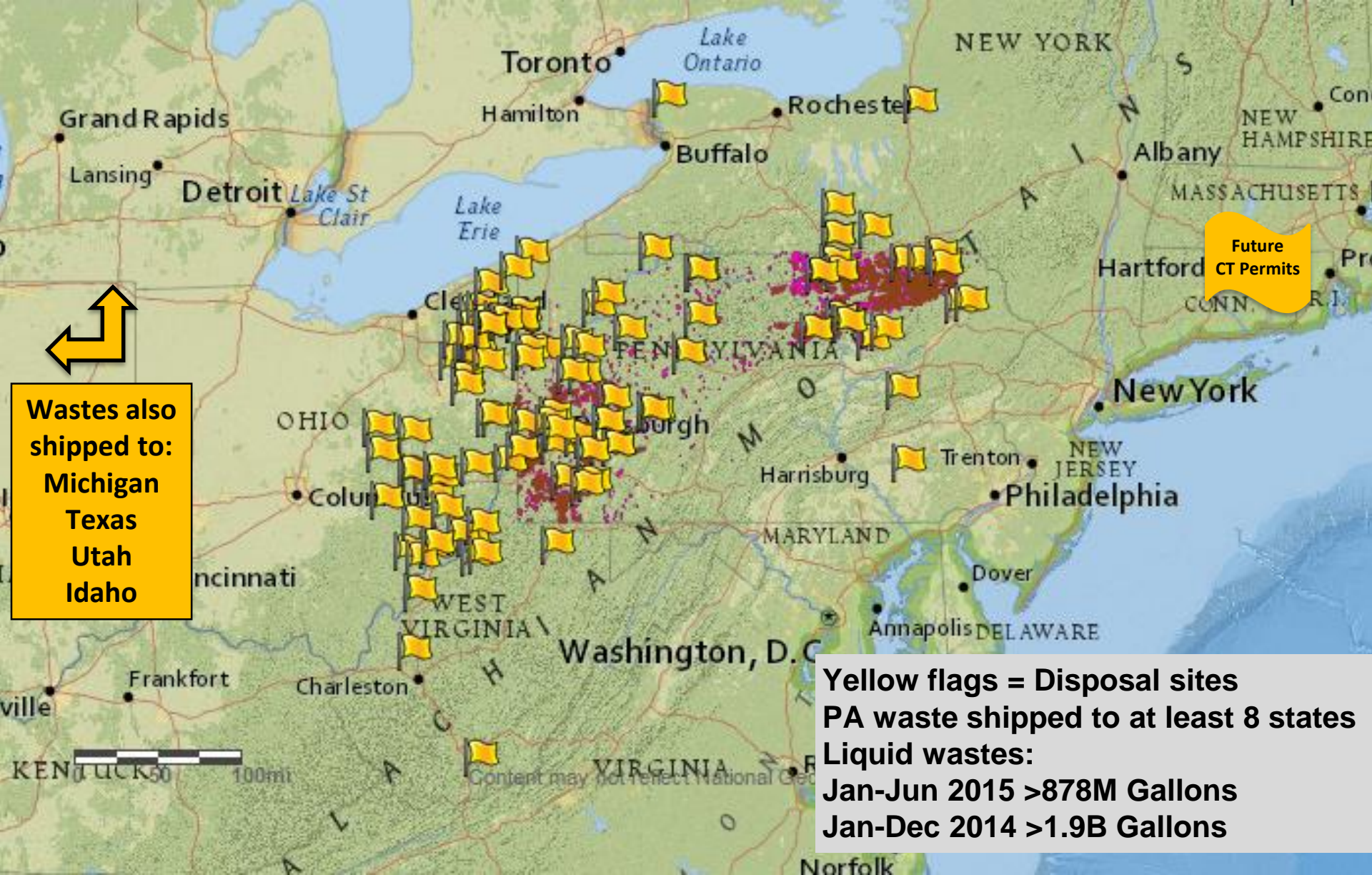




Fracking Waste in Connecticut

Protecting Towns from Future State Regulations
Toxins and Risks of Radioactive & Chemical Contamination
Jen Siskind, Local Coordinator, jsiskind@fwwlocal.org





Wastes also shipped to:
Michigan
Texas
Utah
Idaho

Future CT Permits

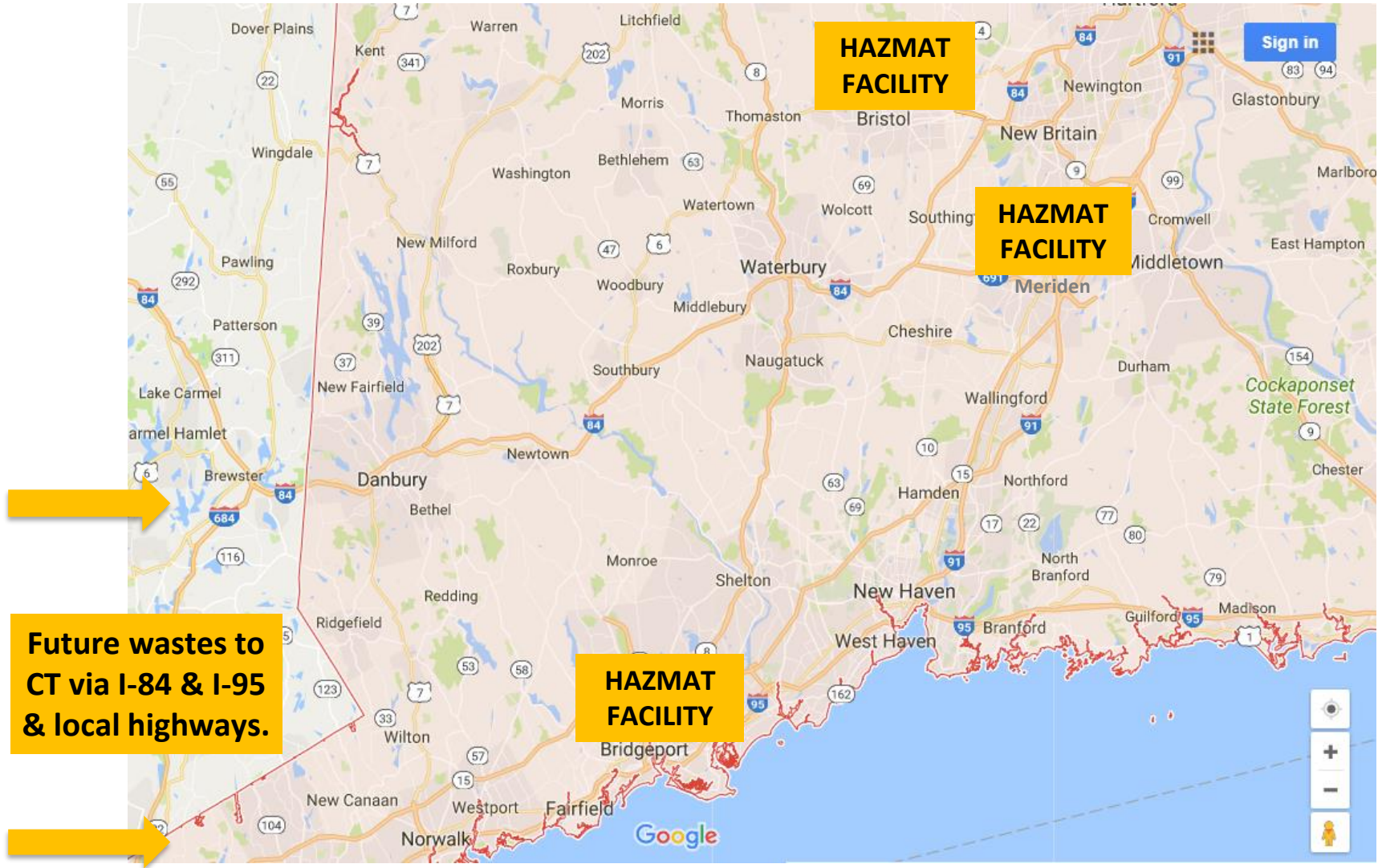
Yellow flags = Disposal sites
PA waste shipped to at least 8 states
Liquid wastes:
Jan-Jun 2015 >878M Gallons
Jan-Dec 2014 >1.9B Gallons

