

Where in New York
is the Marcellus and
Utica Shales??

How do they get to the gas
resource and how do they get
the gas out of the ground?

What are the concerns about
this entire process and what
can/should we do about it?

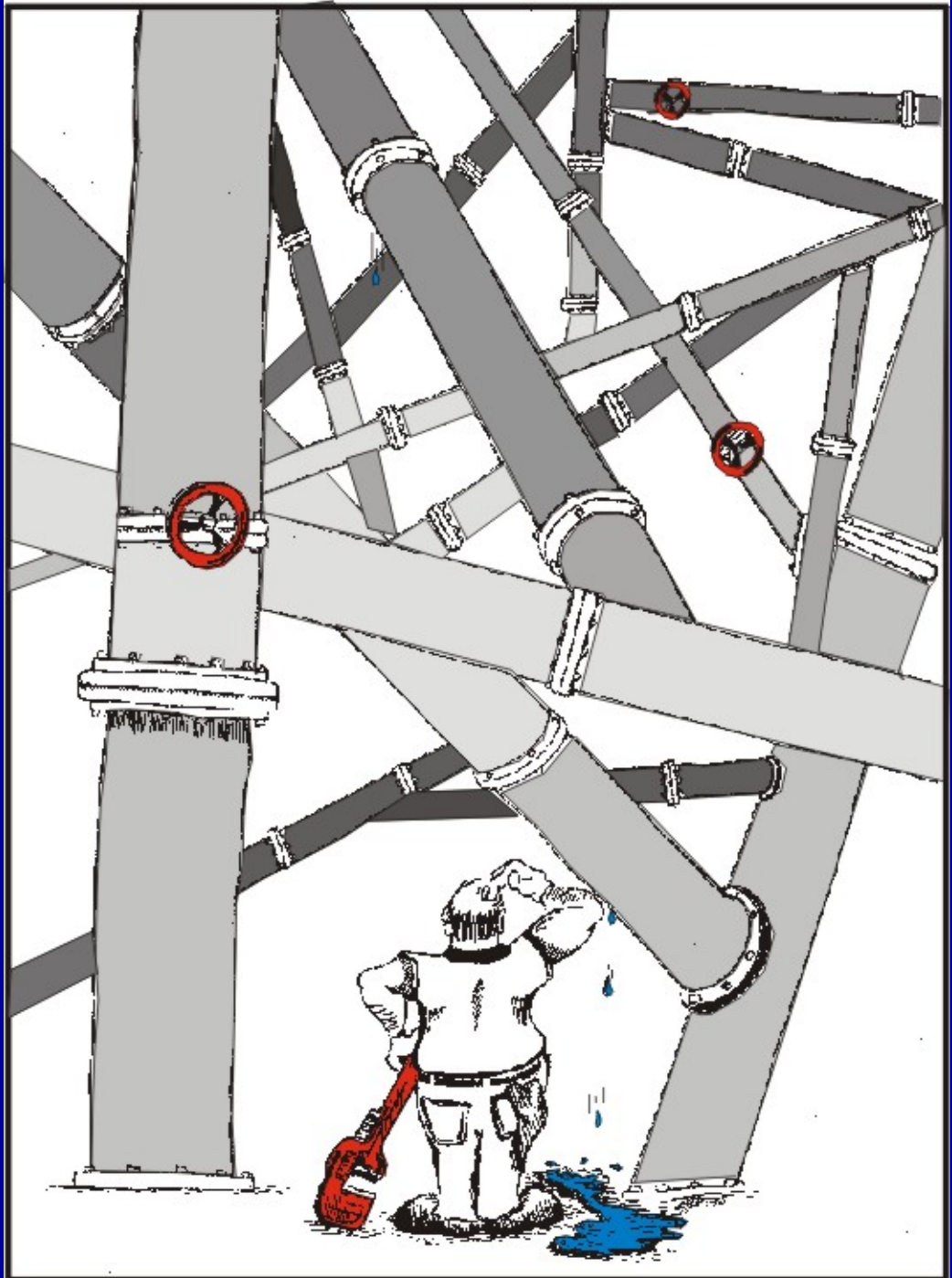
