



EMA of BC History of PFAS



AGAT

Laboratories

Service Beyond Analysis
■ www.agatlabs.com

Agenda

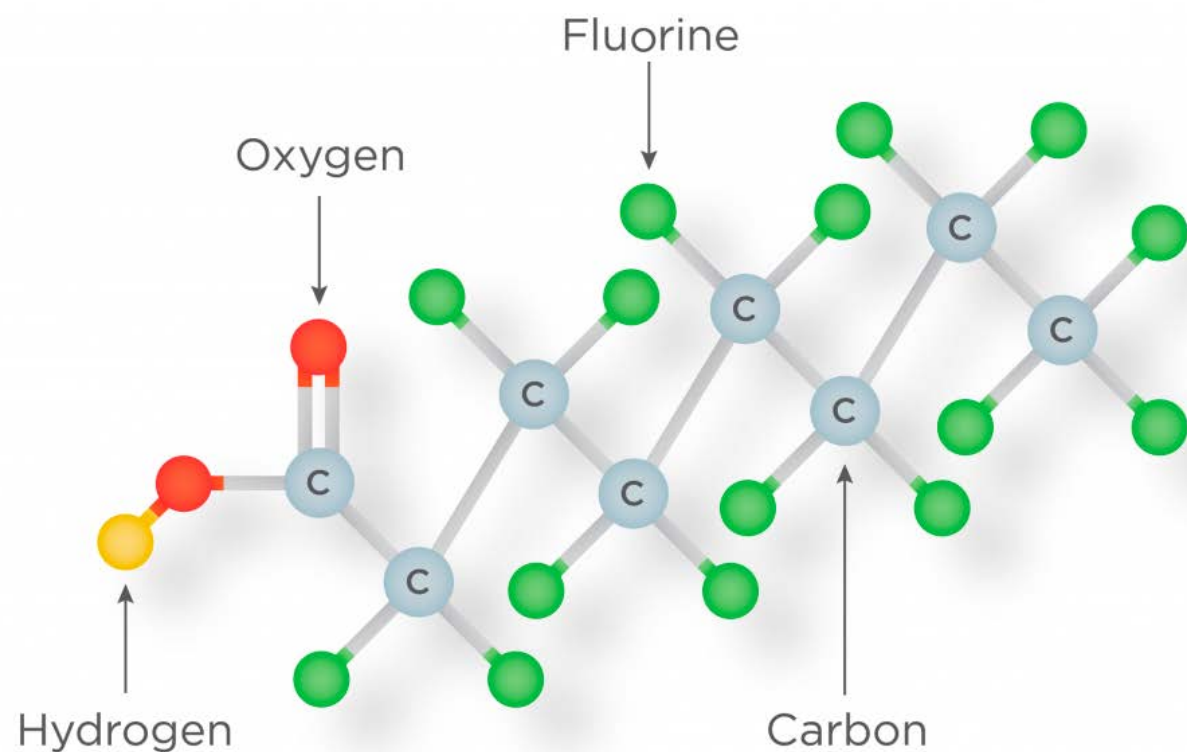
- Safety Share
- PFAS Chemistry
- PFAS – History
- Questions/ Discussion

Safety Share – Sun Glare

- Specific times of the year
- Daily occurrence
- Use visor/sunglasses
- Use extra caution
- Change route
- Change time of travel



Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)



In the Beginning...

Statements by the minister on decision by 3M to phase out perfluorooctanyl chemistry

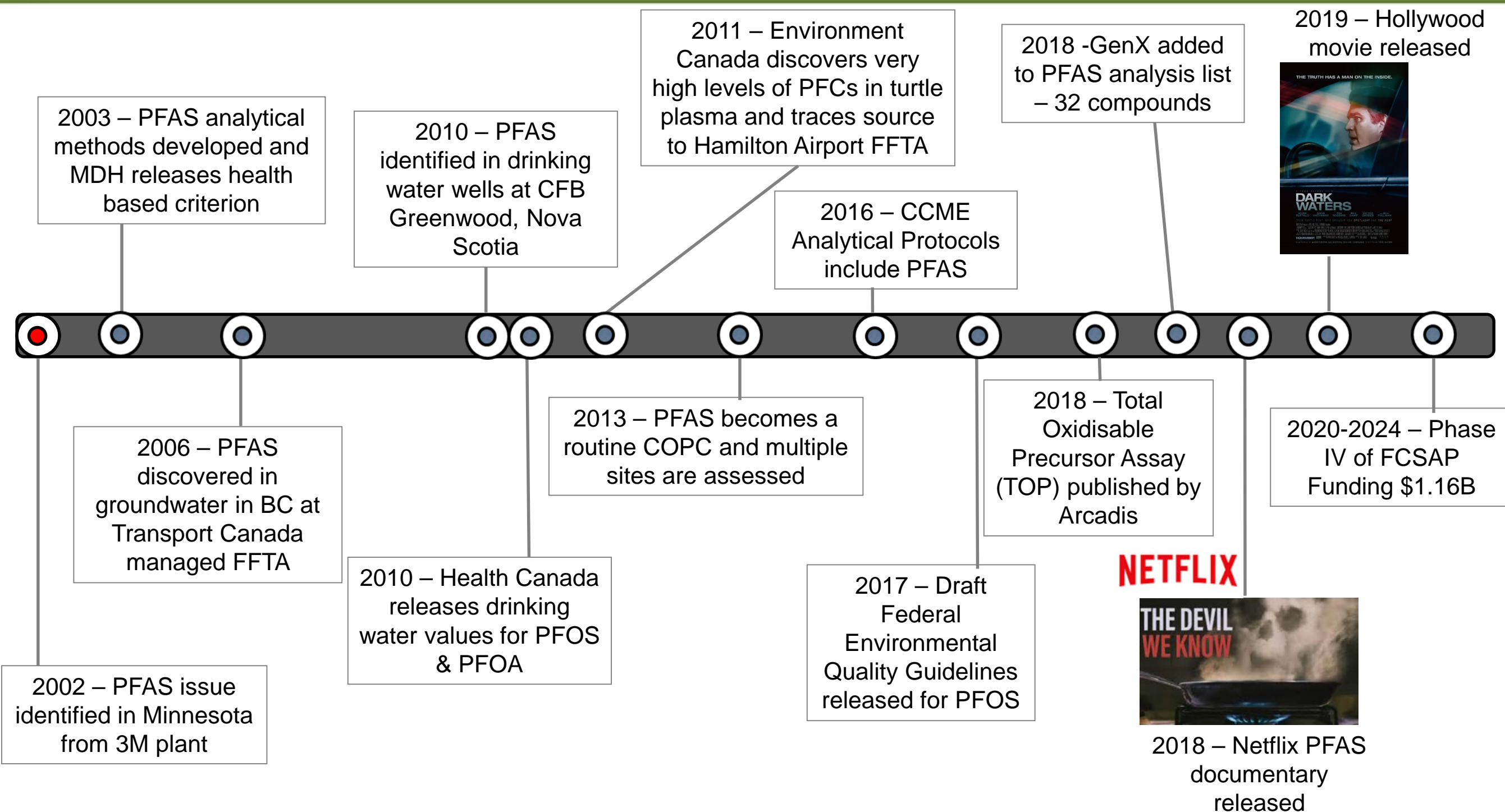
OTTAWA -- May 16, 2000 -- David Anderson, Minister of Environment and Allan Rock, Minister of Health today announced initial actions in response to 3M's decision to phase out the perfluorooctanyl chemistry used in some specialty materials by the end of this year.

