See **Section 5.8.2.3 Representative Monitoring** for the relation between land subsidence and other sustainability indicators.

5.8.3.3 Minimum Thresholds in Relation to Adjacent Basins *[§ 354.28(b)(3)]*

> **23 Cal. Code Regs. § 354.28 Minimum Threshold. (b)** *The description of minimum thresholds shall include the following:*
>
> **(3)** *How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.*

Per criteria described for define minimum thresholds for groundwater levels in **Section 5.8.3.1 Criteria to Define Minimum Thresholds,** the GFM projects groundwater elevations based the Tule Subbasin reaching sustainability by 2040, with built in operational flexibility of a 10-year drought occurring during the 20-year implementation horizon of this plan.

Per criteria described in **Section 5.8.1.2 - Criteria to Define Undesirable Results**, Friant Contractors in adjacent basins, particularly Kern, and other GSAs within the Tule Subbasin, downstream of the ETGSA along the Friant Kern Canal rely on imported water conveyed through the Friant Kern Canal to meet agricultural water demands. Significant impacts to the Friant Kern Canal that limit these contractor's ability to receive contracted quantities of water may ultimately affect their ability to meet their sustainability goal. Therefore, the ETGSA has set more stringent criteria for defining undesirable results for land subsidence to the exceedance of a minimum threshold at one (1) RMS. The ETGSA is also exploring a subsidence management area, but due to lack of data, is unable to create boundaries for such a management area at this time. The intention is for the Land Subsidence Management Plan (See **Section 7.2.3**) to inform and assist this process and prevent significant and unreasonable future subsidence to the Friant Kern Canal.

5.8.3.4 Impact of Minimum Thresholds on Beneficial Uses and Users *[§ 354.28(b)(4)]*

> **23 Cal. Code Regs. § 354.28 Minimum Thresholds. (b)** *The description of minimum thresholds shall include the following:*
>
> **(4)** *How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.*

This requirement is satisfied by the description provided in **Section 4.4.4.4** of the **Coordination Agreement (Appendix A)**.

5.8.3.5 Current Standards Relevant to Sustainability Indicator *[§ 354.28)(b)(5)]*

> **23 Cal. Code Regs. § 354.28 Minimum Thresholds. (b)** *The description of minimum thresholds shall include the following:*
>
> **(5)** *How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.*

No federal, state or local standards currently exist for the chronic lowering of groundwater levels.

5.8.3.6 Measurement of Minimum Thresholds *[§ 354.28(b)(6)]*

> **23 Cal. Code Regs. § 354.28Minimum Thresholds. (b)** *The description of minimum thresholds shall include the following:*
>
> **(6)** *How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in Subarticle 4*.

This requirement is satisfied by the description provided in **Section 4.4.4.6** of the **Coordination Agreement** (**Appendix A)**.

5.9 Depletion of Interconnected Service Waters *[§ 354.26(d)]*

> **23 Cal. Code Regs § 354.26 Undesirable Results. (d)** *An Agency that is able to demonstrate that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin shall not be required to establish criteria for undesirable results related to those sustainability indicators.*

This requirement is satisfied by the description provided in **Section 4.3**of the **Coordination Agreement** (**Appendix A**)

No interconnected surface waters have been identified in any Tule Subbasin GSAs as described more thoroughly in **Chapter 2.26** of the **Tule Subbasin Basin Setting** (**Coordination Agreement, Attachment 2**) **(Appendix A)**. Thus, no criteria need be established.

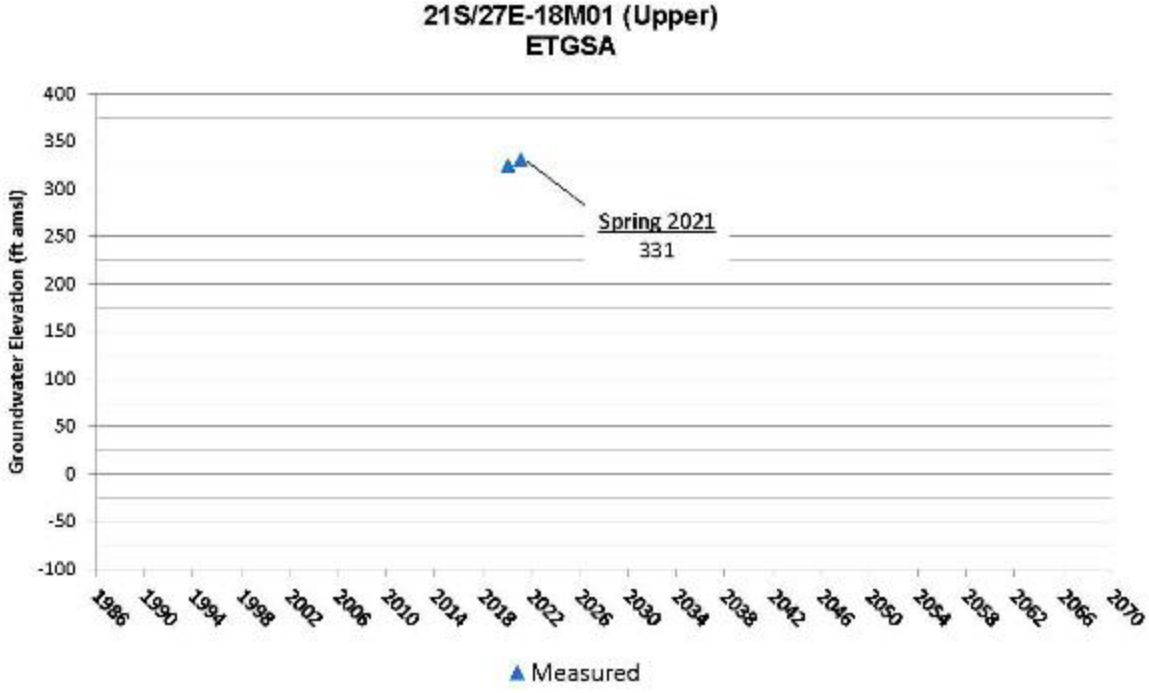
5.10 Seawater Intrusions *[§ 354.26(d)]*

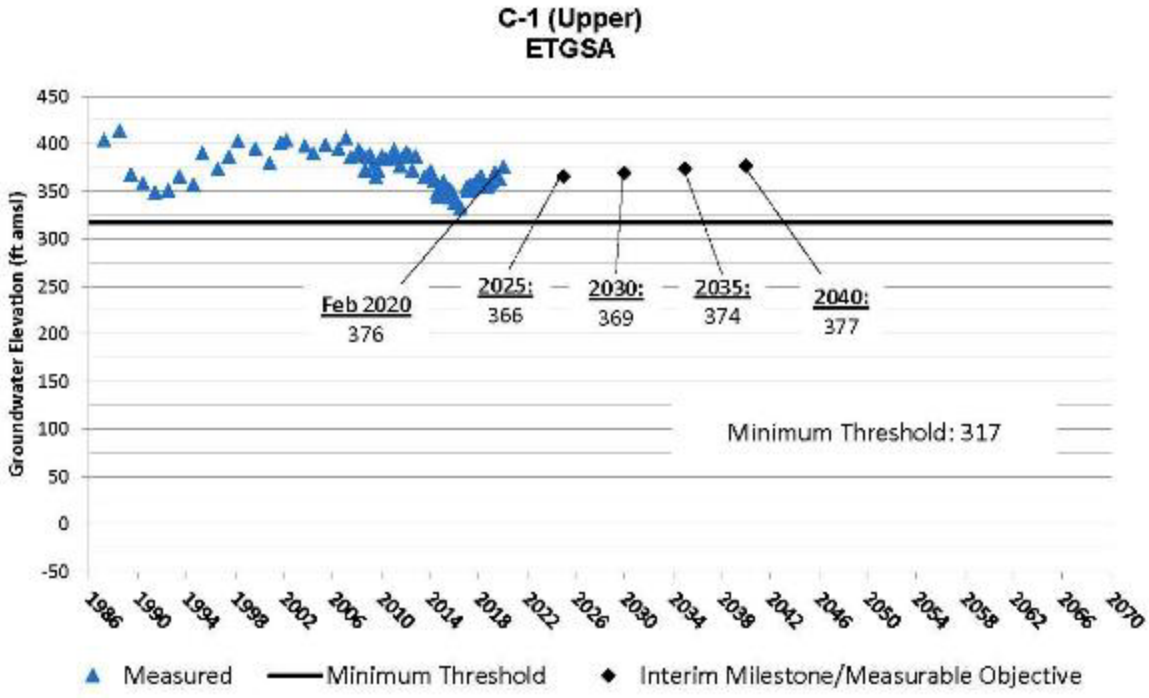
> **23 Cal. Code Regs. § 354.26 Undesirable Results. (d)** *An Agency that is able to demonstrate that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin shall not be required to establish criteria for undesirable results related to those sustainability indicators.*

Seawater intrusion is defined as "the advancement of seawater into a groundwater supply that results in degradation of water quality in the basin and includes seawater from any source." (23 Cal. Code Regs. §351(af).) As described more thoroughly in **Chapter 2.2.7** of the **Tule Subbasin Setting** (**Coordination Agreement, Attachment 2)**, there is no potential for the advancement of seawater into any portion of the Tule Subbasin. Thus, no criteria need be established.

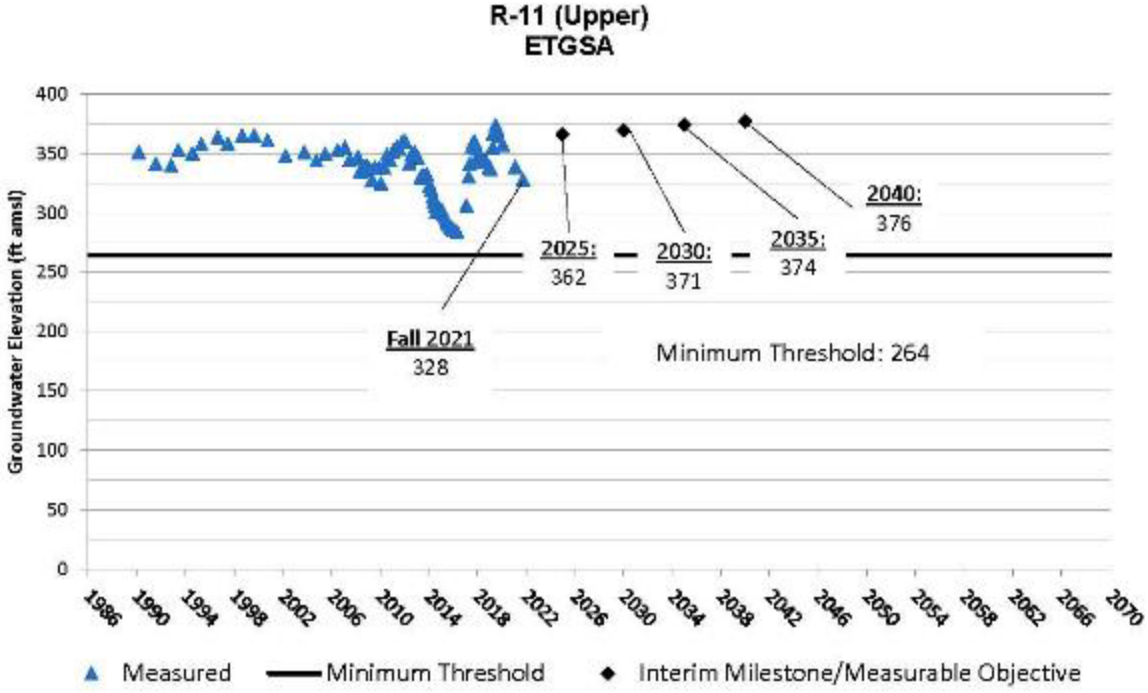
Appendix 5-1: RMS Groundwater Elevation Hydrographs

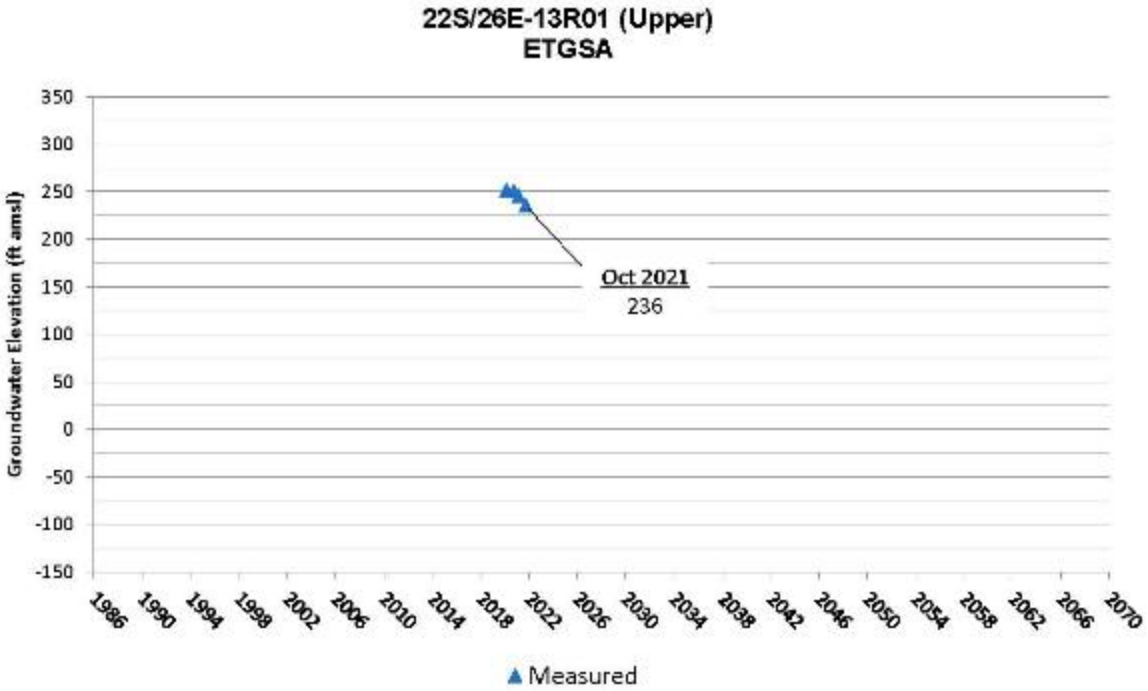
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



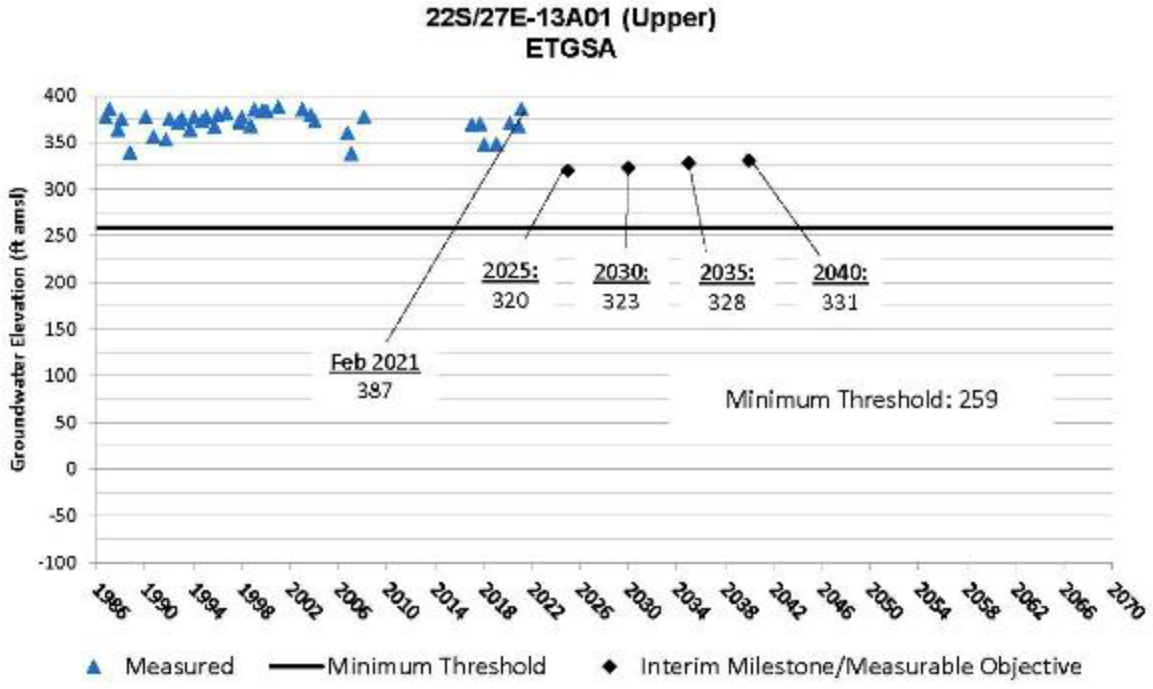


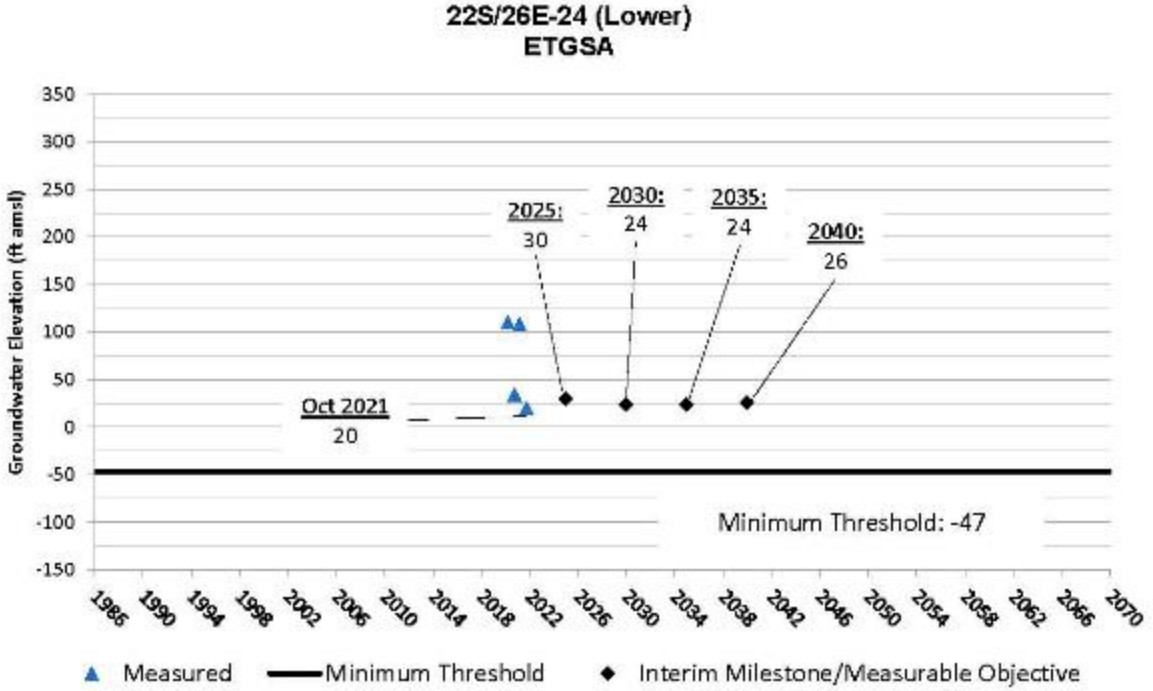
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



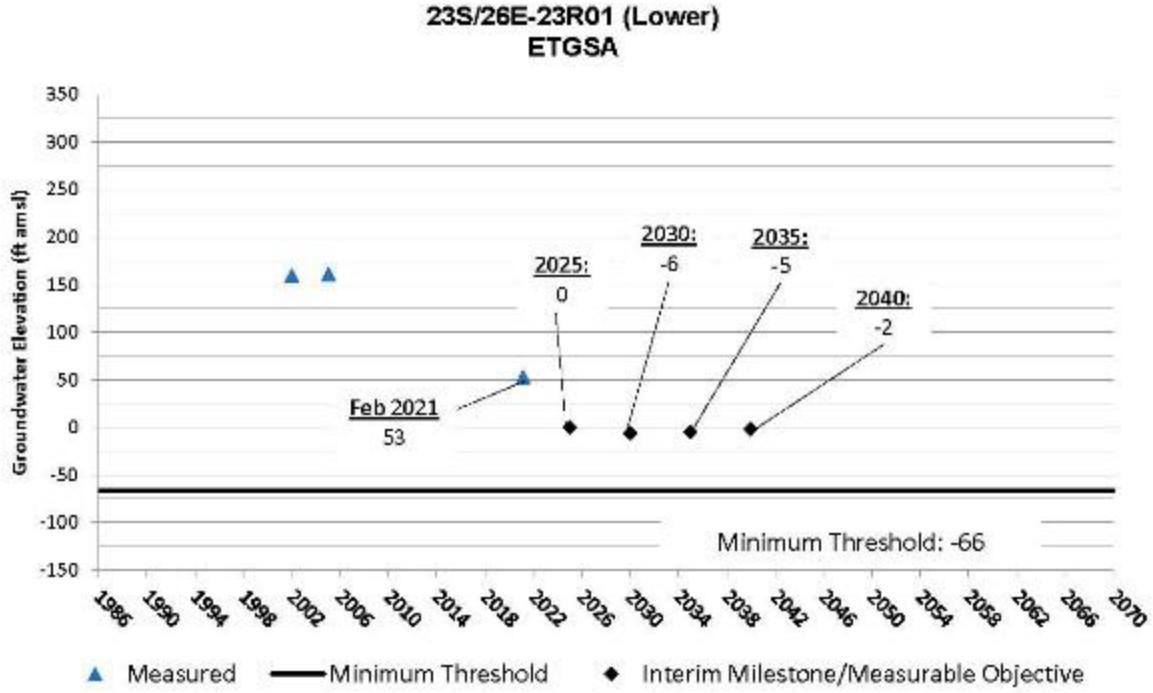


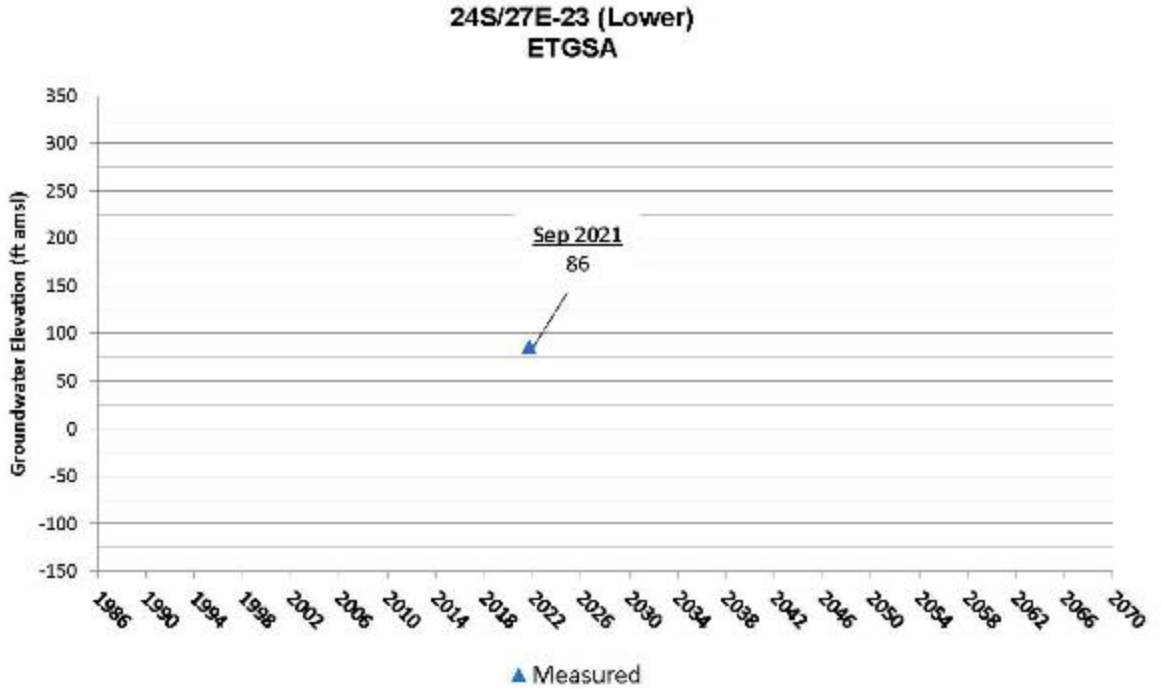
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



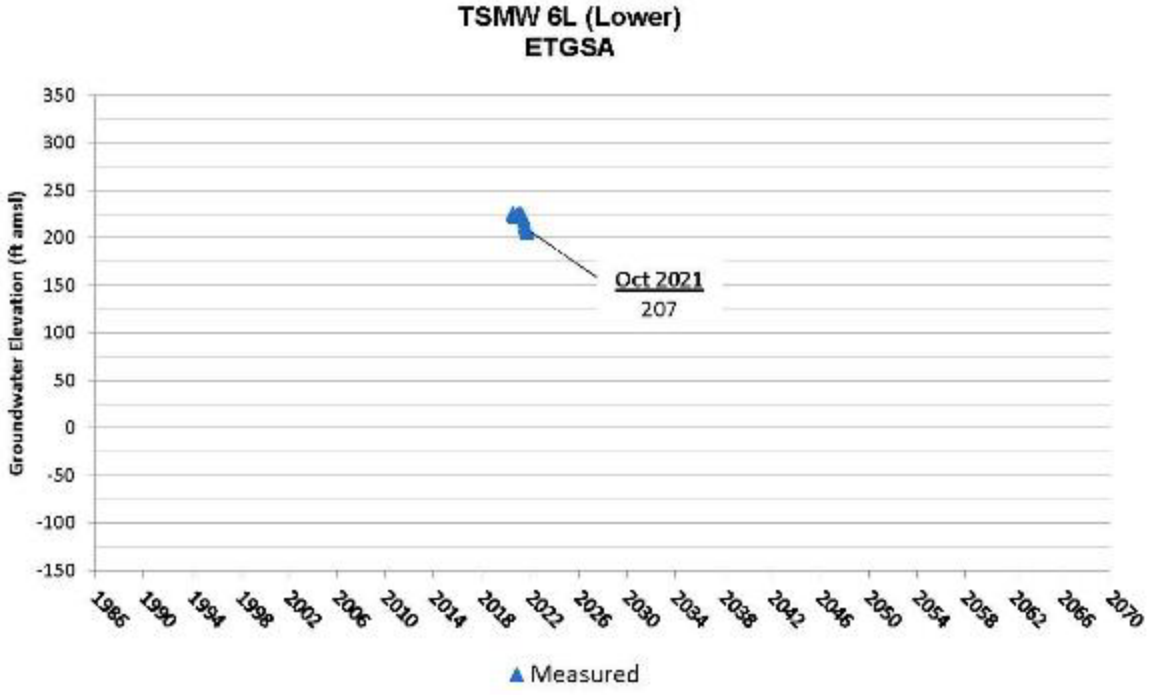


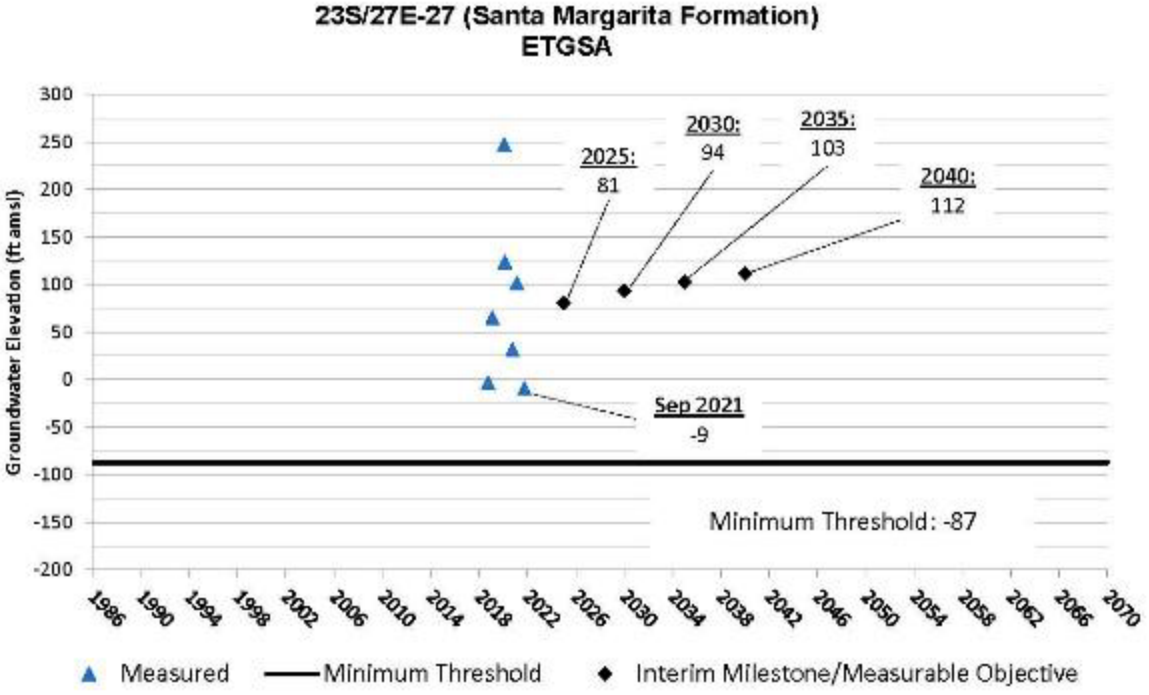
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



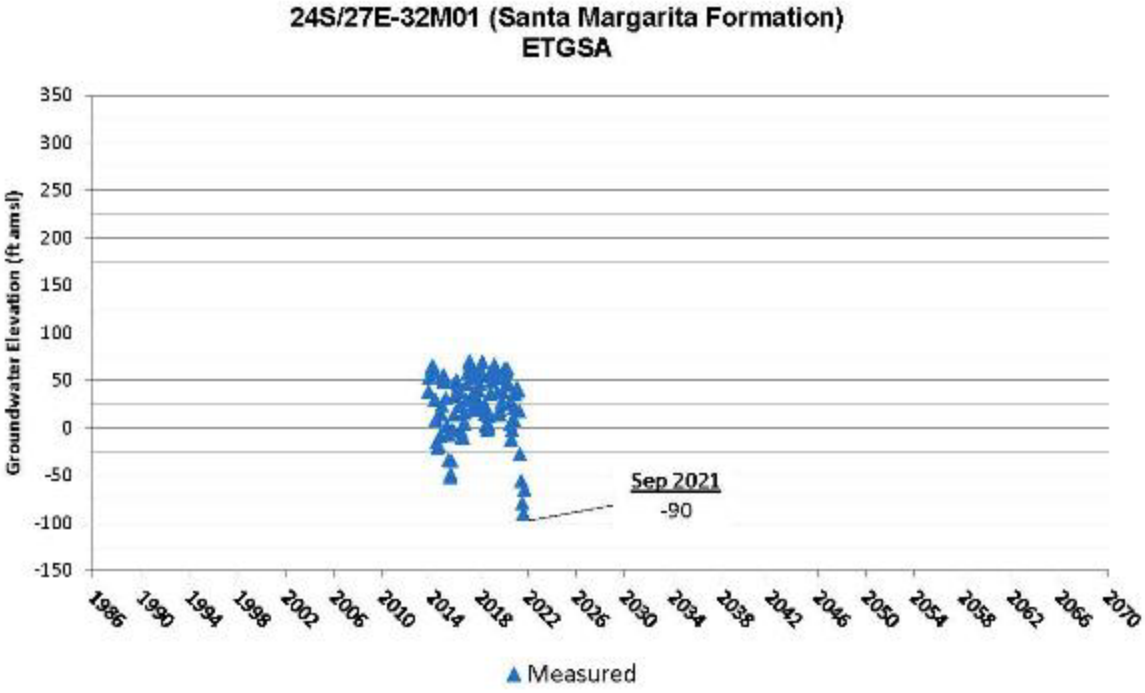


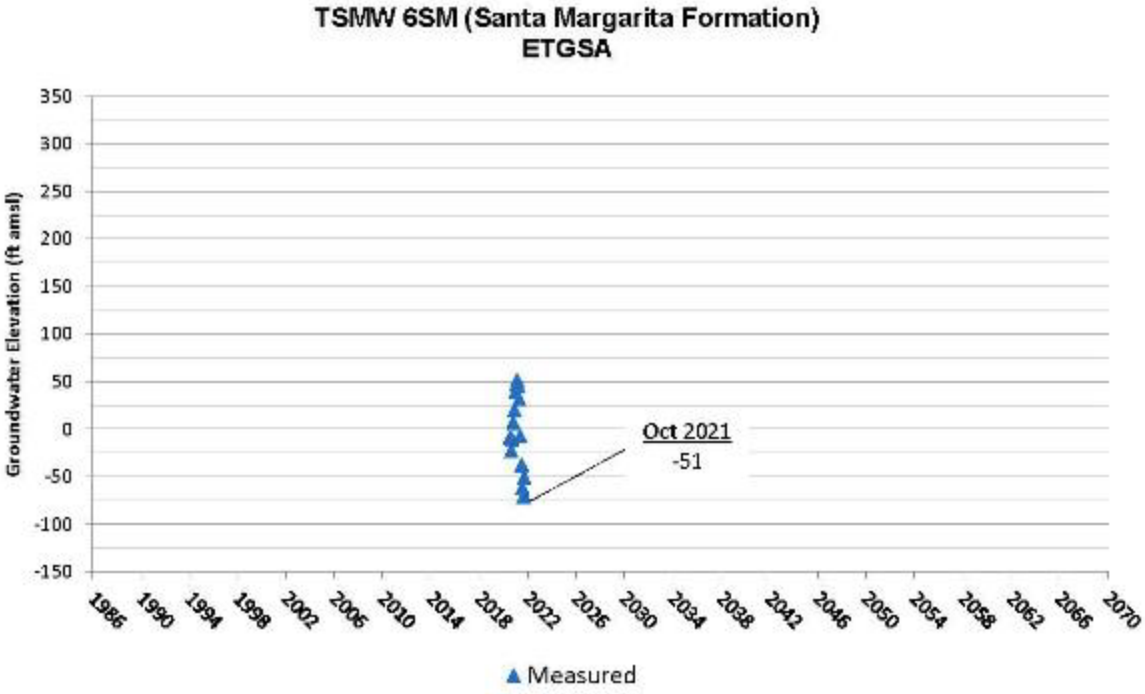
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs



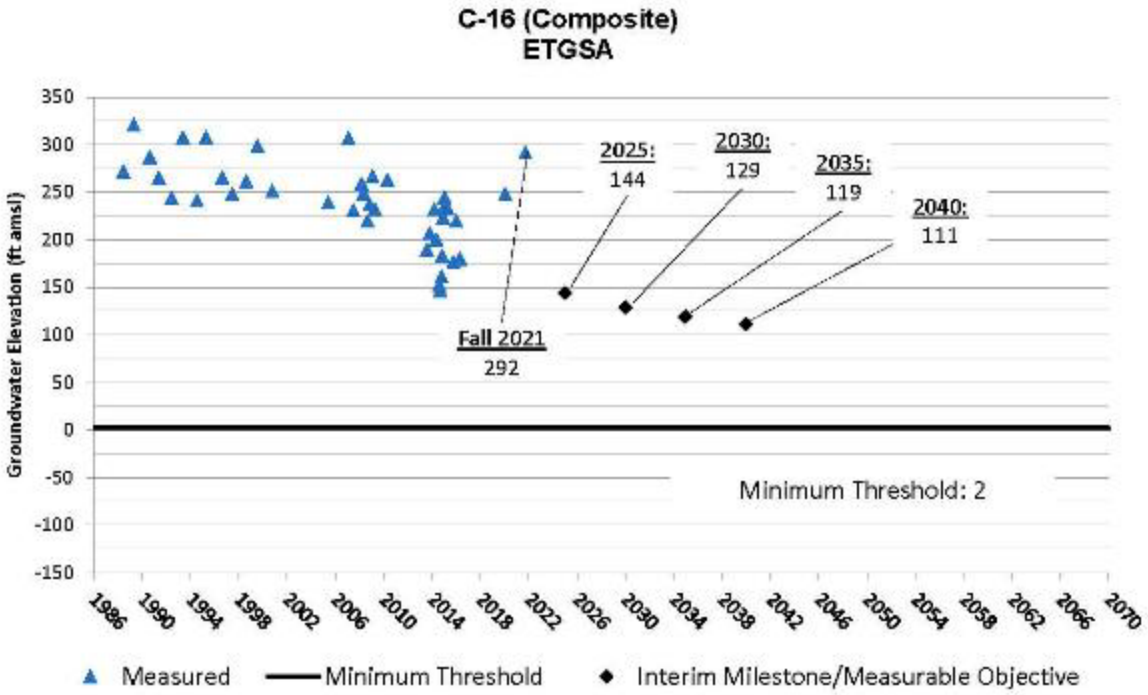


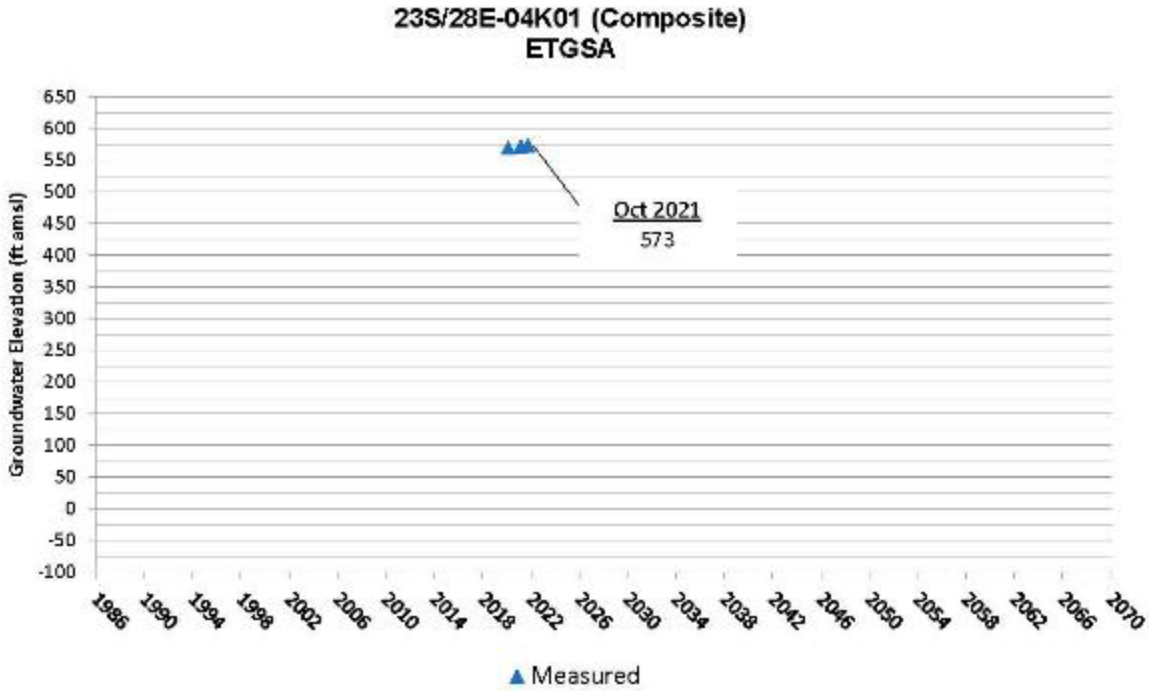
Eastern Tule GSA
RMS Groundwater Elevation Hydrographs





Eastern Tule GSA
RMS Groundwater Elevation Hydrographs





Appendix 5-2: Groundwater Quality Isocontour Maps

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Arsenic 2017-2022

Drinking Water MCL: 10 µg/L

Legend

- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Arsenic (µg/L)

- 0.0 - 2.5
- 2.5 - 5.0
- 5.0 - 7.5
- 7.5 - 10.0
- 10.0+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
LAKE SUCCESS
Tipton
Poplar
Porterville
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Potter Slough
Deer Creek
Mille River
Friant-Kern Canal
137
43
99
65
190
155

N

1 inch = 3 miles

0 1.5 3 Miles

Created by 4Creeks 7/8/2022

Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Chloride 2017-2022

Agricultural Water Quality Goal: 106 mg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Chloride (mg/L)
- 0 - 26.5
- 26.5 - 53.0
- 53.0 - 79.5
- 79.5 - 106
- 106+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
Tipton
Poplar
Porterville
LAKE SUCCESS
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Deer Creek
Friant-Kern Canal
Porter Slough
137
43
99
65
190
155

1 inch = 3 miles
0 1.5 3 Miles
N
Created by 4Creeks 7/7/2022
Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Chloride 2017-2022

Drinking Water MCL: 500 mg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Chloride (mg/L)
- 0 - 125
- 125 - 250
- 250 - 375
- 375 - 500
- 500+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
Tipton
Poplar
Porterville
LAKE SUCCESS
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Porter Slough
Deer Creek
Friant-Kern Canal
Kaweah River
137
43
99
190
65
155

N
1 inch = 3 miles
0 1.5 3 Miles

Created by 4Creeks
7/7/2022

Well Data Source:
GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Chromium-6
2017-2022

Drinking Water MCL:
10 µg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Chromium-6 (µg/L)
- 0.0 - 2.5
- 2.5 - 5.0
- 5.0 - 7.5
- 7.5 - 10.0

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
Tipton
Poplar
Porterville
LAKE SUCCESS
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
Middle Fork Tule River
North Fork Tule River
Tule River
Deer Creek
Friant-Kern Canal
Porter Slough
137
43
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190
155

1 inch = 3 miles
0 1.5 3 Miles
N
Created by 4Creeks 7/9/2022
Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Dibromochloropropane 2017-2022

Drinking Water MCL: 0.2 µg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Dibromochloropropane (µg/L)
- 0 - 0.05
- 0.05 - 0.1
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
LAKE SUCCESS
Porterville
Tipton
Poplar
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Deer Creek
Friant-Kern Canal
Porter Slough
137
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190
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155

N
1 inch = 3 miles
0 1.5 3 Miles
Created by 4Creeks 7/9/2022
Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Nitrate 2017-2022

Drinking Water MCL: 10 mg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Nitrate (mg/L)
- 0.0 - 2.5
- 2.5 - 5.0
- 5.0 - 7.5
- 7.5 - 10.0
- 10.0+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
Tipton
Poplar
Porterville
LAKE SUCCESS
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Deer Creek
Friant-Kern Canal
Porter Slough
137
43
99
190
65
155

1 inch = 3 miles
0 1.5 3 Miles
N
Created by 4Creeks 7/9/2022
Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient PCE (Tetrachloroethene) 2017-2022

Drinking Water MCL: 5 µg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Tetrachloroethene (µg/L)
- 0 - 1.25
- 1.25 - 2.5
- 2.50 - 3.75
- 3.75 - 5.0
- 5.0+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
LAKE SUCCESS
Tipton
Poplar
Porterville
Pixley
Terra Bella
Teviston
Alpaugh
Earlimart
Ducor
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Porter Slough
Deer Creek
Friant-Kern Canal
Mille River
137
43
99
190
65
155

1 inch = 3 miles

0 1.5 3 Miles

N

Created by 4Creeks 7/8/2022

Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Perchlorate 2017-2022

Drinking Water MCL: 6 µg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Perchlorate (µg/L)
- 0.0 - 1.5
- 1.5 - 3.0
- 3.0 - 4.5
- 4.5 - 6.0
- 6.0+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
Tipton
Poplar
Porterville
LAKE SUCCESS
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Deer Creek
Middle River
Porter Slough
Friant-Kern Canal
137
43
99
190
65
155

1 inch = 3 miles

0 1.5 3 Miles

N

Created by 4Creeks 7/8/2022

Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient Sodium
2017-2022

Agricultural Water Quality Goal: 69 mg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Sodium (mg/L)
- 0 - 17.25
- 17.25 - 34.5
- 34.5 - 51.75
- 51.75 - 69.0
- 69.0+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
Tipton
Poplar
Porterville
LAKE SUCCESS
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Porter Slough
Deer Creek
Friant-Kern Canal
White River
137
43
99
190
65
155

N
1 inch = 3 miles
0 1.5 3 Miles

Created by 4Creeks
7/7/2022

Well Data Source:
GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient
1,2,3-Trichloropropane
2017-2022

Drinking Water MCL:
0.005 µg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

1,2,3-Trichloropropane (µg/L)
- 0.0 - 0.00125
- 0.00125 - 0.0025
- 0.0025 - 0.00375
- 0.00375 - 0.005
- 0.005+

4CREEKS

Waukena
Corcoran
Plainview
Strathmore
Woodville
LAKE SUCCESS
Porterville
Tipton
Poplar
Pixley
Terra Bella
Teviston
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Porter Slough
Deer Creek
Friant-Kern Canal
Kaweah River
137
43
99
190
65
155

1 inch = 3 miles
0 1.5 3 Miles
N
Created by 4Creeks 7/8/2022
Well Data Source: GAMA

Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

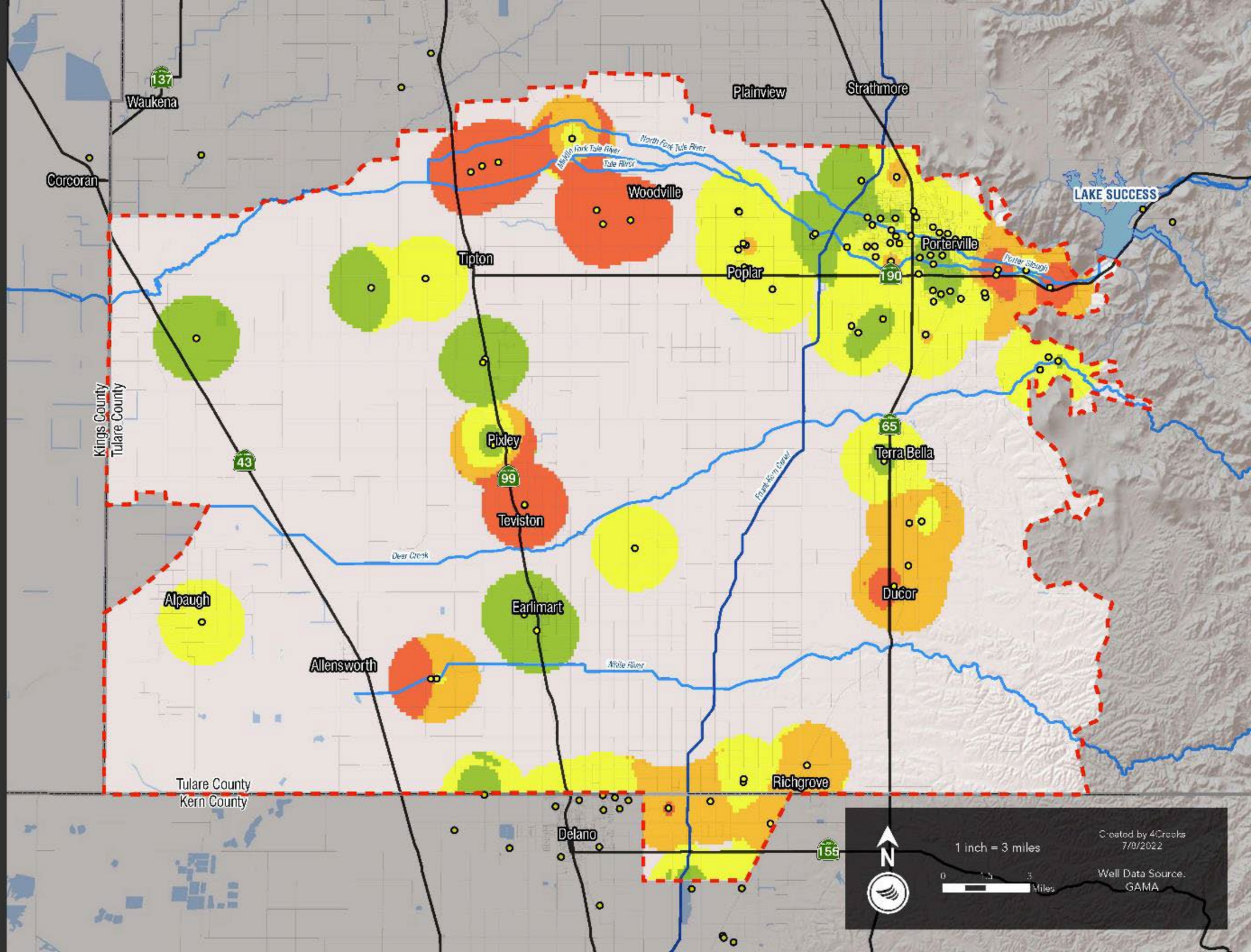
Ambient
Total Dissolved Solids
2017-2022

Agricultural Water Quality Goal:
450 mg/L

Legend
- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Total Dissolved Solids (mg/L)
- 0 - 112.5
- 112.5 - 225
- 225 - 337.5
- 337.5 - 450
- 450+

4CREEKS



Tule Subbasin
Sustainable Groundwater Management Act

Tule Subbasin
Groundwater Quality Analysis

Ambient
Total Dissolved Solids
2017-2022

SMCL: 1000 mg/L

Legend

- Tule Subbasin
- Lake Success
- Major Roads
- Roads
- Friant-Kern Canal
- Waterways
- Constituent Sampling Wells

Total Dissolved Solids (mg/L)

- 0 - 250
- 250 - 500
- 500 - 750
- 750 - 1,000
- 1,000+

4CREEKS

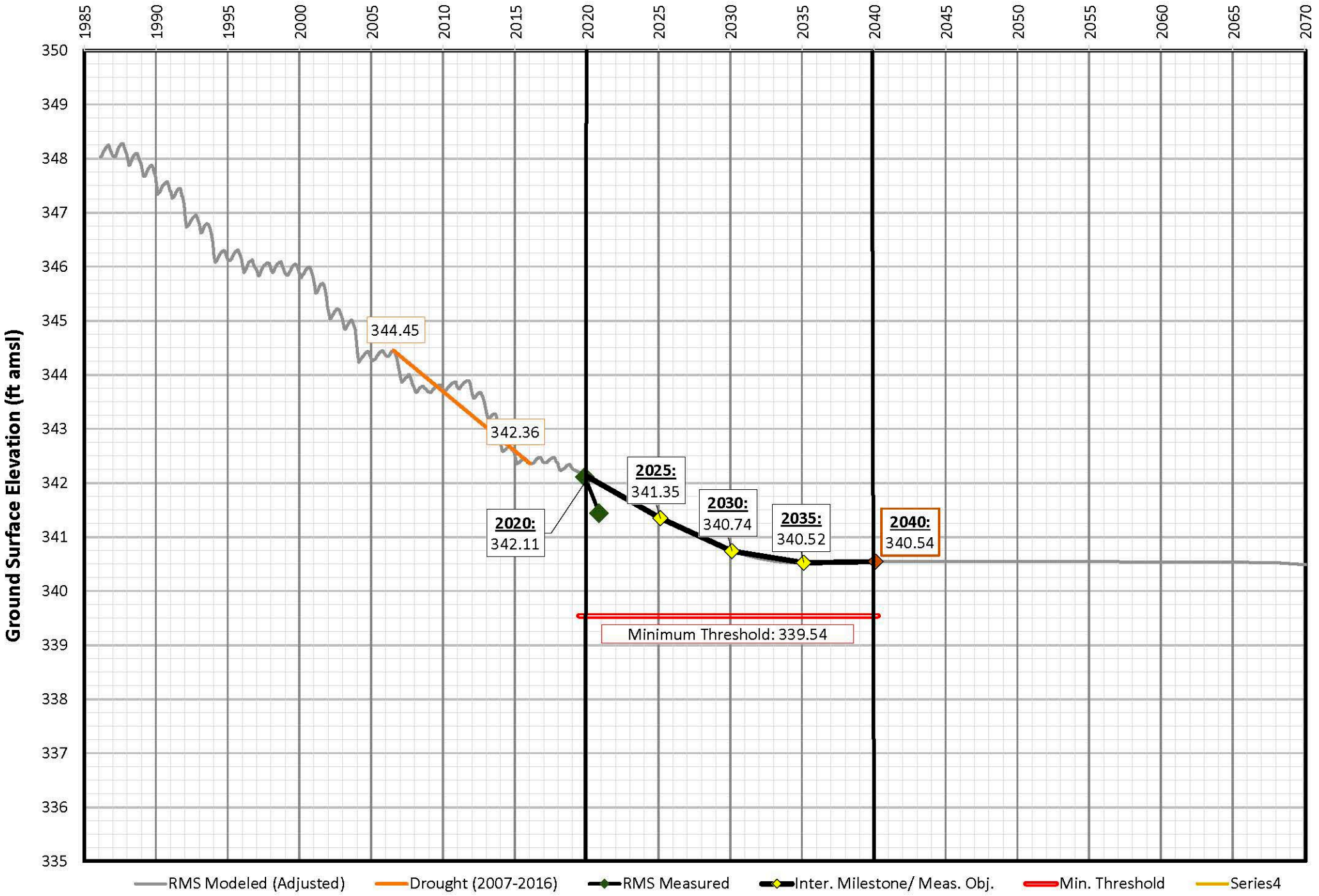
Waukena
Corcoran
Plainview
Strathmore
Woodville
Tipton
Poplar
Porterville
LAKE SUCCESS
Pixley
Teviston
Terra Bella
Ducor
Alpaugh
Earlimart
Allensworth
Richgrove
Delano
Kings County
Tulare County
Tulare County
Kern County
North Fork Tule River
Middle Fork Tule River
Tule River
Deer Creek
Friant-Kern Canal
Porter Slough
137
43
99
190
65
155

1 inch = 3 miles
0 1.5 3 Miles
N
Created by 4Creeks 7/9/2022
Well Data Source: GAMA

Appendix 5-3: RMS Land Subsidence Charts

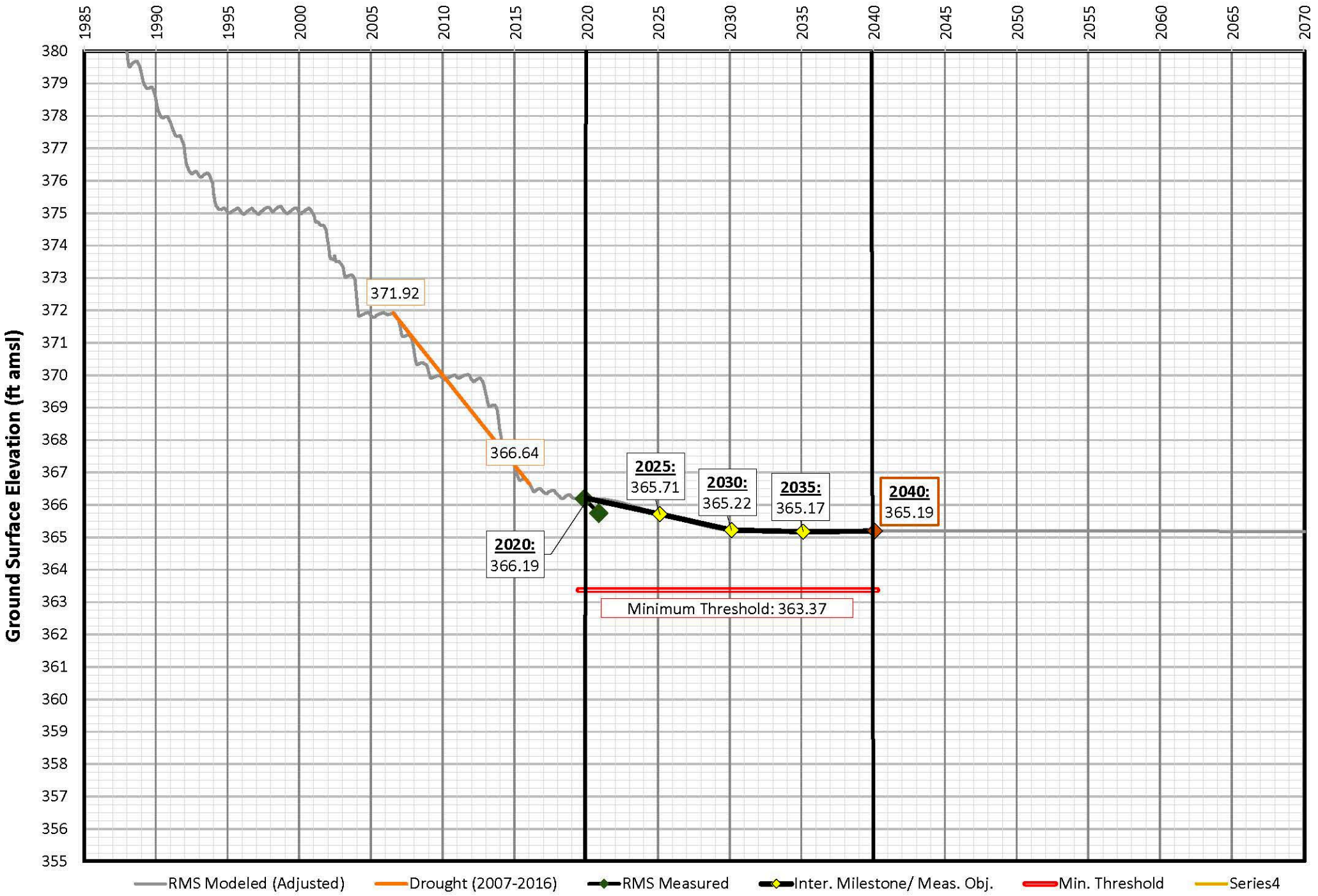
Subsidence RMS ID: E0035_B_RMS

35.94675, -119.17953



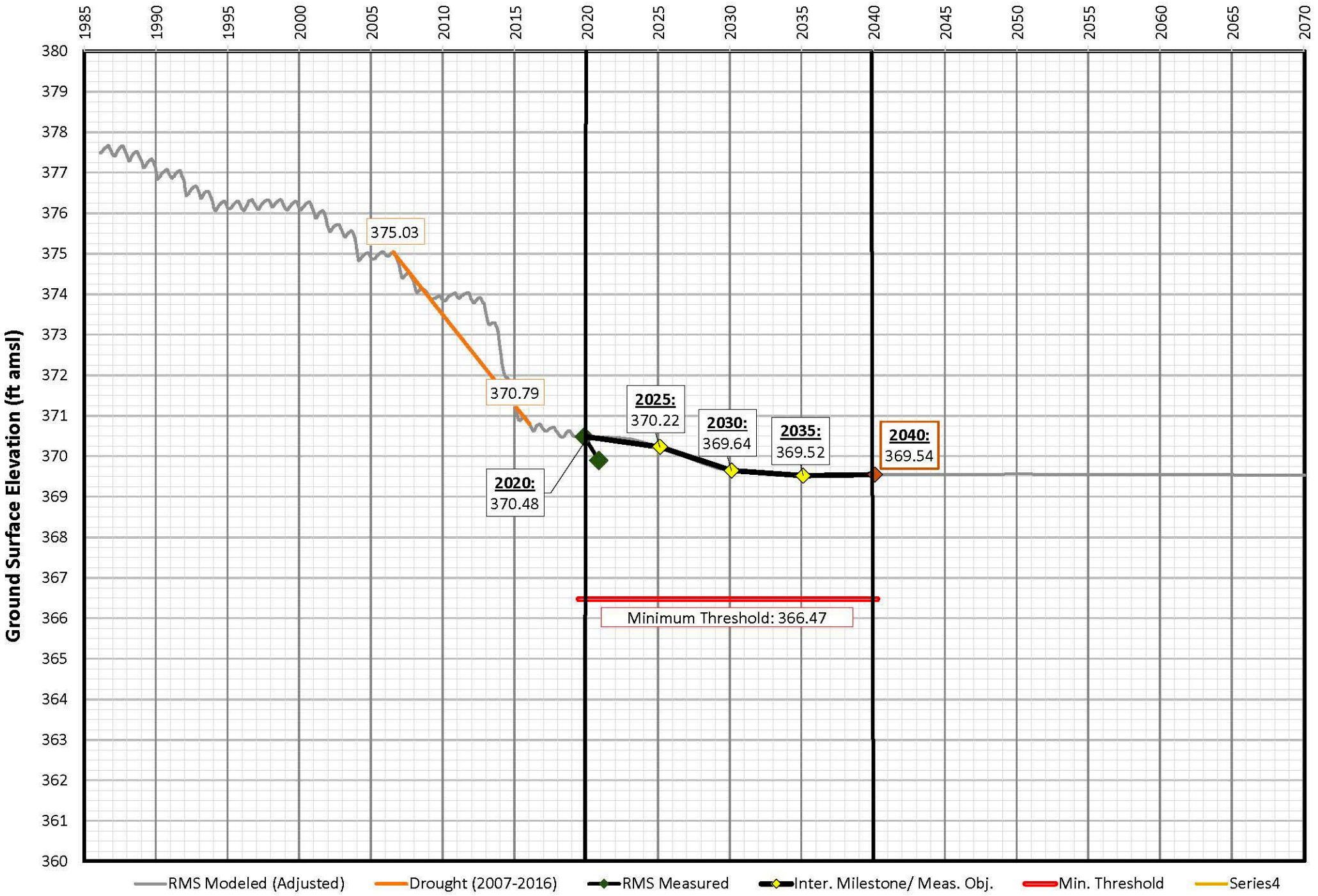
Subsidence RMS ID: E0047_B_RMS

36.00796, -119.14359



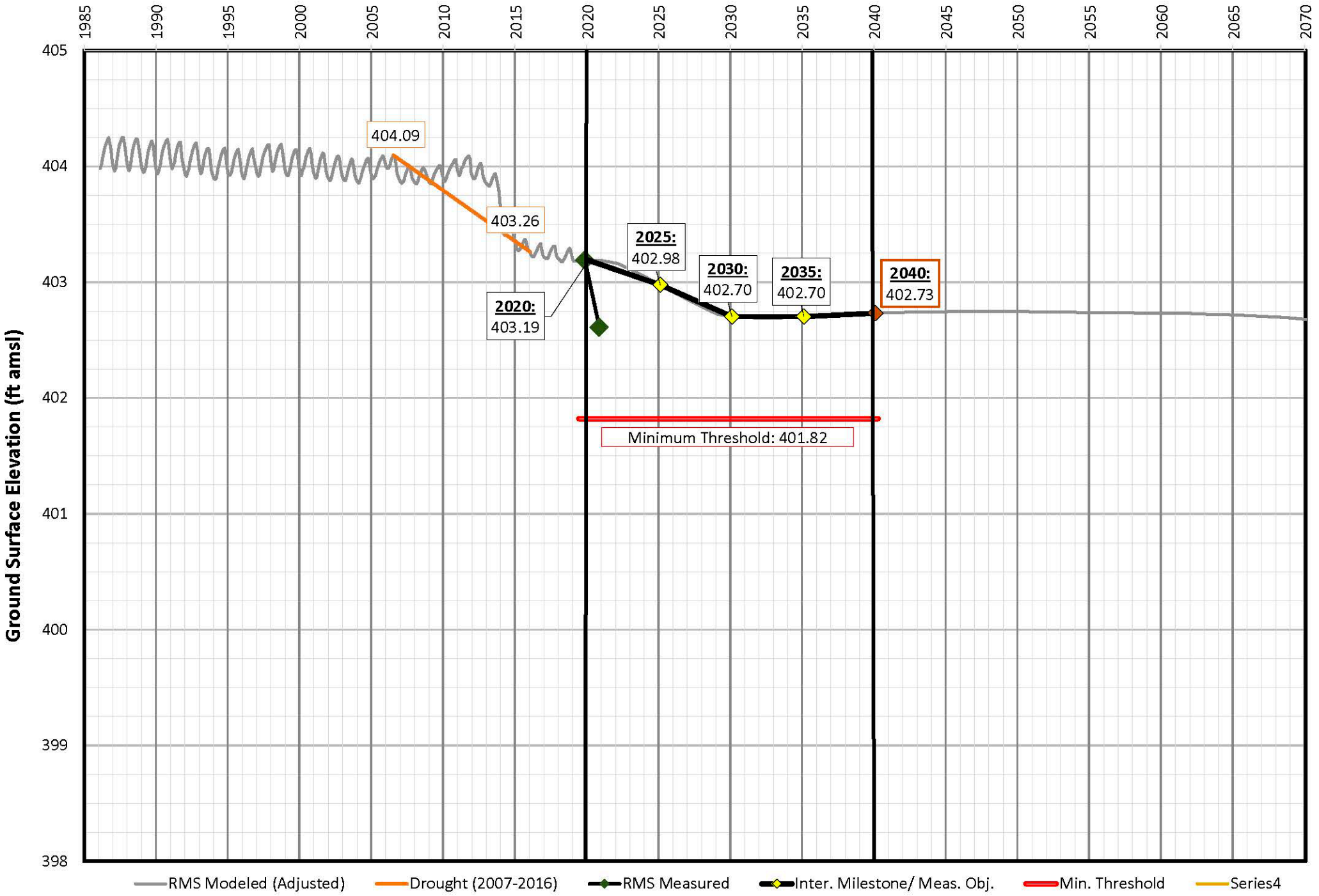
Subsidence RMS ID: E0048_B_RMS

35.96396, -119.14318



Subsidence RMS ID: E0049_B_RMS

35.92121, -119.14385



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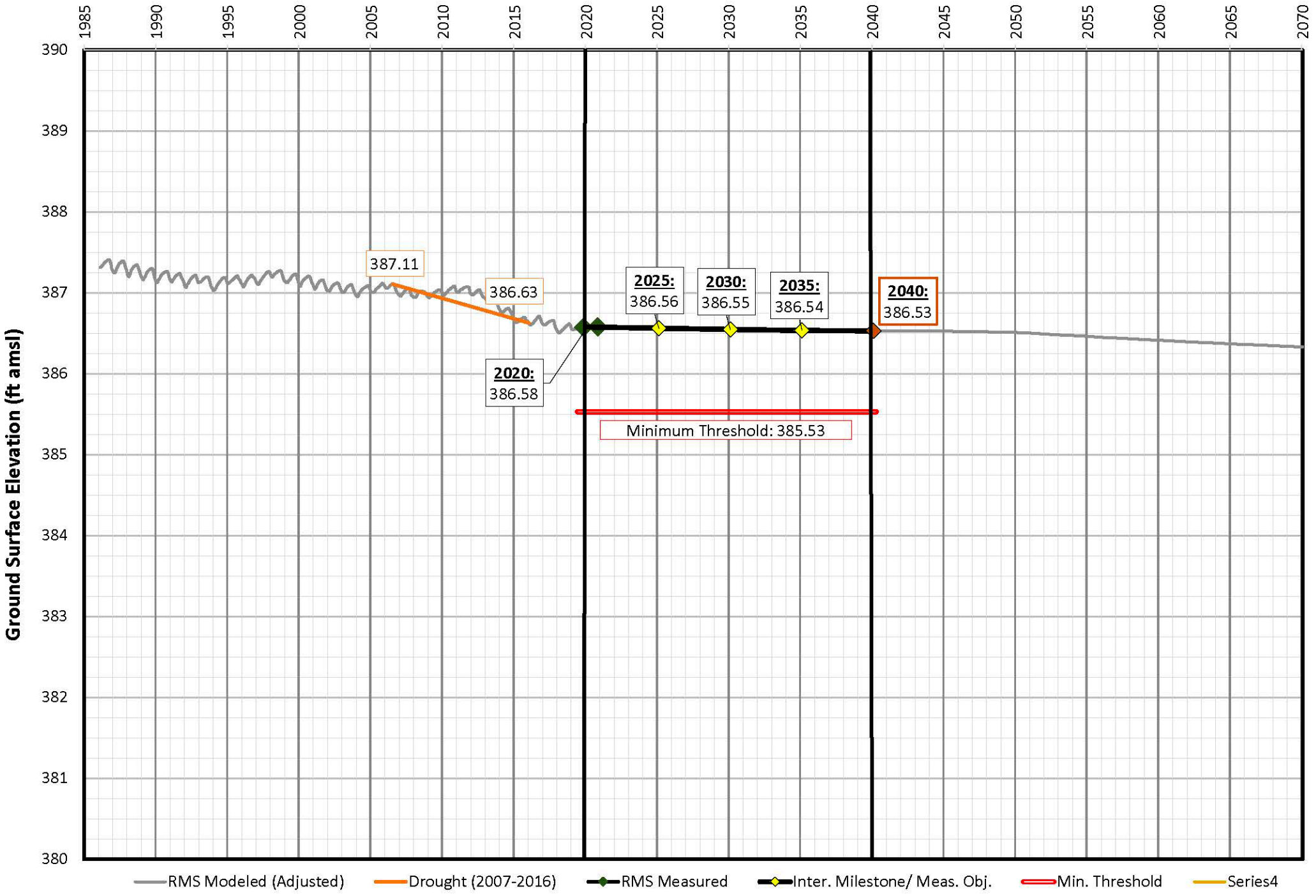

