MADERA SUBBASIN

Sustainable Groundwater Management Act (SGMA)

Joint Groundwater Sustainability Plan

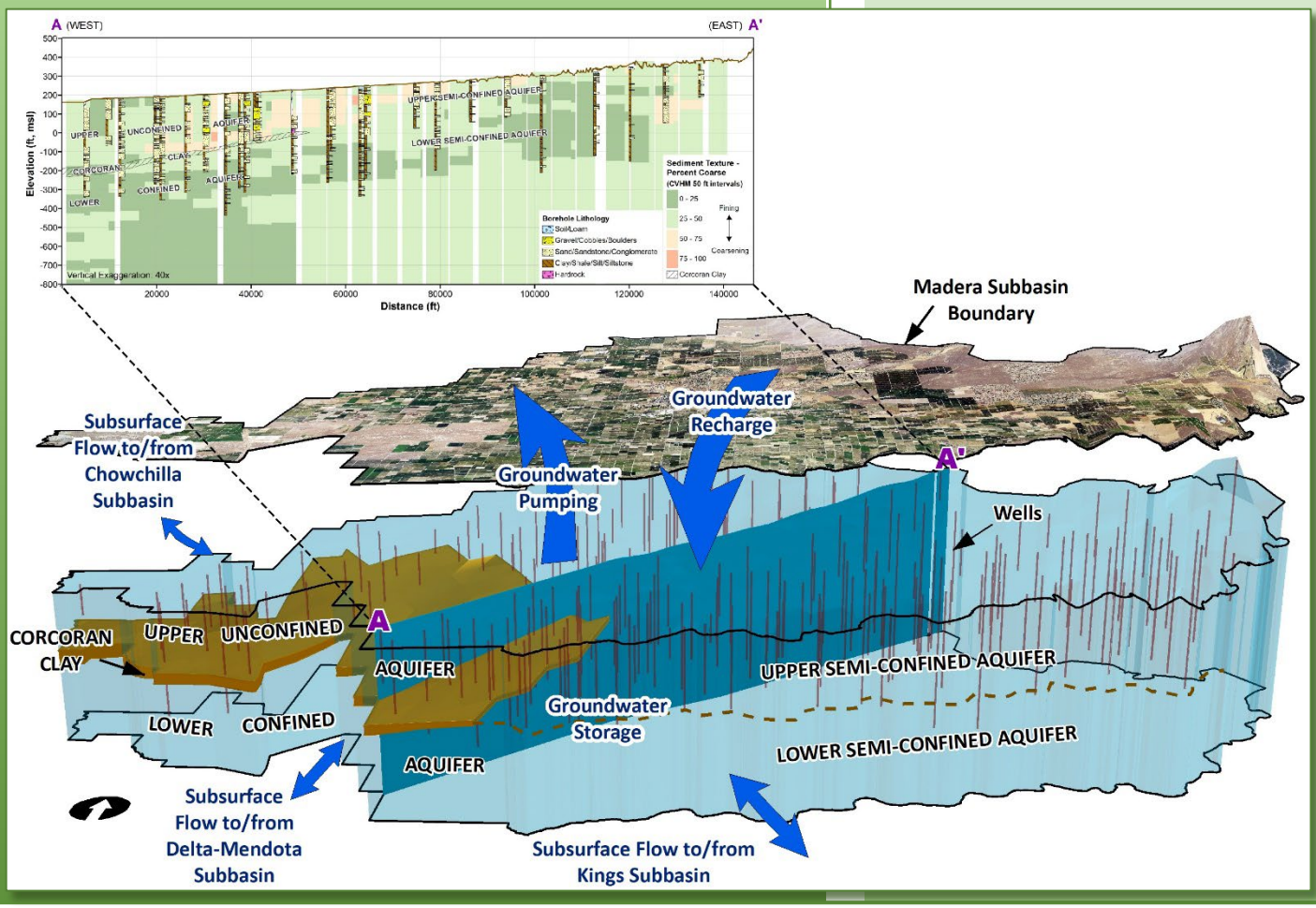
APPENDIX 3. SUSTAINABLE MANAGEMENT CRITERIA

Technical Appendices 3.A. through 3.L.

January 2020, Amended January 2025

Prepared by

Davids Engineering, Inc. (Amended GSP)
Luhdorff & Scalmanini (Amended GSP)
ERA Economics
Stillwater Sciences and
California State University, Sacramento



Madera Subbasin

Sustainable Groundwater Management Act

Joint Groundwater Sustainability Plan

Technical Appendices 3.A. through 3.L.

January 2020

Amended January 2025

Prepared For

Madera Subbasin Coordination Committee

Prepared By

Davids Engineering, Inc. (Amended GSP Team)
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ERA Economics
Stillwater Sciences and
California State University, Sacramento

APPENDIX 3. SUSTAINABLE MANAGEMENT CRITERIA

3.A. Measurable Objectives and Minimum Thresholds for Groundwater Levels.

3.B. Measurable Objectives and Minimum Thresholds for Groundwater Quality.

3.C. Economic Impacts of Accelerated Demand Reduction Program.

3.D. Economic Analysis and Framework for the Domestic Well Mitigation Program.

3.E. Madera Subbasin Domestic Well Mitigation Program Draft Memorandum of Understanding.

3.F. Emergency Tank Water Program Flyer.

3.G. Madera Subbasin Infrastructure Sensitivity Assessment.

3.H. Subsidence Data Gaps Workplan.

3.I. Interconnected Surface Water Updates.

- 3.I.a. Interconnected Surface Water Data Gaps Workplan.
- 3.I.b. Memorandum of Understanding Establishing an Interconnected Surface Water Working Group.

3.J. Supplemental Monitoring Networks.

3.K. Madera Subbasin Joint GSP First Periodic Update – Groundwater Level Representative Monitoring Site (RMS) Network Update.

3.L. Madera Subbasin Joint GSP First Periodic Update – Groundwater Quality Representative Monitoring Site (RMS) Network Update.

APPENDIX 3.A. MEASURABLE OBJECTIVES AND MINIMUM THRESHOLDS FOR GROUNDWATER LEVELS

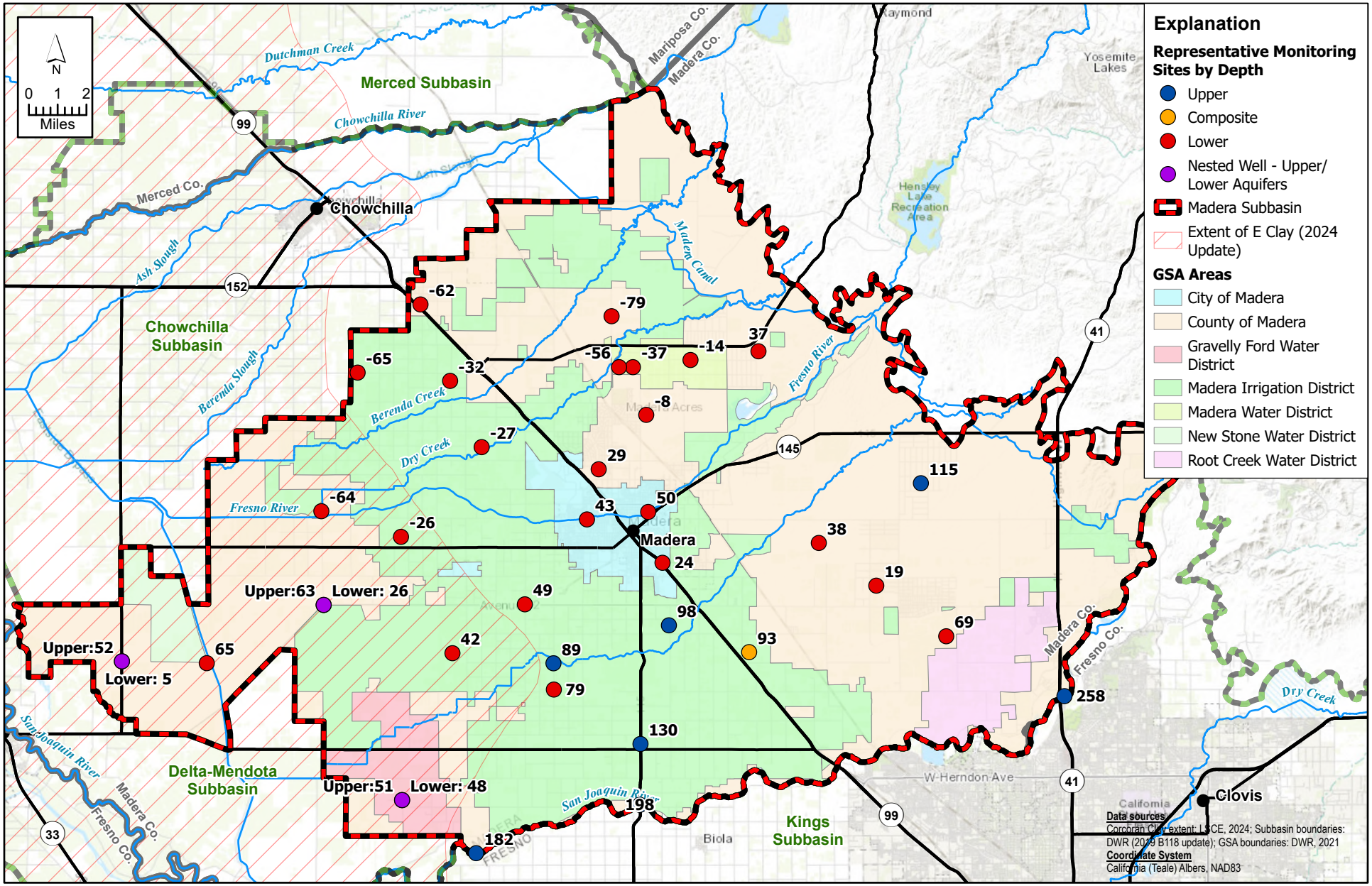
Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Revised March 2023
Amended January 2025

GSP Team:

Davids Engineering, Inc. (Revised GSP Team)
Luhdorff & Scalmanini (Revised GSP Team)
ERA Economics
Stillwater Sciences and
California State University, Sacramento



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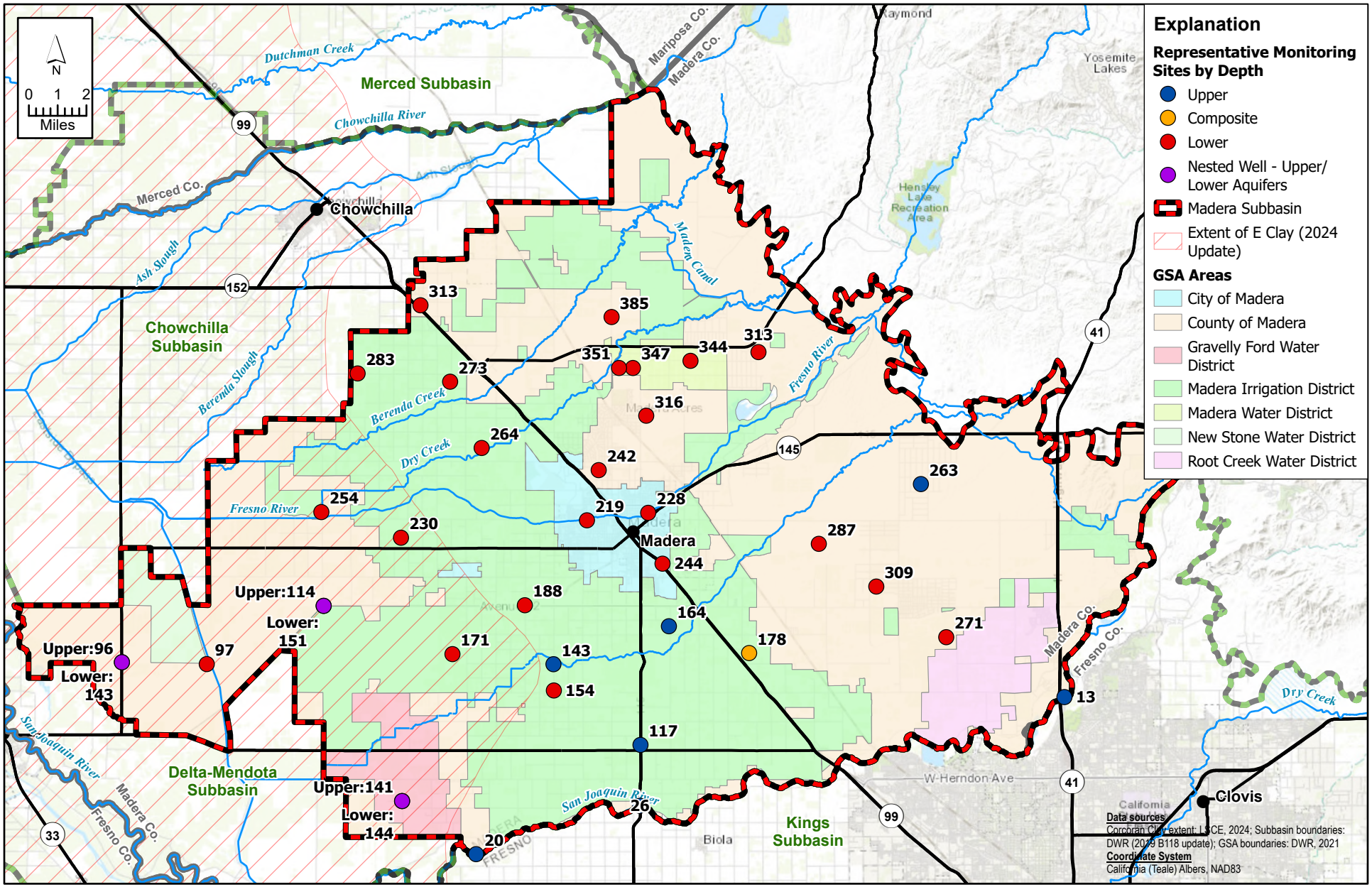
DAVIDS ENGINEERING, INC

Luhdorff & Scalmanini Consulting Engineers

FIGURE 3.A-1

Elevation of Groundwater Level Minimum Thresholds

Madera Subbasin
Groundwater Sustainability Plan - First Plan Amendment



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DAVIDS ENGINEERING, INC

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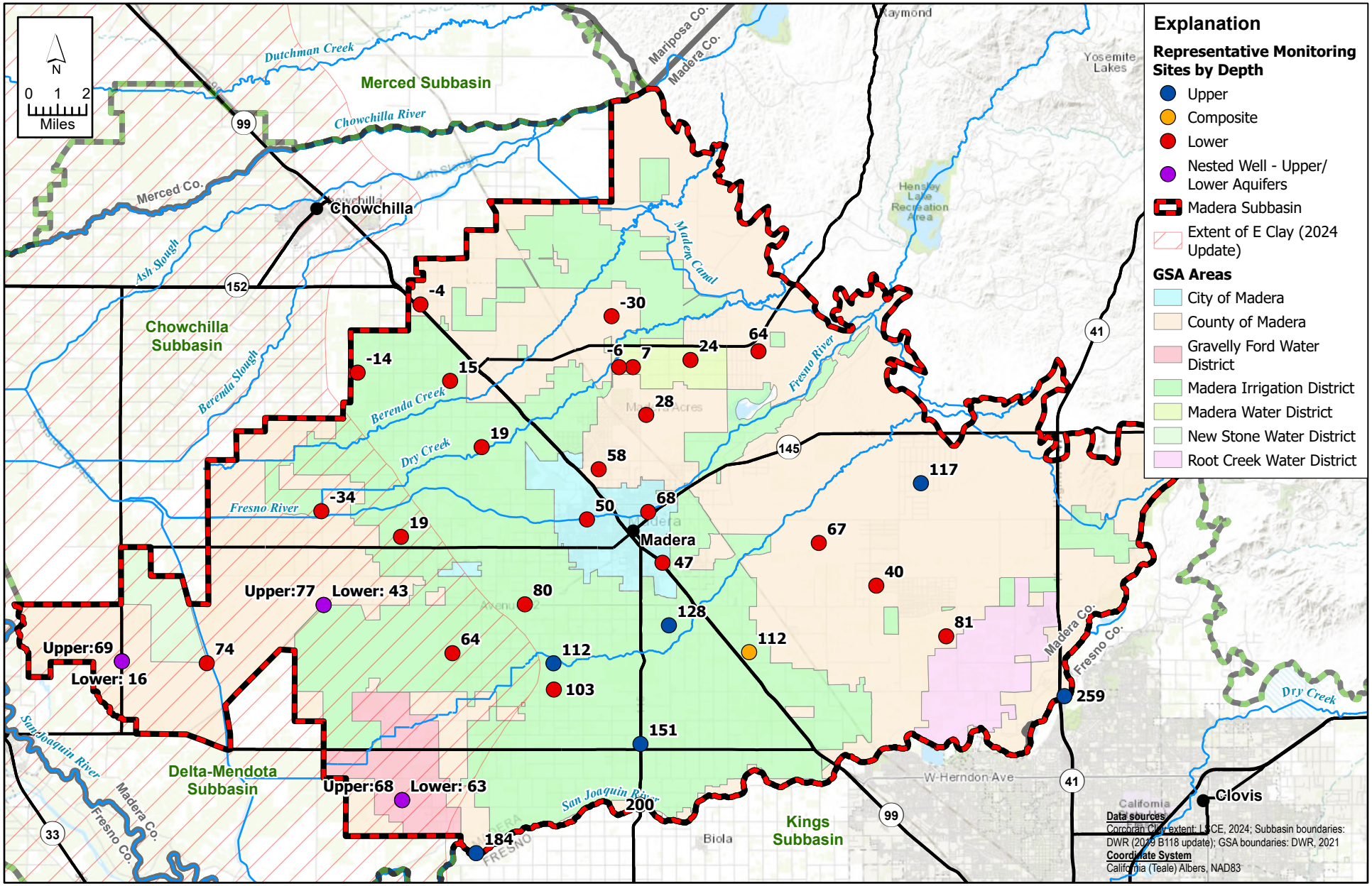
FIGURE 3.A-2

Depth to Groundwater Level Minimum Thresholds

Madera Subbasin
Groundwater Sustainability Plan - First Plan Amendment



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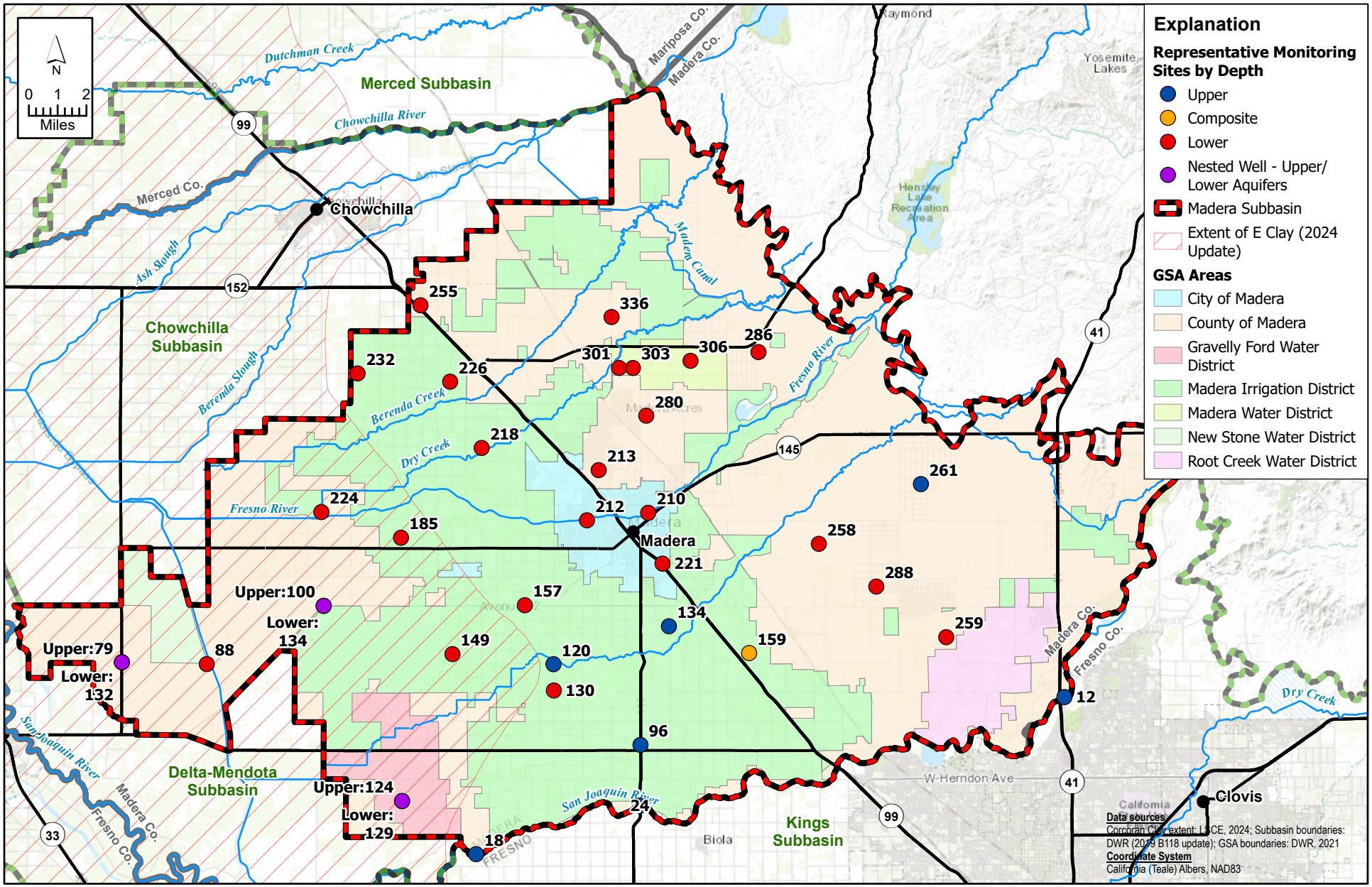
DAVIDS ENGINEERING, INC

Luhdorff & Scalmanini Consulting Engineers

FIGURE 3.A-3

Elevation of Groundwater Level Measurable Objectives

Madera Subbasin
Groundwater Sustainability Plan - First Plan Amendment



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DAVIDS ENGINEERING, INC

Luhdorff & Scalmanini Consulting Engineers

FIGURE 3.A-4

Depth to Groundwater Level Measurable Objectives

Madera Subbasin
Groundwater Sustainability Plan - First Plan Amendment

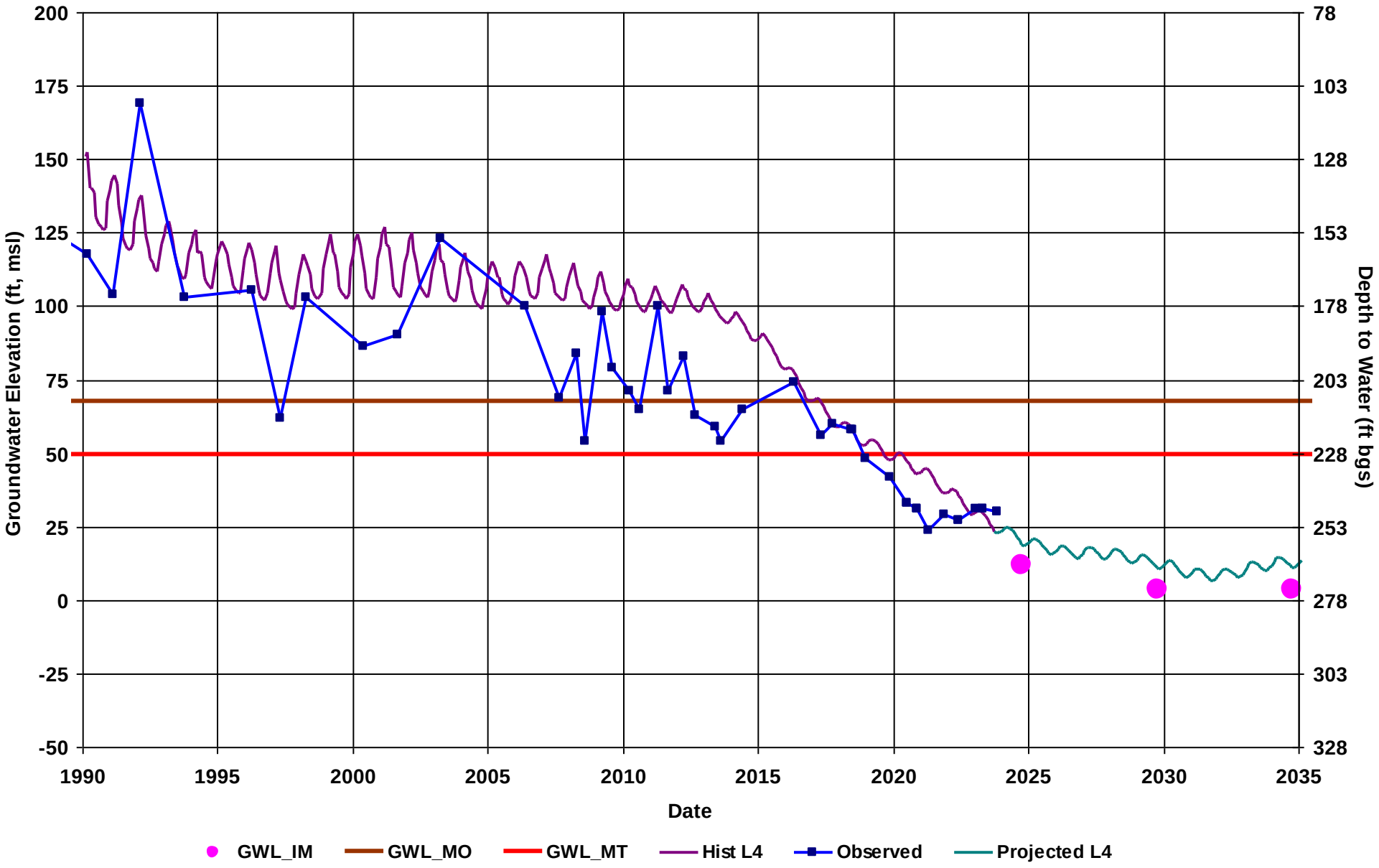
Well Name: COM RMS-1
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 278
GSA: City of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 249
Total Depth Average: 293
Total Depth Minimum: 60
Total Depth Maximum: 790

Top Perf. Count: 188
Top Perf. Average: 237
Top Perf. Minimum: 46
Top Perf. Maximum: 395

Total Depth (ft): 520
Perf Top (ft): 210
Perf Bottom (ft): 510
Top Model Layer: 4
Bottom Model Layer: 4



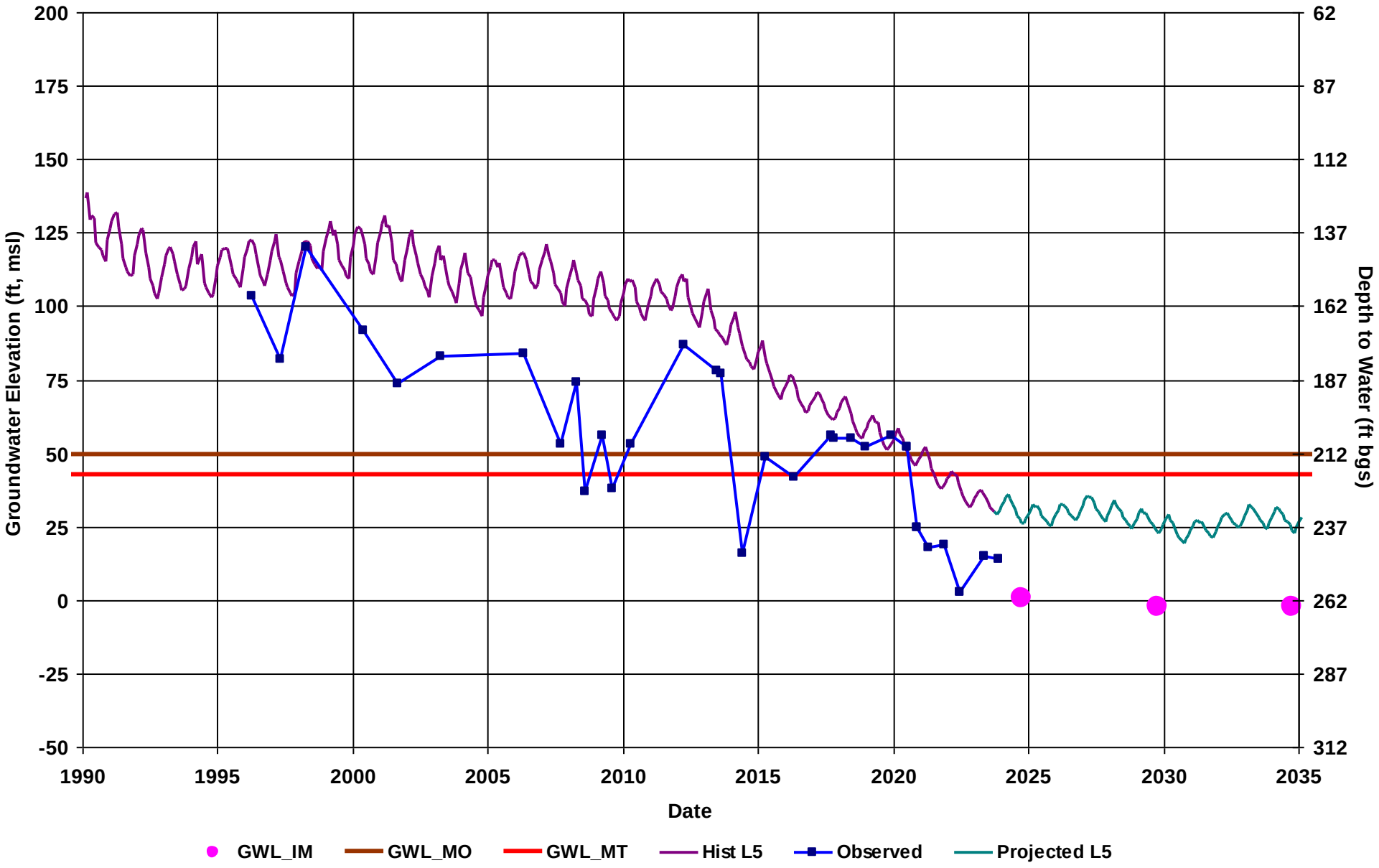
Well Name: COM RMS-2
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 262
GSA: City of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 52
Total Depth Average: 322
Total Depth Minimum: 140
Total Depth Maximum: 1130

Top Perf. Count: 35
Top Perf. Average: 238
Top Perf. Minimum: 120
Top Perf. Maximum: 480

Total Depth (ft): 590
Perf Top (ft): 370
Perf Bottom (ft): 590
Top Model Layer: 5
Bottom Model Layer: 5



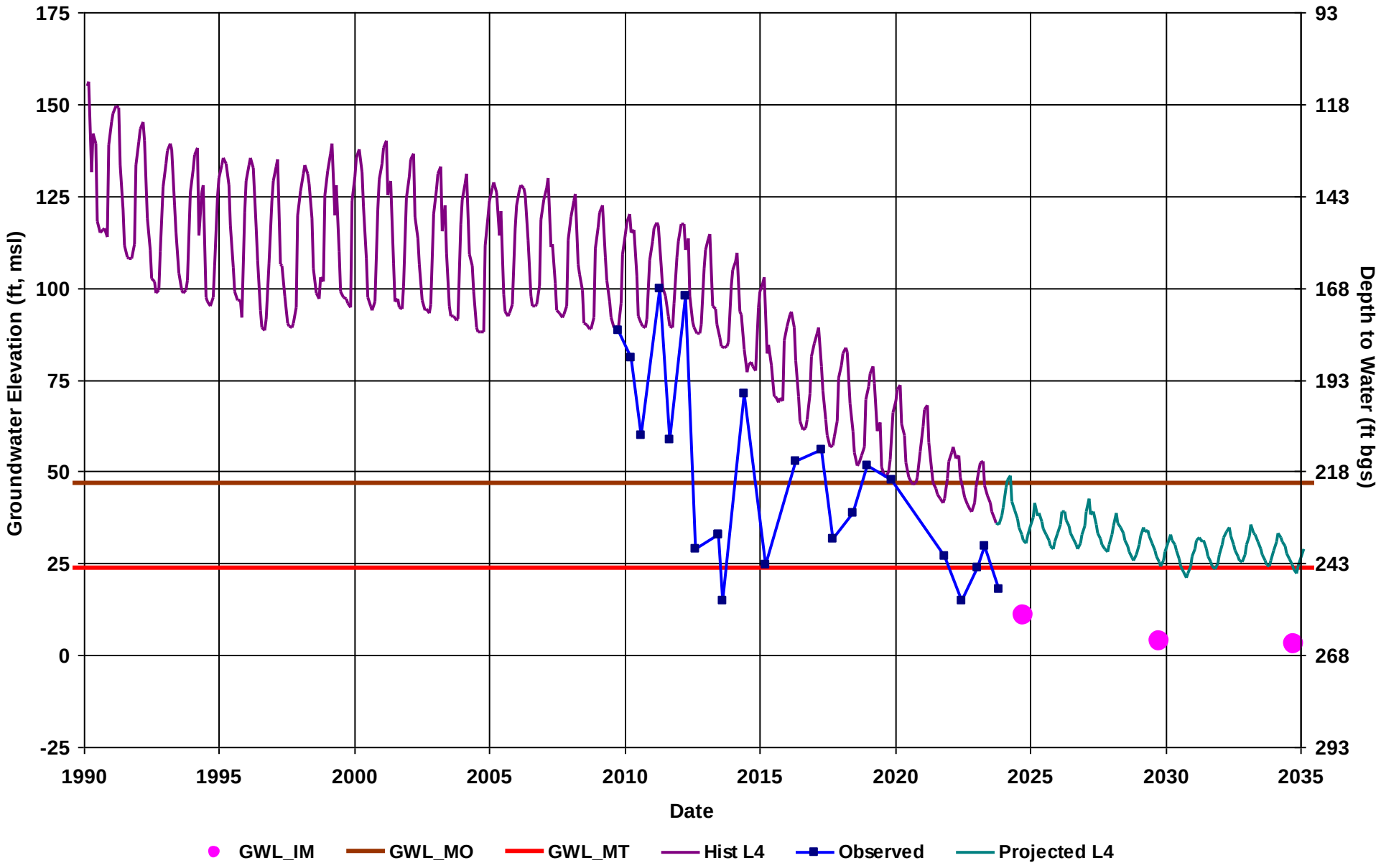
Well Name: COM RMS-4
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 267
GSA: City of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 82
Total Depth Average: 287
Total Depth Minimum: 110
Total Depth Maximum: 620

Top Perf. Count: 53
Top Perf. Average: 219
Top Perf. Minimum: 60
Top Perf. Maximum: 420

Total Depth (ft): 588
Perf Top (ft): 433
Perf Bottom (ft): 568
Top Model Layer: 4
Bottom Model Layer: 4



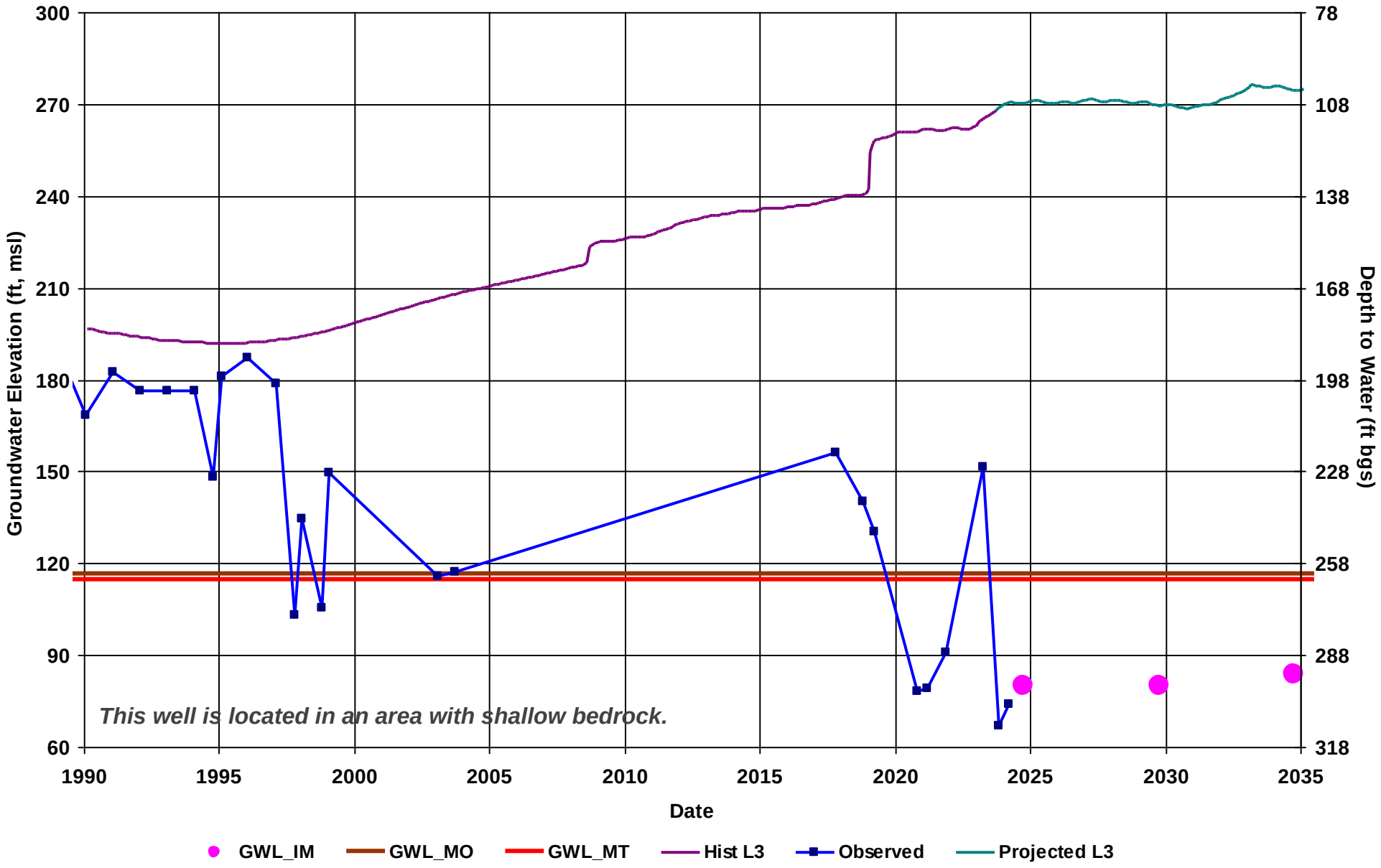
Well Name: MCE RMS-2
Depth Zone: Upper
Subbasin: Madera
GSE (ft, msl): 378
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 945
Total Depth Average: 323
Total Depth Minimum: 110
Total Depth Maximum: 1160

