PFAS in North Dakota

- The State's Approach

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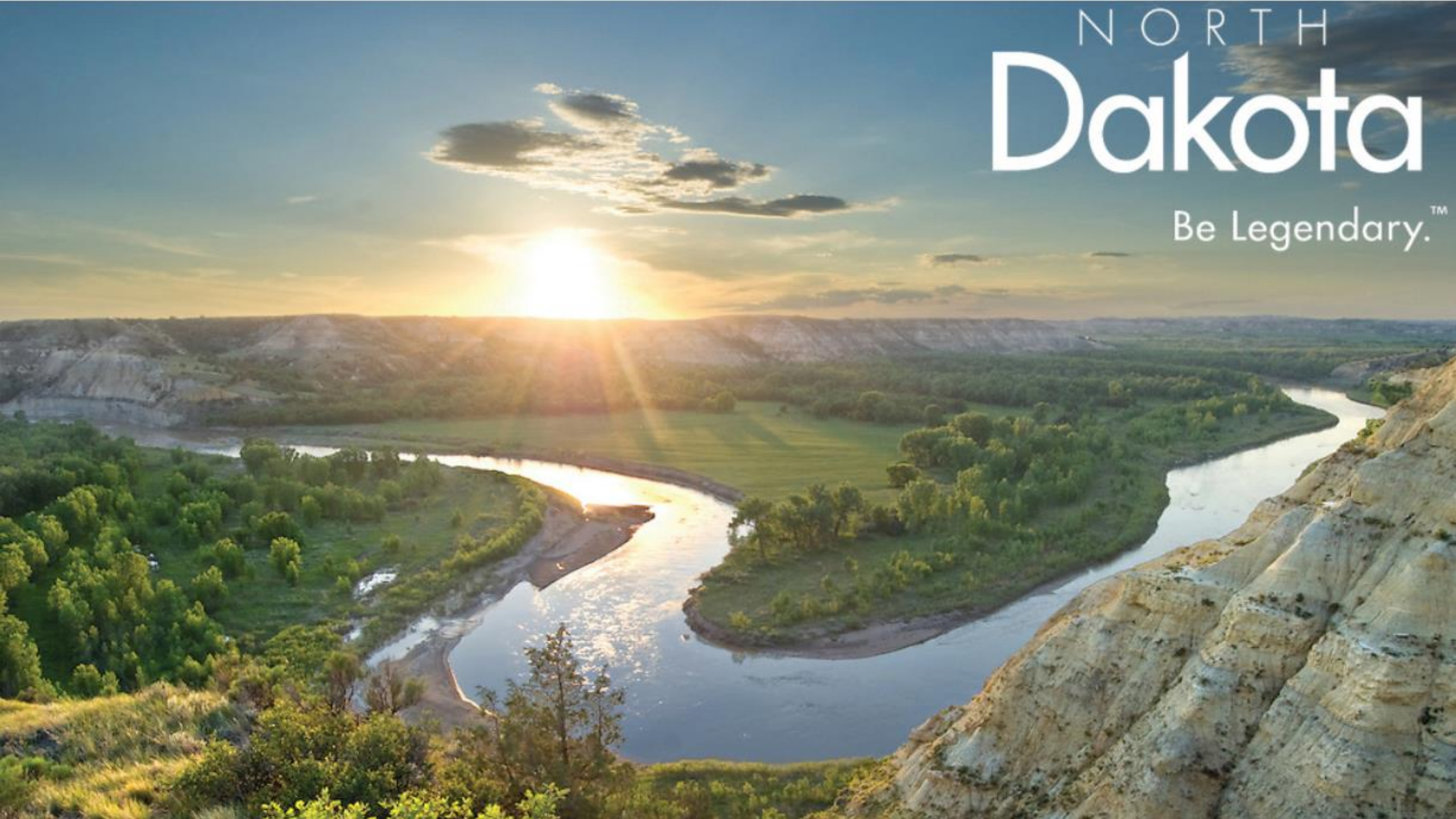
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General Overview

- NDDEQ (formerly EHS of NDDOH) created a work group tasked with conducting an initial baseline survey to determine the presence/absence of Per-and Polyfluoroalkyl Substances (PFAS) in North Dakota.
- PFAS Sampling Events
  - 2018
  - 2020
  - 2021