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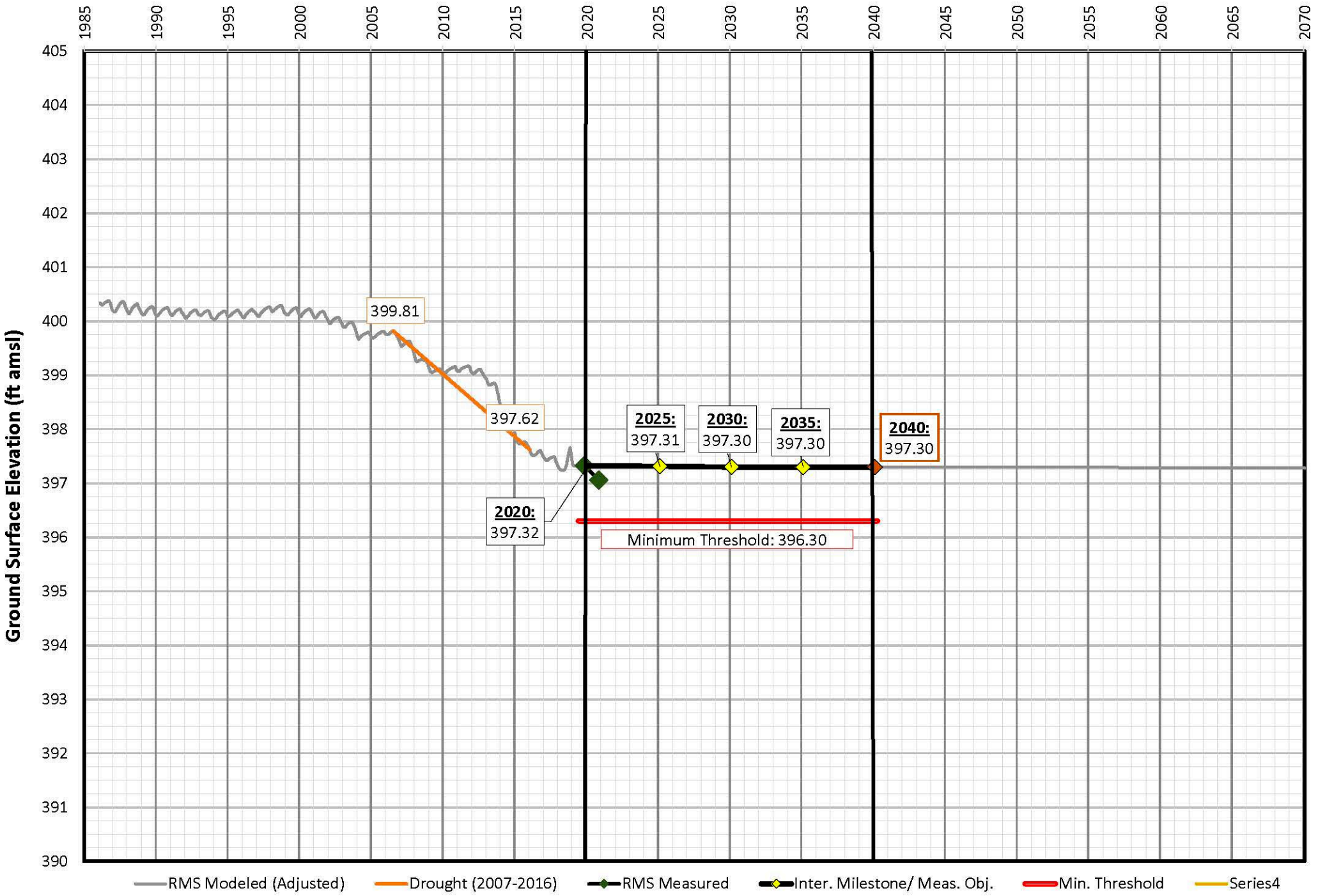

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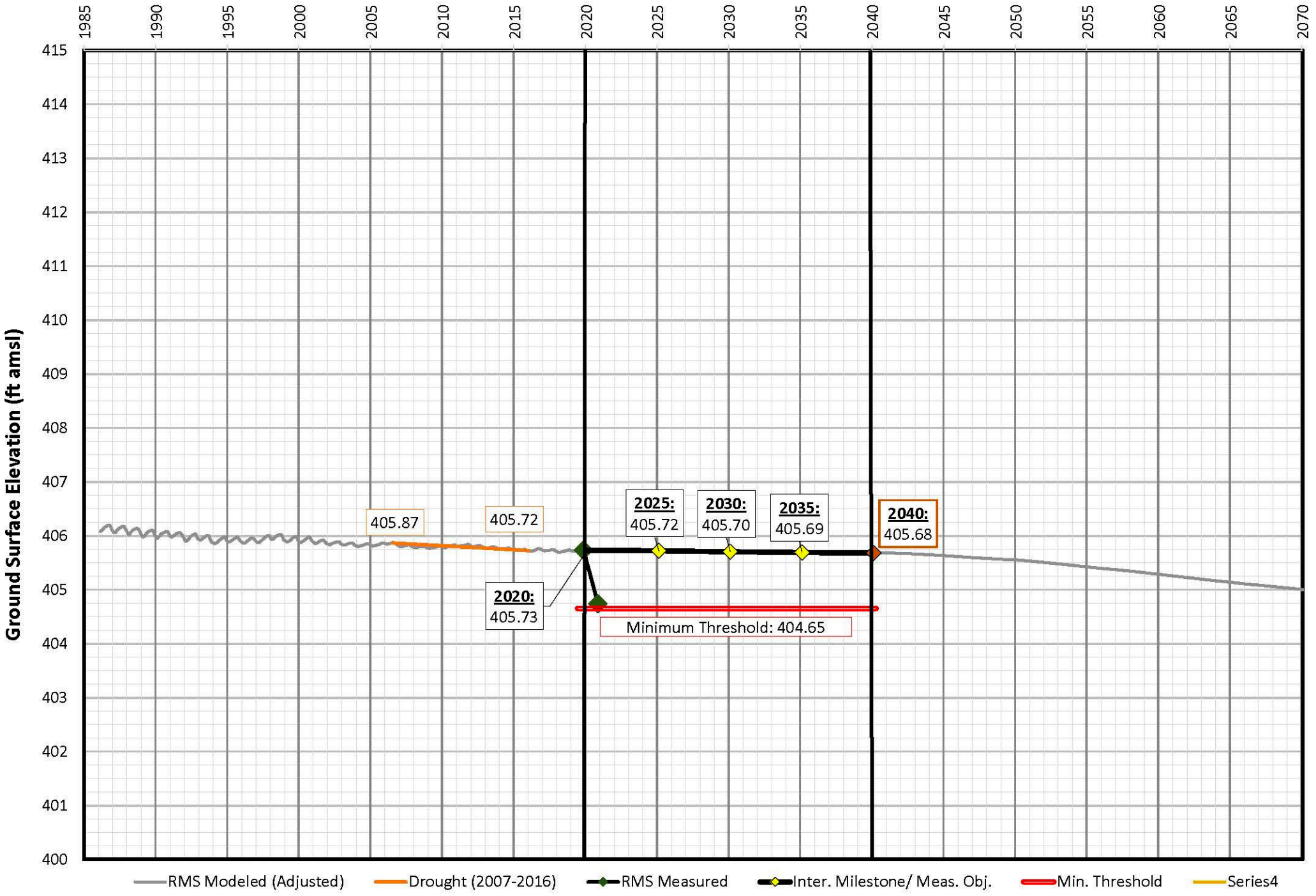

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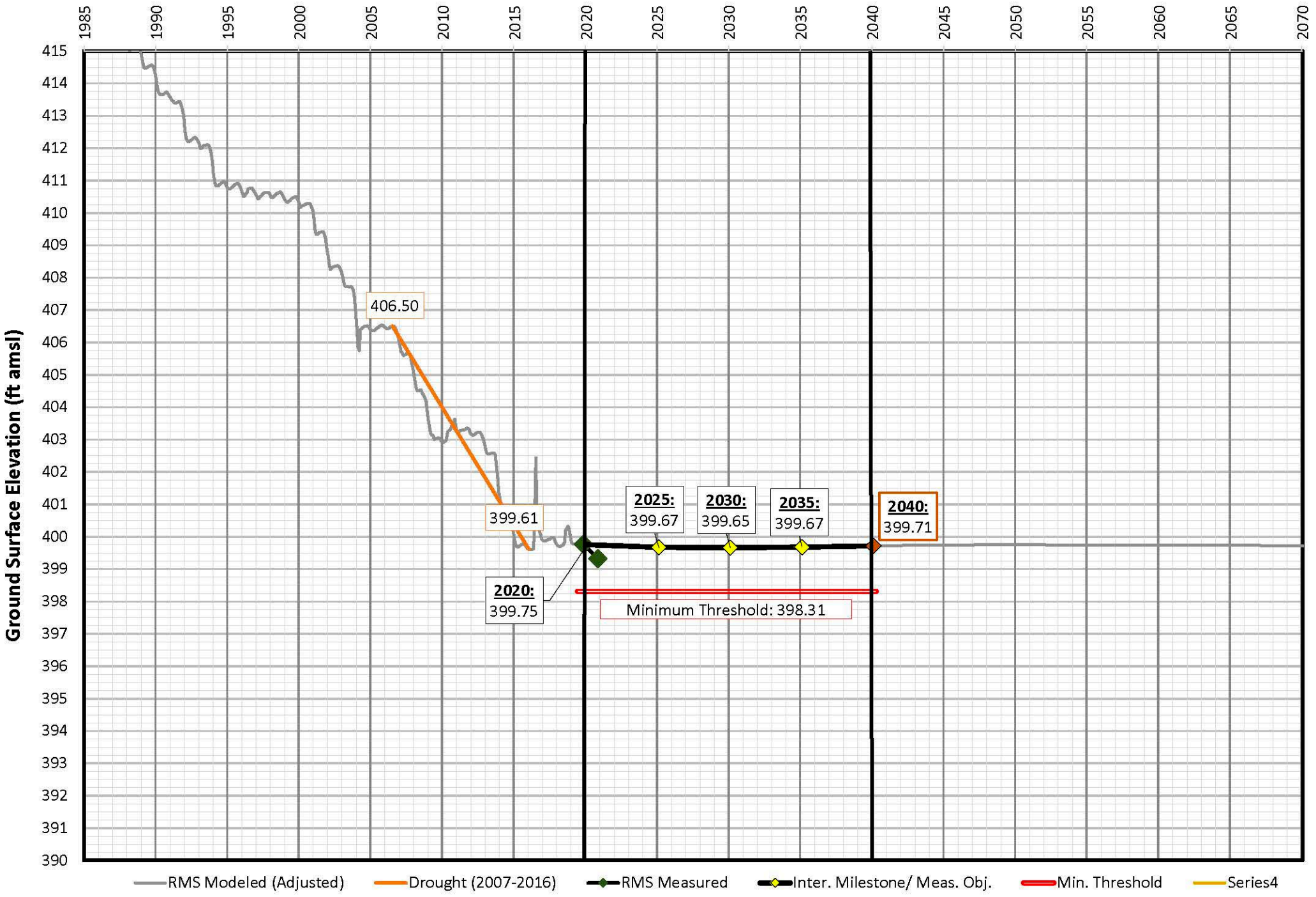

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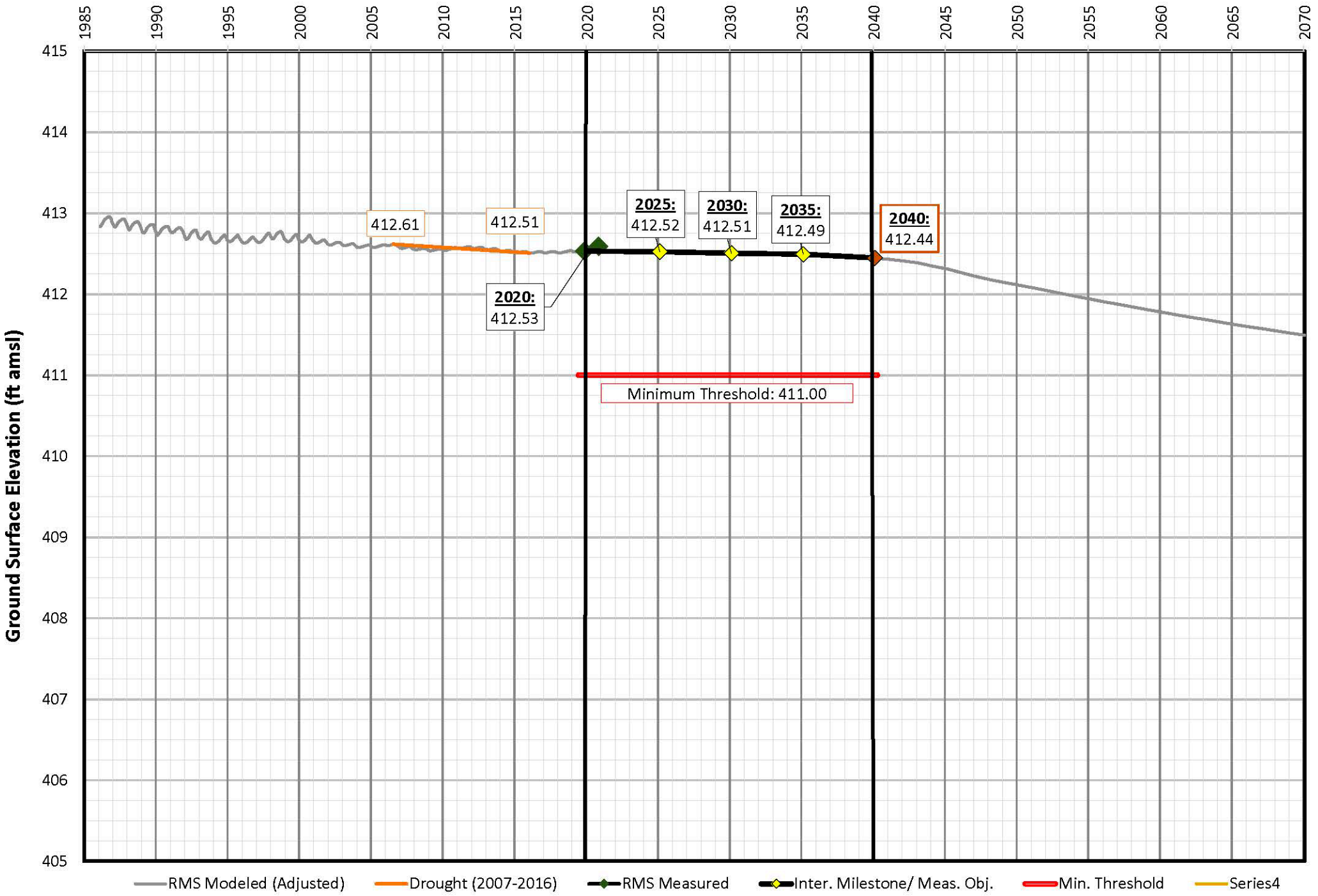

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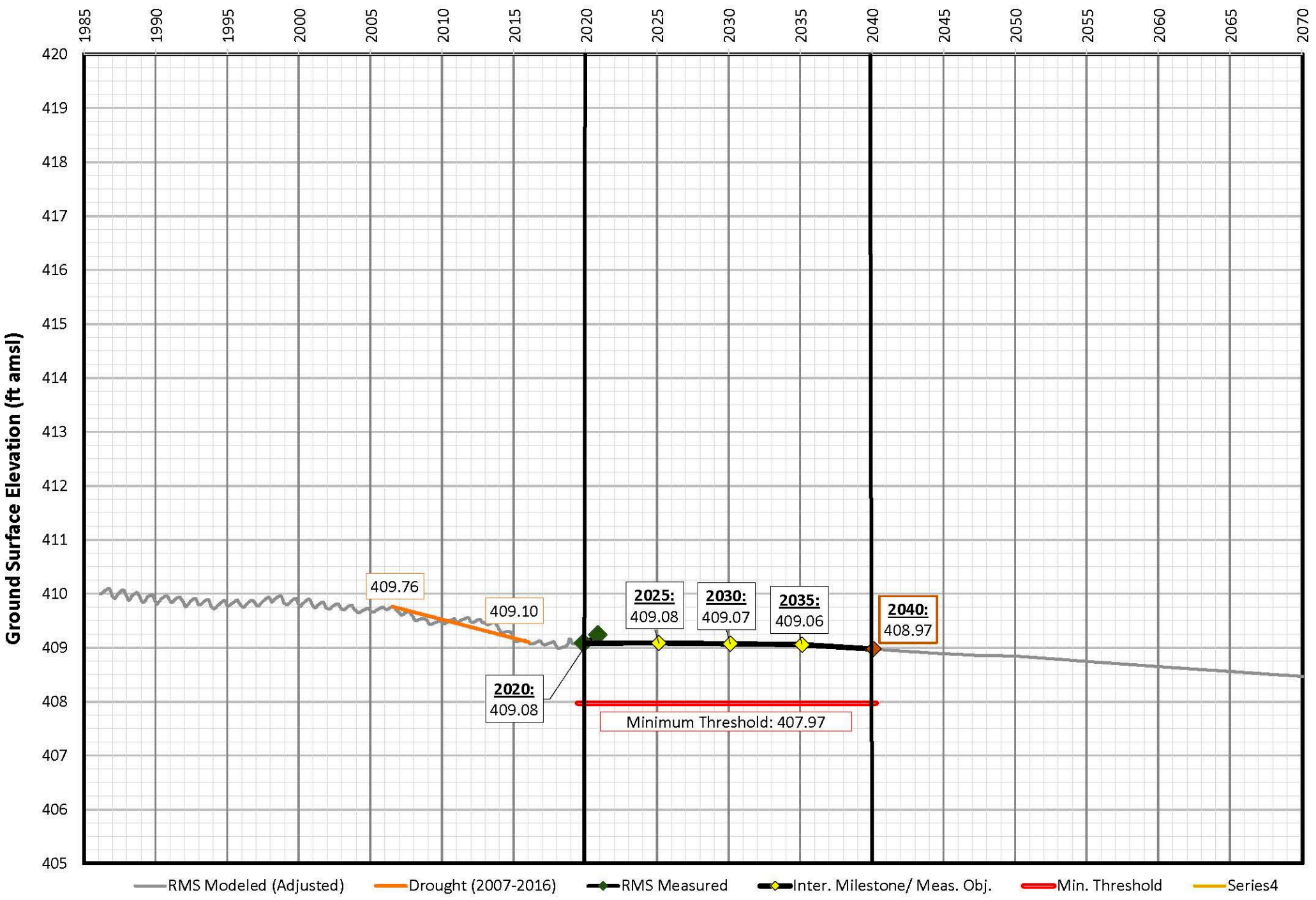

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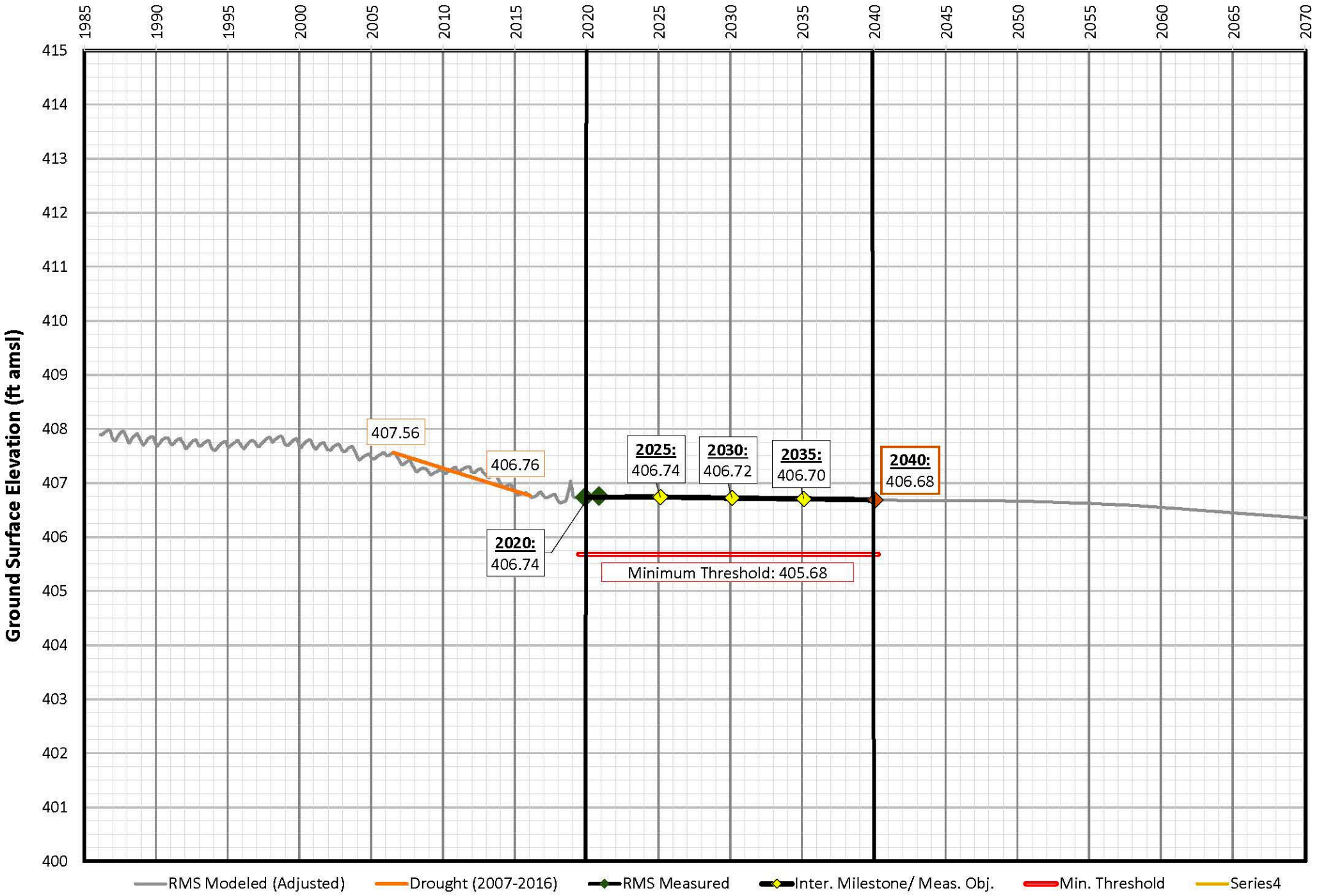

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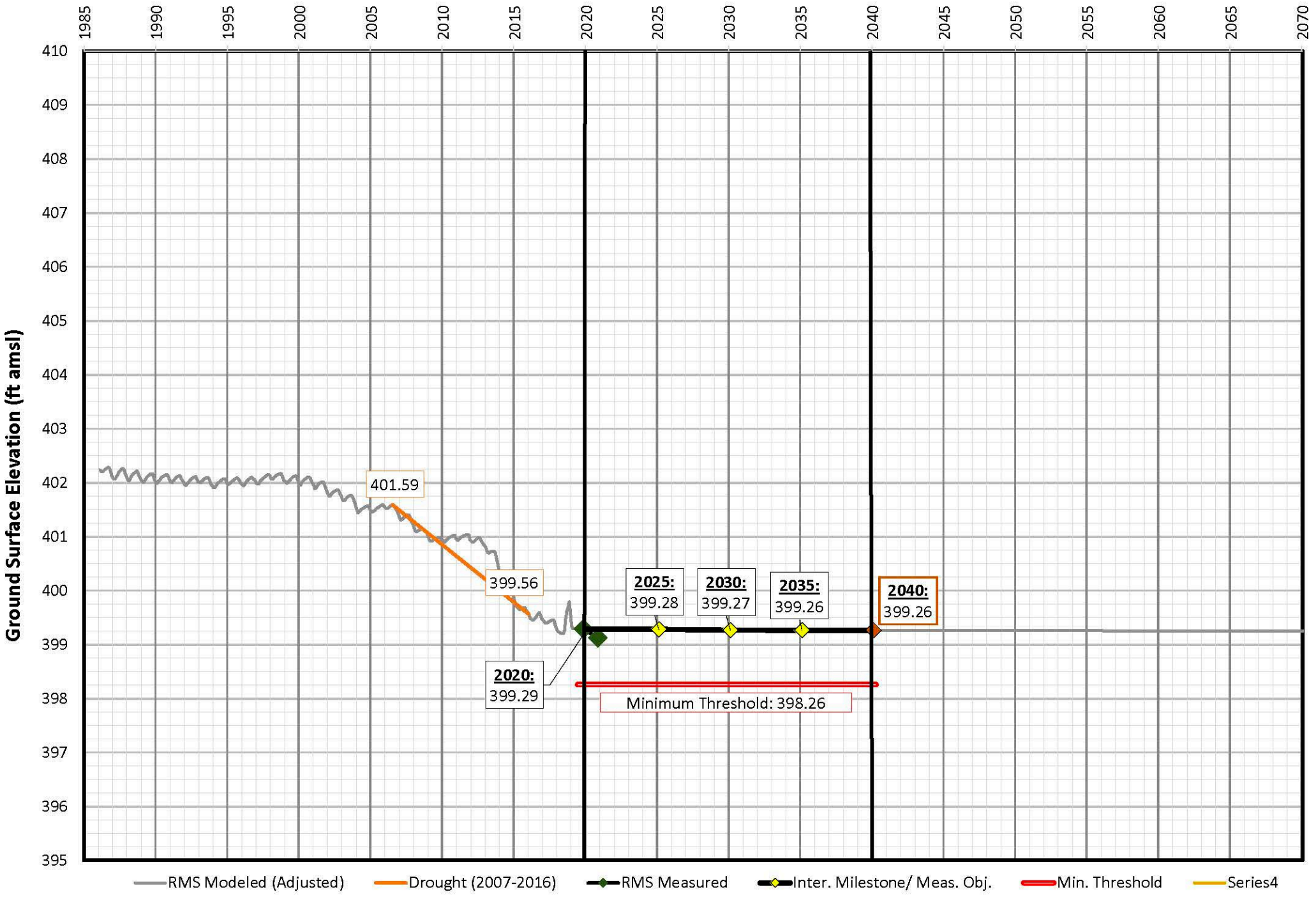

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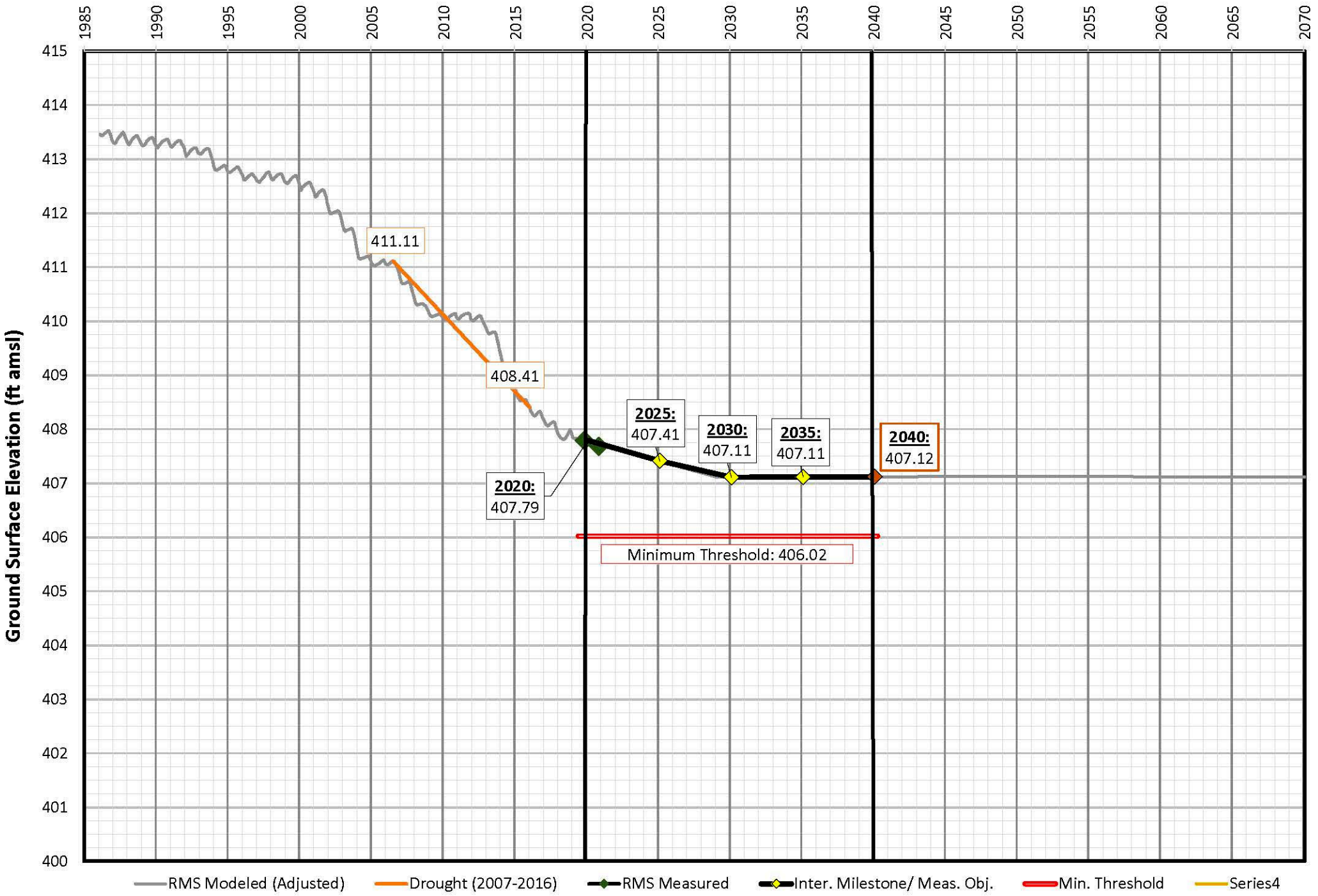

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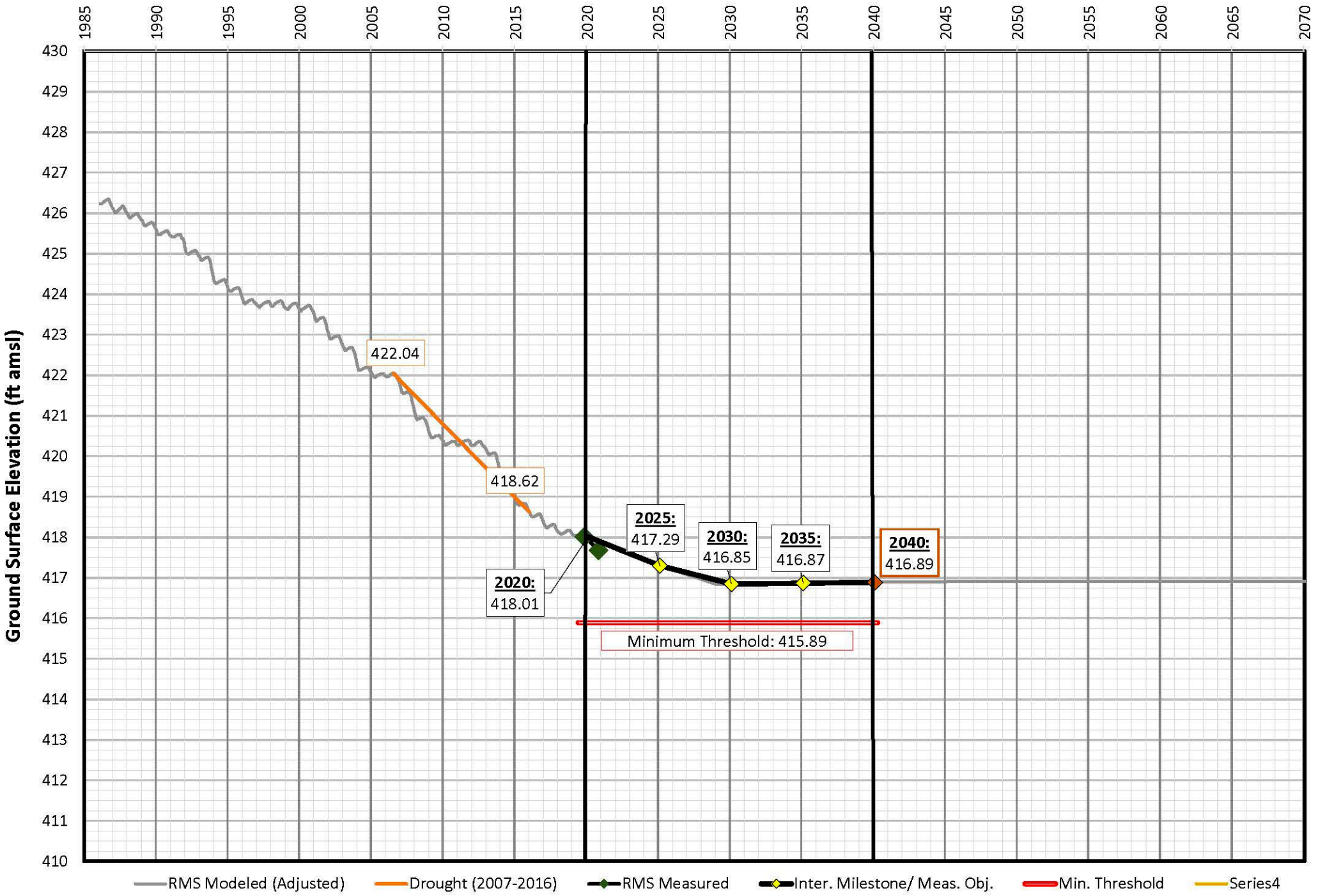

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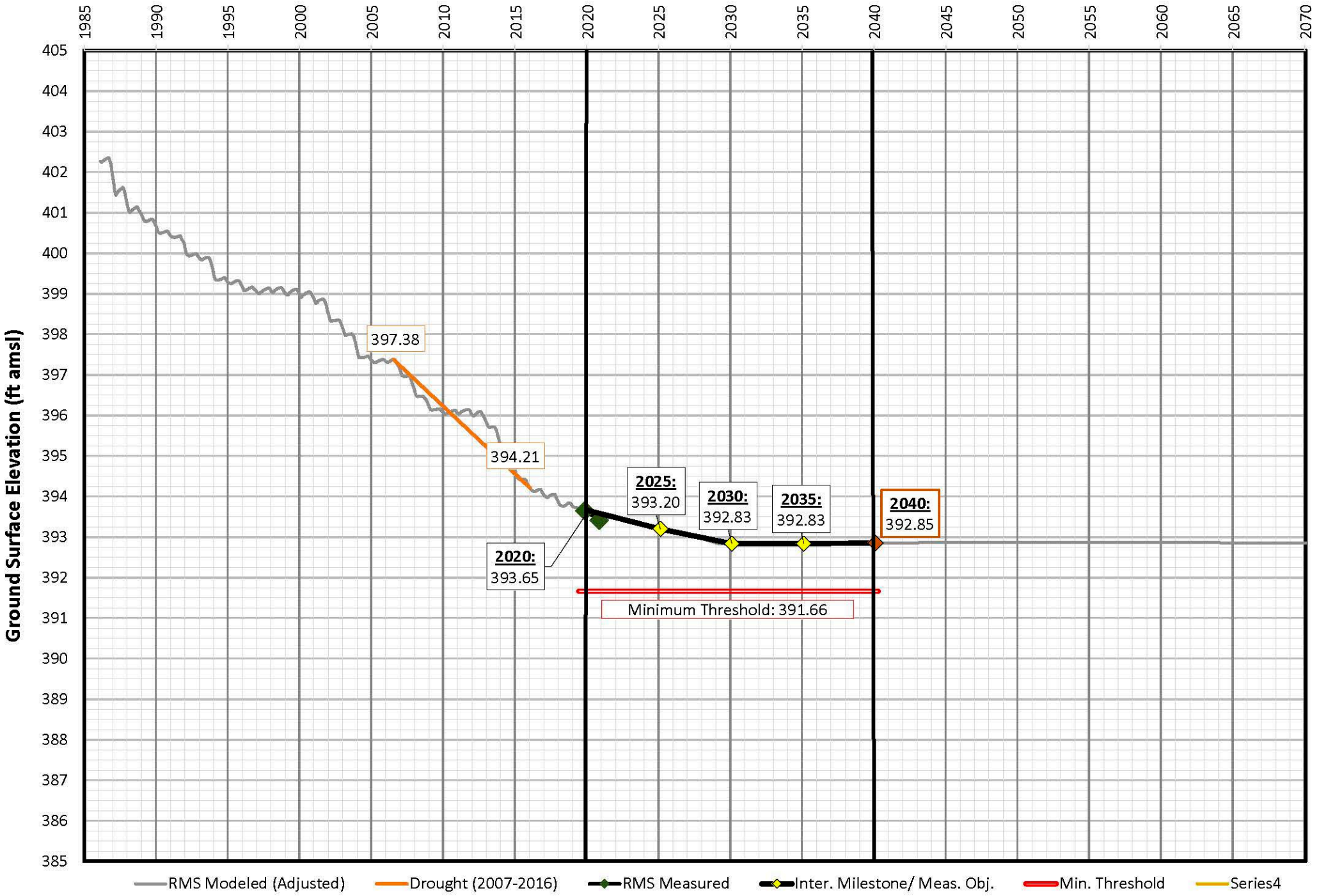

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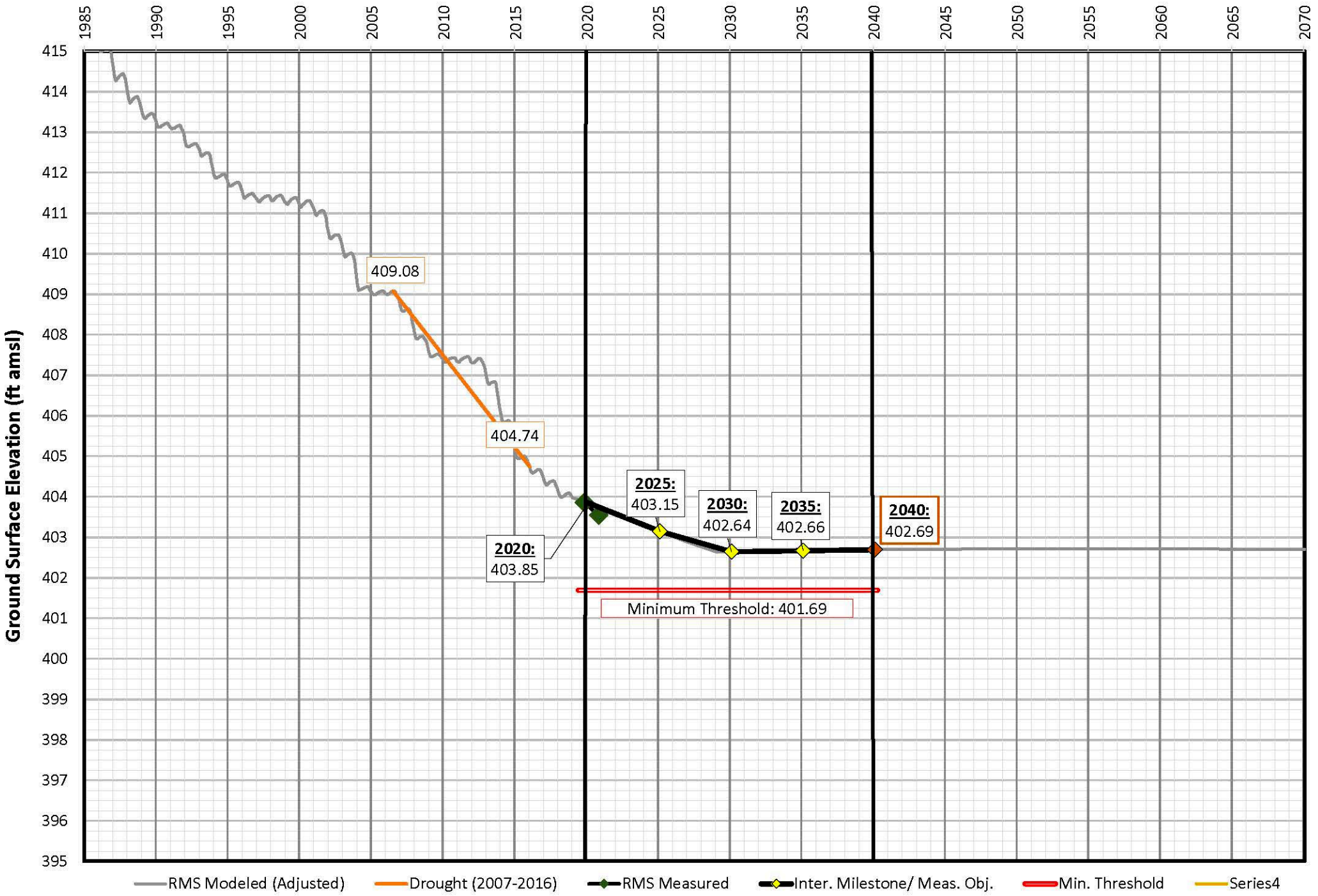

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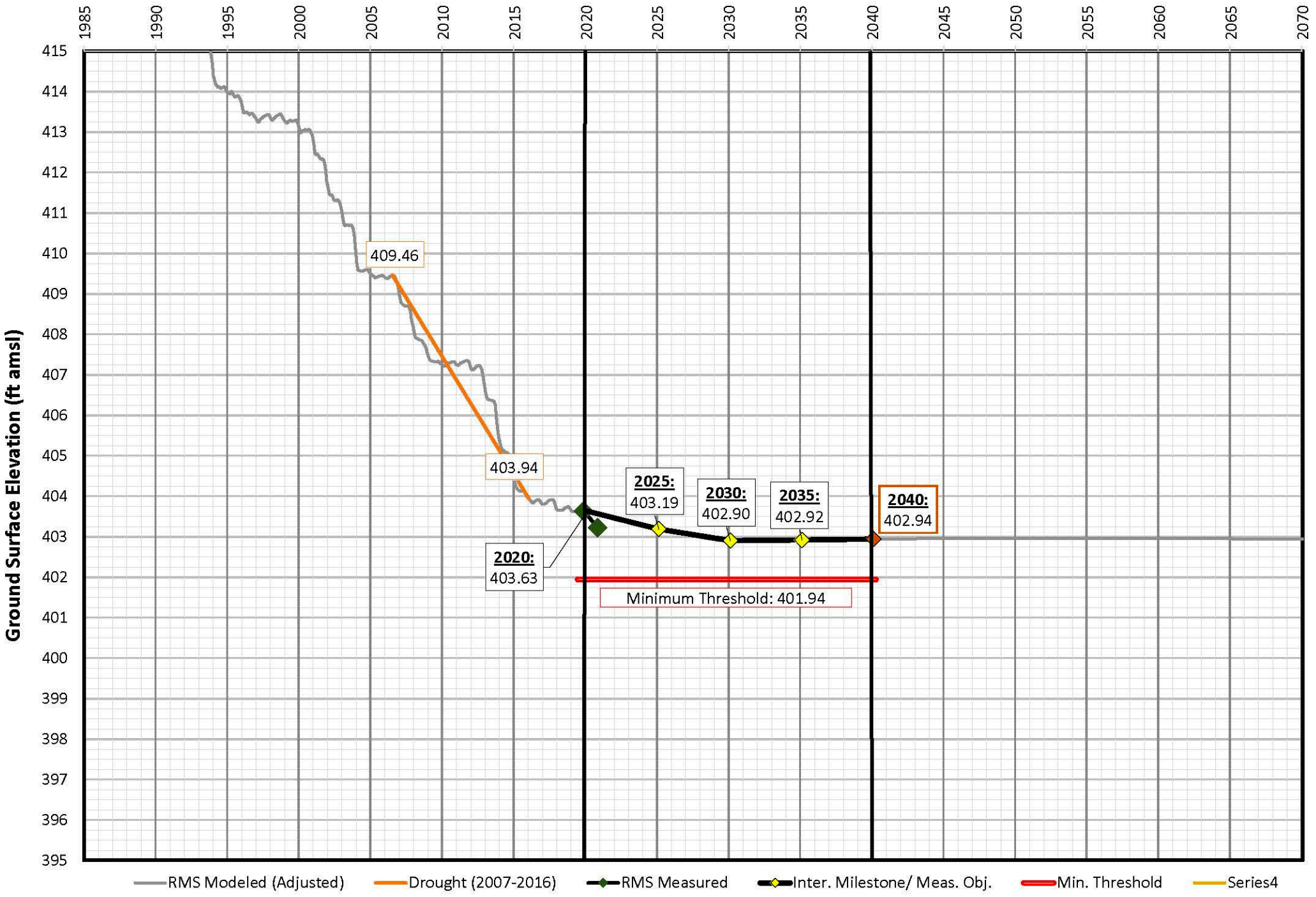

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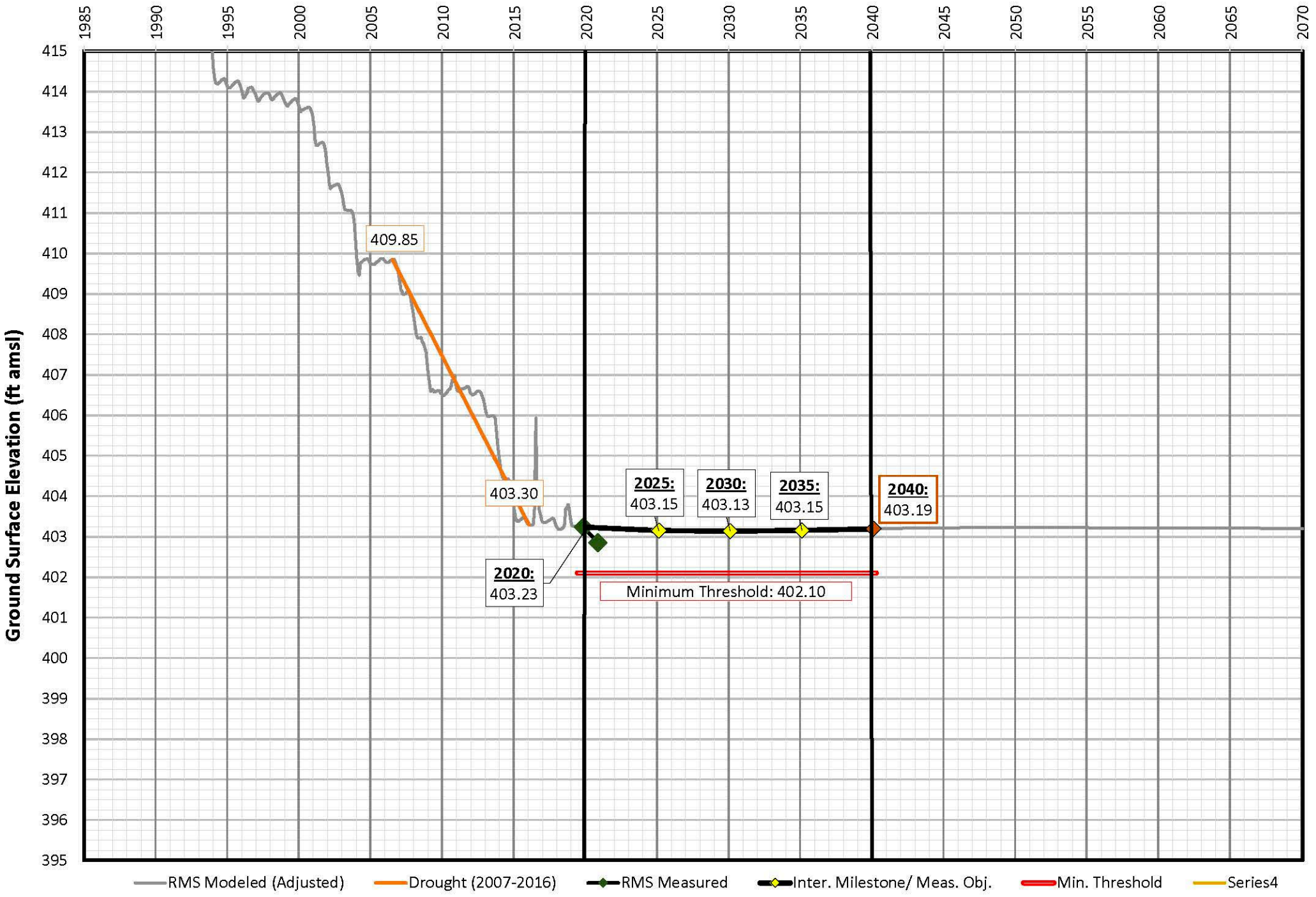

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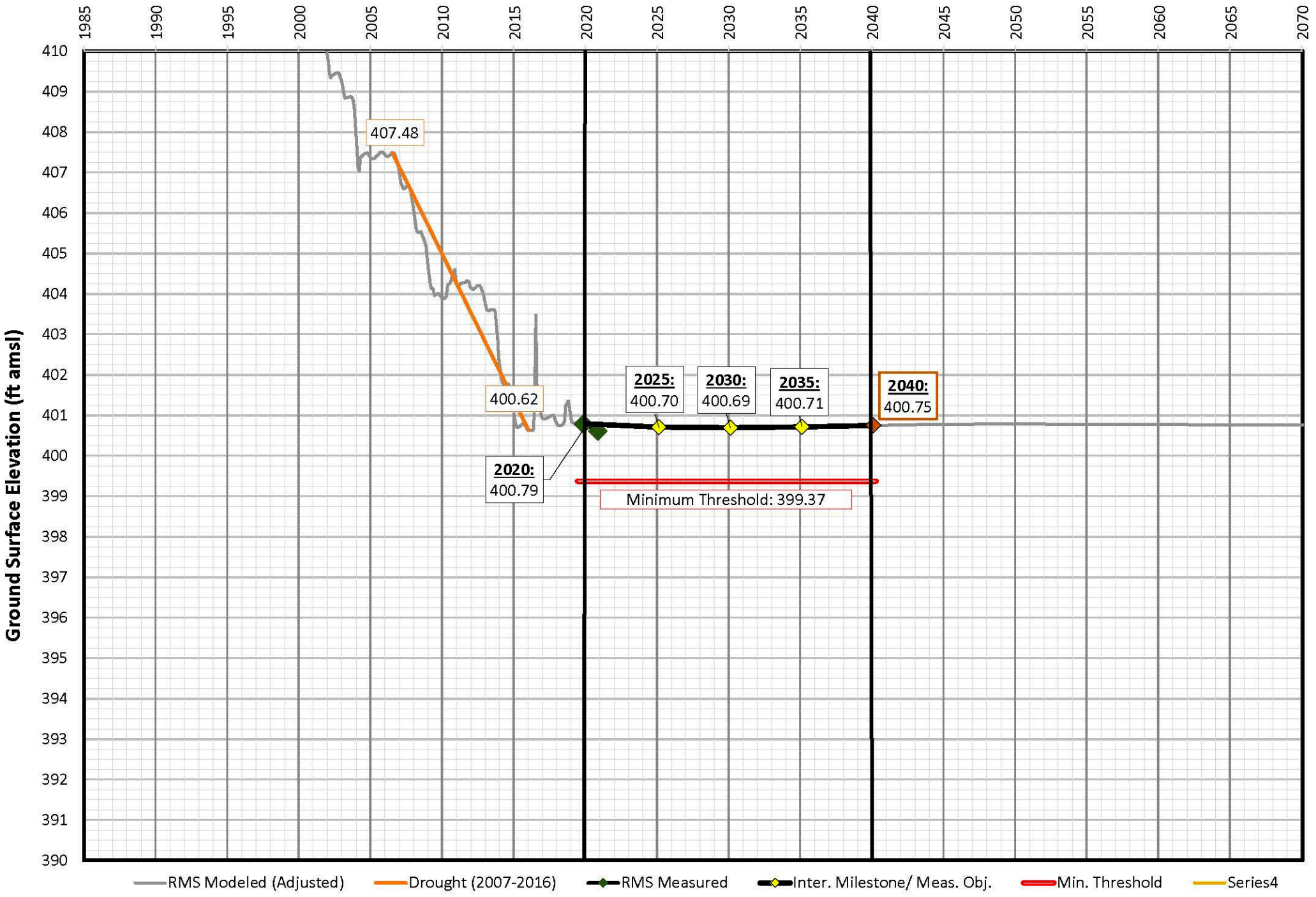

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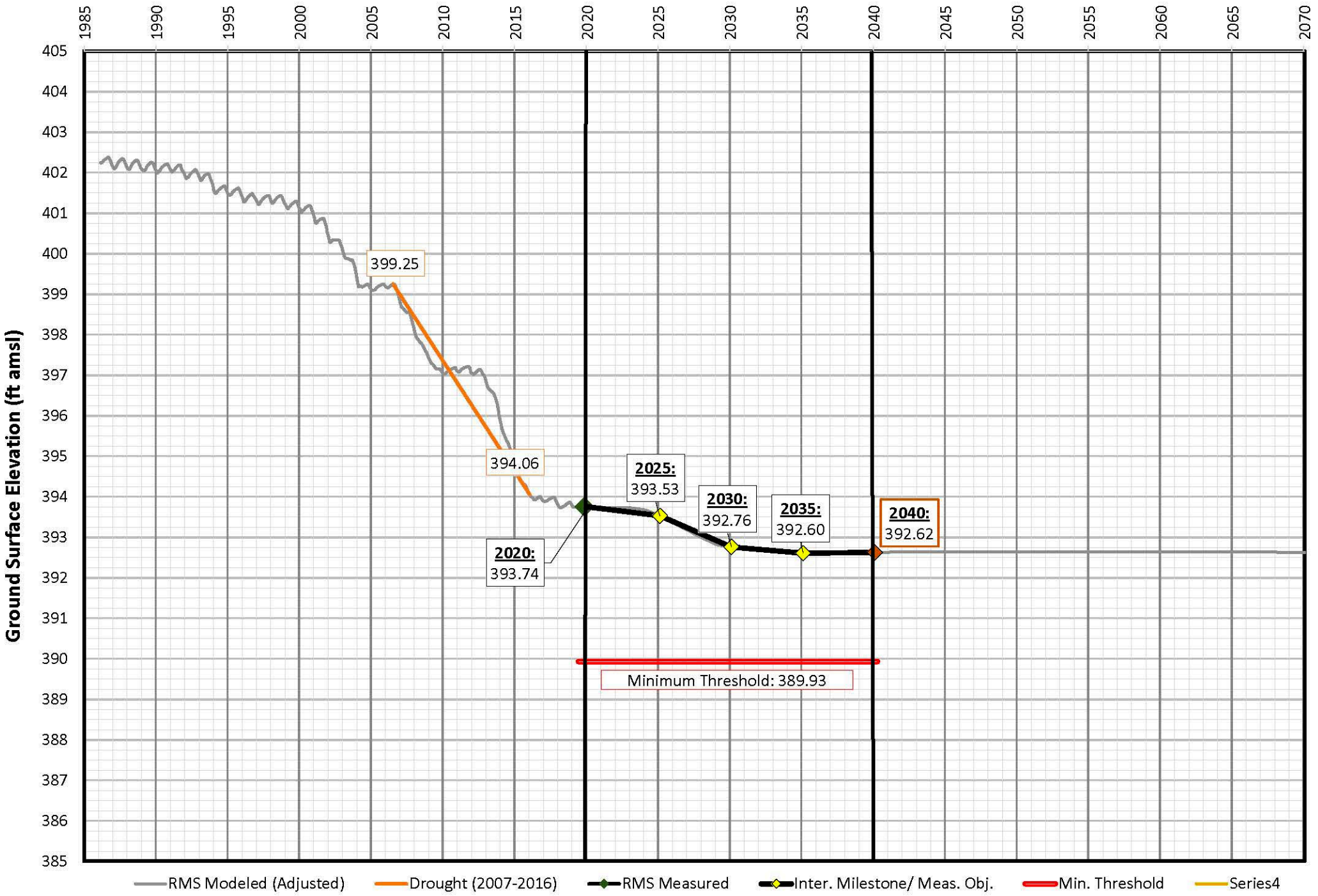

