

***Our nation's leaders are asking the right questions on PFAS. Industry stands ready to answer those questions backed by the best available science. Let's work together to understand the real science on PFAS because our communities depend on it.***

- *Industry cares deeply about the safety and health of our employees, customers, and the communities in which we operate.*
- *Currently, there is significant public confusion over the meaning of some statements by agencies and health organizations on the potential health effects associated with PFOS or PFOA exposures.*
- *Hundreds of studies related to PFAS have been conducted and published over the past 30 years – and the weight of current scientific evidence **does not** show that PFOS or PFOA cause adverse health effects in humans at current levels of exposure.*
- Regulatory decisions should be based on sound science and realistic risk assessments – and industry is committed to furthering scientific research of PFOS and PFOA and to working with regulators, scientists, and community stakeholders.

**Background on PFOS and PFOA:**

- PFOS and PFOA are two PFAS chemicals, that many companies manufactured and/or used in important applications. They are non-wetting, non-stick, fire resistant, and temperature resistant. Manufacture, use and disposal of these chemistries was legal.
- PFAS are valuable in many important applications across many industries such as: medical devices, low emission transportation, fire suppression, fire-safe durable roofs for large events, electronics (precision cleaning of parts) and pharmaceutical manufacturing, fuel cell membranes, industrial heat transfer and recovery (semiconductor manufacturing), flame retardants, corrosion protection and emission reduction in chemical and power plants.
- Key among these products is aqueous film forming foam (AFFF). AFFF is a product containing PFAS that is used by the US military, fire brigades, and airport safety professionals because it saves lives and property and is so effective in fighting fuel-fed fires.
- 3M announced that it would voluntarily phase out of manufacture and use of PFOS and PFOA in 2000, which was completed worldwide by about 2008. Other manufacturers began to phase out of production and use of PFOA under EPA's Stewardship plan, which set a target date of 2015 for completion.

**Presence of PFOS and PFOA Does Not Equal Harm:**

- The presence of PFAS in the human body does not mean that an individual's health has been harmed and does not mean that there is a risk of adverse health effects.
- Data from the American Red Cross show that, as of 2015, levels of PFOS and PFOA in the general U.S. population had declined 70-80% since 2000 and levels continue to decline.
- The weight of scientific evidence does not show that PFOA or PFOS cause health effects in humans.
- There is significant public confusion over the meaning of some statements by agencies and health organizations on the potential health effects associated with PFOS or PFOA exposures. One area of confusion involves cancer.
- Neither EPA nor the International Agency for Research on Cancer (IARC) has determined that PFOS or PFOA causes cancer in people.
- Importantly, even ATSDR itself acknowledges no cause and effect: "The available human studies have identified some potential targets of toxicity; however, cause and effect relationships have not been established for any of the effects, and the effects have not been consistently found in all studies."