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2018 PFAS Assessment

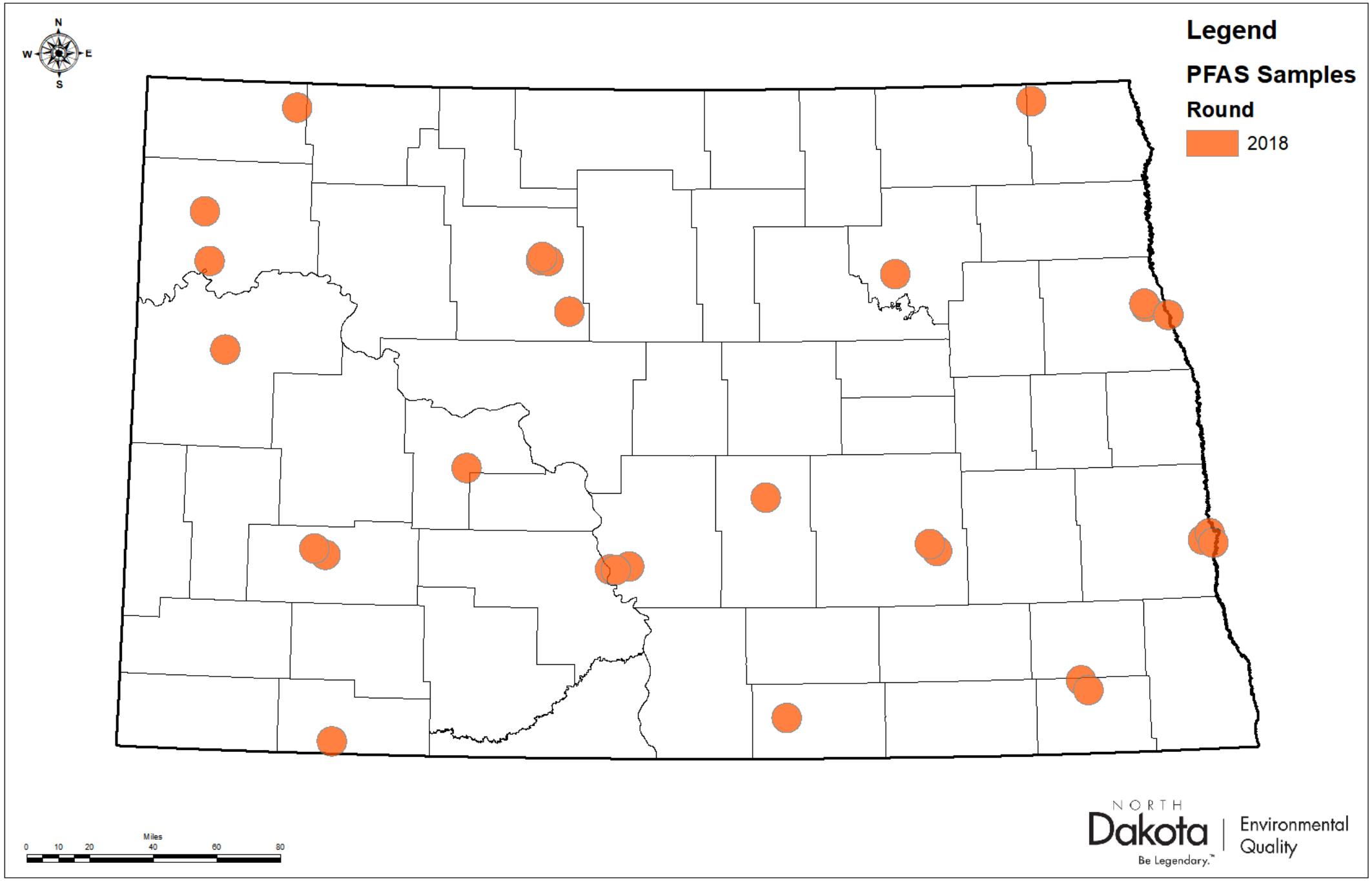
- Focused on industrial areas, fire fighting training facilities, wastewater treatment plants, special waste landfills, and older municipal landfills without liners;
- Public drinking water systems serving large populations or with proximity to industrial activities; and
- Potential groundwater contamination
- Total of 67 primary samples collected (sampling conducted in Sept. – Oct. 2018)
  - 18 landfill leachate samples
  - 14 samples from seven drinking water treatment plants
    - One source, one treated water
  - 11 wastewater treatment plant samples (effluent only)
  - 5 groundwater samples from fire training areas
  - 17 landfill groundwater monitoring well samples
  - 1 groundwater sample from an oilfield-related spill
  - 1 laboratory sample to verify RO-purified water