Under the Canadian Environmental Protection Act (CEPA), the government began efforts last year to categorize 23,000 substances used in Canadian commerce for potential threats to the environment or human health. In this process, 7 substances from a class of commercial chemicals - perfluoroalkyl (PFA) substances, which includes perfluorooctanyl chemicals - were identified for further analysis. PFAs are a large class of chemicals used in a wide range of consumer and household products. In March, Canada learned that the US Environmental Protection Agency was also examining this class of chemicals.

In the coming weeks, Health Canada and Environment Canada officials will use the authorities in CEPA to identify all manufacturers and importers of the chemicals and gather information on Canadian usage and toxicological information.

Canada will protect its citizens and their environment from the threat of any toxic substance and will use regulatory authorities under CEPA should that prove necessary.

PFAS History in Canada



CFB Greenwood without clean drinking water



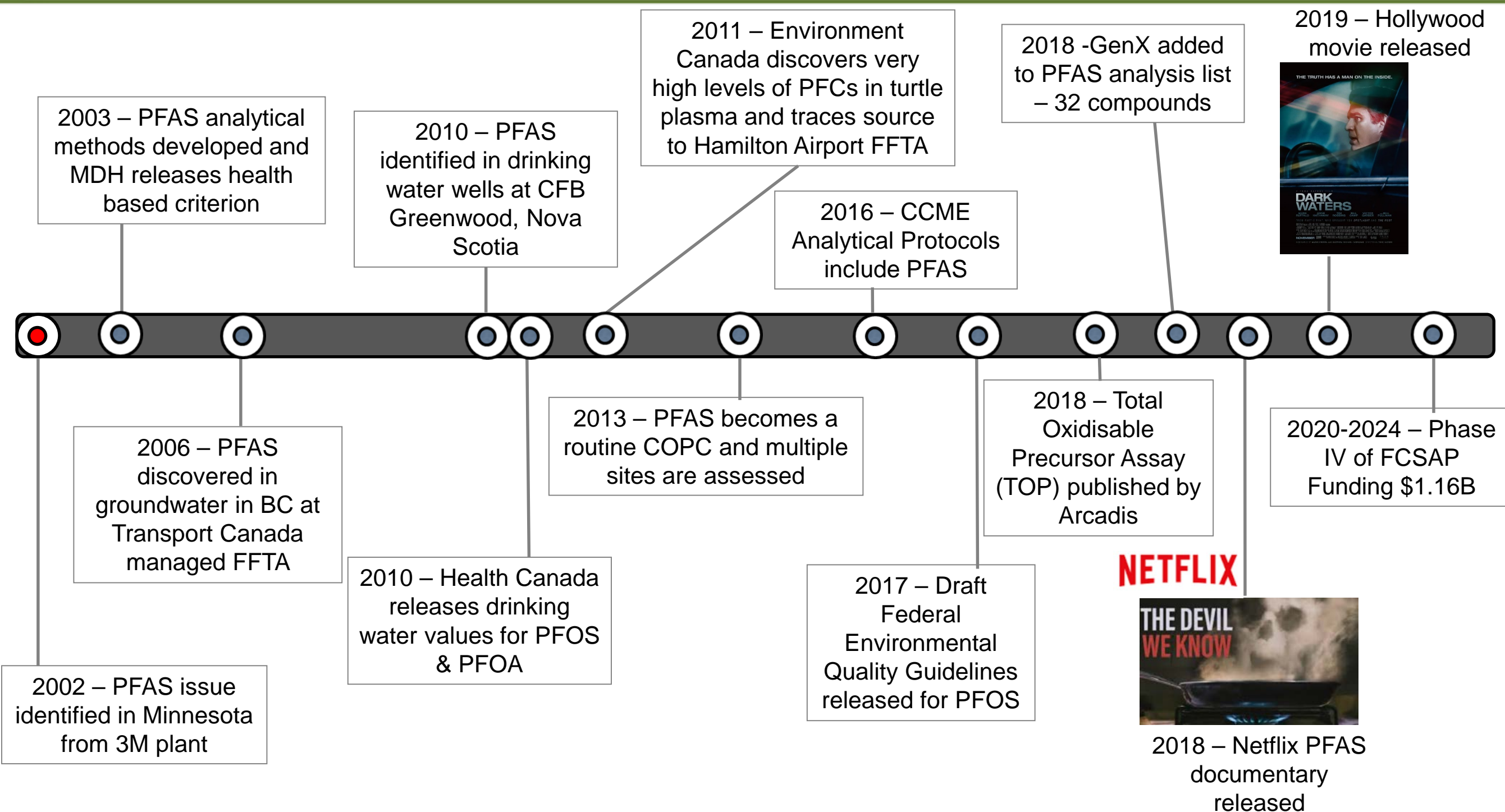
CBC News · Posted: Apr 18, 2010 12:22 PM AT | Last Updated: April 18, 2010

About 250 people living on Nova Scotia's Canadian Forces Base Greenwood have been without their regular supply of clean drinking water for nearly a month.