## ***Essential Uses and Applications of PFAS***



**Low Emission Transportation:**  
**Combustion Engine &  
Alternative Energy  
Aerospace**



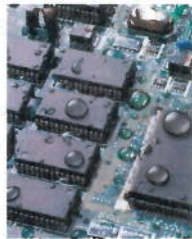
**Medical Applications**



**Fire-safe, durable  
roof for large events**



**Carpet Protection**



**SemiConductor & Pharmaceutical  
Manufacturing**



**Corrosion Protection &  
Emission Reduction  
Chemical & Power plants**



**Energy Recovery & Heat Transfer  
Data Center Cooling**



**Fire Suppression**



**Low Fat - Non Stick  
Cooking & Baking**

### ***Glossary / Terminology:***

***PFAS = Perfluoroalkyl and Polyfluoroalkyl substances***

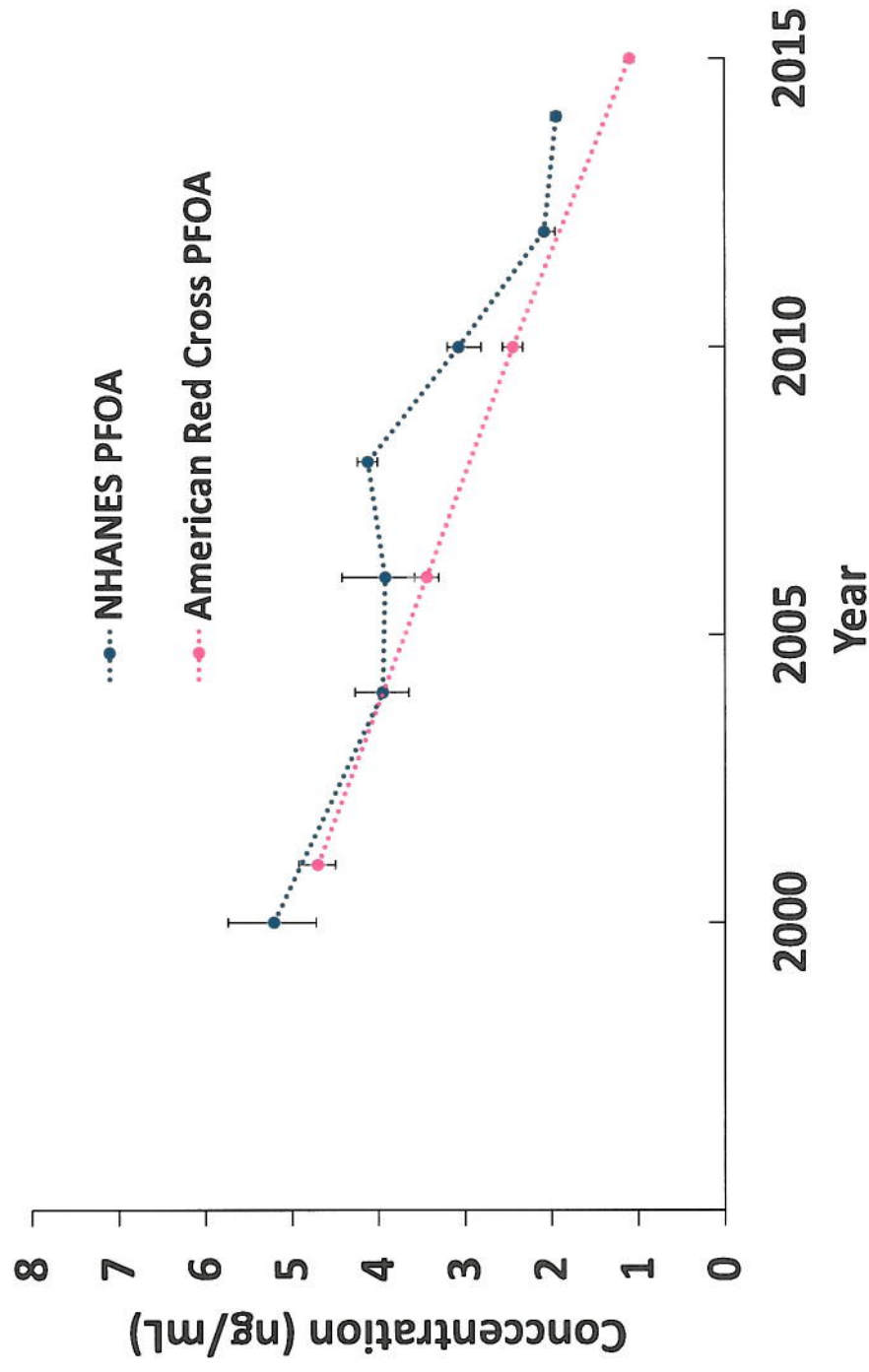
***PFOA = Perfluorooctanoic acid***

***PFOS = Perfluorooctanesulfonic acid***



# Declining of PFOA levels in the blood of US General Population

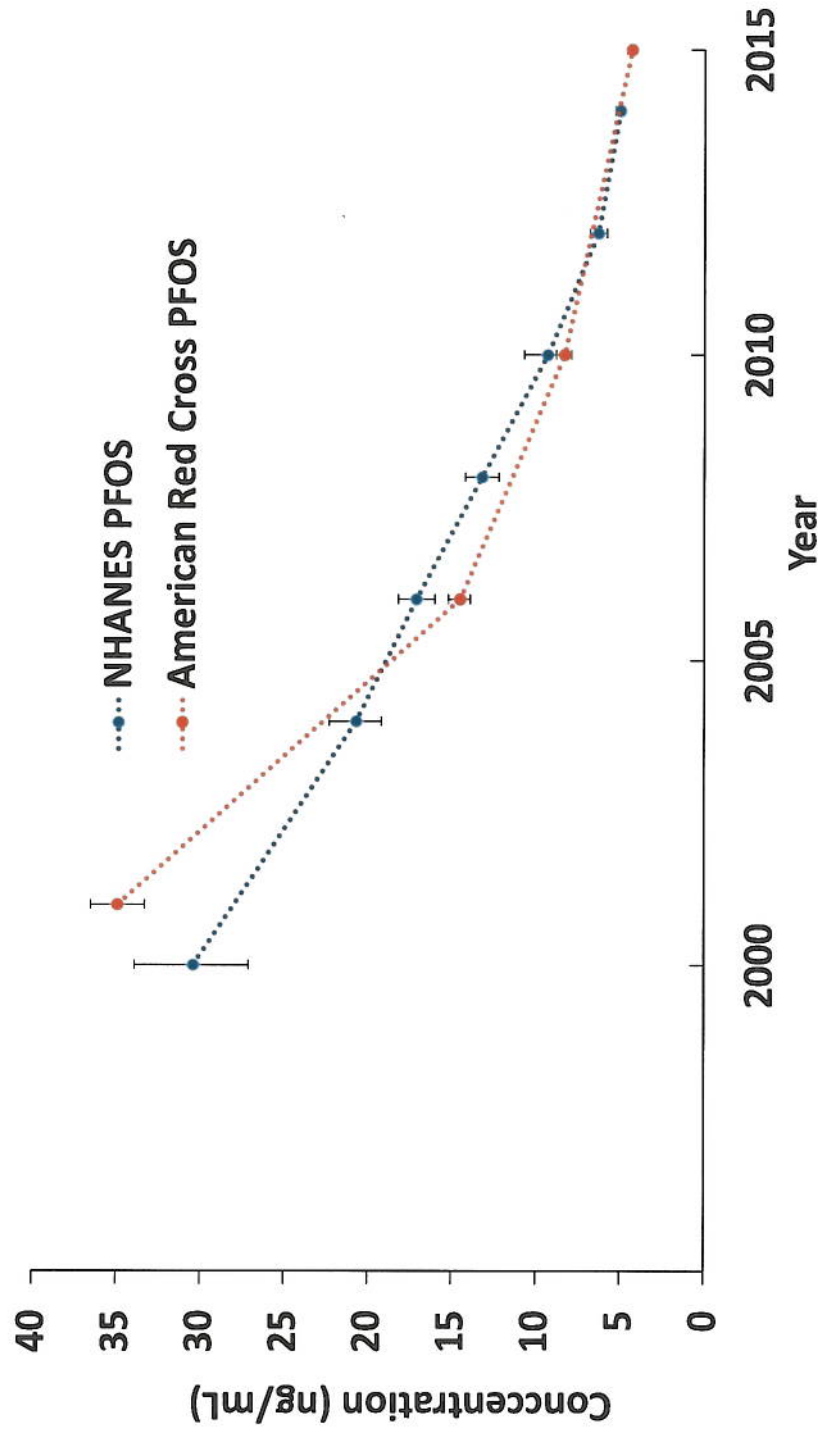
(Source: Olsen et al. 2017 Environ Res 157 87-95)





