

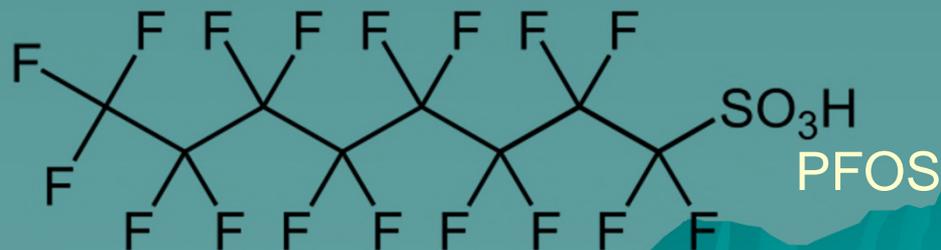
Perfluoroalkyl Chemicals

The Public Health &
Environmental Challenge
at
The Former Wurtsmith
Air Force Base

A stylized silhouette of a mountain range in a darker teal color, located at the bottom right of the slide.

Terminology

- ◆ Perfluorooctane Sulfonate (PFOS)
- ◆ Perfluorooctanoic Acid (PFOA)
- ◆ Perfluorinated or Perfluoroalkyl Chemicals (PFCs)
- ◆ Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)



Objectives

- ◆ Sense of the magnitude of the PFC issue at one Former Air Force Base
- ◆ Understanding of the complexity of dealing with these emerging contaminants at sites



Former Wurtsmith Air Force Base



**Fire Training
Pad – Site
FT02**



Clean Up Criteria

- ◆ PFOS
 - Residential drinking water: **0.220 parts per billion (ppb)** (estimated)
 - GSI: **0.012 ppb** (published)
- ◆ PFOA - Residential drinking water: **0.150 ppb** (estimated)



Characteristics of PFCs

- ◆ Ubiquitous in the environment
- ◆ Virtually indestructible
- ◆ Mobile
- ◆ Highly toxic
- ◆ At least 98% of Americans with detectable levels in their blood.
- ◆ Bioaccumulate
- ◆ Biomagnify



Why Should We Care?