Base map courtesy FracTracker
www.fractracker.org



Current State Law: Temporary moratorium + Mandate for future regulations

Submit for review: July 1, 2017 - July 1, 2018 by CTDEEP to Regs Review Committee. Once finalized, HazMat facilities may apply for future permits in Bristol, Meriden & Bridgeport



Depending on future regulations, risk of partially-treated but still contaminated & radioactive effluent to be sent to additional Publicly Owned Treatment Works (POTW) in CT. See slide 19 for potential locations.



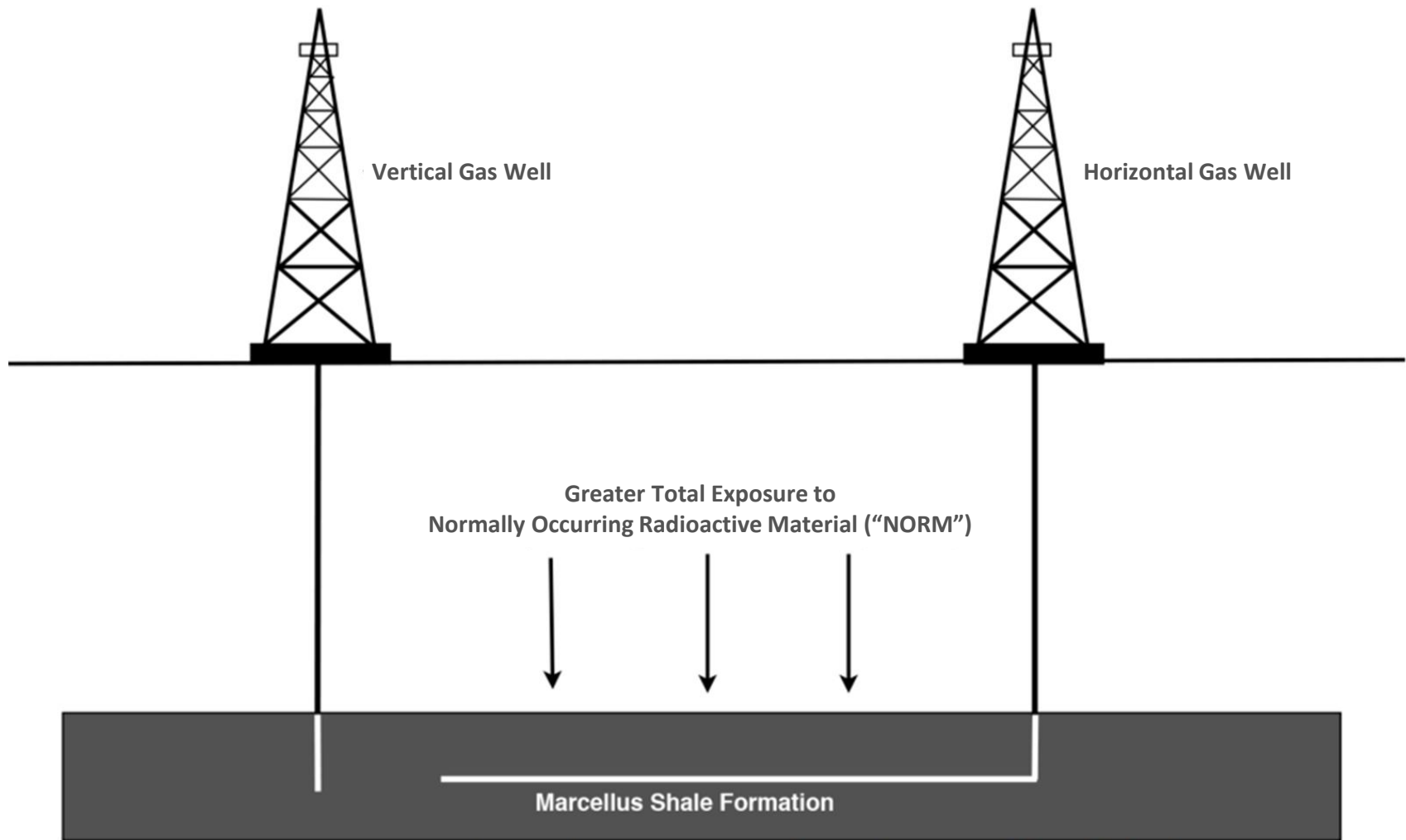


Figure 1: Comparison of Exposure to NORM in Marcellus Shale for Vertical Wells and Horizontal Wells