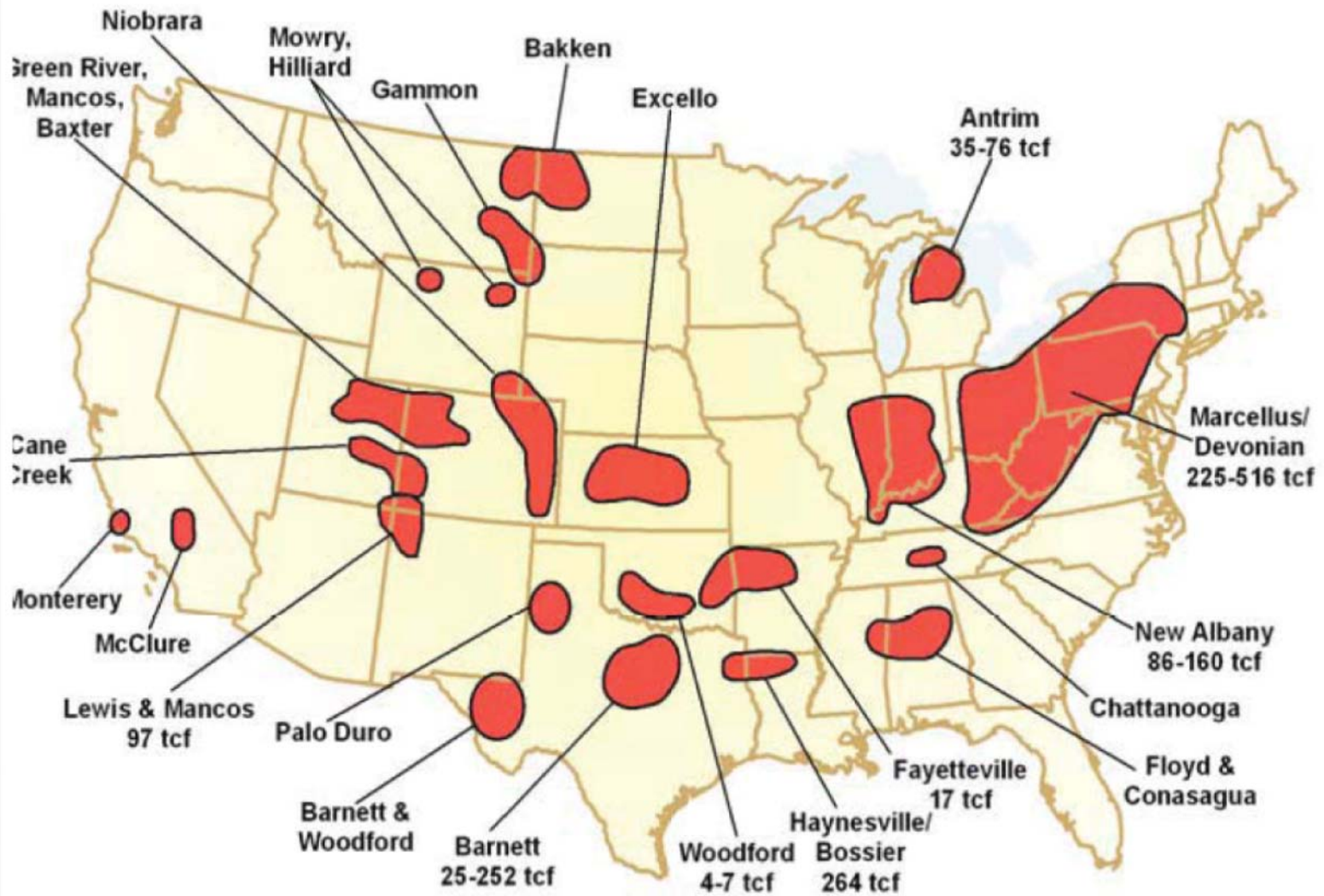
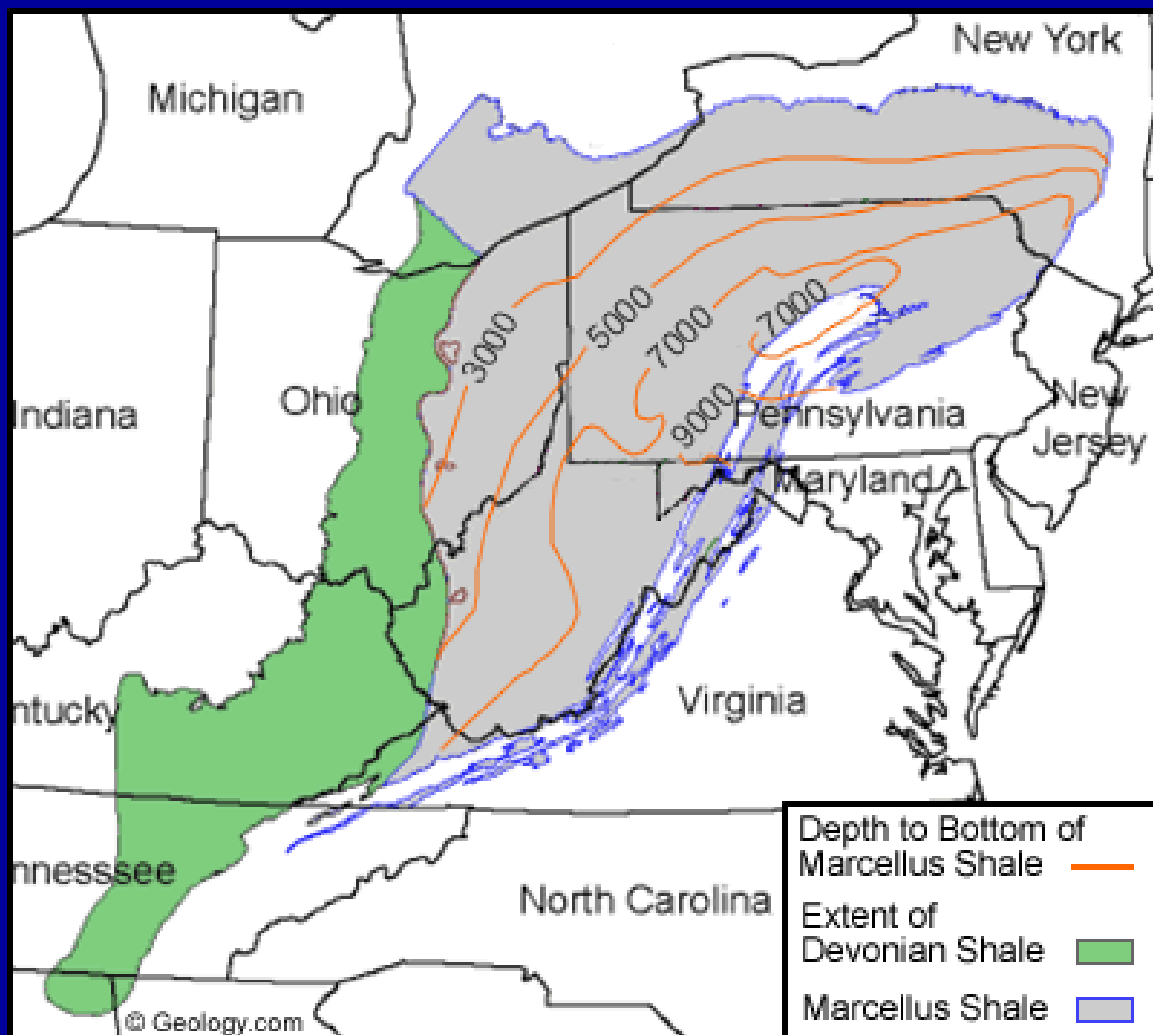
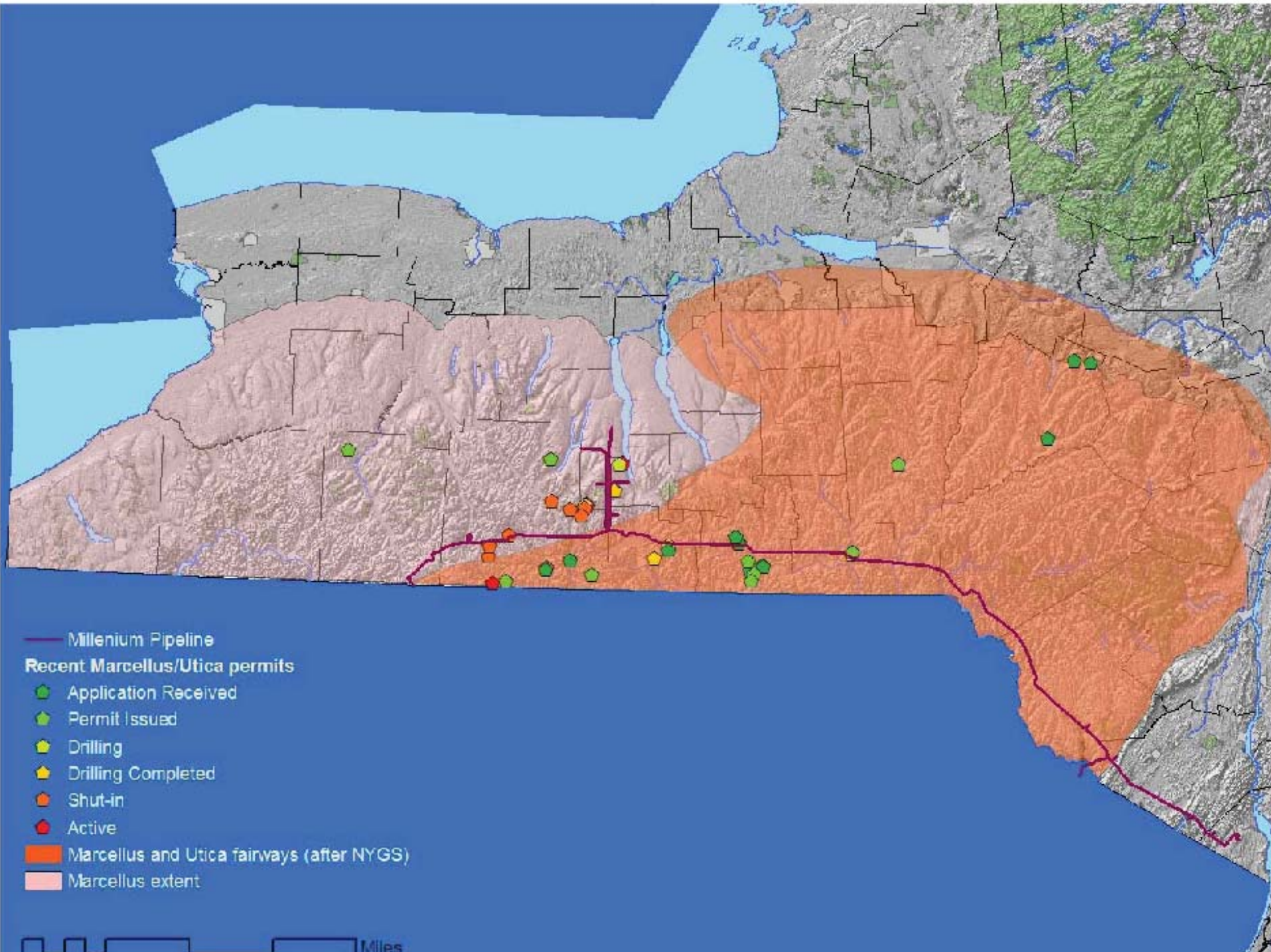