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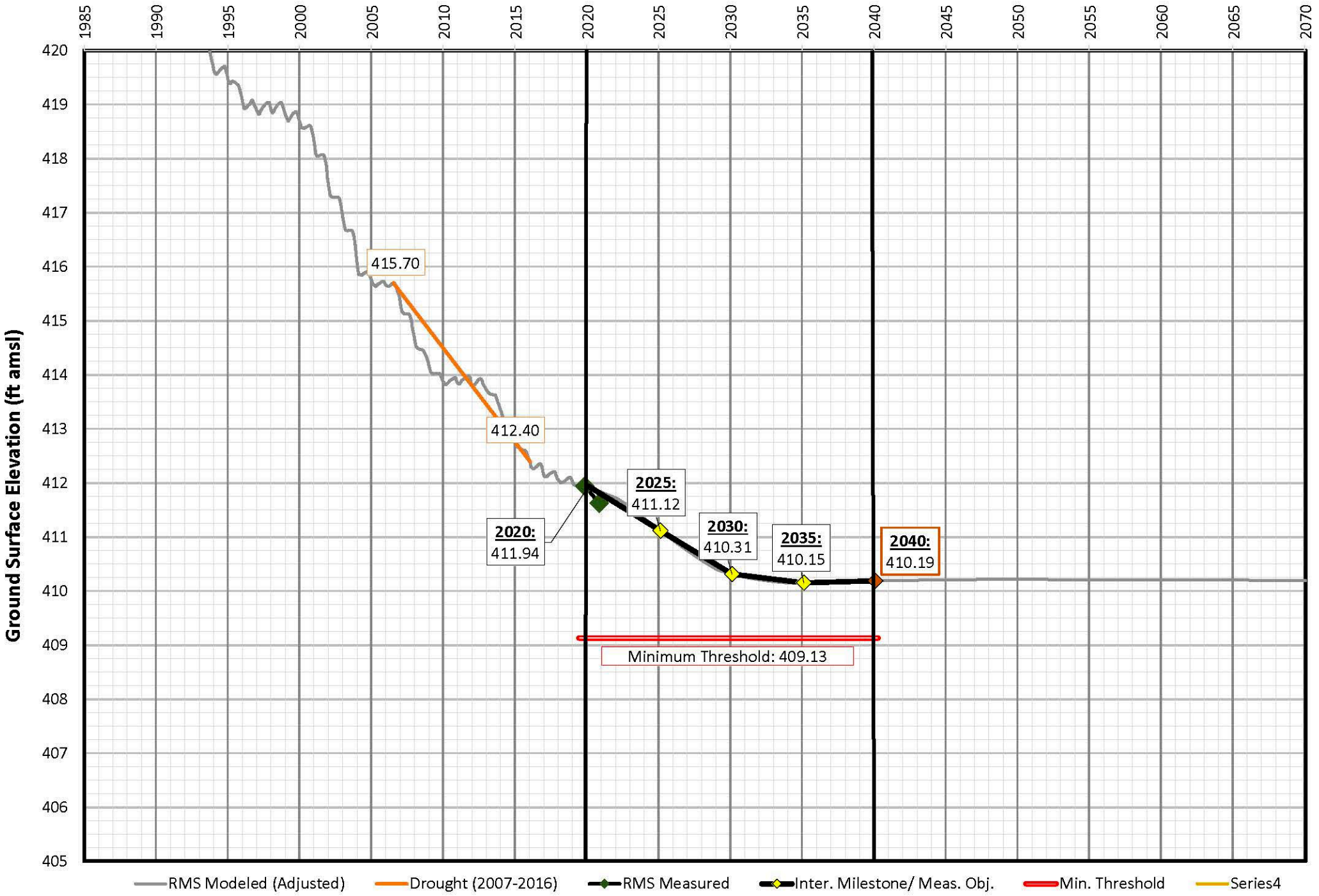

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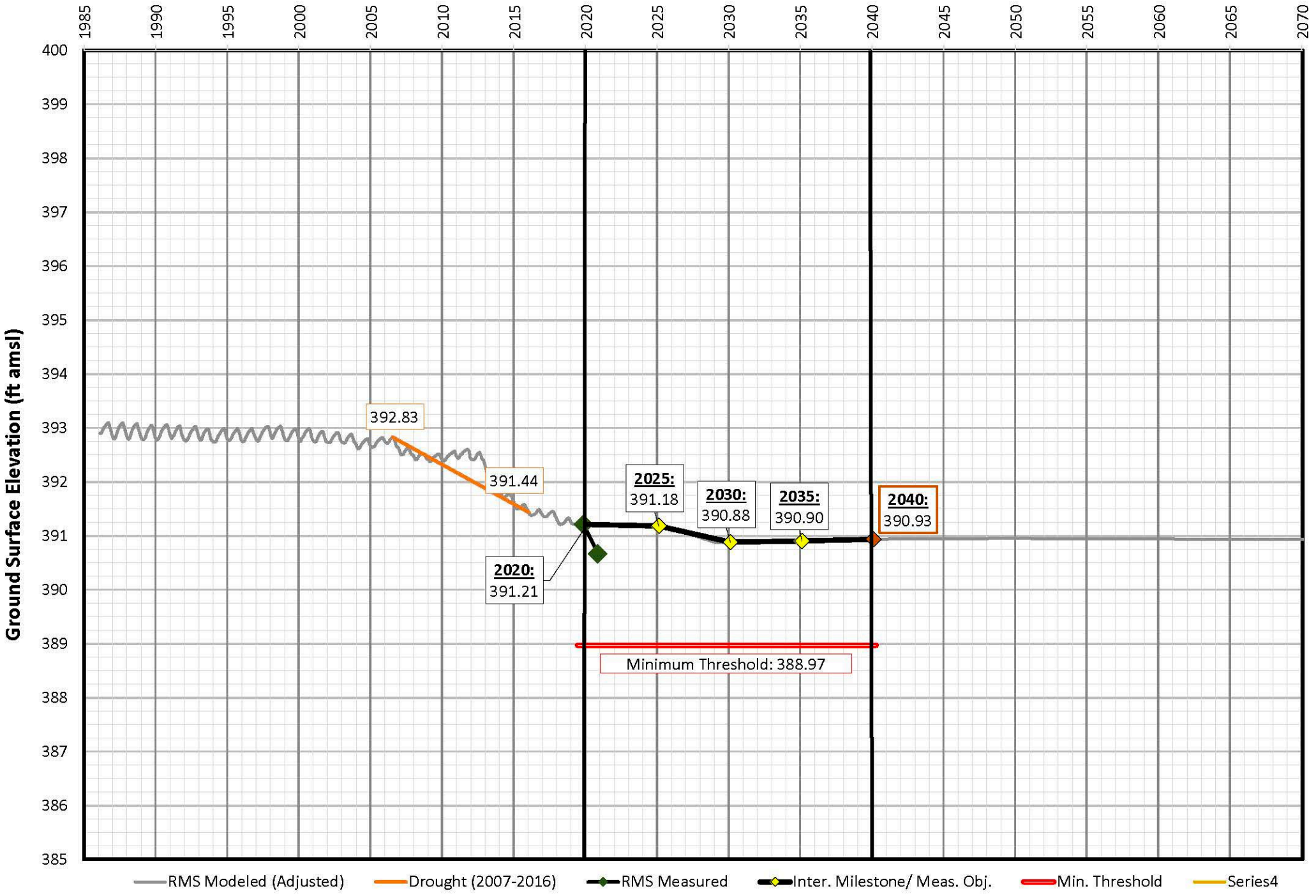

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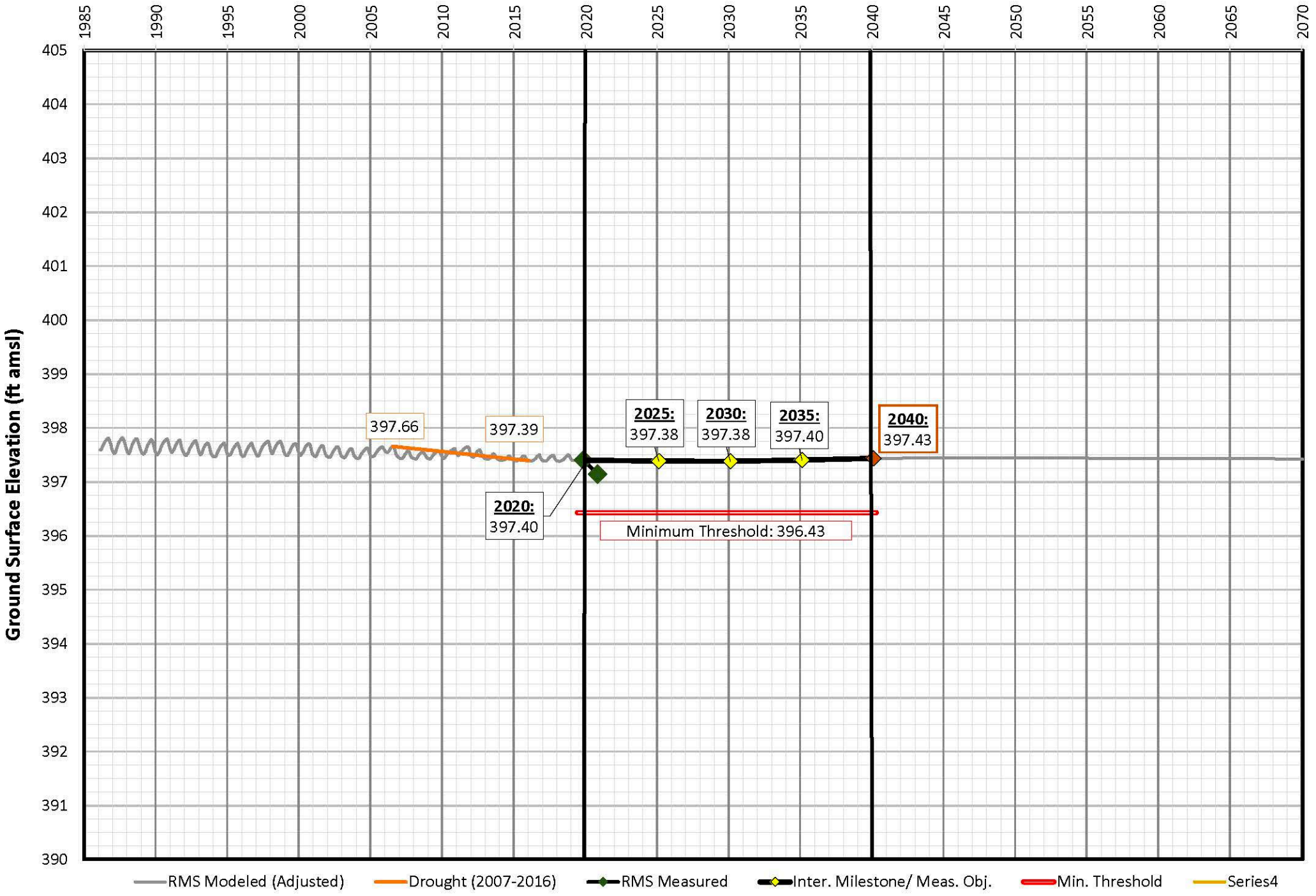

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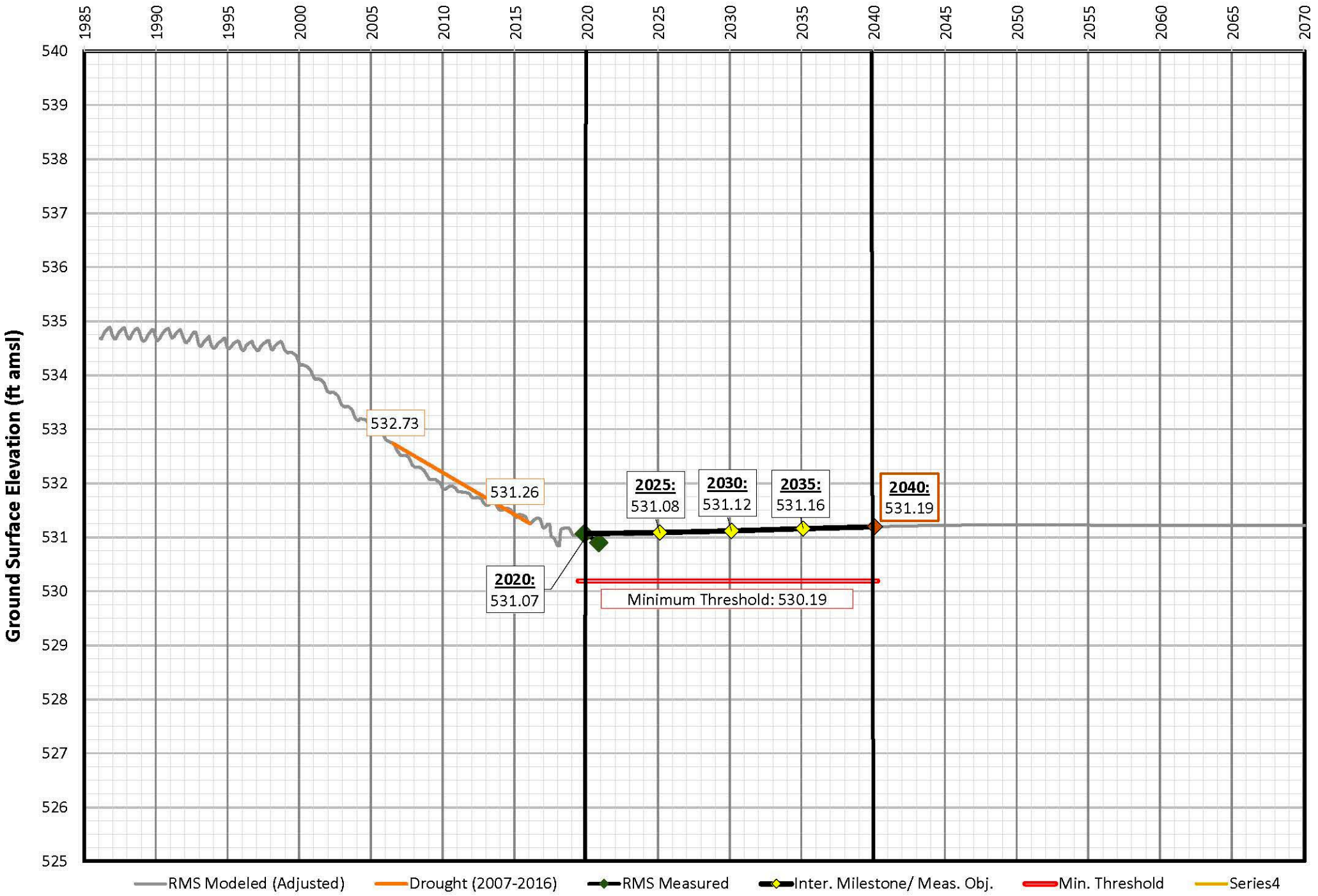

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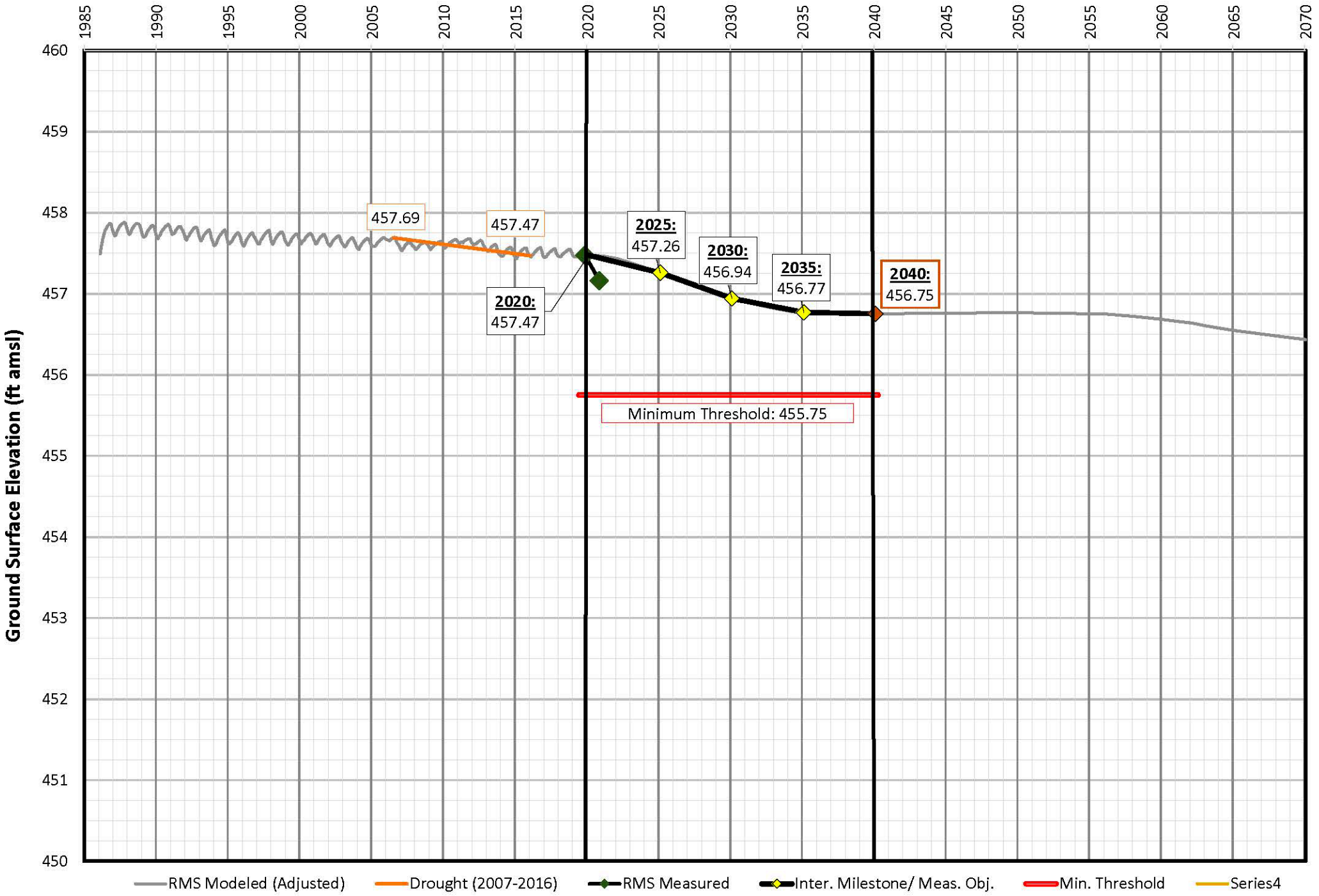

Attachment 5-1: Stantec Technical Memorandum

"*Preliminary Financial Impact Analysis of Transitional Groundwater Pumping-Induced Subsidence on the Friant-Kern Canal as Proposed in the Tule Subbasin Groundwater Sustainability Plans*"

Stantec

Memo

To: Doug DeFlitch, Friant Water Authority

From: Bill Swanson, P.E.
Evan Perez, P.E.

3301 C Street, Suite 1900,
Sacramento, CA 95816

Preliminary Financial Impact Analysis of Transitional Groundwater Pumping-Induced Subsidence on the Friant-Kern Canal as Proposed in the Tule Subbasin Groundwater Sustainability Plans

INTRODUCTION

This document presents estimated water delivery reductions and values associated with projected additional land subsidence that would occur following adoption of the Tule Subbasin Groundwater Sustainability Plans (GSPs).

WATER DELIVERY REDUCTION DUE TO GSP IMPLEMENTATION

The GSPs identify additional subsidence that would occur along the alignment of the Friant-Kern Canal after 2020 during the planned period of transitional pumping. Results were provided as projected changes in land surface compared conditions in 2020.

Figure 1 shows three profiles of the Friant-Kern Canal invert developed as follows:

- 2018 Surveyed Invert, based on a topographic mapping survey completed in 2018 for the FKC Middle Reach Capacity Correction Project.
- 2020 Projected Invert, created by applying 2 years of simulated subsidence (2018 and 2019) from a Thomas Harder and Co. model analysis used to estimate future subsidence for design of the FKC Middle Reach Capacity Correction Project. The additional subsidence estimated through this approach in the most subsided area is 0.87 feet, which is slightly greater than twice the measured subsidence between surveys performed in 2018 and 2019 at that location.
- 2035 Projected Invert, developed by applying additional subsidence that would occur by 2035, as calculated in a groundwater model by Thomas Harder and Co. based on the approach described in the GSPs, to the 2020 Projected Invert.

Reference: **Preliminary Subsidence Cost Impact Analysis of Proposed Transitional Groundwater Pumping on the Friant-Kern Canal Under the Tule Subbasin Groundwater Sustainability Plans**

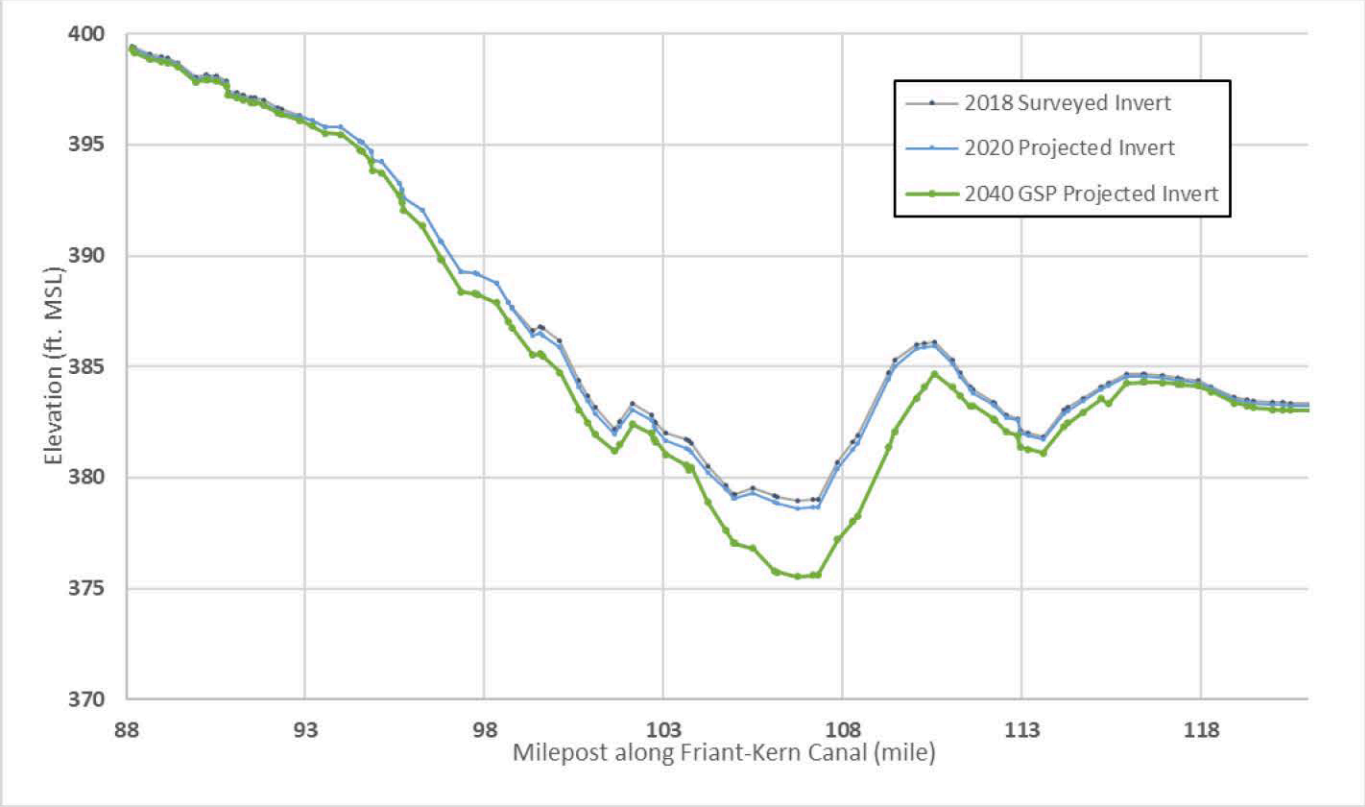

Figure 1. Surveyed and Projected Friant-Kern Canal Invert Profiles

The hydraulic conveyance capacity of the Friant Kern Canal resulting from future subsidence was estimated using a HEC-RAS hydraulic model of the FKC. Subsidence capacity relationships were developed based on 1-foot increments of projected subsidence estimates as estimated in the GSPs.

Water delivery reductions that would occur for estimated canal capacities were determined by applying historical daily delivery patterns based on actual deliveries between 2000 and 2018 to CALSIM II-simulated water allocation estimates over an 82-year period of hydrologic data. Allocated water supplies were converted to daily flow requirements and compared to estimated canal capacity to quantify CVP supplies that would not be conveyed because of FKC capacity constraints. It was assumed water deliveries impeded by capacity constraints would be rescheduled in Millerton Lake to the greatest extent possible for delivery at a later time. Deliveries that could not be rescheduled in Millerton Lake would be released as flood flows from Friant Dam.

Capacity reductions and average annual water delivery reductions for 1-foot increments of potential subsidence after 2020 are listed in Table 1. Capacity was calculated using Reclamation current freeboard requirements, applied to the calculated capacity. Average annual water delivery reductions are based on changes in the weighted average deliveries (based on year types) over the 82-year simulation period, in comparison to deliveries that could be made through a canal with no subsidence-induced capacity restrictions. As shown in Table 1, subsidence that occurred prior to 2020 causes average annual water

Reference: **Preliminary Subsidence Cost Impact Analysis of Proposed Transitional Groundwater Pumping on the Friant-Kern Canal Under the Tule Subbasin Groundwater Sustainability Plans**

delivery reductions of 8,768 acre-feet per year. Incremental water delivery reductions resulting from each 1-foot of additional subsidence are also shown.

Table 1. Estimated FKC Capacity and Associated Average Annual Delivery Reductions Resulting from Subsidence after 2020

Additional Subsidence After 2020	FKC Middle Reach Capacity (cfs)	Incremental FKC Capacity Reduction Due to Subsidence after 2020 (cfs)	Percent of Original 4,000 cfs Design Capacity	Average Annual Delivery Reduction Due to Reduced Capacity (af/yr)	Average Annual Delivery Reduction Due to Subsidence after 2020 (af/yr)
0' - BASELINE	1,625	0	41%	8,768	0
1'	1,450	175	36%	11,194	2,426
2'	1,325	300	33%	16,108	4,914
3'	1,204	421	30%	23,090	6,982

ESTIMATED VALUE OF REDUCED WATER DELIVERIES CAUSED BY TRANSITIONAL PUMPING

The value of water delivery reductions was calculated as the present value over a 100-year planning horizon to quantify the value of project benefits over the Project life. Annual water values in the planning horizon analysis are based on estimates developed by the California Water Commission for application to the Water Storage Investment Program (WSIP), as listed in Table 2. Water values are increased from current to full SGMA values during 2020 to 2040, which is the date at which full SGMA compliance is required for the eastern San Joaquin Valley.

Table 2. Eastern San Joaquin Valley Water Values with SGMA Implementation

Water Year Type (SJ Valley Index)	Number of Years	Current Water Value ($/af of Consumptive Use)	Water Value with Full SGMA Implementation ($/af of Consumptive Use)
Wet	24	$211	$270
Above-Normal	16	$265	$339
Below-Normal	13	$276	$508
Dry	13	$294	$541
Critical	16	$342	$1,168
Weighted Avg.		**$271**	**$540**

Source: California Water Commission, 2016 Water Storage Investment Program Technical Reference, , indexed to 2018 price values, and rounded to nearest dollar.

Reference: **Preliminary Subsidence Cost Impact Analysis of Proposed Transitional Groundwater Pumping on the Friant-Kern Canal Under the Tule Subbasin Groundwater Sustainability Plans**

The present value of reduced water deliveries resulting from subsidence after 2020 was estimated for 1-foot increments of additional subsidence. Table 3 shows the present value of additional subsidence if each increment were to occur during the period from 2020 to 2035 and then remain constant. Incremental impacts of additional subsidence are based on the difference between the value of reduced water deliveries with additional subsidence and the value of reduced water deliveries from subsidence in 2020 if no further subsidence were to occur after 2020.

Table 3. Present Value of Reduced Water Deliveries Resulting from FKC Subsidence between 2020 and 2035

Additional Subsidence Between 2020 and 2035 (ft)	FKC Capacity Reduction Due to Subsidence after 2020 (cfs)	Average Annual Delivery Reduction Due to Subsidence after 2020 (af/yr)	Total Value of Lost Water Delivery Due to Total Subsidence ($M)	Incremental Impact of Additional Subsidence after 2020 ($M)	Cumulative Impact of Additional Subsidence after 2020 ($M)
0' – BASELINE	0		$147	$0	$0
1'	175	2,426	$181	$34	$34
2'	300	4,914	$250	$69	$103
3'	421	6,982	$348	$98	$201

UNCERTAINTY OF FINANCIAL IMPACT ANALYSIS

The results presented above are based on general assumptions that include uncertainty in several variables, including the timing of future subsidence, potential water deliveries that could be made in the absence of subsidence, potential additional water delivery impacts in the FKC middle reach, and potential limitations in rescheduling impacted deliveries. Each of these variables is addressed below.

Timing of Future Subsidence

The results presented above are based on an assumption that land subsidence would occur gradually from 2020 to 2040, as projected in the GSPs, then cease. However, the actual timing of incremental subsidence during the SGMA implementation period is not known. An analysis was performed based on achieving incremental subsidence amounts by 2025 and then remaining constant, as shown on Table 4.

Reference: **Preliminary Subsidence Cost Impact Analysis of Proposed Transitional Groundwater Pumping on the Friant-Kern Canal Under the Tule Subbasin Groundwater Sustainability Plans**

Table 4. Present Value of Reduced Water Deliveries Resulting from FKC Subsidence between 2020 and 2025

Additional Subsidence Between 2020 and 2025 (ft)	FKC Capacity Reduction Due to Subsidence after 2020 (cfs)	Average Annual Delivery Reduction Due to Subsidence after 2020 (af/yr)	Total Value of Lost Water Delivery Due to Total Subsidence ($M)	Incremental Impact of Additional Subsidence after 2020 ($M)	Cumulative Impact of Additional Subsidence after 2020 ($M)
0' - BASELINE	0		$147	$0	$0
1'	175	2,426	$186	$39	$39
2'	300	4,914	$268	$79	$118
3'	421	6,982	$377	$112	$230

Potential Water Deliveries in the Absence of Subsidence

The results presented above are based on simulated water allocations to Friant Division contractors from CALSIM II, which were developed from historical deliveries. Simulated allocated supplies were assumed to be delivered based on historical daily diversion patterns. It is expected that Friant Division contractors will attempt to increase their use of CVP contract water supplies in comparison historical deliveries and further develop other available surface water supplies in response to SGMA, which would increase total allocations under Friant Division contracts and potentially result in modified water delivery timing patterns. Because the reliance on the FKC for delivery of Friant Division water supplies is expected to increase, is likely that water delivery impacts presented in this memo are underestimated.

Potential Water Delivery Impacts in the FKC Middle Reach

Estimated water supply impacts present in this memo represent potential reductions in water delivery to areas downstream from the most capacity-restricted location of the FKC. The analysis does not address additional water delivery reductions at gravity turnouts in the FKC Middle Reach that would result from reduced water surface levels in the Middle Reach. If the water surface at the Reservoir Check Structure were held to maintain the delivery capability for gravity turnouts in the Middle Reach, deliveries downstream from Lake Woollomes would further decrease in comparison to those presented in this memo.

Potential to Reschedule Impacted Water Deliveries

Average annual water delivery reductions presented above are based on an assumption that 100 percent of capacity-constrained water deliveries would be eligible for rescheduling in Millerton Lake using available conservation storage capacity. Any rescheduled water that would cause encroachment into the authorized flood control storage capacity of Millerton Lake would be released as flood flows to the San Joaquin River.

Reference: **Preliminary Subsidence Cost Impact Analysis of Proposed Transitional Groundwater Pumping on the Friant-Kern Canal Under the Tule Subbasin Groundwater Sustainability Plans**

The actual opportunity for rescheduling is expected to be less than evaluated due to several factors including supply and demand forecasting uncertainty, Millerton Lake operations, the ability of Friant-Division long-term contractors to adjust local water uses, water rights, CVP Friant Division contract term requirements, and Reclamation Policy. While it is not possible to precisely estimate the extent to which water users and Reclamation could optimize the use of Millerton Lake and the FKC to reschedule allocated water supplies, it is expected that no more than 70 percent of the affected water supply could be available for rescheduling in Millerton Lake and delivery in any given month.

The financial impact analysis described in this document was also performed assuming 70 percent rescheduling of affected water supplies. Tables 5 through 7 show the results of the financial impact analysis with the reduction in rescheduling ability.

Table 5. Estimated FKC Capacity and Associated Average Annual Delivery Reductions Resulting from Subsidence after 2020 with 70 percent rescheduling

Additional Subsidence After 2020	FKC Middle Reach Capacity (cfs)	Incremental FKC Capacity Reduction Due to Subsidence after 2020 (cfs)	Percent of Original 4,000 cfs Design Capacity	Average Annual Delivery Reduction Due to Reduced Capacity (af/yr)	Average Annual Delivery Reduction Due to Subsidence after 2020 (af/yr)
0' - BASELINE	1,625	0	41%	9,946	0
1'	1,450	175	36%	13,770	3,824
2'	1,325	300	33%	20,075	6,305
3'	1,204	421	30%	28,504	8,429

Table 6. Present Value of Reduced Water Deliveries Resulting from FKC Subsidence between 2020 and 2035 with 70 Percent Rescheduling

Additional Subsidence Between 2020 and 2035 (ft)	FKC Capacity Reduction Due to Subsidence after 2020 (cfs)	Average Annual Delivery Reduction Due to Subsidence after 2020 (af/yr)	Total Value of Lost Water Delivery Due to Total Subsidence ($M)	Incremental Impact of Additional Subsidence after 2020 ($M)	Cumulative Impact of Additional Subsidence after 2020 ($M)
0' – BASELINE	0		$167	$0	$0
1'	175	3,824	$222	$55	$55
2'	300	6,305	$311	$89	$144
3'	421	8,429	$430	$119	$263

Reference: **Preliminary Subsidence Cost Impact Analysis of Proposed Transitional Groundwater Pumping on the Friant-Kern Canal Under the Tule Subbasin Groundwater Sustainability Plans**

Table 7. Present Value of Reduced Water Deliveries Resulting from FKC Subsidence between 2020 and 2025 with 70 Percent Rescheduling

Additional Subsidence Between 2020 and 2025 (ft)	FKC Capacity Reduction Due to Subsidence after 2020 (cfs)	Average Annual Delivery Reduction Due to Subsidence after 2020 (af/yr)	Total Value of Lost Water Delivery Due to Total Subsidence ($M)	Incremental Impact of Additional Subsidence after 2020 ($M)	Cumulative Impact of Additional Subsidence after 2020 ($M)
0' - BASELINE	0		$167	$0	$0
1'	175	3,824	$229	$62	$62
2'	300	6,305	$330	$101	$163
3'	421	8,429	$465	$135	$298

Attachment 5-2: ETGSA/FWA Settlement Agreement

SETTLEMENT AGREEMENT REGARDING TRANSITIONAL OVERDRAFT PUMPING AND ANTICIPATED SUBSIDENCE DAMAGES/REPAIRS TO THE FRIANT KERN CANAL

This Settlement Agreement ("**Agreement**") is effective as of January 12, 2021 ("**Effective Date**"), and is made between the Friant Water Authority, a California joint powers authority ("**FWA**"), and Arvin-Edison Water Storage District ("**District**") (FWA and District are referred to collectively as "**Friant**"), and the Eastern Tule Groundwater Sustainability Agency, a California joint powers authority ("**ETGSA**"). Friant and ETGSA are collectively referred to as the "**Parties.**"

RECITALS

A. FWA is a joint powers authority consisting of public agencies holding long-term repayment contracts ("**Friant Contractors**") with the Bureau of Reclamation ("**Reclamation**") for water service from the Friant Division of the Central Valley Project and for facilities repayment. FWA is responsible for the operation, maintenance, repair and replacement ("**OM&R**") of the Friant-Kern Canal ("**FKC**") which conveys water from Millerton Lake along the 152-mile length of the FKC pursuant to a long-term agreement with Reclamation.

B. ETGSA is a California groundwater sustainability agency formed to implement the Sustainable Groundwater Management Act of 2014, Water Code § 10720 et seq. ("**SGMA**") in a portion of the Tule Subbasin as defined in the Department of Water Resources Bulletin 118. The Tule Subbasin has been designated as a high- or medium-priority basin by the Department of Water Resources ("**Department**").

C. In enacting SGMA, as set forth in Water Code section 10720.1(a) and (c), the California Legislature intended to, among other purposes, "provide for the sustainable management of groundwater basins" and "to avoid or minimize subsidence." All groundwater sustainability plans ("**GSPs**") adopted in a subbasin must be implemented in a manner that achieves the subbasin's sustainability goal and avoids significant and unreasonable undesirable results. Groundwater sustainability agencies ("**GSAs**") must describe in their GSPs the process and criteria relied upon to define undesirable results applicable to the basin. Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators are caused by groundwater conditions occurring throughout the basin. (Cal. Code Regs. Tit. 23, §354.26.)

D. SGMA requires that GSAs located in basins designated high- or medium-priority adopt a groundwater sustainability plan by January 31, 2020. (*Water Code* §10735.2.) For basins that intend to develop and implement multiple groundwater sustainability plans, an Intra-basin Coordination Agreement amongst the GSAs is required prior to the Department accepting any GSPs. (*Water Code* §10727.6.) ETGSA adopted its groundwater sustainability plan ("**ETGSA GSP**") on January 17, 2020, which included approval of the Tule Subbasin Coordination Agreement as required pursuant to *Water Code* §10727.6. The ETGSA GSP, including the Coordination Agreement, is under review by the Department pursuant to Cal. Code Regs. Tit. 23, §355.2. The Department may issue notices of deficiency, causing further amendments to the ETGSA GSP. In addition, at least every five years the Department must review the GSP, potentially necessitating further amendments.

(*Water Code* §10733.8.) A GSA has the authority to amend its GSP pursuant to *Water Code* §10728.4.

E. Under SGMA, a groundwater sustainability plan must establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site. (Cal. Code Regs. Tit. 23, §354.28(a).) The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results. (Cal. Code Regs. Tit. 23, §354.28(a).) Measurable objectives must be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define minimum thresholds. (Cal. Code Regs. Tit. 23, §354.30(b).) Measurable objectives must provide a reasonable margin of operational flexibility under adverse conditions which must take into consideration components such as historical water budgets, seasonal and long-term trends, and periods of drought, and be commensurate with levels of uncertainty. (Cal. Code Regs. Tit. 23, §354.30(c).)

F. Pursuant to the Tule Subbasin Coordination Agreement, land subsidence shall be considered significant and unreasonable if there is a loss of a functionality of a structure or a facility to the point that, due to subsidence, the structure or facility, such as the Friant-Kern Canal, cannot reasonably operate to meet contracted for water supplies deliveries without either significant repair or replacement. (Tule Subbasin Coordination Agreement, Section 4.3.4.1.) The criteria for an undesirable result for land subsidence is defined as the unreasonable subsidence below minimum thresholds at greater than 50% of GSA Management Area RMS resulting in significant impacts to critical infrastructure. (Coordination Agreement, Section 4.3.4.2.) The ETGSA GSP requires a more stringent standard than that provided in the Coordination Agreement providing that due to the presence of the Friant-Kern Canal as critical infrastructure within the ETGSA, undesirable results for land subsidence within the ETGSA is defined as the unreasonable subsidence below the minimum threshold at one (1) representative monitoring site. (ETGSA GSP, Section 5.8.1.2.)

G. The ETGSA GSP quantifies minimum thresholds and measurable objectives for land subsidence at each monitoring site by ground surface elevation. (ETGSA GSP, Tables 5-9 and 5-10.)

H. GSPs are required to include a description of projects and management actions a GSA has determined will achieve the sustainability goal for the basin. (Cal. Code Regs. Tit. 23, §354.44.) The ETGSA GSP provides for a "**Groundwater Accounting Action,**" which will be used to track groundwater use, develop an allocation of groundwater to be used for implementation of SGMA during the plan implementation period, and to develop water budgets for individual landowners and management areas. The Groundwater Accounting Action includes a proposed ramp down schedule of allowable consumed groundwater use of the 20-year plan implementation period, which may be adjusted, and anticipates the board of directors to establish rules and regulations to set allocations accordingly. (ETGSA GSP, Section 7.2.1.)

I. The ETGSA GSP also includes in its projects and management actions a "**Land Subsidence Management and Monitoring Plan**" (ETGSA GSP, Section 7.2.3). As stated in the ETGSA GSP, the ETGSA will, "in cooperation with other interested parties, (1) identify the particular causes of land subsidence within the Area along the Friant-Kern Canal, (2) identify

potential mechanisms for minimizing subsidence in the Area, (3) identify data gaps and additional monitoring sites for the purpose of improving assessment of conditions along the FKC, (4) refinement of land subsidence management criteria for the relevant area, and (5) preparation of a land subsidence monitoring and management plan focused upon the FKC." The ETGSA has undertaken steps towards the implementation of a Land Subsidence Management and Monitoring Plan.

J. FWA contends that additional subsidence in the vicinity of the FKC is not acceptable unless there is appropriate financial mitigation for such impact to FWA and the Friant Contractors affected by such additional subsidence. ETGSA has maintained a commitment to ensure reduced land subsidence, given legacy impacts, while maintaining its obligations under SGMA to reach sustainability by 2040.

K. The ETGSA Board of Directors has approved Rules and Regulations and a First Amended Rules and Regulations on August 6, 2020 and October 1, 2020, respectively. The Rules and Regulations as approved on those dates establish an "**ETGSA Technical Group**" which is authorized to allocate sustainable yield and transitional pumping amounts pursuant to the ramp down schedule in the GSP. The ETGSA Technical Group established the water year 2021 allocation for transitional Tier 1 waters in the amount of 92,087 acre-feet per year. Based on current data, 1,034,553 acre-feet total of transitional waters are available until 2035.

L. ETGSA's First Amended Rules and Regulations provide a penalty structure for all groundwater consumed above sustainable yield. Rates have been established for water pumped pursuant to the ramp down schedule, characterized as "**Tier 1 Penalty Allocation**" in the First Amended Rules and Regulations. Penalties are established for pumping in excess of those rates, identified as "**Tier 2**". In addition to monetary penalties, additional civil remedies exist for pumping in excess of the ramp down schedule.

M. On October 1, 2020, ETGSA adopted Resolution 2020-03 establishing the initial penalty rate for the Tier 1 Penalty Allocation at $245.00 (two hundred and forty-five dollars and zero cents) per acre foot consumed and the Tier 2 penalty rate at $500.00 (five hundred dollars and zero cents) per acre-foot consumed. The First Amended Rules and Regulations provide that the penalty rate for the Tier 1 Penalty Allocation and Tier 2 will be established annually by the ETGSA Board of Directors.

N. The FKC's conveyance system relies on a gravity design. As of 2020, capacity has been reduced to 1,650 cubic-feet per second (cfs) between mile post 88 and mile post 121.5 of the FKC (the "**Middle Reach**"). Design capacity through the Middle Reach was 4,000 cfs. Due to various design deficiencies the design capacity has never been achieved through the Middle Reach. Historic capacity demand through the Middle Reach has been estimated to be approximately 2,500 cfs. The reduced capacity precludes the potential for delivery of significant amounts of water to Friant Contractors in and south of the Middle Reach and limits the ability for exchanges and transfers of water.

O. FWA has provided ETGSA with an engineering memorandum stating that the damages in terms of the value of the lost water that FWA would not be able to deliver to Friant

Contractors if the FKC were to subside an additional three feet in the Middle Reach would be in excess of $263,000,000.00 (two hundred and sixty-three million dollars and zero cents). ETGSA has not evaluated the memorandum, or its allegations, and as a result does not agree to any findings therein.

P. FWA and Reclamation are developing plans to restore historic capacity to the FKC. Presently, FWA and Reclamation are nearing completion of plans to restore capacity in the Middle Reach of the FKC through a project referred to as the Friant-Kern Canal Middle Reach Capacity Correction Project ("**Project**"). The most current engineering estimates place the cost of the Project at approximately $500 million. Project costs estimates are expected to change given the need for additional estimates and further design work on the Project including turnouts and appurtenant facilities in and around the Middle Reach.

Q. FWA is proposing to divide the costs of Project funding into two categories: **Zone 2** –the increased capacity of the FKC attributed to the construction of the Project that is financed by non-reimbursable public funding, GSA funding and FWA OM&R funding (including any reimbursable public funding repaid via FWA OM&R funding); and **Zone 3** - the increase in capacity of the Middle Reach of the FKC above Zone 2 that will result from the construction of the part of the Project with funds derived from additional Friant Contractor voluntary funding.

R. The purpose of the payments to FWA by ETGSA under this Agreement is to fund Project Zone 2 construction. ETGSA may participate in any Zone 3 funding through other agreements with Friant Contractors. The Parties acknowledge and agree that to fully improve capacity conditions on the FKC, further projects north of Middle Reach are necessary, and that the Parties desire to pursue such projects.

S. This Agreement reflects the desire of the Parties to resolve their differences regarding past and future subsidence on the FKC and, among other things, provide (1) FWA with needed financing to complete the Project; and (2) protection to ETGSA and landowners within ETGSA's jurisdictional boundaries ("**Landowners**") that FWA and Friant Contractors affected by subsidence in the Middle Reach will not pursue litigation provided the terms of this Agreement are satisfied and Landowners are in good standing, as defined in Section 5 below, with the ETGSA.

AGREEMENT

In consideration of the foregoing Recitals, which are incorporated herein, and the covenants contained in this Agreement, and for other further good and valuable consideration, including but not limited to the terms herein and the avoidance of further costs, inconvenience, and uncertainties related to the Parties' respective positions, the Parties agree as follows:

1. **Penalty Program.**

A. ETGSA shall approve and maintain a volumetric penalty amount per acre foot consumed on transitional pumping as defined in the ETGSA GSP in an amount that will achieve, at minimum, the collection of $220,000,000.00 (two hundred and twenty

million dollars and zero cents), if the anticipated transitional pumping of 1,034,553 acre-feet actually occurs.

B. ETGSA shall set a penalty amount to collect Tier 1 penalty money not received in year 2020 based on actual transitional water pumped over the next five years (2021-2026), thus increasing the amount of penalties expected to be received by ETGSA in the earlier years of the transitional pumping penalty program.

C. FWA acknowledges that the initial penalties set by ETGSA for Tier 1 ($245 per acre-foot) and Tier 2 ($500 per acre-foot) are consistent with this Agreement and reflect ETGSA's agreement to collect penalties not collected in year 2020 based on actual transitional water pumped over the next five years (2021-2026), thus increasing the amount of penalties expected to be received.

D. ETGSA agrees to take all commercially reasonable efforts to begin invoicing Landowners as soon as reasonably practicable, but no later than March 2021, for all Tier 1 and Tier 2 penalties.

2. **ETGSA Lump Sum Payment under Land-Based Assessment and Reduced Penalty Program Payment.**

A. Lump Sum Payment. In consideration of the mutual benefits that would result from FWA's early receipt of funds that could be applied towards the Project, ETGSA will use its best efforts to take all necessary steps and actions as required by law (including compliance with Proposition 218) to submit for a vote of the Landowners a land-based assessment that could be used as a source of revenue to secure bonds, notes or other obligations ("**ETGSA Bonds**") that would allow for a lump sum payment of $125,000,000.00 (one hundred twenty five million dollars and zero cents) to FWA for Zone 2 of the Project (**"Lump Sum Payment"**).

1. ETGSA will use commercially reasonable efforts to obtain landowner approval of the land-based assessment under Section 2(A) above by no later than July 1, 2022. If the land-based assessment is approved by Landowners, ETGSA will use commercially reasonable efforts to issue ETGSA Bonds and to pay the Lump Sum Payment by no later than December 31, 2022. If ETGSA does not make the Lump Sum Payment by December 31, 2022, FWA in its sole and absolute discretion can decide whether to accept the Lump Sum Payment (or a different amount) at a later date if requested by ETGSA in writing to continue to pursue such payment option.

B. Penalty Money. ETGSA shall make quarterly installments towards the Lump Sum Payment to FWA beginning as soon as reasonably practicable, but no later than the first quarter of 2021. ETGSA shall pay ninety-one percent (91%) of Tier 1 and Tier 2 penalty monies received in each calendar quarter within forty-five (45) days following the end of the subject quarter. ETGSA is entitled to keep the remaining nine percent (9%).

1. Penalty money paid in quarterly installments to FWA under this Section 2(B) shall be credited to and reduce the Lump Sum Payment amount.

2. Payments by ETGSA to FWA under this Section 2(B) will cease, and no further penalty monies shall be paid to FWA, upon payment of the Lump Sum Payment.

3. **ETGSA Payments under the Transitional Pumping Penalty Program.** If the land-based assessment election described in Section 2 above does not pass, ETGSA agrees to the following:

A. If the Proposition 218 land-based assessment election does not pass as described in Section 2, ETGSA shall pay up to a maximum of two hundred million dollars ($200,000,000.00) of penalty monies to FWA on a rolling basis. ETGSA shall pay ninety-one percent (91%) of penalty monies received in each calendar quarter within 45 (forty-five) days following the end of the subject quarter. ETGSA will be entitled to keep the remaining nine percent (9%) of penalty monies received.

B. The Parties acknowledge there is no assurance that any penalty monies will be received due to, among other things, the nature of the transitional pumping program which is designed to disincentivize groundwater pumping.

4. **Land Subsidence Management and Monitoring Plan.**

A. ETGSA shall take such commercially reasonable efforts to adopt and implement such management action(s) as identified within the ETGSA GSP to limit additional subsidence in the Middle Reach. FWA agrees to have its staff and agents meet and confer with representatives of ETGSA in order to coordinate on the monitoring of subsidence along the FKC and to provide input and recommendations as to additional management actions that may help reduce or avoid subsidence entirely. ETGSA's current draft Land Subsidence Management Plan contemplates the creation of a long-term Land Subsidence Monitoring and Management Committee. ETGSA agrees to appoint a FWA representative to the Land Subsidence Monitoring and Management Committee.

5. **Release of Liability.**

A. Release of Landowners and ETGSA.

Upon FWA's receipt of the earliest to occur of: (1) the Lump Sum Payment pursuant to Section 2 above, or (2) the two hundred million dollars and zero cents ($200,000,000.00) of penalties pursuant to Section 3 above, or (3) all penalties collected and required to be transferred to FWA under Section 3 above through 2040 ("**Release Date**"), Friant, on its own behalf and on behalf of each of its respective successors, predecessors, affiliates, assigns, members, officers, employees, and agents (collectively "**Friant Releasors**"), agrees to release and forever discharge each of the Landowners (solely with respect to each such Landowner's real property

interests within the ETGSA) and ETGSA, and their respective successors, predecessors, affiliates, assigns, members, officers, employees, agents, partners, stockholders (collectively "**ETGSA Releasees**") from any and all claims, demands, causes of action, suits, liens, obligations, charges, losses, damages, judgments, attorneys' fees, costs, promises, liabilities, and demands of every nature, kind, and description whatsoever, in law or in equity, whether known or unknown, fixed or contingent, suspected or unsuspected, matured or not matured, liquidated or unliquidated, which the Friant Releasors may have ever had, now have, or will have against the ETGSA Releasees, in any manner arising from or related to the effects of land subsidence on the FKC (collectively "**Claims**") up to and after the Release Date, but excluding any action as provided in Section 5(C) below.

B. Covenant Not to Sue by Friant Releasors.

For so long as ETGSA and each of the ETGSA Releasees remain in compliance with this Agreement, each of the Friant Releasors covenants that, excepting any action or Claims made under the conditions prescribed by Section 5(C) below, no Friant Releasor will directly or indirectly institute any legal, equitable, administrative, or other action, complaint, or proceeding against any of the ETGSA Releasees, or in any other manner assert any Claims against any of the ETGSA Releasees arising from or related to the effects of land subsidence on the FKC, including, without limitation, any past, present, or future damages.

C. Unreleased Claims.

1. Injunctive relief against Landowners. Notwithstanding Section 5(A) and (B) above, in the event of significant and unreasonable land subsidence pursuant to the ETGSA GSP and SGMA is incurred and there is reasonable evidence that such significant and unreasonable land subsidence is caused by groundwater pumping in excess of sustainable yield amounts within the ETGSA boundaries (as defined in the ETGSA GSP and the Rules and Regulations), Friant may pursue injunctive relief against Landowners from either judicial or administrative authorities to enjoin such groundwater pumping.

2. Good Standing. Only Landowners which are in "good standing" with the ETGSA shall be entitled to the benefits and protections of Section 5(A) and (B) above. "**Good standing**" shall mean the Landowner is in compliance with the ETGSA's applicable Rules and Regulations and ETGSA GSP. Pumping in exceedance of the applicable Tier 1 Penalty Allocation will be evidence of not being in "good standing" with the ETGSA. The ETGSA's written confirmation that a Landowner is in "good standing" with the ETGSA shall constitute conclusive evidence that the Landowner is entitled to the benefits and protections of Section 5(A) and (B).

3. Breach of this Agreement. The Parties may seek to enforce the terms of this Agreement in a court of competent jurisdiction as stated in Section 10 and the prevailing party in any such action may recover attorney's fees as stated in Section

12.

6. **Indemnification**.

A. ETGSA agrees to indemnify and hold harmless and defend the Friant Releasors, and each of them, from and against all claims, demands, causes of action, liability, cost and expenses, including damages resulting from the death or injury to any person or property, and including attorney's fees, losses or liabilities in law or in equity, of every kind and nature whatsoever for, but not limited to injury to or death of any person or property, arising out of or related to ETGSA's adoption or implementation of this Agreement, the ETGSA GSP, the Rules and Regulations, or any land-based assessment, charge or fee, imposed by the ETGSA.

B. FWA agrees to indemnify and hold harmless and defend the ETGSA Releasees from and against all claims, demands, causes of action, liability, cost and expenses, including damages resulting from the death or injury to any person or property, and including attorney's fees, losses or liabilities in law or in equity, of every kind and nature whatsoever for, but not limited to, injury to or death of any person or property, arising out of or related to the Project, or subsidence on the FKC, which may be brought by or on behalf of the Department of Interior, Bureau of Reclamation, or any Friant Contractor or Friant Contractor landowner, except to the extent such loss or injury is caused by conduct amounting to an intentional tort.

7. **No Admission of Liability**. This Agreement reflects a compromise of disputed claims and neither the payment or performance of any consideration hereunder nor anything contained in this Agreement will be interpreted or construed to be an admission on the part of, or to the prejudice of, either Party.

8. **Warranty of Authority**. Each Party represents and warrants that it has the full right, power, legal capacity and authority to enter into and perform its obligations under this Agreement and that no approvals or consents of any persons are necessary in connection with it.

9. **Assignment of Claims**. Each Party warrants, represents, and covenants that it has not assigned, transferred or conveyed, or purported to assign, transfer or convey, and will not assign, transfer or convey to anyone any claim, demand, debt, sum of money, liability, account, obligation, action or cause of action herein. Each Party agrees to indemnify, defend and hold harmless any other Party from any claims which may be asserted against such Party, based on, or arising out of or in connection with any such assignment, transfer or conveyance, or purported assignment, transfer or conveyance.

10. **Choice of Law**. This Agreement is governed by and will be construed in accordance with the laws of the State of California. The Parties agree that any breach of the Agreement will be deemed to occur in the County of Tulare, California. The Parties further agree that jurisdiction of any dispute arising out of this Agreement will be in the courts of the State of California, County of Tulare.

11. **Binding Upon Successors**. This Agreement is binding upon and will inure to the benefit of the Parties and their predecessors, successors, heirs, assigns, past, present or future executors, administrators, trustees, beneficiaries, affiliated and related entities, officers, directors, agents, employees and representatives.

12. **Attorney's Fees**. In the event of any dispute in any manner arising from or related to this Agreement or any transaction or event arising therefrom, the prevailing party in any action or proceeding shall be entitled to recover all reasonable attorney's fees incurred in connection with the dispute and any resultant litigation. The prevailing party shall also be entitled to recover all other reasonable costs and expenses incurred in connection with the dispute and any resultant litigation, including, without limitation, all fees of expert consultants and expert witnesses.

13. **Time of Essence**. Time is of the essence in the performance of this Agreement.

14. **Cooperation; Execution of Documents; Subsequent Actions**. Each Party agrees to cooperate fully and in the execution of any and all other documents necessary to effectuate the stated purposes of this Agreement, including but not limited to those documents specifically described in this Agreement, and in the completion of any additional action that may be necessary or appropriate to give full force and effect to the terms and intent of this Agreement.

15. **Construction of Agreement**. This Agreement is the product of negotiation and preparation by and among each Party and its respective attorneys. Therefore, the Parties expressly waive the provisions of Civil Code section 1654 and acknowledge and agree that the Agreement will not be deemed prepared or drafted by any one Party, and will be construed accordingly.

16. **Integration**. This Agreement and the documents executed in connection with it constitute the complete agreement of the Parties with respect to the subject matters referred to in this Agreement. This Agreement supersedes all prior or contemporaneous negotiations, promises, covenants, agreements and representations of every nature whatsoever with respect to the subject matters referred to in this Agreement, all of which have become merged and finally integrated into this Agreement.

17. **Modification**. Any modification of this Agreement must be in writing and signed by all Parties. No oral modifications will be effective to vary or alter the terms of this Agreement.

18. **Entire Agreement**. All representations and promises pertaining to this Agreement are set forth herein and the Parties acknowledge and represent to each other that they are not entering into this Agreement on the basis of any other promises or representations, express or implied, oral or written. Each Party has fully and personally investigated the subject matter of the Agreement, and has consulted with and been represented by independent counsel in negotiation and execution thereof. No Party is relying upon any statement of fact or opinion by or of the other Party except as expressly set forth in this Agreement.

19. **Authorized Signature**. Each signatory to this Agreement warrants and represents that he or she is competent and authorized to enter into this Agreement on behalf of the Party for whom the signatory purports to sign.

20. **Severability**. If any provision or any part of any provision of this Agreement is for any reason, held invalid, unenforceable or contrary to public policy or law, the remainder of this Agreement will not be affected thereby, and will continue to be valid and enforceable.

21. **Enforceable Obligations**. When executed, this Agreement will be valid, binding and legally enforceable in accordance with its terms.

22. **Warranty of Non-Inducement**. The Parties declare and represent that no promises, inducements, or agreements not expressly contained herein have been made and that this Agreement contains the entire agreement between them with respect to the subject matter of this Agreement.

23. **Counterparts**. This Agreement may be executed in counterparts, including true and accurate copies of the original, all of which, when taken together, will be deemed one original agreement. Any executed copy will not be binding upon any Party until all Parties have duly executed a copy of this Agreement.

24. **Force Majeure**. No Party will be liable in damages to any other Party for delay in performance of, or failure to perform, its obligations under this Agreement if such delay or failure is caused by a force majeure event. A "Force Majeure Event" means an event not the fault of, and beyond the reasonable control of, the Party claiming excuse which makes it impossible or extremely impracticable for such Party to perform obligations imposed on it by this Agreement by virtue of its effect on physical facilities and their operation or employees essential to such performance. Force Majeure Events include (a) an "act of God" such as an earthquake, flood, earth movement, drought, or similar catastrophic event, (b) an act of the public enemy, terrorism, sabotage, civil disturbance or similar event, (c) a strike, work stoppage, picketing or similar concerted labor action, (d) delays in construction caused by unanticipated negligence or breach of contract by a third party or inability to obtain essential materials after diligent and timely efforts, or (e) an order or regulation issued by a federal or state regulatory agency after the Effective Date of this Agreement or a judgment or order entered by a federal or state court after the Effective Date of this Agreement.

25. **Landowners**. The Parties recognize and acknowledge that each of the Landowners is an intended third-party beneficiary under this Agreement, and will have standing to enforce any provision of this Agreement.

[Signatures on the following page.]

DISTRICT:

ARVIN-EDISON WATER STORAGE DISTRICT

Edwin Camp, President

1/13/2021
Dated

John Moore, Secretary-Treasurer

Dated

APPROVED AS TO FORM:

Scott K. Kuney, General Counsel

DISTRICT:

ARVIN-EDISON WATER STORAGE DISTRICT

Edwin Camp, President — Dated 1/13/2024

John Moore, Secretary-Treasurer — Dated 1/13/24

APPROVED AS TO FORM:

Scott K. Kuney, General Counsel

ETGSA:

EASTERN TULE GROUNDWATER SUSTAINABILITY AGENCY

Eric Borba, Chairman — Dated 1-15-21

Rogelio Caudillo, Secretary — Dated 1/15/2021

APPROVED AS TO FORM:

Aubrey A. Mauritson, General Counsel

FWA:

FRIANT WATER AUTHORITY

Cliff Loeffler, Chairman — Dated Jan 11, 2021

Jim Erickson, Secretary — Dated Jan 11, 2021

APPROVED AS TO FORM:

Donald M. Davis, General Counsel

Section 6. Monitoring Networks

Table of Contents

Table of Figures

List of Tables

6.1 Introduction to Monitoring Networks *[23 CCR § 354.32]*

23 Cal. Code Regs. § 354.32 Introduction to Monitoring Networks. *This Subarticle describes the monitoring network that shall be developed for each basin, including monitoring objectives, monitoring protocols, and data reporting requirements. The monitoring network shall promote the collection of data of sufficient quality, frequency, and distribution to characterize groundwater and related surface water conditions in the basin and evaluate changing conditions that occur through implementation of the Plan.*

The GSAs in the Tule subbasin have prepared a coordinated Monitoring Plan, the *Tule Subbasin Monitoring Plan*[1], as **Attachment 1** to the *Tule Subbasin Coordination Agreement* (**Appendix A**)[2]. This section of the GSP summarizes the Tule Subbasin monitoring network by providing reference to the *Tule Subbasin Monitoring Plan* (*TSMP*) and, providing additional information that directly relates to the ETGSA monitoring network for each sustainability indicator applicable to the Tule Subbasin.

6.2 Monitoring Network

6.2.1 Monitoring Network Objective *[23 CCR § 354.34 (a), (b)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. **(a)** *Each Agency shall develop a monitoring network capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation*.

(b) *Each Plan shall include a description of the monitoring network objectives for the basin, including an explanation of how the network will be developed and implemented to monitor groundwater and related surface conditions, and the interconnection of surface water and groundwater, with sufficient temporal frequency and spatial density to evaluate the affects and effectiveness of Plan implementation.*

The objectives used in developing the subbasin monitoring plan are provided **Chapter 1.1** of the *Tule Subbasin Monitoring Plan*.

