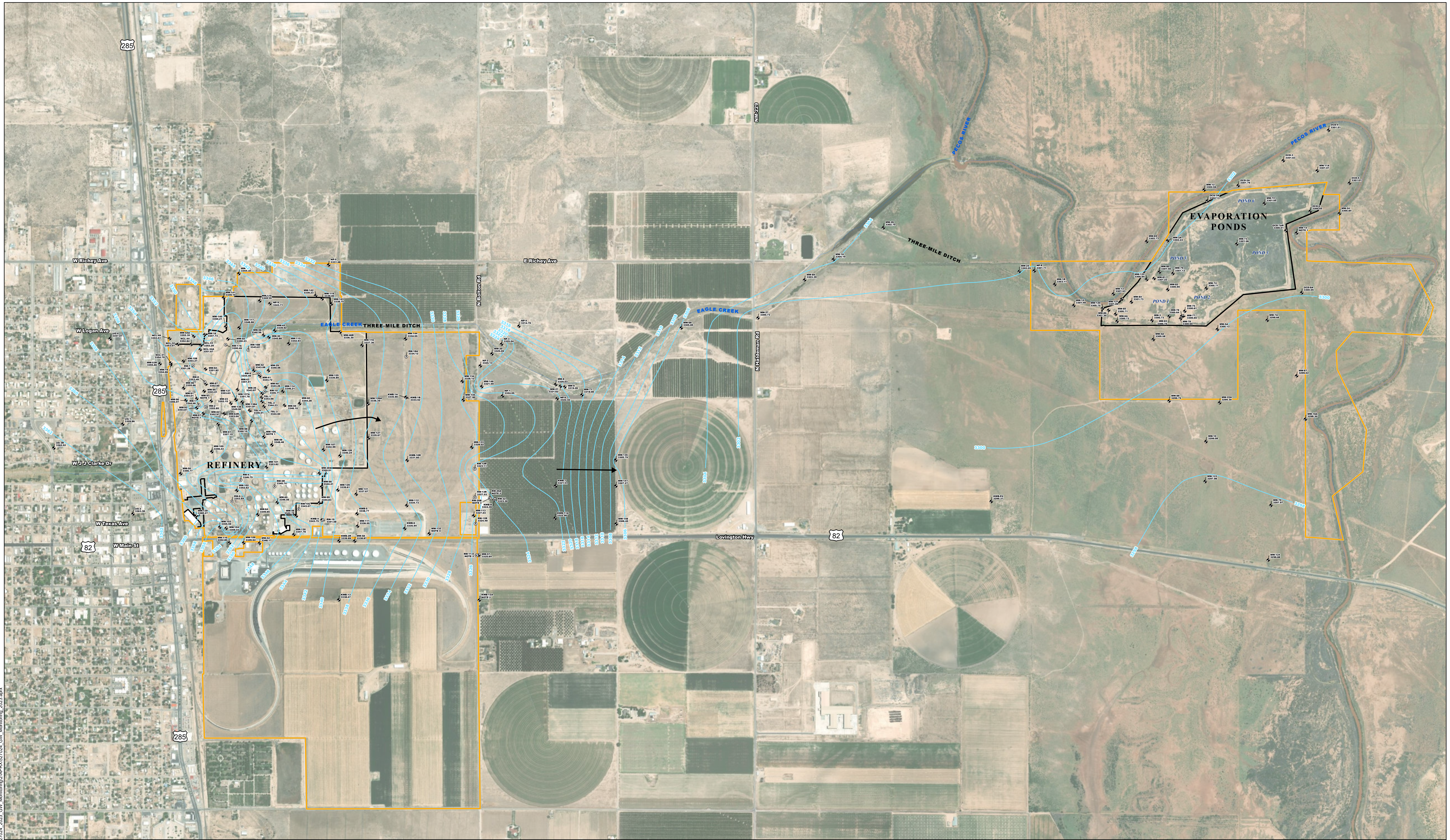
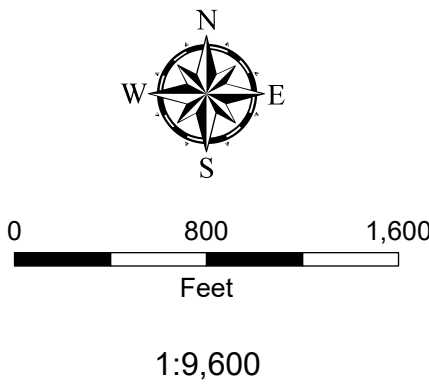




Document Path: T:\SANDBOX\Maps\Areas\527024_2023_GW_Monitoring\2-APR\527024_GW_Monitoring_2023.aprx
AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (7/2/23)

LEGEND

- MONITORING WELL
- RECOVERY WELL
- GROUNDWATER FLOW DIRECTION
- SHALLOW SATURATED ZONE POTENTIOMETRIC SURFACE CONTOURS - DASHED WHERE INFERRED (FEET ABOVE MEAN SEA LEVEL)
- CONTOUR INDICATING IN-WELL GROUNDWATER ELEVATION DEPRESSED FROM ACTIVE RECOVERY SYSTEM
- FENCELINE
- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- GROUNDWATER ELEVATION (FEET)



NOTE:

- GROUNDWATER ELEVATION WAS NOT MEASURED BECAUSE WELL IS NOT IN GAUGING PROGRAM, WELL COULD NOT BE LOCATED, OR WELL WAS DAMAGED.
- WELL WAS DRY AT TIME OF GAUGING.
- ONLY PSH PRESENT IN THE WELL.
- GROUNDWATER ELEVATION NOT MEASURED DUE TO PUMP IN WELL.



SHALLOW SATURATED ZONE
POTENTIOMETRIC SURFACE MAP
2023 FIRST SEMI-ANNUAL EVENT

2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJAOE SAVED: 2/20/2024 MXD: 527024_GW_Monitoring_2023



505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

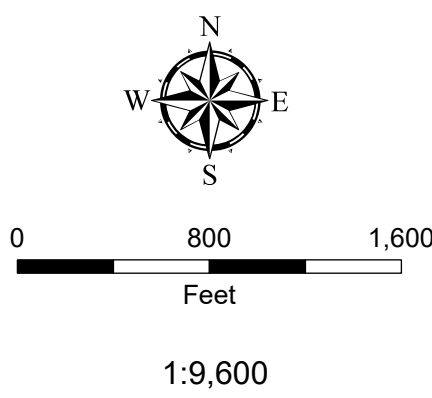
FIGURE
4

- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

☐ FENCELINE

 PHASE-SEPARATED HYDROCARBON (PSH)

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.

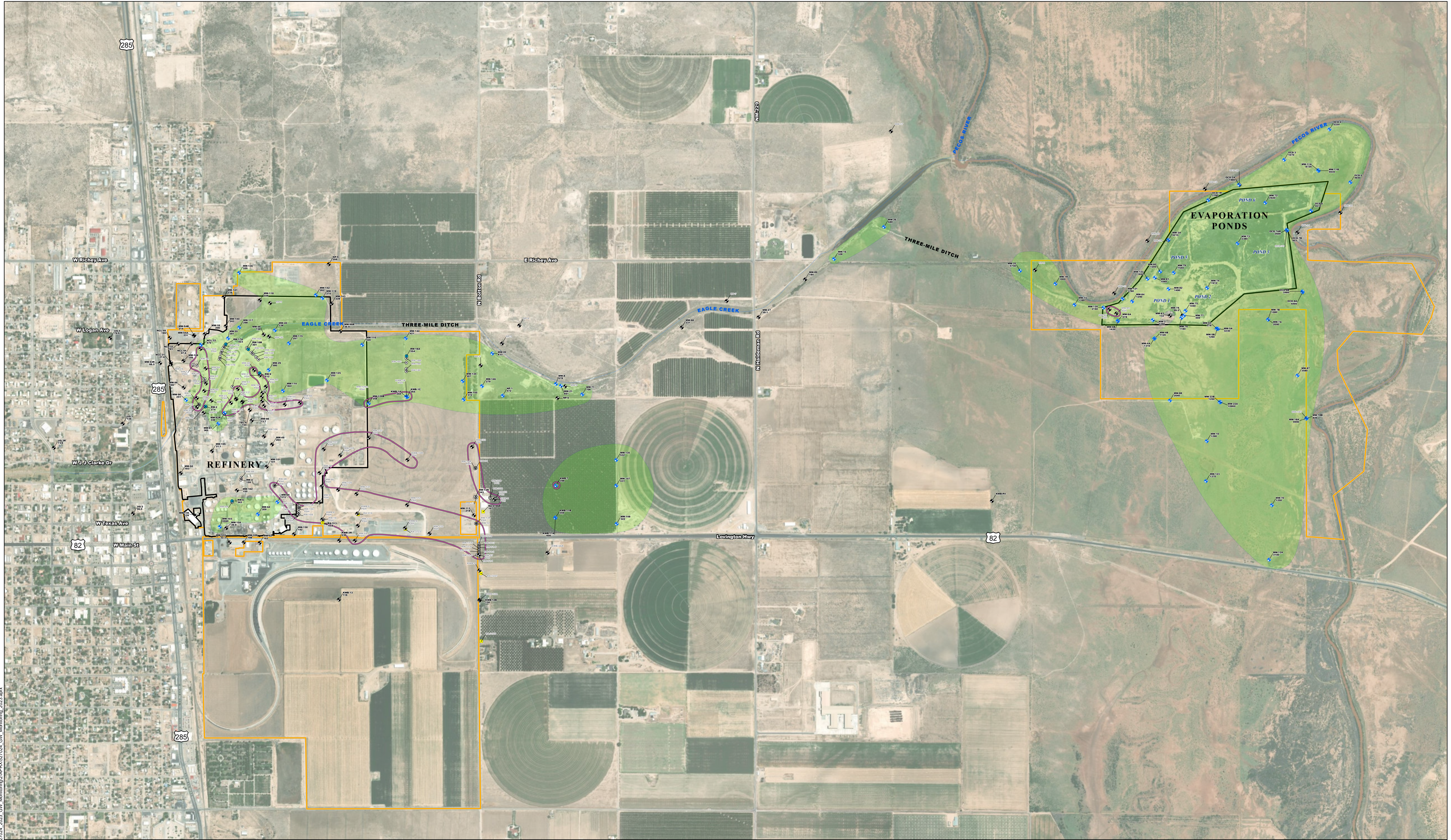


AUTHOR: MJAGOE	SAVED: 2/20/2024	MXD: 527024_GW_Monitoring
----------------	------------------	---------------------------

505 E. HUNTLAND DR. **FIGURE**

TRC 505 E. HUNT LAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE 12



LEGEND

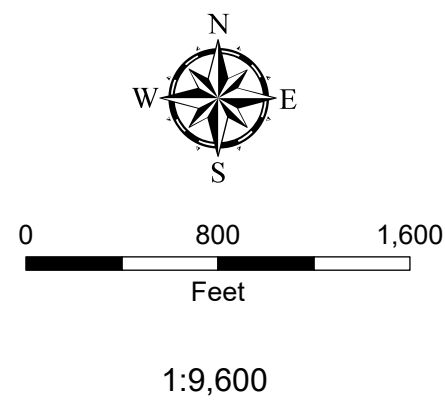
- ♦ MONITORING WELL EXCEEDS SCREENING LEVELS
- ♦ MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 242 CHLORIDE CONCENTRATION
- MW-128 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- CHLORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 250 mg/L)
- FENCELINE

- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. DRO = DIESEL RANGE ORGANICS
3. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.



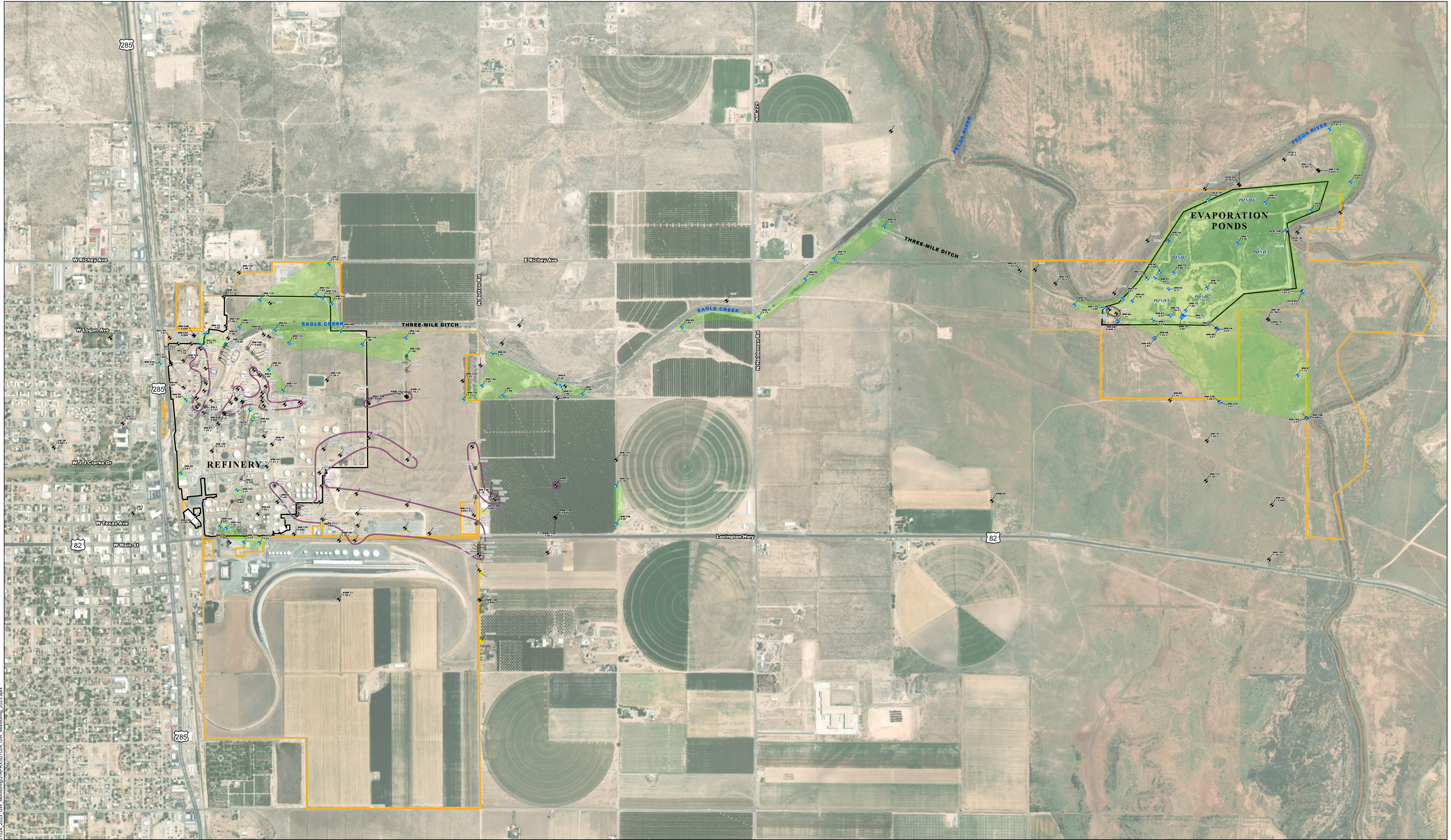
CHLORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2023 FIRST SEMI-ANNUAL EVENT

2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE SAVED: 2/20/2024 MXD: 527024_GW_Monitoring_2023

505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE
20



LEGEND

- MONITORING WELL EXCEEDS SCREENING LEVELS

MONITORING WELL

IRRIGATION WELL

RECOVERY WELL EXCEEDS SCREENING LEVELS

RECOVERY WELL
- 2.00 FLUORIDE CONCENTRATION WELL NOT SAMPLED

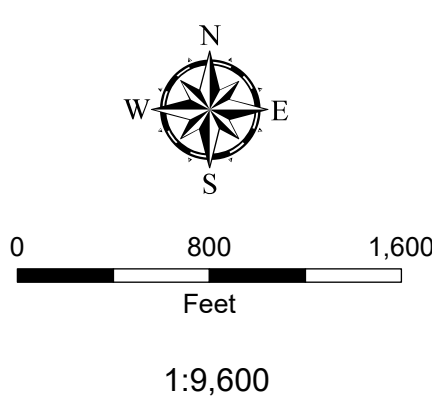
PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)

FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1.6 mg/L)

FENCELINE
- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:
1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).



FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2023 FIRST SEMI-ANNUAL EVENT

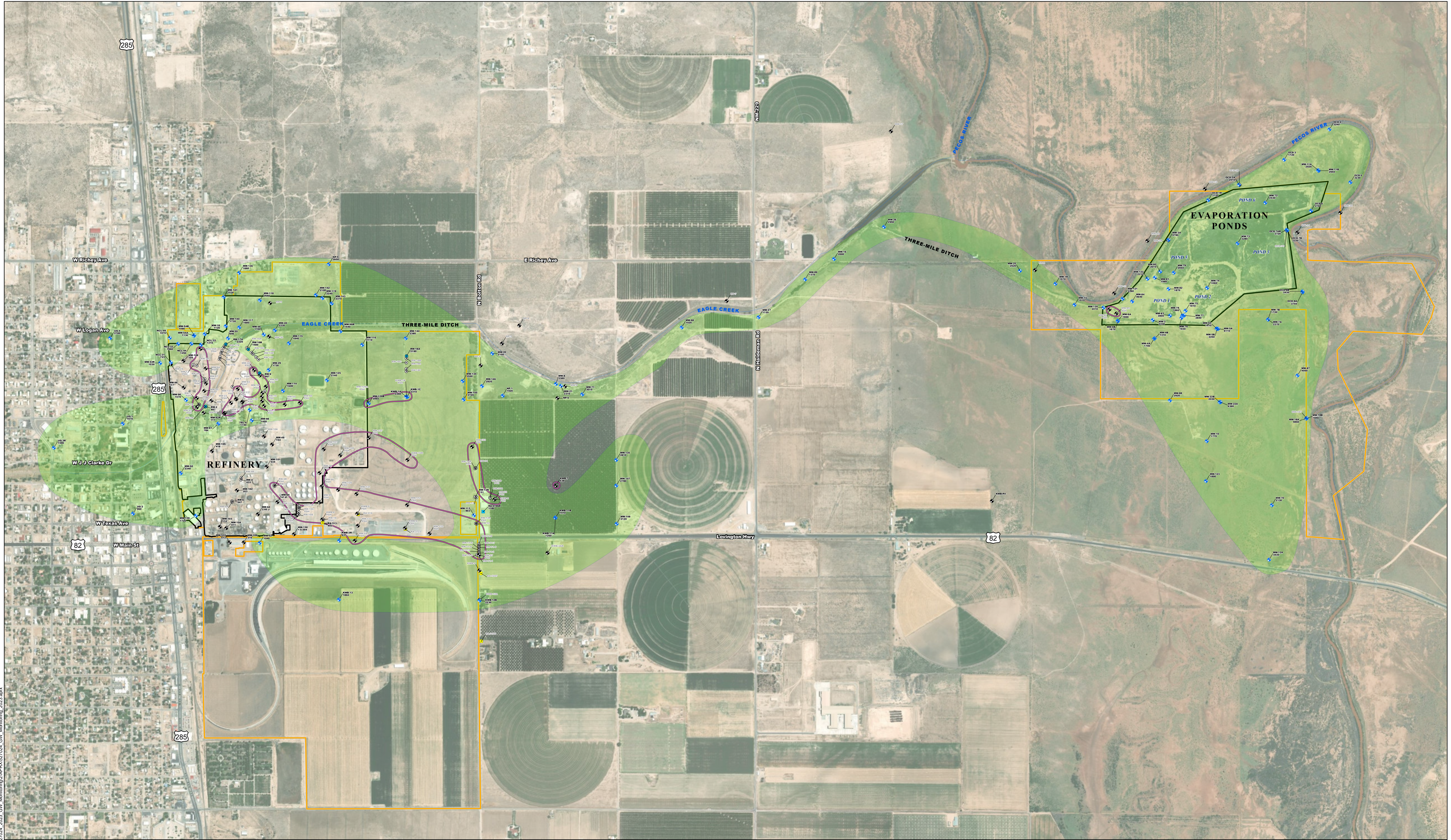
2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE DATED: 2/20/2024 MDD: 527024_GW_Monitoring_2023

505 E. HUNT LAND DR. SUITE 250 AUSTIN, TX 78752 PH: 512-329-6080

FIGURE 22

Document Path: T:\7-SANDBOX\Majgoe\Artesia\527024_2023_GW_Monitoring\2-APRIL\27024_GW_Monitoring_2023.aprx



LEGEND

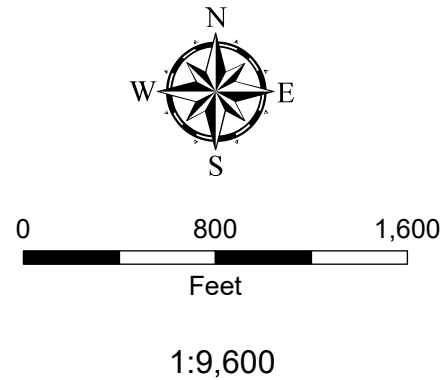
- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL EXCEEDS SCREENING LEVELS
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 958 Sulfate Concentration
- Well Not Sampled
- < 0.0774 Sulfate Not Detected Above Method Detection Limit
- PSH Phase-Separated Hydrocarbon Present in Well (≥ 0.03 Feet Thick)
- Sulfate Critical Groundwater Screening Level Exceedance Area (Concentration > 600 mg/L)
- FENCELINE

- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

- ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
- J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.



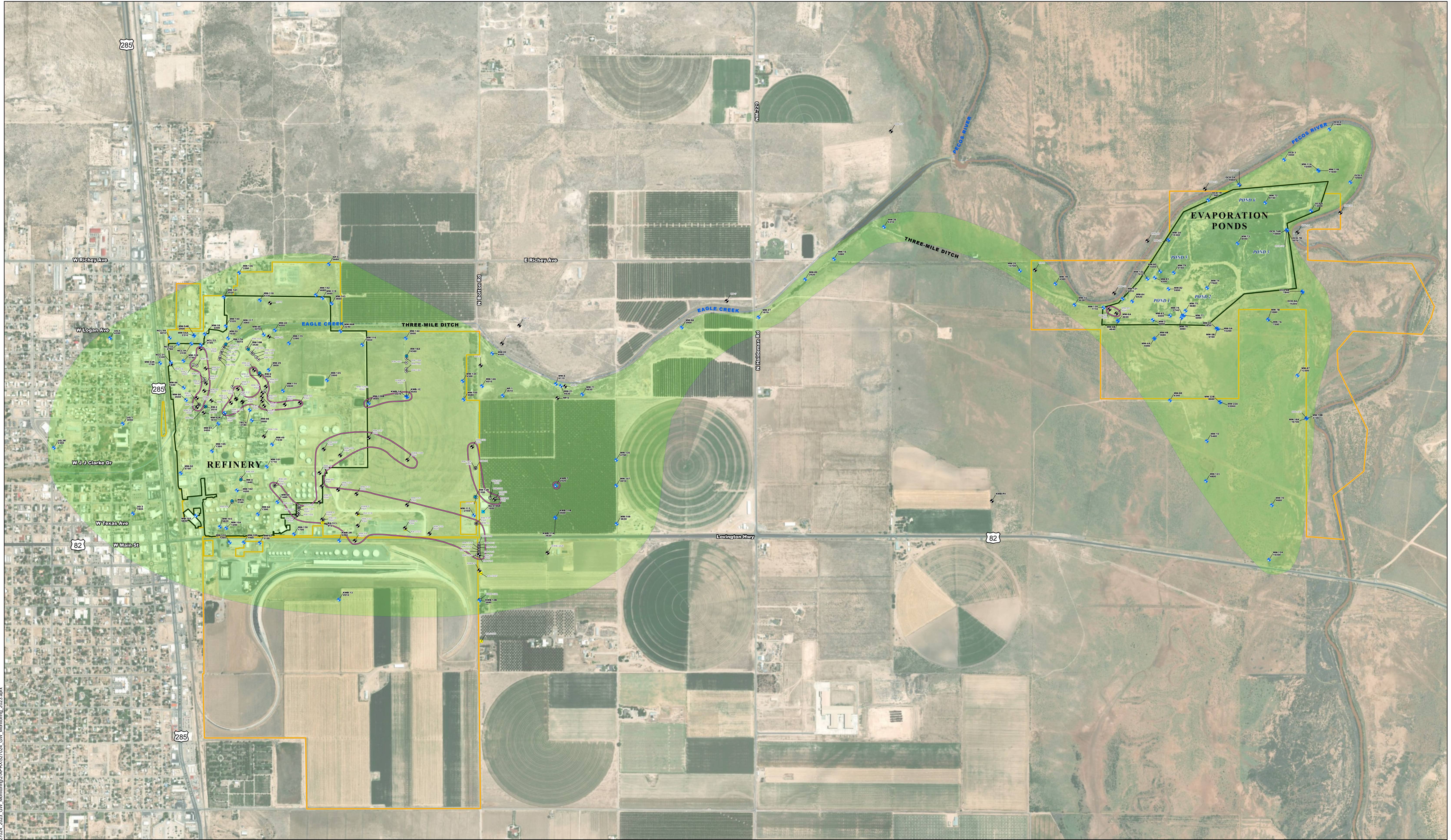
SULFATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2023 FIRST SEMI-ANNUAL EVENT

2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE SAVED: 2/20/2024 MOD: 5/27/2024_GW_Monitoring_2023

505 E. HUNT LAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE
24



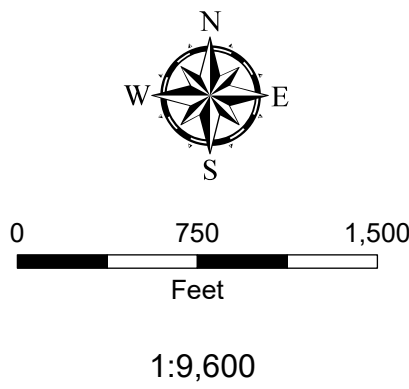
LEGEND

- ♦ MONITORING WELL EXCEEDS SCREENING LEVELS
- ♦ MONITORING WELL
- ♦ IRRIGATION WELL EXCEEDS SCREENING LEVELS
- ♦ IRRIGATION WELL
- ♦ RECOVERY WELL EXCEEDS SCREENING LEVELS
- ♦ RECOVERY WELL

- 1340 TOTAL DISSOLVED SOLIDS CONCENTRATION
- WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1000 mg/L)
- FENCELINE
- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:
1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).

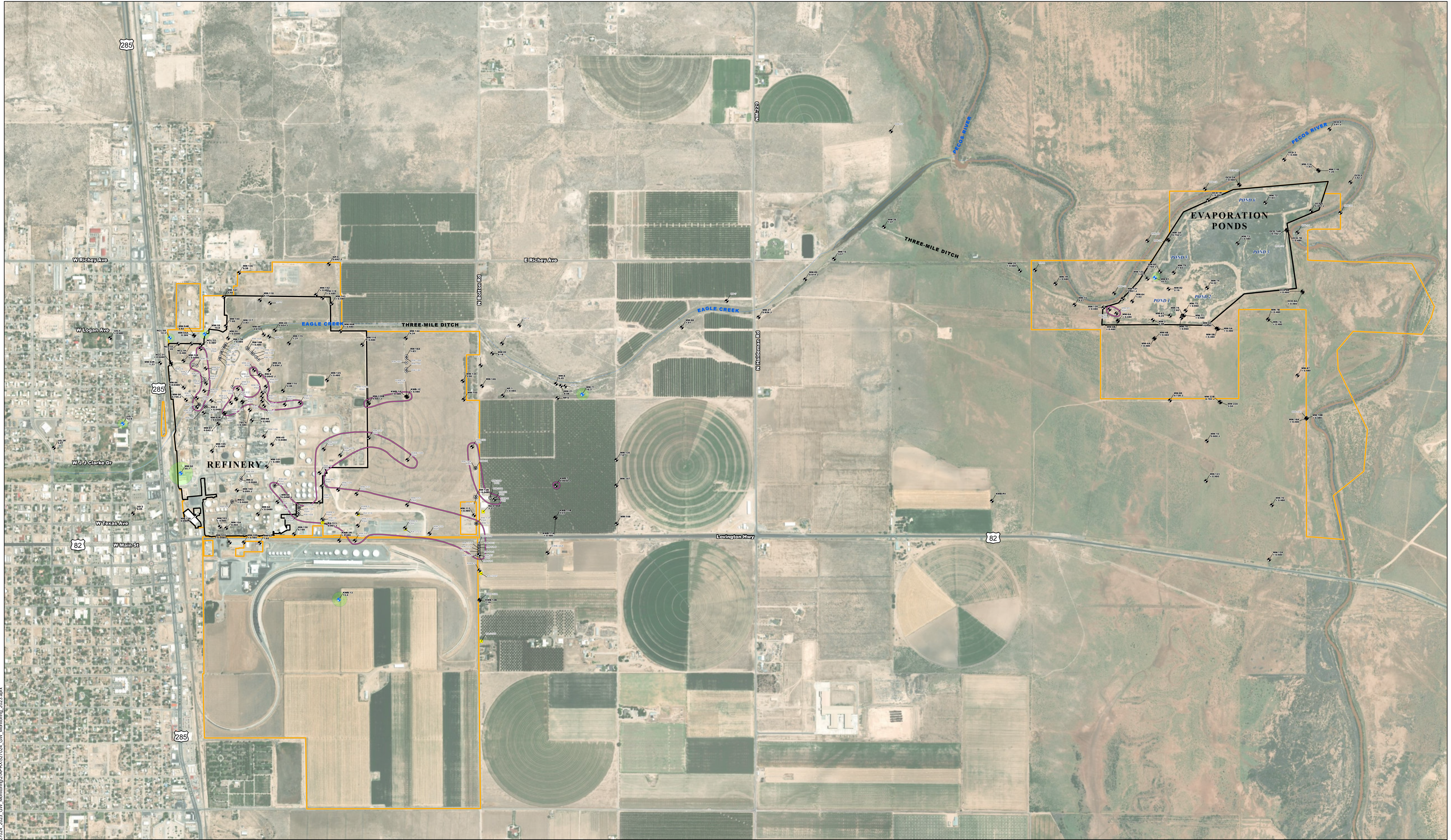


TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP
2023 FIRST SEMI-ANNUAL EVENT
2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE SAVED: 2/20/2024 MOD: 5/7/2024_GW_Monitoring_2023

TRC 505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE 26



LEGEND

-  MONITORING WELL EXCEEDS SCREENING LEVELS

 MONITORING WELL

 IRRIGATION WELL

 RECOVERY WELL
-  11.0 NITRATE CONCENTRATION

 < 0.197 NITRATE NOT DETECTED ABOVE METHOD DETECTION LIMIT

 MW-19 WELL NOT SAMPLED

 PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)

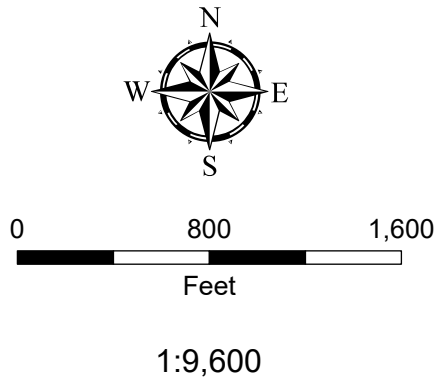
 NITRATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 10 mg/L)

 FENCELINE
-  HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

 PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.



**NITRATE CRITICAL GROUNDWATER
SCREENING LEVEL EXCEEDANCE MAP
2023 FIRST SEMI-ANNUAL EVENT**

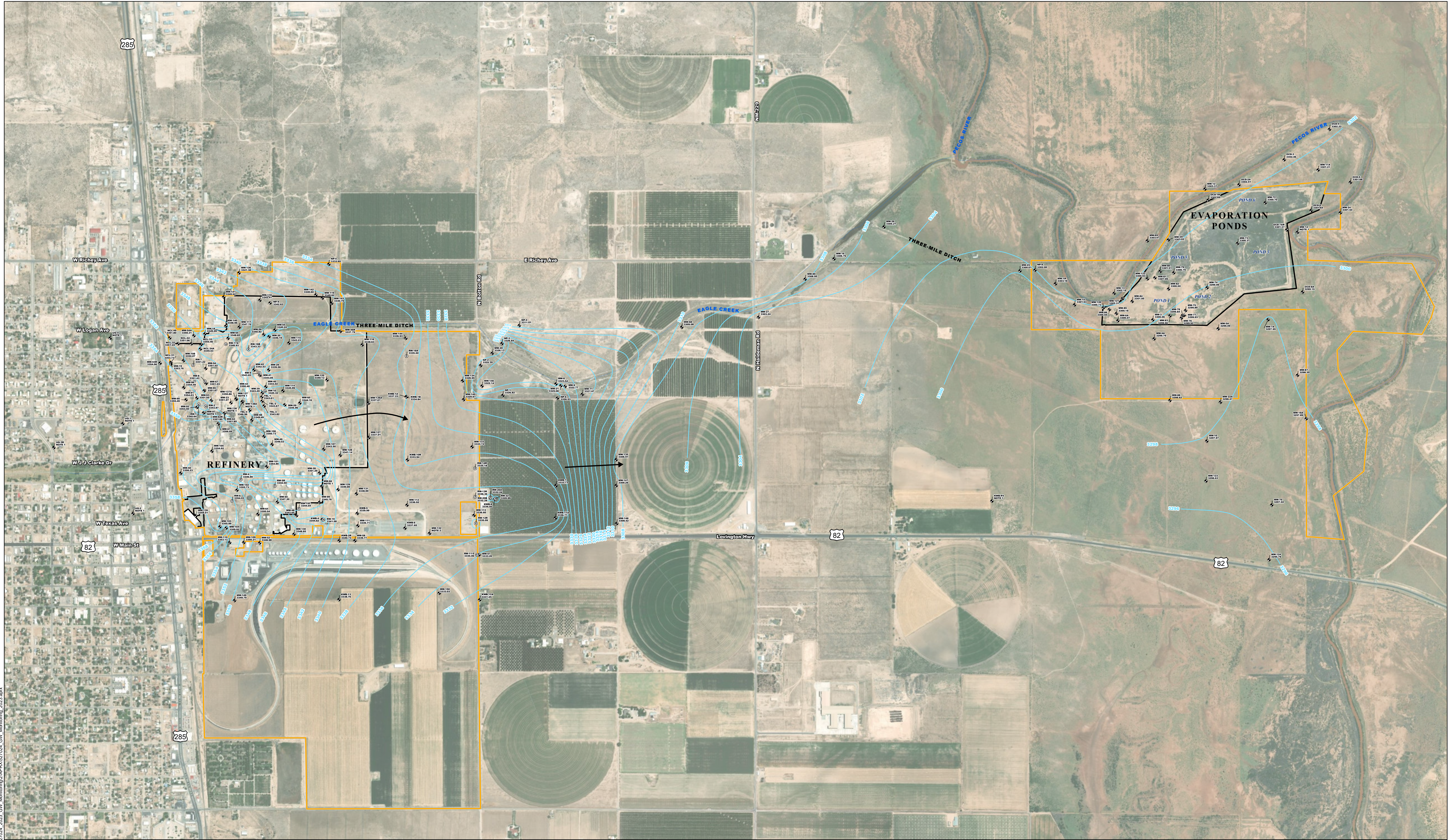
2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE SAVED: 2/20/2024 MXD: 527024_GW_Monitoring_2023



505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

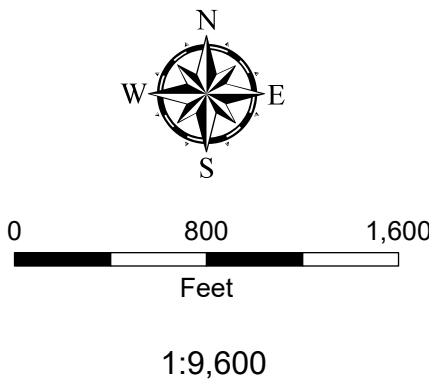
**FIGURE
28**



Document Path: T:\7-SANDBOX\Maps\Areas\527024_2023_GW_Monitoring\2-APR\27024_GW_Monitoring_2023.aprx
AERIAL IMAGERY SOURCE: ESRI WORLD IMAGERY (7/2023)

LEGEND

- MONITORING WELL
- RECOVERY WELL
- GROUNDWATER FLOW DIRECTION
- SHALLOW SATURATED ZONE POTENTIOMETRIC SURFACE CONTOURS - DASHED WHERE INFERRED (FEET ABOVE MEAN SEA LEVEL)
- CONTOUR INDICATING IN-Well GROUNDWATER ELEVATION DEPRESSED FROM ACTIVE RECOVERY SYSTEM
- FENCELINE
- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- 3338.76 GROUNDWATER ELEVATION (FEET)



NOTE:

1. GROUNDWATER ELEVATION WAS NOT MEASURED BECAUSE WELL IS NOT IN GAUGING PROGRAM, WELL COULD NOT BE LOCATED, OR WELL WAS DAMAGED.
2. WELL WAS DRY AT TIME OF GAUGING.
3. GROUNDWATER ELEVATION NOT USED IN POTENTIOMETRIC SURFACE CONTOURING.
4. GROUNDWATER ELEVATION NOT MEASURED DUE TO PUMP IN WELL.



**SHALLOW SATURATED ZONE
POTENTIOMETRIC SURFACE MAP
2023 SECOND SEMI-ANNUAL EVENT**

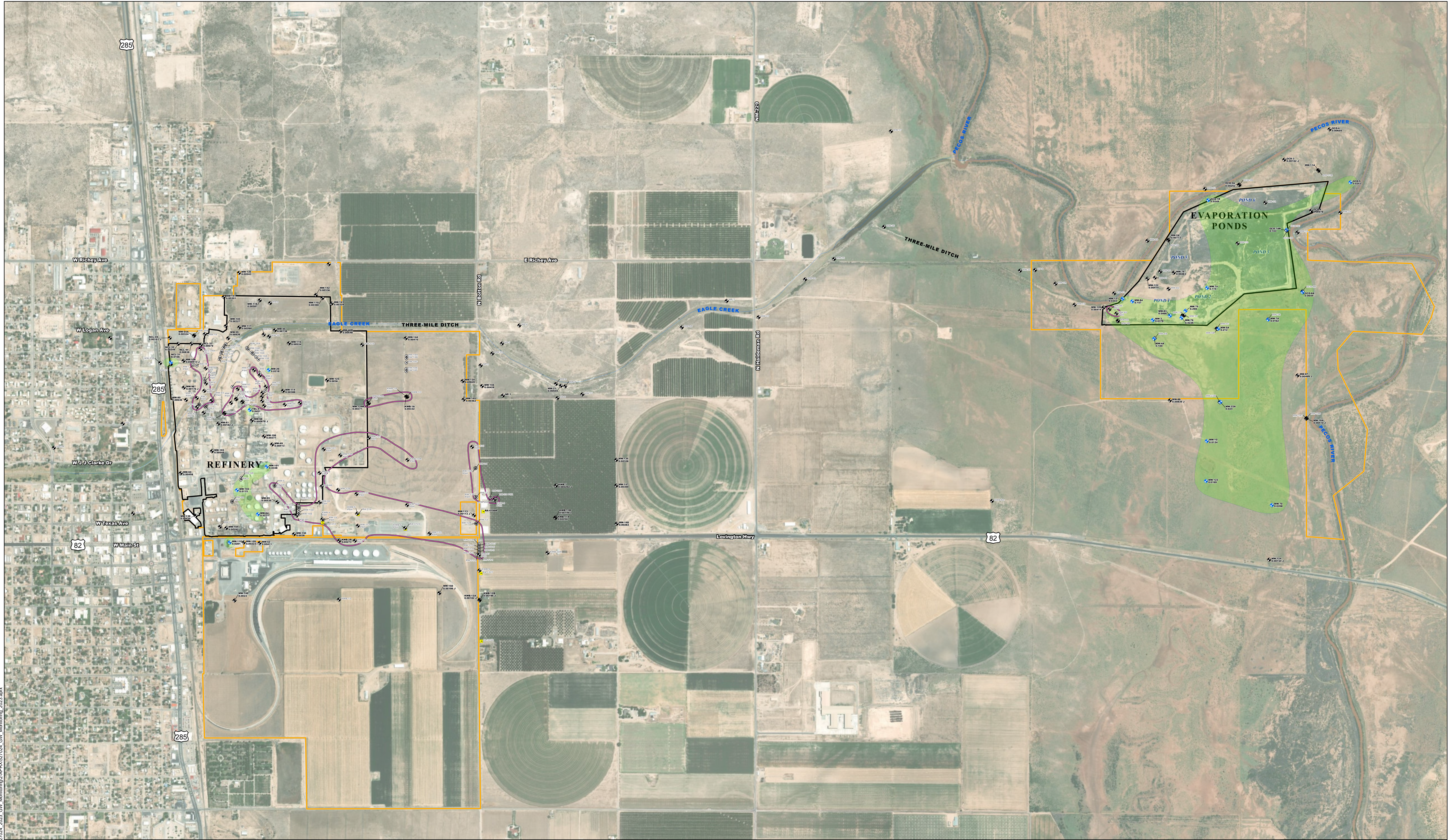
2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJAOE SAVED: 2/20/2024 MXD: 527024_GW_Monitoring_2023



505 E. HUNT LAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

**FIGURE
6**



LEGEND

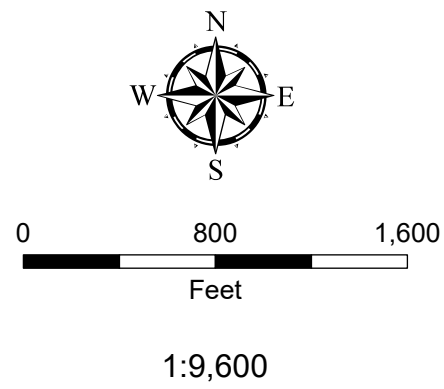
- ◆ MONITORING WELL EXCEEDS SCREENING LEVELS
- ◆ MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 0.0151 ARSENIC CONCENTRATION
- MW-97 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥0.03 FEET THICK)
- ARSENIC CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 0.01 mg/L)
- FENCELINE

- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.



ARSENIC CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2023 SECOND SEMI-ANNUAL EVENT

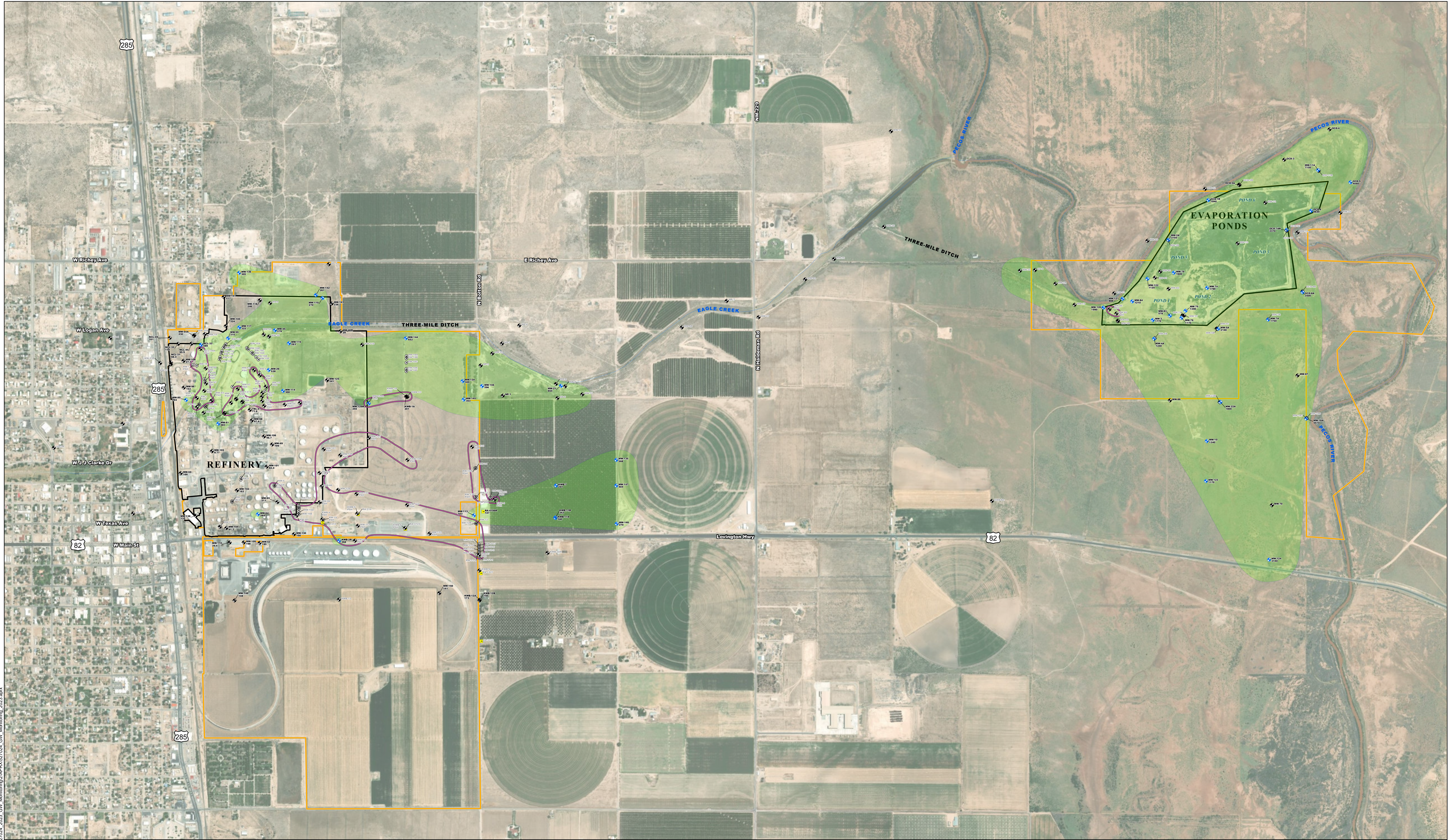
2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE SAVER: 2/20/2024 MXD: 5/27/2024_GW_Monitoring_2023.aprx

505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH:512-329-6080

TRC

FIGURE 13



LEGEND

- ◆

 MONITORING WELL EXCEEDS SCREENING LEVELS

◆

 MONITORING WELL

■

 IRRIGATION WELL EXCEEDS SCREENING LEVELS

■

 IRRIGATION WELL

●

 RECOVERY WELL EXCEEDS SCREENING LEVELS

●

 RECOVERY WELL
- 148

 CHLORIDE CONCENTRATION
- MW-103

 WELL NOT SAMPLED
- PSH

 PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- CHLORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 250 mg/L)
- FENCELINE

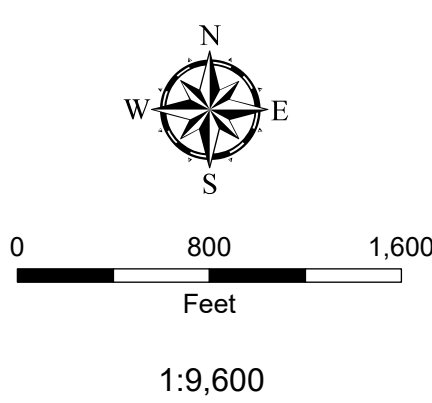
□

 HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

■

 PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:
1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).



CHLORIDE CRITICAL GROUNDWATER
SCREENING LEVEL EXCEEDANCE MAP
2023 SECOND SEMI-ANNUAL EVENT

2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE

SAVED: 2/20/2024

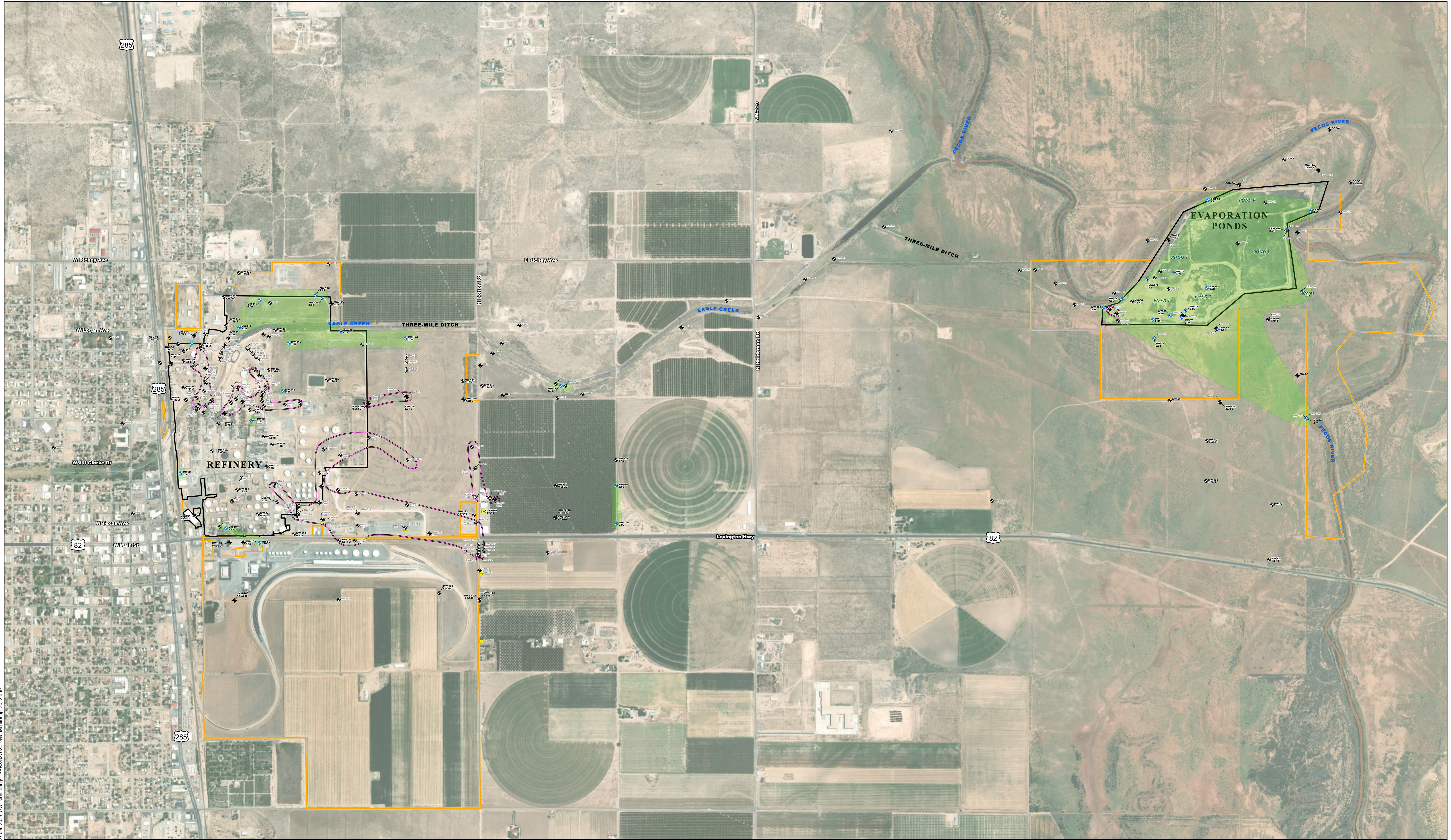
MXD: 527024_GW_Monitoring_2023

TRC

505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE
21

Released to Imaging: 5/8/2024 8:52:20 AM



LEGEND

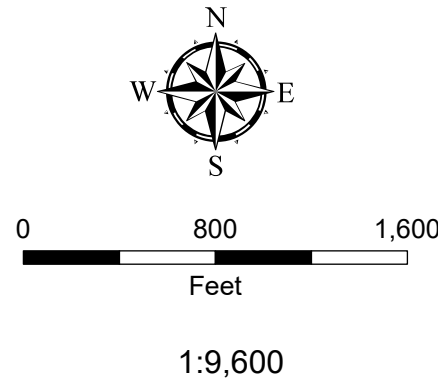
- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL

- 1.63 FLUORIDE CONCENTRATION
- WELL NOT SAMPLED
- PHSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1.6 mg/L)
- FENCELINE
- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).



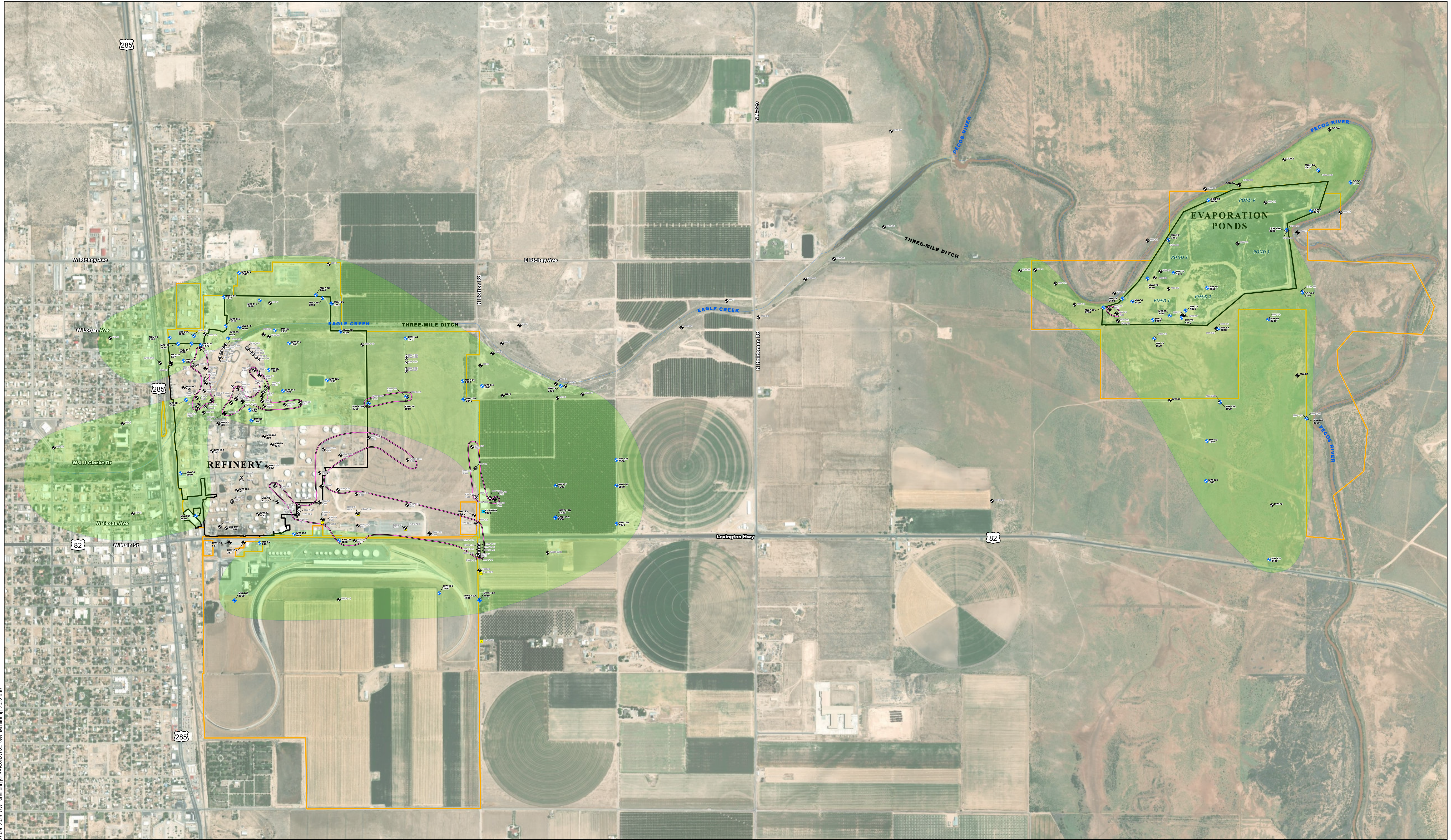
FLUORIDE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2023 SECOND SEMI-ANNUAL EVENT

2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE DATED: 2/20/2024 MDD: 527024_GW_Monitoring_2023

505 E. HUNT LAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE
23



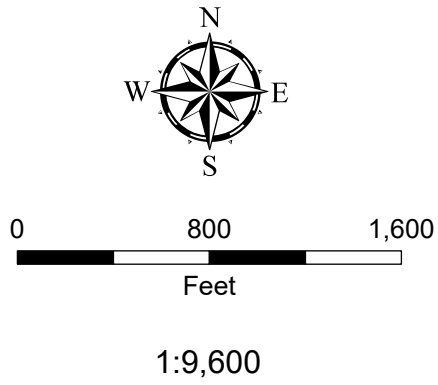
LEGEND

- ♦ MONITORING WELL EXCEEDS SCREENING LEVELS
- ♦ MONITORING WELL
- ♦ IRRIGATION WELL EXCEEDS SCREENING LEVELS
- ♦ IRRIGATION WELL
- ♦ RECOVERY WELL EXCEEDS SCREENING LEVELS
- ♦ RECOVERY WELL

- 740 Sulfate Concentration
- MW-97 WELL NOT SAMPLED
- < 0.0774 Sulfate NOT DETECTED ABOVE METHOD DETECTION LIMIT
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- PSH PHASE-SEPARATED HYDROCARBON (PSH)
- Sulfate CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 600 mg/L)
- FENCELINE

- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

- NOTES:
1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
 2. J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.



