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April 29, 2022

Aaron K. Schindewolf, P.E.
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RE: Review of Fourteenth (14th) Re-measure of Elevations at Monitoring Benchmarks and Monitoring Points Along the Water Line Segments W1A and W2A in the Woodlands, Texas and Evaluation of Potential Damage to the Water Line along Segments W1A and W2A from Land Subsidence

Dear Aaron:

This letter provides INTERA's review of a March 2022 re-measure of elevations for monitoring benchmarks and monitoring points along the waterline Segments W1A and W2A in The Woodlands, Texas. This review is provided in Attachment A. Attachment A also includes an evaluation of potential damage to the water line along Segments W1A and W2A from land subsidence.

The work was performed under Master Professional Services Agreement Contract No. 20-0077 and under Work Order 5 (PO Number: 21-1257). The technical lead for this task was Dr. Steve Young.

Respectfully submitted,

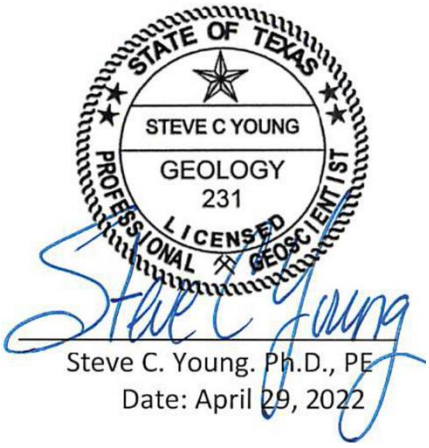
Steven C Young

Steven Young, PHD
Professional Geologist
Professional Engineer

ATTACHMENT A
Review of Fourteenth (14th) Re-measure of the Elevations at Monitoring Points and Monitoring Benchmarks along Water Line Segments W1A and W2A

Geoscientist Seal

Dr. Steven C. Young, performed or supervised all services associated with preparing Attachment A. The geoscientific services included the writing the text, data analysis, tabulation of results, and construction of figures. I am employed by INTERA Incorporated in Austin, Texas. INTERA is Professional Geoscience firm, with registration number 50189. Dr. Young professional geoscience registration number is 231.



Steve C. Young. Ph.D., PE
Date: April 29, 2022

Overview of Fourteenth (14th) Re-measure of the Elevations at Monitoring Points and Monitoring Benchmarks along Water Line Segments W1A and W2A

The fourteenth re-measure includes measurements of elevations monitoring points and monitoring benchmarks along the water line segments W1A and W2A in March 2022. **Figure 1** shows the locations of the water line segments W1A and W2A and the four monitoring systems. Each of the monitoring systems consist of monitoring points or monitoring benchmarks. Monitoring benchmarks terminate in the ground and are used to measure elevation changes in the soil. Monitoring points terminate on top of a pipe or a pipe casing and are used to measure the elevation changes of the waterline. The Egypt Fault Monitoring System and the Big Barn Fault Monitoring System consists only of monitoring points. The Segment W1A Monitoring System and Segment W2A Monitoring System consists of only monitoring benchmarks.

Figure 2 is a satellite map that shows the San Jacinto River Authority (SJRA) water line and the faults that have been identified in the vicinity of waterline segments W1A and W2A by Fugro (2012). The lateral extent of the Egypt, Big Barn, Jones, and Panther Branch faults mapped by Fugro (2012) are represented by the georeferenced fault lines. In their study, Fugro (2012) did not extend the Panther Branch Fault across the SJRA water line route. INTERA mapped the interpolated portion of the Panther Branch Fault in Figure 2 in 2021 based on an evaluation of the monitoring benchmark elevation for Segment W2A and scarp locations in the parking lot of The Woodlands High School.

The March 2022 survey represents the fourteenth (14^{th}) re-measure of the elevations since their initial measurements in March 2015. The re-measurements are made about every six months. **Table 1** shows the re-measured elevations for the monitoring benchmarks located near the Egypt Fault that are a part of the Segment W1A Monitoring System. **Table 2** shows the re-measured elevations for the monitoring points located near the Egypt Fault that are a part of the Egypt Fault Monitoring System. **Table 3** shows the re-measured elevations for the monitoring points located near the Big Barn Fault that are a part of the Big Barn Fault Monitoring System. **Table 4** shows the re-measured elevations for the monitoring

benchmarks located near the Panther Branch Fault that are a part of the Segment W2A Monitoring System.

At the Egypt Fault Monitoring System (see **Figures 2 and 3**) and the Big Barn Fault Monitoring System (see **Figures 2 and 4**) SJRA hired consultants to design and contractors to build safeguards to protect the water line from damage caused by land subsidence. At these two locations SJRA also hired a consultant to install monitoring points to monitor changes in the elevation of the transmission pipe and casing near the faults. At the waterline segment W1A Monitoring System (Figures 2 and 3), SJRA hired a consultant to design and a contractor to build safeguards to protect the water line from damage caused by land subsidence. At the waterline segment W1A Monitoring System, SJRA hired consultants to install monitoring benchmarks to monitor changes in land elevations over time.

At the water line segment W2A Monitoring System (see Figure 3) along Research Forest Drive no safeguards were constructed to protect the water line from possible damage caused by land subsidence because the Fugro report (2012) did not show the Panther Branch Fault crossing the water line. However, SJRA hired consultants to install monitoring benchmarks and to monitor the change in land elevation at the Segment W2A Monitoring System (see **Figure 5**) along Research Forest Drive in the vicinity of Panther Branch Fault.

Along the W1A segment where four monitoring points straddle the Egypt Fault (Figure 3), the changes in the elevations from March 2015 to March 2022 indicate that a greater decrease in land elevation occurred on the downthrown side than on the upthrown side of the Egypt Fault. Over the 7-year period from 2015 to 2022, the land surface on downthrown side of the Egypt Fault decreased 0.02 ft in elevation relative to the upthrown side of the Egypt Fault. The 0.02 ft decrease over a 7-year period translates into an average subsidence rate of approximately 0.003 feet per year (ft/year).

