

TSX/PAZ Satellite Update
InSAR Subsidence
October 4, 2023

Lonquist comment:

Both the SNT satellite (12-day revisit) and the TSX satellite from the TSX/PAZ constellation (4 & 7-day revisit) passed by Sulphur on Wednesday October 4. We received the datasets on Friday and noted that the newest datapoint in both updates are continuing in the direction of the recent trends across all AOI regions. For the TSX/PAZ data, the recent trends are currently being plotted on the data span of 3/24/2023 to present. The “historical” data trends continue to be calculated from a data span of 1/24/2023 - 8/3/2023, before trend departure was observed.

As with the prior TSX/PAZ update, we have appended a review of the distant “Additional” locations of interest to that report, where we are still seeing similar or greater acceleration increases.

A meeting was held with TRE on Friday where we were able to preview the results of their “reprocessing” or “re-baselining” effort for the TSX/PAZ data. We were told that this is a typical step and may be performed every 6 months to 1 year, particularly for a dataset with a relatively short history compared to the SNT data. In this process the data point grid is recreated to include only radar targets that have maintained decent quality. The quality of the reference point, from which the relative measurements are made, is also confirmed.

In this preview meeting we learned that the amount of the trend departures observed in the AOIs and Additional AOIs will likely be diminished. They estimate that this new baseline model will be available for use in the TSX/PAZ dataset that will be received early next week, and may not be available for the PAZ image that was captured on October 8 (dataset still to be received).



TSX/PAZ Satellite Update

Continuous InSAR Monitoring of
Ground Displacement
Near Western Caverns and Dome Flank

Sulphur Mines Salt Dome

Prepared for:
Westlake Chemical

Prepared by:
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Date Signed: October 9, 2023
Austin, Texas

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Dataset

Satellite Source

TerraSAR-X - PAZ Constellation

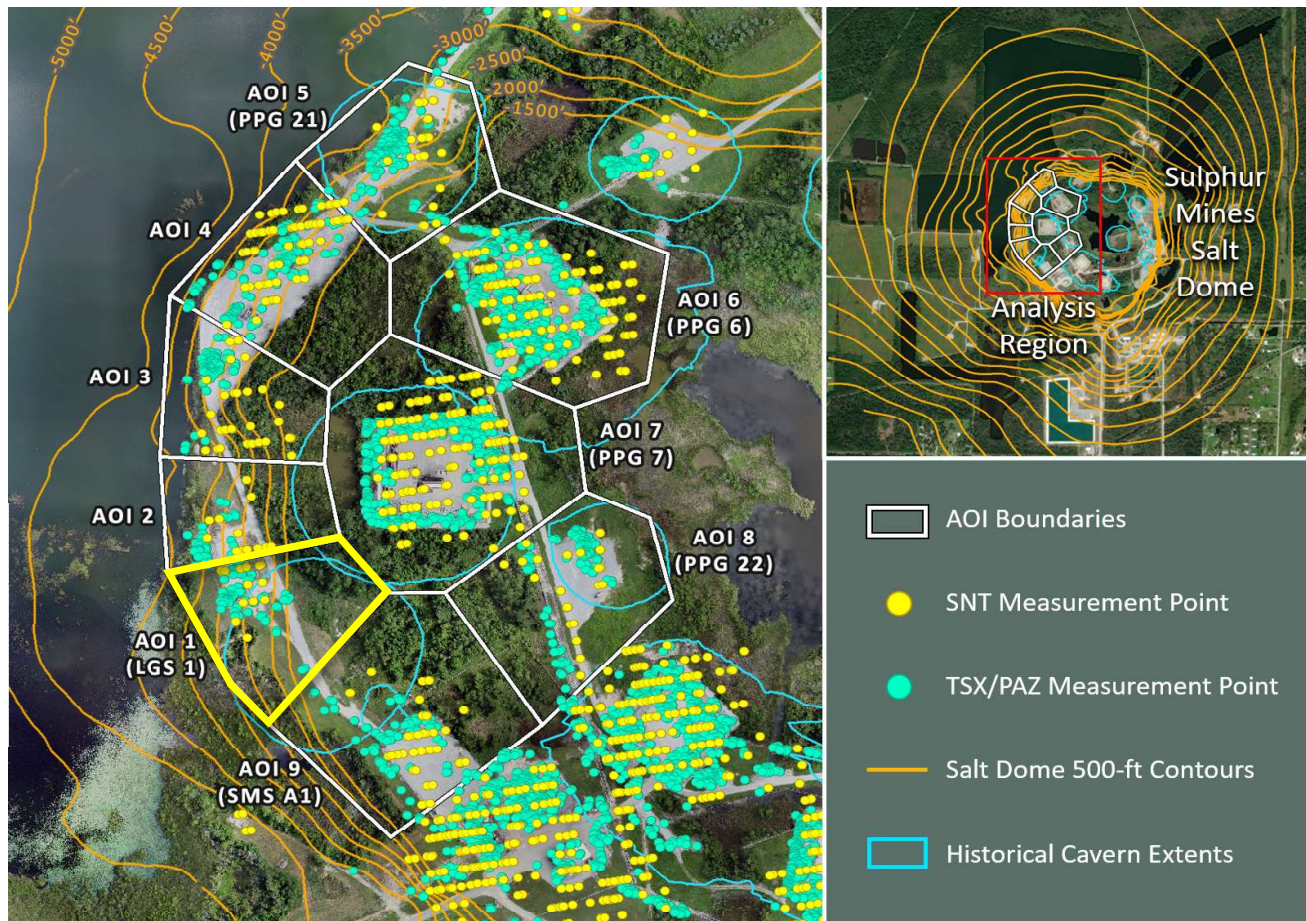
Most Recent Image Date

Wednesday, October 4, 2023

Analysis Report Date:

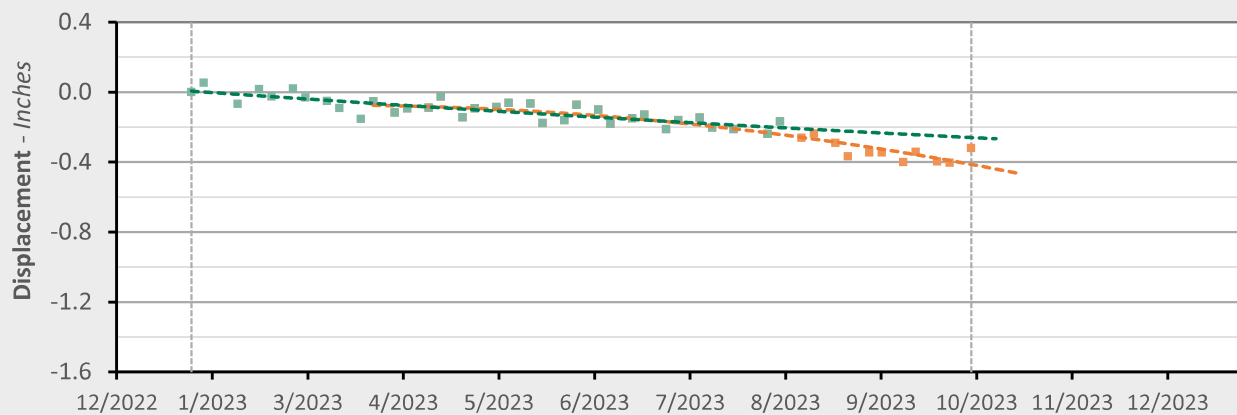
October 9, 2023

AOI 1 (LGS 1) - Location Map



AOI 1 (LGS 1) - Displacement Time Series

TSX/PAZ (10/4/23) Point Count: 77



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	-0.35 in/yr	-1.14 in/yr	-0.79 in/yr
Acceleration:	+0.19 in/yr ²	-2.06 in/yr ²	-2.25 in/yr ²

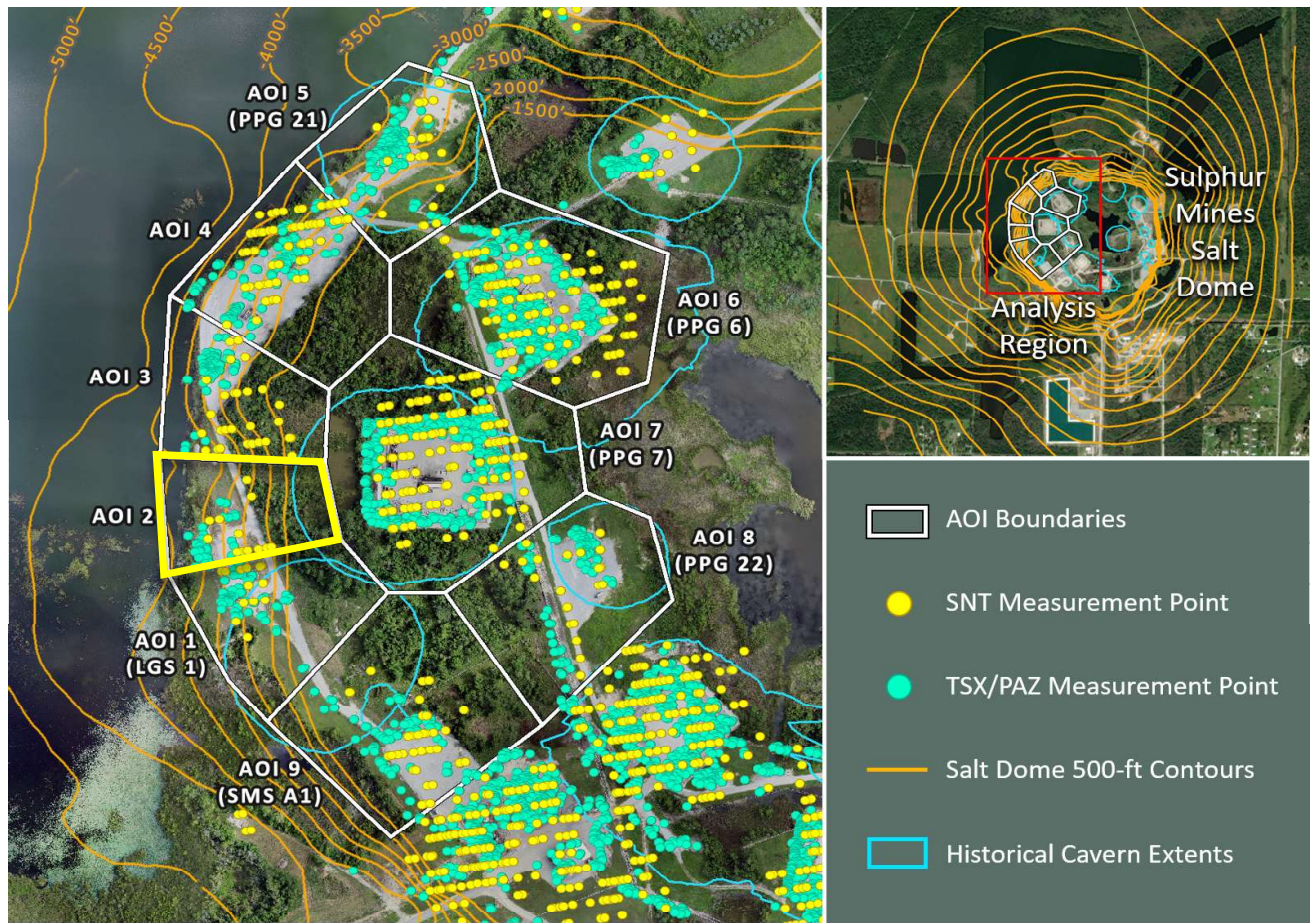
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

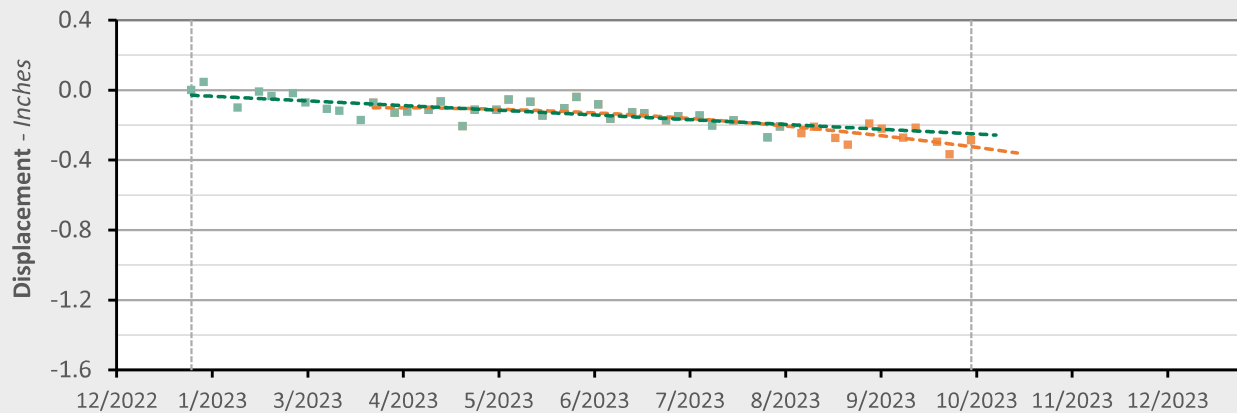
--- Recent Trend Line (Quadratic Regression)

AOI 2 - Location Map



AOI 2 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 42



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	-0.32 in/yr	-0.82 in/yr	-0.50 in/yr
Acceleration:	-0.02 in/yr ²	-1.61 in/yr ²	-1.59 in/yr ²