Figure 1: Gas Shale Basins of the United States







New York State Stratigraphy

PERIOD		GROUP	UNIT	LITH.	THICKNESS	PRODUCTION
DEVONIAN	UPPER	Conewango	Riceville	Sh, ss, cgl	700'	
		Conneuat	Chadakoin	Sh, ss	700'	
		Canadaway	Undiff	Sh, ss	1100 – 1400	Oil, Gas
			Perrysburg - Dunkirk	Sh, ss		Oil, Gas
			sh	Gas		
		West Falls	Java	Sh, ss	365 – 1250'	
			Nunda	Sh, ss		Oil, Gas
			Rhinestreet	Sh		
		Sonyea	Middlesex	Sh	0 – 400'	Gas
	Genesee	Geneseo	Sh	0 – 450'		
	?		Tully	Ls	0 – 50'	Gas
	MIDDLE	Hamilton	Moscow	Sh	200 – 600'	
			Ludlowville	Sh		
			Skaneateles	Sh		
			Marcellus	Sh		Gas
			Onondaga	Ls	30 – 235'	Gas, Oil
	LOWER	Tristates	Oriskany	Ss	0 – 40'	Gas
		Heldergerg	Manlius	Ls	0 – 10'	
			Rondout	Dol		
	SILURIAN	UPPER		Akron	Dol	0 – 15'
Salina			Camillus	Sh, gyp	450 – 1850'	
			Syracuse	Dol, sh, slt		
			Vernon	Sh		
Lockport			Lockport	Dol	150 – 250'	Gas
LOWER		Clinton	Rochester	Sh	125'	Gas
			Irondequoit	Ls		
			Sodus	Sh	75'	Gas
		Reynales	Ls			
		Thorold	Ss			
		Medina	Grimsby	Sh, ss	75 – 150'	Gas
			Whirlpool	Ss	0 – 25'	Gas
ORDOVICIAN	UPPER		Queenston	Sh	1100 – 1500'	Gas
			Oswego	Ss		
			Lorraine	Sh		
			Utica	Sh	900 – 1000'	
	MIDDLE	Trenton-Black River	Trenton	Ls	425 – 625'	Gas
			Black River	Ls	225 – 550'	
		Tripos Hill				