Along the W1A segment where 18 monitoring benchmarks are located FM 2978 (Figure 3), the changes in monitoring benchmark elevations from March 2015 to March 2022 indicate that a greater decrease in land elevation has occurred on the downthrown side than on the upthrown side of the Egypt Fault. Over the 7-year period from 2015 to 2022, the land surface on downthrown side of the Egypt Fault decreased 0.008 ft in elevation relative to the upthrown side of the Egypt Fault. The 0.008 decrease in land elevation over a 7-year period translates into average subsidence rate of approximately 0.001 feet per year (ft/year).

Along the W2A segment where four monitoring benchmarks on Research Forest Drive straddle the Big Barn Fault (Figure 4), the changes in the monitoring benchmark elevations suggest that greater land subsidence has occurred on the downthrown side than on the upthrown side of the Big Barn Fault. Based on the change in elevations of the four monitoring benchmarks over a seven-year period from March 2015 to March 2022, the land surface on downthrown side of the Big Barn Fault decreased 0.015 ft in elevation relative to the upthrown side of the Big Barn Fault. The 0.015 ft decrease in land elevation over a 7-year period translates into average subsidence rate of approximately 0.002 feet per year (ft/year).

Along the W2A segment where 19 monitoring benchmarks on Research Forest Drive are located near the Panther Branch Fault (Figure 5), the changes in the monitoring benchmark elevations suggest that greater land subsidence has occurred on the downthrown side than on the upthrown side of the Panther Branch Fault. Based on the change in elevations of the 19 monitoring benchmarks over a seven-year period from March 2015 to March 2022, the land surface on downthrown side of the Panther Branch Fault decreased 0.037 ft in elevation relative to the upthrown side of the Panther Branch Fault. The 0.037 ft decrease in land elevation over a 7-year period translates into average subsidence rate of approximately 0.005 feet per year (ft/year).

Based on the changes in monitoring benchmark elevations during the last 7 years, INTERA has concluded that the SJRA water line is not at risk of damage from land subsidence where it crosses the Egypt Fault and the Big Barn Fault for the next 50 years if land subsidence continues at its current rate and if the SJRA safeguards work as designed. INTERA also has concluded it has insufficient evidence to determine whether or not the SJRA water line is protected from damage from land subsidence where it crosses the Panther Branch Fault. Our conclusion is consistent with the analysis provided in our review of the thirteenth (13th) re-measure of the waterline W1A and W2A monitoring benchmark and monitoring point elevations, which was submitted to SJRA on November 17, 2021.

General Comment on the Interpretating the Re-measured Monitoring Points and Monitoring Benchmark Elevations for Evidence of Land Subsidence

The monitoring elevations have been remeasured at approximately 6-month intervals since March 2015. The amount of elevation change measured over a 6-month interval is typically on the order of a hundredth of a foot or less. Given that the measured elevations are reported to the nearest hundredth of a foot, an actual elevation difference of just one one-thousandth (0.001) foot (from 0.004 to 0.005) could result in a change in reported elevation of 0.01 foot because of the impact of rounding from thousandths to hundredths of a foot. Thus, elevation changes of a few hundreds of a foot and less should be viewed with care before making conclusions regarding the changes in land elevations inferred from the measured elevations. In addition, other factors besides depressurization of the regional aquifer should be evaluated as possible contributors for changes in land elevation before marking conclusions regarding the cause for the decrease in the land elevation. Among these factors is the shrinkage or swelling of clays near the surface in response changes in soil moisture.

Analysis of the Fourteenth (14th) Re-measure of the Waterline W1A and W2A Monitoring Benchmark and Monitoring Point Elevations over a 6-month and a 7-year Period

W1A Segments

Tables 1 and 2 provide the differences in elevations for 22 monitoring benchmarks and monitoring points located along the W1A Segment. The differences in the measured elevations for the last 6 months and for the last 7 years are discussed below.

Last 6 months: Over the last 6 months, the 18 monitoring benchmarks along FM2978 had the following elevation changes:

- the four monitoring benchmarks on the upthrown side of the Egypt Fault ranged from an increase of 0.01 ft in elevation to an increase of 0.02 ft in elevation and averaged an increase of 0.015 ft in elevation;[1]
- the fourteen monitoring benchmarks on the downthrown side of the Egypt Fault ranged from an increase of 0.01 ft in elevation to an increase of 0.02 ft in elevation and averaged an increase of 0.014 ft in elevation[1];

Over the last 6 months, the four monitoring points along Research Forest Drive had the following elevation changes:

[1] an increase in land surface elevation can occur if a pressure head in the groundwater increases and causes the elastic storage component of the aquifer to cause a rebound at land surface

- the two monitoring points on the upthrown side of the Egypt Fault ranged from a decrease of 0.01 foot in elevation to 0.00 ft in elevation change. The two values averaged a decrease of 0.005 ft in elevation;
- the two monitoring on the downthrown side of the Egypt Fault ranged from an increase of 0.01 ft in elevation to 0.00 ft in elevation change. The two values averaged an increase of 0.005 ft in elevation

The differences in the elevation changes are viewed from two criteria. One criterion is whether there is a consistent set of data that supports a net downward movement on the downthrown side of the Egypt Fault. Neither set of measured elevation data indicates there is more land subsidence on the downthrown side than on the upthrown side of the Egypt Fault. The second criterion is how large are the changes in elevations between the upthrown and downthrown side of the fault compared to the reported accuracy of 0.01 ft for the elevation measurements. For both set of measured elevation data the observed differences are too small compared to the 0.01 ft reported precision of the measured elevations to make definite conclusions regarding the difference in the actual amount of vertical movement on upthrown and downthrown side the Egypt Fault. Based on these two criteria, there is no conclusive evidence to indicate that the downthrown side of the Egypt Fault subsided from September 2021 to March 2022.