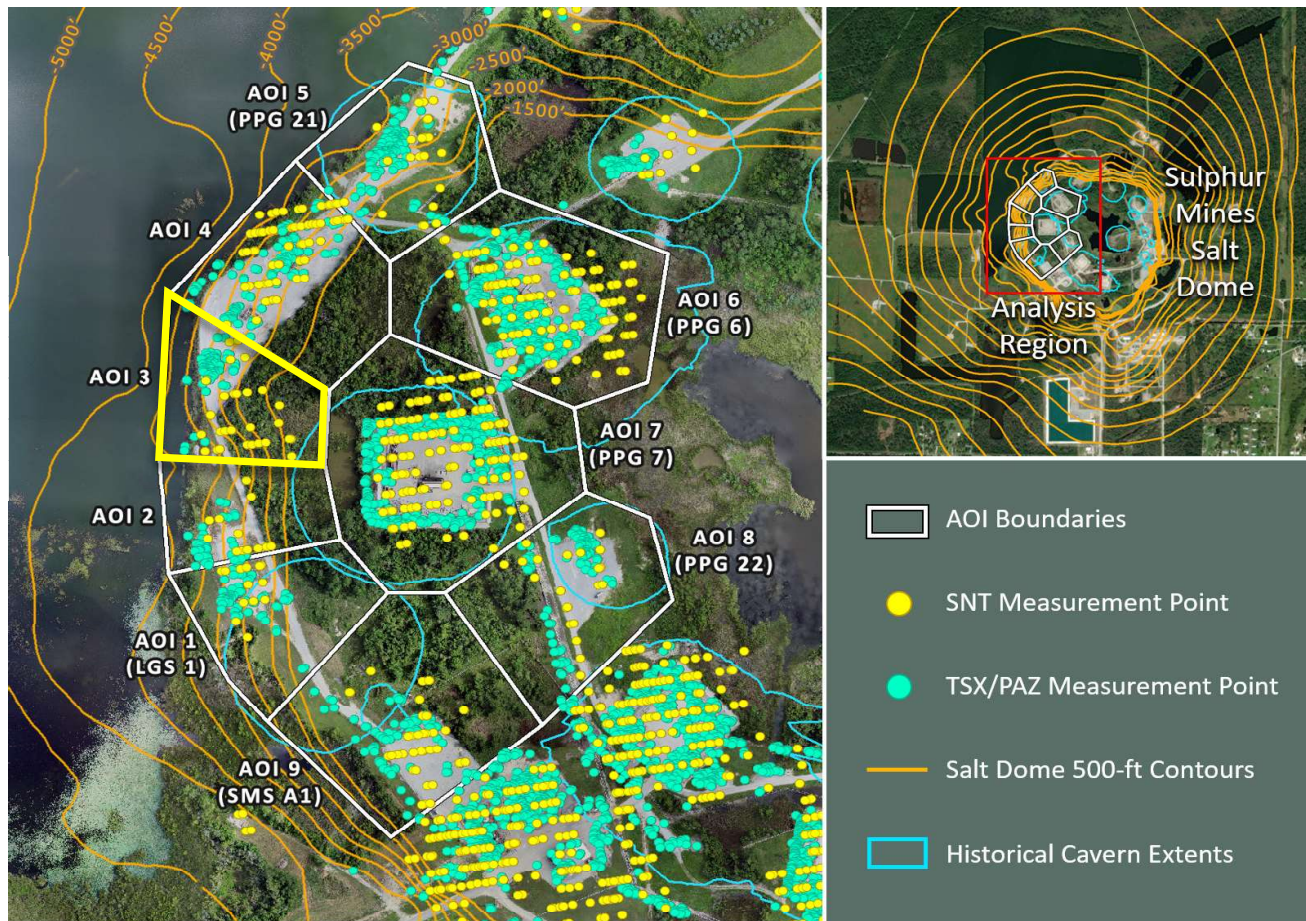
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

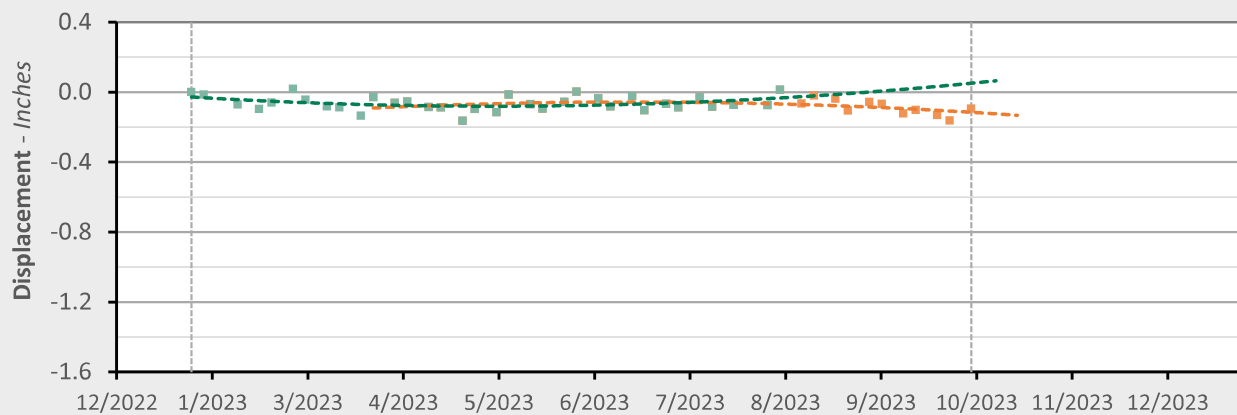
--- Recent Trend Line (Quadratic Regression)

AOI 3 - Location Map



AOI 3 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: **81**



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	+0.37 in/yr	-0.37 in/yr	-0.74 in/yr
Acceleration:	+1.46 in/yr ²	-1.30 in/yr ²	-2.76 in/yr ²

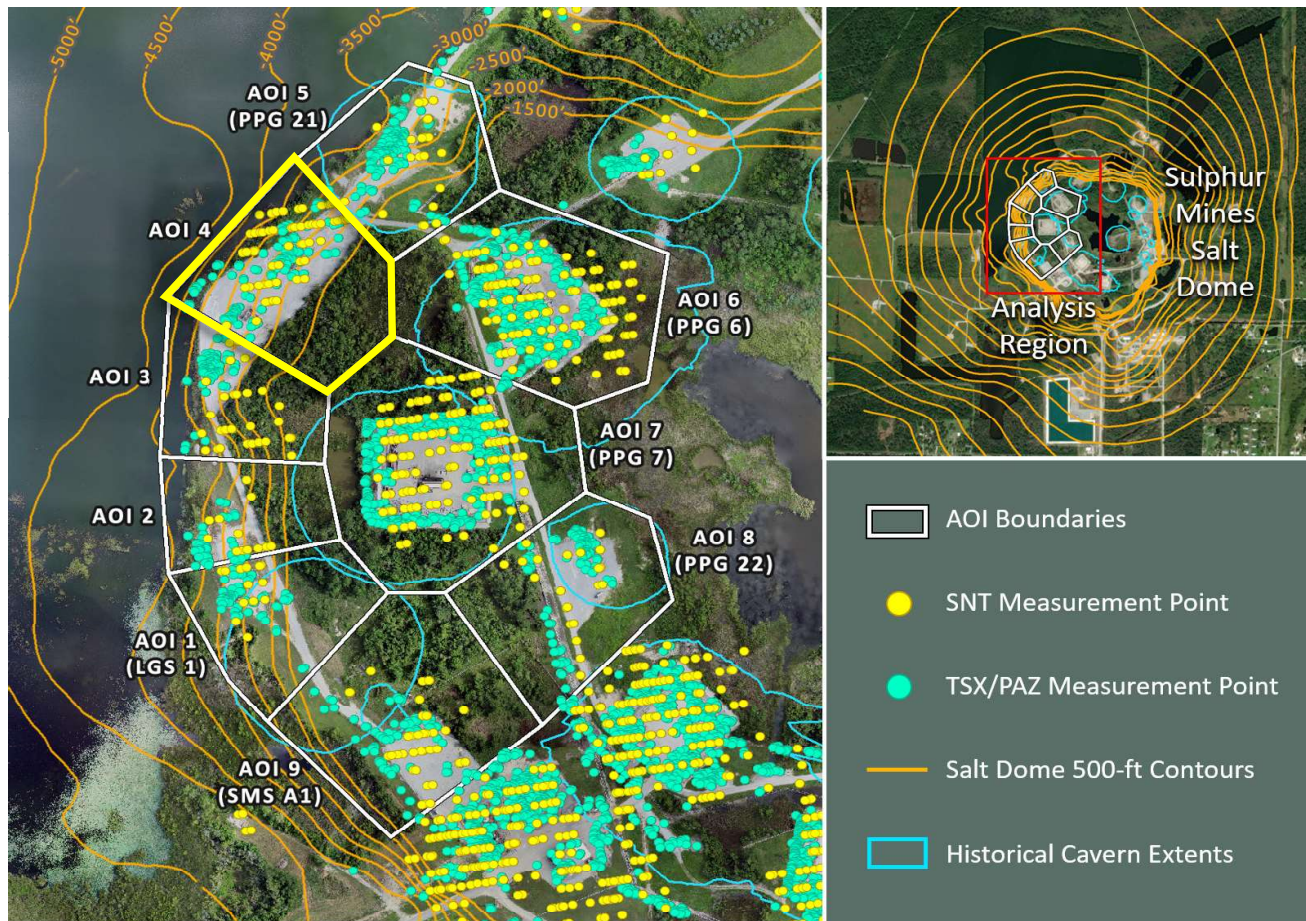
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

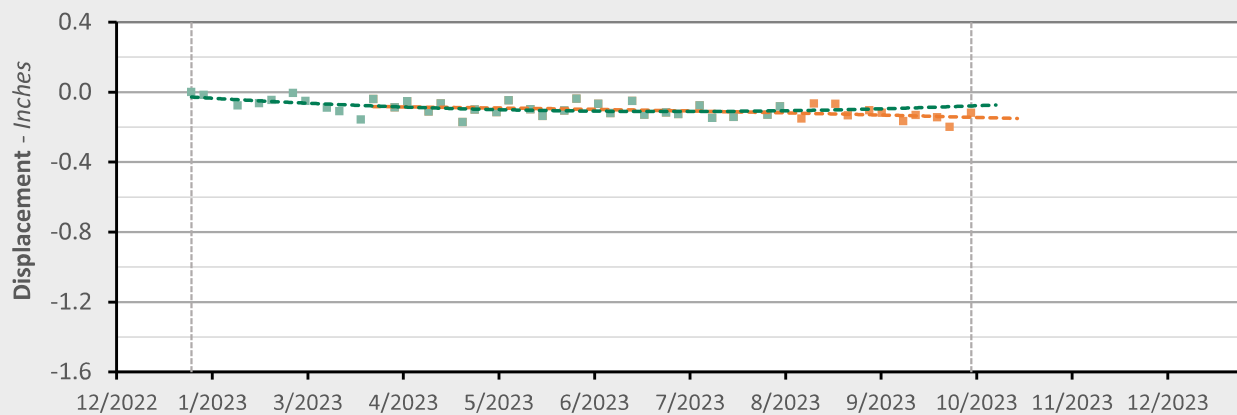
--- Recent Trend Line (Quadratic Regression)

AOI 4 - Location Map



AOI 4 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 140



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	+0.09 in/yr	-0.17 in/yr	-0.25 in/yr
Acceleration:	+0.91 in/yr ²	-0.21 in/yr ²	-1.11 in/yr ²

