

THMs in Ireland Overview

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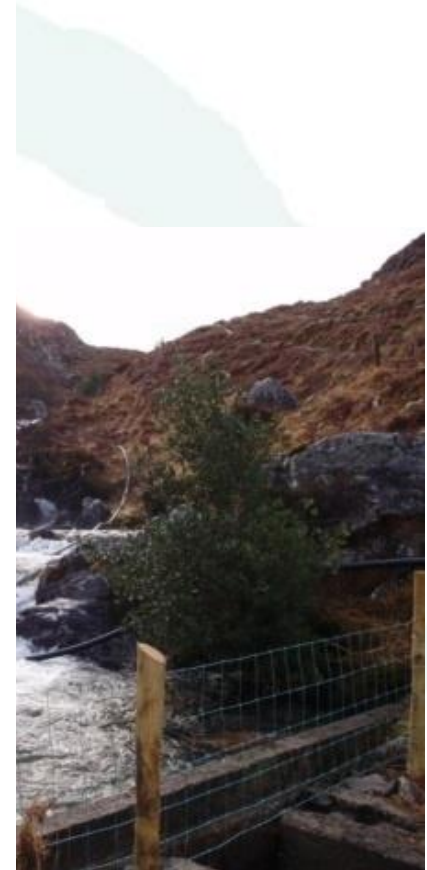
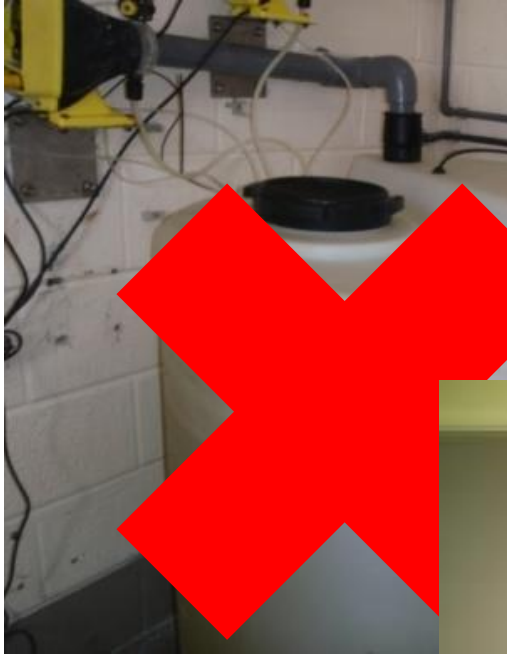
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Irish NOM 2016

Trihalomethanes – Outline of Presentation

- What are THMs ?
- Why are they of interest ?
- Where are we now ?
- When - timeframes?

Trihalomethanes (THMs) – What are they?



Trihalomethanes - Disinfection?

■ World Health Organisation

*“Microbial safety should never be compromised ..
Effective disinfection to prevent waterborne infectious diseases must take precedence.”*

Trihalomethanes - What are they?



- Most common disinfection by product (DBP)
- Chlorine widely used
- 81.6% Irish Public Water Supplies (PWS) - surface water
 - Higher organic content

Trihalomethanes - Forms

- THMs - four chemical group: * WHO Guideline Values
 - Chloroform (CHCl_3) – *300 $\mu\text{g/l}$
 - Bromoform (CHBr_3) – *100 $\mu\text{g/l}$
 - Dibromochloromethane (CHClBr_2) – *100 $\mu\text{g/l}$
 - Bromodichloromethane (CHCl_2Br) – *60 $\mu\text{g/l}$
- Total THMs (TTHMs); the sum of the concentration per litre of the trihalomethane compounds
- TTHM Parametric limit is 100 $\mu\text{g/l}$



Chloroform tends to be found in the highest concentrations

Trihalomethanes - Health Effects

- Two main health concerns associated with long term exposure to THMs in drinking water:
 - IARC - Chloroform and bromodichloromethane possibly carcinogenic.
 - COT (UK) - Possible effects on reproductive outcomes.
- Exposure by:
 - Ingestion of drinking water
 - Inhalation
 - Dermal exposure during showering / bathing.

Where are we in relation to our neighbours?