Top Ten Toxic Chemicals Suspected to Cause Autism and Learning Disabilities

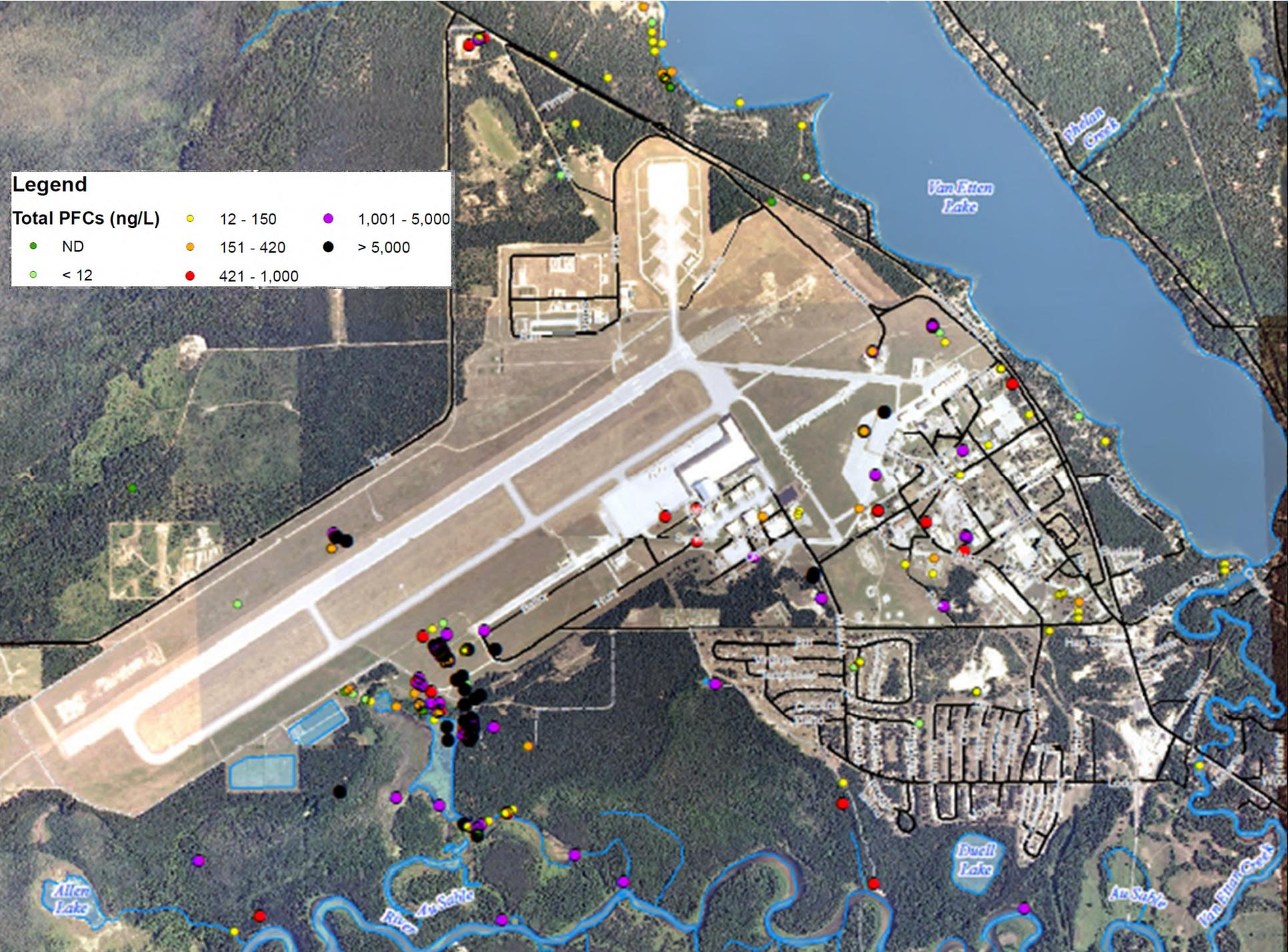
1. Lead
2. Methylmercury
3. Polychlorinated Biphenyls
4. Organophosphate pesticides
5. Organochlorine pesticides
6. Endocrine disruptors
7. Automotive exhaust
8. Polycyclic aromatic hydrocarbons
9. Brominated flame retardants
10. **Perfluorinated compounds**



**Eating these fish may
harm your health.**







| Legend | | |
|-------------------|---------------|-----------------|
| Total PFCs (ng/L) | | |
| ● ND | ● 12 - 150 | ● 1,001 - 5,000 |
| ● < 12 | ● 151 - 420 | ● > 5,000 |
| | ● 421 - 1,000 | |