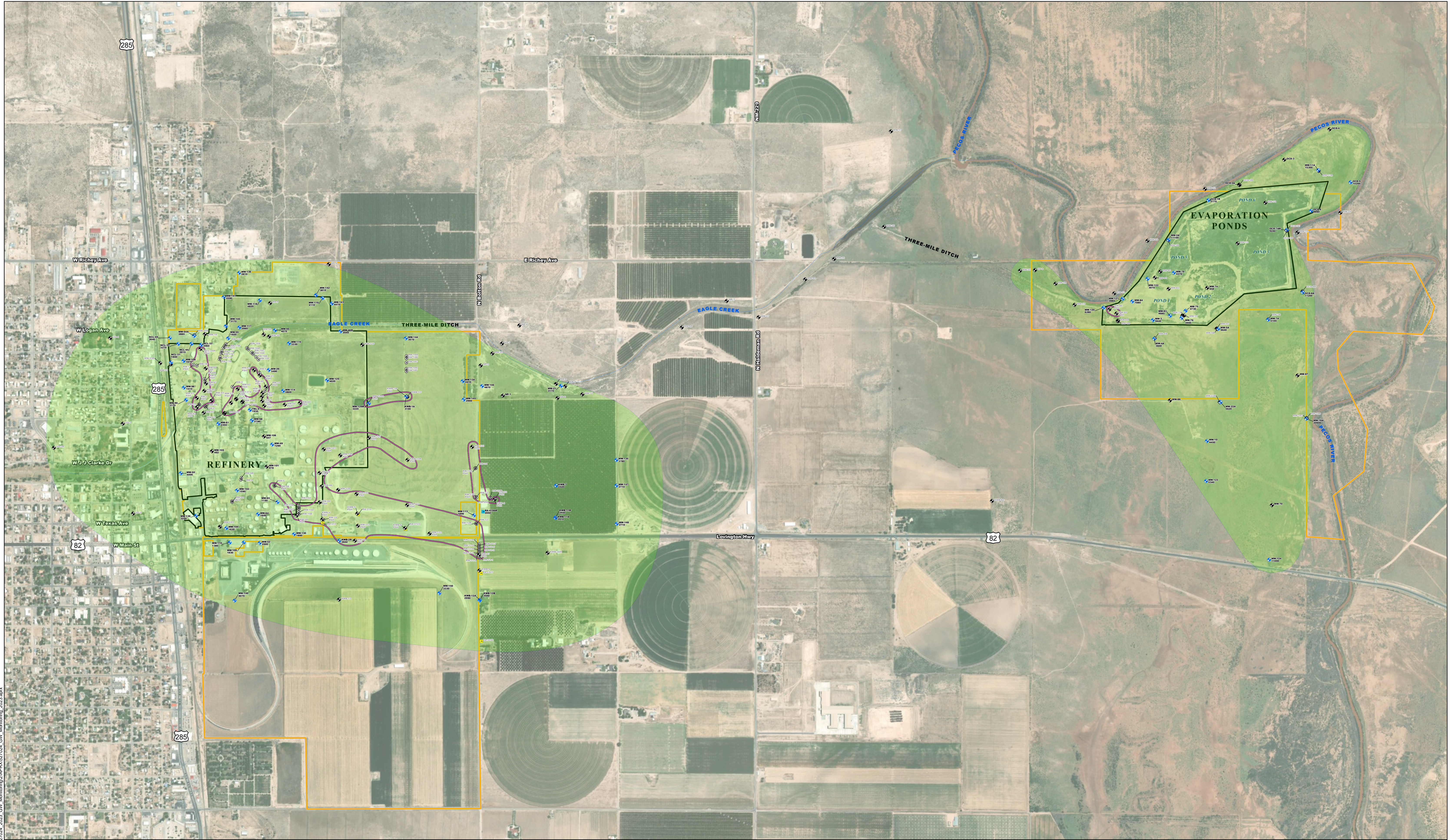
SULFATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP 2023 SECOND SEMI-ANNUAL EVENT

2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE SAVED: 2/20/2024 MXD: 5/27/2024_GW_Monitoring_2023.aprx

505 E. HUNT LAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE
25

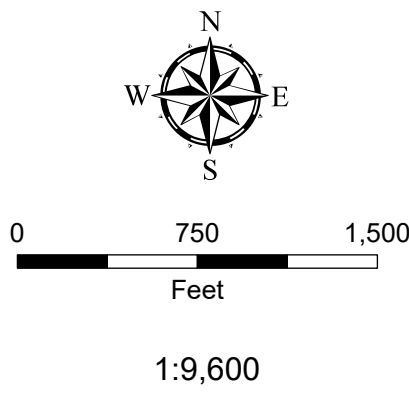


LEGEND

- ♦ MONITORING WELL EXCEEDS SCREENING LEVELS
- ♦ MONITORING WELL
- IRRIGATION WELL EXCEEDS SCREENING LEVELS
- IRRIGATION WELL
- RECOVERY WELL EXCEEDS SCREENING LEVELS
- RECOVERY WELL
- 1340 TOTAL DISSOLVED SOLIDS CONCENTRATION
- MW-10 WELL NOT SAMPLED
- PSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 1000 mg/L)
- FENCELINE
- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)

PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:
1. ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).

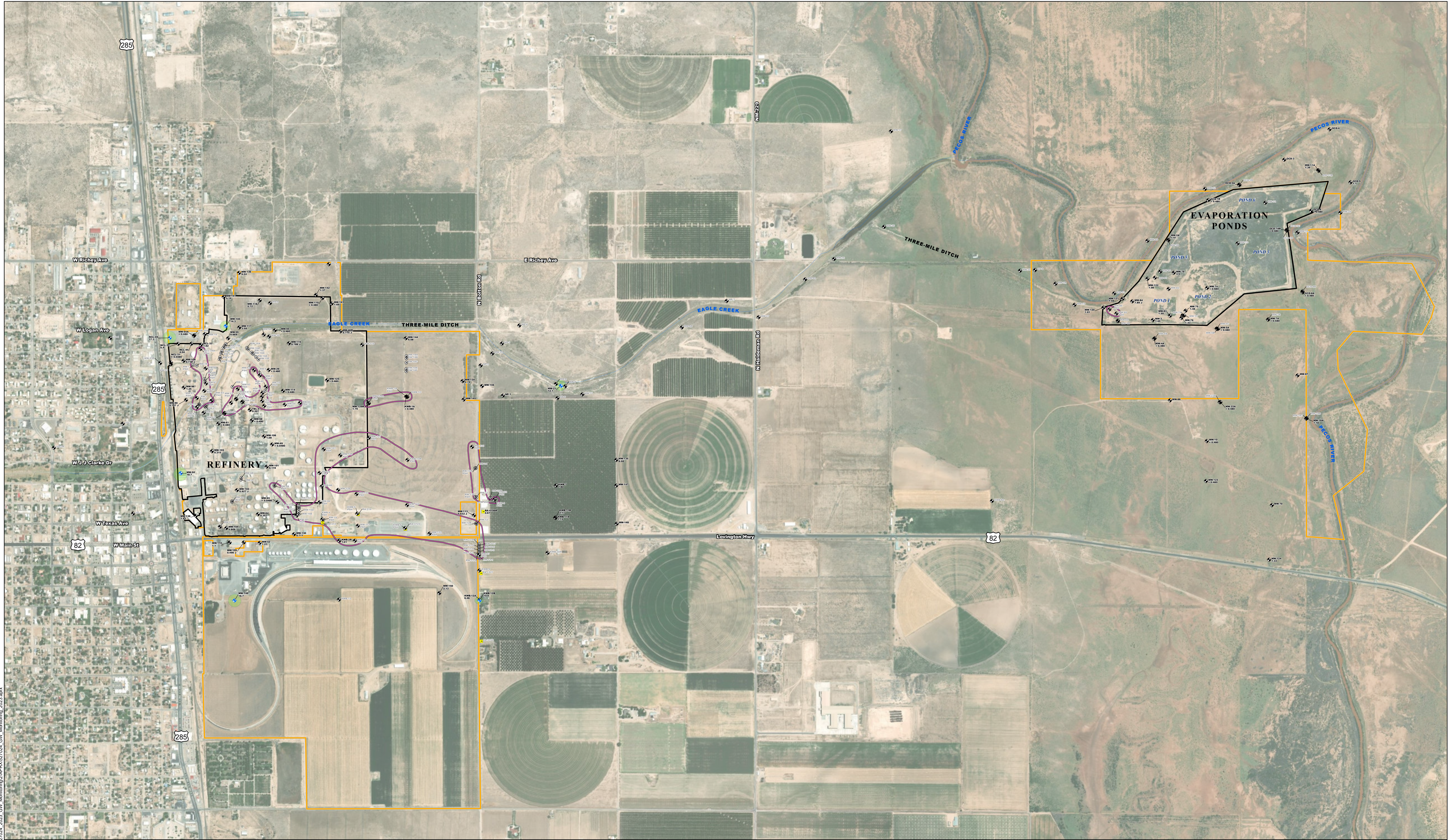


TOTAL DISSOLVED SOLIDS CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE MAP
2023 SECOND SEMI-ANNUAL EVENT
2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MAJGOE	SAVED: 2/20/2024	MXID: 527024_GW_Monitoring_2023
----------------	------------------	---------------------------------

TRC 505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE 27



LEGEND

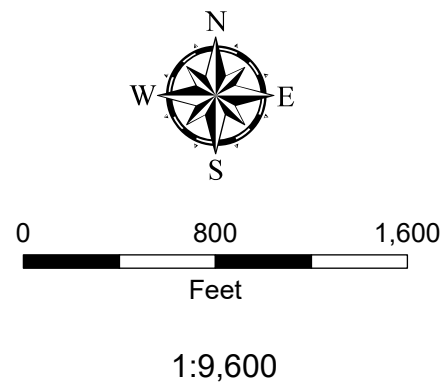
- MONITORING WELL EXCEEDS SCREENING LEVELS
- MONITORING WELL
- IRRIGATION WELL
- RECOVERY WELL

- 16.7 NITRATE CONCENTRATION
- < 0.197 NITRATE NOT DETECTED ABOVE METHOD DETECTION LIMIT
- WELL NOT SAMPLED
- PHSH PHASE-SEPARATED HYDROCARBON PRESENT IN WELL (≥ 0.03 FEET THICK)
- NITRATE CRITICAL GROUNDWATER SCREENING LEVEL EXCEEDANCE AREA (CONCENTRATION > 10 mg/L)
- FENCELINE

- HFSNR PROPERTY BOUNDARY (FENCELINE SHOWN WHERE COINCIDENT)
- PHASE-SEPARATED HYDROCARBON (PSH)

NOTES:

- ALL CONCENTRATIONS ARE IN MILLIGRAMS PER LITER (mg/L).
- J = CONCENTRATION QUALIFIED AS AN ESTIMATED VALUE.



NITRATE CRITICAL GROUNDWATER
SCREENING LEVEL EXCEEDANCE MAP
2023 SECOND SEMI-ANNUAL EVENT

2023 ANNUAL GROUNDWATER REPORT
HF SINCLAIR NAVAJO REFINING LLC
ARTESIA REFINERY, EDDY COUNTY, NEW MEXICO

AUTHOR: MJAGOE SAVED: 2/20/2024 MXD: 527024_GW_Monitoring_2023



505 E. HUNTLAND DR.
SUITE 250
AUSTIN, TX 78752
PH: 512-329-6080

FIGURE
29

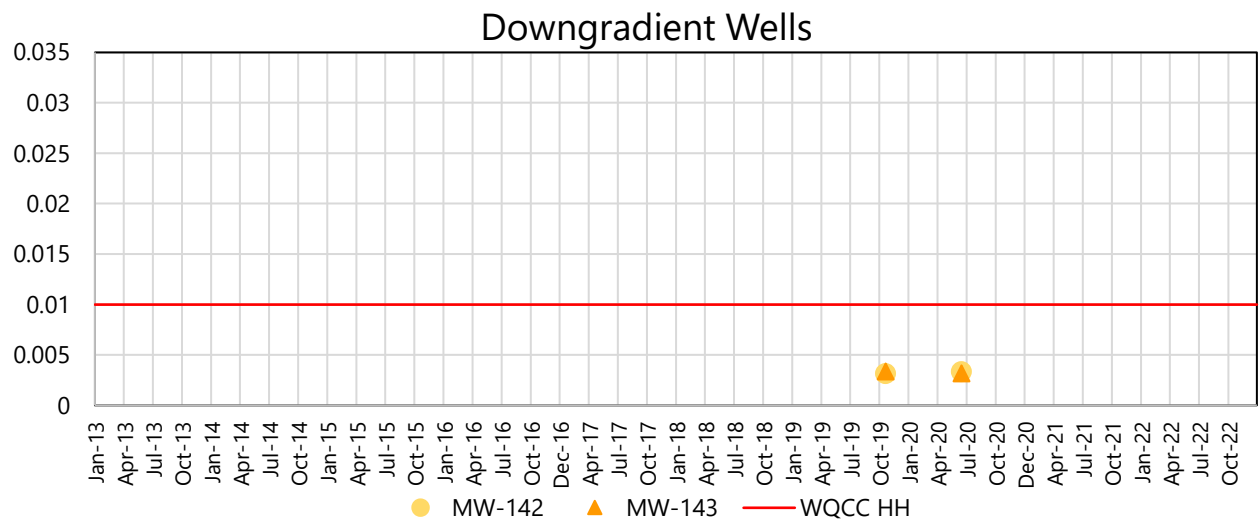
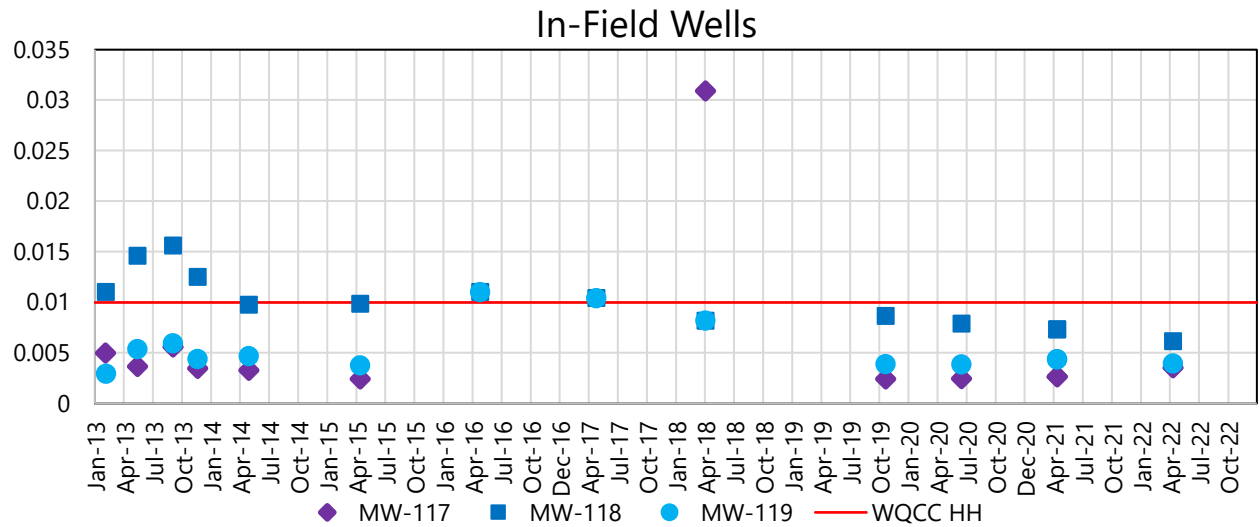
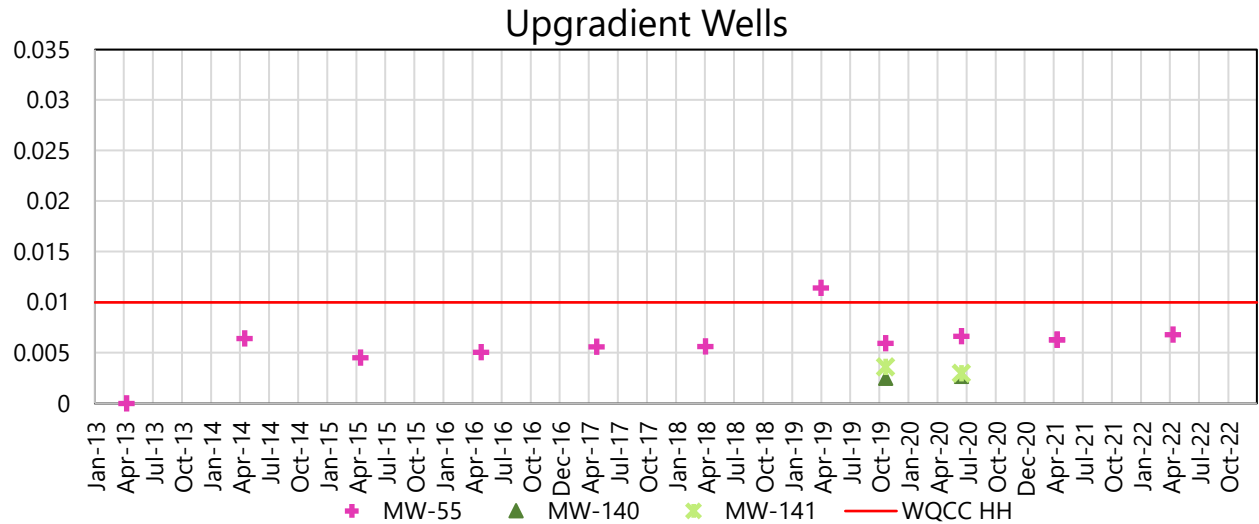
APPENDIX

C

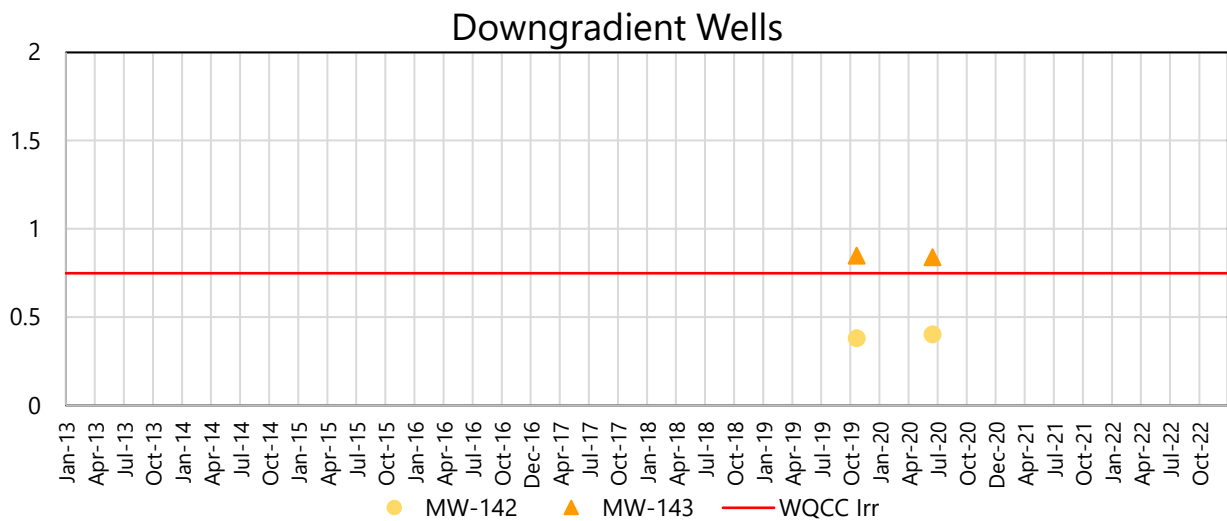
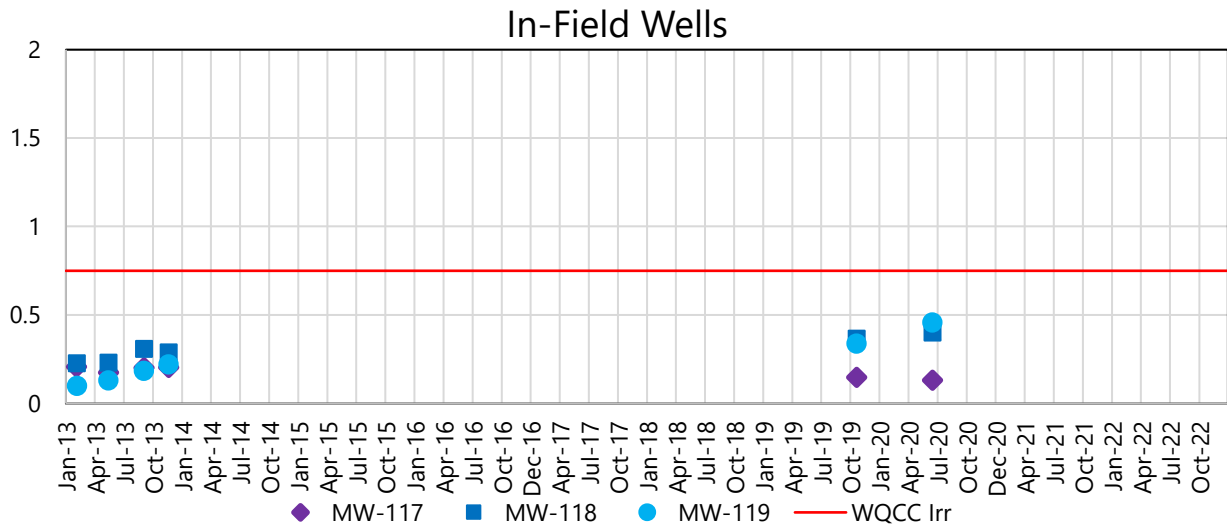
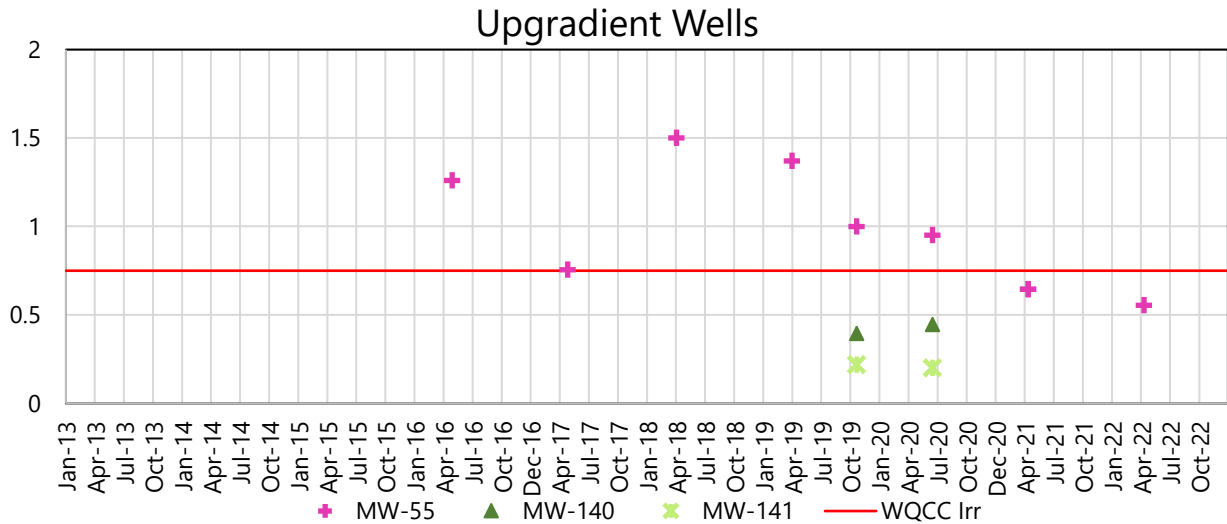
TREND PLOTS OF COCS 2013-2022
PROUCL MANN-KENDALL STATISTICAL
EVALUATION OF COCS 2013-2022

APPENDIX C1
TREND PLOTS OF COCS 2013-2019

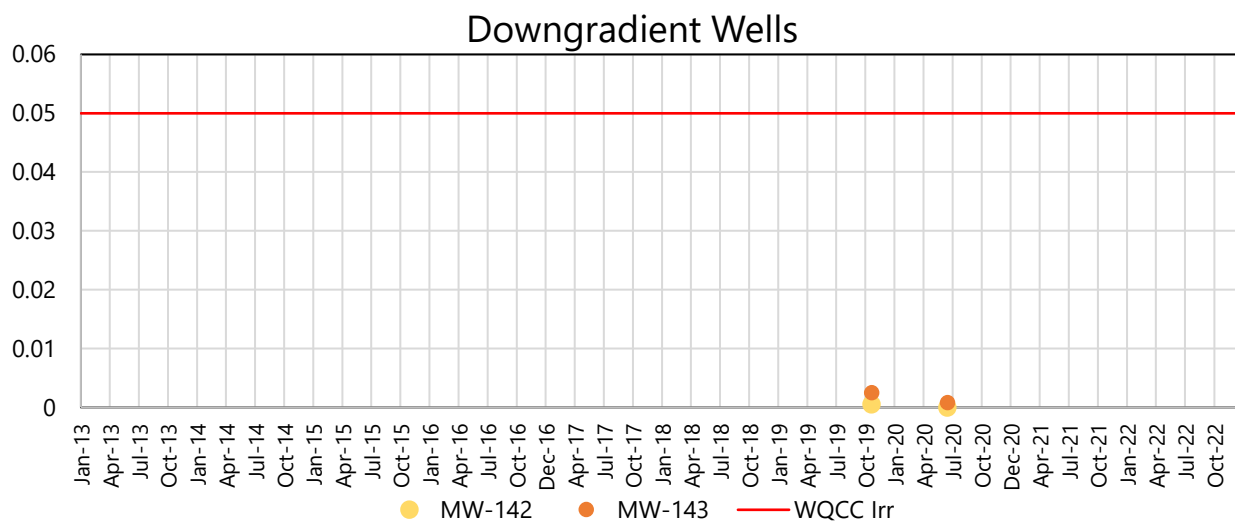
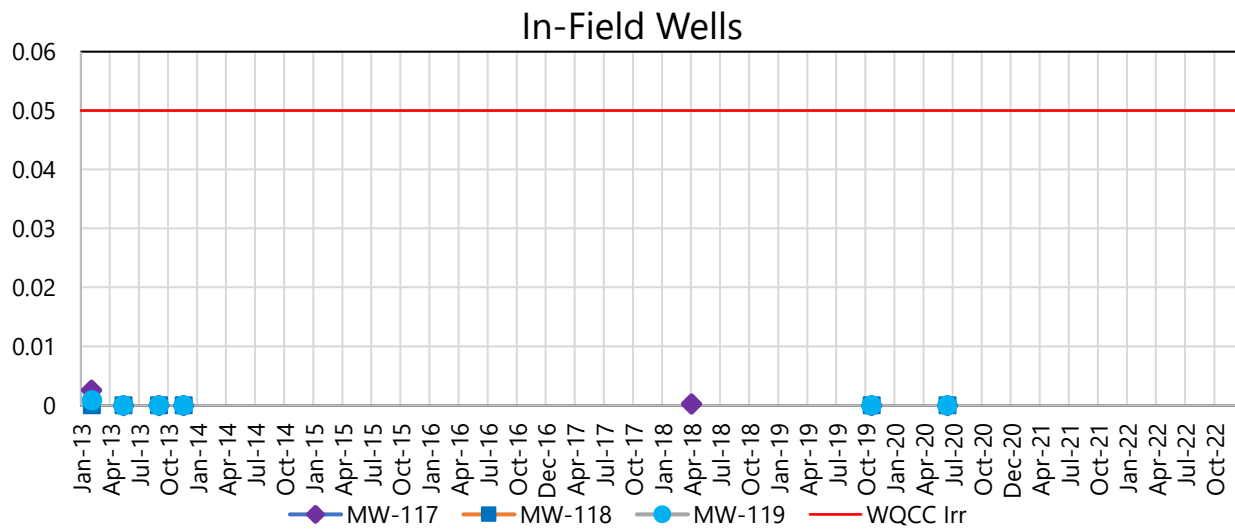
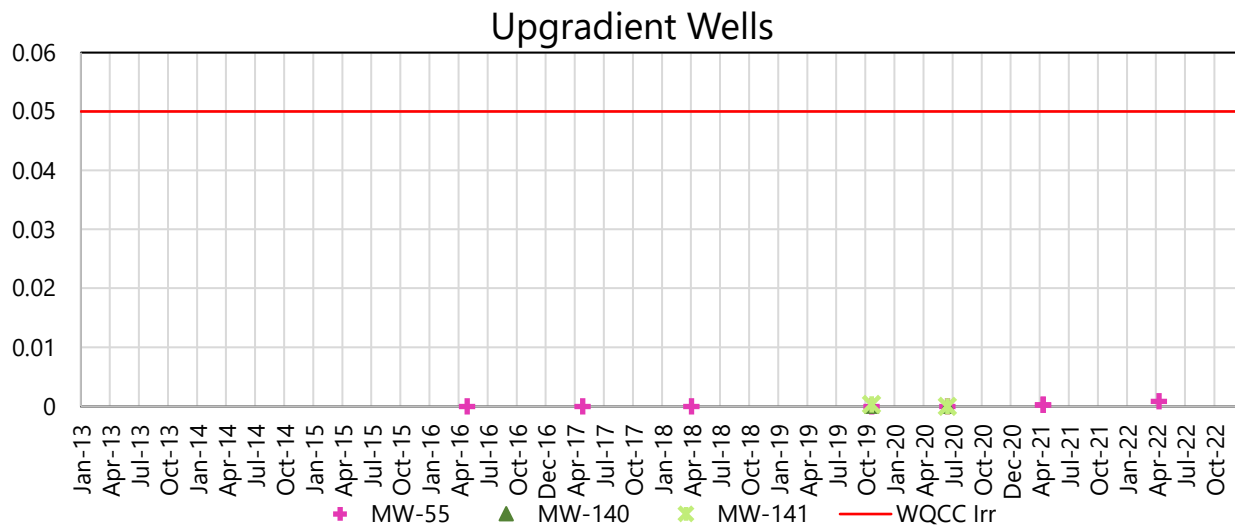
APPENDIX C1A
NORTH RO REJECT DISCHARGE FIELD TREND PLOTS



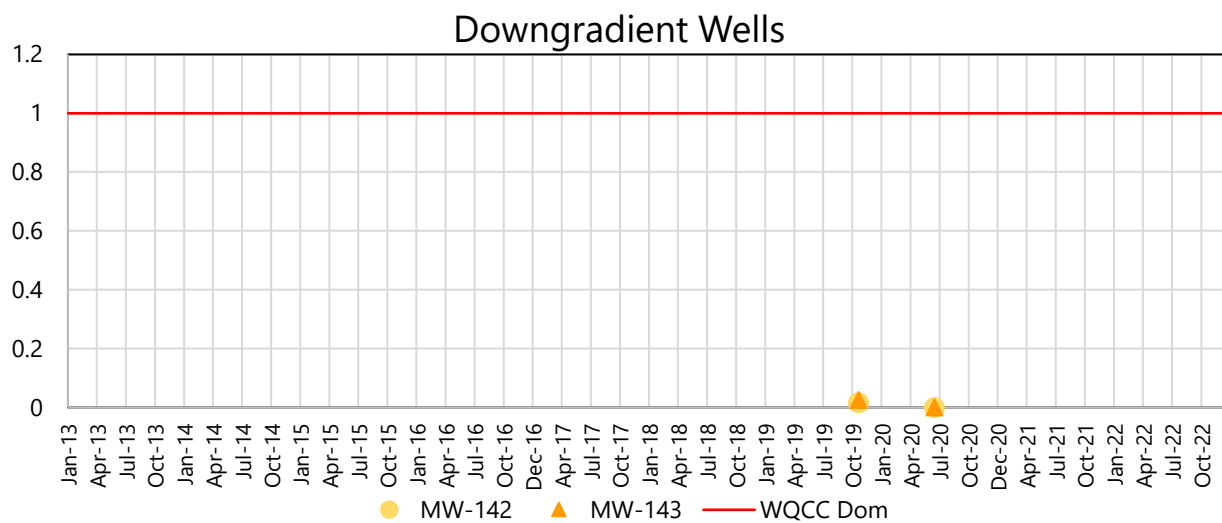
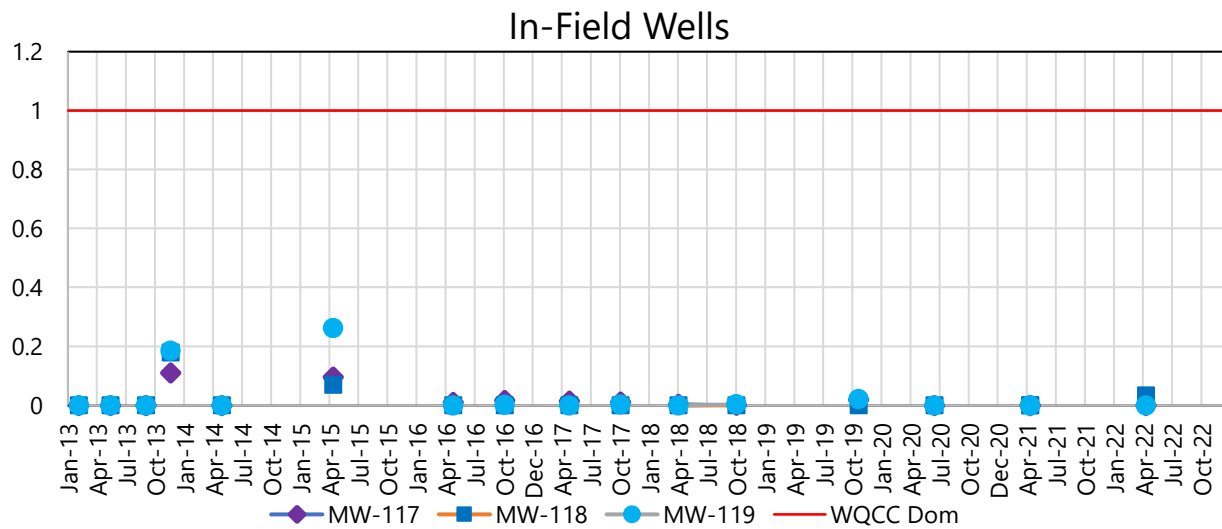
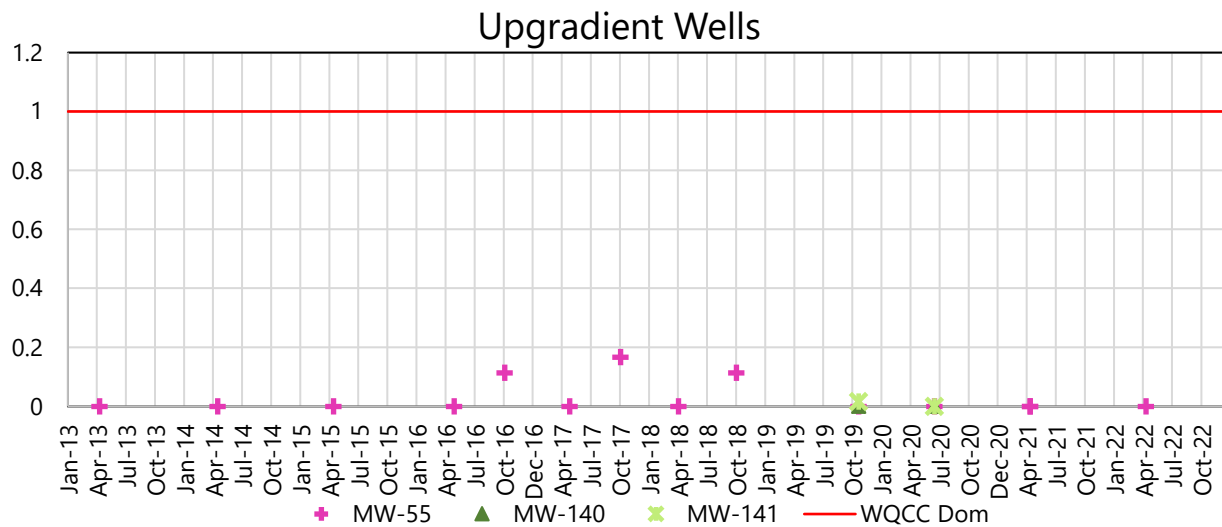
NORTH RO REJECT FIELD TRENDS - ARSENIC, DISSOLVED



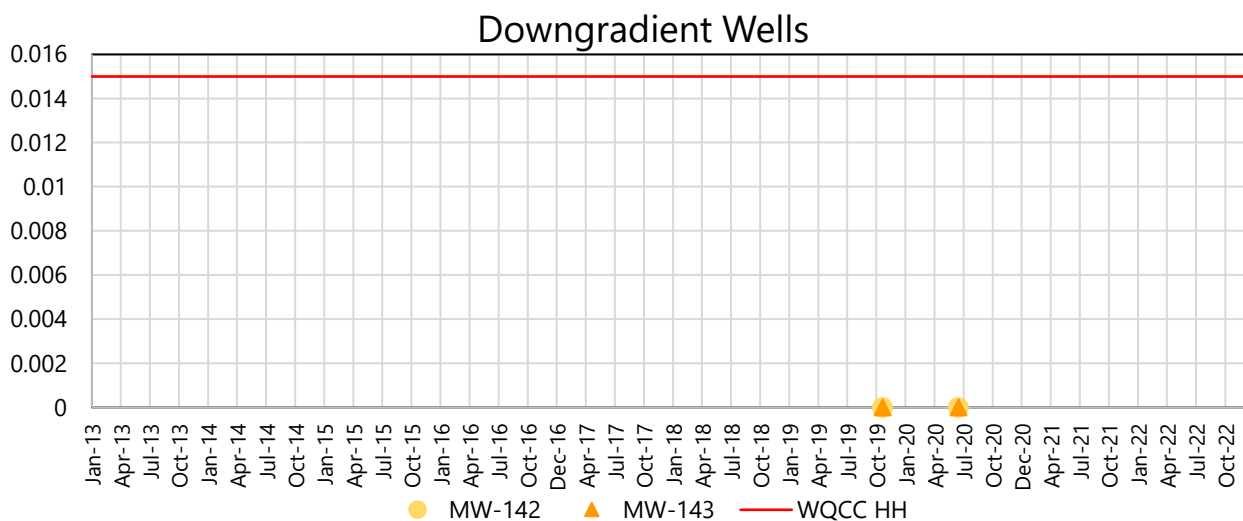
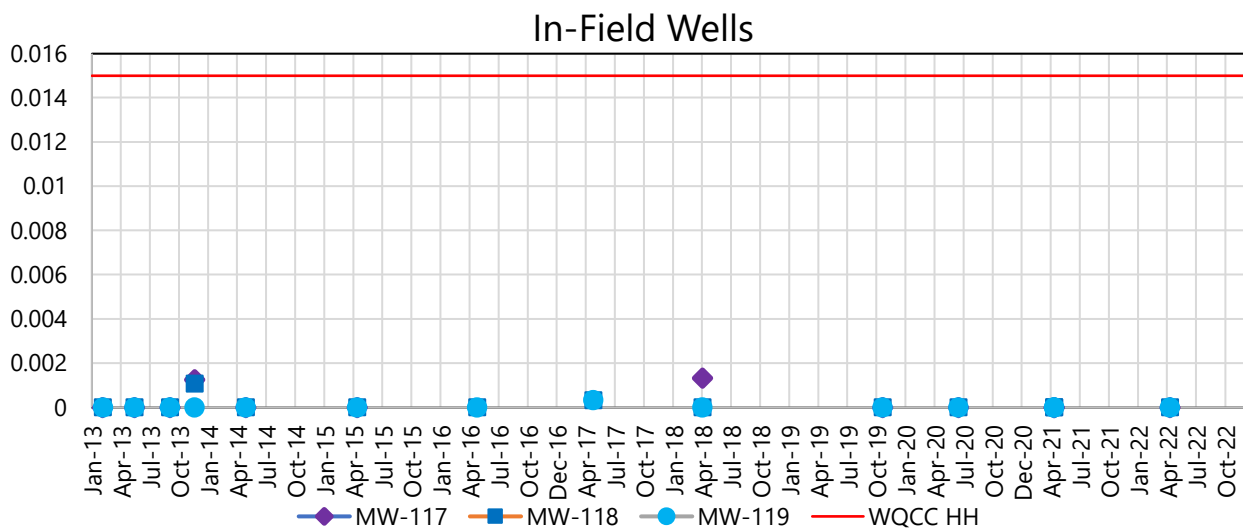
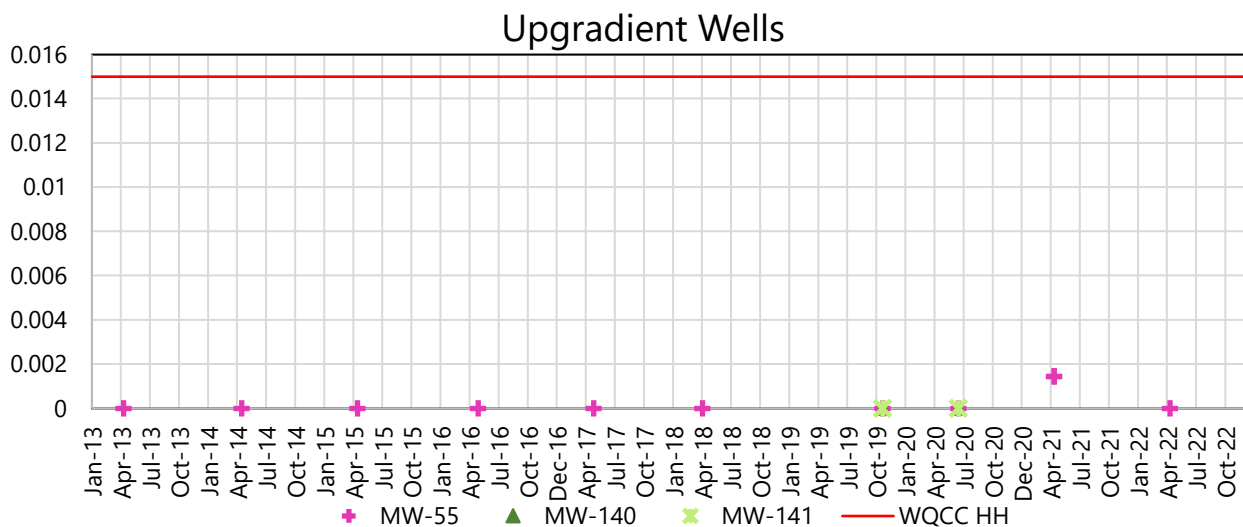
NORTH RO REJECT FIELD TRENDS - BORON, DISSOLVED



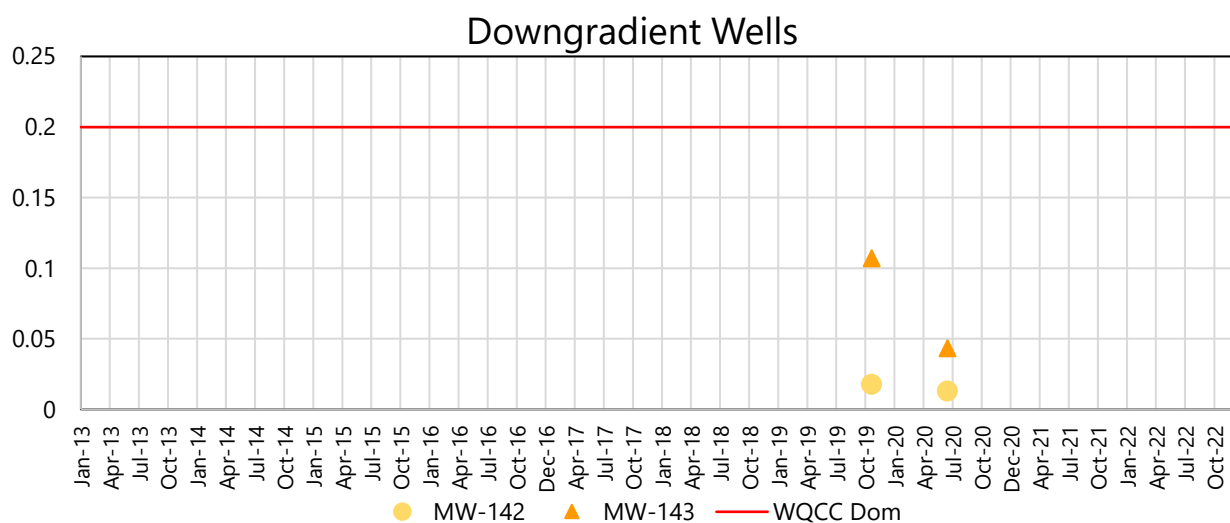
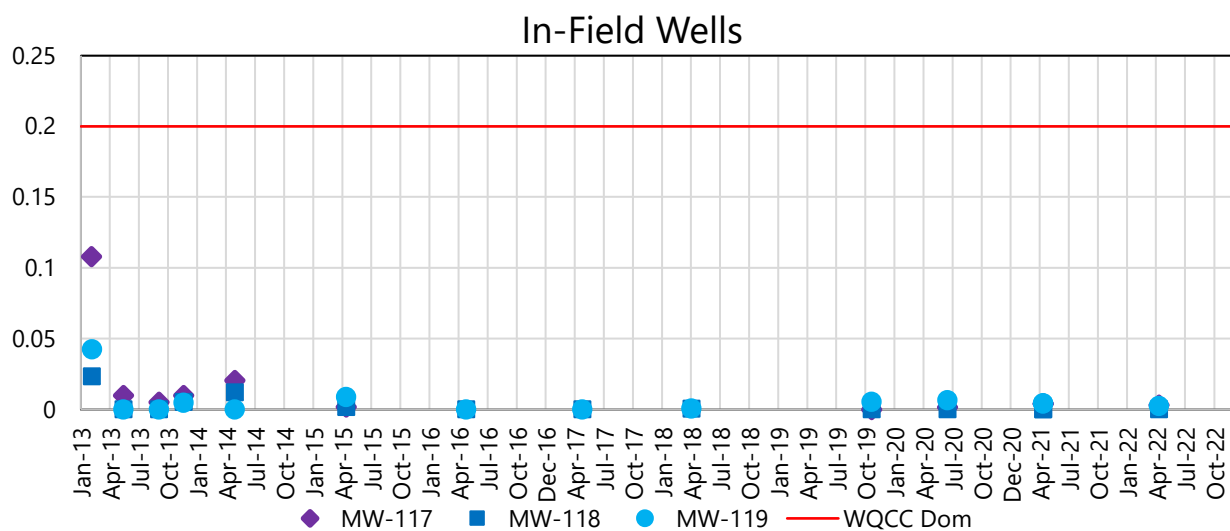
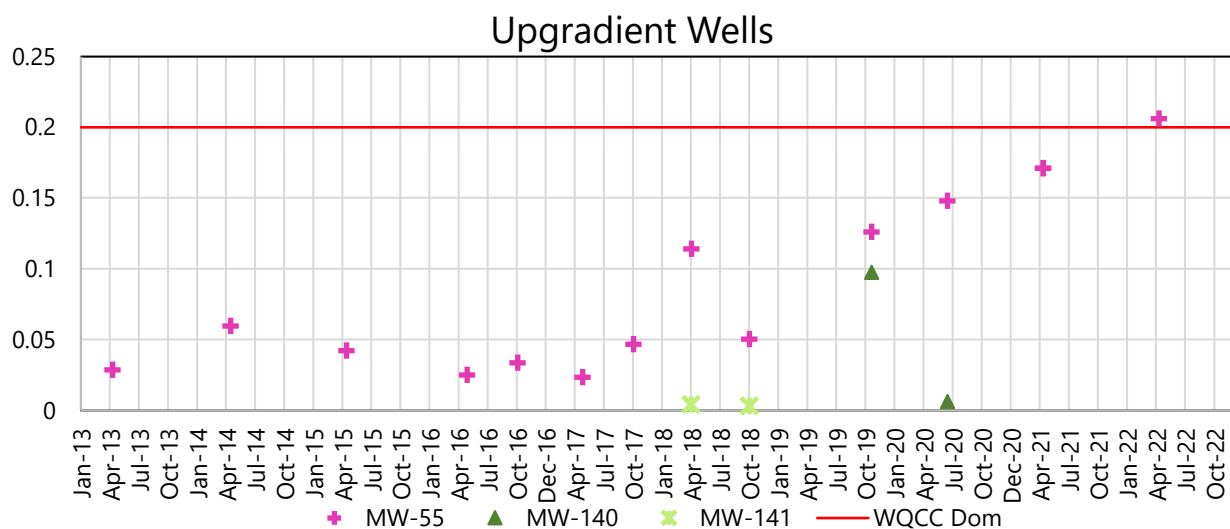
NORTH RO REJECT FIELD TRENDS - COBALT, DISSOLVED



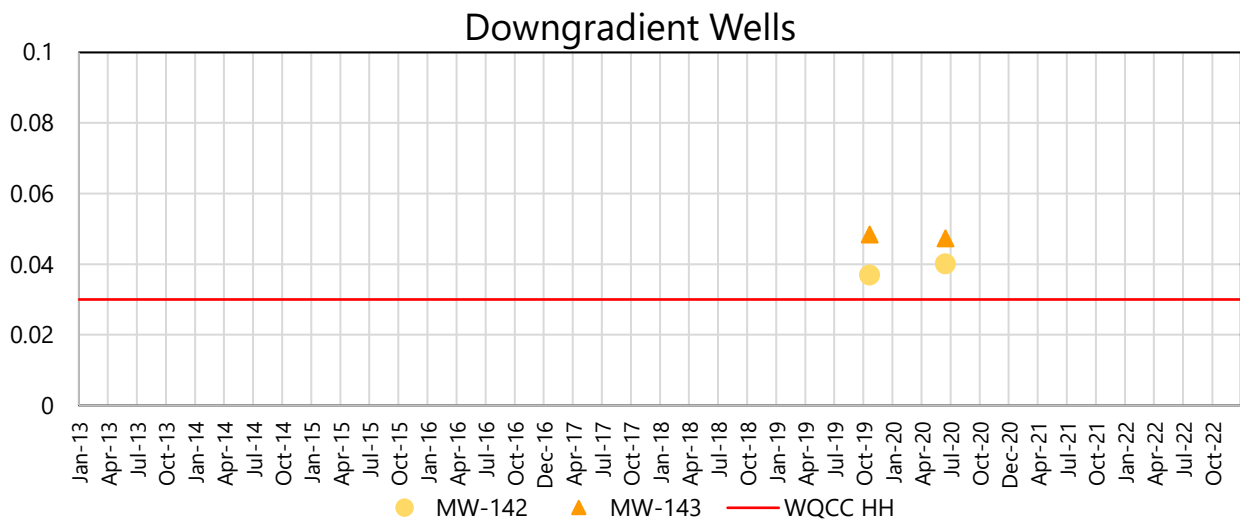
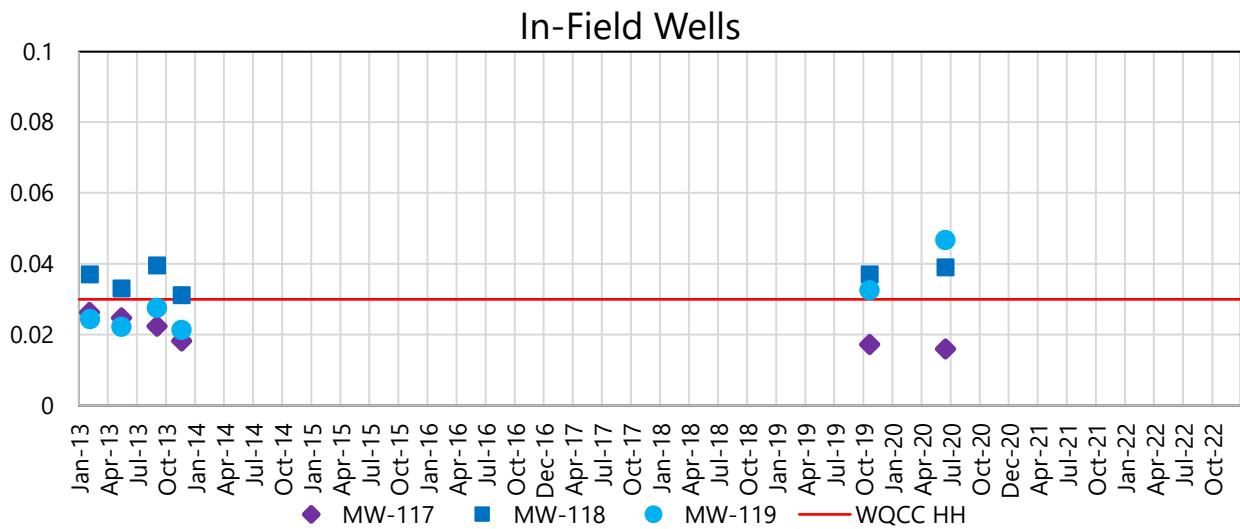
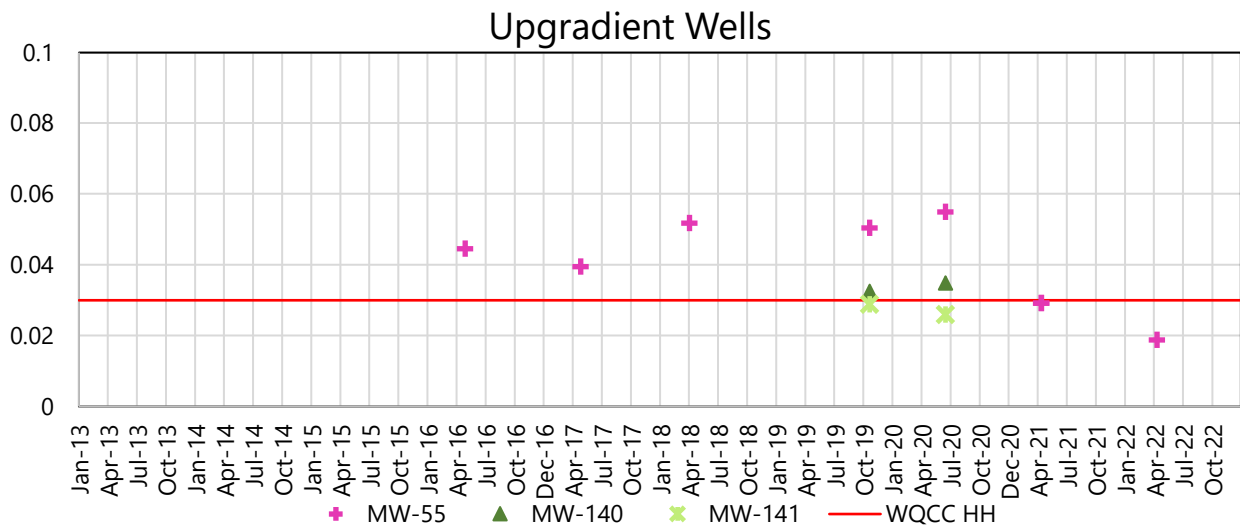
NORTH RO REJECT FIELD TRENDS - IRON, DISSOLVED