Total Trihalomethanes (THM)



* 242 Water Treatment Plants

England Wales and NI- Perspective

- Northern Ireland (391 Samples) 25 DW Plants

1.02% PWS failed THM standard in 2014



- England and Wales (DWI) 1,249 DW Plants

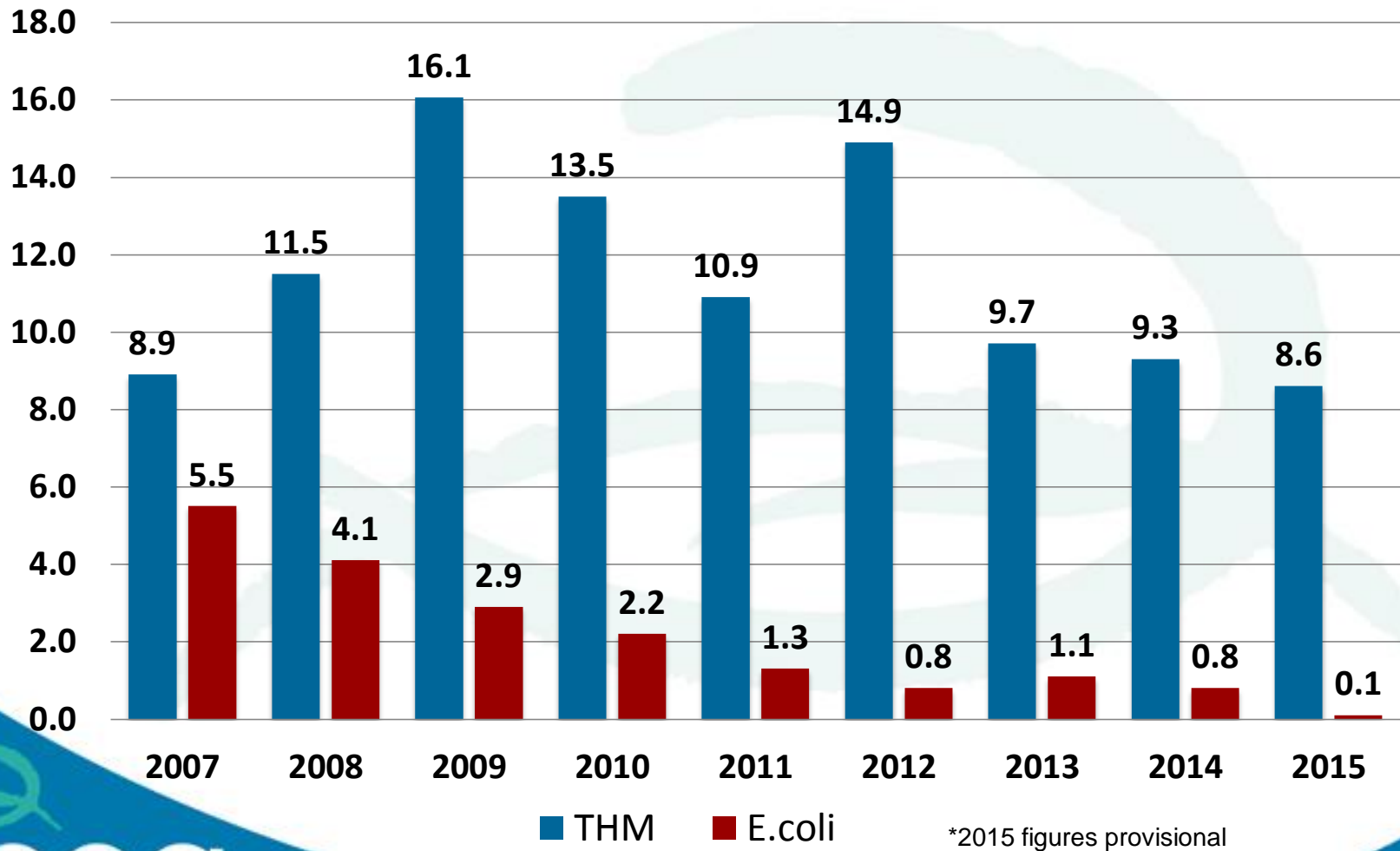
1990 - 5.3% of water samples failed THM standard

