



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Oscoda Area Conceptual Site Model

Beth Place | Amanda Armbruster

EGLE Remediation and Redevelopment Division

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July 21, 2020

Presentation Outline

- Brief On-Base PFAS History
- Conceptual Site Model
- Criteria Exceedances in Groundwater and Surface Water
- Current PFAS Investigations

Former Wurtsmith Air Force Base



2010 - 2011

2012-2013

2014-2015

2016-2017

2018-2019



EGLE



EGLE collects soil, groundwater, surface water, and fish samples

USAF base-wide PFAS sampling

USAF completes Focus Feasibility Study and installs the FT-02 P&T System

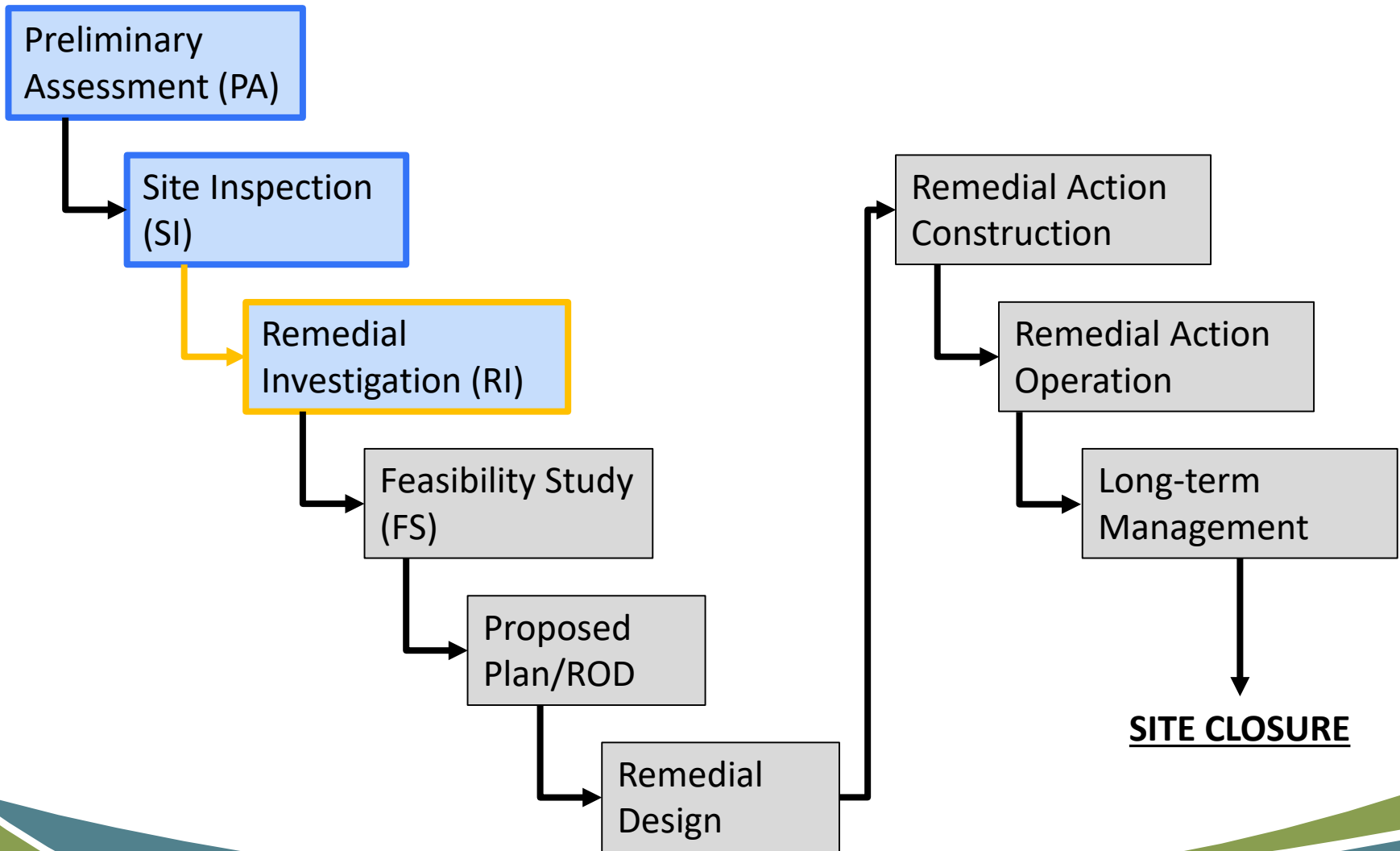
Preliminary Assessment (PA) Site Inspection (SI)

Expanded Site Inspection (ESI)

USAF installs the Central Treatment Plant for PFOS/PFOA

Mission Street PFOS/PFOA Treatment (2019)

CERCLA Process



Conceptual Site Model

Total PFAS (ppt)

Residential Wells

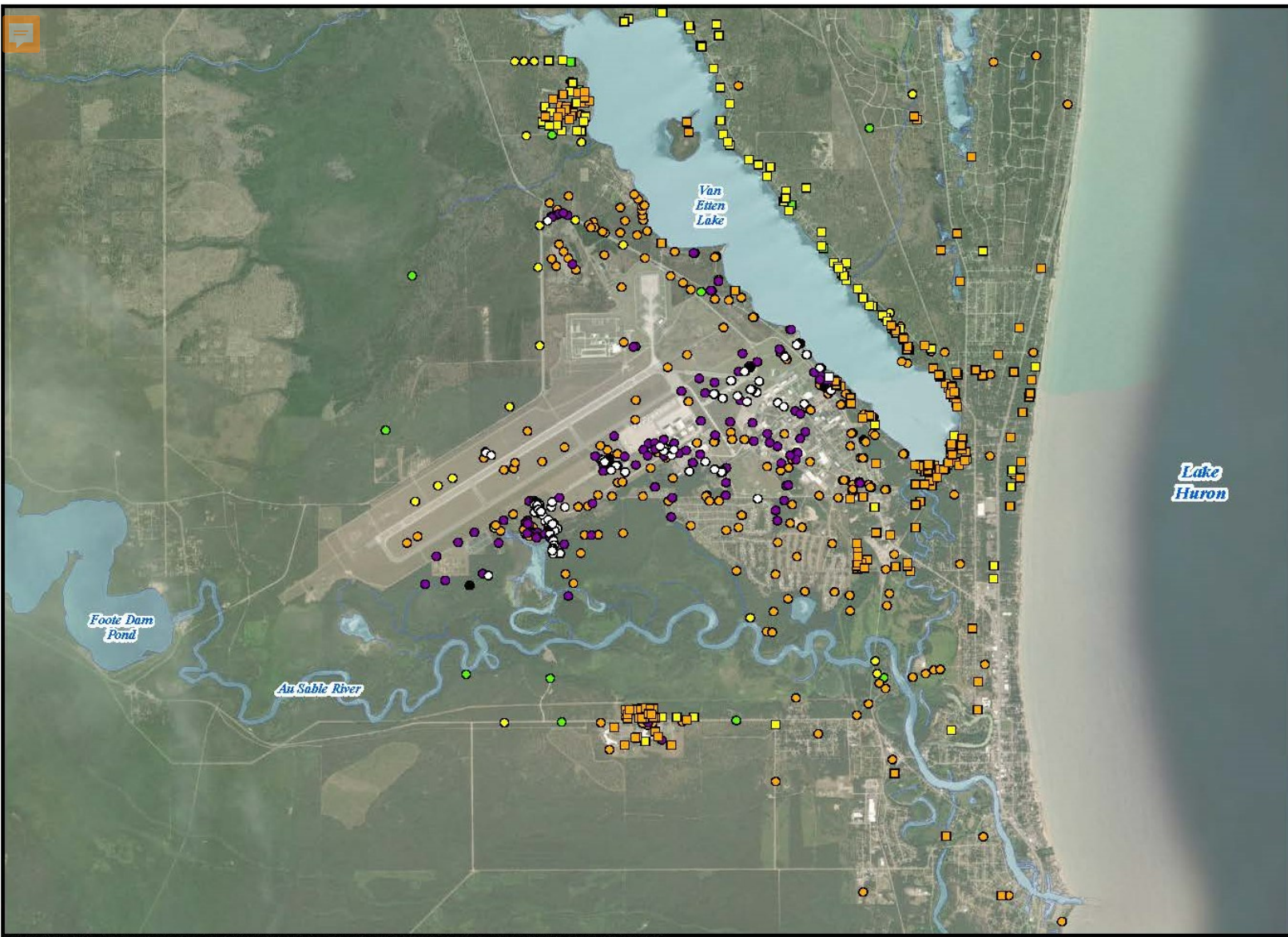
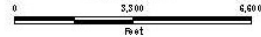
- Non-Detect
- <10
- 10 - <500
- 500 - <5,000
- 5,000 - <10,000
- >10,000