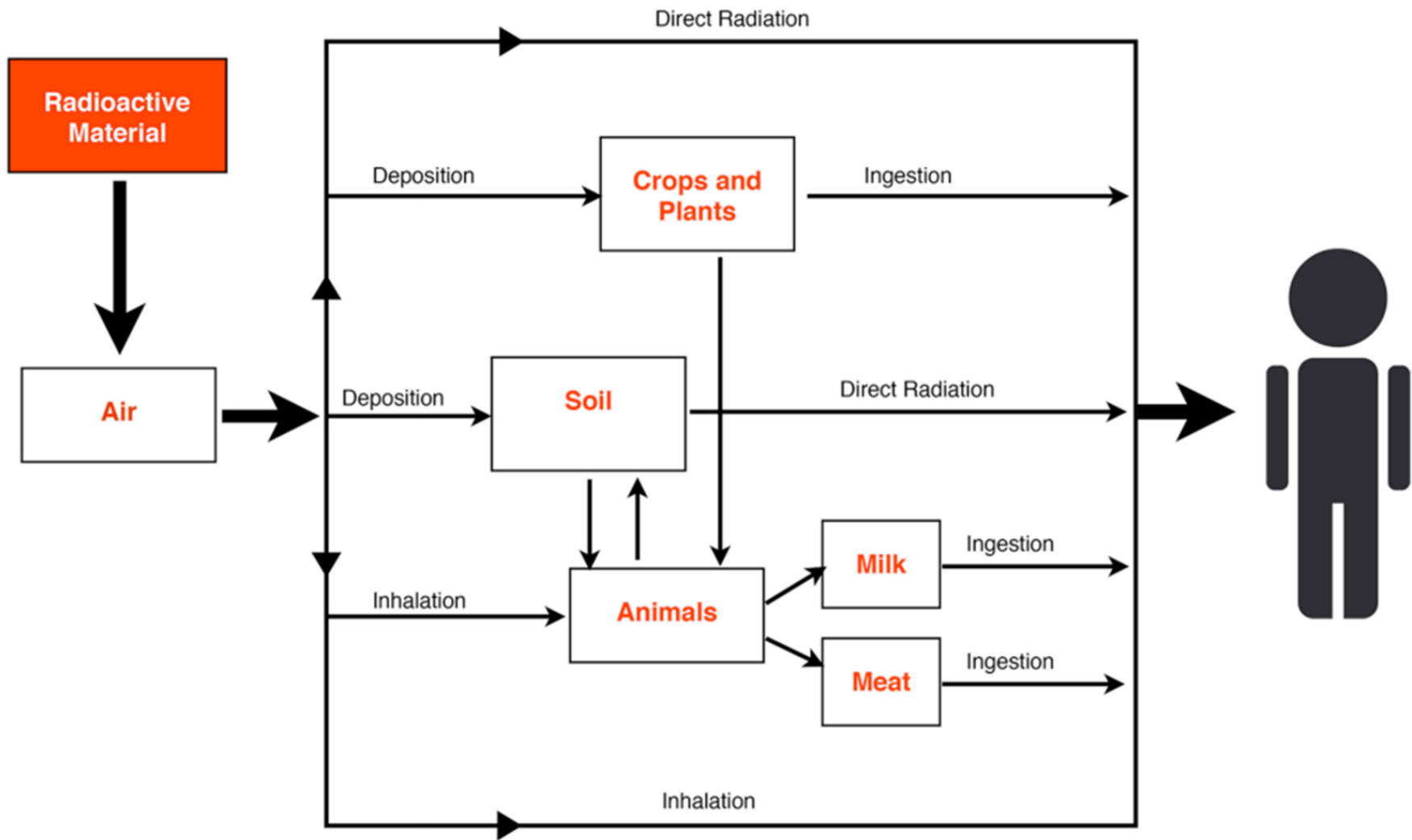


Figure 2: Pathways for Radiation Migration Through Air

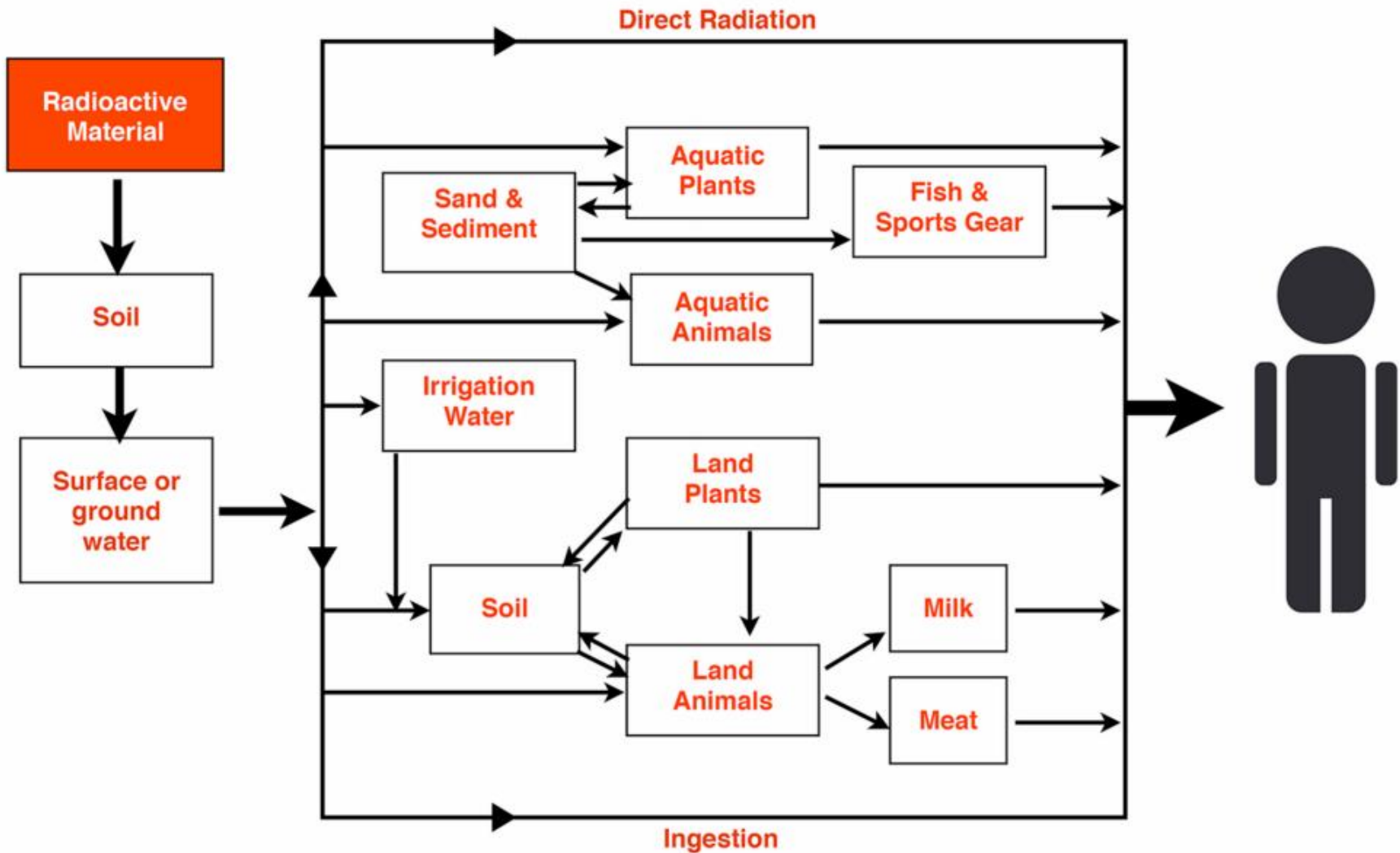


Figure 3: Pathways for Radiation Migration Through Soil and Water

FWW added notes below:
Each shape/color on graph is a tested well

26,600 pCi/L

5 pCi/L
Safe Drinking Water Limit

1,600 yr radioactive half-life
Cumulative
Bioaccumulates

Causes Breast
Bone and
Liver Cancers

Associated with
Adult and Childhood Leukemias

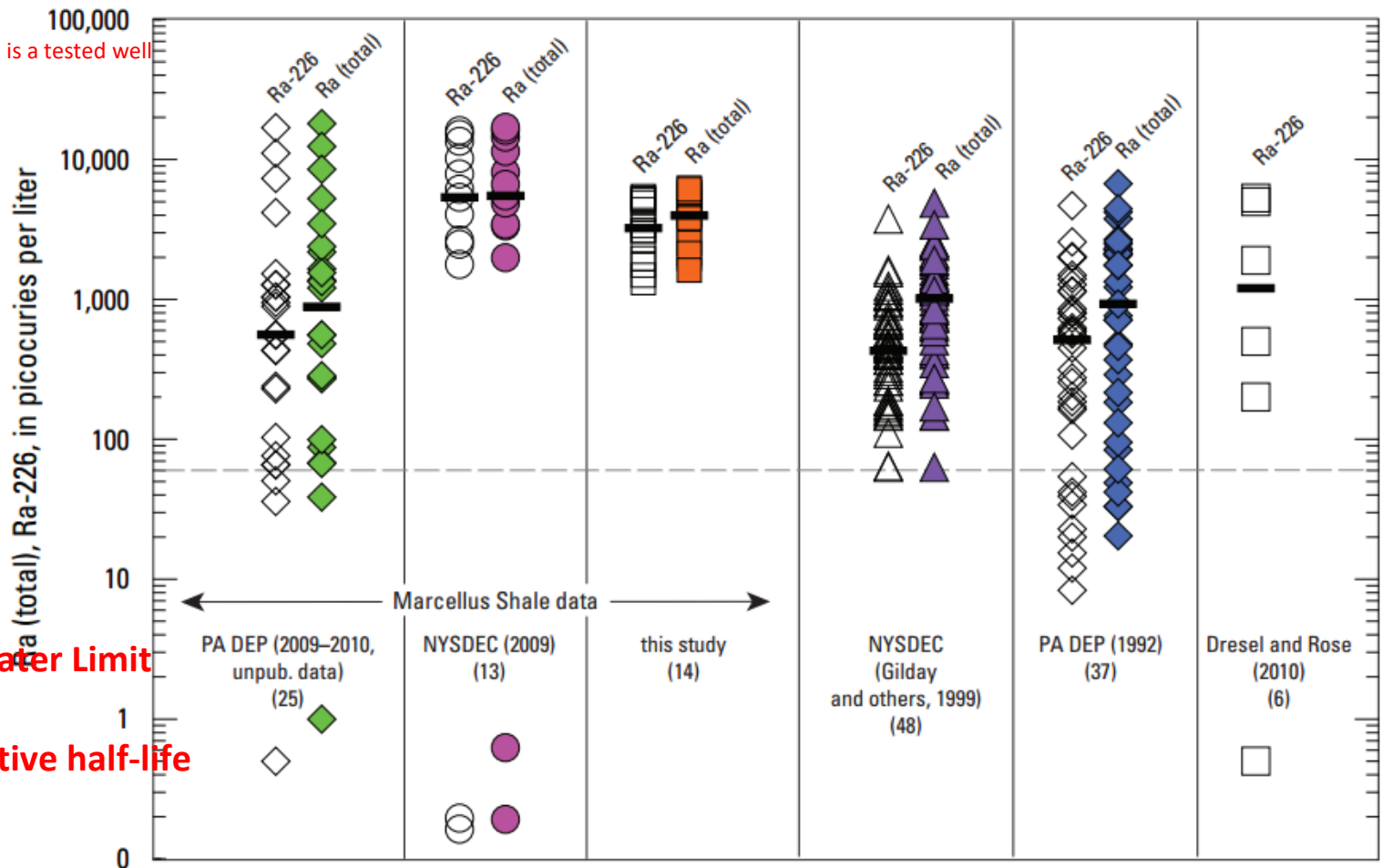


Figure 4. Measured activities for total radium (Ra-226 + Ra-228) and Ra-226 for each of the data sources used in the study. The three datasets for produced water from Marcellus Shale wells are shown on the left; the remaining three datasets are for non-Marcellus Shale wells. The number of points in each dataset is shown in parentheses, and the median values are plotted as heavy black lines. For reference, the dashed line shows the industrial effluent discharge limit (60 pCi/L) for Ra-226 (U.S. Nuclear Regulatory Commission, <http://www.nrc.gov/reading-rm/doc-collections/cfr/part020/appb/Radium-226.html>).