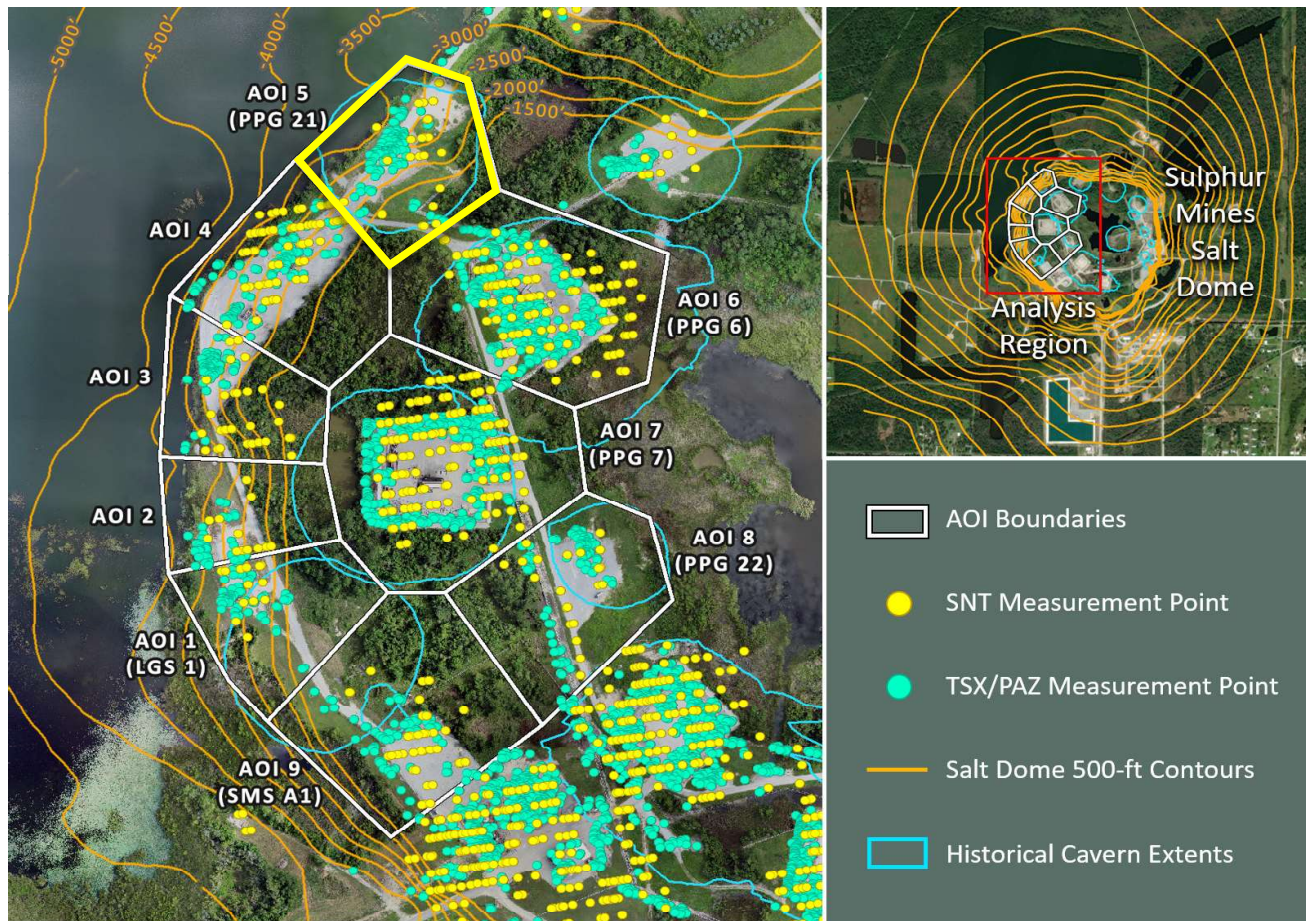
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

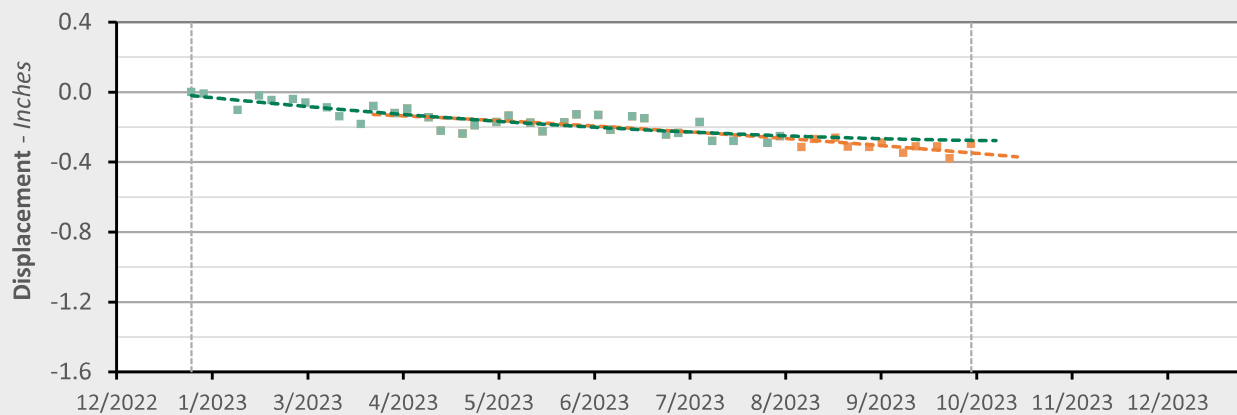
■ Recent LOS Displacement Measurement

--- Recent Trend Line (Quadratic Regression)

AOI 5 (PPG 21) - Location Map



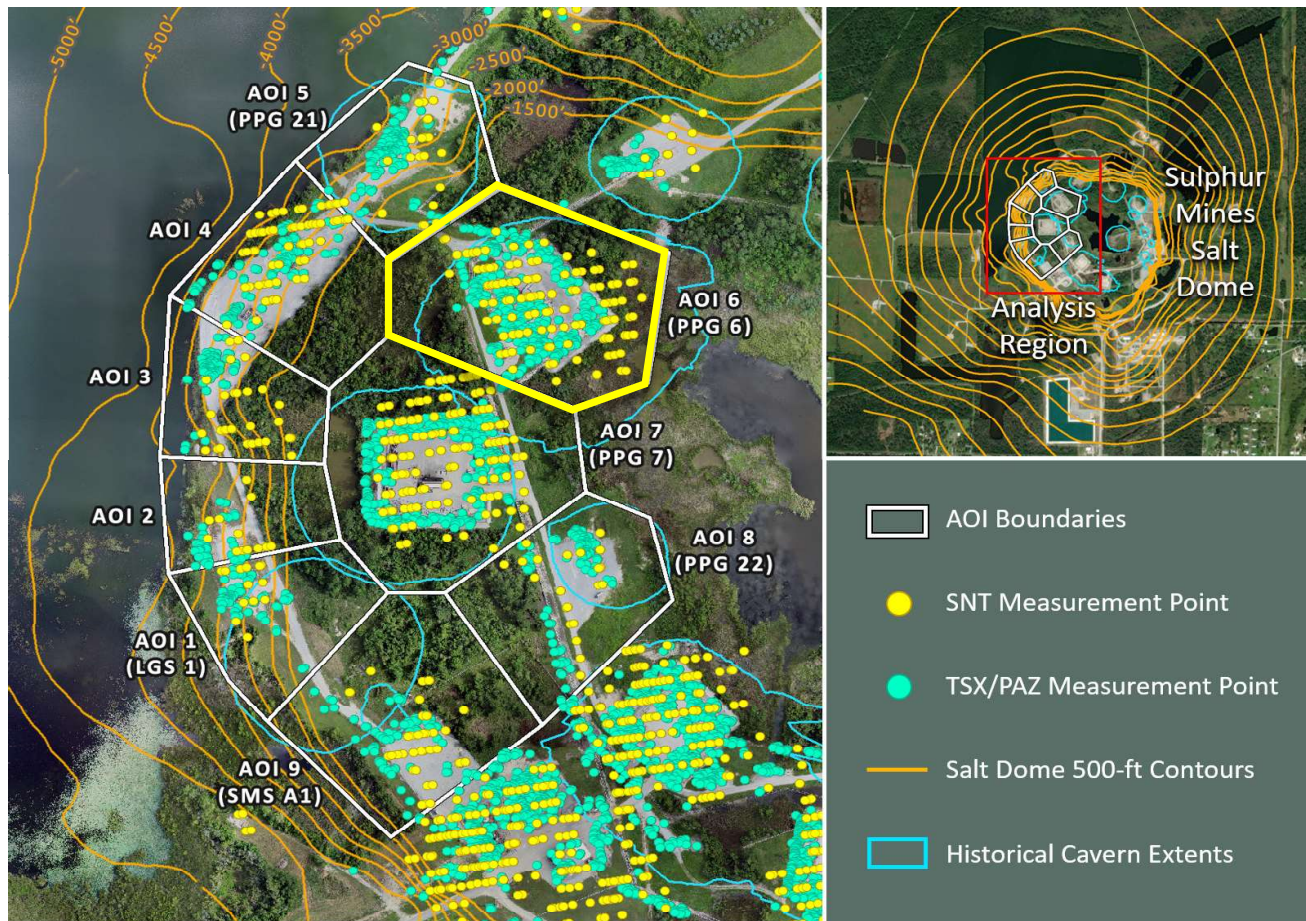
AOI 5 (PPG 21) - Displacement Time Series TSX/PAZ (10/4/2023) Point Count: 136



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	-0.23 in/yr	-0.53 in/yr	-0.30 in/yr
Acceleration:	+0.80 in/yr ²	-0.47 in/yr ²	-1.27 in/yr ²

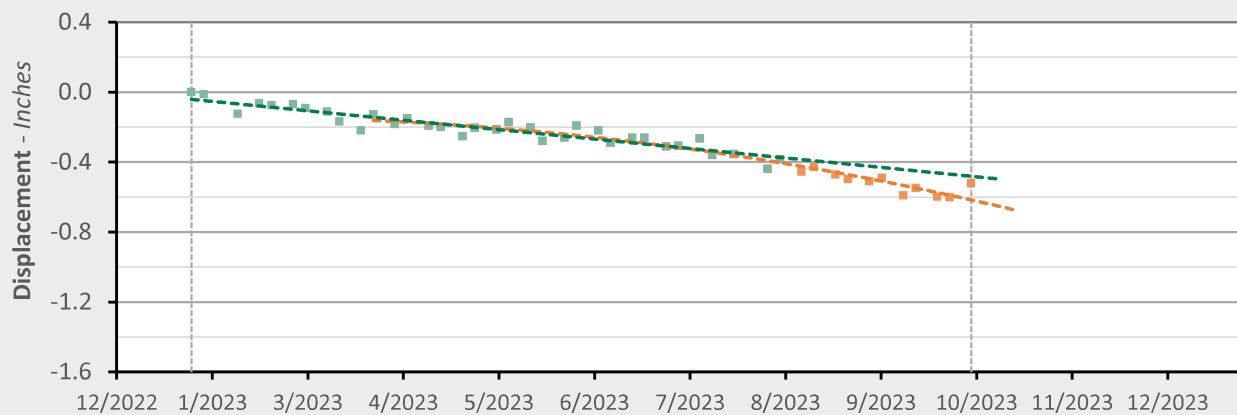
■ Historical LOS Displacement Measurement
 --- Historical Trend Line (Quadratic Regression)
 ■ Recent LOS Displacement Measurement
 --- Recent Trend Line (Quadratic Regression)

AOI 6 (PPG 6) - Location Map



AOI 6 (PPG 6) - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 428



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	-0.64 in/yr	-1.40 in/yr	-0.76 in/yr
Acceleration:	-0.00 in/yr ²	-2.20 in/yr ²	-2.20 in/yr ²

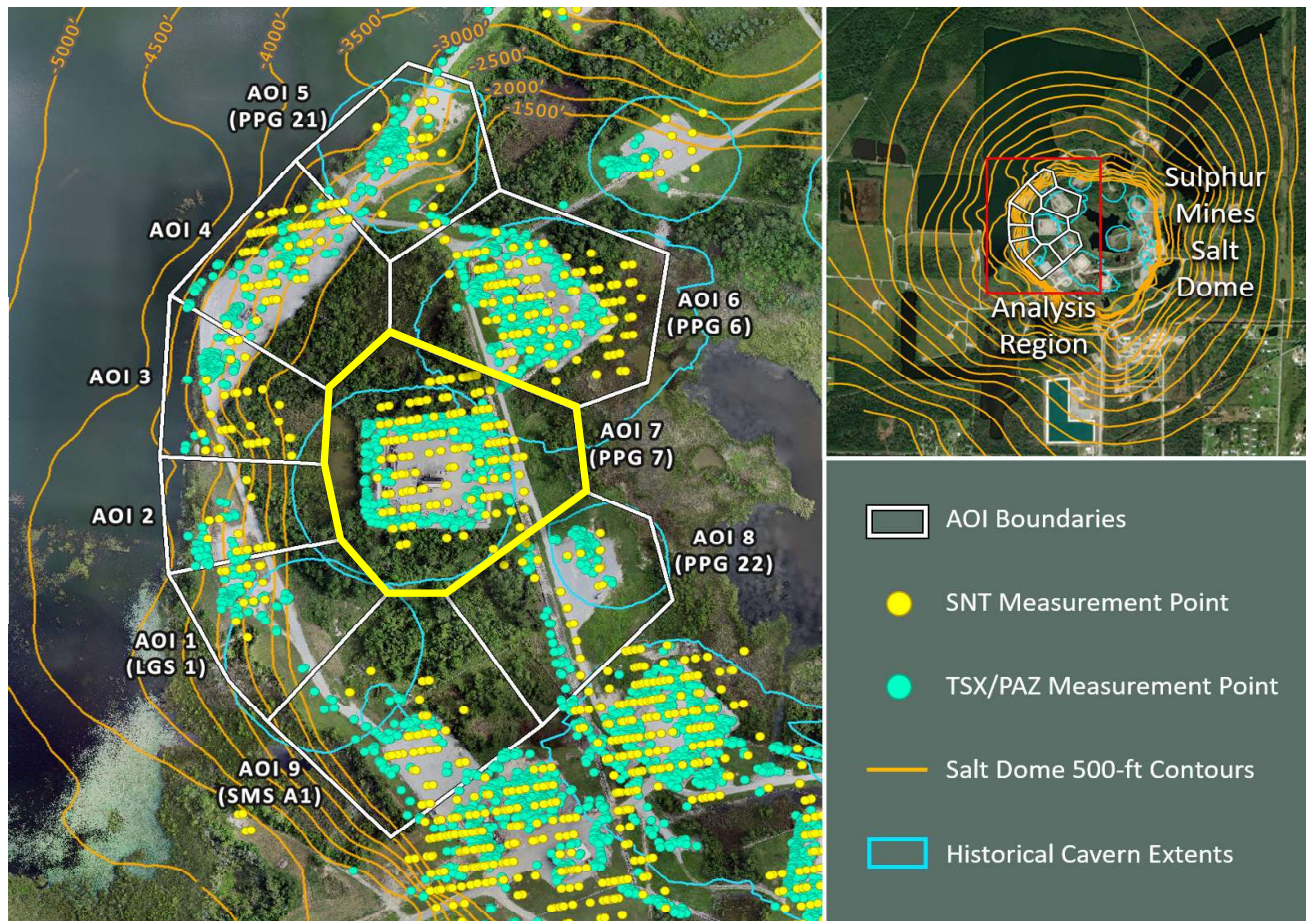
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