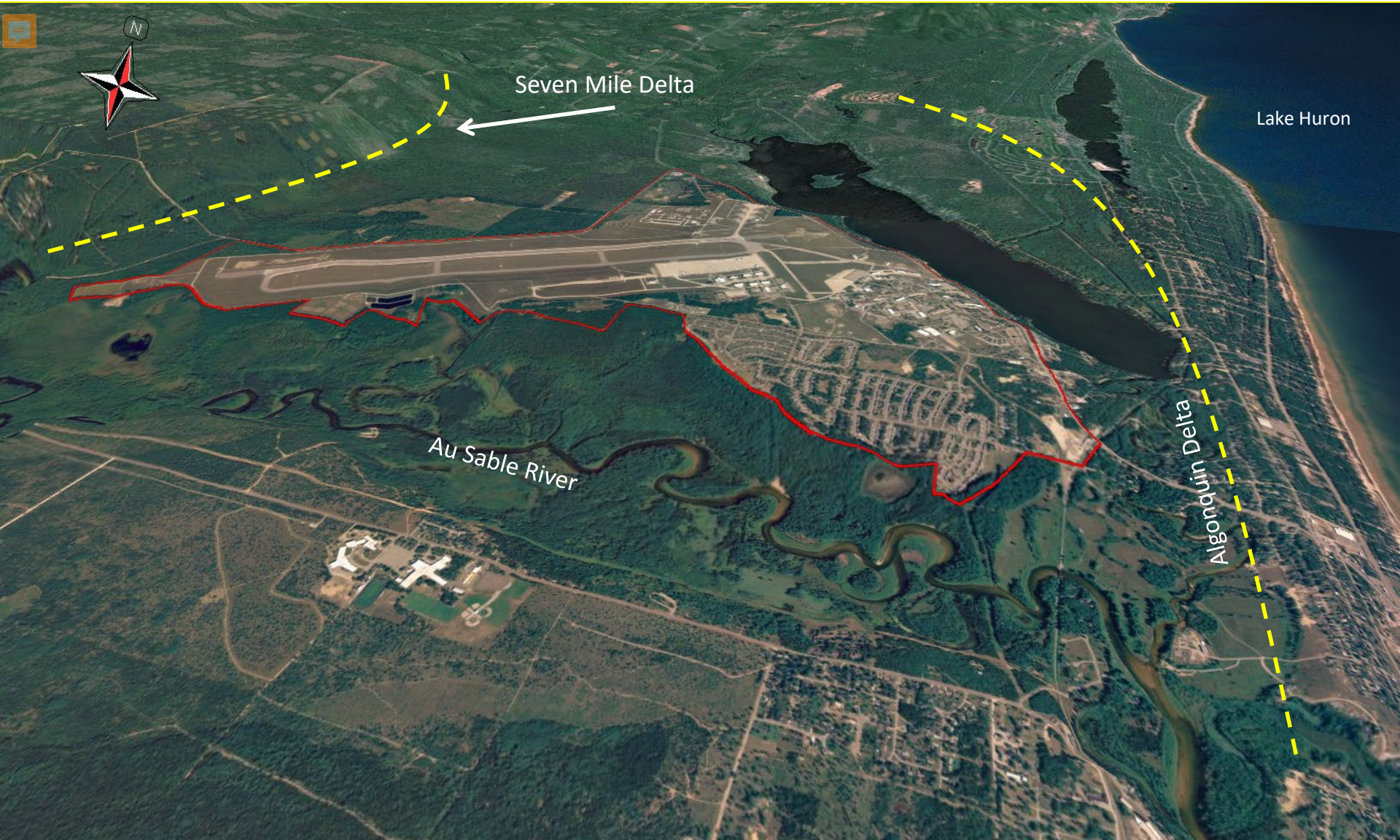
Groundwater Samples

- Non-Detect
- <10
- 10 - <500
- 500 - <5,000
- 5,000 - <10,000
- >10,000

GROUNDWATER AND
RESIDENTIAL SAMPLING
RESULTS TOTAL PFAS

FORMER WURTSMITH
AIR FORCE BASE &
OSCODA AREA
IOSCO COUNTY,
MICHIGAN










Seven Mile Delta

Lake Huron

Au Sable River

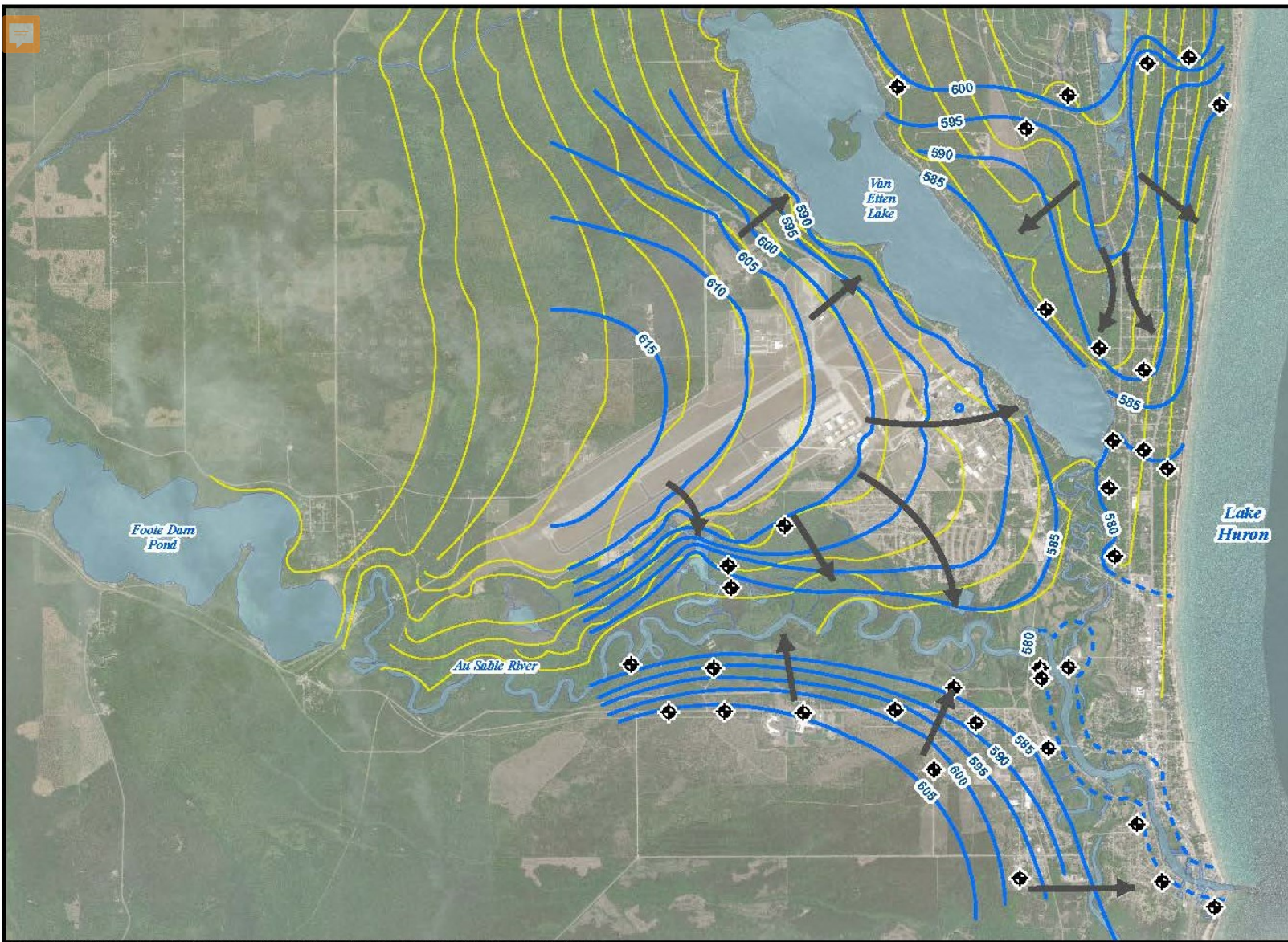
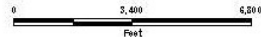
Algonquin Delta