2018 PFAS Assessment

- Analysis for 32 PFAS chemicals using EPA 537 Rev 1.1 modified
  - Reporting levels were much more specific, varied by analyte
- Overall, 23 analytes were detected in 53 of 67 primary samples
- Most commonly detected
  - PFOA
  - PFOS
  - PFBA
  - PFHpA
  - PFHxA

2018 PFAS Assessment

- PFAS contamination was detected at landfills and wastewater treatment plants in North Dakota
  - Landfill leachate contained more analytes and higher detect levels than other sites surveyed
  - Wastewater treatment plants had the second highest detect rate but at much lower level detection rates than landfill leachate
- The 2018 NDDEQ PFAS Assessment report is available on the NDDEQ website: https://deq.nd.gov/Publications/MF/PFAS_Report.pdf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PFAS Samples
Round
2018
0
10
20
40
60
80
Miles
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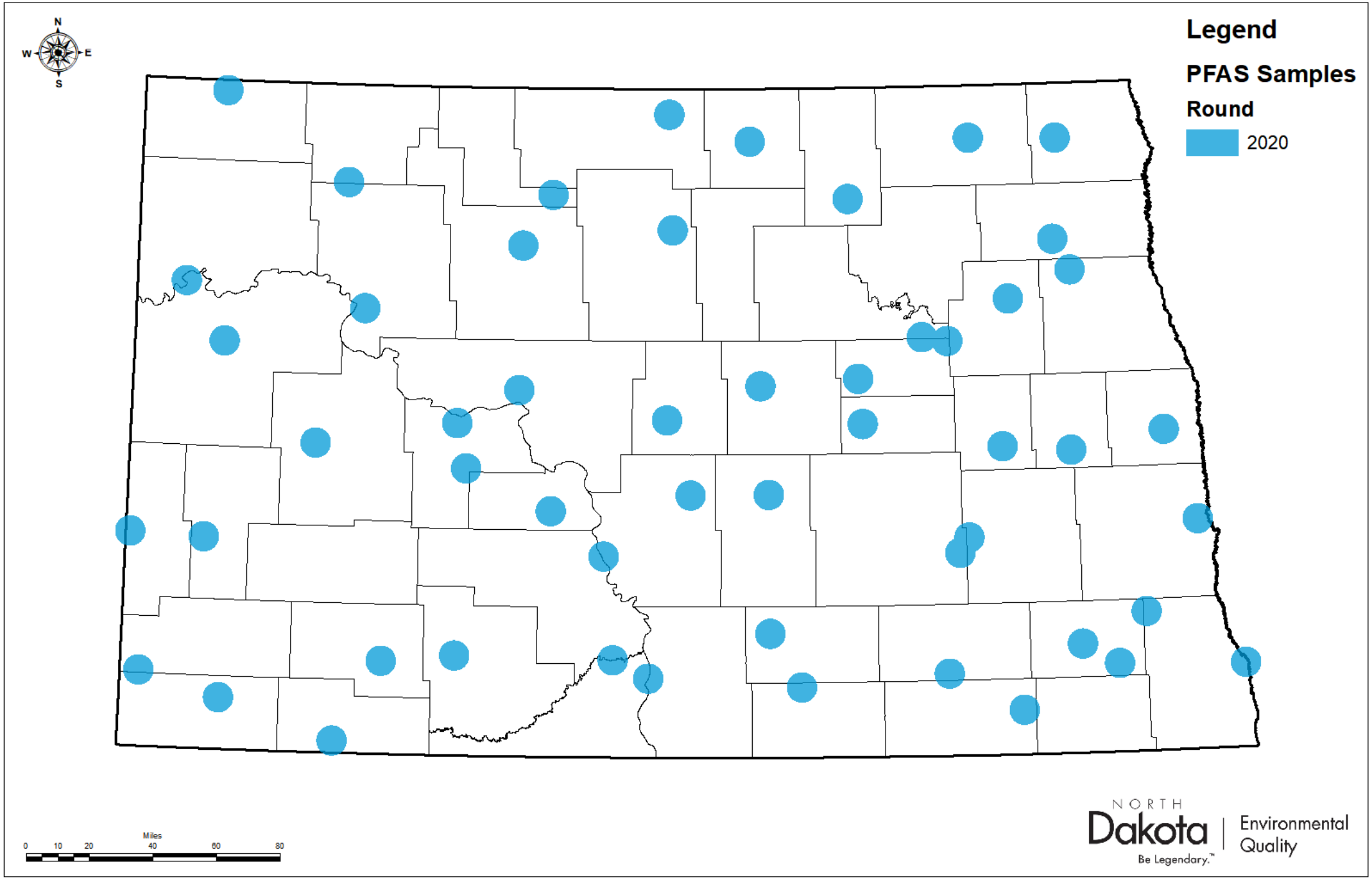
2020 Public Drinking Water Assessment

