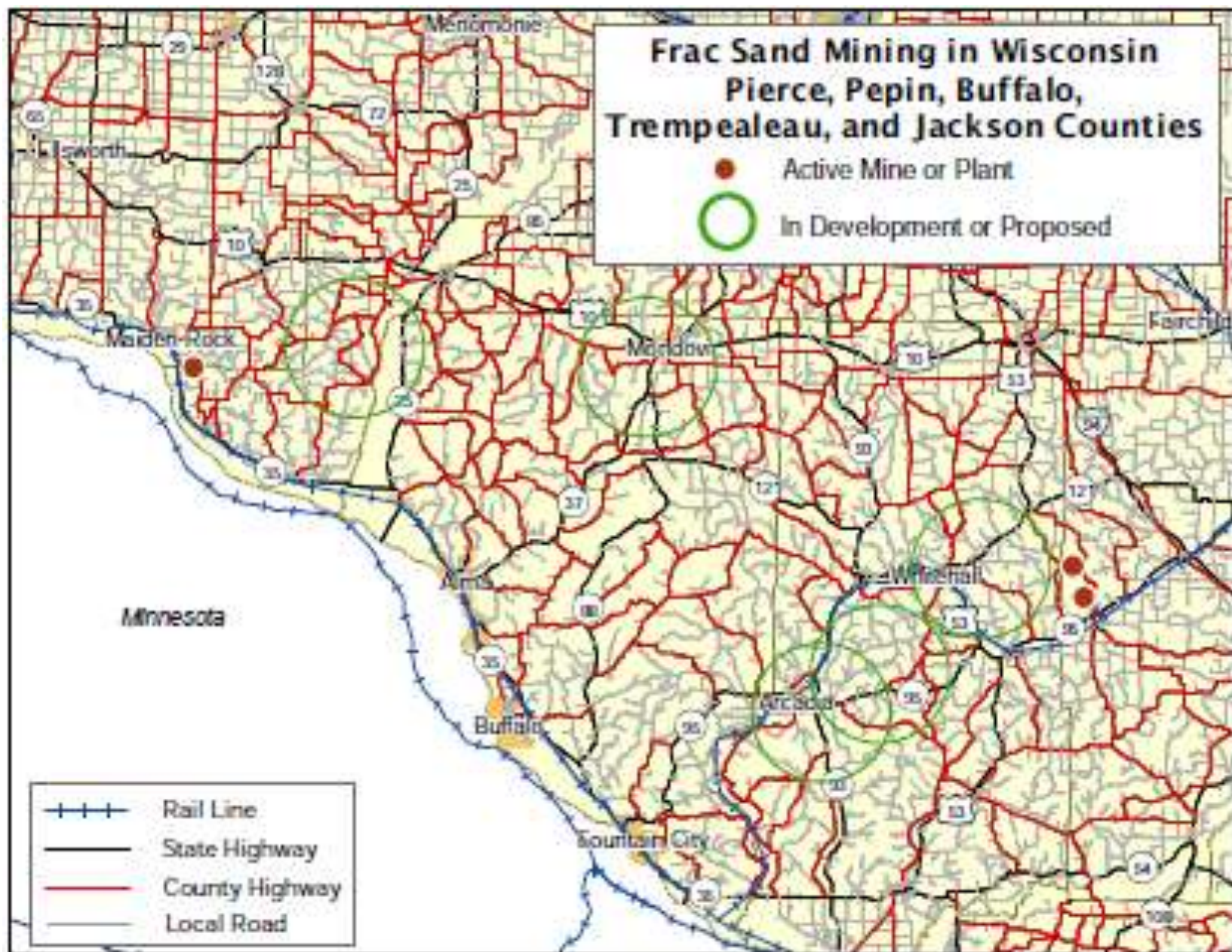
- Active Mine or Plant
- In Development or Proposed





## Frac Sand Mining in Wisconsin Pierce, Pepin, Buffalo, Trempealeau, and Jackson Counties

- Active Mine or Plant
- In Development or Proposed





# Frac Sand Mining in Wisconsin Jackson and Monroe Counties

- Active Mine or Plant
- In Development or Proposed