6.2.1.1 Progress Towards Achieving Measurable Objective *[23 CCR § 354.34 (b)(1)(2)(3)(4)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. **(b)** *…The monitoring network objectives shall be implemented to accomplish the following:*

(1) *Demonstrate progress toward achieving measurable objectives described in the Plan.*

(2) *Monitor impacts to the beneficial uses or users of groundwater.*

(3) *Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.*

(4) *Quantify annual changes in water budget components.*

Annually the GSA will prepare reports documenting the results from the prior year monitoring activities. Utilizing the data collected each year, the Tule Subbasin DMS and the Groundwater Flow Model will be

[1] Thomas Harder & Co., 2019
[2] Tule Subbasin Technical Advisory Committee, August 2019

updated and calibrated to match current groundwater conditions. This data and groundwater flow model will be evaluated each year to quantify any changes to the ETGSA water budget components.

Each year, results from annual monitoring will be compared to the interim milestones and minimum threshold numerical targets established in **Section 5: Sustainability Management Criteria**. If results from several monitoring events provides data more representative of actual condition than what was predicted during development of this plan, the numerical target may be adjusted. If data indicates an exceedance of a minimum threshold, the Project and Management Actions described under **Section 7: Projects and Management Actions** will be evaluated by the ETGSA. An undesirable result may occur if the threshold criteria is exceeded based upon the Plan's definition of an undesirable result.

Quantitative minimum thresholds, interim milestones, and measurable objectives were established at each RMS within the GSA are listed throughout **Section 5: Sustainability Management Criteria** for each applicable sustainability indicator. Criteria for selecting RMS were based on GSA established projects and management areas which correlate to the beneficial users of groundwater within the area. Additional discussion for potential impacts to beneficial users of groundwater relative to the established minimum threshold for each of the applicable sustainability indicators is discussed in **Section 5.**

6.2.2 Monitoring Network Design *[23 CCR § 354.34 (j)]*

> **23 Cal. Code Regs. § 354.34 Monitoring Network**. **(j)** *An Agency that has demonstrated that undesirable results related to one or more sustainability indicators are not present and are not likely to occur in a basin, as described in Section 354.26, shall not be required to establish a monitoring network related to those sustainability indicators*.

The ETGSA monitoring network has been established to monitor data from the four (4) sustainability indicators that may have potential to cause significant and unreasonable effects within the Tule Subbasin (defined in **Section 5.2**), including:

- Chronic lowering of groundwater levels
- Reduction of groundwater storage;
- Degraded water quality, and
- Land subsidence.

The sustainability indicators of depletion of interconnected surface water and seawater intrusion are not applicable to the Tule Subbasin (**Section 5.9** and **5.10, respectively**).

The following sections provide a brief summary of the process, information, and procedures that were incorporated into the development of the ETGSA monitoring network and is supported by the *TSMP,* which was developed for all GSAs within the Tule Subbasin.

The *TSMP* is intended to adapt to the data being collected, allowing for the addition or removal of monitoring features, changes in monitoring frequency, and update to alternative monitoring methodologies, as the monitoring evolves during the Plan Implementation period.

6.2.2.1 Monitoring Network Rationale *[23 CCR § 354.34 (g)(1)(3)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. **(g)** *Each Plan shall describe the following information about the monitoring network:*

(1) *Scientific rationale for the monitoring site selection process.*

(3) *For each sustainability indicator, the quantitative values for the minimum threshold, measurable objective, and interim milestones that will be measured at each monitoring site or representative monitoring sites established pursuant to Section 354.36.*

The rationale and process for selecting RMS for each sustainability indicator is described in **Chapter 2.0** of the *TSMP*. For each sustainability indicator established, quantitative values for minimum thresholds, measurable objectives, and interim miles were set RMS in **Section 3.5** of this Plan.

6.2.2.2 Spatial Density and Frequency of Measurement *[23 CCR § 354.34 (d), (f)(1)(2)(3), (h)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. **(d)** *The monitoring network shall be designed to ensure adequate coverage of sustainability indicators. If management areas are established, the quantity and density of monitoring sites in those areas shall be sufficient to evaluate conditions of the basin setting and sustainable management criteria specific to that area***.**

(f) *The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:*

(1) *Amount of current and projected groundwater use.*

(2) *Aquifer characteristics, including confined or unconfined aquifer conditions, or other physical characteristics that affect groundwater flow.*

(3) *Impacts to beneficial uses and users of groundwater and land uses and property interests affected by groundwater production, and adjacent basins that could affect the ability of that basin to meet the sustainability goal.*

(h) *The location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used.*

The locations of RMS sites in the subbasin are provided in **Figure A1-2**, **Figure A1-5**, **Figure A1-7**, **Figure A1-8,** and **Figure A1-9**, with additional details listed in **Table A1-1, Table A1-2, Table A1-3,** and **Table A1-6** of the *TSMP.*

The criteria considered during selection of RMS location included: aquifer characteristics, current and projected groundwater uses, and beneficial uses and users of groundwater and is discussed throughout **Chapter 2.0** of the *TSMP* for each sustainability indicator.

Existing monitoring features were utilized as RMS based on the conditions outline in the *Tule Subbasin Setting*. The areas where existing monitoring features and networks did not provide adequate coverage of sustainability indicators and were identified as data gaps in **Chapter 4.0** of the *TSMP.* To address these data gaps a discussion in additional monitoring features was also provide in **Chapter 4.0**.

The locations and frequency measurement of RMS sites are described in **Section 6.2.3**.

6.2.2.3 Monitoring Protocols and Reporting Standards *[23 CCR § 354.34 (g)(2), (i)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. **(g)** *Each Plan shall describe the following information about the monitoring network:*

(2) *Consistency with data and reporting standards described in Section 352.4. If a site is not consistent with those standards, the Plan shall explain the necessity of the site to the monitoring network, and how any variation from the standards will not affect the usefulness of the results obtained***.**

(i) *The monitoring protocols developed by each Agency shall include a description of technical standards, data collection methods, and other procedures or protocols pursuant to Water Code Section 10727.2(f) for monitoring sites or other data collection facilities to ensure that the monitoring network utilizes comparable data and methodologies.*

Throughout **Chapter 2.0** of the *TSMP,* monitoring protocols relative to each sustainability indicator are described in the corresponding subchapters. Additionally, a subbasin wide data management system (DMS) is described (see **Chapter 5.0**, *TSMP*) to provide a common database for the Tule Subbasin GSAs to storing data, requiring consistent reporting standards.

6.2.2.4 Existing Monitoring *[23 CCR § 354.34 (e), (f)(4)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. **(e)** *A Plan may utilize site information and monitoring data from existing sources as part of the monitoring network.*

(f) *The Agency shall determine the density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends based upon the following factors:*

(4) *Whether the Agency has adequate long-term existing monitoring results or other technical information to demonstrate an understanding of aquifer response***.**

Existing water resource monitoring and management programs specific to the ETGSA that were incorporated into the *TSMP* were introduced and described in **Section 1.4.9** and **Table A1-9** in **Chapter 5.3** of the *TSMP* list existing data sources and monitoring programs that were used during the development and implementation of the *TSMP*.

6.2.3 Representative Monitoring *[23 CCR § 354.36 (a), (b)(1)(2), (c)]*

23 Cal. Code Regs. § 354.36 Representative Monitoring. *Each Agency may designate a subset of monitoring sites as representative of conditions in the basin or an area of the basin, as follows:*

(a) *Representative monitoring sites may be designated by the Agency as the point at which sustainability indicators are monitored, and for which quantitative values for minimum thresholds, measurable objectives, and interim milestones are defined.*

(b) *Groundwater elevations may be used as a proxy for monitoring other sustainability indicators if the Agency demonstrates the following:*

(1) *Significant correlation exists between groundwater elevations and the sustainability indicators for which groundwater elevation measurements serve as a proxy.*

(2) *Measurable objectives established for groundwater elevation shall include a reasonable margin of operational flexibility taking into consideration the basin setting to avoid undesirable results for the sustainability indicators for which groundwater elevation measurements serve as a proxy.*

(c) *The designation of a representative monitoring site shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area.*

Chapter 3.0 of the *TSMP* describes representative monitoring in the Tule Subbasin by identifying one or more RMS within each management area for monitoring sustainability indicators. **Section 6.2.3.1** through **Section 0** of this Plan references the *TSMP* chapters for the corresponding sustainability indicator and further provides a list of each RMS in the ETGSA, including, identifying the management area the RMS is representative of.

Management areas within ETGSA were introduced in **Section 3.6** of this Plan and further described in **Section 4.5.** In summary, the area covered by the ETGSA has been divided into three (3) separate management categories totaling five (5) management areas corresponding to the jurisdictional status and principle land use of those respective areas. The management areas are shown on **Figure 3-6** in **Section 3.6** of this Plan and consist of:

- Three (3) Community Management Areas
  1. Porterville Community Management Area
  2. Terra Bella Community management Area
  3. Ducor Community management Area
- Cross-Boundary Management Area:
  4. Kern-Tulare Water District Management Area
- Greater Tule Management Area
  5. Great Tule Management Area

6.2.3.1 Chronic Lowering of Groundwater Levels *[23 CCR § 354.34 (c) (1)(A)(B)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. (c) *Each monitoring network shall be designed to accomplish the following for each sustainability indicator:*

(1) *Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features by the following methods:*

(A) *A sufficient density of monitoring wells to collect representative measurements through depth-discrete perforated intervals to characterize the groundwater table or potentiometric surface for each principal aquifer.*

(B) *Static groundwater elevation measurements shall be collected at least two times per year, to represent seasonal low and seasonal high groundwater conditions.*

Groundwater levels will be monitored as described in **Chapter 2.1** of the *TSMP*. The GSA will monitor groundwater levels at RMS within management areas shown on **Figure 6-1: RMS for Monitoring Groundwater Levels**. The methods used to establish the RMS and the frequency of monitoring are discussed in **Chapter 3.1** of the *TSMP*. Existing and proposed RMS identified for monitoring groundwater levels in the upper and lower aquifer in the Tule Subbasin are included in **Table A1-1** and **Table A1-3** and mapped in **Figure A1-2** and **Figure A1-5** of the *TSMP*.

Within the ETGSA, twelve (12) RMS have been identified for monitoring groundwater levels semiannually (spring and fall). **Table 6-1: RMS for Monitoring Groundwater Levels** list these RMS and describes the aquifer and management area the monitoring site is representative of, and well construction details.

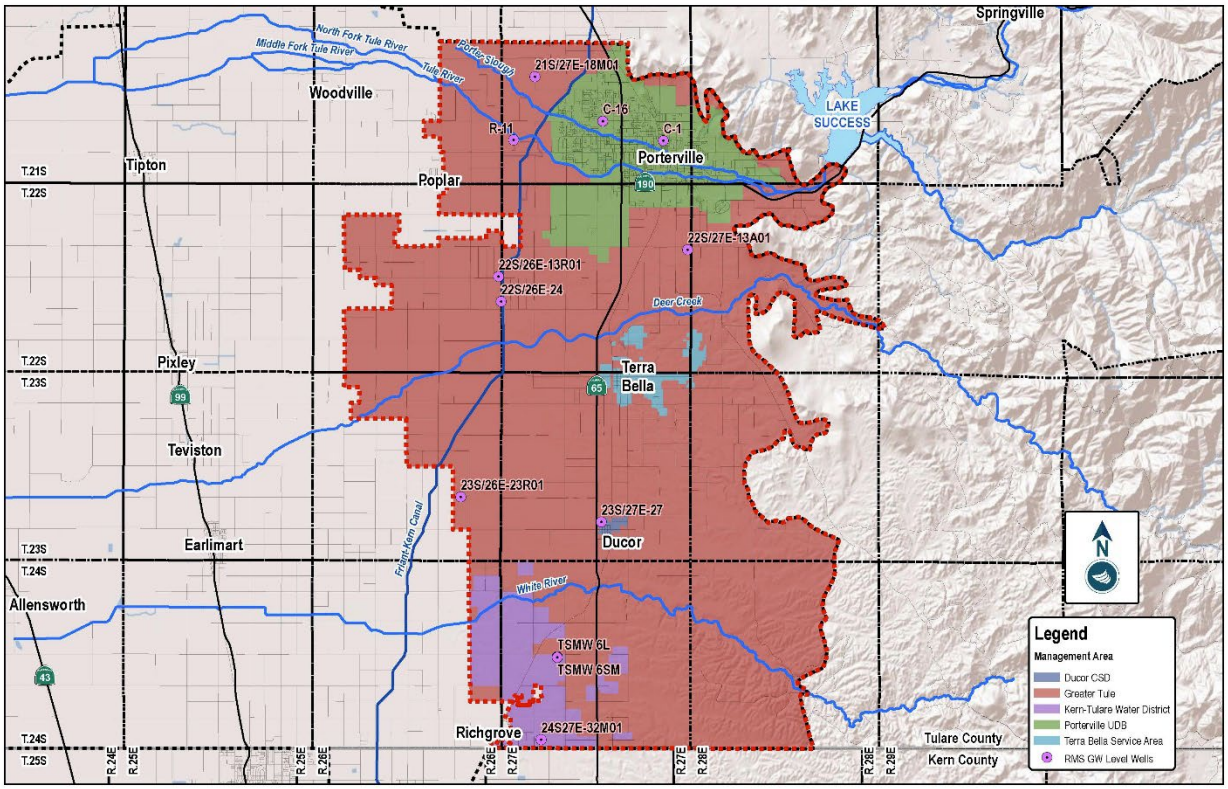

Figure 6-1: RMS for Monitoring Groundwater Levels

Table 6-1: RMS for Monitoring Groundwater Levels

RMS Well ID	Management Area	Aquifer	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
21S27E-18M01	Greater Tule	Upper	300	150	300
22S-27E-13A01	Greater Tule	Upper	400	120	380
22S26E-13R01	Greater Tule	Upper	285	240	380
C-1	Porterville	Upper	330	120	240
R-11	Porterville	Upper	216	0	216
23S/27E-27	Ducor	Lower	1,405	1.035	1,385
C-16	Porterville	Composite	580	240	548
23S26E-23R01	Greater Tule	Lower	1,720	600	1,700
22S/26E-24	Greater Tule	Lower	1,270	800	1,240
TSMW 6L	KTWD	Lower	610	350	600
TSML 6SM	KTWD	Santa Maragita	2020	1950	2020
24S/27E-32M01	KTWD	Santa Maragita	1800	1002	1800

6.2.3.2 Reduction in Groundwater Storage *[23 CCR § 354.34 (c)(2)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. (c) *Each monitoring network shall be designed to accomplish the following for each sustainability indicator:*

(2) *Reduction of Groundwater Storage. Provide an estimate of the change in annual groundwater in storage.*

Annual change groundwater storage within the GSA will estimated using either of the methods identified in **Section 4.3.2** of the *Tule Subbasin Coordination Agreement*, utilizing groundwater level data as a proxy for the calculation. The estimated change in annual groundwater in storage will be calculated by the Groundwater Flow Model using the groundwater level data collected each year for each management area, the ETGSA, and the Tule Subbasin.

6.2.3.3 Seawater Intrusion *[23 CCR § 354.34 (c)(3)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. (c) *Each monitoring network shall be designed to accomplish the following for each sustainability indicator:*

(3) *Seawater Intrusion. Monitor seawater intrusion using chloride concentrations, or other measurements convertible to chloride concentrations, so that the current and projected rate and extent of seawater intrusion for each applicable principal aquifer may be calculated.*

Seawater intrusion does not occur in the Tule Subbasin for reasons described in **Chapter 2.3.3** of the *Tule Subbasin Setting.*

6.2.3.4 Degraded Water Quality *[23 CCR § 354.34 (c)(4)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. (c) *Each monitoring network shall be designed to accomplish the following for each sustainability indicator:*

(4) *Degraded Water Quality. Collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.*

Degraded water quality will be monitored as described in **Chapter 2.4** and monitoring locations are shown on **Figure A1-7** of the *TSMP*. The GSA will evaluate groundwater quality conditions using data collected under separate groundwater quality regulatory programs. These programs include public water systems, for compliance with the requirements of Title 22[3], Tule Basin Water Quality Coalition (TBWQC)[4] for compliance with the requirements of General order R5-2013-0120 and other sources that may be applicable.

The Constituent of Concern (COC) vary depending on the suitability of the groundwater, whether agriculture use, domestic use, or municipal use. RMS sites will be monitored for a COC's identified in **Section 6**: **Sustainable Management Criteria,** depending on the management area the RMS is representative of.

Within the ETGSA seven (7) RMS have been identified for monitoring groundwater quality annually (see **Figure 6-2: RMS for Monitoring Groundwater Quality)**. **Table 6-2: RMS for Monitoring Groundwater Quality** list the RMS and describes the aquifer, management area, COC and baseline measurements for RMS for groundwater quality in the ETGSA.

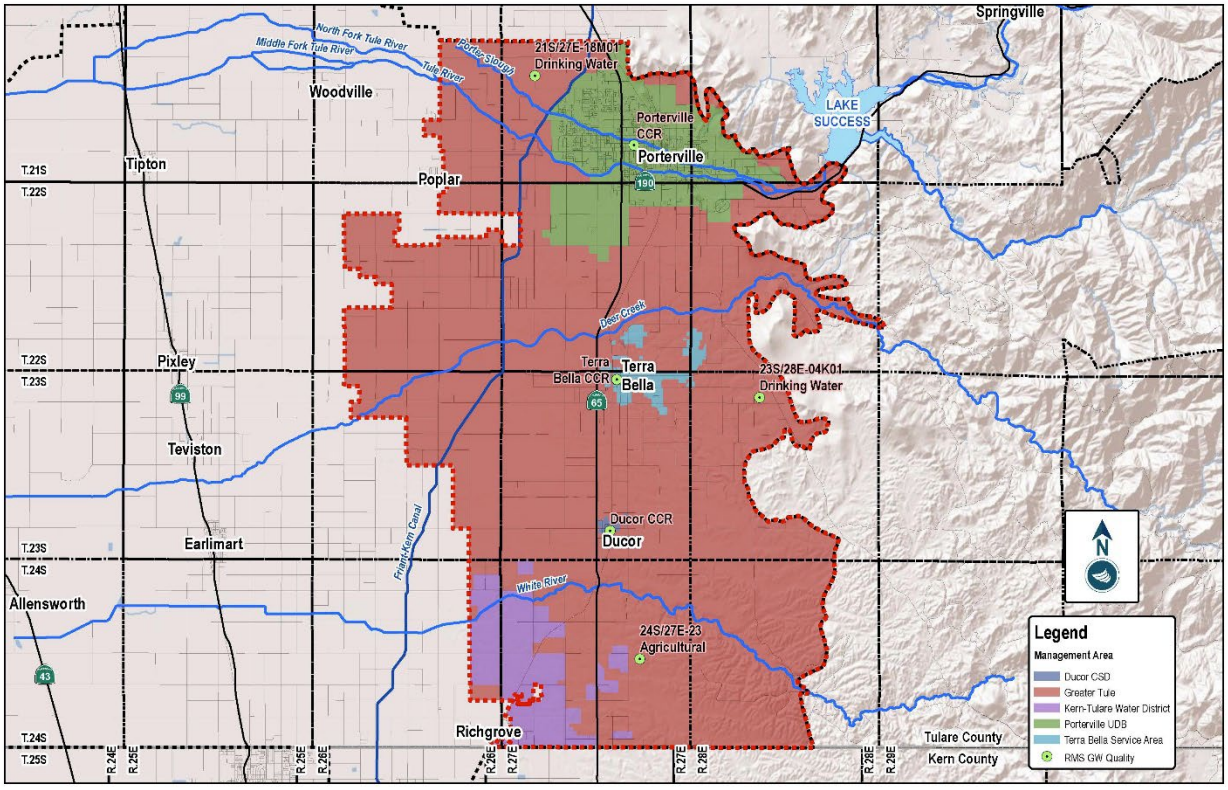

Figure 6-2: RMS for Monitoring Groundwater Quality

[3] California Division of Drinking Water, 2018
[4] Tule Basin Water Quality Coalition (TBWQC), 2017

Table 6-2: RMS for Monitoring Groundwater Quality

RMS ID	Well Designation	Aquifer	Lat	Long	Well Depth *(ft bgs)*	Top of Perforation *(ft bgs)*	Bottom of Perforation *(ft bgs)*
21S/27E-18M01 (360725)	Drinking	Upper	36.10059	-119.08878	300	150	300
23S/28E-04K01 (500094)	Drinking	Composite	35.95211	-118.96082	530	160	530
24S/27E-23 (E0155481)	Agr.	Lower	35.83159	-119.0289	1,500	1,090	1,500
COP CCR	Drinking	N/A	N/A	N/A	N/A	N/A	N/A
DCSD CCR	Drinking	N/A	N/A	N/A	N/A	N/A	N/A
TBID CCR	Drinking	N/A	N/A	N/A	N/A	N/A	N/A

6.2.3.5 Land Subsidence [23 CCR § 354.34 (c)(5)]

23 Cal. Code Regs. § 354.34 Monitoring Network. **(c)** *Each monitoring network shall be designed to accomplish the following for each sustainability indicator:*

(5) *Land Subsidence. Identify the rate and extent of land subsidence, which may be measured by extensometers, surveying, remote sensing technology, or other appropriate method.*

Land subsidence within the Tule Subbasin will be monitored as described in **Chapter 2.5** and at the RMS shown on **Figure A1-8** of the *TSMP*. Within the GSA, RMS for land subsidence will consist of GPS monitoring sites supplemented by InSAR data when available, monitored annually. RMS land subsidence are shown in **Figure 6-3: RMS for Monitoring Land Subsidence** and listed in **Table 6-3: RMS for Monitoring Land Subsidence.**

Additionally, the ETGSA has begun working with the Tule Subbasin Hydrogeologist on developing a Land Subsidence Management Plan, including identifying additional monitoring in the vicinity of the Friant Kern Canal (hereafter "FKC), to assist in management decisions to minimize future subsidence on the FKC. Part of the management plan is to monitor additional sites along the canal at 1- mile intervals.

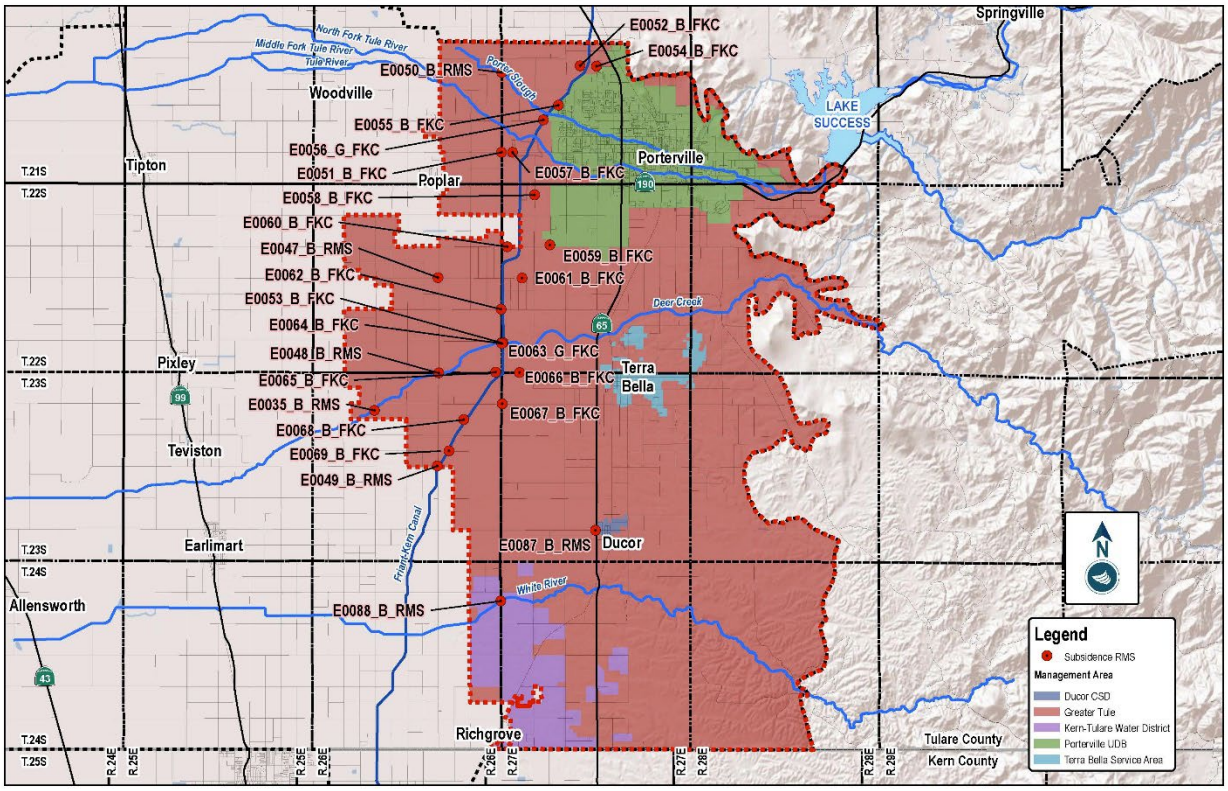

Figure 6-3: RMS for Monitoring Land Subsidence

Table 6-3: RMS for Monitoring Land Subsidence

RMS ID	GPS Coordinates	
	Latitude	Longitude
E0035_B_RMS	35.94676	-119.14319
E0047_B_RMS	36.00797	-119.14385
E0048_B_RMS	35.96397	-119.10756
E0049_B_RMS	35.92122	-119.10774
E0050_B_RMS	36.10256	-119.06308
E0051_B_FKC	36.06572	-119.10747
E0052_B_FKC	36.10566	-119.05358
E0053_B_FKC	35.97802	-119.07520
E0054_B_FKC	36.10548	-119.08389
E0055_B_FKC	36.08750	-119.10147
E0056_G_FKC	36.08073	-119.08889
E0057_B_FKC	36.06585	-119.08004
E0058_B_FKC	36.04611	-119.10415
E0059_B_FKC	36.02316	-119.09597
E0060_B_FKC	36.02225	-119.10767
E0061_B_FKC	36.00775	-119.10673
E0062_B_FKC	35.99332	-119.10724
E0063_G_FKC	35.97805	-119.11082
E0064_B_FKC	35.97759	-119.09725
E0065_B_FKC	35.96434	-119.10702
E0066_B_FKC	35.96428	-119.12888
E0067_B_FKC	35.94976	-119.13736
E0068_B_FKC	35.94259	-119.05407
E0069_B_FKC	35.92805	-119.10778
E0087_B_RMS	35.89159	-119.14319
E0088_B_RMS	35.85901	-119.14385

6.2.3.6 Interconnect Surface Water *[23 CCR § 354.34 (c)(6)]*

23 Cal. Code Regs. § 354.34 Monitoring Network. **(c)** *Each monitoring network shall be designed to accomplish the following for each sustainability indicator:*

(6) *Depletions of Interconnected Surface Water. Monitor surface water and groundwater, where interconnected surface water conditions exist, to characterize the spatial and temporal exchanges between surface water and groundwater, and to calibrate and apply the tools and methods necessary to calculate depletions of surface water caused by groundwater extractions. The monitoring network shall be able to characterize the following:*

(A) *Flow conditions including surface water discharge, surface water head, and baseflow contribution.*

(B) *Identifying the approximate date and location where ephemeral or intermittent flowing streams and rivers cease to flow, if applicable.*

(C) *Temporal change in conditions due to variations in stream discharge and regional groundwater extraction.*

(D) *Other factors that may be necessary to identify adverse impacts on beneficial uses of the surface water.*

Interconnected surface water does not occur in the Tule Subbasin for reasons described in **Chapter 2.3.6** of the *Tule Subbasin Setting* and **Section 4.3.6** of this Plan.

6.3 Assessment and Improvement of Monitoring Network *[23 CCR § 354.38 (a), (e)(1)(2)(3)(4)]*

23 Cal. Code Regs. § 354.38 Assessment and Improvement of Monitoring Network. **(a)** *Each Agency shall review the monitoring network and include an evaluation in the Plan and each five-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.*

(e) *Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:*

(1) *Minimum threshold exceedances.*

(2) *Highly variable spatial or temporal conditions.*

(3) *Adverse impacts to beneficial uses and users of groundwater.*

(4) *The potential to adversely affect the ability of an adjacent basin to implement its Plan or impede achievement of sustainability goals in an adjacent basin.*

Chapter 4.0 of the *TSMP* provides the following general statement regarding the monitoring network developed for the Tule Subbasin:

> *"The TSMP is both flexible and iterative, allowing for the addition or subtraction of monitoring features, as necessary, and to accommodate changes in monitoring frequency and alternative methodologies, as appropriate."*

Annually, data would be collected and analyzed providing for a better understanding of the groundwater conditions in the Tule Subbasin and how the actual groundwater conditions react to the projects and management actions implemented by each GSA. At a minimum, the monitoring network will be evaluated on 5-year basis and adjustments will be made accordingly. Additionally, when minimum threshold exceedances or adverse impacts to beneficial uses and users of groundwater occur, the monitoring networks will be evaluated for potential improvement to better understand the sources and causation leading to these occurrences.

6.3.1 Data Gaps *[23 CCR § 354.38 (b), (c)(1)(2), (d)]*

23 Cal. Code Regs. § 354.38 Assessment and Improvement of Monitoring Network. **(b)** *Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.*

(c) *If the monitoring network contains data gaps, the Plan shall include a description of the following:*

(1) *The location and reason for data gaps in the monitoring network.*

(2) *Local issues and circumstances that limit or prevent monitoring.*

(d) *Each Agency shall describe steps that will be taken to fill data gaps before the next five-year assessment, including the location and purpose of newly added or installed monitoring sites.*

See **Chapter 4.1** in the *TSMP*, which identifies data gaps within the Tule Subbasin and recommended new features to address the data gaps.

Of the proposed monitoring networks, monitoring wells represent the biggest data gap in the subbasin To address the data gap, new dedicated monitoring wells have been identified for monitoring the various aquifers at RMS in the GSA and are described in **Chapter 2.1.1.1** and shown in **Figure A1-2** (upper aquifer) and in **Chapter 2.1.1.2** and **Figure A1-5** (lower aquifer) of the *TSMP.* Funding generating during the plan implementation period may be used to further develop the monitoring features where there are data gaps, as described in **Section 8** of this Plan.

6.4 Reporting Monitoring Data to the Department *[23 CCR § 354.40]*

23 Cal. Code Regs. § 354.40 Reporting Monitoring Data to the Department. *Monitoring data shall be stored in the data management system developed pursuant to Section 352.6. A copy of the monitoring data shall be included in the Annual Report and submitted electronically on forms provided by the Department.*

Chapter 5.0 of the *TSMP* provides a detailed description of the Tule Subbasin Data Management System (DMS), that each of the GSA will utilize for reporting monitoring data according to the standardized monitoring protocols at RMS discussed within this Plan.

Data stored in the DMS will be assembled in standardized formats as required for the annual and 5-year reports to the Department.

Section 7. Projects and Management Actions

Table of Contents

List of Tables

LIST OF ATTACHMENTS

7.1 Introduction [Reg. § 354.42]

23 Cal. Code Regs. § 354.42 Introduction to Projects and Management Actions. *This Subarticle describes the criteria for projects and management actions to be included in a Plan to meet the sustainability goal for the basin in a manner that can be maintained over the planning and implementation horizon.*

This Section of the Plan describes the criteria for projects and management actions that the Agency, its member agencies, and/or its regional partners intend to undertake in order to achieve the sustainability goal of the Tule Subbasin by achieving one or more of the following criteria:

- Increase available water supplies;
- Optimize existing water supplies;
- Decreased consumptive use of non-sustainable groundwater supplies to mitigate overdraft;
- Groundwater levels sustained to sustainable management criteria quantified in this Plan;
- Reduction or cessation of subsidence near critical infrastructure;
- Stabilized water quality for agronomic and municipal beneficial uses;
- Funding for local water management; and/or
- Improved collection and management of water related data within the Agency.

All projects and management actions are taken in furtherance of protecting natural water resources and the environment within the ETGSA. The most immediate goal of all projects and management actions within the ETGSA is to help eliminate overdraft conditions.

7.2 Agency Projects and Management Actions *[Reg. § 354.44]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (a) *Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.*

The projects and management actions of the Agency to achieve the sustainability goal for the Tule Subbasin include the development of accounting tools to efficiently administrate and collect data that can be provided to its member agencies and stakeholders. This database and accounting platform will provide accurate information to assist the ETGSA Board to adaptively manage and develop policy to implement SGMA.

7.2.1 Groundwater Accounting Action *[Reg. § 354.44(b)(1)]*

3 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

The ETGSA has developed a groundwater accounting system, BasinSafe, to track groundwater use and implement a groundwater allocation program as also described herein. The rules upon which BasinSafe

operates is based on the ETGSA's Fifth Amended Rules and Regulations which sets forth a groundwater allocation methodology for annual allocations, including a ramp down schedule allowing for a quantity of continued overdraft until 2035 at which point the ETGSA GSP and Rules and Regulations anticipate the ETGSA will have reached sustainability. The Rules and Regulations are attached hereto and incorporated by reference as **Attachment 7-1**. BasinSafe and the Rules and Regulations specifically restrict groundwater pumping with the ETGSA. The allocation methodology was first implemented in Water Year 2021. ETGSA is in its second successful year of implementation.

BasinSafe was designed to enable the ETGSA to efficiently manage activity relevant to its SGMA compliance efforts. These activities include management of individual and/or entity groundwater accounts pursuant the various policies instituted by the Agency, and enable ETGSA staff to undertake core administrative tasks such as member management, tracking, billing and reporting.

7.2.1.1 Lead Entity

ETGSA (or "Agency")

7.2.1.2 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

This Action will benefit all of the following sustainability indicators: groundwater elevations, groundwater change in storage, land subsidence, and groundwater quality

7.2.1.3 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(A) *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

ETGSA has already implemented BasinSafe and has currently adopted the Fifth Amended Rules and Regulations. Use of groundwater is measured pursuant to the Rules and Regulations through either meters or Land IQ. ETGSA contracted with Land IQ on February 6, 2020 to monitor and measure total consumptive use. Through the Rules and Regulations, the ETGSA is using Land IQ to measure consumptive use for each individual parcel within the ETGSA. A landowner has the option to use Land IQ or a meter for such purpose.

7.2.1.4 Public Notice Process [Reg. § 354.44(b)(1)(B)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(B) *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

The ETGSA has engaged in extensive outreach to implement BasinSafe and to adopt the initial Rules and Regulations and subsequent versions thereof. Both the Executive and Stakeholder committees were directly involved in the actual drafting of the Rules and Regulations through an open public process. Numerous workshops were conducted regarding BasinSafe. In addition, one on one meetings are constantly occurring with landowners to assist in enrolling and administration of accounts.

7.2.1.5 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

This Action identifies the need to maintain average annual groundwater use within a sustainable limit and proposes to reach this sustainable limit through the gradual reduction in allowable groundwater use over time. The Rules and Regulations specifically set a methodology for groundwater allocations which incorporates the "ramp down" schedule provided in the GSP, as shown in **Table 7-1: Proposed Reduction in Groundwater Use Over Time.**

Table 7-1: Proposed Reduction in Groundwater Use Over Time

Percentage of Historical Annual Avg. Use Allowed Above Sustainable Limit			
2021-2025	**2026-2030**	**2031-2035**	**2035-2040**
90%	80%	30%	0%

As additional projects and management actions are implemented or are not implemented by the landowners and member agencies, adjustments to this gradual ramp down schedule will be made by the Agency to ensure sustainability is achieved by the end of the Plan Implementation period.

7.2.1.6 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

Pursuant SGMA, groundwater management implemented by ETGSA shall be consistent with Section 2 of Article X of the California Constitution and shall not determine or alter water rights (WAT § 10720.5). This provision is also incorporated in the Rules and Regulations.

ETGSA will comply with any applicable CEQA requirements.

7.2.1.7 Timeline [Reg. § 354.44(b)(4)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

BasinSafe and the Rules and Regulations were implemented prior to Water Year 2021.

7.2.1.8 Anticipated Benefits *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

It is anticipated that overtime BasinSafe and the Rules and Regulations will protect and enhance groundwater resources by reducing groundwater overdraft gradually until groundwater use reaches sustainability limits. Other benefits include mitigating decline of groundwater levels, and limiting or eliminating land subsidence and/or the migration of contaminated plumes.

Benefits to relevant sustainability indicators and their associated measurable objectives will be evaluated per the monitoring programs and procedures described in the Tule Subbasin Monitoring Plan (see Attachment 2 of Appendix A, Tule Subbasin Coordination Agreement). Regular reporting by groundwater users, surface water users, ETGSA Member Agencies, and all others required to participate will provide additional data in addition to other benefits.

7.2.1.9 Accomplishment [Reg. § 354.44(b)(6)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(6) *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

BasinSafe and the Rules and Regulations have already been implemented. The objective long term is to reduce groundwater overdraft during the Plan implementation.

7.2.1.10 Legal Authority [Reg. § 354.44(b)(7)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

A GSA is authorized to:

- Require the registration of groundwater extraction facilities (Water Code § 10725.6);
- Control groundwater extractions by regulating, limiting, or suspending groundwater extractions (Water Code § 10726.4(a)(2).);
- Authorize temporary and permanent transfers of groundwater extraction allocations within the agency (Water Code § 19726.4(a)(3));
- Establish accounting rules to allow unused groundwater allocations issued by the agency to be carried over from one year to another (Water Code § 10726.4(a)(4)).
- Perform any act necessary or proper to carry out the purposes of this part (Water Code § 10725.2(a)); and
- Adopt rules, regulations, ordinances and resolutions for the purposes of carrying out SGMA (Water Code §10725.2(b)).

7.2.1.11 Cost & Funding [Reg. § 354.44(b)(8)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Costs associated with BasinSafe include its initial development as well as consultant costs. The development of the Rules and Regulations also include consultant costs associated with drafting and technical review. These costs have been incurred initial through Member Agency contributions and most recently through the imposition of groundwater extraction fees.

7.2.1.12 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

Implementation of BasinSafe and the Rules and Regulations is intended to reduce groundwater extractions within the ETGSA until they reach sustainability. Various components of the Rules and Regulations, including allocations, carryover, recharge credits, and enforcement, will ensure that groundwater users are able to plan for and manage against periods of drought while operating within limits determined to be sustainable.

7.2.2 Fees and Incentives [Reg. § 354.44(b)(1)]

3 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

The following fees have been implemented by the Agency:

1. Development of Fees per Rules and Regulations.
2. Groundwater Extraction Fee
3. Transitional Pumping Fees

The GSA has implemented both groundwater extraction fees and penalties to fund programs described herein and also discourage overdraft pumping. The Rules and Regulations attached hereto and incorporated by reference as **Attachment 7-1**, describes the authority for fees and penalties. The board annual sets both rates after legal compliance

7.2.2.1 Lead Entity

ETGSA (or "Agency") is the lead entity.

7.2.2.2 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

This Action will benefit all of the following sustainability indicators: groundwater elevations, groundwater change in storage, land subsidence, and groundwater quality.

7.2.2.3 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(A) *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The ETGSA implemented the fee and penalty structure after compliance with all procedural and substantive requirements of SGMA, and any applicable Proposition 218 Constitutional requirements.

7.2.2.4 Public Notice Process [Reg. § 354.44(b)(1)(B)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(B) *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

The board has annually set groundwater extraction fees and penalty rates both held and noticed at public meetings in accordance with the Brown Act and in addition to any Proposition 218 requirements, if any.

7.2.2.5 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The imposition of groundwater extraction fees and penalties is in part to disincentivize overdraft pumping and encourage sustainable levels of extraction.

7.2.2.6 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

It is not anticipated any permits and other regulatory requirements are required for fees or penalty imposition. The ETGSA will comply with all procedural and substantive requirements of SGMA and any applicable Proposition 218 Constitutional requirements.

7.2.2.7 Timeline [Reg. § 354.44(b)(4)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

Groundwater extraction fees and penalties were imposed during Water Year 2021. The ETGSA is in its second year of implementation.

7.2.2.8 Anticipated Benefits *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The primary benefit resulting from fees and penalties is the reduction in groundwater overuse over time. The fee and penalty structure will help protect and enhance groundwater resources.

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7.2.2.9 Accomplishment [Reg. § 354.44(b)(6)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(6) *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The ETGSA will comply with all procedural and substantive requirements of SGMA and any applicable Proposition 218 Constitutional requirements.

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7.2.2.10 Legal Authority [Reg. § 354.44(b)(7)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

SGMA authorizes the imposition of fees and penalties pursuant to Water Code §10730, *et seq*. In addition, the ETGSA has authority to collect land-based assessment, other fees and penalties pursuant to the Joint Exercise of Powers Act and the common powers rule pursuant to Government Code §6500, *et seq*. In addition a GSA is authorized to perform any act necessary or proper to carry out the purposes of this part (Water Code § 10725.2(a)) and adopt rules, regulations, ordinances and resolutions for the purposes of carrying out SGMA (Water Code §10725.2(b)).

7.2.2.11 Cost & Funding [Reg. § 354.44(b)(8)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Staff and consultant costs are necessary to impose the fees and penalties. The same will be required for collection and enforcement of the same.

7.2.2.12 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

Imposition of fees and penalties will encourage use within sustainable limits and disincentivize overdraft pumping. The fees and penalties program will assist the ETGSA in reaching sustainability targets by enhancing groundwater resources and eliminating overdraft conditions.

7.2.3 Land Subsidence Management and Monitoring *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

The following Plans have been adopted by the Agency to address land subsidence:

1. Land Subsidence Monitoring Plan
2. Land Subsidence Management Plan

7.2.3.1 General Summary

The ETGSA has adopted a Land Subsidence Monitoring Plan ("Monitoring Plan" and Land Subsidence Management Plan ("Management Plan"), which are attached hereto and incorporated by reference as **Attachment 7-2**.

The purpose of both Plans are to: 1) identify a geographical area along the Friant-Kern canal to establish the Land Subsidence Management Area ("Area"); 2) identify the particular causes of land subsidence within the Area; 3) identify mechanisms for minimizing subsidence along the Area; 4) identify data gaps and additional monitoring sites for the purpose of improving assessment of conditions in the Area; and 5) refinement of land subsidence management criteria for the Area.

7.2.3.2 Lead Entity

ETGSA (or "Agency").

7.2.3.3 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

The Monitoring Plan and Management Plan are intended to better identify causes of subsidence, levels and rates of subsidence and better react and implement early actions to further decrease rates of extraction in the Area. The combined Plans will allow the ETGSA to better assess conditions and react accordingly to better achieve measurable objectives.

7.2.3.4 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(A) *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The well-documented effects of land subsidence in the Area require this management action to be commenced without delay.

7.2.3.5 Public Notice Process [Reg. § 354.44(b)(1)(B)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(B) *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Both Plans were circulated to the public for written and verbal public comment. Numerous workshops occurred in addition to both the Stakeholder and Executive Committees having drafting opportunities. The Plans were ultimately adopted by the board of directors in a public meeting and in compliance with the Ralph M. Brown Act.

7.2.3.6 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The Plans are likely to have a net positive impact upon the water budget, as addressing subsidence issue in the Area will likely optimize the delivery of surface water within the ETGSA's boundaries and also will further reduce overdraft groundwater extractions.

7.2.3.7 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

No additional permits are required to implement in addition to those which have already been obtained or complied with in addition to the ETGSA Rules and Regulations. CEQA has been and will be complied with as necessary. As further projects come underway, permitting and regulatory requirements will be addressed as those currently unidentified projects are proposed and ultimately pursued.

7.2.3.8 Timeline [Reg. § 354.44(b)(4)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The ETGSA has approved the Plans.

7.2.3.9 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The primary benefit will be to reduce land subsidence, reduce impacts to the FKC, allow more surface water deliveries and reduce overall overdraft groundwater extractions. Benefits also include mitigating the decline of groundwater levels and limiting migration of contaminant plumes.

Benefits to relevant sustainability indicators and their associated measurable objectives will be evaluated per the monitoring programs and procedures described herein.

7.2.3.10 Accomplishment [Reg. § 354.44(b)(6)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(6) *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Plans have already been approved by the ETGSA. The Management Plan will be incorporated and enforced through the ETGSA's Rules and Regulations. The basis of the Management Plan is to increase restrictions in allowable overdraft in the Area, more so than already establish in the current allocation-scheme.

7.2.3.11 Legal Authority [Reg. § 354.44(b)(7)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

A GSA is authorized to:

- Control groundwater extractions by regulating, limiting, or suspending groundwater extractions (Water Code § 10726.4(a)(2).);
- Authorize temporary and permanent transfers of groundwater extraction allocations within the agency (Water Code § 19726.4(a)(3));
- Perform any act necessary or proper to carry out the purposes of this part (Water Code § 10725.2(a)); and
- Adopt rules, regulations, ordinances and resolutions for the purposes of carrying out SGMA (Water Code §10725.2(b)).

7.2.3.12 Cost & Funding [Reg. § 354.44(b)(8)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Staff and consultant costs were necessary to develop and implement the Plans. The same will be required for implementation through the Rules and Regulations and enforcement.

7.2.3.13 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The Plans are intended to better understand and identify causes and impacts of land subsidence in the Area. The management actions as a result of this understanding and identification is to further limit overdraft groundwater extractions. The result of further restrictions will result in mitigation of lowering of groundwater levels and reducing and/or eliminating land subsidence. In addition, the Plans will maximize surface water delivering ensuring impacts to the FKC are reduced.

7.2.4 Land Subsidence Mitigation *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

7.2.4.1 General Summary

Available data has shown that overdraft pumping has caused or contributed to land subsidence along the Friant Kern Canal. The current proposed measurable objectives and minimum thresholds for groundwater levels and land subsidence show continued impacts to the FKC. As a result, the ETGSA and Friant Water Authority ("FWA") reached a settlement upon which ETGSA would monetarily contribute a certain amount of funds to a project undertaken by FWA to restore the FKC to historic capacity. Attached hereto and incorporated by reference as **Attachment 5-2** to **Section 5** of this Plan is a copy of the Settlement Agreement ("Agreement").

7.2.4.2 Lead Entity

ETGSA and FWA entered into the Settlement Agreement.

7.2.4.3 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

The purpose of the Agreement is to mitigate for impacts caused by continued overdraft conditions to the FKC. As a result, the impacts established within the ETGSA for groundwater level declines and land subsidence are not considered significant and unreasonable.

7.2.4.4 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

The Agreement was finalized in January of 2021 and payments have been performed by ETGSA on a quarterly basis since the time of finalization.

7.2.4.5 Public Notice Process [Reg. § 354.44(b)(1)(B)]

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

The Agreement is a Settlement Agreement as a result of threat of litigation by FWA. The monies used for purposes of payment to FWA was monies already being collected by ETGSA through penalty revenue. The Settlement also provided for another form of payment should the ETGSA successfully pass a Proposition 218 Land Based Assessment. In compliance with Proposition 218, the ETGSA adopted an Engineer's Report, provided public notice, and mailed ballots to affected landowners. The election did not successfully pass.

7.2.4.6 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(2)** *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The Agreement itself mitigates for allowable continued overdraft conditions and impacts to the FKC as a result. Thus, impacts to the FKC during the implementation period are not significant and unreasonable.

7.2.4.7 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

No permitting or regulatory requirements exist for the approval of the Settlement Agreement. Funds use for payment under the Agreement were from revenues already collected through the fee disincentive program.

7.2.4.8 Timeline [Reg. § 354.44(b)(4)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The Agreement has already been entered into and payments are already being made.

7.2.4.9 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The anticipated benefits are to further expedite repairs to the FKC and restore historic capacity that has been reduced due to land subsidence. As groundwater levels and subsidence reach sustainable levels, no further impacts to the FKC are expected.

7.2.4.10 Accomplishment [Reg. § 354.44(b)(6)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(6) *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Agreement was approved by each respective board. Payments are being made as revenues are realized.

7.2.4.11 Legal Authority [Reg. § 354.44(b)(7)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The Agreement is a settlement based on a threat of litigation by FWA. The ETGSA board is authorized to settle legal claims, in combination with an in addition to the Joint Exercise of Powers Act, Government Code § 6500, *et seq*.

7.2.4.12 Cost & Funding [Reg. § 354.44(b)(8)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

Staff and consultant costs were incurred as a result of finalizing the Agreement. Further staff and consultant costs are required to continue monitoring and payments.

7.2.4.13 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

The purpose of the Agreement is to ensure no further impacts to the FKC are incurred, outside of those expected pursuant to the ETGSA 2020 GSP. This ensures the ETGSA will reach sustainability upon the timeline set forth in this GSP.

7.2.5 Well Mitigation *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

The Tule Subbasin GSAs have agreed to each implement a Mitigation Program to mitigate for impacts caused to beneficial uses and users due to groundwater level declines, land subsidence, and water quality. See **ATTACHMENT-7** to the Tule Subbasin Coordination Agreement. The following describes the ETGSA's Mitigation Program in conformance with the Coordination Agreement.

7.2.5.1 General Summary

The Subbasin has been in overdraft for many years resulting in a significant lowering of regional and local groundwater levels. The GSP is designed for the Subbasin to reach sustainability by 2040 and beyond. However, until sustainability is reached, some level of continued groundwater level decline and land subsidence is expected in areas of the Subbasin while the GSAs are in the process of implementing projects and management actions to achieve sustainability by 2040. The purpose of the Mitigation Program is to mitigate those wells, critical infrastructure, and land uses that are adversely affected by declining groundwater levels, land subsidence, and changes to groundwater quality while the ETGSA reaches sustainability.

a) **Identification of Impacts to be Addressed by Mitigation Program**

Each Tule Subbasin GSA will adopt and implement a Mitigation Program to identify the specific needs for mitigation caused by pumping within the GSA's boundaries. Each GSA Mitigation Program will separately identify the impacts to beneficial uses that the Program is intended to address. Each GSA Mitigation Program must provide a claim process to address impacts to (i) domestic and municipal wells (ii) agricultural wells and (iii) critical infrastructure. Decisions to include or exclude impacted users from participation in a GSA's Mitigation Program shall be supported by appropriate written technical data and analysis.

b) **Process**

For claims of impacts to wells related to groundwater level declines, the ETGSA plans to set forth the follow process:

1) an application process by the well owner;
2) data collection by the GSA to verify the claim;
3) identification of suitable mitigation; and/or
4) response to said affected user.

For claims of impact to land uses from land subsidence, the ETGSA plans to set forth the follow process:

1) an application process by the affected party;
2) data collection by the GSA to verify the claim;
3) identification of suitable mitigation; and/or
4) coordination, as necessary, with said affected parties to implement the mitigation.

For claims of impact to groundwater quality that is attributable to pumping allowed by a GSA/GSP, the ETGSA plans to set forth the follow process:

1) an application process by the affected party;
2) data collection by the GSA to verify the claim;
3) identification of suitable mitigation; and/or
4) coordination, as necessary, with said affected parties to implement the mitigation.

For those claims that are shown not to be related to GSP- / GSA-approved or authorized activities, the ETGSA will, to the extent possible, provide assistance to the affected party to identify programs for addressing their issue.

c) **Investigation**

Once a claim of adverse impact has been made, whether it be for well, specific land use, critical infrastructure or groundwater quality issue(s), the ETGSA will investigate the claim.

d) **Qualifications for Mitigation**

The ETGSA may determine whether to provide full or partial mitigation based on a user's compliance with the ETGSA's GSP, Rules & Regulations, policies, or other laws or regulations. For example, a user whose own pumping has caused or contributed to overdraft or damage to their own well may not qualify for mitigation under the Program. Further, mitigation will be applied only to those claims that are shown to be attributable to GSP- / GSA-approved or authorized activities. ETGSA will also address how claims that a landowner within ETGSA has caused impacts outside of the ETGSA.

e) **Mitigation**

Once a claim of impact has been confirmed to be due to GSP-/GSA-approved or authorized activities, the ETGSA will identify suitable mitigation to alleviate the impact.

For groundwater level impacts, the ETGSA plans to set forth the follow potential mitigation options for an affected user:

1) Deepening the well;
2) Constructing a new well;
3) Modifying pump equipment;
4) Providing temporary or permanent replacement water;
5) Coordinating consolidation of the domestic well owner with existing water systems; or
6) With the consent of the affected user, providing other acceptable means of mitigation.

For land use impacts, the ETGSA plans to set forth the follow potential mitigation options for an affected user:

1) Repair to canals, turnouts, stream channels, water delivery pipelines, and basins;
2) Repair to damaged wells;
3) Addressing flood control;
4) Addressing other damaged infrastructure; or
5) With the consent of the affected user, providing other acceptable means of mitigation.

For groundwater quality impacts (due to groundwater management/actions), the ETGSA plans to set forth the follow potential mitigation options for an affected user:

1) Adjusting groundwater pumping locations, rates or schedules;
2) Modifying project operations;
3) Providing temporary or permanent replacement water;
4) Coordinating consolidation with existing water systems; or

5) With the consent of the affected user, providing other acceptable means of mitigation.

Various factors may reflect the proper mitigation methods for the specific issue. For example, age, location, financial impact to the beneficial user as a result of mitigation, and the beneficial user may reflect which mitigation measures are chosen by the ETGSA.

7.2.5.2 Lead Entity

ETGSA (or the "Agency").

7.2.5.3 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

The program will directly address the impacts of the chronic lowering of groundwater levels, land subsidence, and water quality by providing funding for replacement wells, well modifications, or other mitigation to eligible landowners.

7.2.5.4 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(A) *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

This is a high priority program that is necessary to mitigate the impacts of declining water levels, land subsidence, and water quality, and provide water supply to meet basic health and safety needs. The ETGSA is committed to implementing this Program.

7.2.5.5 Public Notice Process [Reg. § 354.44(b)(1)(B)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(B) *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

Public outreach and education will be performed during development of the mitigation program and prior to implementation.

Prior to implementation, extensive outreach will be needed to notify landowners of the ETGSA Program requirements and how they can apply for assistance. Outreach may be needed to be performed in multiple languages. Outreach methods could include workshops, mailings, flyers, website postings, Board meeting announcements, etc.

7.2.5.6 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

The Program plans to mitigate for those impacts caused based on the ETGSA 2020 GSP. Because those impacts are mitigated, the impacts are not considered significant and unreasonable. Thus, the Program is critical to ensuring Undesirable Results do not occur in the ETGSA.

7.2.5.7 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

The ETGSA will comply with any CEQA requirements prior to approval and implementation of the Program. Permitting will be required for any replacement or new wells under the Program. No other permits or other regulatory requirements are expected to be necessary for the Program at this time.

7.2.5.8 Timeline [Reg. § 354.44(b)(4)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

Each GSA will formulate and implement a mitigation claims process for domestic and municipal use impacts by 12/31/2022, and complete all other aspects of the Mitigation Program by June 30, 2023. During program development, the GSAs will conduct community outreach and refer landowners and others to available local programs as well as other resources and funding programs from the County, State or non-profit organizations, including the Tule Basin Water Foundation

7.2.5.9 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The benefits derived from the Program include mitigation from any and all impacts as a result of the GSP, while the ETGSA moves forward to sustainability. The benefits from the Project ensure that all beneficial uses and users are protected within the ETGSA.

7.2.5.10 Accomplishment [Reg. § 354.44(b)(6)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(6) *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Program will first be accomplished by setting forth a claims process as described above and utilizing existing programs for impacted users. The Program will be fully developed after proper assessment of all potential impacts to users who are unable to receive benefits under other existing programs.

7.2.5.11 Legal Authority [Reg. § 354.44(b)(7)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

California Water Code Section 10725.2 provides the GSA has the powers and authorities "perform any act necessary or proper" to implement SGMA regulations and allows the GSA to adopt rules, regulations, ordinances, and resolutions necessary for SGMA implementation. Because the Department is required to evaluate whether the Plan provides a reasonable means to mitigate for continued overdraft, a mitigation program is an act necessary or proper to implement SGMA. (23 CCR §355.4(b)(6).)

7.2.5.12 Cost & Funding [Reg. § 354.44(b)(8)]

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The ETGSA will develop a funding mechanism for the Program dependent on specific needs identified for mitigation. The ETGSA will actively explore available grant funding and work in cooperation with local NGOs for furtherance and assistance in this regard. In addition, the ETGSA will utilize existing funded programs such as the Tule Basin Water Foundation to provide immediate assistance and relief. The ETGSA will also explore the possibility of land-based assessments, increases in groundwater extraction fees, and potentially utilization of available penalty revenue to fund the Program costs.

7.2.5.13 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

7.3 The intent of the Program is to mitigate for these impacts while the ETGSA implements the GSP and reaches sustainability. To be effective, other management actions and projects must be implemented in tandem such as the groundwater accounting and allocation methodology in the Rules and Regulations. This will ensure impacts will remain as expected and will be mitigated in a timely fashion. Member Agency / Landowner Project and Management Actions *[Reg. § 354.44(b)(1)]*

3 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

Over the plan implementation period, the ETGSA may decide to complete projects that collectively benefit the entire Agency area to achieve the Sustainability Goal, but most Project and Management Actions will be completed separate by the member agencies or the individual landowners.

The Agency will help coordinate the implementation of these projects and management actions throughout the plan implementation period in response to actual changing conditions with the GSA. To help communicate the beneficial projects and actions to implement within the ETGSA, the following Project and Management Categories were established, and subsequently described in more detail on items required to complete and the benefits these projects or management actions would have to achieving the sustainability goal of the Tule Subbasin.

Following is a list of the categories of the various types of projects and management actions to help achieve sustainability within the ETGSA:

1. Water Supply Optimization: Optimizing efficiencies in existing surface water or groundwater operations.
2. Surface Water Development: Developing new surface water supplies.
3. Managed Aquifer Recharge and Banking: Developing recharge and groundwater banking projects.
4. Agricultural Land Retirement: Projects related to fallowing agriculture land.

Because of the relative diversity of the Agency, it is anticipated that there are several Actions wherein the entity coordinating and/or administering the undertaking of the Action (hereafter, "Lead Entity") will be an entity other than the Agency. In these circumstances, the Agency is committed to collaborating with the appropriate Lead Entity and providing its support and/or approval, if necessary.

The objective of the Agency is to provide this Plan and identify the procedures for the member agencies and stakeholders to implement the Projects and Management Actions, rather than the Agency itself complete projects and actions.

A description of the projects and management actions by each category includes the following:

1) A general summary of the Project or Action and the Lead Entity anticipated to undertake the Project or Action. [Reg. § 354.44(a)]
2) A description of the measurable objective(s) expected to benefit from the Project or Action. [Reg. § 354.44(b)(1)]
3) A description of the circumstances that have or will lead to the consideration and/or trigger the implementation of the Project or Action. [Reg. § 354.44(b)(1)(A)]
4) A summary of the anticipated process of public notice regarding the consideration and implementation of the Project or Action. /[Reg. § 354.44(b)(1)(B)]
5) If applicable, a quantification of the anticipated groundwater demand to be reduced as a result implementing of the Project or Action. [Reg. § 354.44(b)(2)]
6) A summary of the permitting and regulatory processes that may be required to undertake the Project or Action. [Reg. § 354.44(b)(3)]
7) A timeline summarizing the expected initiation, completion, and accrual of expected benefits for the Project or Action. [Reg. § 354.44(b)(4)]
8) An explanation of the benefits that are expected to be realized and how those benefits will be evaluated for the Project or Action. [Reg. § 354.44(b)(5)]
9) A general explanation of how the Project or Action will be accomplished and, if applicable, the source and reliability of waters relied upon from outside of the Agency's jurisdiction to accomplish the action. [Reg. § 354.44(b)(6)]
10) A summary of the legal authority of the Lead Entity to undertake the Project or Action. [Reg. § 354.44(b)(7)]
11) An estimate of the cost and funding source anticipated to undertake the Project or Action. [Reg. § 354.44(b)(8)]
12) If applicable, an explanation of how groundwater extractions and/or recharge during periods of drought will be offset during other periods to ensure the avoidance of chronic lower of groundwater levels and/or the depletion of supplies. [Reg. § 354.44(b)(9)]

Several specific Projects and/or Management Actions that meet the criteria described in this Section have been started prior to, or may begin soon thereafter, the adoption of this Plan.

7.3.1 Water Supply Optimization *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

7.3.1.1 General Summary

Water Supply Optimization Projects are those that a Lead Entity (*Public Agency of Individual Landowner*) may implement to optimize the delivery of existing available and typically recurring water supplies. Through the optimized management of these supplies, which is often surface water, entities will be able to:

- More efficiently distribute available water supplies (through District or Farm); and/or
- Minimize conveyance losses; and/or

Implementation of successful supply optimization Projects will, in general, either reduce the average annual extraction or actual consumption of groundwater supplies within ETGSA. Specific water supply optimization projects will be developed during the Plan Implementation period and be described during the 5-year Plan updates. Examples of these types of Projects may include, but are not limited to:

- Open Channel Canal replacement with Pipeline System
- Fixing leaks in existing distribution systems
- SCADA systems to more efficiently manage water distribution
- On-Farm irrigation distribution system upgrades (e.g. drip systems, field leveling).

The Agency strongly encourages its stakeholders and member agencies to implement water supply optimization projects to help achieve groundwater sustainability.

7.3.1.2 Lead Entity

The Lead Entity will vary depending on the Public Agency or landowner undertaking the Project.

7.3.1.3 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

These types of Projects will generally affect the groundwater elevation, groundwater change in storage, and land subsidence measurable objectives.

7.3.1.4 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(A) *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Each Public Agency or landowner considering a project for supply optimization will review the benefits of the project compared to the cost of the project. The Public Agency will evaluate whether optimizing water supplies is the most beneficial use of Public Agency funds to achieve the goals and objectives of this Plan, or if other projects or actions might be more cost effective to achieve similar results.

7.3.1.5 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(B) *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

For those projects that are Public Agency projects, standard CEQA public process will be implemented. All meetings of the Public Agency will follow the requirements of the Ralph M. Brown Act. For those projects' which are landowner driven, public noticing will not be required.

7.3.1.6 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Projects completed under this category will have varying effects on the Water Budget, but generally, each project will increase the available quantity of surface water available for consumption and prevent unnecessary pumping of groundwater. Each year, the Agency will measure groundwater levels and calculate the change in groundwater storage, per the Monitoring Plan (**Section 5**) for which the quantification can be estimated from these projects.

7.3.1.7 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

The permitting and regulatory process will vary depending on the location and description of the Project. In general, the permitting and regulatory process may include the following:

- A Mitigated Negative Declaration and other materials and activities as required by the California Environmental Quality Act (hereafter, "CEQA"), for the construction of facilities and other activities;
- A Mitigated Finding of No Significant Impact and other materials and activities as required by the National Environmental Policy Act (hereafter, "NEPA"), for the use of federal grant funds provided by BOR and construction of the facilities and other activities;
- A Construction General Permit issued by State Water Resources Control Board and required Stormwater Pollution Prevention Plan (hereafter, "SWPPP") for soil disturbances related to construction of the facilities; and
- A Dust Control Plan (hereafter, "DCP") as required by the San Joaquin Valley Air Pollution Control District for mitigation of dust-related disturbances related to construction of the facilities.
- A US Army Corps of Engineers and/or California Department of Fish & Wildlife permit if effecting jurisdictional waterways.
- Local Tulare County Building Permit

7.3.1.8 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The timeline to complete Projects in this category varies depending on the complexity of each project. The projects may vary from a few weeks to several years.