Top Perf. Count: 894
Top Perf. Average: 237
Top Perf. Minimum: 2
Top Perf. Maximum: 580

Total Depth (ft):
Perf Top (ft):
Perf Bottom (ft):
Top Model Layer: 3
Bottom Model Layer: 3



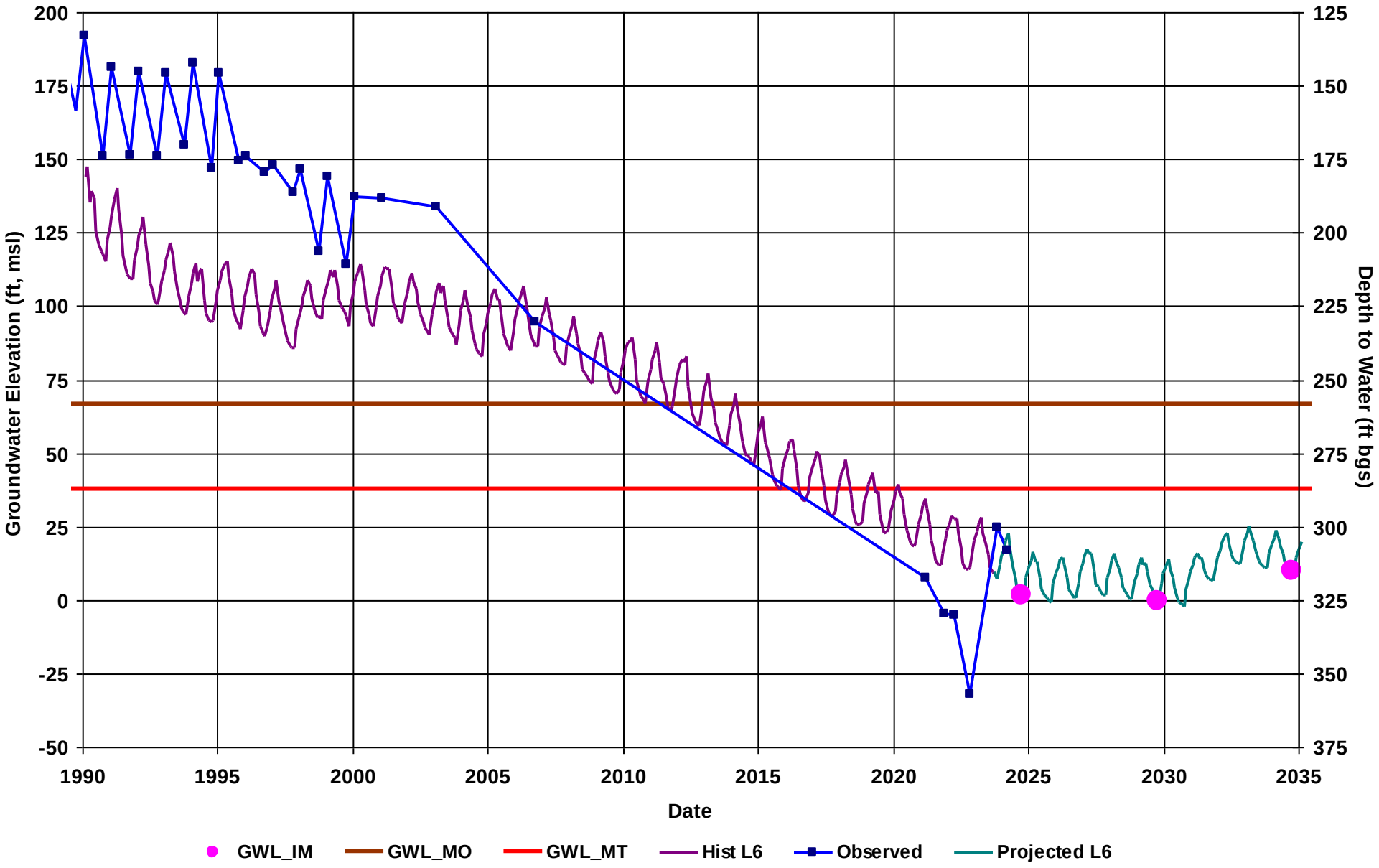
Well Name: MCE RMS-3
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 325
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 156
Total Depth Average: 357
Total Depth Minimum: 144
Total Depth Maximum: 600

Top Perf. Count: 136
Top Perf. Average: 281
Top Perf. Minimum: 60
Top Perf. Maximum: 420

Total Depth (ft):
Perf Top (ft):
Perf Bottom (ft):
Top Model Layer: 6
Bottom Model Layer: 6



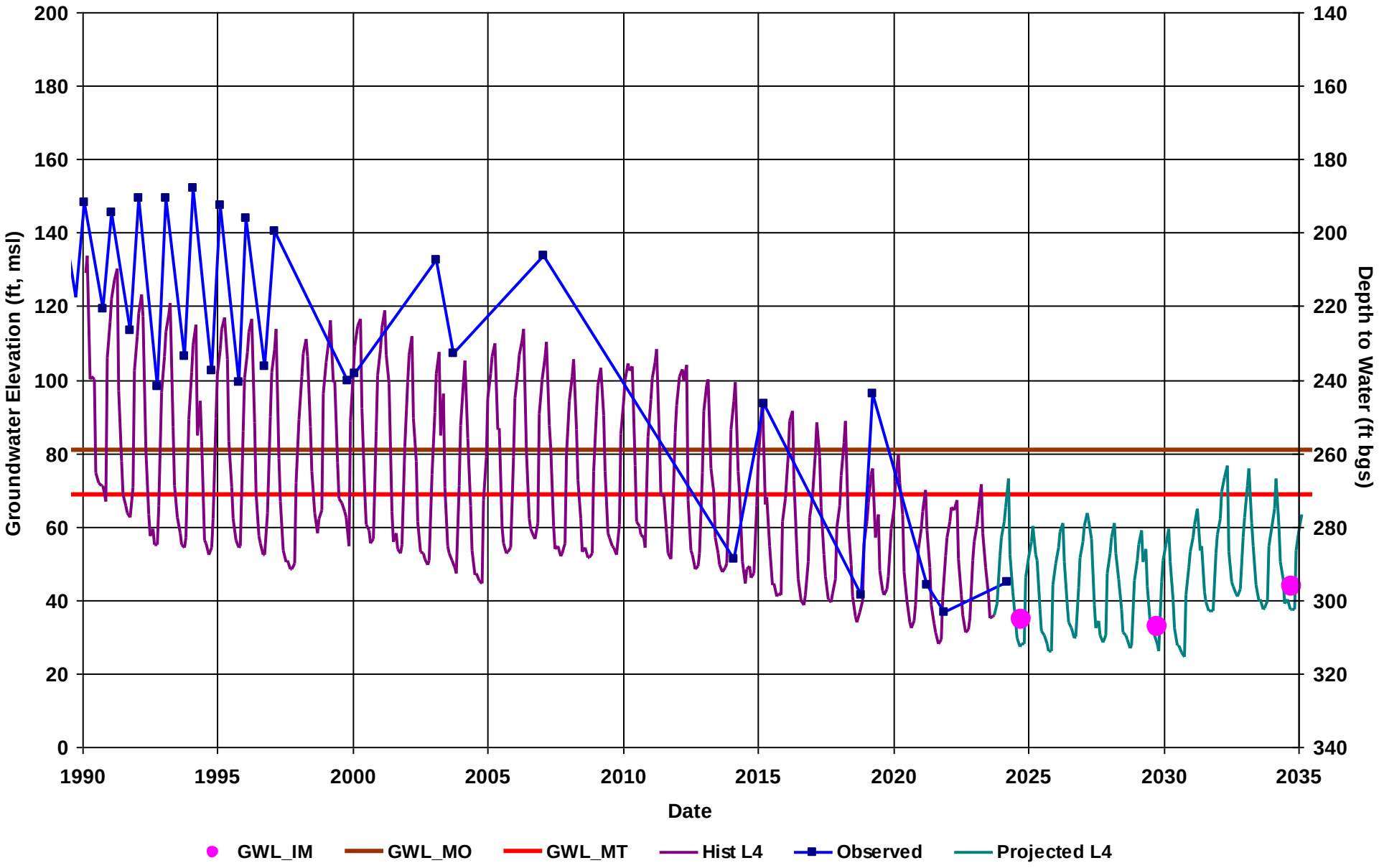
Well Name: MCE RMS-5
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 340
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 81
Total Depth Average: 355
Total Depth Minimum: 160
Total Depth Maximum: 577

Top Perf. Count: 71
Top Perf. Average: 263
Top Perf. Minimum: 60
Top Perf. Maximum: 390

Total Depth (ft):
Perf Top (ft):
Perf Bottom (ft):
Top Model Layer: 4
Bottom Model Layer: 4



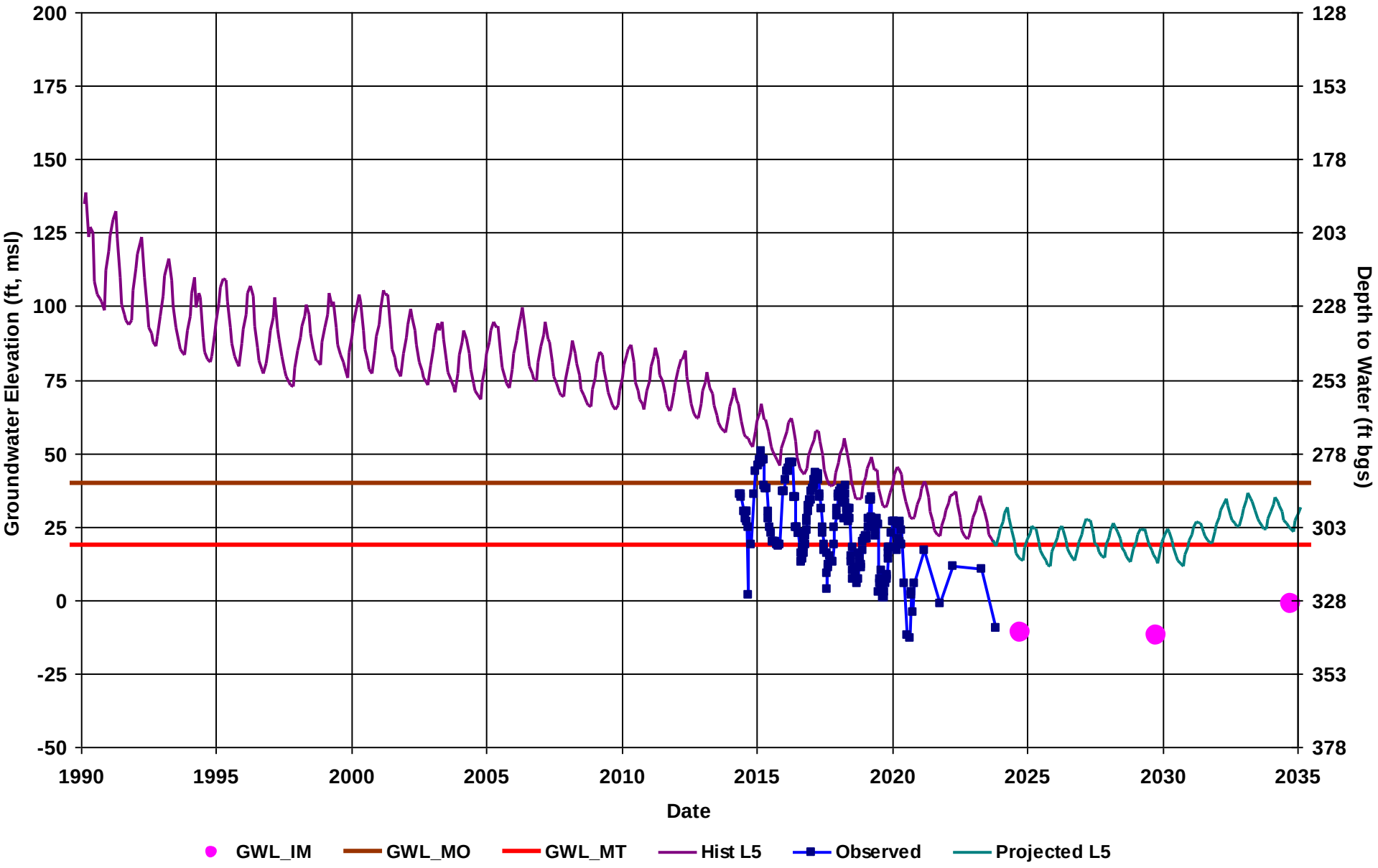
Well Name: MCE RMS-6
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 328
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 655
Total Depth Average: 361
Total Depth Minimum: 133
Total Depth Maximum: 640

Top Perf. Count: 601
Top Perf. Average: 287
Top Perf. Minimum: 80
Top Perf. Maximum: 560

Total Depth (ft): 550
Perf Top (ft): 450
Perf Bottom (ft): 550
Top Model Layer: 5
Bottom Model Layer: 5

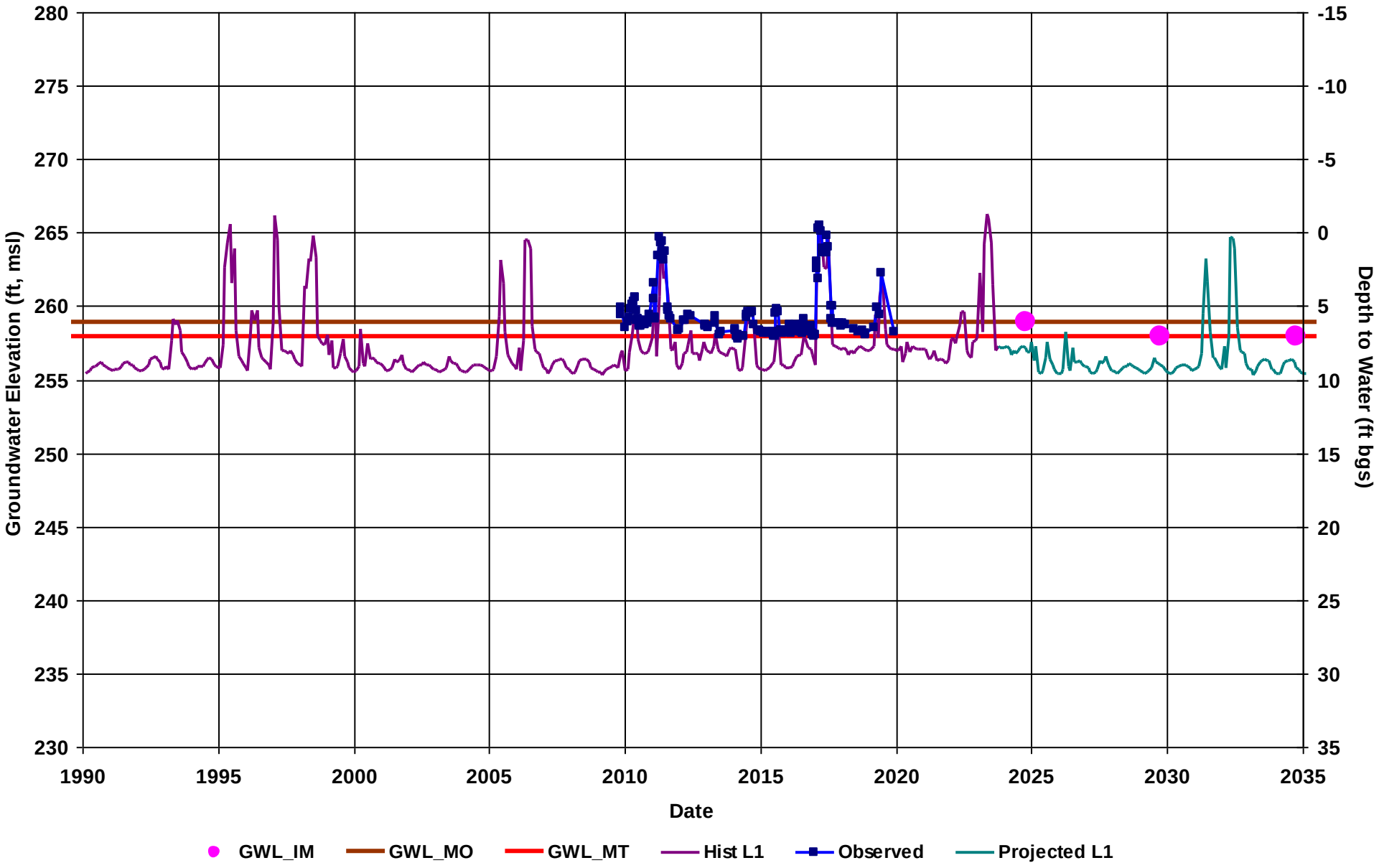


Well Name: MCE RMS-9
Depth Zone: Shallow
Subbasin: Madera
GSE (ft, msl): 270
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 40	Top Perf. Count: 22
Total Depth Average: 212	Top Perf. Average: 118
Total Depth Minimum: 8	Top Perf. Minimum: 16
Total Depth Maximum: 1510	Top Perf. Maximum: 220

Total Depth (ft): 37
Perf Top (ft): 17
Perf Bottom (ft): 37
Top Model Layer: 1
Bottom Model Layer: 1



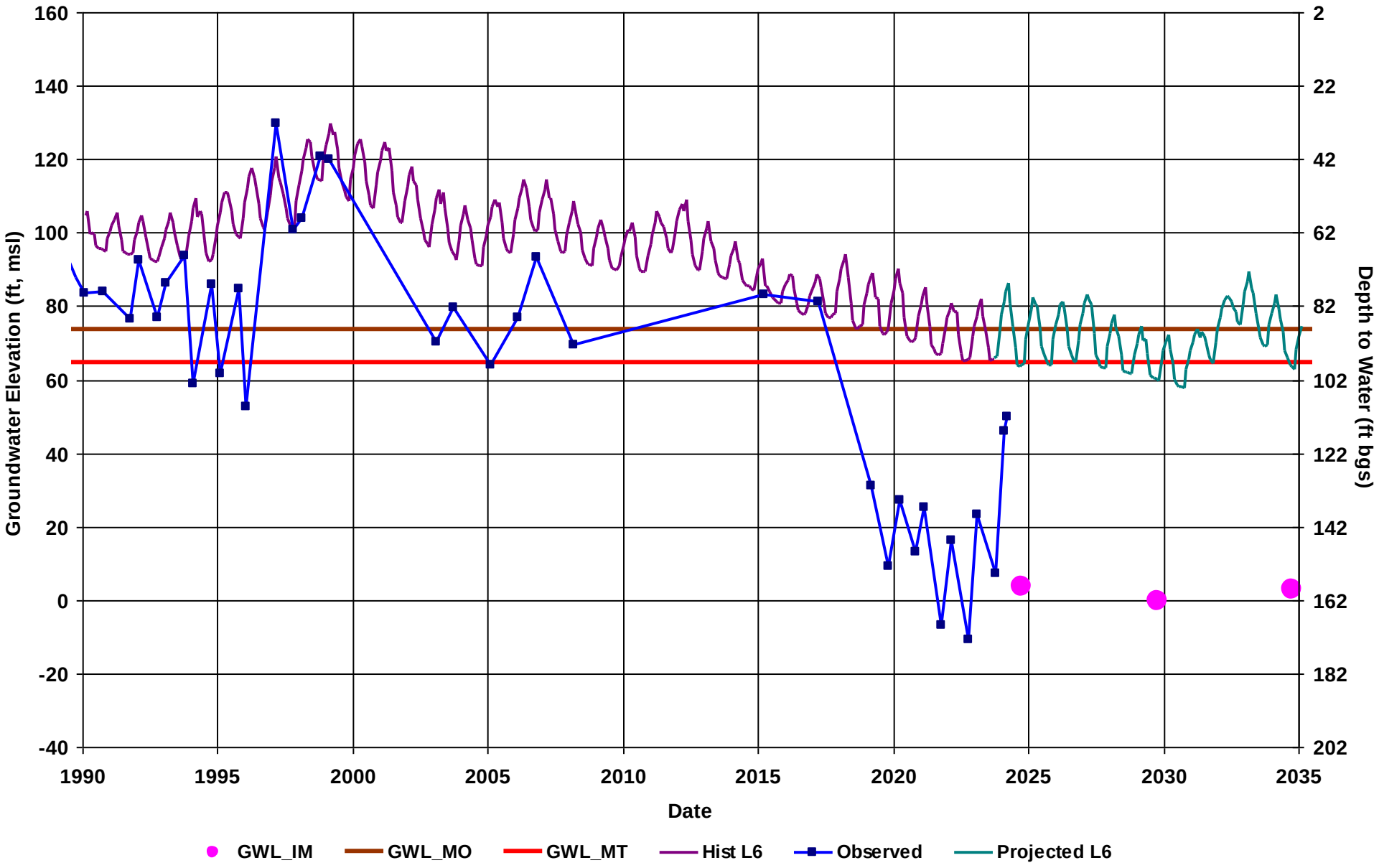
Well Name: MCW RMS-3
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 163
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 1
Total Depth Average: 200
Total Depth Minimum: 200
Total Depth Maximum: 200

Top Perf. Count: 0
Top Perf. Average: -9999
Top Perf. Minimum: 0
Top Perf. Maximum: 0

Total Depth (ft):
Perf Top (ft):
Perf Bottom (ft):
Top Model Layer: 6
Bottom Model Layer: 6



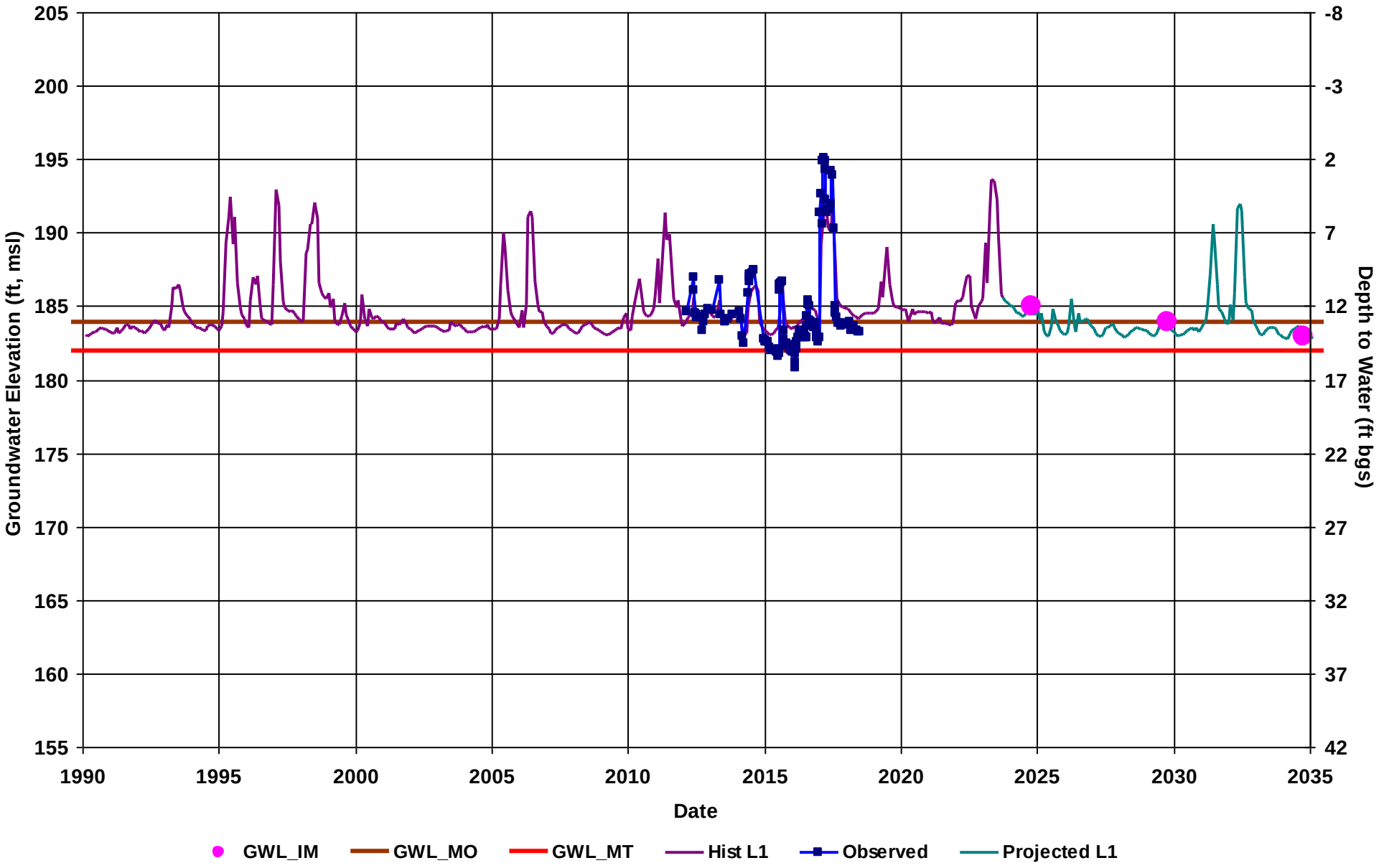
Well Name: MCW RMS-5
Depth Zone: Shallow
Subbasin: Madera
GSE (ft, msl): 199
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 21
Total Depth Average: 184
Total Depth Minimum: 52
Total Depth Maximum: 340

Top Perf. Count: 8
Top Perf. Average: 216
Top Perf. Minimum: 120
Top Perf. Maximum: 324

Total Depth (ft): 30
Perf Top (ft):
Perf Bottom (ft):
Top Model Layer: 1
Bottom Model Layer: 1



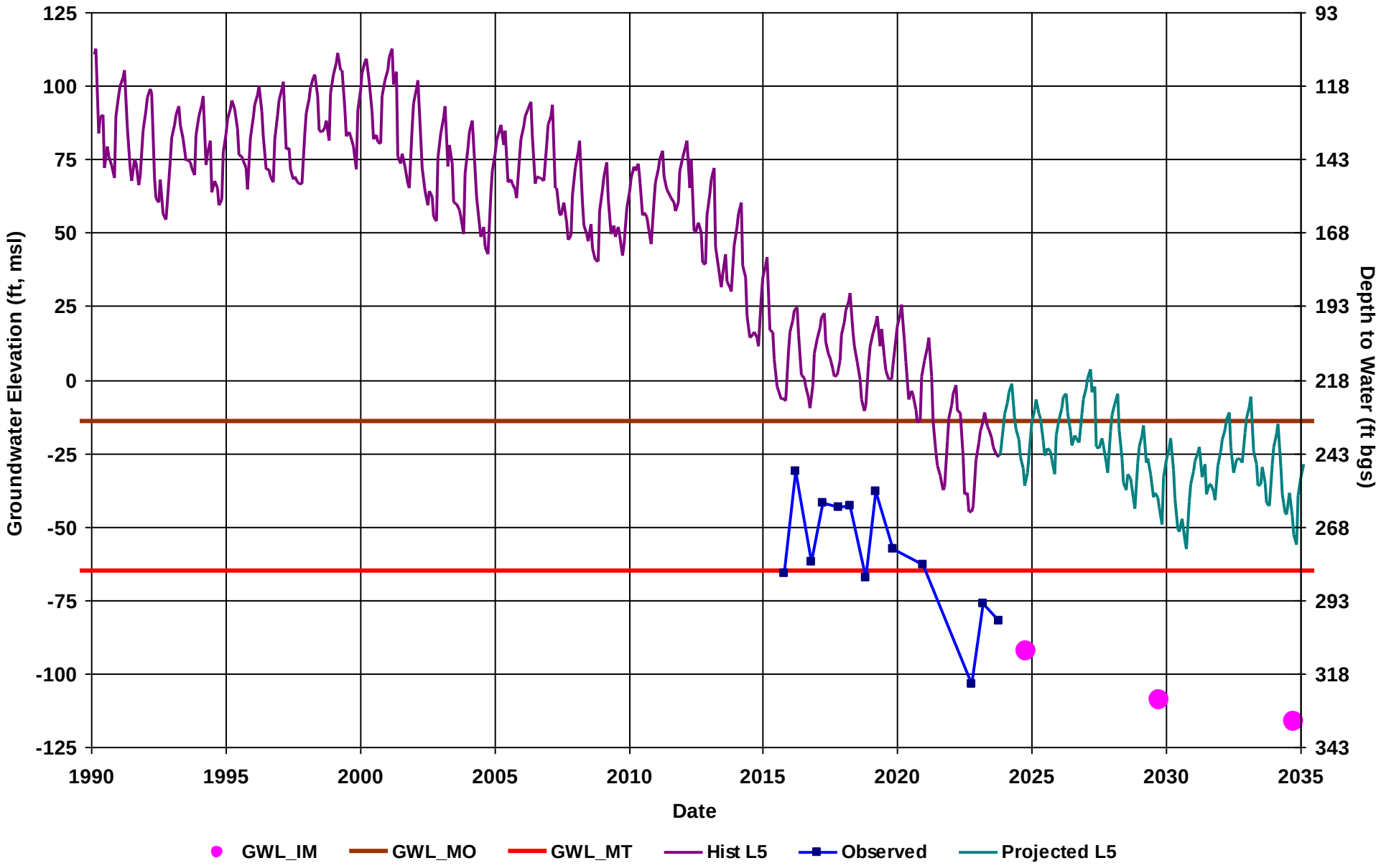
Well Name: MID RMS-2
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 294
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 15
Total Depth Average: 345
Total Depth Minimum: 183
Total Depth Maximum: 495

Top Perf. Count: 9
Top Perf. Average: 267
Top Perf. Minimum: 123
Top Perf. Maximum: 410

Total Depth (ft): 563
Perf Top (ft): 298
Perf Bottom (ft): 509
Top Model Layer: 5
Bottom Model Layer: 5



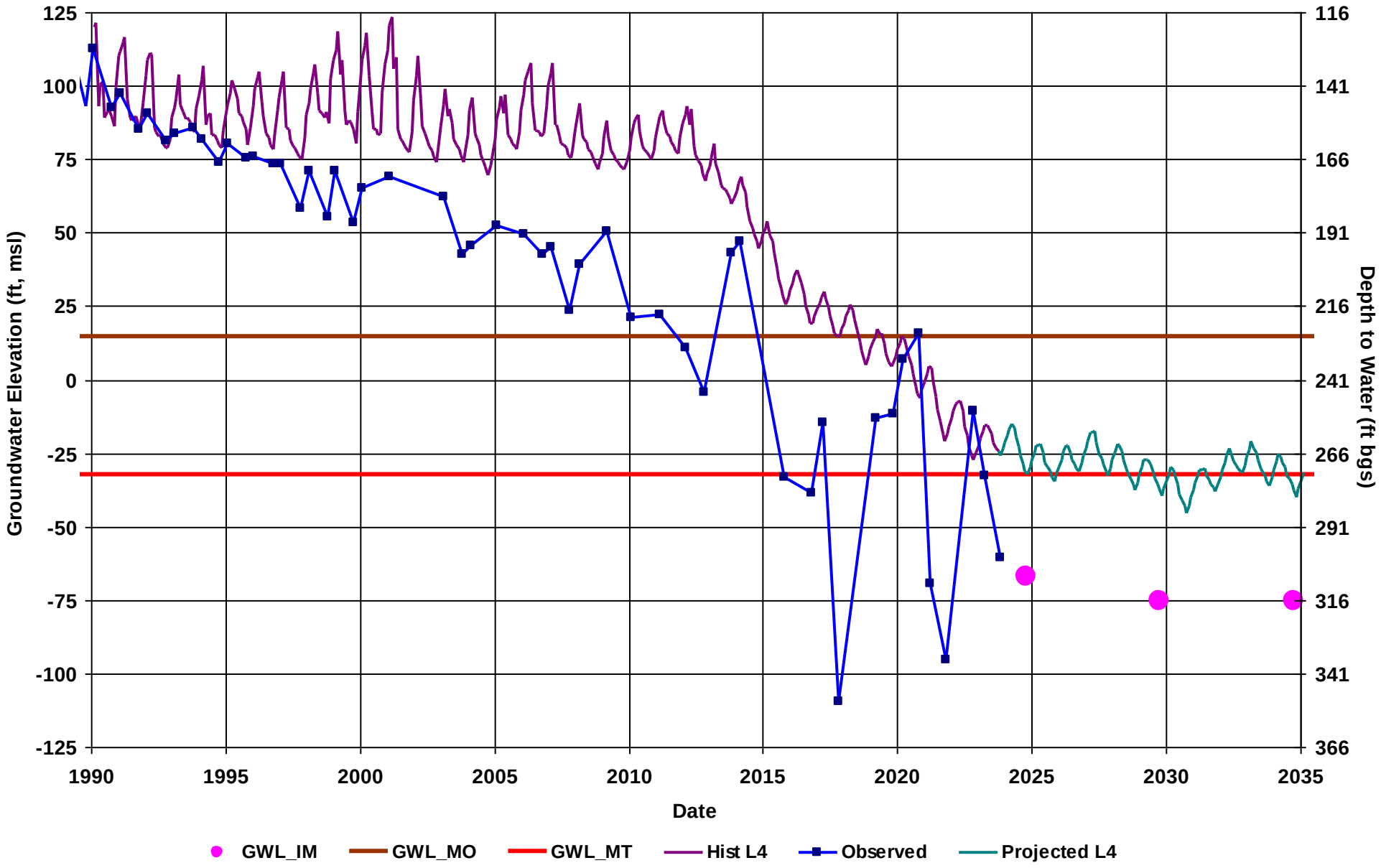
Well Name: MID RMS-3
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 273
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 38
Total Depth Average: 341
Total Depth Minimum: 190
Total Depth Maximum: 600

Top Perf. Count: 29
Top Perf. Average: 261
Top Perf. Minimum: 156
Top Perf. Maximum: 420

Total Depth (ft): 516
Perf Top (ft): 260
Perf Bottom (ft): 507
Top Model Layer: 4
Bottom Model Layer: 4



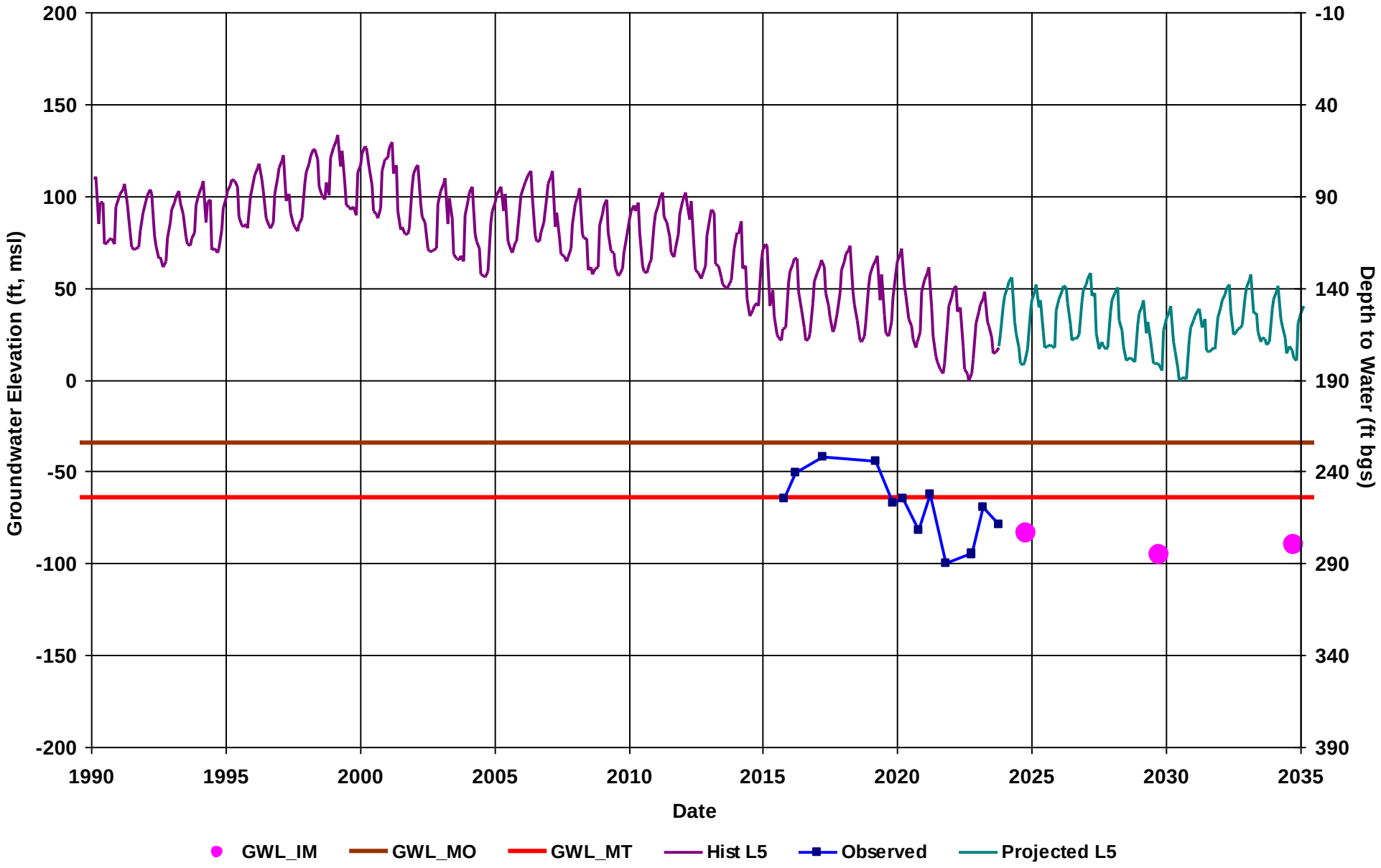
Well Name: MID RMS-4
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 259
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 11
Total Depth Average: 311
Total Depth Minimum: 180
Total Depth Maximum: 600