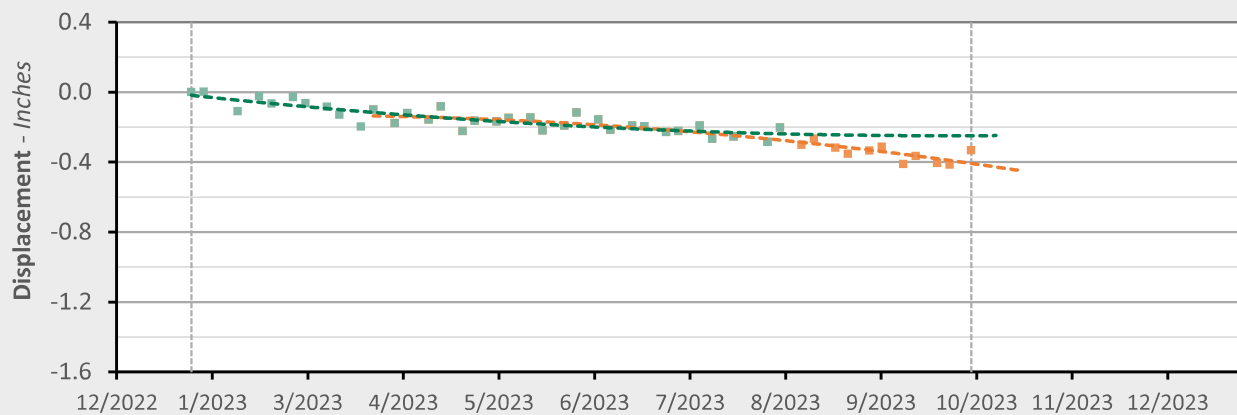
■ Recent LOS Displacement Measurement

--- Recent Trend Line (Quadratic Regression)

AOI 7 (PPG 7) - Location Map



AOI 7 (PPG 7) - Displacement Time Series

TSX/PAZ (10/4/23) Point Count: **374**

	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	-0.15 in/yr	-0.89 in/yr	-0.73 in/yr
Acceleration:	+1.02 in/yr ²	-1.52 in/yr ²	-2.55 in/yr ²

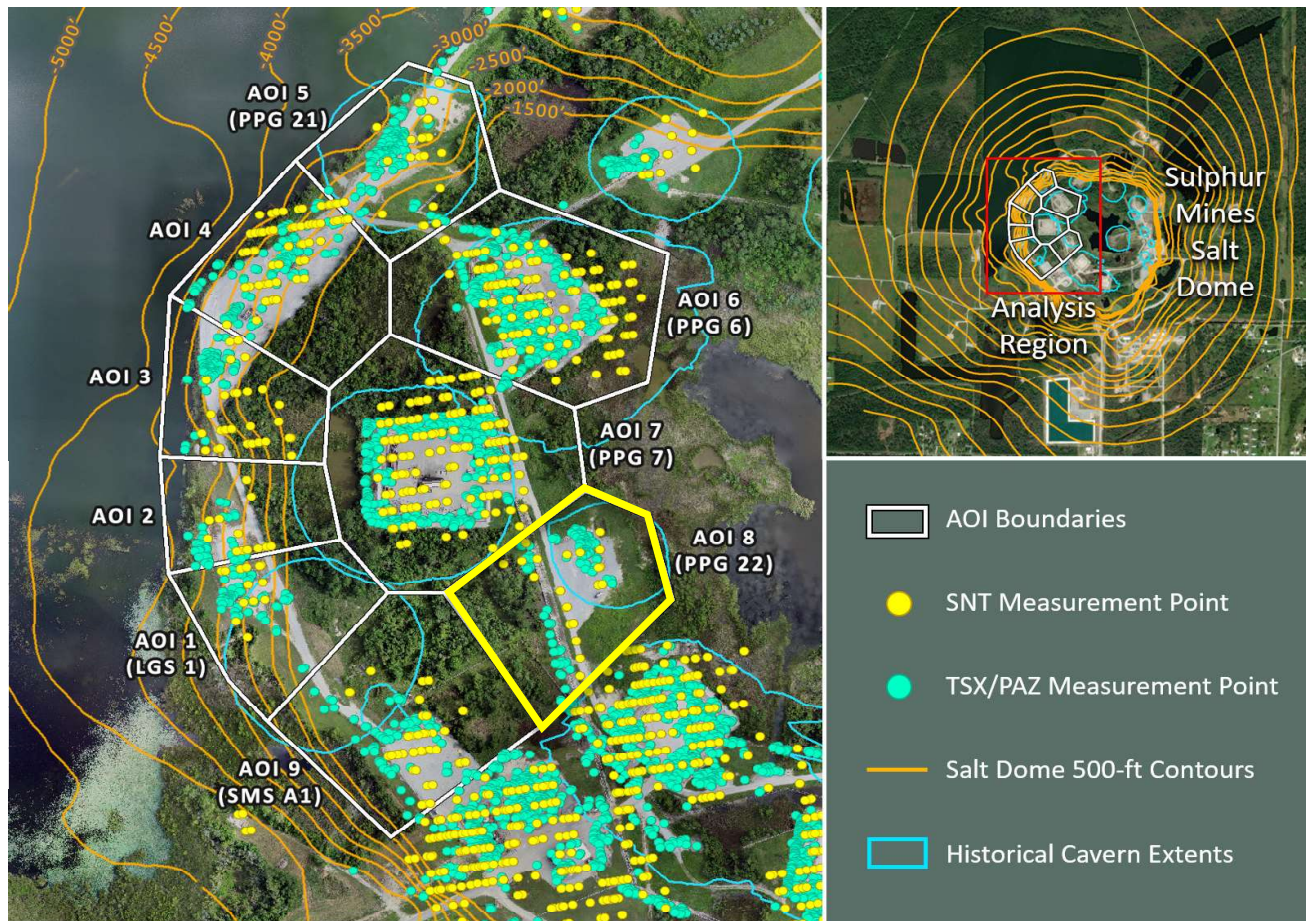
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

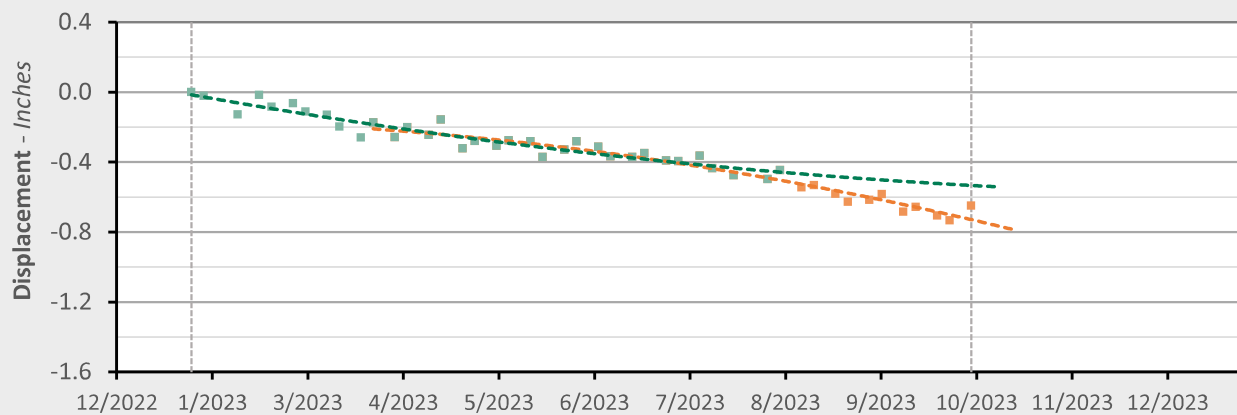
■ Recent LOS Displacement Measurement

--- Recent Trend Line (Quadratic Regression)

AOI 8 (PPG 22) - Location Map



AOI 8 (PPG 22) - Displacement Time Series TSX/PAZ (10/4/2023) Point Count: 111



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	-0.55 in/yr	-1.45 in/yr	-0.91 in/yr
Acceleration:	+1.14 in/yr ²	-1.94 in/yr ²	-3.08 in/yr ²

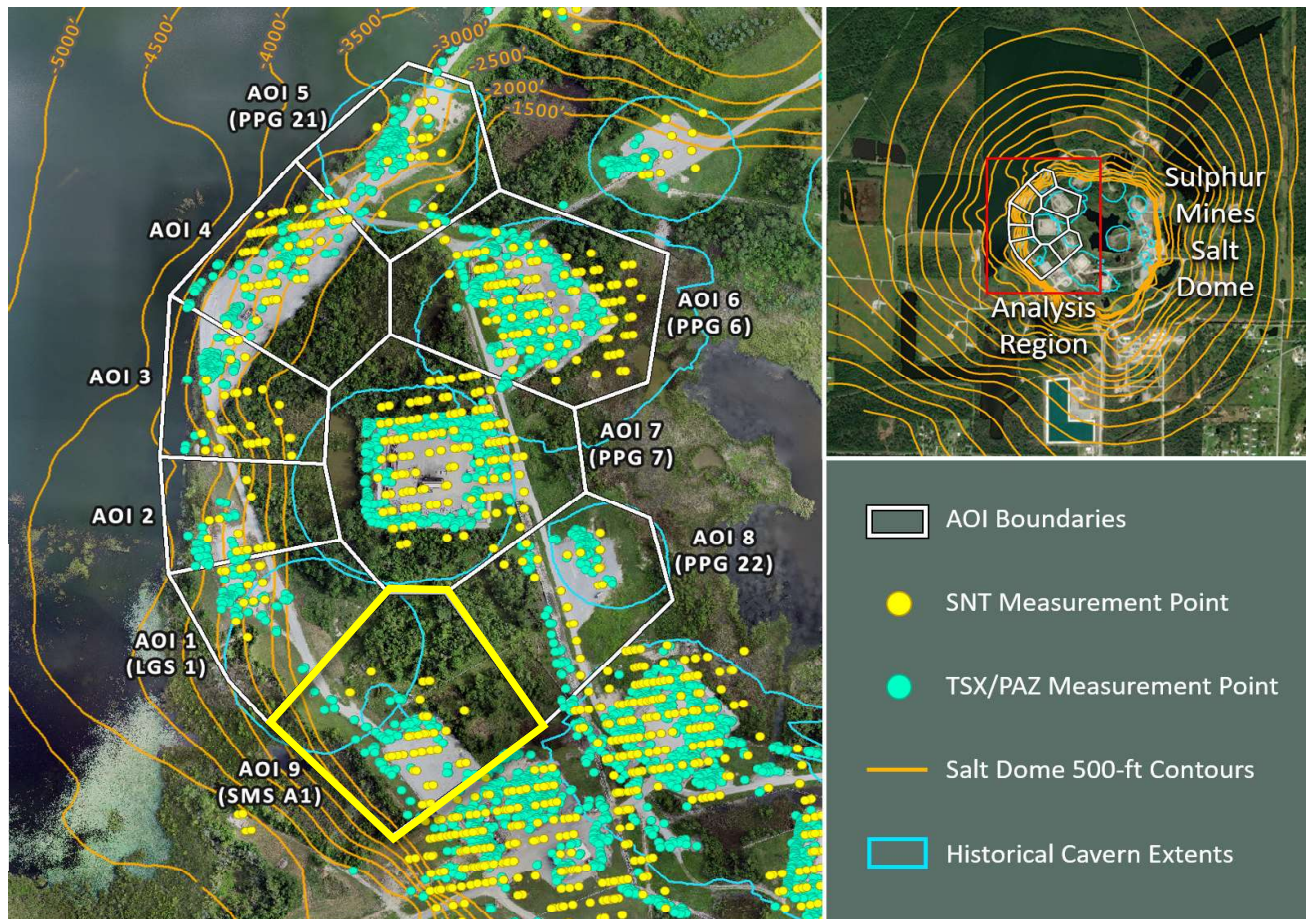
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

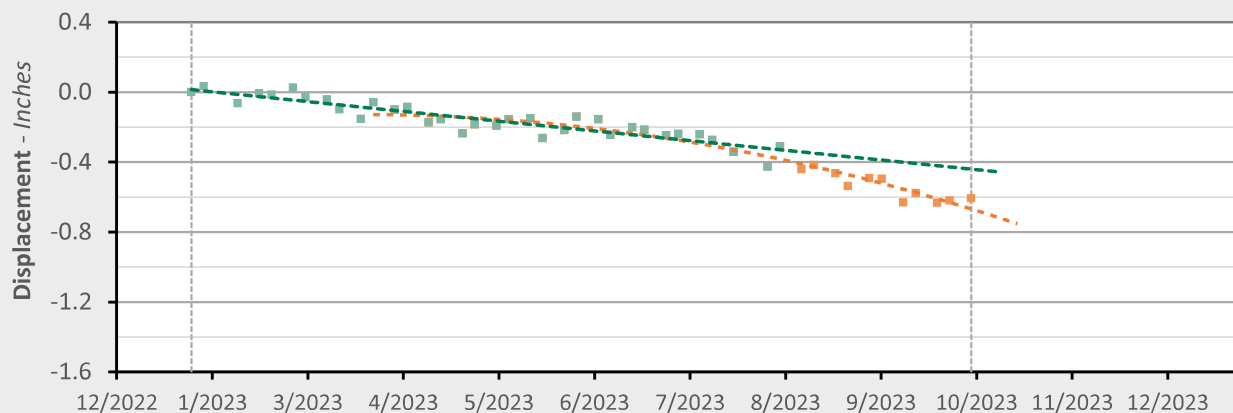
■ Recent LOS Displacement Measurement

--- Recent Trend Line (Quadratic Regression)

