PFAS Investigation Princeton

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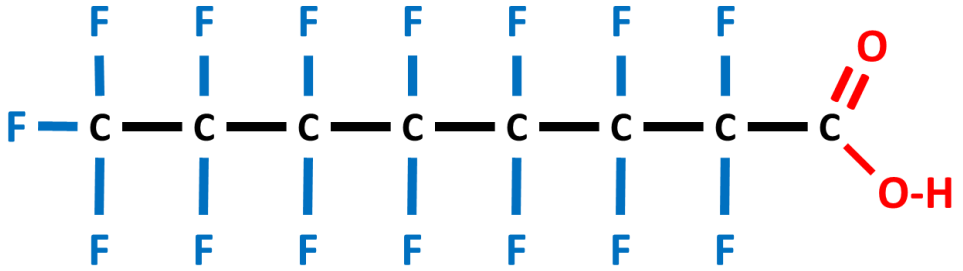
What Are PFAS?



Poly- and per**f**luoro**a**lkyl **S**ubstances

A family of thousand of compounds with varying structure
(e.g, carbon chain length)

- **Extremely stable** – Heat & Stain Resistant, Water repellant
- **"Forever chemicals"** - Very persistent, do not biodegrade
- **Water Soluble**
- **Some are very toxic**
  - Slowly excreted from the body – half lives of years (1-8+ for longer-chain)
  - Developmental risks to fetus/infants
  - Endocrine Disruption
  - Cancers

What Are Common Uses of PFAS?

- Textile treatments: stain resistance/ water repellency
- Paper coatings: grease resistant
- “Waxes”: some floor, car, ski
- Hairsprays
- “Waterproof” down
- Manufacturing
- Aqueous Fire-fighting Foam (AFFF)

Most Americans are exposed to some levels of PFAS through use of consumer products

What Are Exposures of Concern for PFAS?

Sensitive groups – *including pregnant women, nursing mothers and infants* – drinking (and cooking with) contaminated water in a residential setting

(sensitivity – concentration – frequency)

Water uses that pose (relatively) *less* concern include:

- Water use by individual *not* considered in "sensitive group"
- Non-residential water use – *restaurants, workplace*
- Water use for other purposes – *bathing, washing vegetables*

Ways an individual may reduce potential exposure:

- Drink & cook with bottled water
- Use a home water treatment system (NSF certification)

THREE CATEGORIES OF PUBLIC WATER SYSTEMS, WHICH ARE SYSTEMS THAT SERVE 25 OR MORE PEOPLE:

- **COMMUNITY** SYSTEMS SERVE THE SAME 25 PEOPLE YEAR ROUND.
- **NON-TRANSIENT NON-COMMUNITY** SYSTEMS SERVE THE SAME 25 PEOPLE MORE THAN 4 HOURS/DAY,4 DAYS/WEEK, 6 MONTHS/YEAR.
- **TRANSIENT NON-COMMUNITY** SYSTEMS SERVE 25 DIFFERENT PEOPLE MORE THAN 60 DAYS/YEAR

EPA'S UNREGULATED CONTAMINANT MONITORING RULE

- Applies to systems that serve more than 10,000 people
- Designed to collect information about contaminants that should be regulated but aren't currently
- Every five years, sampling for 20-30 emerging contaminants
- In the third round of the rule from 2012 to 2016, six PFAS compounds were on the list (PFOS, PFOA, PFNA,PFHxS, PFHpA, AND PFBS)
- Based on the data collected from across the country, in 2016 EPA set a national health advisory of 70 ppt for two of the most commonly found PFAS: PFOA and PFOS

Regulatory Status of PFAS

- May 2016 EPA issues Health Advisory of 70 ppt for PFOS and PFOA combined
- June 2018 MassDEP Office of Research and Standards Guideline for Drinking Water (ORSG)
  - Extended to very closely related compounds that have less extensive data based on similarities in chemical structures; half lives; effects
  - 70 ppt for PFOS, PFOA, plus **PFHxS, PFHpA, PFNA**

- December 2019 MassDEP issues groundwater cleanup standard of 20 ppt for six PFAS compounds, adding **PFDA**. MassDEP also proposes the same number as a Maximum Contaminant Level (MCL) for drinking water; that proposal is open for public comment.