Legend

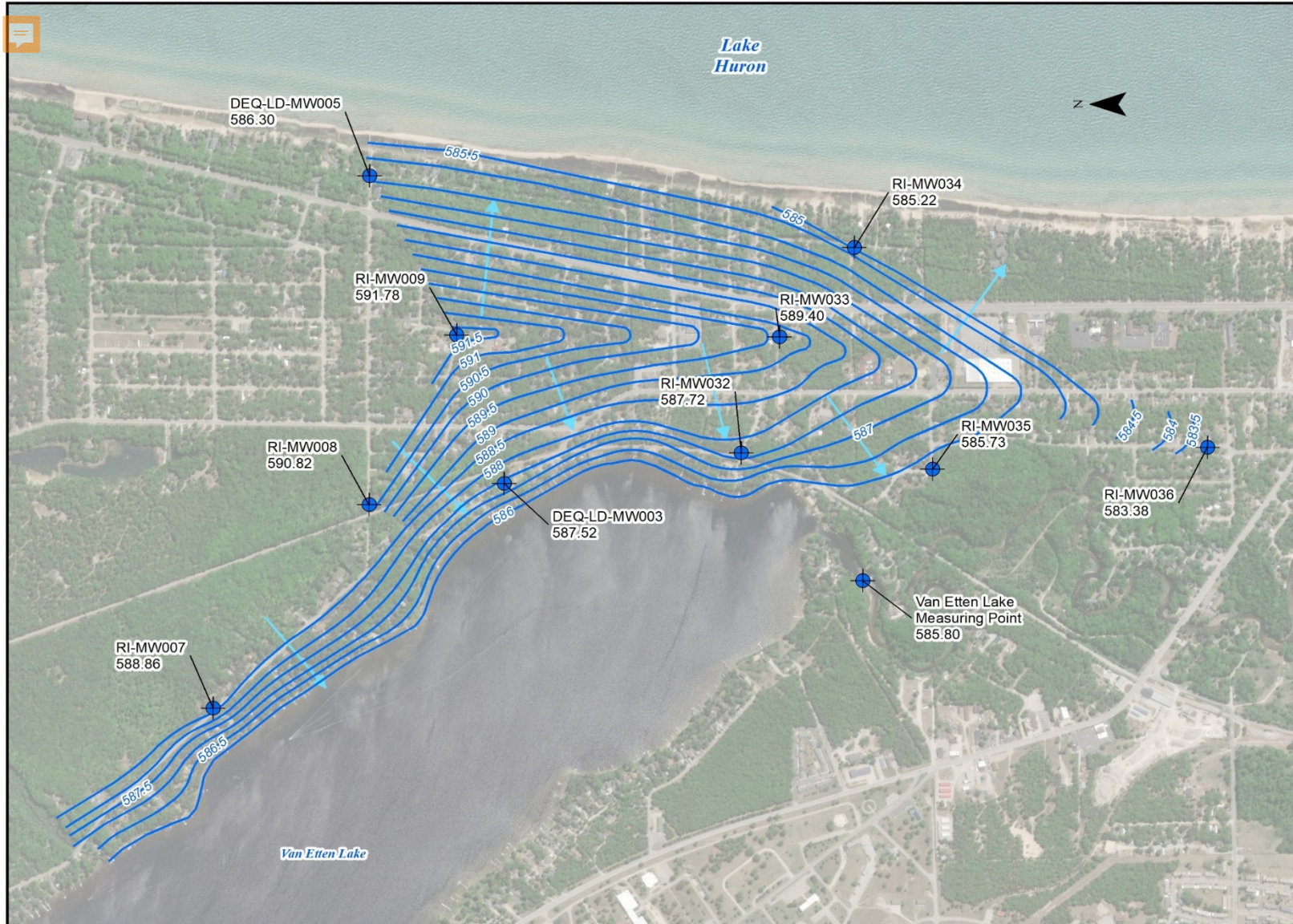
-  Monitoring Wells
-  Groundwater Contour
-  Inferred Groundwater Contour
-  USGS Contour
-  Groundwater Flow Direction

COMPOSITE POTENTIOMETRIC GROUNDWATER CONTOURS




FORMER WURTSMITH AIR FORCE BASE & OSCODA AREA
IOSCO COUNTY, MICHIGAN



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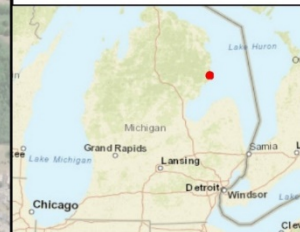
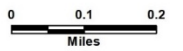


Legend

-  Groundwater Elevation Monitoring Points
-  Groundwater Elevation Contours
-  Groundwater Flow Direction