Top Perf. Count: 7
Top Perf. Average: 186
Top Perf. Minimum: 90
Top Perf. Maximum: 320

Total Depth (ft): 698
Perf Top (ft): 320
Perf Bottom (ft): 667
Top Model Layer: 5
Bottom Model Layer: 5



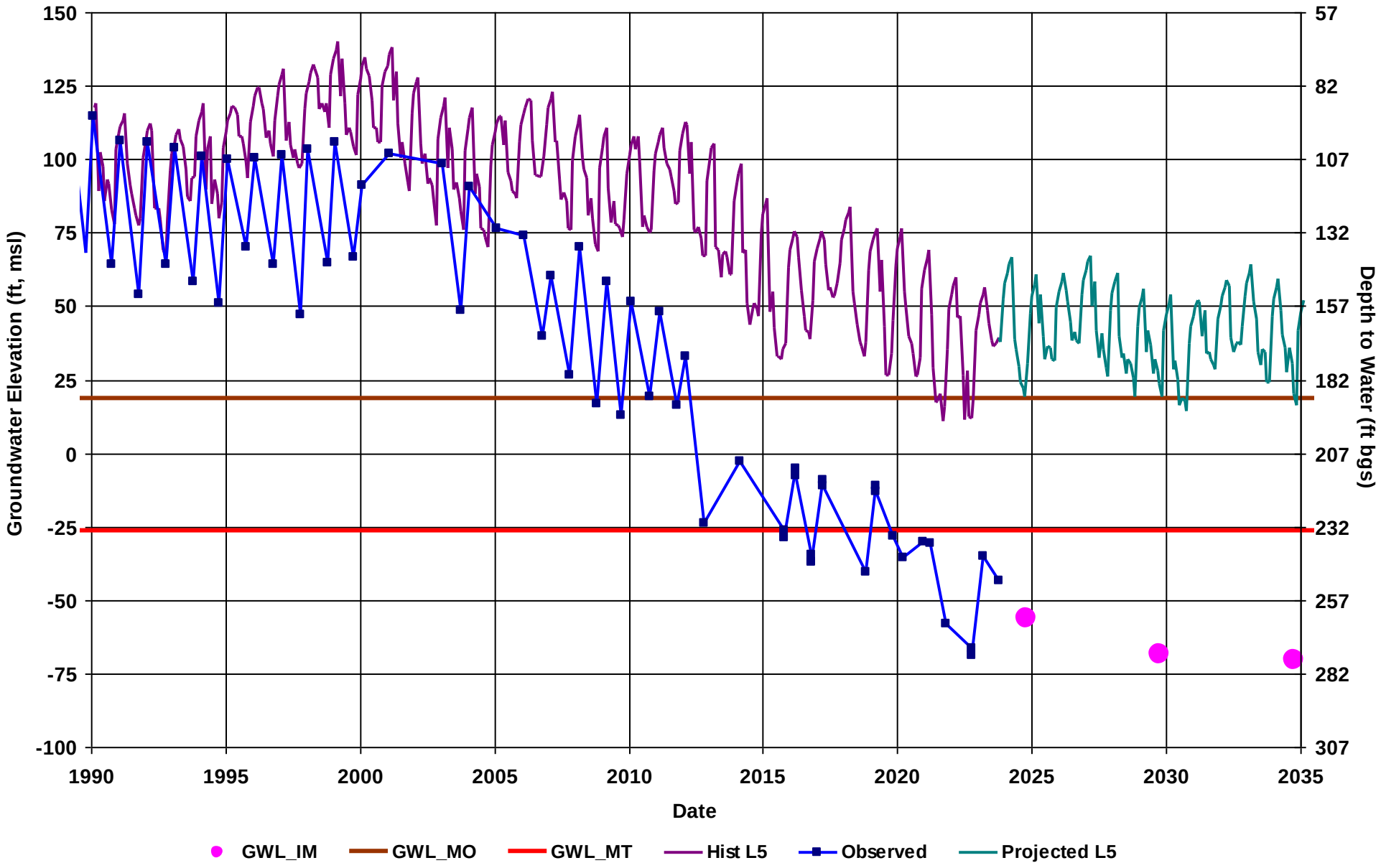
Well Name: MID RMS-5
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 239
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 23
Total Depth Average: 321
Total Depth Minimum: 133
Total Depth Maximum: 570

Top Perf. Count: 13
Top Perf. Average: 254
Top Perf. Minimum: 99
Top Perf. Maximum: 465

Total Depth (ft): 570
Perf Top (ft): 270
Perf Bottom (ft): 570
Top Model Layer: 5
Bottom Model Layer: 5



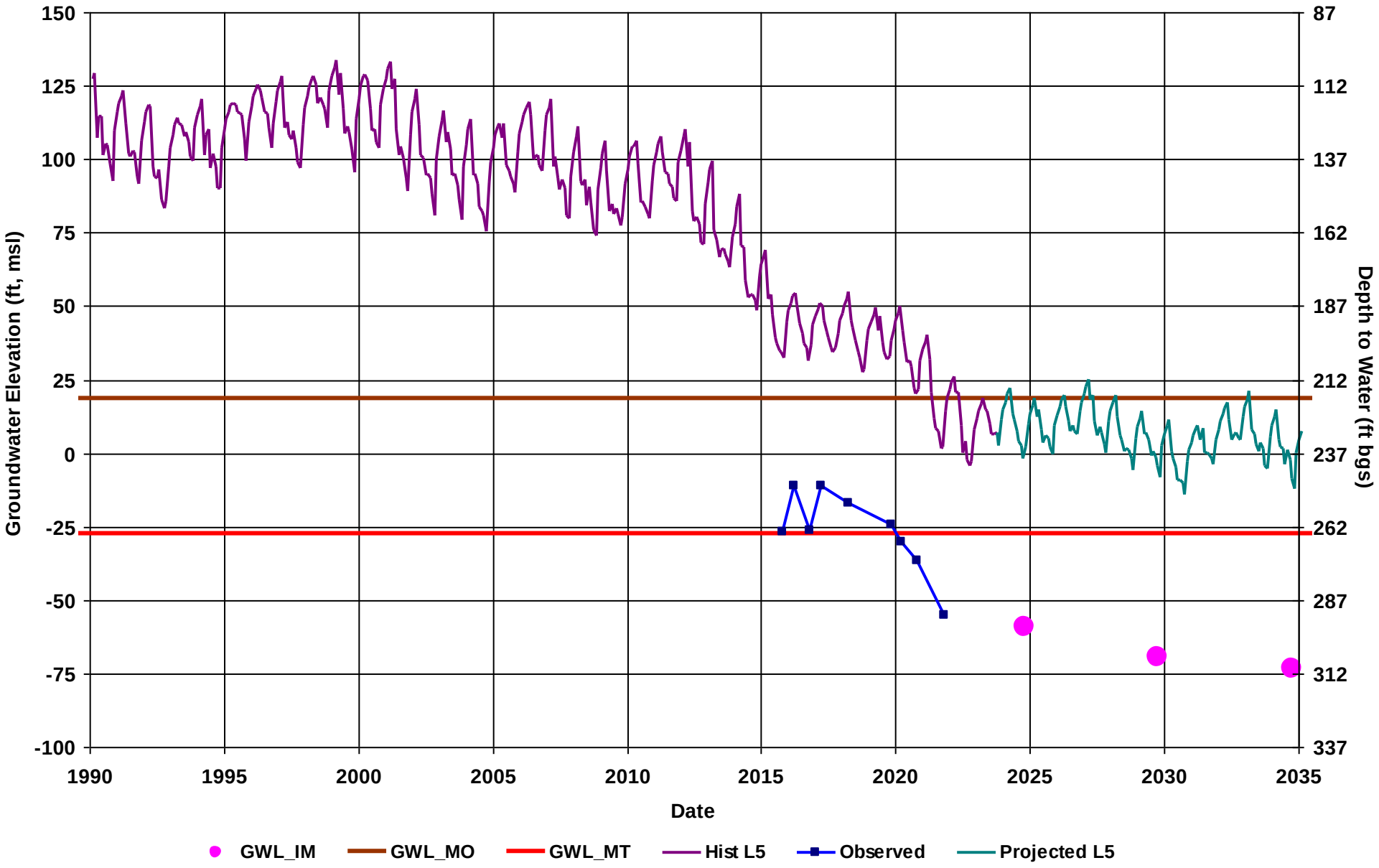
Well Name: MID RMS-6
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 237
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 39
Total Depth Average: 339
Total Depth Minimum: 190
Total Depth Maximum: 600

Top Perf. Count: 29
Top Perf. Average: 261
Top Perf. Minimum: 142
Top Perf. Maximum: 400

Total Depth (ft): 680
Perf Top (ft): 320
Perf Bottom (ft): 680
Top Model Layer: 5
Bottom Model Layer: 5



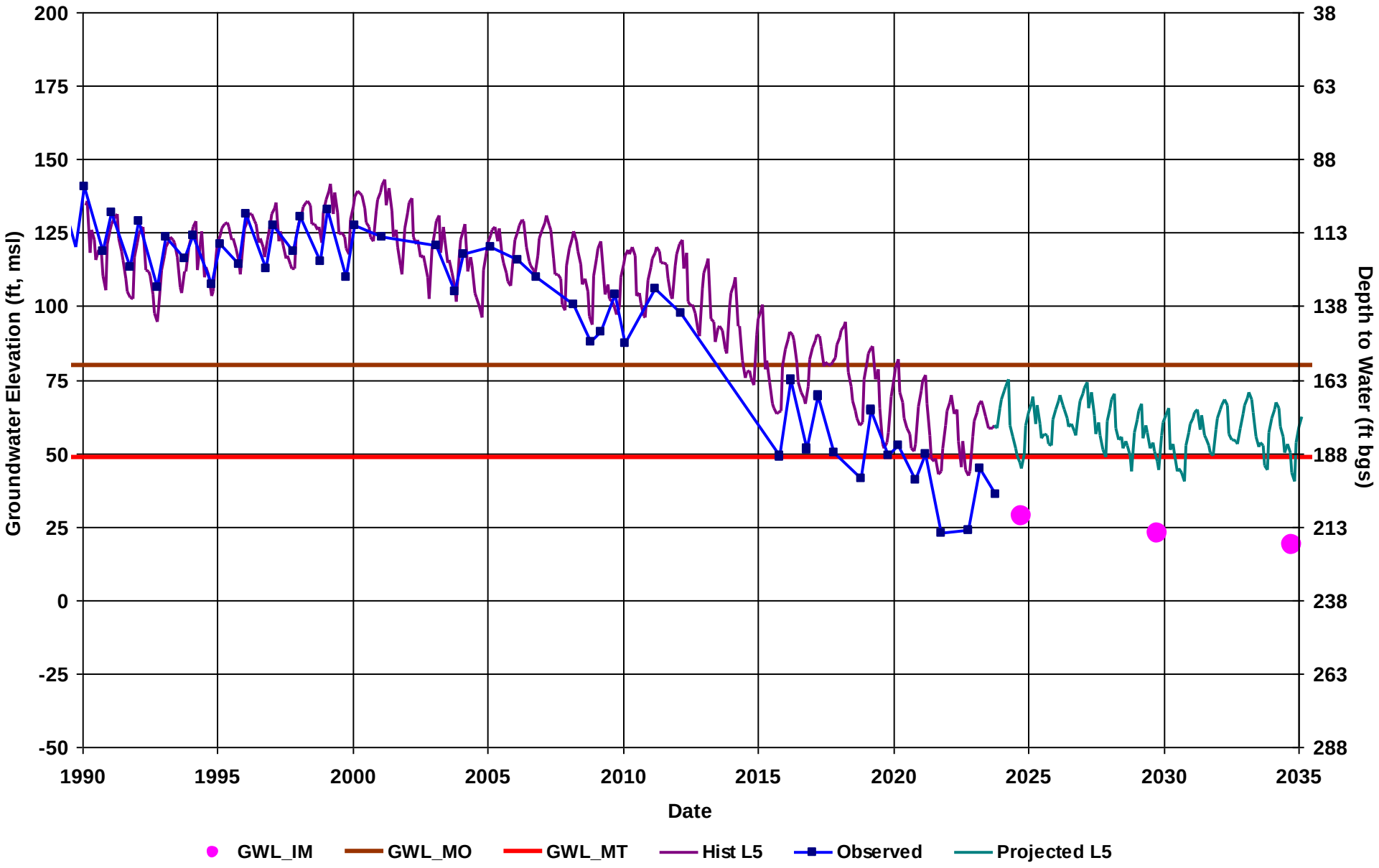
Well Name: MID RMS-7
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 238
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 41
Total Depth Average: 295
Total Depth Minimum: 132
Total Depth Maximum: 560

Top Perf. Count: 27
Top Perf. Average: 236
Top Perf. Minimum: 100
Top Perf. Maximum: 405

Total Depth (ft): 656
Perf Top (ft): 290
Perf Bottom (ft): 635
Top Model Layer: 5
Bottom Model Layer: 5



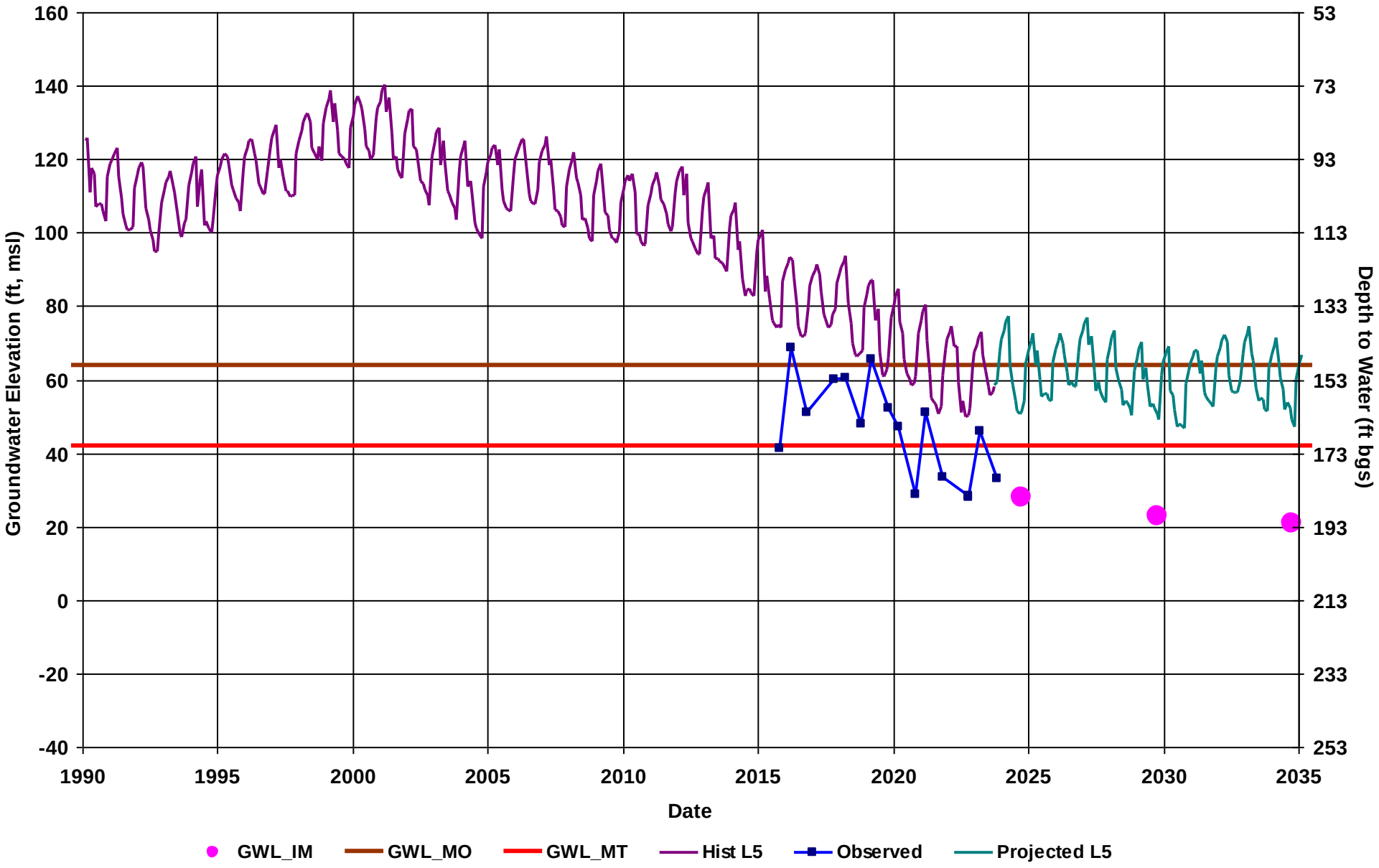
Well Name: MID RMS-10
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 213
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 5
Total Depth Average: 387
Total Depth Minimum: 260
Total Depth Maximum: 615

Top Perf. Count: 4
Top Perf. Average: 259
Top Perf. Minimum: 200
Top Perf. Maximum: 390

Total Depth (ft): 615
Perf Top (ft): 315
Perf Bottom (ft): 615
Top Model Layer: 5
Bottom Model Layer: 5



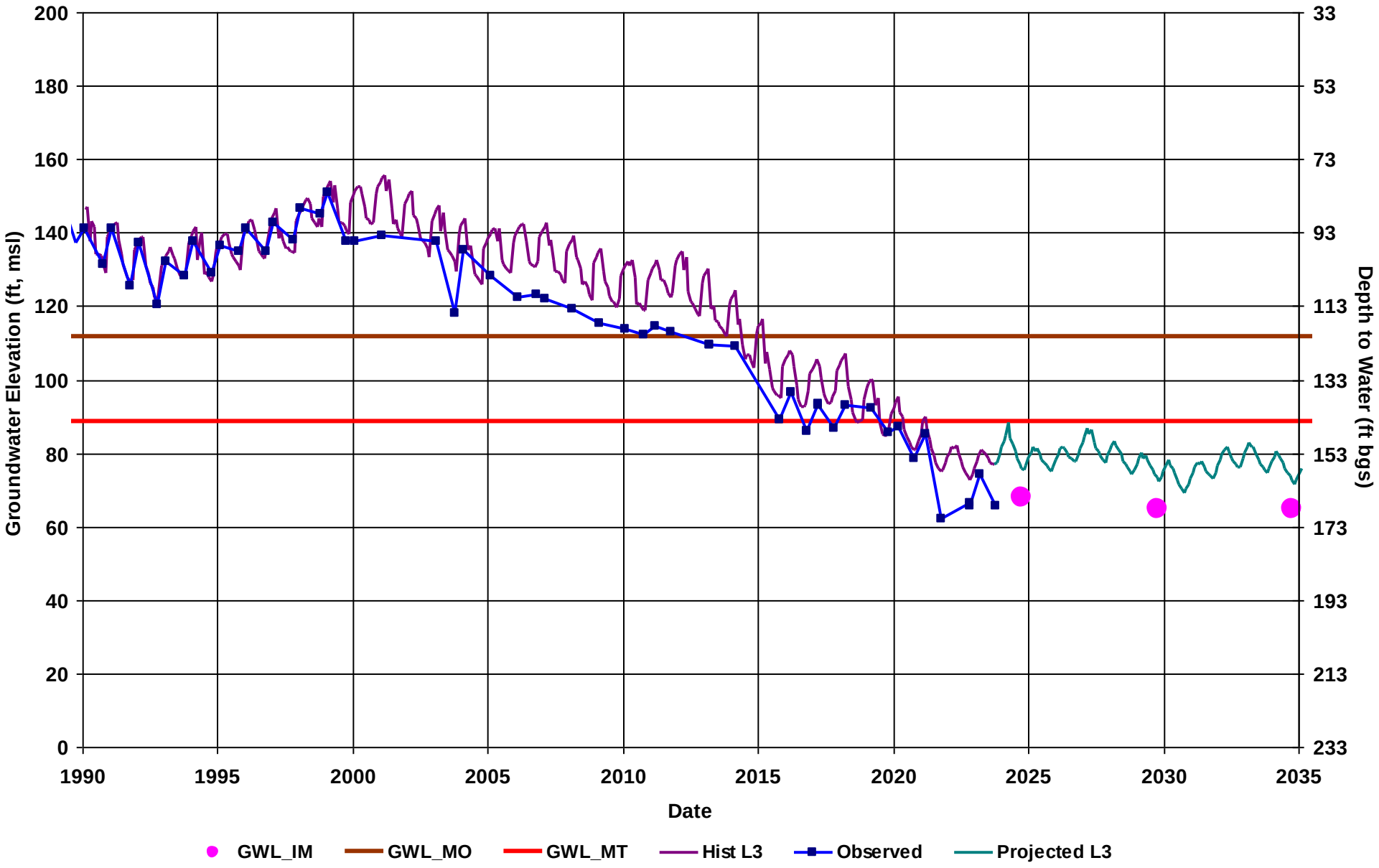
Well Name: MID RMS-11
Depth Zone: Upper
Subbasin: Madera
GSE (ft, msl): 233
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 18
Total Depth Average: 264
Total Depth Minimum: 151
Total Depth Maximum: 500

Top Perf. Count: 9
Top Perf. Average: 188
Top Perf. Minimum: 135
Top Perf. Maximum: 247

Total Depth (ft): 315
Perf Top (ft):
Perf Bottom (ft):
Top Model Layer: 3
Bottom Model Layer: 3



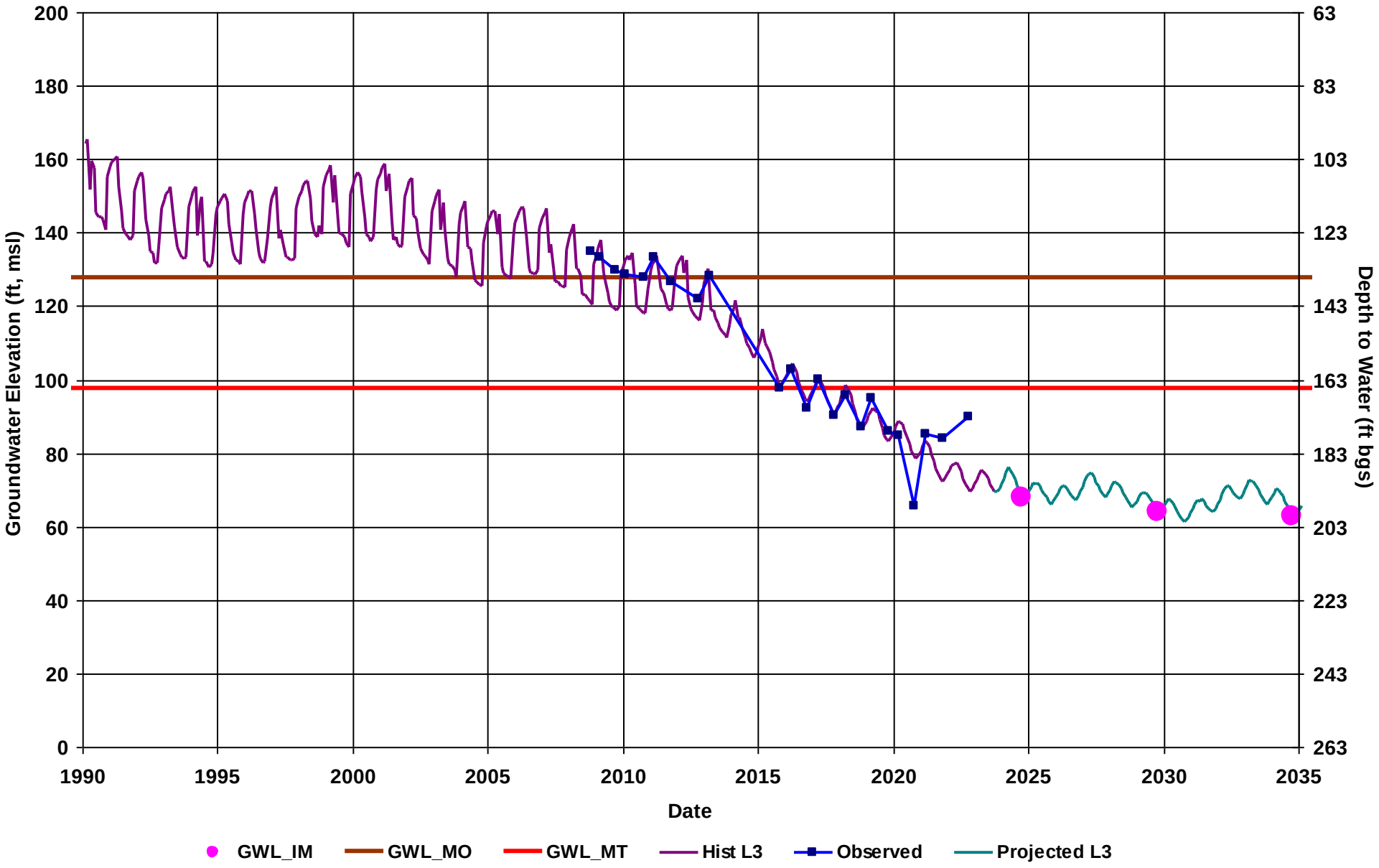
Well Name: MID RMS-12
Depth Zone: Upper
Subbasin: Madera
GSE (ft, msl): 263
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 51
Total Depth Average: 298
Total Depth Minimum: 170
Total Depth Maximum: 482

Top Perf. Count: 33
Top Perf. Average: 245
Top Perf. Minimum: 152
Top Perf. Maximum: 420

Total Depth (ft): 176
Perf Top (ft):
Perf Bottom (ft):
Top Model Layer: 3
Bottom Model Layer: 3



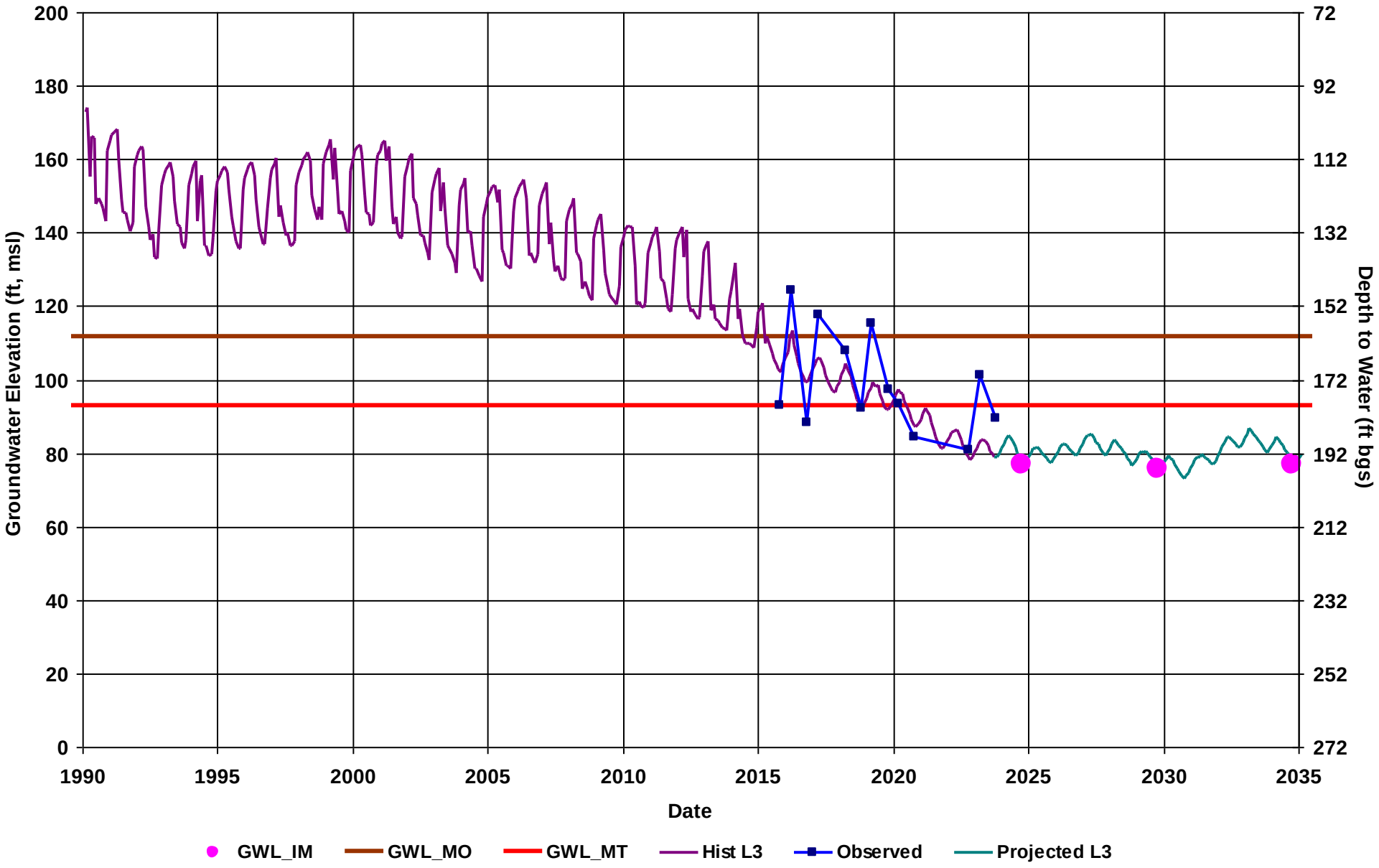
Well Name: MID RMS-13
Depth Zone: Composite
Subbasin: Madera
GSE (ft, msl): 272
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 31
Total Depth Average: 265
Total Depth Minimum: 130
Total Depth Maximum: 570

Top Perf. Count: 16
Top Perf. Average: 224
Top Perf. Minimum: 133
Top Perf. Maximum: 560

Total Depth (ft): 600
Perf Top (ft): 228
Perf Bottom (ft): 552
Top Model Layer: 3
Bottom Model Layer: 3



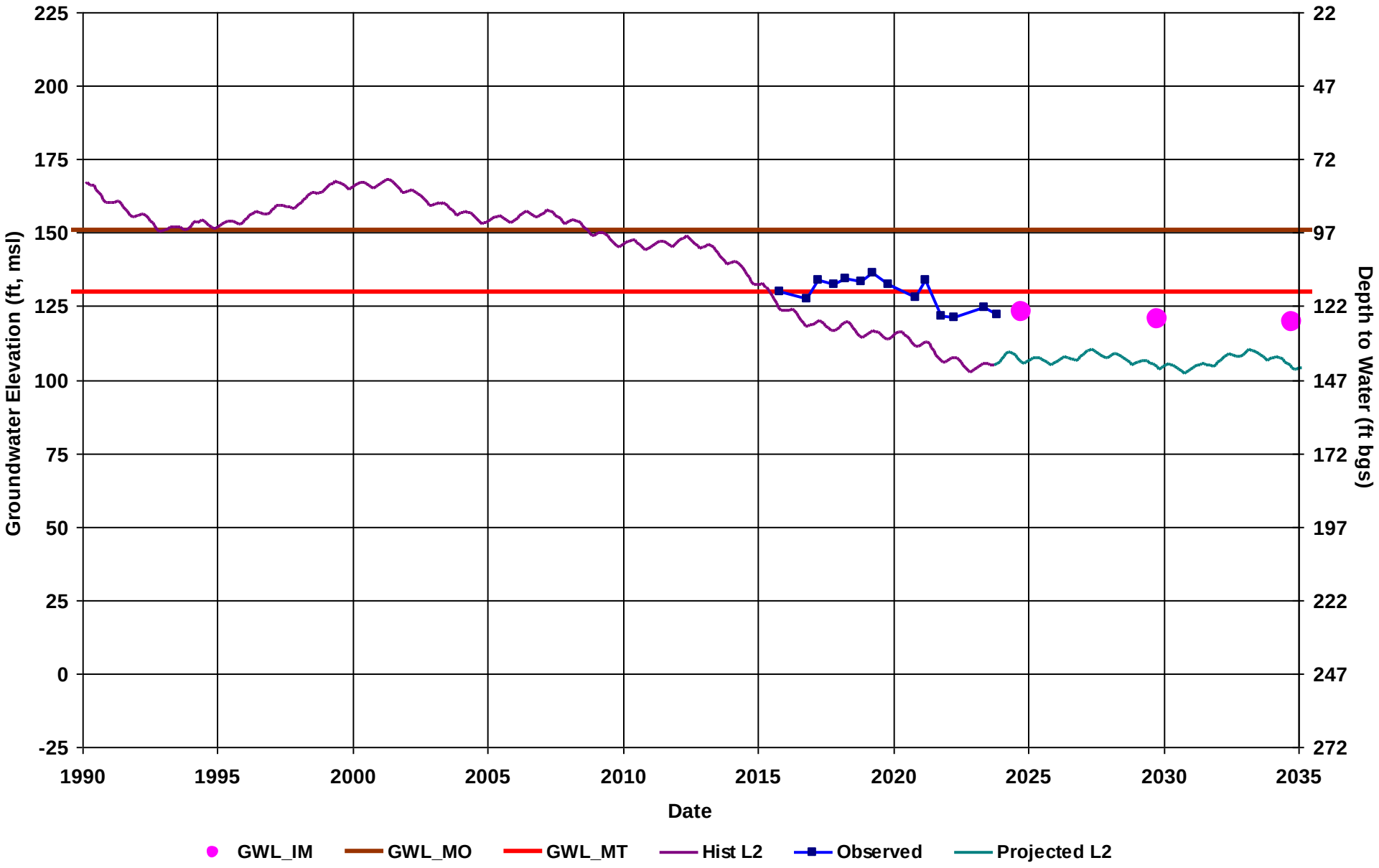
Well Name: MID RMS-15
Depth Zone: Upper
Subbasin: Madera
GSE (ft, msl): 247
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 23
Total Depth Average: 255
Total Depth Minimum: 93
Total Depth Maximum: 480

Top Perf. Count: 11
Top Perf. Average: 196
Top Perf. Minimum: 105
Top Perf. Maximum: 320

Total Depth (ft): 502
Perf Top (ft): 160
Perf Bottom (ft): 200
Top Model Layer: 2
Bottom Model Layer: 2