7.3.1.9 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The ability to delivery historically available but otherwise undelivered surface water supplies to landowners within the member agencies, or to utilize water more efficiently, will prevent unnecessary use of pumping of groundwater. It is anticipated that the primary benefit will be an increase in average annual surface water supplies available in-lieu of using groundwater. Ancillary benefits include mitigating the decline of local groundwater levels and mitigating the occurrence of other conditions associated with declining groundwater levels, such as subsidence and the migration of contaminant plumes.

Benefits to relevant sustainability indicators and their associated measurable objectives will be evaluated per the monitoring programs and procedures described in the Tule Subbasin Monitoring Plan (see

Attachment 2 of **Appendix A, Tule Subbasin Coordination Agreement**). Isolating the effects of these specific Projects to relevant sustainability indicators will be difficult due to the other Actions contemplated to be implemented concurrently within ETGSA and the remainder of the Tule Subbasin.

7.3.1.10 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Projects will be accomplished by receiving adequate funding, completing the permitting, and construction of the physical infrastructure associated.

The purpose of these Projects is to utilize existing water supplies that are historically reliable and utilize these supplies more efficiently.

7.3.1.11 Legal Authority *[Reg. § 354.44(b)(7)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(7)** *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The legal authority for these projects varies depending on the Public Agency involved. Generally, the Water Code or Muncipal Code for the formation of these Public Agencies allows them the authority to do the Projects described in this category.

7.3.1.12 Cost & Funding *[Reg. § 354.44(b)(8)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(8)** *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The costs associated with these projects will vary by project may include:

- Environmental & Planning Permitting
- Construction Documents & Building Permits
- Construction

Funding for these projects will vary by project also, and may include:

- State or Federal Grant Programs
- Member Agency Assessments
- Private Landowner Contributions

7.3.1.13 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This Action is intended to maximize surface water availability for water users within Member Agencies utilizing new conveyance infrastructure to supply surface water to landowners more efficiently. During drought periods, when surface water is scarce, efficient distribution of this surface water to minimize groundwater pumping will be beneficial.

Secondly, groundwater that is pumped will be done more efficiently. Therefore, while groundwater use may generally increase during periods of drought, it is expected that these projects in this category will minimize the amount of groundwater needed to be pumped to meet demands.

7.3.2 Surface Water Development *[Reg. § 354.44(b)(1)]*

3 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

7.3.2.1 General Summary

Surface Water Development Projects are those Projects that a Lead Entity (Public Agency of Landowner) may implement to import new surface water supplies or develop other surface water supplies that historically not available for import, delivery, or captured within the ETGSA. Through the creation of these new supplies, entities will be able to:

- Increase the total volume of water that can be made sustainably available for existing and future uses; and/or
- Increase the total volume of water dedicated toward groundwater recharge.

Implementation of successful Surface Water Development Actions will, in general, either reduce the average annual extraction of or actual consumption of groundwater supplies within ETGSA.

Examples of Surface Water Development Projects within the ETGSA may include, but are not limited to:

1. Success Reservoir Enlargement Project (TRA): Increase storage in Lake Success primarily for flood control purposes but would increase opportunity to manage surface water diversions and increase the yield of the Tule River to downstream water rights holders, many within the ETGSA.
2. Wastewater Treatment and Recycling (COP): Additional treatment of wastewater effluent from the City of Porterville due to increase in Population, which will increase available water for recharge.

3. Surface Water Infrastructure Development: Increase capacity of existing or develop additional surface water delivery systems to maximize ability to capture flood waters and any available water for import during above average hydrology periods.

7.3.2.2 Lead Entity

The Lead Entity will vary depending on the Public Agency or landowner undertaking the Project.

7.3.2.3 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

These types of Projects will generally affect the groundwater elevation, groundwater change in storage, and land subsidence measurable objectives.

7.3.2.4 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Each Public Agency or landowner considering a project for surface water development will review the benefits of the project compared to the cost of the project. The Public Agency will evaluate whether developing new surface water is the most beneficial use of Public Agency funds to achieve the goals and objectives of this Plan, or if other projects or actions might be more cost effective to achieve similar results.

7.3.2.5 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(B) *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

For those projects that are Public Agency projects, standard CEQA public process will be implemented. All meetings of the Public Agency will follow the requirements of the Ralph M. Brown Act. For those projects' which are landowner driven, public noticing will not be required.

7.3.2.6 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Projects completed under this category will have varying effects on the Water Budget, but generally, each project will increase the available quantity of surface water available for consumption and prevent unnecessary pumping of groundwater. Each year, the Agency will measure groundwater levels and calculate the change in groundwater storage, per the Monitoring Plan (**Section 5**) for which the quantification can be estimated.

7.3.2.7 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

The permitting and regulatory process will vary depending on the location and description of the Project. In general, the permitting and regulatory process may include the following:

- A Mitigated Negative Declaration and other materials and activities as required by the California Environmental Quality Act (hereafter, "CEQA"), for the construction of facilities and other activities;
- A Mitigated Finding of No Significant Impact and other materials and activities as required by the National Environmental Policy Act (hereafter, "NEPA"), for the use of federal grant funds provided by BOR and construction of the facilities and other activities;
- A Construction General Permit issued by State Water Resources Control Board and required Stormwater Pollution Prevention Plan (hereafter, "SWPPP") for soil disturbances related to construction of the facilities; and

- A Dust Control Plan (hereafter, "DCP") as required by the San Joaquin Valley Air Pollution Control District for mitigation of dust-related disturbances related to construction of the facilities.
- A US Army Corps of Engineers and/or California Department of Fish & Wildlife permit if effecting jurisdictional waterways.
- Local Tulare County Building Permit

7.3.2.8 Timeline *[Reg. § 354.44(b)(4)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(4)** *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The timeline to complete Projects in this category varies depending on the complexity of each project. The projects may vary from a few weeks to several years.

7.3.2.9 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(5)** *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The ability to develop additional surface water into the ETGSA will be very beneficial to offset the current overdraft and subsidence that is occurring. The primary benefit is to offset groundwater pumping by providing surface water to meet demand. Ancillary benefits include mitigating the decline of local groundwater levels and mitigating the occurrence of other conditions associated with declining groundwater levels, such as subsidence and the migration of contaminant plumes.

Benefits to relevant sustainability indicators and their associated measurable objectives will be evaluated per the monitoring programs and procedures described in the Tule Subbasin Monitoring Plan (see **Attachment 2** of **Appendix A, Tule Subbasin Coordination Agreement**). Isolating the effects of these specific Projects to relevant sustainability indicators will be difficult due to the other Actions contemplated to be implemented concurrently within ETGSA and the remainder of the Tule Subbasin.

7.3.2.10 Accomplishment *[Reg. § 354.44(b)(6)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(6)** *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Projects will be accomplished by receiving adequate funding, completing the permitting, and construction of the physical infrastructure associated.

The reliability of these projects is contingent upon the availability of surface water. For new surface water developed and brought to the ETGSA members or member agencies, secure contracts and agreements will increase reliability and consistency of the surface water prior to completing the permitting and construction of the facilities.

7.3.2.11 Legal Authority

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The legal authority for these projects varies depending on the Public Agency involved. Generally, the Water Code or Muncipal Code for the formation of these Public Agencies allows them the authority to do the Projects described in this category.

7.3.2.12 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The costs associated with these projects will vary by project may include:

- Environmental & Planning Permitting
- Construction Documents & Building Permits
- Construction

Funding for these projects will vary by project also, and may include:

- State or Federal Grant Programs
- Member Agency Assessments
- Private Landowner Contributions

7.3.2.13 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This Action is intended to increase the surface water availability for water users, which will primarily be available during above average hydrologic periods. During drought periods, when surface water is scarce, groundwater will be relied upon to meet water demands. But, if the groundwater utilized includes the

additional surface water developed or imported that was recharged and banked during the wet years, during the droughts the impacts to groundwater will be mitigated.

7.3.3 Managed Aquifer Recharge and Banking *[Reg. § 354.44(b)(1)]*

3 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

7.3.3.1 General Summary

Managed Aquifer Recharge and Banking Projects are those Projects that a Lead Entity may implement to recharge imported, recycled, or other surface water (rights or purchased) to improve local groundwater conditions and/or extract these supplies in the future. Through the development or continuation of various recharge activities, entities will be able to:

- Increase the total volume of water that can be made sustainably available for existing and future uses;
- Increase groundwater inflow and mitigate for groundwater extraction that is in excess of the Tule Subbasin's native safe yield;
- Store water within the subbasin in anticipation of future extraction and application to beneficial uses;
- Decelerate or otherwise mitigate ongoing subsidence; and/or
- Create intermittent wildlife habitat.

Implementation of successful Managed Aquifer Recharge and Banking Actions will, in general, assist in the balancing of groundwater extractions with groundwater inflows within the ETGSA.

Examples of Managed Aquifer Recharge and Banking Projects may include, but are not limited to:

1. Expansion of City of Porterville Basins for Recharge of surface water
2. Expansion of Irrigation District Recharge Basins
3. Development of Landowner and District Recharge Basins

7.3.3.2 Lead Entity

The Lead Entity will vary depending on the Public Agency or landowner undertaking the Project.

7.3.3.3 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

These types of Projects will generally affect the groundwater elevation, groundwater change in storage, and land subsidence measurable objectives.

7.3.3.4 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(A) *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Each Public Agency or landowner considering a project for managed aquifer recharge and banking will review the benefits of the project compared to the cost of the project. The Public Agency will evaluate whether optimizing water supplies is the most beneficial use of Public Agency funds to achieve the goals and objectives of this Plan, or if other projects or actions might be more cost effective to achieve similar results.

7.3.3.5 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *…The Plan shall include the following:*

(B) *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

For those projects that are Public Agency projects, standard CEQA public process will be implemented. All meetings of the Public Agency will follow the requirements of the Ralph M. Brown Act. For those projects' which are landowner driven, public noticing will not be required.

7.3.3.6 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Projects completed under this category will have varying effects on the Water Budget, but generally, each project will increase the available quantity of ground water available for consumption. Each year, the Agency will measure groundwater levels and calculate the change in groundwater storage, per the Monitoring Plan (**Section 5**) for which the quantification of groundwater storage can be estimated.

7.3.3.7 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

The permitting and regulatory process will vary depending on the location and description of the Project. In general, the permitting and regulatory process may include the following:

- A Mitigated Negative Declaration and other materials and activities as required by the California Environmental Quality Act (hereafter, "CEQA"), for the construction of facilities and other activities;
- A Mitigated Finding of No Significant Impact and other materials and activities as required by the National Environmental Policy Act (hereafter, "NEPA"), for the use of federal grant funds provided by BOR and construction of the facilities and other activities;
- A Construction General Permit issued by State Water Resources Control Board and required Stormwater Pollution Prevention Plan (hereafter, "SWPPP") for soil disturbances related to construction of the facilities; and
- A Dust Control Plan (hereafter, "DCP") as required by the San Joaquin Valley Air Pollution Control District for mitigation of dust-related disturbances related to construction of the facilities.
- A US Army Corps of Engineers and/or California Department of Fish & Wildlife permit if effecting jurisdictional waterways.
- Local Tulare County Building Permit

7.3.3.8 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The timeline to complete Projects in this category varies depending on the complexity of each project. The projects may vary from a few weeks to several years.

7.3.3.9 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The ability to recharge and bank historically available but otherwise undelivered surface water supplies will increase groundwater storage and provide reliability of water within the ETGSA.

Benefits to relevant sustainability indicators and their associated measurable objectives will be evaluated per the monitoring programs and procedures described in the Tule Subbasin Monitoring Plan (see **Attachment 2** of **Appendix A, Tule Subbasin Coordination Agreement**). Isolating the effects of these specific Projects to relevant sustainability indicators will be difficult due to the other Actions contemplated to be implemented concurrently within ETGSA and the remainder of the Tule Subbasin.

7.3.3.10 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(6) *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Projects will be accomplished by receiving adequate funding, completing the permitting, and construction of the physical infrastructure associated.

The purpose of these Projects is to utilize existing water supplies that are historically reliable and utilize these supplies more efficiently.

7.3.3.11 Legal Authority *[Reg. § 354.44(b)(7)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The legal authority for these projects varies depending on the Public Agency involved. Generally, the Water Code or Municipal Code for the formation of these Public Agencies allows them the authority to do the Projects described in this category.

7.3.3.12 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The costs associated with these projects will vary by project may include:

- Environmental & Planning Permitting
- Construction Documents & Building Permits
- Construction

Funding for these projects will vary by project also, and may include:

- State or Federal Grant Programs
- Member Agency Assessments
- Private Landowner Contributions

7.3.3.13 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This Action is intended to maximize the recharge of available surface during wet years and banking this water for use during the drought years. As surface water is stored in the groundwater, reliability of water during droughts to prevent the exceedances of minimum thresholds is greatly increased.

7.3.4 Agricultural Land Retirement *[Reg. § 354.44(b)(1)]*

3 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(1) *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

7.3.4.1 General Summary

Agricultural Land Retirement Projects are those Projects that a Lead Entity (Public Agency of Landowner) may implement to decrease the agriculture consumptive use of water.

Examples of Agriculture Land Retirement Projects within the ETGSA may include, but are not limited to:

1. Member Agency purchase of land to permanently retire, which would include removal of agriculture farming infrastructure from the land area retired.
2. Individual landowner setting aside a portion of their farm, permanently to reduce crop consumptive demand.
3. Individual Landowner setting aside a portion of their farm, on an annual basis, depending on the availability of water each year.

Note that the land which is retired could also be utilized for groundwater recharge if a water supply is available at the physical site location.

7.3.4.2 Lead Entity

The Lead Entity will vary depending on the Public Agency or landowner undertaking the Project.

7.3.4.3 Relevant Measurable Objective(s) *[Reg. § 354.44(b)(1)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent.*

These types of Projects will generally affect the groundwater elevation, groundwater change in storage, and land subsidence measurable objectives.

7.3.4.4 Circumstantial Considerations *[Reg. § 354.44(b)(1)(A)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(A)** *A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.*

Each Public Agency or landowner considering a project for agriculture land retirement will review the benefits of the project compared to the cost of the project. The Public Agency will evaluate whether retiring land is the most beneficial use of Public Agency funds to achieve the goals and objectives of this Plan, or if other projects or actions might be more cost effective to achieve similar results.

7.3.4.5 Public Notice Process *[Reg. § 354.44(b)(1)(B)]*

> **23 Cal. Code Regs § 354.44 Projects and Management Actions. (b)** *Each Plan shall include a description of the projects and management actions that include the following:*
>
> **(1)** *…The Plan shall include the following:*
>
> **(B)** *The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken***.**

For those projects that are Public Agency projects, standard CEQA public process will be implemented. All meetings of the Public Agency will follow the requirements of the Ralph M. Brown Act. For those projects' which are landowner driven, public noticing will not be required.

7.3.4.6 Quantification of Water Budget Impact *[Reg. § 354.44(b)(2)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(2) *If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.*

Projects completed under this category will have varying effects on the Water Budget, but generally, each project will decrease water consumed and prevent excess pumping of groundwater. Each year, the Agency will measure groundwater levels and calculate the change in groundwater storage, per the Monitoring Plan (**Section 5**) for which the quantification can be estimated.

Each acre of land that is retired will reduce the consumptive demands in the ETGSA between 2.5 acre-feet per acre to 4 acre-feet per acre (see Section 4), which is the average range of consumptive use for agriculture lands within the ETGSA.

7.3.4.7 Permitting and Regulatory Process *[Reg. § 354.44(b)(3)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(3) *A summary of the permitting and regulatory process required for each project and management action.*

The permitting and regulatory process will vary depending on the location and description of the Project. In general, the permitting and regulatory process may include the following:

- A Mitigated Negative Declaration and other materials and activities as required by the California Environmental Quality Act (hereafter, "CEQA"), for the construction of facilities and other activities;
- A Mitigated Finding of No Significant Impact and other materials and activities as required by the National Environmental Policy Act (hereafter, "NEPA"), for the use of federal grant funds provided by BOR and construction of the facilities and other activities;
- A Construction General Permit issued by State Water Resources Control Board and required Stormwater Pollution Prevention Plan (hereafter, "SWPPP") for soil disturbances related to construction of the facilities; and
- A Dust Control Plan (hereafter, "DCP") as required by the San Joaquin Valley Air Pollution Control District for mitigation of dust-related disturbances related to construction of the facilities.
- A US Army Corps of Engineers and/or California Department of Fish & Wildlife permit if effecting jurisdictional waterways.
- Local Tulare County Grading Permit

7.3.4.8 Timeline *[Reg. § 354.44(b)(4)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(4) *The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.*

The timeline to complete Projects in this category varies depending on the complexity of each project. The projects may vary from a few weeks to several years.

7.3.4.9 Anticipated Benefits and Evaluation *[Reg. § 354.44(b)(5)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(5) *An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.*

The ability to retire agriculture lands within the ETGSA will be beneficial to offset the current overdraft and subsidence that is occurring. The primary benefit is to offset groundwater pumping by reducing the consumptive demands. Ancillary benefits include mitigating the decline of local groundwater levels and mitigating the occurrence of other conditions associated with declining groundwater levels, such as subsidence and the migration of contaminant plumes.

Benefits to relevant sustainability indicators and their associated measurable objectives will be evaluated per the monitoring programs and procedures described in the Tule Subbasin Monitoring Plan (see **Attachment 2** of **Appendix A, Tule Subbasin Coordination Agreement**). Isolating the effects of these specific Projects to relevant sustainability indicators will be difficult due to the other Actions contemplated to be implemented concurrently within ETGSA and the remainder of the Tule Subbasin.

7.3.4.10 Accomplishment *[Reg. § 354.44(b)(6)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(6) *An explanation of how the project or management action will be accomplished. If the project or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.*

The Projects will be accomplished by receiving adequate funding, completing the permitting, and construction of the physical infrastructure associated.

The reliability of these projects is contingent upon the availability of surface water. For new surface water developed and brought to the ETGSA members or member agencies, secure contracts and agreements will increase reliability and consistency of the surface water prior to completing the permitting and construction of the facilities.

7.3.4.11 Legal Authority

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(7) *A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.*

The legal authority for these projects varies depending on the Public Agency involved. Generally, the Water Code or Municipal Code for the formation of these Public Agencies allows them the authority to do the Projects described in this category.

7.3.4.12 Cost & Funding *[Reg. § 354.44(b)(8)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(8) *A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.*

The costs associated with these projects will vary by project may include:

- Environmental & Planning Permitting
- Construction Documents & Building Permits
- Construction & Demolition

Funding for these projects will vary by project also, and may include:

- State or Federal Grant Programs
- Member Agency Assessments
- Private Landowner Contributions

7.3.4.13 Drought Offset Measures *[Reg. § 354.44(b)(9)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (b) *Each Plan shall include a description of the projects and management actions that include the following:*

(9) *A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.*

This Action is intended to decrease the use of groundwater pumping during drought periods by reducing the agriculture demand. The agriculture land retirement may occur on an annualized basis, and only retire land during drought periods when water is scarce. But, during periods of abundant water supplies, land could be farmed to provide economic benefits to the local economy and work force.

7.4 Summary of Actions and Ability to Achieve Sustainability *[Reg. § 354.44(d)]*

23 Cal. Code Regs § 354.44 Projects and Management Actions. (d) *An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.*

ETGSA, in collaboration with its Member Agencies, stakeholders, and other local partners, can become sustainable through the implementation of the Actions identified above.

Implementation of the Actions described above is envisioned to occur pursuant the timeline provided with each Action, with the understanding that some Actions may not be implemented subject to certain triggers and/or future needs assessments.

During the preparation of the GSP, the stakeholder process included the evaluation of Project or Actions proposed. The likelihood of each Project or Action was considered using factors including, but not limited to, the Project or Action's cost, relative need, ability to complete the action pursuant the described Timeline, and source(s) of water supply. Those Projects or Actions deemed most likely during the stakeholder process are included in this Section, although this is not an exhaustive list and the ETGSA will continue to consider and evaluate any project or action that helps achieve the goals and objectives during the plan implementation period.

To ensure that sustainability can be achieved within the Tule Subbasin, the Tule Subbasin GSAs collectively modelled the coordinated implementation of their various projects and management actions. The modelling exercises included the gradual groundwater extraction ramp down.

Attachment 7-1: ETGSA Adopted Rules and Regulations

FIFTH AMENDED

RULES AND REGULATIONS

OF THE

EASTERN TULE GROUNDWATER SUSTAINABILITY AGENCY

Adopted August 6, 2020

First Amended October 1, 2020

Second Amended March 4, 2021

Third Amended May 18, 2021

Fourth Amended October 7, 2021

Fifth Amended January 6, 2022

Rogelio Caudillo, Secretary
Eastern Tule GSA

Article I. General

Section 1.01 Purpose

These rules and regulations are established by the Board of Directors of the Eastern Tule Groundwater Sustainability Agency (ETGSA) in order to provide for the sustainable management of groundwater within the ETGSA.

Section 1.02 Authority

Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10725.2 expressly states as follows:

"A groundwater sustainability agency may adopt rules, regulations, ordinances, and resolutions for the purpose of this part, in compliance with any procedural requirements applicable to the adoption of a rule, regulation, ordinance, or resolution by the groundwater sustainability agency."

Section 1.03 Groundwater Sustainability Plan

Pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10725, a groundwater sustainability agency may exercise the powers described in Chapter 5 provided the groundwater sustainability agency adopts and submits a groundwater sustainability plan to the Department of Water Resources. These rules and regulations are designed to implement the provisions of the ETGSA Groundwater Sustainability Plan (GSP), and may be amended at any time if necessary to achieve consistency with the groundwater sustainability plan and steps needed to achieve sustainability.

Section 1.04 Definitions

"Coordination Agreement" means the Tule Subbasin Coordination Agreement developed and agreed to pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10727.6, and any amendments or additions thereto.

"De minimis" means a person who extracts, for domestic purposes, two acre-feet or less per year, as defined in SGMA.

"ETGSA" means Eastern Tule Groundwater Sustainability Agency.

"ETGSA GSP" means the ETGSA Groundwater Sustainability Plan developed and submitted to the Department of Water Resources pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10727, *et al.*

"ETGSA Technical Group" means the ETGSA's Consulting Engineer, the Tule Subbasin's designated Hydrogeologist, and the ETGSA's designated Agronomist.

"Operator" means an authorized representative of an owner.

"Overdraft" means the prior five year (2015-2019) average amount of water consumed prior to SGMA implementation beyond the Sustainable Yield within the Greater Tule Management Area.

"Owner" means fee title owner of land within the ETGSA boundaries.

"SGMA" means the Sustainable Groundwater Management Act, pursuant to Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10720, *et seq*.

"Tier 1 Penalty Allocation" means groundwater consumed in excess of Sustainable Yield and less than Tier 2.

"Tier 2" means groundwater consumed in excess of the Tier 1 Penalty Allocation.

"Water year" means the 12-month period October 1, for any given year through September 30, of the following year. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1999 is called the "1999" water year.

Section 1.05 Effective Date and Changes

These rules and regulations shall become effective upon adoption and may be added to, amended and/or repealed at any time by resolution of the Board of Directors of the ETGSA and such additions, amendments, and/or repeals shall become effective upon their adoptions or as otherwise specified by the Board of Directors.

Section 1.06 Actions Against the ETGSA

Nothing contained in these rules and regulations shall constitute a waiver by the ETGSA or estop the ETGSA from asserting any defenses or immunities from liability as provided in law, including, but not limited to, those provided in Division 3.6 of Title 1 of the Government Code.

Section 1.07 Rights of Access

The ETGSA staff and/or others authorized by the ETGSA's General Manager shall notify and request consent from the owner of any land prior to their entry. Any such entry must be for the sole and exclusive purpose of conducting ETGSA business.

Section 1.08 Severability of Provisions

If any provision of these rules and regulations, or the application thereof to any person or circumstance, is held invalid, the remainder of these rules and regulations, and the application of its provisions to other persons or circumstances, shall not be affected thereby.

Article II. Groundwater Monitoring

Section 2.01 Well Registration

(a) **Registration Requirement**

Any new groundwater extraction facilities permitted after January 31, 2020, excluding de minimis extractions, shall be registered with the ETGSA within 30 days of the completion of drilling activities. In addition, any owner selecting to use meters to report groundwater use, shall register with the ETGSA. The owner of an extraction facility shall register the extraction facility and provide, in full, the information required to complete the form provided by the ETGSA that includes the following:

i. Name and address of the operator(s).
ii. Name and address of the owner(s) of the land upon which the extraction facility is located.
iii. Well Driller Log and Completion Report. If not available, a description of the equipment associated with the extraction facility, including pump size (horsepower), estimated depth of the well casing and size of the well casing.
iv. Location, parcel number and state well number of the water extraction facility.

(b) **Registration Fee**

An administrative fee shall be paid to the ETGSA, in an amount determined by the ETGSA board of directors, for each groundwater extraction facility registered with the ETGSA to cover the nominal administrative costs of the registration process.

(c) **Change in Owner or Operator**

The name of the owner of each extraction facility, the Tulare County Assessor's Parcel Number (APN) on which the facility is located, along with the names of all operators for each registered extraction facility shall be reported to the ETGSA within 60 days upon any change of ownership or operators, together with such other information required by the General Manager.

Section 2.02 Consumed Groundwater Use Measurement

This Section outlines two methodologies for measuring or estimating groundwater extraction by each owner: (1) information provided from flowmeters which have been connected to the relevant well or extraction facility continuously for the preceding period or (2) evapotranspiration information obtained via satellite technology. Subject to Section 3.05 below, and except as otherwise provided in this Section, each owner shall have the option to select the methodology used for measuring or estimating the owner's groundwater extraction unless the owner is diverting groundwater and surface water which in such event, owner may only utilize the methodology outlined for evapotranspiration.

If the owner does not (1) communicate an election to use flowmeters to the ETGSA by October 1 of each water year; and (2) provide all relevant information needed for the ETGSA to verify measurements from each flowmeter 30 days from the end of the prior month, then the ETGSA will default to utilize the evapotranspiration data to determine groundwater consumption for that period. If the owner desires to change his or her election after October 1, he or she may do so by presenting such request to the General Manager who then shall present for approval to the Board of Directors. And owner may only opt to change his or her election once annually.

(a) **Criteria for Using Meters**

If the owner selects using a meter on a well to report groundwater use, the following criteria and information shall be provided to the ETGSA:

i. Manufacturer and Model of flowmeter;
ii. Date Flow Meter Installed;
iii. Diameter of Pipe and Size of Flow Meter;
iv. Identification of who installed flowmeter and calibrated flowmeter per manufacturer specifications;
v. Inspection records will be required to submit to ETGSA per schedule outlined in the manufacturer specifications.
vi. Pictures to identify flowmeter installed correctly (e.g. adequate straight pipe sections before and after the flowmeter);

vii. Type of crop, age of crop (if perennial), single/double/triple crop (if annual), irrigation methodology (e.g. flood, drip, sprinkler) for the irrigated acres serviced by the water from the flow meter; and

viii. If multiple flowmeters on a farm, a map identifying the locations of the various flowmeters and lands serviced collectively by these flowmeters.

Additionally, the owner of the flowmeter will allow access to staff from the ETGSA to physically inspect the flowmeter, if needed.

For each month following an election under this subsection, the owner shall report to the ETGSA, no later than 30 days following the last day of the month, the quantity of groundwater extracted at each parcel for which the election is made, as measured by the flowmeter(s). Failure to timely report the quantity of groundwater extraction to the ETGSA, in accordance with this section, for any parcel to which the election applies for any month shall be deemed a withdrawal of the election as to those parcels for those months, in which case groundwater extraction shall be measured for those parcels for those months in accordance with the evapotranspiration method described in subsection (b) below.

(b) **Criteria for Using Evapotranspiration Method**

Groundwater extraction shall be measured according to the evapotranspiration method described in this subsection for any parcels to which a valid election under subsection (a) above has not been made, or for which that election is deemed withdrawn in accordance with subsection (a).

Crop evapotranspiration (ET) is estimated using remote sensing data from LandSAT satellites. The satellite data is entered into a model, which is used to estimate the ET rate and ET spatial distribution of an area in any given time period. When appropriately calibrated to land-based ET and/or climate stations and validated with crop surveys, the satellite-based model provides an estimate of crop ET (i.e. consumptive use).

Article III. Groundwater Accounting/Data Management System

Section 3.01 Authority

Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10726.4, expressly authorizes a groundwater sustainability agency to establish accounting rules to allow unused groundwater extraction allocations to be carried over and transferred.

Section 3.02 Online Water Accounting Database

The ETGSA shall establish an online database for owners to account for total water use within the ETGSA. Owners may allow operators access and control of their account(s).

Section 3.03 Categories of Water

The online database described in Section 3.02 shall account for water through the following six categories:

a) Direct Diversions of Surface Water. As described in Section 3.06, an owner's account may be credited or debited with surface water.

b) Sustainable Yield Allocations. As described in Section 4.03(a) below, Sustainable Yield shall consist of (1) Native Sustainable Yield, and (2) Total Precipitation, and may be credited to an owner's account. Transfers of Sustainable Yield, as described in Section 4.03(c)(i)(2) below may be debited from an owner's account.

    i. Non-Irrigated Parcels. Parcels which have not received a Tier 1 Penalty Allocation, but have received a Sustainable Yield Allocation pursuant to Section 4.03(a) of these Rules and Regulations, shall be allowed to separately account for the Native Sustainable Yield and Precipitation components of the Sustainable Yield Allocation. Accordingly, for such landowners, for example, a deficit amount in the Precipitation category shall not affect the owner's Native Sustainable Yield allocation with respect to the parcel in question.

c) Groundwater Credits. As described in Section 4.03(c)(i)(1) below, an owner's account may be credited or debited with groundwater credits.

d) Surface Water Recharge Credits and Debits. As described in 3.07, an owner's account may be credited or debited with groundwater recharge or banking activities. Transfers will be recognized by the GSA when authorized by the applicable surface water entity.

e) Transitional Tier 1 Penalty. As described in Section 4.03(c)(ii), the account of owners engaged in irrigation of lands actively used for agricultural production may be allocated an amount for groundwater used above sustainable limits. Carryovers of Tier 1 Penalty Allocations shall be credited to owner accounts in accordance with Section 4.03(c)(ii)(1), and transfers of Tier 1 Penalty Allocations shall be debited from owner accounts in accordance with Section 4.03(c)(ii)(2).

i. Fallowed Irrigated Agricultural Land. Parcels which have received a Tier 1 Penalty Allocation pursuant to Section 4.03(b) shall be allocated, and the owner permitted to transfer, the entire Sustainable Yield Allocation (including both Native Sustainable Yield and Precipitation) associated with the parcel(s) in question with no deduction for ET, provided that each such parcel has been completely fallowed and is no longer characterized as irrigated acreage. All fallowed parcels shall be maintained to prevent the growth of any vegetation. Parcels which have been fallowed during a portion of any water year shall receive a pro rata allocation of the annual allocation (for example, a parcel which begins fallowing at the beginning of June would receive 4/12, or 1/3, of the annual allocation.) An owner shall only be entitled transfer the entire Sustainable Yield allocation with no deduction for ET pursuant to this Section if the parcel in question remains completely fallowed for at least six months.

f) Transitional Tier 2 Penalty. As provided in Section 4.03(c)(iii), no carryovers or transfers of Tier 2 extractions shall be allowed. As further set forth in Article V below, an owner who consumes water in excess of all remaining credits shall be liable for Tier 2 penalty rates, reduction in future Tier 1 Penalty Allocations, and shall be subject to other remedies as may be available to the ETGSA in law or equity.

Section 3.04 Priority of Use

Each owner with multiple categories of credits under these rules and regulations shall have the power to elect which of such credits are to be prioritized to be debited or transferred in connection with such consumption, except for Transitional Tier 2 Penalty which can only be used if all other available sources of water are exhausted. Owners may elect to modify the default priorities, which shall be completed no later than thirty (30) days prior to the end of each quarter. If the owner or operator does not elect the priority of allocations to be debited, the default priority will follow in order of Section 3.03 (a)-(e).

Section 3.05 Net Groundwater Consumptive Use Reporting and Debiting

(a) **Amount of New Groundwater Consumptive Use**

The amount of net groundwater consumptive use will be calculated monthly, within 30 days of the end of the prior month, using one of the measurement methods described in Section 2.02.

If the owner is using flowmeters, calculations will be prepared by the ETGSA's Consulting Engineer to determine the net groundwater consumed using the following formulas:

1. Net Consumed Groundwater Used = Gross Groundwater Pumped (Flowmeter) – Estimated Return Flow (varies based on irrigation method) + Total Precipitation,

or

2. Net Consumed Groundwater Used = Calculated ET using the crop coefficients and actual weather data,

Whichever calculated value is greater from the formulas above is the consumed value applied to the owner.

If the owner is using crop ET, the net consumed groundwater used will be provided by the ETGSA's consultant.

After the calculation is completed each month as described in this section, the net groundwater consumed will be debited from the owner groundwater account.

In the event that a watercourse, including but not limited to canals, ditches, or riparian areas, is located within the boundaries of a parcel, the area of such watercourse shall not be evaluated for any consumed use of groundwater.

(b) **Appeal Process**

Within thirty (30) days of notification of the net consumed groundwater use, any owner may protest the amount or the method. The written protest must be submitted to the General Manager at the ETGSA's Main Office.

The General Manager shall investigate matters related to the protest, may consult with the ETGSA Technical Group, and may present any relevant information, along with any recommendation, to the Board within sixty (60) days of receipt of the protest. The Board shall act on the written protest and supporting documentation within sixty (60) days of receipt of all relevant information, including the possibility of authorizing a separate methodology not identified in these Rules and Regulations.

Section 3.06 Surface Water Reporting

Any owner within the ETGSA which utilizes surface water shall cause to be reported from the applicable surface water entity, the diversion of surface water to direct irrigation.

Section 3.07 Groundwater Recharge and Banking Reporting

An owner within the ETGSA which is performing recharge or groundwater banking activities shall report, or cause to be reported, the diversion of surface water to underground storage to the ETGSA. Prior to crediting or debiting the owner's account, the ETGSA shall ensure the request is consistent with any applicable groundwater banking or recharge policy, including but not limited to, Article VI. The ETGSA acknowledges that several special districts, organized and existing under the laws of the State of California for the purpose of facilitating the beneficial use of the waters of the State, operate within ETGSA's boundaries. Several such districts have adopted and implemented groundwater banking and recharge policies in order to facilitate the underground storage and beneficial use of surface water. ETGSA shall honor the groundwater banking and recharge policies of all such entities within its jurisdictional boundaries.

Article IV. Allocation of Water

Section 4.01 Purpose

Consistent with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10726, the purpose of this Article is to provide for the sustainable management of groundwater within the ETGSA jurisdictional area and Tule Subbasin, and to fulfill the legislative goals and policies of SGMA. Nothing in this Article shall be used to determine or alter water rights.

Section 4.02 Determination of Allocations

Each year by October 1, the General Manager shall determine the allocations available for use within the ETGSA's various Management Areas based on data and calculations provided by the ETGSA Technical Group. In providing such data and calculations to the General Manager, the ETGSA Technical Group shall use the methodologies and calculations defined in this Article 4.

Section 4.03 Greater Tule Management Area

(a) **Sustainable Yield Allocation**

Each year, the General Manager shall establish a use allocation for each agricultural assessor's parcel within the Greater Tule Management Area boundary, as defined in the ETGSA GSP. The allocation for each owner shall be calculated as follows:

1. Sustainable Yield for the Tule Subbasin shall first be calculated using methodologies as agreed upon in the Tule Subbasin Coordination Agreement, incorporated herein by

reference. As described therein, the Tule Subbasin Sustainable Yield estimate will be developed using a calibrated groundwater flow model of the Tule Subbasin.*

Sustainable Yield allocated to the ETGSA shall be comprised of the following two components:

(A) Native Sustainable Yield is calculated as the long-term average natural channel loss water within the Tule River, Porter Slough, Deer Creek, and White River channels and the calculated underflow from the Sierra Nevada Mountains. The volume is determined by utilizing the data provided in the Tule Subbasin Water Budget within the Tule Subbasin Setting attached to the Coordination Agreement. As described in the Coordination Agreement, the ETGSA will determine its portion of the Tule Subbasin Native Sustainable Yield by multiplying the GSA's proportionate acreage of the Tule Subbasin multiplied by the total Native Sustainable Yield of the Tule Subbasin.

(B) Total Precipitation is calculated as the long-term average total precipitation for the entire ETGSA jurisdictional area. The long-term average is based on precipitation data collected from calibrated weather stations within and adjacent to the ETGSA, interpolated to lands within ETGSA. Each year the Total Precipitation long term average is updated with prior year actual total precipitation measured.

2. The ETGSA's total available Sustainable Yield shall be the sum of the ETGSA's portion of the Tule Subbasin Native Sustainable Yield and total precipitation within the ETGSA.

3. The ETGSA's total available Sustainable Yield will deduct the sustainable yield allocation provided by ETGSA to the municipal and the Kern Tulare Management Area as described in Sections 4.04 and 4.06. The remaining balance will be divided by the total acreage within the GSA to establish a per acre allocation for each parcel, comprised of (A) a Native Sustainable Yield Component, and (B) a Total Precipitation Component.

4. Each parcel within the Greater Tule Management Area will receive allocations in the amount equal to the gross assessor parcel acreage multiplied by the per acre allocation established in Section 4.03(a)(3).

**As additional data becomes available and as projects, monitoring, and management actions are implemented, the groundwater flow model used to estimate the Sustainable Yield of the Tule Subbasin will be updated and the Native Sustainable Yield may be adjusted to reflect the new data. Additionally, the allocation of the total available Sustainable Yield according to gross assessor parcel acreage may be revised as the ETGSA develops additional historical use data and allocation methodologies beyond gross acreage.*

(b) **Transitional Tier 1 Penalty Allocation**

In addition to the Sustainable Yield Allocation, irrigated parcels as of January 31, 2020, which are identified as enrolled in the Irrigated Lands Regulatory Program, other regulatory programs that document historical irrigation use (i.e. Dairy General Order), or as identified by other certified crop map datasets shall be allocated a Transitional Tier 1 Penalty Allocation ("Tier 1 Penalty Allocation"). Once a parcel has been identified as an irrigated parcel, the parcel will remain in the transitional pumping program until the program expires. If a parcel is not identified as an irrigated parcel as of January 31, 2020, an owner may file a request to the ETGSA General Manager to be included in the transitional program. For agricultural development of parcels after January 31, 2020, the owner may also file a request to the ETGSA General Manager to allow such lands to receive a Tier 1 Penalty Allocation, which such allocation shall be prorated based on the date of development. ETGSA shall develop forms as needed to assist owners with the request.

Changes in the total irrigated acres will affect the Tier 1 Penalty Allocation. To achieve consistency with the ETGSA GSP, the amount of Tier 1 Penalty Allocations may vary year to year.

The allocations shall be consistent with the objectives of the ETGSA GSP, as follows:

1. Tier 1 Penalty Allocations for 2020-2024. For the years 2020 through 2024, the total Tier 1 Penalty Allocation will equal 90% of overdraft. To determine allocations to individual water users, the total Tier 1 Penalty Allocation will be divided by the current total number of acres qualified for transitional pumping within the Greater Tule Management Area.

    a. The initial Tier 1 Penalty Allocation in water year 2021 will be allocations for water years 2021, 2022, and 2023.

    b. Beginning in water year 2022, the remaining Tier 1 Penalty Allocations shall be made on an annual basis.

2. Tier 1 Penalty Allocation for 2025-2029. For the years 2025 through 2029, the total Tier 1 Penalty Allocation shall equal 80% of overdraft. All Tier 1 Penalty Allocations to individual water users during this time period shall be made on an annual basis. To determine allocations to individual water users, the total Tier 1 Penalty Allocation will be divided by the current total number of acres qualified for transitional pumping within the Greater Tule Management Area.

3. Tier 1 Penalty Allocations for 2030-2034. For the years 2030 through 2034, the total Tier 1 Penalty Allocation will equal 30% of overdraft. All Tier 1 Penalty Allocations to individual water users during this time period shall be made on an annual basis. To determine allocations to individual water users, the total Tier 1 Penalty Allocation will be divided by the current total number of acres qualified for transitional pumping within the Greater Tule Management Area.

(c) **Carryover and Transfers**

(i) Sustainable Yield Allocation

1) Carryover of Sustainable Yield

If an owner uses less than his or her total Sustainable Yield allocation in a given year, the difference between the allocation amount for that year and the amount of groundwater used and/or transferred for that year shall be carried over to the next year. Portions of Sustainable Yield allocation successfully carried over from the previous year shall be credited to the owner's account as groundwater credits.

If the carryover amount for the year in question continues to remain unused as a groundwater credit, it may be carried over on a five-year rolling basis. The impact of the total quantity of water used in any five-year period shall be consistent with the provisions of the ETGSA GSP.

Example:
Sustainable Yield (SY) Allocation

Water Year 2021
Unused portion of 2021 SY allocation → groundwater credit → may be carried over until the end of Water Year 2026.

Water Year 2022
Unused portion of 2022 SY allocation → groundwater credit → may be carried over until the end of Water Year 2027.

2) Transfer of Sustainable Yield

An owner may transfer all or a portion of the Native Sustainable Yield component of his or her Sustainable Yield allocation at any time, provided that the transfer satisfies conditions 1 through

4. Transferred Native Sustainable Yield shall be credited to the transferee's account as groundwater credits.

An owner may transfer all or a portion of the Total Precipitation component of his or her Sustainable Yield allocation only insofar as any portion of the Total Precipitation component has been carried over from a previous year and thereby converted to groundwater credits pursuant to Section 4.03(c)(i)(1) above. Any such transfer of groundwater credits must satisfy the conditions below. Total Precipitation shall be credited to the transferee's account as groundwater credits.

1. The proposed transferee will put the allocation to use within the Tule Subbasin;
2. If outside the ETGSA boundaries, the proposed transferee will put the allocation to use within the boundaries of a groundwater sustainability agency which permits the transfer of its own groundwater allocations to water users within the ETGSA;
3. The transfer agreement is memorialized in writing, using a form provided by the ETGSA; and
4. Both the ETGSA and the groundwater sustainability agency of the transferee are informed of the parties to the transfer and the quantity transferred.

The ETGSA Technical Advisory Group shall establish an annual limitation on the total amount of allowable allocations outside the ETGSA boundaries based on water year. Requests for transfers shall be received beginning on October 1. Transfers shall be accepted on a first come, first serve basis.

No action shall occur on any proposed transfer unless all past due assessments, interest and penalties owed to the ETGSA by either transferee or transferor have been paid prior to the date that the proposed transfer is submitted to the General Manager.

(ii) Tier 1 Penalty Allocation

1) Carryover of Tier 1 Penalty Allocation

If an owner uses less than his or her total Tier 1 Penalty Allocation, the difference between the allocation amount for the relevant period and the amount of the Tier 1 Penalty Allocation used and/or transferred during that period year shall be carried over to the next year. Carryover of Tier 1 Penalty Allocations shall accumulate on a rolling five-year basis. No Tier 1 Penalty Allocation may carry over for longer than five years from the date of the allocation.

2) Transfer of Tier 1 Penalty Allocation

An owner may transfer all or a portion of his or her Tier 1 Penalty Allocation to another owner if all of the following conditions apply:

1. The proposed transferee will put the allocation to use within the ETGSA;
2. The transfer agreement is memorialized in writing, using a form provided by the ETGSA identifying the quantity and signed by both parties.

No action shall occur on any proposed transfer unless all past due assessments, interest and penalties owed to the ETGSA by either transferee or transferor have been paid prior to the date that the proposed transfer is submitted to the General Manager.

(iii) Tier 2

1) No Carryover and Transfers

No carryover or transfer of Tier 2 extractions is allowed. In addition to penalties associated with Tier 2 extractions as defined in Article V, the quantity of Tier 2 water consumed shall be deducted from the owner's Tier 1 Penalty Allocation account the following year(s). If the owner's Tier 1 Penalty Allocation account is depleted, further enforcement actions may be taken by the ETGSA.

(d) **Community Lands**

Lands designated as Community served lands by the City of Porterville, Ducor CSD, or Terra Bella Irrigation District, and the ETGSA within the Greater Tule Management Area shall be managed pursuant to the Community Management Areas pursuant to Section 4.06.

(e) **Opt-Out**

An owner who has not received a Transitional Tier 1 Penalty Allocation, but who has received a Sustainable Yield Allocation pursuant to Section 4.03(a) of these Rules and Regulations may elect to opt out of the ETGSA Rules and Regulations for the subsequent water year by submitting a request to the ETGSA no later than September 1. Should the owner wish to participate in the future, at that time, all current assessments, fees, interest, and penalties will be paid prior to participation. An owner is not allocated any water during the period in which he or she has chosen to opt out and will not be allocated any prior years allocation upon choosing to opt in.

(f) **Watercourse(s)**

In the event that a watercourse, including but not limited to canals, ditches, or riparian areas, is located within the boundaries of a parcel, the area of such watercourse shall not receive any allocation of groundwater.

Section 4.04 Kern Tulare Water District Management Area

[*To be determined*]

Section 4.05 Land Subsidence Management Area

[*To be determined*]

Section 4.06 Community Management Areas

(a) **City of Porterville Management Area**

(i) Irrigated parcels

Irrigated parcels, as defined in Section 4.03(b), which are designated by the City of Porterville and ETGSA shall be managed pursuant to the Greater Tule Management Area under Section 4.03.

(ii) To be determined

Rules and regulations for the remaining parcels within the City of Porterville Management Area shall be further developed at a later date.

(b) **Ducor Community Service District Management Area**

(i) Irrigated parcels

Irrigated parcels, as defined in Section 4.03(b), which are designated by the Ducor Community Service District and ETGSA shall be managed pursuant to the Greater Tule Management Area under Section 4.03.

(ii) To be determined

Rules and regulations for the remaining parcels within the Ducor Community Service District Management Area shall be further developed at a later date.

(c) **Terra Bella Community Management Area**

(i) Irrigated parcels

Irrigated parcels, as defined in Section 4.03(b), which are designated by the Terra Bella Community Management Area and ETGSA shall be managed pursuant to the Greater Tule Management Area under Section 4.03.

(ii) To be determined

Rules and regulations for the remaining parcels within the Terra Bella Community Management Area shall be further developed at a later date.

Section 4.07 Appeal Process

(a) **Notification of Allocations and Extraction Limits**

The General Manager shall provide written notice to each owner and if requested, the operator, of the groundwater allocations described in this Article 4.

(b) **Protest of Allocations and Extraction Limits**

Within thirty (30) days of the date identified in the written notification described in Section 4.07(a), an owner may protest the extraction allocations and extraction limits identified in the notification. The written protest must be submitted to the General Manager at the ETGSA's Main Office.

The General Manager shall investigate matters related to the protest, may consult with the ETGSA Technical group, and may present any relevant information, along with any recommendation, to the Board within sixty (60) days of receipt of the protest. The Board shall act on the written appeal and supporting documentation within 120 days of receipt of all relevant information.

Section 4.08 Emergency Ordinances

Nothing in this Article shall prevent the ETGSA, in the event of an emergency, from enacting emergency regulations or ordinances to prevent harm to landowners within the ETGSA.

Article V. Fees & Penalties

Section 5.01 Penalties

(a) Penalty for Excess Use

If any owner within the Greater Tule Management Area exceeds his or her Sustainable Yield allocation, he or she shall be liable for penalties as follows: (1) liability rate in an amount to be determined annually by the Board, for each Tier 1 Penalty Allocation acre-foot consumed; and (2) additional liability rate, in an amount to be determined annually by the Board, for each Tier 2 acre-foot consumed.

(b) SGMA Penalties

Any owner, operator or other person who violates the provisions of these rules and regulations is subject to the criminal and civil sanctions set forth in SGMA.

(c) Civil Remedies

Upon the failure of any person to comply with any provision of this rules and regulations, the ETGSA may petition the Superior Court for a temporary restraining order, preliminary or permanent injunction, or such other equitable relief as may be appropriate. The right to petition for injunctive relief is an additional right to those, which may be provided elsewhere in these rules and regulations or otherwise allowed by law. The ETGSA may petition the Superior Court to recover any sums due to the ETGSA.

Section 5.02 Groundwater Extraction Fees

The Board may propose fees, including groundwater extraction fees, consistent with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section Sections 10730 through 10730.6, and the California Constitution. The owner shall pay to the ETGSA all Groundwater Extraction Fees within 30 days of the date of any invoice submitted by the ETGSA.

De Minimis Extractors. No extraction fees shall be charged to any de minimis extractor.

Section 5.03 Real Property Assessments

The Board may propose land-based assessments consistent with Division 6 Conservation, Development and Utilization of State Water Resources Part 2.74, Chapter 5, Section 10730, and

the California Constitution. The owner shall pay to the ETGSA all assessments within 30 days of the date of any invoice submitted by the ETGSA.

Section 5.04 Notification and Appeal of Penalties

(a) **Notification of Tier 1 and Tier 2 Penalties**

Each year, the General Manager shall provide written notification to each owner if requested by owner of: (1) the Tier 1 penalty rate, and (2) the Tier 2 penalty rate. The notification shall include the water accounting used to determine both Tier 1 penalties and Tier 2 penalties for excess consumption.

(b) **Payment of Penalties**

The owner shall pay to the ETGSA all Tier 1 and Tier 2 penalties within 30 days of the date of any invoice submitted by the ETGSA.

(c) **Protest of Penalty Determination**

Within 30 days of the date identified in any invoice submitted by the ETGSA an owner may appeal a penalty determination in writing. Owner must still submit payment within thirty (30) days of the invoice. The written appeal must be submitted to the General Manager, at the ETGSA's Main Office.
The General Manager shall investigate matters related to the appeal, and may present any relevant information, along with any recommendation, to the Board within sixty (60) days of receipt of the appeal. The Board shall act upon the written appeal and supporting documentation within 120 days of receipt of all relevant information.

Article VI. Surface Water Recharge in the Underground

Section 6.01 Groundwater Recharge

Owners may use existing facilities to store surface water underground within the ETGSA boundaries. An owner who stores surface water pursuant to this Section may subsequently put such water to his or her own beneficial use within the ETGSA boundaries, or may transfer the water to another owner for use within the ETGSA boundaries. The use of stored water pursuant to this Section must be achieved utilizing on-farm activities. All water stored pursuant to this Section must be used within the ETGSA boundaries. Each owner who stores surface water pursuant to this Section shall provide accurate, verifiable records of the quantity and source of surface water stored for recharge, confirmed by the district or entity that supplied the surface water.

The owner shall adhere to any rules promulgated by any district or entity supplying the surface water. Surface water stored and documented in compliance with the requirements of this Section shall be credited to the relevant owner's account as a surface water credit. Each owner shall be solely responsible for locating, purchasing, accessing, or otherwise acquiring surface water for the purposes of recharge pursuant to this Section. This policy applies only to all non-districted lands and districted lands which choose to adhere to this Article VI. This policy does not apply to districted lands or areas within the ETGSA boundaries which have adopted a separate, independent recharge policy. The ETGSA shall honor the groundwater banking and recharge policies of all such entities as described in Section 3.07.

[end of document]

Attachment 7-2: ETGSA Land Subsidence Monitoring and Management Plans

Eastern Tule Groundwater Sustainability Agency Land Subsidence Monitoring Plan

September 2021

Thomas Harder & Co.
Groundwater Consulting

Eastern Tule Groundwater Sustainability Agency Land Subsidence Monitoring Plan

September 2021

Prepared for

Eastern Tule Groundwater Sustainability Agency

Prepared by

Thomas Harder, PG, CHG
Principal Hydrogeologist

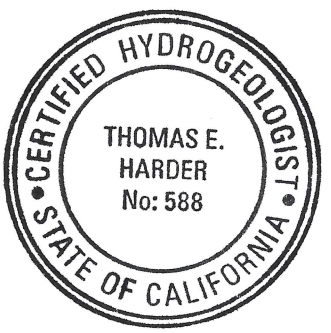

Table of Contents

Figures

Tables

Appendices

1.0 Background

The Eastern Tule Groundwater Sustainability Agency (ETGSA) is a Groundwater Sustainability Agency (GSA) formed in response to the Sustainable Groundwater Management Act of 2014 (SGMA). The ETGSA is one of seven GSAs within the Tule Subbasin in the southern San Joaquin Valley of California (see Figure 1). The area of the ETGSA covers approximately one-third of the eastern part of the Tule Subbasin.

The sustainable management of the groundwater resources within the Tule Subbasin, including the ETGSA, is being achieved in the context of multiple sustainability indicators including:

- Chronic lowering of groundwater levels indicating a depletion of supply if continued over the planning and implementation horizon;
- Reduction of groundwater storage;
- Seawater intrusion;
- Degraded water quality, including the migration of contaminant plumes that impair water supplies;
- Land subsidence that substantially interferes with surface land uses; and
- Depletions of interconnected surface water that have adverse impacts on beneficial uses.

Four of these seven sustainability indicators have been identified as having the potential to cause significant and unreasonable effects in the Tule Subbasin. They are:

- Chronic lowering of groundwater levels indicating a depletion of supply if continued over the planning and implementation horizon;
- Reduction of groundwater storage;
- Degraded water quality, including the migration of contaminant plumes that impair water supplies; and
- Land subsidence that substantially interferes with surface land uses.

The Tule Subbasin GSAs have each developed Groundwater Sustainability Plans (GSPs) that identify key monitoring features (Representative Monitoring Sites; RMS), minimum thresholds, interim milestones, and measurable objectives to monitor each of the four relevant sustainability indicators. The GSPs are coordinated through a common set of Sustainable Management Criteria, as defined in the Tule Subbasin Coordination Agreement. The minimum set of monitoring features, including RMS, to address each of the sustainability indicators, including land subsidence, are identified in the Tule Subbasin Monitoring Plan, which is Attachment 1 to the Tule Subbasin Coordination Agreement.

This Land Subsidence Management Plan (LSMP) has been developed to specifically address land subsidence within the ETGSA and is separate from, and in addition to, the land subsidence monitoring specified in the Tule Subbasin Monitoring Plan. Given the documented impacts of

land subsidence on the Friant-Kern Canal, this LSMP takes into consideration the Settlement Agreement between the Friant Water Authority (FWA), Arvin-Edison Water Storage District (AEWSD), and ETGSA, which releases certain claims against the ETGSA provided the GSA is in compliance with its GSP.[1] The ETGSA GSP identifies three feet of additional subsidence as the minimum threshold. The Pixley Irrigation District GSA has also entered into a Settlement Agreement with the FWA to coordinate with the ETGSA in the development and implementation of this LSMP.

1.1 Documented Land Subsidence in the Tule Subbasin

Land surface subsidence resulting from groundwater withdrawal has been well documented in numerous places throughout the Central Valley of California, including the Tule Subbasin (Ireland et al., 1984; Faunt, 2009; Luhdorff and Scalmanini, 2014). Land subsidence in the Tule Subbasin was documented as early as the late 1930s (Lofgren and Klausing, 1969). Prior to 1970, as much as 12 ft of land surface subsidence was documented for the area immediately south of Pixley (Ireland et al., 1984). As groundwater levels rose in the area throughout the 1970s and early 1980s, land subsidence was largely arrested. Spirit level monitoring for land subsidence that had previously been conducted along the portion of the Friant-Kern Canal that is within the ETGSA was discontinued in the 1980s.

Land survey elevation data from the Porterville Global Positioning System (GPS) station indicates land subsidence in the Tule Subbasin has been reactivated, since at least 2007 (see Figures 2 and 3). Interferometric Synthetic Aperture Radar (InSAR) data from satellites indicates that the maximum rates of land subsidence since 2007 have occurred in the northwest portion of the subbasin. However, as much as 9 feet of land subsidence has occurred beneath the Friant-Kern Canal (FKC) in the ETGSA (see Figure 4). Land subsidence in the Tule Subbasin is attributed to lowering of groundwater levels from groundwater pumping in areas where the subsurface sediments include thick sequences of fine-grained material (silt and clay) (Lofgren and Klausing, 1969).

1.2 Documented Land Subsidence in the ETGSA

Evidence of land subsidence in the ETGSA has been observed from benchmark surveys along the FKC, a GPS established near Porterville in 2007, and InSAR data. Survey benchmarks were established along the FKC in 1959 and were periodically surveyed by the Friant Water Authority (FWA) between 1959 and 2019, with a survey hiatus from the early-1980s to 2017. Cumulative land subsidence along the canal between 1959 and 2017, based on benchmark surveys, has ranged

[1] Settlement Agreement Regarding Transitional Overdraft Pumping and Anticipated Subsidence Damages/Repairs to the Friant Kern Canal. Dated January 12, 2021.

from approximately 1.7 ft at the FKC/Tule River crossing to approximately 9 feet in the vicinity of Deer Creek (see Figure 4). Approximately 2.7 ft of land subsidence was documented at the Porterville GPS station between 2007 and 2020 (see Figure 3). Between January 2020 and October 2020, the greatest amount of land subsidence has occurred in an area approximately four to five miles north and south of Deer Creek and between Highway 65 and the western ETGSA boundary (see Figure 5).

1.3 Mechanisms of Land Subsidence

Land surface subsidence from groundwater withdrawal occurs in areas where the subsurface aquifer system includes relatively thick aquitards and the groundwater level is lowered from groundwater pumping. Aquitards are low permeability layers with relatively high silt and clay content. As the aquitards are compressible, the release of pore pressure caused by the lowering of groundwater levels results in compression of the low permeability layers. Within a limited range of groundwater level fluctuation, the compressed aquitards can accept water back into their structure when groundwater levels rise resulting in elastic rebound. However, if groundwater levels are maintained at these lower levels for long enough periods of time as a result of groundwater pumping, the compression of aquitards becomes permanent. This permanent compression of subsurface layers results in land surface subsidence.

1.4 Hydrogeological Conditions in the ETGSA that Cause Land Subsidence

Large areas of the ETGSA are susceptible to land surface subsidence due to a combination of thick fine-grained layers in the subsurface and locally declining groundwater levels. The subsurface sediments in the vicinity of the FKC consist of interbedded layers of silt, clay and sand. The percentage of clay layers (which are compressible) relative to sand layers (which are not compressible) that makes up the cross-sectional subsurface area varies from place to place. As shown on Figure 6, the area of the FKC where historical land subsidence has been greatest is also an area where the percentage of subsurface fine-grained sediments (which includes clay) is relatively high (dark brown areas). As such, these areas of substantial thickness of subsurface clay are conducive to subsidence. In addition, groundwater levels in wells located along the canal have dropped as much as 60 feet between 2007 and 2018 (see Figure 7). The subsurface conditions that result in land subsidence are not unique to the ETGSA and significant land subsidence has been observed in the Tule Subbasin to the west and throughout much of the Central Valley. It is possible that some of the groundwater level decline causing land subsidence at the FKC is from pumping outside the ETGSA (see Section 1.6 of this LSMP). The combination of thick sequences of subsurface clay and dropping groundwater levels in the vicinity of the FKC has resulted in land subsidence along the canal.

The relationship between groundwater levels and aquifer system compaction that results in land subsidence is further illustrated by extensometer data from the United States Geological Survey

(USGS) station 22S/27E-30D02 located on the FKC approximately one mile north of Deer Creek, where the greatest amount of land subsidence along the canal has occurred. This extensometer consists of a 2-inch diameter steel pipe anchored at the bottom of a 12-inch diameter well with a total depth of 1,180 feet. The well is perforated from 1,083 to 1,180 feet below ground surface (ft bgs) to allow for the measurement of groundwater levels, which are indicative of the Lower Aquifer. The top of the 2-inch diameter extensometer pipe is connected to instrumentation at the land surface that measures changes in land surface elevation relative to the elevation of the top of the pipe, which does not move. The changes in land surface elevation are equated to aquifer system compaction.

Figure 8 shows cumulative aquifer compaction at the USGS extensometer between June 2018 and May 2021 as a function of groundwater level. The hydrograph (blue line) shows seasonal variations in groundwater levels between a low of approximately 25 feet above mean sea level (ft amsl) and a high of approximately 125 ft amsl (approximately 100 feet). The aquifer compaction record (orange line) is cumulative, indicating approximately 0.2 feet of aquifer compaction has occurred at this location over the period of record. As groundwater levels drop, aquifer compaction occurs as pore pressure in the aquitards is reduced and the effective stress of overburden increases. When groundwater levels rise, the aquitards can take some water back into their structure resulting in rebound (October 2018 to March 2019). When the compaction no longer fully recovers to zero, despite groundwater levels rising, the compaction is considered permanent or non-recoverable.

Preliminary review of the groundwater level data from the USGS extensometer 22S/27E-30D02 suggests that the Lower Aquifer system at this location is confined and there is a groundwater level in this aquifer that is protective of further aquifer compaction and land subsidence. The 100-ft seasonal swings in groundwater levels are typical of a confined aquifer system. Further, the magnitude of the groundwater level change will likely result in a significant increase in effective stress of the aquifer system resulting in compaction. This compaction is seen in the extensometer data when groundwater levels drop. In addition, compaction reduces to near zero when the groundwater level rises above approximately 125 ft amsl. This suggests that maintaining groundwater levels in the deep aquifer above 125 ft amsl are protective of further compaction and land subsidence.

1.5 Impacts of Land Subsidence on Surface Water Delivery Capacity in the Friant-Kern Canal

Differential land subsidence rates along the portion of the Friant-Kern Canal that extends through the ETGSA has had a significant impact on the ability of the FWA to deliver surface water downstream of the impacted areas. Where the FKC crosses the northern and southern ETGSA boundaries, land subsidence rates have been relatively low and cumulative land subsidence in those areas have been on the order of 1 to 2 feet between 1959 and 2019. Land subsidence between the Tule River and White River, however, have resulted in up to approximately 9 feet of cumulative

land subsidence at the FKC. This differential land subsidence has resulted in a low spot along the canal in the vicinity of Deer Creek that restricts flow in the canal. The original design flow capacity of the FKC was approximately 4,000 cubic feet per second (cfs). As of 2019, the flow capacity at the canal at Deer Creek had been reduced to approximately 1,900 cfs (United States Bureau of Reclamation, 2019). The FWA is currently pursuing repairs to the FKC to restore the original flow capacity. The long-term effectiveness of the repairs at maintaining flow capacity in the canal relies on limiting additional land subsidence during the SGMA transition period from 2020 to 2040 within the design of the repairs and arresting land subsidence altogether after 2040.