DECEMBER 12, 2018
GROUNDWATER
CONTOURS

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MICHIGAN



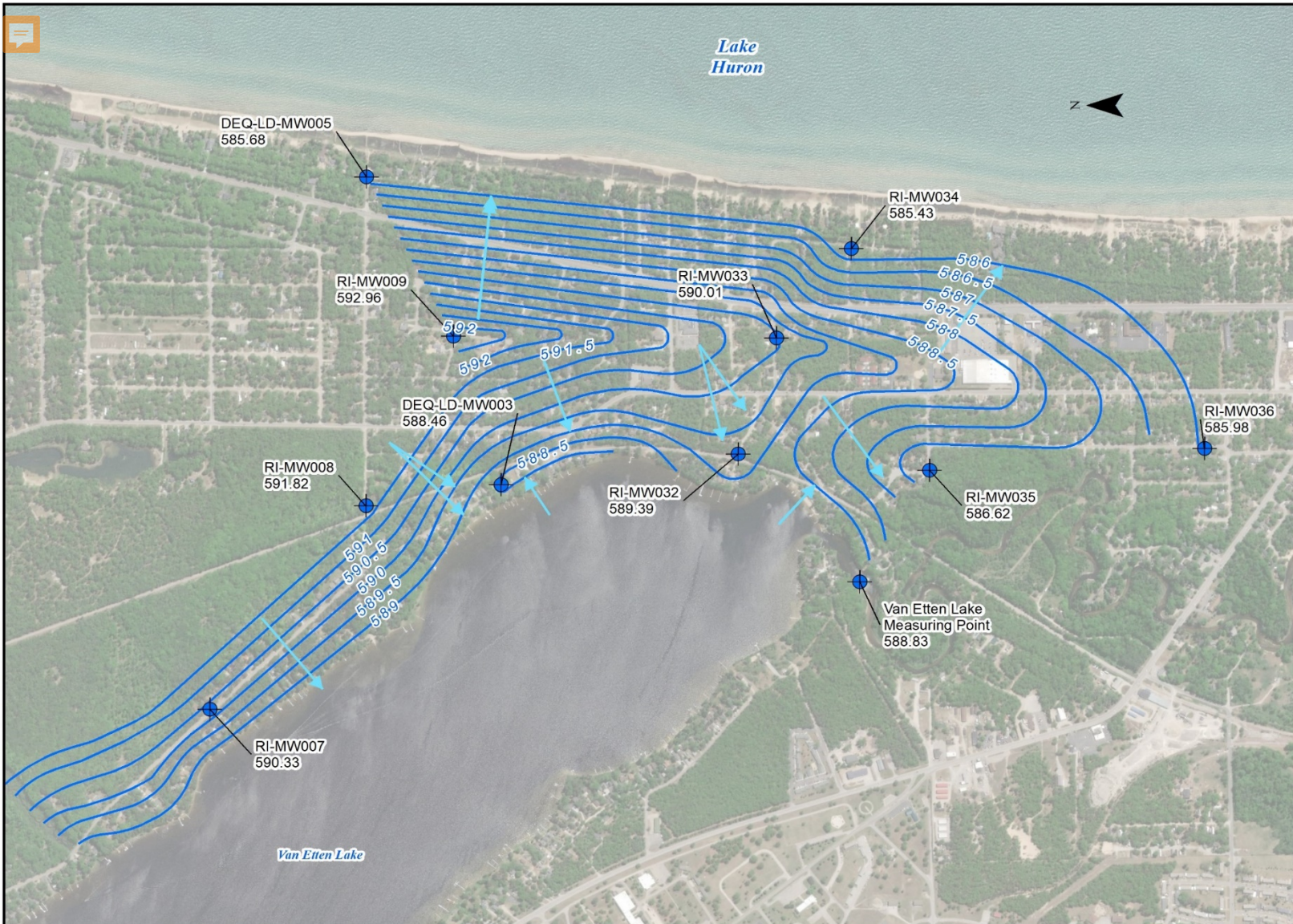
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Lake Huron



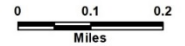
Legend

- Groundwater Elevation Monitoring Points
- Groundwater Elevation Contours
- Groundwater Flow Direction



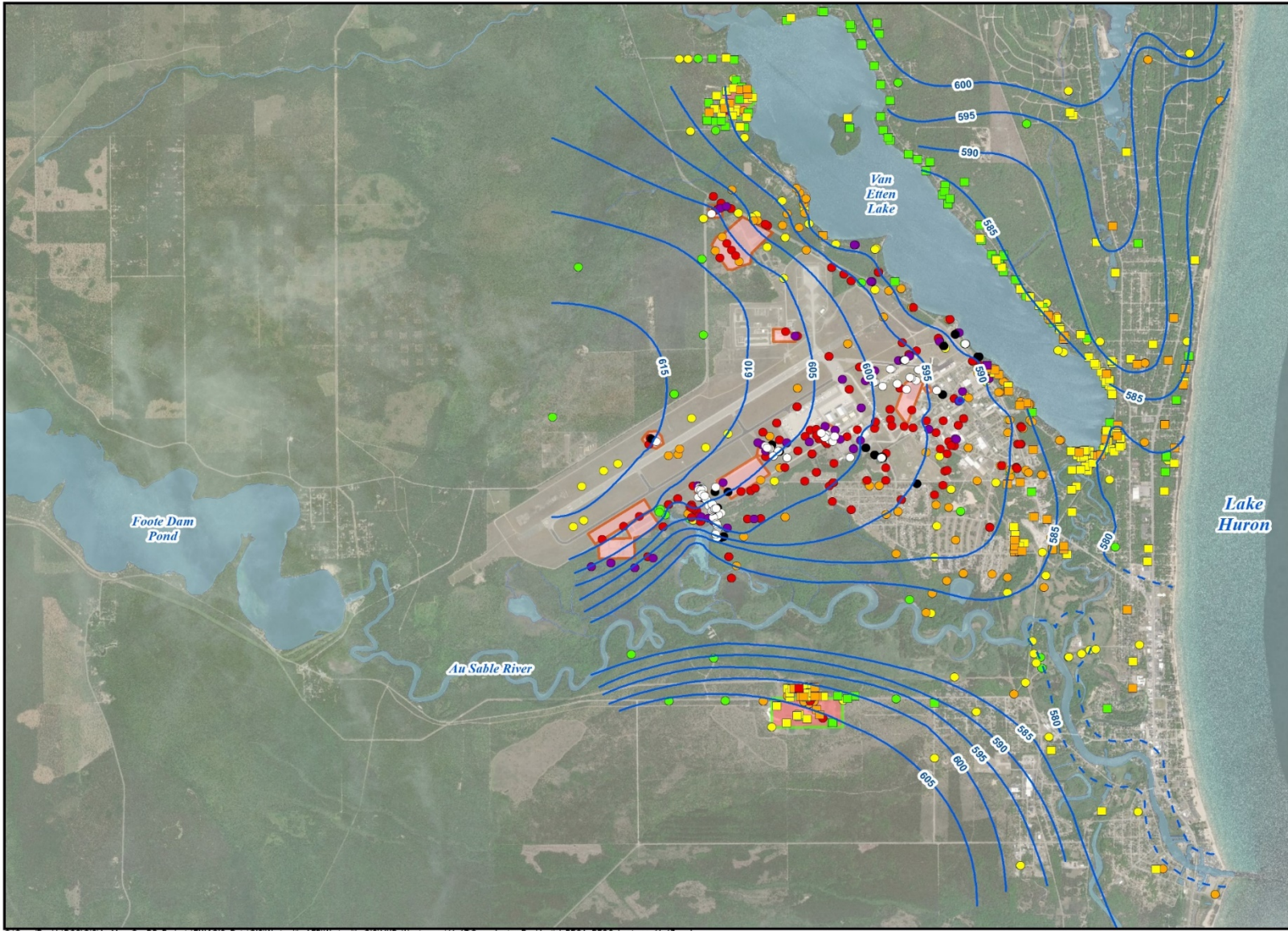
JULY 17, 2019
GROUNDWATER
CONTOURS

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IOSCO COUNTY,
MICHIGAN



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Criteria Exceedances in Groundwater and Surface Water



PFOA + PFOS (ppt)
Residential Wells

- Non-Detect
- <10
- 10 - <70
- 70 - <1,000
- 1,000 - <5,000
- 5,000 - <10,000

Groundwater Samples

- Non-Detect
- <10
- 10 - <70
- 70 - <1,000
- 1,000 - <5,000
- 5,000 - <10,000
- >10,000