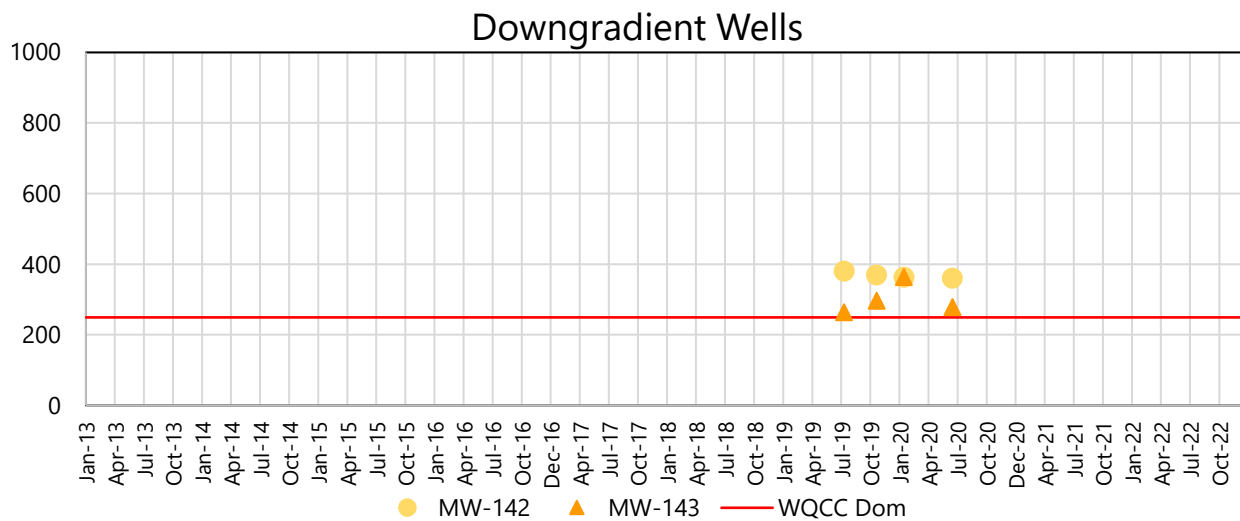
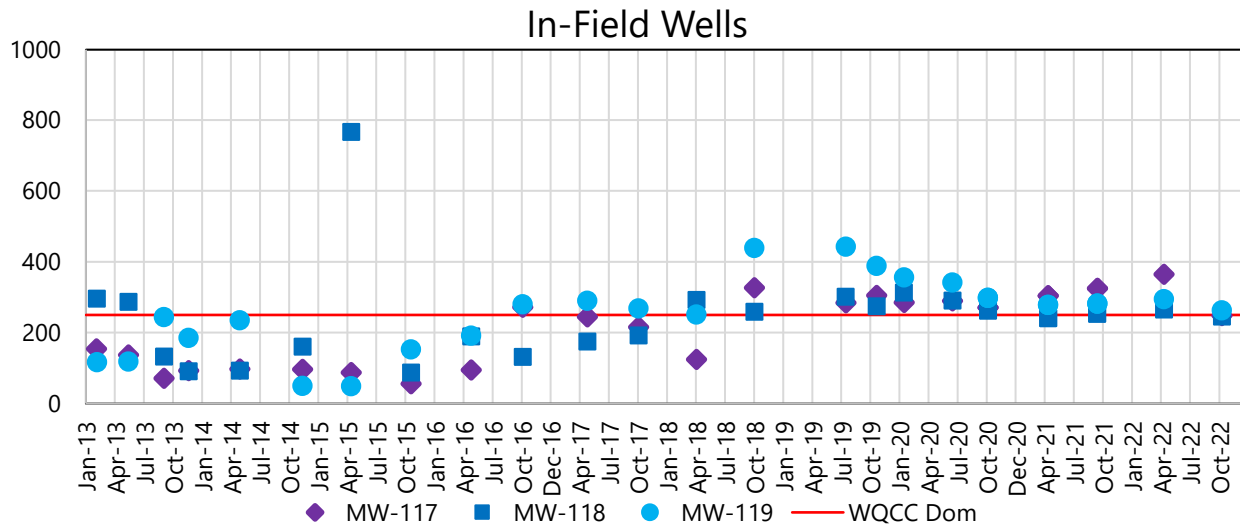
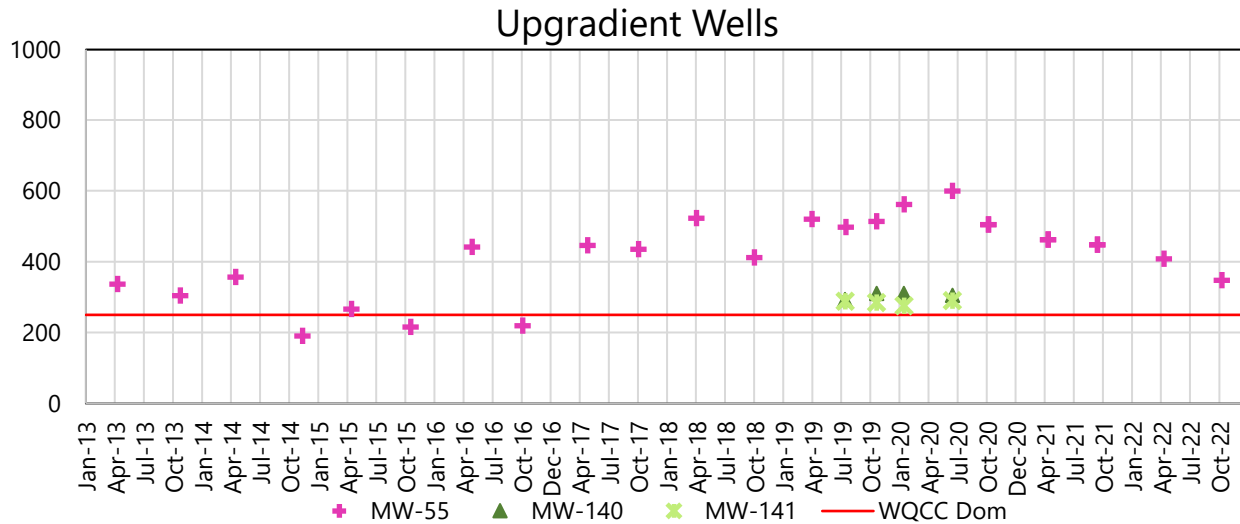
NORTH RO REJECT FIELD TRENDS - LEAD, DISSOLVED



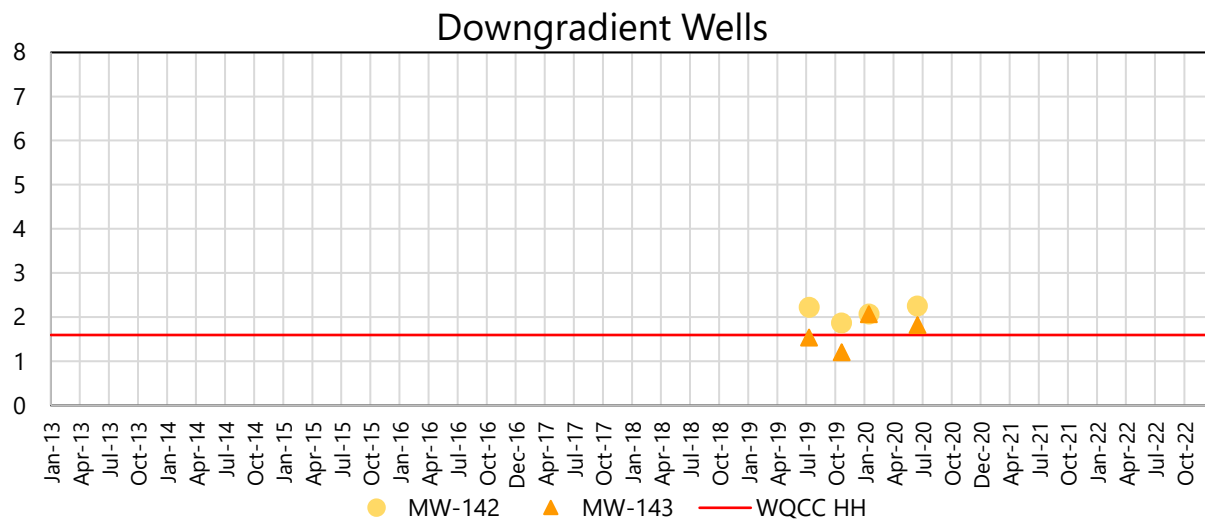
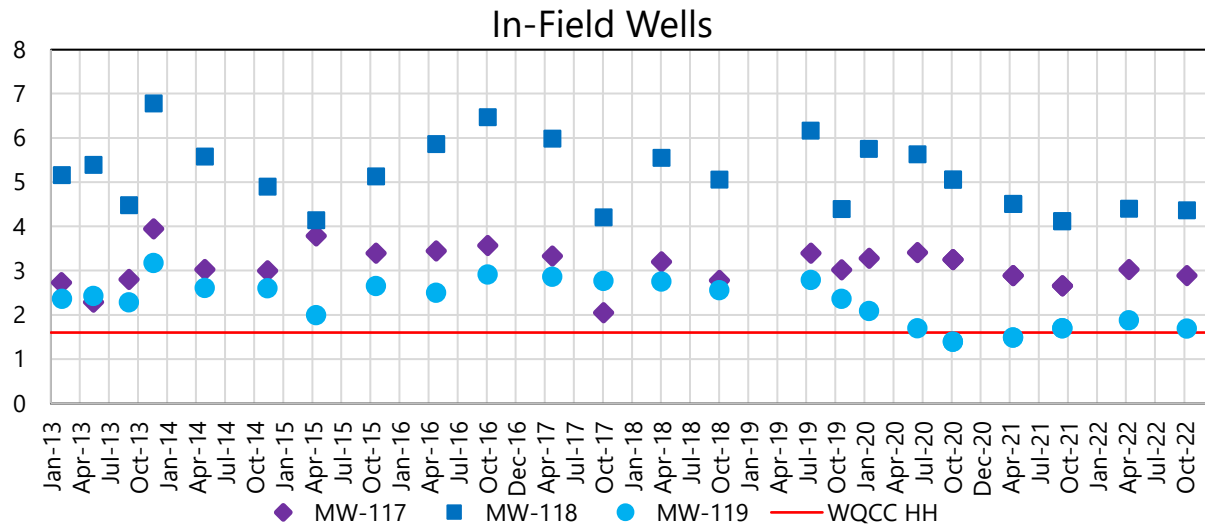
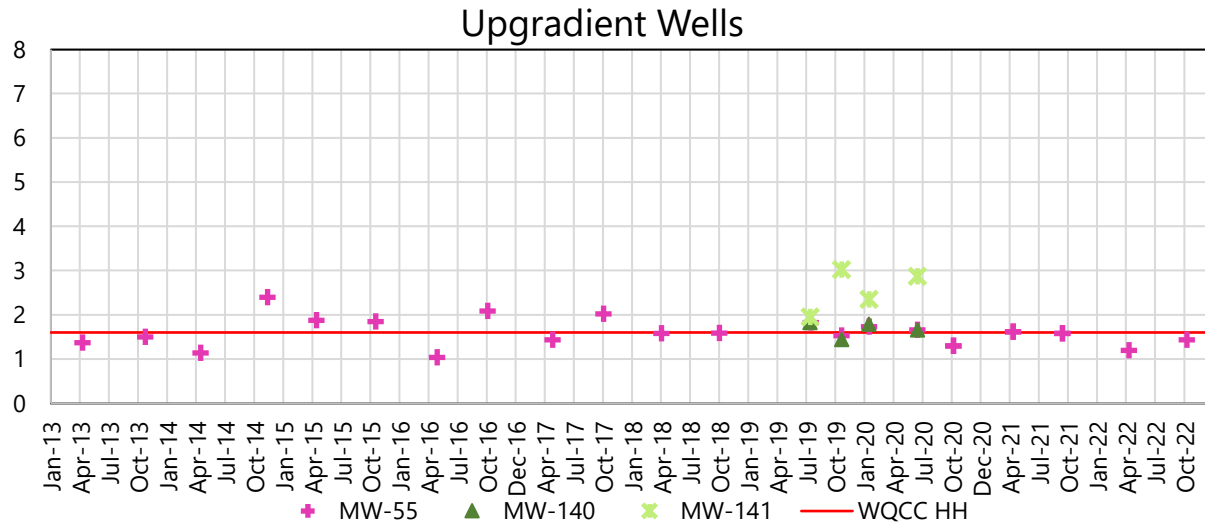
NORTH RO REJECT FIELD TRENDS - MANGANESE, DISSOLVED



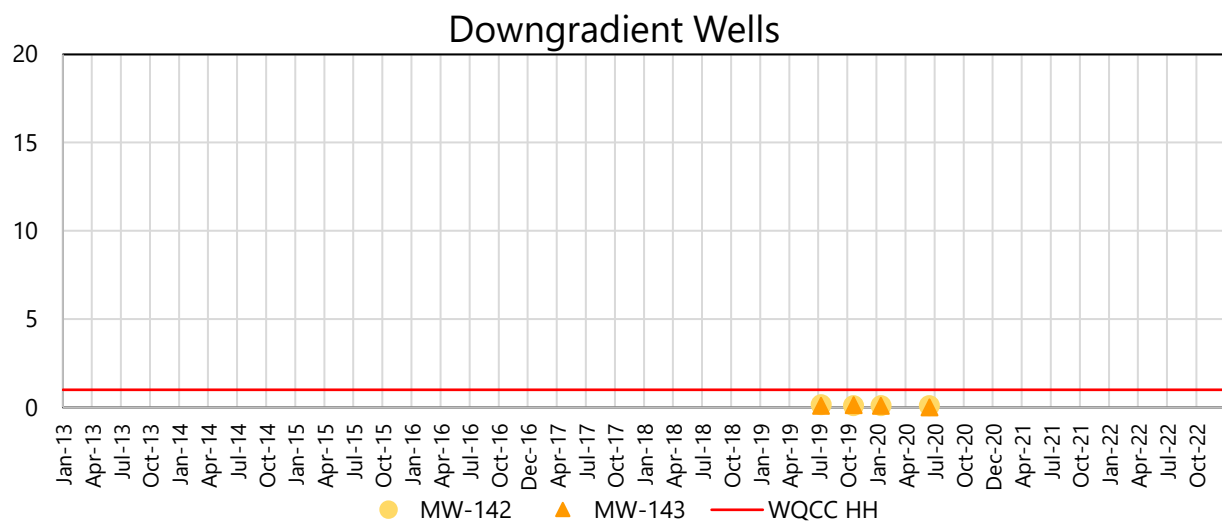
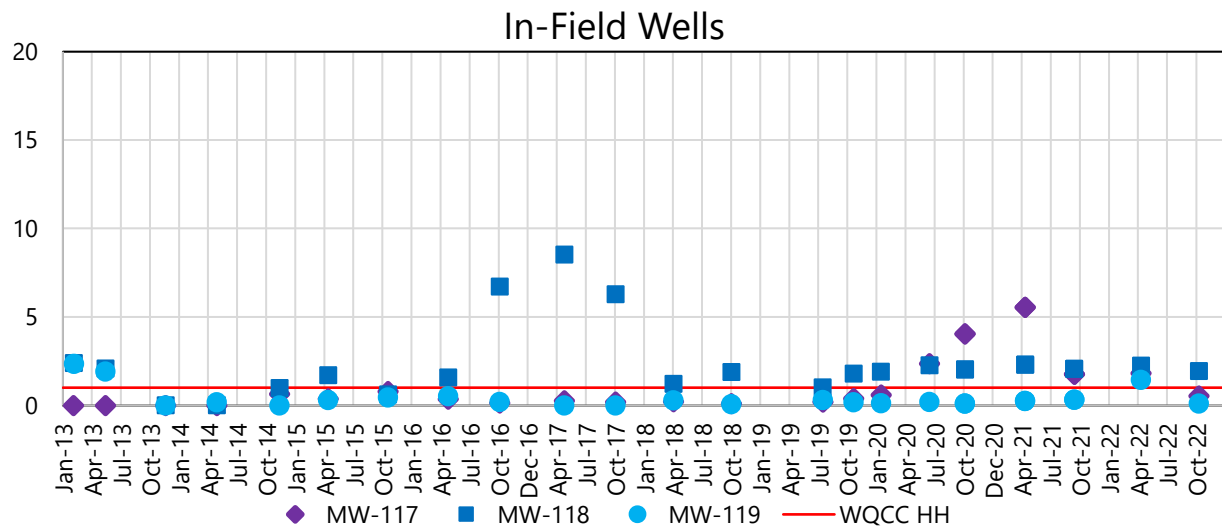
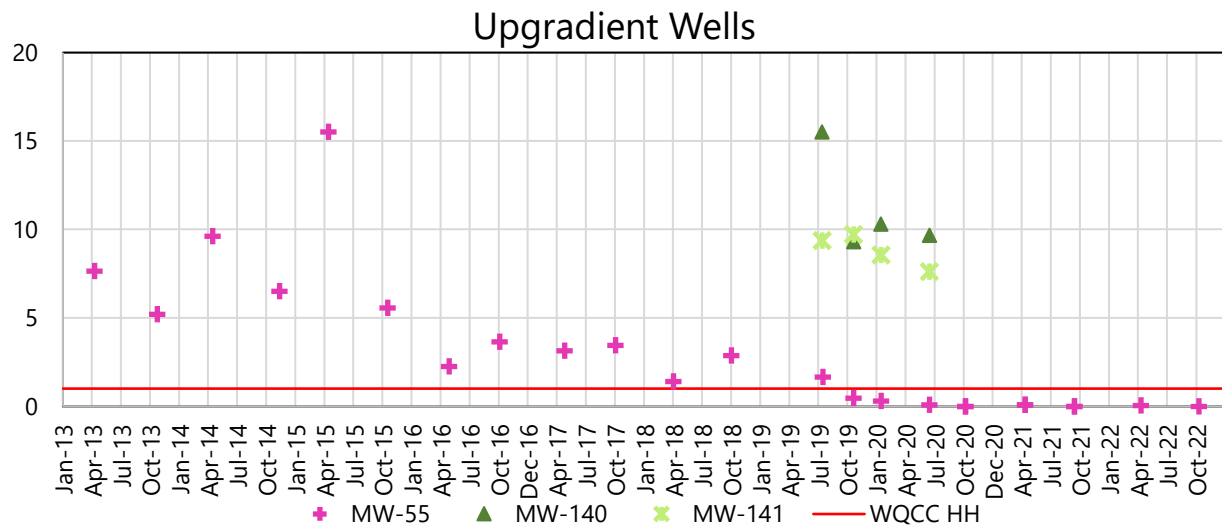
NORTH RO REJECT FIELD TRENDS - URANIUM, DISSOLVED



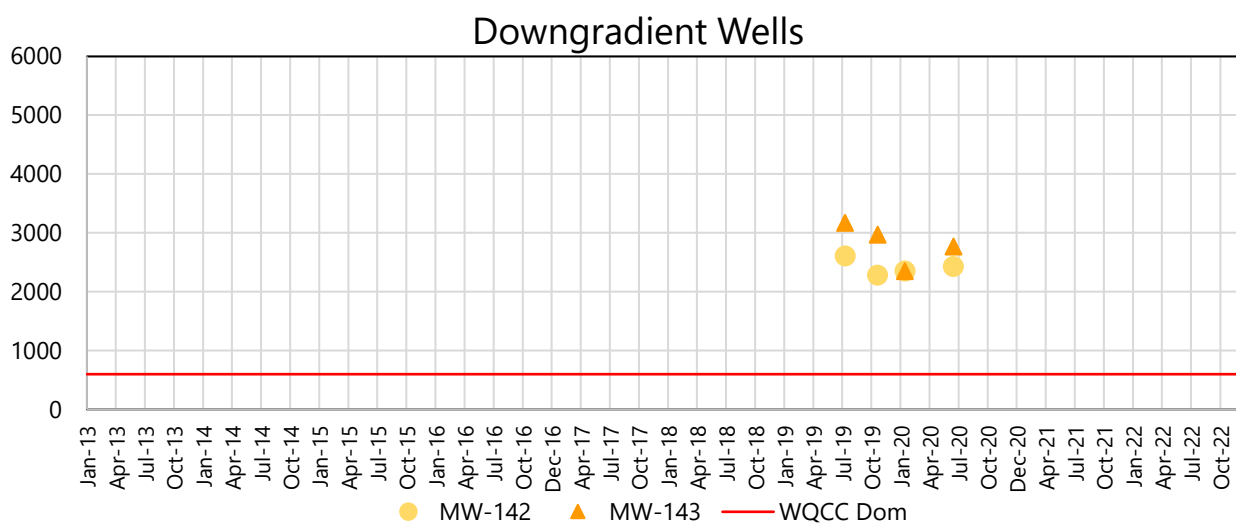
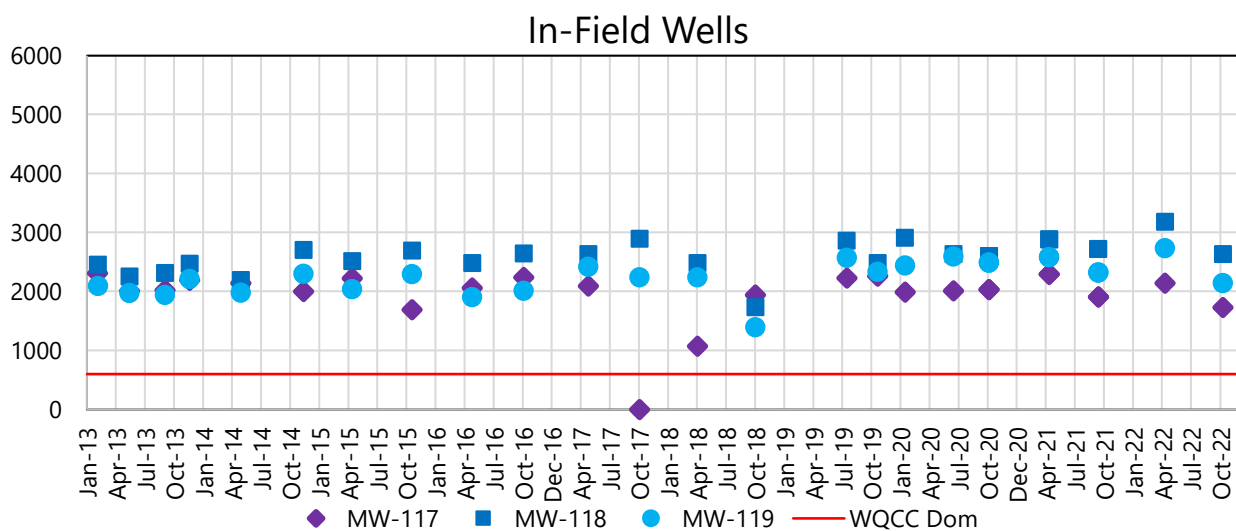
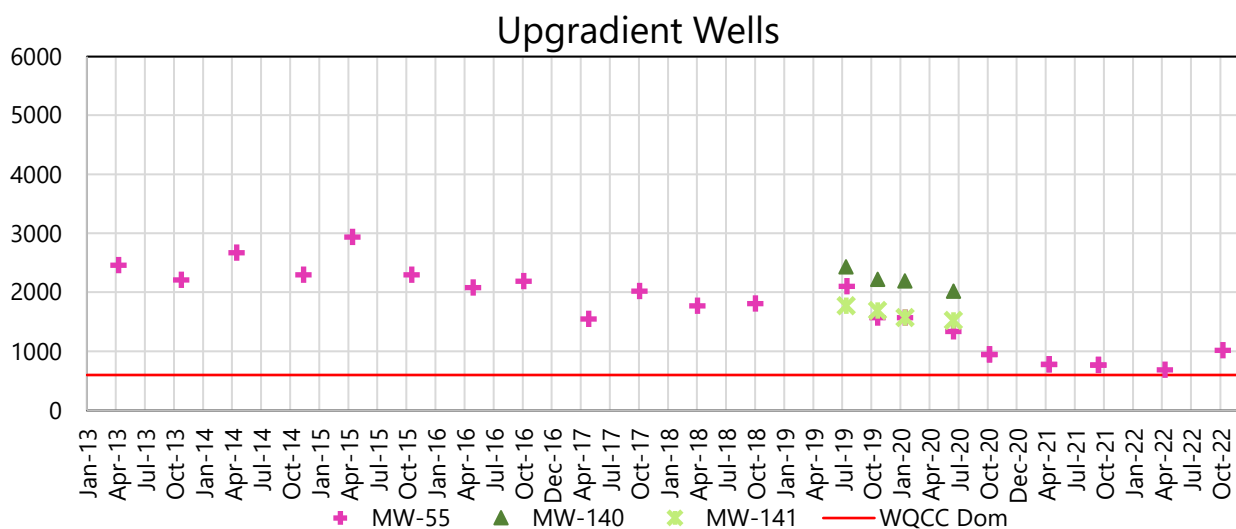
NORTH RO REJECT FIELD TRENDS - CHLORIDE



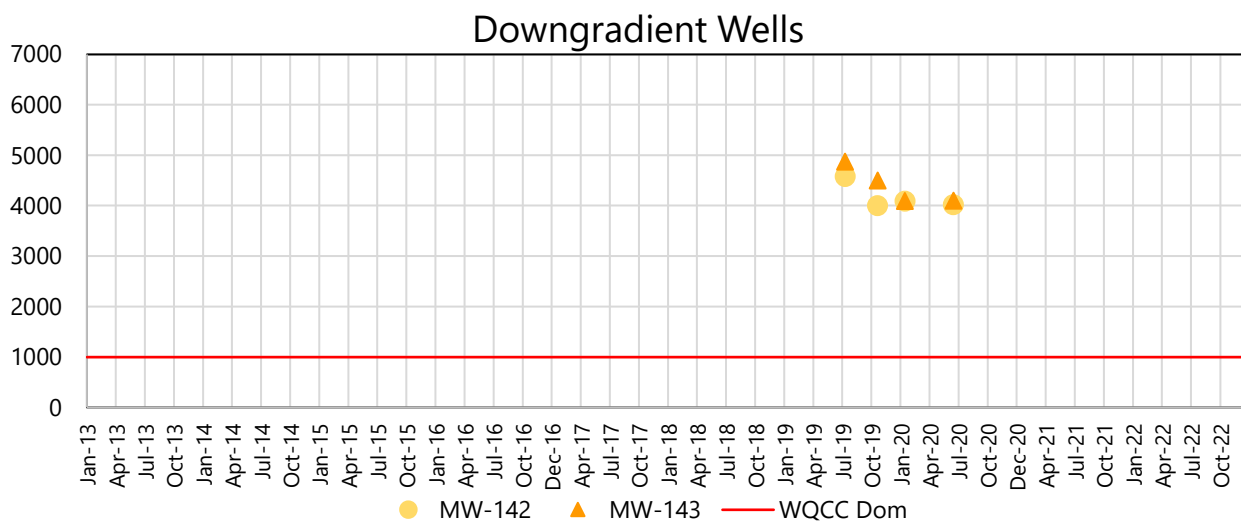
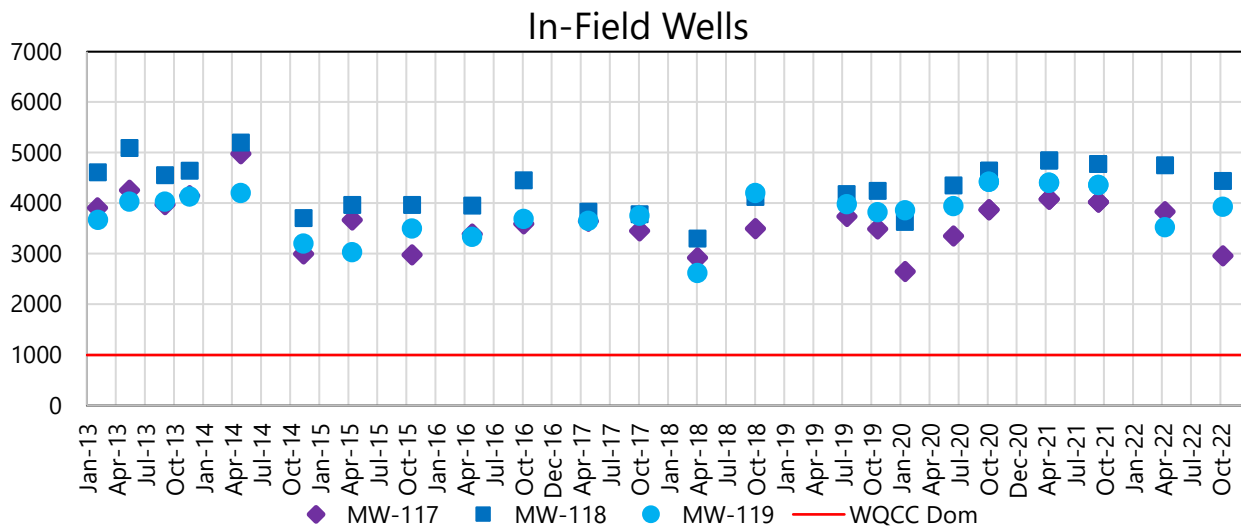
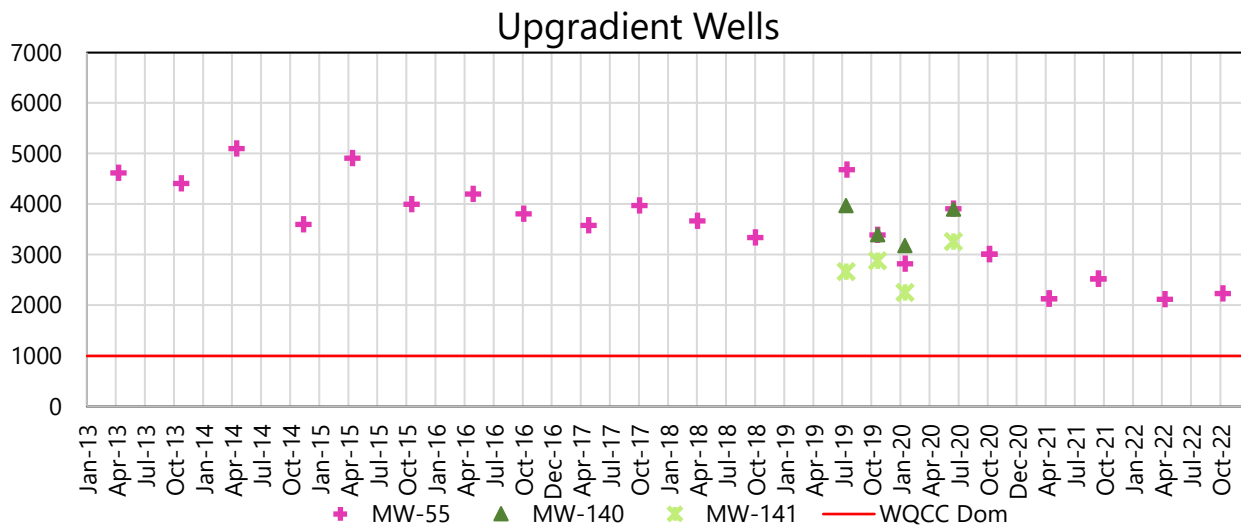
NORTH RO REJECT FIELD TRENDS - FLUORIDE



NORTH RO REJECT FIELD TRENDS - NITRATE/NITRITE

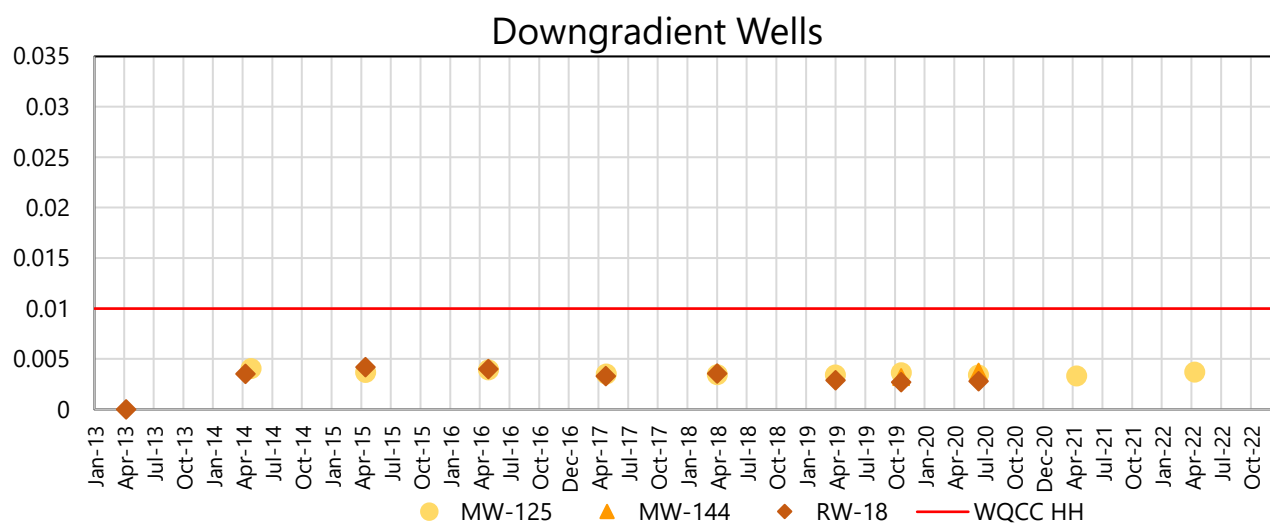
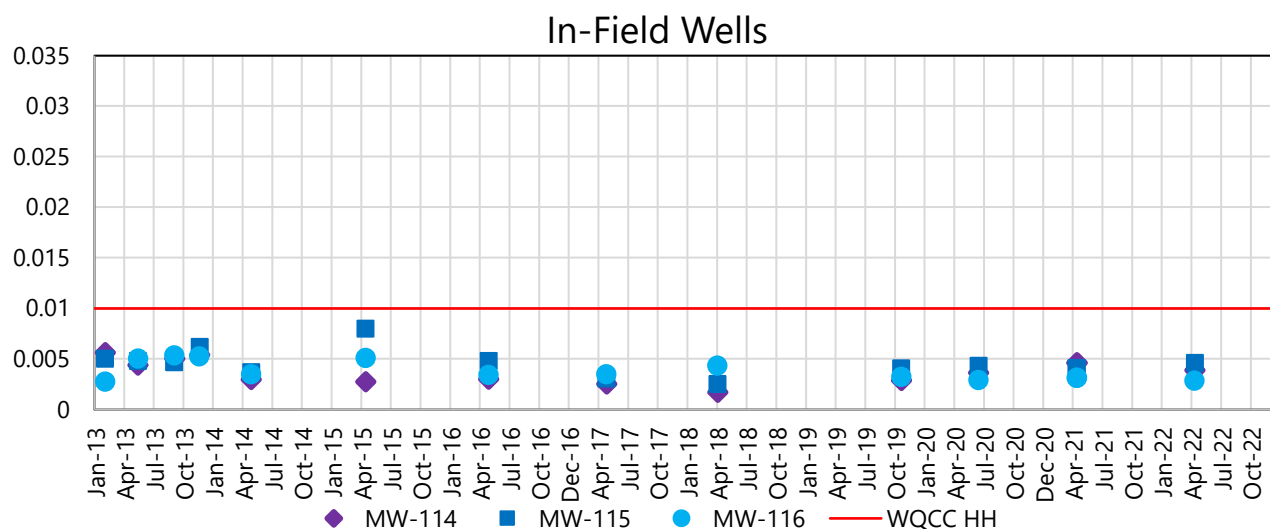
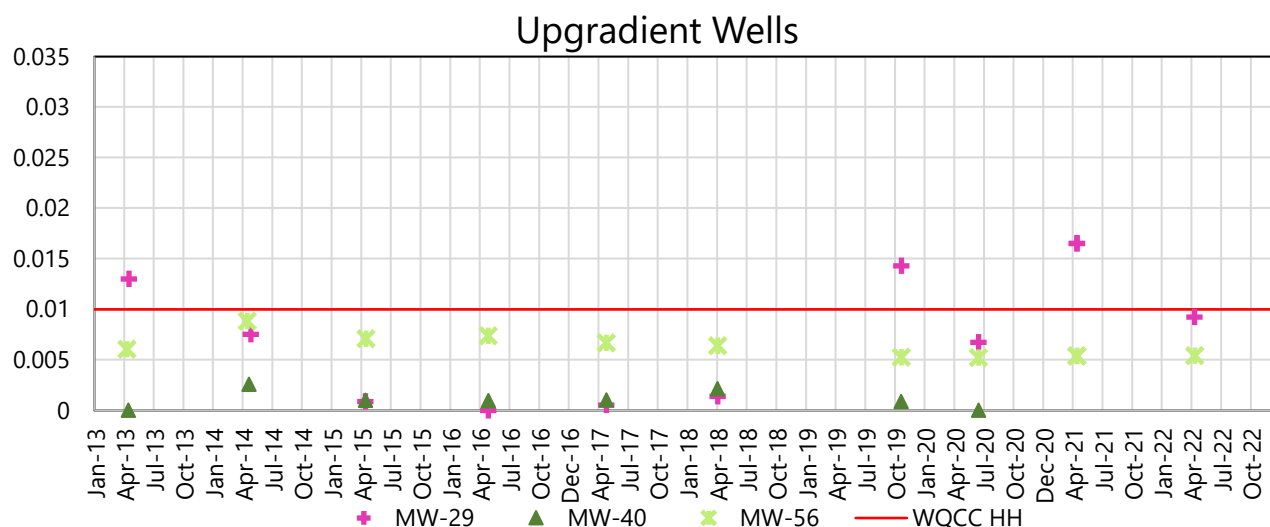


NORTH RO REJECT FIELD TRENDS - SULFATE

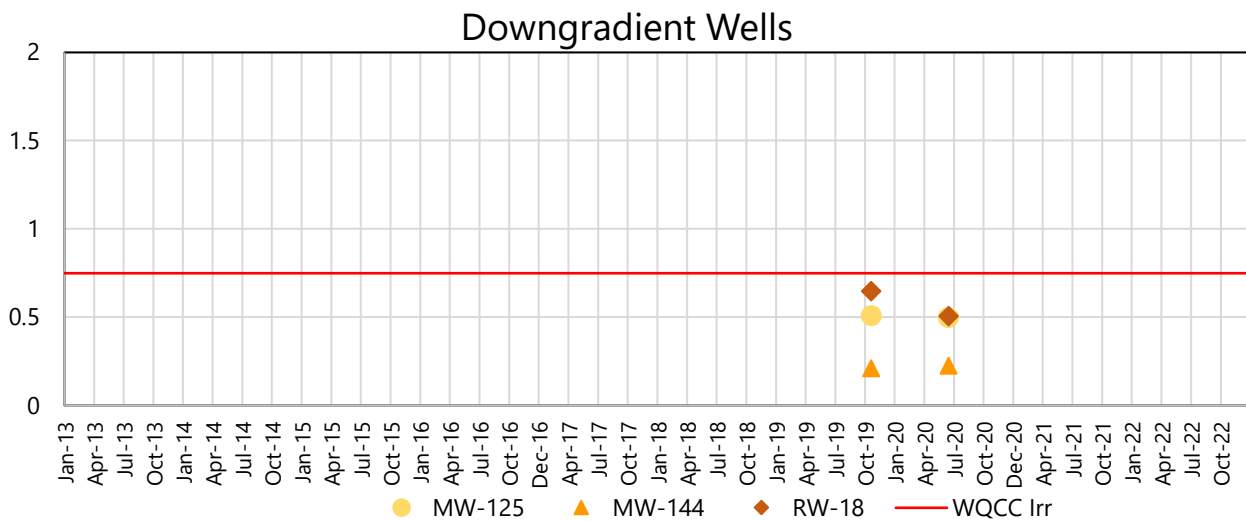
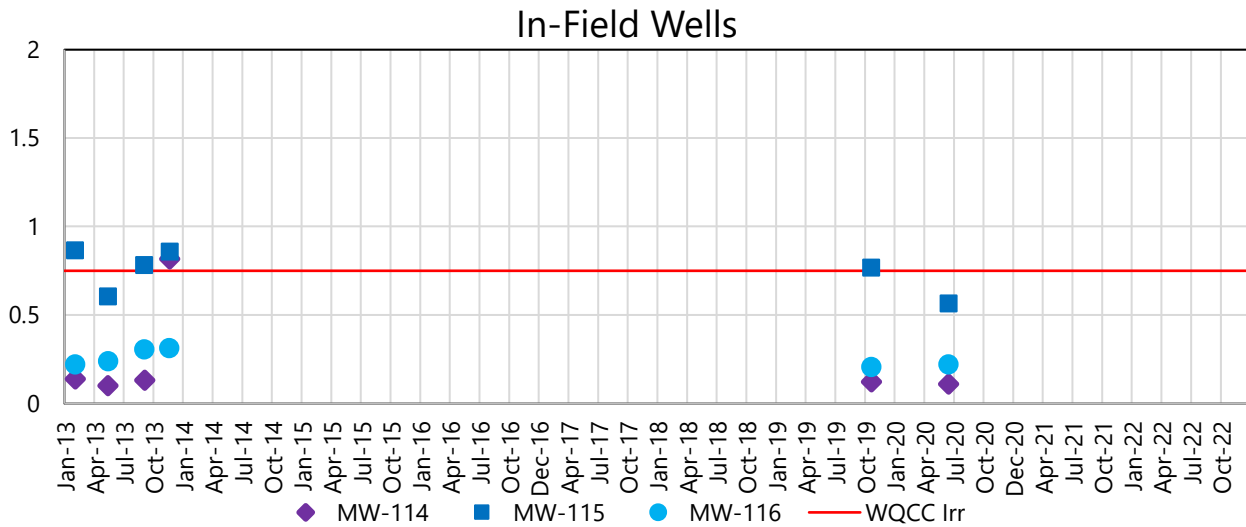
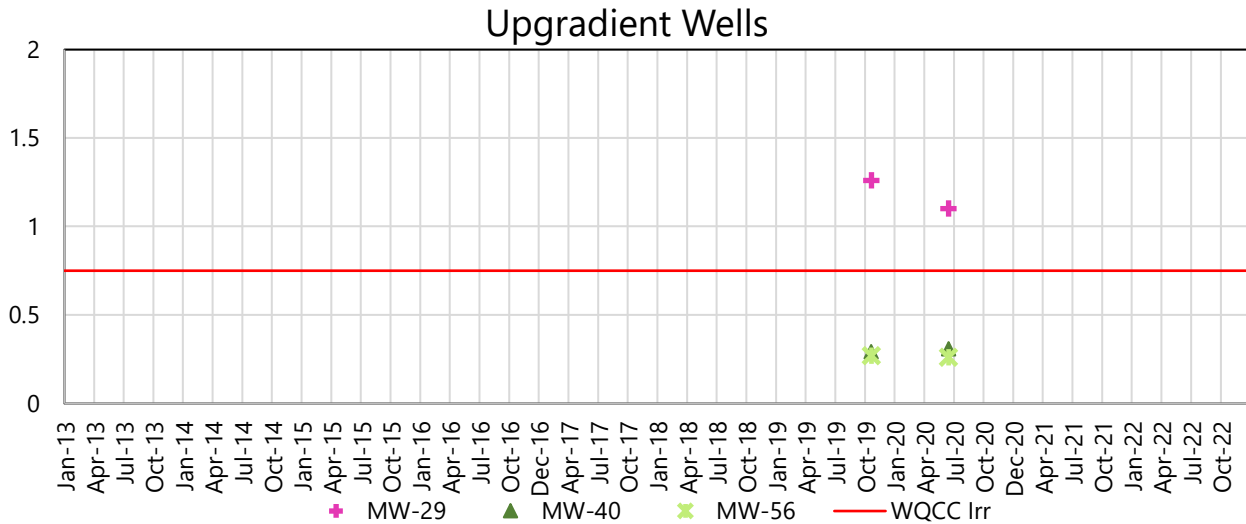


NORTH RO REJECT FIELD TRENDS - TDS

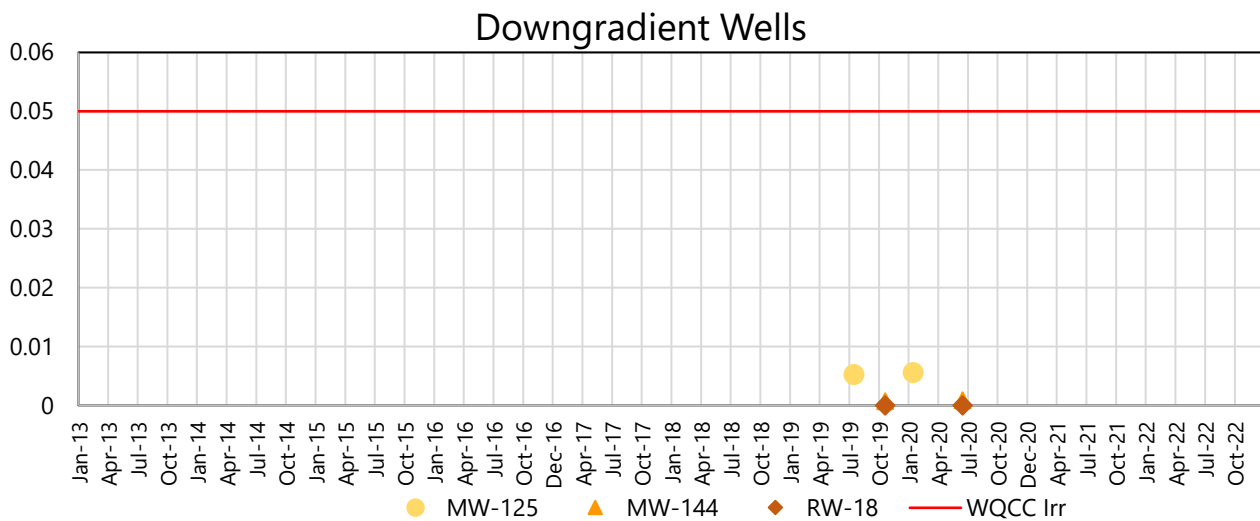
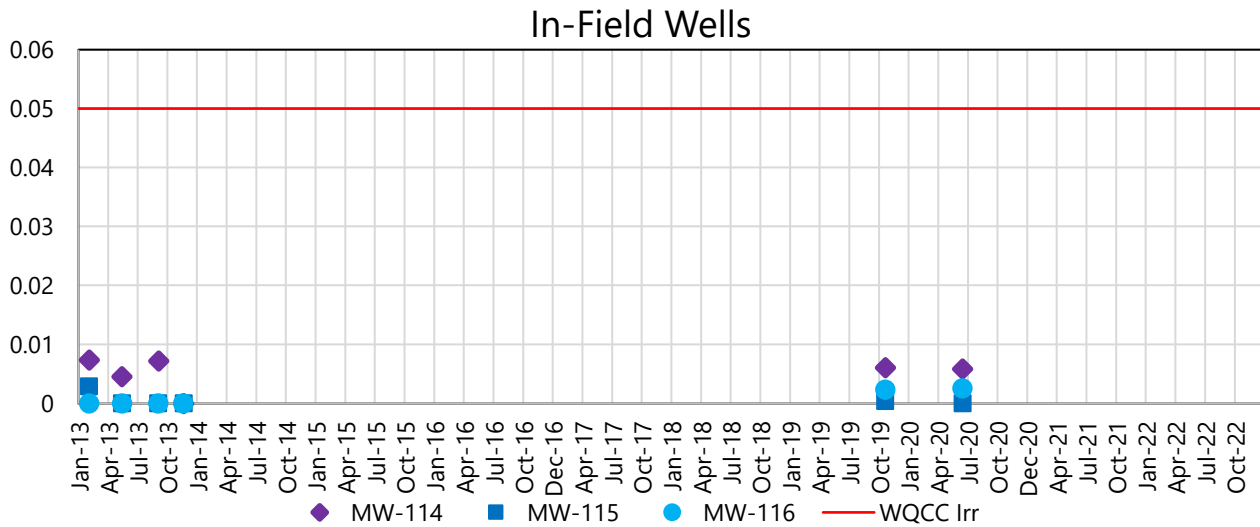
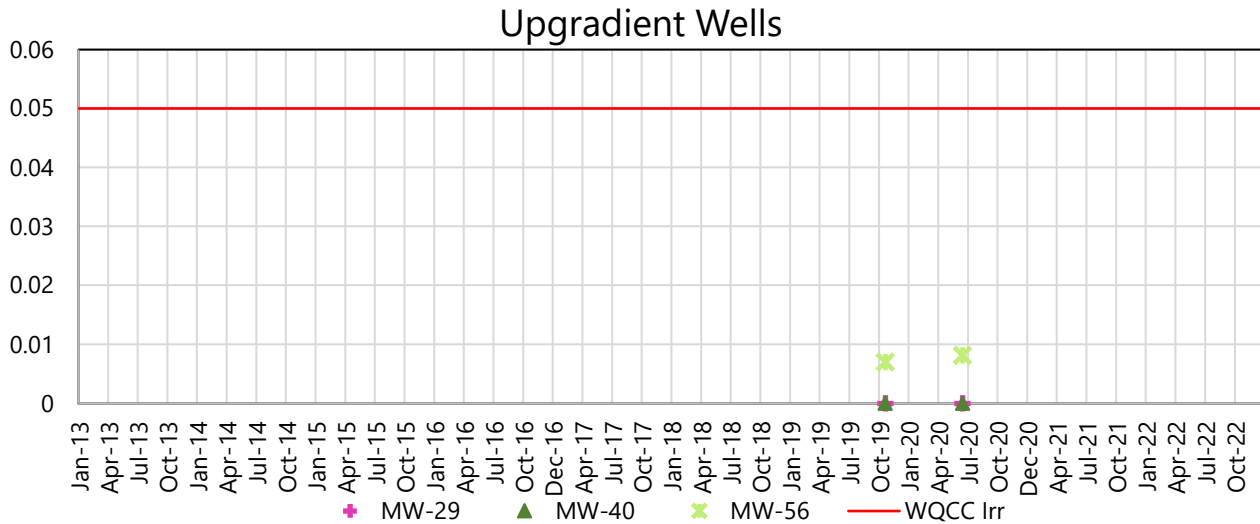
APPENDIX C1B
SOUTH RO REJECT DISCHARGE FIELD TREND PLOTS



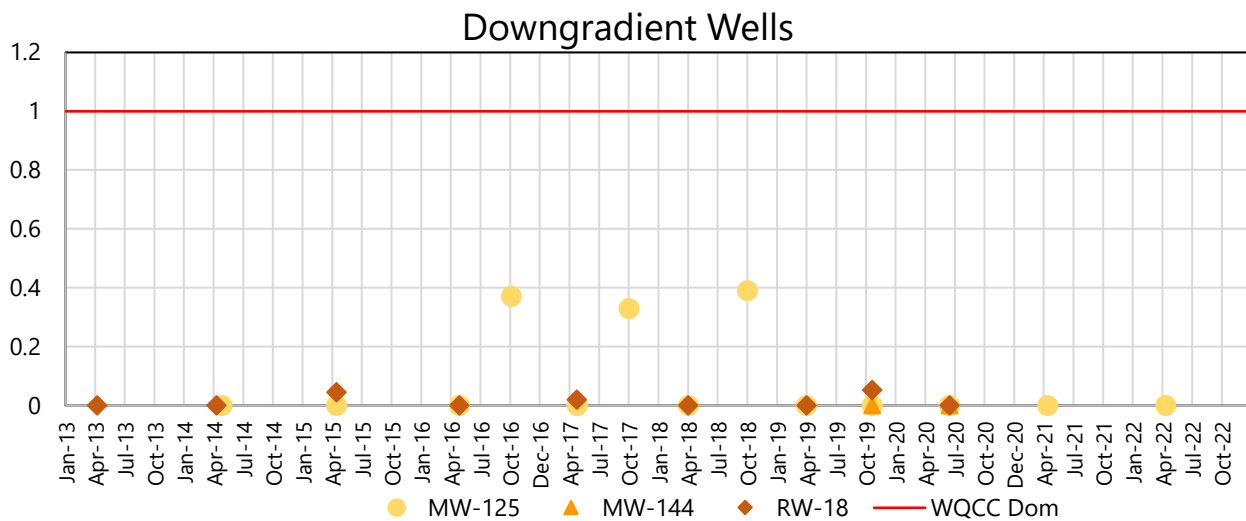
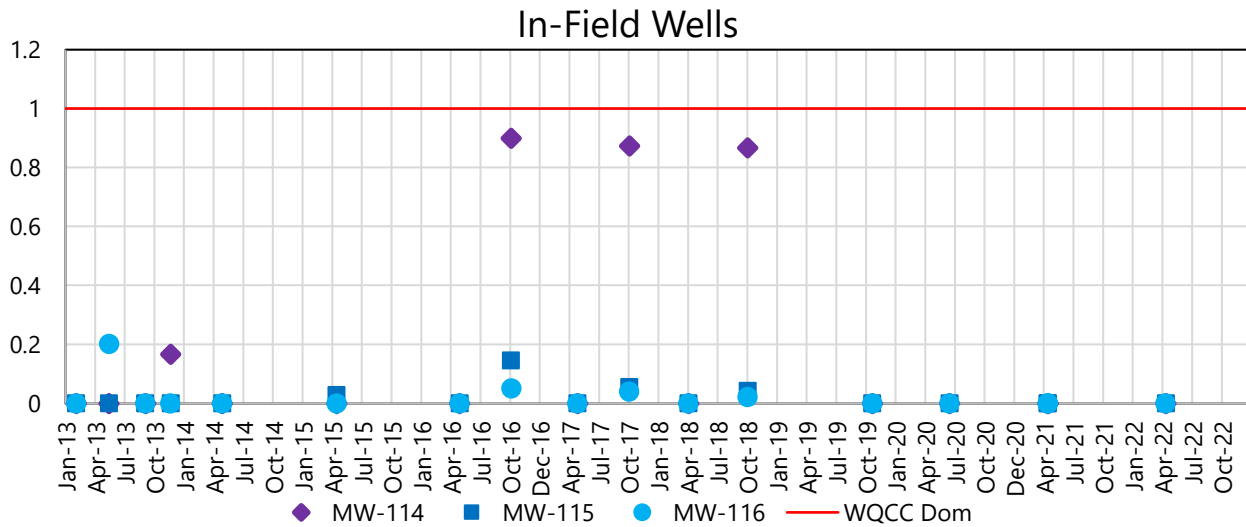
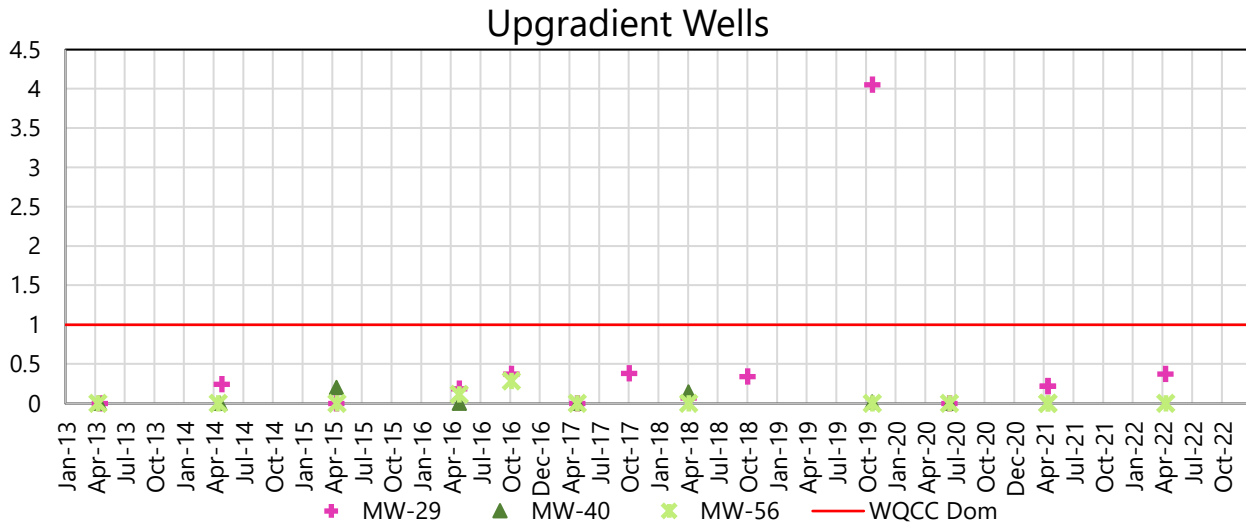
SOUTH RO REJECT FIELD TRENDS - ARSENIC, DISSOLVED