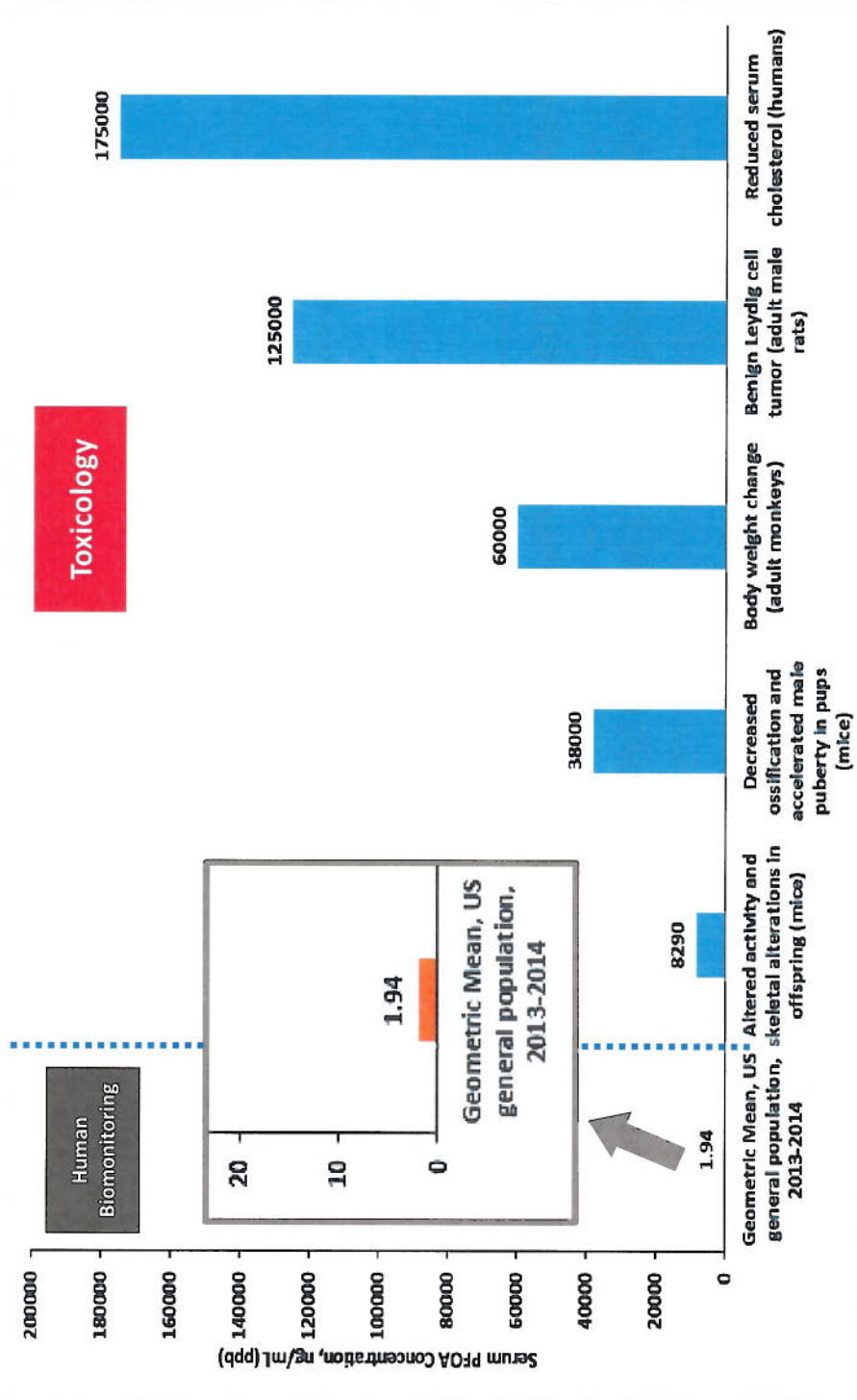
# Declining of PFOS levels in the blood of US General Population

(Source: Olsen et al. 2017 Environ Res 157 87-95)