AOI 9 (PPG A1) - Location Map



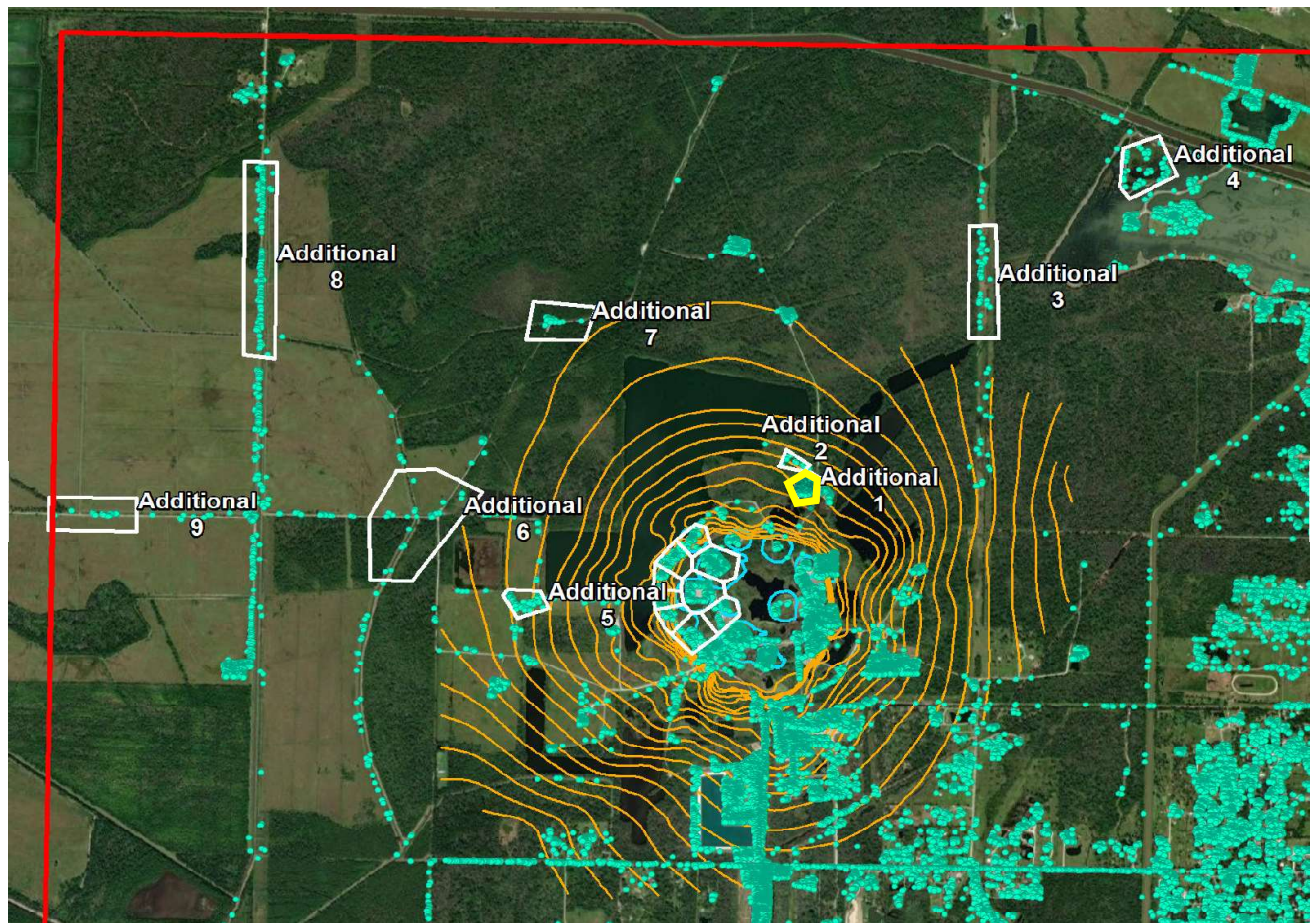
AOI 9 (SMS A1) - Displacement Time Series TSX/PAZ (10/4/23) Point Count: 85



	As of 8/3/23	3/24/2023 - 10/04/23	Trend Change
Velocity:	-0.65 in/yr	-1.92 in/yr	-1.27 in/yr
Acceleration:	+0.02 in/yr ²	-3.66 in/yr ²	-3.68 in/yr ²

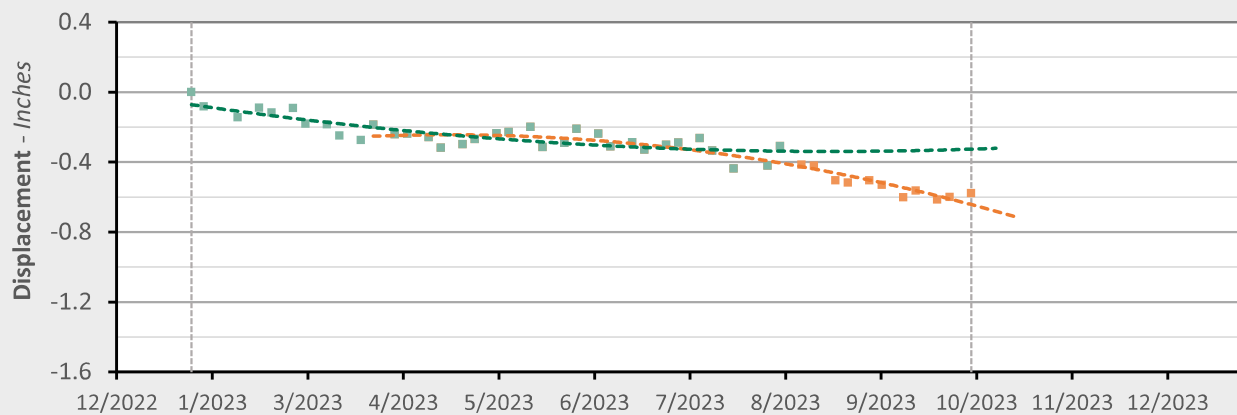
■ Historical LOS Displacement Measurement
 --- Historical Trend Line (Quadratic Regression)
 ■ Recent LOS Displacement Measurement
 --- Recent Trend Line (Quadratic Regression)

Additional 1 - Location Map



Additional 1 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 135



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	-0.07 in/yr	-1.64 in/yr	-1.57 in/yr
Acceleration:	+1.66 in/yr ²	-3.68 in/yr ²	-5.34 in/yr ²

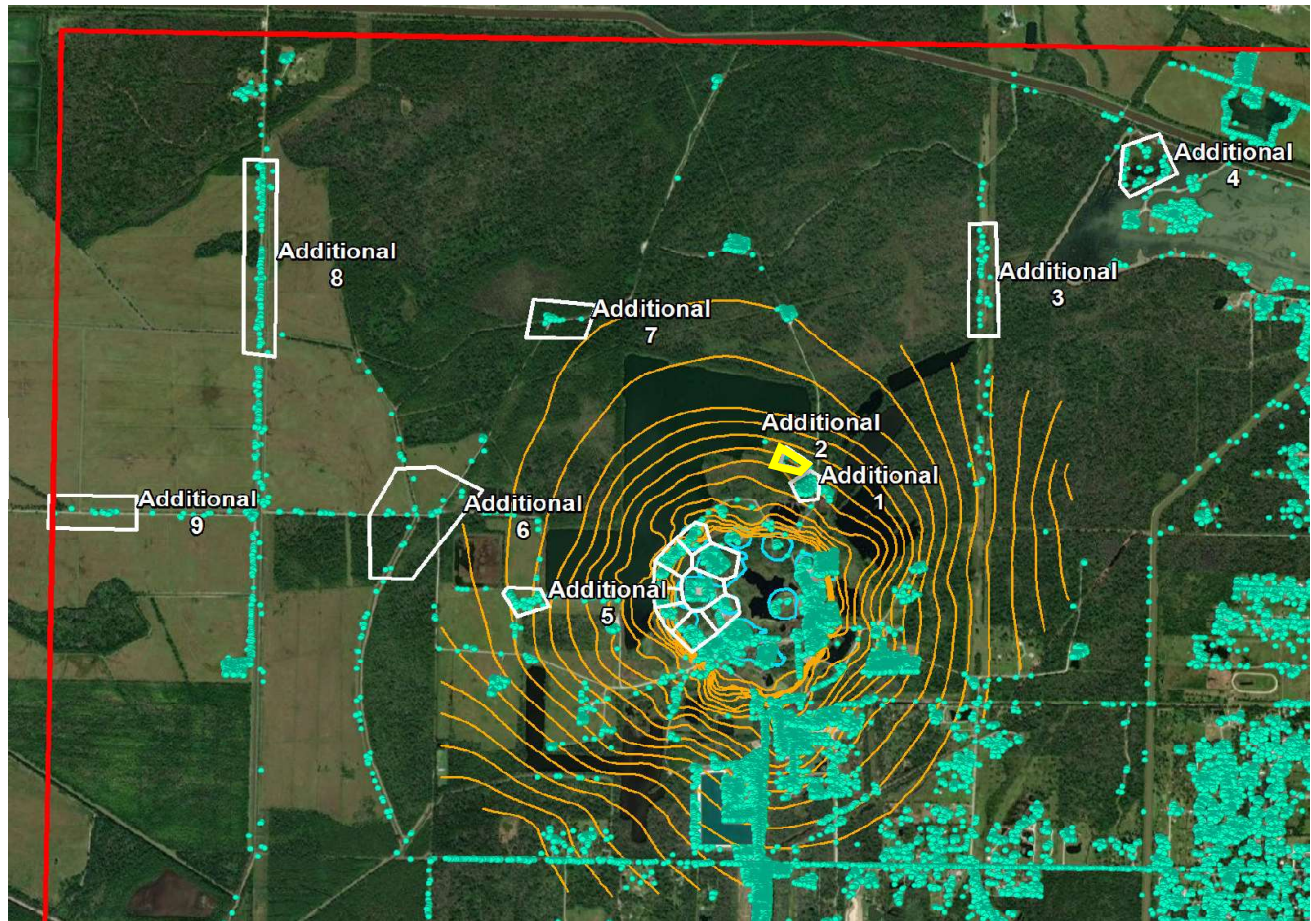
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

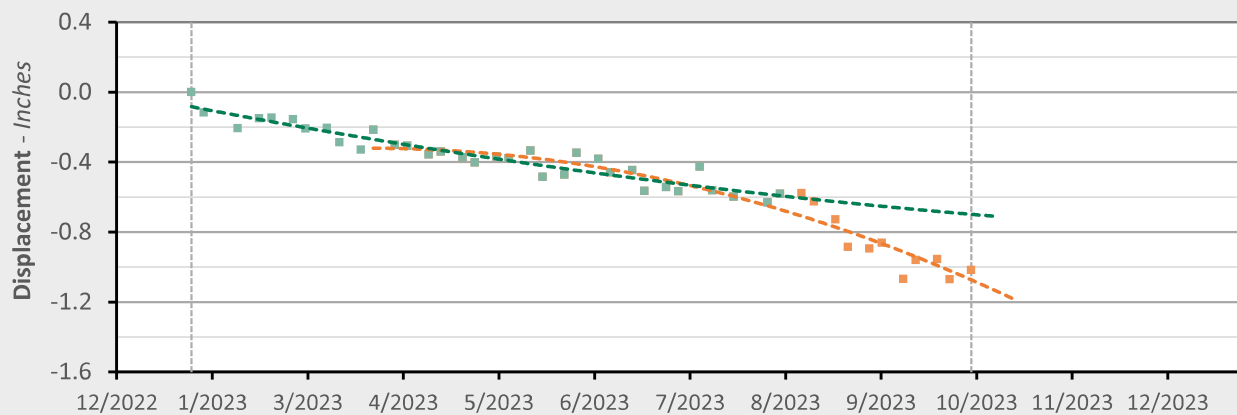
--- Recent Trend Line (Quadratic Regression)

Additional 2 - Location Map



Additional 2 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 18



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	-0.71 in/yr	-2.72 in/yr	-2.01 in/yr
Acceleration:	+1.00 in/yr ²	-5.28 in/yr ²	-6.27 in/yr ²