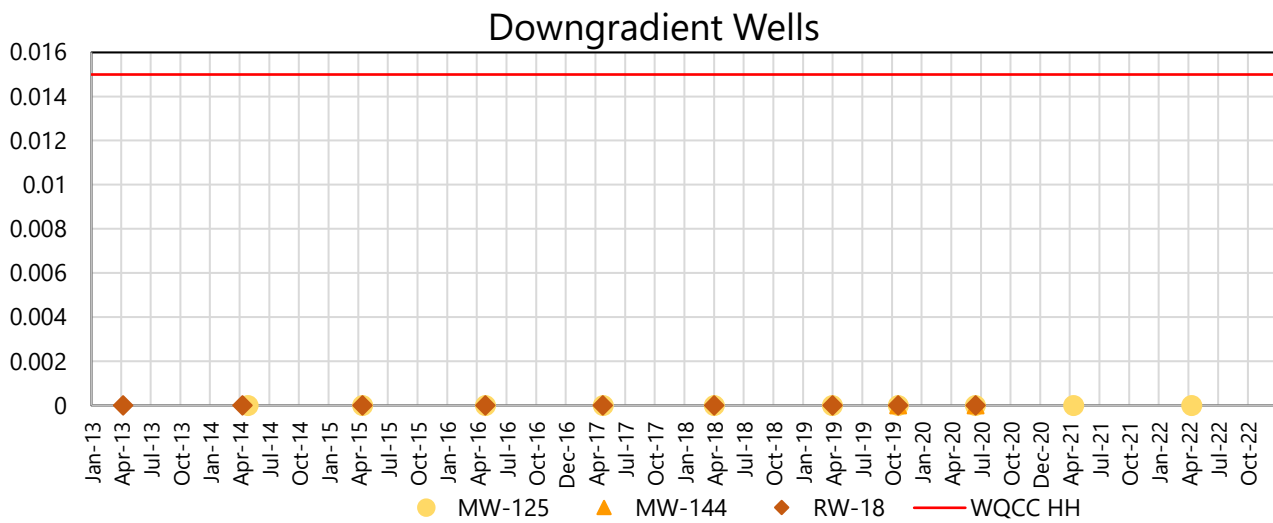
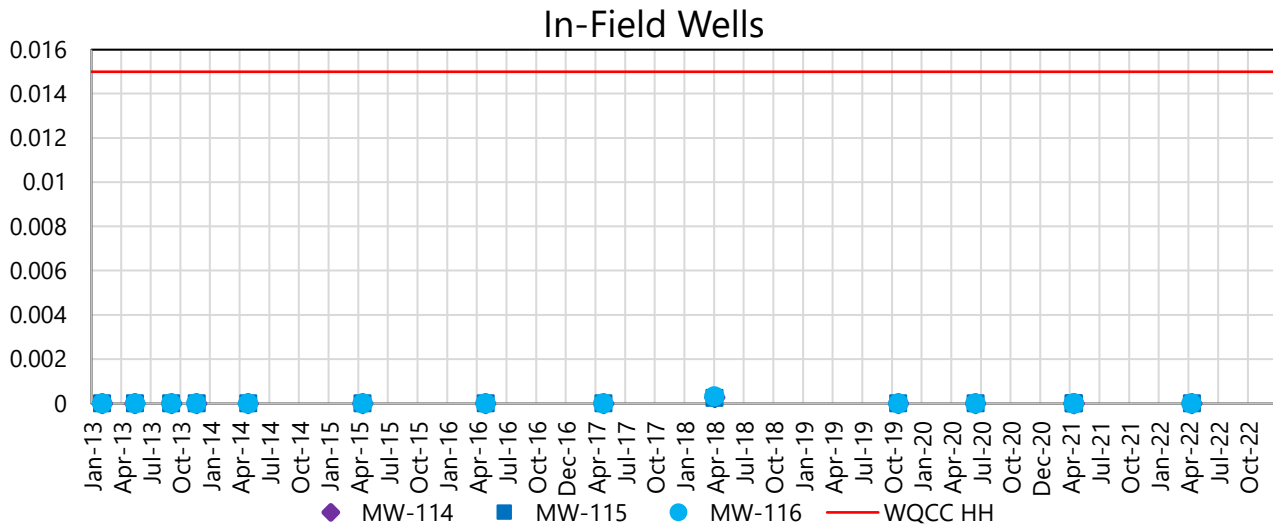
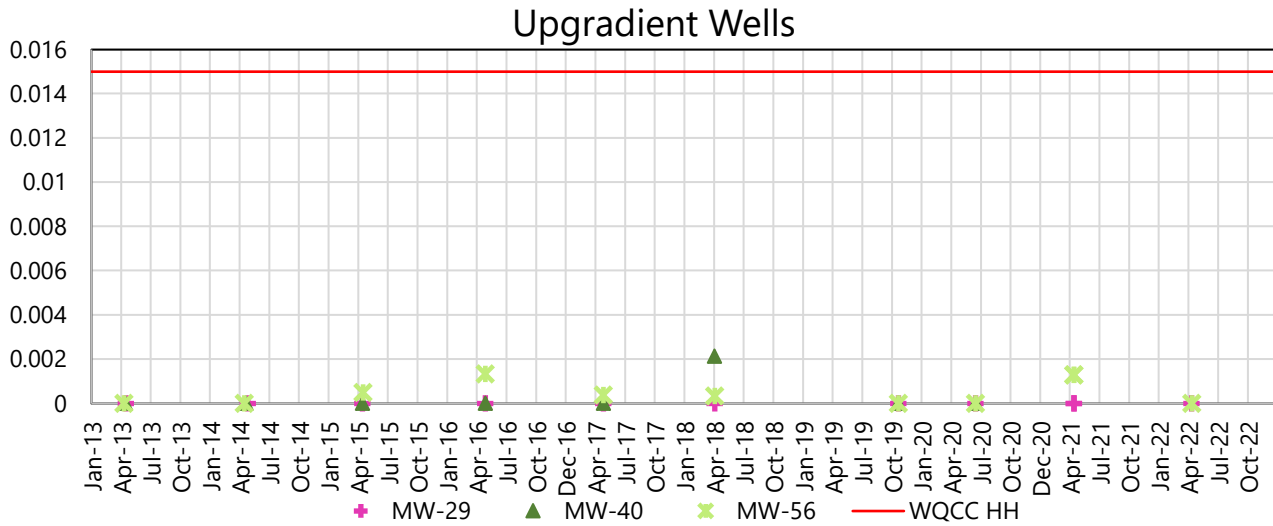
SOUTH RO REJECT FIELD TRENDS - BORON, DISSOLVED



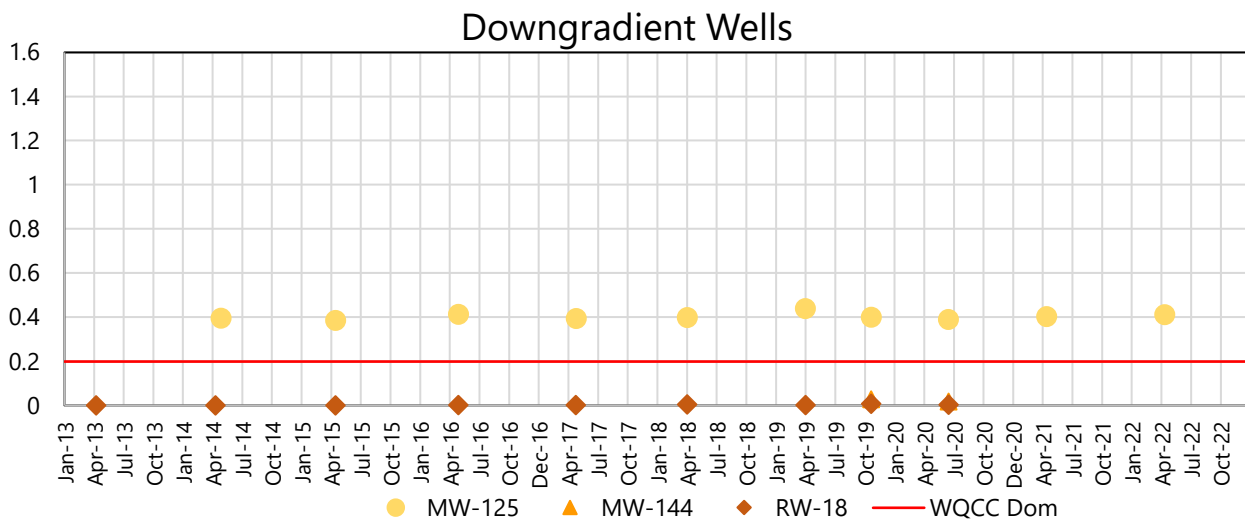
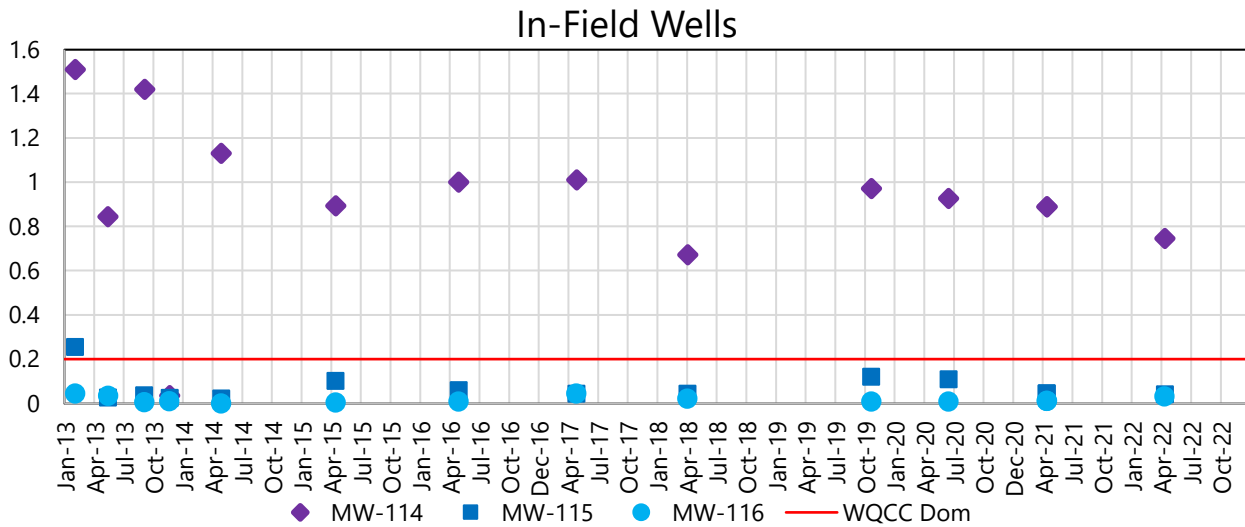
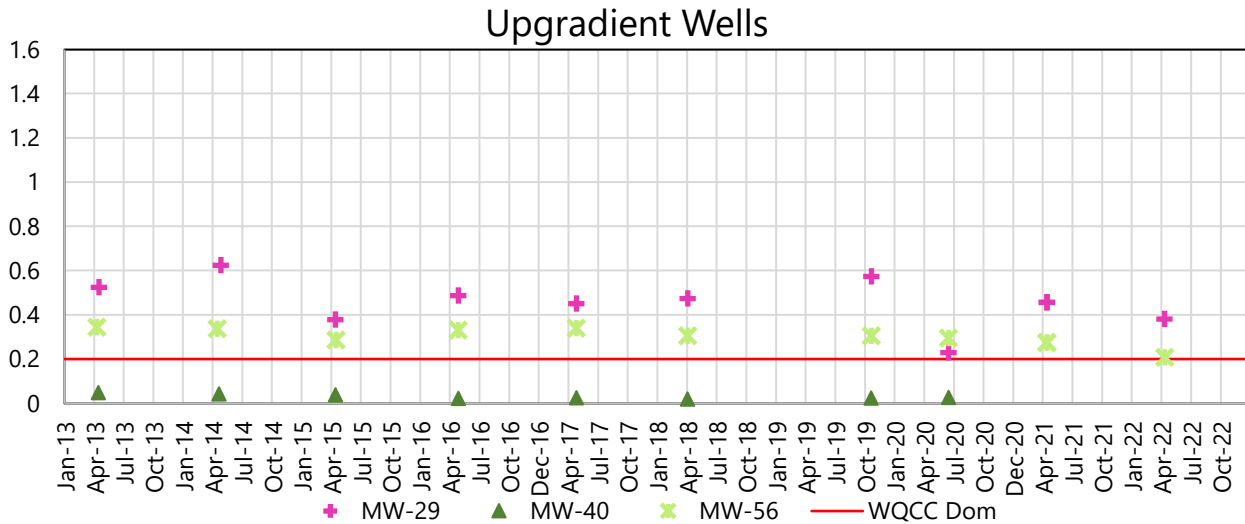
SOUTH RO REJECT FIELD TRENDS - COBALT, DISSOLVED



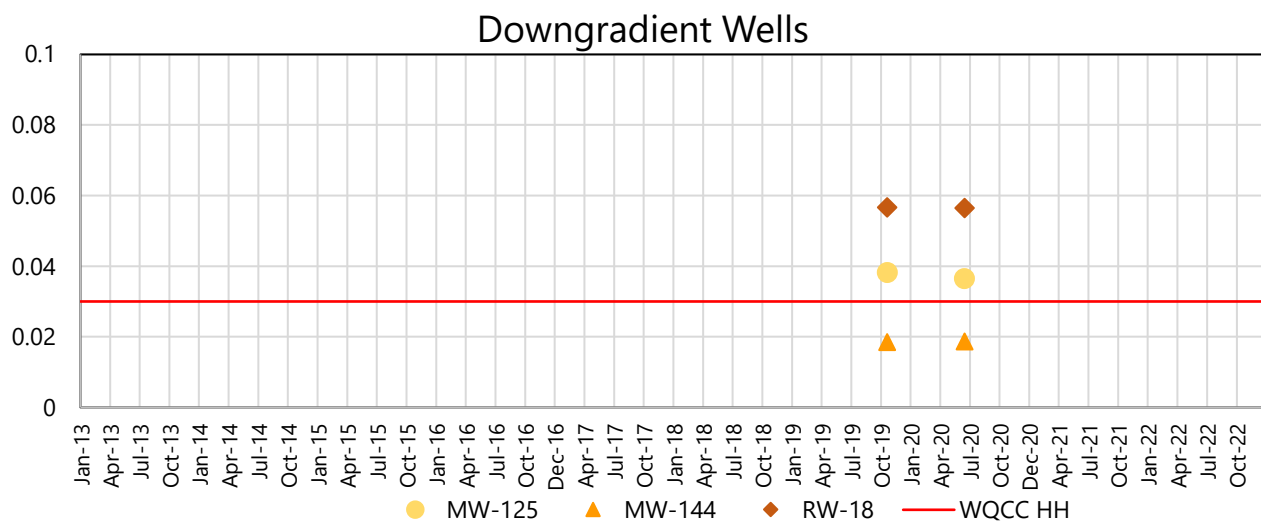
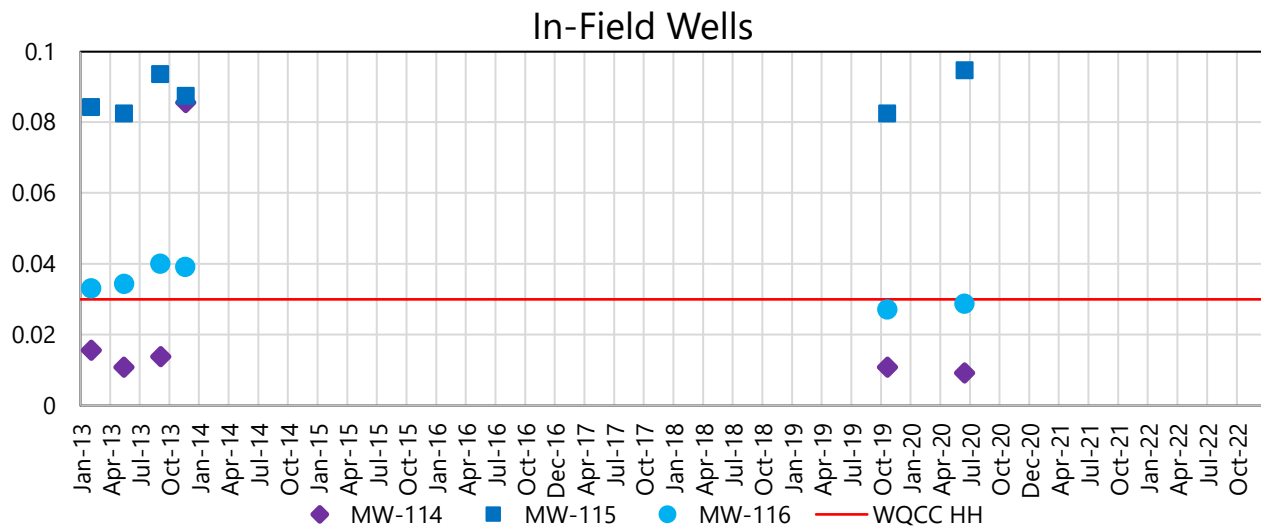
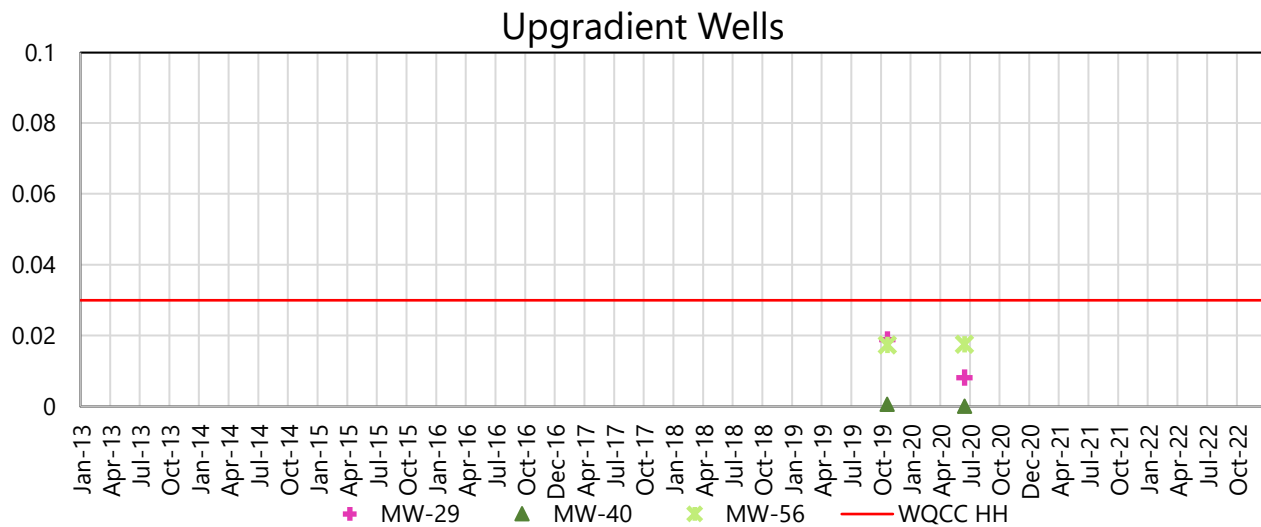
SOUTH RO REJECT FIELD TRENDS - IRON, DISSOLVED



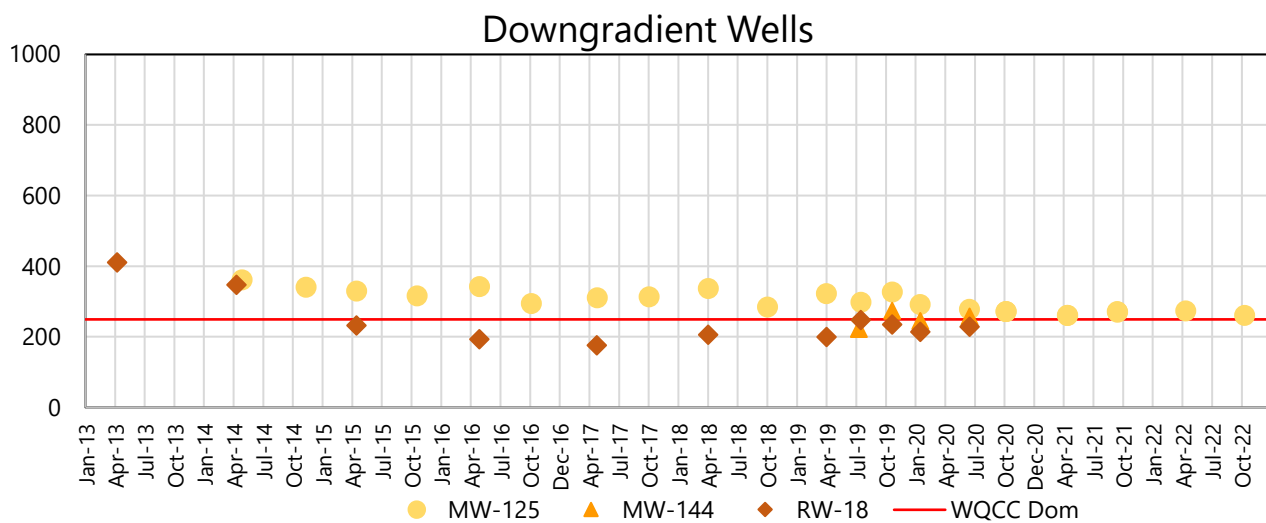
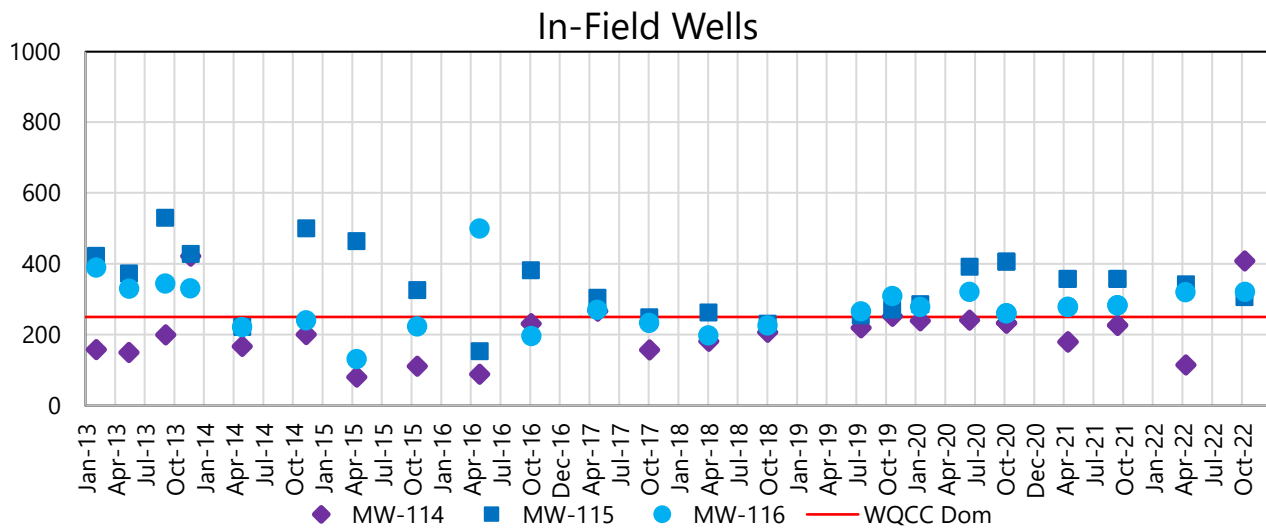
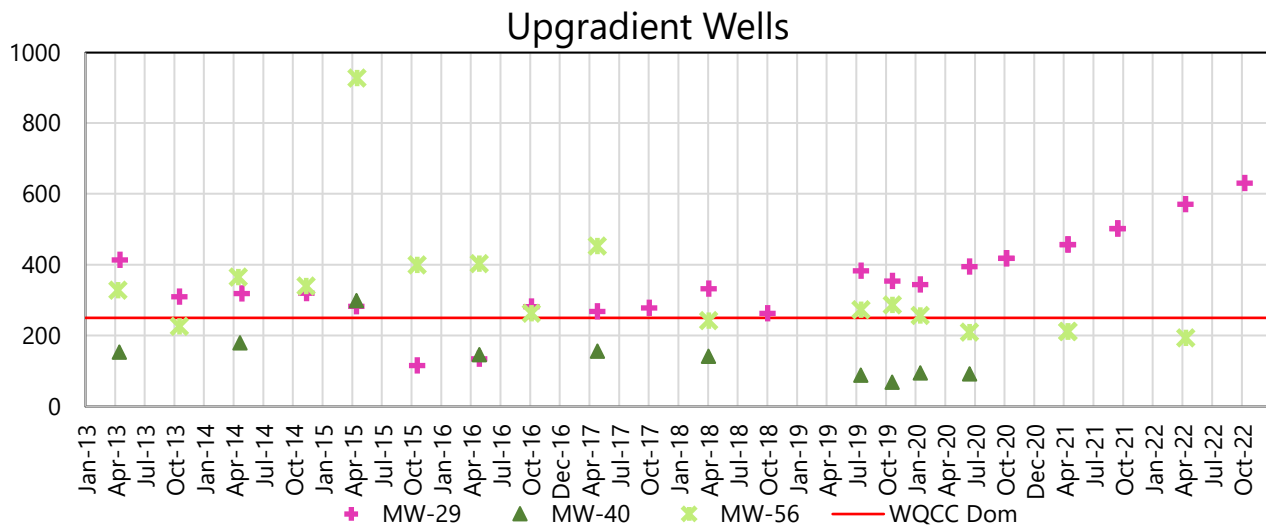
SOUTH RO REJECT FIELD TRENDS - LEAD, DISSOLVED



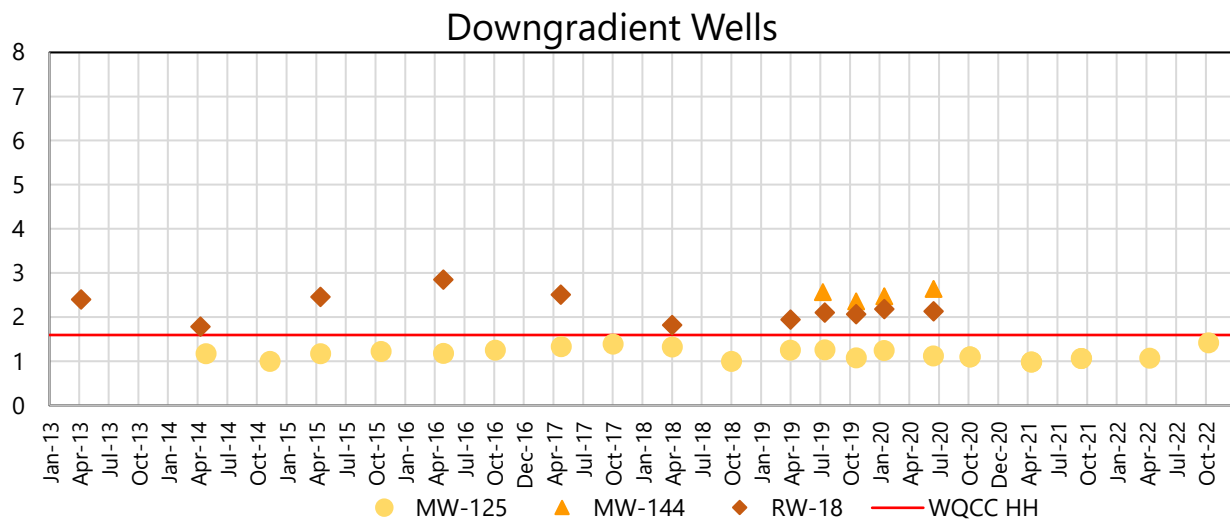
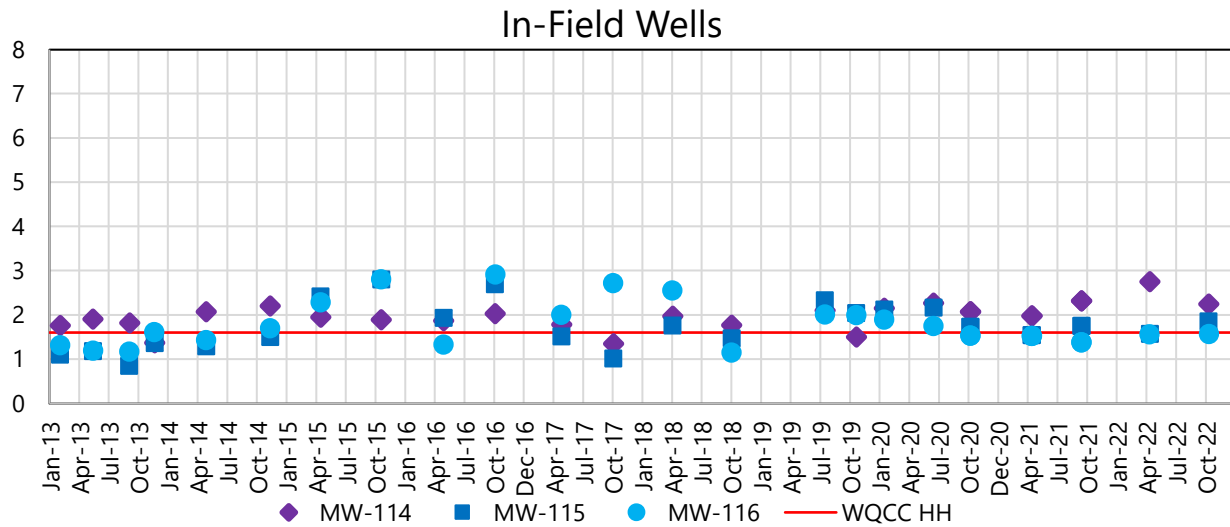
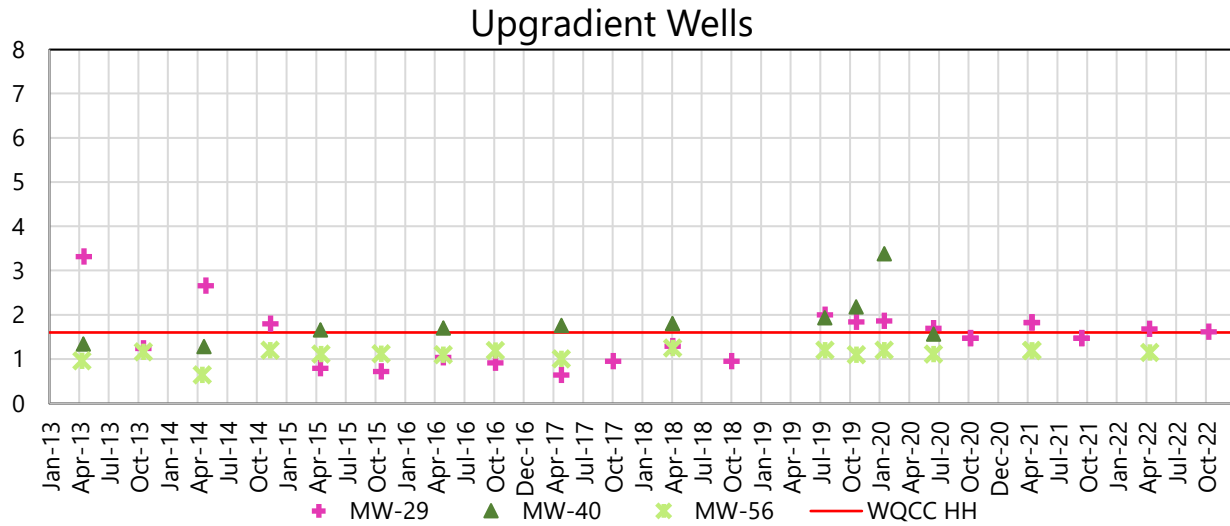
SOUTH RO REJECT FIELD TRENDS - MANGANESE, DISSOLVED



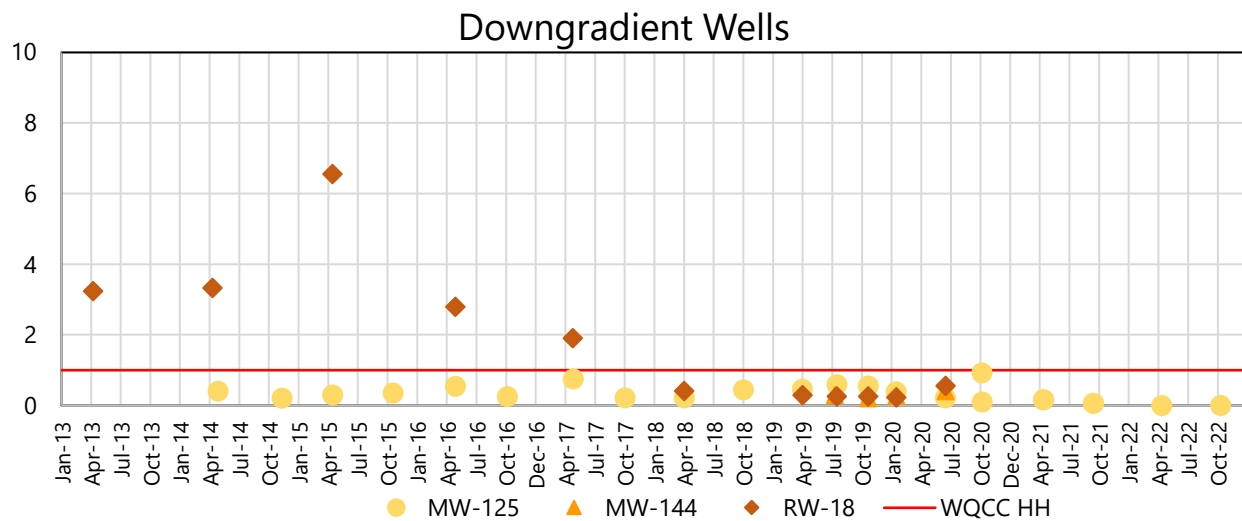
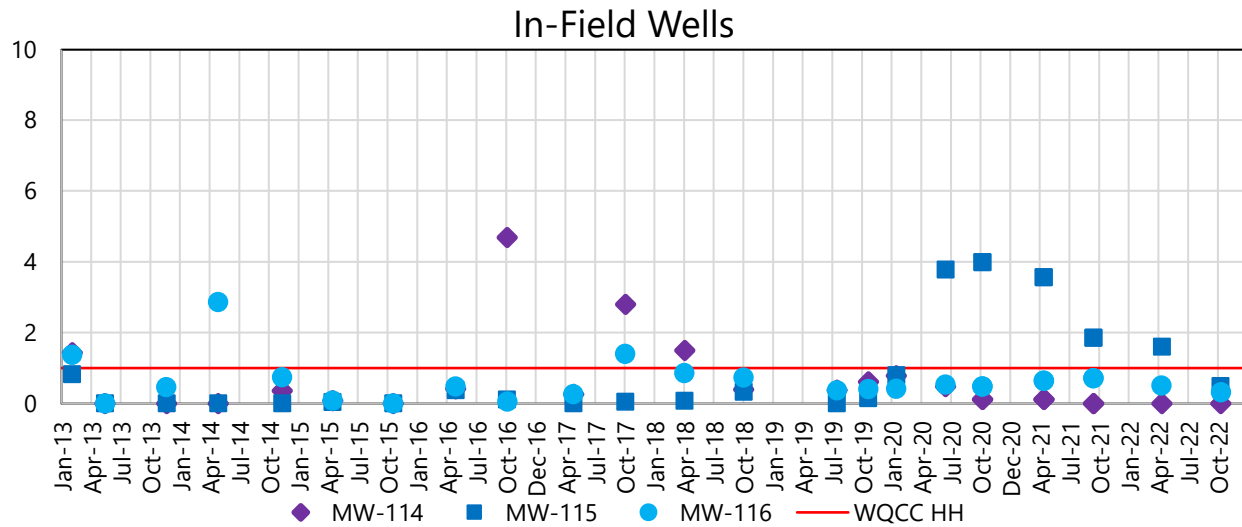
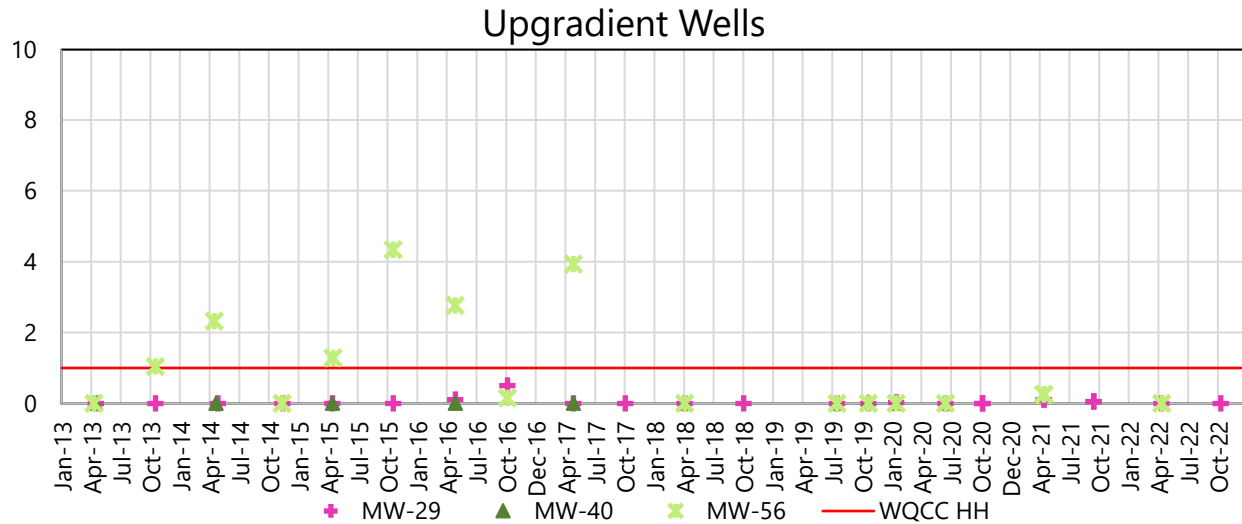
SOUTH RO REJECT FIELD TRENDS - URANIUM, DISSOLVED



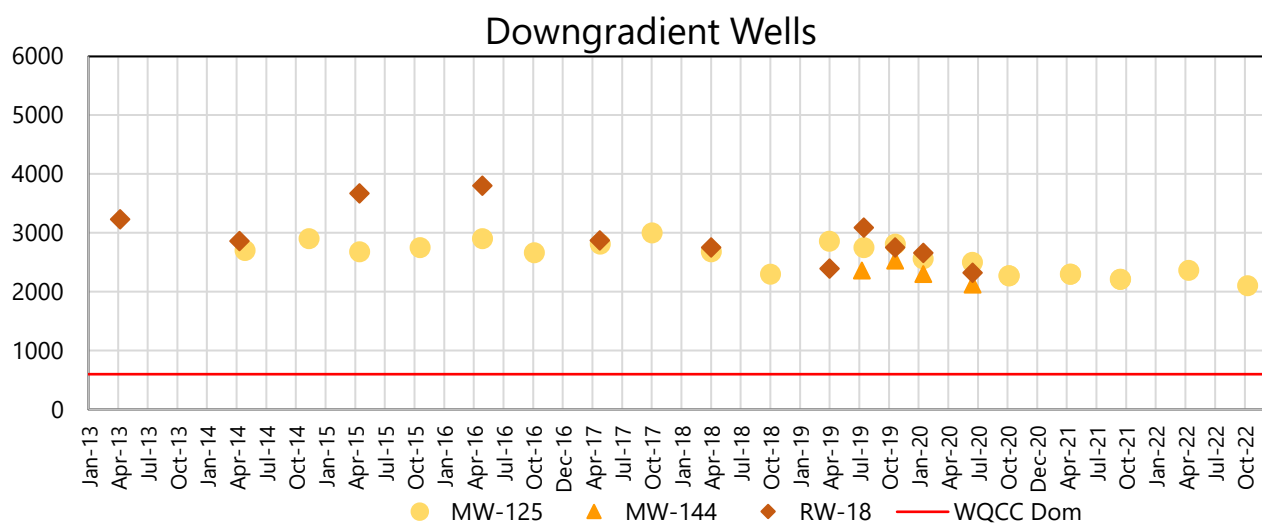
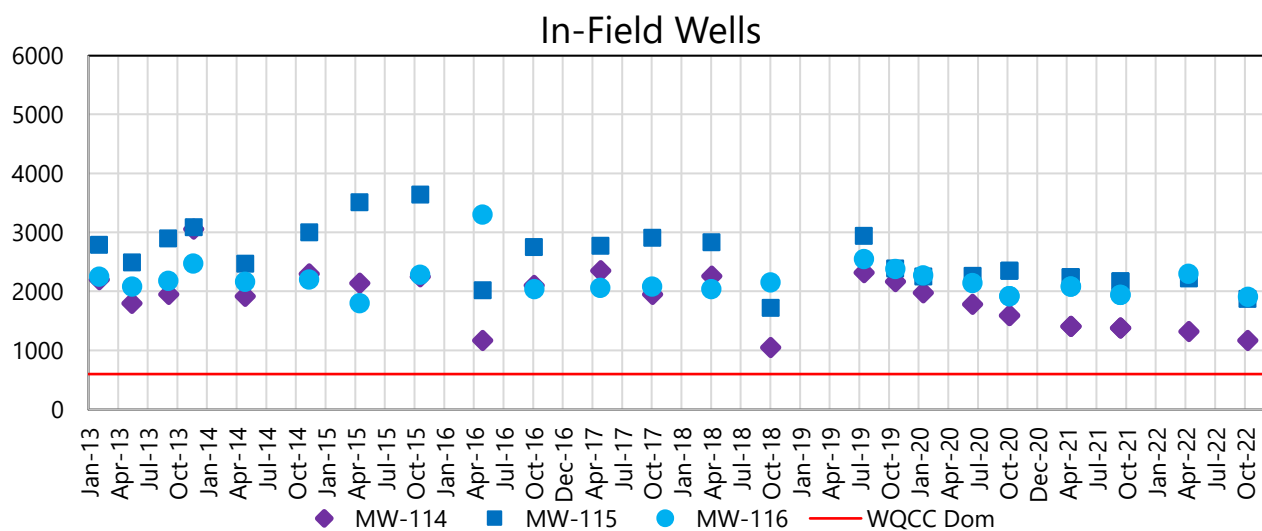
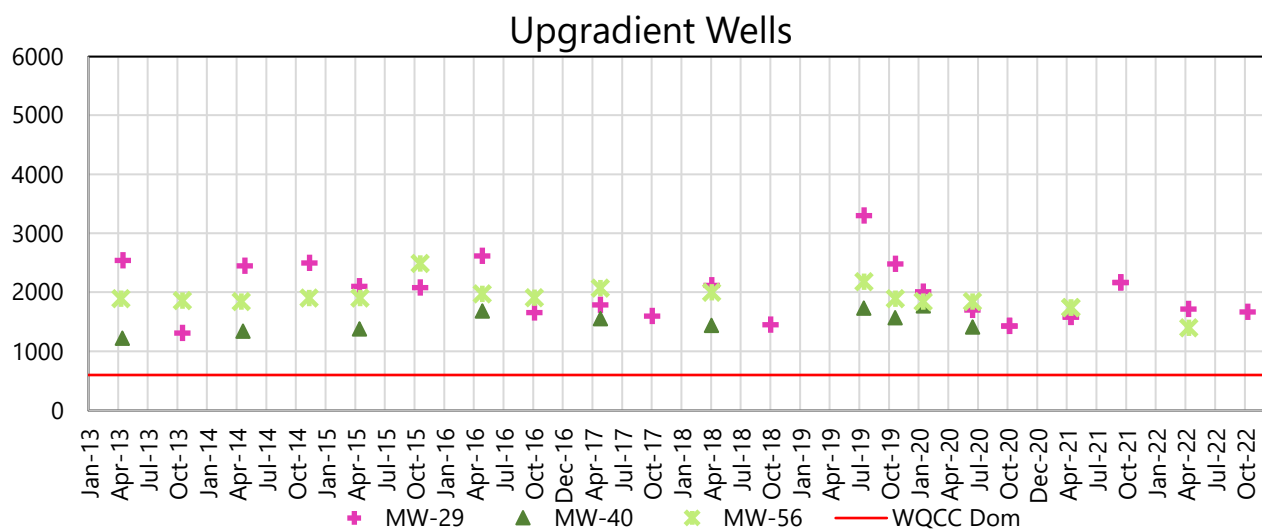
SOUTH RO REJECT FIELD TRENDS - CHLORIDE



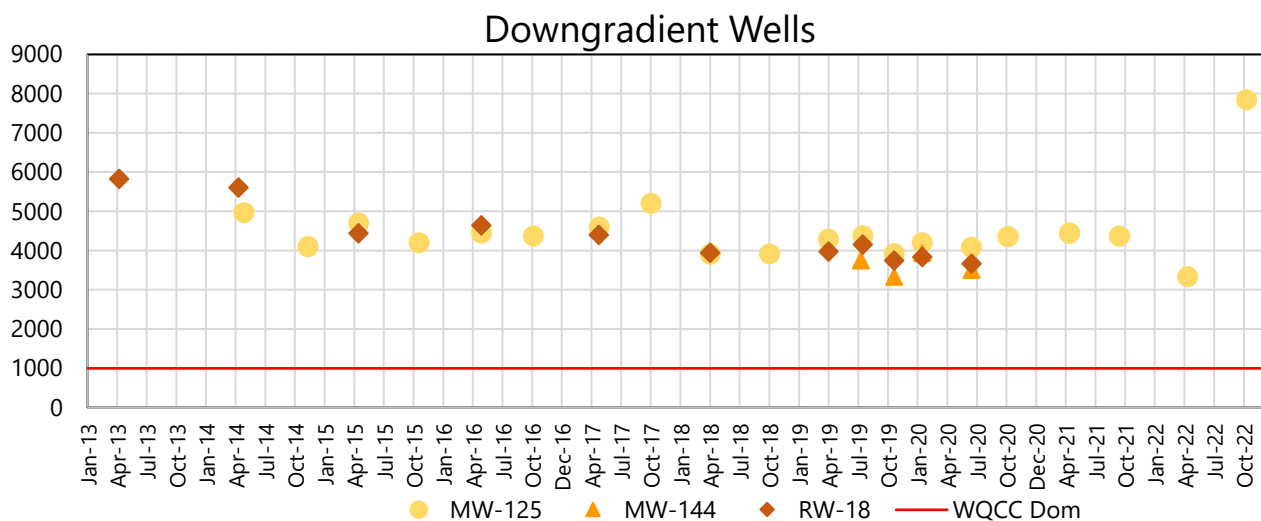
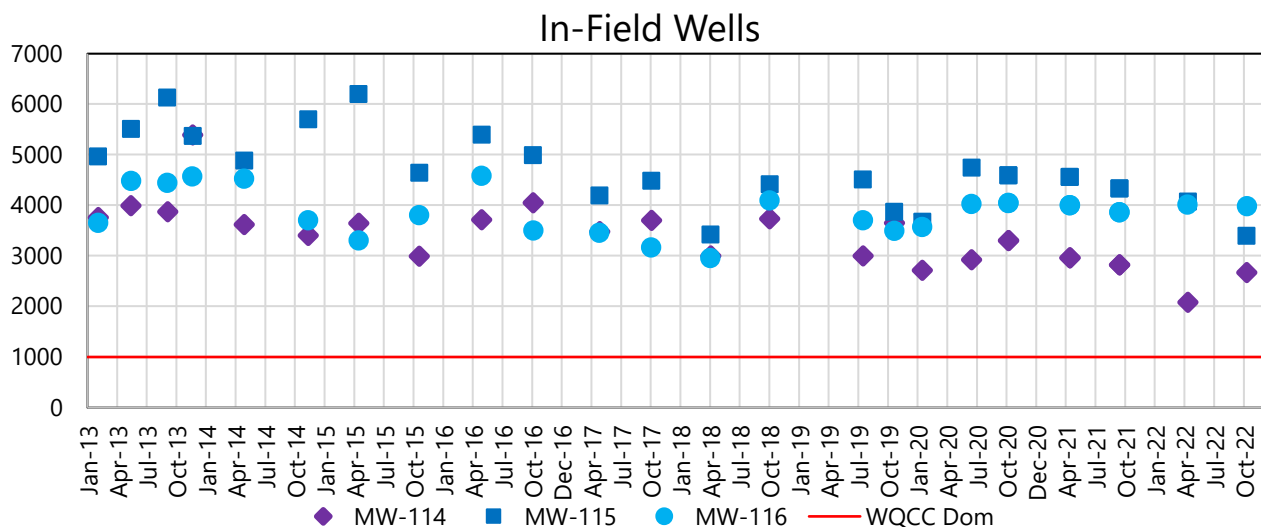
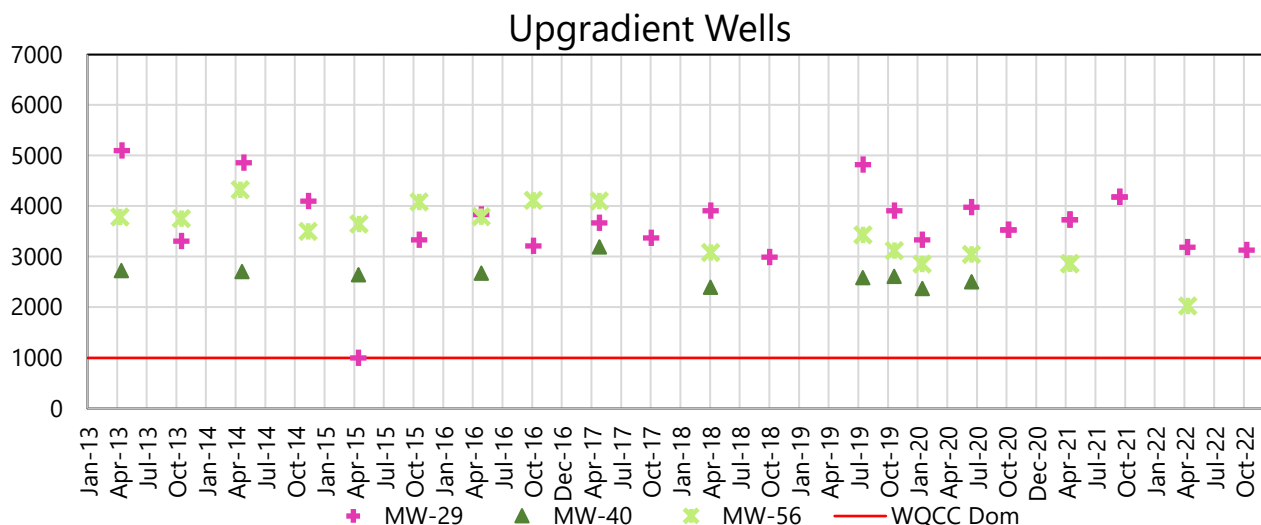
SOUTH RO REJECT FIELD TRENDS - FLUORIDE