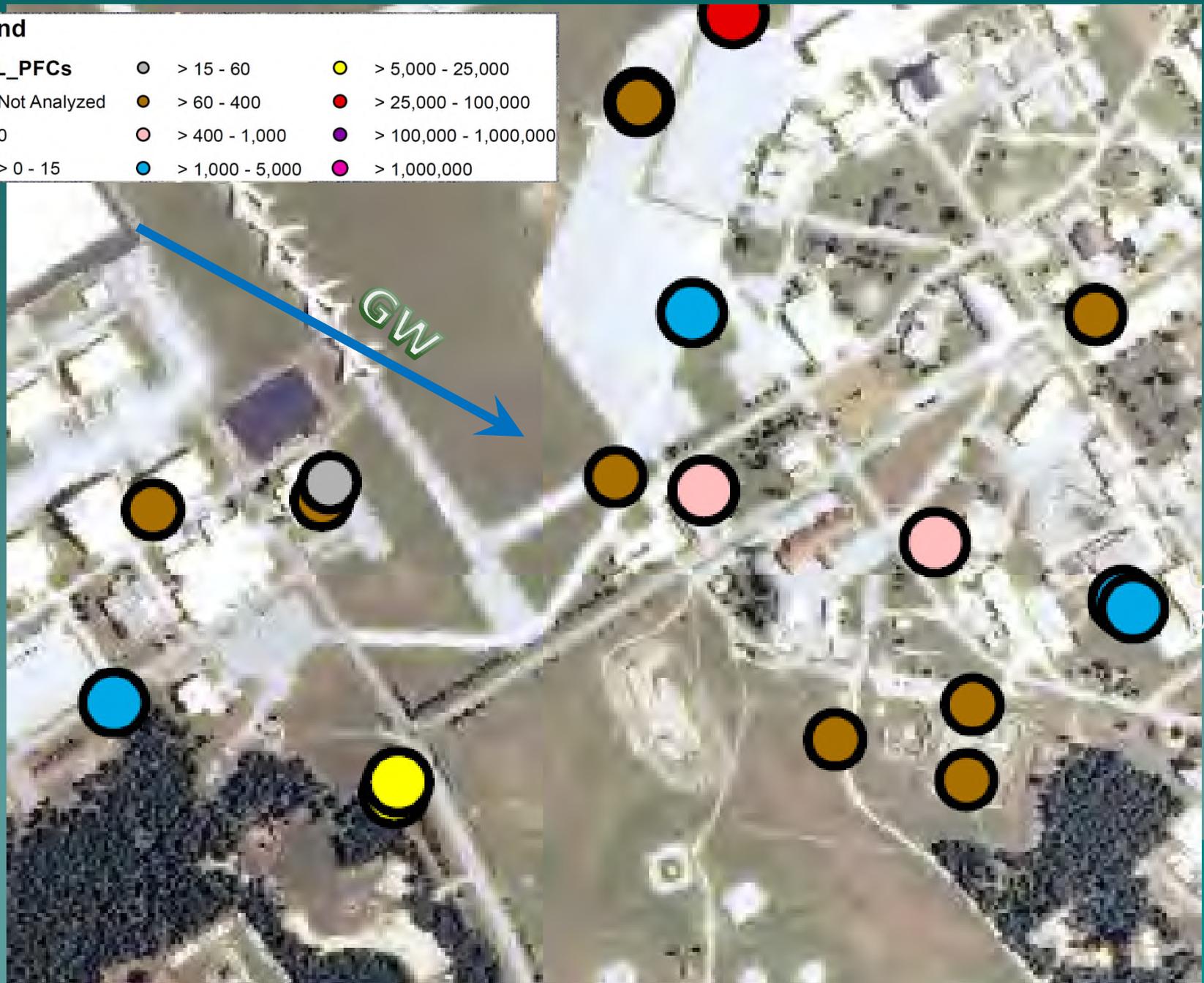
Extent of Contamination from Wurtsmith



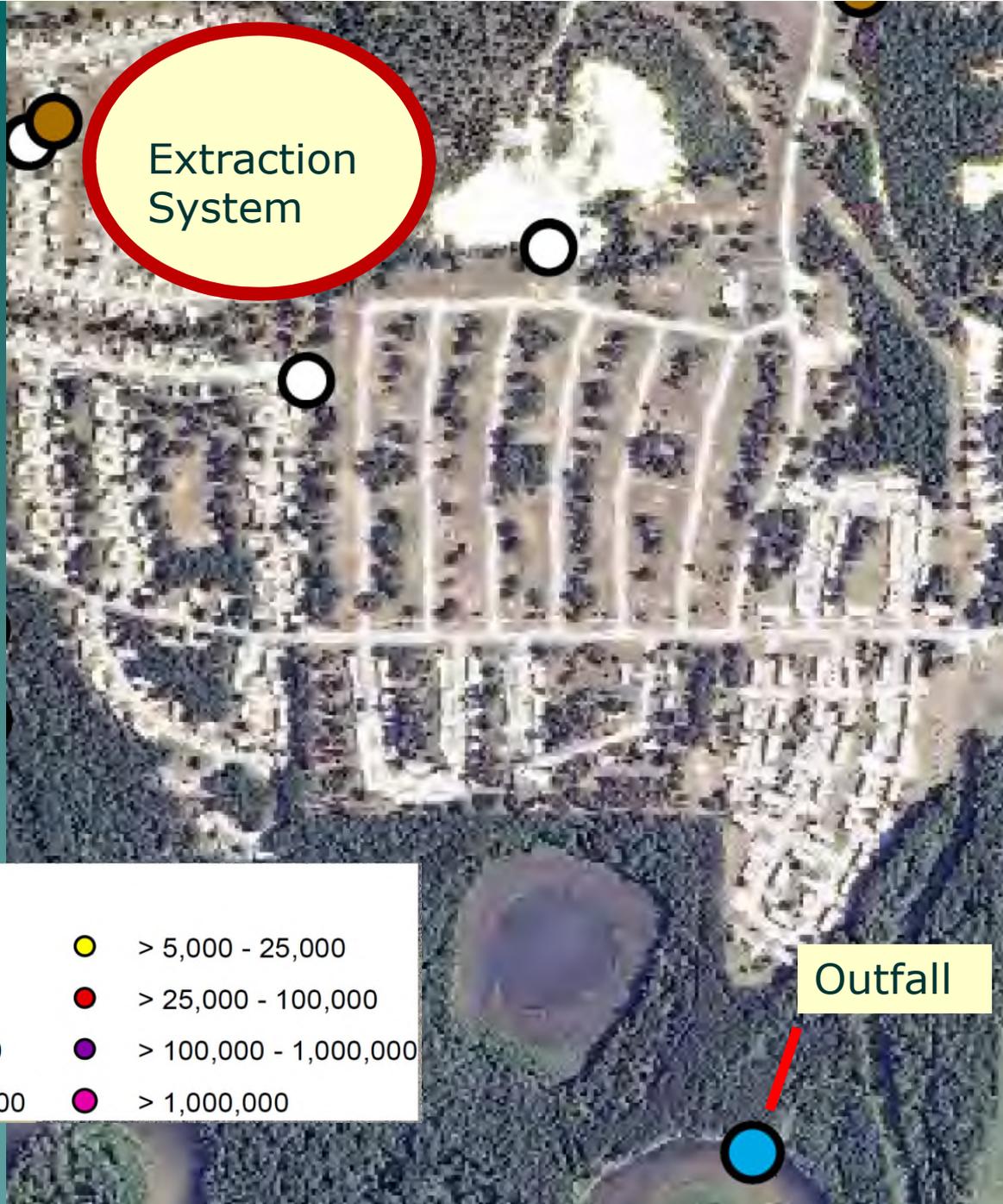
Legend

TOTAL_PFCs

| | | | |
|---|--------------------|---|-----------------------|
| ○ | > 15 - 60 | ● | > 5,000 - 25,000 |
| ○ | Not Analyzed | ● | > 60 - 400 |
| ● | > 25,000 - 100,000 | ● | > 100,000 - 1,000,000 |
| ● | > 400 - 1,000 | ● | > 1,000,000 |
| ● | > 0 - 15 | ● | > 1,000 - 5,000 |