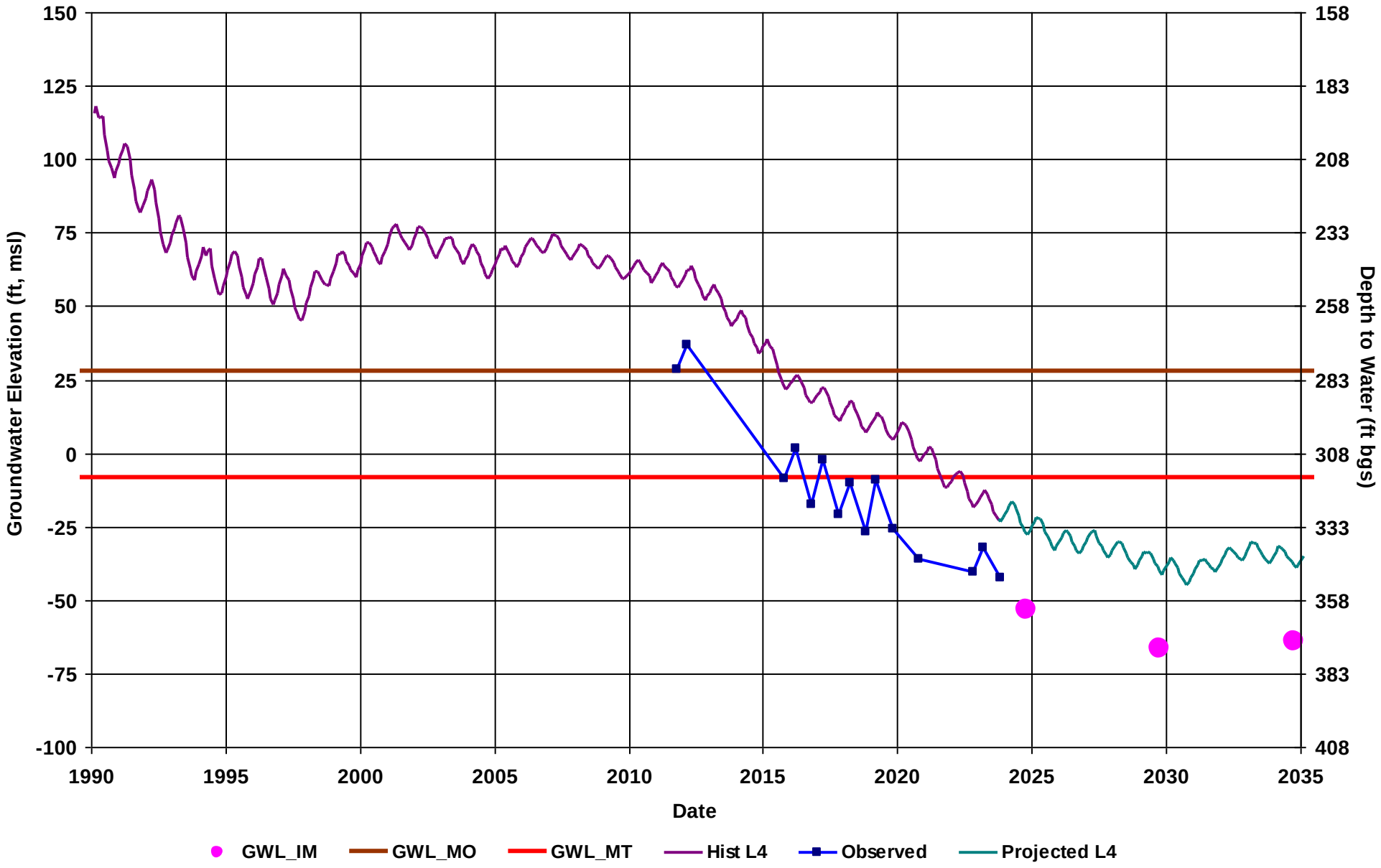
Well Name: MID RMS-16
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 340
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 109
Total Depth Average: 344
Total Depth Minimum: 140
Total Depth Maximum: 600

Top Perf. Count: 98
Top Perf. Average: 278
Top Perf. Minimum: 60
Top Perf. Maximum: 480

Total Depth (ft): 452
Perf Top (ft): 348
Perf Bottom (ft): 388
Top Model Layer: 4
Bottom Model Layer: 4



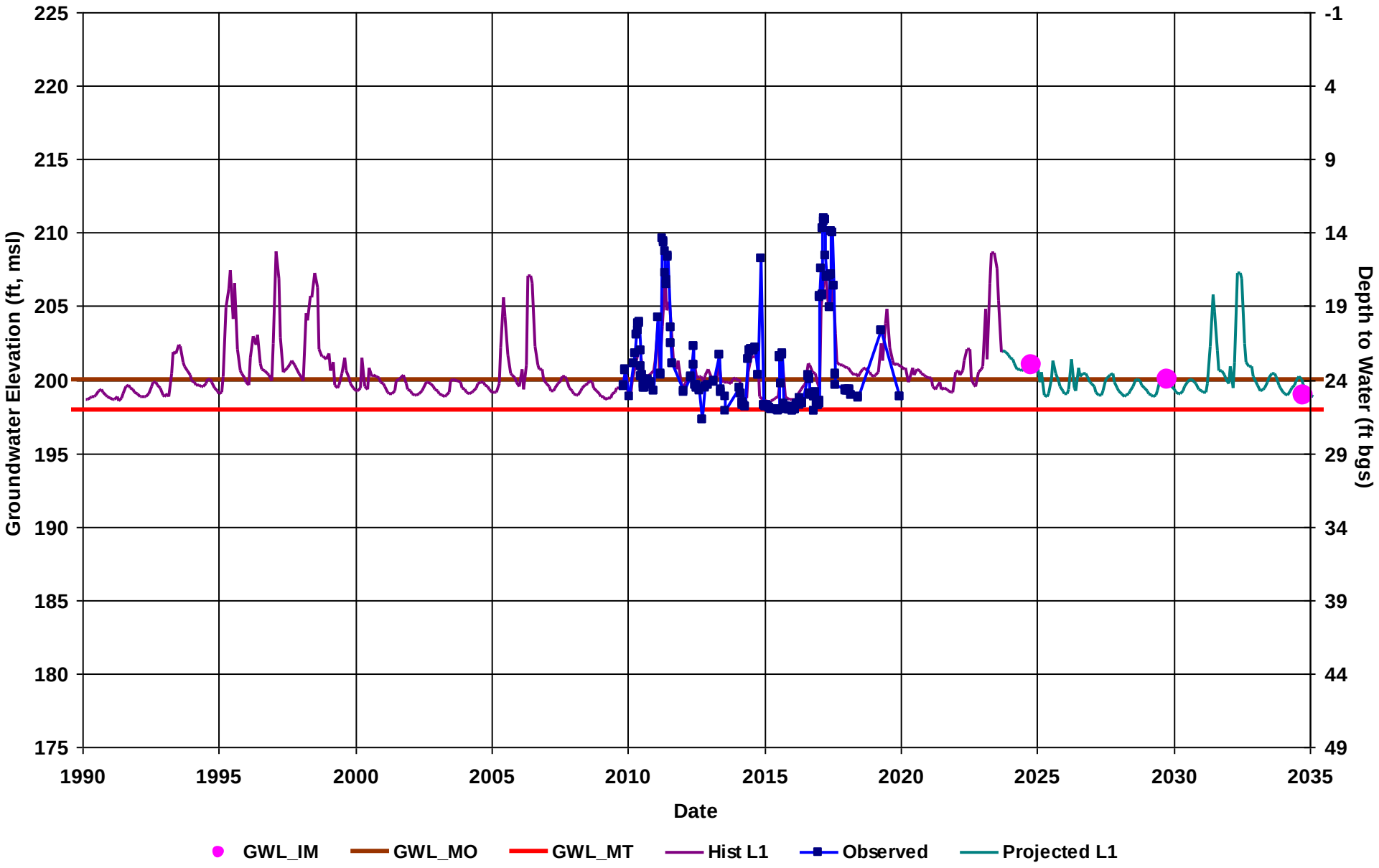
Well Name: MID RMS-17
Depth Zone: Shallow
Subbasin: Madera
GSE (ft, msl): 224
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 8*

Total Depth Count: 31
Total Depth Average: 188
Total Depth Minimum: 106
Total Depth Maximum: 400

Top Perf. Count: 14
Top Perf. Average: 144
Top Perf. Minimum: 33
Top Perf. Maximum: 256

Total Depth (ft): 47
Perf Top (ft): 26
Perf Bottom (ft): 46
Top Model Layer: 1
Bottom Model Layer: 1



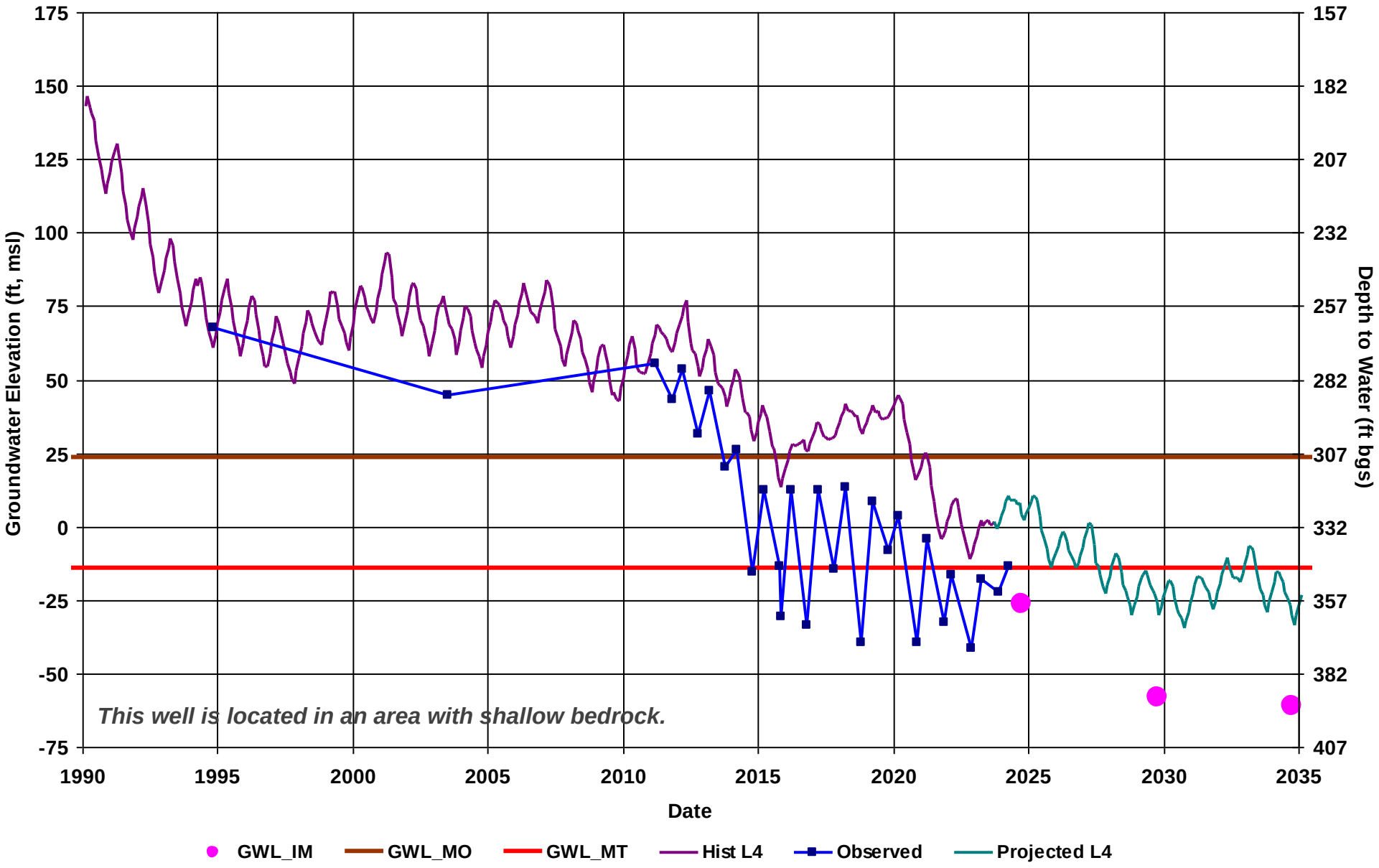
Well Name: MWD RMS-1
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 350
GSA: Madera Water District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 161
Total Depth Average: 360
Total Depth Minimum: 214
Total Depth Maximum: 700

Top Perf. Count: 141
Top Perf. Average: 289
Top Perf. Minimum: 170
Top Perf. Maximum: 610

Total Depth (ft): 504
Perf Top (ft): 200
Perf Bottom (ft): 500
Top Model Layer: 4
Bottom Model Layer: 4



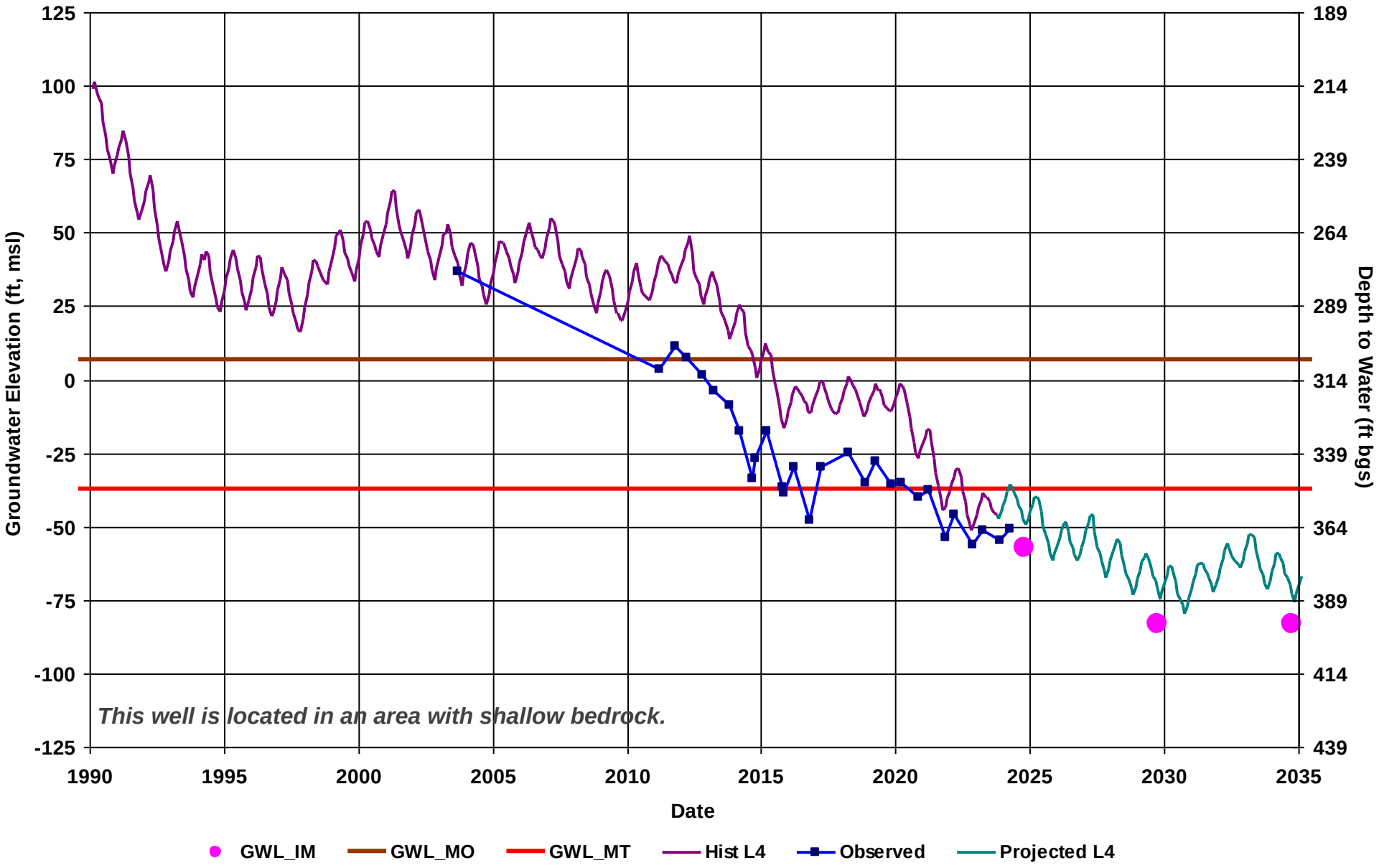
Well Name: MWD RMS-2
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 365
GSA: Madera Water District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 30
Total Depth Average: 386
Total Depth Minimum: 220
Total Depth Maximum: 687

Top Perf. Count: 18
Top Perf. Average: 287
Top Perf. Minimum: 180
Top Perf. Maximum: 435

Total Depth (ft): 537
Perf Top (ft): 200
Perf Bottom (ft): 537
Top Model Layer: 4
Bottom Model Layer: 4



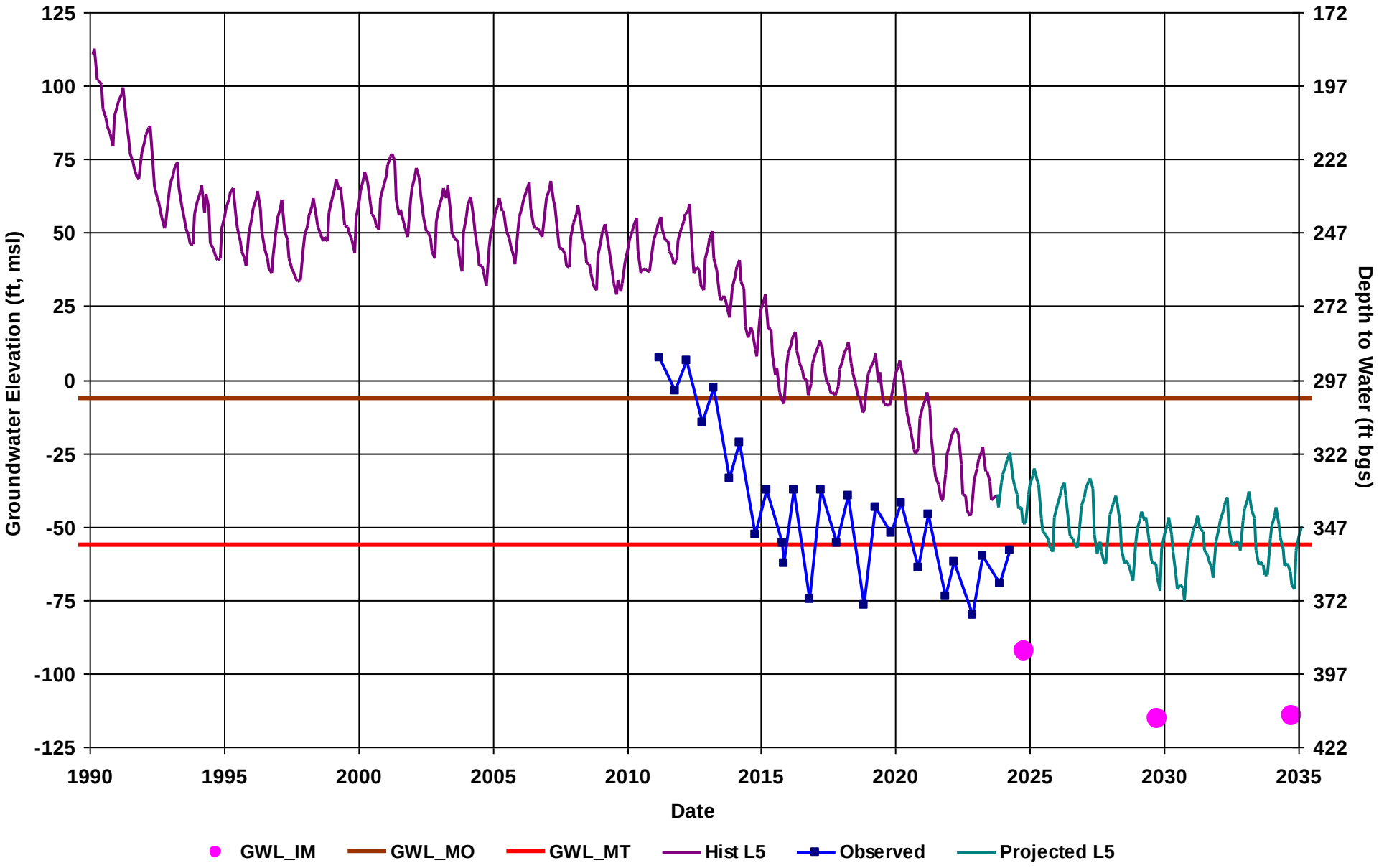
Well Name: MWD RMS-3
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 358
GSA: Madera Water District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 30
Total Depth Average: 386
Total Depth Minimum: 220
Total Depth Maximum: 687

Top Perf. Count: 18
Top Perf. Average: 287
Top Perf. Minimum: 180
Top Perf. Maximum: 435

Total Depth (ft): 800
Perf Top (ft): 380
Perf Bottom (ft): 800
Top Model Layer: 5
Bottom Model Layer: 5



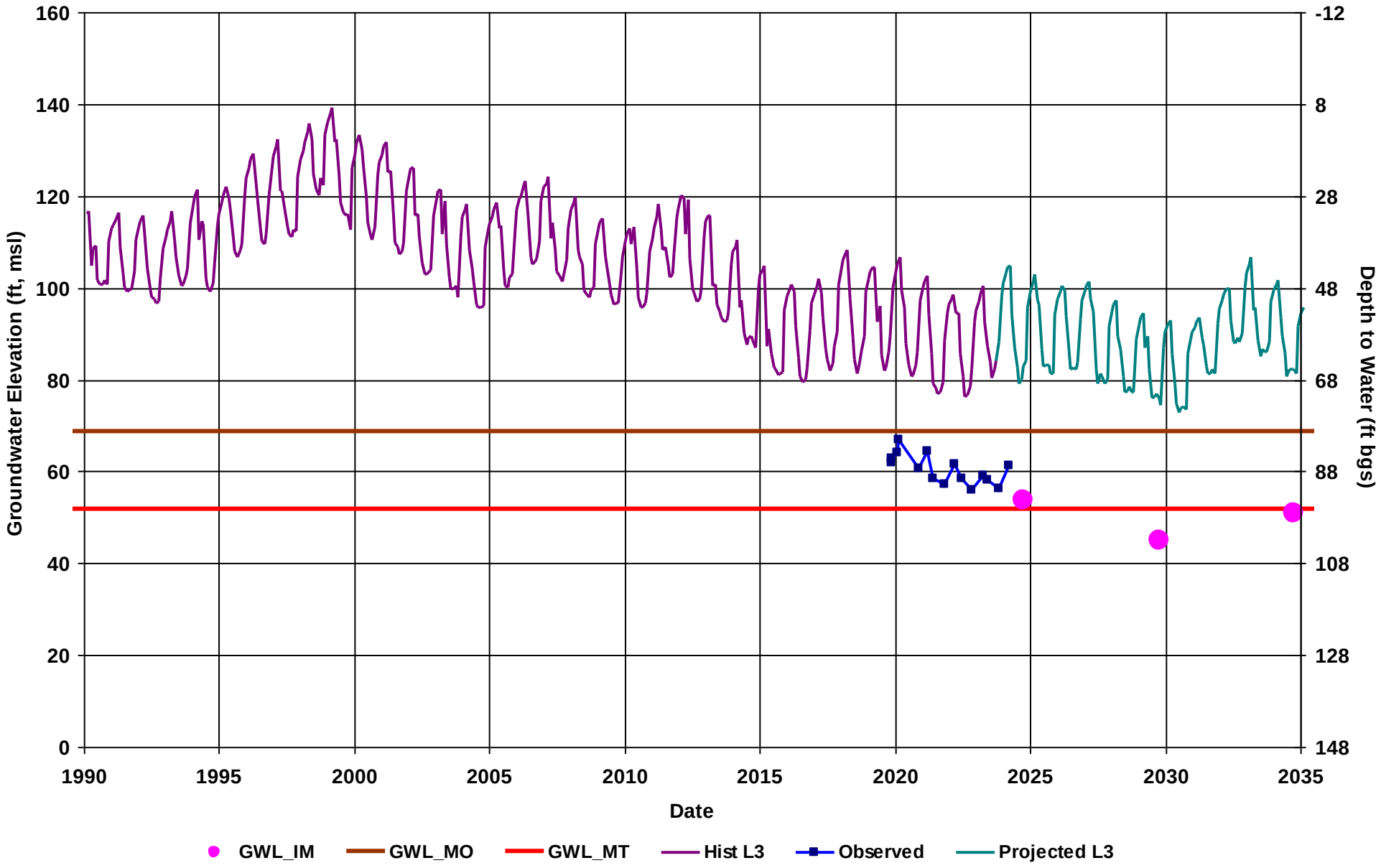
Well Name: MSB03B
Depth Zone: Upper
Subbasin: Madera
GSE (ft, msl): 148
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 8*

Total Depth Count: 2
Total Depth Average: 228
Total Depth Minimum: 55
Total Depth Maximum: 400

Top Perf. Count: 2
Top Perf. Average: 150
Top Perf. Minimum: 39
Top Perf. Maximum: 260

Total Depth (ft): 295
Perf Top (ft): 215
Perf Bottom (ft): 285
Top Model Layer: 3
Bottom Model Layer: 3



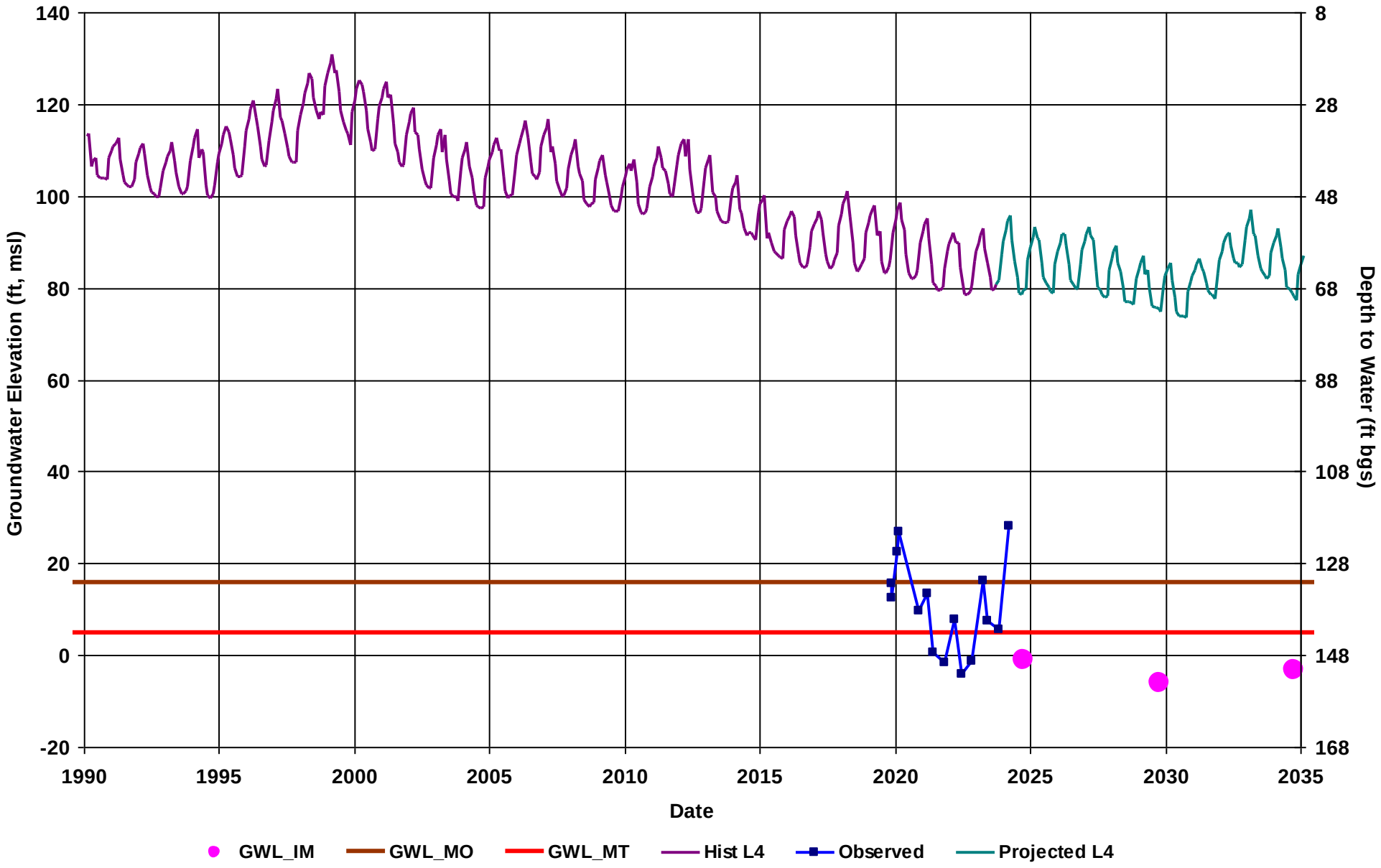
Well Name: MSB03C
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 148
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 8*

Total Depth Count: 2
Total Depth Average: 228
Total Depth Minimum: 55
Total Depth Maximum: 400

Top Perf. Count: 2
Top Perf. Average: 150
Top Perf. Minimum: 39
Top Perf. Maximum: 260

Total Depth (ft): 430
Perf Top (ft): 355
Perf Bottom (ft): 420
Top Model Layer: 4
Bottom Model Layer: 4



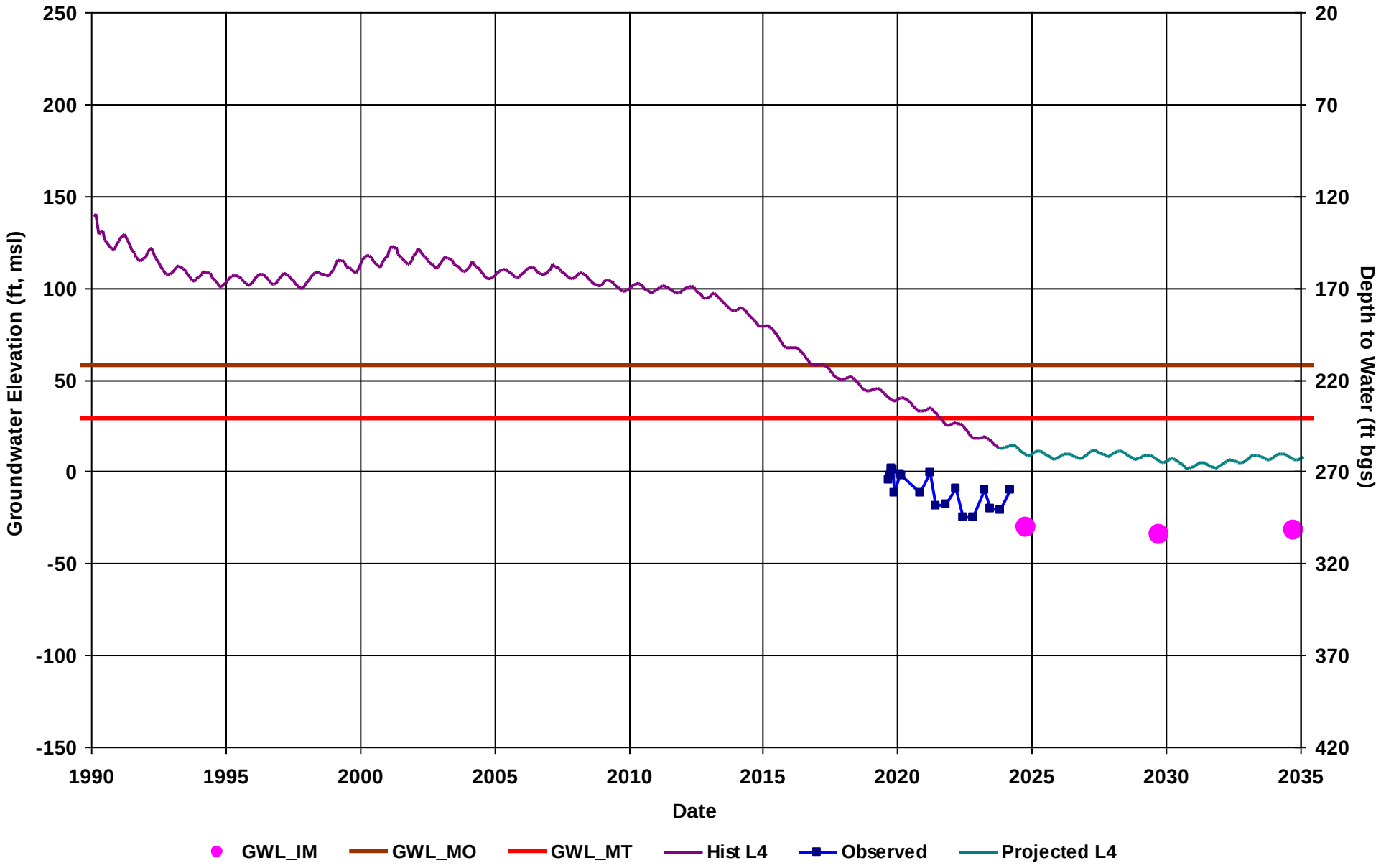
Well Name: MSB04B
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 270
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 412
Total Depth Average: 321
Total Depth Minimum: 117
Total Depth Maximum: 790

Top Perf. Count: 359
Top Perf. Average: 261
Top Perf. Minimum: 29
Top Perf. Maximum: 400

Total Depth (ft): 695
Perf Top (ft): 530
Perf Bottom (ft): 685
Top Model Layer: 4
Bottom Model Layer: 4



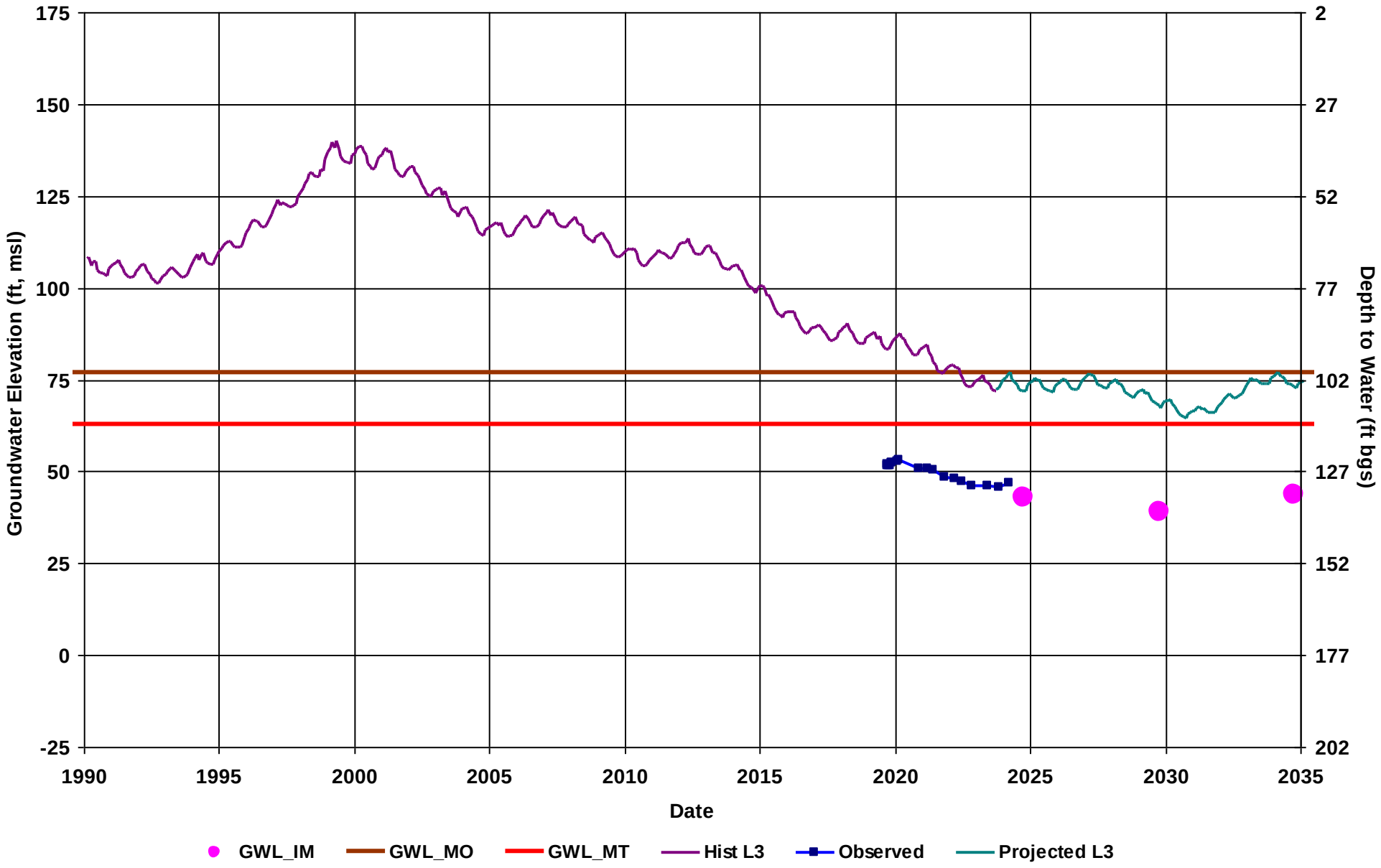
Well Name: MSB05A
Depth Zone: Upper
Subbasin: Madera
GSE (ft, msl): 177
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 5
Total Depth Average: 213
Total Depth Minimum: 155
Total Depth Maximum: 256

Top Perf. Count: 4
Top Perf. Average: 202
Top Perf. Minimum: 164
Top Perf. Maximum: 248

Total Depth (ft): 210
Perf Top (ft): 140
Perf Bottom (ft): 200
Top Model Layer: 3
Bottom Model Layer: 3