SOUTH RO REJECT FIELD TRENDS - NITRATE/NITRITE



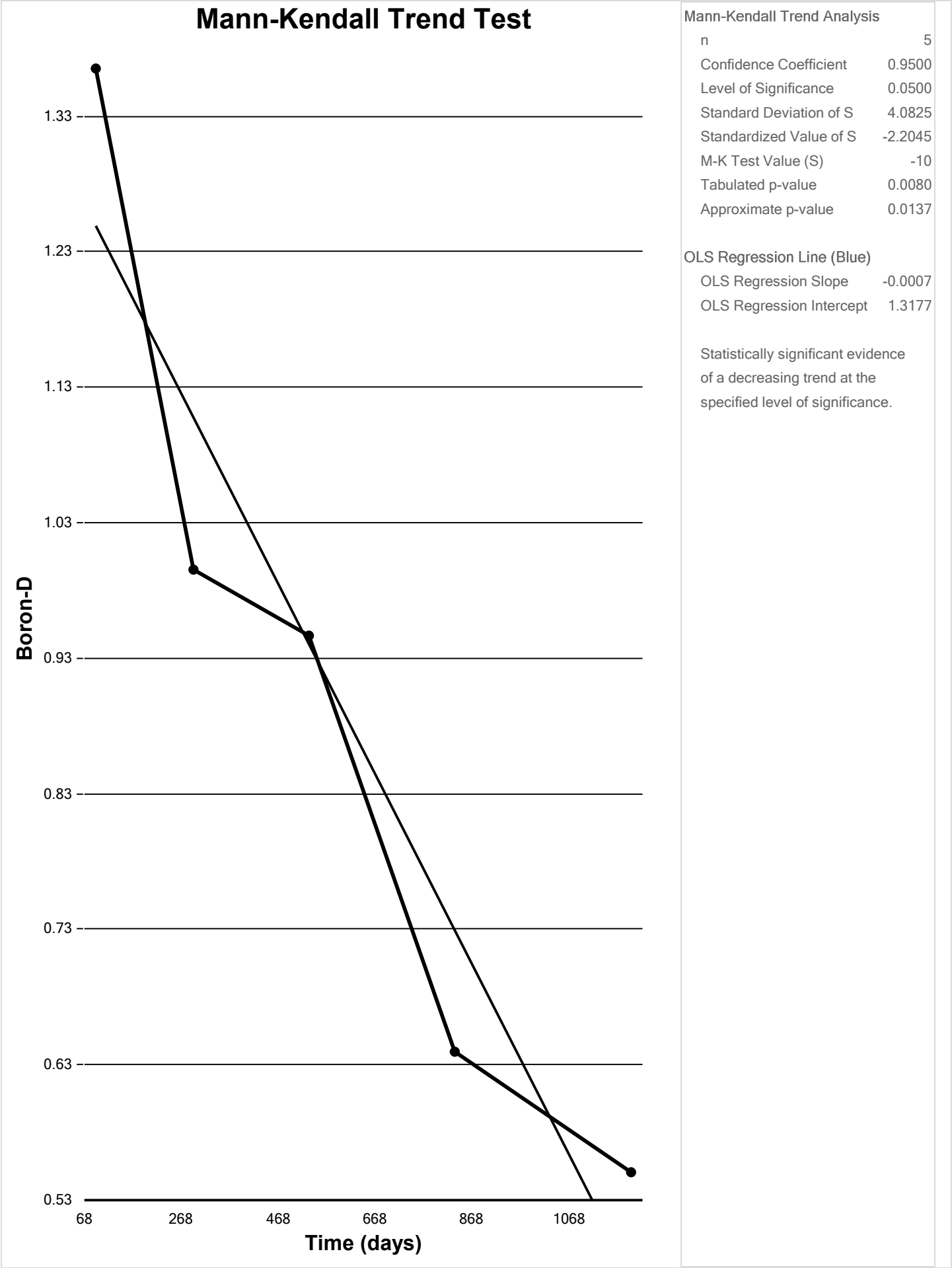
SOUTH RO REJECT FIELD TRENDS - SULFATE

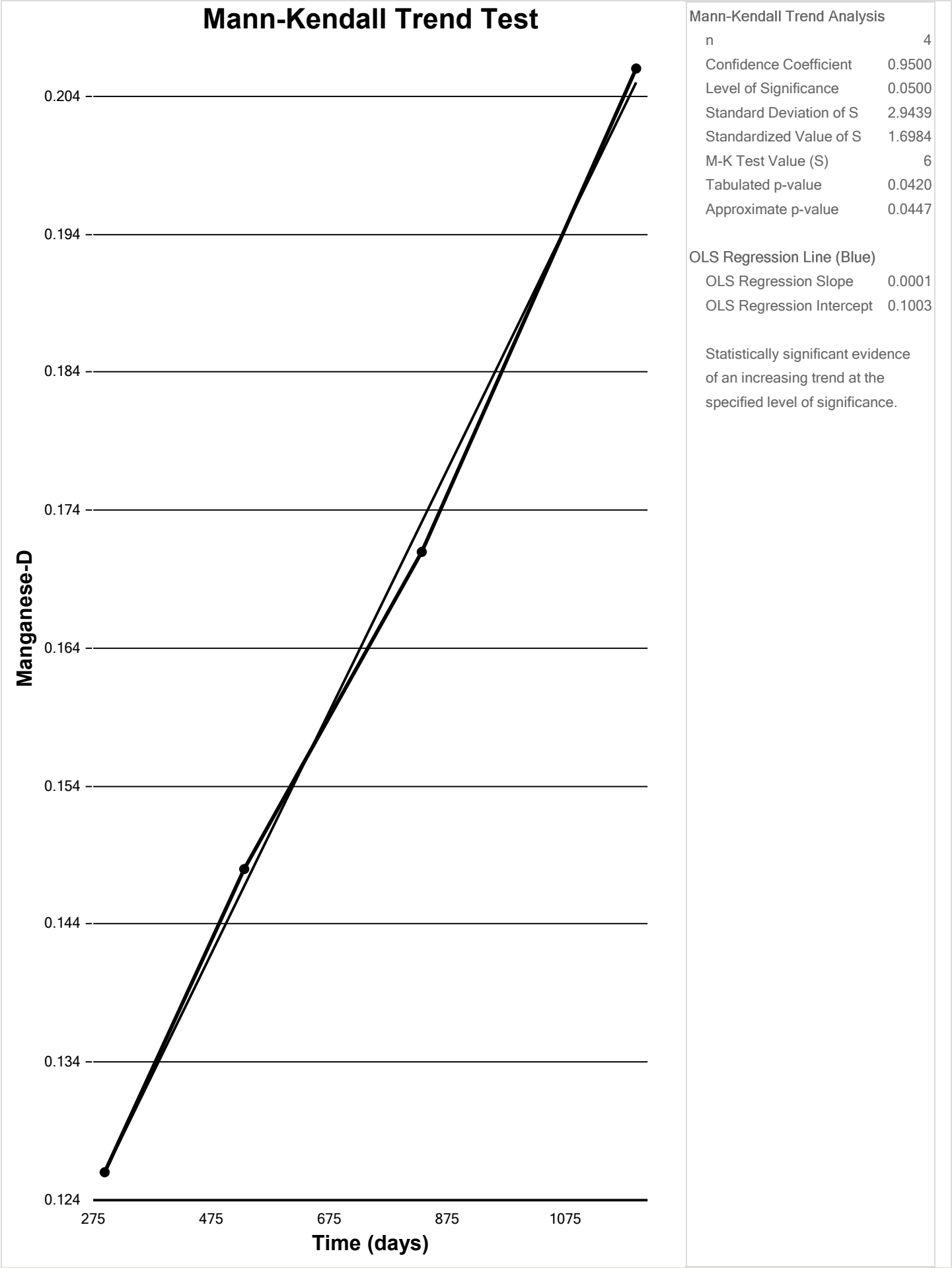


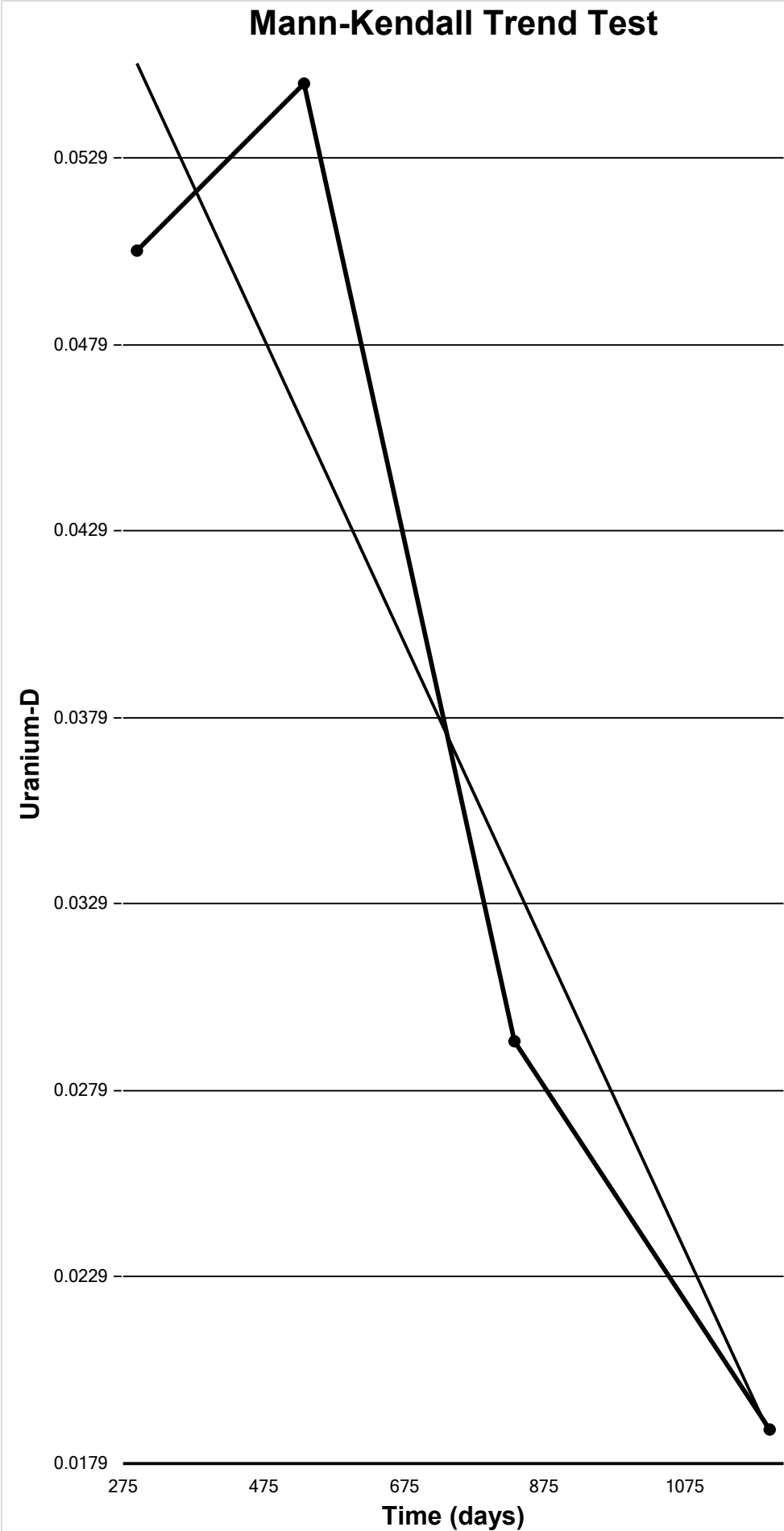
SOUTH RO REJECT FIELD TRENDS - TDS

APPENDIX C2
ProUCL MANN-KENDALL STATISTICAL
EVALUATION OF COCs 2019-2022

APPENDIX C2A
MANN-KENDALL STATISTICAL EVALUATION
MW-55



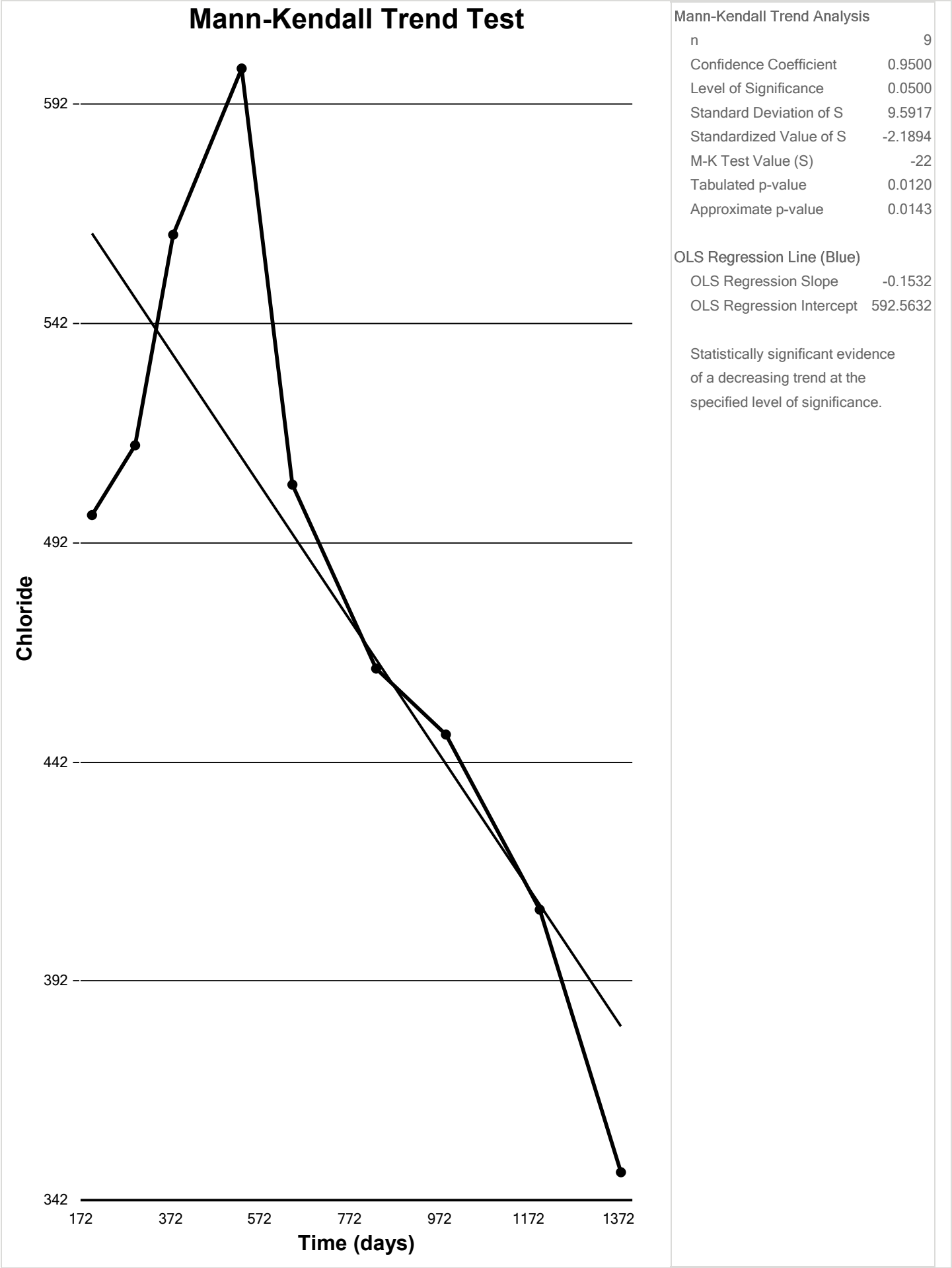


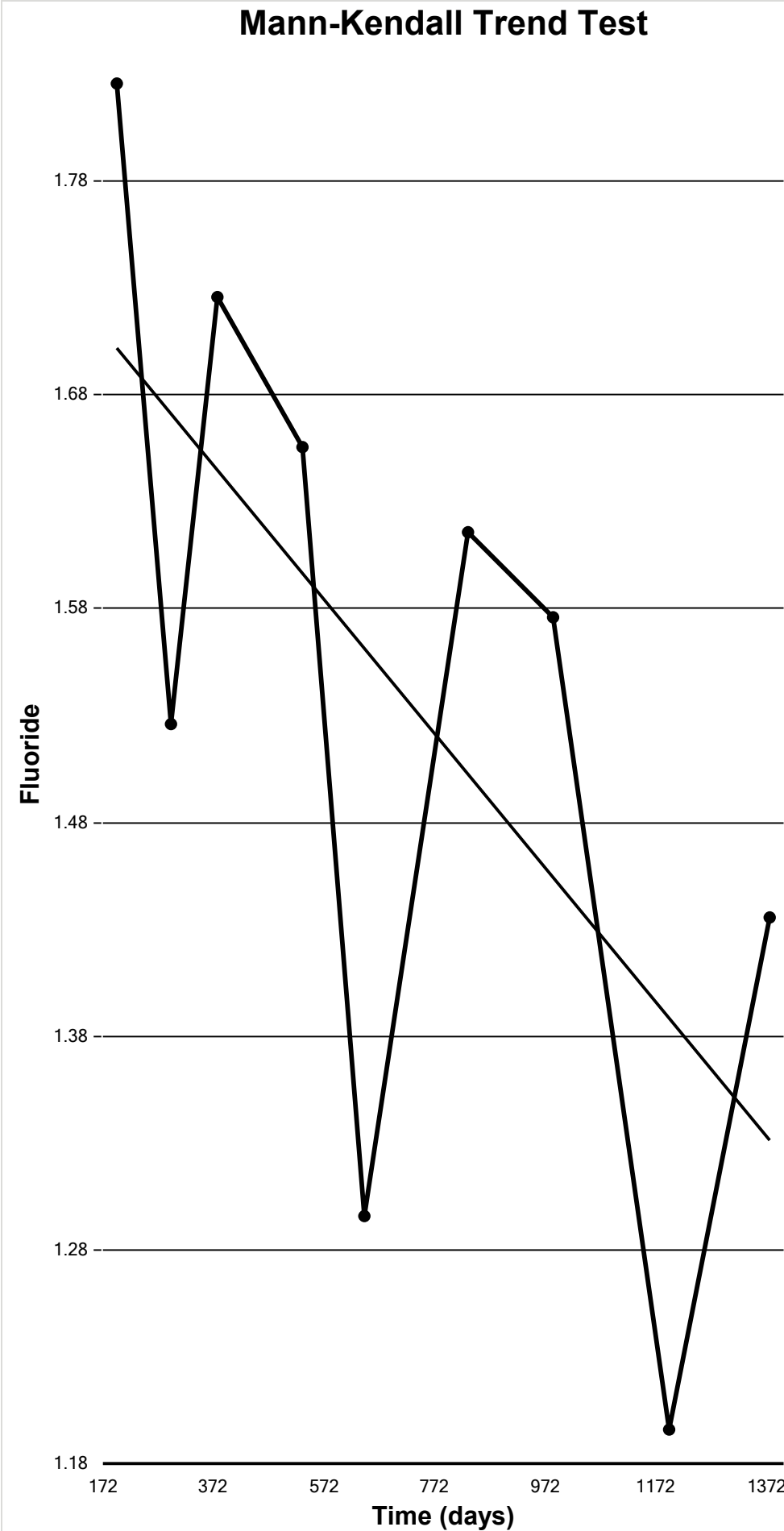


Mann-Kendall Trend Analysis	
n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)	
OLS Regression Slope	0.0000
OLS Regression Intercept	0.0674

Insufficient statistical evidence
of a significant trend at the
specified level of significance.

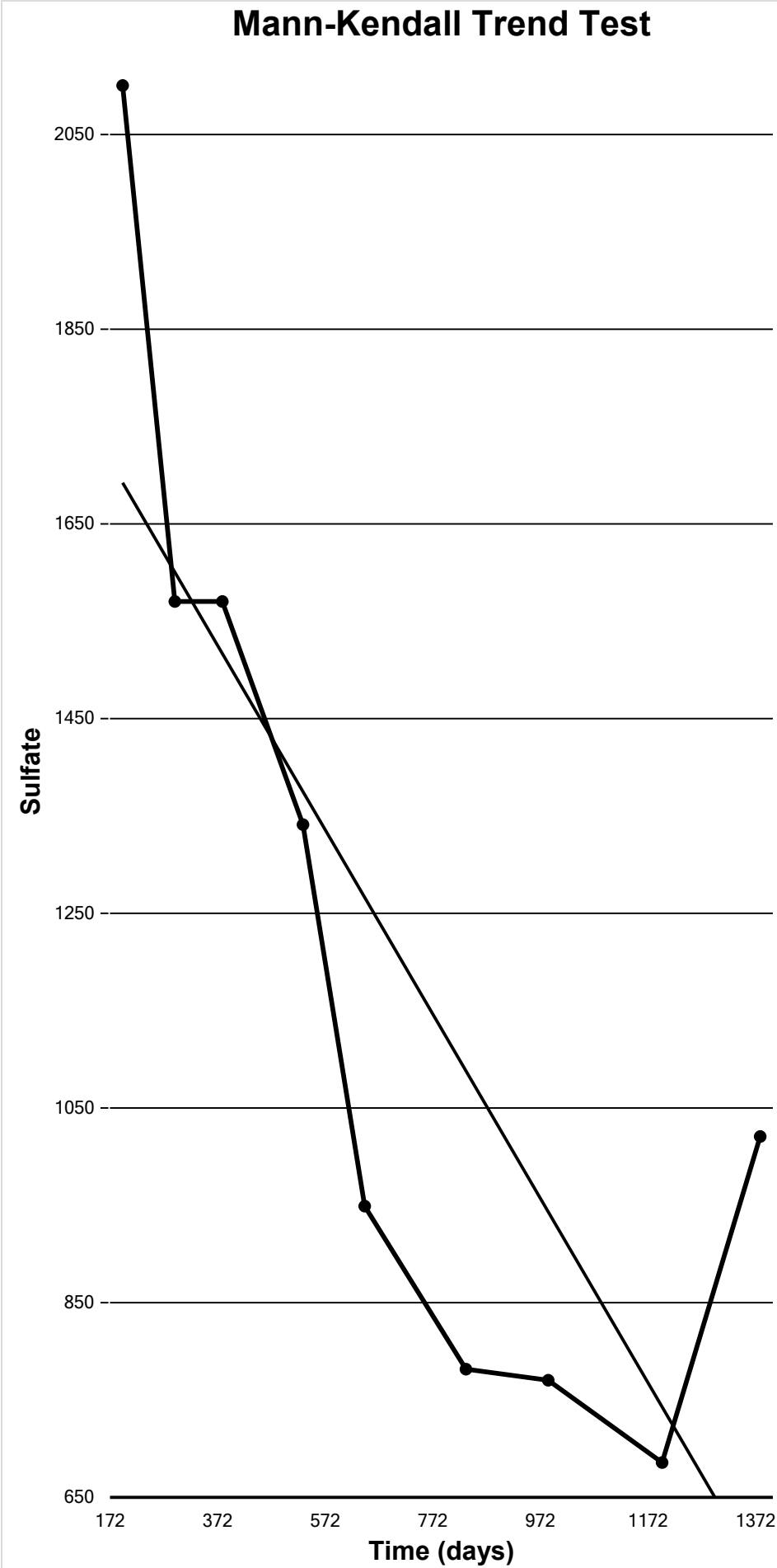




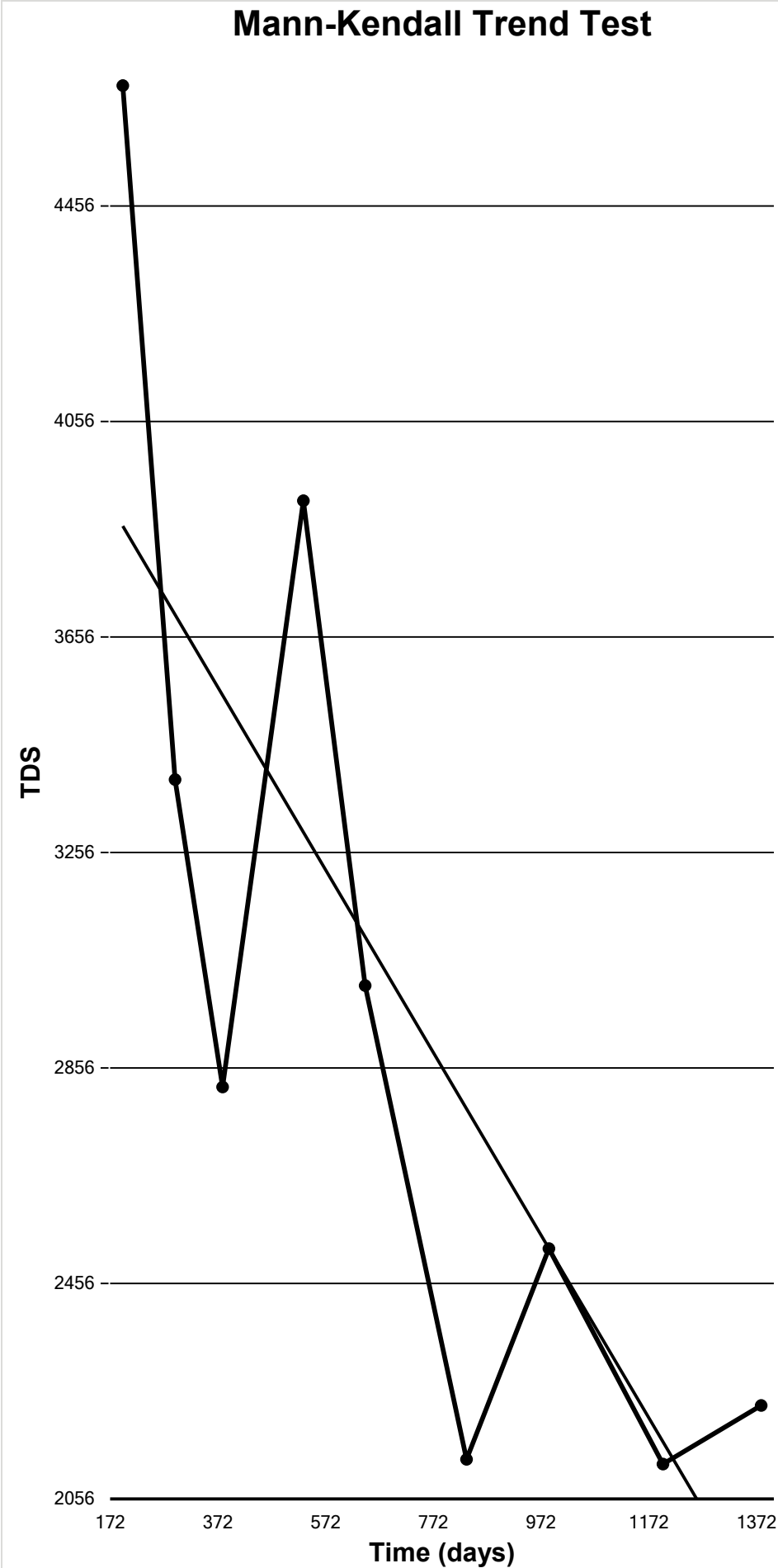
Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-1.9809
M-K Test Value (S)	-20
Tabulated p-value	0.0220
Approximate p-value	0.0238

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0003
OLS Regression Intercept	1.7674

Statistically significant evidence of a decreasing trend at the specified level of significance.



Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5394
Standardized Value of S	-2.7255
M-K Test Value (S)	-27
Tabulated p-value	0.0030
Approximate p-value	0.0032
OLS Regression Line (Blue)	
OLS Regression Slope	-0.9490
OLS Regression Intercept	1,877.8338
Statistically significant evidence of a decreasing trend at the specified level of significance.	

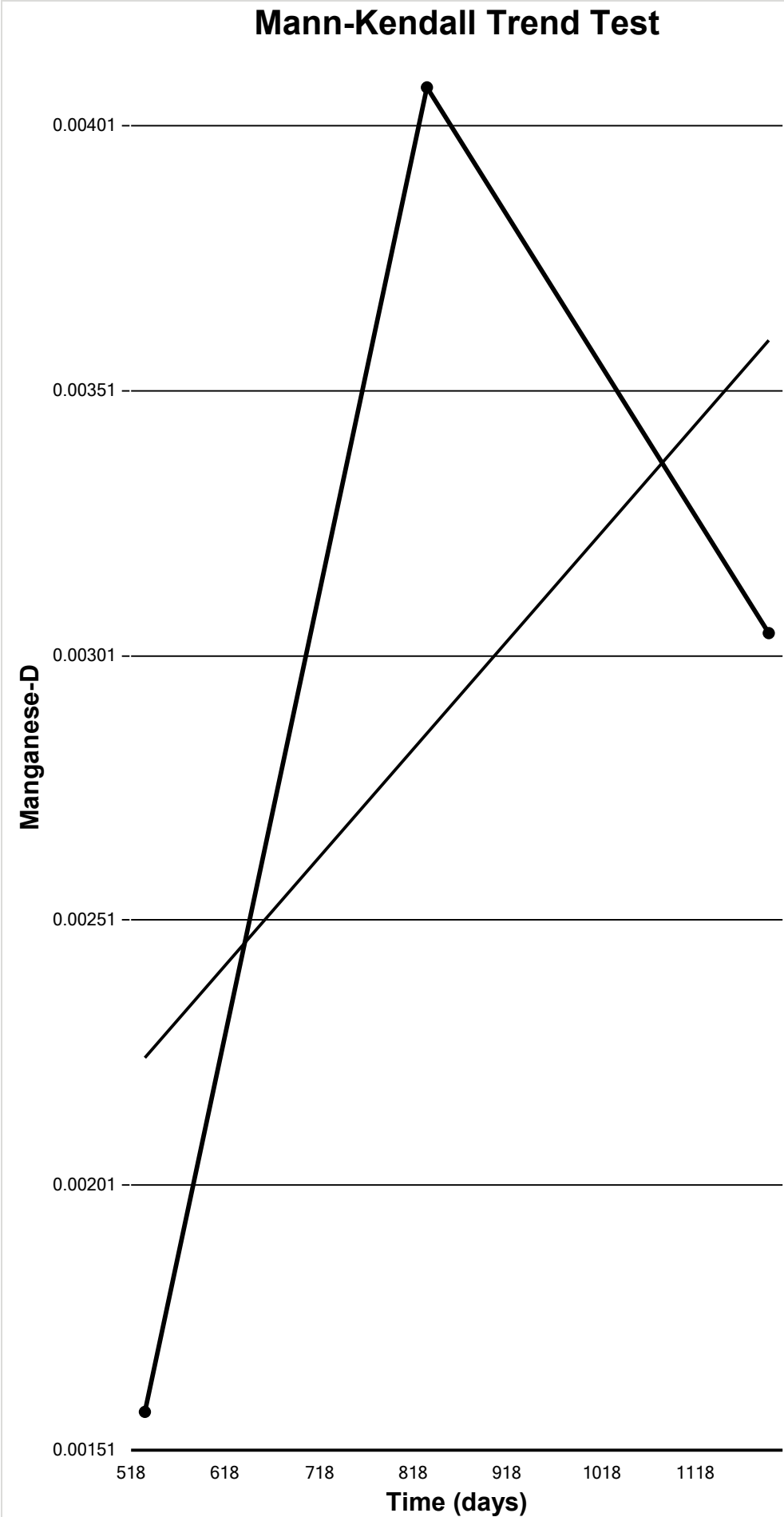


Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-2.3979
M-K Test Value (S)	-24
Tabulated p-value	0.0060
Approximate p-value	0.0082

OLS Regression Line (Blue)	
OLS Regression Slope	-1.7018
OLS Regression Intercept	4,197.3673

Statistically significant evidence of a decreasing trend at the specified level of significance.

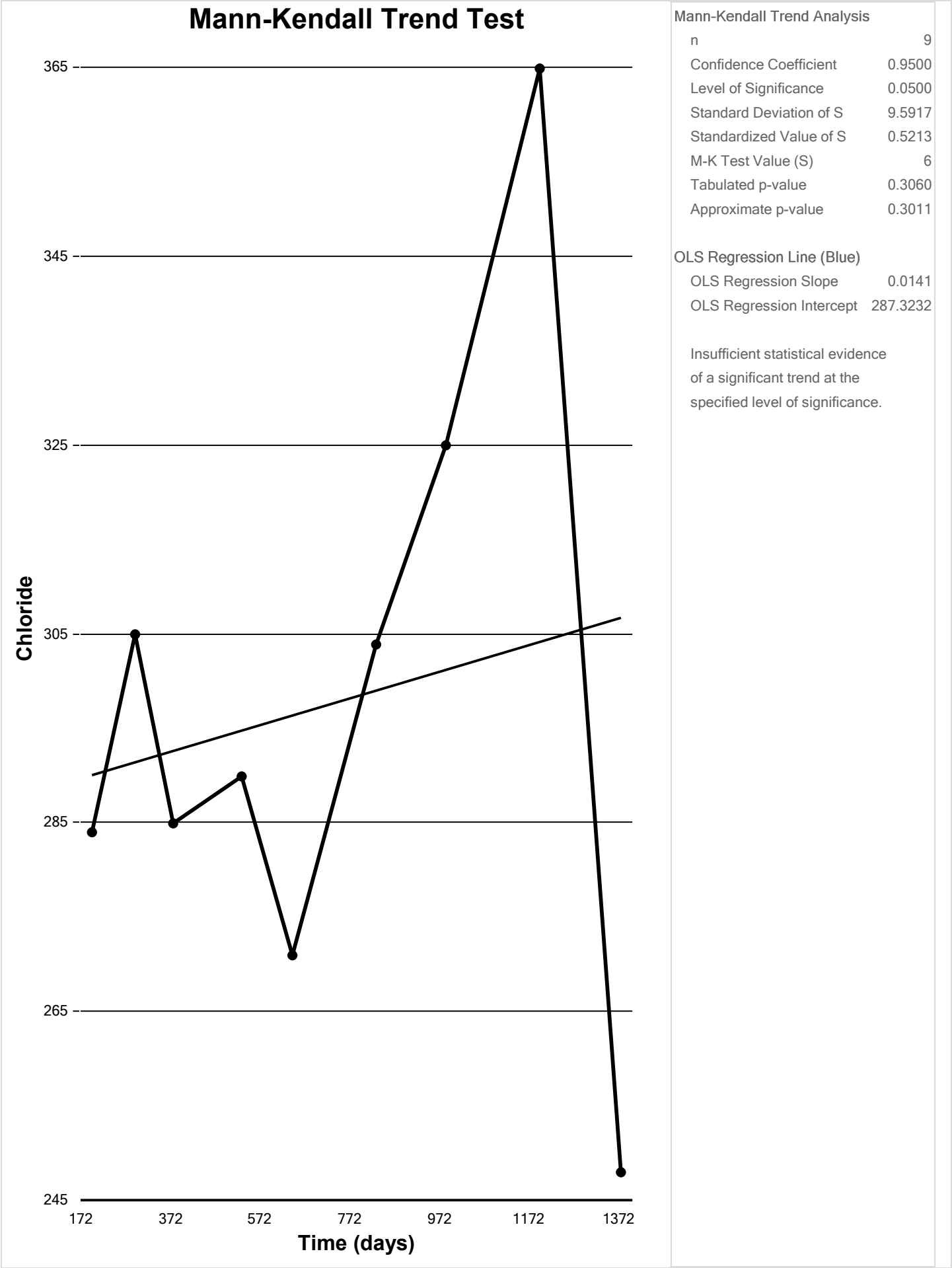
APPENDIX C2B
MANN-KENDALL STATISTICAL EVALUATION
MW-117

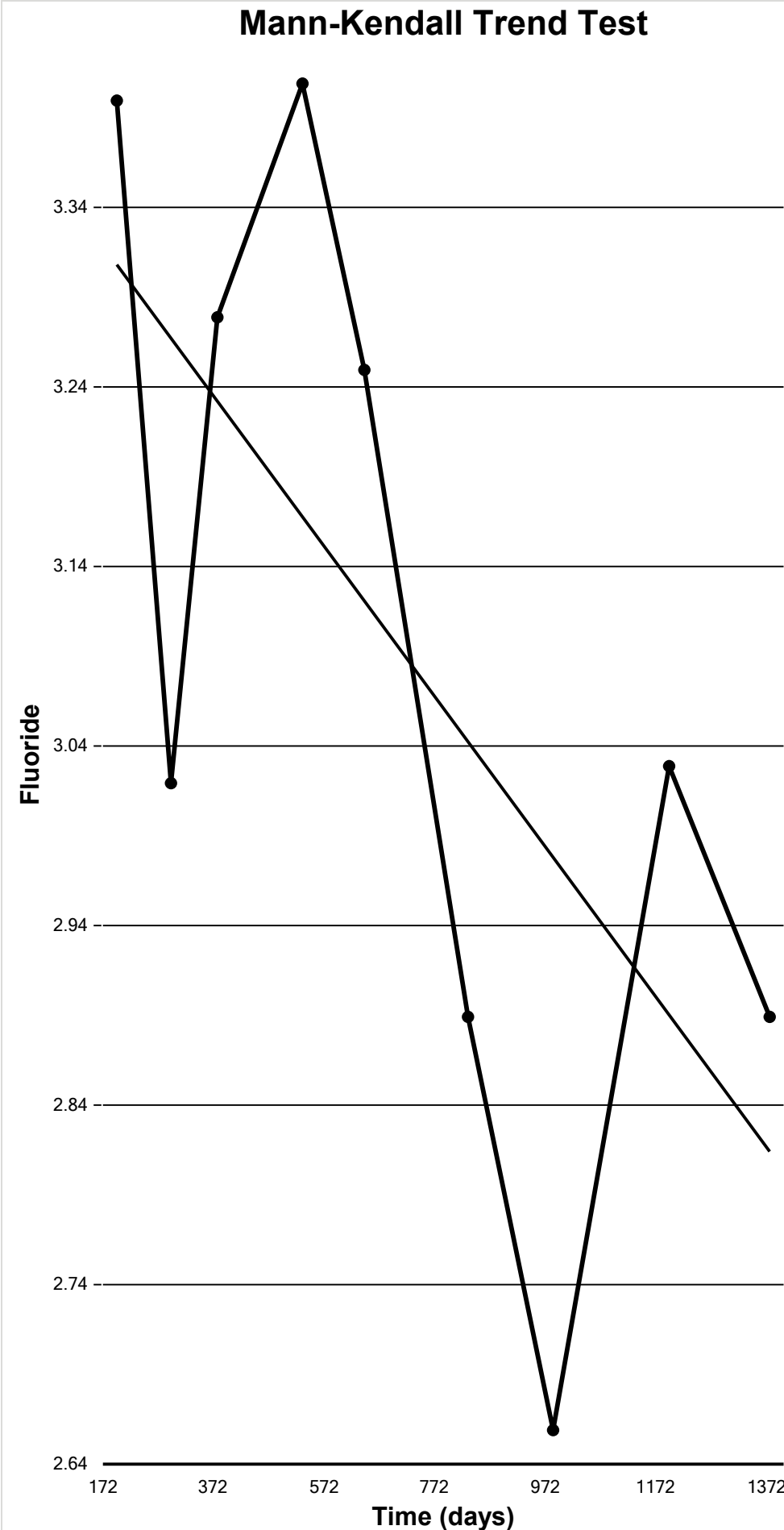


Mann-Kendall Trend Analysis	
n	3
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	1.9149
Standardized Value of S	0.0000
M-K Test Value (S)	1
Tabulated p-value	
Approximate p-value	0.5000

OLS Regression Line (Blue)	
OLS Regression Slope	0.0000
OLS Regression Intercept	0.0012

Insufficient statistical evidence
of a significant trend at the
specified level of significance.

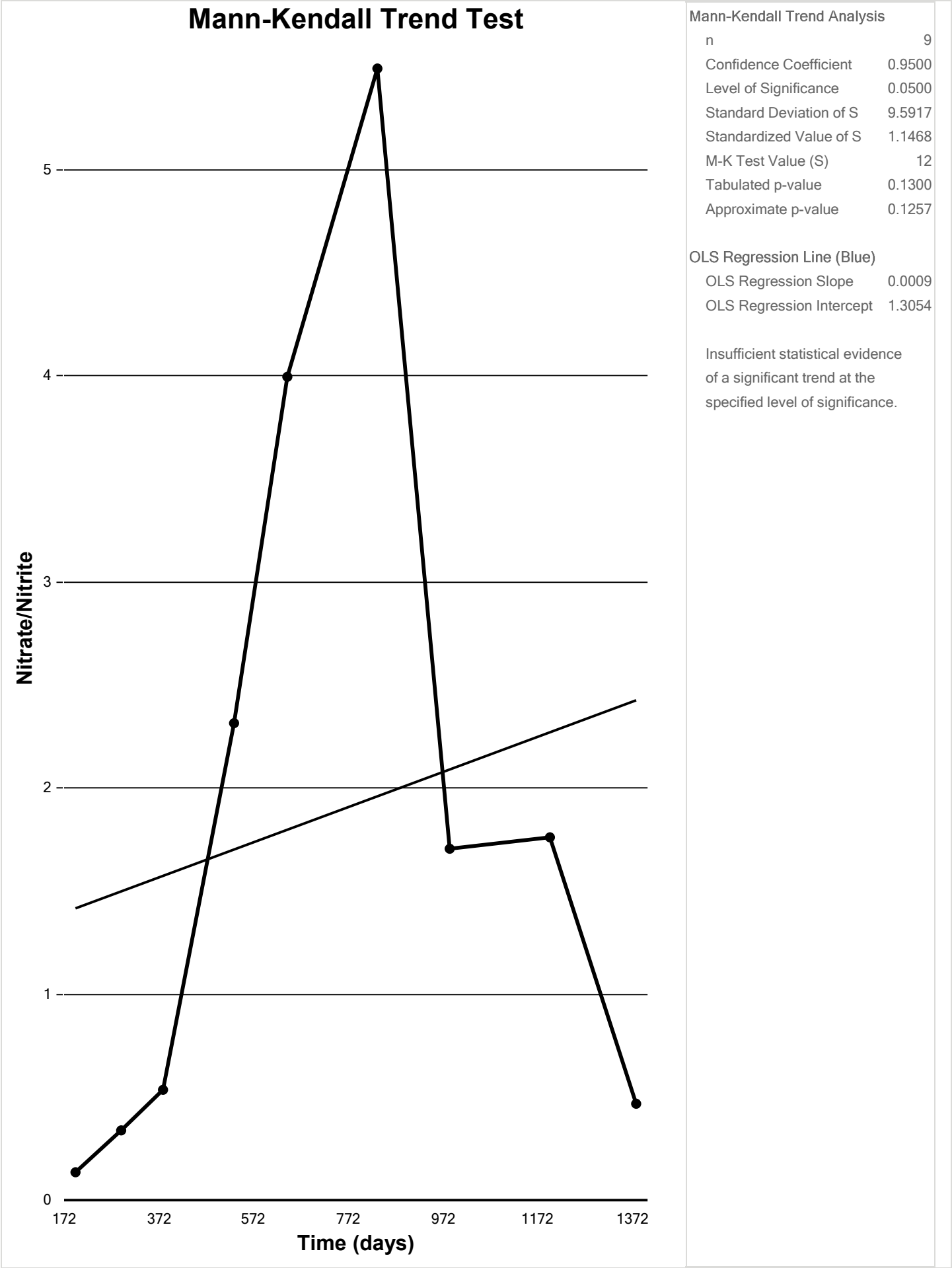


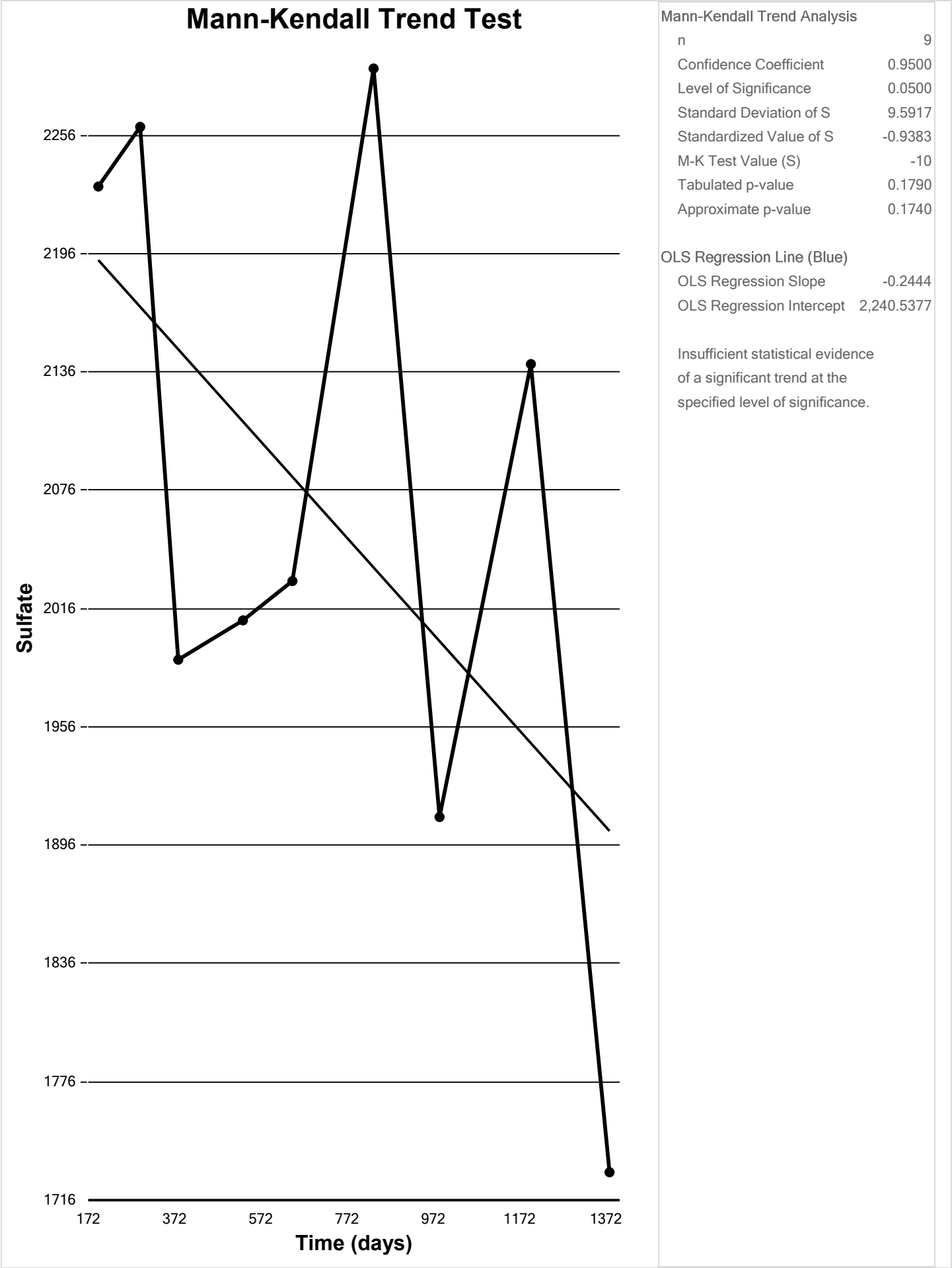


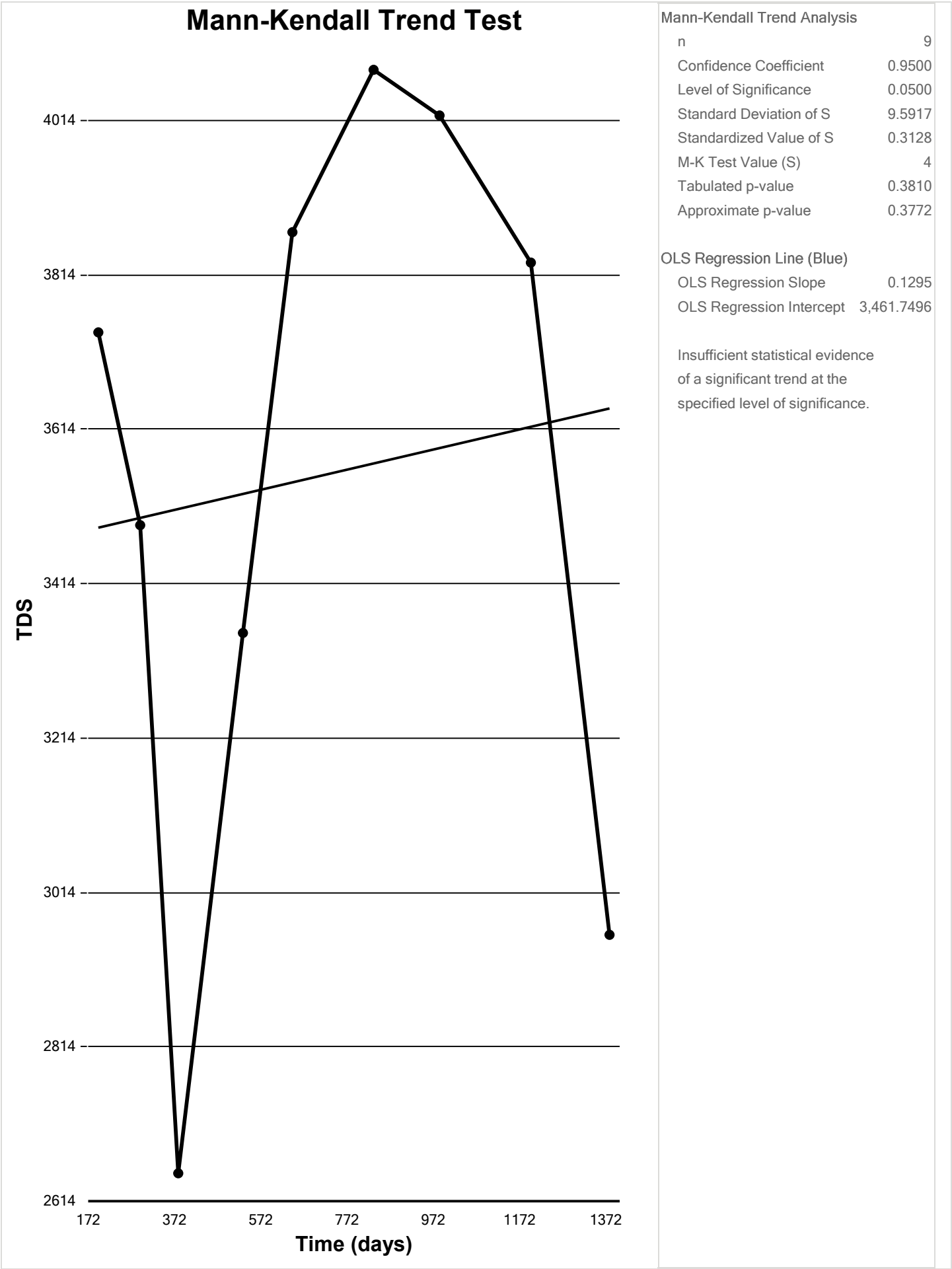
Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5394
Standardized Value of S	-1.6773
M-K Test Value (S)	-17
Tabulated p-value	0.0600
Approximate p-value	0.0467

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0004
OLS Regression Intercept	3.3912

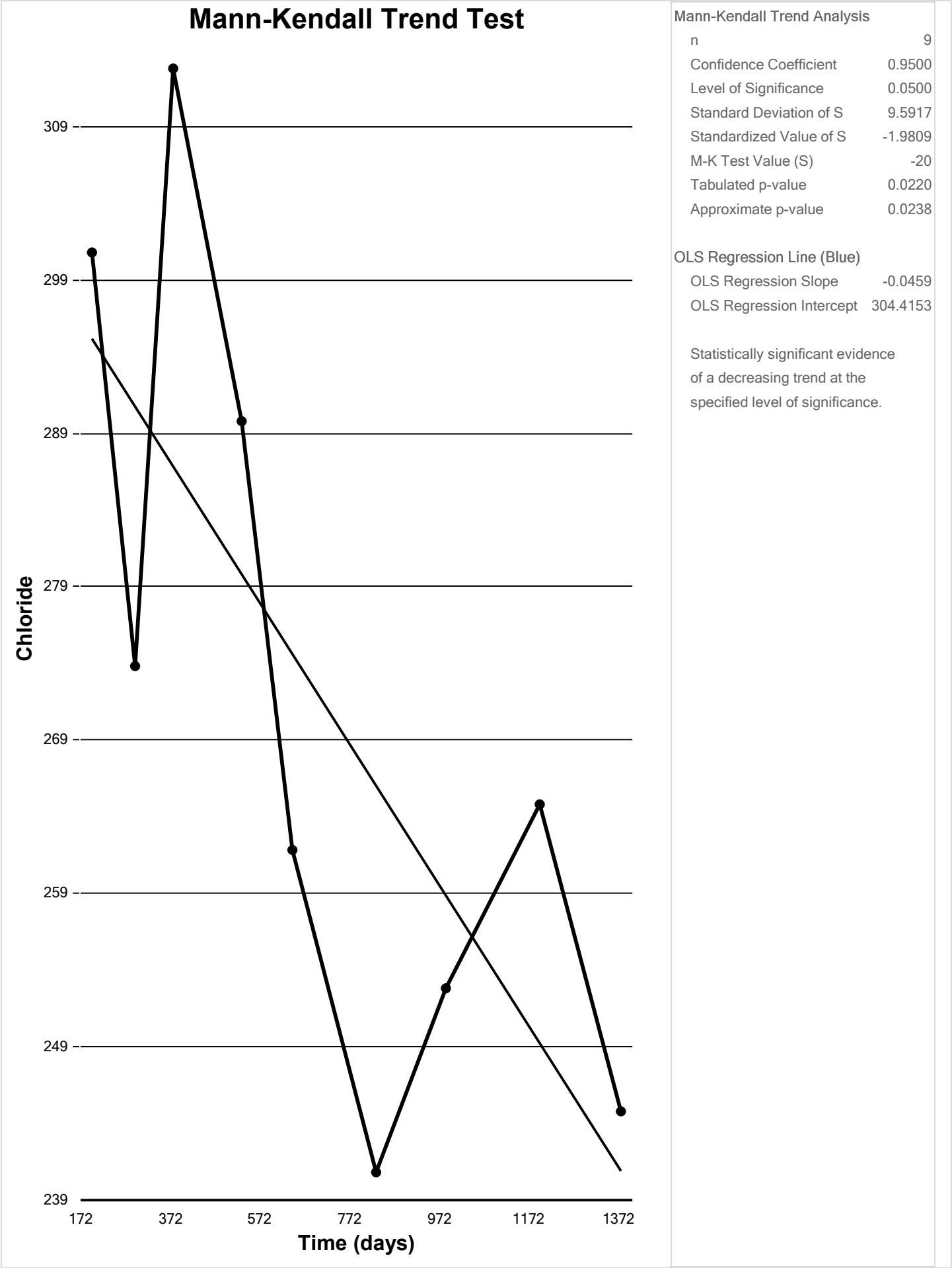
Insufficient statistical evidence of a significant trend at the specified level of significance.