- Goal was to sample one public water system per county (53 counties in North Dakota)
- 56 samples were collected
- Site Selection
  - Difficult – some counties did not have any original source community water systems (many or all systems in the area were consecutive user or hooked up to rural water systems). In those cases, non-communities or non-transient non-communities were sampled.
  - Otherwise, systems that served the highest population were sampled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PFAS Samples
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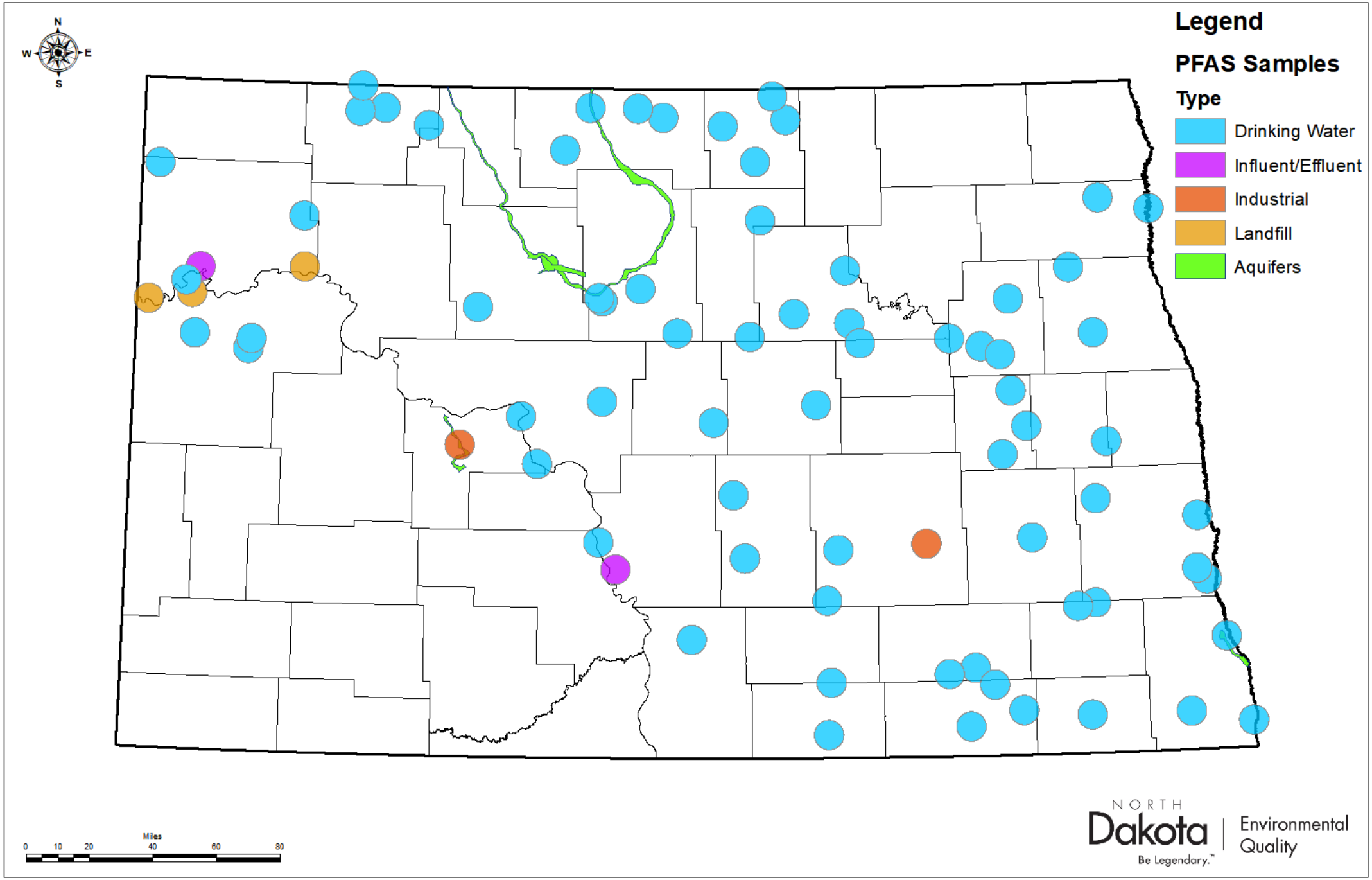
2021 PFAS Assessment