The Department of National Defence announced in March that it found dangerous levels of perfluorooctane sulfonate, a chemical that is used as an additive in special firefighting foam, in the base's well-water supply.

The 250 people affected by the contamination are being supplied with bottled water for drinking, cooking and cleaning.

PFAS History in Canada



➤ [Environ Int.](#) 2012 Feb;39(1):19-26. doi: 10.1016/j.envint.2011.09.011. Epub 2011 Oct 29.

Highly elevated levels of perfluorooctane sulfonate and other perfluorinated acids found in biota and surface water downstream of an international airport, Hamilton, Ontario, Canada

S R de Solla ¹, A O De Silva, R J Letcher

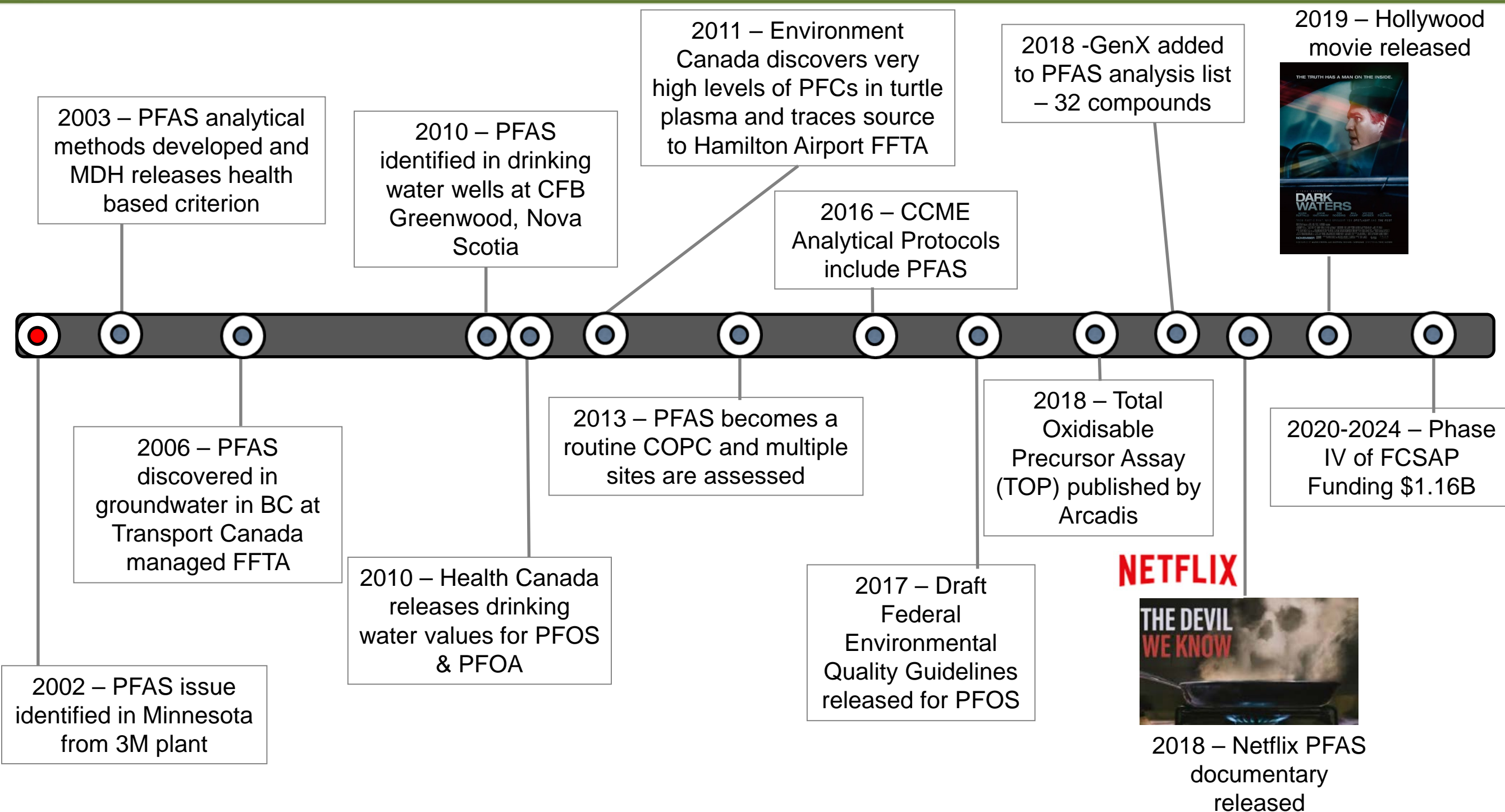
Affiliations + expand

PMID: 22208739 DOI: [10.1016/j.envint.2011.09.011](#)