On average 4 failures per year

No THM failures in 2014



Ireland ~ % of PWS failing parametric limit THM & E.coli



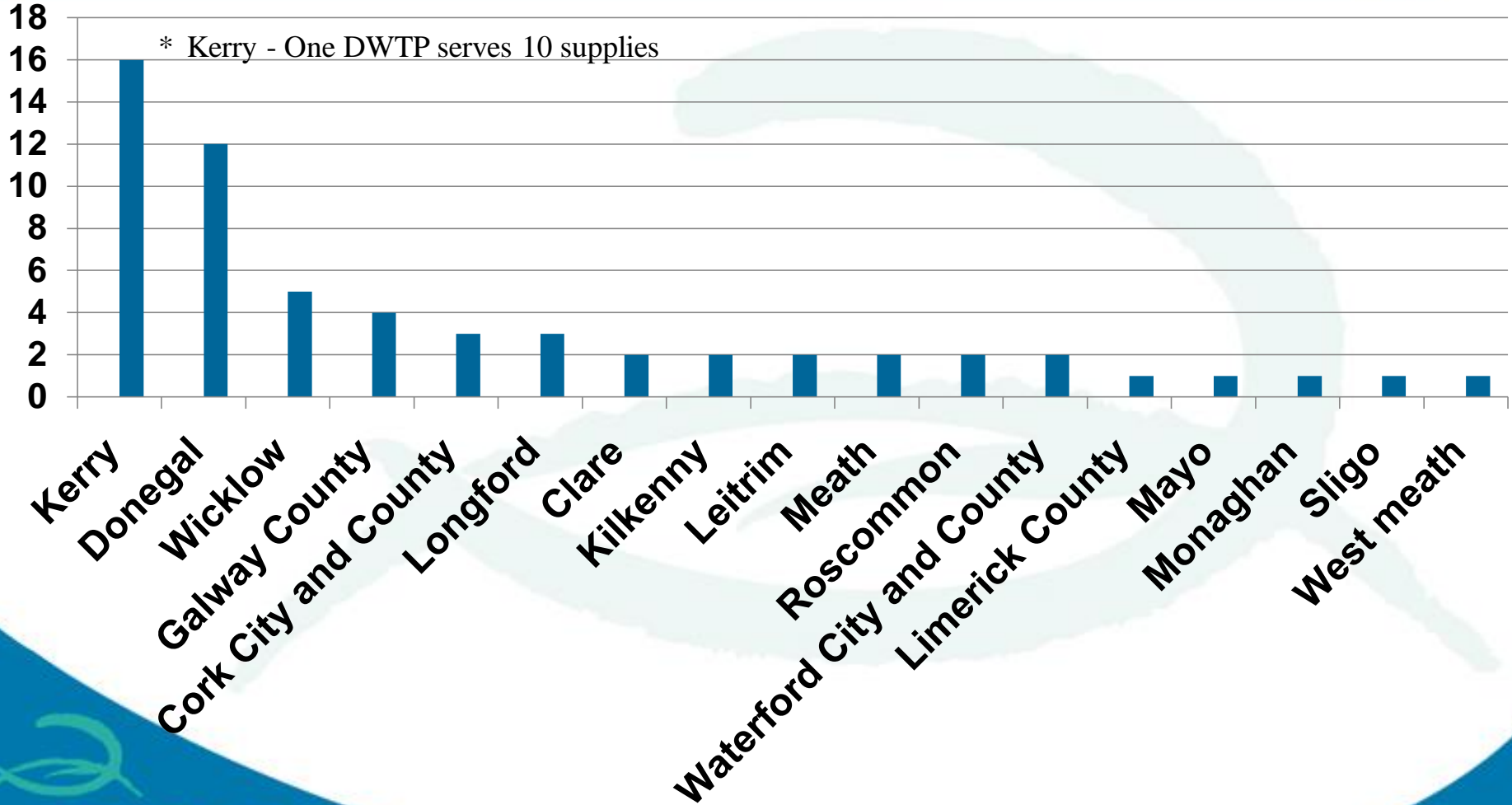
Ireland % of PWS failing parametric limit THM 2015

- 8.6 % PWS equates to population of approx

?