Health Affects of Naturally-occurring Toxins

Radium226 & 228	Causes breast, bone & liver cancers, Associated with leukemia Radioactive half-life of 1,600 years Decays into other radioactive material & lead
Arsenic	Associated with bladder, kidney & skin cancers
Lead	Children - Brain & nervous system damage, developmental delay Adults - High blood pressure & kidney damage
Barium	Abnormal heart rhythms
Strontium	Children - Impacts bone growth
Benzene	Causes Leukemia
Toluene	Nervous system, liver & kidney damage
Xylene	Memory, stomach upset, liver & kidney changes, impacts to fetus
Chromium 6	Dermal burns, vertigo, GI hemorrhage, liver & kidney damage
PAHs	Associated with skin, lung, bladder & gastrointestinal cancers
Bromides	React synergistically with chlorine added to disinfect drinking water creating brominated trihalomethane - highly carcinogenic

649 Known chemicals in 2011

56% Examined & reported here-363*

44% No information available
on these chemicals

Soluble in water = Run-off & leaching
Impact drinking water supplies
Impact soil, property & surface waters

Volatile = Vaporize

Travel through air - Inhaled

Settle on surfaces, water & crops

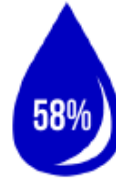
- Absorbed by skin
- Ingested

Colborn, et al 2011

Physicians for Social Responsibility-LA

www.PSA-LA.org

FOR THE 56% OF
FRACKING
CHEMICALS WE
CAN IDENTIFY



58%

SOLUBLE
IN WATER



36%

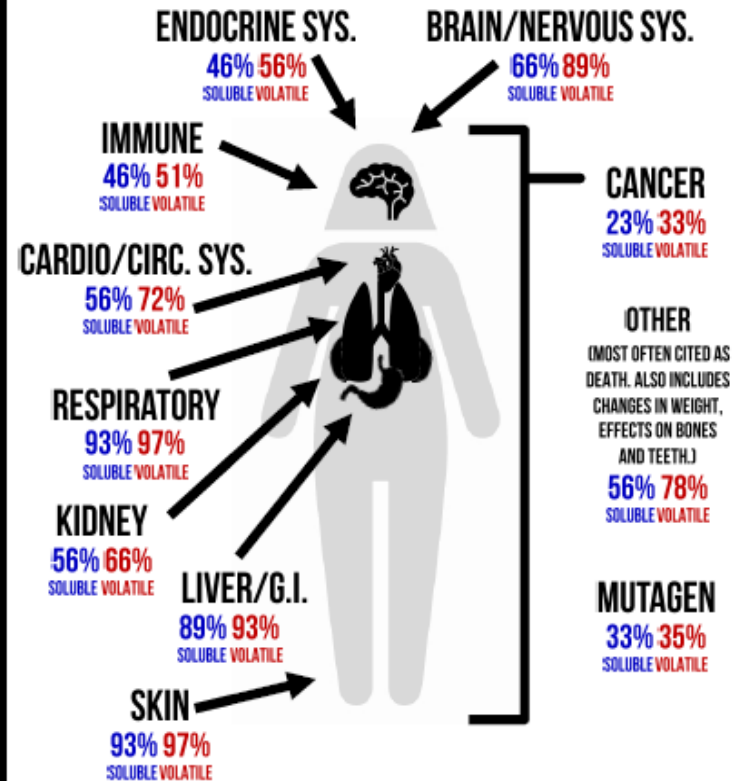
VOLATILE

SMALLER PERCENTAGE,
BUT BIGGER IMPACT. THESE
CHEMICALS CAN BE
INHALED, SWALLOWED,
AND/OR ABSORBED
THROUGH THE SKIN

ALL IMAGES FROM
THE NDJN PROJECT —
FRACKING: TOM ANANTWERP,
STOMACH: SERIO DELGADO
GARCIA, HEART: CATHERINE
PLEASE, LUNGS: JORIS HOOGEN-
DOORN, WATER DROP: CRIS
DOBBINS, CLOUD: JAMES FEN-
TON, QUESTION CLOUD: ANAS
RAMADAN, WOMAN: LUIS PRADO

BODY SYSTEMS AFFECTED BY FRACKING CHEMICALS*

SHOWN WITH % OF CHEMICALS AFFECTING EACH BODY SYSTEM
(SOLUBLE CHEMICALS IN BLUE AND VOLATILE CHEMICALS IN RED)



Yale SCHOOL OF PUBLIC HEALTH

Toxins Linked to Developmental & Reproductive Health Problems
1,157 known chemical additives

Yale SCHOOL OF PUBLIC HEALTH

119 Carcinogens
Known & Suspected
Travel Through Air and Water

SCHOOL OF ENGINEERING & APPLIED SCIENCE Yale

Elevated Levels of Diesel-like Chemicals Found in 65 Home Wells
Tied to Surface Spills
Trace Amounts 3-5 Years Later



Study: Fracking associated with migraines, fatigue, chronic nasal and sinus symptoms



Johns Hopkins study links fracking to premature births, high-risk pregnancies

Researchers look at nearly 11,000 births in north, central Pennsylvania

colorado school of public health

Age 5-24 Leukemia
4.3 x likely live near dense drilling activity



Increased Hospitalizations in Heavily-drilled PA Counties:

- Cardiology
- Neurology
- Dermatology
- Neonatology
- Urology
- Oncology



- **Radioactive sediment in waterways in PA & ND**
Spills and post-treatment discharge causing contamination
- **Iodide, Bromide + Chlorine = Carcinogenic Trihalomethane**
- **6,648 spills in 4 states over 10 years - 50% storing & moving waste**

750+ Studies Compendium 2016 4th Ed
Concerned Health Professionals of NY
concernedhealthny.org/compendium/



Drilling Process = Drill Cuttings & drilling muds
Chemicals + naturally-occurring toxins



Hydraulic Fracturing Process = Flowback Waste =
Fracking fluids + silica sand + drill cuttings + brine + sludge
Chemicals + naturally-occurring toxins



Production/Dehydration Process
Produced Water or Brine
Residual chemicals + naturally-occurring toxins



"Fresh Water" (Industry term)
Partially treated & re-used many times
Finally too contaminated to use & needs disposal
Chemicals + naturally-occurring toxins



EPA Violations



www.riversalliance.org

Click on:

- Priority Topics
- HazWaste Treatment
- CT HazWaste Treatment Facility Compliance Overview

Clean Harbors of CT Inc. of Bristol (USEPA ECHO ID: 110002083478)