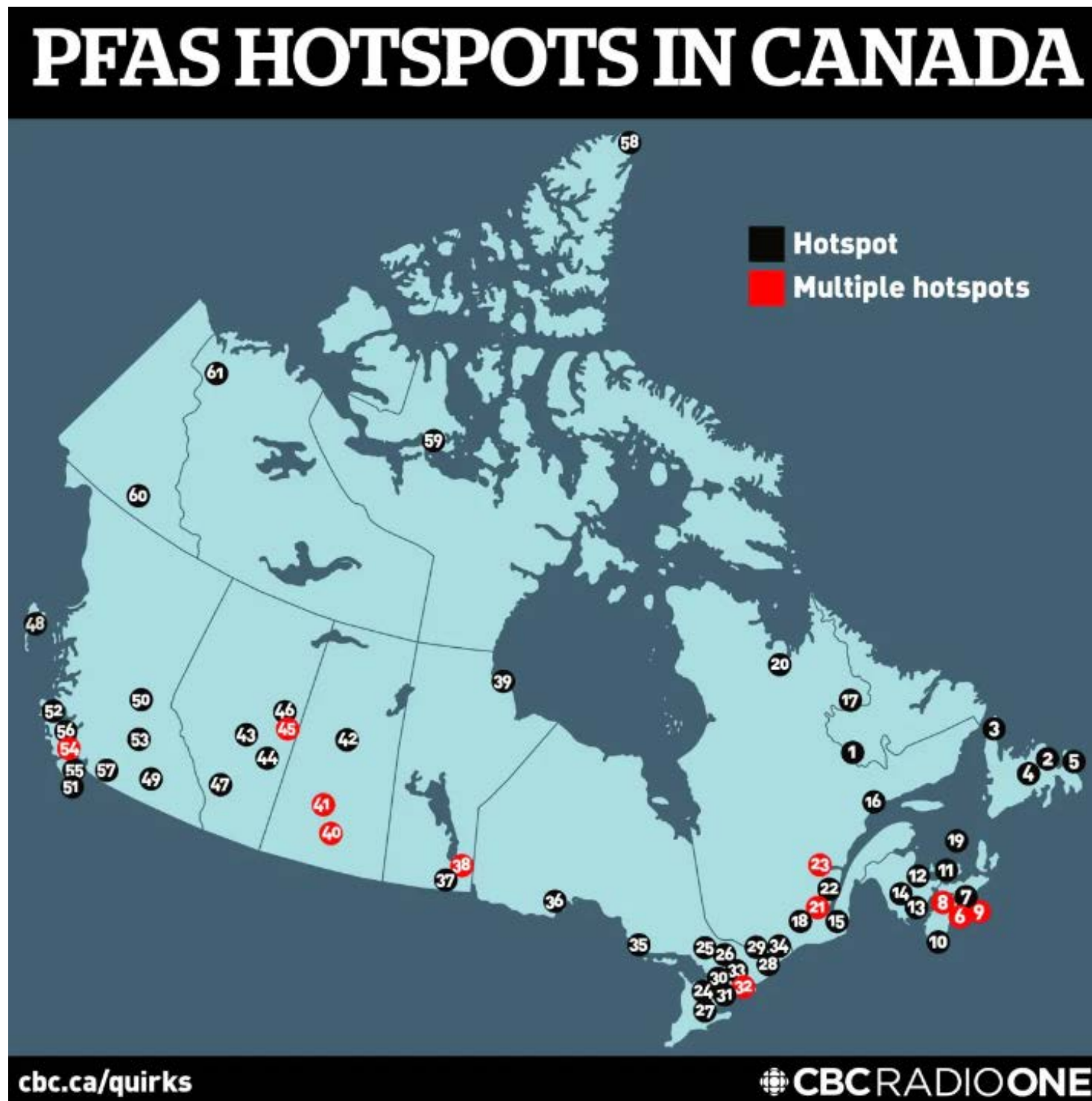
Abstract

Per- and poly-fluorinated compounds (PFCs), which include perfluorinated carboxylates (PFCAs) and sulfonates (PFSA) and various precursors, are used in a wide variety of industrial, commercial and domestic products. This includes aqueous film forming foam (AFFF), which is used by military and commercial airports as fire suppressants. In a preliminary assessment prior to this study, very high concentrations (>1 ppm wet weight) of the PFSA, perfluorooctane sulfonate (PFOS), were discovered