Units-
opt



Extraction System

Outfall

Units - ppt

Legend

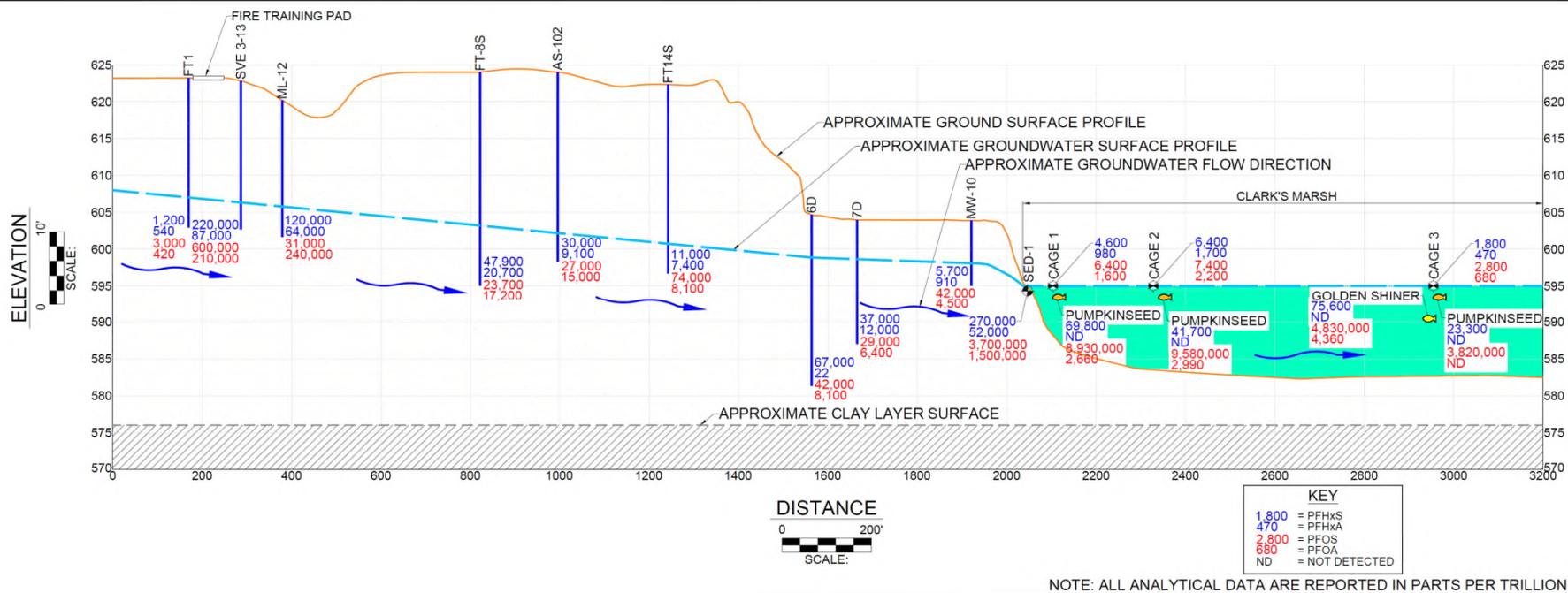
TOTAL_PFCs

- | | | | |
|---|-----------------|---|-----------------------|
| ○ | > 15 - 60 | ● | > 5,000 - 25,000 |
| ○ | Not Analyzed | ● | > 25,000 - 100,000 |
| ● | > 60 - 400 | ● | > 100,000 - 1,000,000 |
| ● | > 400 - 1,000 | ● | > 1,000,000 |
| ● | > 0 - 15 | ● | |
| ● | > 1,000 - 5,000 | | |