Primary Black/Gray Shales

Dunkirk

Rhinestreet

Genesee

Marcellus

Rochester

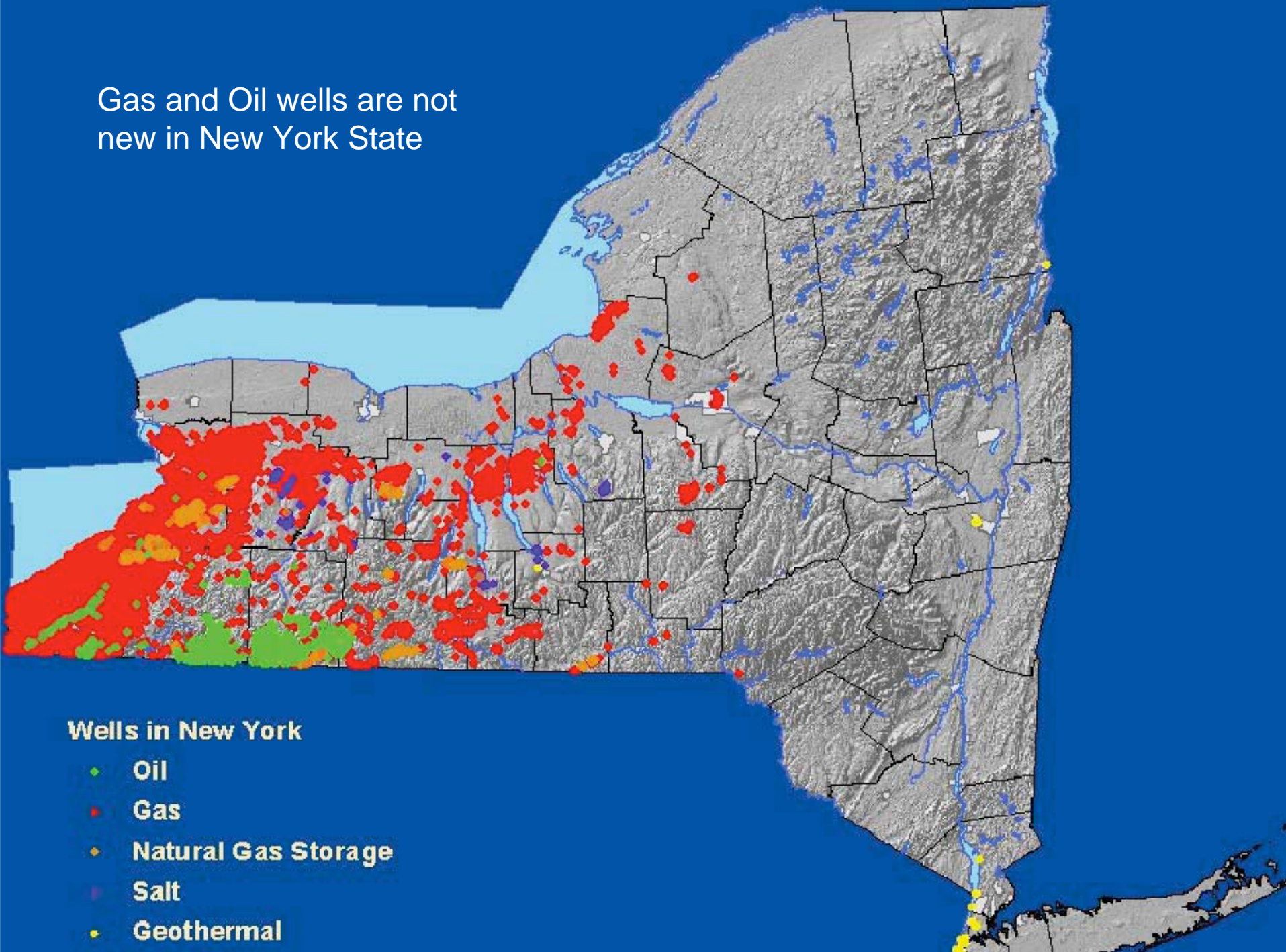
Sodus

Medina S.
Central/
Western NY

Lorraine

Utica (estimated
4,500 ft. deep in
vicinity of Dayton)