PFAS History in Canada



PFAS Sites in Canada

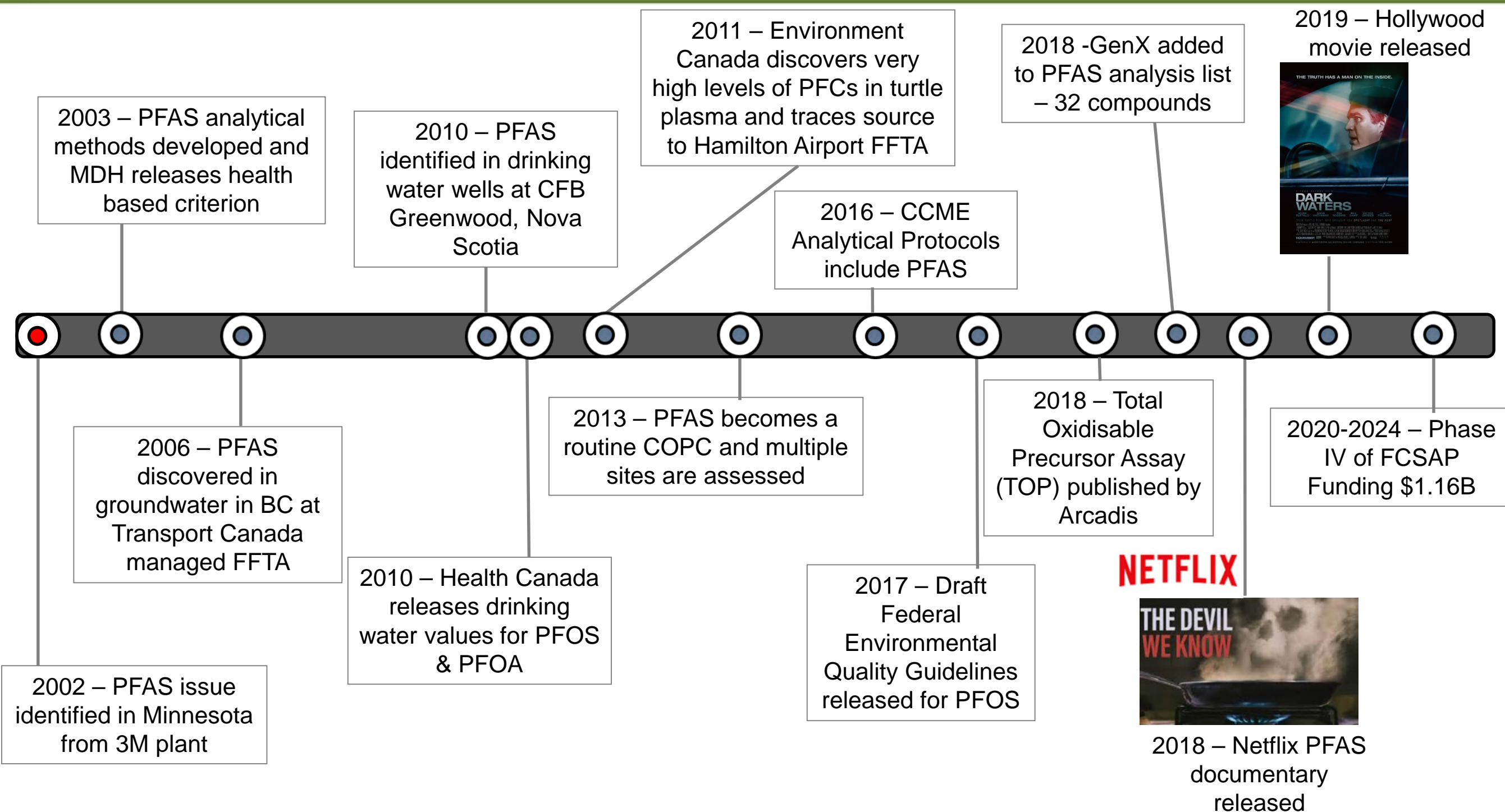


PFAS Sites in Canada

NEWFOUNDLAND	
1 Wabush Airport	33 London Airport
2 Gander Airport	34 Ottawa Airport
3 St. Anthony Airport	35 Sault Ste Marie Airport
4 CFB Gander / 9 Wing Royal Canadian Air Force	36 Thunder Bay Airport
5 St. John's Airport	
NOVA SCOTIA	
6 CFB Halifax	MANITOBA
7 Halifax Airport	37 Winnipeg Airport
8 CFB Greenwood / 14 Wing Royal Canadian Air Force	38 17 Wing Royal Canadian Air Force
9 CFB Shearwater / 12 Wing Shearwater	39 Churchill Airport
10 Canadian Forces Station Barrington	
PEI	
11 Charlottetown Airport	SASKATCHEWAN
NEW BRUNSWICK	
12 Moncton Airport	40 15 Wing Royal Canadian Air Force
13 Saint John Airport	41 15 Wing Detachment Royal Canadian Air Force
14 Fredericton Airport	42 La Ronge Airport
QUEBEC	
15 Firefighting activity	ALBERTA
16 Sept-Îles Airport	43 CFB Edmonton
17 Schefferville Airport	44 CFB Wainwright
18 Montreal Mirabel Airport	45 4 Wing Royal Canadian Air Force
19 Îles-de-la-Madeleine Airport	46 Crash site
20 Kuujuaq Airport	47 Calgary Airport
21 Munitions Experimental Test Centre	
22 CFB Valcartier	BRITISH COLUMBIA
23 CFB Bagotville / 3 Wing Royal Canadian Air Force	48 Sandspit Airport
ONTARIO	
24 Toronto Pearson Airport	49 Penticton Airport
25 North Bay Airport	50 Prince George Airport
26 22 Wing Royal Canadian Air Force	51 Victoria Airport
27 Hamilton Airport	52 Port Hardy Airport
28 Firefighting activity	53 Williams Lake Airport
29 National Research Council's National Fire Laboratory	54 CFB Comox / 19 Wing Royal Canadian Air Force
30 CFB Borden	55 CFB Esquimalt
31 Bear Creek, Nottawasaga River, Pine River	56 Campbell River Airport
32 CFB Trenton / 8 Wing Royal Canadian Air Force	57 Abbotsford Airport
	NUNAVUT
	58 Canadian Forces Station Alert
	59 Cambridge Bay Airport
	YUKON
	60 Watson Lake Airport
	NORTHWEST TERRITORIES
	61 Inuvik Airport
	cbc.ca/quirks
	CBCRADIOONE