- Goal was to add to the growing body of knowledge regarding potential PFAS impacts across North Dakota
- 100 primary samples from sample areas including:
  - 65 Drinking Water Treatment Systems
  - 2 Wastewater Treatment Systems
  - 3 Landfills
  - 2 Industrial
  - 4 aquifers
  - 4 Ultra purified RO lab water samples
- Sample analysis included:
  - EPA Method 537.1 for drinking water samples
  - PFAS by ID 36 (Minnesota approved method) for non-drinking water samples and biosolids
- The 2021 NDDEQ PFAS Assessment report is available on the NDDEQ website: https://deq.nd.gov/Publications/MF/PFAS_Report_2021.pdf?v=1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PFAS Samples
Type
Drinking Water
Influent/Effluent
Industrial
Landfill
Aquifers
0
10
20
40
60
80
Miles
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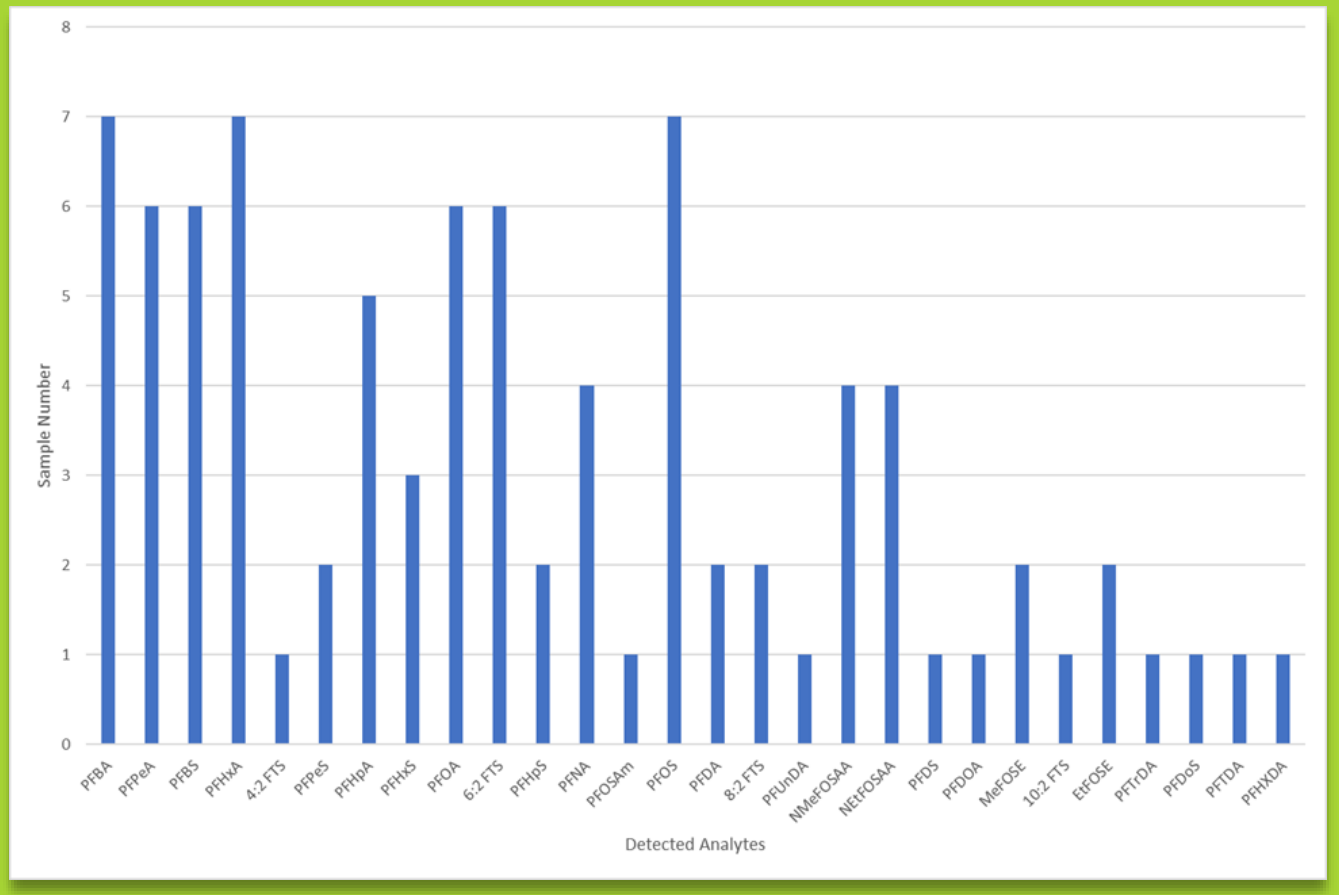
Wastewater and Biosolids