440,000* (Provisional Figure)

Number of supplies failing THM standard by County (2015)



Top Ten ~ Counties affected in 2015 ~ by Population

* Provisional figures & rounded

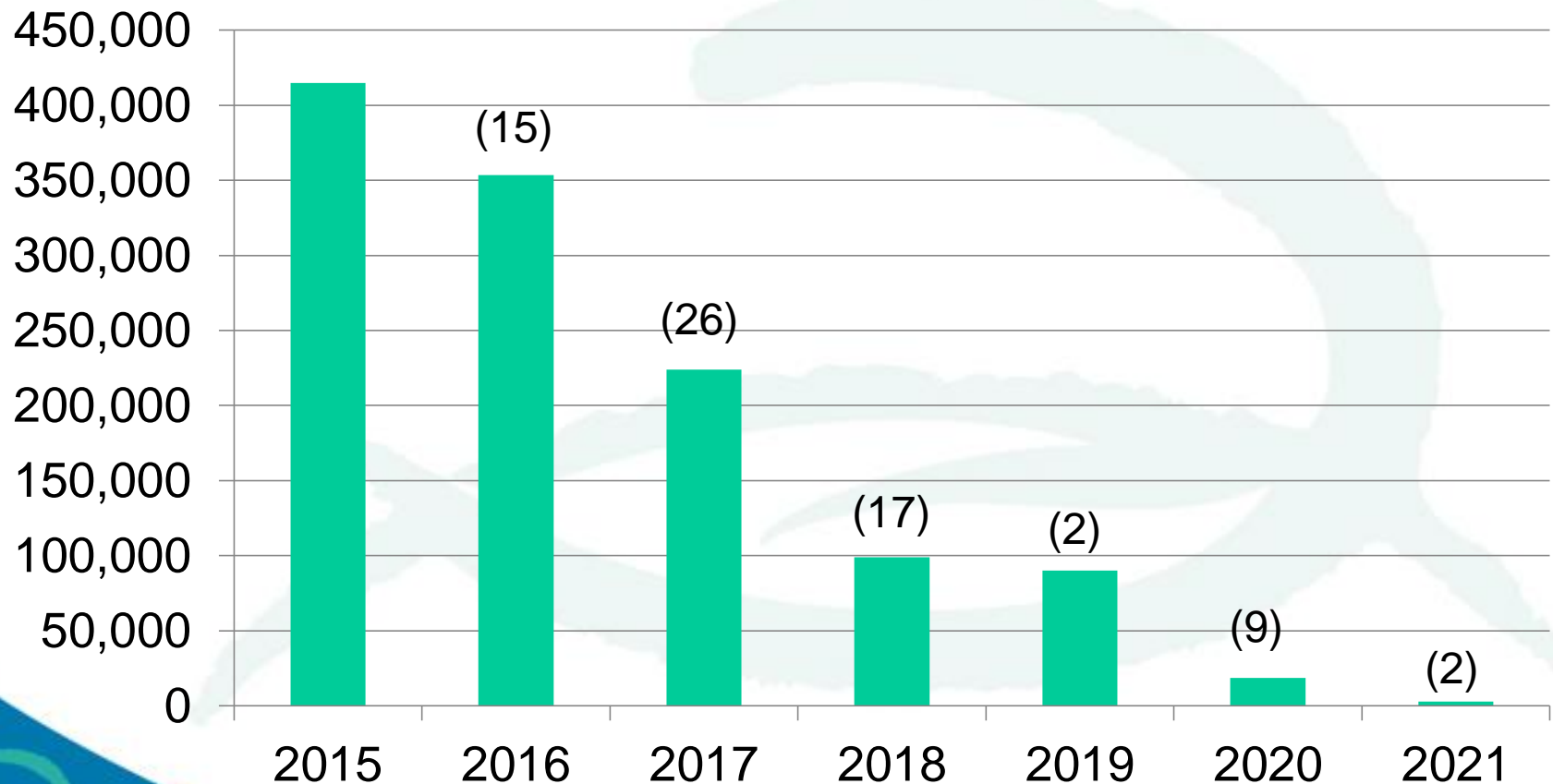
County	Population affected	No of Supplies	No of Failures
Cork City and County	126,100	2	3
Kerry	64,000	16	38 (29 one source)
Meath	54,400	2	5
Donegal	46,500	12	64
Longford	25,000	3	6
Wicklow	23,200	5	7
Limerick County	20,600	1	1
Leitrim	19,600	2	5
Kilkenny	18,500	2	2
Sligo	11,400	1	4