# Comparison of Human PFOA Biomonitoring Data to Toxicology Study Endpoints



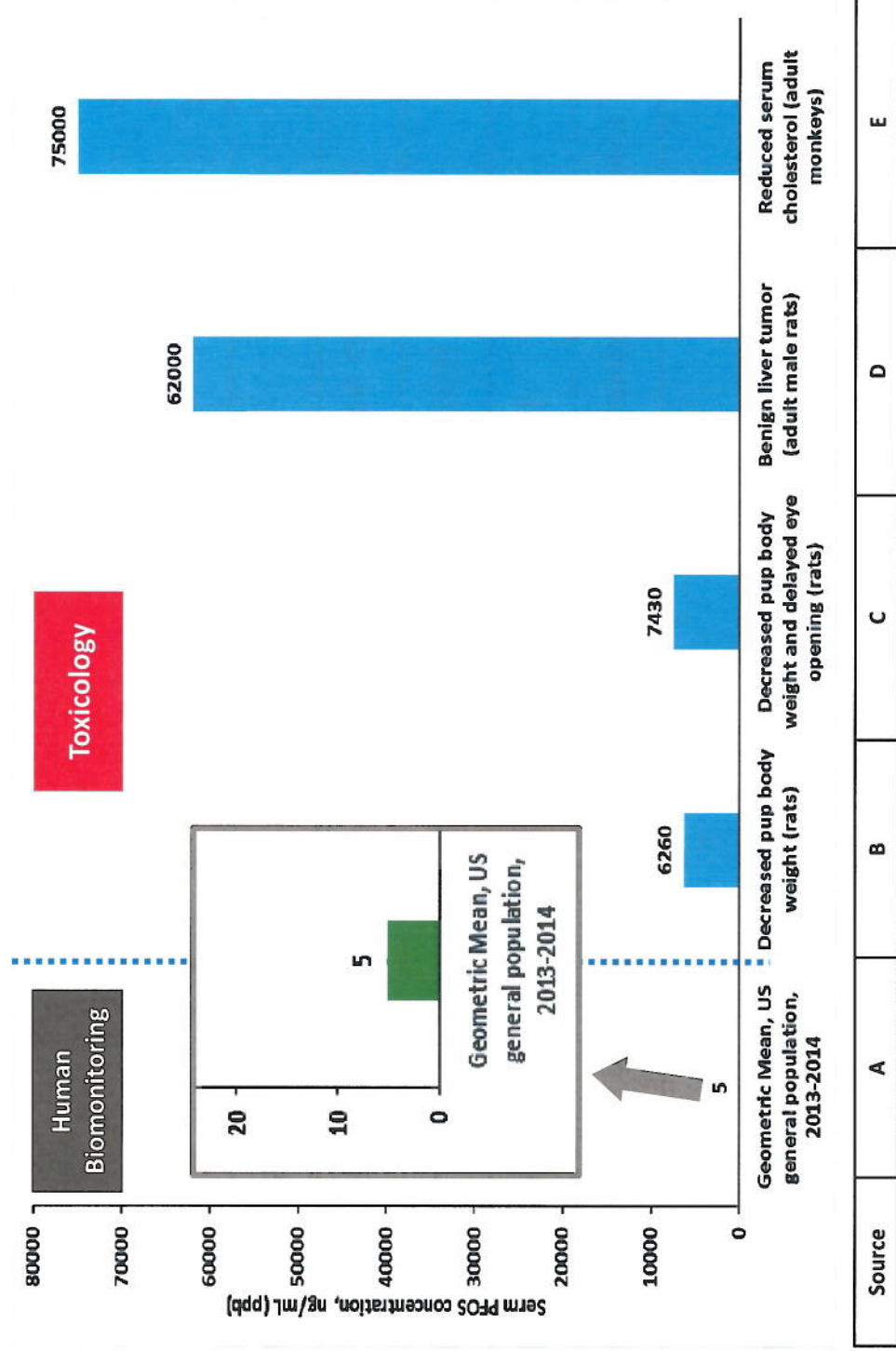
Source	A	B	C	D	E	F
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## Reference Sources (PFOA):

A	CDC NHANES, <a href="https://www.cdc.gov/biomonitoring/pdf/FourthReport_UpdatedTables_Volume1_Jan2017.pdf">https://www.cdc.gov/biomonitoring/pdf/FourthReport_UpdatedTables_Volume1_Jan2017.pdf</a>
B	ATSDR 2018 draft MRL POD (ATSDR modeled data based on Onishchenko et al. 2011 and Koskela et al. 2016)
C	USEPA 2016 LHWA POD (modeled based on data from Lau et al. 2006)
D	Butenhoff et al. 2004 Regul Toxicol Pharmacol 39 363-380
E	Butenhoff et al. 2004 Regul Toxicol Pharmacol 39 363-380
F	Convertino et al. 2018 Toxicol Sci 163 293-306



# Comparison of Human PFOS Biomonitoring Data to Toxicology Study Endpoints



## Reference Sources (PFOS):

A	CDC NHANES, <a href="https://www.cdc.gov/biomonitoring/pdf/FourthReport_UpdatedTables_Volume1_Jan2017.pdf">https://www.cdc.gov/biomonitoring/pdf/FourthReport_UpdatedTables_Volume1_Jan2017.pdf</a>
B	USEPA 2016 LHWA POD (USEPA modeled data based on Luebker et al. 2005)
C	ATSDR 2018 draft MRL POD (ATSDR modeled data based on Luebker et al. 2005)
D	Butenhoff et al. 2012 Toxicology 293 1-15 (BMDL_10 based on on PFOS 2-year cancer study)
E	Chang et al. 2017 Tox Sci 156 387-401 (BMCL_1sd based on monkey study)