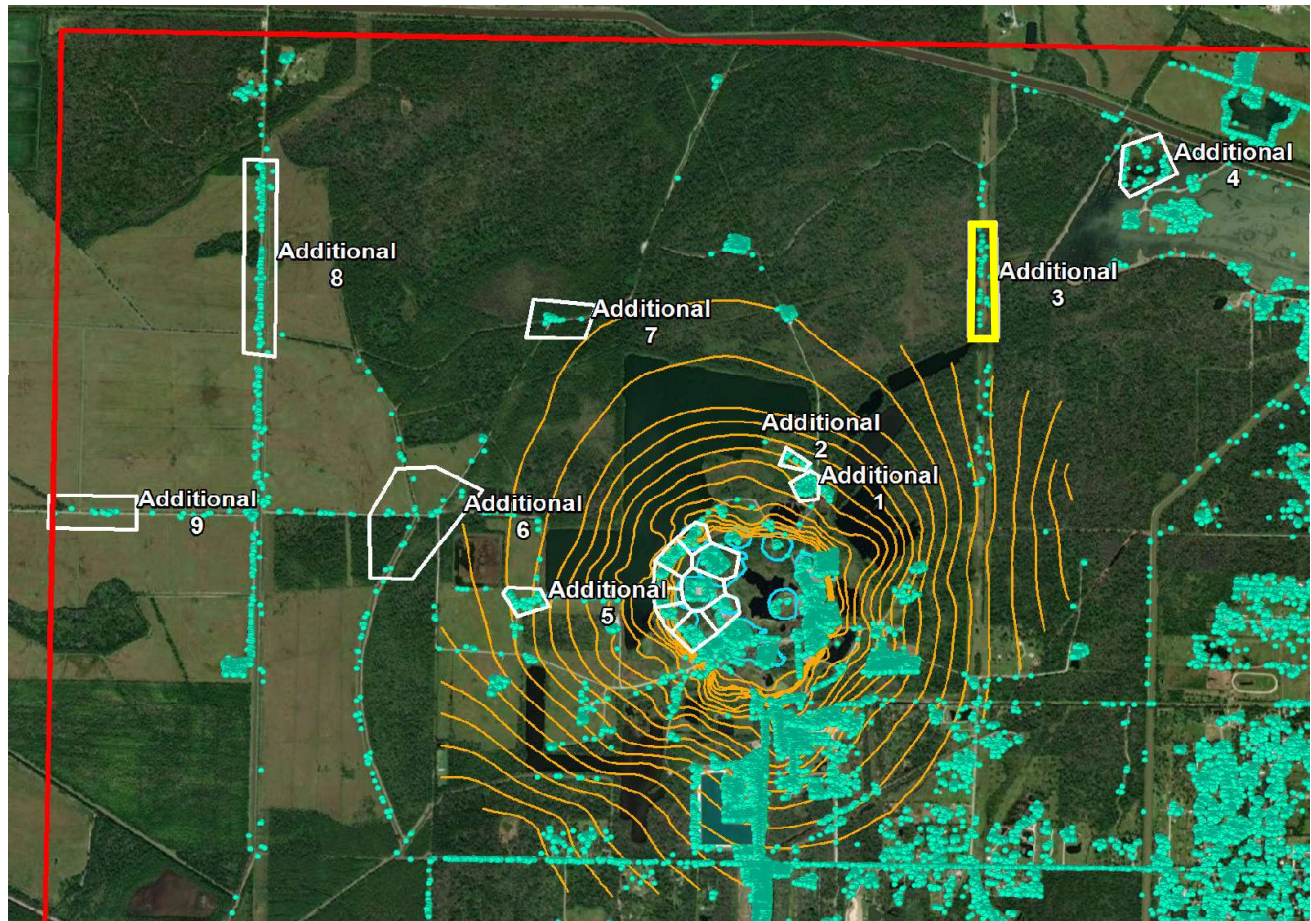
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

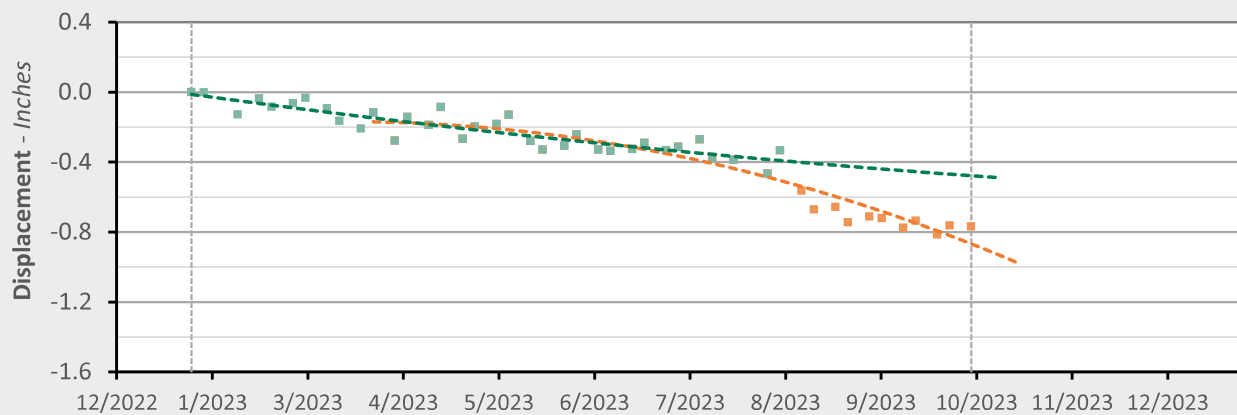
--- Recent Trend Line (Quadratic Regression)

Additional 3 - Location Map



Additional 3 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 40



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	-0.56 in/yr	-2.44 in/yr	-1.87 in/yr
Acceleration:	+0.61 in/yr ²	-4.55 in/yr ²	-5.16 in/yr ²

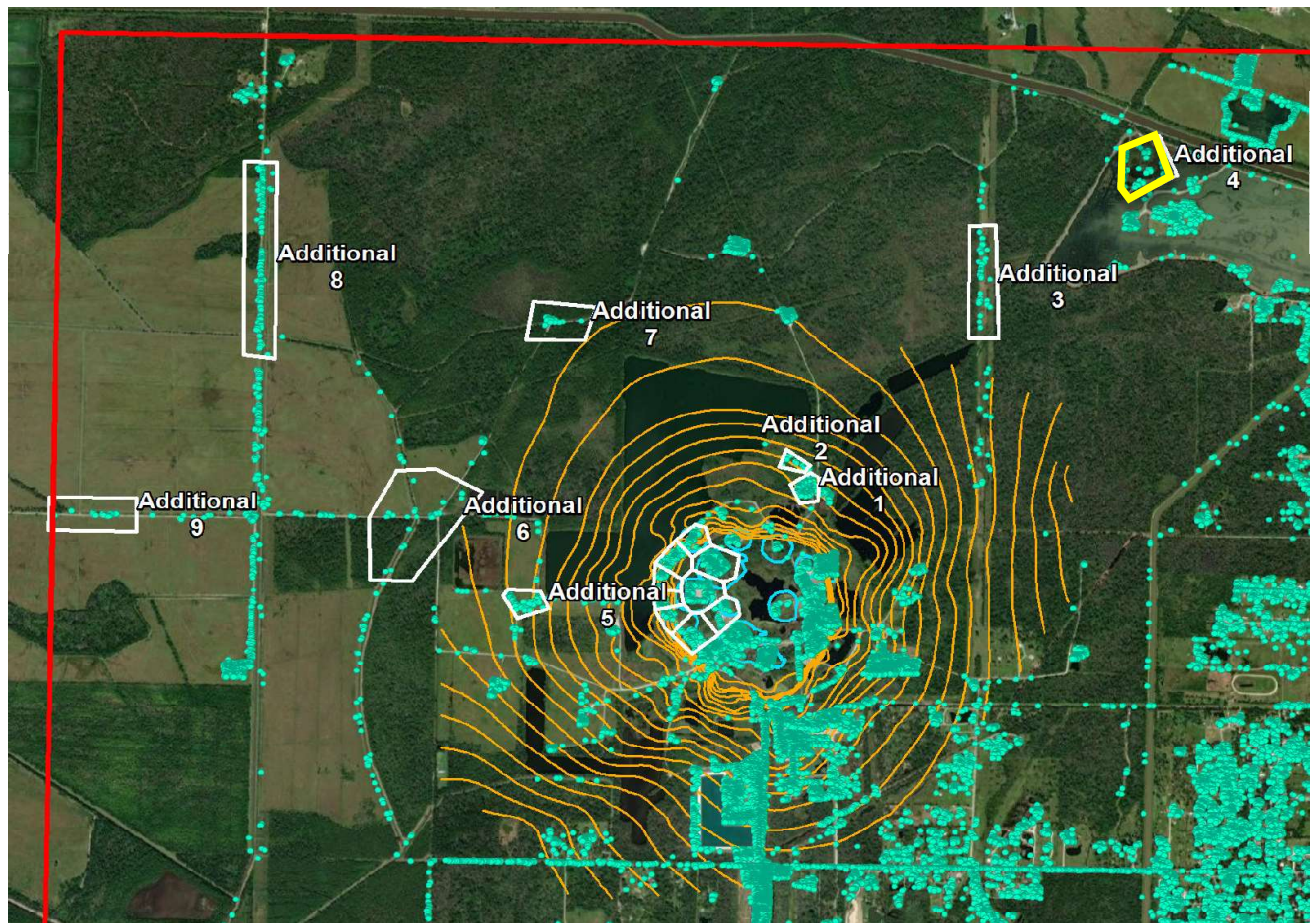
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

--- Recent Trend Line (Quadratic Regression)

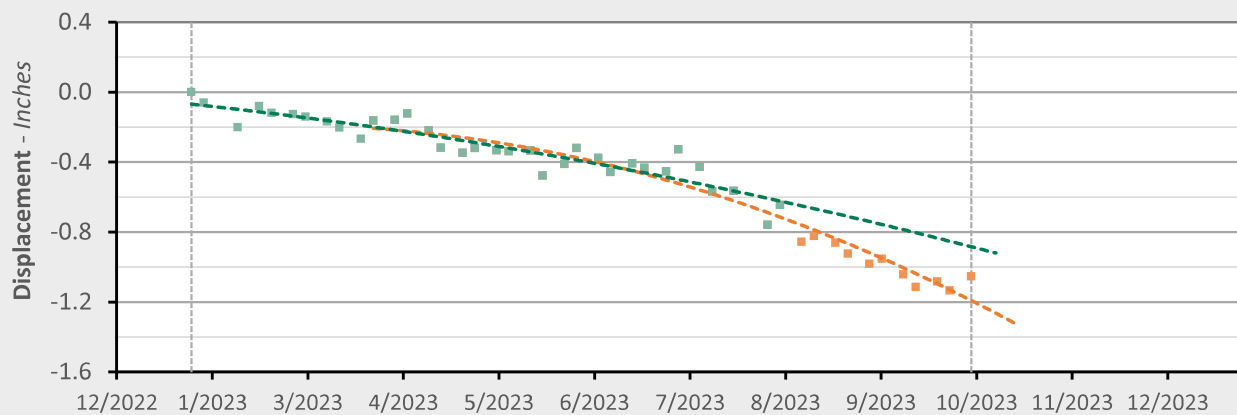
Additional 4 - Location Map



Additional 4 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count:

71



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	-1.42 in/yr	-3.16 in/yr	-1.74 in/yr
Acceleration:	-1.38 in/yr ²	-5.30 in/yr ²	-3.92 in/yr ²

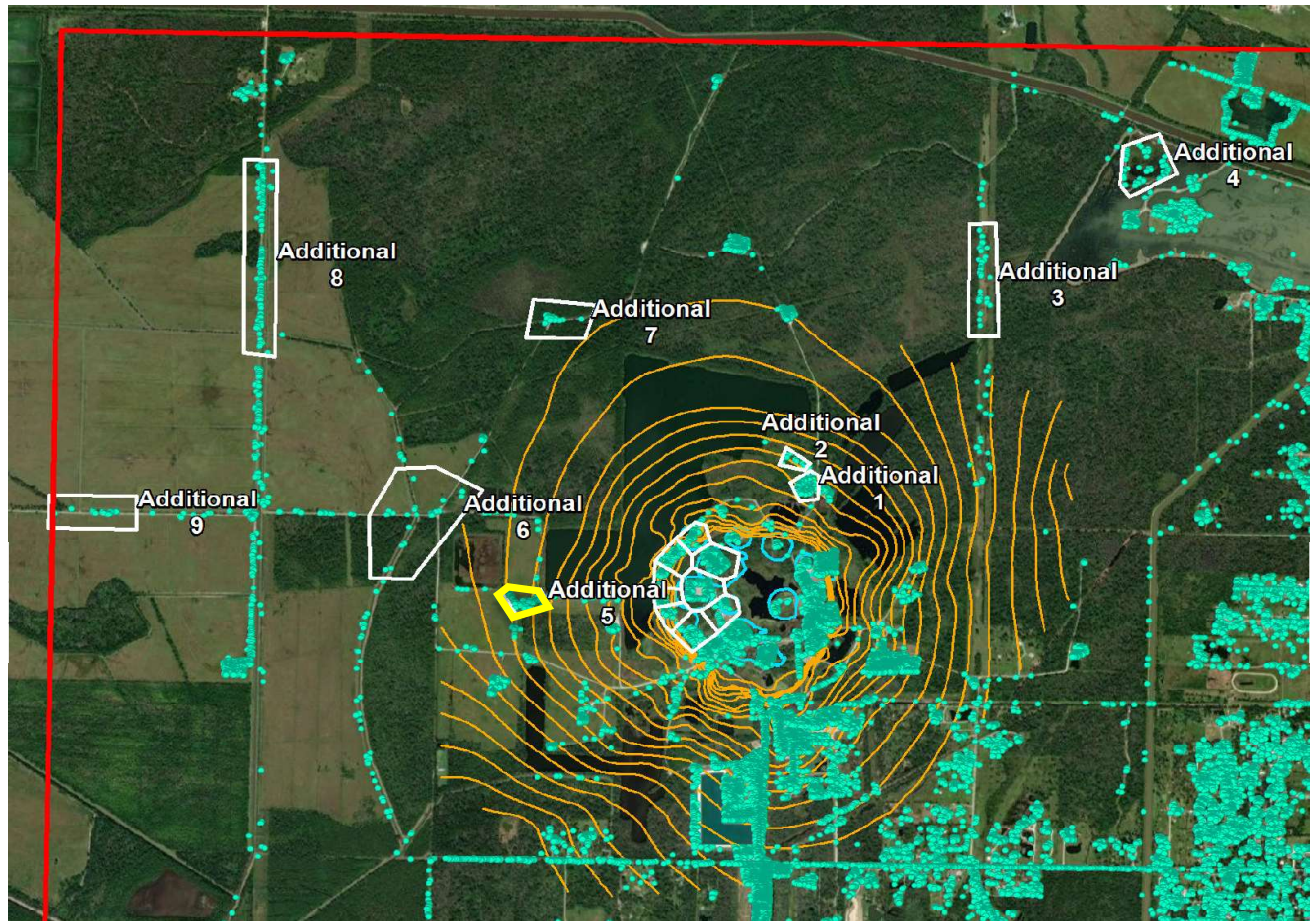
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