Last 7 years: From March 2015 to March 2021, the 18 monitoring benchmarks along FM 2978 had the following elevation changes:

- the four monitoring benchmarks on the upthrown side of the Egypt Fault ranged from a 0.00 ft elevation change to an increase of 0.01 ft in elevation. The four monitoring benchmarks averaged an increase of 0.005 ft in elevation.
- excluding monitoring benchmark MbM-11, the thirteen monitoring benchmarks on the downthrown side of the Egypt Fault ranged from a decrease of 0.01 ft in elevation to an increase of 0.01 ft in elevation. The thirteen monitoring benchmarks averaged a decrease of 0.003 ft in elevation;

From March 2015 to March 2021, the four monitoring points along Research Forest Drive had the following elevation changes:

- the two monitoring points on the upthrown side of the Egypt Fault each had a decrease of 0.01 ft in elevation and averaged a decrease of 0.01 ft;
- the two monitoring points on the downthrown side of the Egypt Fault each had a decrease of 0.03 ft in elevation and averaged a decrease of 0.03 ft;

The decrease of 0.10 ft in elevation at monitoring benchmark MbM-11 is an outliner when compared to other measured differences in elevations along FM 2798. The significantly higher amount of decrease elevation at MbM-11 is attributed to the monitoring benchmark being located in a narrow zone of highly disturbed soil in the downthrown fault blocks. The 0.10 ft decrease in elevation change is likely caused by the slow, progressing compaction of soil. The elevation changes at the remaining 13 monitoring benchmarks that include MbM-7 through MbM-20 (with MbM-11 excluded) on the downthrown side of the Egypt Fault average a decrease of 0.003 in elevation from March 2015 to March 2022. Across the monitoring benchmarks on the upthrown side of the Egypt Fault along FM 2798, the monitoring benchmarks MbM-1 to MbM-4 averaged an increase of 0.005 ft in elevation from March 2015 to March 2022. Comparison of the two set of values indicate that the downthrown side of the Egypt fault has

decreased approximately 0.008 ft more than the upthrown side of the Egypt Fault. Over a 7-year period, a decrease of 0.008 ft averages a subsidence rate of about 0.001 ft/year.

Over the last 7 years, the two monitoring points on the upthrown side of the Egypt Fault on Research Forest Drive both decreased 0.01 ft in elevation, whereas the two benchmarks on the downthrown side of the Egypt Fault both decreased 0.03 ft. From March 2015 to March 2022, the downthrown side has decreased approximately 0.02 ft relative to the upthrown side of the Egypt Fault. Over a 7-year period, the difference of 0.02 ft translates into an average subsidence rate of about 0.003 ft/year.

W2A Segments–

Tables 3 and 4 provide the differences in elevations for 23 monitoring benchmarks and monitoring points located along the W2A Segment. The differences in measured elevations for the last 6 months and for the last 7 years are discussed below.

Last 6 months: - Over the last 6 months, the four monitoring points along Research Forest Drive at the Big Barn Fault Monitoring System in Figure 4 had the following elevation changes:

- the two monitoring points on the upthrown side of the Big Barn Fault had 0.00 ft elevation change;
- the two monitoring points on the downthrown side of the Big Barn Fault had a decrease of 0.01 ft in elevation and had 0.00 ft elevation change and averaged a decrease of 0.005 ft change in elevation;

Over the last 6 months the 19 monitoring benchmarks along Research Forest Drive at the Segment W2A Monitoring System in Figure 5 had the following elevation changes:

- the six monitoring benchmarks (MbM-13 through MbM-18) on the upthrown side of the Panther Branch Fault had elevation changes that ranged from 0.00 in elevation to an increase of 0.01 ft in elevation and averaged an increase of 0.004 ft in elevation;
- excluding monitoring benchmark MbM-10, the twelve monitoring benchmarks (MbM-1 through MbM-12 and MbM-20) on the downthrown side of the Panther Branch Fault had elevation changes that ranged from 0.00 ft in elevation to an increase of 0.02 ft in elevation. The twelve monitoring benchmarks averaged an increase of 0.004 ft in elevation. (The measured elevation at monitoring point MbM-10 was excluded because its measured elevation in September 2021 appears to be 0.03 ft too high based on analysis of all available data)

From September 2021 to March 2022, both the upthrown and the downthrown sides of the Panther Branch Fault along Research Forest Drive had an approximate increase 0.004 ft of elevation. Thus, the measured elevation did not indicate any land subsidence during the last six months. From September 2021 to March 2022, the downthrown side of the Big Barn Fault decreased approximately 0.005 ft more than the upthrown side of Big Barn Fault. However, given that the amount of change is less than the reported precision of the measured elevations, the 0.005 ft of elevation change should not be considered as an estimated amount of land subsidence that has occurred on the downside of the Panther Fault from September 2021 to March 2022.

Last 7.0 years: –From March 2015 to March 2022, the four monitoring points along Research Forest Drive near the Big Barn Fault in Figure 4 had the following elevation changes:

- the two monitoring benchmarks on the upthrown side of the Big Barn Fault had a 0.01 ft decrease in elevation and 0.00 ft elevation change and averaged a decrease of 0.005 ft in elevation;

- the two monitoring benchmarks on the downthrown side of the Big Barn Fault had a decrease of 0.02 ft in elevation and averaged a decrease of 0.02 ft in elevation;

The changes in the elevation of monitoring points that straddle the Big Barn Fault indicate that the downthrown side of the fault has subsided approximately 0.015 ft more than the upthrown side of the fault. A 0.015 ft decrease in elevation translates into an average subsidence rate of approximately 0.002 ft/year.

From March 2015 to March 2022, the 19 monitoring benchmarks located along Research Forest Drive near the Panther Branch Fault in Figure 5 had the following elevation changes:

- the six monitoring benchmarks (MbM-13 through MbM-18) on the upthrown side of the Panther Branch Fault had elevation changes of 0.00 ft in elevation change and averaged 0.00 ft in elevation change;
- the thirteen monitoring benchmarks (MbM-1 through MbM-12 and MbM-20) on the downthrown side of the Panther Branch Fault had elevation changes that ranged from a decrease of 0.03 ft elevation to a decrease of 0.05 elevation and averaged a decrease of 0.037 ft in elevation.