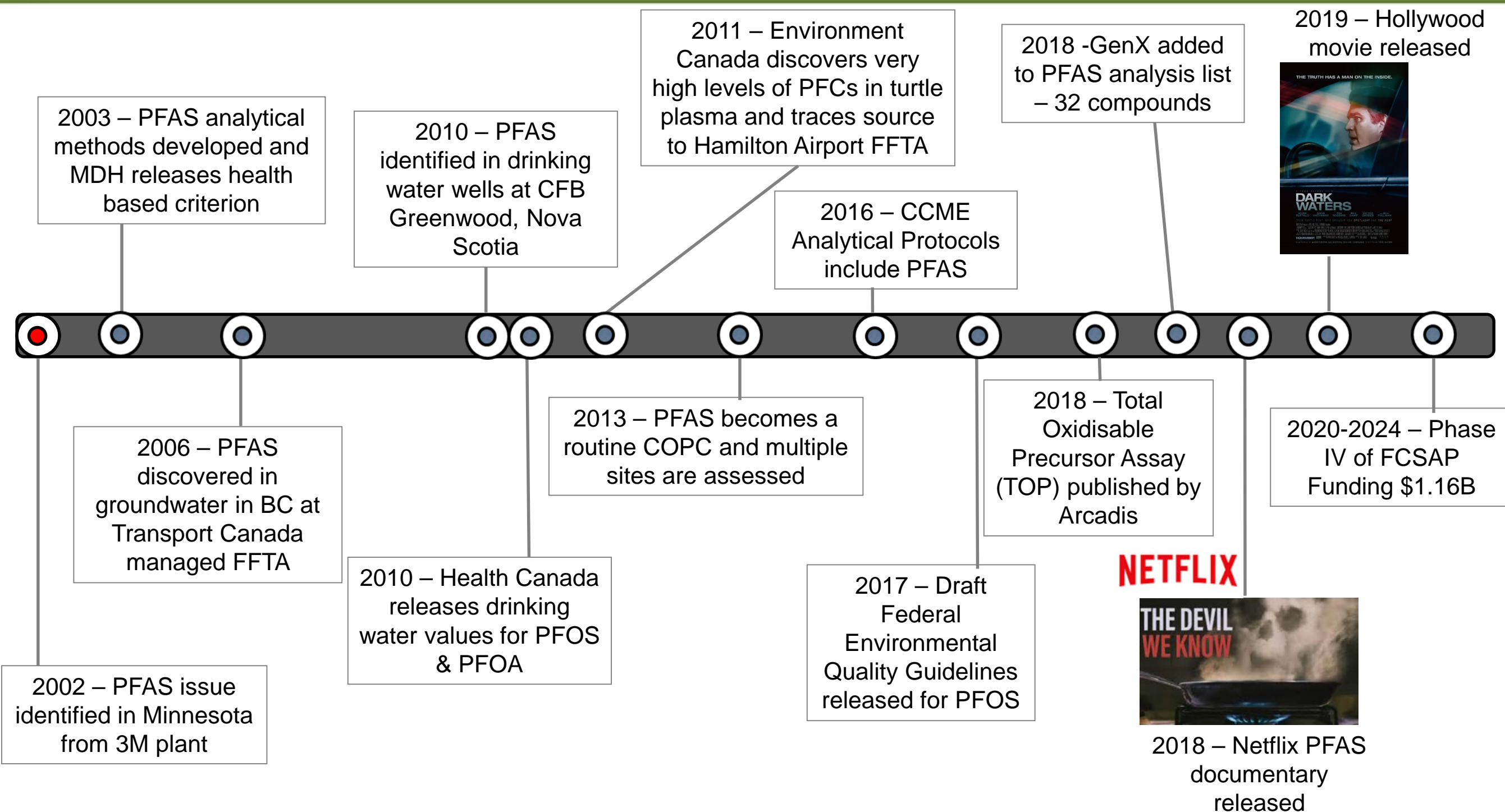
PFAS History in Canada



AGAT PFAS Capabilities

Parameter	Unit	RDL	Unit	RDL
Perfluorobutanoic Acid PFBA	ng/L	1.0	ug/kg	1.0
Perfluoropentanoic Acid PFPeA	ng/L	1.0	ug/kg	1.0
Perfluorohexanoic Acid PFHxA	ng/L	1.0	ug/kg	1.0
Perfluoroheptanoic Acid PFHpA	ng/L	1.0	ug/kg	1.0
Perfluorooctanoic Acid PFOA	ng/L	1.0	ug/kg	1.0
Perfluorononanoic Acid PFNA	ng/L	1.0	ug/kg	1.0
Perfluorodecanoic Acid PFDA	ng/L	1.0	ug/kg	1.0
Perfluoroundecanoic Acid PFUnA	ng/L	1.0	ug/kg	1.0
Perfluorododecanoic Acid PFDoA	ng/L	1.0	ug/kg	1.0
Perfluorotridecanoic Acid PFTTrDA	ng/L	1.0	ug/kg	1.0
Perfluorotetradecanoic Acid PFTeDA	ng/L	1.0	ug/kg	1.0
Perfluorobutanesulfonic Acid PFBS	ng/L	1.0	ug/kg	1.0
Perfluorohexasulfonic Acid PFHxS	ng/L	1.0	ug/kg	1.0
Perfluoroheptanesulfonate PFHpS	ng/L	1.0	ug/kg	1.0
Perfluorooctasulfonic Acid PFOS	ng/L	1.0	ug/kg	1.0
Perfluorooctanesulfonamide Acid PFOSA	ng/L	1.0	ug/kg	1.0
Perfluorodecanesulfonic Acid PFDS	ng/L	1.0	ug/kg	1.0
N-Methylperfluorosulfonamideacetic N-MeFOSAA	ng/L	1.0	ug/kg	1.0
N-Ethylperfluorosulfonamideacetic N-EtFOSAA	ng/L	1.0	ug/kg	1.0
2H-Perfluorooctenoic acid (6:2) C6 6:2-FTUCA	ng/L	2.0	ug/kg	2.0
2H-Perfluorodecanoic acid (8:2) C8 8:2-FTUCA	ng/L	2.0	ug/kg	2.0
2H-Perfluorododecanoic acid (10:2) C10 10:2-FTUCA	ng/L	2.0	ug/kg	2.0
1H, 1H, 2H, 2H-Perfluorohexane sulfonate (4:2) C4	ng/L	2.0	ug/kg	2.0
1H, 1H, 2H, 2H-Perfluorooctane sulfonate (6:2) C6	ng/L	2.0	ug/kg	2.0
1H, 1H, 2H, 2H-Perfluorodecane sulfonate (8:2) C8	ng/L	2.0	ug/kg	2.0
1H, 1H, 2H, 2H-Perfluorododecane sulfonate (10:2)	ng/L	2.0	ug/kg	2.0
N-methylperfluorooctane sulfonamide C8 NMeFOSA	ng/L	2.0	ug/kg	2.0
N-ethylperfluorooctane sulfonamide C8 NEtFOSA	ng/L	2.0	ug/kg	2.0
Sodium Dodecafluoro-3H-4,8-dioxanonoate (aDONA)	ng/L	2.0	ug/kg	2.0
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	ng/L	2.0	ug/kg	2.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonate (PF3ONS)	ng/L	2.0	ug/kg	2.0
11-Chloroeicosafluoro-3-oxaundeca-1-sulfonate (PF3OUdS)	ng/L	2.0	ug/kg	2.0