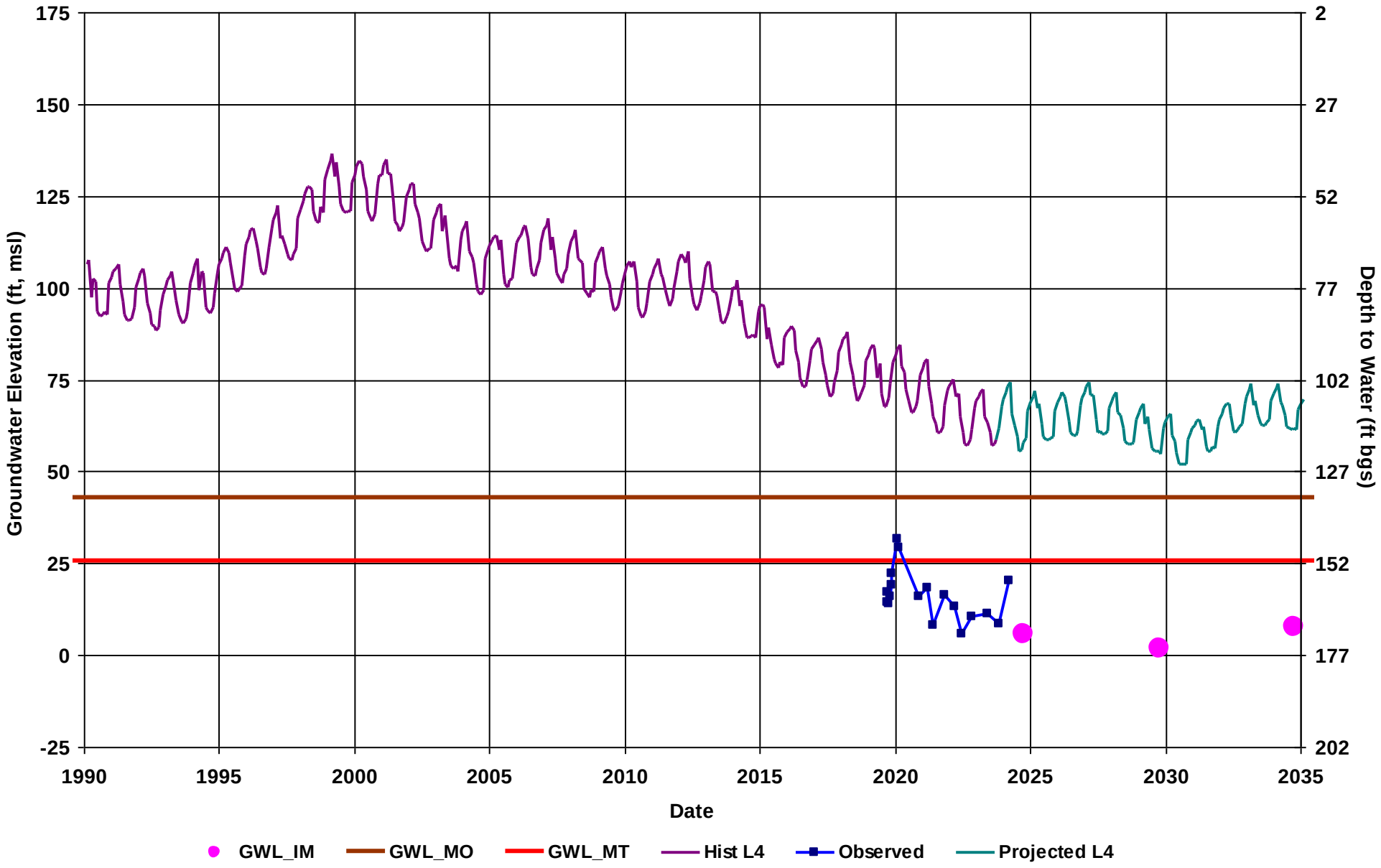
Well Name: MSB05B
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 177
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 5
Total Depth Average: 213
Total Depth Minimum: 155
Total Depth Maximum: 256

Top Perf. Count: 4
Top Perf. Average: 202
Top Perf. Minimum: 164
Top Perf. Maximum: 248

Total Depth (ft): 375
Perf Top (ft): 240
Perf Bottom (ft): 365
Top Model Layer: 4
Bottom Model Layer: 4



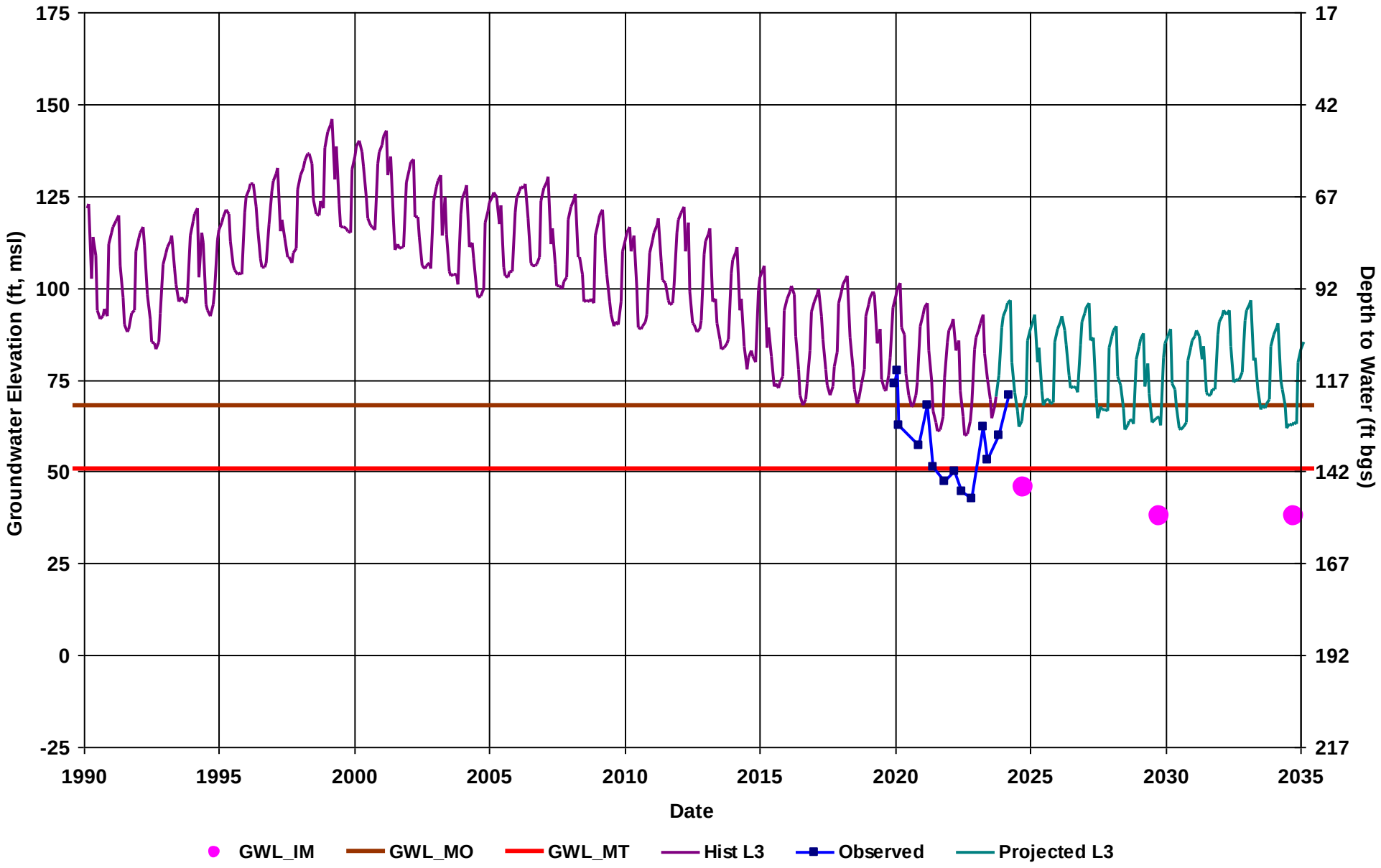
Well Name: MSB06A
Depth Zone: Upper
Subbasin: Madera
GSE (ft, msl): 192
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 8*

Total Depth Count: 3
Total Depth Average: 252
Total Depth Minimum: 172
Total Depth Maximum: 304

Top Perf. Count: 3
Top Perf. Average: 215
Top Perf. Minimum: 144
Top Perf. Maximum: 280

Total Depth (ft): 350
Perf Top (ft): 135
Perf Bottom (ft): 340
Top Model Layer: 3
Bottom Model Layer: 3



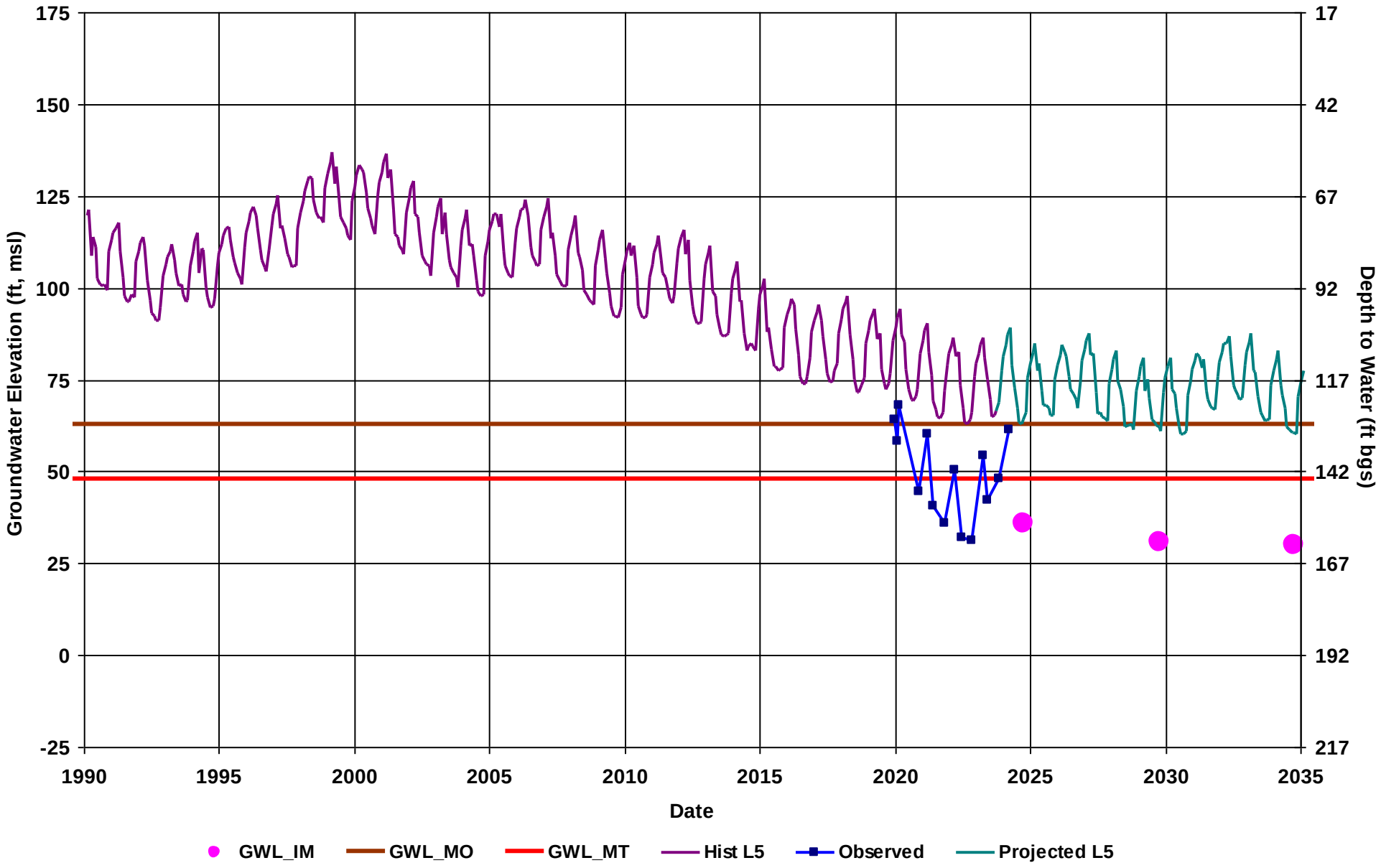
Well Name: MSB06C
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 192
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 8*

Total Depth Count: 3
Total Depth Average: 252
Total Depth Minimum: 172
Total Depth Maximum: 304

Top Perf. Count: 3
Top Perf. Average: 215
Top Perf. Minimum: 144
Top Perf. Maximum: 280

Total Depth (ft): 715
Perf Top (ft): 630
Perf Bottom (ft): 705
Top Model Layer: 5
Bottom Model Layer: 5



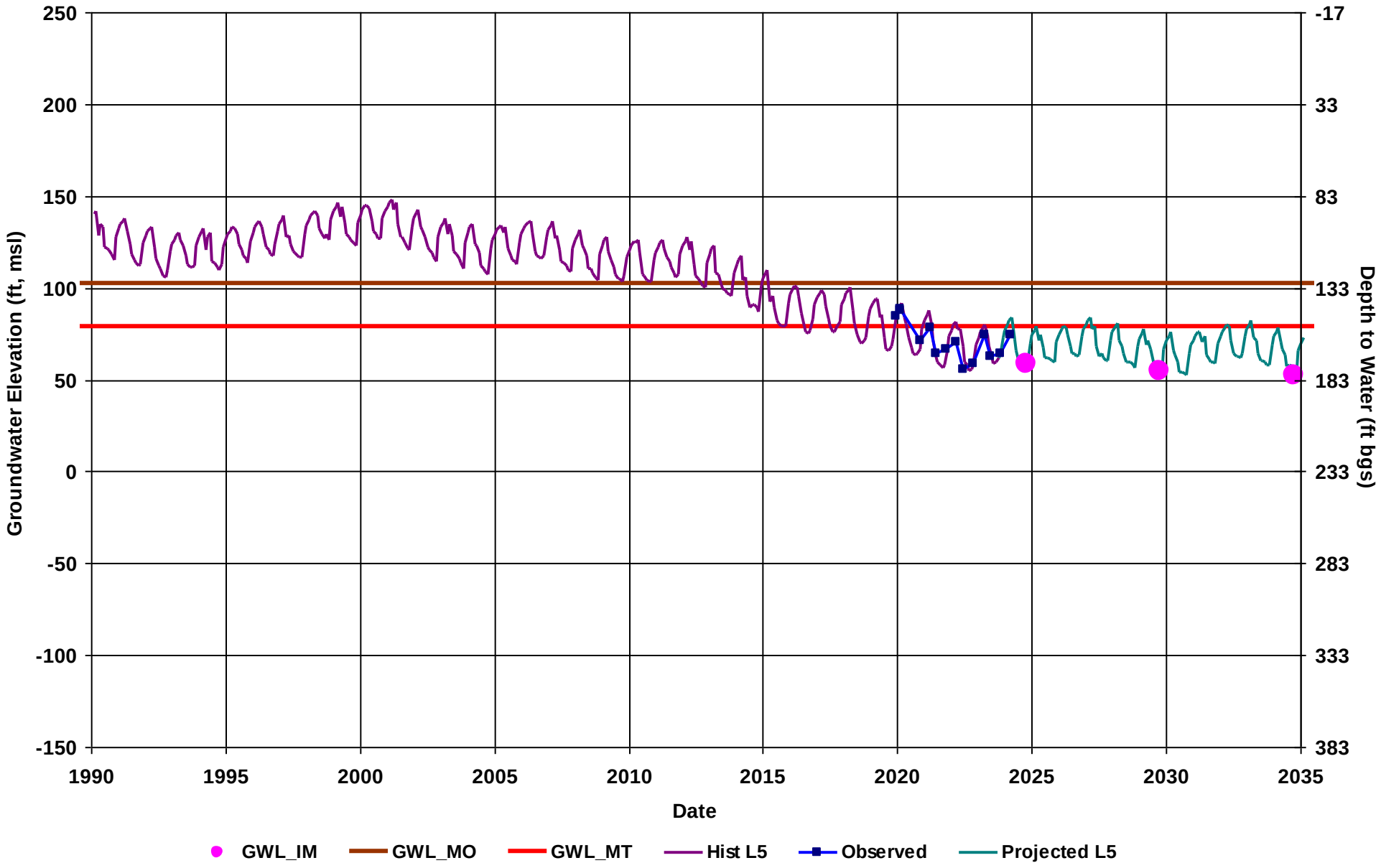
Well Name: MSB09C
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 233
GSA: Madera Irrigation District

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 18
Total Depth Average: 264
Total Depth Minimum: 151
Total Depth Maximum: 500

Top Perf. Count: 9
Top Perf. Average: 188
Top Perf. Minimum: 135
Top Perf. Maximum: 247

Total Depth (ft): 955
Perf Top (ft): 880
Perf Bottom (ft): 945
Top Model Layer: 5
Bottom Model Layer: 5



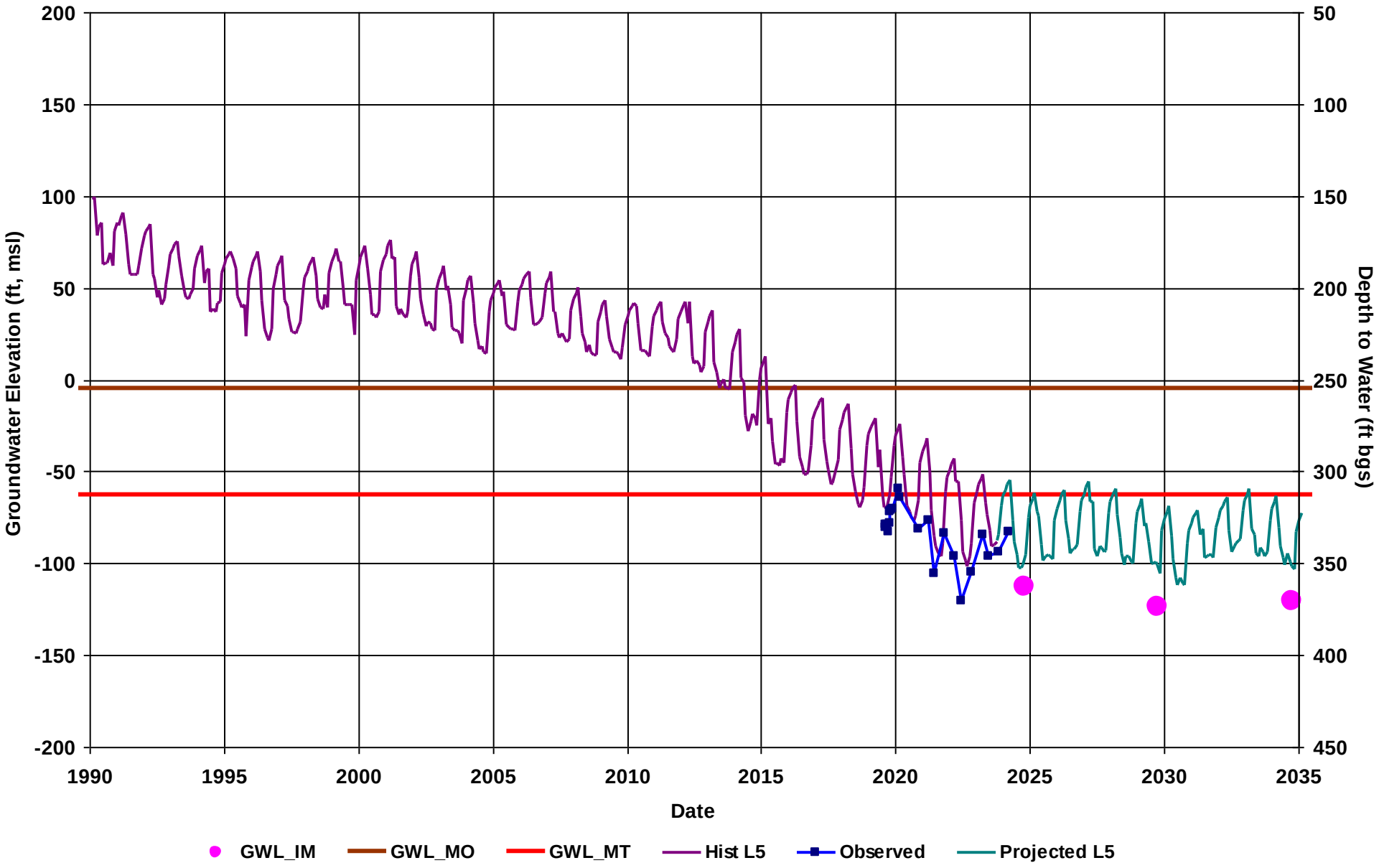
Well Name: MSB10C
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 250
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 101
Total Depth Average: 373
Total Depth Minimum: 173
Total Depth Maximum: 690

Top Perf. Count: 64
Top Perf. Average: 243
Top Perf. Minimum: 100
Top Perf. Maximum: 440

Total Depth (ft): 880
Perf Top (ft): 790
Perf Bottom (ft): 870
Top Model Layer: 5
Bottom Model Layer: 5



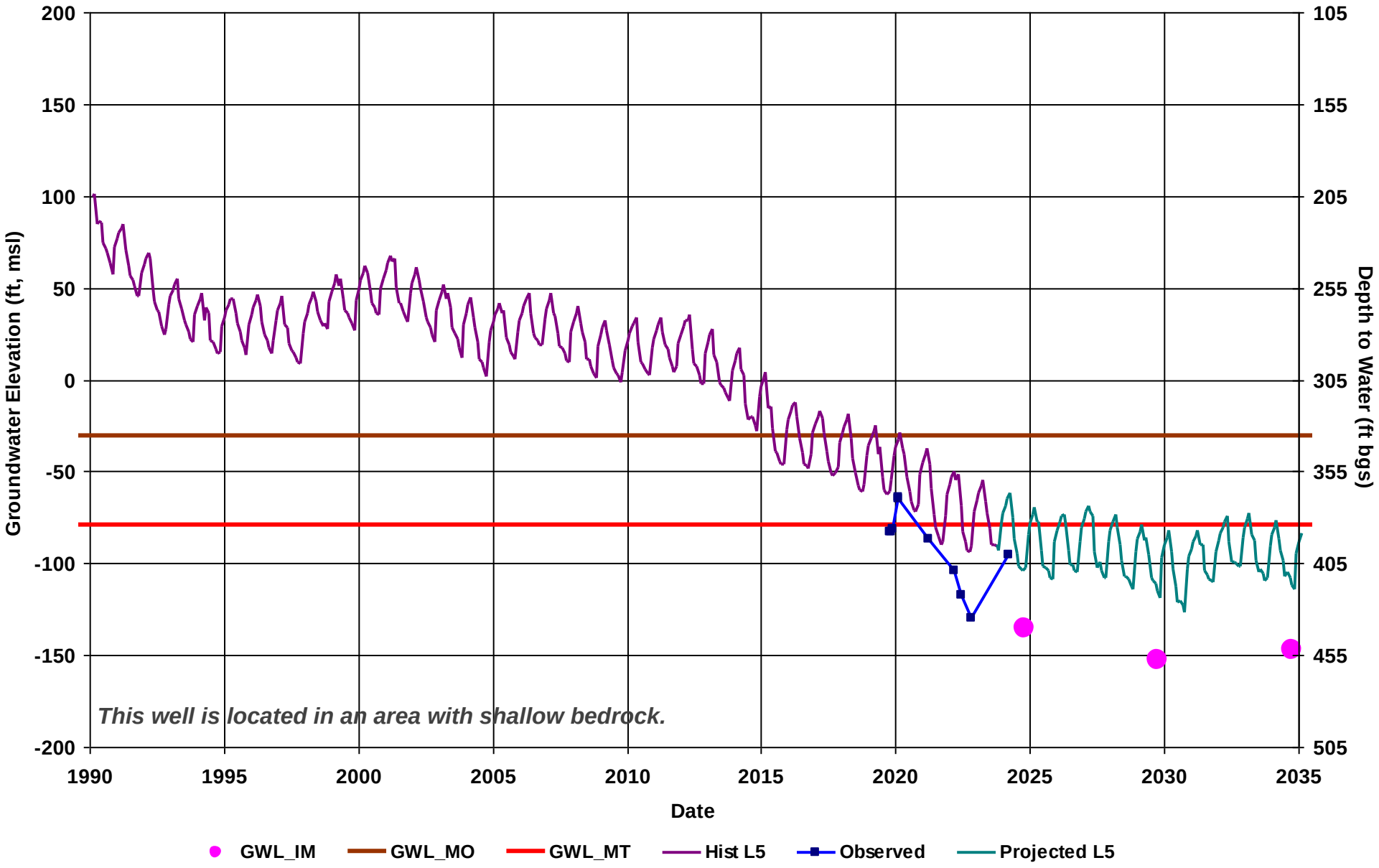
Well Name: MSB11C
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 305
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 21
Total Depth Average: 368
Total Depth Minimum: 250
Total Depth Maximum: 500

Top Perf. Count: 19
Top Perf. Average: 284
Top Perf. Minimum: 170
Top Perf. Maximum: 480

Total Depth (ft): 880
Perf Top (ft): 775
Perf Bottom (ft): 870
Top Model Layer: 5
Bottom Model Layer: 5



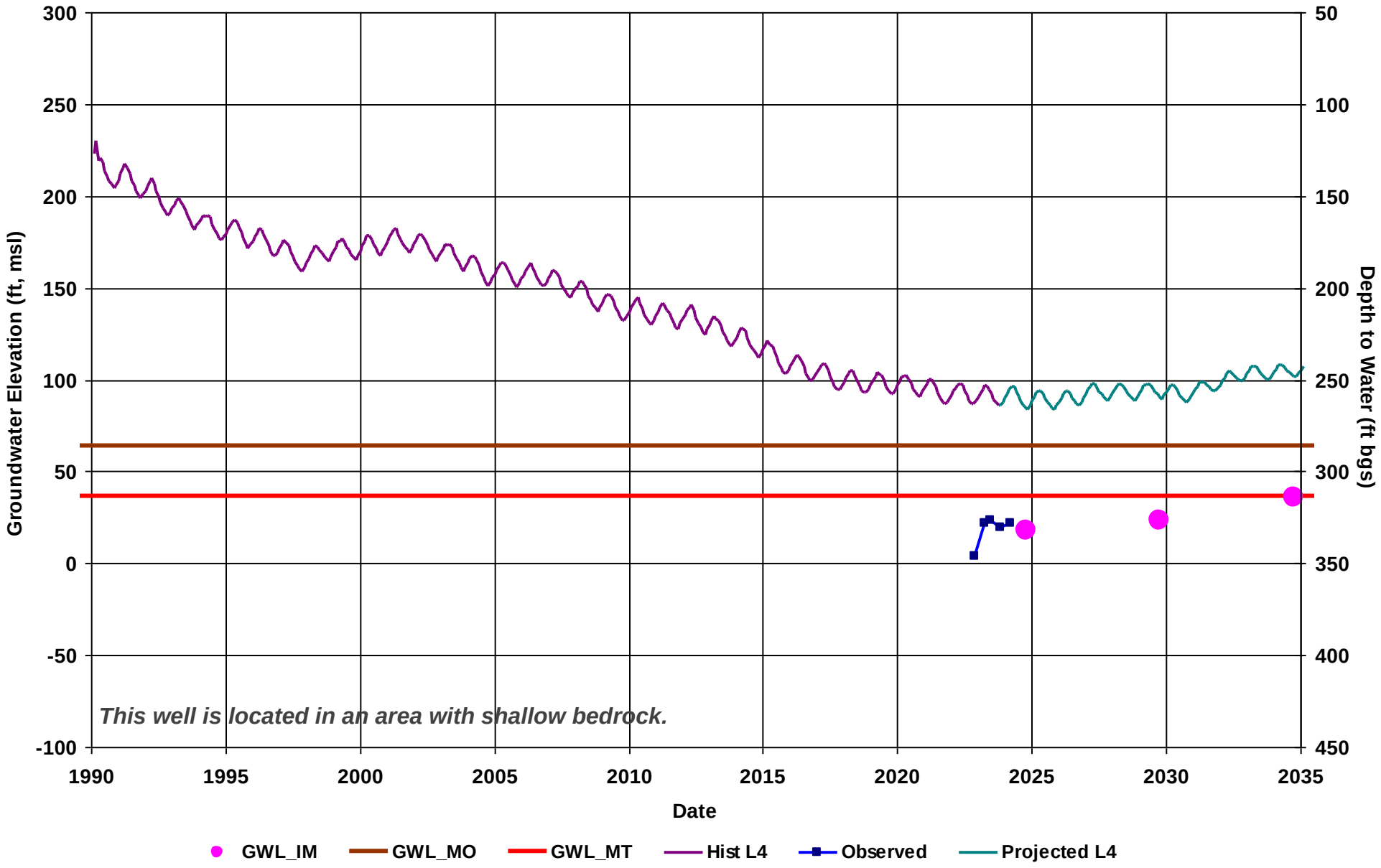
Well Name: MSB12
Depth Zone: Lower
Subbasin: Madera
GSE (ft, msl): 350
GSA: County of Madera

Domestic Well Data: *Total Sections Included: 9*

Total Depth Count: 258
Total Depth Average: 372
Total Depth Minimum: 200
Total Depth Maximum: 645

Top Perf. Count: 231
Top Perf. Average: 294
Top Perf. Minimum: 14
Top Perf. Maximum: 520

Total Depth (ft): 465
Perf Top (ft): 355
Perf Bottom (ft): 465
Top Model Layer: 4
Bottom Model Layer: 4



APPENDIX 3.B. MEASURABLE OBJECTIVES AND MINIMUM THRESHOLDS FOR GROUNDWATER QUALITY

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Amended January 2025

GSP Team:

Davids Engineering, Inc
Luhdorff & Scalmanini
ERA Economics
Stillwater Sciences and
California State University, Sacramento

Summary of Recent (Since January 2015) Results for Key Water Quality Constituents in Groundwater Quality Indicator Wells

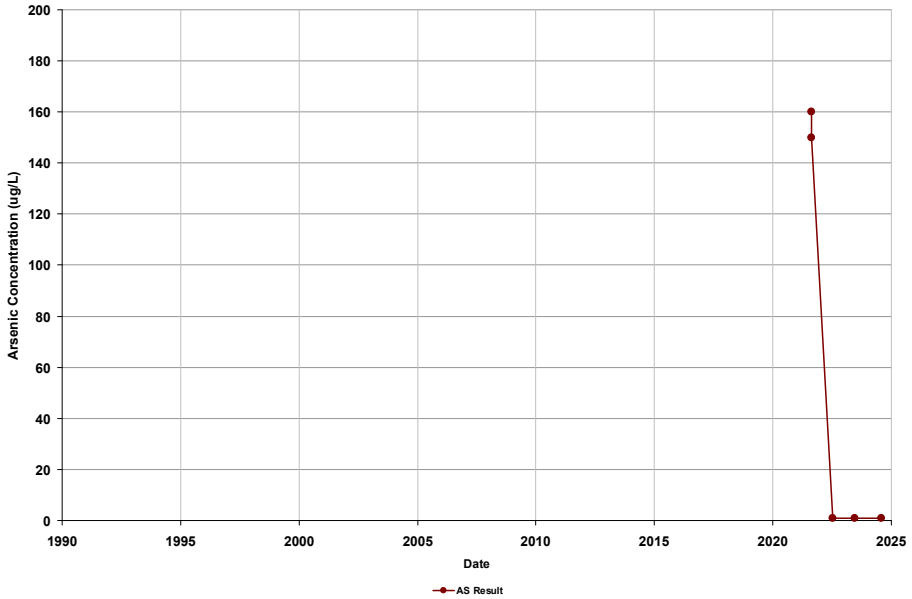
	Arsenic Concentration (ug/L)					Nitrate Concentration (mg/L as nitrogen)					Specific Conductance (us/cm)					TDS Concentration (mg/L)				
Well ID	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**
MCE RMS-3	ND	160	63.20	8/18/2021	7/30/2024	ND	0.53	0.27	8/18/2021	7/30/2024	873	873	873	8/18/2021	8/18/2021	590	720	640	8/18/2021	7/30/2024
MID RMS-4																				
MID RMS-5B																				
MID RMS-6	ND	ND	2.00	7/12/2022	7/12/2022	5.4	5.4	5.40	7/12/2022	7/12/2022						270	270	270	7/12/2022	7/12/2022
MID RMS-7	ND	ND	2.00	7/12/2022	7/25/2024	0.7	0.77	0.74	7/12/2022	7/25/2024						190	220	205	7/12/2022	7/25/2024
MID RMS-13																				
MWD RMS-1	2	3	2.75	7/18/2019	8/19/2022	1.4	2.8	2.23	7/18/2019	8/19/2022	256	278	267	7/18/2019	8/19/2022	191	230	205	7/18/2019	8/19/2022
MSB03A	2.3	4.7	3.10	2/12/2020	7/23/2024	7.2	8.1	7.70	6/22/2022	7/23/2024	1,200	1,453	1,333	2/12/2020	8/3/2022	720	930	833	2/12/2020	7/23/2024
MSB03B	3.9	5.5	4.57	2/12/2020	7/23/2024	0.37	0.45	0.41	6/15/2021	7/23/2024	280	280	280	2/12/2020	2/12/2020	210	400	354	2/12/2020	7/23/2024
MSB03C	ND	5.5	4.33	2/12/2020	7/23/2024	ND	ND	0.22	6/15/2021	7/23/2024	370	370	370	2/12/2020	2/12/2020	250	1,400	990	2/12/2020	7/23/2024
MSB04A	ND	3.1	2.52	2/13/2020	6/15/2023	5	6.5	5.80	6/15/2021	6/15/2023	280	280	280	2/13/2020	2/13/2020	200	240	218	2/13/2020	6/15/2023
MSB04B	45	57	48.33	2/13/2020	7/24/2024	ND	ND	0.20	6/15/2021	7/24/2024	600	600	600	2/13/2020	2/13/2020	360	420	386	2/13/2020	7/24/2024
MSB04C	48	60	54.00	2/13/2020	7/24/2024	ND	ND	0.20	6/15/2021	7/24/2024	520	520	520	2/13/2020	2/13/2020	340	400	364	2/13/2020	7/24/2024
MSB05A	1.9	10	5.15	2/12/2020	7/23/2024	3.2	18	9.53	6/22/2022	7/23/2024	716	1,271	1,062	2/12/2020	8/3/2022	330	720	559	2/12/2020	7/23/2024
MSB05B	9	49	27.50	2/12/2020	7/23/2024	0.29	2.3	0.98	6/22/2022	7/23/2024	340	340	340	2/12/2020	2/12/2020	230	320	260	2/12/2020	7/23/2024
MSB05C	5.3	9	7.55	2/12/2020	7/23/2024	ND	0.92	0.68	6/22/2022	7/23/2024	430	430	430	2/12/2020	2/12/2020	99	270	210	2/12/2020	7/23/2024
MSB06A	ND	3.2	2.09	2/12/2020	7/23/2024	8.5	16	10.68	6/15/2021	7/23/2024	562	660	618	2/12/2020	8/3/2022	330	1,300	530	2/12/2020	7/23/2024
MSB06B	ND	47	31.80	2/12/2020	7/23/2024	0.25	4	1.39	6/15/2021	7/23/2024	570	570	570	2/12/2020	2/12/2020	350	520	398	2/12/2020	7/23/2024
MSB06C	2	20	12.67	2/12/2020	7/23/2024	ND	0.97	0.37	6/15/2021	7/23/2024	760	760	760	2/12/2020	2/12/2020	160	540	437	2/12/2020	7/23/2024
MSB09A	ND	2.1	1.83	2/11/2020	7/25/2024	7.7	9.9	8.63	6/17/2021	7/25/2024	693	900	783	2/11/2020	8/3/2022	450	570	505	2/11/2020	7/25/2024
MSB09B	ND	3.3	2.33	2/11/2020	7/25/2024	1.3	1.7	1.45	6/17/2021	7/25/2024	230	230	230	2/11/2020	2/11/2020	170	530	268	2/11/2020	7/25/2024
MSB09C	110	120	112.00	2/11/2020	7/25/2024	ND	ND	0.20	6/17/2021	7/25/2024	430	430	430	2/11/2020	2/11/2020	130	310	248	2/11/2020	7/25/2024
MSB10B	ND	3	2.33	2/13/2020	7/26/2024	1.5	2.3	2.03	6/15/2021	7/26/2024	268	290	283	2/13/2020	8/2/2022	170	220	208	2/13/2020	7/26/2024
MSB10C	ND	3.8	2.37	2/13/2020	7/26/2024	ND	1.7	0.60	6/15/2021	7/26/2024	440	440	440	2/13/2020	2/13/2020	260	540	326	2/13/2020	7/26/2024
MSB11C	4.5	8.5	6.50	2/11/2020	7/31/2024	ND	ND	0.23	6/21/2022	7/31/2024	850	850	850	2/11/2020	2/11/2020	450	520	477	2/11/2020	7/31/2024
MSB13A																				
MSB13B	3.1	3.6	3.35	6/15/2023	7/24/2024	3.5	3.7	3.60	6/15/2023	7/24/2024						290	290	290	6/15/2023	7/24/2024
MSB13C	3.6	4.7	4.15	6/15/2023	7/24/2024	ND	ND	0.23	6/15/2023	7/24/2024						890	1,000	945	6/15/2023	7/24/2024
2000507-001	2.6	4.6	3.80	4/20/2017	5/11/2023	2.8	3.1	2.98	4/20/2017	6/28/2024										
2000553-001	1.5	2	1.78	9/23/2015	2/14/2024	3.8	9.8	5.20	6/22/2015	7/9/2024	380	510	438	1/10/2018	10/9/2023	220	420	325	9/23/2015	2/14/2024
2000682-002	2.1	2.2	2.15	6/21/2017	8/23/2023	0.76	11.8	3.04	7/14/2015	1/16/2024	200	230	215	5/26/2020	8/23/2023					
2000727-001	1.4	1.8	1.63	9/23/2015	2/21/2024	1.5	6.7	2.16	9/23/2015	2/21/2024	290	300	295	1/10/2018	1/6/2021	200	380	253	9/23/2015	2/21/2024
2000938-001						1.1	5.6	1.63	1/9/2015	1/17/2023	220	230	227	6/29/2016	3/4/2020					
2010002-014						0.88	7.4	1.86	5/21/2015	6/3/2024	240	297	258	8/25/2016	5/22/2023	180	207	191	8/25/2016	5/22/2023
2010002-032	2	2	2.00	3/25/2024	3/25/2024	1.9	9.4	3.17	2/19/2015	3/25/2024	280	349	312	2/16/2017	11/10/2021	200	235	219	2/19/2015	11/10/2021
2010008-005	2	3.1	2.68	3/4/2015	3/25/2024	1.8	18	4.65	3/4/2015	3/25/2024	430	480	455	1/10/2018	1/6/2021	290	360	323	3/4/2015	3/25/2024
2010009-002						1.6	1.8	1.70	1/11/2016	1/26/2017										
2010010-007	2.7	2.7	2.70	9/9/2022	9/9/2022	0.24	6	1.67	1/5/2015	1/2/2024	230	290	263	1/15/2016	9/9/2022	210	220	213	1/15/2016	9/9/2022
2010801-001	4.8	22	16.58	1/6/2015	7/2/2024	0.55	2.5	1.78	4/14/2015	8/5/2021	310	320	315	8/7/2018	8/5/2021	220	250	237	9/15/2015	8/5/2021
2801077-001						0.1	0.14	0.12	4/12/2018	4/24/2024										
ESJ12	0.57	0.57	0.57	7/27/2021	7/27/2021						805	805	805	8/4/2020	8/4/2020					
ESJ17	2	2	2.00	7/27/2021	7/27/2021						249	249	249	8/4/2020	8/4/2020					