- January 2020 MassDEP lowers the ORSG from 70 ppt for five PFAS compounds to 20 ppt for the total sum of 6 PFAS (PFOS, PFOA, PFHxS, PFHpA, PFNA, PFDA).

Drinking Water Values for PFAS (parts per trillion; ppt) (1/20)

	PFOS	PFOA	PFNA	PFHxS	PFHpA	PFDA
USEPA Health Advisories	70 Sum of two		NA	NA	NA	NA
MA	70 (2018 ORSG) → 20 (GW standard; proposed MCL) Sum of five → Sum of six (adds PFDA)					
VT GW standard	20 Sum of five					NA
CT Action Levels	70 Sum of five					NA
WI Recommended GW standard	20					
ATSDR Based on draft ATSDR toxicity values	7	11	10	70	NA	NA
NY Recommended MCL	10	10	NA	NA	NA	NA
NJ MCL or recommended	13	14	13	NA	NA	NA
CA Notification levels (9/19)	6.5	5.1	NA	NA	NA	NA
MI Health-based values	16	8	6	51	NA	PFNA value
MN Drinking water guidelines	15	35	NA	47	NA	NA
NH MCLs (7/18/2019)	15	12	11	18	NA	NA
Most other states (EPA value by default)	70		NA	NA	NA	NA

Princeton Town Campus Sampling

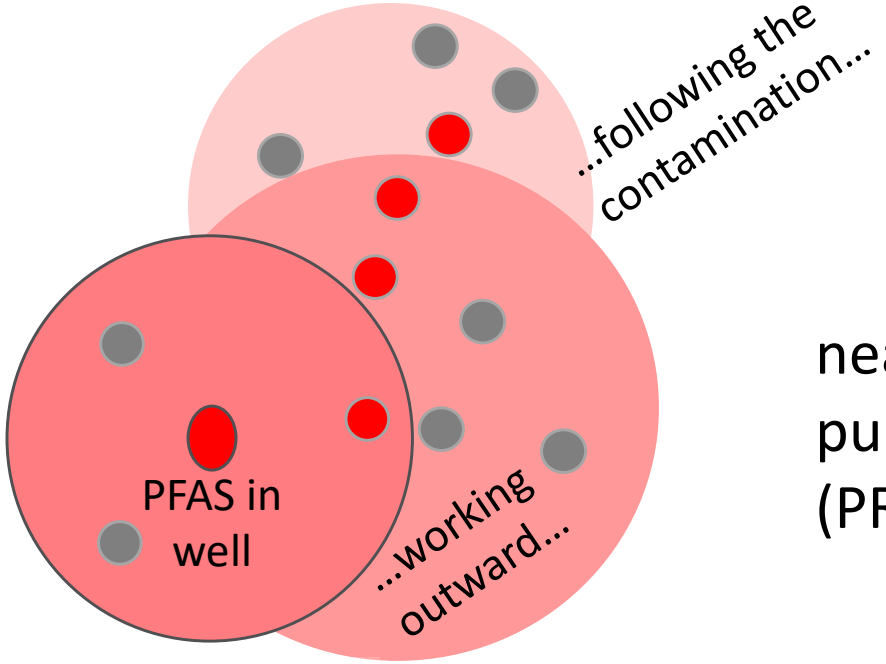
Public Water Supply Well serving Town Campus:
Town Hall, Library, Public Safety Building