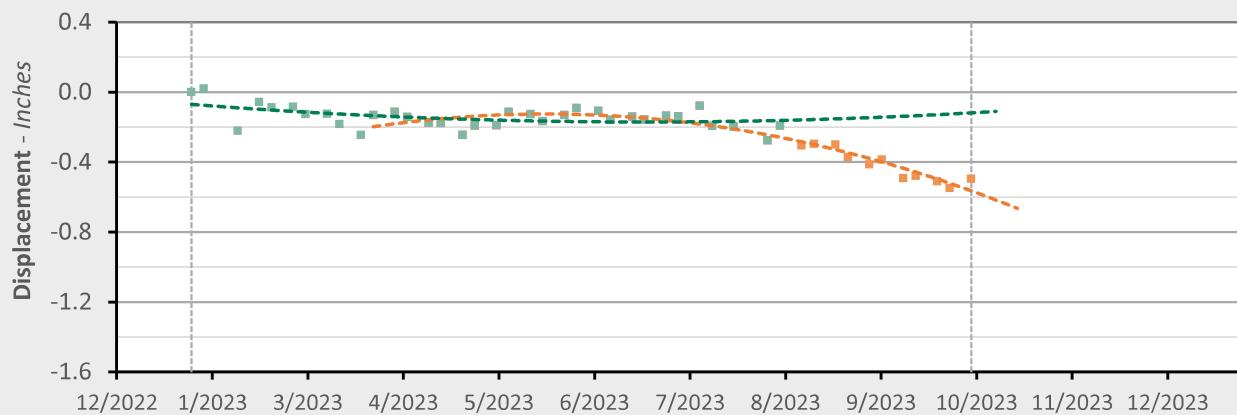
--- Recent Trend Line (Quadratic Regression)

Additional 5 - Location Map



Additional 5 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 76



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	+0.15 in/yr	-2.21 in/yr	-2.36 in/yr
Acceleration:	+1.24 in/yr ²	-6.16 in/yr ²	-7.39 in/yr ²

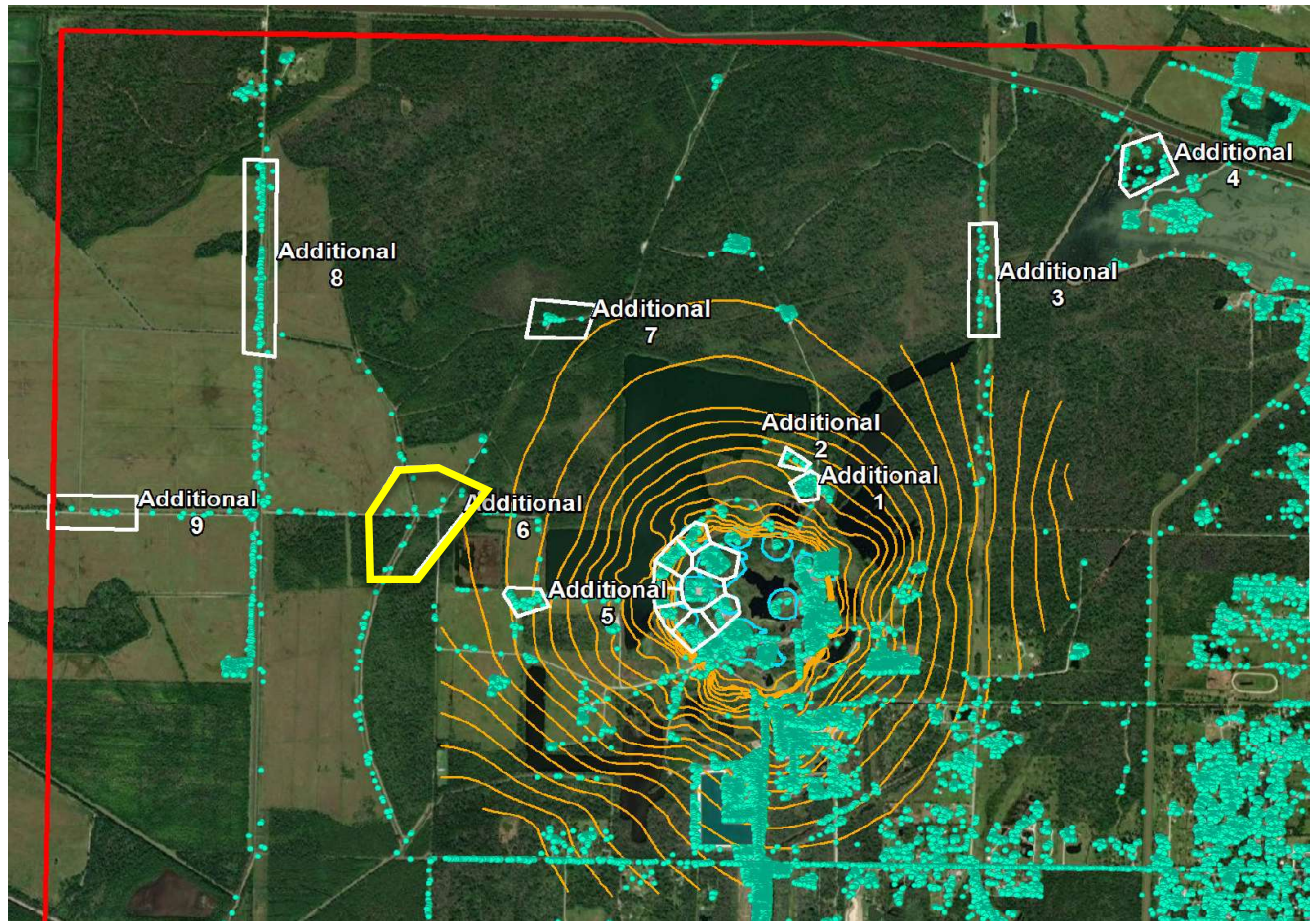
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

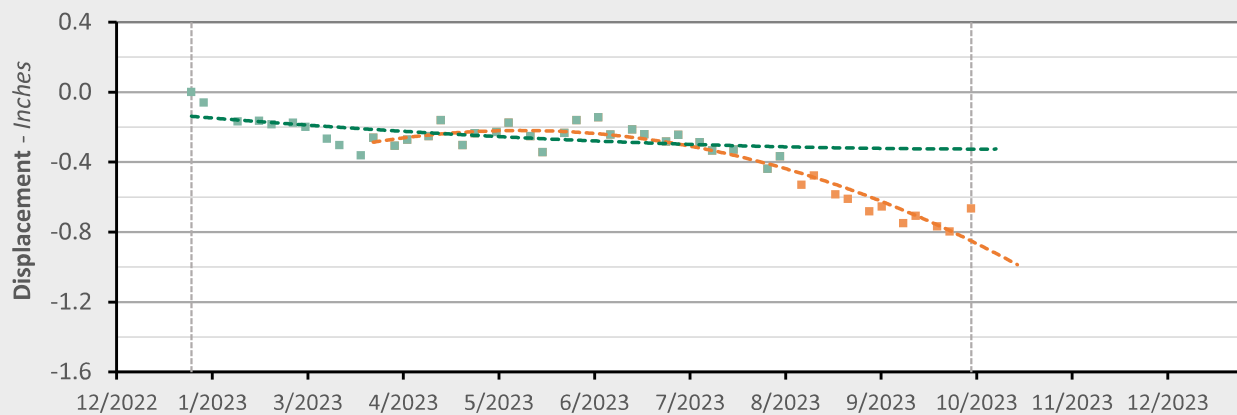
--- Recent Trend Line (Quadratic Regression)

Additional 6 - Location Map



Additional 6 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 24



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	-0.14 in/yr	-3.00 in/yr	-2.86 in/yr
Acceleration:	+0.73 in/yr ²	-7.86 in/yr ²	-8.60 in/yr ²

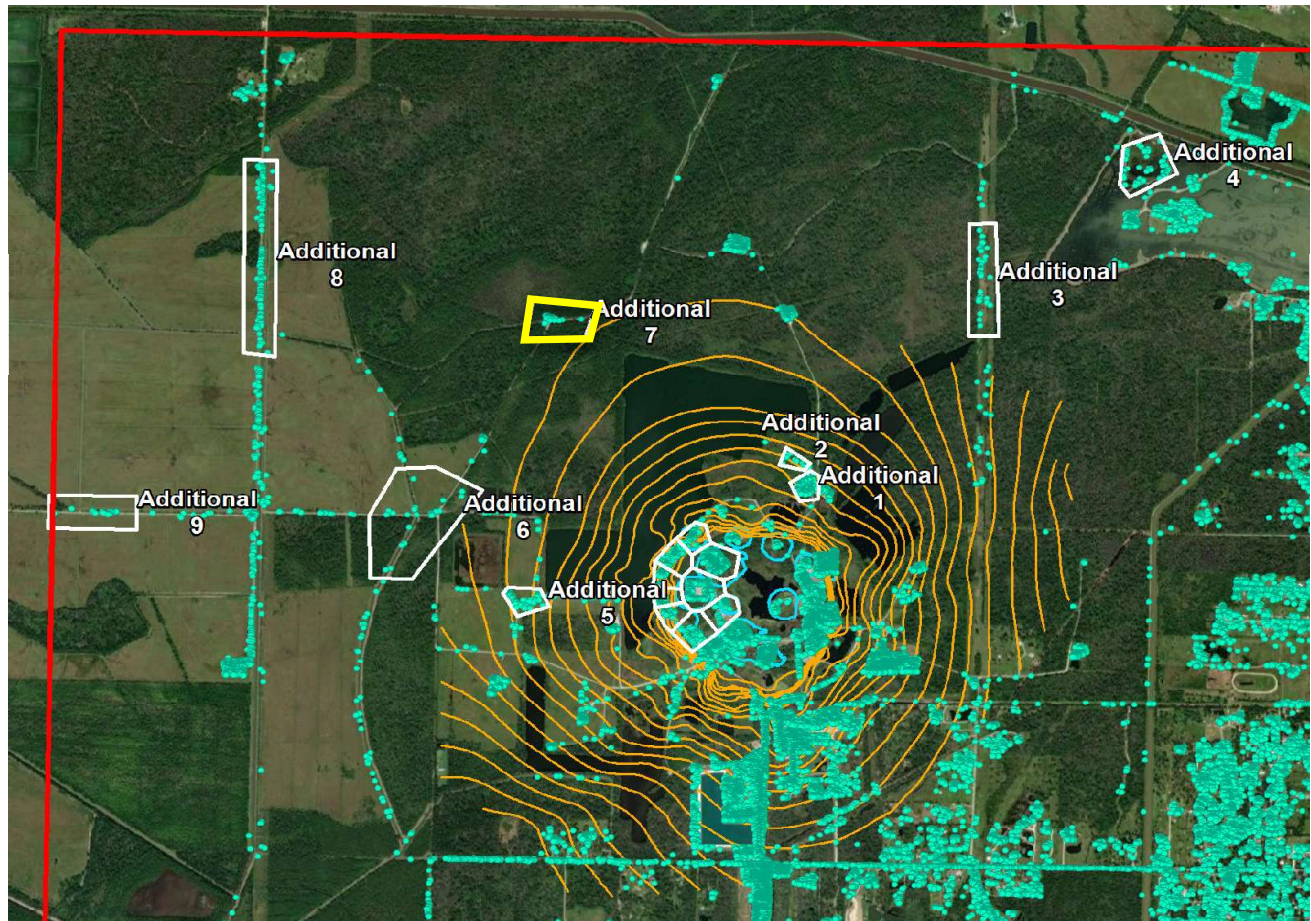
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