	QTR. 2	QTR. 3	QTR. 4	QTR. 5	QTR. 6	QTR. 7	QTR. 8	QTR. 9	QTR. 10	QTR. 11	QTR. 12	QTR. 13*	
Clean Water Act Permit Compliance For The Past Three Years	Apr Jun 2013	Jul Sep 2013	Oct Dec 2013	Jan Mar 2014	Apr Jun 2014	Jul Sep 2014	Oct Dec 2014	Jan Mar 2015	Apr Jun 2015	Jul Sep 2015	Oct Dec 2015	Jan Mar 2016	Apr Jun 2016
Facility Status During That Quarter:	In Viol	In Viol	In Viol	In Viol	In Viol	In Viol	In Viol (Resvd)	No Viol (Resvd)	No Viol	In Viol	No Viol	In Viol	In Viol*

Tradebe Treatment and Recycling Northeast LLC of Meriden (USEPA ECHO ID: 110000316248)

	QTR. 1	QTR. 2	QTR. 3	QTR. 4	QTR. 5	QTR. 6	QTR. 7	QTR. 8	QTR. 9	QTR. 10	QTR. 11	QTR. 12	QTR. 13*
Clean Water Act Permit Compliance For The Past Three Years	Apr Jun 2013	Jul Sep 2013	Oct Dec 2013	Jan Mar 2014	Apr Jun 2014	Jul Sep 2014	Oct Dec 2014	Jan Mar 2015	Apr Jun 2015	Jul Sep 2015	Oct Dec 2015	Jan Mar 2016	Apr Jun 2016
Facility Status During That Quarter:	In Viol (ResPend)	In Viol (ResPend)	In Viol (ResPend)	In Viol	SNC / Cat 1	In Viol	In Viol ****	In Viol ****	In Viol	In Viol ****	In Viol	In Viol (ResPend)	In Viol*

Tradebe Treatment and Recycling of Bridgeport (USEPA ECHO ID: 110000317069)

	QTR. 1	QTR. 2	QTR. 3	QTR. 4	QTR. 5	QTR. 6	QTR. 7	QTR. 8	QTR. 9	QTR. 10	QTR. 11	QTR. 12	QTR. 13*
Clean Water Act Permit Compliance For The Past Three Years	Apr Jun 2013	Jul Sep 2013	Oct Dec 2013	Jan Mar 2014	Apr Jun 2014	Jul Sep 2014	Oct Dec 2014	Jan Mar 2015	Apr Jun 2015	Jul Sep 2015	Oct Dec 2015	Jan Mar 2016	Apr Jun 2016
Facility Status During That Quarter:	In Viol	SNC / Cat 1	SNC / Cat 1	In Viol (Resvd)	SNC / Cat 1	In Viol (Resvd)	In Viol **	SNC / Cat 1	SNC / Cat 1	No Viol (Resvd)	SNC / Cat 1	SNC / Cat 1	In Viol*

Partially-treated effluent is discharged into the sewage systems of Bristol, Meriden & Bridgeport. Depending of future regulations, there is risk of still contaminated & radioactive effluent to also be sent to additional Publicly Owned Treatment Works (POTW) in CT. See slide 19 for locations.



Clean Harbors of CT Inc. of Bristol (click for details)

Yellow background indicates noncompliance was noted in the data. Red background indicates significant noncompliance.

Clean Harbors of CT, Inc.

[Click here to go to EPA ECHO ID: 110002083478](#)

Statute	Insp (5 Years)	Last Inspection	Current Status	Qtrs in Noncompliance (of 12)	Qtrs in Significant Violation	Informal Enforcement Actions (5 years)	Formal Enforcement Actions (5 years)
CAA							
RCRA	4	09/29/2016	Noncompliance	11	3	12/23/2013 12/17/2014 12/13/2016	06/07/2017
CWA	1	05/03/2017 09/17/2014	Noncompliance	7 (separate sheet)		05/04/2017, 11/28/2014, 12/10/2013 (see below)	

Summary of [Notice of Violation FNOV WRIN13213 issued 12/10/2013 \(closed 02/06/2014\)](#): Failed to comply with the requirement(s) of general permit #GSI000726; failed to update plan to include Middle street, failed to have the PE certify non-stormwater discharge, failed to collect sample between October 2012 and March 2013, failed to perform Quarterly Visual Evaluations, failed to perform semi-annual Comprehensive ... Compliance Evaluations, failed to perform annual training. Failed to use proper sample collection, preservation, handling, and/or analytical method (minimum detection level). Company has not met minimum detection level requirements for Bis[2-ethylhexyl] phthalate and ... See also reports for [09/17/2014](#), [12/23/2013](#)

Summary of [Notice of Violation NOV WRIN14020 issued 11/28/2014, closed 01/16/2015](#):
On Sep 17, 2014 a grab sample was collected, it appears effluent limitations exceed for Copper - Analytical Result: 0.65mg/L - Grab Limit: 0.405mg/L. [Copy of Laboratory Report](#) shows apparent exceedences for Chromium, Iron, Total Suspended Solids.

Information from USEPA ECHO, retrieved Sep 5, 2017, from 2 FOIA requests to CT DEEP: (1) disc dated Aug 5, 2014, (2) email Jul 15, 2015, [Permit Fact Sheet](#).
Entries in italics are not considered inspections in official counts.

EPA ECHO Records. Chart courtesy Rivers Alliance of CT rivers@riversalliance.org



Tradebe Treatment and Recycling Northeast LLC of Meriden (click for details)

Yellow background indicates noncompliance was noted in the data. Red background indicates significant noncompliance.

(USEPA ECHO ID: 110000316248)

Statute	Insp (5 Years)	Last Inspection	Current Status	Qtrs in Noncompliance (of 12)	Qtrs in Significant Violation	Informal Enforcement Actions (5 years)	Formal Enforcement Actions (5 years)
CAA		03/17/2004 06/03/2015		0	0	01/14/2016	
RCRA	12	8/8/2017	Noncompliance	12	0	06/06/2017, 12/21/2016, 10/08/2015, 12/02/2014, 11/13/2014, 03/08/2013	10/12/2016
CWA	2	03/27/2014 03/28/2017	Noncompliance	9 (separate sheet)	1	04/16/2015, 05/23/2017	

Information from USEPA ECHO retrieved Aug 17, 2017, from Permit, from SPDES Permit Renewal May 2013 Fact Sheet.

Entries in italics are not considered inspections in official counts.

* Q13 is unofficial.

EPA ECHO Records. Chart courtesy Rivers Alliance of CT rivers@riversalliance.org



Tradebe Treatment and Recycling of Bridgeport (click for details)

Yellow background indicates noncompliance was noted in the data. Red background indicates significant noncompliance.