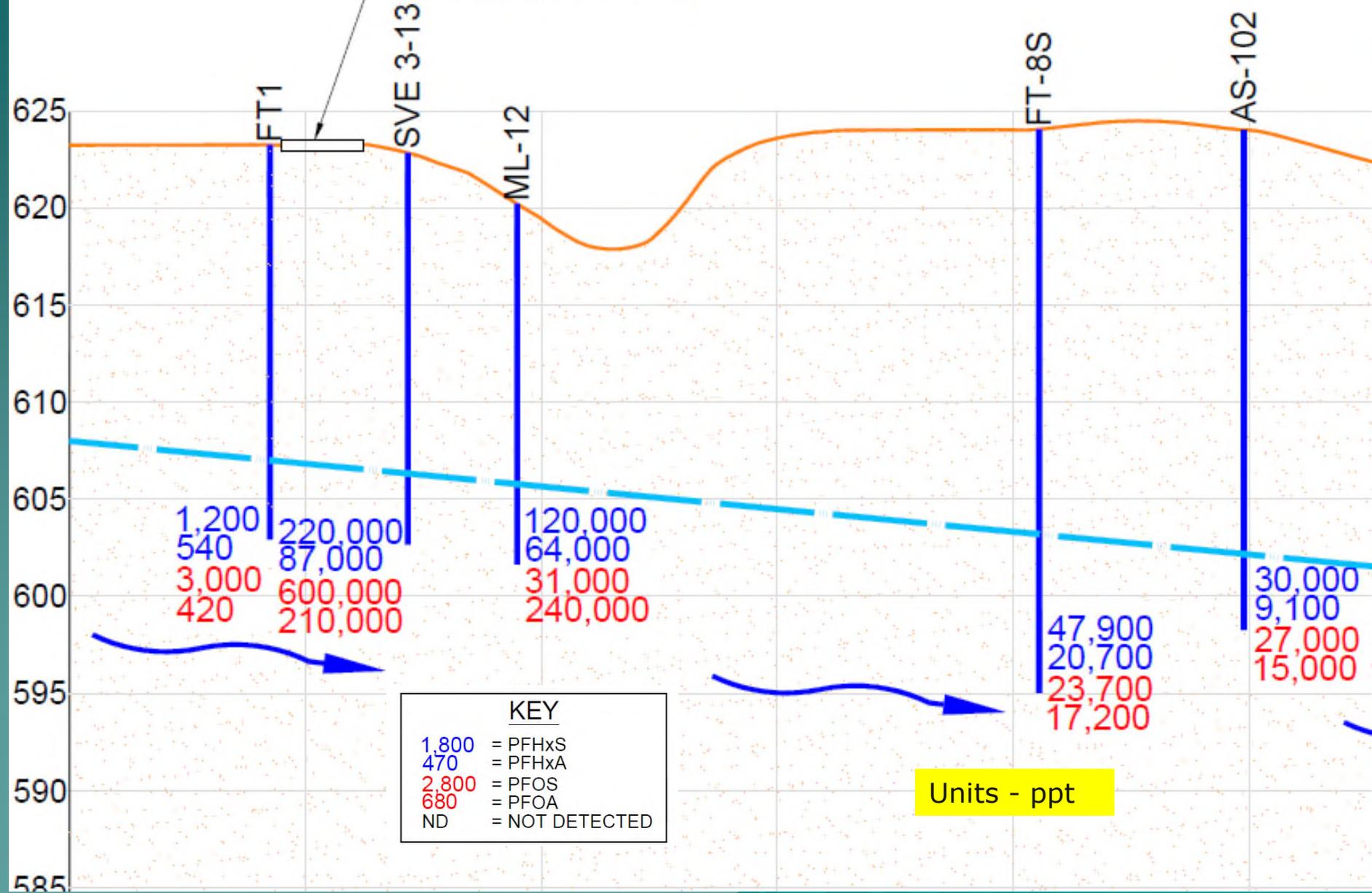
Influent and Stream Outfall Data

| Sample ID | | MSPTS-INFLUENT-4FEB2013 (Mission Drive Pump and Treat) | OUTFALL Stream (Consumers Property) |
|-----------------------------------|------|---|--|
| Date collected | | 2/4/2013 | 5/22/2012 |
| | unit | | |
| Perfluorohexanoic acid (PFHxA) | ng/L | 310 | 320 |
| PFOA | ng/L | 96 | 80 |
| Perfluorobutane Sulfonate (PFBS) | ng/L | 550 | 510 |
| Perfluorohexane Sulfonate (PFHxS) | ng/L | 1800 E | 1100 E |
| PFOS | ng/L | 1.4 J | 3 |