Summary of All Historical Results for Key Water Quality Constituents in Groundwater Quality Indicator Wells

	Arsenic Concentration (ug/L)					Nitrate Concentration (mg/L as nitrogen)					Specific Conductance (us/cm)					TDS Concentration (mg/L)				
Well ID	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**	**Minimum Result**	**Maximum Result**	**Average Result**	**Date First Observation**	**Date Last Observation**
MCE RMS-3	ND	160	63.20	8/18/2021	7/30/2024	ND	0.53	0.27	8/18/2021	7/30/2024	873	873	873	8/18/2021	8/18/2021	590	720	640	8/18/2021	7/30/2024
MID RMS-4																				
MID RMS-5B																				
MID RMS-6	ND	ND	2.00	7/12/2022	7/12/2022	5.4	5.4	5.40	7/12/2022	7/12/2022						270	270	270	7/12/2022	7/12/2022
MID RMS-7	ND	ND	2.00	7/12/2022	7/25/2024	0.7	0.77	0.74	7/12/2022	7/25/2024						190	220	205	7/12/2022	7/25/2024
MID RMS-13																				
MWD RMS-1	2	3	2.75	7/18/2019	8/19/2022	1.4	2.8	2.23	7/18/2019	8/19/2022	256	278	267	7/18/2019	8/19/2022	191	230	205	7/18/2019	8/19/2022
MSB03A	2.3	4.7	3.10	2/12/2020	7/23/2024	7.2	8.1	7.70	6/22/2022	7/23/2024	1,200	1,453	1,333	2/12/2020	8/3/2022	720	930	833	2/12/2020	7/23/2024
MSB03B	3.9	5.5	4.57	2/12/2020	7/23/2024	0.37	0.45	0.41	6/15/2021	7/23/2024	280	280	280	2/12/2020	2/12/2020	210	400	354	2/12/2020	7/23/2024
MSB03C	ND	5.5	4.33	2/12/2020	7/23/2024	ND	ND	0.22	6/15/2021	7/23/2024	370	370	370	2/12/2020	2/12/2020	250	1,400	990	2/12/2020	7/23/2024
MSB04A	ND	3.1	2.52	2/13/2020	6/15/2023	5	6.5	5.80	6/15/2021	6/15/2023	280	280	280	2/13/2020	2/13/2020	200	240	218	2/13/2020	6/15/2023
MSB04B	45	57	48.33	2/13/2020	7/24/2024	ND	ND	0.20	6/15/2021	7/24/2024	600	600	600	2/13/2020	2/13/2020	360	420	386	2/13/2020	7/24/2024
MSB04C	48	60	54.00	2/13/2020	7/24/2024	ND	ND	0.20	6/15/2021	7/24/2024	520	520	520	2/13/2020	2/13/2020	340	400	364	2/13/2020	7/24/2024
MSB05A	1.9	10	5.15	2/12/2020	7/23/2024	3.2	18	9.53	6/22/2022	7/23/2024	716	1,271	1,062	2/12/2020	8/3/2022	330	720	559	2/12/2020	7/23/2024
MSB05B	9	49	27.50	2/12/2020	7/23/2024	0.29	2.3	0.98	6/22/2022	7/23/2024	340	340	340	2/12/2020	2/12/2020	230	320	260	2/12/2020	7/23/2024
MSB05C	5.3	9	7.55	2/12/2020	7/23/2024	ND	0.92	0.68	6/22/2022	7/23/2024	430	430	430	2/12/2020	2/12/2020	99	270	210	2/12/2020	7/23/2024
MSB06A	ND	3.2	2.09	2/12/2020	7/23/2024	8.5	16	10.68	6/15/2021	7/23/2024	562	660	618	2/12/2020	8/3/2022	330	1,300	530	2/12/2020	7/23/2024
MSB06B	ND	47	31.80	2/12/2020	7/23/2024	0.25	4	1.39	6/15/2021	7/23/2024	570	570	570	2/12/2020	2/12/2020	350	520	398	2/12/2020	7/23/2024
MSB06C	2	20	12.67	2/12/2020	7/23/2024	ND	0.97	0.37	6/15/2021	7/23/2024	760	760	760	2/12/2020	2/12/2020	160	540	437	2/12/2020	7/23/2024
MSB09A	ND	2.1	1.83	2/11/2020	7/25/2024	7.7	9.9	8.63	6/17/2021	7/25/2024	693	900	783	2/11/2020	8/3/2022	450	570	505	2/11/2020	7/25/2024
MSB09B	ND	3.3	2.33	2/11/2020	7/25/2024	1.3	1.7	1.45	6/17/2021	7/25/2024	230	230	230	2/11/2020	2/11/2020	170	530	268	2/11/2020	7/25/2024
MSB09C	110	120	112.00	2/11/2020	7/25/2024	ND	ND	0.20	6/17/2021	7/25/2024	430	430	430	2/11/2020	2/11/2020	130	310	248	2/11/2020	7/25/2024
MSB10B	ND	3	2.33	2/13/2020	7/26/2024	1.5	2.3	2.03	6/15/2021	7/26/2024	268	290	283	2/13/2020	8/2/2022	170	220	208	2/13/2020	7/26/2024
MSB10C	ND	3.8	2.37	2/13/2020	7/26/2024	ND	1.7	0.60	6/15/2021	7/26/2024	440	440	440	2/13/2020	2/13/2020	260	540	326	2/13/2020	7/26/2024
MSB11C	4.5	8.5	6.50	2/11/2020	7/31/2024	ND	ND	0.23	6/21/2022	7/31/2024	850	850	850	2/11/2020	2/11/2020	450	520	477	2/11/2020	7/31/2024
MSB13A																				
MSB13B	3.1	3.6	3.35	6/15/2023	7/24/2024	3.5	3.7	3.60	6/15/2023	7/24/2024						290	290	290	6/15/2023	7/24/2024
MSB13C	3.6	4.7	4.15	6/15/2023	7/24/2024	ND	ND	0.23	6/15/2023	7/24/2024						890	1,000	945	6/15/2023	7/24/2024
2000507-001	2.6	4.6	3.83	12/23/2008	5/11/2023	2.8	9.7	5.43	11/5/2004	6/28/2024										
2000553-001	1.5	2.6	1.95	5/27/2008	2/14/2024	3.8	22	7.71	12/8/2005	7/9/2024	170	510	390	12/8/2005	10/9/2023	180	420	281	12/8/2005	2/14/2024
2000682-002	2.1	3.8	2.70	5/20/2008	8/23/2023	0.76	13.8	6.72	5/20/2008	1/16/2024	200	306	245	5/20/2008	8/23/2023	220	220	220	5/20/2008	5/20/2008
2000727-001	ND	2.1	1.80	5/27/2008	2/21/2024	1.5	7.8	4.85	5/24/2006	2/21/2024	190	310	276	3/18/2008	1/6/2021	190	380	229	5/27/2008	2/21/2024
2000938-001	2	2	2.00	12/17/2008	8/4/2010	1.1	6.5	3.19	6/25/2008	1/17/2023	220	230	226	8/4/2011	3/4/2020					
2010002-014	ND	30	6.71	3/4/1986	5/22/2008	ND	14	4.50	3/4/1986	6/3/2024	221	297	241	3/4/1986	5/22/2023	148	207	181	3/4/1986	5/22/2023
2010002-032	ND	3.9	2.48	11/16/2006	3/25/2024	ND	12	5.88	11/16/2006	3/25/2024	220	349	281	9/6/2006	11/10/2021	190	240	212	9/6/2006	11/10/2021
2010008-005	2	4.4	3.01	5/1/1997	3/25/2024	1.8	22.3	11.82	5/1/1997	3/25/2024	350	480	419	5/1/1997	1/6/2021	280	360	322	5/1/1997	3/25/2024
2010009-002	4.1	10	5.99	10/22/1985	7/15/2013	1.6	8.7	6.36	10/22/1985	1/26/2017	140	200	173	10/22/1985	7/15/2013	110	150	138	10/22/1985	7/15/2013
2010010-007	2	3.2	2.38	10/18/2005	9/9/2022	0.24	20	8.16	10/18/2005	1/2/2024	200	290	238	10/18/2005	9/9/2022	190	220	204	10/18/2005	9/9/2022
2010801-001	4.3	22	14.86	3/4/1998	7/2/2024	ND	4.6	1.64	3/4/1998	8/5/2021	300	390	332	3/4/1998	8/5/2021	220	270	242	3/4/1998	8/5/2021
2801077-001	5	5	5.00	4/3/2002	4/3/2002	ND	75	10.77	4/3/2002	4/24/2024										
ESJ12	0.57	0.57	0.57	7/27/2021	7/27/2021						805	805	805	8/4/2020	8/4/2020					
ESJ17	2	2	2.00	7/27/2021	7/27/2021						249	249	249	8/4/2020	8/4/2020					

Well Name: MCE RMS-3
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Unknown

Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-4
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 698
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 667

NOTE: Non-Detect results shown as half the reporting limit.

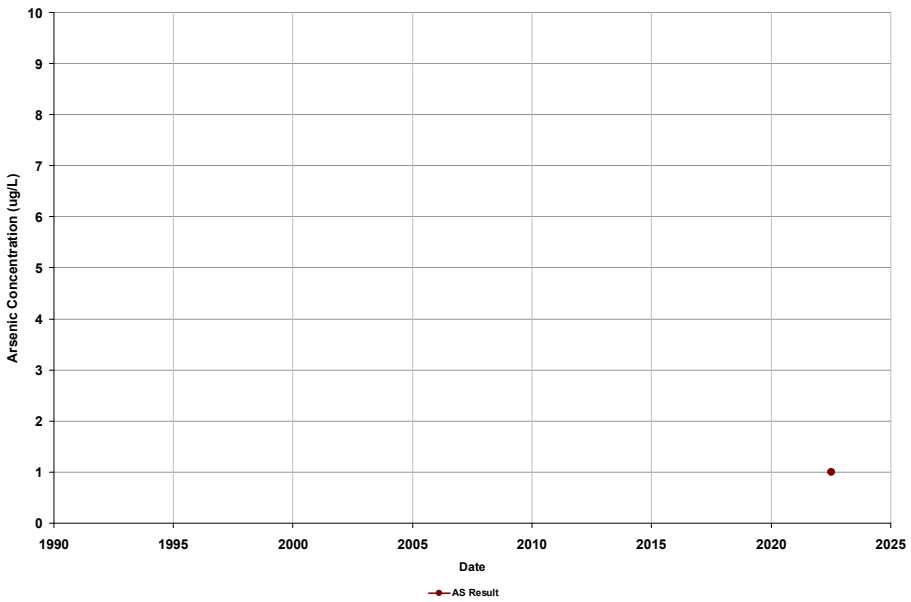
Well Name: MID RMS-5B
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 514
Perf. Top (ft bgs): 245
Perf. Bottom (ft bgs): 496

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-6
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Industrial

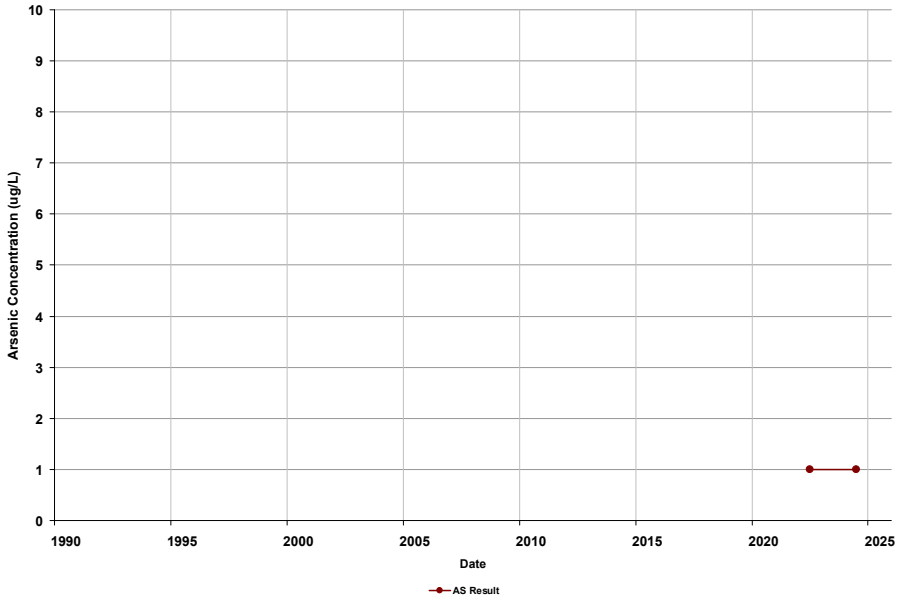
Total Depth (ft bgs): 680
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 680



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-7
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 656
Perf. Top (ft bgs): 290
Perf. Bottom (ft bgs): 635



NOTE: Non-Detect results shown as half the reporting limit.

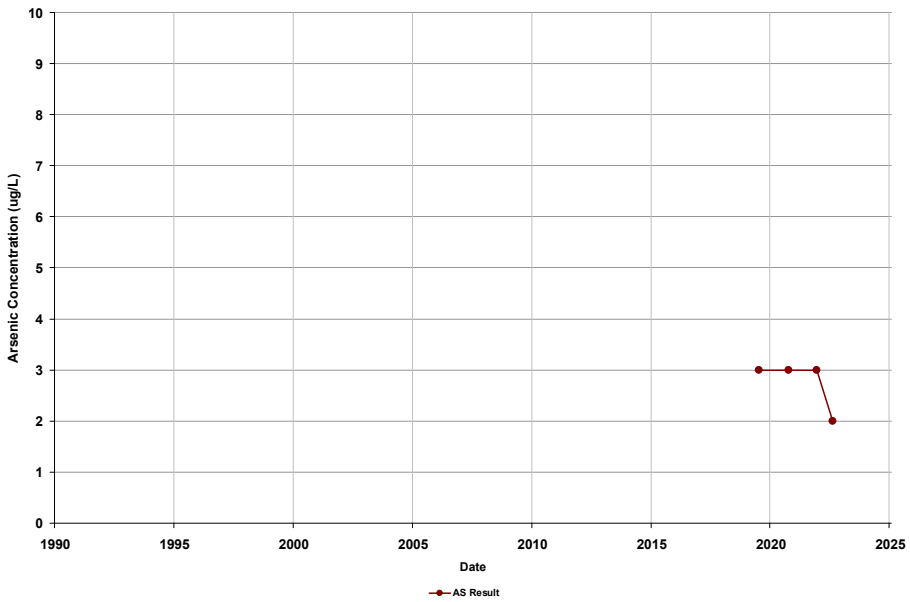
Well Name: MID RMS-13
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 600
Perf. Top (ft bgs): 228
Perf. Bottom (ft bgs): 552

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MWD RMS-1
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

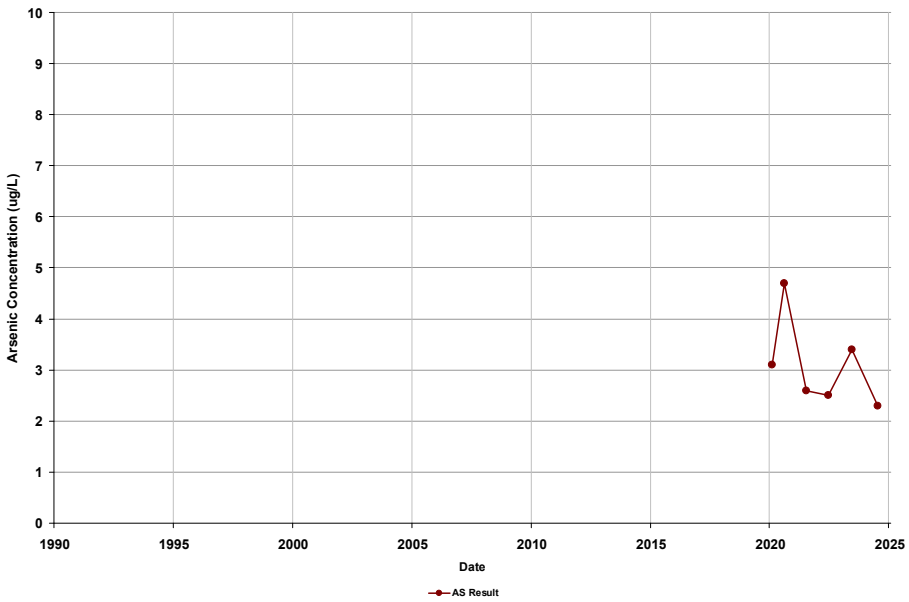
Total Depth (ft bgs): 504
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

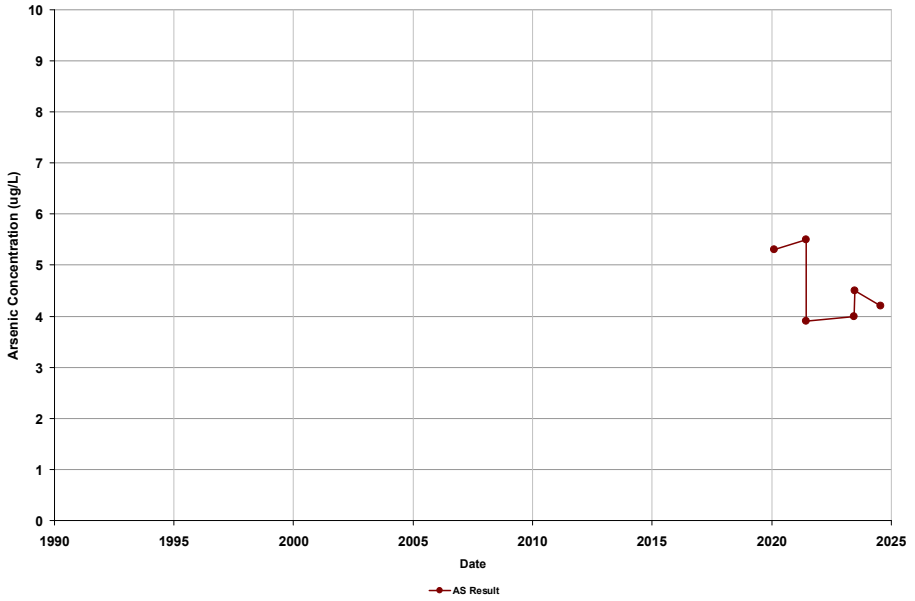
Total Depth (ft bgs): 139
Perf. Top (ft bgs): 74
Perf. Bottom (ft bgs): 134



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

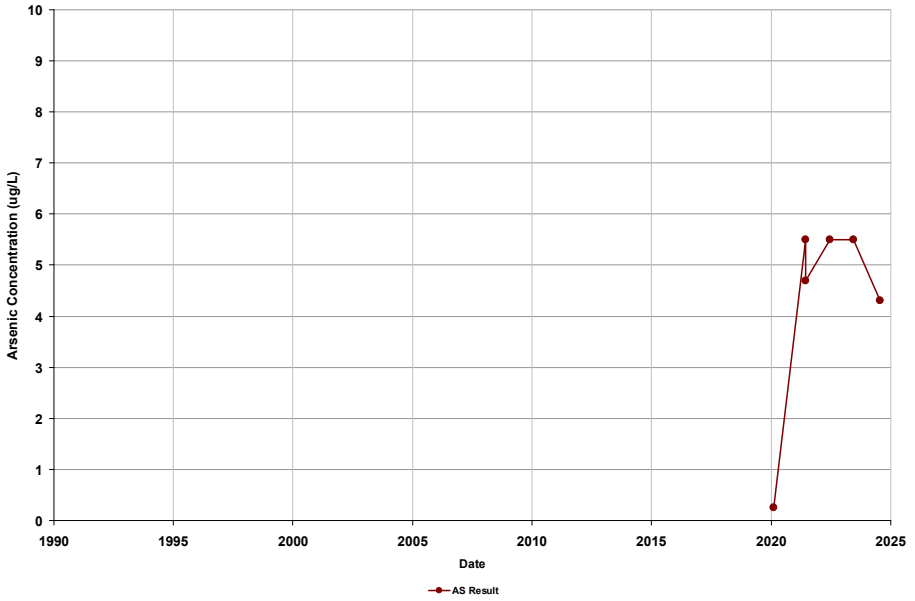
Total Depth (ft bgs): 295
Perf. Top (ft bgs): 215
Perf. Bottom (ft bgs): 285



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

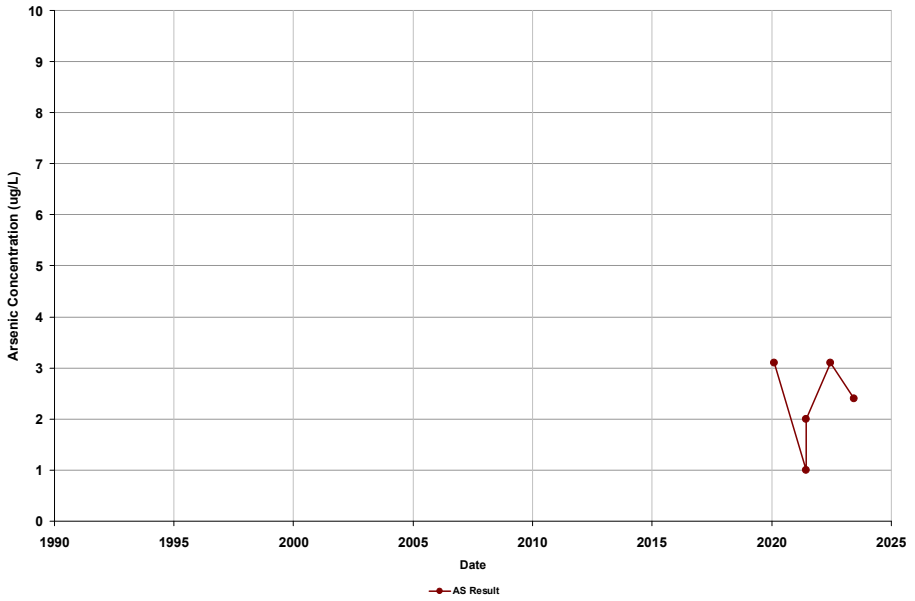
Total Depth (ft bgs): 430
Perf. Top (ft bgs): 355
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

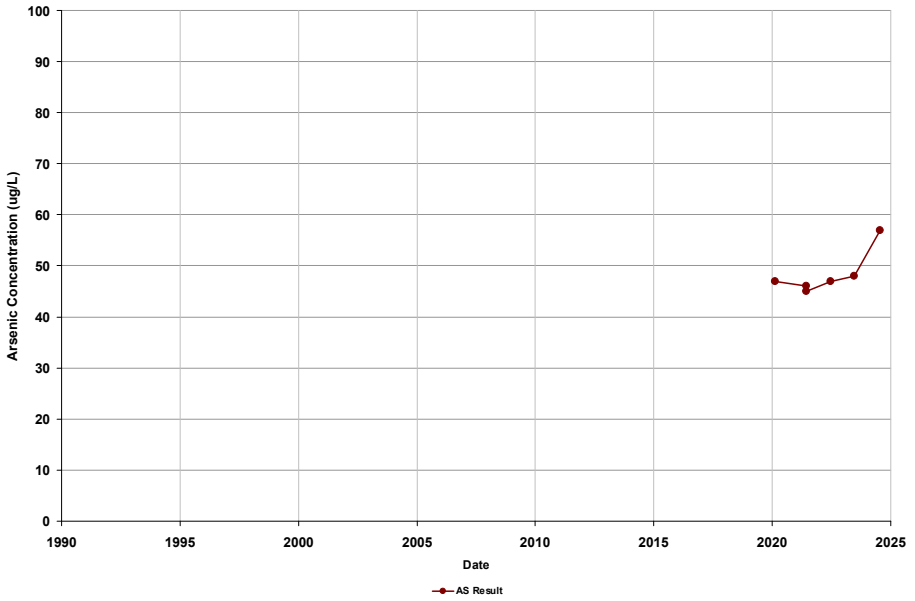
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 180
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

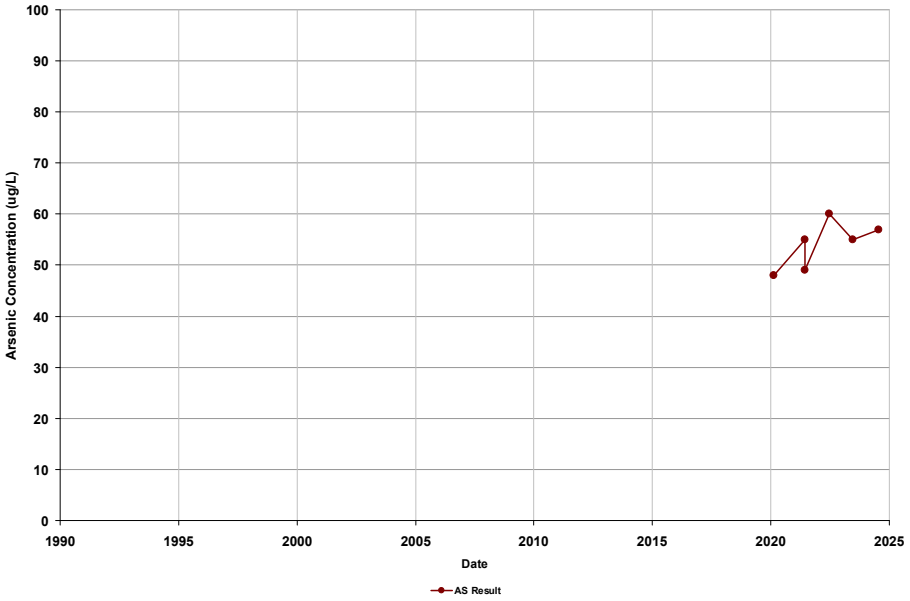
Total Depth (ft bgs): 695
Perf. Top (ft bgs): 530
Perf. Bottom (ft bgs): 685



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

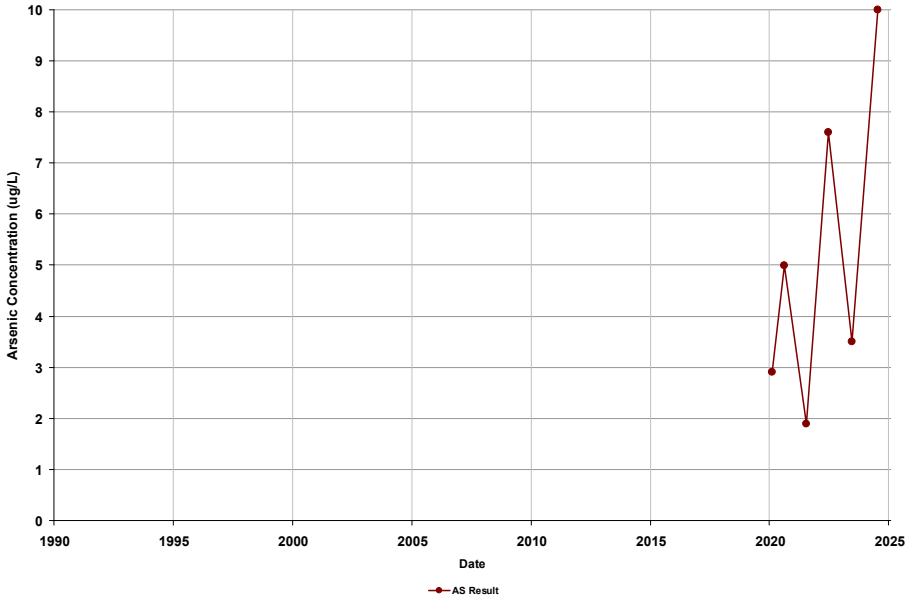
Total Depth (ft bgs): 905
Perf. Top (ft bgs): 750
Perf. Bottom (ft bgs): 895



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

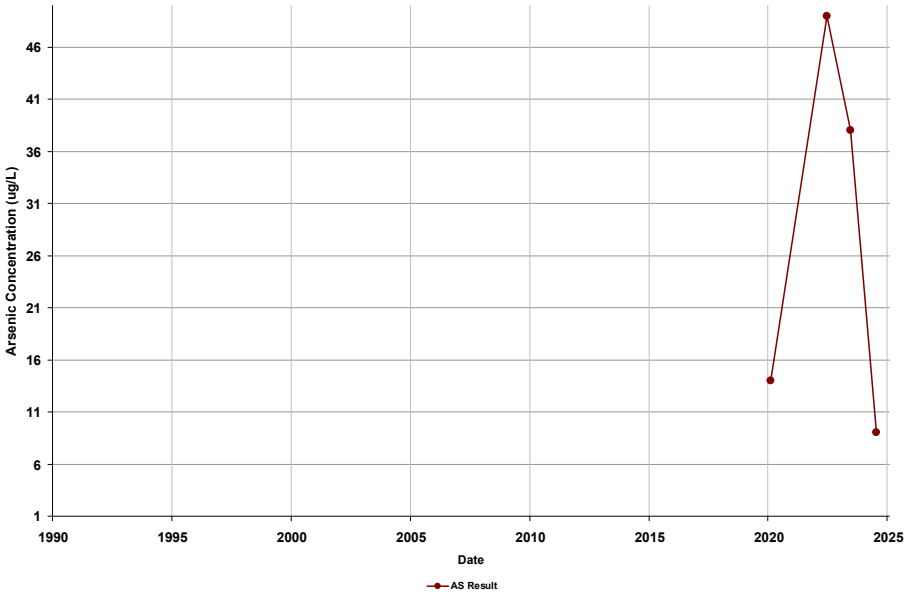
Total Depth (ft bgs): 210
Perf. Top (ft bgs): 140
Perf. Bottom (ft bgs): 200



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

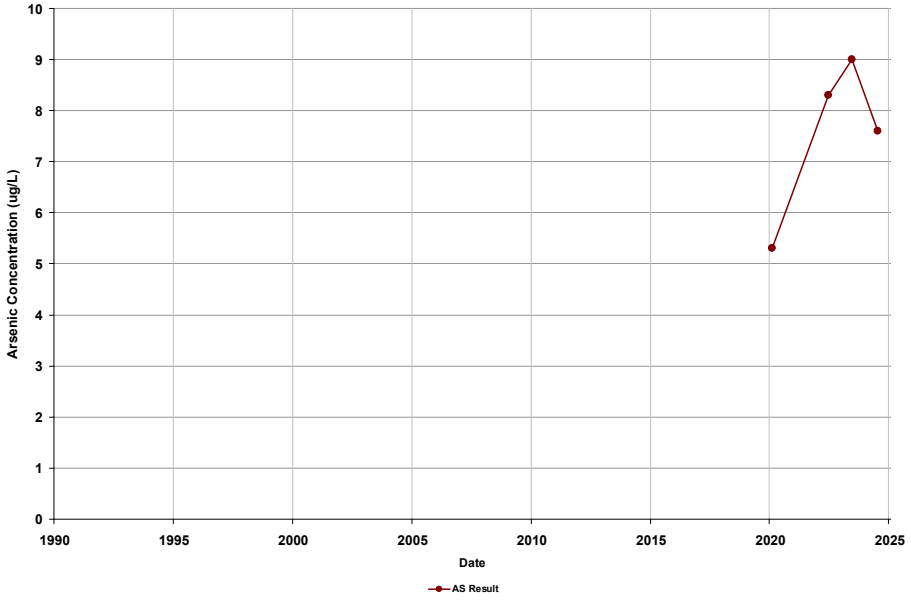
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 240
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

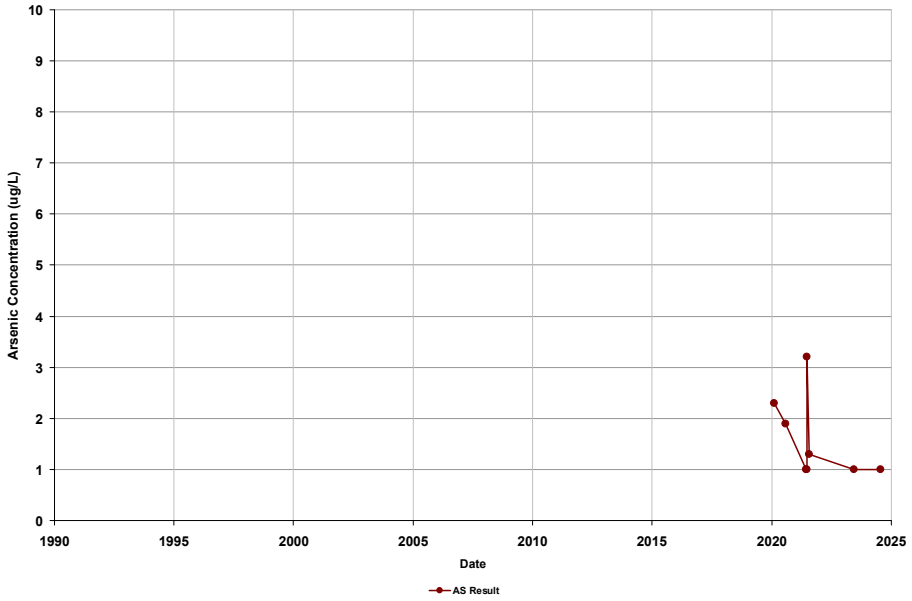
Total Depth (ft bgs): 585
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 585



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

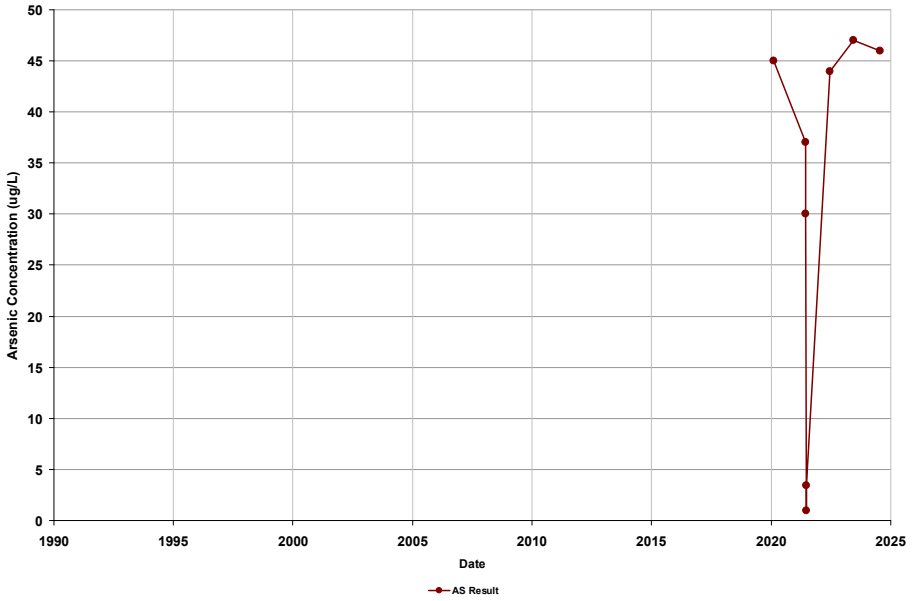
Total Depth (ft bgs): 350
Perf. Top (ft bgs): 135
Perf. Bottom (ft bgs): 340



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

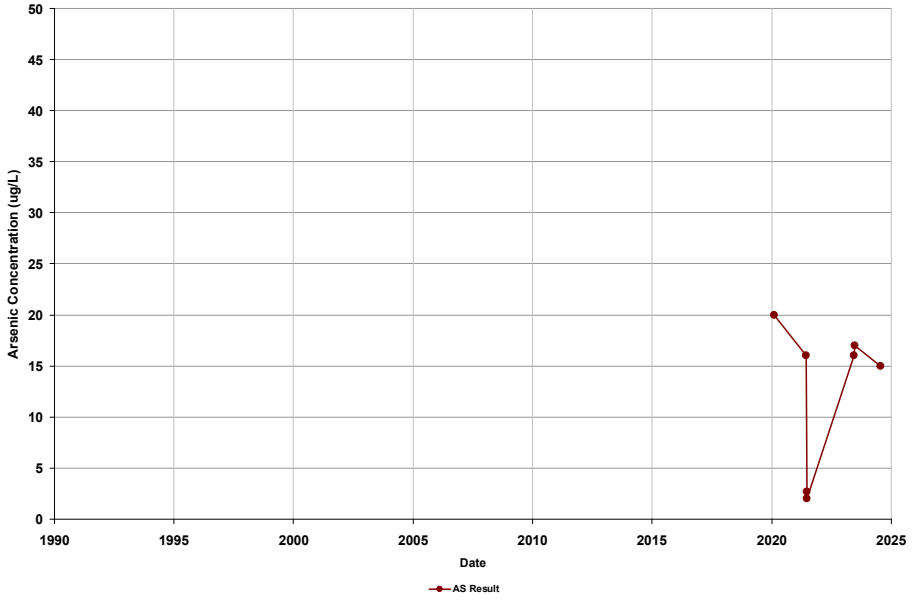
Total Depth (ft bgs): 520
Perf. Top (ft bgs): 425
Perf. Bottom (ft bgs): 510