(USEPA ECHO ID: 110000317069)

Statute	Insp (5 Years)	Last Inspections	Current Status	Qtrs in Noncompliance (2012-2016)	Qtrs in Significant Violation	Informal Enforcement Actions (5 years)	Formal Enforcement Actions (5 years)
RCRA	3	09/16/2015	Noncompliance	9	0	2 10/08/2013, 11/25/2015	
CAA	1	09/02/2015, 12/18/2012		1	0	1 01/14/2016	
CWA	4	03/07/2017 01/05/2016,	Noncompliance	9 (separate sheet)	5 (separate sheet)	3 07/19/2016, 12/05/2013, 04/30/2013 (see below)	

1. Summary from [Notice of Violation No. WR IN13 104 April 30, 2013](#): Failed to collect O&G (?) as a grab sample average for February and March 2013. Company representatives / employees state the pH probe is cleaned daily however they do not document the date the probes are cleaned. The total volatile verification analysis has not been submitted quarterly as required. The 2012 and 2013 analyses were provided at the time of this inspection. [CLOSURE 7/10/2013](#) Summary: Based upon the representations made in your submittal and Department information, it has been decided that no further action by the Department will be taken at this time...

2. [Notice Of Violation No. WR IN 13 029 Dec 5, 2013 and Cover Letter](#). Summary: Based on a review of the discharge monitoring reports it appears the effluent limitations were violated 50 times from August 2011 through September 2013 including violations that placed the facility in the status of significant noncompliance (SNC). [CLOSURE Mar 5, 2014](#). Summary: Based upon the representations made in a facility submittal and Department information, it was been decided that no further action by the Department will be taken at this time ...

Information from USEPA ECHO at [http:// echo.epa.gov/ detailed-facility-report?fid=110000317069](http://echo.epa.gov/detailed-facility-report?fid=110000317069) retrieved Apr 7, 2016.
Entries in italics are not considered inspections in official counts.
 *Quarter 13 is draft/unofficial and has not been fully quality assured."

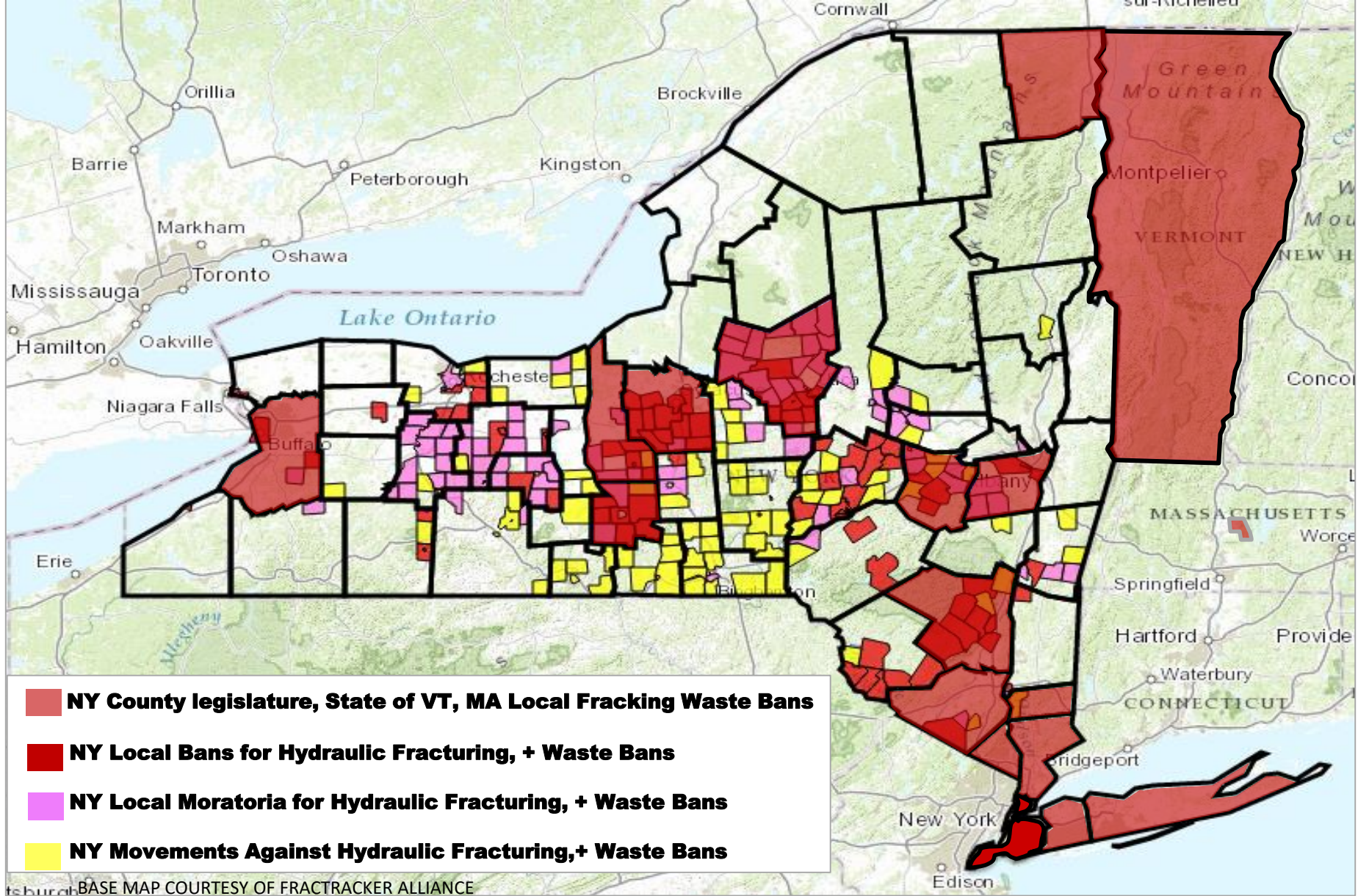
EPA ECHO Records. Chart courtesy Rivers Alliance of CT rivers@riversalliance.org

Potential Chain of Radioactive & Chemical Contamination in CT

Transport	Accidents, leaks, spills Run-off, leaching into soil, ground & surface Water	
Transfer & Storage	Accidents, leaks, spills Run-off, leaching into soil, ground & surface water	
Hazardous Waste Facility	Concentrated residuals transferred out of state Effluent Discharged to local sewage system Effluent to POTW or City Waste Water Facilities	
Effluent to POTW	Effluent discharged to waterways Sludge to incinerators	
Trash to Energy Incinerator	Incinerator emissions Disposal of incinerator ash	
Beneficial Use (BUD)	Solids	Liquids
	Construction fill	Sprayed on roads
	Road base	De-icer
	Brownfield capping	Dust control
	De-watered salts	
	Run-off and leaching into soil & surface water	