- 2021 Assessment
- 2 Sites – 36 analytes
  - Influent
  - Effluent
  - Leachate
  - Biosolids
    - Class A
    - Class B

Wastewater Results

- Influent
  - WWTP 1 – 2 analytes
  - WWTP 2 – 8 analytes
- Effluent
  - WWTP 1 – 7 analytes
  - WWTP 2 – 9 analytes (in both original and duplicate sample)
- Leachate
  - WWTP 1 – 16 analytes
  - WWTP 2 – 12 analytes
- Biosolids
  - WWTP 1 – 8 analytes (Class B)
  - WWTP 2 – 26 analytes (Class A)
- Most common analytes, detected in 8 out of 9 samples were: PFBA, PFBS, PFHxA, and PFOS



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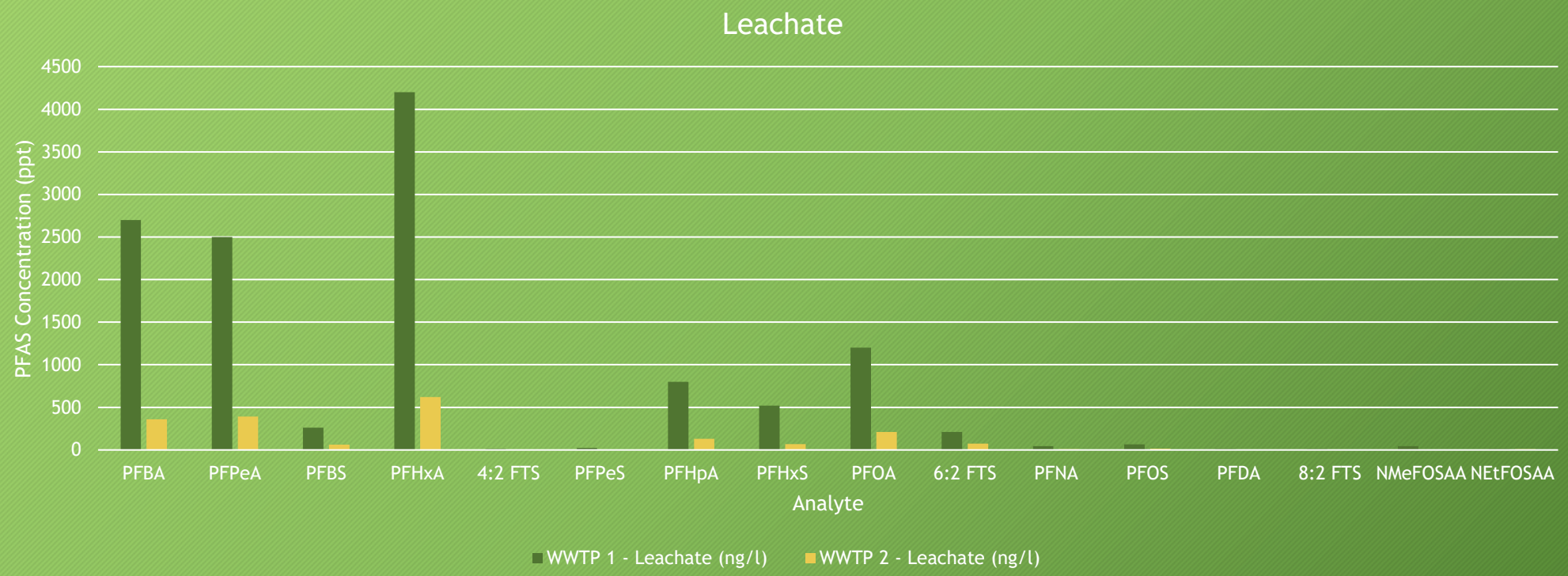
Leachate