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

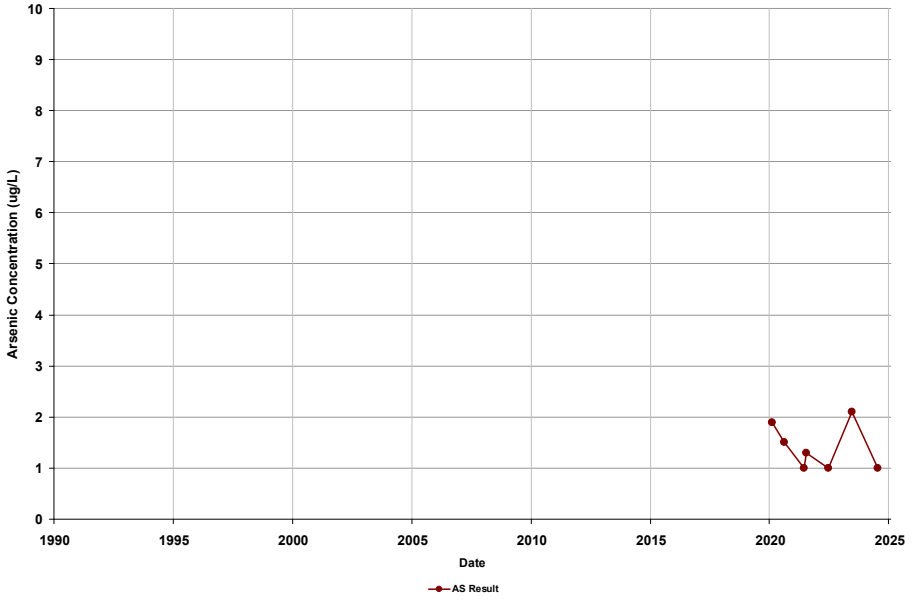
Total Depth (ft bgs): 715
Perf. Top (ft bgs): 630
Perf. Bottom (ft bgs): 705



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

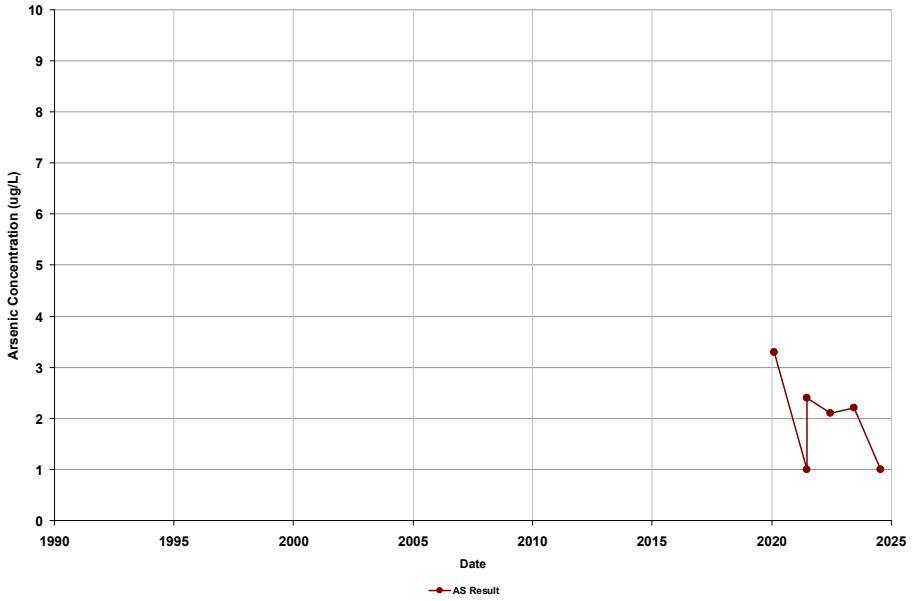
Total Depth (ft bgs): 320
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 310



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

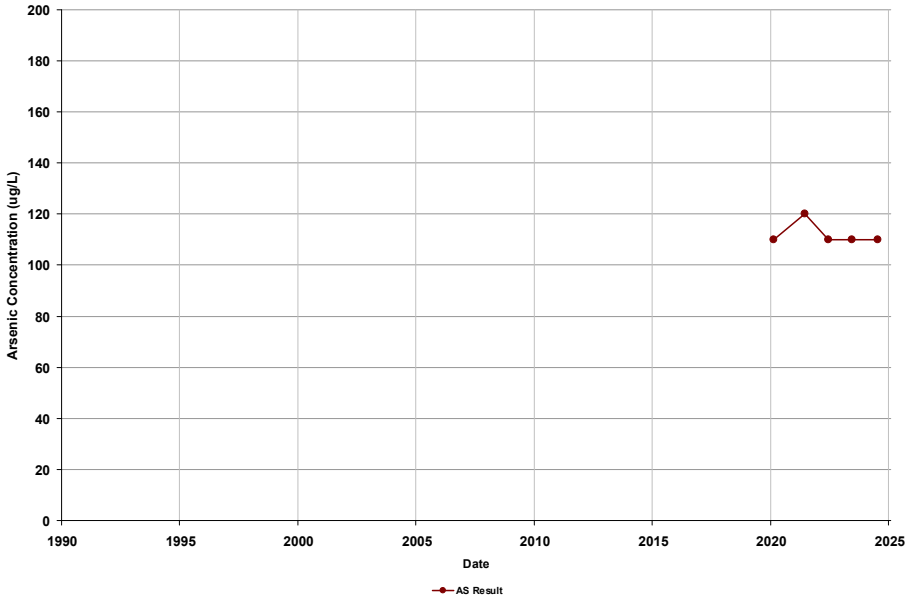
Total Depth (ft bgs): 725
Perf. Top (ft bgs): 520
Perf. Bottom (ft bgs): 715



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

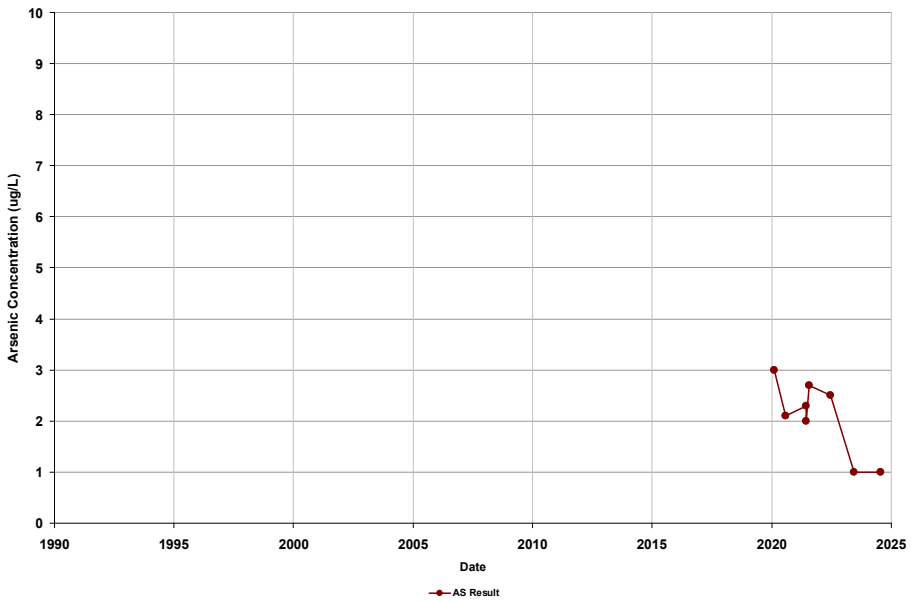
Total Depth (ft bgs): 955
Perf. Top (ft bgs): 880
Perf. Bottom (ft bgs): 945



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

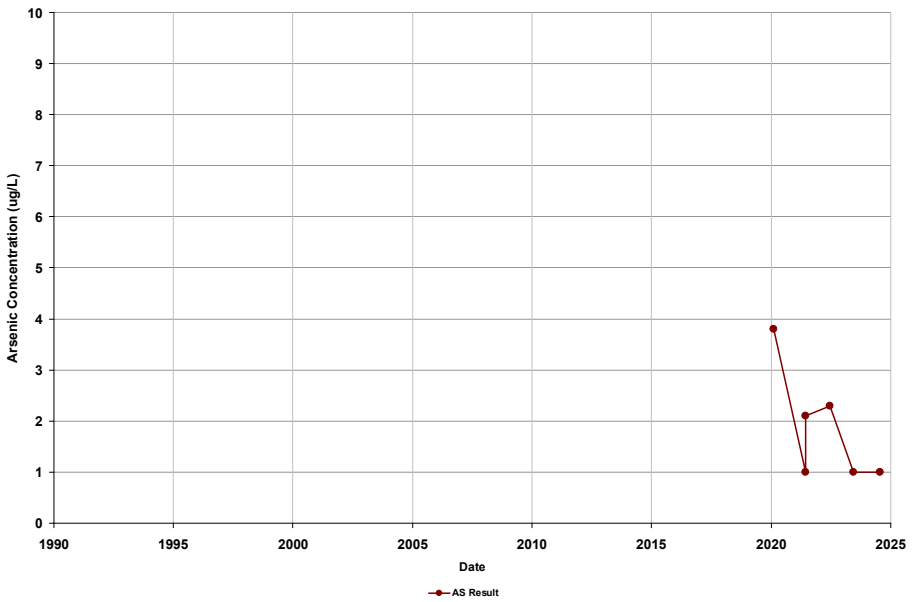
Total Depth (ft bgs): 510
Perf. Top (ft bgs): 400
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

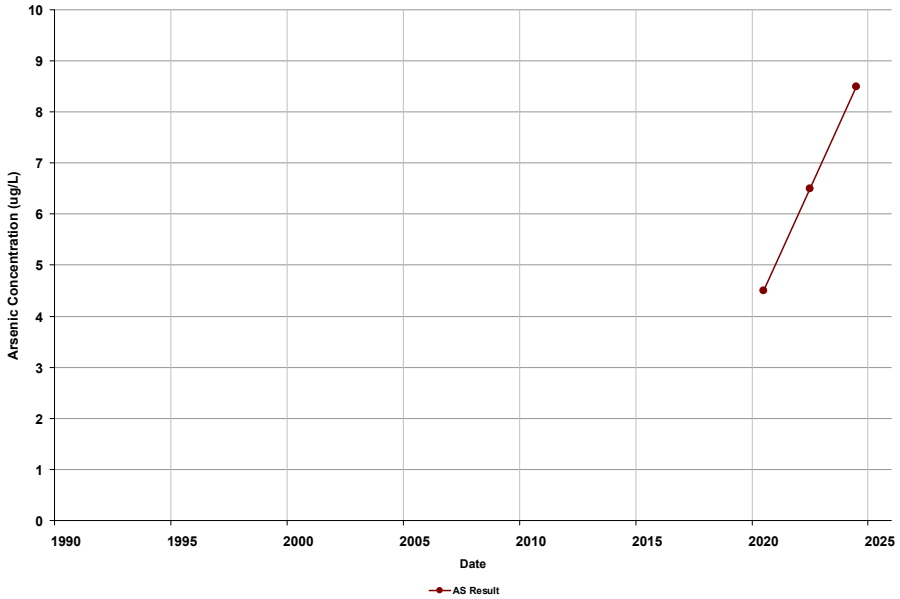
Total Depth (ft bgs): 880
Perf. Top (ft bgs): 790
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB11C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

Total Depth (ft bgs): 880
Perf. Top (ft bgs): 775
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

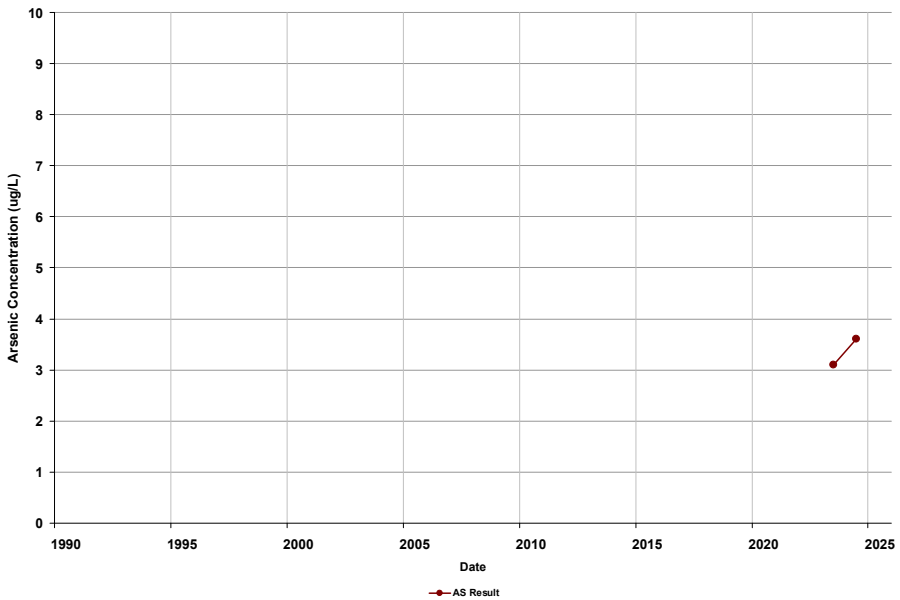
Well Name: MSB13A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

Total Depth (ft bgs): 290
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 280

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

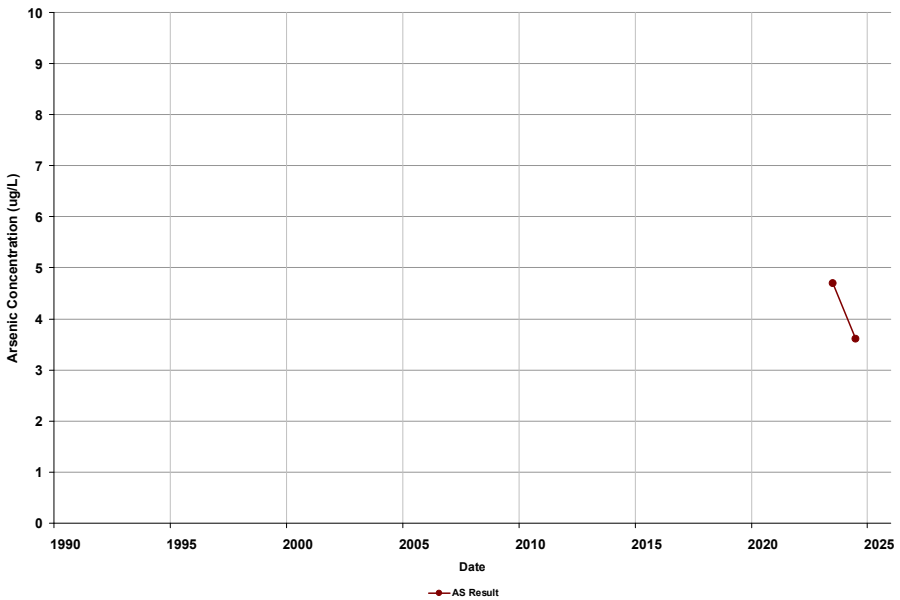
Total Depth (ft bgs): 446
Perf. Top (ft bgs): 396
Perf. Bottom (ft bgs): 436



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

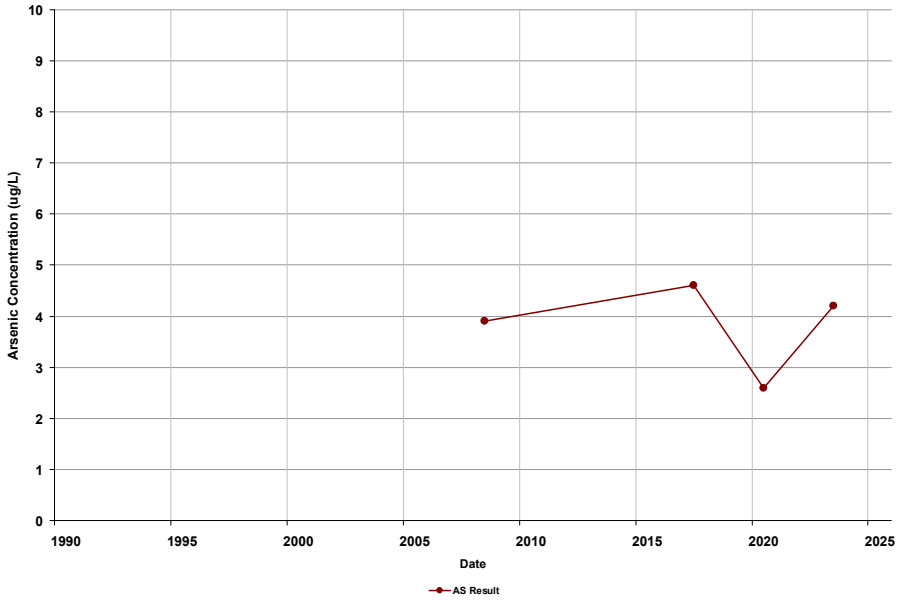
Total Depth (ft bgs): 532
Perf. Top (ft bgs): 522
Perf. Bottom (ft bgs): 532



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000507-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

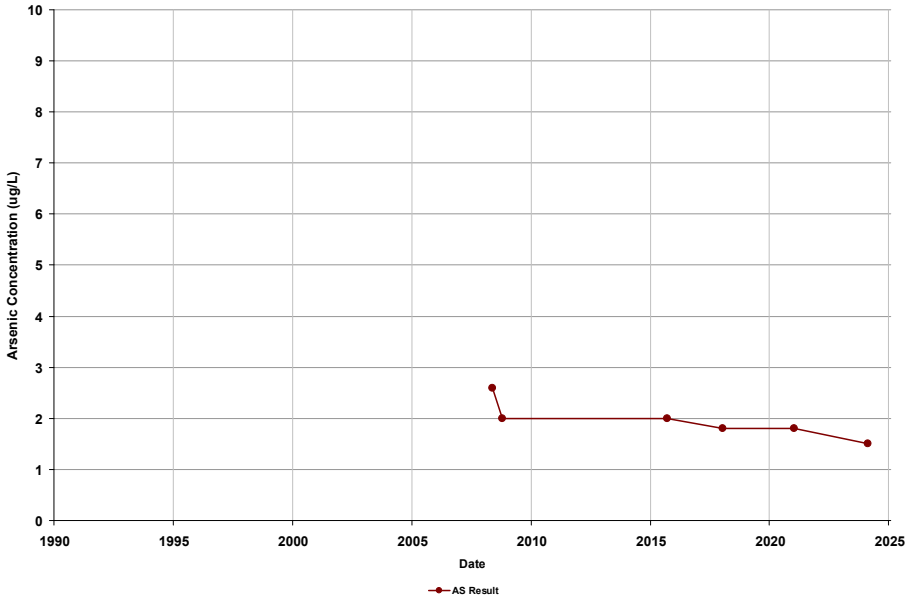
Total Depth (ft bgs):
Perf. Top (ft bgs): 372
Perf. Bottom (ft bgs): 372



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000553-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

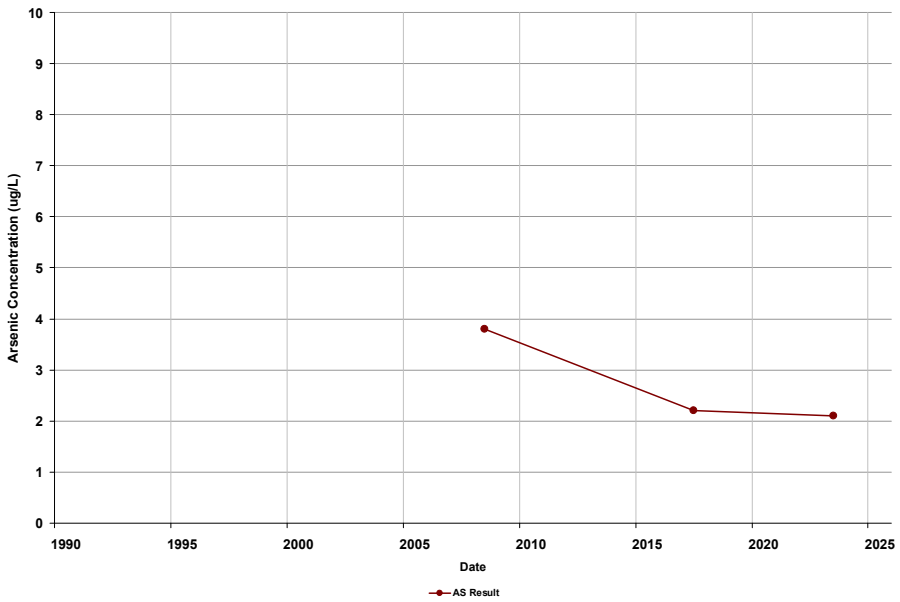
Total Depth (ft bgs):
Perf. Top (ft bgs): 450
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000682-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

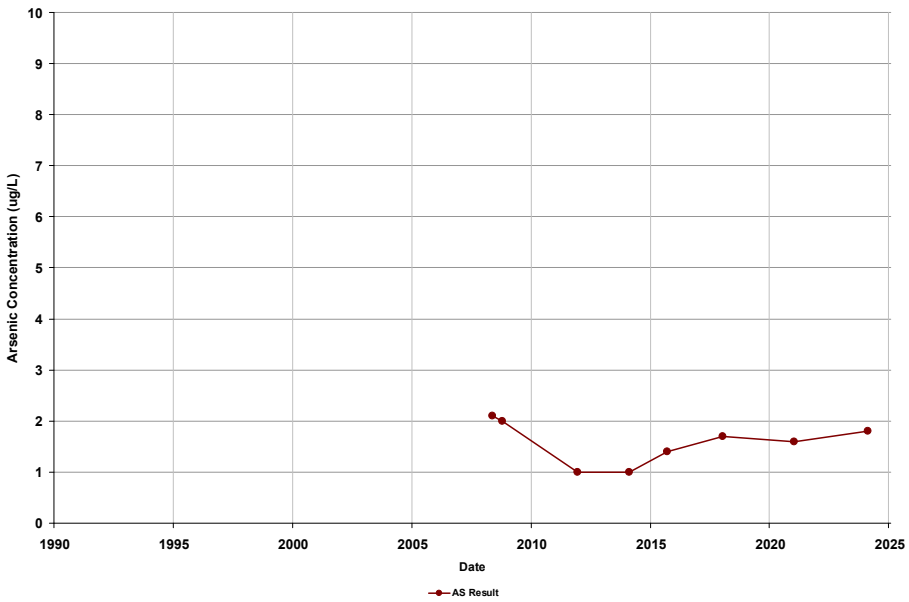
Total Depth (ft bgs):
Perf. Top (ft bgs): 295
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000727-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

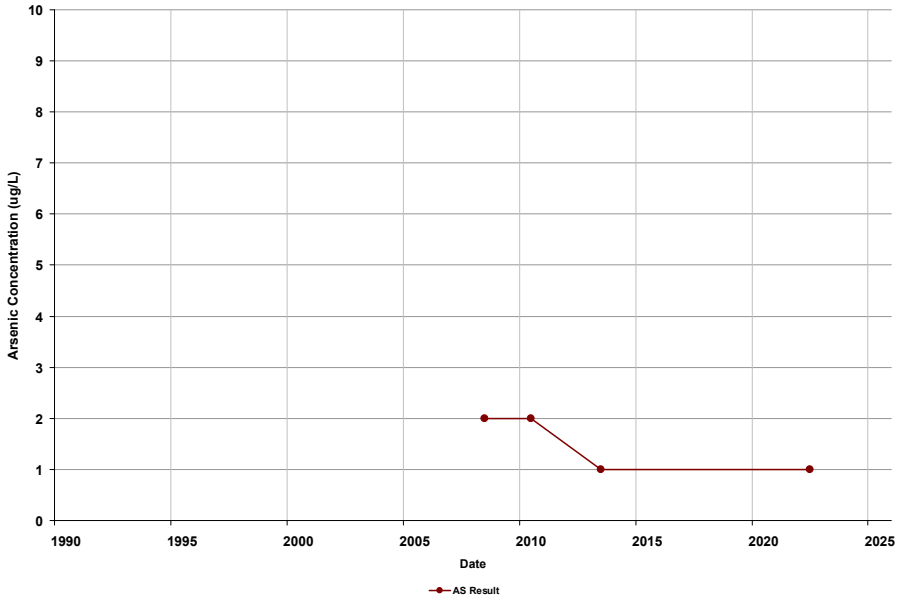
Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 360



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000938-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

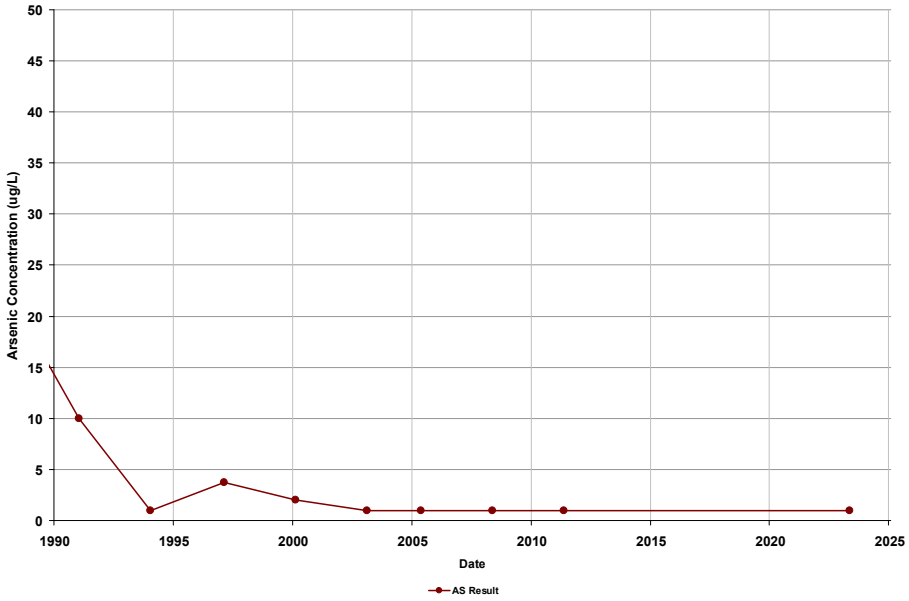
Total Depth (ft bgs):
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 560



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-014
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

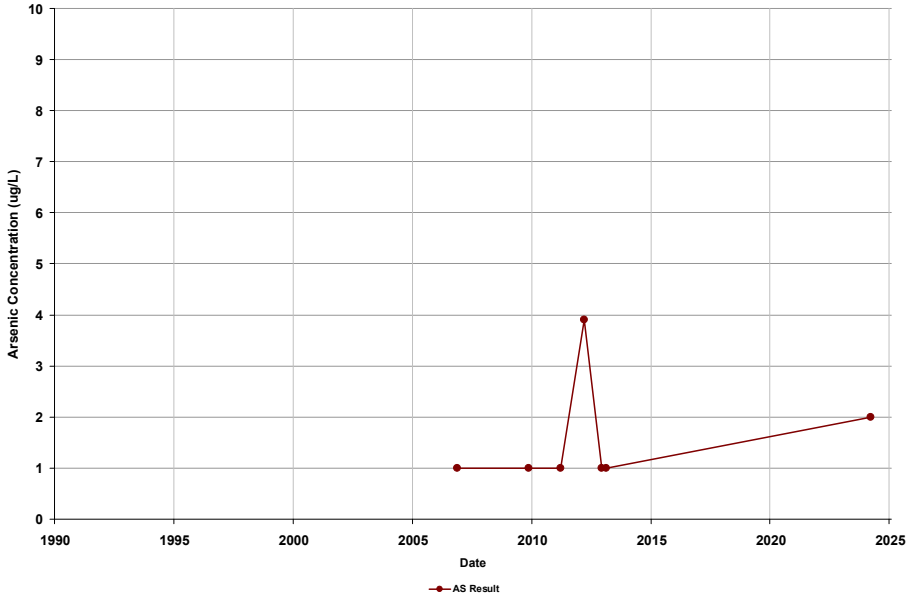
Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 610



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-032
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

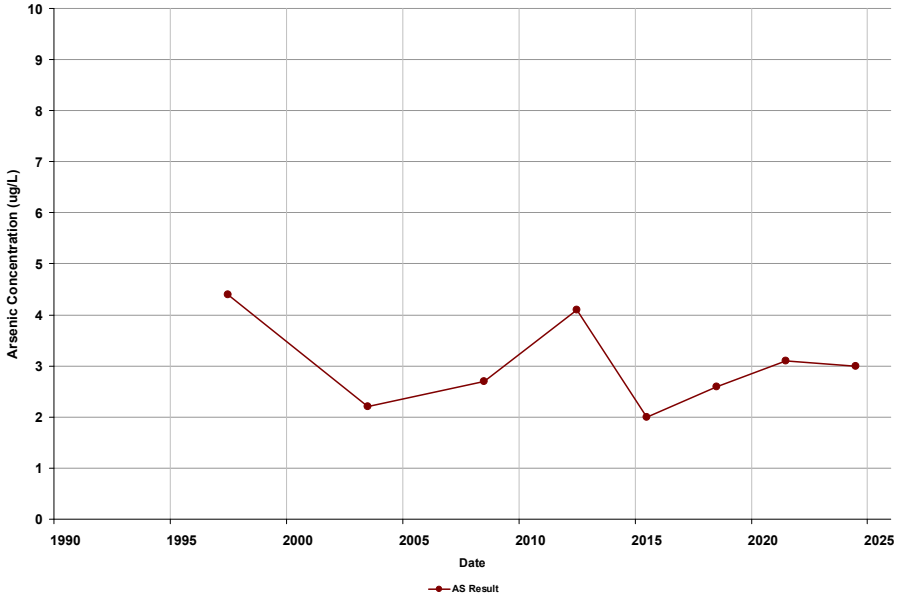
Total Depth (ft bgs):
Perf. Top (ft bgs): 310
Perf. Bottom (ft bgs): 600



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010008-005
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

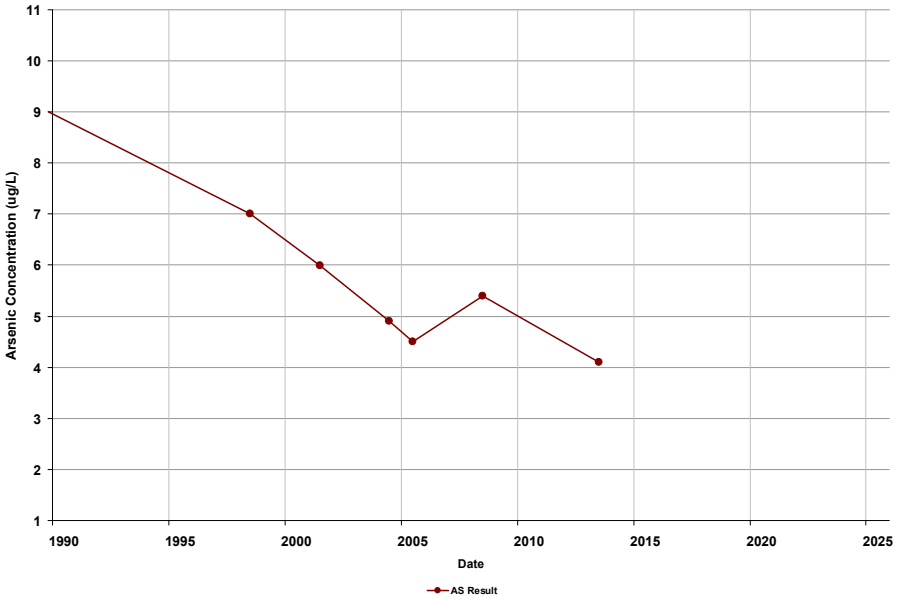
Total Depth (ft bgs):
Perf. Top (ft bgs): 250
Perf. Bottom (ft bgs): 465



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010009-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

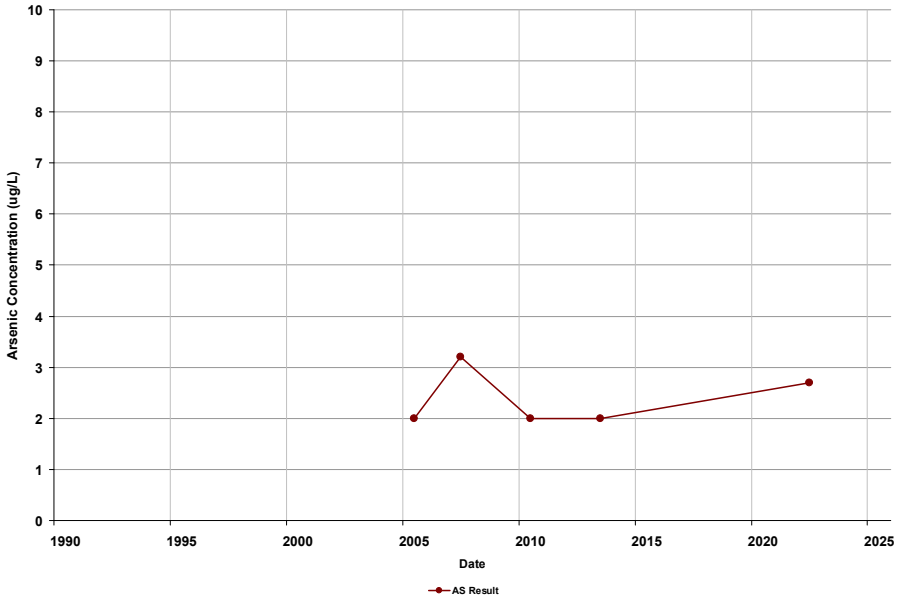
Total Depth (ft bgs):
Perf. Top (ft bgs): 324
Perf. Bottom (ft bgs): 369



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010010-007
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

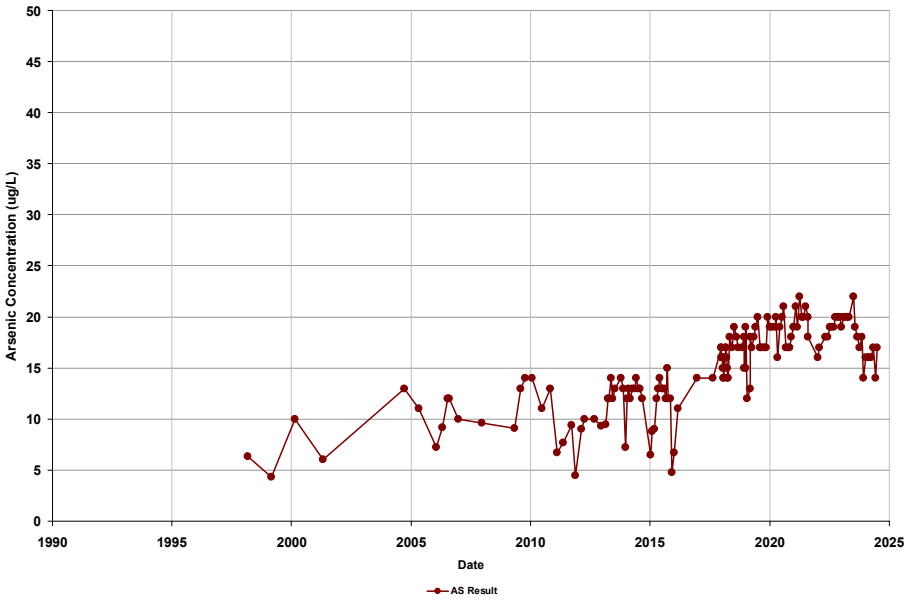
Total Depth (ft bgs):
Perf. Top (ft bgs): 242
Perf. Bottom (ft bgs): 374



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010801-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

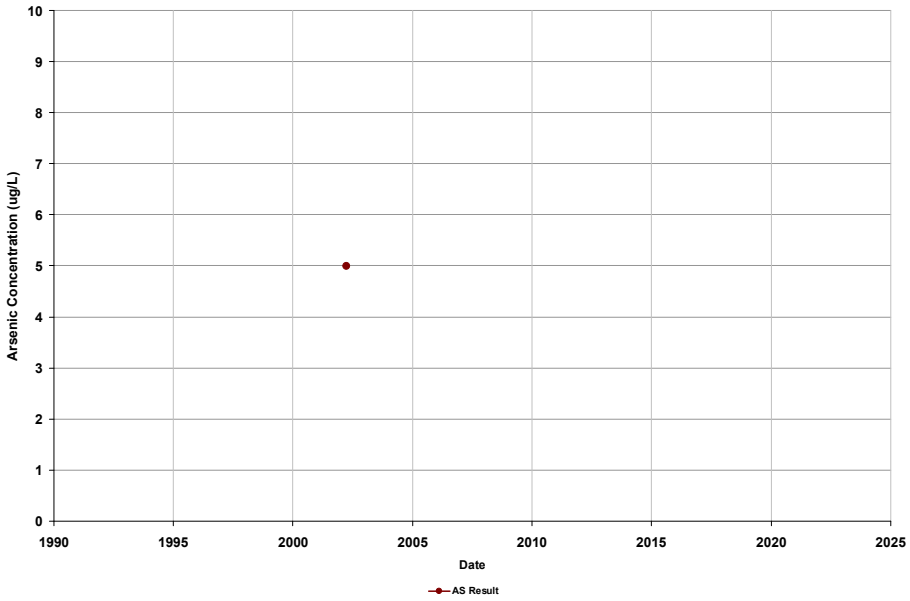
Total Depth (ft bgs):
Perf. Top (ft bgs): 375
Perf. Bottom (ft bgs): 760