September 5, 2019: 124.7 ppt

September 27, 2019 100.2 ppt

Average result 112.45 ppt

Bring Releases Into the MCP



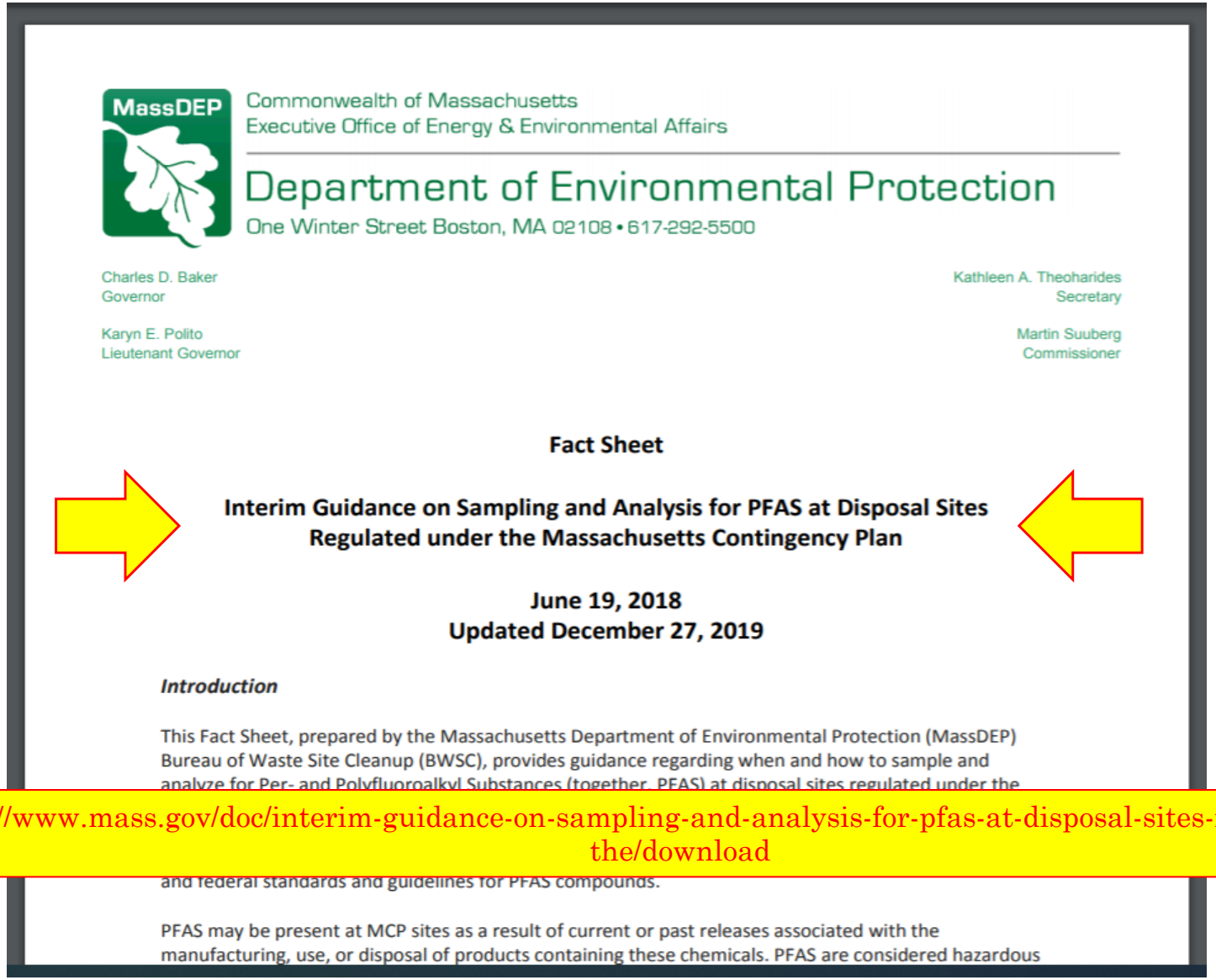
Sample Private Wells in Area…

- **Source Discovery**
  Issue Requests for Information (RFIs) and
  Notices of Responsibility (NORs)

- **Sampling private wells**

near known PFAS-contaminated public wells or known sources (PRP-lead or MassDEP)

When to Sample for PFAS



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Fact Sheet

Interim Guidance on Sampling and Analysis for PFAS at Disposal Sites Regulated under the Massachusetts Contingency Plan

June 19, 2018
Updated December 27, 2019

Introduction

This Fact Sheet, prepared by the Massachusetts Department of Environmental Protection (MassDEP) Bureau of Waste Site Cleanup (BWSC), provides guidance regarding when and how to sample and analyze for Per- and Polyfluoroalkyl Substances (together, PFAS) at disposal sites regulated under the

and federal standards and guidelines for PFAS compounds.

