

# Health Impacts of Coal Seam Gas Drilling

---

## Sydney Food Fairness Alliance “Undermining Our Food Bowls”

Sydney Mechanics School of Arts

6<sup>th</sup> February 2012

Dr Helen Redmond MBBS FAFRM (RACP)  
Doctors for the Environment Australia

[www.dea.org](http://www.dea.org)



# Health Impacts of Coal Seam Gas Drilling:

---

- Chemicals
- Coal Seam contaminants
- Air Pollution
- Mental Health

# Unconventional Gas

---

Coal Seam Gas

Shale Gas

Tight Sands Gas

# 1. Chemicals

---

- ❑ 20-85% Fracking chemicals stay underground
- ❑ Fracking may create connectivity to aquifers
- ❑ Depressurising the coal seam may lower water levels in aquifers, change subterranean water flows
- ❑ No mandatory disclosure



# New York State Chemicals

---

- 260 chemicals
  - 17 toxic to aquatic organisms
  - 38 acute human toxins
  - 8 known carcinogens
  - 6 suspected carcinogens
  - 7 mutagenic
  - 5 reproductive effects

# NICNAS

---

- National Industrial Chemical Notification and Assessment Scheme
  
- Australia's national chemical regulator
  - 50-60 chemicals on their list
  - Assessed only 4, not for fracking

# 4 assessed chemicals

---

- Ammonium persulfate and Sodium persulfate
  - used in hair bleach and fracking, hazardous chemicals, irritant to the skin and eyes and able to cause allergic responses, harmful if swallowed.
  
- Limonene
  - skin and respiratory irritant and a known skin sensitizer
  
- Butoxyethanol
  - toxic to red blood cells, carrying the risk of haemolysis, and damage to spleen, liver and bone marrow

# Other chemicals used in Australia

---

- ethylene glycol
  - anti-freeze; forms chemicals that crystallize and collect in the kidneys affecting kidney function; forms acidic chemicals, affecting the nervous system, lungs and heart
- Glutaraldehyde
  - irritant to skin, eye, throat and lungs; allergic reactions
- fumaric acid
  - irritant of skin and mucous membranes



# Safety of chemicals

---

- ❑ Mining companies frequently infer safety of products because some are components of household products
- ❑ However many of these products have the potential to cause health problems
- ❑ Just because we may have hair bleach or antifreeze in the cupboard does not mean it is safe to drink it !



# Bamberger and Oswald: Impacts of Gas Drilling on Human and Animal Health, *New Solutions*, January 2012

---

- Fracking fluid spills
  - 17 cows died in 1 hour
  - Goats infertile 2 yrs
- Drilling fluid blowout
  - Stillborn calves, congenital defects

- Wastewater exposure:
  - 21 of 60 cattle died, 16 no calves
  - 70 of 140 cattle died, high incidence still birth or stunted calves in rest

# Bamberger and Oswald: Impacts of Gas Drilling on Human and Animal Health, *New Solutions*, January 2012

---

## □ Human symptoms

- Upper respiratory
- Burning eyes
- Headaches
- Gastrointestinal
- Skin
- Neurological
- Sensory
- Immunological
- Reproductive
- Endocrine
- Vascular
- Bone marrow
- Urological
- musculoskeletal

## □ Arsenic poisoning in child

## □ Benzene poisoning of two families

# CS water contaminants

---

- ❑ Salt
- ❑ Heavy metals: arsenic, cadmium, chromium, lead, selenium
- ❑ VOCs (Volatile Organic Compounds) including BTEX (benzene, toluene, ethyl benzene and xylene)
- ❑ Radioactive isotopes: thorium, radium and uranium

# BTEX

---

- ❑ Benzene
  - ❑ Toluene -
  - ❑ Ethyl benzene
  - ❑ Xylene
- 
- ❑ Long-term exposure to benzene can affect the bone marrow, causing anaemia, ↑ risk of leukaemia
  - ❑ ADWG benzene guideline below the level of detection, which is 1ppb : ie. one drop of water in a swimming pool.

# Air pollution:

---

- Methane – fugitive emissions
- VOCs
- Ozone
- Flaring
- Greenhouse gas emissions

# Flaring

---



# Mental Health Impacts:

---

- Economic and community impacts
- Industrialization
- Noise pollution
- Loss of livelihood
- Loss of landscape



# Regulation needed

---

- ❑ Health Impact Assessment, nationally, for whole unconventional gas industry
- ❑ Mandatory disclosure of chemicals
- ❑ Baseline and ongoing independent testing of water, air, soil during gas extraction
- ❑ Rigorous scientific study of animal and human populations living in gas fields

# Bamberger...

---

- Without rigorous scientific studies, the gas drilling boom sweeping the world will remain an uncontrolled health experiment on an enormous scale.

# And finally

---

“At what point does preliminary evidence of harm become definitive evidence of harm? When someone says, “We were not aware of the dangers of these chemicals back then,” whom do they mean by *we*?”

—Sandra Steingraber, *Living Downstream* (Da Capo Press, 2010)





Doctors for the Environment Australia  
[www.dea.org.au](http://www.dea.org.au)

Thank You