Gas and Oil wells are not
new in New York State



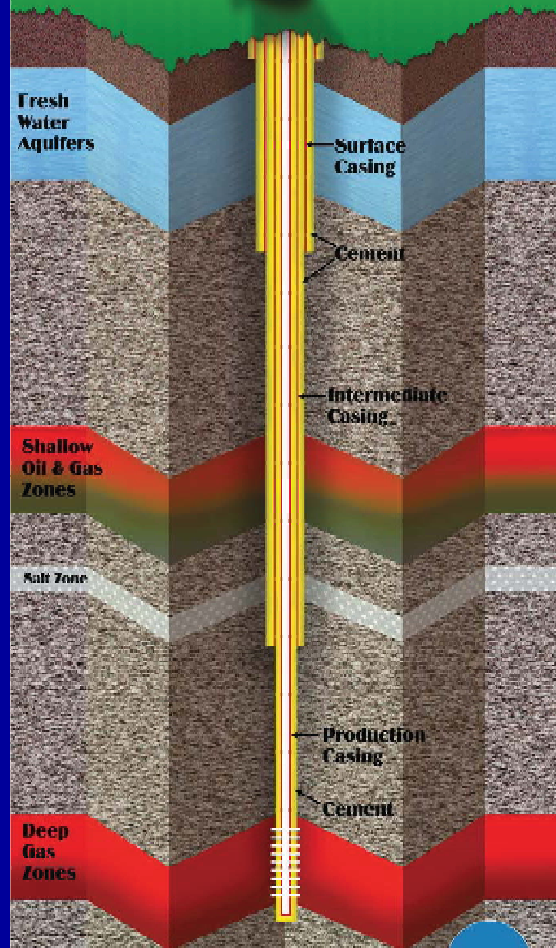
Groundwater Protection

Well Casing and Cementing Program

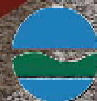
The Division of Mineral Resources' well casing and cementing regulations provide for the protection of the State's fresh water aquifers



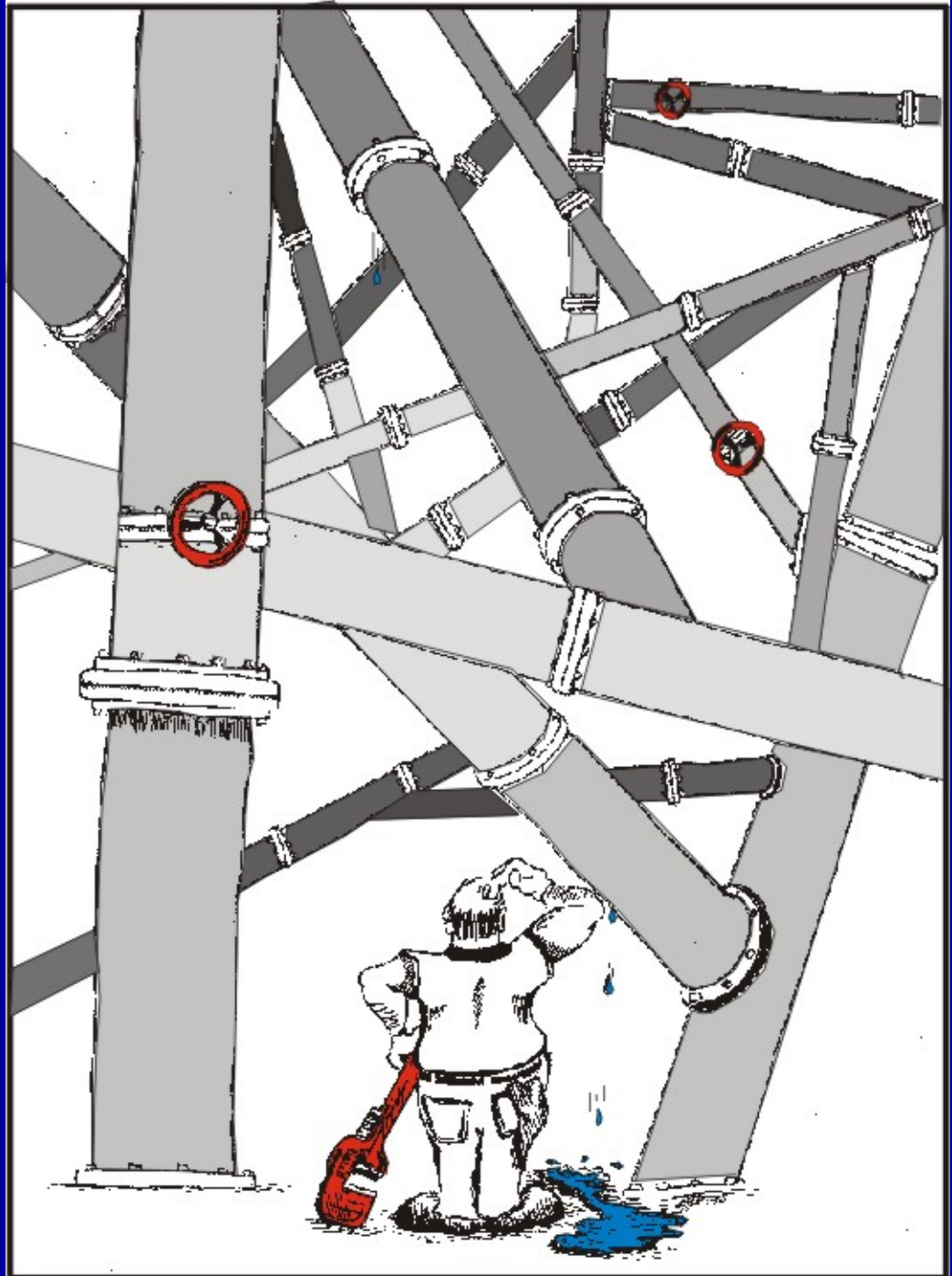
Regulations require that wells be constructed and operated to prevent the movement of oil, gas or water from one zone to another