— Groundwater Contour
- - - Inferred Groundwater Contour

PFAS Sources

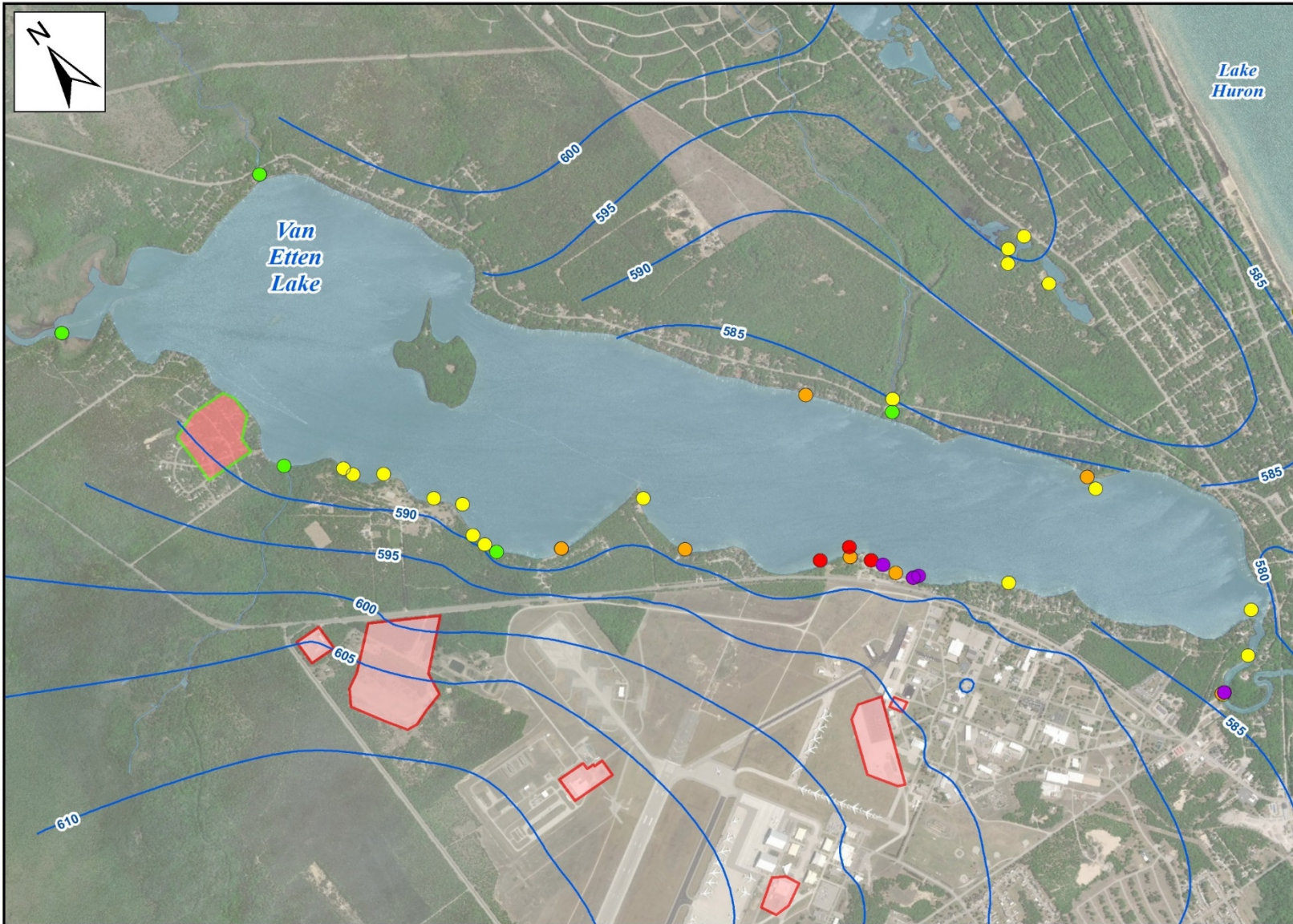
- On-Site Source
- Off-Site Source

GROUNDWATER & RESIDENTIAL SAMPLING RESULTS PFOA + PFOS

FORMER WURTSMITH AIR FORCE BASE & OSCODA AREA IOSCO COUNTY, MICHIGAN



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Legend

Surface Water Sample PFOS (ppt)

- Non-Detect
- <12
- 12 - <50
- 50 - <100
- 100 - <1,000
- 1,000 - <2,500
- >2,500

— Groundwater Contours

PFAS Sources

- On-Site Source
- Off-Site Source

*Samples collected between 2012-2018, Highest concentration shown

VAN ETTEN LAKE
SURFACE WATER
PFOS
SAMPLING RESULTS

FORMER WURTSMITH
AIR FORCE BASE &
OSCODA AREA
IOSCODA COUNTY,
MICHIGAN

0 1,600 3,200
Feet



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Legend

**Surface Water Sample
PFOS (ppt)**

- Non-Detect
- <12
- 12 - <50
- 50 - <100
- 100 - <1,000
- 1,000 - <2,500
- >2,500

- Groundwater Contour
- Inferred Groundwater Contour

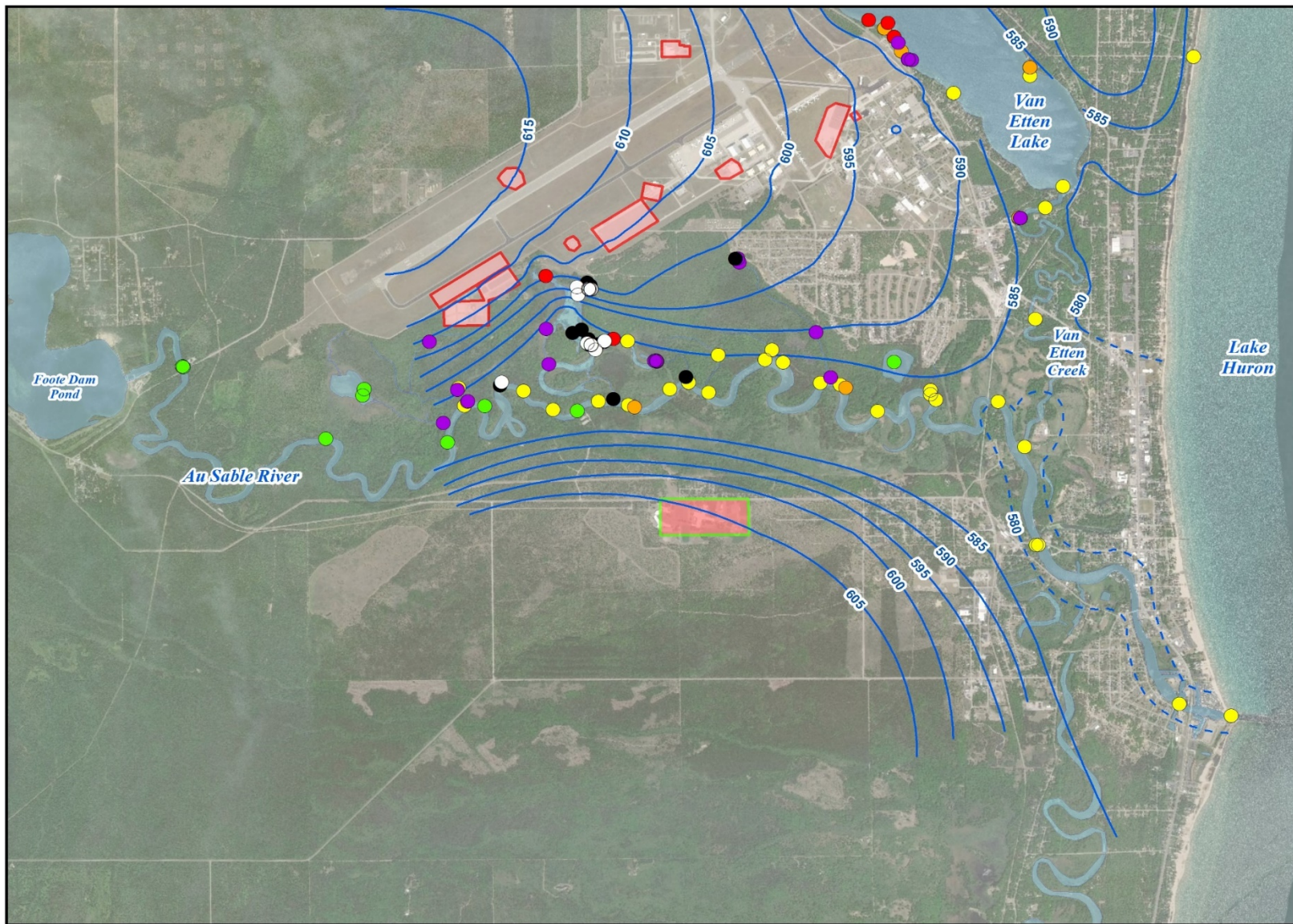
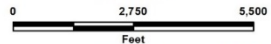
PFAS Sources