Oil & Gas Drilling & Extraction Wastes	Local Bans in 25 of 26 CT Towns (Washington, CT passed State of CT language)	Temporary Moratorium Pending CT Regulations
Gas Drilling Muds	X	
Gas Drill Cuttings	X	
Gas Hydraulic Fracturing Flowback	X	X
Gas Flowback & Drill Cuttings Mix	X	X
Gas Flowback & Brine Mix	X	X
Gas Flowback & Used Frac Sand	X	X
Gas Brine Produced During Gas Flow	X	?
Gas Chemicals Used on Pad Surface	X	?
Gas Underground Storage Waste	X	
Gas Liquefied Petroleum Gas Waste	X	
Oil Drilling Muds	X	
Oil Drill Cuttings	X	
Oil Hydraulic Fracturing Flowback	X	
Oil Flowback & Drill Cuttings Mix	X	
Oil Flowback & Brine Mix	X	
Oil Flowback & Used Frac Sand	X	
Oil Brine Produced During Oil Flow	X	
Oil Chemicals Used on Pad Surface	X	

- Definitions of wastes in local ordinances are very specific and do not allow loopholes found in CT law.
- Ordinance language specifically prohibits drilling, extraction & some storage wastes.
- Wastes derived from refining petroleum or using refined products, such as tar used for roadway asphalt and used motor oils, are NOT prohibited by ordinance language and will NOT interfere with local/state road paving or disposal of other petroleum products.

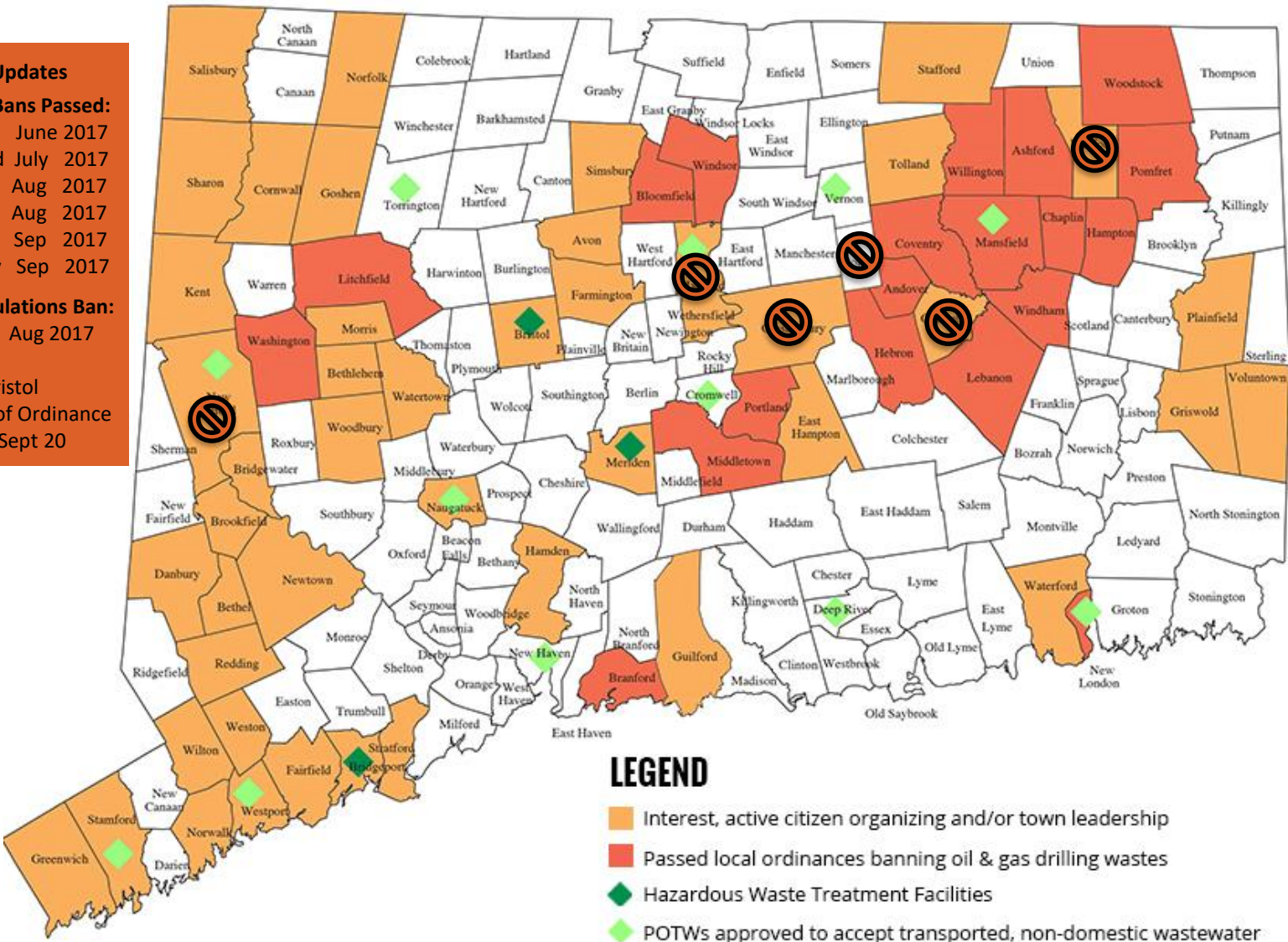


Map Updates

Ordinance Bans Passed:
 Bolton June 2017
 New Milford July 2017
 Eastford Aug 2017
 Columbia Aug 2017
 Hartford Sep 2017
 Glastonbury Sep 2017

Zoning Regulations Ban:
 Hartford Aug 2017

Pending - Bristol
 Passed out of Ordinance Committee Sept 20



LEGEND

- Interest, active citizen organizing and/or town leadership
- Passed local ordinances banning oil & gas drilling wastes
- Hazardous Waste Treatment Facilities
- POTWs approved to accept transported, non-domestic wastewater (Publicly Owned Treatment Work or City Wastewater Treatment Facility)

BASE MAP COURTESY OF THE CONNECTICUT DEPARTMENT OF ECONOMIC AND COMMUNITY DEVELOPMENT