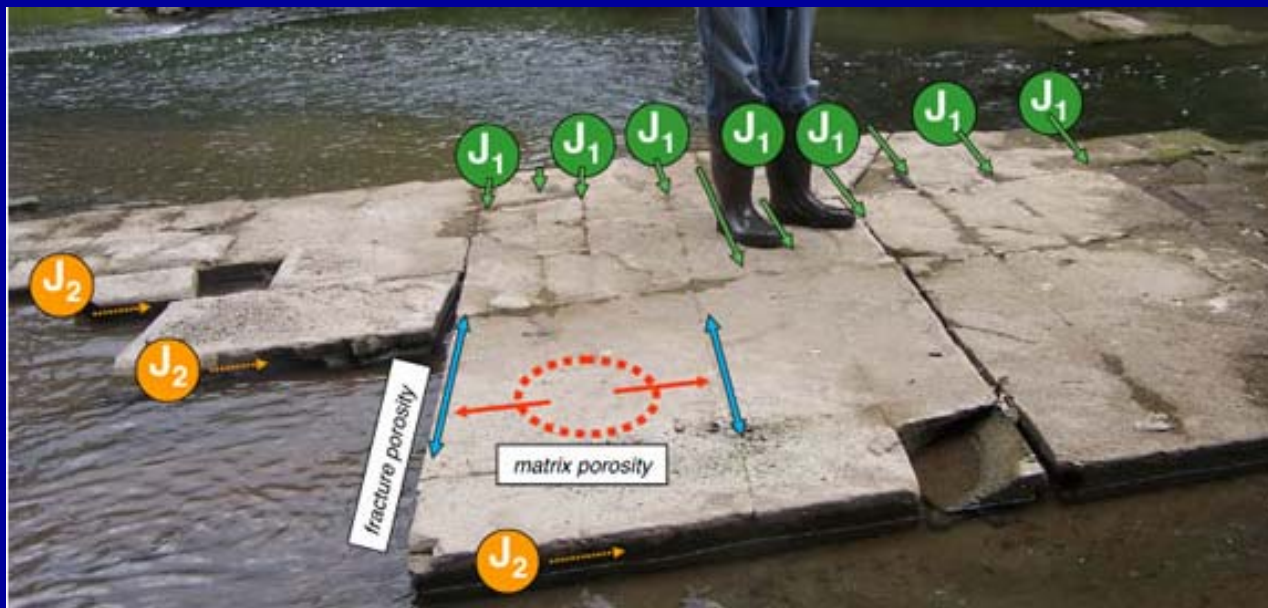


New York State Department
of Environmental Conservation



What is different about Marcellus/Utica shale gas development?



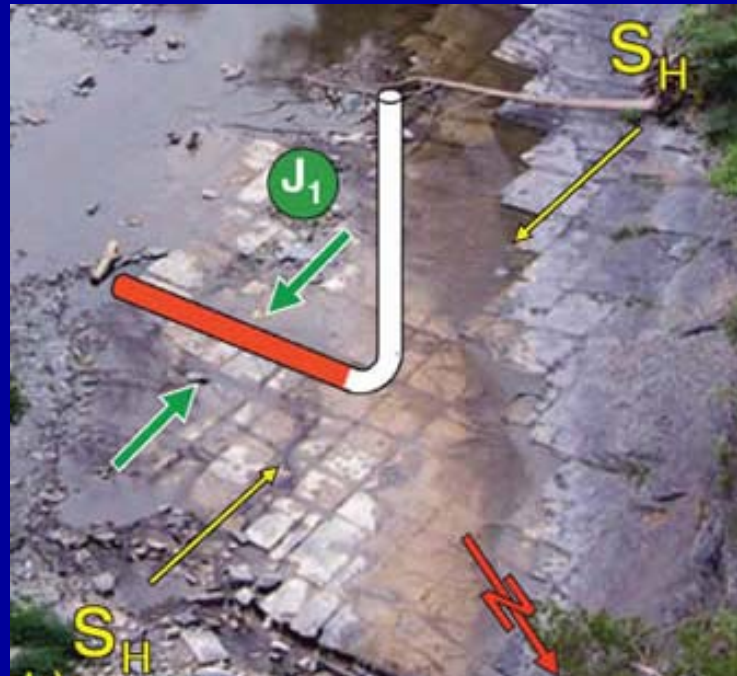


East-northeast trending J1 fractures more closely spaced and cross-cut by less well-developed, northwest-trending J2 fractures