- On-Site Source
- Off-Site Source

*Samples collected between 2012-2018, Highest concentration shown

AU SABLE RIVER & CLARK'S MARSH SURFACE WATER PFOS SAMPLING RESULTS

FORMER WURTSMITH AIR FORCE BASE & OSCODA AREA IOSCO COUNTY, MICHIGAN



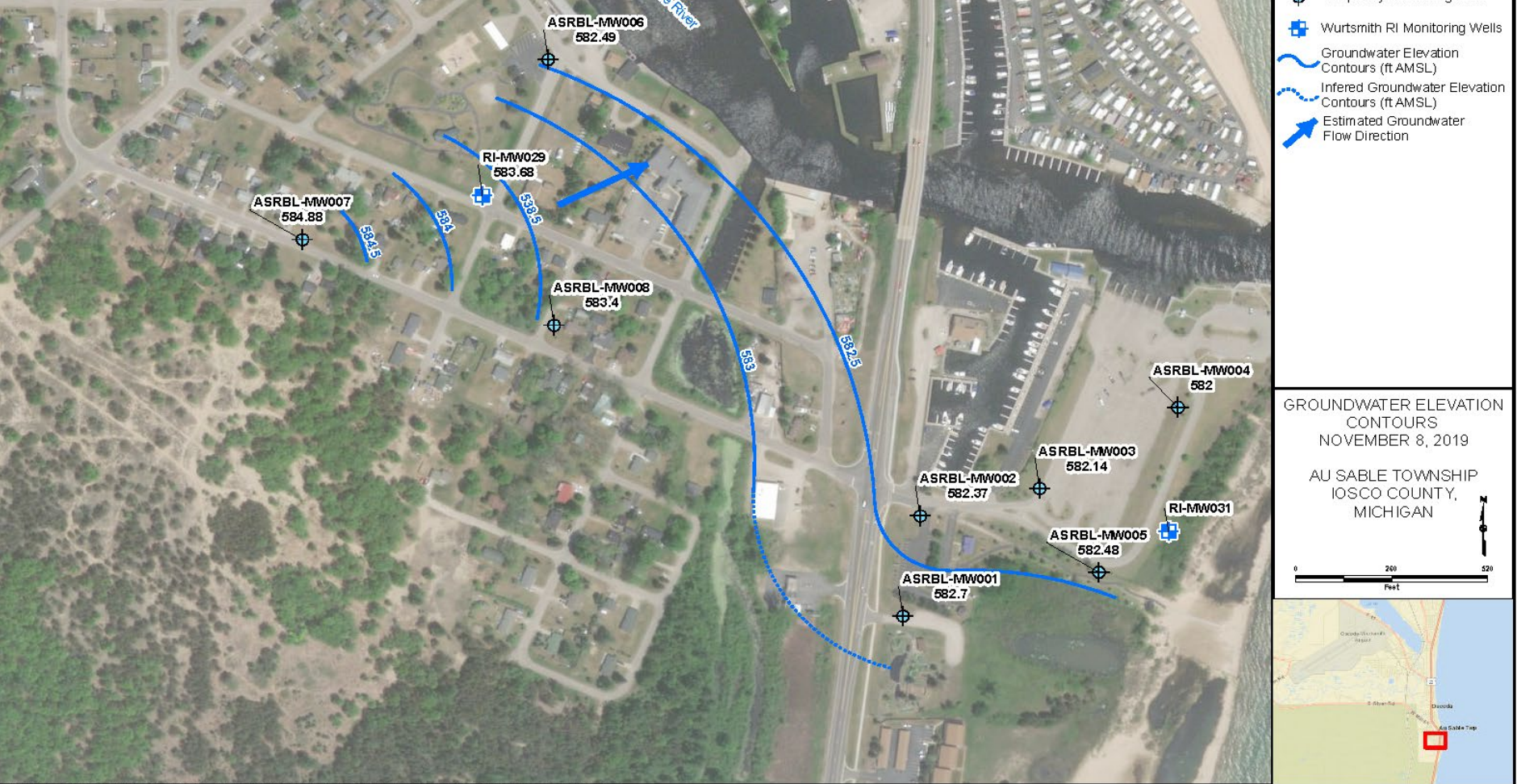
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Current PFAS Investigations



- **EGLE Superfund**
 - Oversight of Air Force environmental activities
 - EGLE Project manager - Beth Place
 - Superfund Section, Lansing

- **EGLE Saginaw Bay District**
 - EGLE Quarterly Groundwater Sampling
 - Au Sable River Boat Launch Investigation
 - Projects managed by Amanda Armbruster
 - Bay City District



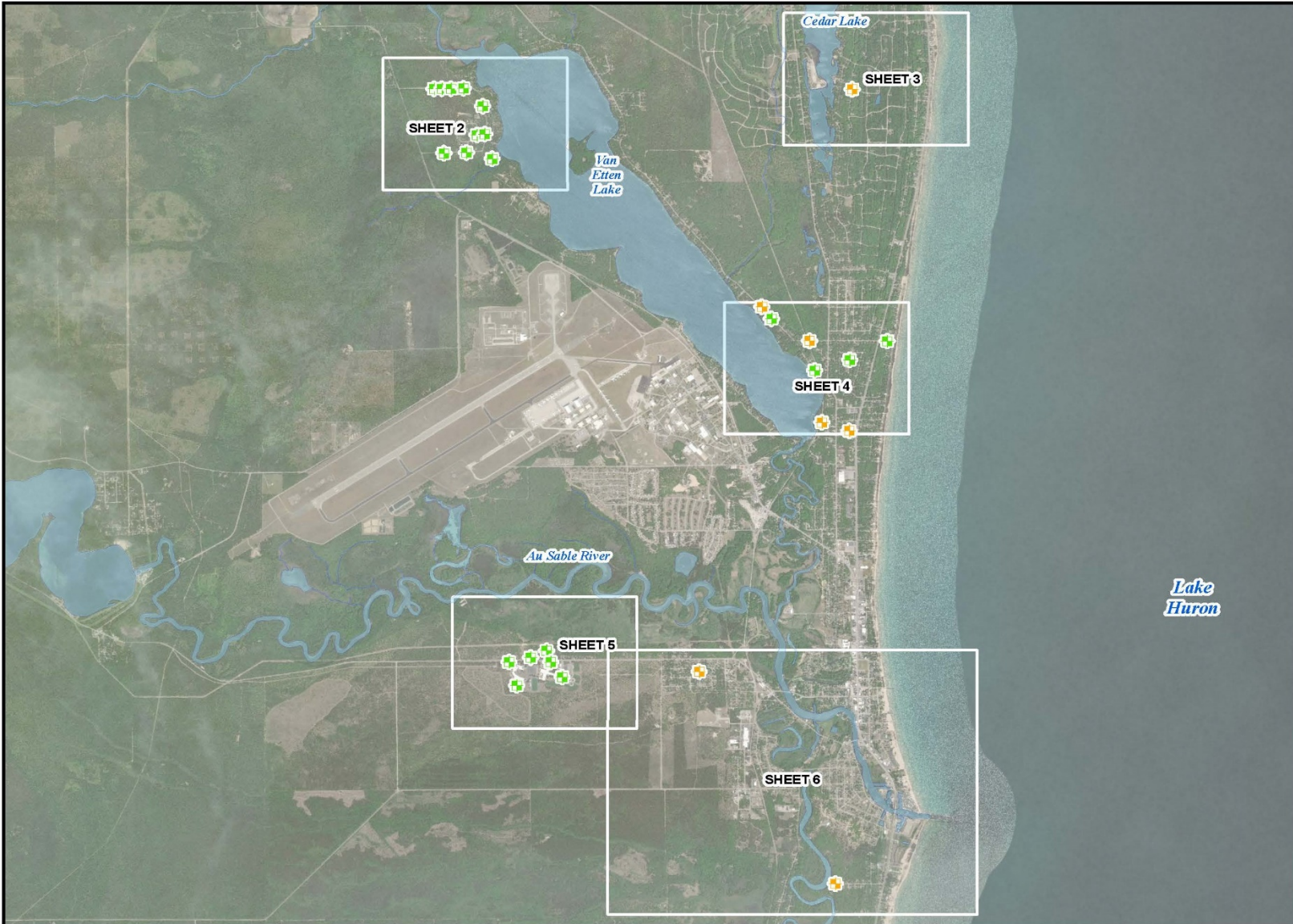
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Legend