PFAS may be present at MCP sites as a result of current or past releases associated with the manufacturing, use, or disposal of products containing these chemicals. PFAS are considered hazardous

https://www.mass.gov/doc/interim-guidance-on-sampling-and-analysis-for-pfas-at-disposal-sites-regulated-under-the/download

MCP PFAS Notification Criteria & Cleanup Standards

Reportable Concentrations (RCs) in Groundwater (310 CMR 40.1600)

- RCGW-1: triggers notification/action in areas protected for current or future use as drinking water source
  VALUES: Sum of 6 PFAS, 20 ppt
- RCGW-2: triggers notification/action everywhere else
  VALUES: PFAS-specific, ranging from 500,000 – 40,000,000 ppt
- Notification to MassDEP required for:
  - Detection of PFAS in a public or private water supply well
  - Detection of PFAS in the Zone I of a public water supply well
  - Detection of PFAS > RCGW-1 within 500 ft. of private well

Princeton Town Campus Sampling

- Town Well results
  - September 5, 2019: 124.7 ppt
  - September 27, 2019 100.2 ppt

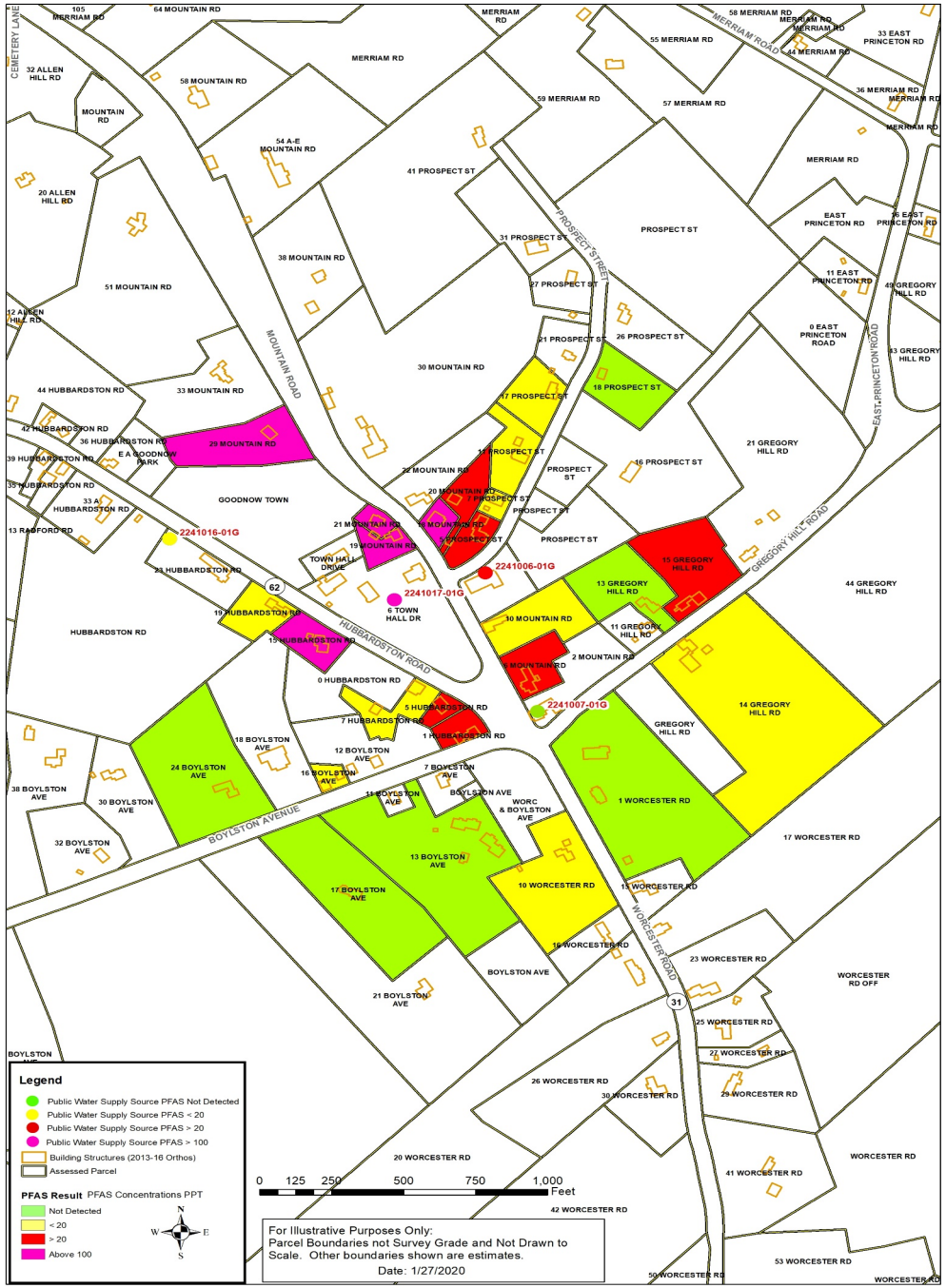
- MassDEP issues a Notice of Responsibility (NOR)to the Town, requiring:
  - Sampling of all private wells within 500 ft. of the Town Well and any new detections
  - Provision of bottled water or treatment for affected residents
  - Sampling of monitoring wells at Public Safety Building