Remedial Action List

- List of Public Water Supplies (PWS) - need improvement.
- First published in 2008
 - 339 PWS
 - 77 PWS THM issues ~ population of 416,451
- Current RAL
 - 119 PWS
 - 76 PWS THM issues ~ population of 415,000
 - (43 PWS primary THMs, 33 for other reasons)
 - 58% of original THM supplies removed from RAL.

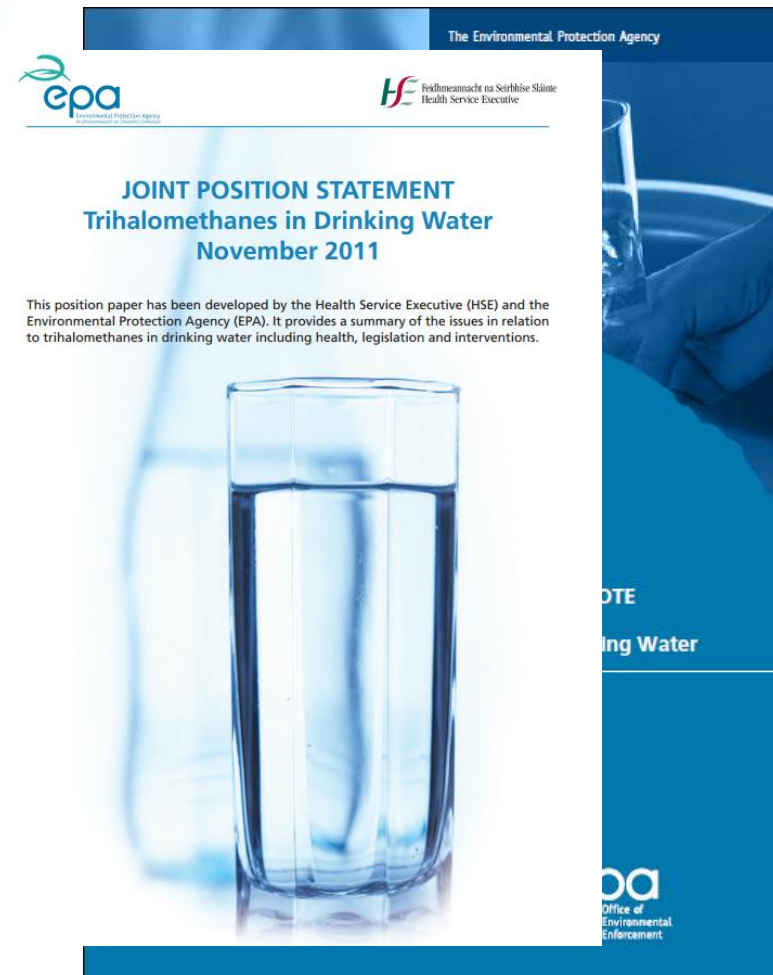


Timeframes for THM issues to be resolved ~ Population (Number of Supplies)



EPA Publications

- EPA Drinking Water Advice Note No. 4
Disinfection by Products in Drinking Water
- Joint Position Statement HSE and EPA
Trihalomethanes In Drinking Water 2011.



Treatment THMs

- Optimise coagulation and filtration before disinfection
- Optimise disinfection
- Optimise storage in distribution
- Scouring programmes
- Adopt a water safety plan approach

Questions and Answers

- What are THMs ?
Most common disinfection by product
- Why are they of interest ?
Possibly Carcinogenic
- Where are we now ?
8.6 % PWS THM Failure 2015
Equating to population 440,000
- When – timeframes for THM issues?
76% affected population, to be resolved 2018



Conclusion

- “Disinfection should not be compromised in attempting to control disinfection by-products”
- THMs are important
- EPA Priority
- Work is being undertaken, more to do..

- EPA advice note and publications

<http://www.epa.ie/pubs/advice/drinkingwater/>