- GSU Monitoring Well
- Wurtsmith PFAS Groundwater Investigation Monitoring Well

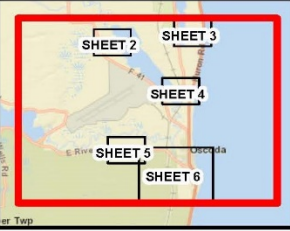
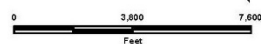
Well ID	
Well Screen Depth Interval	
PFDA+PFOS	Total PFAS
Result (ppt)	Result (ppt)

ND - non-detect
* No label = well not sampled.



GSU YEAR 1 QUARTER 3
GROUNDWATER SAMPLING
APRIL 2020
SHEET 1 OF 6

OSCODA AREA
IOSCO COUNTY,
MICHIGAN



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Legend

- + GSU Monitoring Well
- Wurtsmith PFAS
- + Groundwater Investigation Monitoring Well

Well ID	
Well Screen Depth Interval	
PFOA+PFOS	Total PFAS
Result (ppt)	Result (ppt)

ND - non detect
 * No Label = Well not sampled.



GSU YEAR 1 QUARTER 3
 GROUNDWATER SAMPLING
 APRIL 2020
 SHEET 2 OF 6

OSCODA AREA
 IOSCO COUNTY,
 MICHIGAN



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Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well

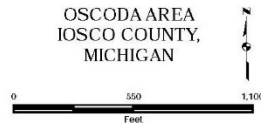
Well ID	
Well Screen Depth Interval	
PFOA+PFOS	Total PFAS
Result (ppt)	Result (ppt)

ND - non detect
 * No Label = Well not sampled.



GSU YEAR 1 QUARTER 3
 GROUNDWATER SAMPLING
 APRIL 2020
 SHEET 3 OF 6

OSCODA AREA
 IOSCO COUNTY,
 MICHIGAN



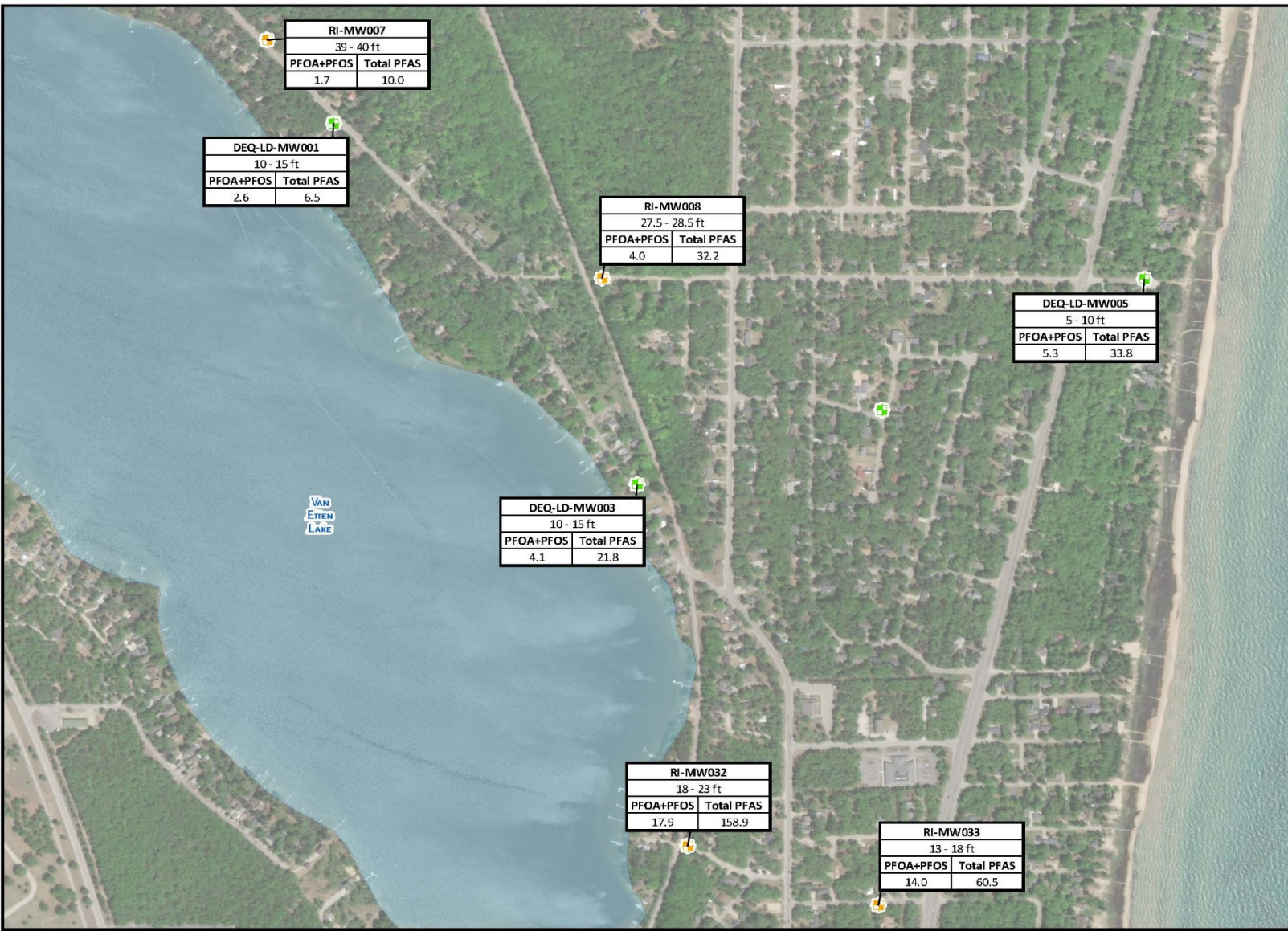
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Legend

- GSU Monitoring Well
- Wurtsmith PFAS
- Groundwater Investigation Monitoring Well

Well ID	
Well Screen Depth Interval	
PFOA+PFOS	Total PFAS
Result (ppt)	Result (ppt)

ND - non-detect
 * No Label = Well not sampled.