The changes in the elevation of the monitoring benchmarks that are near the Panther Branch Fault indicate that the downthrown side of the fault has subsided approximately 0.037 ft more than the upthrown side of the fault. The 0.037 ft decrease in elevation translates into an average subsidence rate of approximately 0.005 ft/year.

Evaluation of Potential Damage to the Water Line along Segments W1A and W2A from Land Subsidence

To assess the risk of potential damage to the water line, INTERA compiled information on the design of these safeguards through construction drawings and discussions with persons knowledgeable of the safeguards. The construction drawings prepared by Lockward, Andrews & Newman, Inc include the design of the casing pipe for the W1A area, and the construction drawings by Binkey & Barfield Inc., include the design pipe for the W2A area. The design of the safeguards for the Big Barn Fault is based on the design used for where the Egypt Fault intersects the 48-inch water line.

W1A Segments

In the vicinity of the Egypt Fault Monitoring System along Research Forest Drive, SJRA's 48-inch diameter water line is protected by a pipe casing along a 500-ft section that crosses over the Egypt Fault. The water line is constructed of steel and capable of shifting approximately 1-ft over the 500-ft interval without problems. Because of the possibility that the water line could eventually have a differential movement of more than 1 ft, a pipe casing as a safeguard around the water line was constructed. The pipe casing safeguard is designed to protect the water line for up to 0.25 inch of vertical movement at the fault per year over a 50-year period, or a total of 12.5 inches. The dip angle of the fault was estimated at 70 degrees. A 12.5-inch vertical movement is expected to cause the casing and pipe to bow and move horizontally up to 4 inches. The pipe and casing can deflect and "flex" with the vertical movement but a horizontal movement of 4 inches could stress the steel enough to break the joints. To protect against the horizontal movement, two expansion couplings, each of which can move up to 4 inches horizontally, were added at the pipe connections. These expansion joints allow up for 8 inches of horizontal movement. Several methods are in place to monitor the condition of the water pipe. One of these methods is measuring the change in elevations in the casing and pipe at the ends of the pipe casing. After 7 years of monitoring the net change in the monitoring point elevations on both the downthrown and the upthrown side of the

fault are less than 0.02 ft. Based on the information that INTERA has reviewed, INTERA concludes the water line is not at risk of damage from land subsidence where it crosses the Egypt Fault along Research Forest Drive for the next 50 years if land subsidence continues at its current rate and if the SJRA safeguards work as designed.

Along FM 2978, the 16-inch water line extends to SJRA Woodlands Division Plant No. 4. Instead of using pipe casing to protect the water line, a SJRA contractor installed a series of ball connections in the vicinity of Egypt Fault to accommodate movement of up to 0.25 inch of vertical movement per year over a 50-year period, or a total of 12.5 inches. Along a length of approximately 400 ft, six ball couplings were installed. After 7 years of monitoring, the changes in the monitoring benchmark elevations are less than 0.02 ft for both the upthrown and downthrown side of the fault. Based on the information that INTERA has reviewed, INTERA concludes that the water line is not at risk of damage from land subsidence where it crosses the Egypt Fault along FM 2978 for the next 50 years if land subsidence continues at its current rate and if the SJRA safeguards work as designed.

W2A Segments

INTERA has reviewed the drawings for the safeguard that SJRA has constructed for the transmission pipe at the Big Barn Fault Monitoring System. The safeguard is similar to the safeguard SJRA constructed using pipe casing for the Egypt Fault. The net change in the monitoring benchmark elevations at the Big Barn Fault over 7 years for both the upthrown and the downthrown side of the fault is 0.02 ft. The safeguards that were constructed are designed to handle 12.5 inches of vertical movement over 50 years. Based on the information that INTERA has reviewed, INTERA concludes that the water line is not at risk of damage from land subsidence where it crosses the Big Barn Fault along Research Forest Drive for the next 50 years if land subsidence continues at its current rate and if the SJRA safeguards work as designed.

Because the Fugro report (2012) did not show that Panther Branch Fault crossing the water line, SJRA did not hire a contractor to construct safeguards to protect the water line from differential subsidence associated with the Panther Branch Fault. However, based on the location of the Panther Branch Fault mapped by INTERA in Figure 5, the Panther Branch Fault crosses a section of the water line that has been provided additional protection by being enclosed in pipe casing. Per discussion with SJRA, SJRA plans to continue to monitor any subsidence that is observed from the Segment W2A Monitoring System and discuss with water line experts if significant movement is observed.

References

Fugro Consultants, Inc., 2012. Geologic Fault Delineation Study SJRA Distribution Lines – Route W1 San Jacinto River Authority Montgomery County, Texas. Report No. 04.12110014-9 Prepared for Lockwood, Andrews & Newman, Inc., Houston Texas.

Table 1 Elevations for Monitoring Benchmarks along SJRA Segment W1A Monitoring Survey for March 2015, September 2021, and March 2022

Point ID	Measured Elevation			Calculated Differences	
	(a) Initial Survey March, 2015 Elev. (ft msl)	(b) September 2021 Elev. (ft, msl)	(c) March 2022 Elev. (ft, msl)	March 2022 minus Mar 2015 (c) - (a)	March 2022 minus Sept. 2021 (c) - (b)
MbM-1	189.24	189.23	189.25	0.01	0.02
MbM-2	189.27	189.26	189.28	0.01	0.02
MbM-3	189.45	189.44	189.45	0.00	0.01
MbM-4	189.73	189.72	189.73	0.00	0.01
MbM-5	190.41	Destroyed	Destroyed	na	na
MbM-6	190.26	Destroyed	Destroyed	na	na
MbM-7	188.81	188.80	188.81	0.00	0.01
MbM-8	188.28	188.27	188.29	0.01	0.02
MbM-9	187.93	187.91	187.93	0.00	0.02
MbM-10	187.76	187.75	187.76	0.00	0.01
MbM-11	188.00	187.88	187.90	-0.10	0.02
MbM-12	187.77	187.75	187.76	-0.01	0.01
MbM-13	187.50	187.48	187.50	0.00	0.02
MbM-14	187.75	187.73	187.74	-0.01	0.01
MbM-15	188.49	188.48	188.49	0.00	0.01
MbM-16	187.86	187.84	187.85	-0.01	0.01
MbM-17	189.31	189.29	189.31	0.00	0.02
MbM-18	189.75	189.73	189.74	-0.01	0.01
MbM-19	189.32	189.30	189.32	0.00	0.02
MbM-20	188.55	188.53	188.54	-0.01	0.01

note: na= not applicable

Table 2 Elevations for Monitoring Points Along SJRA Segment W1A for March 2015, September 2021, and March 2022 at Existing Fault Protection System| Egypt Fault