Dual porosity gas reservoir where fractures drain rapidly and matrix drain slowly

Free gas and adsorbed gas in matrix

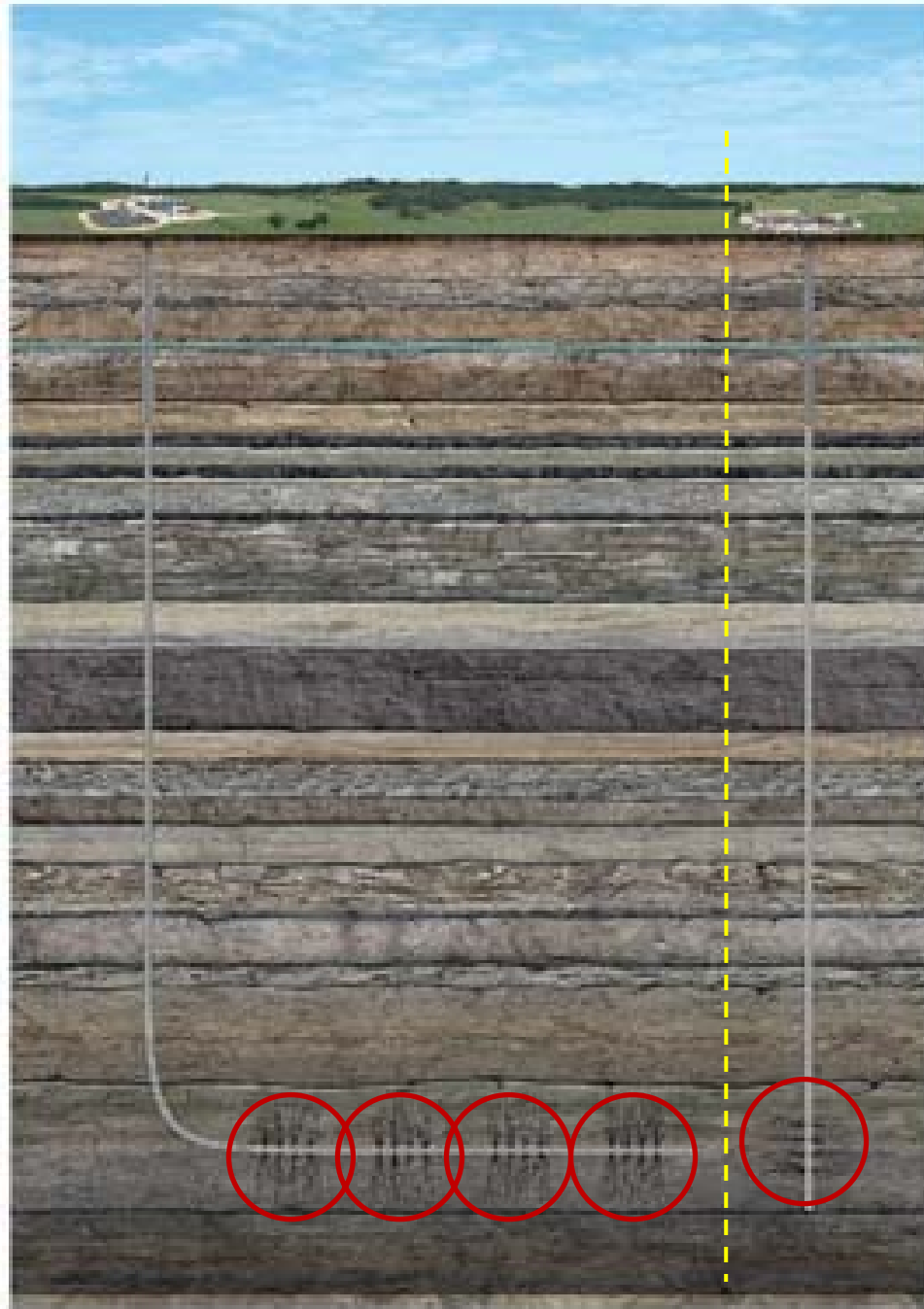
Connect matrix porosity to the wellbore by intersecting multiple J1 fractures



Drill horizontal wells to the north-northwest, or south-southeast that cross and drain densely developed J1 fractures

Typical well
with horizontal
leg and multiple
sets of hydro-
fractures

Marcellus Shale



Typical vertical
well with hydro-
fractures

“Typical” Drillpad Design



Drilling Phase – drillrig, pumps, supplies, frack tanks

(a month or two)





Hydro-fracking Phase –
(a week or two)

Injection pumps, supplies,
and many frack tanks for
fresh and flowback waters



Where do you get the water for fracking?

Each source has its own set of concerns.....