RI-MW007	
39 - 40 ft	
PFOA+PFOS	Total PFAS
1.7	10.0

DEQ-LD-MW001	
10 - 15 ft	
PFOA+PFOS	Total PFAS
2.6	6.5

RI-MW008	
27.5 - 28.5 ft	
PFOA+PFOS	Total PFAS
4.0	32.2

DEQ-LD-MW005	
5 - 10 ft	
PFOA+PFOS	Total PFAS
5.3	33.8

DEQ-LD-MW003	
10 - 15 ft	
PFOA+PFOS	Total PFAS
4.1	21.8

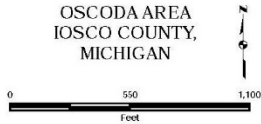
RI-MW032	
18 - 23 ft	
PFOA+PFOS	Total PFAS
17.9	158.9

RI-MW033	
13 - 18 ft	
PFOA+PFOS	Total PFAS
14.0	60.5

VAN
ETTEN
LAKE

GSU YEAR 1 QUARTER 3
 GROUNDWATER SAMPLING
 APRIL 2020
 SHEET 4 OF 6

OSCODA AREA
 IOSCO COUNTY,
 MICHIGAN



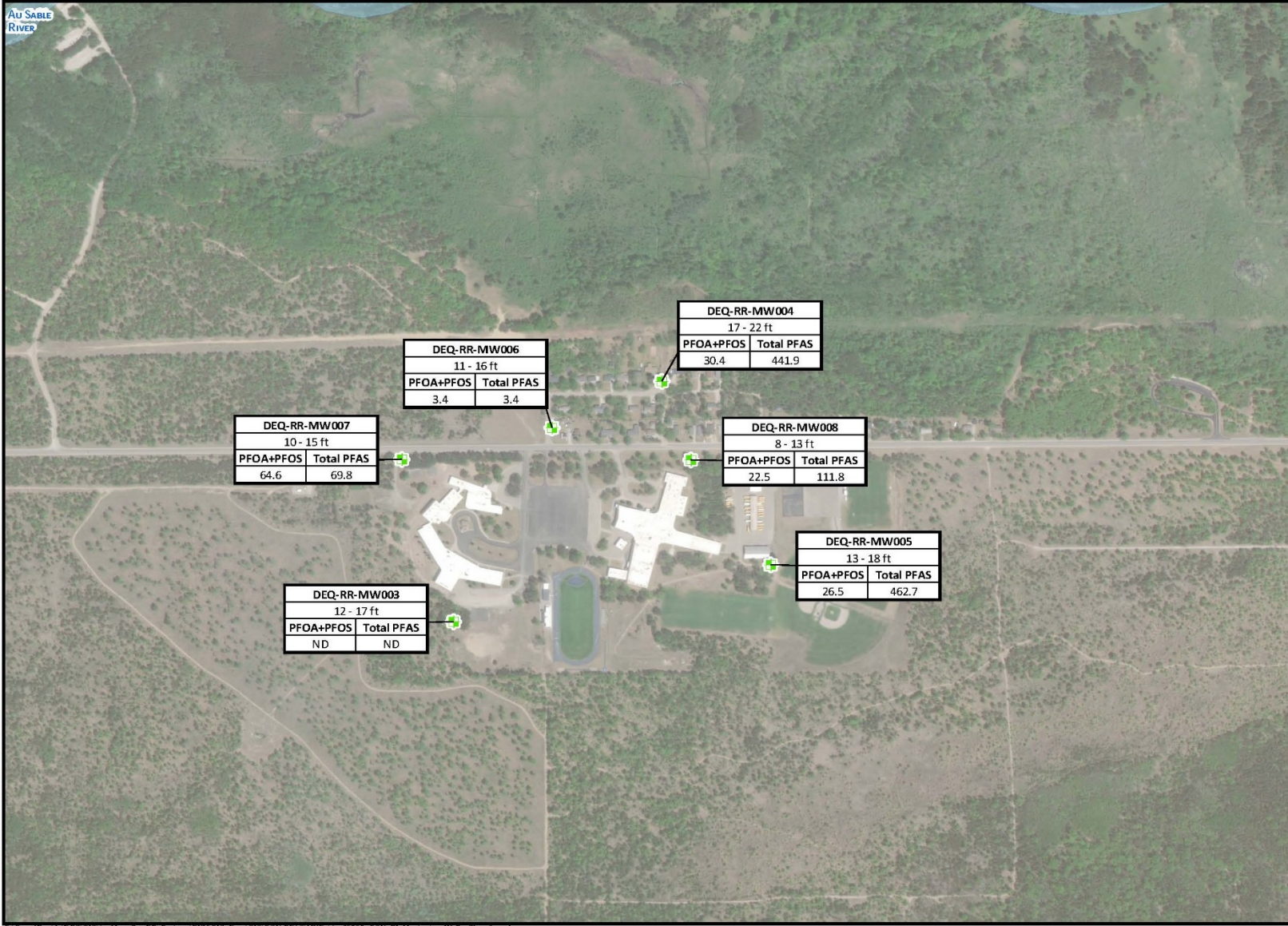
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Legend

- GSU Monitoring Well
- Wurtsmith PFAS Groundwater Investigation Monitoring Well

Well ID	
Well Screen Depth Interval	
PFOA+PFOS	Total PFAS
Result (ppt)	Result (ppt)

ND - non-detect
 * No Label = Well not sampled.



DEQ-RR-MW004	
17 - 22 ft	
PFOA+PFOS	Total PFAS
30.4	441.9

DEQ-RR-MW006	
11 - 16 ft	
PFOA+PFOS	Total PFAS
3.4	3.4

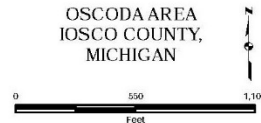
DEQ-RR-MW007	
10 - 15 ft	
PFOA+PFOS	Total PFAS
64.6	69.8

DEQ-RR-MW008	
8 - 13 ft	
PFOA+PFOS	Total PFAS
22.5	111.8

DEQ-RR-MW005	
13 - 18 ft	
PFOA+PFOS	Total PFAS
26.5	462.7

DEQ-RR-MW003	
12 - 17 ft	
PFOA+PFOS	Total PFAS
ND	ND

GSU YEAR 1 QUARTER 3
 GROUNDWATER SAMPLING
 APRIL 2020
 SHEET 5 OF 6



RI-MW024	
17 - 18 ft	
PFOA+PFOS	Total PFAS
4.0	27.0
26 - 27 ft	
PFOA+PFOS	Total PFAS
3.1	14.5

RI-MW030	
24 - 25 ft	
PFOA+PFOS	Total PFAS
ND	4.3

Legend

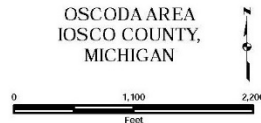
- GSU Monitoring Well
- Wurtsmith PFAS Groundwater Investigation Monitoring Well

Well ID	
Well Screen Depth Interval	
PFOA+PFOS	Total PFAS
Result (ppt)	Result (ppt)

ND - non detect
 * No Label = Well not sampled.

GSU YEAR 1 QUARTER 3
 GROUNDWATER SAMPLING
 APRIL 2020
 SHEET 6 OF 6

OSCODA AREA
 IOSCO COUNTY,
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