Station/Description	Measured Elevation			Calculated Differences	
	(a) Initial Survey March, 2015 Elev.	(b) September 2021 Elev.	(c) March 2022 Elev.	March 2022 minus Mar 2015 (c) - (a)	March 2022 minus September 2021 (c) - (b)
Sta 103 + 72 Top Square Nut on 2" Steel Cap	187.20	187.20	187.19	-0.01	-0.01
Sta 103 + 82 Top 2" Steel Pipe (NO CAP)	186.93	186.92	186.92	-0.01	0.00
Sta 108 + 70 Top Square Nut on 2" Steel Cap	190.28	190.24	190.25	-0.03	0.01
Sta 108 + 80 Top 2" Steel Cap	190.31	190.28	190.28	-0.03	0.00

Table 3 Elevations for Monitoring Points along SJRA Segment W2A for March 2015, September 2021, and March 2022 at Existing Fault Protection System Big Barn Fault

Station/Description	Measured Elevation			Calculated Differences	
	(a) Initial Survey March, 2015 Elev. (ft, msl)	(b) September 2021 Elev. (ft, msl)	(c) March 2022 Elev. (ft, msl)	March 2022 minus Mar 2015 (c) - (a)	March 2022 minus September 2021 (c) - (b)
Sta 9 + 25 Top 2" Steel Cap	177.81	177.81	177.81	0.00	0.00
Sta 9 + 35 Top 2" Steel Cap	177.74	177.73	177.73	-0.01	0.00
Sta 9 + 85 Top 2" Steel Cap	176.73	176.71	176.71	-0.02	0.00
Sta 9 + 95 Top 2" Steel Cap	176.78	176.77	176.76	-0.02	-0.01

Table 4 Elevations for Monitoring Benchmarks along SJRA Segment W2A Monitoring Survey for March 2015, September 2021, and March 2022

Point ID	Measured Elevation			Calculated Differences	
	(a) Initial Survey March, 2015 Elev. (ft, msl)	(b) September 2021 Elev. (ft, msl)	(c) March 2022 Elev. (ft, msl)	March 2022 minus Mar 2015 (c) - (a)	March 2022 minus September 2021 (c) - (b)
MbM-1	142.59	142.55	142.55	-0.04	0.00
MbM-2	142.80	142.77	142.77	-0.03	0.00
MbM-3	143.31	143.26	143.27	-0.04	0.01
MbM-4	143.35	143.28	143.30	-0.05	0.02
MbM-5	143.85	143.81	143.81	-0.04	0.00
MbM-6	144.14	144.11	144.11	-0.03	0.00
MbM-7	144.29	144.26	144.26	-0.03	0.00
MbM-8	145.20	145.16	145.16	-0.04	0.00
MbM-9	145.51	145.48	145.48	-0.03	0.00
MbM-10	145.63	145.63	145.59	-0.04	-0.04
MbM-11	146.16	146.11	146.12	-0.04	0.01
MbM-12	145.42	145.38	145.39	-0.03	0.01
MbM-13	145.00	145.00	145.00	0.00	0.00
MbM-14	144.99	144.98	144.99	0.00	0.01
MbM-15	144.79	144.79	144.79	0.00	0.00
MbM-16	144.78	144.78	144.78	0.00	0.00
MbM-17	144.79	144.79	144.79	0.00	0.00
MbM-18	144.55	144.54	144.55	0.00	0.01
MbM-20	145.86	145.82	145.82	-0.04	0.00