1.6 Previous Analyses of Land Subsidence Along the Friant-Kern Canal

Preliminary analyses of the relationship between groundwater pumping distance from the FKC on land subsidence at the canal was conducted in the Spring of 2019 and published by Thomas Harder & Co. (TH&Co) in a draft report to the Tule Subbasin Technical Advisory Group (TH&Co, 2019). The analysis also examined the potential relationship between groundwater pumping depth and land subsidence. The analysis showed that land subsidence along the canal is sensitive to both the location of groundwater pumping with respect to the canal and the depth from which the pumping is occurring. On a subbasin-wide scale, groundwater pumping closer to the canal had a greater impact on land subsidence than groundwater pumping further away. The analysis also showed that the depth from which groundwater was being extracted also contributed to land subsidence at the canal. While the TH&Co (2019) report was never finalized, key aspects of the analysis, as they relate to the ETGSA LSMP are summarized in this section.

1.6.1 Analyses Methodology

Preliminary analysis of land subsidence near the portion of the Friant-Kern Canal that is within the Tule Subbasin was conducted using a calibrated numerical groundwater flow model (Tule Subbasin GFM) developed for the Tule Subbasin Technical Advisory Committee in support of their compliance with the Sustainable Groundwater Management Act (SGMA). The model domain (i.e. active model area) is focused on the Tule Subbasin but extends approximately 4 to 6 miles outside the subbasin on each side (see Figure 8).

1.6.1.1 Model Code

The Tule Subbasin GFM was developed using MODFLOW. MODFLOW is a block centered, finite difference groundwater flow modeling code developed by the USGS for simulating groundwater flow (MacDonald and Harbaugh, 1989). MODFLOW is one of the most widely used and critically accepted model codes available (Anderson and Woessner, 2002). The version of MODFLOW utilized for this work is the USGS One Water Hydrologic Flow Model (OWHFM) (Hanson et al., 2014), which integrates both surface water and groundwater processes. The model includes a subsidence and aquifer system compaction package (Hoffman et al., 2003), which was utilized for the analysis of subsidence in this study.

1.6.1.2 Model Domain and Boundary Conditions

The Tule Subbasin GFM domain is as shown on Figure 9. This domain encompasses the Tule Subbasin alluvial groundwater system covering an area of approximately 1,500 square miles (i.e., approximately 1 million acres). The model is subdivided into uniform 1,000-foot by 1,000-foot cells. Vertically, the model is subdivided into five hydrostratigraphic layers, which represent groupings of geologic sediments with generally similar properties. The vertical layers are described as follows (from shallow to deep):

- Layer 1 is the upper unconfined aquifer and ranges in thickness from approximately 100 feet in the northeast part of the subbasin to approximately 400 feet in the northwestern part of the subbasin;
- Layer 2 is an underlying comparatively low permeability unit separating the upper and lower aquifers and generally coincides with the Corcoran Clay west of Highway 99. This layer ranges in thickness from approximately 300 feet in the western part of the subbasin to zero in the eastern part of the subbasin;
- Layer 3 is the lower alluvial aquifer, which is semi-confined in the east and confined below the Corcoran Clay in the west. This layer ranges in thickness from approximately 200 feet on the east side of the subbasin to greater than 1,600 feet on the west side;
- Layer 4 is a low permeability layer separating the lower alluvial aquifer from the underlying Santa Margarita Formation aquifer. This layer ranges in thickness from approximately 200 feet on the east side of the subbasin to more than 800 feet in the central part of the subbasin; and
- Layer 5 is the Santa Margarita Formation aquifer, which is located at depth only on the eastern side of the subbasin. This layer ranges in thickness from approximately 200 feet on the east side of the subbasin to more than 600 feet in the central part of the subbasin.

Groundwater flow into and out of the model area is controlled by boundary conditions. On the north, south and west boundaries of the Tule Subbasin GFM, historical groundwater flow is conditioned to measured groundwater levels (i.e. hydrographs) from wells located along the boundaries. On the east side of the model, groundwater flow from the bedrock of the Sierra Nevada Mountains is difficult to simulate due to the fractured nature of the granitic rock and lack of data. This issue has been addressed by assigning the area of the Sierra Nevada Mountains as "no flow" or inactive and assigning recharge from the mountains as a boundary condition along the bedrock/alluvium interface. The granitic bedrock also forms the base of the model (assumed to be impermeable) in the subsurface beneath model Layer 5. This boundary is not vertical but slopes towards the west consistent with our understanding of how the Sierra Nevada basement extends beneath the subbasin.

1.6.1.3 Model Transient Setup and Calibration

The version of the Tule Subbasin GFM (hereinafter referred to as Tule Subbasin GFM v.2019) used for the preliminary analysis was calibrated from 1986 through 2017 with monthly stress periods. Thus, historical groundwater pumping and recharge data is input into the model monthly. The model calibration was achieved for the 1986 to 2017 time period by adjusting aquifer parameters until the best possible match between measured and model-generated groundwater levels was obtained. The model calibration process included both manual and automated methods. Based on the comparison of model-generated and measured groundwater levels, it is our opinion that the historical model is adequately calibrated to measured data for the preliminary analysis of land subsidence (see Figure 10).

In addition to calibrating groundwater levels, TH&Co also calibrated model-generated land subsidence to measured land subsidence in the Tule Subbasin. Measured historical changes in land surface elevation were obtained from Global Positioning System (GPS) stations in the subbasin and satellite data (Interferometric Synthetic Aperture Radar or InSAR). GPS measures land surface elevation at any given time based on position relative to multiple satellites. TH&Co received GPS data from the Friant Water Authority (FWA) for multiple stations with records from 2005 to 2018. Historical cumulative subsidence at the GPS stations is shown on Figure 2. InSAR enables estimates of changes in land surface elevation over time based on radar images from multiple satellite passes over the same area. Changes in land surface elevation based on InSAR data were obtained from the Jet Propulsion Laboratory (JPL) for the following time periods:

- InSAR Dataset 1: 2007 - 2011
- InSAR Dataset 2: 2014 – 2015
- InSAR Dataset 3: 2015 – 2017

Results of the land subsidence calibration for selected locations near the FKC is shown on Figure 11. Based on comparison of model generated and measured rates of land surface subsidence in the Tule Subbasin, the calibration of land elevation changes over time was considered acceptable for analyzing future projections of land subsidence under varying pumping conditions in the subbasin.

1.6.2 Analysis Approach

TH&Co developed a stepwise approach to 1) assess the sensitivity of land subsidence to the distance of pumping laterally from the Friant-Kern Canal, and 2) assess the sensitivity of land subsidence to the depth of wells in the vicinity of the Friant-Kern Canal. The general process included the following:

- Refining the agricultural water budget zones within the eastern portion of the model domain (see Figure 12).

- Modifying the historical calibrated model to remove pumping in selected agricultural zones at progressively increasing distances from the Friant-Kern Canal to assess the sensitivity of pumping distance from the canal on land subsidence at the canal.
- Analyzing the sensitivity of land subsidence to pumping distance from the Friant-Kern Canal assuming a future scenario whereby the Tule Subbasin transitions to sustainable pumping within 10 years, starting in 2020.
- Modifying the historical calibrated model to remove pumping at progressively decreasing depths in the vicinity of the FKC to assess the sensitivity of well depth on land subsidence.

1.6.2.1 Sensitivity of Well Production Location Relative to the Friant-Kern Canal Using the Historical Groundwater Flow Model

As an initial step in evaluating the sensitivity of pumping distance from the Friant-Kern Canal on land subsidence at the canal, TH&Co analyzed twelve water budget zone alternatives for the historical period of the model (1986 to 2017). In this analysis, groundwater pumping in selected zones at increasingly greater distances from the canal was turned off for the historical period to assess what the land subsidence at the canal would have been if that production had not occurred. The twelve water budget zone combinations analyzed in this step are shown on Figures 13a and 13b.

1.6.2.2 Water Budget Zone Combinations Analyzed for the Model Projection Under a 10-Yr Tule Subbasin Transitional Pumping Scenario

As of the May 2019 analysis, the transitional pumping schedules for each of the GSAs within the Tule Subbasin had not been determined. In addition, the projects and management actions that would be incorporated into the version of the model later used in support of the Tule Subbasin GSPs had not been fully defined. As such, three pumping transition scenarios (5-yr ramp down, 10-yr ramp down, and 20-yr ramp down) were developed from which to evaluate potential impacts on land subsidence beneath the FKC. Land subsidence predicted by the 10-yr transitional pumping scenario most closely matched the land subsidence predicted by the later version of the model used to support the GSPs (Tule Subbasin GFM v.2020a). As such, only results of the 10-yr transitional pumping scenario are presented herein. The 10-yr transitional pumping scenario assumed that 2019 groundwater pumping rates in the regional Tule Subbasin would be reduced to sustainable levels (as determined from the sustainable yield of the subbasin) in ten years, starting in 2020. Each simulation was run 50 years into the future, to 2070. The scenario also incorporated the following assumptions:

- Surface water hydrology in the Tule River, Deer Creek, and White River are based on an average of the historical flow from 1986 to 2017 and adjusted for climate change based on California Department of Water Resources (DWR) climate change scenarios

- Water deliveries from the Friant-Kern Canal were based on projections published in FWA (2018).
- The sustainability target for consumptive use of crops was 0.37 acre-ft/acre.

It is noted that it was necessary to lower the sustainability target in a later version of the Tule Subbasin GFM (Tule Subbasin GSM v.2020a) in order to obtain a balance of recharge and discharge in the Tule Subbasin (TH&Co, 2020). In addition, the scenario did not incorporate planned projects and management actions, including the final transitional pumping schedules of the Tule Subbasin GSAs. As such, the analysis results are conceptual. However, they are useful for identifying areas where management actions are most effective for mitigating land subsidence along the FKC.

Multiple water budget zone alternatives were identified for analysis under the 10-yr transitional pumping scenario. Each alternative included a different combination of water budget zones whereby the pumping in the selected zones was turned off in 2020 and left off for the duration of the model simulation. In some zones where surface water deliveries were available, agricultural consumptive use continued even though groundwater pumping was curtailed on the assumption that the crop demand could be fulfilled through increased deliveries. The objective of the analysis was to identify the smallest total managed area most effective at limiting future land subsidence. The most effective water budget zone alternatives at mitigating land subsidence beneath the portion of the FKC in the ETGSA are shown on Figure 14.

1.6.2.3 Sensitivity Analysis of Well Depth and Land Subsidence Near the Friant-Kern Canal

To assess the sensitivity of well depth on land subsidence at the FKC, TH&Co analyzed multiple scenarios for the historical model whereby the wells in the refined water budget area shown on Figure 12 were shortened at progressively shallower depths. The groundwater pumping rate was kept the same but the contribution of water to the wells was from progressively shallower portions of the aquifer system. The purpose of the exercise was to assess what the land subsidence along the Friant-Kern would have been in history if well depths were shallower. The following nine scenarios were analyzed:

1. Maximum well depth limited to 1,200 ft bgs
2. Maximum well depth limited to 1,100 ft bgs
3. Maximum well depth limited to 1,000 ft bgs
4. Maximum well depth limited to 900 ft bgs
5. Maximum well depth limited to 800 ft bgs
6. Maximum well depth limited to 700 ft bgs
7. Maximum well depth limited to 600 ft bgs
8. Maximum well depth limited to 500 ft bgs
9. Maximum well depth limited to 400 ft bgs

1.6.3 Analysis Results

Analysis of the historical simulation whereby groundwater pumping is eliminated from progressively larger areas around the FKC (Figures 13a and 13b) shows that the larger the area of eliminated pumping, the greater the reduction in land subsidence at the canal (see Figure 15). It also showed that preferentially reducing pumping east of the FKC had a greater reduction in land subsidence than preferentially reducing pumping west of the FKC (compare scenarios H10 and H11). Finally, the analysis was not successful at eliminating land subsidence at the FKC, suggesting that groundwater pumping and groundwater level declines outside the study area were also contributing to land subsidence at the FKC.

Analysis of potential future land subsidence at the FKC under a 10-yr transitional pumping scenario showed that as much as three feet of additional land subsidence was projected between Deer Creek and White River (see Figure 16). Of the water budget area scenarios evaluated, the ones that focused on a combination of pumping elimination and continuance of irrigation from surface water deliveries (see NP1-F7 on Figures 14 and 16) were the most effective at preventing further land subsidence along the FKC south of Deer Creek. Scenarios such as H11 that extended no pumping zones north to the Tule River were effective at preventing land subsidence north of Deer Creek.

The analysis of restricting pumping depth on land subsidence at the FKC showed that, at least with the model as conceptualized and calibrated, restricting pumping depth helped reduce land subsidence at the FKC (see Figure 17). The greatest impact on land subsidence mitigation was achieved by limiting groundwater pumping to the upper 600 feet below land surface. However, limits on pumping depth will need to be further evaluated using extensometer data, as discussed in Section 1.4.

1.7 Potential Future Land Subsidence per the ETGSA Groundwater Sustainability Plan

Model analyses of potential future land subsidence using Tule Subbasin GSM v.2020a, which incorporates planned transitional pumping schedules by the ETGSA and other Tule Subbasin GSAs, has shown that continued groundwater pumping over and above the Sustainable Yield during the transition period allowed under SGMA (2020 to 2040) is projected to result in further groundwater level declines and land subsidence along the FKC during that period. The model analysis is documented in TH&Co (2020) and the simulation incorporates the following assumptions:

- Municipal pumping by the City of Porterville was increased in accordance with their 2015 Urban Water Master Plan (UWMP).
- Baseline stream flow hydrology for the Tule River, Deer Creek and White River for the future projection model was based on the 20-yr average of historical stream flows measured

or estimated between water years 1990/91 and 2009/10. This base period approximates the 115-year average surface water flow within the Tule River between 1903/04 and 2016/17 (TRA 2018 Annual Report, Appendix).

- The baseline streamflow on the major streams used in the future projection for the model were adjusted to account for projections of future climate change, as described in TH&Co (2020).
- Projected surface water deliveries from the Friant-Kern Canal were based on climate adjusted historical average deliveries from 1990/91 to 2009/10 provided by the Friant Water Authority (FWA, 2018), as described in TH&Co (2020).

From 1986 to 2017, estimated average annual groundwater pumping in the ETGSA was approximately 206,600 acre-ft/yr. The Sustainable Yield of the ETGSA has been estimated to be approximately 22,500 acre-ft/yr. In order to reduce groundwater pumping to sustainable levels by 2040, the ETGSA has developed the following transitional pumping schedule:

Eastern Tule GSA

2020-2025	90% of over-pumping
2025-2030	80% of over-pumping
2030-2035	30% of over-pumping
2035-2040	Sustainable
2040+	Sustainable

The effect of reducing groundwater pumping to sustainable levels will stabilize groundwater levels and help reduce land subsidence rates around the FKC. The model analysis of future land subsidence incorporates the ETGSA transitional pumping schedule as well as the transitional pumping schedules for all other GSAs in the Tule Subbasin.

The model projection assumes that the following projects will be implemented within the ETGSA:

Lead Entity	Project Name	Description	Time Frame	Annual Volume	Water Source
City of Porterville	Population Increase	Increase GW Production	2.5%/yr 2020-2040	9,500 af/yr by 2040	Groundwater
City of Porterville	Recycling Increase	Increase RW Applied to Ag	2.5%/yr 2020-2040	1,900 af/yr by 2040	Recycled Water

City of Porterville	Recycling Increase	Increase RW Recharge	2.5%/yr 2020-2040	1,600 af/yr by 2040	Recycled Water
City of Porterville	Tule River Recharge	Recharge Project	Starting 2019/20	900 af/yr	Tule River
City of Porterville	FKC Recharge	Recharge Project	Starting 2020/21	1,100 af/yr	FKC via Porterville ID
Porterville ID	SA 1 & 2	Expand distribution system	Starting 2018/19	3,200 af/yr	Tule River and FKC
Porterville ID	FKC/Tule River Banking Project	Develop water bank	Starting 2020/21	3,300 af/yr of leave-behind	FKC and others
Porterville ID	Recharge Policy	On-Farm recharge	Starting 2019/20	3,000 af/yr	Tule River and FKC
Saucelito ID	FKC/Deer Creek Banking Project	Develop water bank	Starting 2020/21	1,100 af/yr of leave-behind	FKC and others
Saucelito ID	Recharge Policy	On-Farm recharge	Starting 2019/20	2,000 af/yr	FKC
Kern-Tulare WD	In-District Pricing	Pricing change	Starting 2020/21	2,600 af/yr	N/A
Kern-Tulare WD	Reservoir Storage	Surface water storage	Starting 2029/30	500 af/yr	FKC and others
Kern-Tulare WD	CRC Pipeline	Deliver produced water	Starting 2024/25	680 af/yr	CRC Produced water
Terra Bella ID	Deer Creek Recharge	Divert and recharge DC	Starting 2017/18	800 af/yr	Deer Creek

PWC, VWD, & CMDC	SREP	Success Dam Enlargement	Starting 2024/25	400 af/yr	Tule River
Hope WD	In-District Recharge	Recharge Project	Starting 2022/23	5,000 af/yr every 3 years	FKC and others / unknown
Ducor ID	In-District Recharge	Pipeline and Recharge Project	Starting 2023/24	4,000 af/yr	FKC and others / unknown

These projects would add an additional 38,000 acre-ft of groundwater recharge to the ETGSA and all were included in the Tule Subbasin GFM v.2020a model simulation that projected potential future land subsidence, as published in the GSP for ETGSA.

The model analysis of future land subsidence conducted for the ETGSA GSP predicted as much as four feet of additional land subsidence beneath the FKC between 2020 and 2040 (see Figures 18 and 19). The greatest land subsidence was predicted to occur between Deer Creek and White River. Between 2040 and 2050, the rate of land subsidence is predicted to decrease as groundwater levels stabilize throughout the ETGSA. Less than 0.5 feet (average of 0.05 ft/yr) of land subsidence is predicted in the vicinity of the FKC after 2040.

While the Tule Subbasin GFM is good at predicting relative changes in land surface elevation given predicted groundwater pumping stresses, there remains uncertainty as to the magnitude and spatial distribution of land subsidence that would result from the ETGSA's planned transitional pumping schedule. Figure 19 shows the statistical ranges of potential land subsidence at various locations along the FKC based on multiple groundwater flow model realizations of the area. These predictions will be refined over time through the collection of additional data.

Critical elements of uncertainty include (but are not necessarily limited to):

- The groundwater elevation near the FKC at which inelastic compaction of the aquifer system is triggered (i.e. the groundwater elevation at which land subsidence will not occur).
- Depth-specific groundwater levels in the Monitored Area
- The depth of groundwater pumping that causes the greatest stress to the aquifer system and the most aquifer compaction.
- The relationship and timing of groundwater level changes with aquifer system compaction (the delay or lag between groundwater level changes and aquifer compaction or rebound).

- Aquifer system parameters of transmissivity and storativity including elastic and inelastic storage properties specific to the FKC area.
- Future precipitation conditions.

For this LSMP, potential uncertainty will need to be considered when selecting management actions to minimize future land subsidence.

2.0 Land Subsidence Management Goal

The goal of the Eastern Tule Land Subsidence Management Plan (LSMP) is to implement groundwater management measures necessary to minimize future non-recoverable land subsidence along the FKC in the SGMA transition period from 2020 – 2040 and to arrest nonrecoverable land subsidence along the FKC after 2040.

The LSMP includes the following elements to meet the goal:

- A land subsidence enhanced monitoring area that includes additional monitoring features and monitoring frequency relative to the Tule Subbasin-wide Monitoring Plan (the "Monitored Area").
- An enhanced land subsidence monitoring network within the Monitored Area to collect the data necessary to address data gaps and uncertainty and inform basin managers regarding the status of land subsidence within the ETGSA with focus along the FKC.
- A land subsidence data collection program for the Monitored Area that ensures that data are collected in sufficient quantities, areal distribution, frequency and accuracy to provide meaningful results for evaluating progress with respect to meeting the land subsidence goal for the ETGSA.
- A central, secure monitoring database available to the ETGSA for their use in monitoring land subsidence and progress toward arresting land subsidence along the FKC.
- A land subsidence managed area (the "Managed Area") where groundwater management actions may be different than those specified in the GSP to address the most active land subsidence along the FKC.
- Management Zones within the Managed Area where land subsidence management actions would be implemented.

The LSMP is both flexible and iterative, allowing for the addition or subtraction of monitoring features, as necessary, and to accommodate changes in monitoring frequency and alternative methodologies, as appropriate. The LSMP is also adaptive, to enable changes in management actions to address undesirable results.

3.0 Area Encompassed by the Land Subsidence Management Plan

To meet the land subsidence management goals identified in Section 2.0 of this LSMP, it will be necessary to implement a combination of monitoring and management actions in the vicinity of the canal. The recommended enhanced Monitored Area presented herein is the area, based on existing information and data, where land subsidence in the ETGSA has occurred in the past and where future groundwater level management is considered critical to avoiding land subsidence in the future. Throughout much of the recommended Monitored Area, the only management action specific to limiting land subsidence at the FKC will be an increase in the number of monitoring features (e.g. GPS Benchmarks) and frequency of monitoring those features. A portion of the Monitored Area will be set aside as a Managed Area where more urgent management actions may be needed to meet the land subsidence management goals.

It is noted that previous studies have shown that reductions in pumping to the west and outside the ETGSA boundary help mitigate land subsidence along the FKC. In accordance with Pixley Irrigation District GSA's commitment to coordinate and cooperate with the ETGSA as it relates to land subsidence mitigation along the FKC and implementation of the LSMP, as stated in the FWA Settlement Agreement, the southeastern portion of the Pixley Irrigation District GSA is included in this LSMP (see Figure 20). Coordination with other adjacent GSAs may be necessary to achieving the goals of the LSMP.

3.1 Monitored Area

The area addressed by the LSMP is defined by the Monitored Area shown on Figure 20. This area includes additional land subsidence monitoring features that are not included in the Tule Subbasin Monitoring Plan. The monitored area covers most of the ETGSA. The basis for the eastern and northern boundaries of the monitored area is the limit of land subsidence detected by the 2015 – 2018 InSAR map (see Figure 20). This area of land subsidence is considered recently active and prone to continued subsidence in the future. These boundaries are approximately two to three miles east of the communities of Ducor and Terra Bella and approximately one mile north of the Tule River at the FKC. The western and southern boundaries of the Monitored Area are the western and southern boundaries of the ETGSA.

3.2 Managed Area

A land subsidence Managed Area has been identified based on InSAR satellite data and groundwater flow model analysis of land subsidence presented in Section 1.6 of this LSMP (see Figure 21). The Managed Area extends two miles on either side of the Friant-Kern Canal from the Tule River to the southern boundary of the ETGSA. Preliminary analysis using a groundwater flow model showed that an elimination of groundwater pumping in this area had the greatest impact on groundwater levels in the immediate vicinity of the canal and were most effective at mitigating future land subsidence along the FKC (see Figures 14 and 16). Management actions

within this area will be separate from, and may be different than, planned management actions published in the ETGSA GSP for the greater ETGSA.

3.3 Management Zones

The Managed Area has been subdivided into 96 Management Zones where management actions specific to that area will be implemented (see Figure 21). There are eight, ¼-mile east-west zones on each side of the FKC (20 total). There are six north-south zones (A through F). Thus, there are 96 total Management Zones within the Managed Area. Crop types in the Managed Area, as of 2018, are shown on Figure 22.

4.0 Land Subsidence Monitoring Network

The land subsidence monitoring network specified herein includes, and builds upon, the land subsidence monitoring network described in the Tule Subbasin Monitoring Plan.[2] There are multiple tools available to monitor land subsidence, including:

- Benchmarks
- InSAR satellite surveys
- Extensometer Data

In addition, given that the potential for land subsidence is a function of groundwater levels, monitoring wells are also a critical tool for predicting and preventing land subsidence. In consideration of this, monitoring wells specific to this LSMP have been incorporated in addition to the minimum groundwater level monitoring network described in the Tule Subbasin Monitoring Plan.

4.1 Land Subsidence Monitoring Features

Monitoring of changes in land surface elevation related to groundwater withdrawal will be conducted through global positioning surveys, data collected from extensometers, and satellite data.

4.1.1 Global Positioning Surveys

Existing GPS Benchmarks in the Tule Subbasin Monitoring Plan

The FWA measures land surface elevation at 32 stations along the Friant-Kern Canal, including 16 within the ETGSA Monitored Area, using a Global Positioning System (GPS) (see Figure 23). Data from these surveys are entered into the Tule Subbasin Data Management System (DMS) on an annual basis and will be available for download and analysis.

Nineteen GPS survey stations have been established in the ETGSA Monitored Area as part of the Tule Subbasin Monitoring Plan (see Figure 23). Each survey station consists of a benchmark labeled with the station identification.

The Porterville GPS Station (Station P056) is operated by UNAVCO and has been collecting daily land surface elevation data since November 2005.

[2] Tule Subbasin Coordination Agreement, 2020. Attachment 1: Tule Subbasin Monitoring Plan. Prepared for the Tule Subbasin Technical Advisory Committee. Dated January 2020.

Proposed Additional GPS Benchmarks for the Eastern Tule GSA Land Subsidence Monitoring and Management Plan

Additional GPS benchmarks are proposed for both the Monitored Area and Managed Area of the ETGSA LSMP. Recommended benchmarks will be located at approximately 1-mile spacing throughout the Managed Area (see Figure 23). Where possible, benchmarks consisting of a brass disc will be affixed to an existing concrete structure. If no concrete structure is available, the benchmark will be constructed within a 3-foot deep hole encased with 6-inch diameter PVC casing. Two 4-foot long sections of 0.625-inch diameter copper-plated steel rod or rebar will be advanced into the soil within the encased borehole and cemented into place. The benchmark will be completed at the surface with a 3.25-inch diameter brass tablet cemented to the top of the rods with industrial-grade epoxy. Each benchmark will be stamped with the bench-mark identifier.

4.1.2 Extensometers

Existing Extensometer

The USGS collects data on aquifer system compaction, which causes land subsidence, from one existing extensometer located adjacent to the FKC approximately one mile north of Deer Creek (22S/27E-30D2; see Figure 30). The USGS extensometer consists of a 2-inch diameter steel pipe anchored within a 12-inch diameter well at a depth of 1,180 ft bgs. The extensometer measures the mechanical response of the aquifer system to changes in piezometric pressure (changes in groundwater levels). The well is perforated from 1,083 to 1,180 to allow for groundwater level measurements, which are measured once a day using a pressure transducer. The data are accessed via the USGS website and entered annually into the Tule Subbasin DMS.

4.1.3 Satellite Data (InSAR)

Changes in land surface elevation over time can be observed on a regional scale using satellite data. The data is generated using interferometric synthetic aperture radar (InSAR). Monthly InSAR datasets will be published on a quarterly basis by the DWR. Additional information on the DWR's InSAR subsidence data is available at https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence.

4.2 Land Subsidence Monitoring Procedure

4.2.1 Global Positioning Surveys

The GPS network will be established and monitored in accordance with National Geodetic Survey (NGS) Guidelines for Establishing GPS-Derived Ellipsoid Heights (National Oceanographic and Atmospheric Administration and Guidelines for Establishing GPS-Derived Orthometric Heights. All GPS-derived elevations will be constrained to an established NGS benchmark located on Lake

Success Dam (KT 200). All land surface elevation readings will be to an accuracy of 0.1 feet relative to NAVD88.

Land surface from the Porterville GPS Station will be downloaded from the UNACO website https://www.unavco.org/instrumentation/networks/status/nota/overview/P056 for analysis once a month.

4.2.2 Extensometers

The USGS extensometer (Site 355933119062001) is equipped with a continuous monitoring device to record aquifer system compaction. Aquifer system compaction data will be downloaded from the USGS website https://maps.waterdata.usgs.gov/mapper/index.html for analysis once a month.

4.2.3 Satellite Data (InSAR)

InSAR data will be downloaded from https://gis.water.ca.gov/arcgisimg/rest/services/SAR to develop maps showing regional land surface changes.

4.3 Frequency of Measurement

4.3.1 Global Positioning Surveys

GPS surveys of the stations within the LSMP managed area shown on Figure 23 will be conducted on a quarterly basis. GPS surveys of stations located outside the managed area but within the LSMP monitored area will be conducted annually. If monthly extensometer data indicate relatively rapid changes in land subsidence, more frequent surveys may be required. Otherwise, the GPS survey frequency requirements will be reevaluated on an annual basis.

4.3.2 Extensometers

Aquifer system compaction is measured on a continuous basis at the USGS extensometer. Aquifer system compaction data will be downloaded from the USGS website for analysis monthly.

4.3.3 Satellite Data (InSAR)

InSAR data will be downloaded from the DWR website and analyzed on a quarterly basis as it is published.

4.4 Groundwater Level Monitoring

ETGSA, monitoring wells have been identified to enable the collection of data from both the Upper Aquifer and Lower Aquifer. The depths of each of these units follow the hydrogeological

conceptual model of the Tule Subbasin outlined in the hydrogeological conceptual model and incorporated into the Tule Subbasin Groundwater Flow Model (TH&Co, 2020). The Upper Aquifer is generally unconfined to semi-confined. The bottom of the Upper Aquifer varies in depth in the Monitored Area from approximately 400 ft ft bgs in the western portion to less than 100 ft bgs in the northeastern. The Lower Aquifer occurs below the Upper Aquifer with total depths up to 1,300 ft bgs.

Monitoring wells are identified with perforations exclusively in the Upper Aquifer or Lower Aquifer. Individual wells perforated across multiple aquifer layers will not be allowed for new wells constructed as part of this LSMP. Over time, wells in the monitoring network that are perforated across multiple aquifers will be replaced with nested or cluster wells with perforations specific to the Upper or Lower aquifers.

4.4.1 Monitoring Features

4.4.1.1 Upper Aquifer Monitoring Wells

Upper aquifer monitoring wells are shown on Figure 24. A total of 42 monitoring wells have been identified for measuring groundwater levels within the Upper Aquifer within the Monitored Area. Of the 42 wells, seven are existing wells. The remaining 35 wells are proposed to be constructed. Within the LSMP Managed Area, Upper Aquifer well spacing is generally 1.5 to 2 miles and spread evenly across the area. The same spacing was applied to the Monitored Area west of the Managed Area. Upper Aquifer well spacing east of the Managed Area was more spread out, particularly in the southern part where the Upper Aquifer is not saturated.

The depths and perforation intervals of the new Upper Aquifer monitoring wells will vary depending on location within the LSMP Monitored Area. In general, Upper Aquifer monitoring wells will be perforated from approximately 10 ft below the then current static groundwater level to the bottom of the Upper Aquifer, as defined by the Tule Subbasin model. In general, new Upper Aquifer wells constructed on the west side of the Monitored Area will be the deepest and new Upper Aquifer wells constructed in the northeast Monitored Area will be shallowest. It is noted that the depths presented herein are for planning purposes. The final well construction details will be refined in the field during drilling once site-specific data have been obtained and reviewed. As such, the final well depths and perforation intervals may be adjusted for site specific conditions.

A conceptual well design drawing for new Upper Aquifer monitoring wells is shown on Figure 25. In general, new monitoring wells will be constructed of 5-inch diameter Schedule 80 PVC blank and slotted casing. A filter pack for the new wells will be placed in the annular borehole space opposite the perforations from the total borehole depth to at least 10 feet above the top of perforations. The upper portion of the annular space shall be backfilled with a seal consisting of bentonite or other approved sealing material. The surface completion for each new monitoring well will include a steel above-ground riser equipped with a protective locking cap for keeping the

wellhead secure. The above-ground riser will be surrounded by cement-filled steel bollards for further protection.

A dedicated reference point will be established and marked on the top of each monitoring well casing. All groundwater level measurements shall be obtained relative to the reference point. The elevation of the reference point shall be surveyed to an accuracy of 0.1 foot relative to mean sea level (NAVD88) by a California licensed land surveyor. The location of each well will be surveyed to an accuracy of 1 foot.

4.4.1.2 Lower Aquifer Monitoring Wells

Lower Aquifer monitoring wells are shown on Figure 26. A total of 47 wells have been identified for monitoring groundwater levels in the Lower Aquifer within the Monitored Area. Of the 47 wells, 22 are existing wells. The remaining 25 wells are proposed to be constructed. Within the LSMP Managed Area, Lower Aquifer well spacing is generally the same as for the Upper Aquifer monitoring wells. More Lower Aquifer wells are included in the southeast part of the Monitored Area where the Lower Aquifer is present and saturated.

Potential existing Lower Aquifer wells for which access is denied or, upon investigation, do not otherwise meet the minimum criteria specified in Section 3.2.1.1 of the Coordination Agreement, will be removed and replaced with an alternate existing well with documented total depth and perforation interval located in the same area. If no other wells exist in the area, a new Lower Aquifer well will be constructed in the area.

The depths and perforation intervals of the new Lower Aquifer monitoring wells will vary depending on location within the Monitored Area. In general, Lower Aquifer monitoring wells will be perforated at depths where the aquifer is assumed to be confined, as defined by the Tule Subbasin conceptual model. New Lower Aquifer monitoring wells will be constructed with total depths ranging from 400 to 1,000 ft bgs. It is noted that the depths presented herein are for planning purposes. The final well construction details will be refined in the field during drilling once site-specific data have been obtained and reviewed. As such, the final well depths and perforation intervals may be adjusted for site specific conditions.

A conceptual well design drawing for new Lower Aquifer monitoring wells is shown on Figure 27. In general, new monitoring wells shall be constructed of 5-inch diameter PVC blank and slotted casing. A dedicated reference point shall be established and marked on the top of each monitoring well casing. All groundwater level measurements shall be obtained relative to the reference point. The elevation of the reference point shall be surveyed to an accuracy of 0.1 foot relative to mean sea level (NAVD88) by a California licensed land surveyor. The location of each well will be surveyed to an accuracy of 1 foot.

4.4.2 Monitoring Procedure

Groundwater level measurements shall be collected from each well using either a steel tape, a calibrated well sounder, or a pressure transducer. Where possible, groundwater level measurements shall be collected with a steel tape or an electrical groundwater level sounder calibrated to the nearest 0.01 ft. For pre-existing wells with limited access, a calibrated steel tape and chalk may be used. All equipment must be in good working condition. No damaged or refurbished electrical sounding tape shall be used. All new monitoring wells shall be equipped with calibrated pressure transducers.

Groundwater level measurements must be representative of static (i.e. non-pumping) groundwater level conditions. To ensure measurement of static groundwater levels in active pumping wells, the field technician collecting the data must verify that the pump has been off for at least 24 hours prior to collecting the data.

4.4.2.1 Manual Groundwater Level Measurements

The following monitoring procedure shall be used to obtain manual groundwater level measurements in the field:

- Upon arrival at each site, the field technician shall note the well name, time of day, and date on the standard groundwater level data form (see Appendix A).
- All monitoring equipment shall be cleaned prior to lowering it into the well(s) using the following decontamination procedure:
    - Wash equipment with an Alconox solution which is followed by a deionized water rinse.
    - Triple rinse equipment with deionized water.
    - Place equipment on clean surface such as teflon or polyethylene sheet to air dry.
- To measure the depth to groundwater with a steel tape or an electrical sounder or meter, slowly lower the steel tape or water level electrical tape into the designated sounding port for production wells and into the main well for monitoring wells. Steel tapes and electrical tapes are lowered to the water surface, as determined by the audio signal, meter, or technician. Depths to groundwater are measured relative to the dedicated reference point at the top of the casing or sounding tube. Depth to groundwater shall be immediately recorded on the standard groundwater level data form (see Appendix A). Depths to groundwater shall be compared to previous measurements in the field and re-measured if significantly different.
- For wells with limited access (such as agricultural wells or domestic wells equipped with a pump), a steel tape and chalk may be used. For this method, chalk is applied to a 1- to 3-foot section of the steel tape prior to lowering in the well. The steel tape is lowered to a depth at least 1-ft below the static groundwater level and a whole number on the calibrated tape is matched to the reference point at the surface. Both the foot mark held at the

reference point and the groundwater level observed on the chalk shall be recorded on the standard field forms (see Appendix B). The difference between the two is the depth to groundwater.

- When finished sounding the groundwater level, all downhole equipment shall be removed, and where existing, the well cap shall be replaced, and the riser locked.
- Prior to leaving the monitoring well site, the field representative shall note any physical changes in the concrete well pad and riser pipe, such as erosion, cracks or damage. All changes shall be recorded on the standard field forms provided in Appendices A and B.

4.4.2.2 Automatic Groundwater Level Measurements Using Transducers

Transducers shall be installed in all new monitoring wells and existing monitoring wells. Transducers shall be installed below the groundwater level with enough submergence to accommodate anticipated groundwater level fluctuations.

4.4.3 Frequency of Measurement

Groundwater level measurements will be collected from existing monitoring wells within the Monitored Area on a quarterly basis. Groundwater level measurements from all new monitoring wells will be collected using pressure transducers permanently installed in the wells and set to collect one measurement per day. Pressure transducers will be downloaded on a quarterly basis. During each download session, the field technician will also obtain a manual groundwater level measurement to verify transducer readings and ensure that the instruments are working properly.

5.0 Assessment and Improvement of Monitoring Network

The LSMP is both flexible and iterative, allowing for the addition or subtraction of monitoring features, as necessary, and to accommodate changes in monitoring frequency and alternative methodologies, as appropriate.

5.1 Land Surface Monitoring Data Gaps

The land surface elevation benchmark stations identified in the Tule Subbasin Monitoring Plan do not provide the spatial resolution necessary to provide detailed confirmation of areal land subsidence indicated by InSAR satellite data in the enhanced Monitored Area and particularly in the Managed Area of this LSMP. To address this data gap, a total of 85 additional benchmark stations have been identified within the Monitored Area, which would be added to the 13 benchmarks that have been established for the Tule Subbasin Monitoring Plan (see Figure 23). Of the 85 new benchmarks, 57 would be located within the Managed Area at a spacing of approximately 1 mile between benchmarks to provide detailed resolution of land surface elevation changes along the FKC. It is recommended to obtain GPS surveys of these benchmarks on a quarterly basis.

In addition to the existing USGS extensometer, two additional extensometers are planned for the Tule River/Friant-Kern Canal Water Bank and Deer Creek/Friant-Kern Canal Water Bank projects. Assuming that these monitoring features are constructed and that the USGS extensometer can be preserved, they will provide suitable sites for monitoring aquifer system compaction and determining protective groundwater elevations.

5.2 Groundwater Monitoring Data Gaps

Despite the number of existing monitoring wells that have been identified within the Tule Subbasin, there remain data gaps that, if addressed, would improve the ability to monitor groundwater level changes and flow patterns specific to the Upper and Lower aquifers. The current data gaps relate primarily to spatial coverage of monitoring features necessary to prepare detailed groundwater level contour maps and hydrographs specific to the Upper and Lower aquifers in the enhanced Monitored Area. Thirty-five (35) additional Upper Aquifer monitoring wells are recommended for the Monitored Area in addition to the seven existing Upper Aquifer monitoring wells to address the data gaps. In addition, 25 new Lower Aquifer monitoring wells are recommended for this area to supplement the 22 existing Lower Aquifer monitoring wells. Selected new monitoring wells will be designated as RMS wells for monitoring compliance with groundwater level sustainable management criteria near the FKC.

In addition to groundwater level data gaps, there is a lack of aquifer parameter data, as obtained from controlled pumping tests of wells. The groundwater flow model has been developed based predominantly on short-term pumping tests, which enable the development of estimates of aquifer

transmissivity. However, these tests are not as representative as long-term pumping tests (24-hr tests or longer). Further, pumping tests where groundwater level interference is measured in nearby monitoring wells have not been conducted. These tests enable the estimation of aquifer storage properties. During the construction of new monitoring features, it is anticipated that long-term pumping tests will be conducted to obtain aquifer parameter data specific to both the Upper and Lower aquifers. Further, pumping tests will be planned, where feasible, on existing high capacity groundwater production wells.

6.0 Land Subsidence Monitoring and Management Committee

A Land Subsidence Monitoring and Management Committee (LSMC) will be formed as part of the LSMP to periodically review data and technical reports collected as part of the plan. The LSMC will consist of technical experts assigned by the stakeholders as defined in Section 6.1 below. The LSMC would review data and technical analyses collected by ETGSA or their technical representatives and provide technical comments and recommendations to the ETGSA. The LSMC will be a standing committee and will be subject to opening meeting requirements of the Ralph M. Brown Act.

6.1 Representation

The LSMC shall consist of seven representative technical experts from the following agencies:

- ETGSA (two representatives with alternates),
- FWA (one representative with alternate),
- Tule Subbasin Technical Advisory Committee (one representative with alternate),
- Pixley Irrigation District (one representative with alternate), and
- Eastern Tule White Area Growers, Inc. (two representatives with alternates).

Additionally, the ETGSA may consult with other public agencies deemed to have relevant expertise or interest such as the California State Department of Water Resources, County of Tulare, USGS, or others. The ETGSA may also invite guests to participate in meetings of the LSMC to present, explain, or clarify the data and analyses collected in accordance with the LSMP.

6.2 Responsibilities

The ETGSA will convene timely meeting(s) of the LSMC to review monitoring data and reports and evaluate changes to the LSMP. The LSMC will meet at the request of the ETGSA, no less than in July and December of each year to:

- Review and analyze monitoring data and updated model results.
- Evaluate land surface elevation trends related to interim milestones, minimum thresholds and measurable objectives.
- Review proposed refinements to the LSMP.
- Provide recommendations to the ETGSA.

6.3 Recommendations to the ETGSA

Recommendations from the LSMC to the ETGSA may include (but are not limited to):

- Changes to the number or location of monitoring wells.

- Changes to the number or location of extensometers.
- Changes in monitoring frequency.
- Changes in monitoring technology.
- Changes in management actions.
- Refinement of models.
- Other modifications to the LSMP.
- Changes to the LSMC meeting schedule.

7.0 Reporting

At the end of each water year (ending September 30), ETGSA's technical consultant will analyze the data generated per the LSMP during the prior water year. The results and interpretations generated from the analysis will be documented in an annual report to be submitted to the ETGSA in January following the water year. Key sections of the annual report will include:

Section 1 – Introduction. This section provides background information on the history of land subsidence in the ETGSA, the formation of the LSMC and its responsibilities, and the LSMP.

Section 2 – Ground-Level Monitoring Program. This section describes the monitoring and testing activities performed by ETGSA per the LSMP during the previous calendar year.

Section 3 – Results and Interpretations. This section discusses and interprets the monitoring and testing data collected and analyzed during the previous calendar year. It also includes an evaluation of the effectiveness of the LSMP at maintaining land subsidence rates in accordance with the goals of the LSMP.

Section 4 – Conclusions and Recommendations. This section summarizes the main conclusions derived from the monitoring program through the previous calendar year and recommends updates to the LSMP, if any, as warranted by the data.

Section 5 – References. This section lists the publications cited in the report.

A draft version of the annual report will be submitted to the LSMC for review and comment prior to the December LSMC meeting. Upon consideration of all comments, the final report will be submitted to the ETGSA in January for review and consideration.

8.0 References

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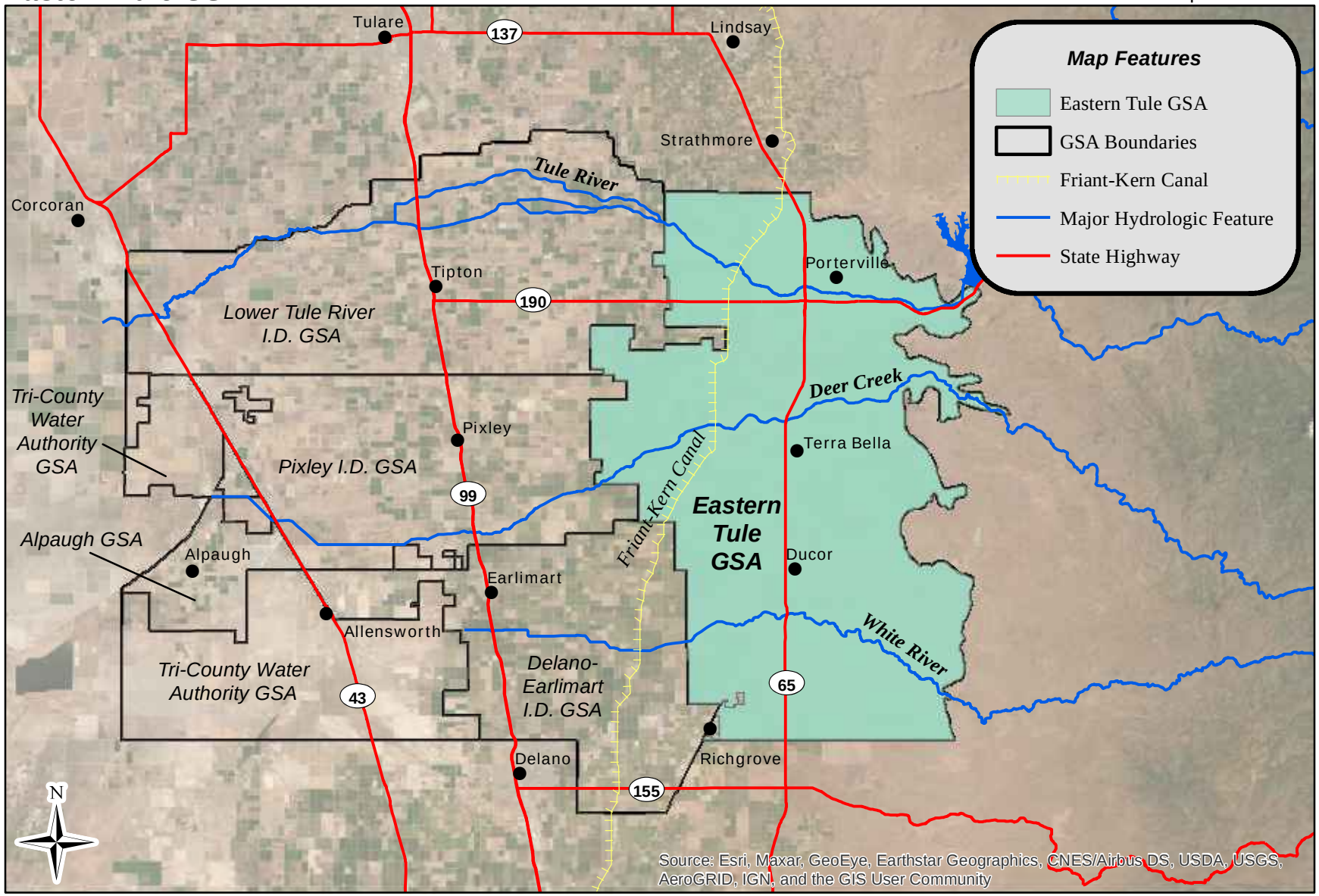
Figures

Eastern Tule GSA



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0 2.5 5 10 Miles

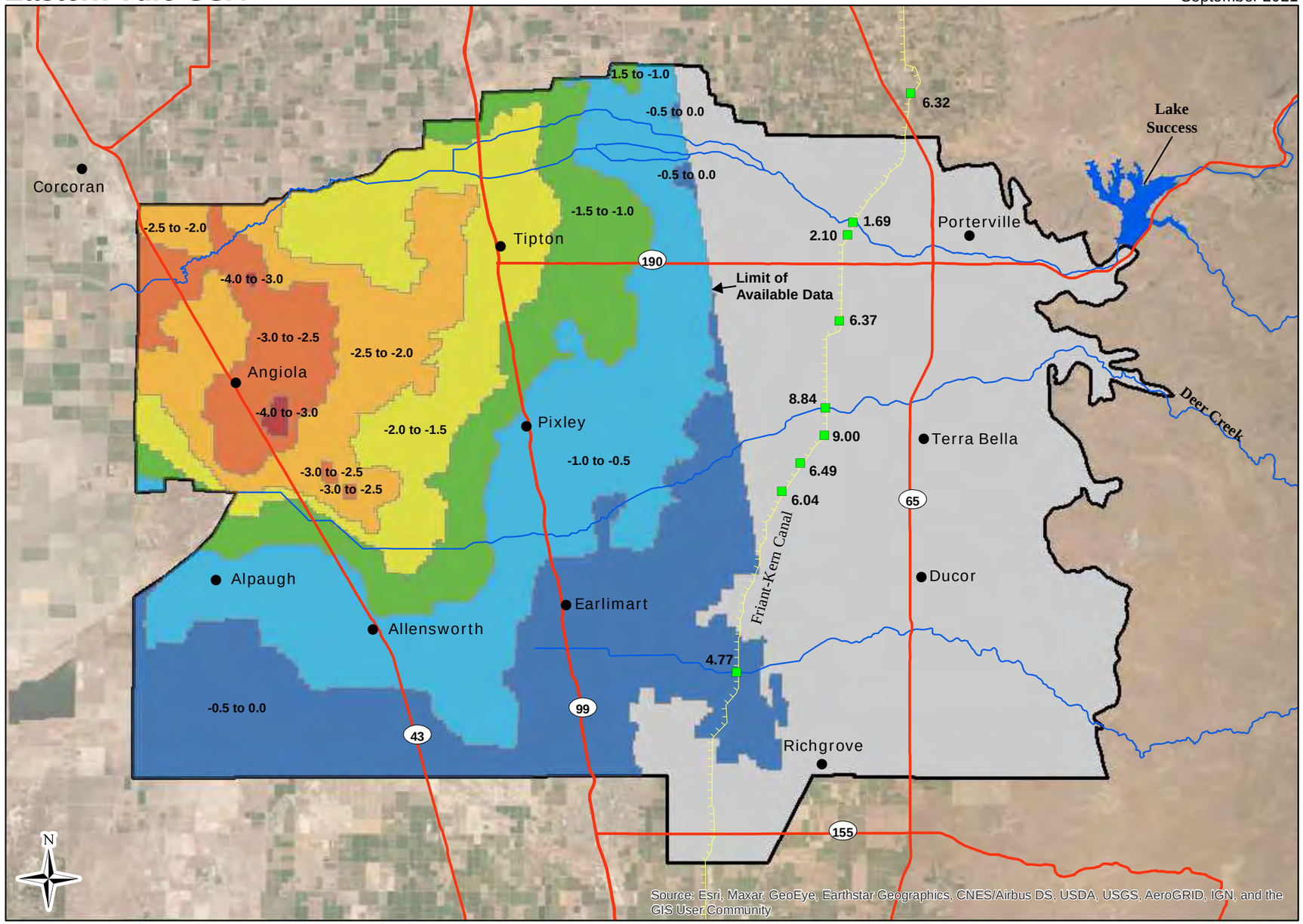
NAD 83 State Plane Zone 4

Eastern Tule Groundwater Sustainability Agency

Figure 1

Eastern Tule GSA

September 2021



NAD 83 State Plane Zone 4

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Land Subsidence Monitoring Plan

Map Features

2007 - 2011 Land Surface Subsidence* (ft)

- -4.0 to -3.0
- -3.0 to -2.5
- -2.5 to -2.0
- -2.0 to -1.5
- -1.5 to -1.0
- -1.0 to -0.5
- -0.5 to 0.0

Measured Subsidence Points along the Friant-Kern Canal (ft) 1959-2017

Friant-Kern Canal

Basin Boundary

City or Community

Major Hydrologic Feature

Freeway/State Highway

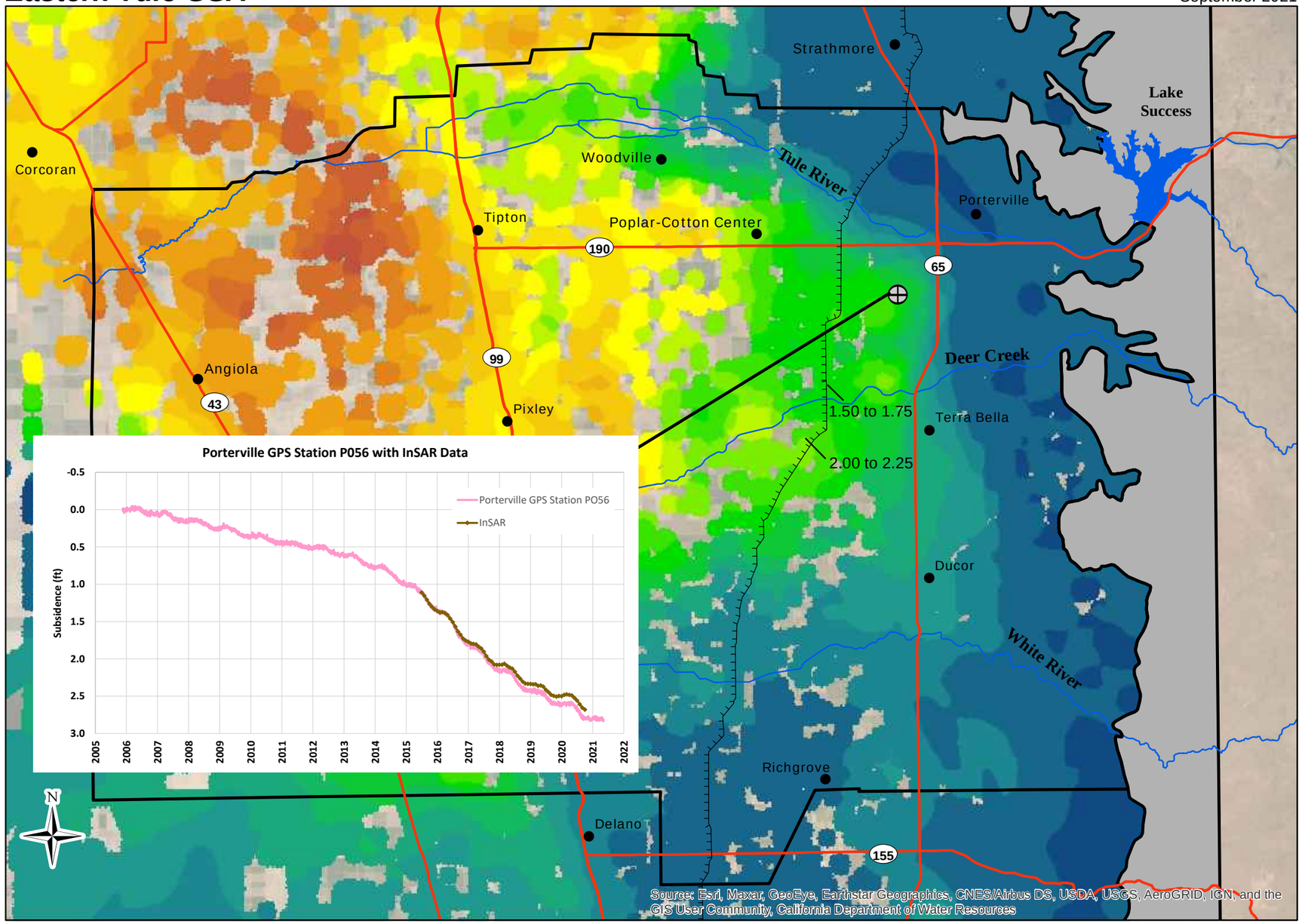
*From LSCE, 2014

2007 to 2011 Land Subsidence

Figure 2

Eastern Tule GSA

September 2021



0 2 4 8 Miles

NAD 83 State Plane Zone 4

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InSAR data from: https://gis.water.ca.gov/arcgisimg/rest/services/SAR/Vertical_Displacement_TRE_ALTAMIRA_v2020_Total_Since_20150613_20201001/ImageServer

GPS Data from https://www.unavco.org/instrumentation/networks/status/nota/overview/P056

Land Subsidence Monitoring Plan

Map Features

InSAR Subsidence from June 2015 to October 2020 (ft)

- 4.50 to 4.75
- 4.25 to 4.50
- 4.00 to 4.25
- 3.75 to 4.00
- 3.50 to 3.75
- 3.25 to 3.50
- 3.00 to 3.25
- 2.75 to 3.00
- 2.50 to 2.75
- 2.25 to 2.50
- 2.00 to 2.25
- 1.75 to 2.00
- 1.50 to 1.75
- 1.25 to 1.50
- 1.00 to 1.25
- 0.75 to 1.00
- 0.50 to 0.75
- 0.25 to 0.50
- 0.00 to 0.25
- 0.00 to +0.25
- +0.25 to +1.75

Friant-Kern Canal

No Flow Boundary

Basin Boundary

City or Community

Major Hydrologic Feature

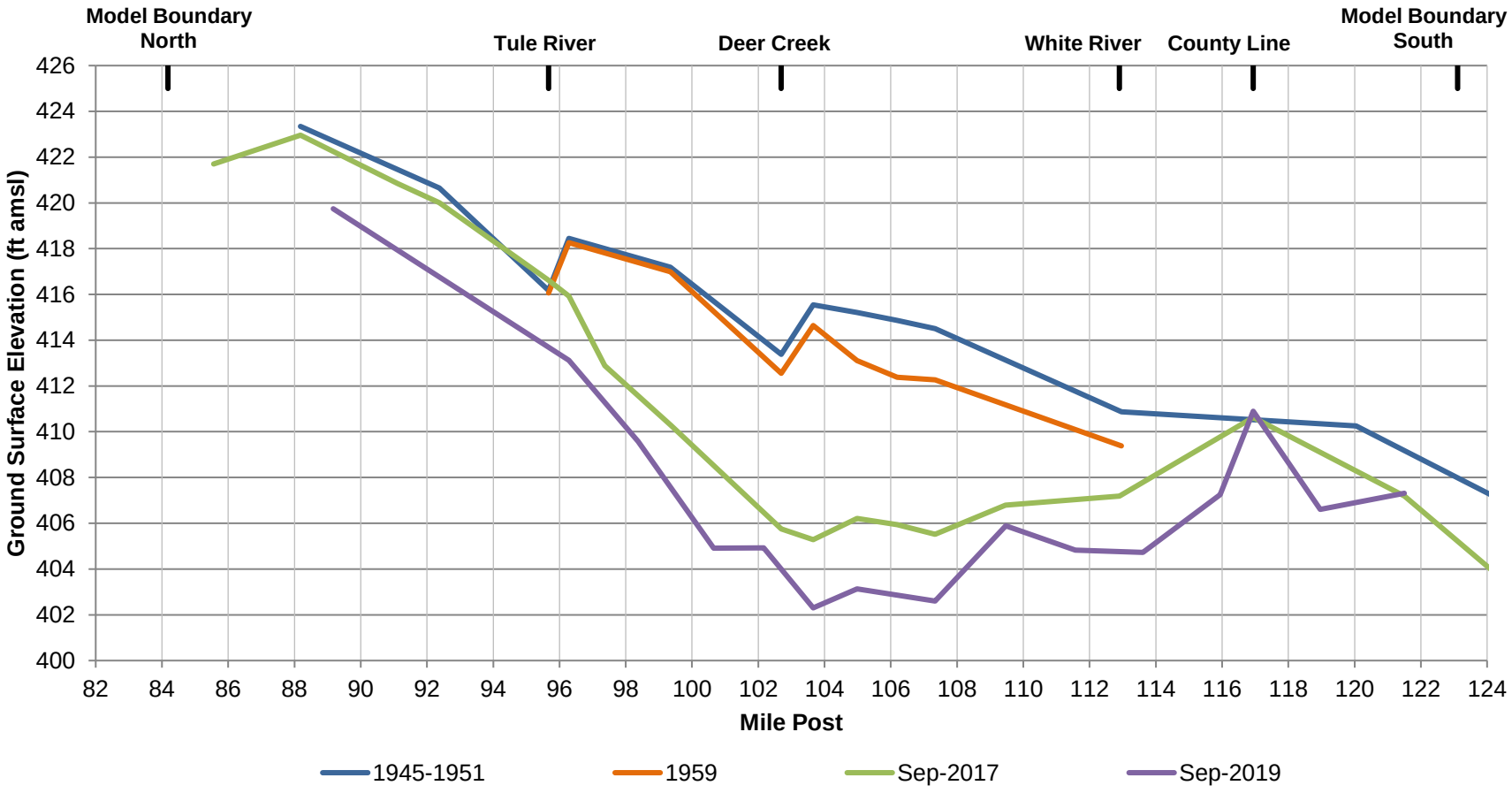
State Highway/Major Road

2015 to 2020 Land Subsidence

Figure 3

Figure 4

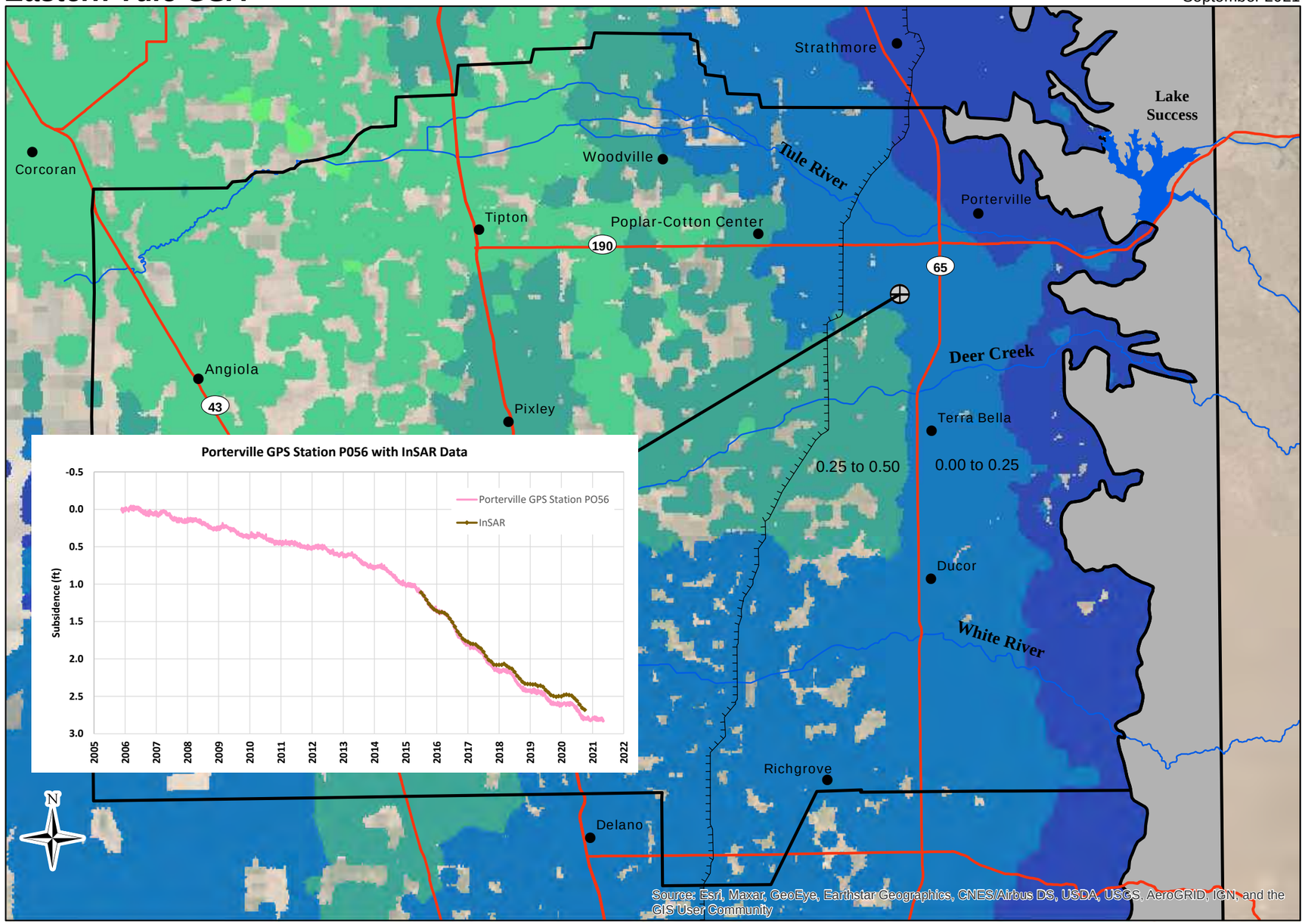
Profile of Historical Land Surface Elevation Change Along the Friant-Kern Canal



Note: Historical elevations from Stantec. 2019 GPS data not shown.