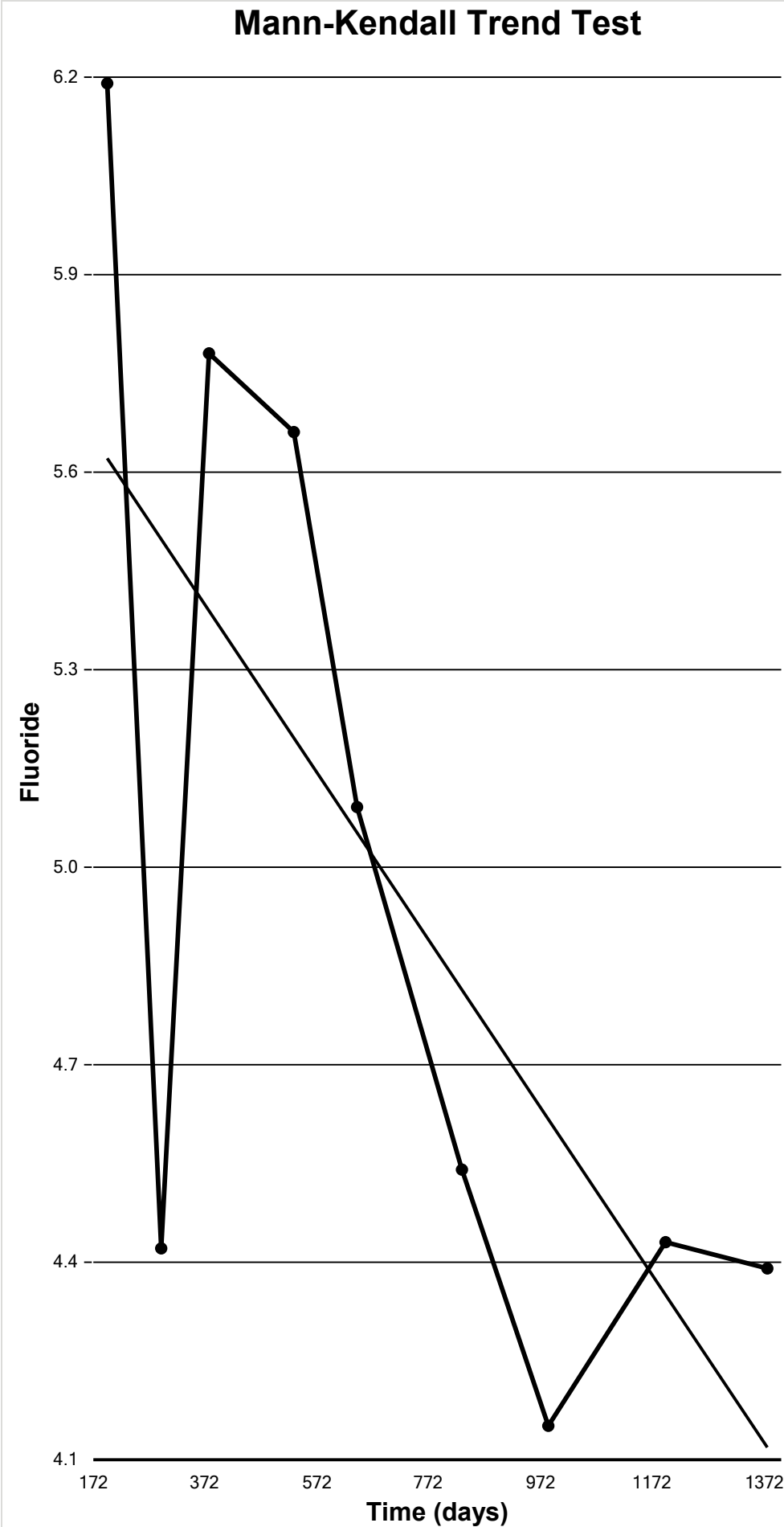






APPENDIX C2C
MANN-KENDALL STATISTICAL EVALUATION
MW-118

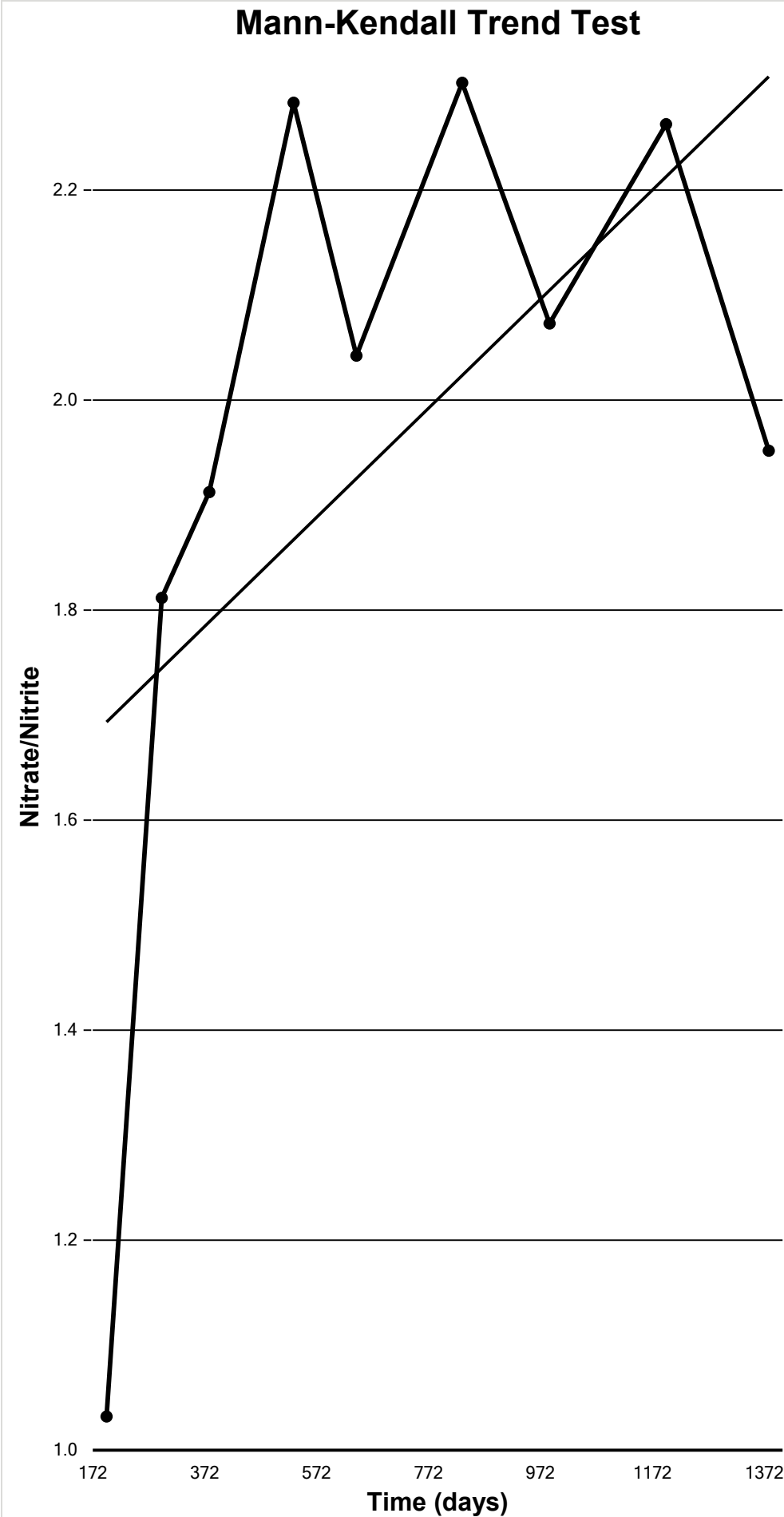




Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-2.1894
M-K Test Value (S)	-22
Tabulated p-value	0.0120
Approximate p-value	0.0143

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0013
OLS Regression Intercept	5.8412

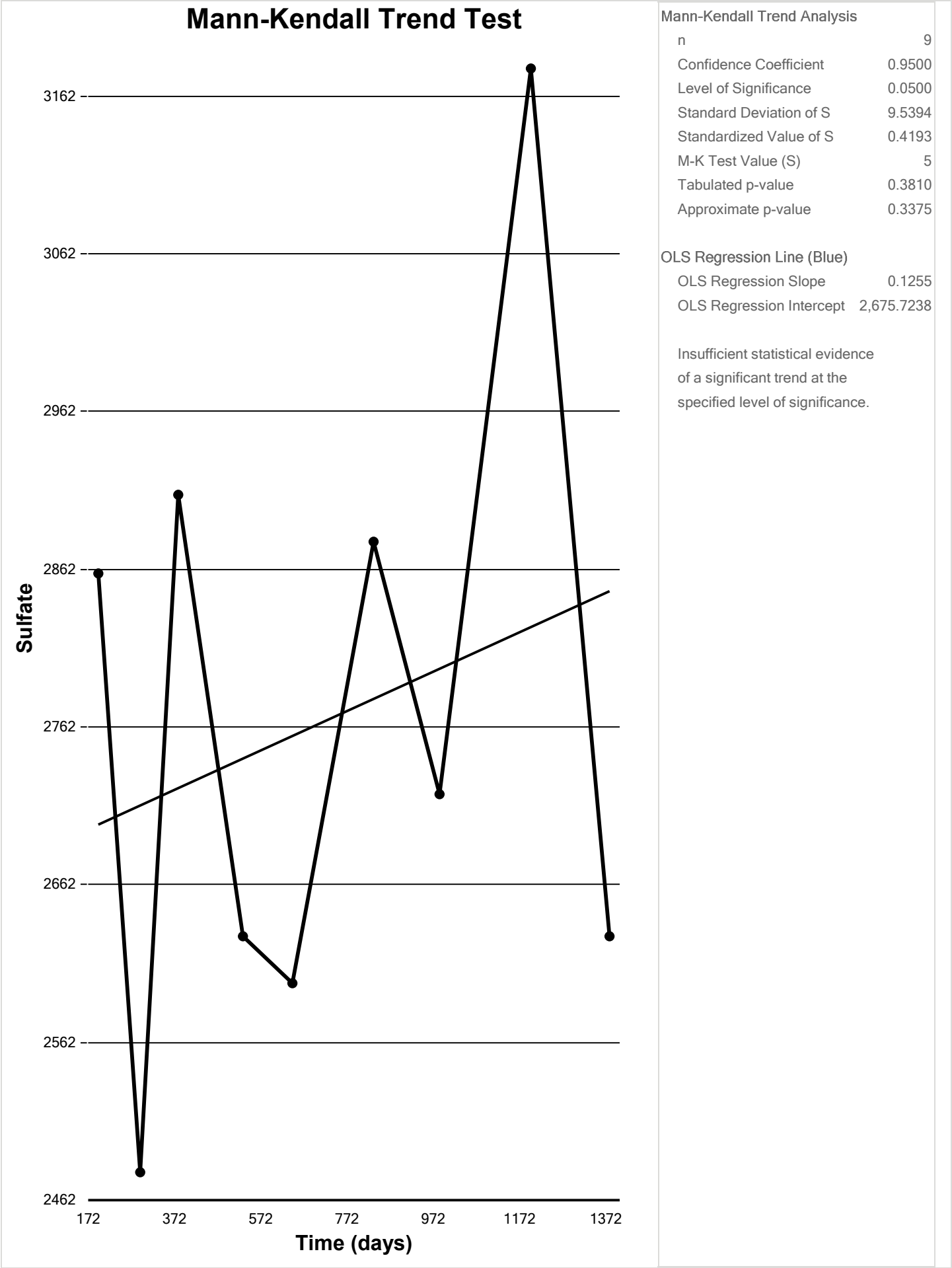
Statistically significant evidence of a decreasing trend at the specified level of significance.

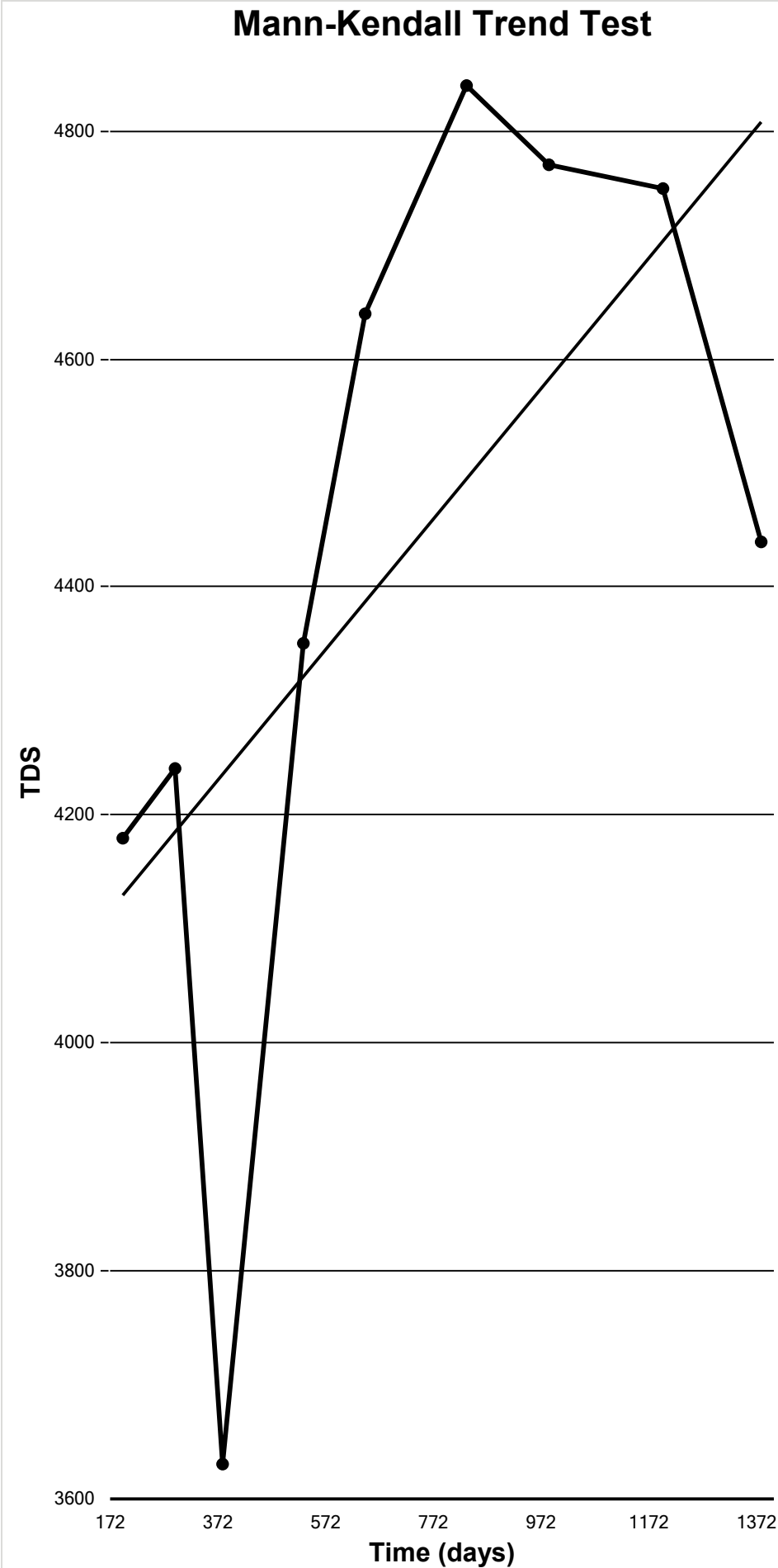


Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	1.5639
M-K Test Value (S)	16
Tabulated p-value	0.0600
Approximate p-value	0.0589

OLS Regression Line (Blue)	
OLS Regression Slope	0.0005
OLS Regression Intercept	1.5791

Insufficient statistical evidence of a significant trend at the specified level of significance.



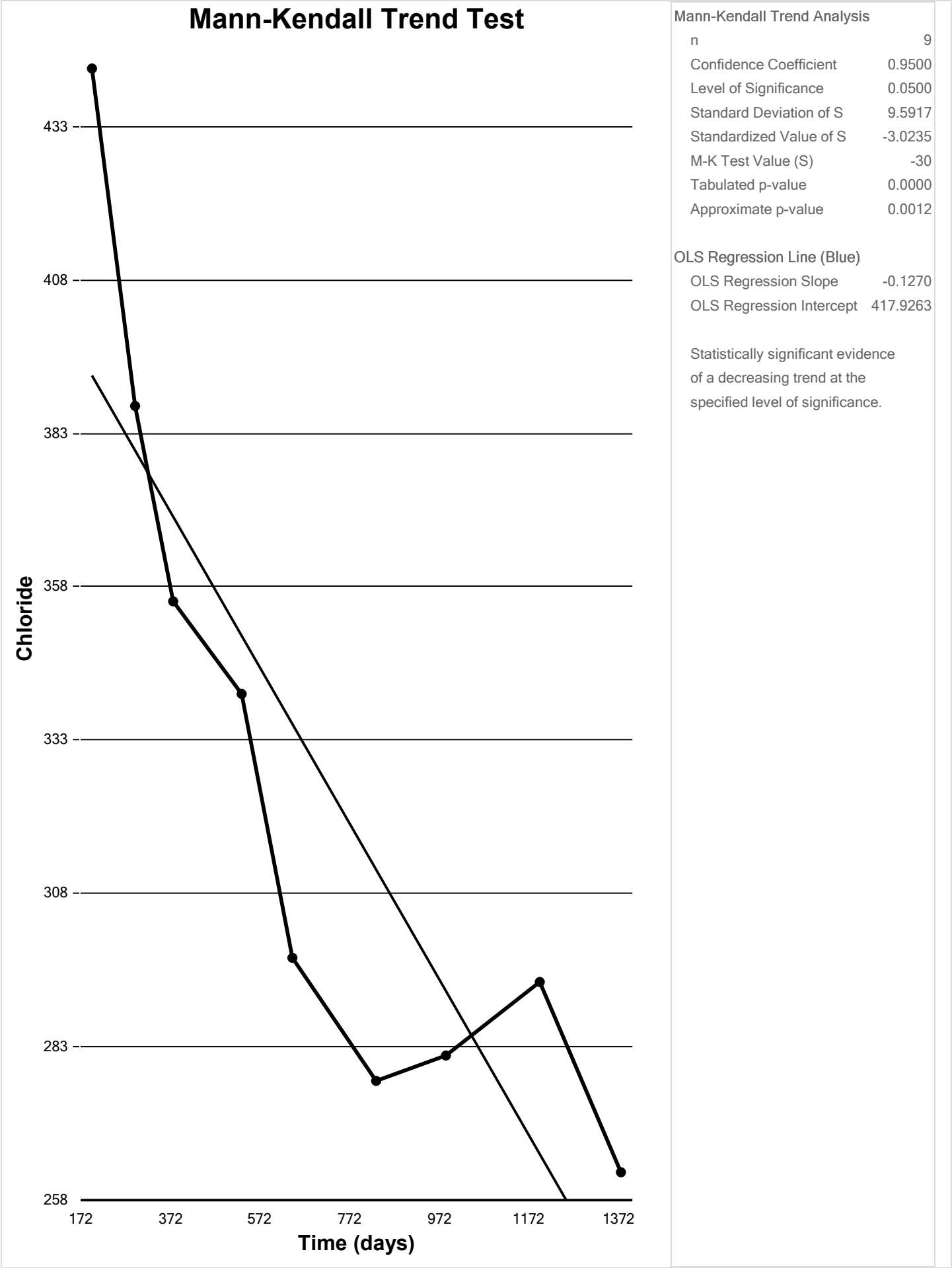


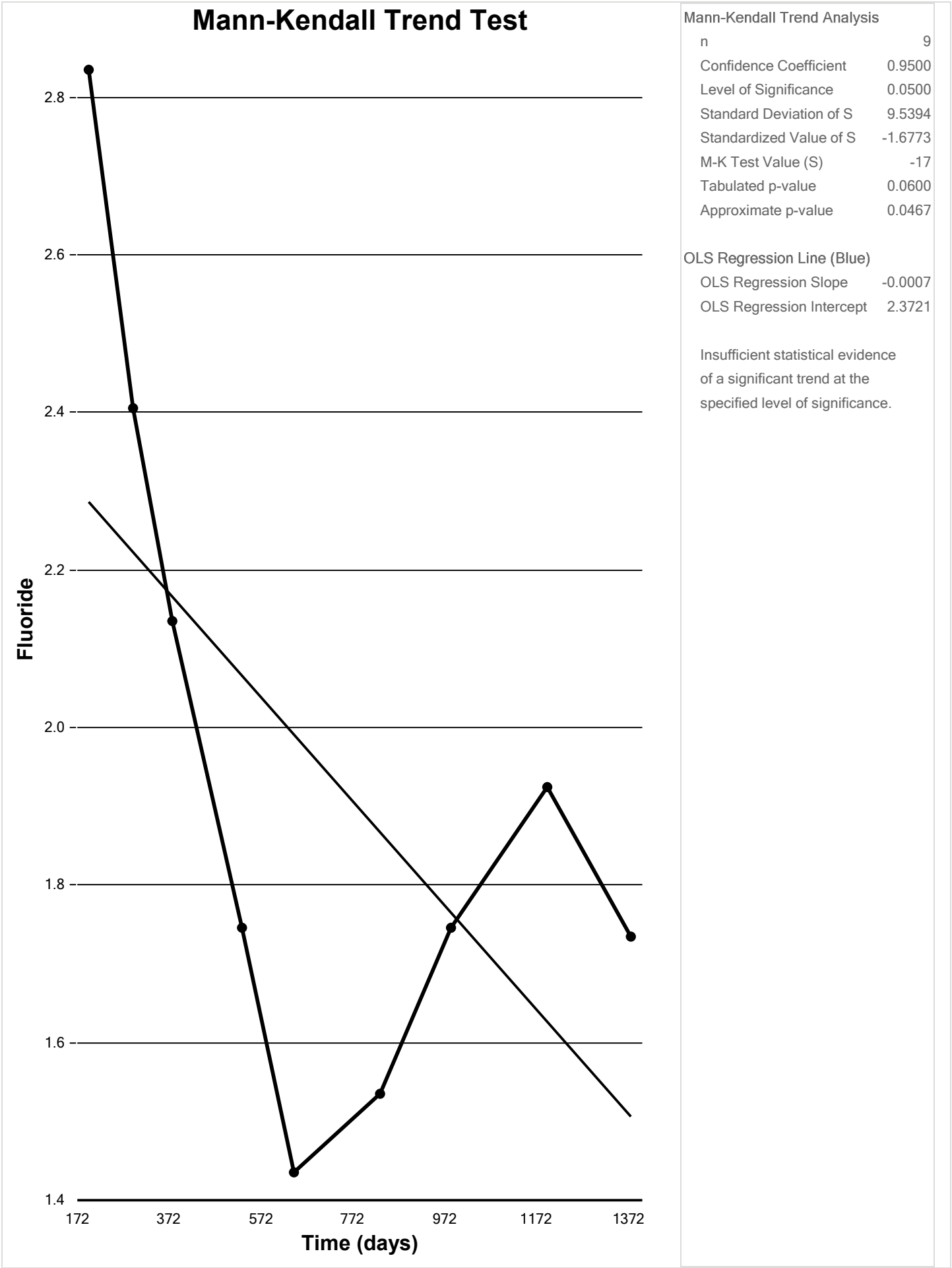
Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	1.7724
M-K Test Value (S)	18
Tabulated p-value	0.0380
Approximate p-value	0.0382

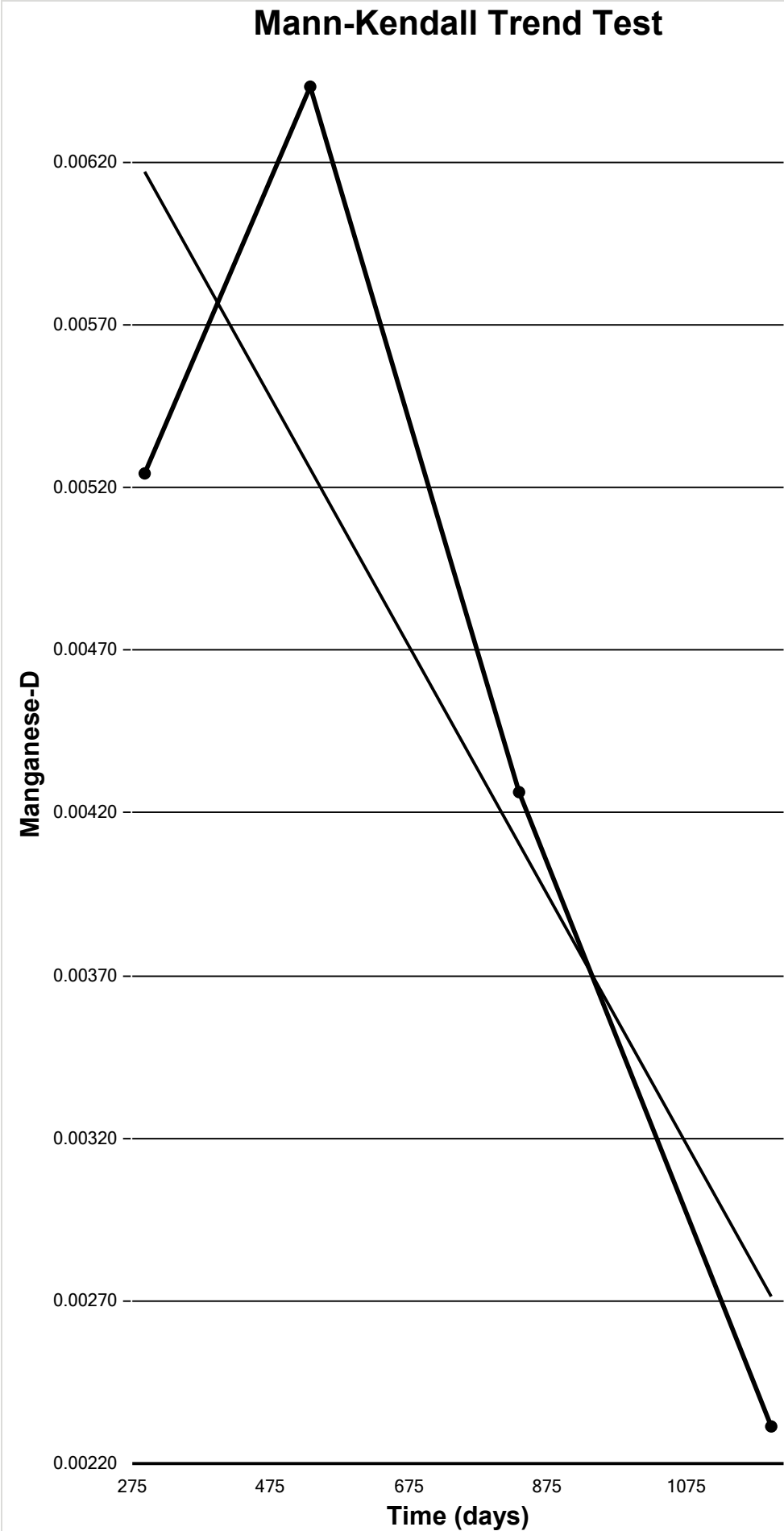
OLS Regression Line (Blue)	
OLS Regression Slope	0.5739
OLS Regression Intercept	4,015.8437

Statistically significant evidence of an increasing trend at the specified level of significance.

APPENDIX C2D
MANN-KENDALL STATISTICAL EVALUATION
MW-119



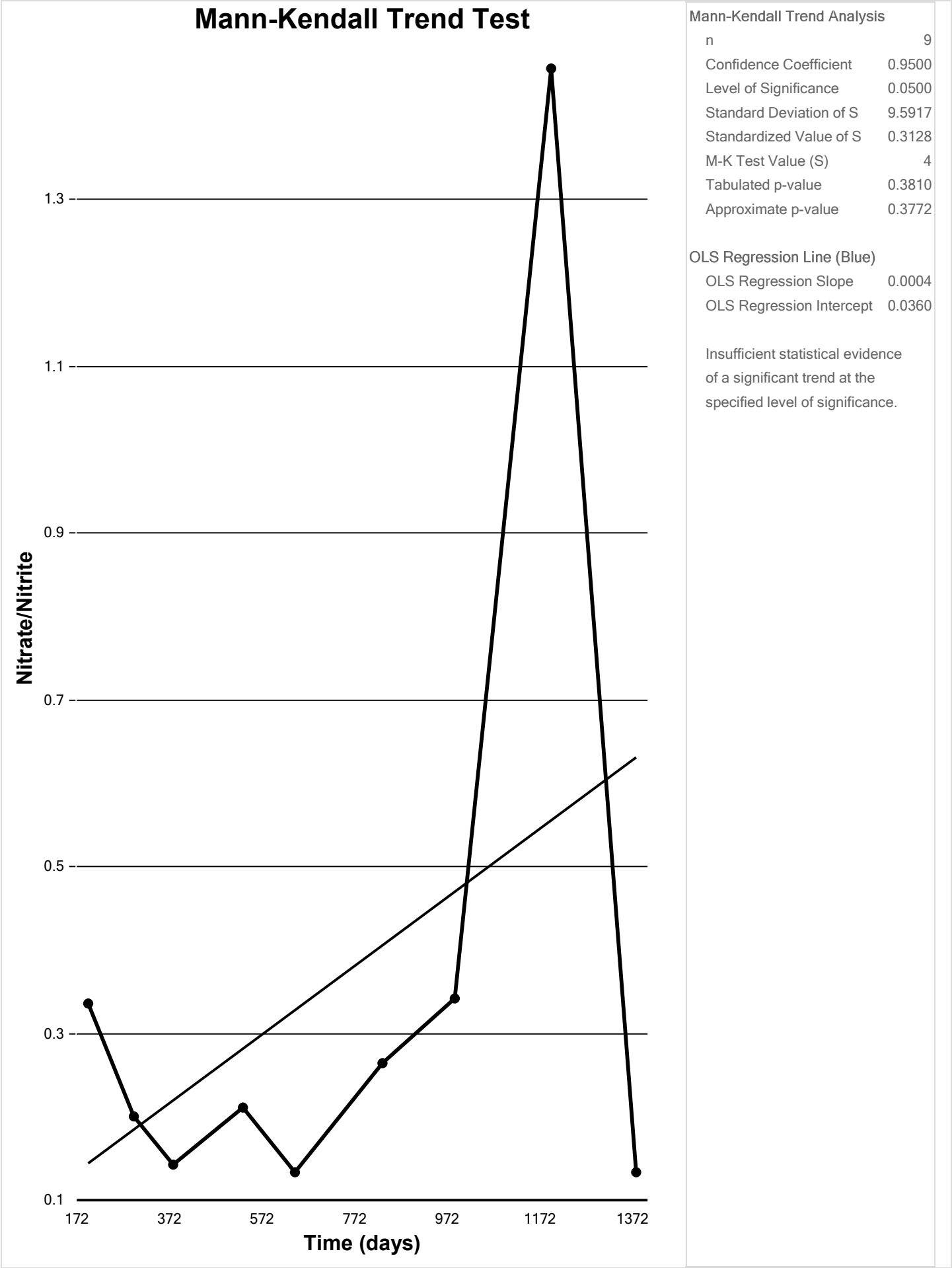


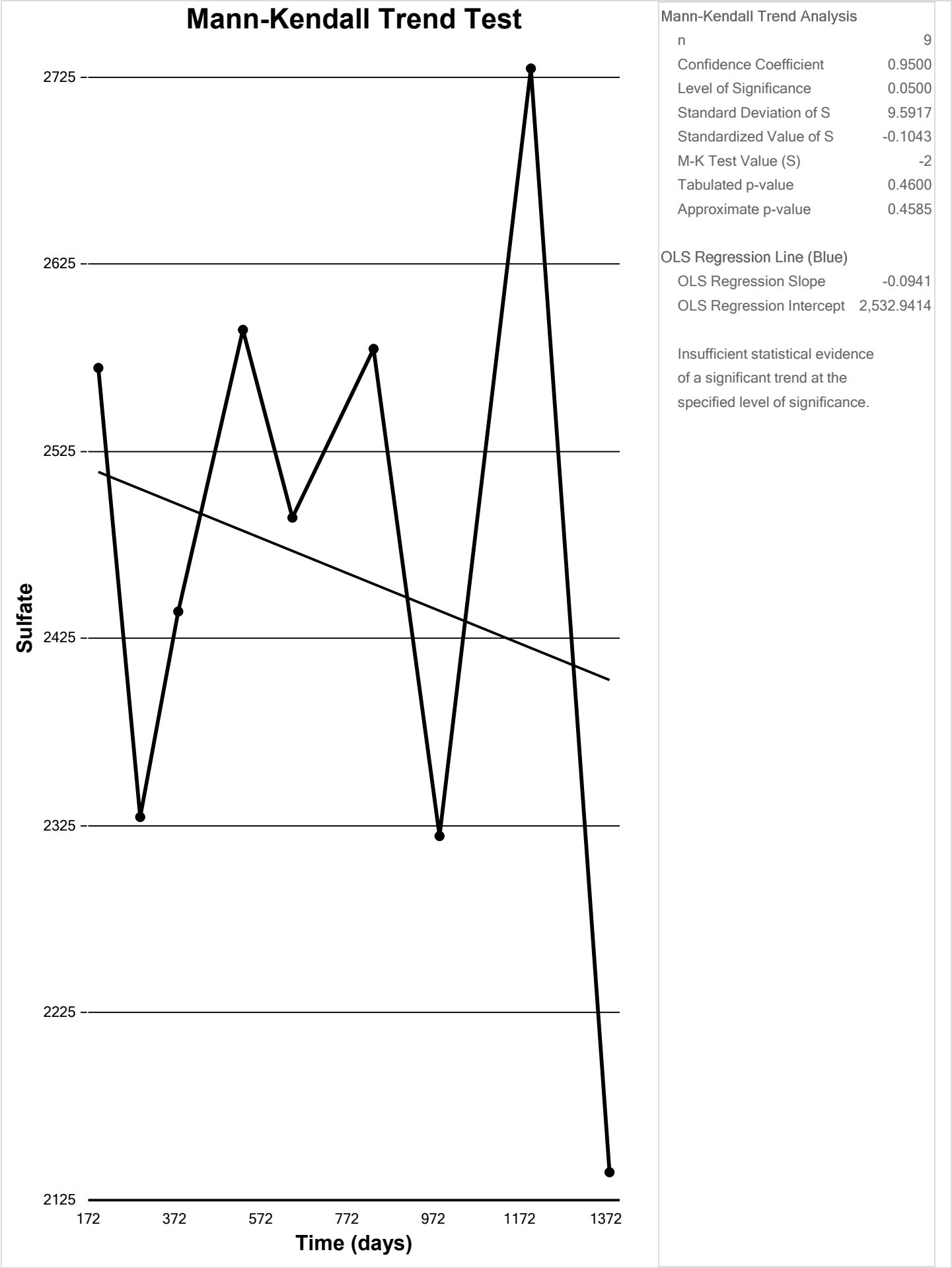


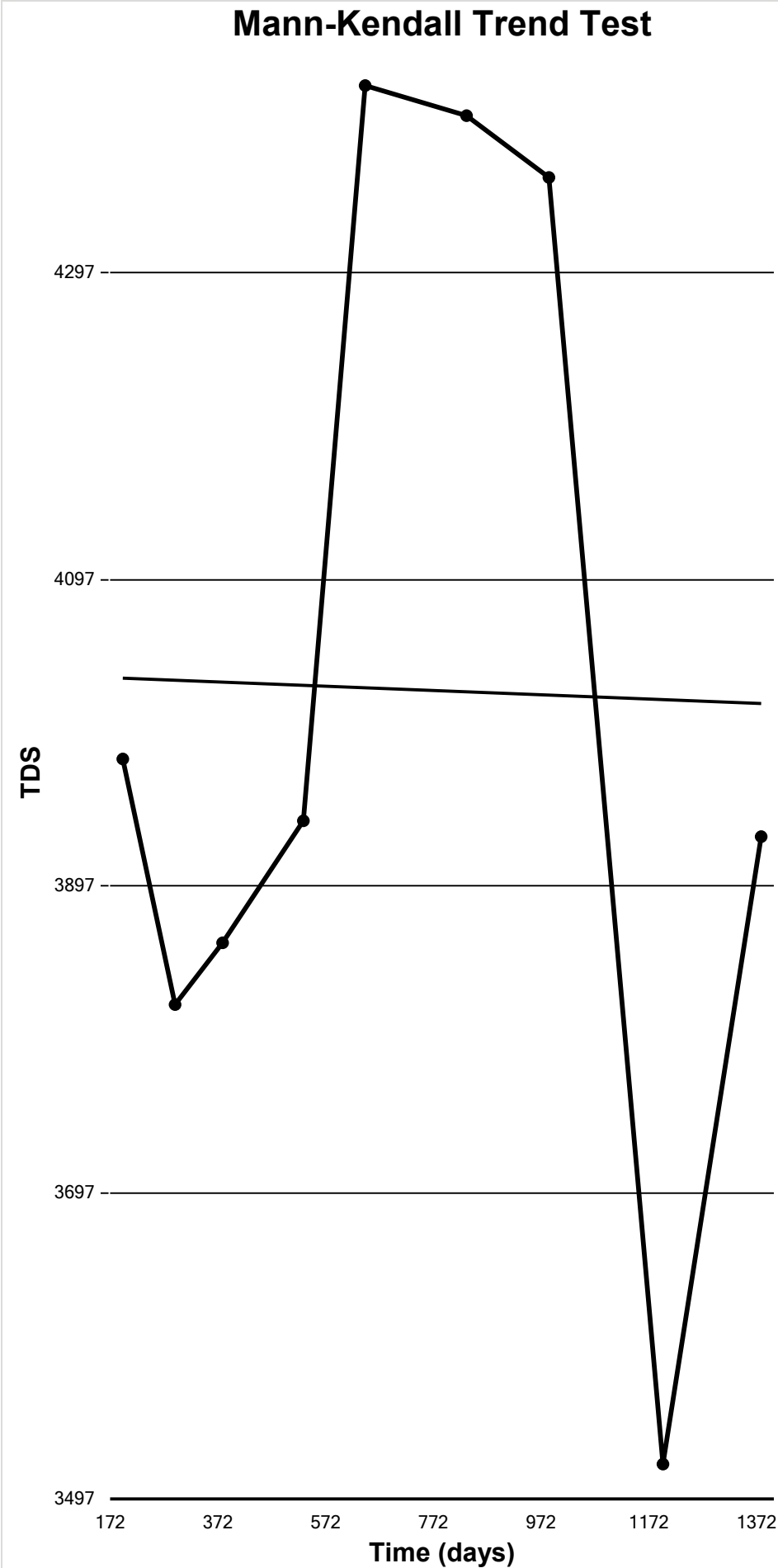
Mann-Kendall Trend Analysis	
n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.0190
M-K Test Value (S)	-4
Tabulated p-value	0.1670
Approximate p-value	0.1541

OLS Regression Line (Blue)	
OLS Regression Slope	0.0000
OLS Regression Intercept	0.0073

Insufficient statistical evidence of a significant trend at the specified level of significance.





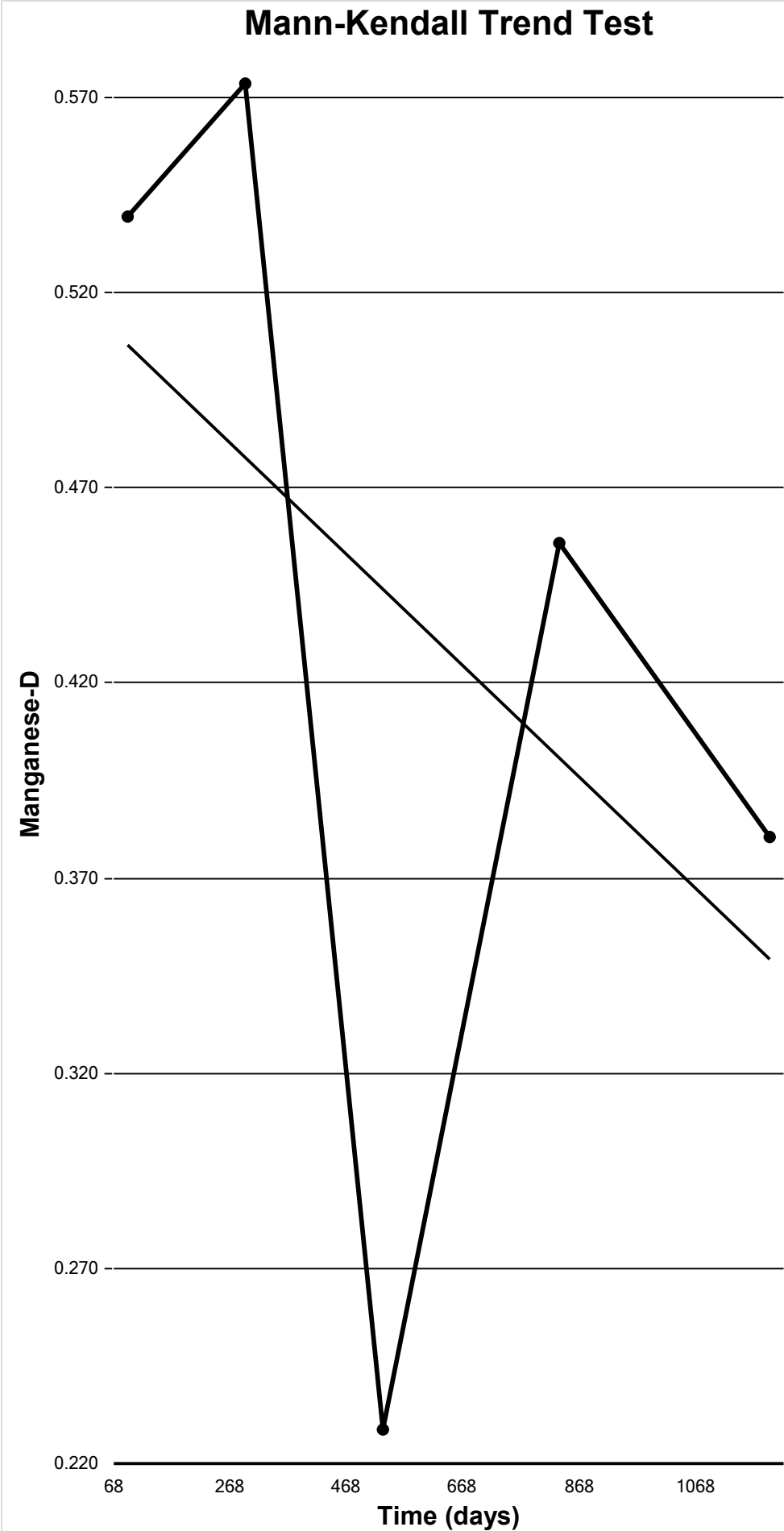


Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	
M-K Test Value (S)	0
Tabulated p-value	0.5400
Approximate p-value	

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0138
OLS Regression Intercept	4,035.4305

Insufficient statistical evidence
of a significant trend at the
specified level of significance.

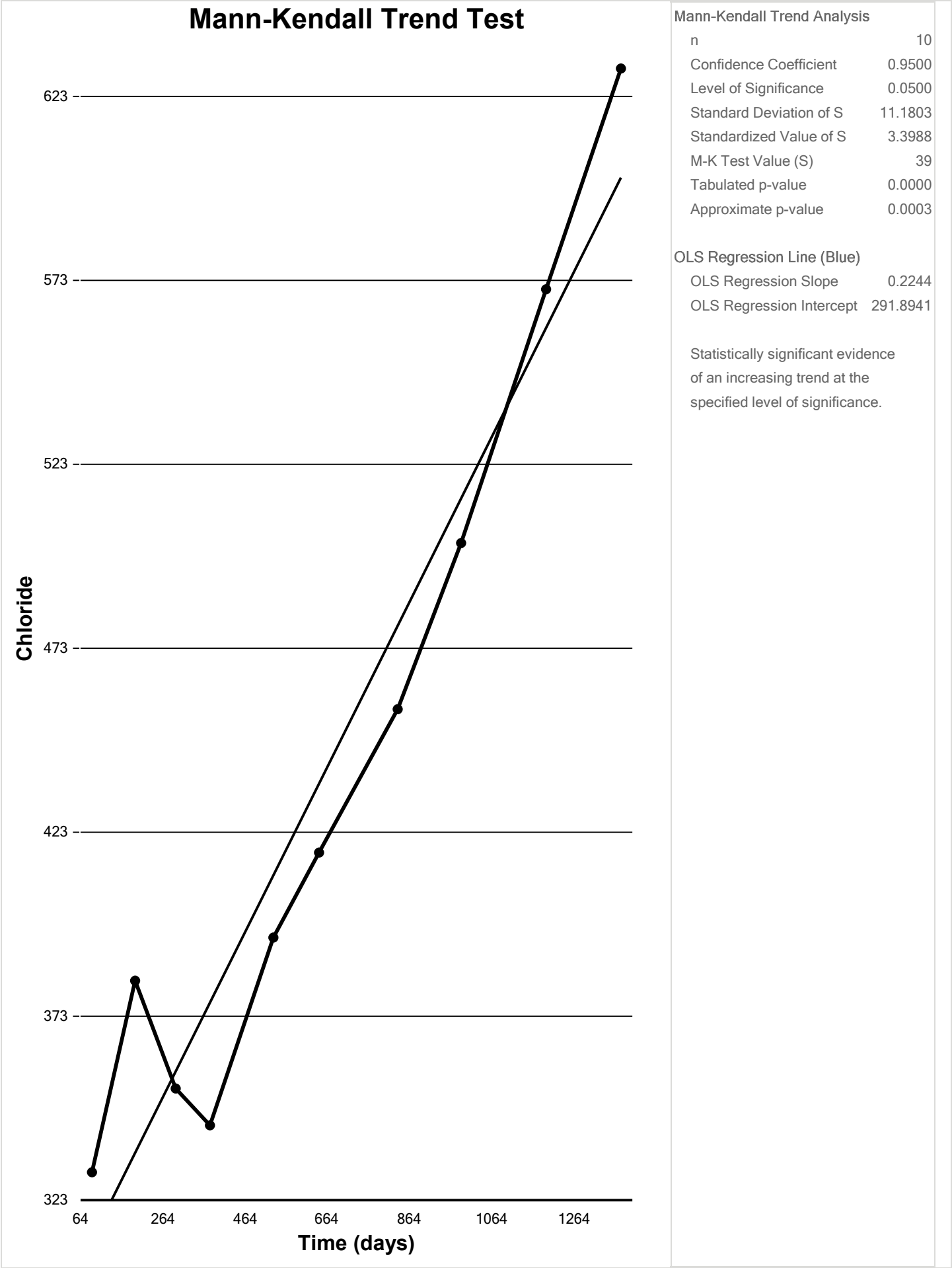
APPENDIX C2E
MANN-KENDALL STATISTICAL EVALUATION
MW-29

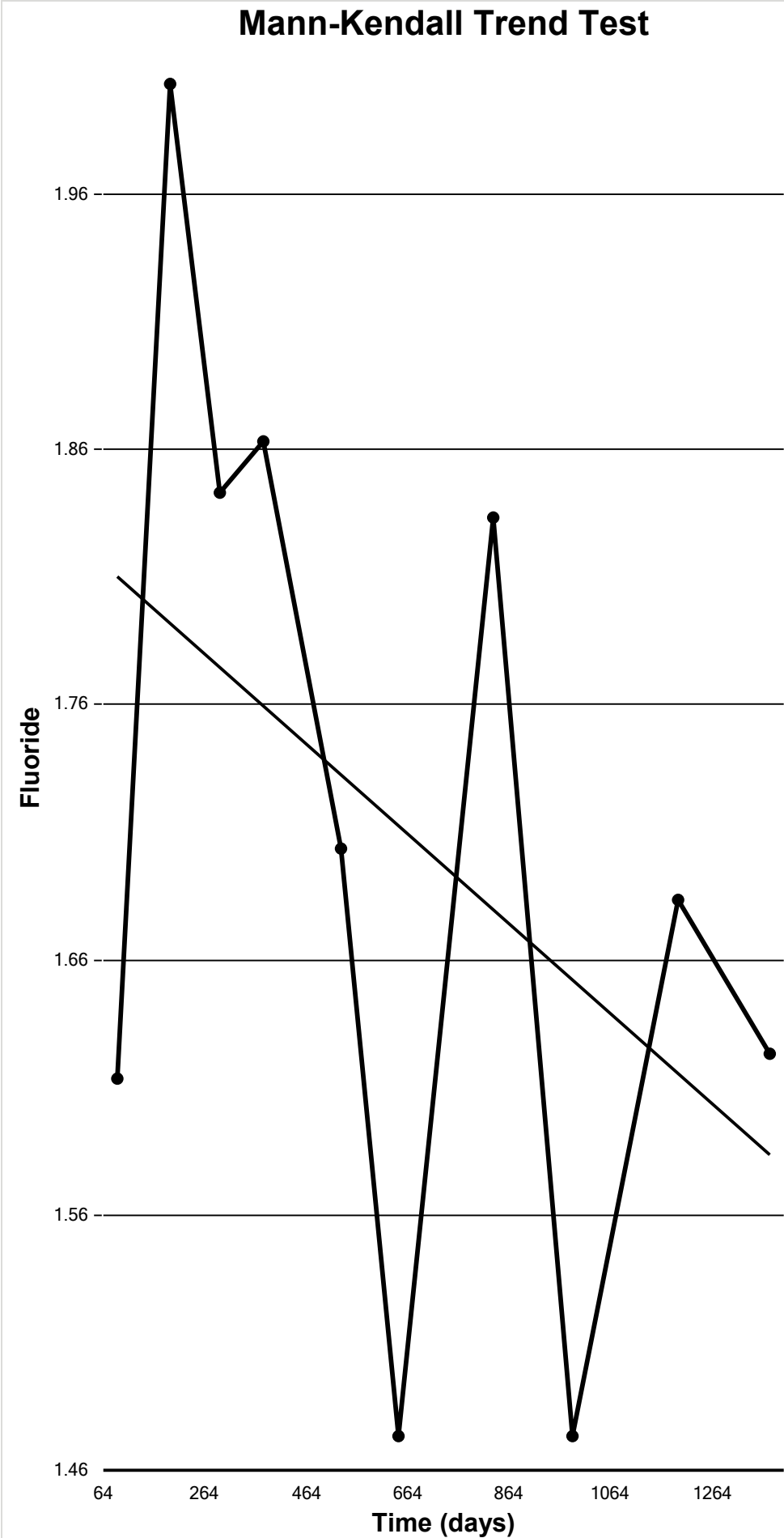


Mann-Kendall Trend Analysis	
n	5
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	4.0825
Standardized Value of S	-0.7348
M-K Test Value (S)	-4
Tabulated p-value	0.2420
Approximate p-value	0.2312

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0001
OLS Regression Intercept	0.5199

Insufficient statistical evidence
of a significant trend at the
specified level of significance.

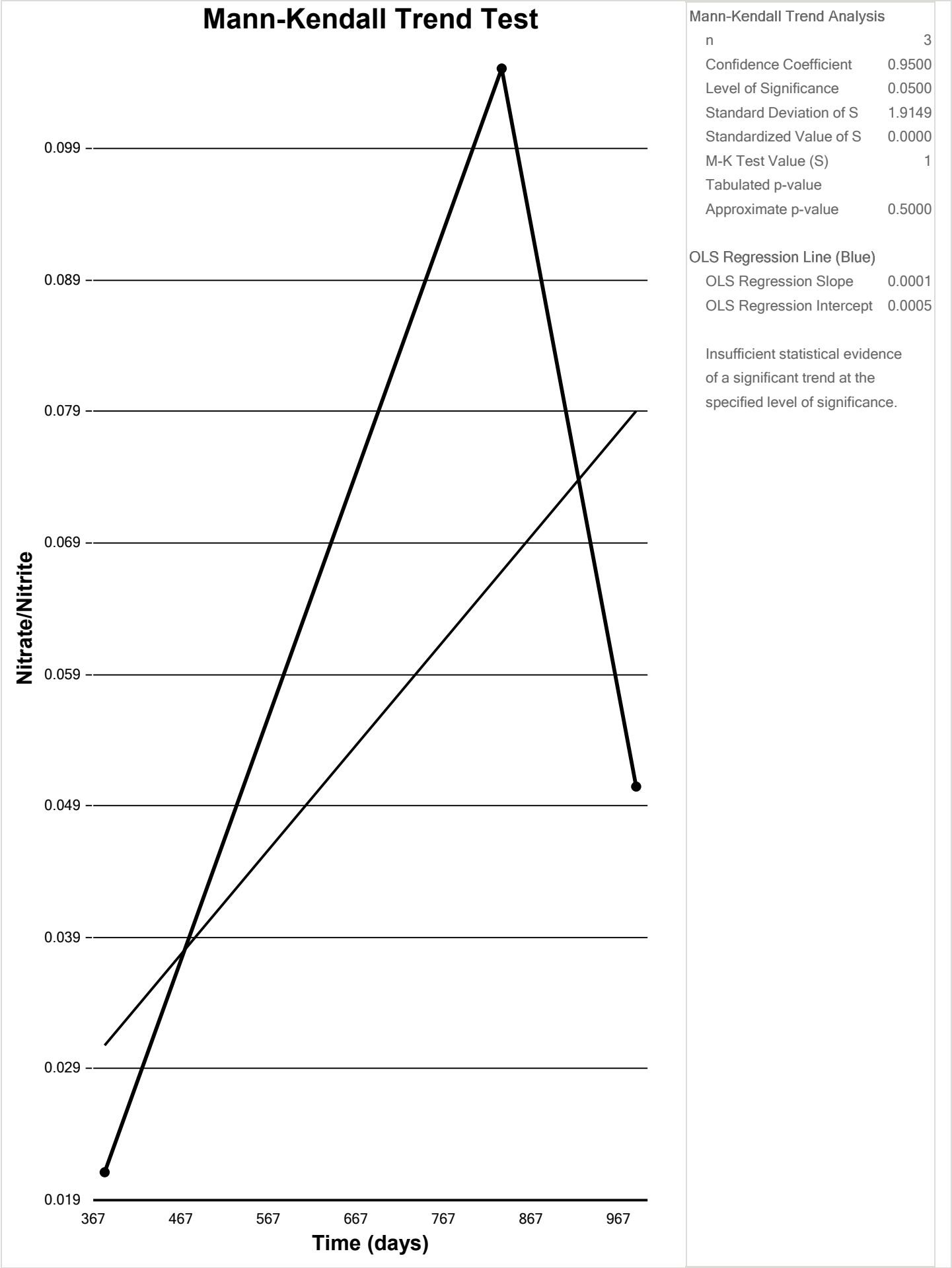


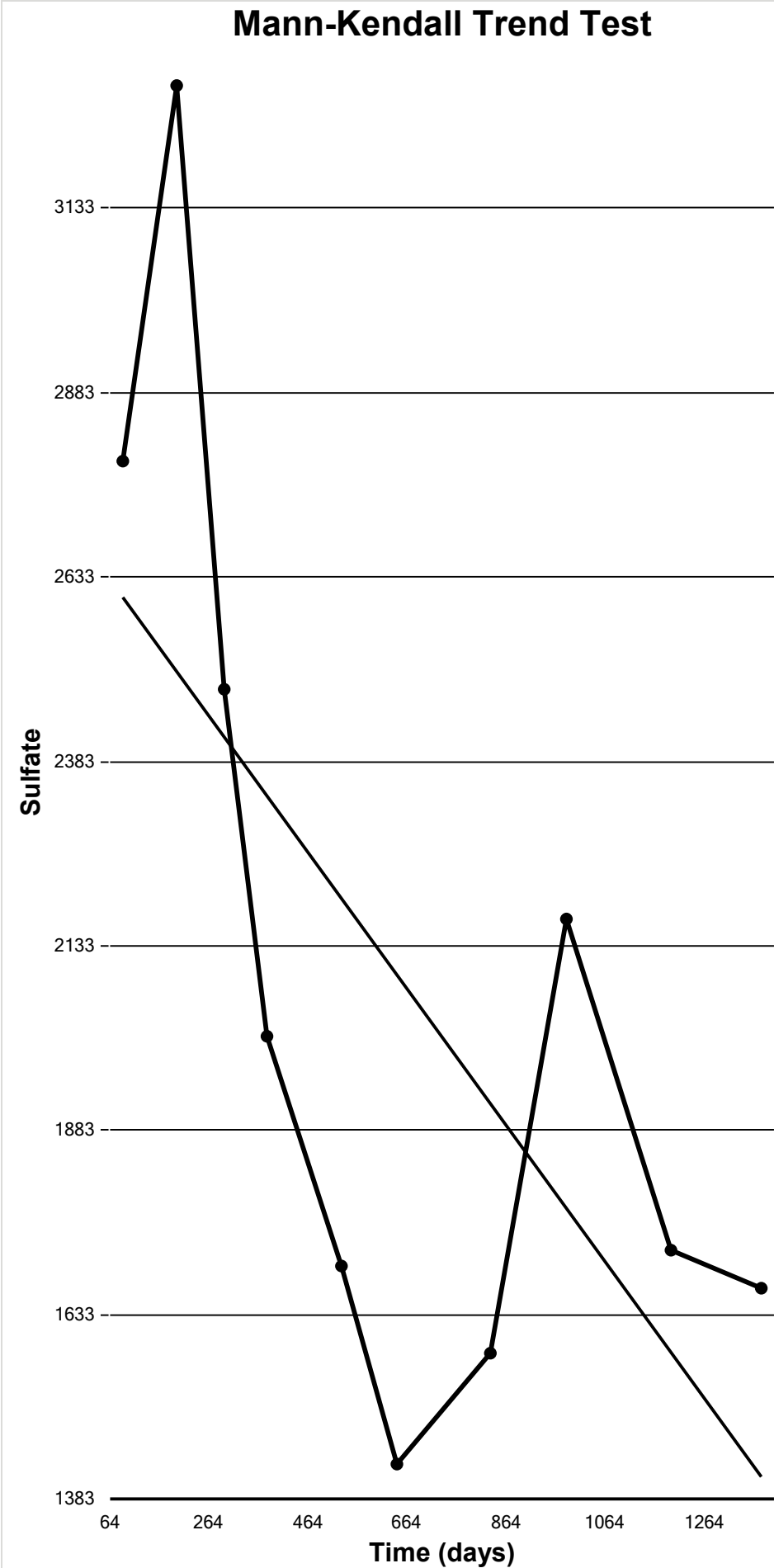


Mann-Kendall Trend Analysis	
n	10
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	11.1355
Standardized Value of S	-1.3470
M-K Test Value (S)	-16
Tabulated p-value	0.0780
Approximate p-value	0.0890

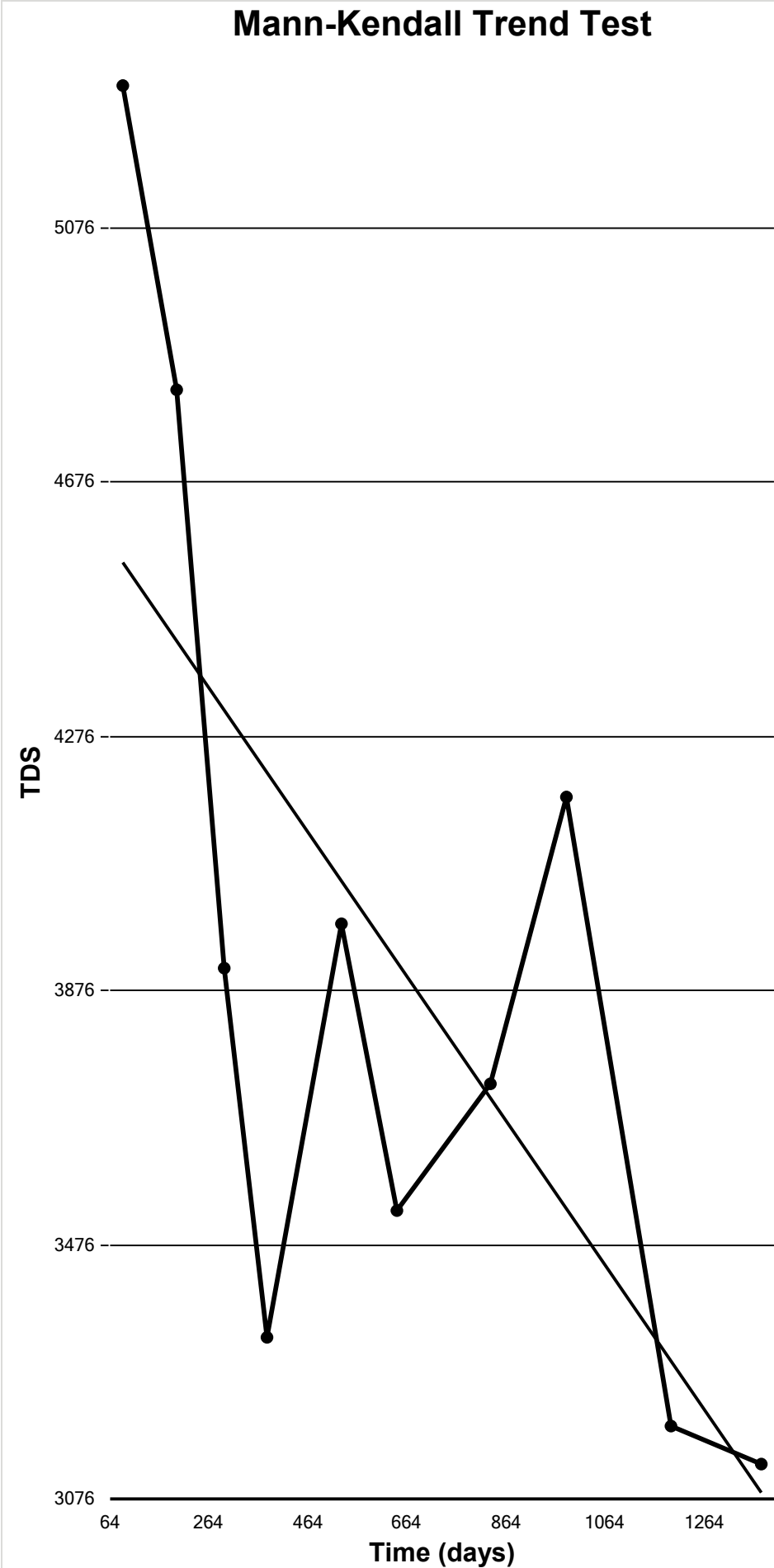
OLS Regression Line (Blue)	
OLS Regression Slope	-0.0002
OLS Regression Intercept	1.8230

Insufficient statistical evidence
of a significant trend at the
specified level of significance.