Princeton Town Campus Sampling

- Sampling of 29 drinking water wells since December 2019 has detected PFAS concentrations range from non-detect to 421 ppt.
- Sampling of 4 groundwater monitoring wells at the Public Safety Building detected PFAS concentrations ranging from 29 ppt to 350 ppt.

Princeton Town Campus Sampling

7 Non-detect
10 <20 ppt
12 > 20 ppt



MassDEP Drinking Water Program

Per- and Polyfluoroalkyl Substances (PFAS) in Private Well Drinking Water Supplies FAQ

Introduction

This fact sheet provides answers to questions frequently asked by private well owners about per- and polyfluoroalkyl Substances (PFAS) in a private drinking water supply. A separate MassDEP fact sheet "PFAS in Drinking Water: Questions and Answers for Consumers" describes the sources of PFAS compounds, health effects, and MassDEP recommendations to reduce consumer exposure. This consumer factsheet is available at https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers. In addition, Massachusetts Department of Public Health has issued the following factsheet on PFAS in drinking water located at https://www.mass.gov/doc/per-and-polyfluoroalkyl-substances-pfas-in-drinking-water

What are PFAS?

PFAS are a group of man-made chemicals manufactured and used in a variety of consumer products and industries throughout the world. Two PFAS chemicals, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were extensively produced and are the most studied and regulated of these chemicals. Several other PFAS that are similar to PFOS and PFOA exist. These PFAS are contained in some firefighting foams used to extinguish oil and gas fires. They have also been used in a number of industrial processes and to make carpets, clothing, fabrics for furniture, paper packaging for food, and other materials (e.g., cookware) that are resistant to water, grease, and stains. Because these chemicals have been used in many consumer products, most people have been exposed to them.

What are the levels of concern for PFAS chemicals?

PFAS Drinking Water Levels of Concern or Limits in Massachusetts				
Organization	**Date**	**Criterion**	**Levels of concern in parts trillion (ppt) or ng/L**	**Status**
US EPA	2016	Health Advisory	70 - Individually or for the sum of PFOS and PFOA	current
MassDEP	2020	ORSG[1]	20 - Individually or for the sum of PFOS, PFOA, PFHxS, PFHpA, PFNA, and PFDA	current
MassDEP Bureau of Waste Site Cleanup (BWSC)	2019	groundwater cleanup standard, GW-1	20 - Individually or for the sum of PFOS, PFOA, PFHxS, PFHpA, PFNA, and PFDA	current
MassDEP	2019	Maximum Contaminant Level (MCL)	20 - Individually or for the sum of PFOS, PFOA, PFHxS, PFHpA, PFNA, and PFDA	proposed