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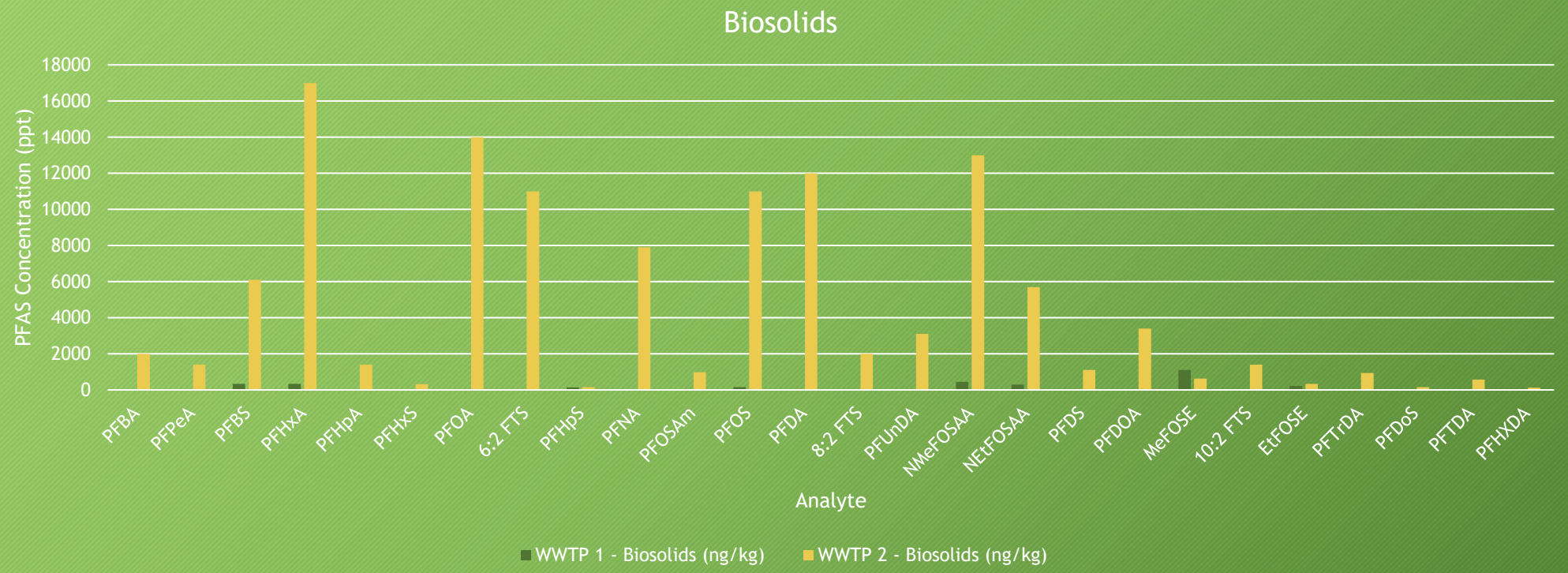
Biosolids



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Next Steps

- Continued biosolids sampling
  - 4 major POTWs that land apply biosolids (other major POTWs landfill biosolids)
- Research into land application of biosolids
  - Minimal industrial contribution
  - Concern over moratoriums on land application based on research of industrially impacted biosolids (Maine, Michigan, etc.)
- Collaboration with North Dakota State University (NDSU)
  - Greenhouse study using ND biosolids
  - Study soil make-up and plant uptake

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