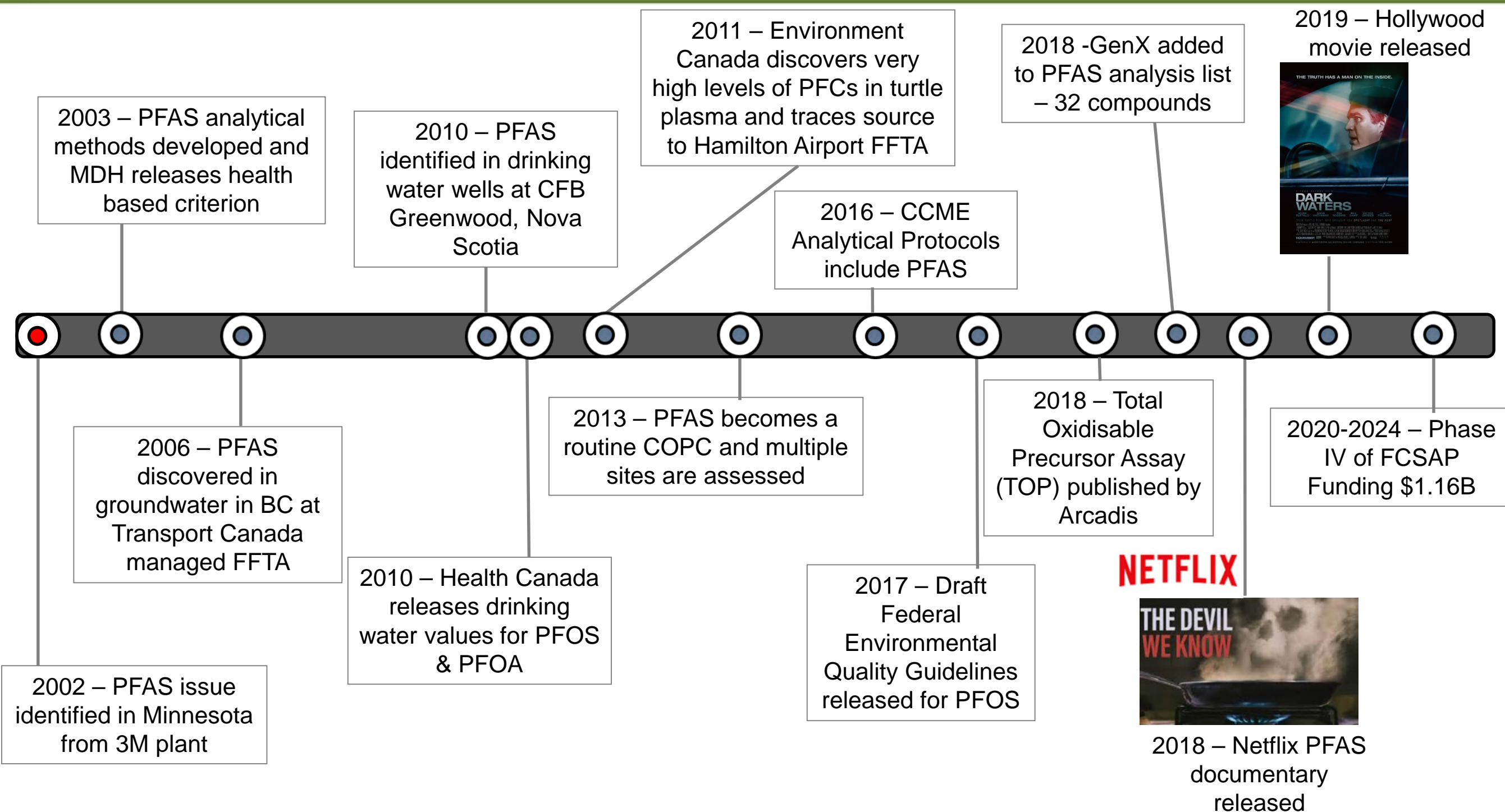
PFAS History in Canada



Dark Waters – Released Dec. 6, 2019



PFAS History in Canada



Continued Research

COMMENTARY

WILEY

PFAS Experts Symposium: Statements on regulatory policy, chemistry and analytics, toxicology, transport/fate, and remediation for per- and polyfluoroalkyl substances (PFAS) contamination issues

John A. Simon¹ | Stew Abrams² | Tim Bradburne³ | Dan Bryant⁴ | Matthew Burns⁵ | Daniel Cassidy⁶ | John Cherry⁷ | Sheau-Yun (Dora) Chiang⁸ | Douglas Cox⁹ | Michelle Crimi¹⁰ | Elizabeth Denly¹¹ | Bill DiGuseppi¹² | Jim Fenstermacher¹³ | Stephanie Fiorenza¹⁴ | Joseph Guarnaccia¹⁵ | Nathan Hagelin¹⁶ | Linda Hall¹⁷ | John Hesemann¹⁸ | Erika Houtz¹⁹ | Stephen S. Koenigsberg²⁰ | Francois Lauzon²¹ | Jeffrey Longworth²² | Tom Maher²³ | Angus McGrath²⁴ | Ravi Naidu²⁵ | Charles J. Newell²⁶ | Beth L. Parker²⁷ | Tadbir Singh²⁸ | Paul Tomiczek²⁹ | Rick Wice³⁰

¹Nathan Associates Inc, Arlington, VA

²Langan

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⁴Woodard & Curran

⁵WSP

⁶Western Michigan University

⁷University of Guelph

⁸CDM Smith

⁹GHD

¹⁰Clarkson University

¹¹TRC

Abstract

Sixty leading members of the scientific, engineering, regulatory, and legal communities assembled for the PFAS Experts Symposium in Arlington, Virginia on May 20 and 21, 2019 to discuss issues related to per- and polyfluoroalkyl substances (PFAS) based on the quickly evolving developments of PFAS regulations, chemistry and analytics, transport and fate concepts, toxicology, and remediation technologies. The Symposium created a venue for experts with various specialized skills to provide opinions and trade perspectives on existing and new approaches to PFAS assessment and remediation in light of lessons learned managing other contaminants encoun-