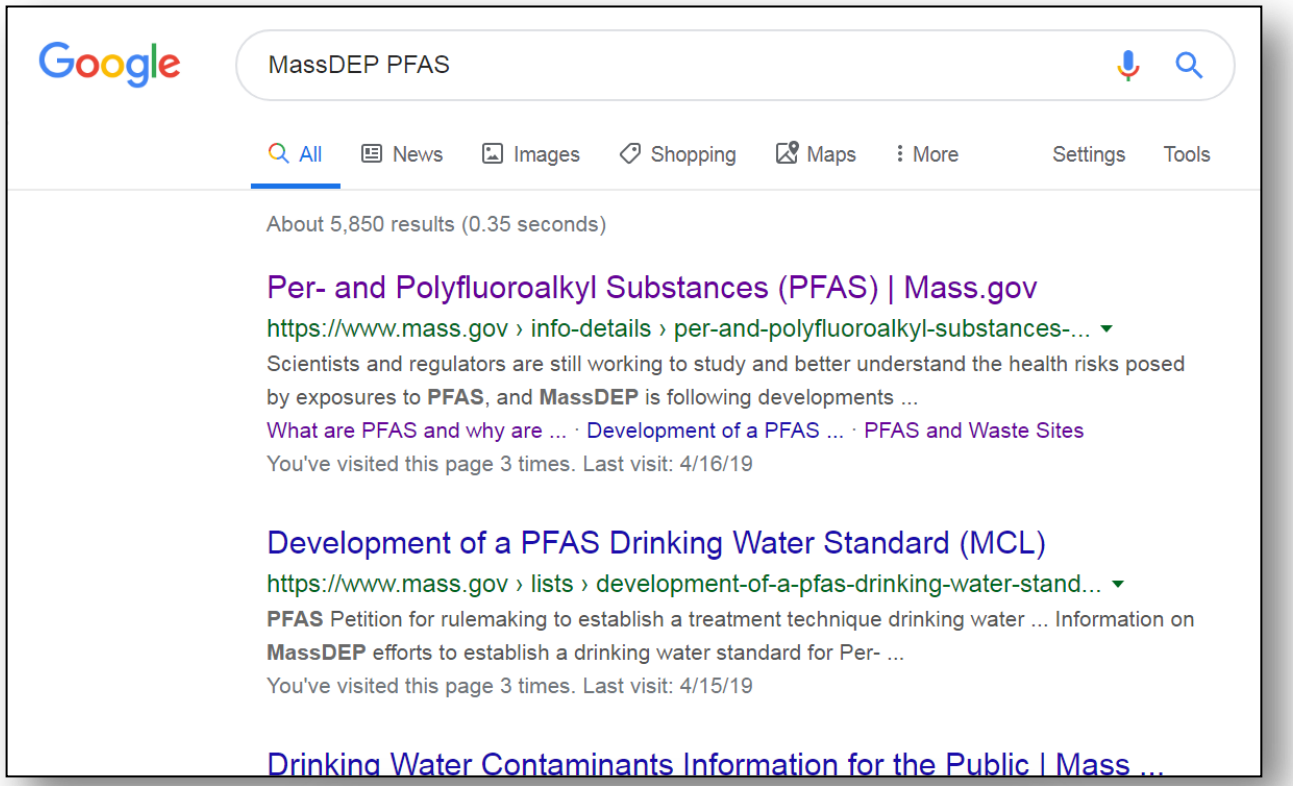
[1] Office of Research and Standards Guideline

Upcoming Activity

- Additional private well testing and source discovery.
- January 31, 2020 Public Hearing for MCL
  (MassDEP Central Regional Office, 8 NewBond St., Worcester @ 10:00 am and LIVE on MassDEP's YouTube channel… Youtube.com/MassDEP)
- Public Comment Period closes February 28, 2020

More Information…

Just Google… *MassDEP PFAS*



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