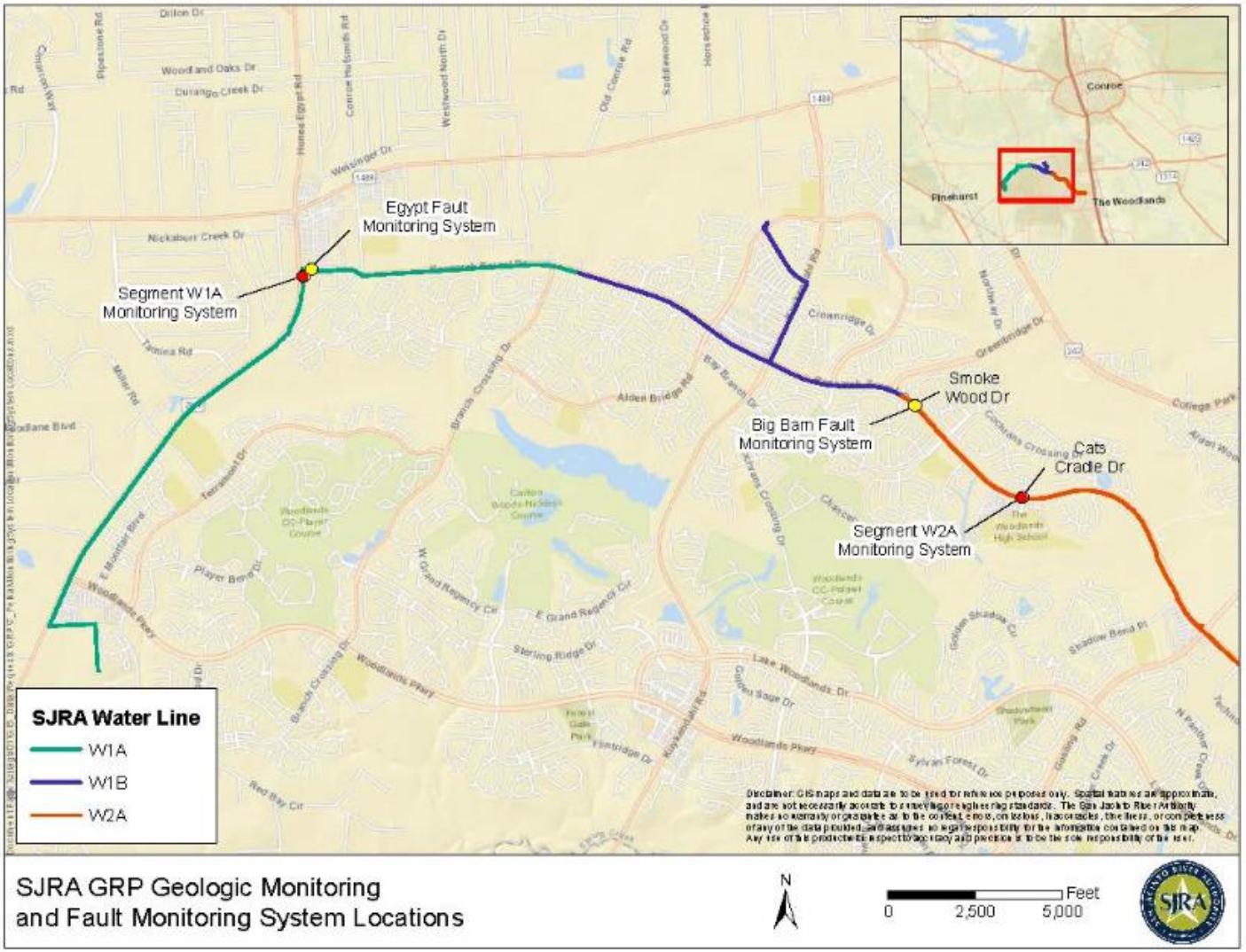


Figure 1 SJRA Groundwater Reduction Plan (GRP) Fault Monitoring System Locations (https://www.sjra.net/grp/fault-monitoring/)

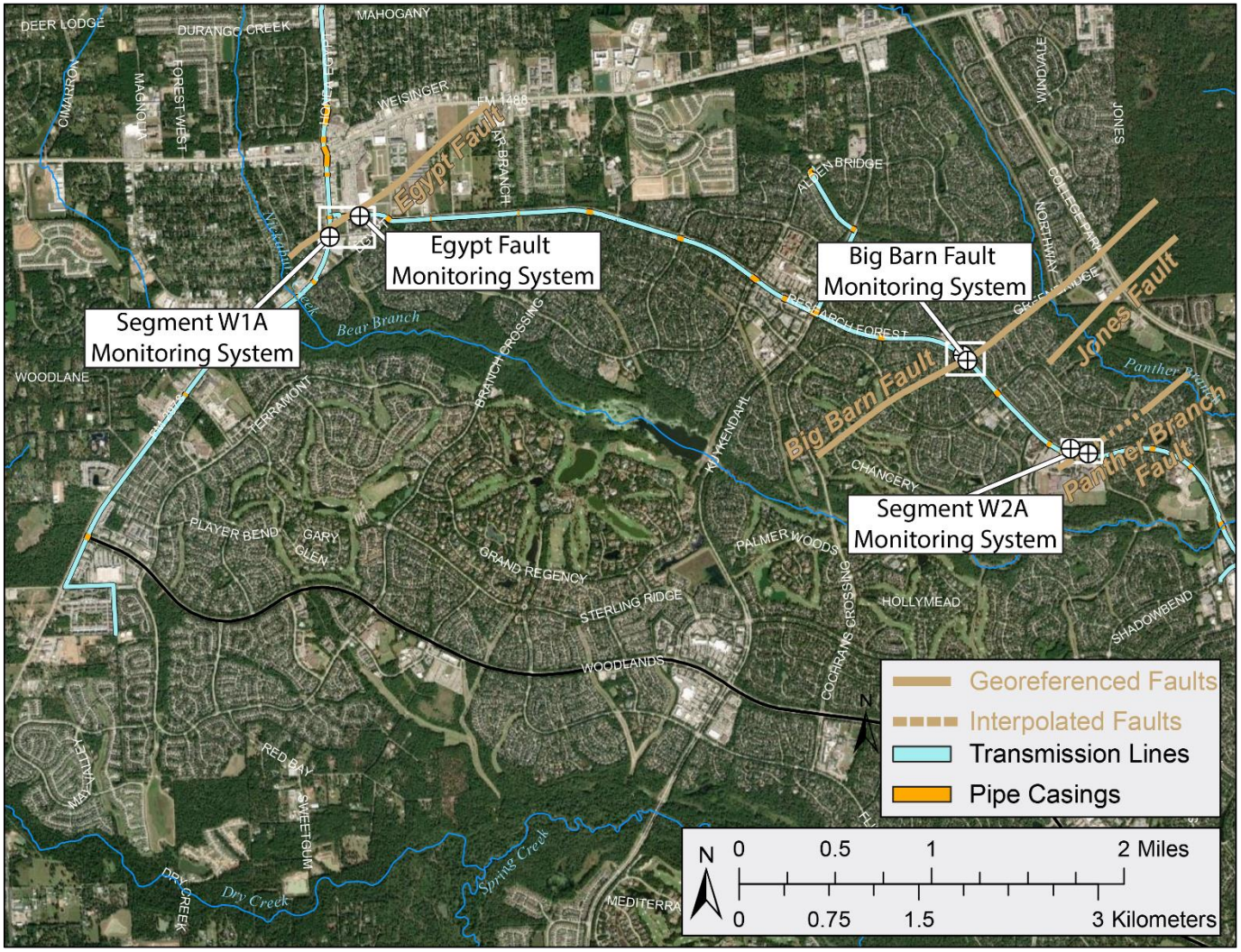


Figure 2 Satellite map showing the location of the SJRA water line, the fault locations mapped by Fugro (2012), and SJRA monitoring systems