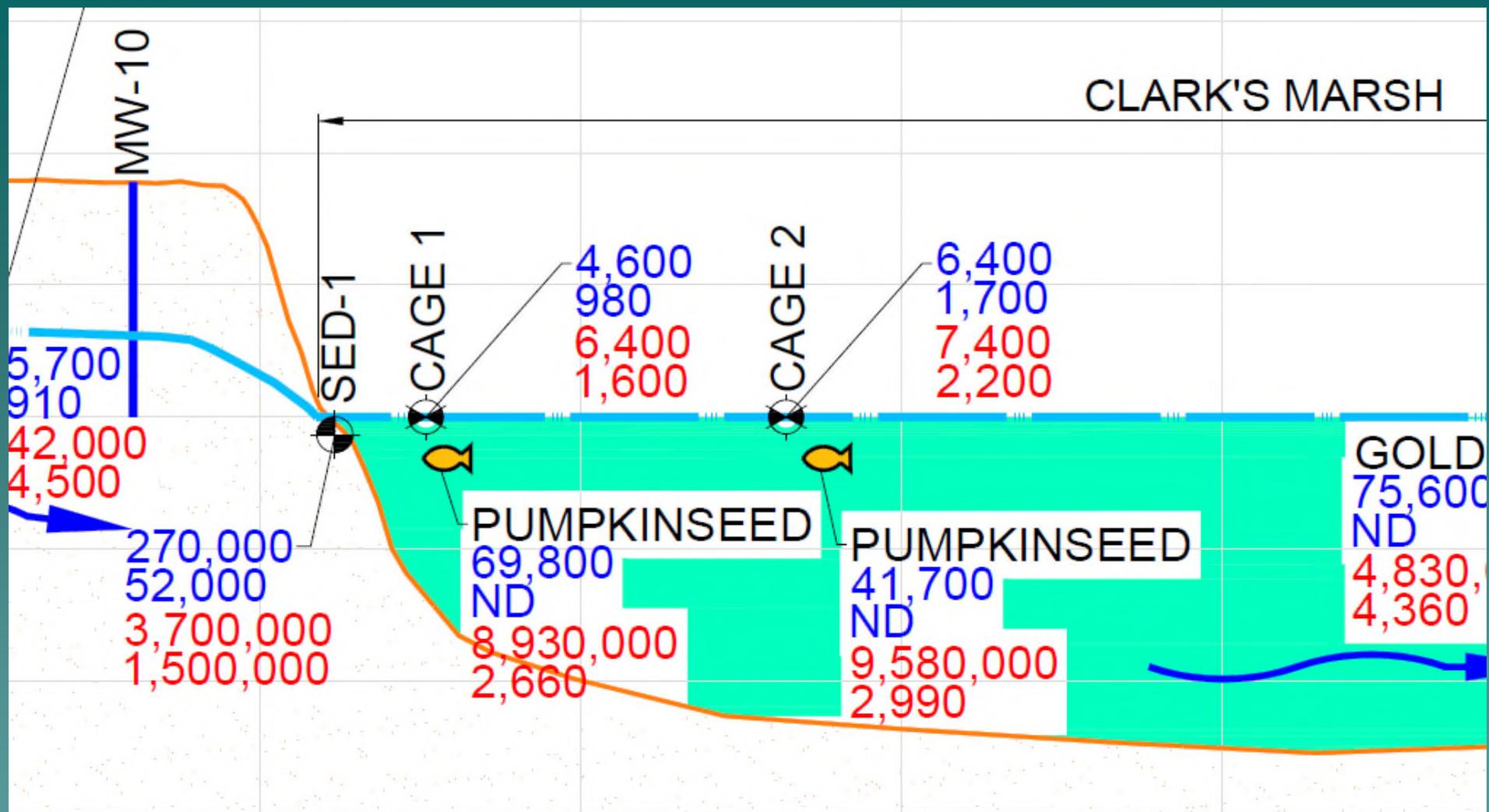
Cross Section from Fire Training Pad to Clarks Marsh



FIRE TRAINING PAD



CLARK'S MARSH



Units - ppt

| KEY | |
|-------|----------------|
| 1,800 | = PFHxS |
| 470 | = PFHxA |
| 2,800 | = PFOS |
| 680 | = PFOA |
| ND | = NOT DETECTED |

LIBRAGE

Historic Drinking Water Well Locations

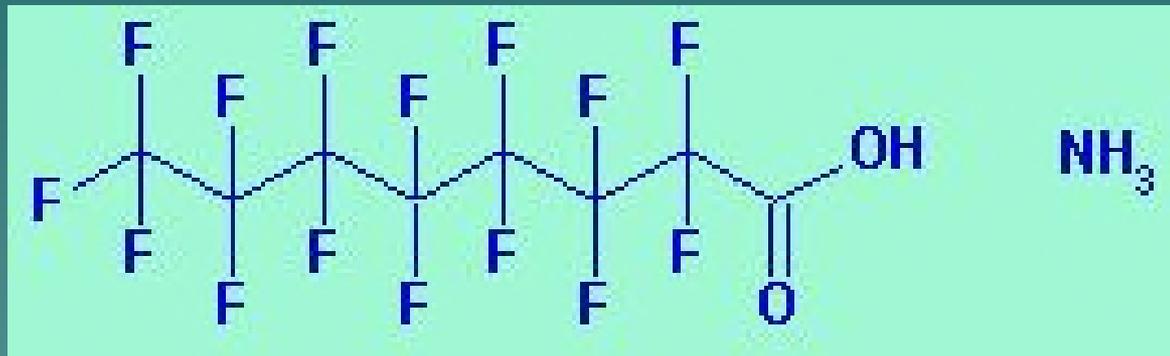


Summary

- ◆ Many plumes and many sources of PFAS at the Former Wurtsmith Air Force Base
- ◆ Expect the same at other DoD facilities
- ◆ PFOS and PFOA are not the only PFAS that need to be addressed

- ◆ Existing remedies do not address PFAS
- ◆ Many people were exposed to PFAS at the Former Wurtsmith Air Force Base
- ◆ Are current water supplies at other bases secure?

Questions?



PFOA



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