Eastern Tule GSA

September 2021



0 2 4 8 Miles

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InSAR data from:
https://gis.water.ca.gov/arcgisimg/rest/services/SAR/Vertical_Displacement_TRE_ALTAMIRA_v2020_Total_Since_20150613_20200101/ImageServer
and
https://gis.water.ca.gov/arcgisimg/rest/services/SAR/Vertical_Displacement_TRE_ALTAMIRA_v2020_Total_Since_20150613_20201001/ImageServer

Land Subsidence Monitoring Plan

Map Features

InSAR Subsidence from January 2020 to October 2020 (ft)

- 0.75 to 1.00
- 0.50 to 0.75
- 0.25 to 0.50
- 0.00 to 0.25
- +0.25 to 0.00
- Friant-Kern Canal
- No Flow Boundary
- Basin Boundary
- City or Community
- Major Hydrologic Feature
- State Highway/Major Road

Land Subsidence in the Tule Subbasin January 2020 - October 2020

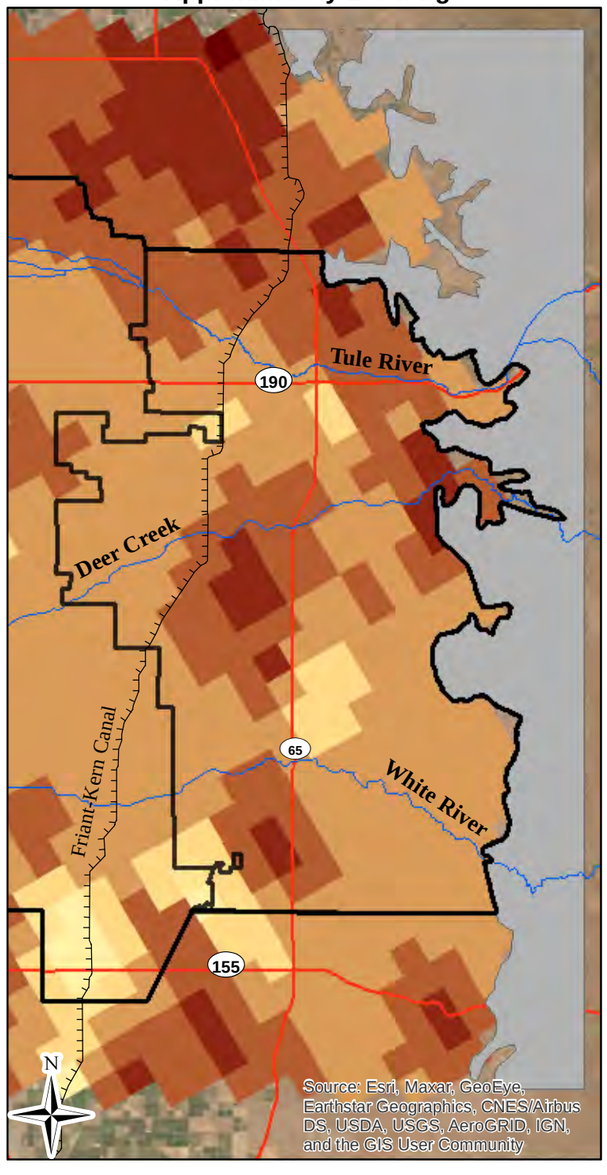
Figure 5

Eastern Tule GSA

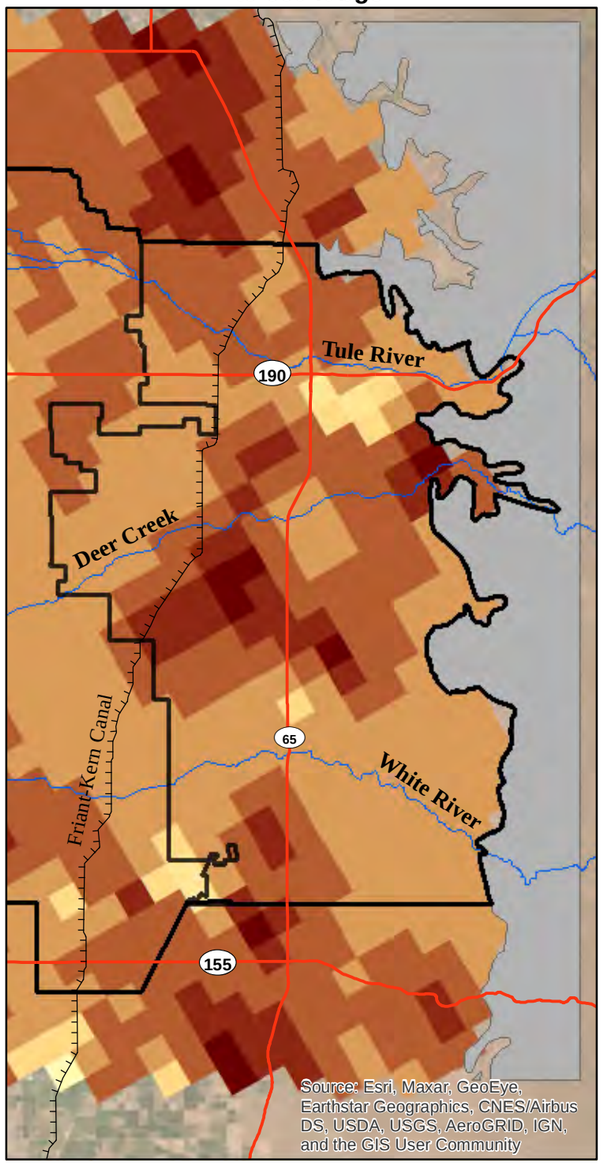
September 2021

Land Subsidence Monitoring Plan

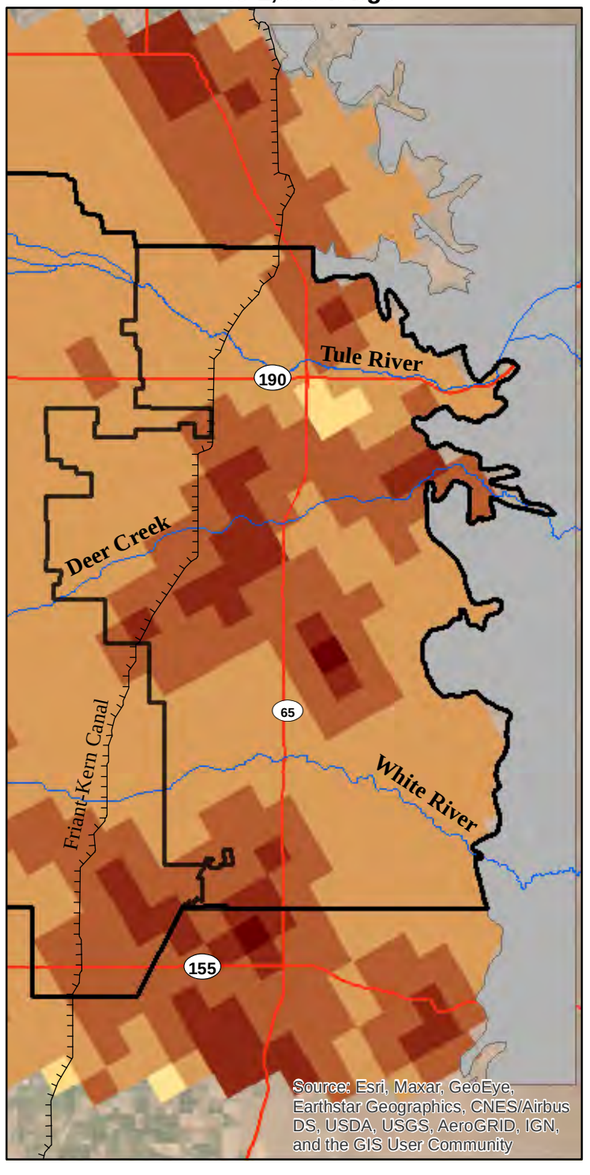
Land Surface to Approximately 250 ft bgs



Aproximately 250 ft bgs to 350 ft bgs



Approximately 350 ft bgs to 1,300 ft bgs



Map Features

Aquifer Percent Fine-Grained Sediment

- 0 - 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 55
- 55 - 65
- 65 - 75
- 75 - 85
- 85 - 95

- No Flow Zone
- Friant-Kern Canal
- Tule Groundwater Subbasin
- State Highway
- Major Hydrologic Feature

Note: Data modified from USGS Professional Paper 1766

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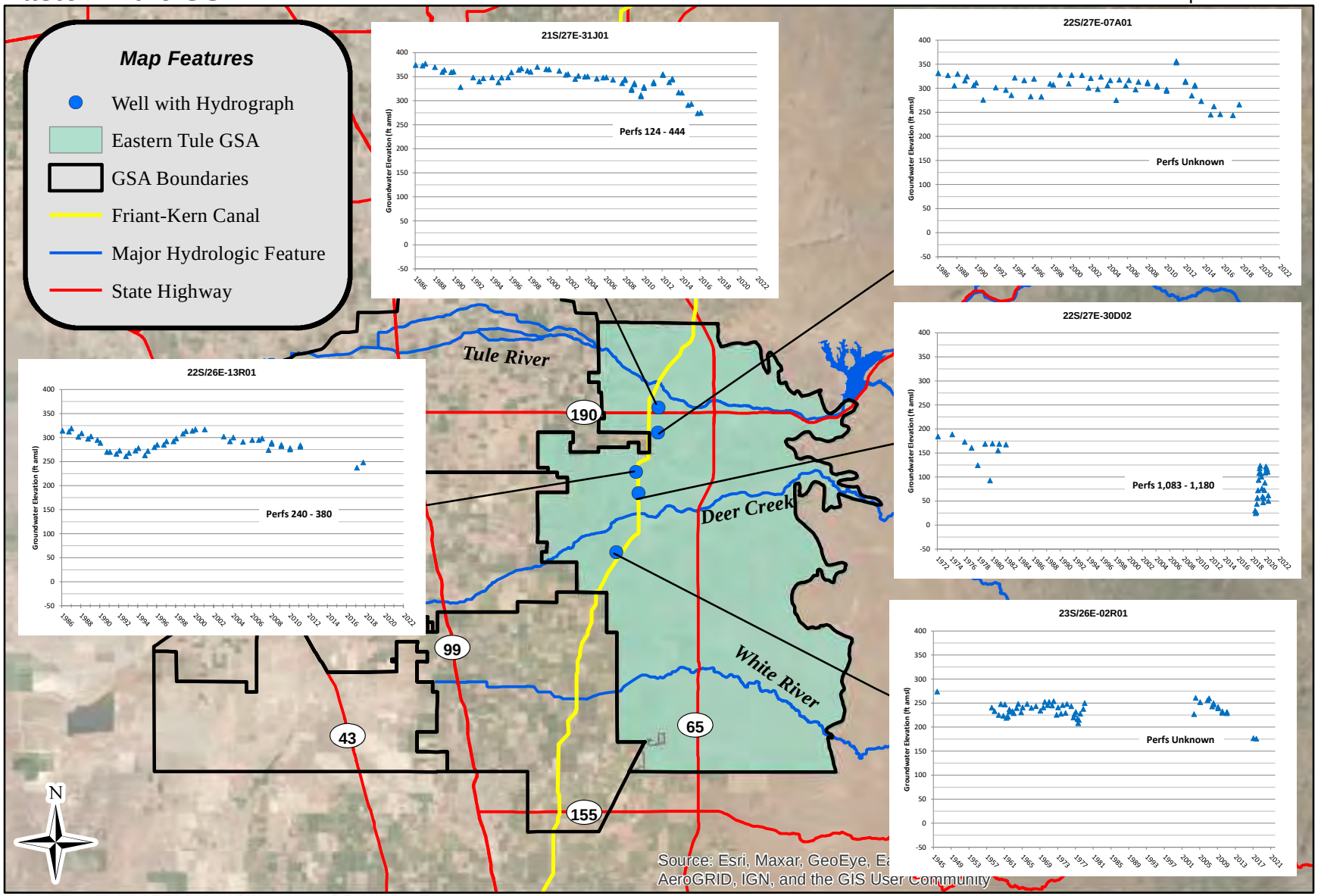
0 2.5 5 10 Miles

NAD 83 State Plane Zone 4

Percent Fine-Grained Sediments with Depth

Figure 6

Eastern Tule GSA



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0 3 6 12 Miles

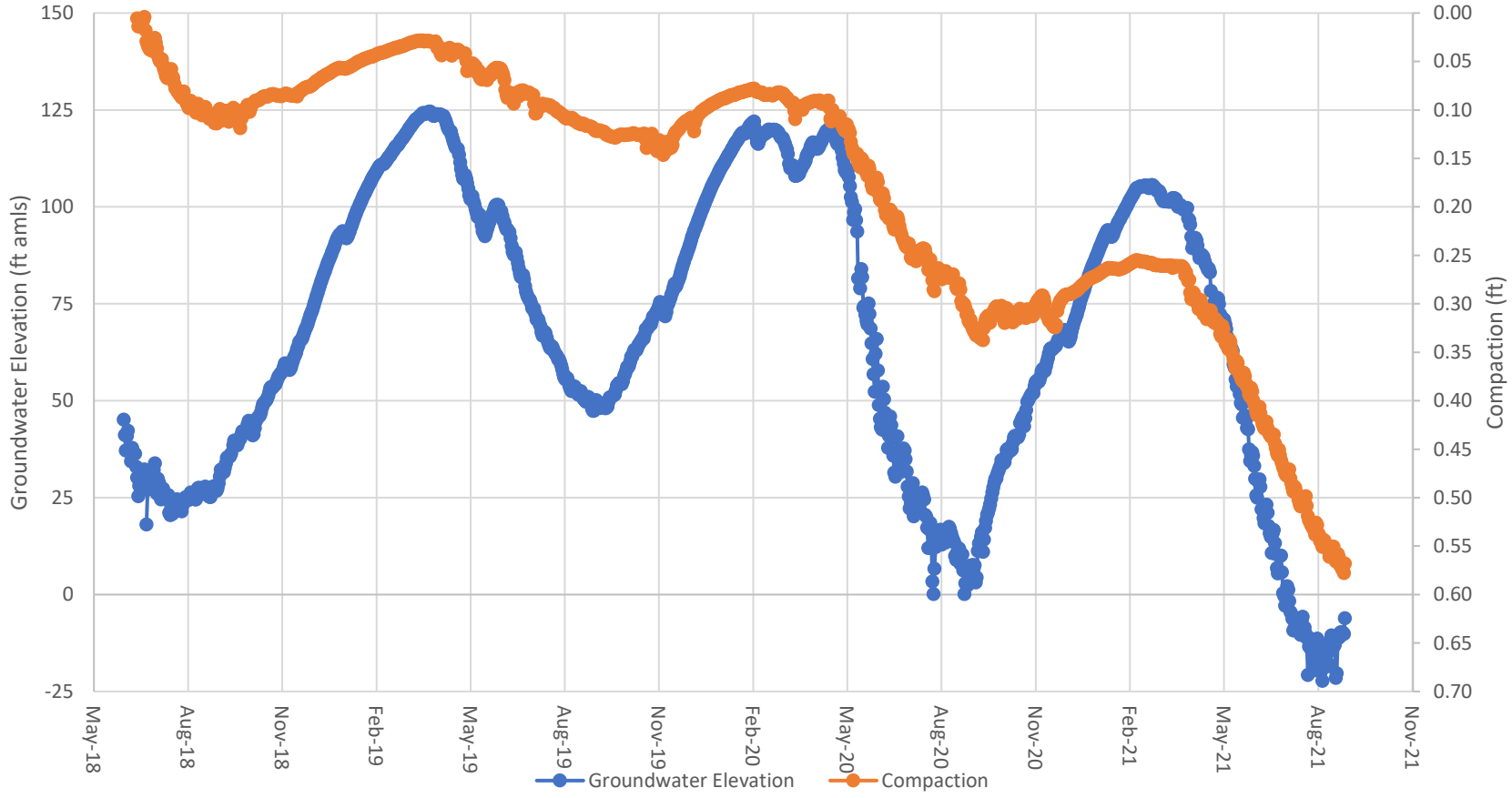
NAD 83 State Plane Zone 4

Groundwater Levels in Selected Wells Along the Friant-Kern Canal

Figure 7

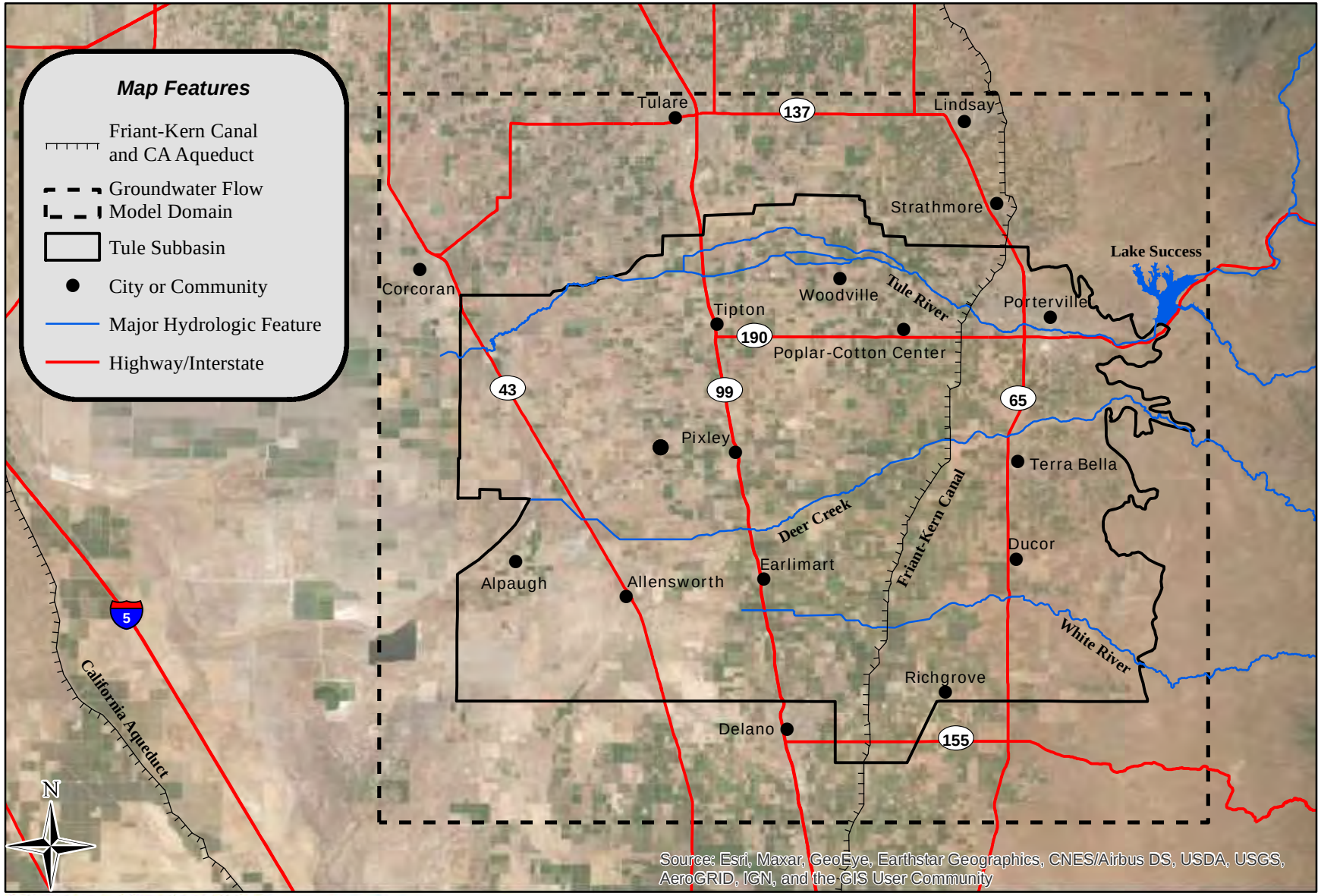
Figure 8

Aquifer System Compaction and Groundwater Level Change at USGS Extensometer at Friant-Kern Canal near Deer Creek (22S/27E-30D02)



Data from USGS Site 355933119062001, https://maps.waterdata.usgs.gov/mapper/index.html
Extensometer depth 1,180 ft bgs and screened interval 1,083-1,180 ft bgs.

Eastern Tule GSA



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0 5 10 20 Miles

NAD 83 State Plane Zone 4

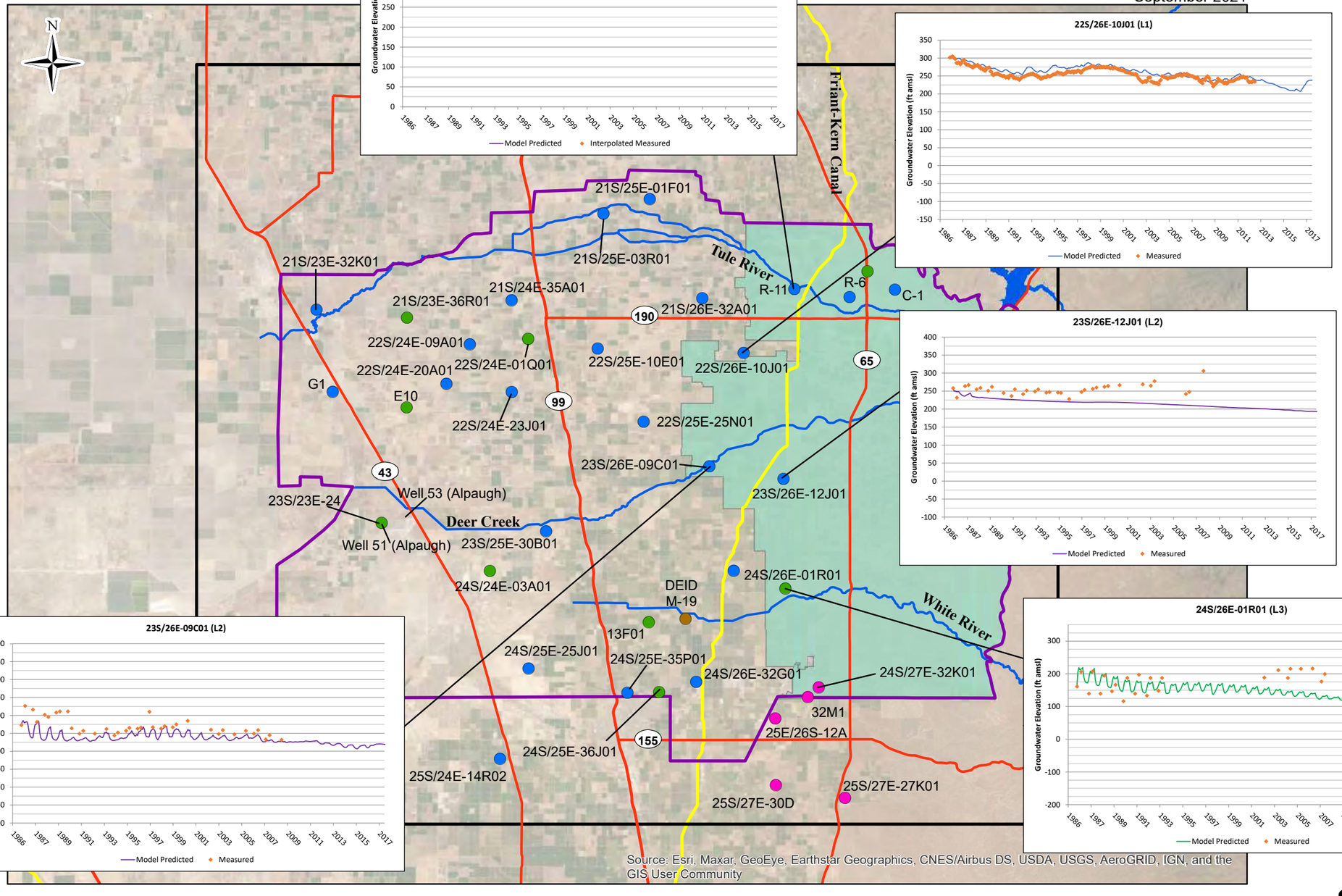
Groundwater Flow Model Domain

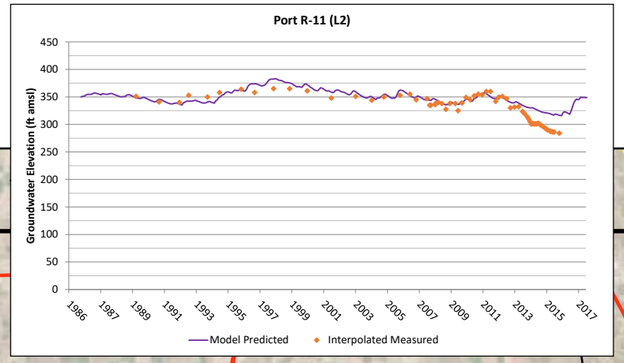
Figure 9

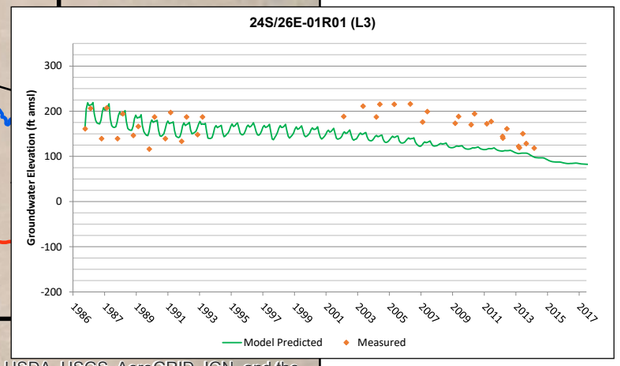
Land Subsidence Monitoring Plan

Eastern Tule GSA

September 2021







Map Features

- Layer 1 - Shallow Well
- Layer 3 - Deep Well
- Layer 4 - Deep Well
- DEID M-19 Nested (L1 and L3)
- Eastern Tule GSA
- State Highway/Major Road
- Friant-Kern Canal
- Major Hydrologic Feature
- Tule Subbasin
- Model Domain

0 3 6 12 Miles

NAD 83 State Plane Zone 4

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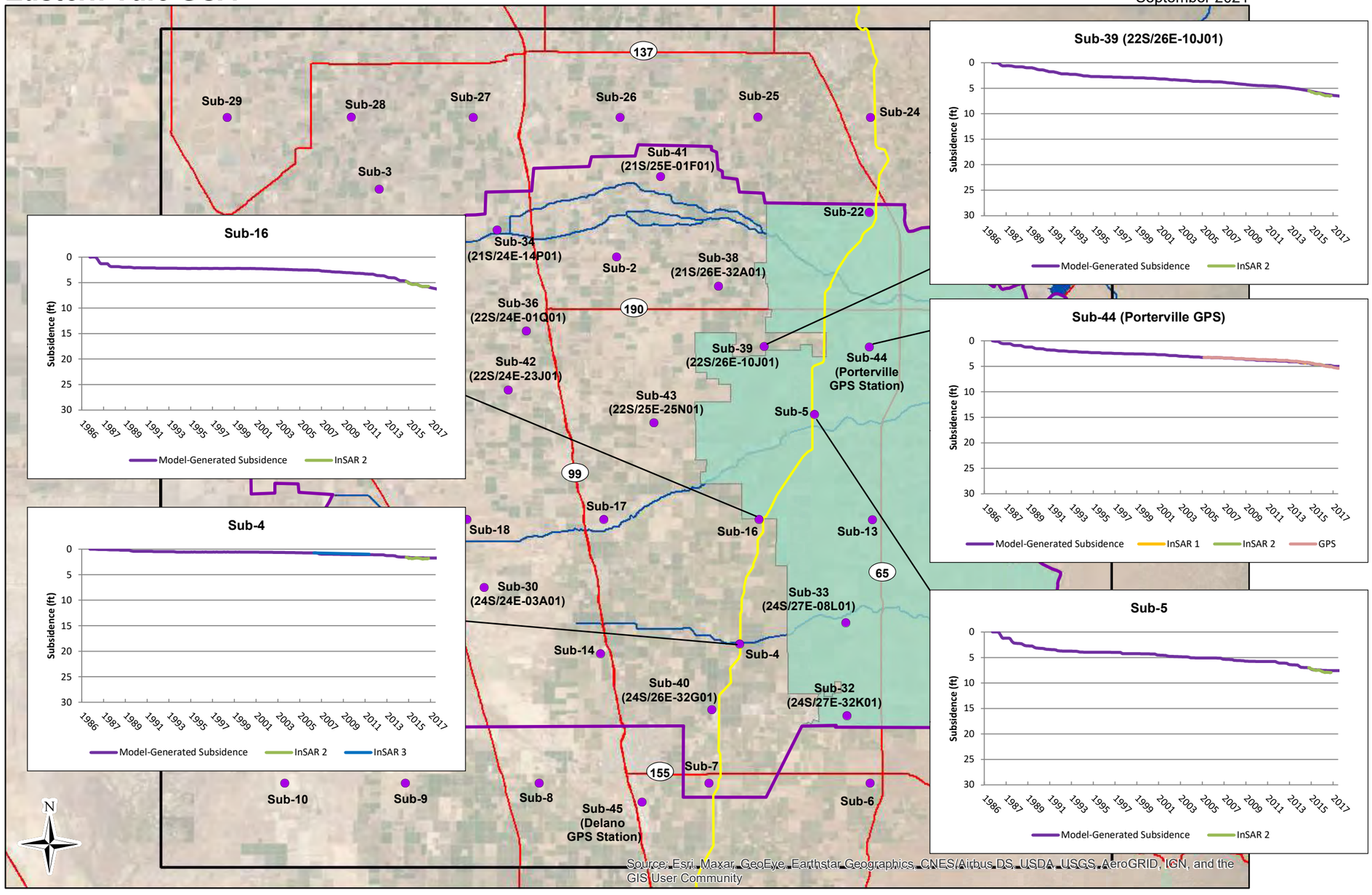
Selected Model Calibration Hydrographs - ETGSA

Figure 10

Land Subsidence Monitoring Plan

Eastern Tule GSA

September 2021



Map Features

- Subsidence Target
- Eastern Tule GSA
- Friant-Kern Canal
- Major Hydrologic Feature
- State Highway
- Tule Subbasin
- Model Domain

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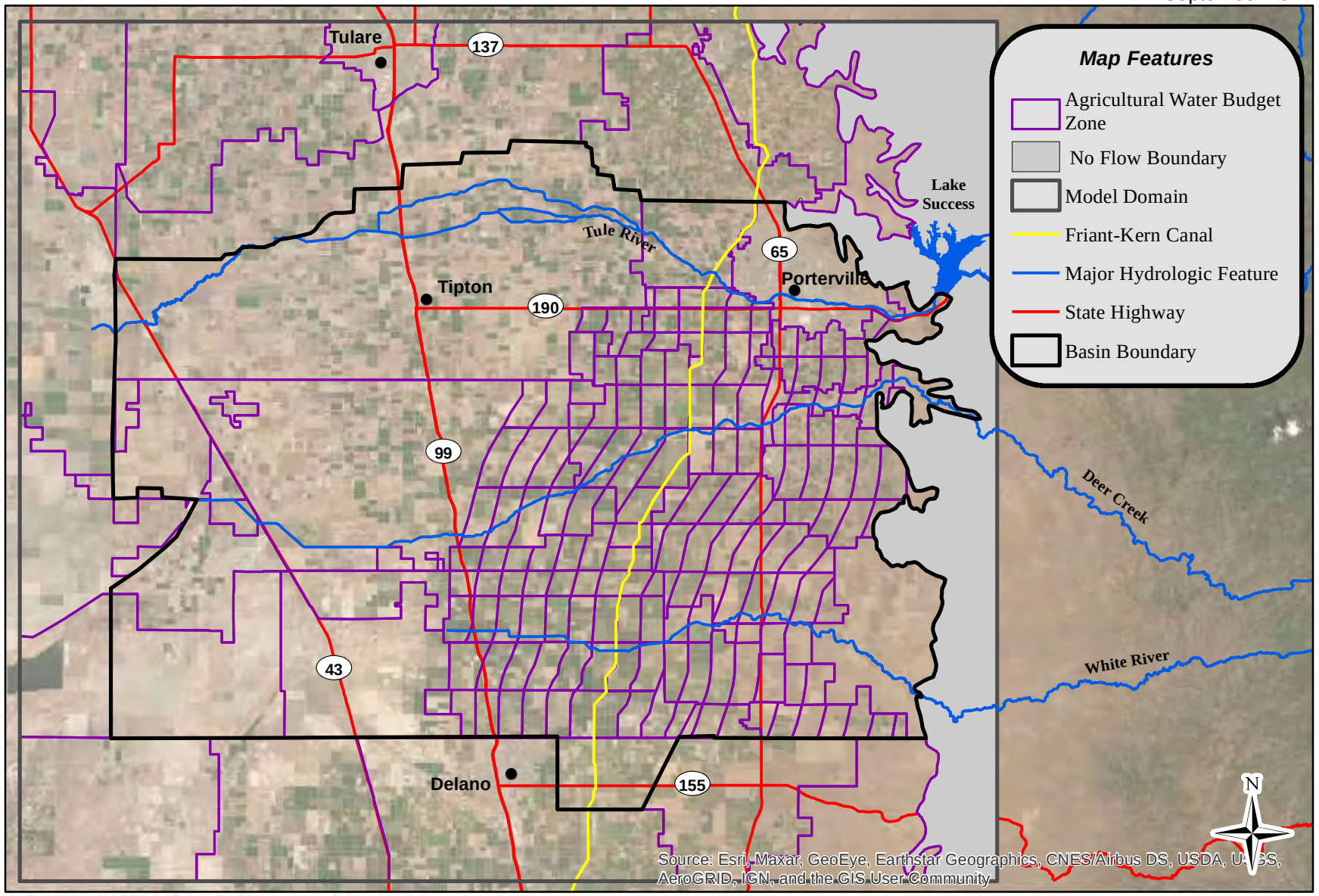
Selected Land Subsidence Calibration Plots - ETGSA

Figure 11

Eastern Tule GSA



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Groundwater Consulting

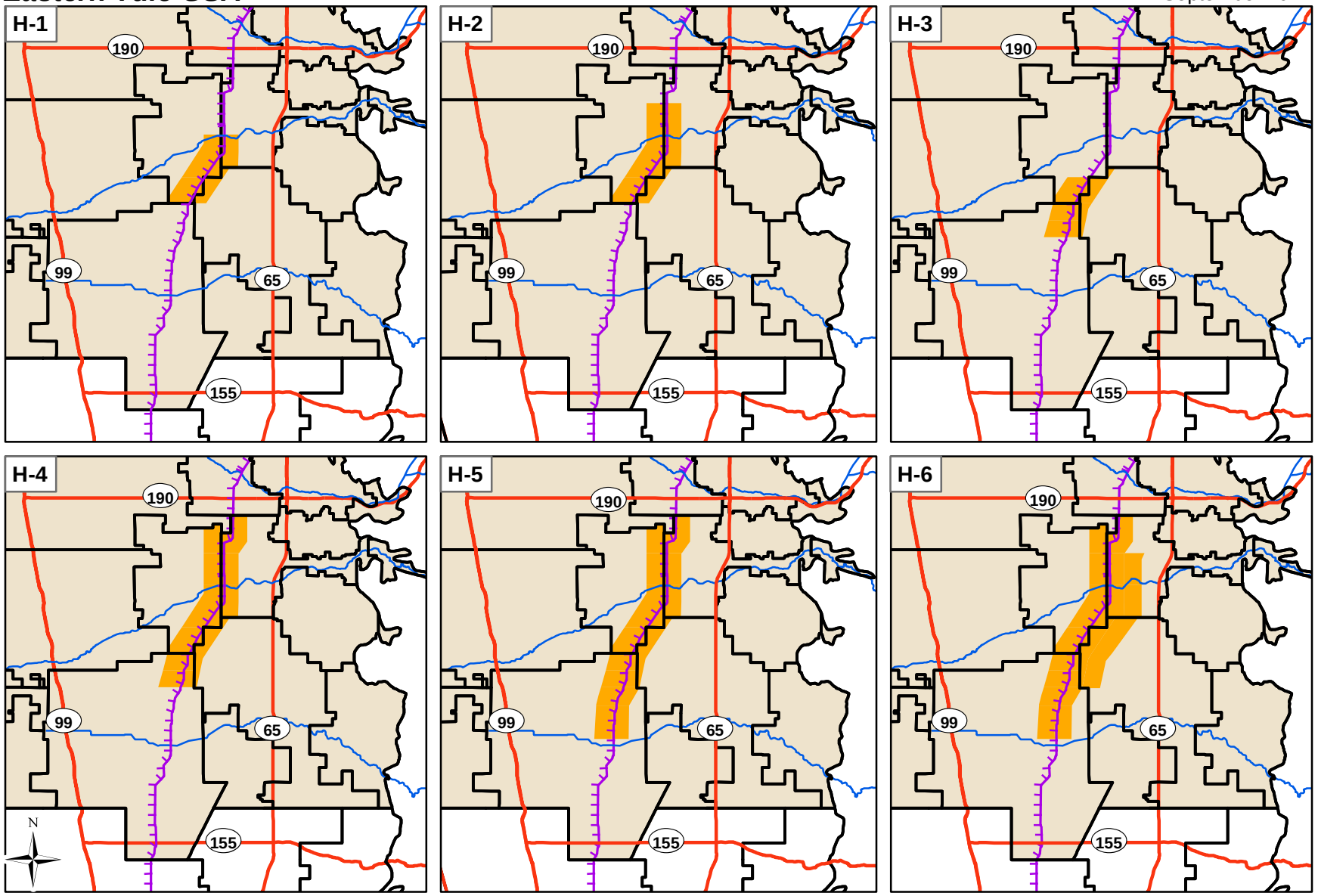
0 3 6 12 Miles

NAD 83 State Plane Zone 4

Agricultural Water Budget Zones for Analyzing Land Subsidence Mitigation Alternatives

Figure 12

Eastern Tule GSA



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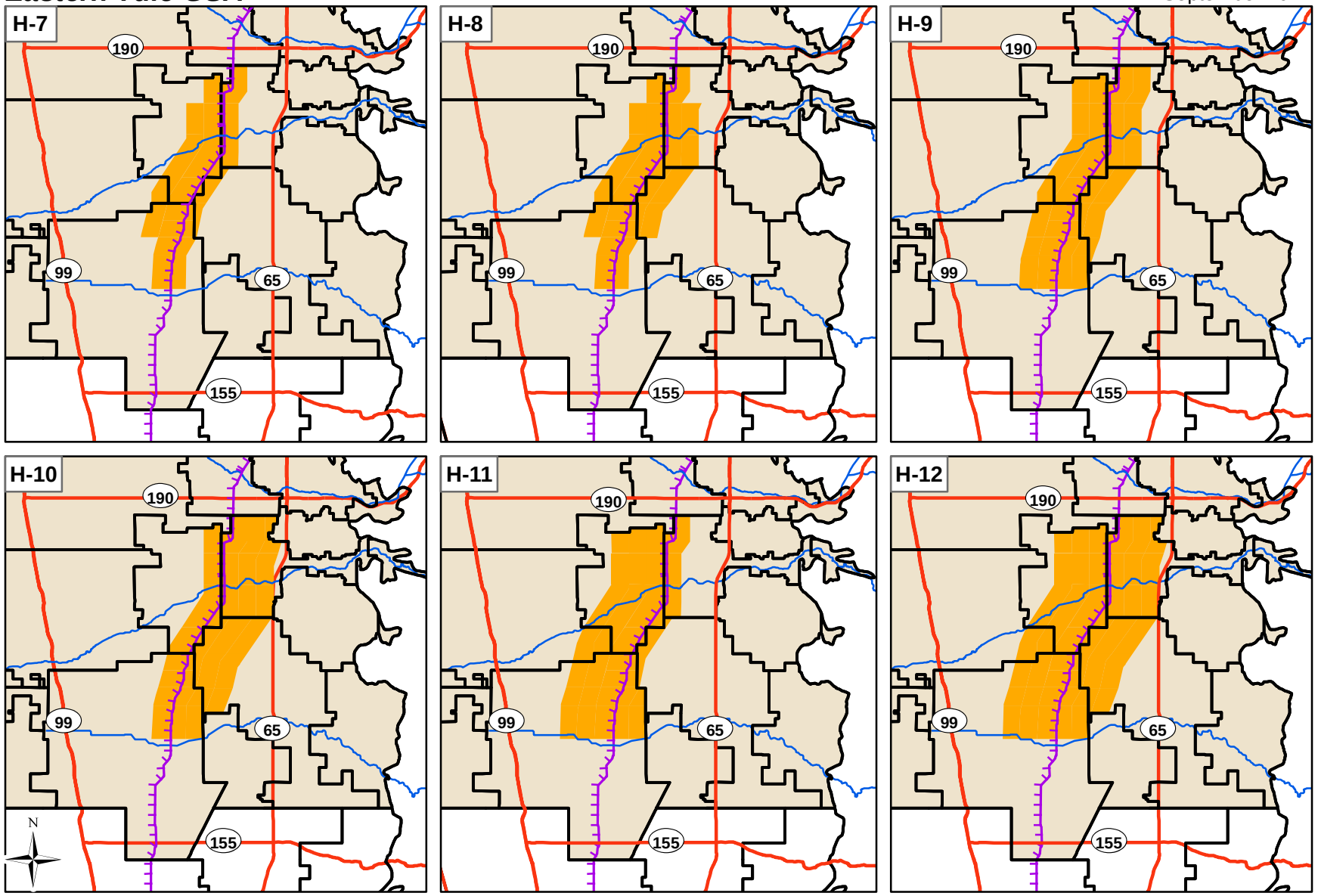
Water Budget Zone Combinations Analyzed with the Model: Historical

Figure 13A

Eastern Tule GSA



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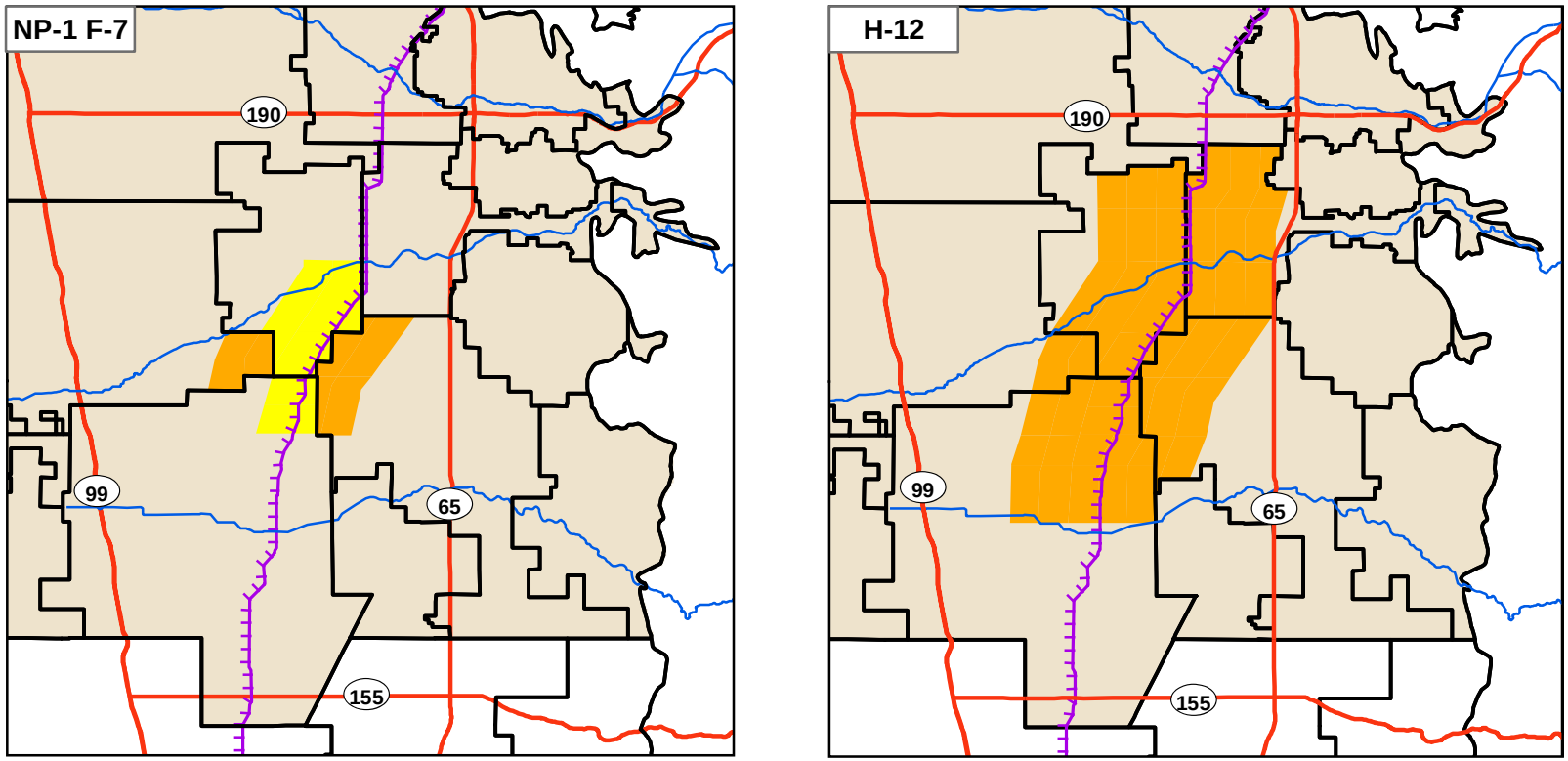
Water Budget Zone Combinations Analyzed with the Model: Historical

Figure 13B



Yellow - No Groundwater Pumping; in-Lieu Irrigation Only
Orange - No Groundwater Pumping; No In-Lieu Deliveries

Water Budget Zone Combinations Most Effective at Mitigating Land Subsidence Along Friant-Kern Canal

Figure 14

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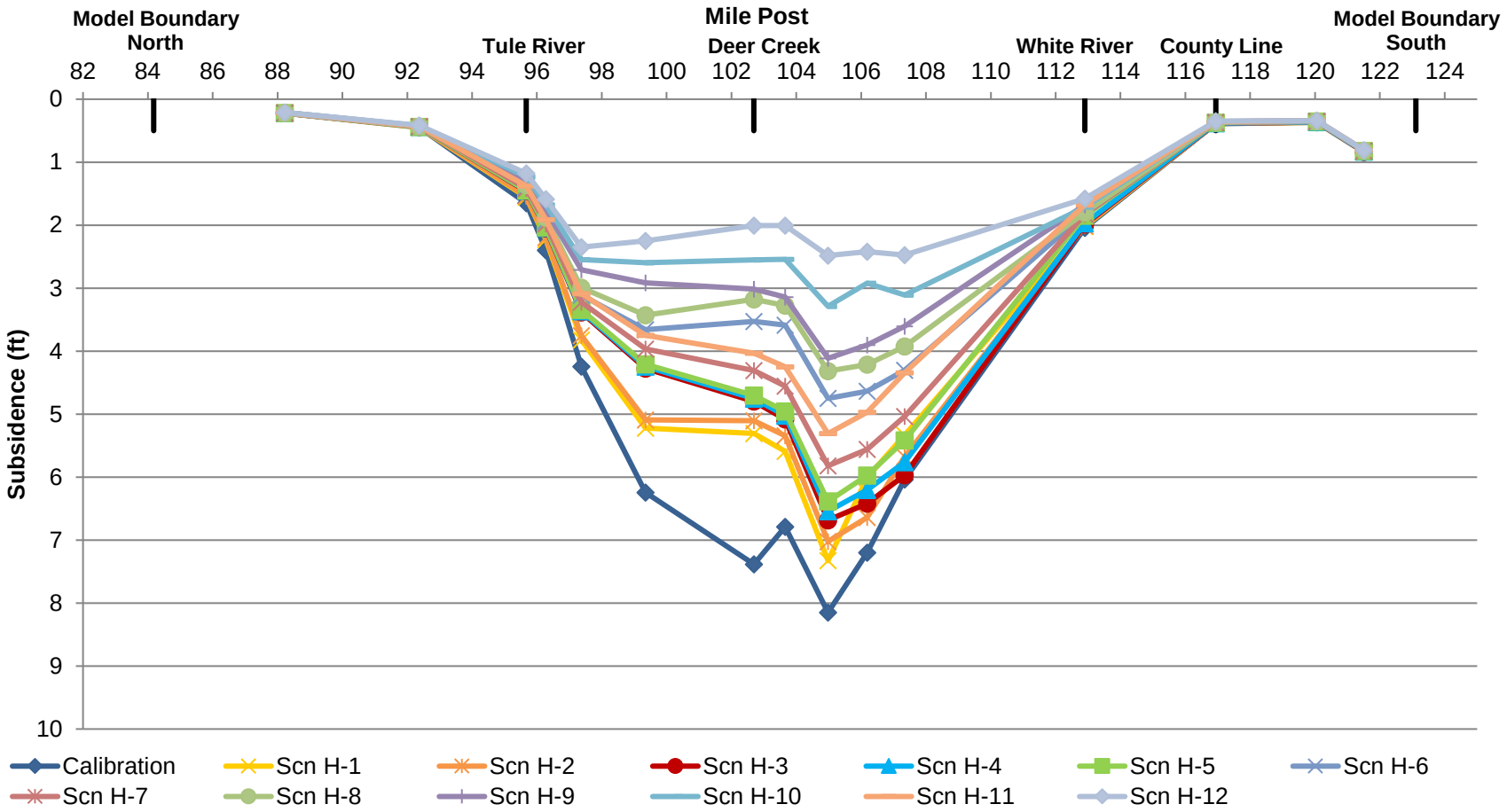
Figure 15

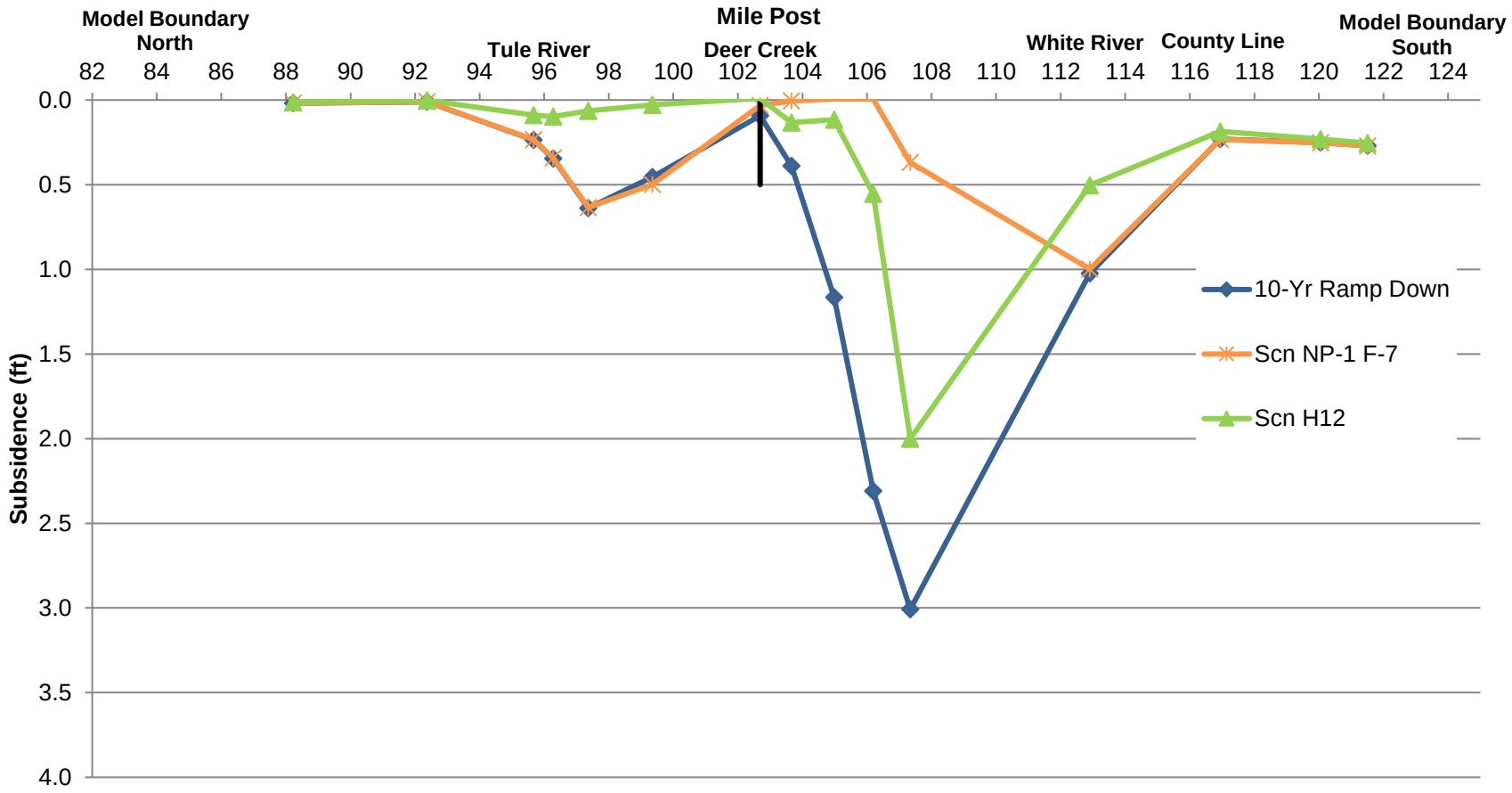
Model-Simulated Land Subsidence Along Friant-Kern Canal for Historical (1986-2017) Water Budget Zone Combinations



*The data shown are for October 1986 through September 2017. See Figure 12a and 12b for Water Budget Zones.

Figure 16

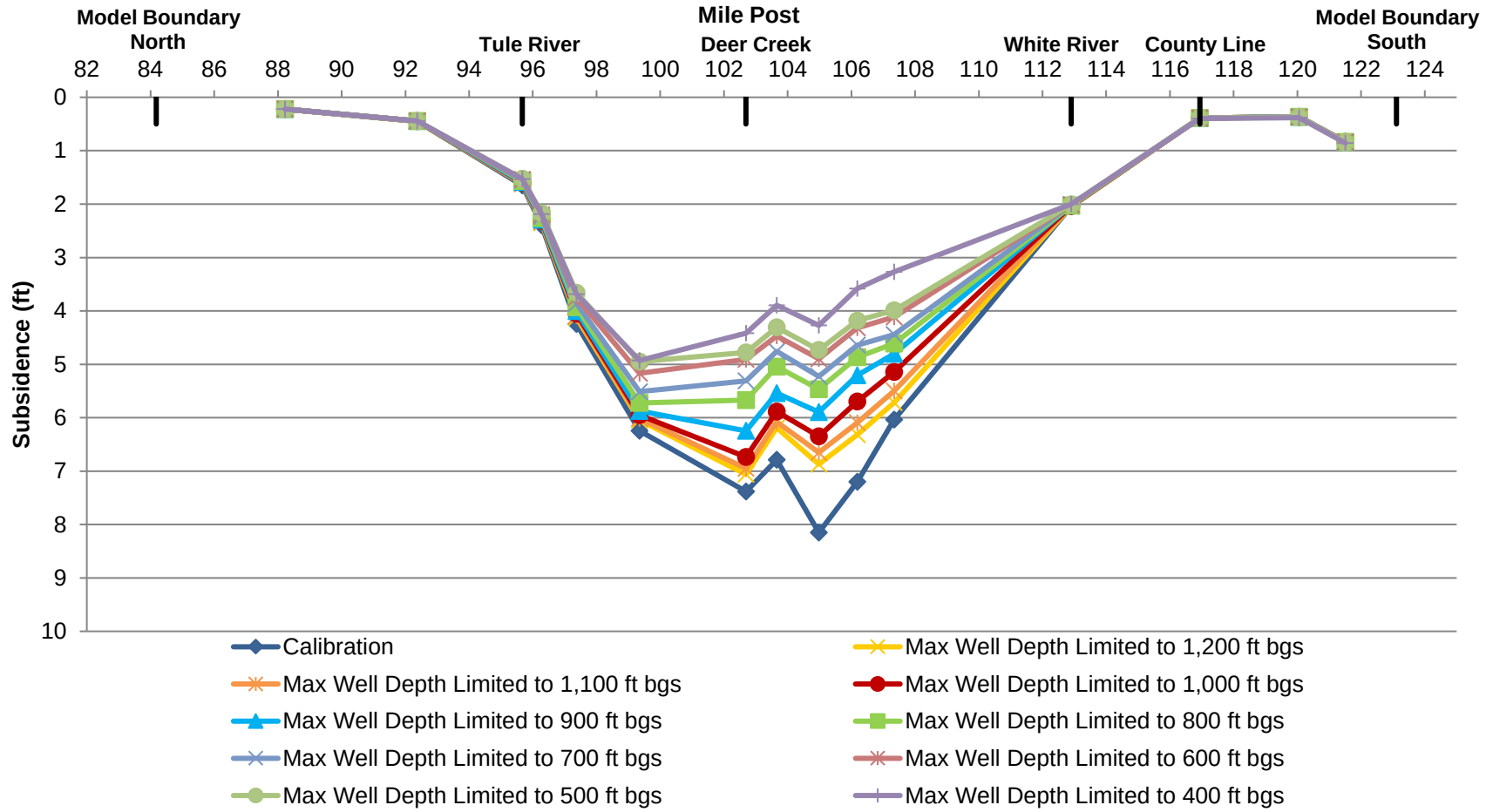
Model Simulations of Potential Future Land Subsidence Along the Friant-Kern Canal for the Most Effective Water Budget Zone Combination



*The data shown are for October 2019 through September 2040. 10-Yr Ramp Down 0.37 CU; DEID Capped at 2017 CU.