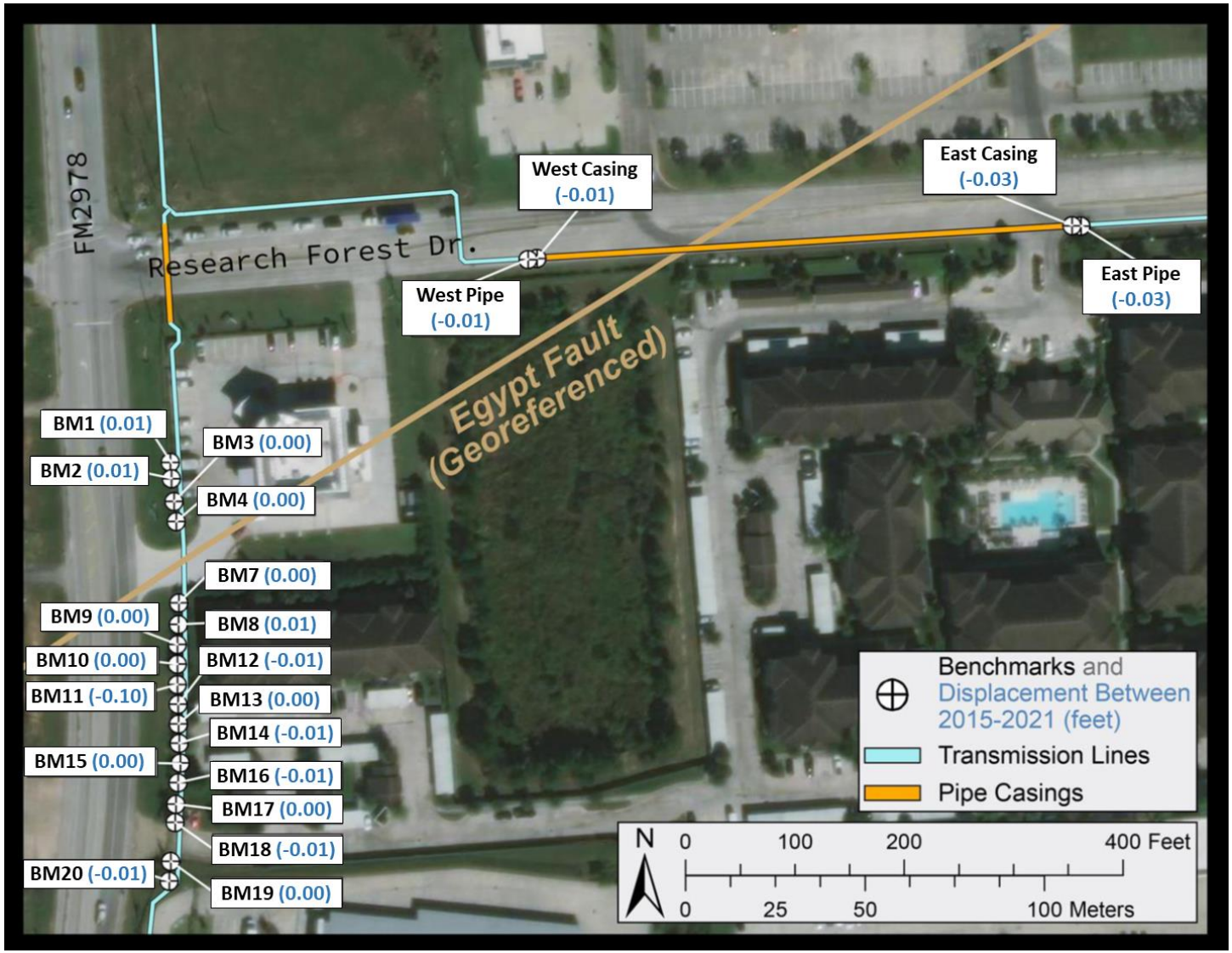


Figure 3 Satellite map showing the location of the Egypt Fault (Fugro, 2012), the W1A monitoring locations and calculated vertical displacement from March 2015 to March 2022 and the SJRA water line and pipe casing.