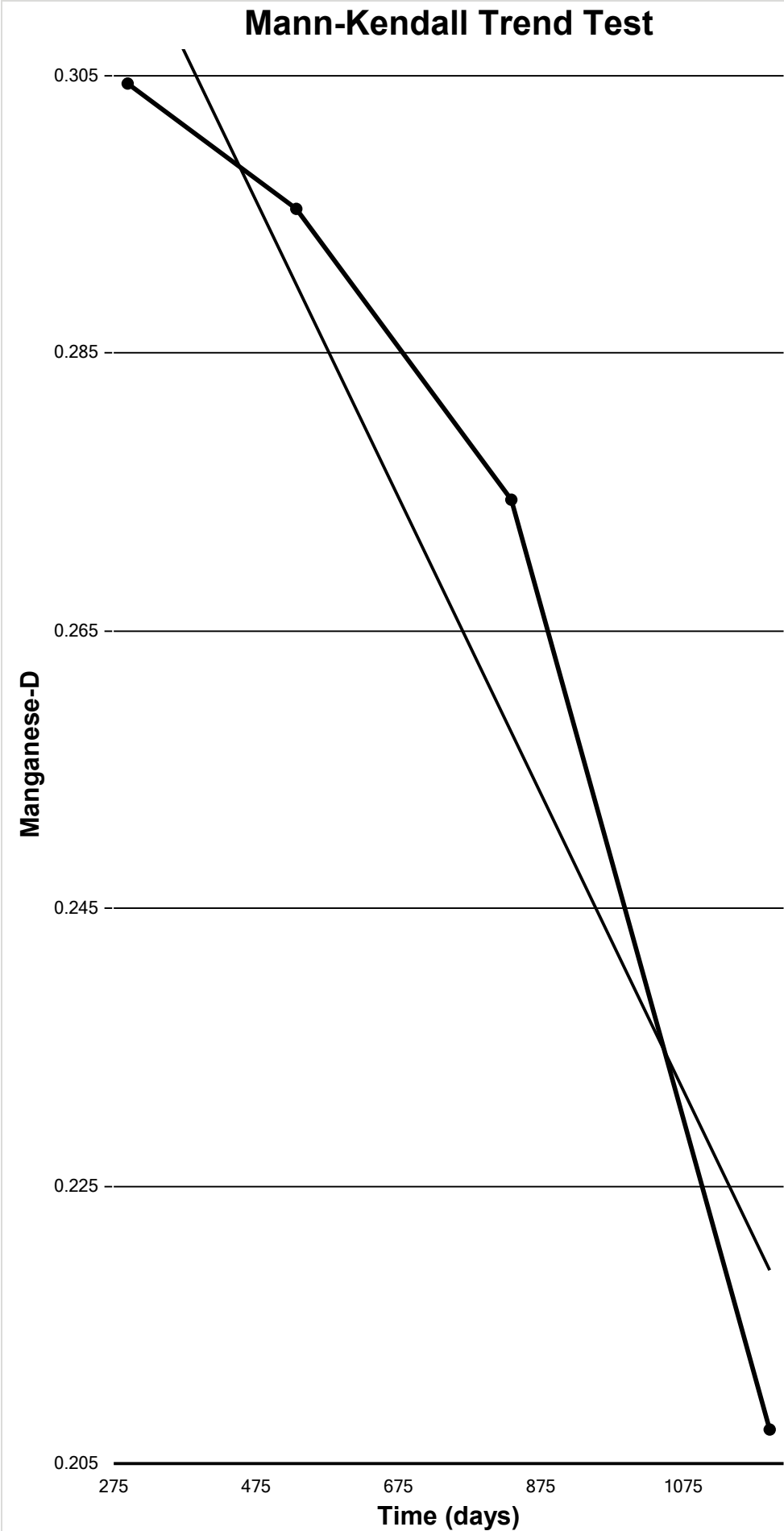


Mann-Kendall Trend Analysis	
n	10
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	11.1803
Standardized Value of S	-1.9677
M-K Test Value (S)	-23
Tabulated p-value	0.0230
Approximate p-value	0.0245
OLS Regression Line (Blue)	
OLS Regression Slope	-0.9255
OLS Regression Intercept	2,690.0122
Statistically significant evidence of a decreasing trend at the specified level of significance.	



Mann-Kendall Trend Analysis	
n	10
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	11.1803
Standardized Value of S	-2.1466
M-K Test Value (S)	-25
Tabulated p-value	0.0140
Approximate p-value	0.0159
OLS Regression Line (Blue)	
OLS Regression Slope	-1.1365
OLS Regression Intercept	4,652.9424
Statistically significant evidence of a decreasing trend at the specified level of significance.	

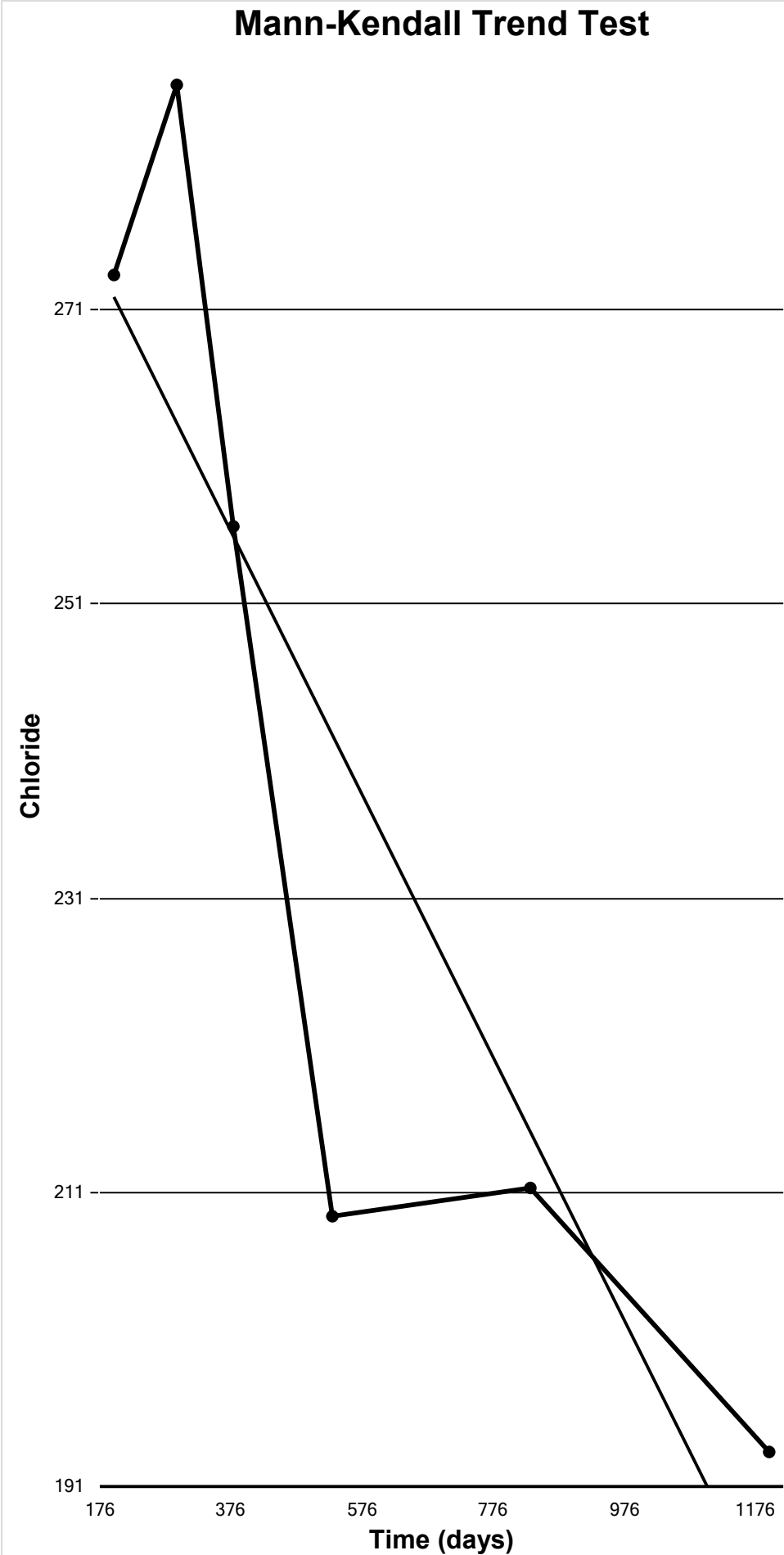
APPENDIX C2F
MANN-KENDALL STATISTICAL EVALUATION
MW-56



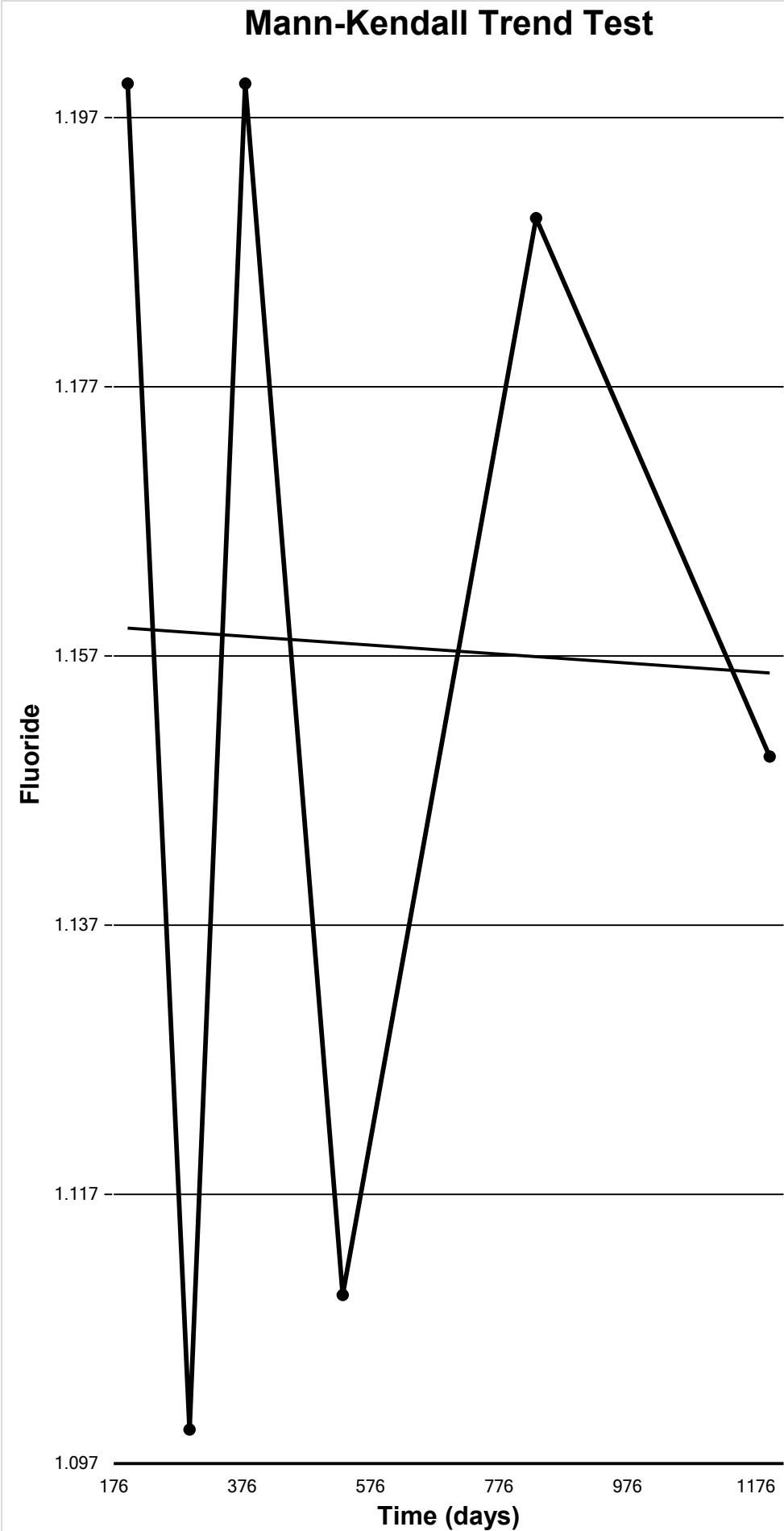
Mann-Kendall Trend Analysis		
n		4
Confidence Coefficient		0.9500
Level of Significance		0.0500
Standard Deviation of S		2.9439
Standardized Value of S		-1.6984
M-K Test Value (S)		-6
Tabulated p-value		0.0420
Approximate p-value		0.0447

OLS Regression Line (Blue)		
OLS Regression Slope		-0.0001
OLS Regression Intercept		0.3462

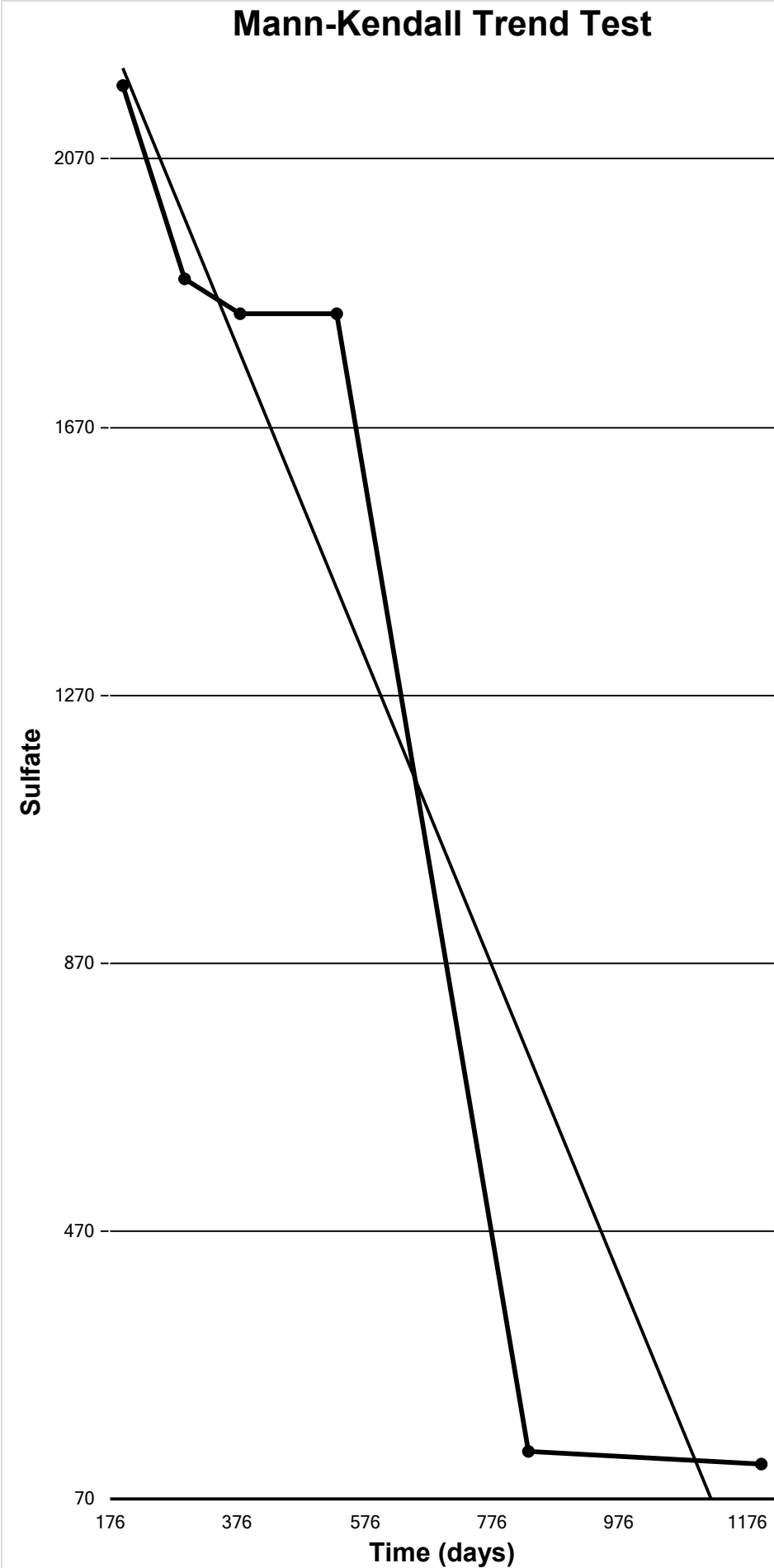
Statistically significant evidence of a decreasing trend at the specified level of significance.



Mann-Kendall Trend Analysis	
n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-1.8787
M-K Test Value (S)	-11
Tabulated p-value	0.0280
Approximate p-value	0.0301
OLS Regression Line (Blue)	
OLS Regression Slope	-0.0893
OLS Regression Intercept	289.1167
Statistically significant evidence of a decreasing trend at the specified level of significance.	



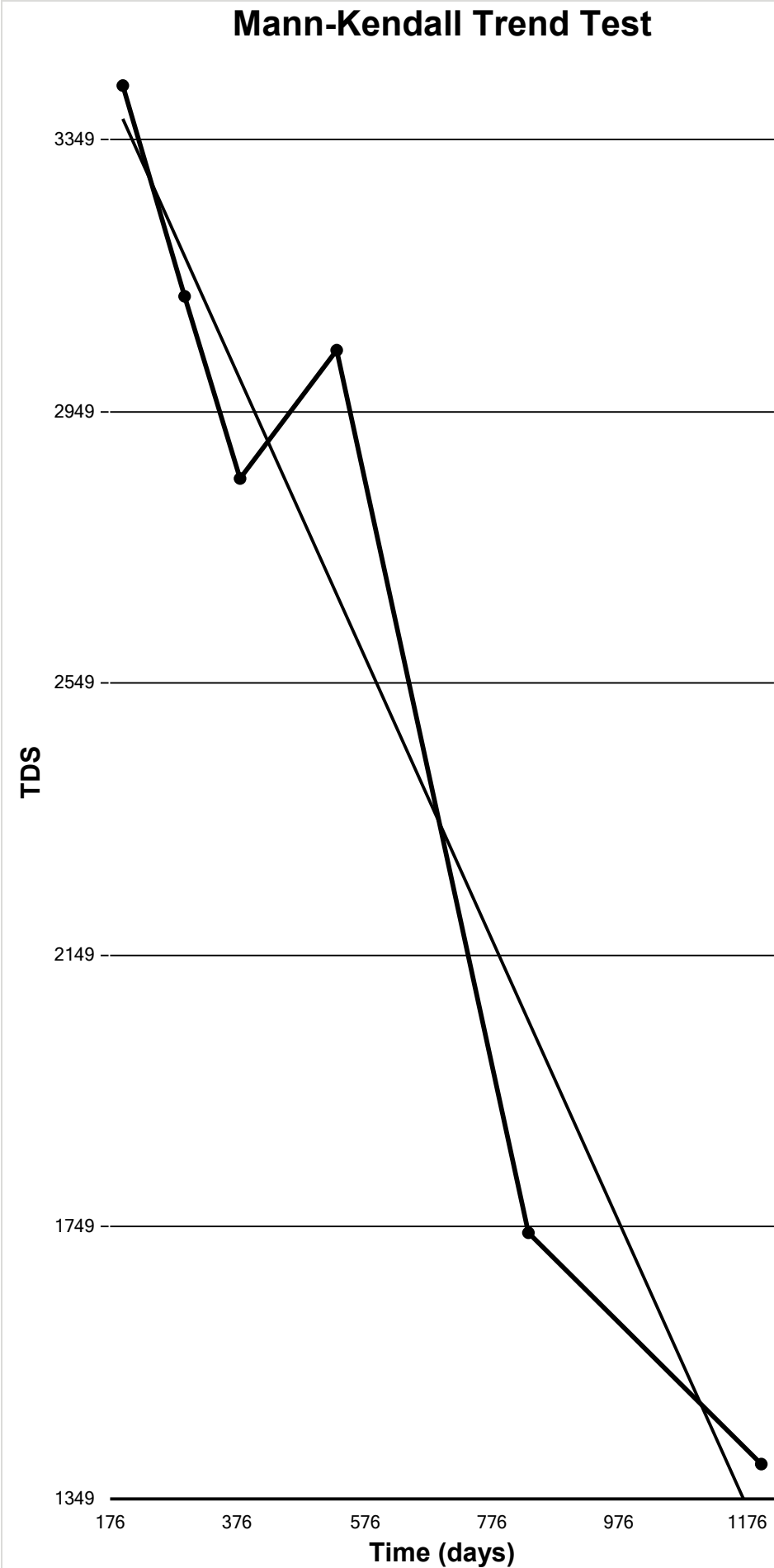
Mann-Kendall Trend Analysis	
n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.2281
Standardized Value of S	-0.1913
M-K Test Value (S)	-2
Tabulated p-value	0.3600
Approximate p-value	0.4242
OLS Regression Line (Blue)	
OLS Regression Slope	0.0000
OLS Regression Intercept	1.1602
Insufficient statistical evidence of a significant trend at the specified level of significance.	



Mann-Kendall Trend Analysis	
n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.2281
Standardized Value of S	-2.4865
M-K Test Value (S)	-14
Tabulated p-value	0.0010
Approximate p-value	0.0064

OLS Regression Line (Blue)	
OLS Regression Slope	-2.3175
OLS Regression Intercept	2,661.9222

Statistically significant evidence
of a decreasing trend at the
specified level of significance.

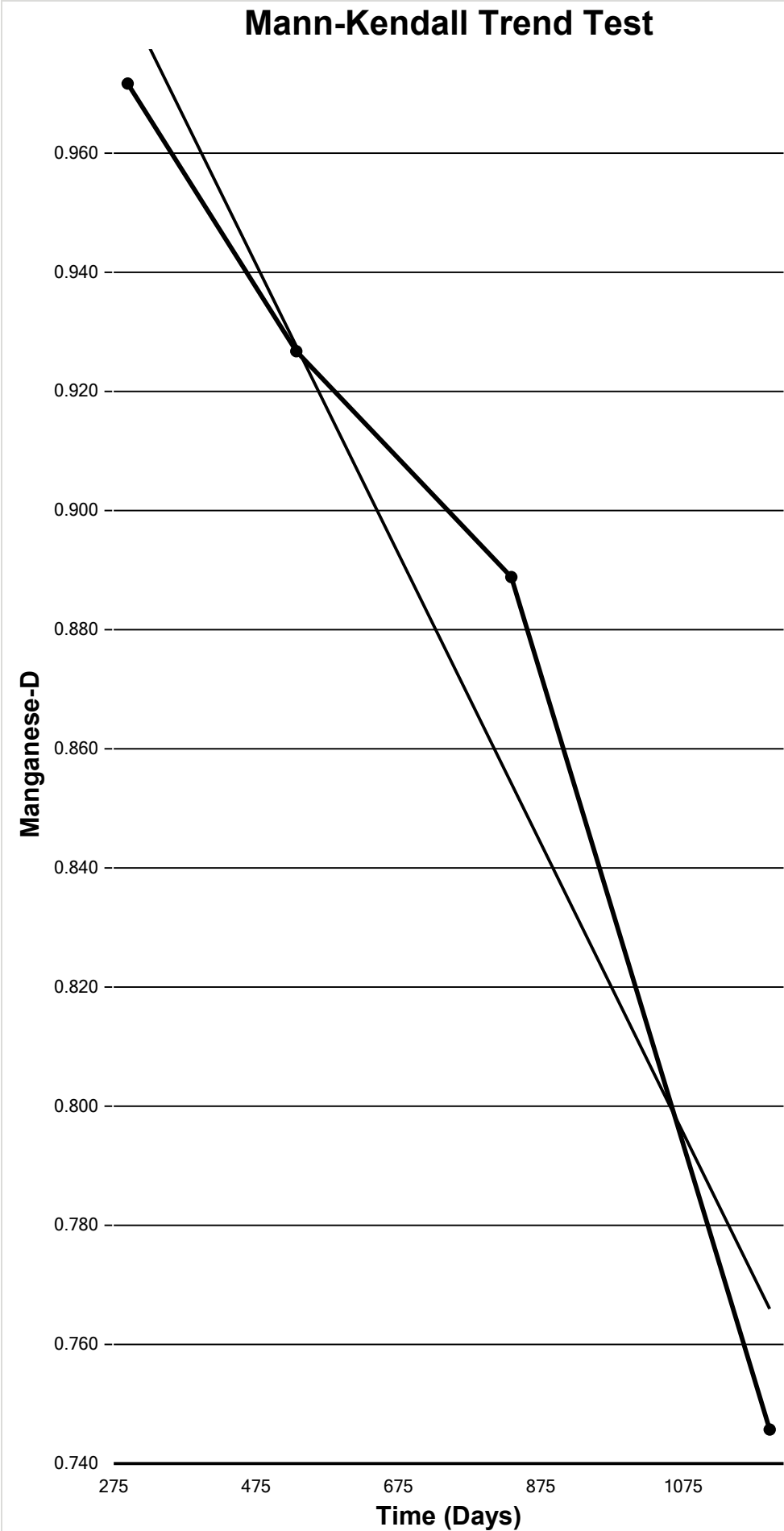


Mann-Kendall Trend Analysis	
n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.3229
Standardized Value of S	-2.2544
M-K Test Value (S)	-13
Tabulated p-value	0.0080
Approximate p-value	0.0121

OLS Regression Line (Blue)	
OLS Regression Slope	-2.0895
OLS Regression Intercept	3,792.8856

Statistically significant evidence of a decreasing trend at the specified level of significance.

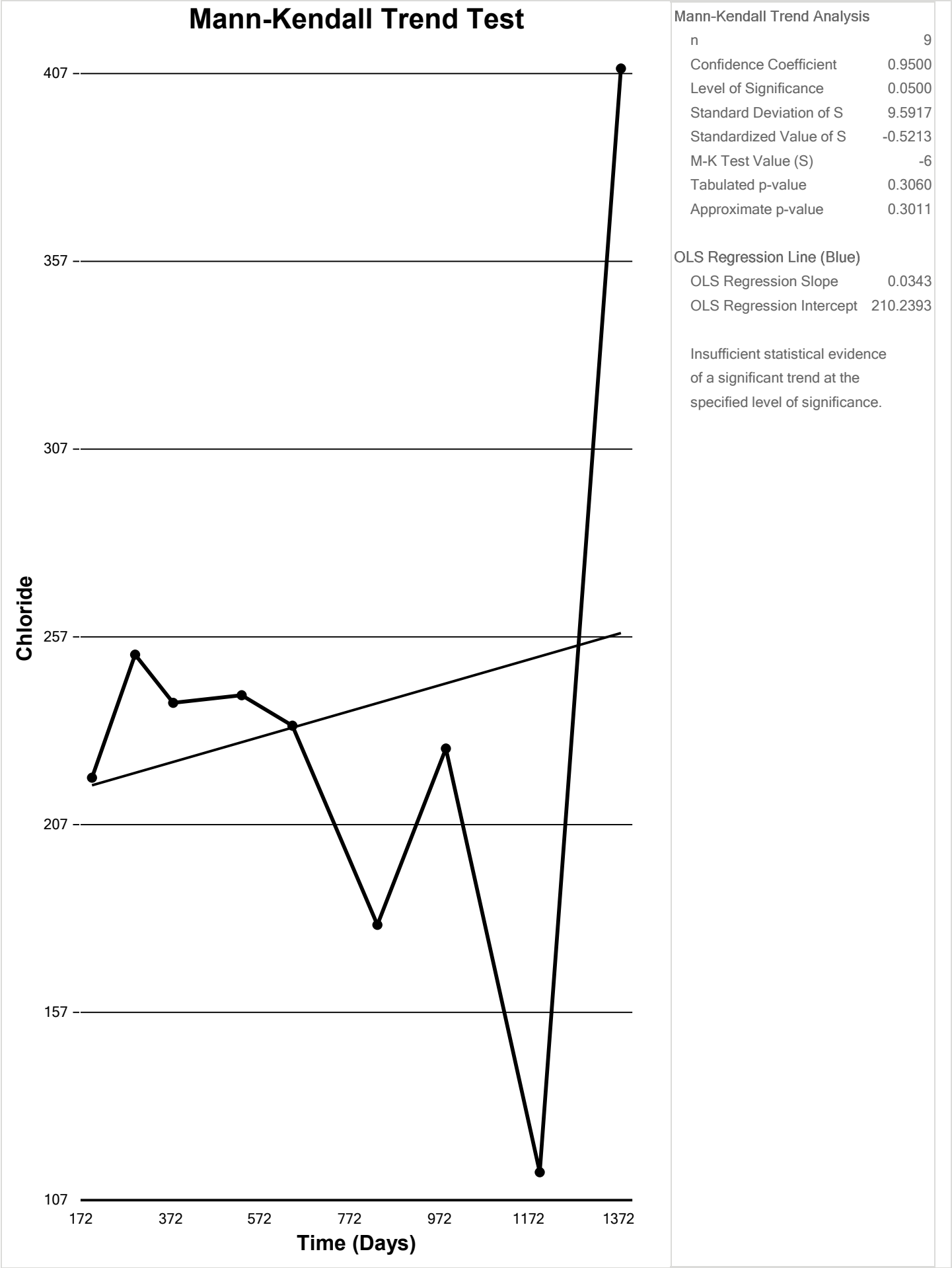
APPENDIX C2G
MANN-KENDALL STATISTICAL EVALUATION
MW-114

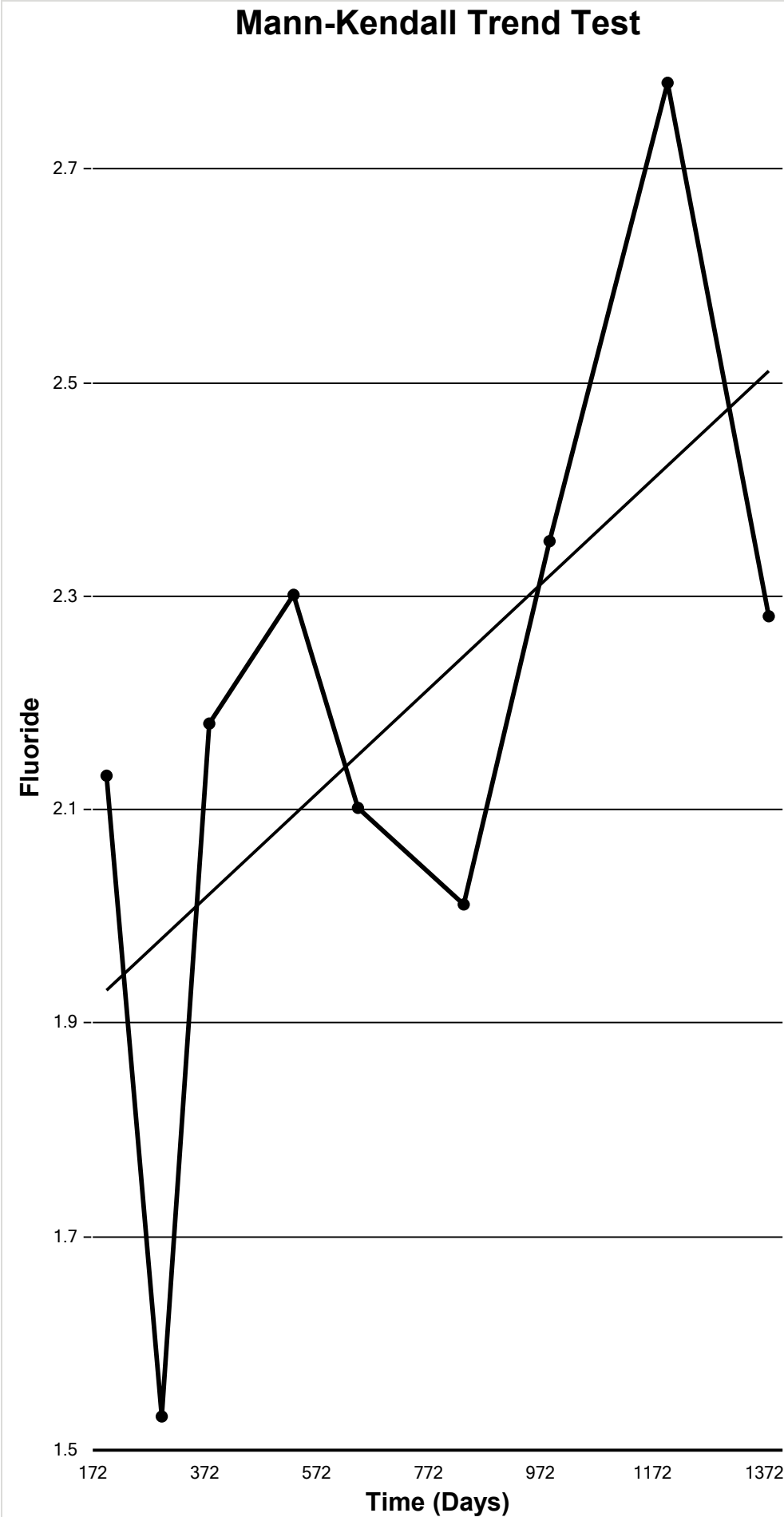


Mann-Kendall Trend Analysis	
n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.6984
M-K Test Value (S)	-6
Tabulated p-value	0.0420
Approximate p-value	0.0447

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0002
OLS Regression Intercept	1.0566

Statistically significant evidence of a decreasing trend at the specified level of significance.

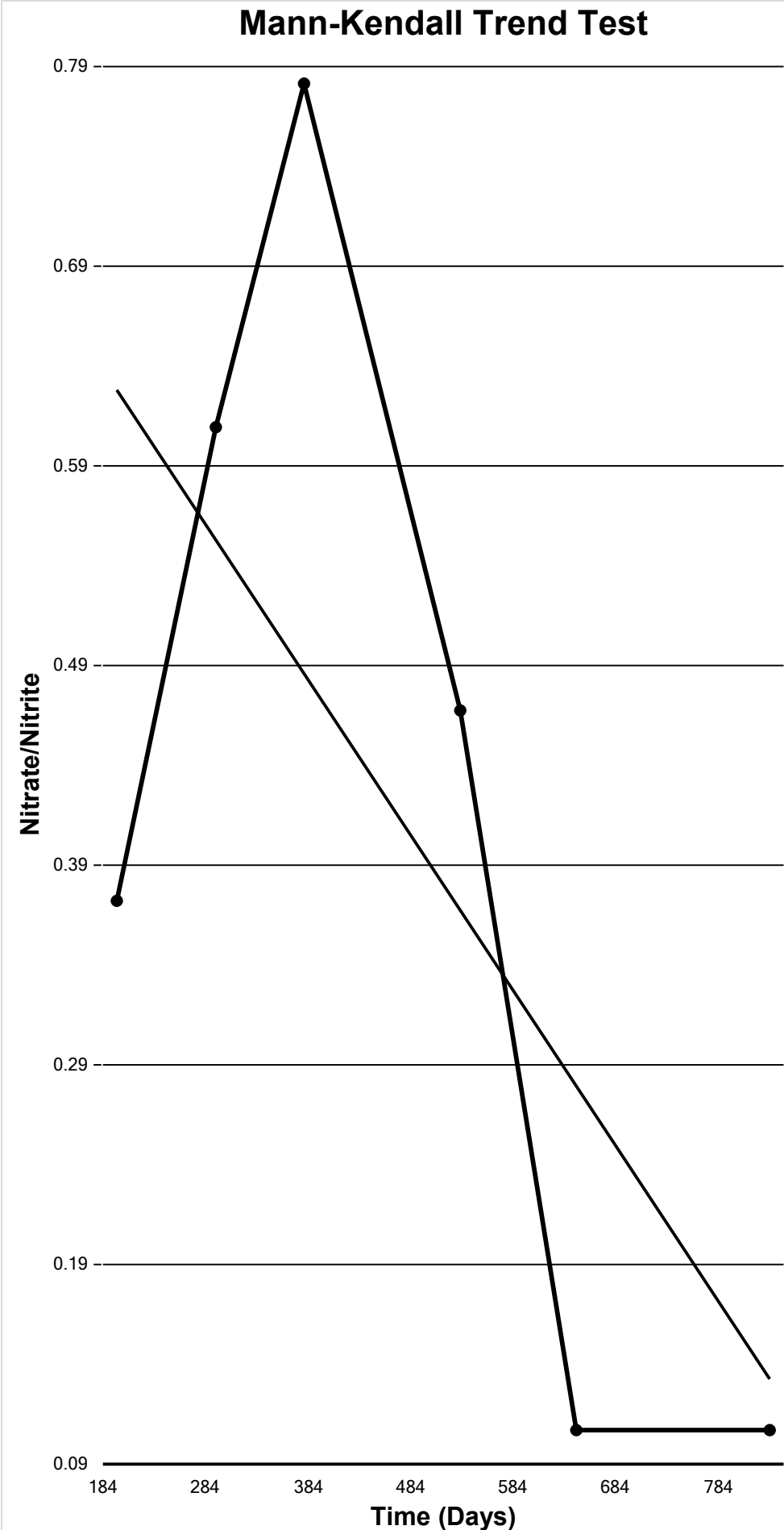




Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	1.3553
M-K Test Value (S)	14
Tabulated p-value	0.0900
Approximate p-value	0.0877

OLS Regression Line (Blue)	
OLS Regression Slope	0.0005
OLS Regression Intercept	1.8037

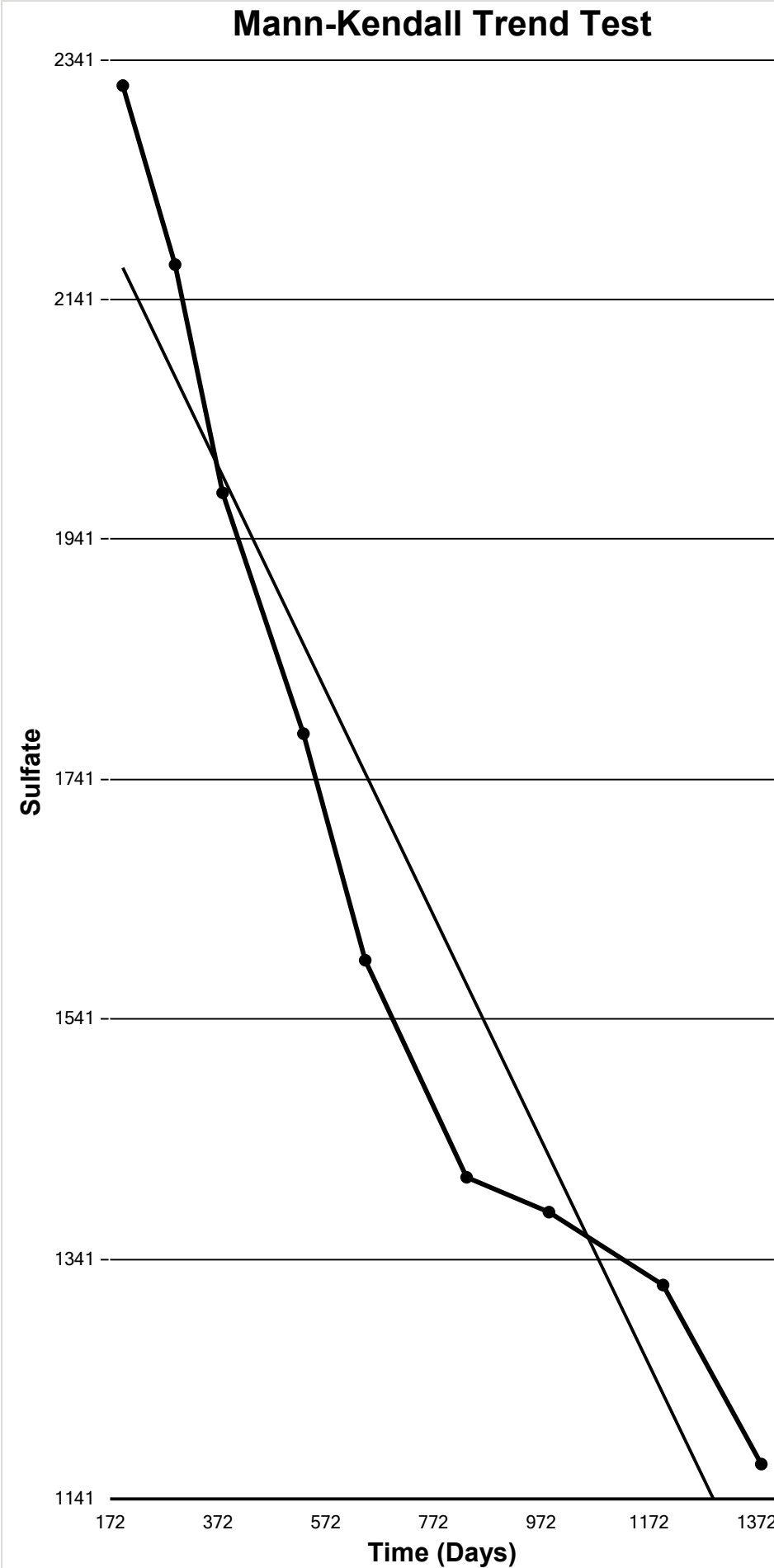
Insufficient statistical evidence
of a significant trend at the
specified level of significance.



Mann-Kendall Trend Analysis	
n	6
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	5.2281
Standardized Value of S	-0.9564
M-K Test Value (S)	-6
Tabulated p-value	0.1360
Approximate p-value	0.1694

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0008
OLS Regression Intercept	0.7845

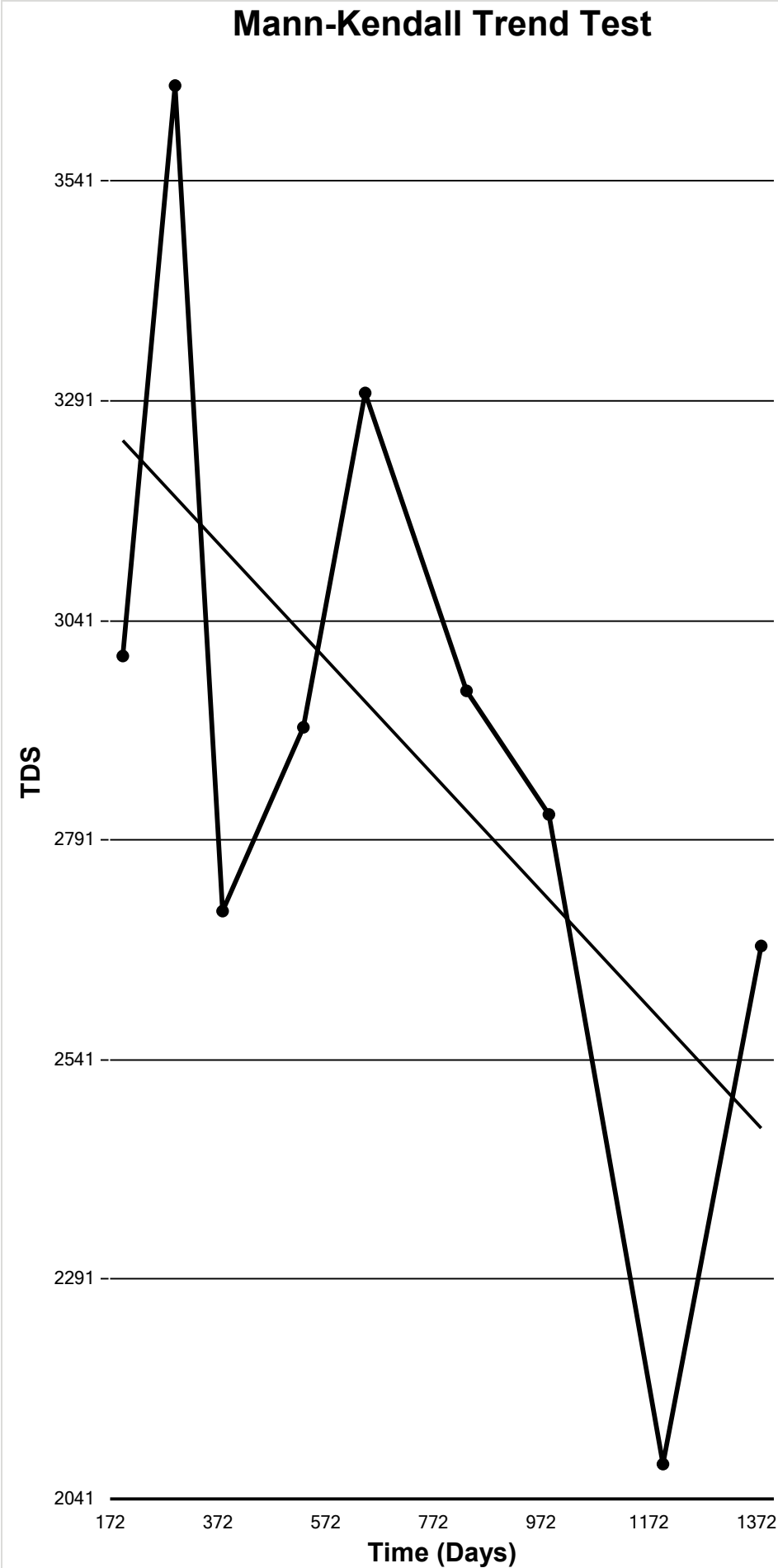
Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-3.6490
M-K Test Value (S)	-36
Tabulated p-value	0.0000
Approximate p-value	0.0001

OLS Regression Line (Blue)	
OLS Regression Slope	-0.9397
OLS Regression Intercept	2,353.0244

Statistically significant evidence of a decreasing trend at the specified level of significance.

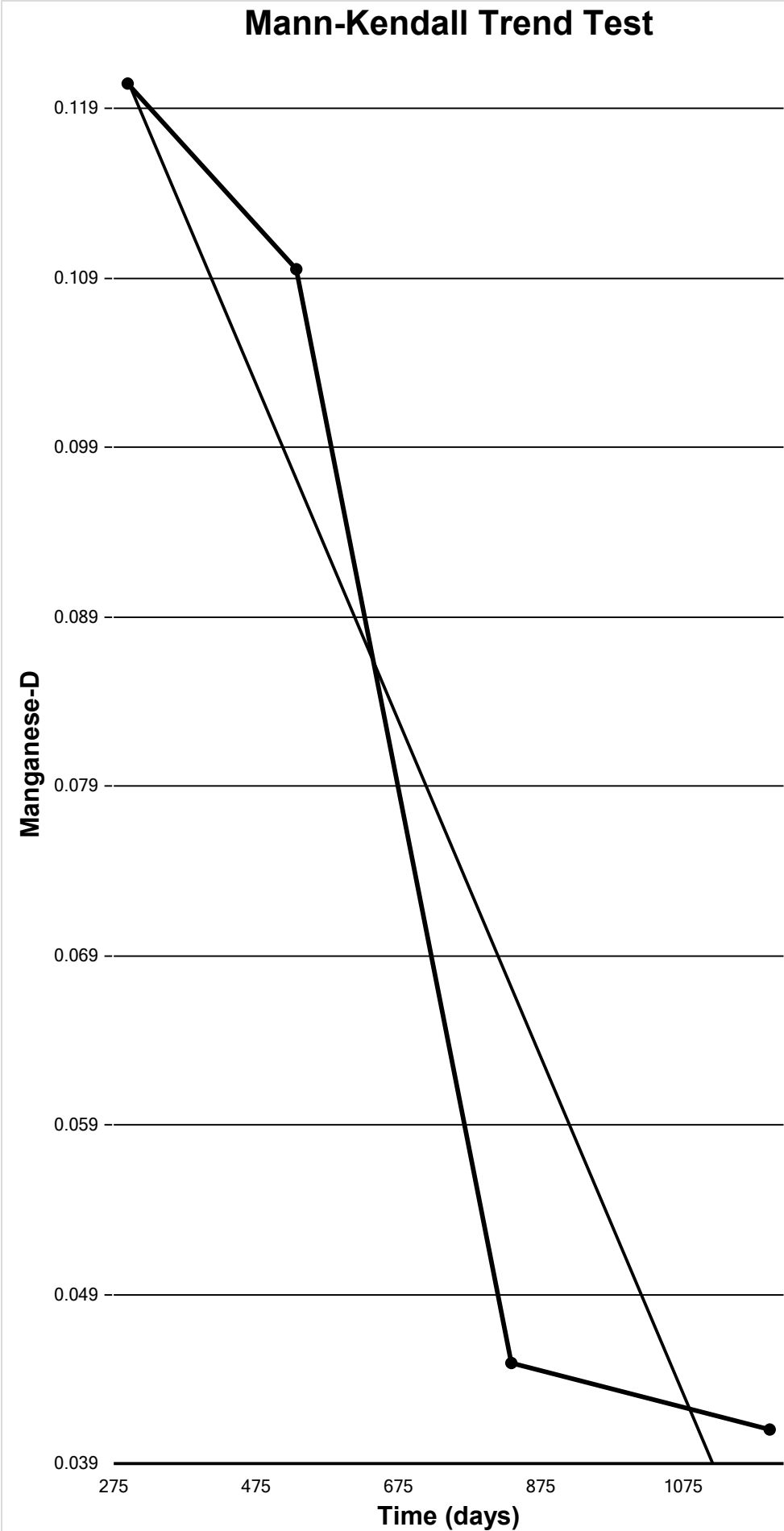


Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-1.7724
M-K Test Value (S)	-18
Tabulated p-value	0.0380
Approximate p-value	0.0382

OLS Regression Line (Blue)	
OLS Regression Slope	-0.6617
OLS Regression Intercept	3,375.0647

Statistically significant evidence of a decreasing trend at the specified level of significance.