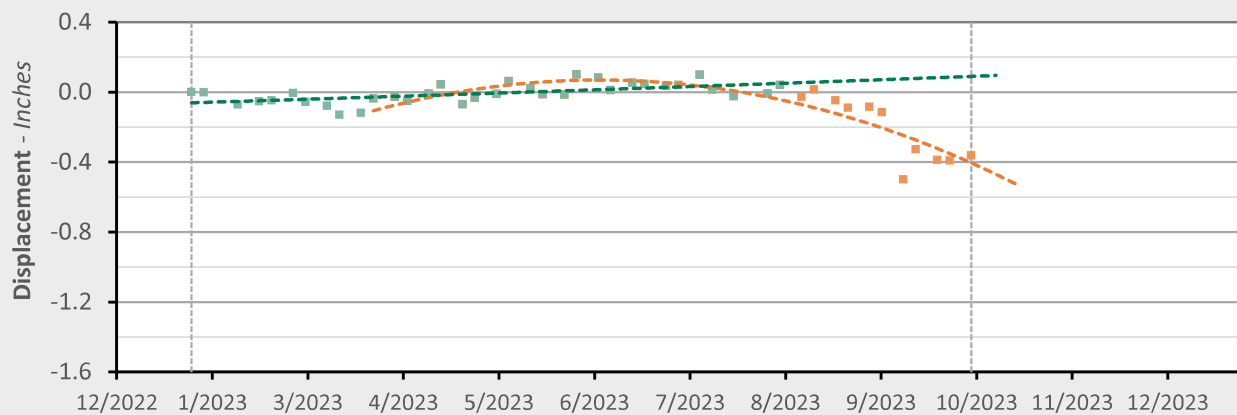
--- Recent Trend Line (Quadratic Regression)

Additional 7 - Location Map



Additional 7 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 26



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	+0.23 in/yr	-2.70 in/yr	-2.93 in/yr
Acceleration:	+0.06 in/yr ²	-8.69 in/yr ²	-8.75 in/yr ²

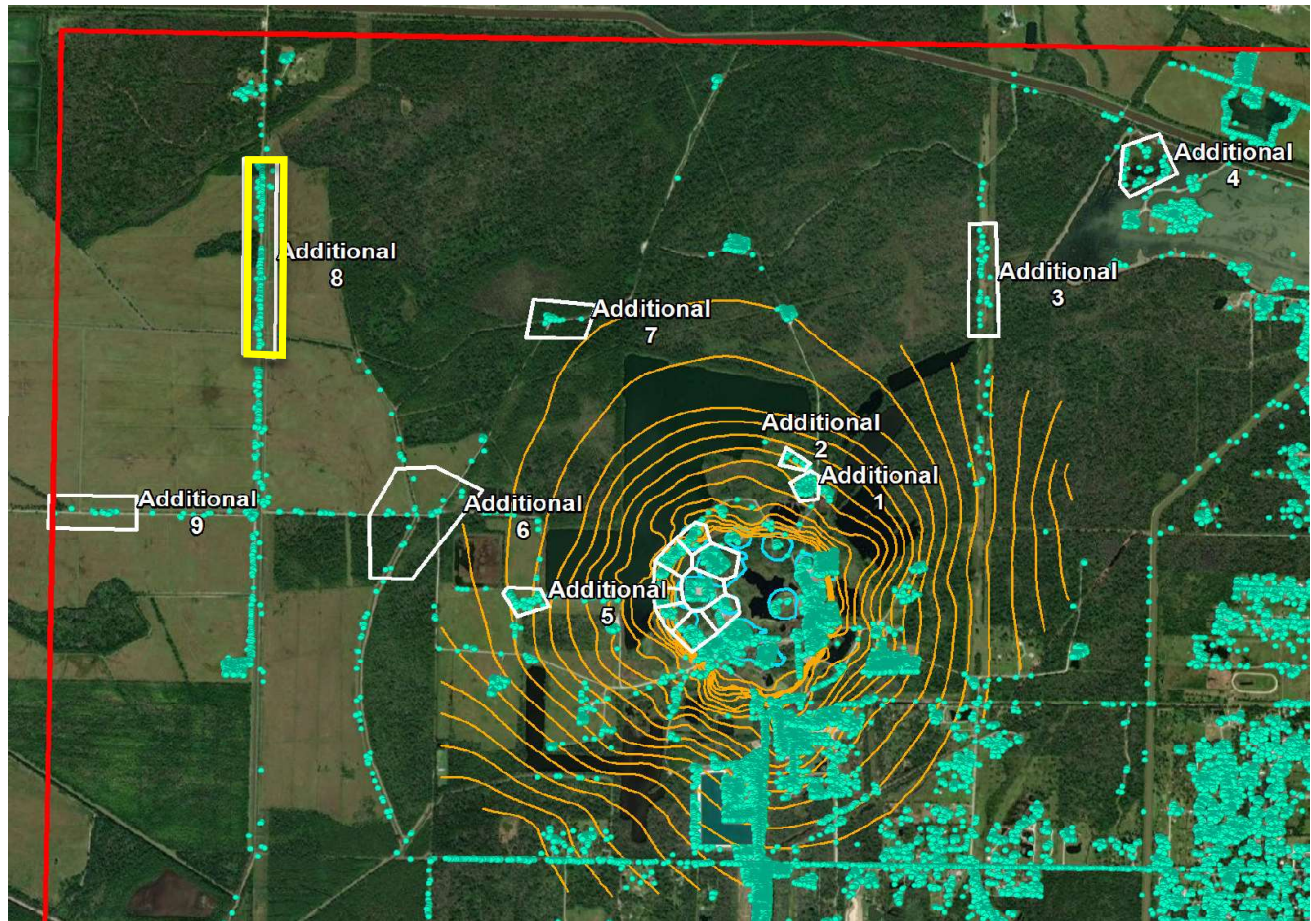
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

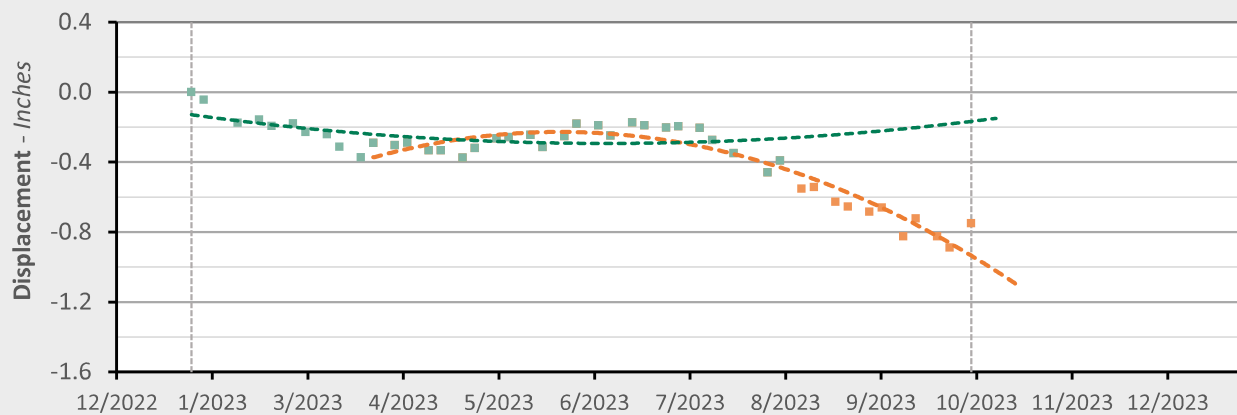
--- Recent Trend Line (Quadratic Regression)

Additional 8 - Location Map



Additional 8 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 203



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	+0.37 in/yr	-3.67 in/yr	-4.04 in/yr
Acceleration:	+2.41 in/yr ²	-10.59 in/yr ²	-12.99 in/yr ²

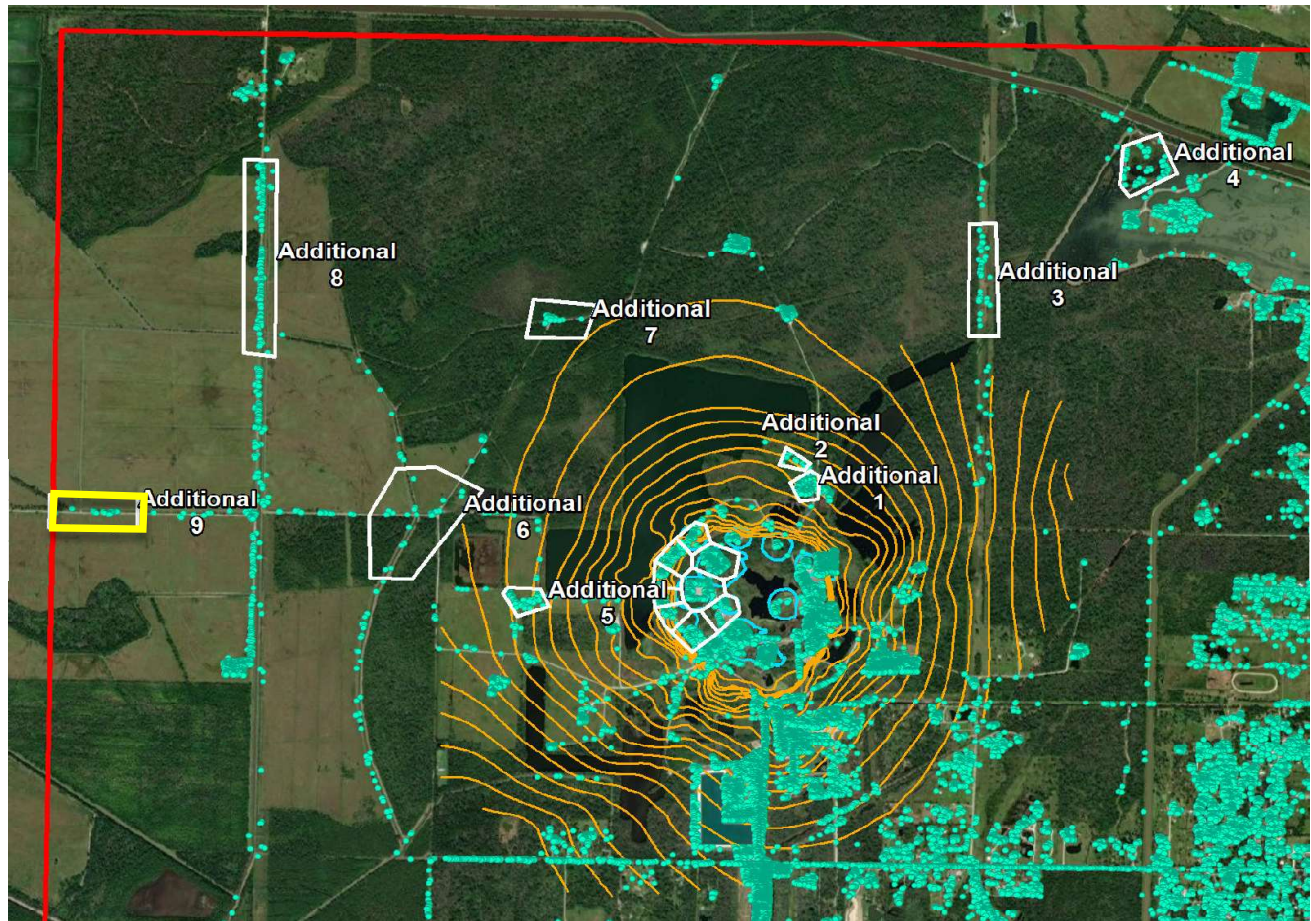
■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

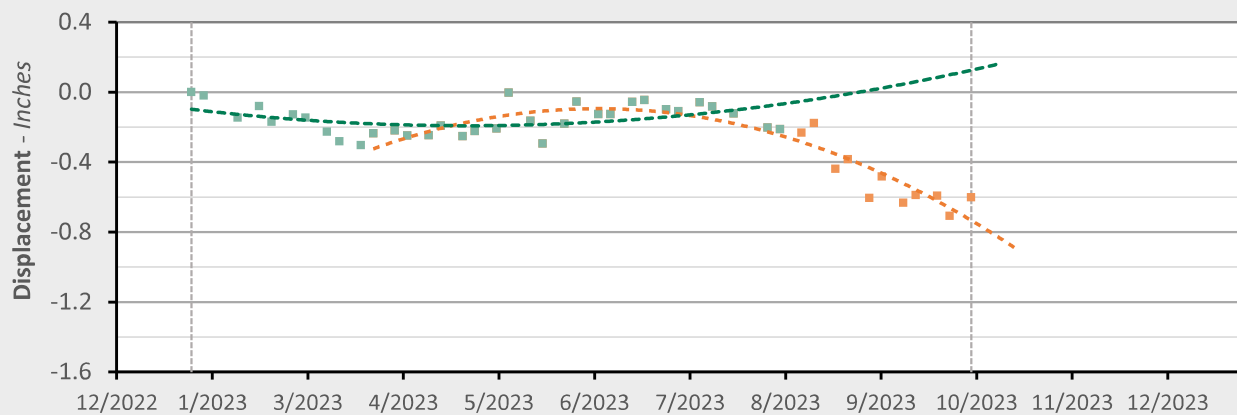
--- Recent Trend Line (Quadratic Regression)

Additional 9 - Location Map



Additional 9 - Displacement Time Series

TSX/PAZ (10/4/2023) Point Count: 21



	As of 8/3/23	3/24/2023 - 9/27/23	Trend Change
Velocity:	+0.88 in/yr	-3.62 in/yr	-4.50 in/yr
Acceleration:	+3.15 in/yr ²	-11.58 in/yr ²	-14.73 in/yr ²

■ Historical LOS Displacement Measurement

--- Historical Trend Line (Quadratic Regression)

■ Recent LOS Displacement Measurement

--- Recent Trend Line (Quadratic Regression)