Continued Research

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Department of Environment, Great Lakes, and Energy

Michigan PFAS Action Response Team

HEALTH

DRINKING WATER

INVESTIGATIONS

TESTING

FISH AND WILDLIFE

PFAS FOAM

MPART

PFAS RESPONSE / MPART / TREATMENT TECHNOLOGY ROUNDTABLE

Treatment Technology Roundtable

The Michigan PFAS Action Response Team (MPART) formed the PFAS Treatment Technology Roundtable (TTR) to facilitate and support research, development, implementation, and education on treatment and remediation technologies for PFAS contamination in Michigan. Members represent state and federal agencies, industry, utilities, consultants, and researchers. The TTR is focused on issues most relevant to Michigan, including: the creation of a lasting network for information sharing and coordination; reviewing new technologies; and hosting an informative **Great Lakes PFAS Summit, now a virtual event occurring October 26 – 30, 2020.**

The conference will focus on various PFAS topics, including: rules and regulations; public health and communication; pollution prevention; materials management; sampling and analytical; treatment technology and research; and PFAS in agriculture and natural resources.



ARE YOU A VENDOR/RESEARCHER/CONSULTANT WITH AN INNOVATIVE TREATMENT TECHNOLOGY FOR PFAS?



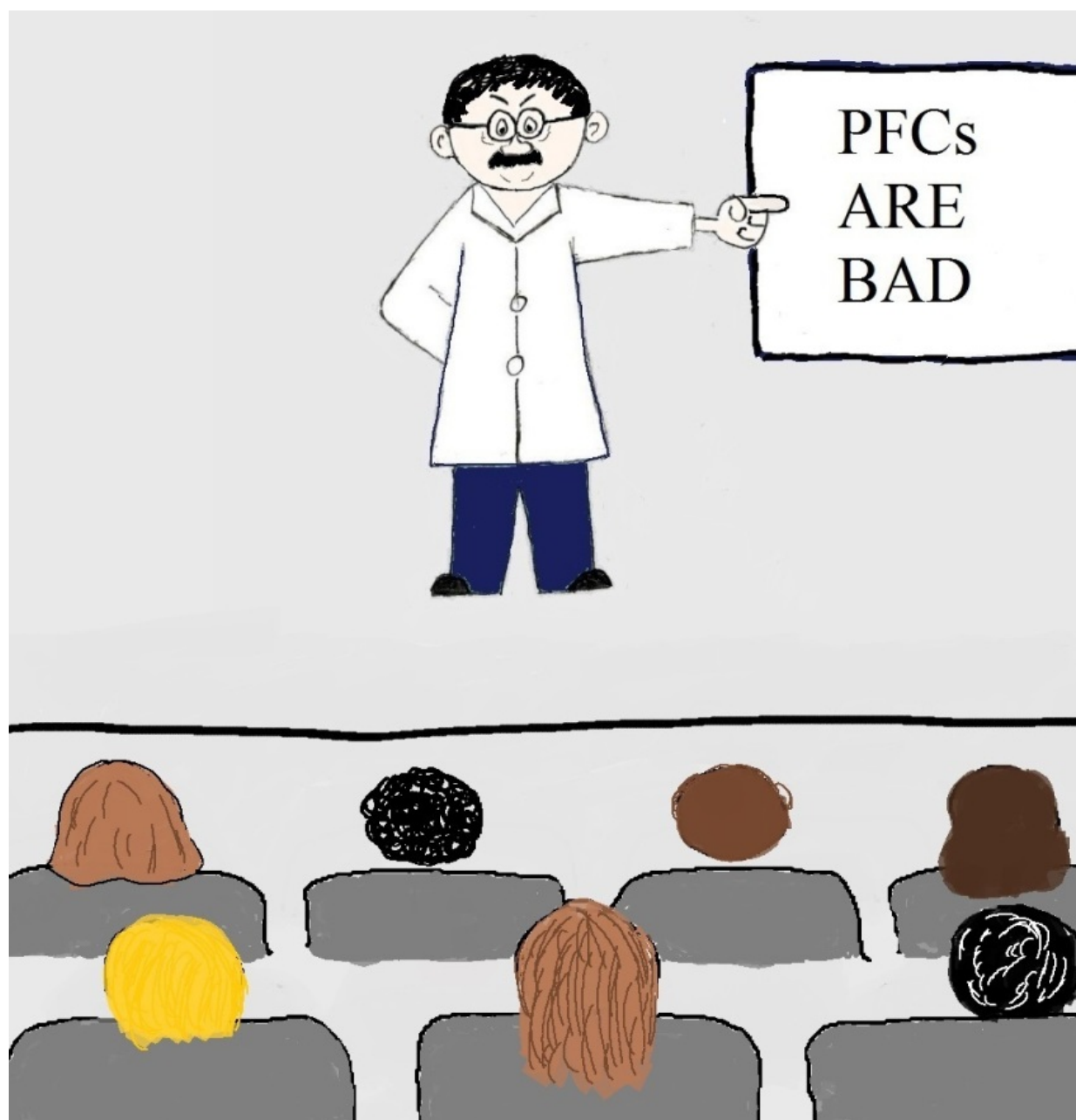
The **Vendor Documentation Form** will be **required** for all vendors approaching EGLE with treatment technology innovations. This form will help document contact, allow for side-by-side review of comparable technologies, and categorize technologies for potential further interaction with the TTR. Interested vendors should fill out the Vendor Documentation Form, which is hosted on SurveyMonkey. Email documents associated with the submission as attachments to the email provided on the form. Forms will be reviewed as appropriate and may be discussed with TTR members for input and feedback. MPART will share what we learn from these submissions.

INTERESTED IN JOINING?

AGAT PFAS Capabilities

- **Accredited for PFAS in soil, water and tissue by LC/MS/MS**
- **1 systems currently running PFAS analysis, 2 more coming online in near future**
- **32 Compound extended list including GenX**
- **TOPS Assay**
- **Technical support in project set up, field sampling design and data interpretation**

Questions?



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