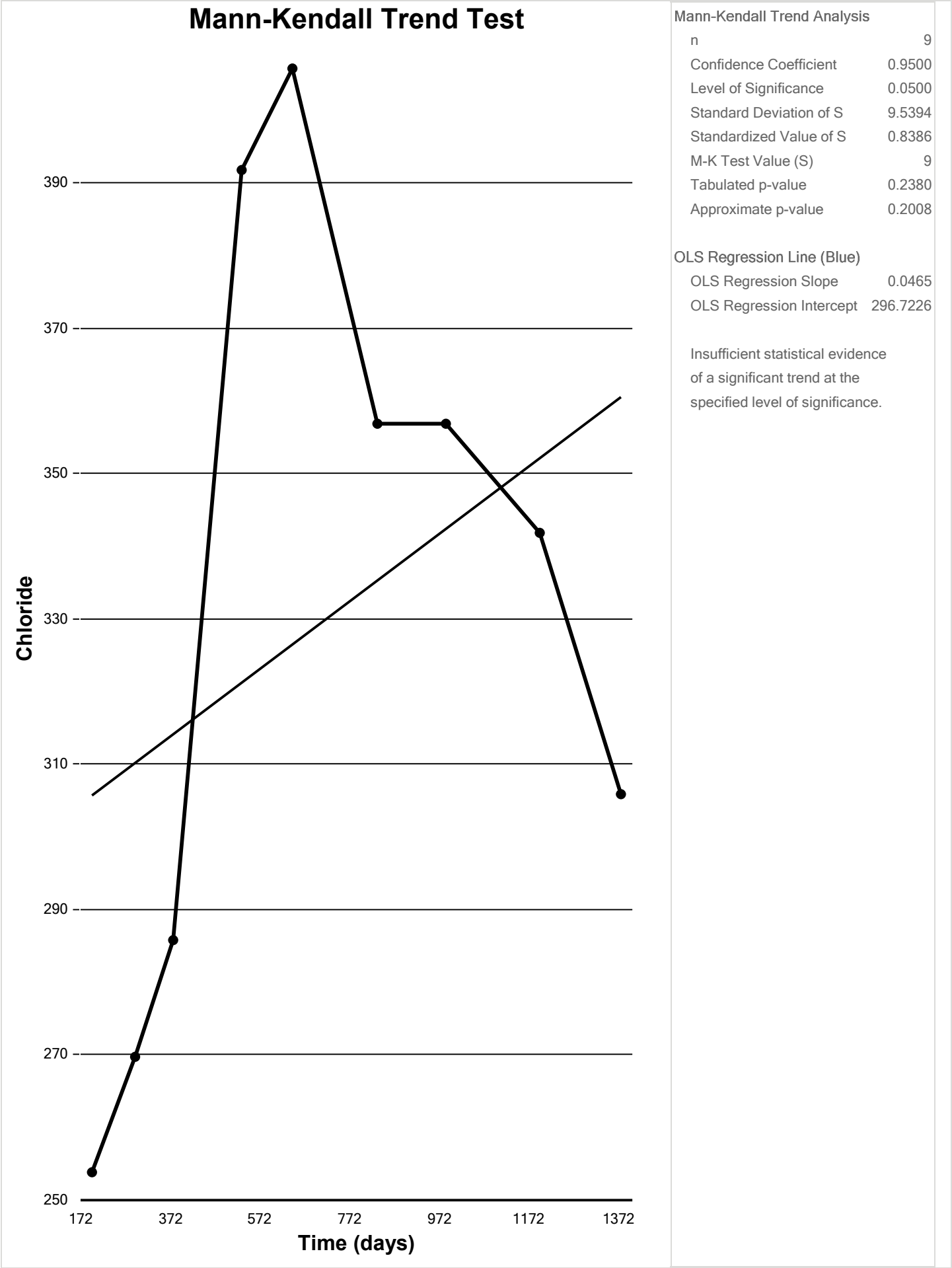
APPENDIX C2H
MANN-KENDALL STATISTICAL EVALUATION
MW-115

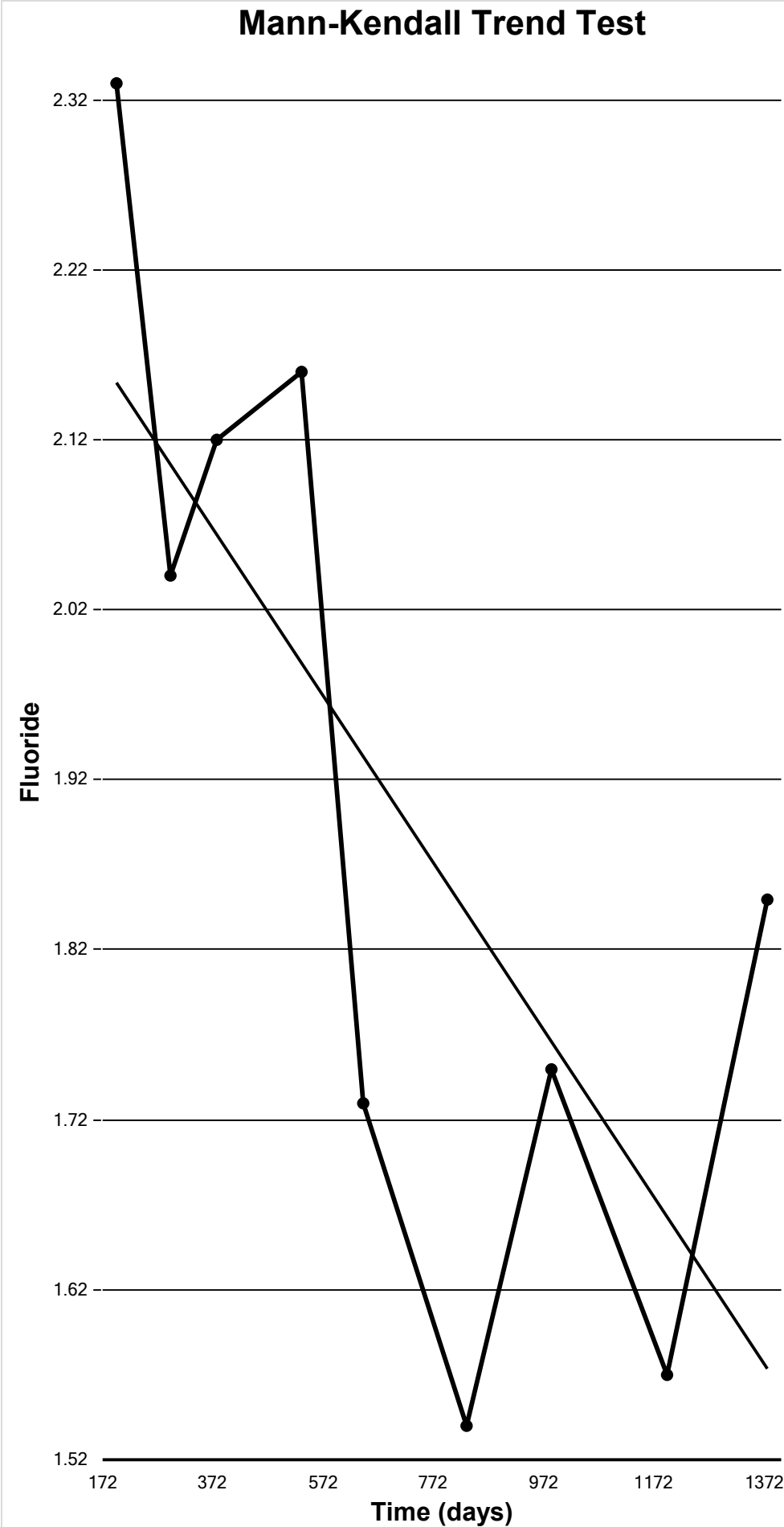


Mann-Kendall Trend Analysis	
n	4
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	2.9439
Standardized Value of S	-1.6984
M-K Test Value (S)	-6
Tabulated p-value	0.0420
Approximate p-value	0.0447

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0001
OLS Regression Intercept	0.1494

Statistically significant evidence of a decreasing trend at the specified level of significance.

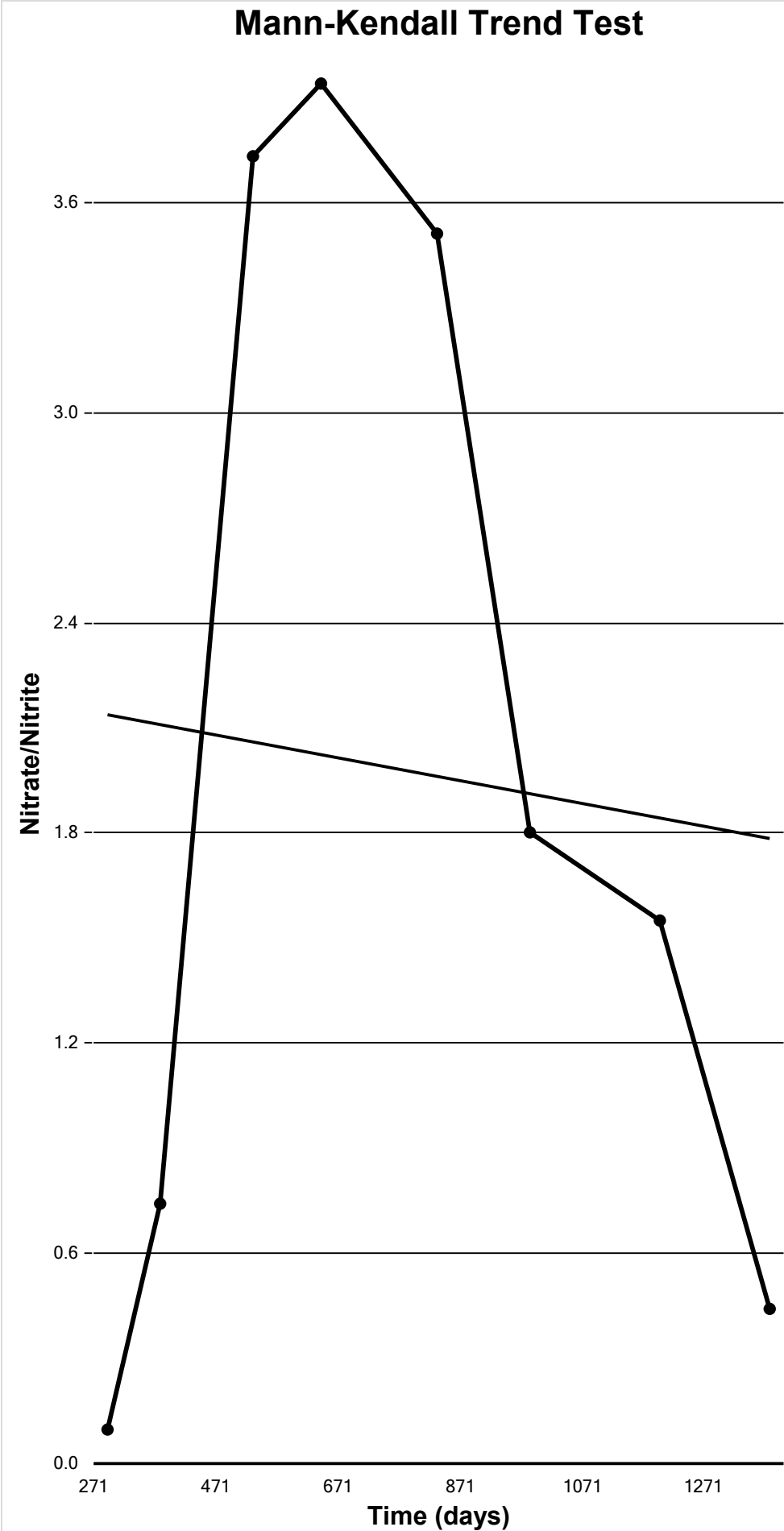




Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-1.5639
M-K Test Value (S)	-16
Tabulated p-value	0.0600
Approximate p-value	0.0589

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0005
OLS Regression Intercept	2.2507

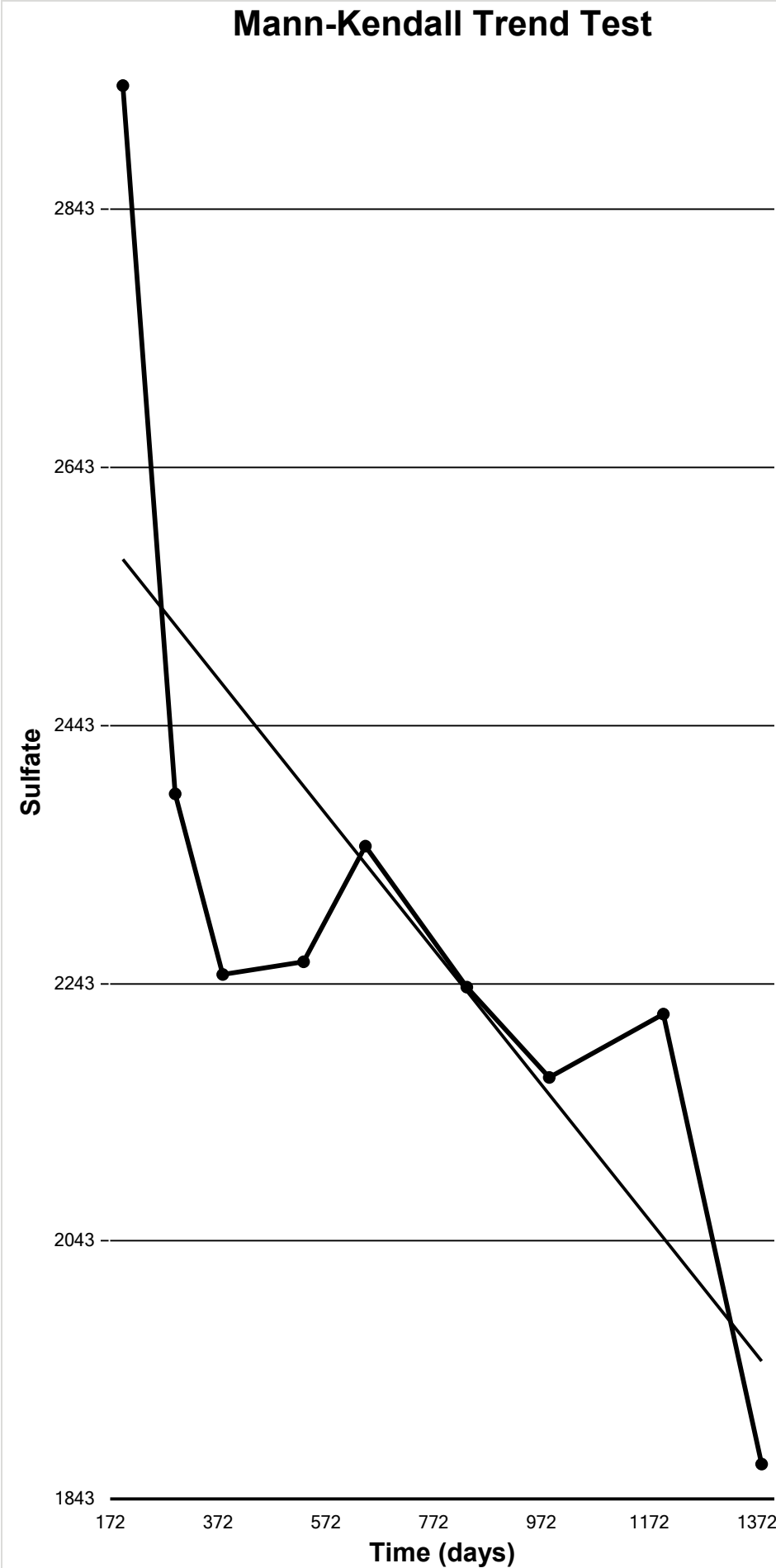
Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis	
n	8
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	8.0829
Standardized Value of S	-0.1237
M-K Test Value (S)	-2
Tabulated p-value	0.4520
Approximate p-value	0.4508

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0003
OLS Regression Intercept	2.2804

Insufficient statistical evidence of a significant trend at the specified level of significance.



Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-2.8149
M-K Test Value (S)	-28
Tabulated p-value	0.0010
Approximate p-value	0.0024
OLS Regression Line (Blue)	
OLS Regression Slope	-0.5267
OLS Regression Intercept	2,676.1064
Statistically significant evidence of a decreasing trend at the specified level of significance.	

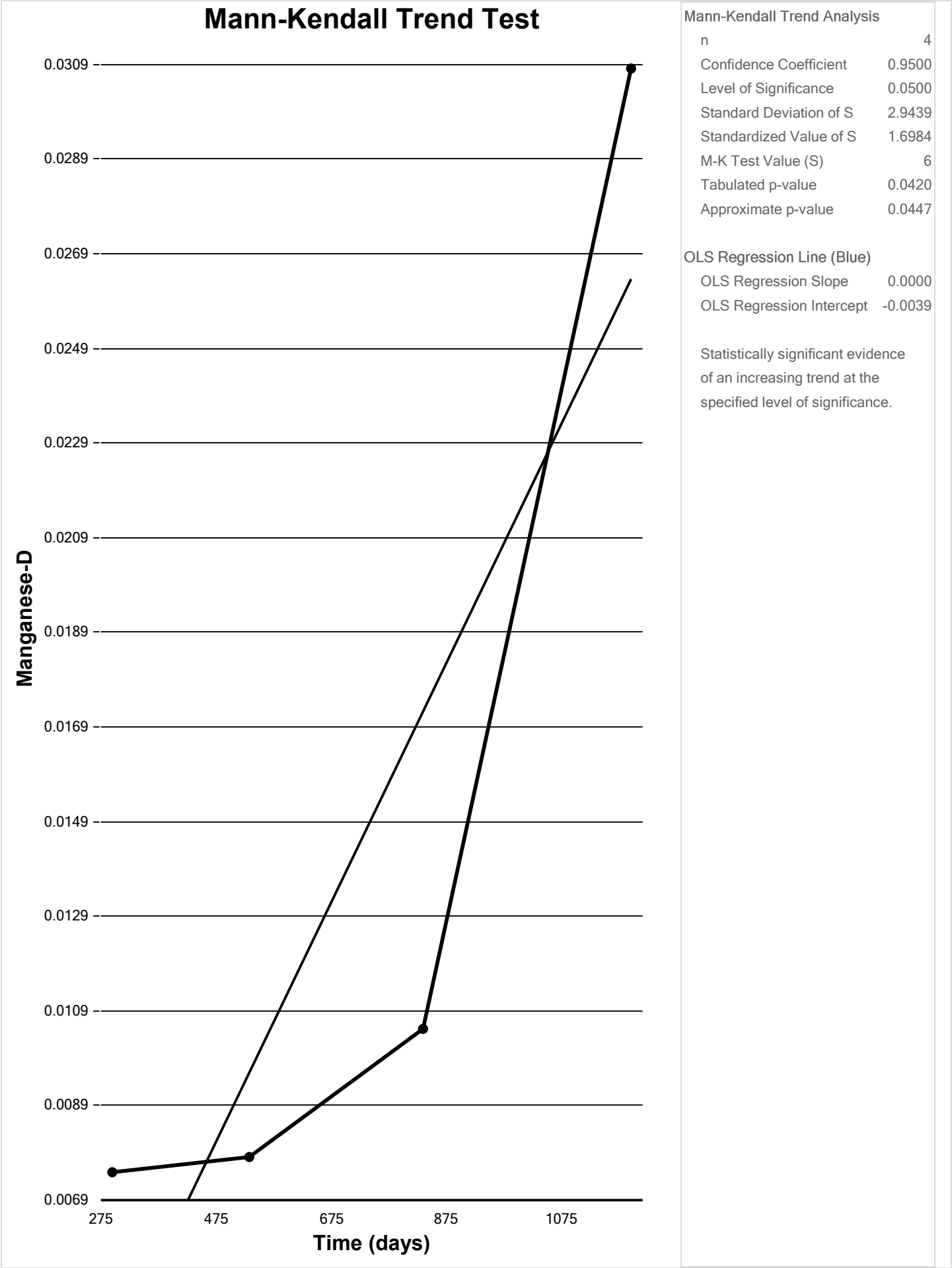


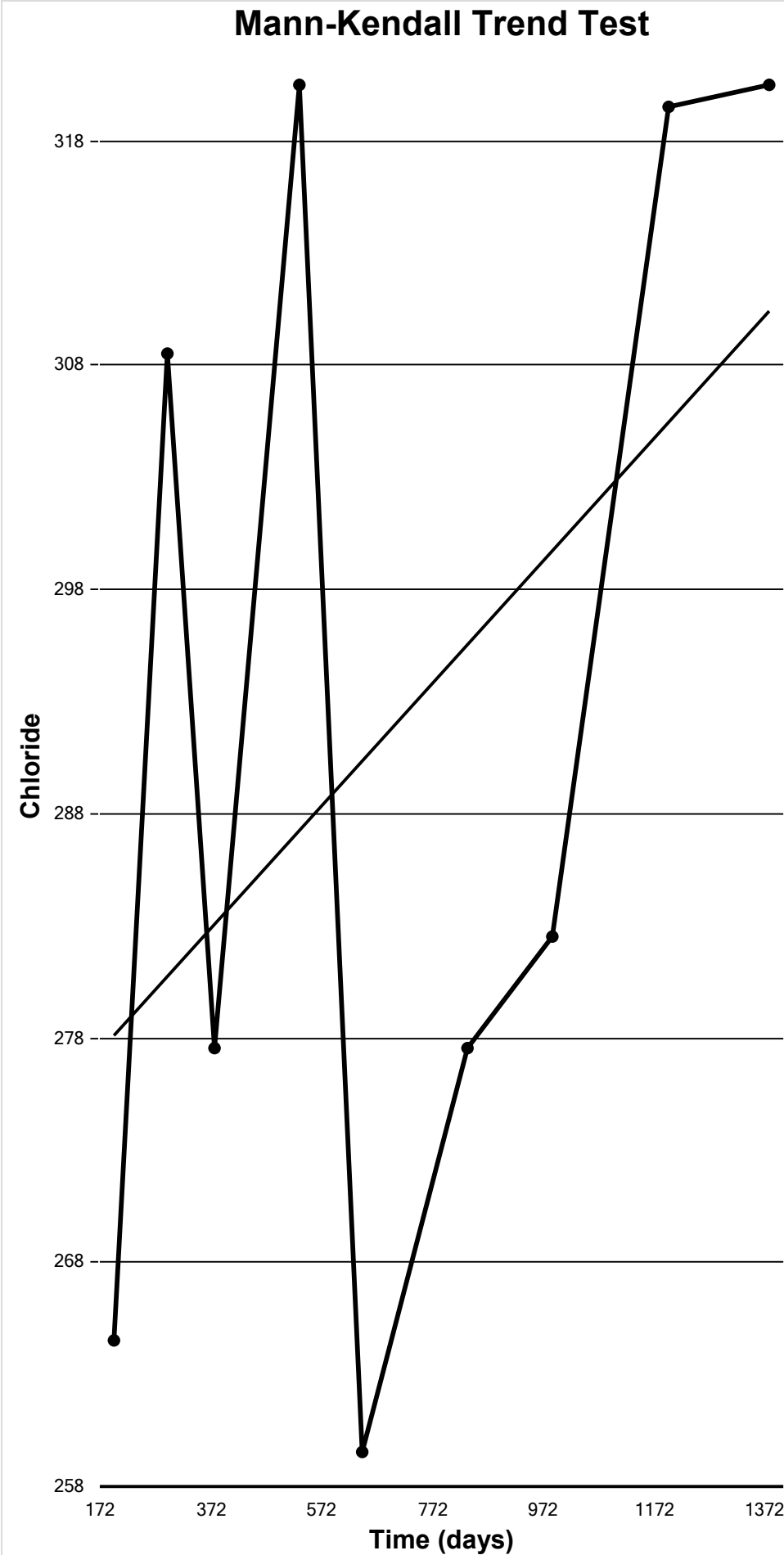
Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-0.9383
M-K Test Value (S)	-10
Tabulated p-value	0.1790
Approximate p-value	0.1740

OLS Regression Line (Blue)	
OLS Regression Slope	-0.3626
OLS Regression Intercept	4,451.9107

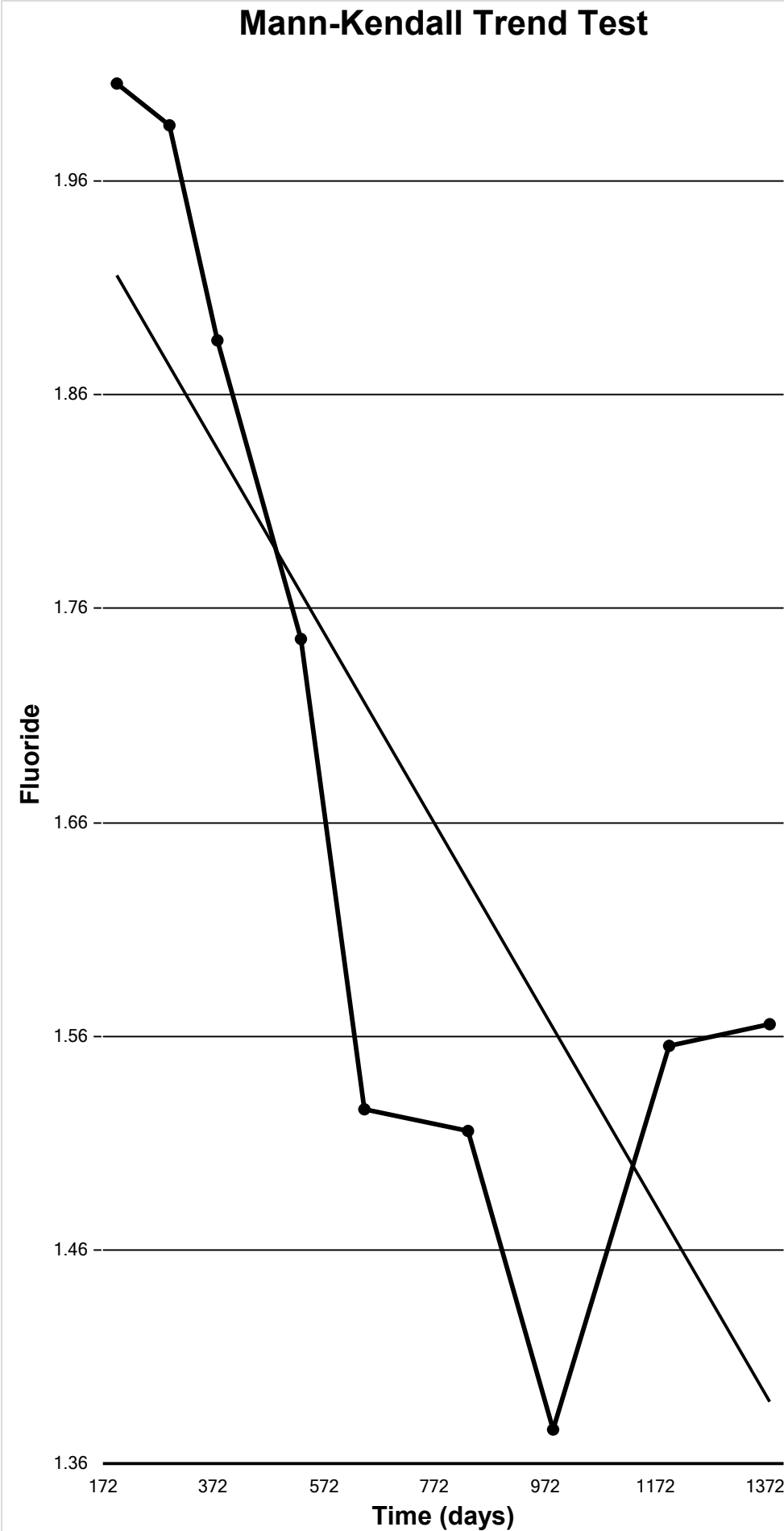
Insufficient statistical evidence
of a significant trend at the
specified level of significance.

APPENDIX C2I
MANN-KENDALL STATISTICAL EVALUATION
MW-116





Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.4868
Standardized Value of S	1.3703
M-K Test Value (S)	14
Tabulated p-value	0.0900
Approximate p-value	0.0853
OLS Regression Line (Blue)	
OLS Regression Slope	0.0273
OLS Regression Intercept	273.2178
Insufficient statistical evidence of a significant trend at the specified level of significance.	



Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-2.1894
M-K Test Value (S)	-22
Tabulated p-value	0.0120
Approximate p-value	0.0143

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0004
OLS Regression Intercept	2.0082

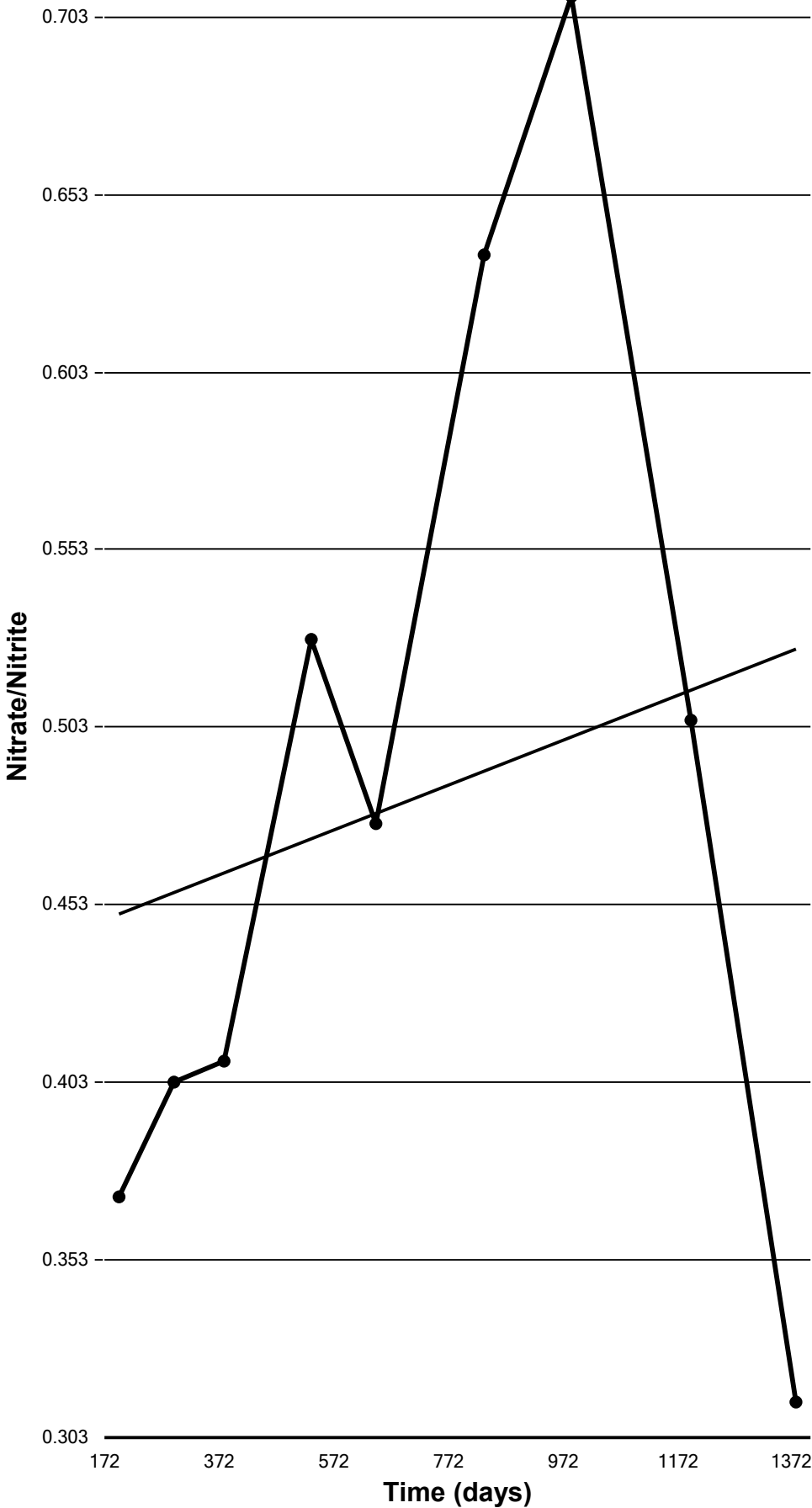
Statistically significant evidence of a decreasing trend at the specified level of significance.

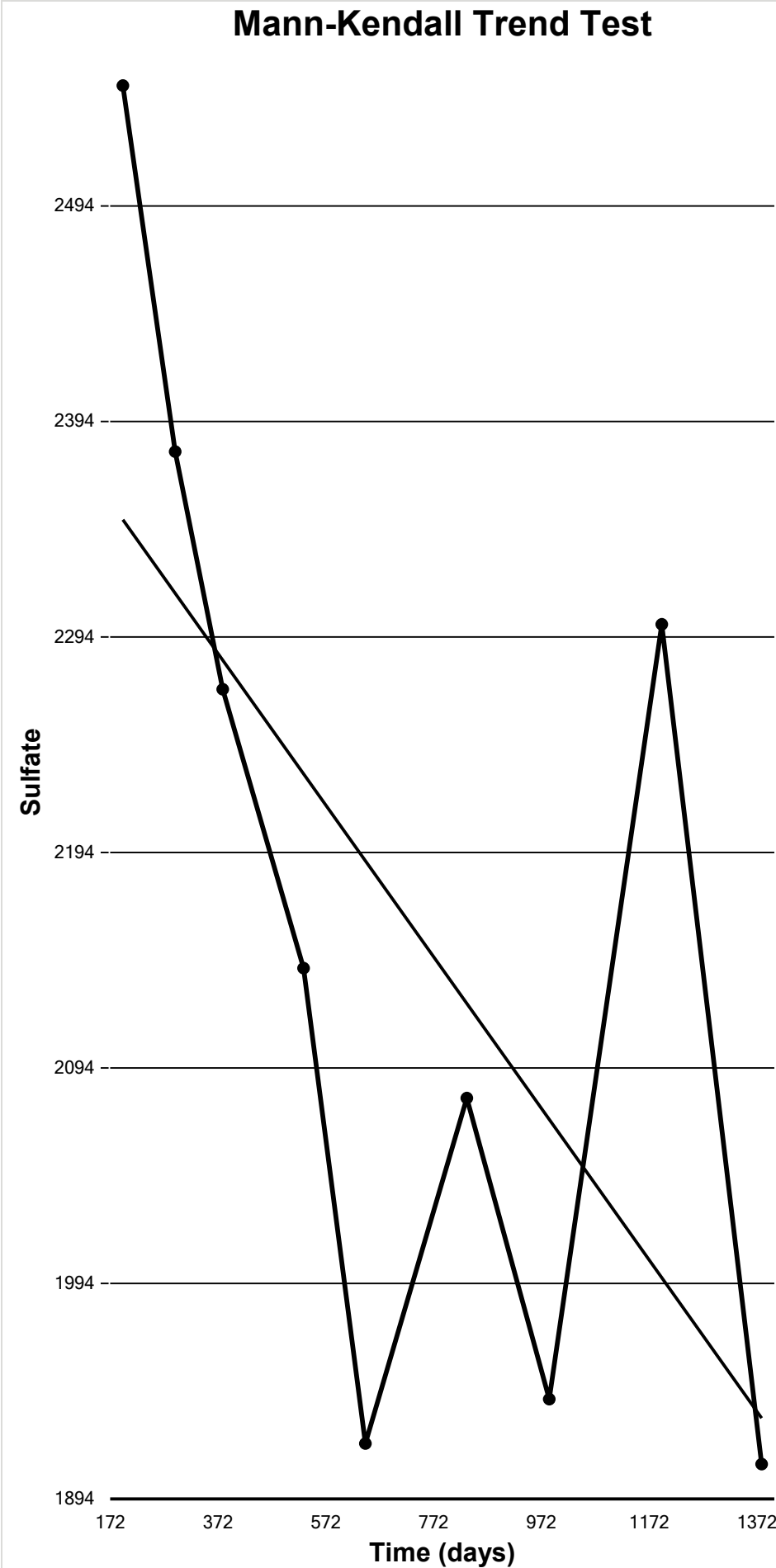
Mann-Kendall Trend Test

Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	1.1468
M-K Test Value (S)	12
Tabulated p-value	0.1300
Approximate p-value	0.1257

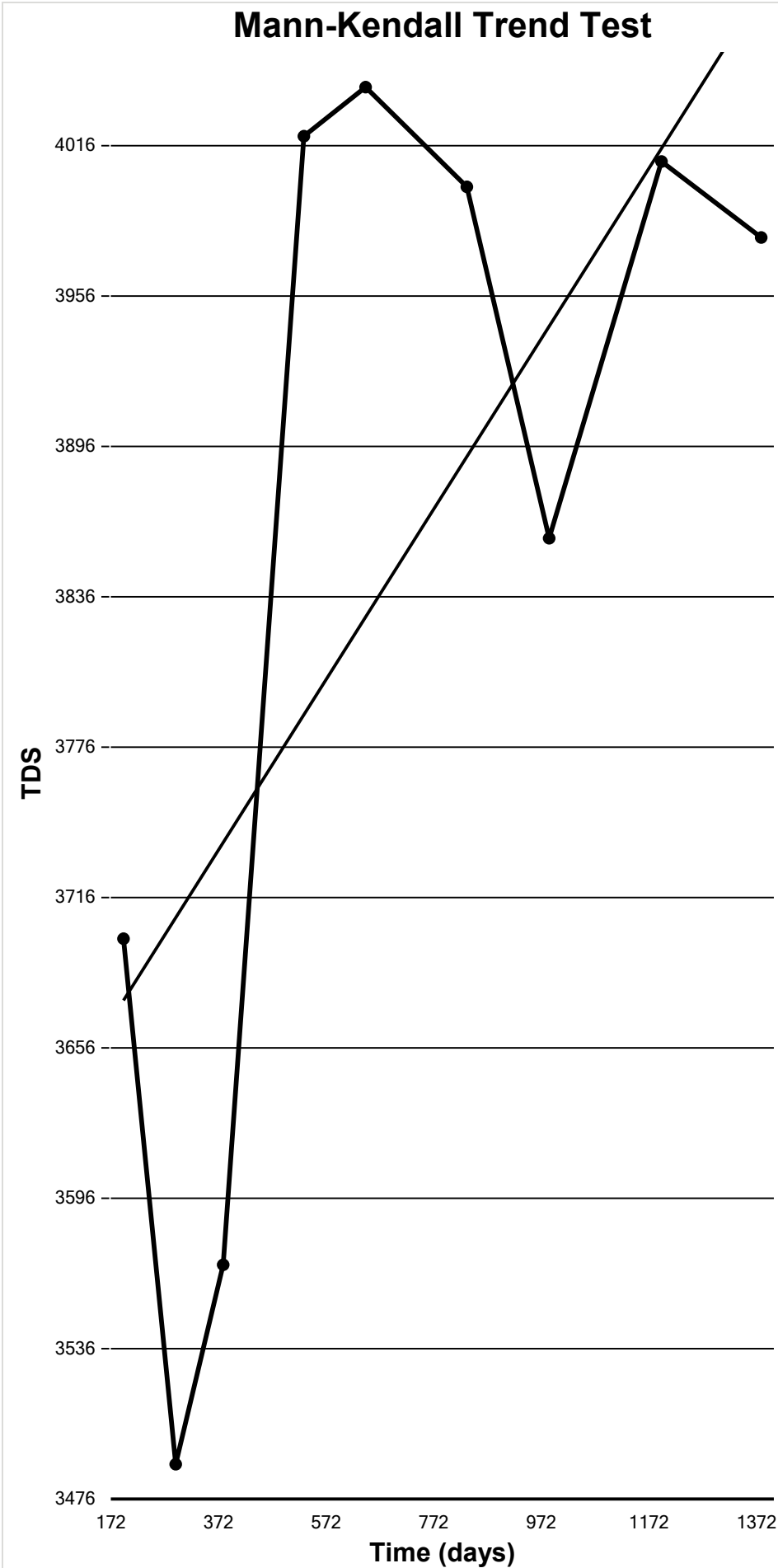
OLS Regression Line (Blue)	
OLS Regression Slope	0.0001
OLS Regression Intercept	0.4380

Insufficient statistical evidence of a significant trend at the specified level of significance.





Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	-2.1894
M-K Test Value (S)	-22
Tabulated p-value	0.0120
Approximate p-value	0.0143
OLS Regression Line (Blue)	
OLS Regression Slope	-0.3527
OLS Regression Intercept	2,418.1415
Statistically significant evidence of a decreasing trend at the specified level of significance.	



Mann-Kendall Trend Analysis	
n	9
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	9.5917
Standardized Value of S	0.9383
M-K Test Value (S)	10
Tabulated p-value	0.1790
Approximate p-value	0.1740

OLS Regression Line (Blue)	
OLS Regression Slope	0.3406
OLS Regression Intercept	3,608.3096

Insufficient statistical evidence
of a significant trend at the
specified level of significance.

APPENDIX

D

DRAFT PUBLIC NOTIFICATION

PUBLIC NOTICE

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

Notice is hereby given that pursuant to New Mexico Water Quality Control Commission Regulations (20.6.2.4108 NMAC), the following Stage 2 Abatement Plan has been submitted to the Permitting Group of the New Mexico Oil Conservation Division ("OCD"), 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505, Telephone (505) 490-0798 or E-mail: michael.buchanan@emnrd.nm.gov.

HF Sinclair Navajo Refining LLC, PO Box 159, Artesia, NM has submitted a Stage 2 Abatement Plan Work Plan (APWP) to the Permitting Group of the OCD for the Former Reverse Osmosis (RO) Discharge Reject Fields at the Artesia Refinery. The exact location of the facility is/will be at latitude and longitude decimal degrees: 32.853099°, -104.389493° Datum: NAD83. To aid in locating this facility, the approximate location is 501 E Main St in Artesia, NM, Eddy County. The Former Reverse Osmosis Discharge Reject Fields are located north, northeast and east of the intersection of E Logan Avenue and Navajo Road in Artesia.

HFSNR utilizes RO to remove minerals and salts from fresh water prior to use in the refining process. The fresh water is supplied from a blend of publicly supplied water from the City of Artesia and fresh groundwater obtained from the Refinery's water supply wells. The treated water (permeate stream) is used in the Refinery process while the RO reject stream cannot be used in the Refinery process as it contains concentrated salts and minerals that do not pass through the RO membranes. Prior to January 24, 2019, this concentrated rejected stream was discharged to the surface of two fields located northeast of the Refinery operations area. The RO reject discharge fields are covered with native grass and discharged water was allowed to percolate or evaporate in those permitted areas. The discharge was performed under the jurisdiction of the OCD in accordance with Discharge Permit GW-028, which was initially issued in October 1991. The Permit has subsequently been modified and renewed several times with the most recent renewal issued in August 2022.

The Stage 2 APWP includes remedial alternatives focused on removal of fluoride (and potentially other inorganics) from shallow soil and/or groundwater or removal of the potential infiltration pathway. The Stage 2 APWP includes the installation of two additional shallow groundwater monitoring wells, semi-annual groundwater monitoring for a period of at least 3 years, and the design and implementation of a phytoremediation pilot study of the RO Discharge Reject Fields to reduce contaminant concentrations in soil and groundwater. It is anticipated that the tasks associated with the Stage 2 APWP will be completed during the period between May 2024 and March 2026. The Stage 2 APWP addresses well installation, construction and development, groundwater monitoring, potential remediation alternatives, details regarding the phytoremediation pilot study design and implementation, a proposed schedule, reporting, and a closure/post-closure plan.

The OCD has determined the Stage 2 Work Plan is complete. The OCD will accept comments and statements of interest regarding this work plan and will create a facility-specific mailing list for persons who wish to receive future notices. Persons interested in obtaining further information, submitting comments or requesting to be on a facility-specific mailing list may contact the OCD Permitting Group at the address given above. The permit may be viewed at the Artesia OCD office located at 506 W. Texas, Artesia, New Mexico 88210 between 8:00 a.m. and 4:00 p.m., Monday through Friday, or at the OCD web site <http://www.emnrd.state.nm.us/oecd/>. Persons interested in obtaining a copy of the Stage 2 APWP may contact the OCD at the address given above. Prior to ruling on any proposed permit, the Director shall allow a period of at least sixty (60) days after the date of publication of this notice, during which interested persons may submit comments or request that OCD hold a public meeting or hearing. Requests for a hearing shall set forth the reasons why a meeting or hearing should be held. A hearing will be held if the Director determines there is a significant public interest. If no hearing is held, the Director will approve the proposed work plan based on information available, including all comments received. If a public hearing is held, the Director will approve or disapprove the proposed work plan based on information in the plan and information submitted at the hearing.

Para obtener mas información sobre esta solicitud en español, sirvase comunicarse por favor: New Mexico Energy,

Minerals and Natural Resources Department (Depto. Del Energia, Minerals y Recursos Naturales de Nuevo Mexico), Oil Conservation Division (Depto. Conservación Del Petróleo), 1220 South St. Francis Drive, Santa Fe, New Mexico (Contacto: Michael Buchanan, (505) 490-0798).

Given under the Seal of New Mexico Oil Conservation Commission at Santa Fe, New Mexico, on this XXst day of XX 2024.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

Dylan Fuge, Director (Acting)

APPENDIX

E

COST ESTIMATE FOR FINANCIAL ASSURANCE PLAN

APPENDIX E-1
 Cost Estimate for Financial Assurance
 Former RO Reject Discharge Fields
 HFSNR Artesia, New Mexico

Task	Description	Estimated Cost
1	Monitor Well/Probe Installation	
	Additional Well Installation (Year 1)	\$59,418
	Moisture Probe Installation (Year 1)	\$37,796
	Subtotal	\$97,214
2	Groundwater Monitoring (30 years Post-Closure)	\$1,656,279
	Subtotal	\$1,656,279
3	Phytoremediation Pilot Study (Year 1)	
	Soil Sampling and Analysis	\$8,415
	Irrigation Source Evaluation	\$7,347
	Field Preparation	\$8,953
	Plant Test Species	\$39,516
	Phyto Pilot Study Monitoring	\$40,716
	PM & Reporting	\$34,491
	Subtotal	\$139,439
4	Phytoremediation Implementation (Years 2 & 3 combined)	
	Additional Planting	\$63,222
	Phyto Monitoring	\$46,904
	PM & Reporting	\$56,910
	Subtotal	\$167,036
TOTAL FINANCIAL ASSURANCE ESTIMATE		\$1,962,754

APPENDIX E-2
 Cost Estimate for Financial Assurance - Task 1: Monitor Well/Probe Installation - Year 1
 Former RO Reject Discharge Fields
 HFSNR Artesia, New Mexico

Scope and Assumptions

Two additional 2-inch diameter shallow groundwater monitoring wells will be installed during 2023 to depths between 20 to 30 feet below ground surface.

- One well approximately 350 feet northeast of MW-119 to provide downgradient of the North RO reject discharge field
- One well approximately 1,000 feet east of RW-18A to provide additional downgradient monitoring of the South RO reject discharge field

During 2023, existing soil moisture probes installed during the Stage 1 AP will be evaluated to determine if they are still functioning. Two additional soil moisture probe nests (one in each field) will be installed in 2023. Soil moisture probes will remain in place throughout the pilot study as well as during implementation of the full-scale phytoremediation, and data will continue to be collected to evaluate the vadose zone moisture and electrical conductivity (EC).

Cost Estimate

Item: Monitor Well Installation

Cost

Labor:

On-site Tasks (Well Installation)	\$3,830
Off-site Tasks (Project Management)	\$4,634

Expenses:

Drilling Subcontractor	\$43,050
Other Direct Costs (i.e. Travel, Equipment)	\$3,895
NMGRT	\$4,009
Subtotal	\$59,418

Item: Moisture Probe Installation

Cost

Labor:

On-site Tasks (Probe Installation)	\$1,811
Off-site Tasks (Project Management)	\$4,634

Expenses:

Drilling Subcontractor	\$21,024
Other Direct Costs (i.e. Travel, Equipment)	\$7,900
NMGRT	\$2,427
Subtotal	\$37,796

TOTAL \$97,214

APPENDIX E-3

Cost Estimate for Financial Assurance - Task 2: Groundwater Monitoring - 30 Years

Former RO Reject Discharge Fields

HFSNR Artesia, New Mexico

Scope and Assumptions

Groundwater samples will be collected and analyzed semiannually during the routine facility-wide monitoring events for a period of 30 years to determine if the COC concentrations continue to attenuate following cessation of discharge of the RO reject stream to the fields. The following wells will be sampled.

- North RO Reject Discharge Field:
 - Upgradient: MW-55, MW-140, MW-141
 - Within Field: MW-117, MW-118, MW-119
 - Downgradient: MW-142, MW-143, new well northeast of MW-119 (well number to be determined)
- South RO Reject Discharge Field:
 - Upgradient: MW-29, MW-40, MW-56
 - Within Field: MW-114, MW-115, MW-116
 - Downgradient: MW-125, RW-18A, MW-144, new well east of RW-18A (well number to be determined)

Groundwater samples will be analyzed for the following COCs and methods:

- Dissolved (field-filtered) metals by Methods 6010 or 6020:
 - Arsenic
 - Boron
 - Iron
 - Manganese
 - Uranium
- Chloride by Method 300 or 9056
- Fluoride by Method 300 or 9056
- Nitrate by Method 300 or 9056
- Nitrite by Method 300 or 9056
- Sulfate by Method 300 or 9056
- TDS by Method 2540

Cost Estimate		
Item: Groundwater Monitoring - 30 Years		Cost
Labor:		
Off-site Tasks (Data, Reporting and Project Management)		\$24,541
Expenses:		
Groundwater Monitoring Subcontractor		\$18,102
Laboratory		\$10,322
NMGRT		\$2,244
Annual Total		\$55,209
TOTAL FOR 30 YEARS (2023-2052)		\$1,656,279

APPENDIX E-4
 Cost Estimate for Financial Assurance - Task 3: Phytoremediation Pilot Study - Year 1
 Former RO Reject Discharge Fields
 HFSNR Artesia, New Mexico

Scope and Assumptions

A stepwise approach to the Pilot Study is anticipated. Subtasks include performing agronomic soil analysis to confirm site suitability and assist in species selection, as well as amendment and fertilizer needs, evaluate potential species, and evaluate the irrigation water supply to be used. Additional subtasks will include field preparation, planting, irrigation and harvesting of the test species, monitoring, and reporting during Year 1.

- Soil samples will be collected from three locations in each of the two fields and will be submitted to an agricultural laboratory for agronomic analysis (6 samples total).
- Potential candidate species including Sudan Grass, Western Wheat Grass, Indian Grass and Tall Wheat Grass will be tested during the Pilot Study.
- The available irrigation water supply will be sampled and analyzed for suitability prior to planting.
- A local agricultural contractor will be retained to install and manage the plots. Plans and specifications developed as part of the final design will provide details as to the plant material, planting techniques including compost and fertilizer requirements, irrigation design, and follow up maintenance. It should be noted that after the system is implemented, ongoing operation, maintenance, and monitoring will be conducted to ensure the vegetation develops vigorous and deep root systems
- A Monitoring Program will be implemented, to include inspections for plant health and growth, pests and weeds; periodic local agricultural contractor will be retained to install and manage the plots. Plans and specifications developed as part of the final design will provide details as to the plant material, planting techniques including compost and fertilizer requirements, irrigation design, and follow up maintenance. It should be noted that after the system is implemented, ongoing operation, maintenance, and monitoring will be conducted to ensure the vegetation develops vigorous and deep root systems
- Reporting will consist of the following:
 - Quarterly status reports to describe the activities completed during the previous three months.
 - Final pilot study design to be submitted prior to implementation of the pilot study.
 - Final report of pilot study to be submitted within 90 days of the completion of the pilot study.

Cost Estimate

Item: Soil Sample Collection and Analysis

Cost

Labor:

On-site Tasks (Sampling)	\$1,811
Off-site Tasks (Data Evaluation, Reporting and Project Management)	\$4,665

Expenses:

Laboratory	\$1,260
Other Direct Costs (i.e. Travel, Equipment)	\$405
NMGRT	\$274
Subtotal	\$8,415

Item: Irrigation Source Evaluation

Cost

Labor:

On-site Tasks (Sampling)	\$1,502
Off-site Tasks (Data Evaluation, Reporting and Project Management)	\$4,336

Expenses:

Laboratory	\$709
Other Direct Costs (i.e. Travel, Equipment)	\$580
NMGRT	\$220
Subtotal	\$7,347

Item: Field Preparation

Cost

Expenses:

Ag Subcontractor and Irrigation Setup	\$8,295
NMGRT	\$658
Subtotal	\$8,953

APPENDIX E-4
 Cost Estimate for Financial Assurance - Task 3: Phytoremediation Pilot Study - Year 1
 Former RO Reject Discharge Fields
 HFSNR Artesia, New Mexico

Cost Estimate (continued)		
<u>Item: Plant Test Species</u>		<u>Cost</u>
Labor:		
	Off-site Tasks (Coordination, Reporting and Project Management)	\$7,905
Expenses:		
	Agricultural Subcontractor	\$29,295
	NMGRT	\$2,316
	Subtotal	\$39,516
 <u>Item: Phyto Pilot Study Monitoring</u>		 <u>Cost</u>
Labor:		
	On-site Tasks (Inspections, Sampling and Monitoring)	\$21,216
	Off-site Tasks (Data, Reporting and Project Management)	\$5,103
Expenses:		
	Laboratory	\$583
	Other Direct Costs (i.e. Travel, Equipment)	\$11,205
	NMGRT	\$2,609
	Subtotal	\$40,716
 <u>Item: Reporting</u>		 <u>Cost</u>
Labor:		
	Off-site Tasks (Data Evaluation, Reporting and Project Management)	\$34,491
	Subtotal	\$34,491
	TOTAL	\$139,439

APPENDIX E-5
Cost Estimate for Financial Assurance - Task 4: Phytoremediation Implementation (Years 2 & 3)
Former RO Reject Discharge Fields
HFSNR Artesia, New Mexico

Scope and Assumptions

- Years 2 and 3 of the Phytoremediation Implementation will consist of planting and harvesting, monitoring and reporting.
- Assume 1 planting event per field per year (however, the Sudan Grass plot will be replanted each winter since it is an annual species)
 - Assume 1 fertilizer application event per field per year
 - Assume weekly irrigation from April through October. Total of 3 acre feet of water per field. Assume \$25 per acre foot
 - Assume 2 harvest operators per year

Cost Estimate

Item: Additional Planting (one year)		Cost
	Agricultural Subcontractor	\$29,295
	NMGRT	\$2,316
	Subtotal	\$31,611
Item: Phyto Pilot Study Monitoring (one year)		
Labor:	On-site Tasks (Inspections and Sampling)	\$4,387
Expenses:	Laboratory	\$7,308
	Other Direct Costs (i.e. Travel, Equipment)	\$10,359
	NMGRT	\$1,398
	Subtotal	\$23,452
Item: Reporting (one year)		
Labor:	Off-site Tasks (Data Evaluation, Reporting and Project Management)	\$28,455
	Subtotal	\$28,455
	Annual Total	\$83,518
TOTAL FOR 2 YEARS (2024-2025)		\$167,036

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 335128

CONDITIONS

Operator: HF Sinclair Navajo Refining LLC ATTN: GENERAL COUNSEL Dallas, TX 75201	OGRID: 15694
	Action Number: 335128
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	RO Discharge Field Supporting Docs accepted for the record for Navajo Artesia Refinery.	5/8/2024