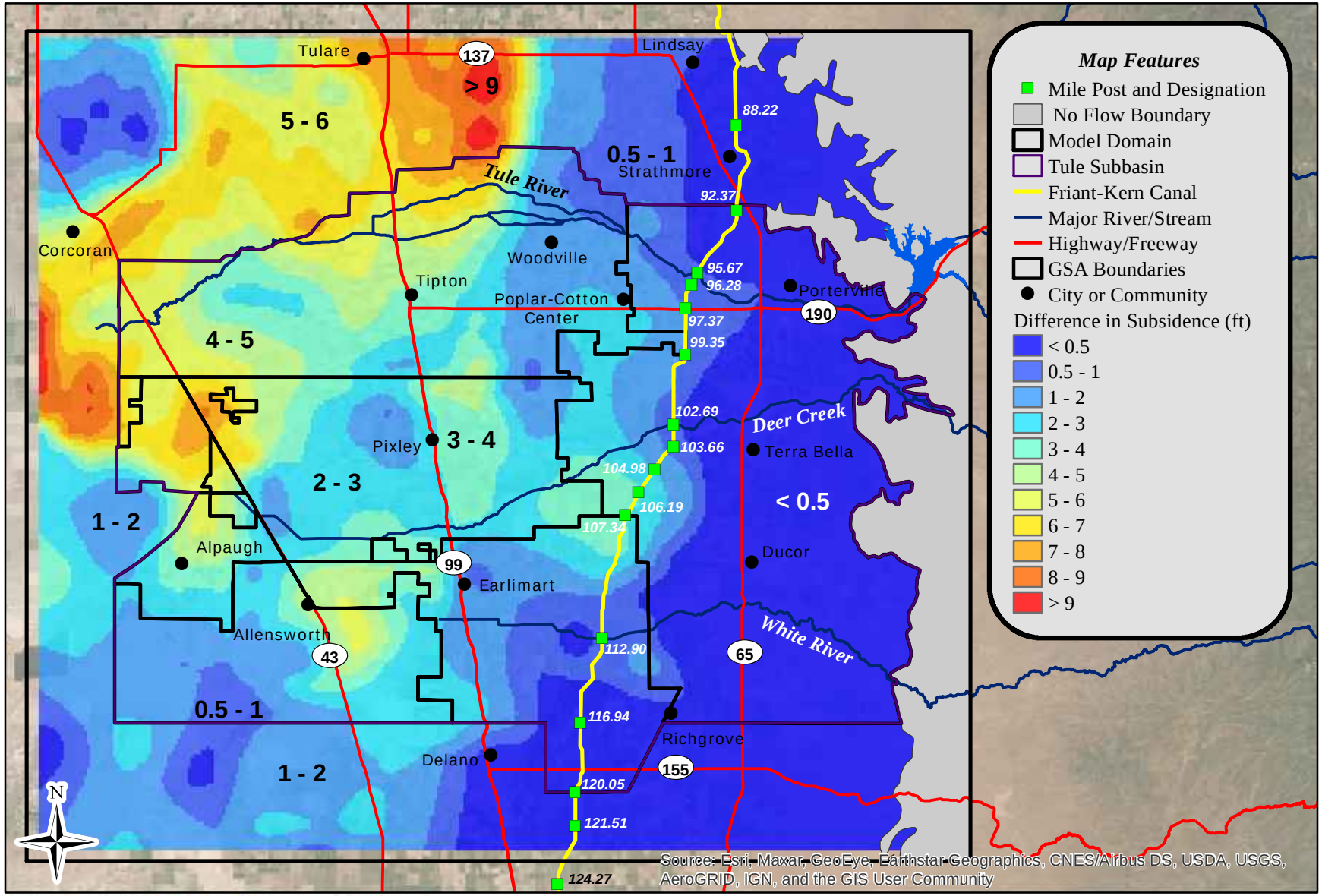
Figure 17

Model-Simulations of Land Subsidence at Friant-Kern Canal with Progressively Shallower Pumping Depths



*October 1986 through September 2017

Eastern Tule GSA



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0 2.5 5 10
Miles

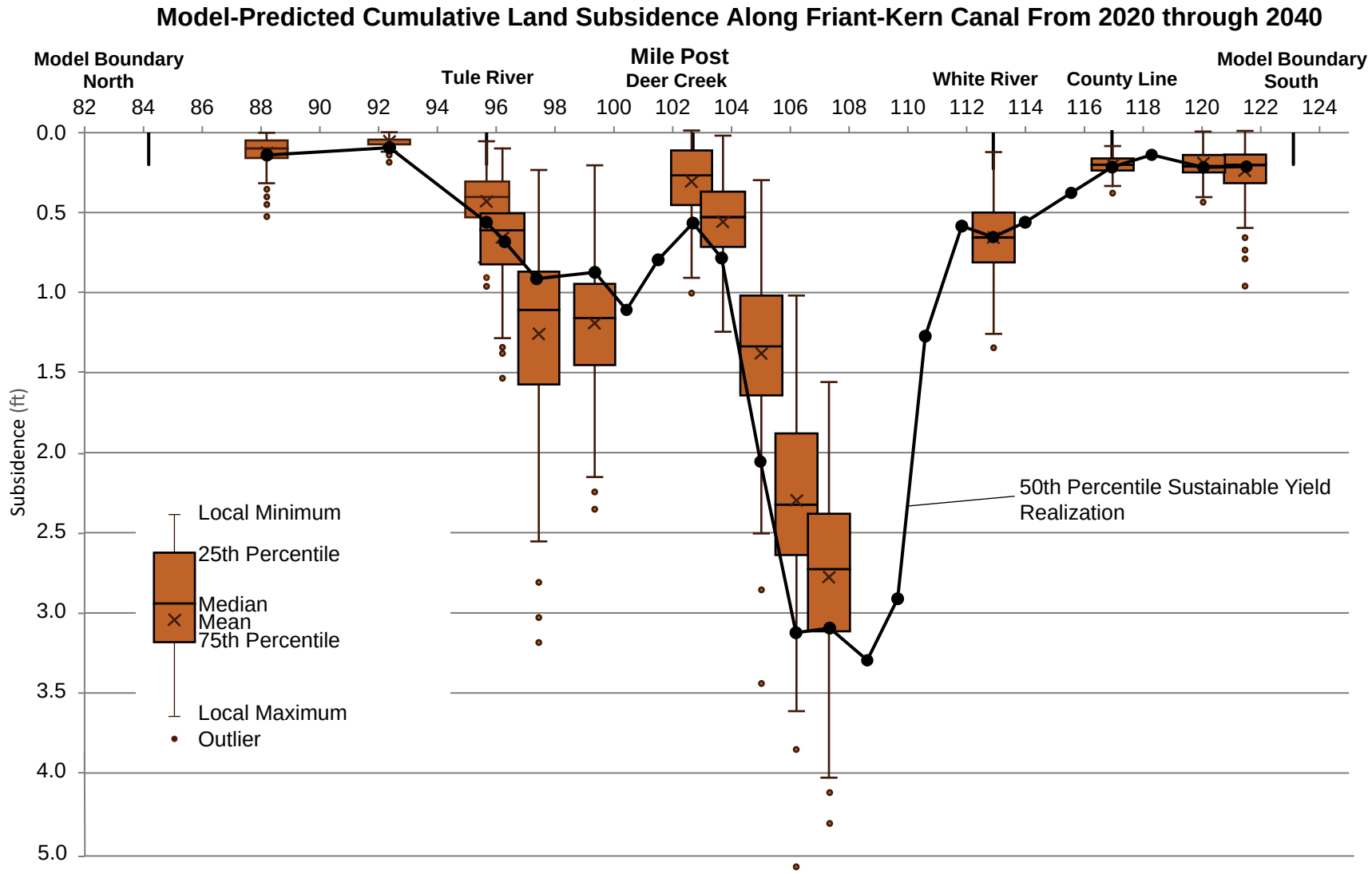
NAD 83 State Plane Zone 4

Note: This map shows the difference in subsidence from September 30, 2019 to September 30, 2039.

Cumulative Land Subsidence in the Tule Subbasin from 2020 to 2040

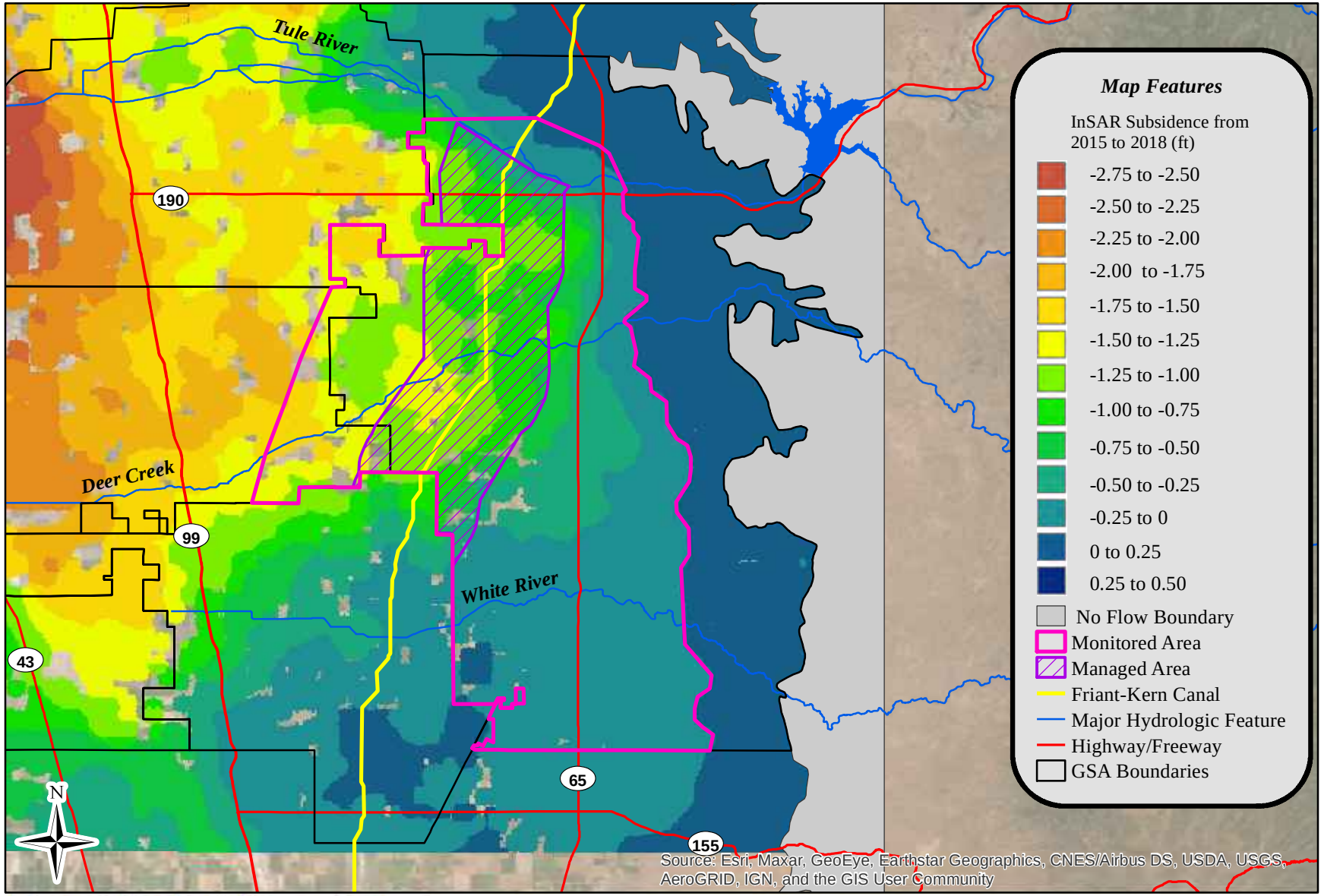
Figure 18

Figure 19


Model-Predicted Cumulative Land Subsidence Along Friant-Kern Canal From 2020 through 2040
Model Boundary North
Tule River
Mile Post
Deer Creek
White River
County Line
Model Boundary South
82
84
86
88
90
92
94
96
98
100
102
104
106
108
110
112
114
116
118
120
122
124
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
5.0
Subsidence (ft)
Local Minimum
25th Percentile
Median
Mean
75th Percentile
Local Maximum
Outlier
50th Percentile Sustainable Yield Realization

Eastern Tule GSA

Land Subsidence Monitoring Plan
September 2021



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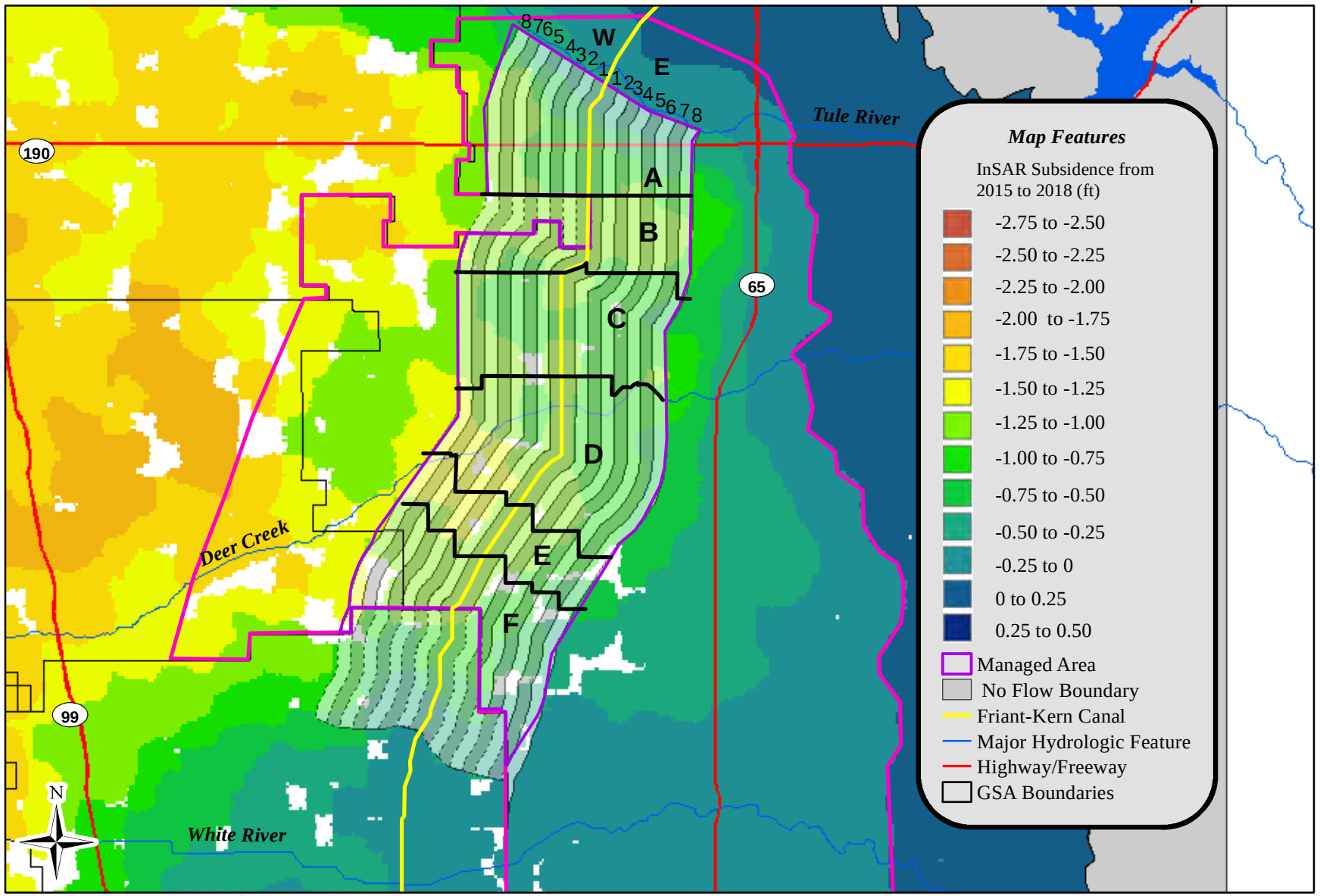
0 1 2 4 6 8 Miles

NAD 83 State Plane Zone 4

Land Subsidence Monitored and Managed Areas

Figure 20

Eastern Tule GSA



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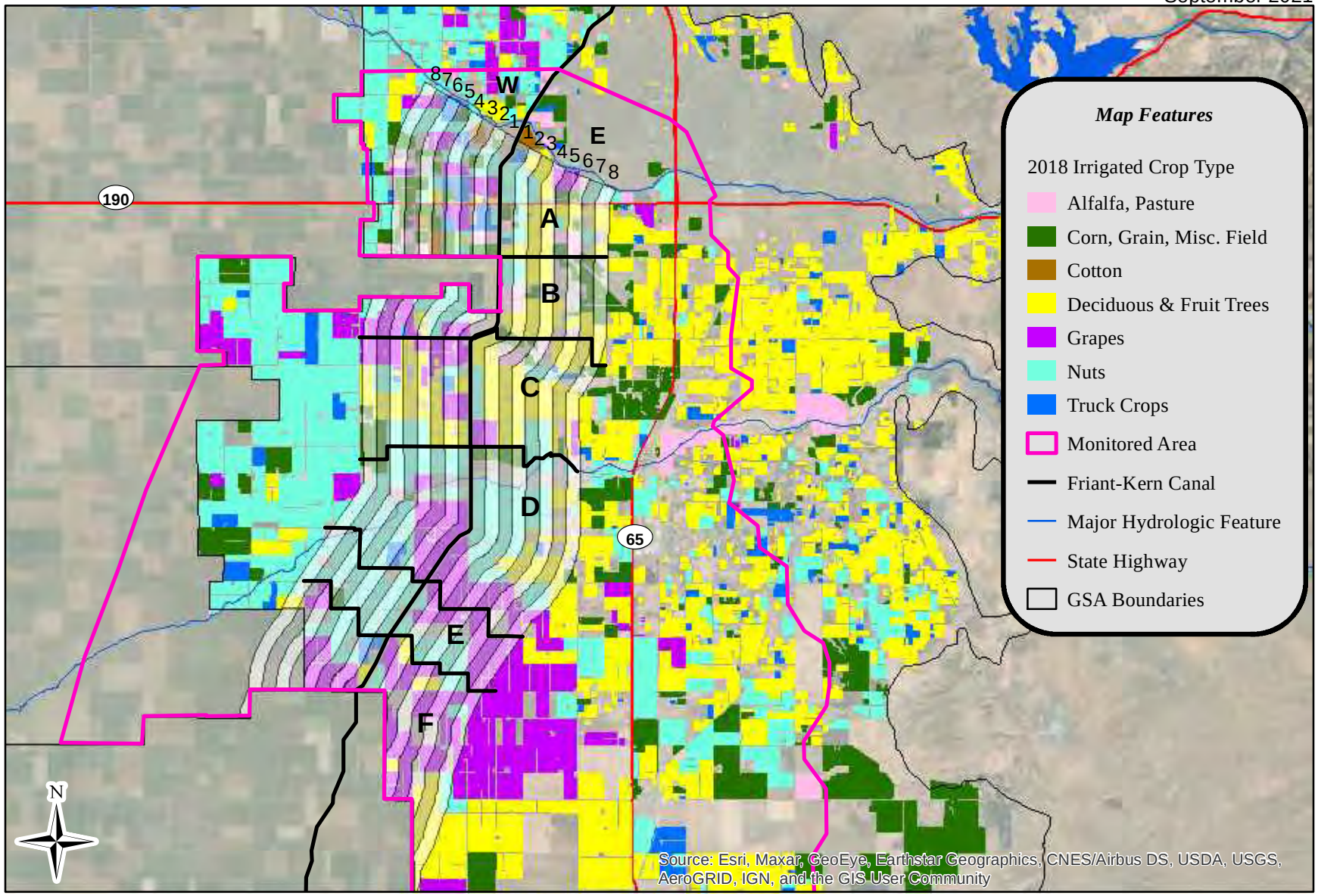
0 0.5 1 2 3 4 Miles

NAD 83 State Plane Zone 4

Land Subsidence Managed Area with Management Subzones

Figure 21

Eastern Tule GSA



NAD 83 State Plane Zone 4

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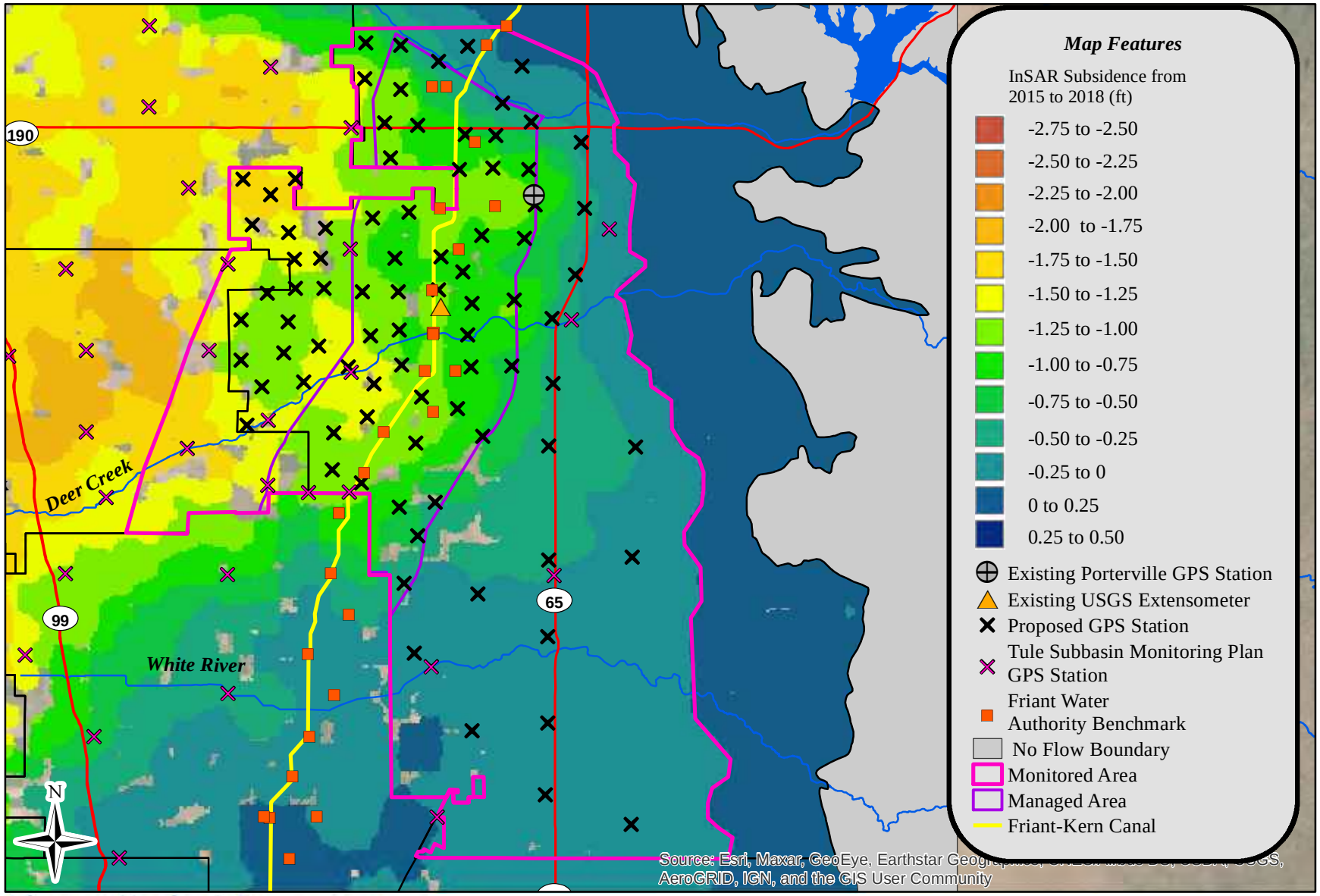
Irrigated Crops in the Eastern Tule GSA in 2018

Figure 22

Eastern Tule GSA



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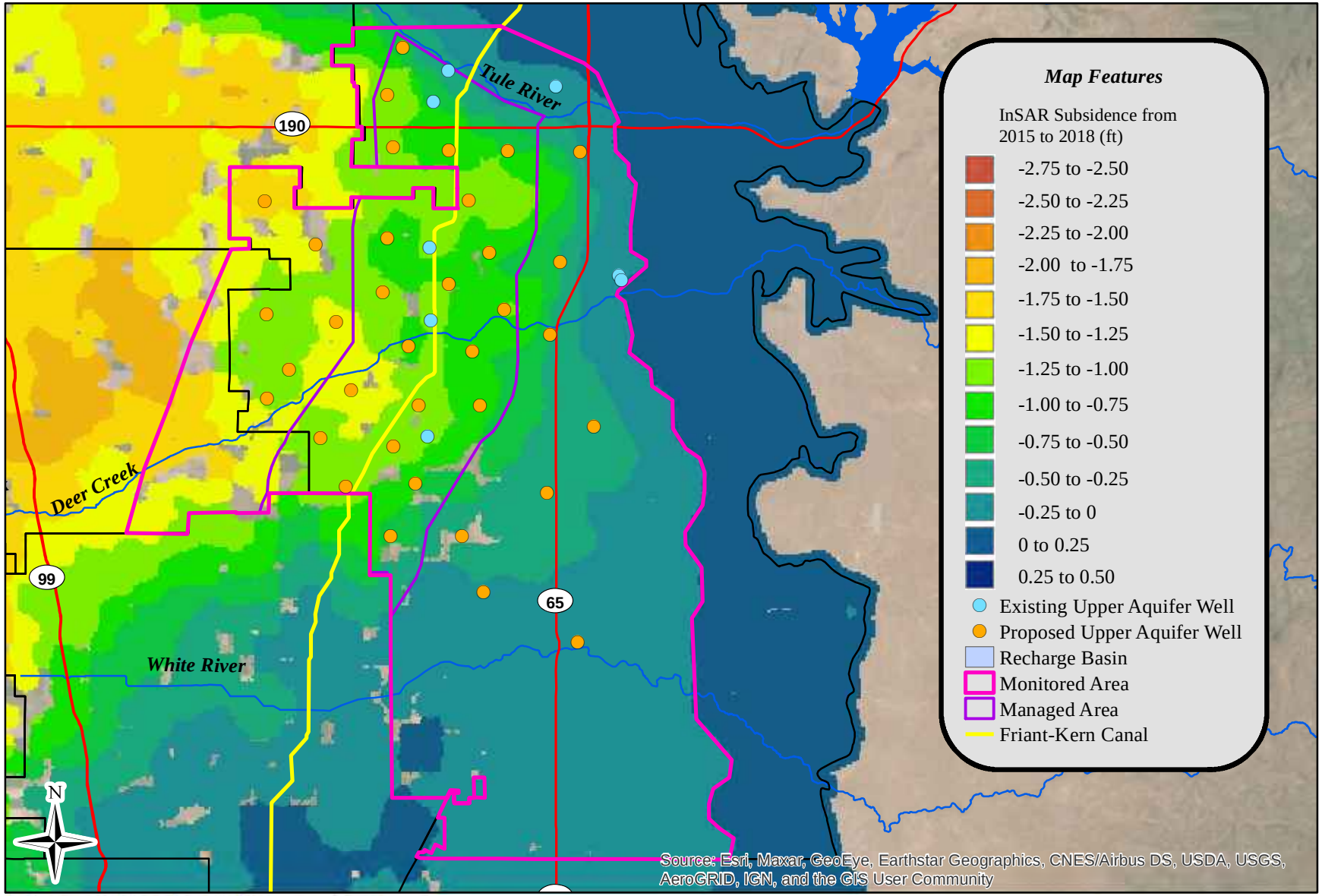
0 0.5 1 2 3 4 5 6 7 8 Miles

NAD 83 State Plane Zone 4

ETGSA Enhanced Land Elevation Subsidence Monitoring Network

Figure 23

Eastern Tule GSA



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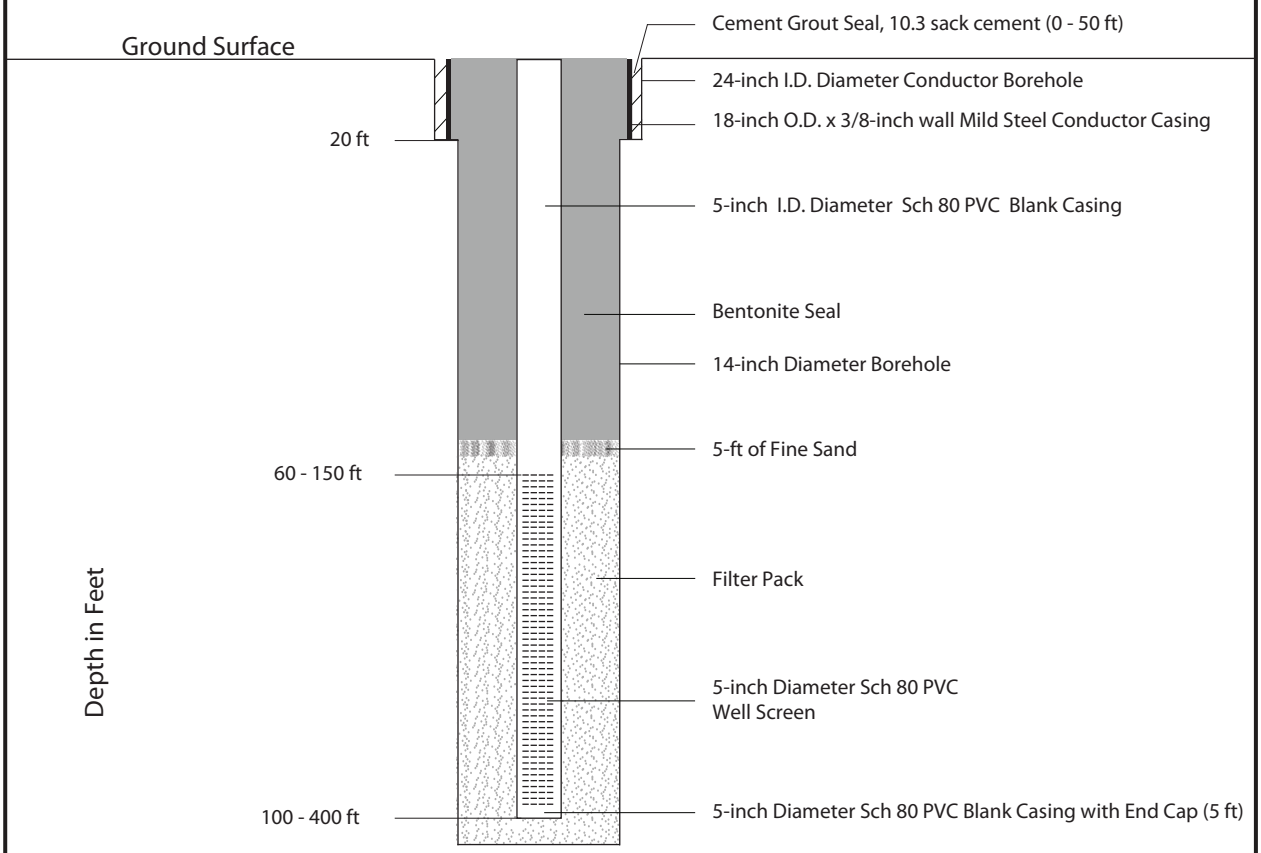
NAD 83 State Plane Zone 4

Groundwater Monitoring Network
Upper Aquifer Wells

Figure 24



Note:
1. Not to Scale.
2. Centralizers to be placed every 60 ft in screened sections only.
3. Casing to include at least one compression section.

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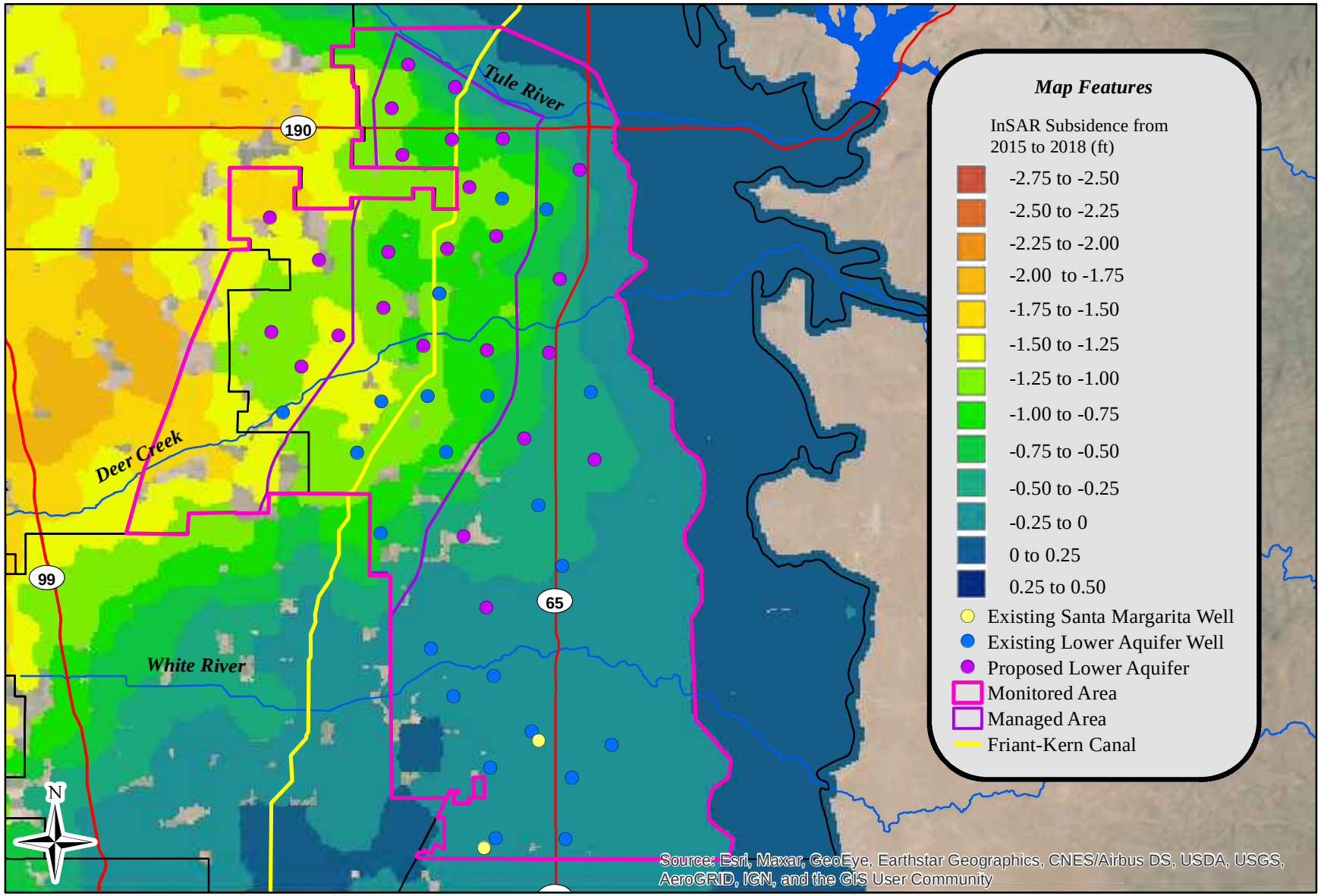
Conceptual Upper Aquifer Well Construction Diagram
Figure 25

Eastern Tule GSA



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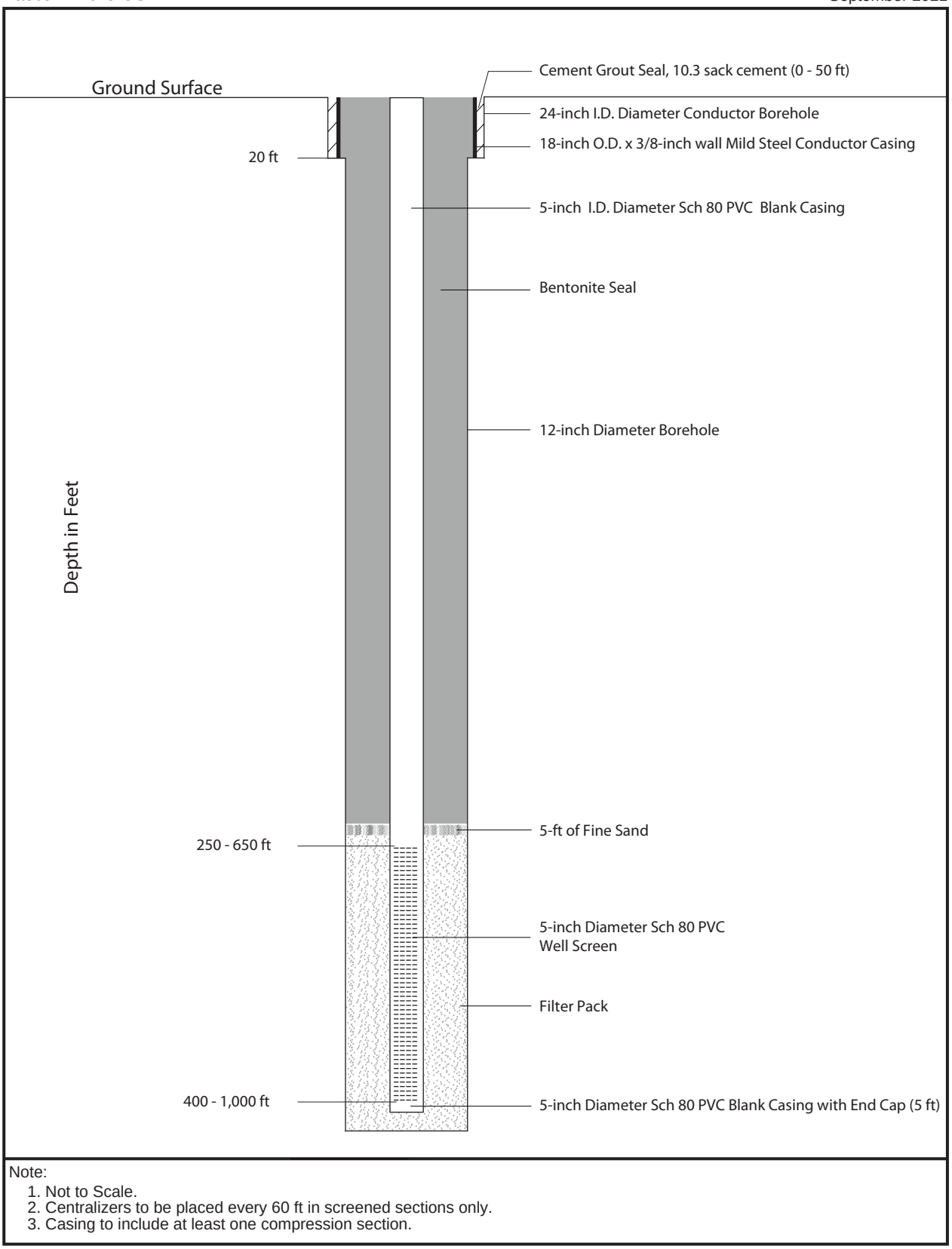
NAD 83 State Plane Zone 4

Groundwater Monitoring Network
Lower Aquifer Wells

Figure 26



Note:
1. Not to Scale.
2. Centralizers to be placed every 60 ft in screened sections only.
3. Casing to include at least one compression section.

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Conceptual Lower Aquifer Well Construction Diagram
Figure 27

Tables

Annual and Cumulative Land Subsidence
ETGSA Land Subsidence Managed Area

Management Zone[1]		2020 Annual Land Subsidence[2] (ft)	Cumulative Land Subsidence[2] (ft)	Management Action
North-South	East-West			
A	1 E	0.16	0.16	TBD[3]
A	2 E	0.16	0.16	TBD
A	3 E	0.14	0.14	TBD
A	4 E	0.16	0.16	TBD
A	5 E	0.13	0.13	TBD
A	6 E	0.11	0.11	TBD
A	7 E	0.14	0.14	TBD
A	8 E	0.11	0.11	TBD
A	1 W	0.17	0.17	TBD
A	2 W	0.18	0.18	TBD
A	3 W	0.17	0.17	TBD
A	4 W	0.18	0.18	TBD
A	5 W	0.19	0.19	TBD
A	6 W	0.19	0.19	TBD
A	7 W	0.19	0.19	TBD
A	8 W	0.21	0.21	TBD
B	1 E	0.24	0.24	TBD
B	2 E	0.21	0.21	TBD
B	3 E	0.21	0.21	TBD
B	4 E	0.23	0.23	TBD
B	5 E	0.21	0.21	TBD
B	6 E	0.24	0.24	TBD
B	7 E	0.23	0.23	TBD
B	8 E	0.19	0.19	TBD
B	1 W	0.24	0.24	TBD
B	2 W	0.23	0.23	TBD
B	3 W	0.21	0.21	TBD
B	4 W	0.21	0.21	TBD
B	5 W	0.21	0.21	TBD
B	6 W	0.21	0.21	TBD
B	7 W	0.23	0.23	TBD
B	8 W	0.27	0.27	TBD
C	1 E	0.27	0.27	TBD
C	2 E	0.26	0.26	TBD
C	3 E	0.29	0.29	TBD
C	4 E	0.27	0.27	TBD

Annual and Cumulative Land Subsidence
ETGSA Land Subsidence Managed Area

Management Zone[1]		2020 Annual Land Subsidence[2] (ft)	Cumulative Land Subsidence[2] (ft)	Management Action
North-South	East-West			
C	5 E	0.35	0.35	TBD
C	6 E	0.27	0.27	TBD
C	7 E	0.33	0.33	TBD
C	8 E	0.37	0.37	TBD
C	1 W	0.27	0.27	TBD
C	2 W	0.26	0.26	TBD
C	3 W	0.24	0.24	TBD
C	4 W	0.26	0.26	TBD
C	5 W	0.25	0.25	TBD
C	6 W	0.29	0.29	TBD
C	7 W	0.30	0.30	TBD
C	8 W	0.31	0.31	TBD
D	1 E	0.38	0.38	TBD
D	2 E	0.35	0.35	TBD
D	3 E	0.34	0.34	TBD
D	4 E	0.34	0.34	TBD
D	5 E	0.33	0.33	TBD
D	6 E	0.33	0.33	TBD
D	7 E	0.33	0.33	TBD
D	8 E	0.31	0.31	TBD
D	1 W	0.40	0.40	TBD
D	2 W	0.35	0.35	TBD
D	3 W	0.33	0.33	TBD
D	4 W	0.38	0.38	TBD
D	5 W	0.39	0.39	TBD
D	6 W	0.38	0.38	TBD
D	7 W	0.42	0.42	TBD
D	8 W	0.46	0.46	TBD
E	1 E	0.38	0.38	TBD
E	2 E	0.39	0.39	TBD
E	3 E	0.35	0.35	TBD
E	4 E	0.35	0.35	TBD
E	5 E	0.34	0.34	TBD
E	6 E	0.30	0.30	TBD
E	7 E	0.33	0.33	TBD
E	8 E	0.30	0.30	TBD

Annual and Cumulative Land Subsidence
ETGSA Land Subsidence Managed Area

Management Zone[1]		2020 Annual Land Subsidence[2] (ft)	Cumulative Land Subsidence[2] (ft)	Management Action
North-South	East-West			
E	1 W	0.41	0.41	TBD
E	2 W	0.38	0.38	TBD
E	3 W	0.41	0.41	TBD
E	4 W	0.42	0.42	TBD
E	5 W	0.40	0.40	TBD
E	6 W	0.43	0.43	TBD
E	7 W	0.47	0.47	TBD
E	8 W	0.45	0.45	TBD
F	1 E	0.31	0.31	TBD
F	2 E	0.33	0.33	TBD
F	3 E	0.27	0.27	TBD
F	4 E	0.27	0.27	TBD
F	5 E	0.28	0.28	TBD
F	6 E	N/A[3]	N/A[3]	N/A[4]
F	7 E	0.24	0.24	TBD
F	8 E	0.24	0.24	TBD
F	1 W	0.32	0.32	TBD
F	2 W	0.32	0.32	TBD
F	3 W	0.35	0.35	TBD
F	4 W	0.33	0.33	TBD
F	5 W	0.35	0.35	TBD
F	6 W	0.37	0.37	TBD
F	7 W	0.39	0.39	TBD
F	8 W	0.35	0.35	TBD

Notes:

[1] See Figure 21 for Management Zone Locations.

[2] Land subsidence values based on InSAR data from January 2020 to October 2020. Values represent average subsidence within each Management Zone.

[3] To be determined.

Appendices

Appendix A

Groundwater Level Field Measurement Form

Field Groundwater Level Measurements

Well Name/ Number:	Checked By:
Project:	Field Personnel:

Well Name/Owner	Date	Time	Reference Point Elevation (ft)	Depth To Groundwater (ft)	Groundwater Elevation (ft)	Instrument Type

Appendix B

Chalk/Tape Groundwater Level Measurement

Sheet ______ of ________

Chalk/Tape Groundwater Level Measurements

Recorded By:

A	B	C	D	E	F	G	H
Well Name/Owner	Date	Time	Reference Point Elevation (ft)	Tape Measurement at Reference Point	Chalk Measurement	Depth To Groundwater (ft) (E - F)	Groundwater Elevation (ft) (D - G)

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EASTERN TULE GROUNDWATER SUSTAINABILITY AGENCY

LAND SUBSIDENCE MANAGEMENT PLAN

Purpose

The purpose of this document is to set forth policies and concepts the Eastern Tule GSA plans to implement as a result of subsidence impacts along the Friant Kern Canal. This policy document shall be used as a tool and guideline to adopt amendments to the ETGSA's Groundwater Sustainability Plan, the Rules and Regulations, and any other legal documents necessary to implement the ideas and concepts set forth herein.

Land Subsidence Management Area

The Land Subsidence Management Area shall include the following lands identified on the attached Exhibit A.

Management Action Criteria

The ETGSA Management Area has been divided into both east-west and north-south Management Areas centered on the FKC between the Tule River and ETGSA boundary with Delano-Earlimart Irrigation District (See Figure 20 of the Land Subsidence Monitoring Plan). There are four, ½ - mile east-west zones on each side of the FKC (8 total). There are six north-south zones. Thus, there are 48 total Management Zones within the Management Area.

Section 7.2.3.1 of the GSP specifically contemplates that ETGSA will refine the sustainable management criteria and management actions associated with the Management Area.

Management actions will be required within any given Management Zone within the Management Area in accordance with the tiered land subsidence action criteria specified in this section. The action criterion for each Tier is the range of additional land subsidence that occurs after January 2020 in any given Management Zone relative to the land elevation measured in that Zone in January 2020.

Extraction of the groundwater restricted in the Tier's below does not apply to Sustainable Yield as defined in the ETGSA's Rules and Regulations and does not apply to surface water recharged or banked in the underground, including transfers (and resulting surface water credits) of any such water. In addition, the Land Subsidence Management Plan does not currently implement recommended management actions for domestic wells. Furthermore, parcels within a

Management Zone without any groundwater extraction are not subject to any of the below management actions.

Immediate Actions for Plan Irrespective of Level of Subsidence

Land Subsidence Monitoring Program

- Expand existing Land Subsidence Monitoring Program to include additional benchmarks, monitored quarterly, to identify rates of subsidence
- Develop Existing Well Database for the Management Area, with location and information on each well.

Projects

- Infrastructure projects to supply surface water to areas with limited access.
- Construction of Aquifer Storage and Recovery (ASR) wells to allow for storage and recovery of water.
- Purchasing easements for a set aside program (short term or long term).
- In Lieu Program Option (*Water Code* § 10726.2(b)):
    - Parcels receiving, or with the possibility of receiving, surface water could develop programs with relevant surface water entities to receive either surface water, or groundwater from other areas, to be delivered to said lands.
- Land Repurposing Program
    - Develop conservation easements, either between the landowner and GSA or other groups. (*Water Code* § 10726.2(a).)
    - Partner with local groups to further develop Land Fallowing Program and apply for grant funds.

Project Funding

- Transitional Water Penalty Revenue
- Grant Funding

Projects, opportunities, and allocation of funding would be evaluated and recommended by an ETGSA Committee assigned to review and allocate transitional water funds received. At a minimum, penalty revenue collected from within the Management Area will be allocated for the potential projects within the Management Area.

Outreach

- Provide outreach workshops to landowners within the Management Area.

Subbasin

- Continue to monitor and evaluate subbasin contributions to land subsidence.

Extractions Outside the Management Area

- Encourage voluntary pumping of all water outside the Management Area (e.g. some land owners can pump from areas of their property that are adjacent but outside the Management Area to supply irrigation demands within the Management Area).

Tier 1: Land Subsidence Between 0 ft and 1.49 ft

- Propose revisions to ETGSA Recharge and Banking Policies to limit pumping from ASR or groundwater banking/recharge projects to the volume of water recharged minus an established leave behind. Pumping of recharged water outside of irrigation/water districts would be limited to 90 percent of water so recharged (e.g. 10 percent "leave behind").

Tier 2: Land Subsidence Between 1.50 ft and 2.00 ft

All actions in Tier 1 apply plus the following additional management actions:

- Limit extractions within the Management Area to 60%* of available Tier 1 Penalty Allocation. (*Water Code* § 10726.4(a)(2).) Any wells implementing pumping of any water 600 ft below land surface will require a meter and reporting of the data monthly to the ETGSA staff, and subject to meter specifications as defined in the ETGSA Rules and Regulations.
- The remaining 40% of Tier 1 Penalty Allocation is available to be extracted or transferred outside of the Management Area, provided such use and transfer is otherwise consistent with the ETGSA Rules and Regulations.

Tier 3: Land Subsidence Between 2.00 ft and 2.49 ft

All actions in Tier 1 and Tier 2 apply plus the following additional management actions:

- Limit extractions within the Management Area to 30%* of available Tier 1 Penalty Allocation. (*Water Code* § 10726.4(a)(2).) Any wells implementing pumping of any water 600 ft below land surface will require a meter and reporting

of the data monthly to the ETGSA staff, and subject to meter specifications as defined in the ETGSA Rules and Regulations.

- The remaining 70% of Tier 1 Penalty Allocation is available to be extracted and or transferred outside of the Management Area, provided such use and transfer is otherwise consistent with the ETGSA Rules and Regulations.

Tier 4: Land Subsidence Between 2.50 ft and 2.99 ft

All actions in Tiers 1 through Tier 3 apply plus the following additional management actions:

- No extraction of Tier 1 Penalty Allocation within the Management Area. (*Water Code* § 10726.4(a)(4).) Extraction of Tier 1 can occur in the Management Area if analyses and data are provided to demonstrate that it will not result in additional land subsidence.

Initial land elevations for each of the 48 Management Zones and the basis for those measurements are provided in Table 2. Changes in land elevation within each Management Zone will be evaluated and interpolated on an annual basis based on measurements recorded at established benchmarks and, if available, analysis of InSAR data. Change in land surface elevation throughout the Management Area will be documented in the LSMP annual report (see Section 8 of the Land Subsidence Monitoring Plan) and submitted to the Land Subsidence Monitoring Committee (see Section 7 of the Land Subsidence Monitoring Plan) for review and comment. If the cumulative land subsidence average within a Management Zone exceeds the criterion of its current Tier, the Land Subsidence Monitoring Committee will recommend to the ETGSA Board that the next higher Tier go into effect in the Management Area, effective October 1 of that year.

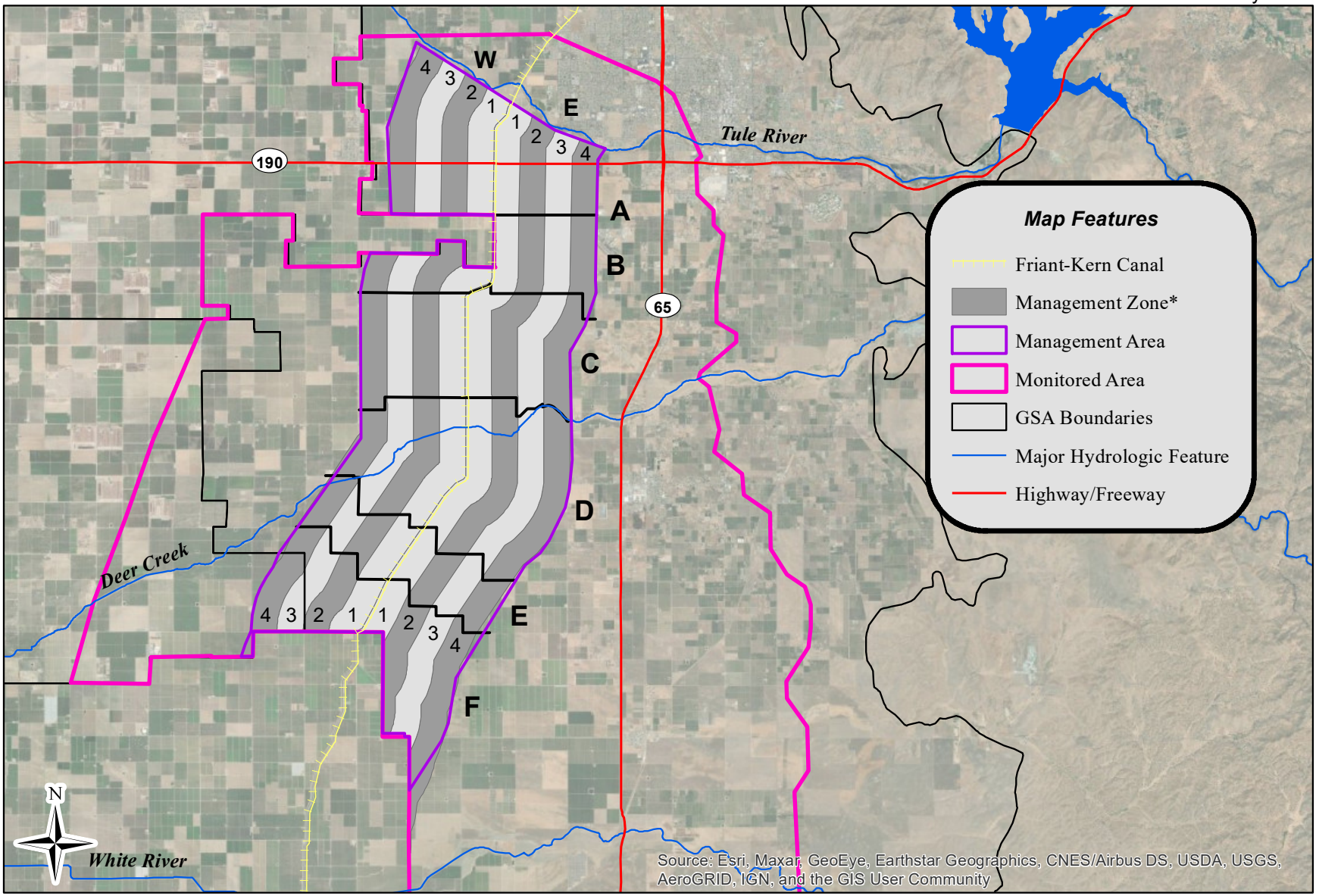
As land subsidence has been observed throughout the entire Management Zones since 2020 (see Figures 3 and 7 of the Land Subsidence Monitoring Plan), Tier 1 management actions initially apply to all Management Zones.

**As additional data becomes available and as projects, monitoring, and management actions are implemented, the groundwater flow model used to estimate the percentage reduction of Tier 1 extractions within the Management Area may be adjusted to reflect new data.*

Land Subsidence Management Plan

February 2022

Eastern Tule GSA



Thomas Harder & Co.
Groundwater Consulting

0 0.5 1 2 3 4 Miles

NAD 83 State Plane Zone 4

*Management Zones are conceptual until finalization of the Land Subsidence Management Plan.

Land Subsidence Management Area with Management Zones

Exhibit A

Section 8. Notices and Communication

Table of Contents

List of Tables

Appendices

8.1 Introduction

This Section describes or otherwise refers to documents and other materials that describe the Agency's notices and communication with stakeholders and interested parties with regards to the development and implementation of the GSP. The information provided here is intended to fulfill the requirements outlined in 23 CCR § 354.10, including a description of beneficial uses and users, a list of public meetings, how ETGSA has encouraged and will continue to encourage active involvement from its diverse stakeholder population, comments received on the plan and its development, and a summary of the Agency's responses to these comments.

8.2 Beneficial Uses, Users, Other Agency Stakeholders and Agency Communication *[23 CCR § 354.10(a), (d)]*

23 Cal. Code Regs. § 354.10 Notice and Communication. *Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:*

(a) *A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties.*

(d) *A communication section of the Plan that includes the following:*

(1) *An explanation of the Agency's decision-making process.*

(2) *Identification of opportunities for public engagement and a discussion of how public input and response will be used.*

(3) *A description of how the Agency encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.*

(4) *The method the Agency shall follow to inform the public about progress implementing the Plan, including the status of projects and actions.*

An explanation of the Agency's decision-making process, identification of opportunities for public engagement and discussion of how public input will be considered, a description of how the Agency has encouraged the active involvement of diverse social, cultural, and economic elements of the population within its jurisdiction, and the methods by which the Agency has and will continue to inform the public regarding progress on Plan implementation are described in the Agency's Communication and Engagement Plan (hereafter, "C&E Plan"), which is included as **Appendix 8-A: ETGSA Communication and Engagement Plan**.

A description of the various beneficial uses and users of groundwater, including those interests that might be affected using groundwater in the basin, and types of parties representing these interests, can be found in Section 2 of the C&E Plan. The nature of consultation with those parties is also described throughout the C&E Plan

The C&E Plan was developed with stakeholder involvement and adopted by the Board of Directors on October 4, 2018. Its contents should be considered living, and the ETGSA will continue to update its assessments and approaches over time as necessary.

8.3 Notices, Outreach, and Public Meetings *[23 CCR § 354.10(b)]*

23 Cal. Code Regs. § 354.10 Notice and Communication. *Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:*

(b) *A list of public meetings at which the Plan was discussed or considered by the Agency.*

The Agency meets in Public regularly per the following schedule each month, noticed per Brown Act requirements.

- Board of Directors: First Thursday each month
- Stakeholder Committee: Second Thursday each month
- Executive Committee: Third Thursday each month
- Finance Committee: First Thursday each month

Additionally,, the ETGSA website (www.etgsa.com) is updated consistently to include copies of agendas, meeting notices, meeting minutes, and presentations discussed.

A list of each public meetings held by ETGSA wherein which the Plan was discussed or considered, as well as a non-exhaustive chronological timeline highlighting various notices, meetings, outreach events, and other activities undertaken by the Agency so as to consult with or otherwise engage the wide variety of interests potentially affected by this GSP prior to its adoption can be found in **Appendix 8-A: ETGSA Communication and Engagement Plan**. Outreach efforts and events hosted or attended by representatives of the ETGSA occurring after the adopting of the ETGSA Communication and Engagement Plan is listed below.

November 2018: Bilingual ETGSA Factsheet

- Provided to Self Help Enterprises. Community Water Center, and others.

November 2018: Outreach Email

- Sent to TBWQC Members to encourage ETGSA involvement.

December 2018: ETGSA Involvement Survey

- January 2019 – Bilingual Stakeholder Survey Mailer to al unique APN owners with the ETGSA

December 2018: Outreach Presentations

- Pioneer Water Company,
- Porterville Irrigation District,
- Tea Pot Dome Water District,
- Vandalia Water District

February 2019: Stakeholder Survey Mailer

October 20, 2019: Attended CWC Ducor Community Draft GSP Workshop

October 30, 2019: Attended CWC East Porterville Draft GSP Workshop

November 13, 2019: Hosted GSP Draft Workshop at Porterville College

November 14, 2019: Presentation of Draft GSP to Exchange Club of Porterville

On September 16, 2019, pursuant to *Water Code* § 10728.4, ETGSA provided written notice of its December 16, 2019 public hearing on the adoption of its GSP to both the County of Tulare and the City of Porterville. Also, on September 16, 2019, ETGSA issued a notice of the hearing to the public. The notice was sent to all persons on the interested parties list.

In addition, though not required by SGMA, notice of the December 16, 2019 public hearing on GSP adoption was published in the following newspapers: _____.

Consistent with the prescriptions of 23 Cal. Code Regs. § 353.6(a), a copy of the entire draft GSP was made available on ETGSA's website.

Following these notice procedures, ETGSA received numerous written comments on the draft GSP. In addition, at the public hearing on GSP adoption held on December 16, 2019, the Board heard oral comments presented concerning the GSP.

Table 8-1: Requirements of Statues and Regulations Regarding GSA and GSP Development describes the various requirements pertaining to GSA and GSP-related notices and communications, and how these have been addressed and fulfilled by ETGSA.

Table 8-1: Requirements of Statues and Regulations Regarding GSA and GSP Development

Requirement	Requirement Section Reference	ETGSA Fulfillment	Comments
Publish notice pursuant to Section 6066 of the Government Code prior to a public hearing to decide to become a GSA	SGMA Section 10723(b)	See Appendix 2-C, which includes as an attachment the public notice provided.	n/a
Hold a public hearing to decide to become a GSA	SGMA Section 10723(b)	Public hearing was held on February 23, 2017.	
Provide notice to DWR regarding the agency's election to become a GSA, including service area boundaries, resolutions, bylaws, and list of interested parties and description of how such interests will be considered	SGMA Section 10723.8	See Appendix 2-C; See Appendix 2-H	n/a
Consideration of all interests of all beneficial uses and users of groundwater	SGMA Section 10723.2	See Appendix 2-C; See C&E Plan	n/a
Maintenance of an interested parties list	SGMA Section 10723.4	See Appendix 2-C, which describes ETGSA's maintenance of an interested parties list; Also described in Section 2.3 of the C&E Plan.	The ETGSA interested parties list has been continually updated since its inception; entities may request to be added online at ETGSA's website, at meetings, or by otherwise contacting the ETGSA.
Provide a written statement to the DWR and public describing how interested parties may participate in the development and implementation of the GSP	SGMA Section 10727.8	See Appendix 2-G; See C&E Plan	The ETGSA's Notice of Intent to Develop a GSP, which describes opportunities for participation, was provided to the Department on June 19, 2019. The notice is publicly posted on ETGSA's website, and available on DWR's website.
Encourage the active involvement of diverse social, cultural, and economic elements of the population within the groundwater basin	SGMA Section 10727.8(a)	See C&E Plan; See Appendix 8-C	n/a
Description of beneficial uses and users of groundwater	23 CCR § 354.10(a)	See C&E Plan (Section 2)	n/a
List of public meetings at which the GSP was discussed or considered	23 CCR § 354.10(b)	See Appendix 8-B	n/a
Comments regarding the GSP received by the Agency and summary of responses	23 CCR § 354.10©	See GSP Section 8.4 and Appendix 8-D	n/a
Explanation of the Agency's decision-making process	23 CCR § 354.10(d)(1)	See C&E Plan (Section 1.2)	n/a
Identification of opportunities for public engagement and how input and responses will be used	23 CCR § 354.10(d)(2)	See C&E Plan (Sections 2, 3, 4, 5, and 7)	n/a
Description of how the Agency encourages active involvement of diverse social, cultural, and economic, elements of the population within the Basin	23 CCR § 354.10(d)(3)	See Appendix 2-G; See C&E Plan	n/a
The method the Agency shall follow to inform the public about progress implementing the Plan, including status of projects and actions	23 CCR § 354.10(d)(4)	See C&E Plan (Section 5)	n/a
Provide notice to city and/or county prior to the public hearing on the Draft GSP	SGMA Section 10728.4	See Appendix 8-D for copies of the notices provided.	n/a
Adopt a GSP after public hearing	SGMA Section 10728.4	Public hearing regarding the adoption of the GSP was held on [to be completed]	n/a

8.4 Comments Received and Agency Responses *[23 CCR § 354.10(c)]*

23 Cal. Code Regs. § 354.10 Notice and Communication. *Each Plan shall include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following:*

(c) *Comments regarding the Plan received by the Agency and a summary of any responses by the Agency.*

Comments received by the Agency regarding the proposed GSP and a summary of responses provided by the Agency can be found in **Appendix 8-B: Comments Received by the ETGSA Regarding the Proposed GSP and Summary of the ETGSA's Responses.** As indicated in Appendix 8-B, all comments were taken into consideration. As further indicated in Appendix 8-B, a substantial number of comments generated responsive changes to the draft GSP.

Appendix 8-A: ETGSA Communication and Engagement Plan

Eastern Tule

Groundwater Sustainability Agency

Joint Powers Authority

Communication and Engagement Plan

Adopted: October 4, 2018

Prepared by:

Bryce McAteer

Executive Director

Eastern Tule Groundwater Sustainability Agency Joint Powers Authority

881 W. Morton Ave, Ste. D, Porterville, CA 93257

Agency Background:

Eastern Tule Groundwater Sustainability Agency Joint Powers Authority ("ETGSA", "Agency") is a Groundwater Sustainability Agency ("GSA") that was formed via Joint Powers Agreement on December 6th, 2016 pursuant the requirements of California's Sustainable Groundwater Management Act. The Agency was approved by the California Department of Water Resources to serve as an exclusive GSA on June 6th, 2017.

Eight member agencies form ETGSA (County of Tulare, City of Porterville, Kern-Tulare Water District, Porterville Irrigation District, Saucelito Irrigation District, Terra Bella Irrigation District, Tea Pot Dome Water District, Vandalia Water District). The Agency is governed by a 9-member Board of Directors.

ETGSA is charged with preparing and implementing a Groundwater Sustainability Plan ("GSP") across its 161,174 acre jurisdiction. The Agency is one of seven GSAs located within the Tule Subbasin (Bulletin 118, 5-22.13).

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ETGSA

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Prepared For:

Board of Directors

ETGSA

Disclaimer: This Communication and Engagement Plan is current as of the Adoption Date listed on the Cover Page, but is to be considered "Living" and is subject to continual update and review throughout the development, review, and implementation of ETGSA's GSP. Members of the Public and Interested Parties are encouraged to provide their feedback to improve this document across the planning and implementation horizon.

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Table of Contents