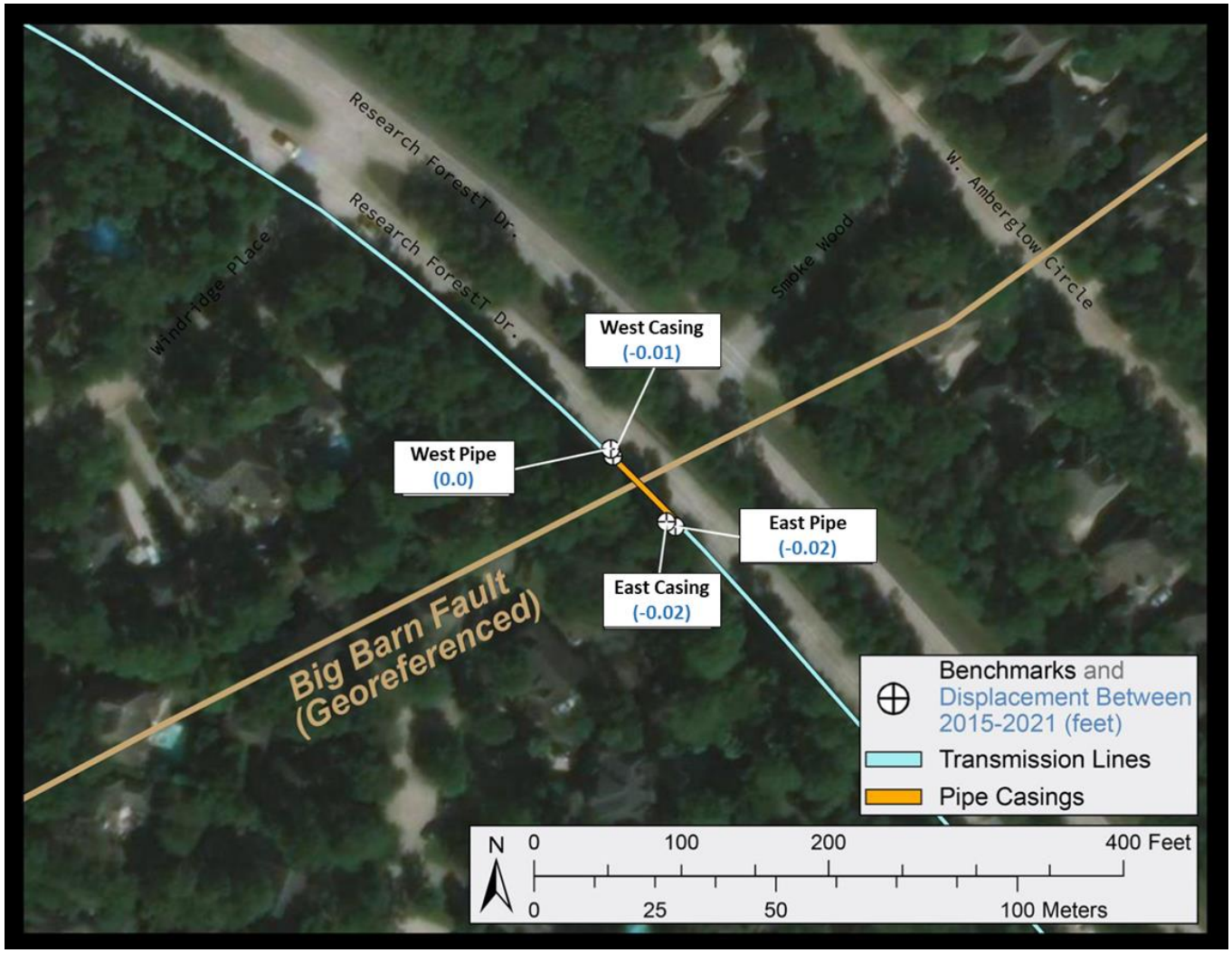


Figure 4 Satellite map showing the location the Big Barn Fault (Fugro, 2012), the Big Barn Fault Monitoring System, calculated vertical displacement from March 2015 to March 2022, and the SJRA water line and pipe casing

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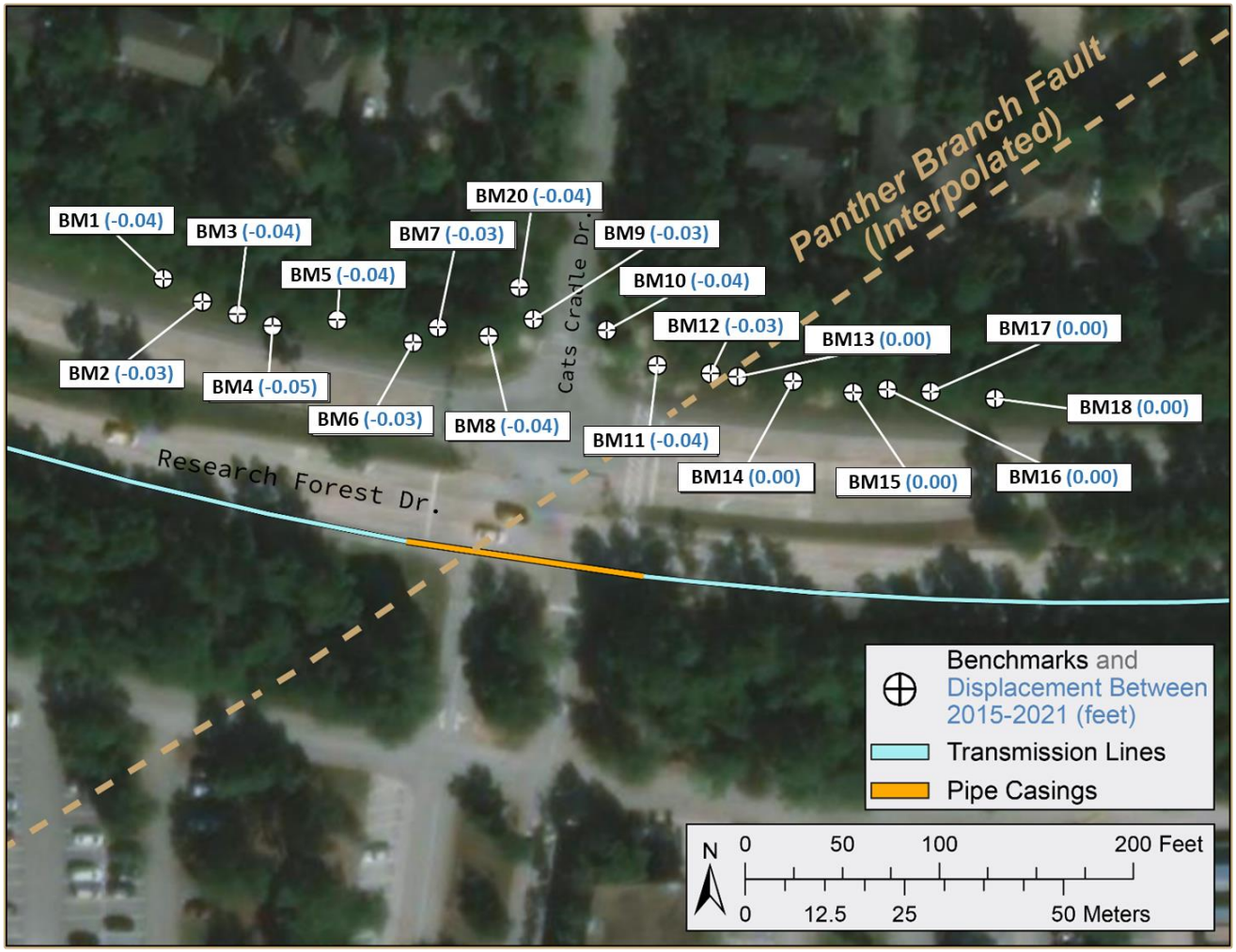

Figure 5 Satellite map showing the location the Panther Branch Fault mapped by INTERA, the Segment W2A Monitoring System, calculated vertical displacement from March 2015 to March 2022, and the SJRA water line and pipe casing.