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2801077-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

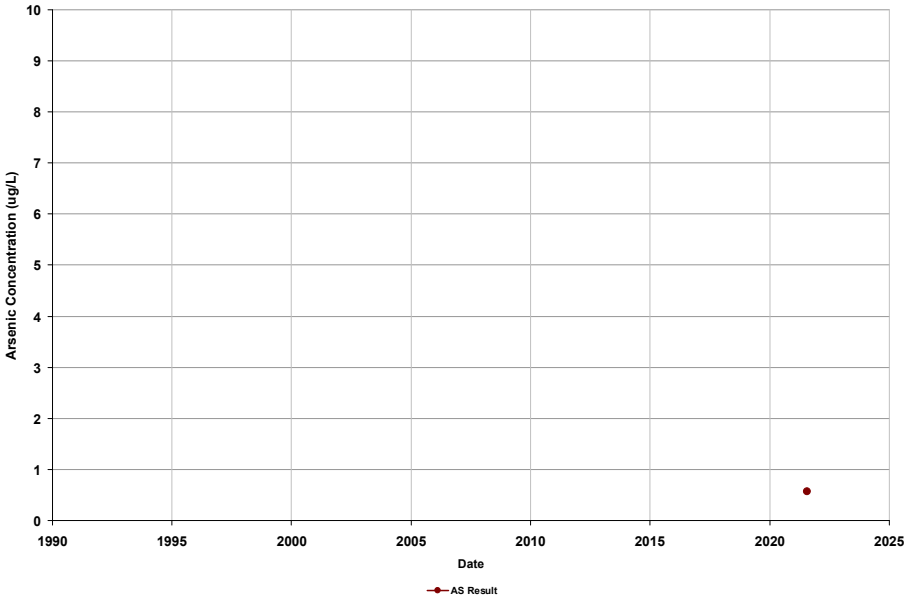
Total Depth (ft bgs):
Perf. Top (ft bgs): 60
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: ESJ12
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

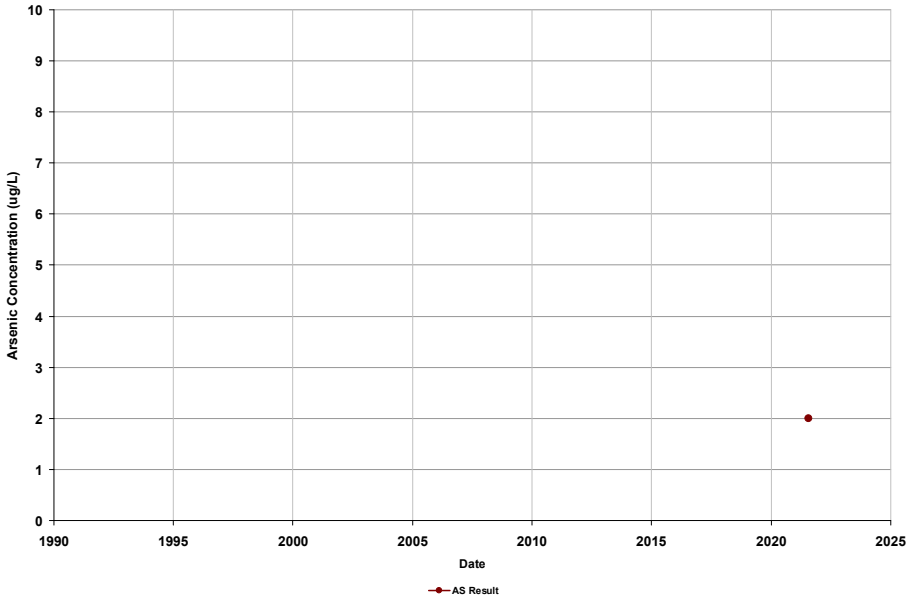
Total Depth (ft bgs): 276
Perf. Top (ft bgs): 160
Perf. Bottom (ft bgs): 172



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: ESJ17
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

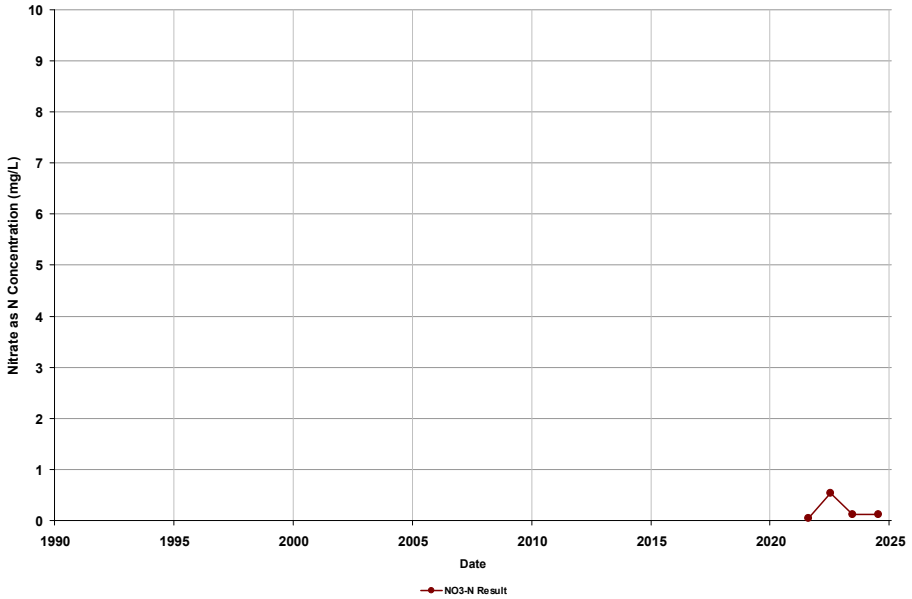
Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MCE RMS-3
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Unknown

Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-4
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 698
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 667

NOTE: Non-Detect results shown as half the reporting limit.

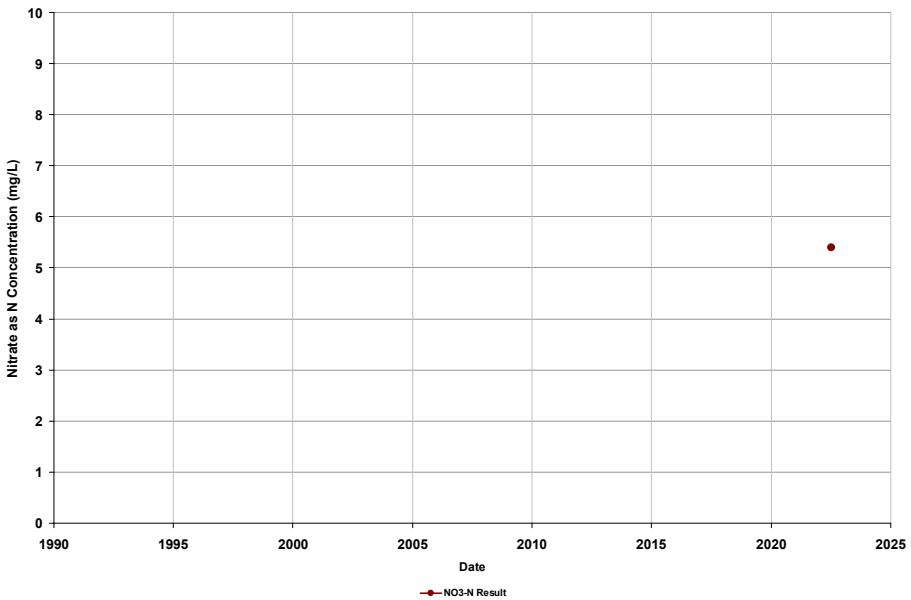
Well Name: MID RMS-5B
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 514
Perf. Top (ft bgs): 245
Perf. Bottom (ft bgs): 496

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-6
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Industrial

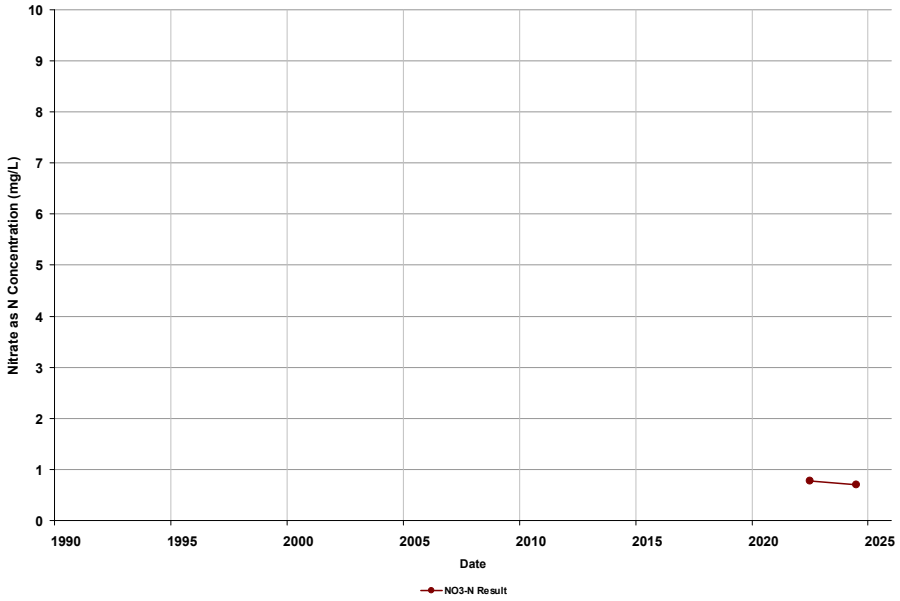
Total Depth (ft bgs): 680
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 680



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-7
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 656
Perf. Top (ft bgs): 290
Perf. Bottom (ft bgs): 635



NOTE: Non-Detect results shown as half the reporting limit.

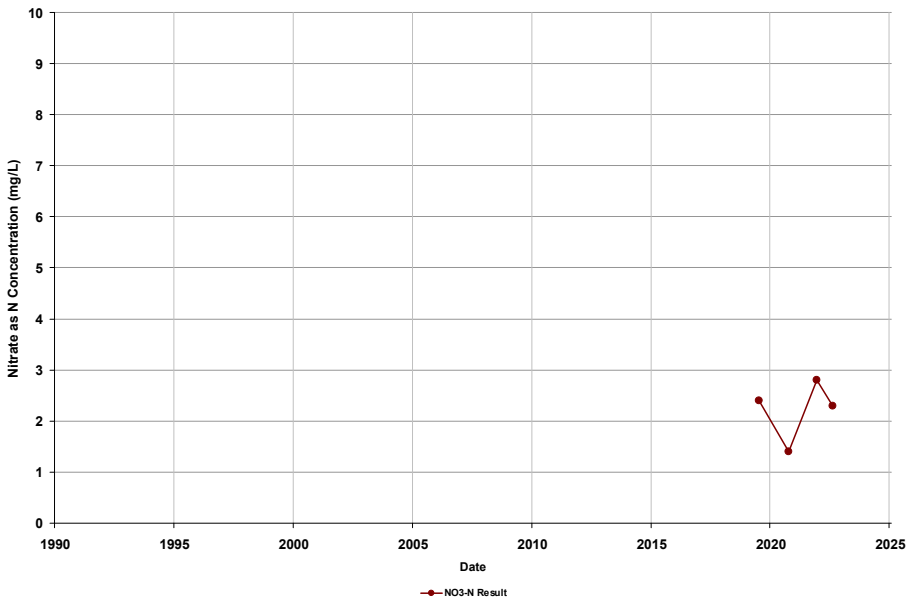
Well Name: MID RMS-13
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 600
Perf. Top (ft bgs): 228
Perf. Bottom (ft bgs): 552

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MWD RMS-1
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

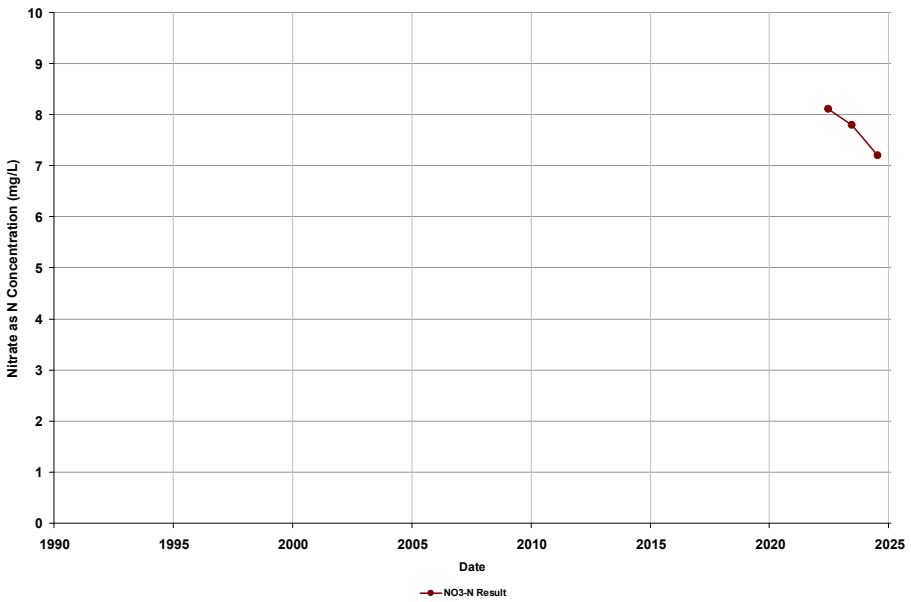
Total Depth (ft bgs): 504
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

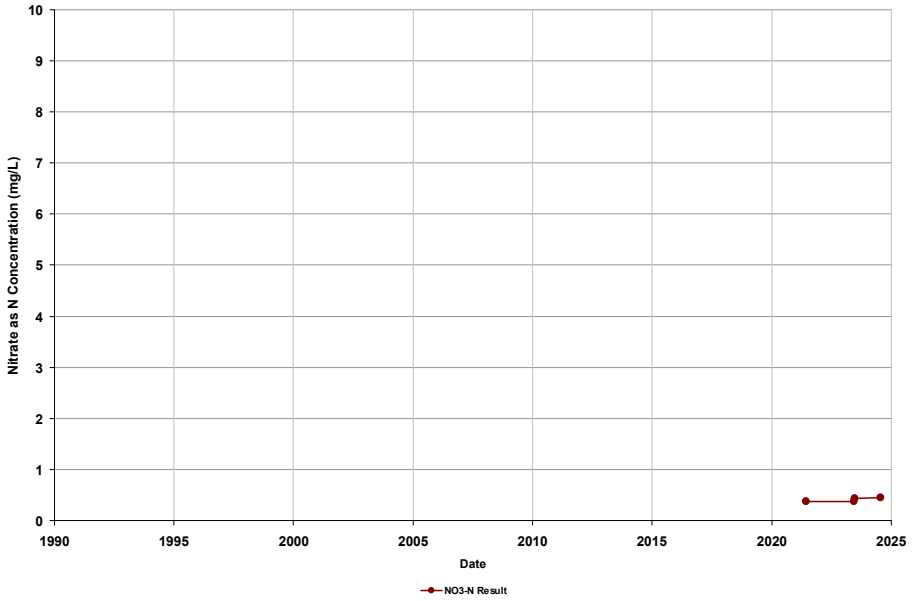
Total Depth (ft bgs): 139
Perf. Top (ft bgs): 74
Perf. Bottom (ft bgs): 134



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

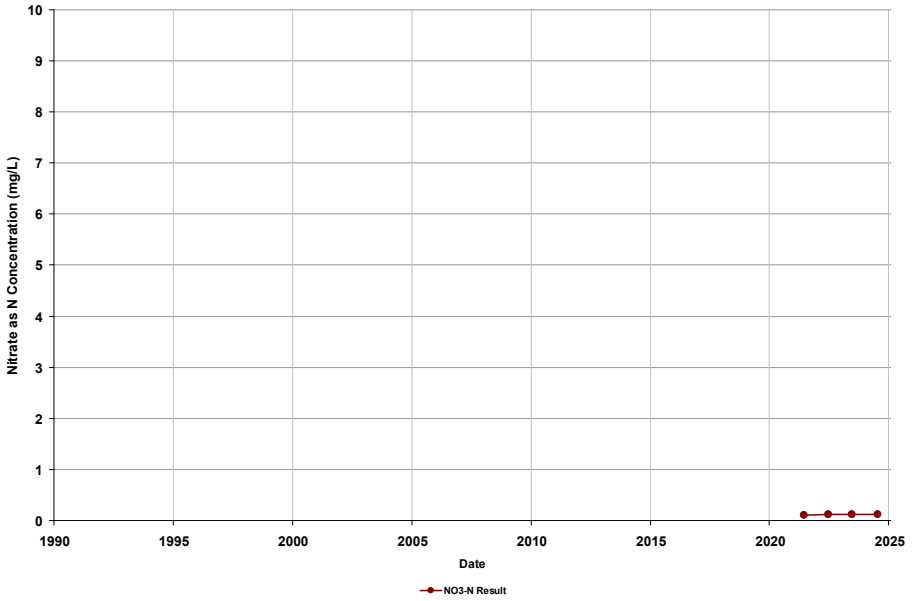
Total Depth (ft bgs): 295
Perf. Top (ft bgs): 215
Perf. Bottom (ft bgs): 285



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

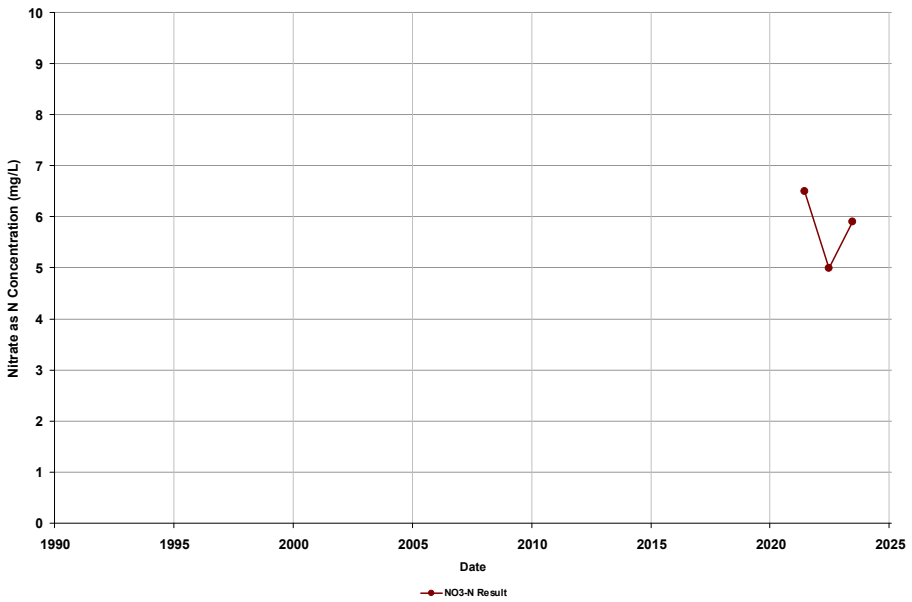
Total Depth (ft bgs): 430
Perf. Top (ft bgs): 355
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

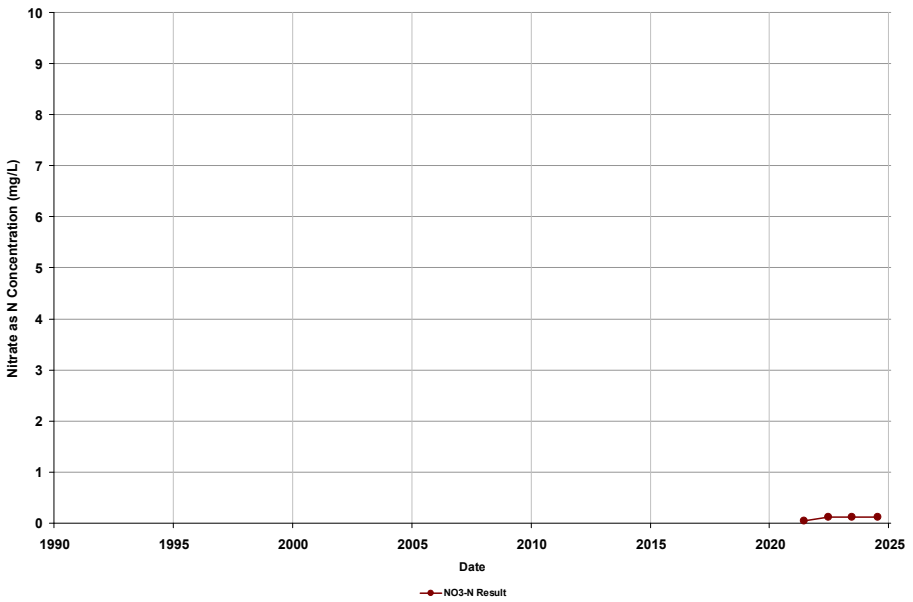
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 180
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

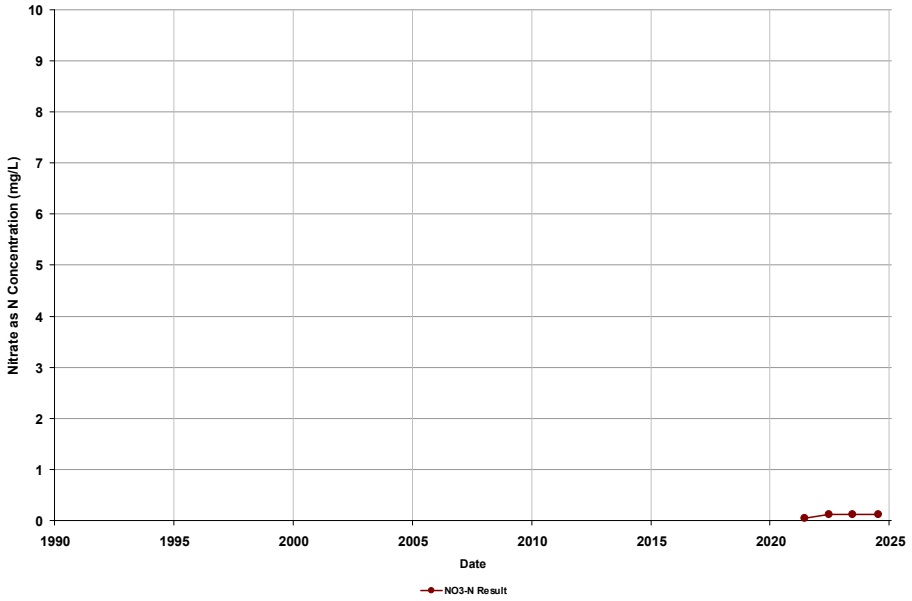
Total Depth (ft bgs): 695
Perf. Top (ft bgs): 530
Perf. Bottom (ft bgs): 685



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

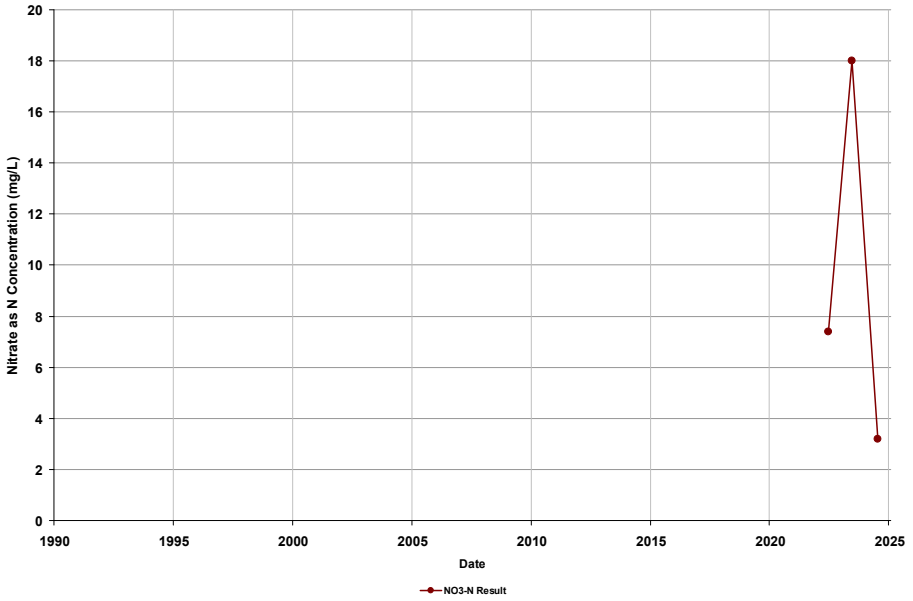
Total Depth (ft bgs): 905
Perf. Top (ft bgs): 750
Perf. Bottom (ft bgs): 895



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

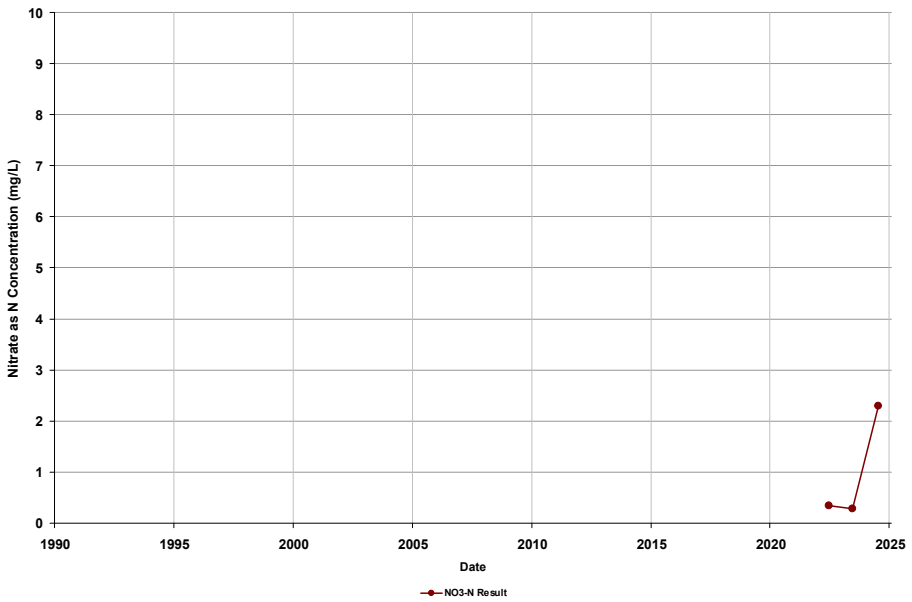
Total Depth (ft bgs): 210
Perf. Top (ft bgs): 140
Perf. Bottom (ft bgs): 200



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

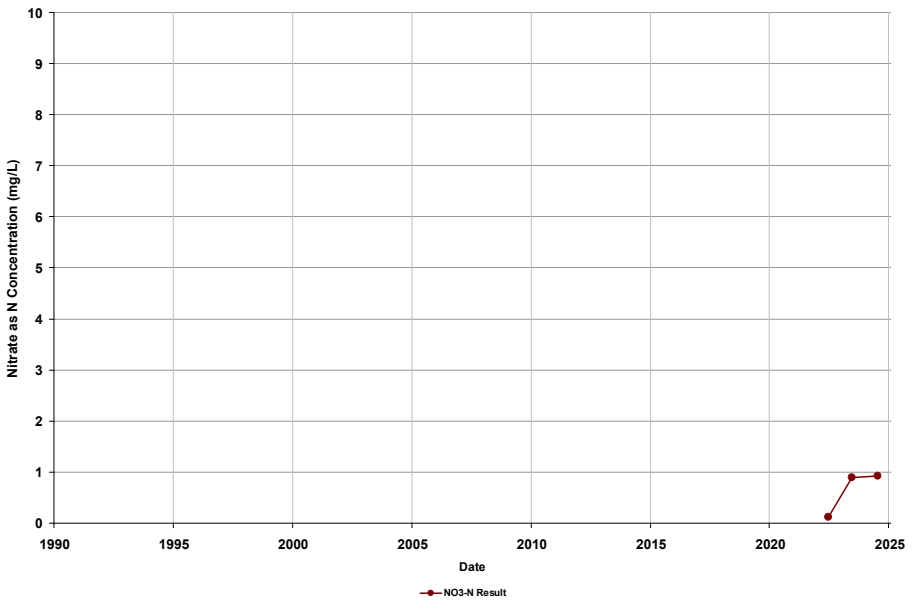
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 240
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

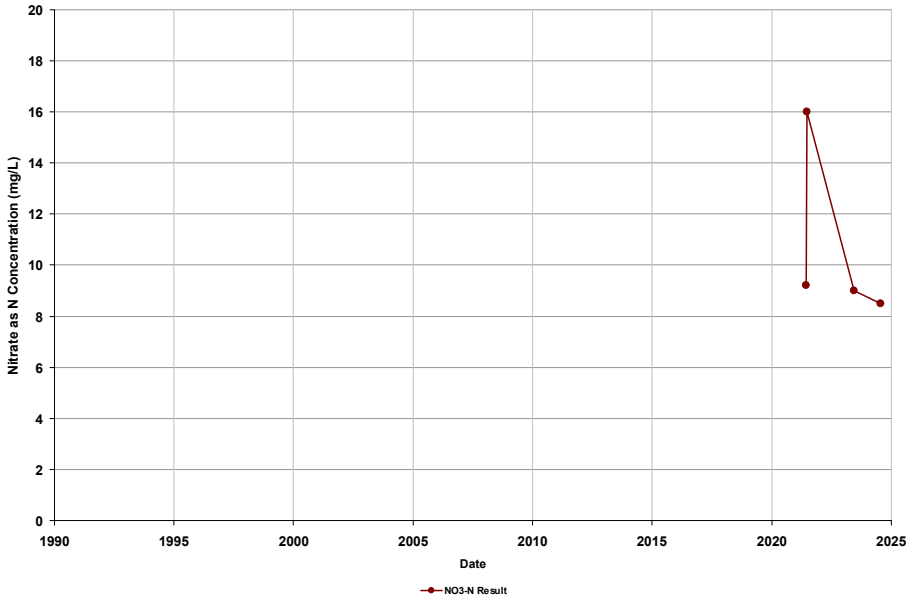
Total Depth (ft bgs): 585
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 585



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

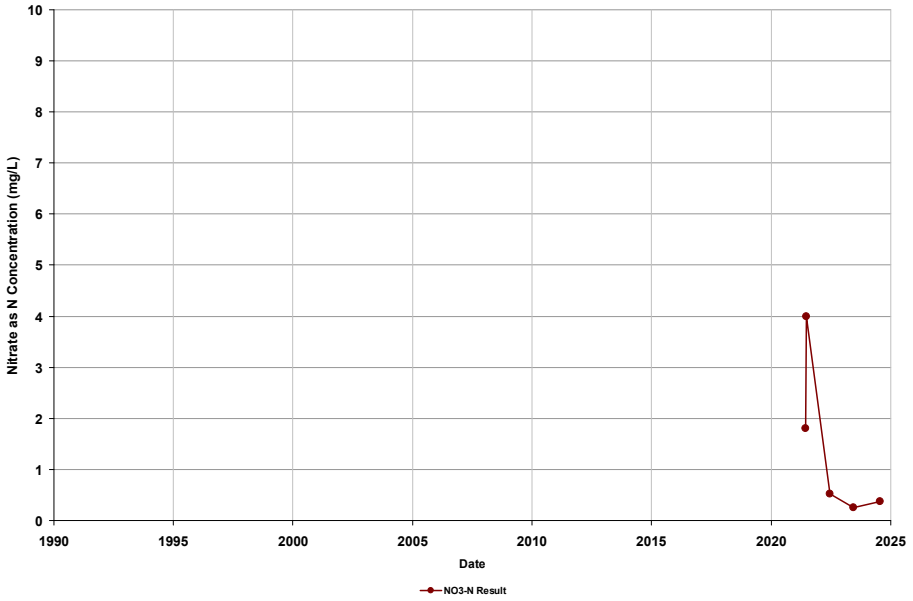
Total Depth (ft bgs): 350
Perf. Top (ft bgs): 135
Perf. Bottom (ft bgs): 340



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

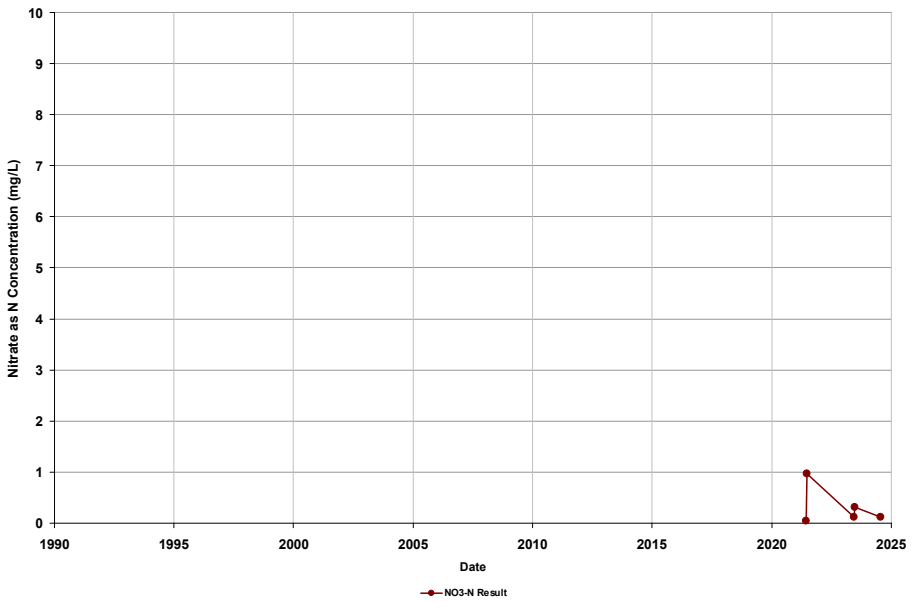
Total Depth (ft bgs): 520
Perf. Top (ft bgs): 425
Perf. Bottom (ft bgs): 510



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

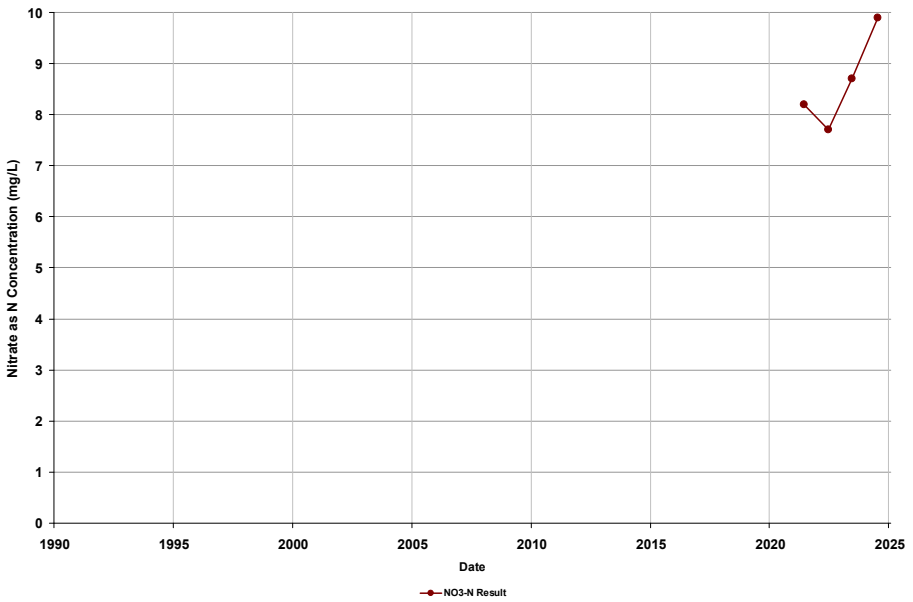
Total Depth (ft bgs): 715
Perf. Top (ft bgs): 630
Perf. Bottom (ft bgs): 705



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

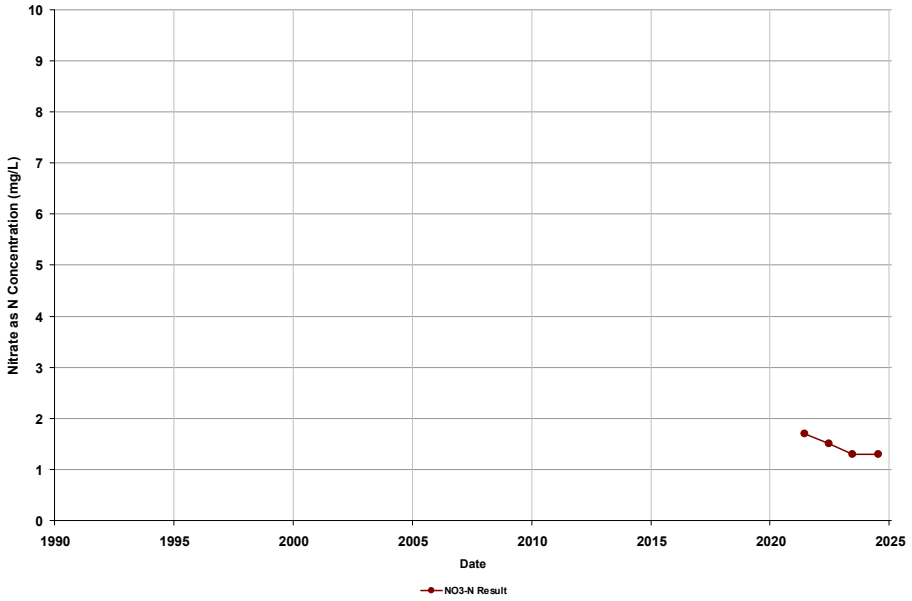
Total Depth (ft bgs): 320
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 310



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

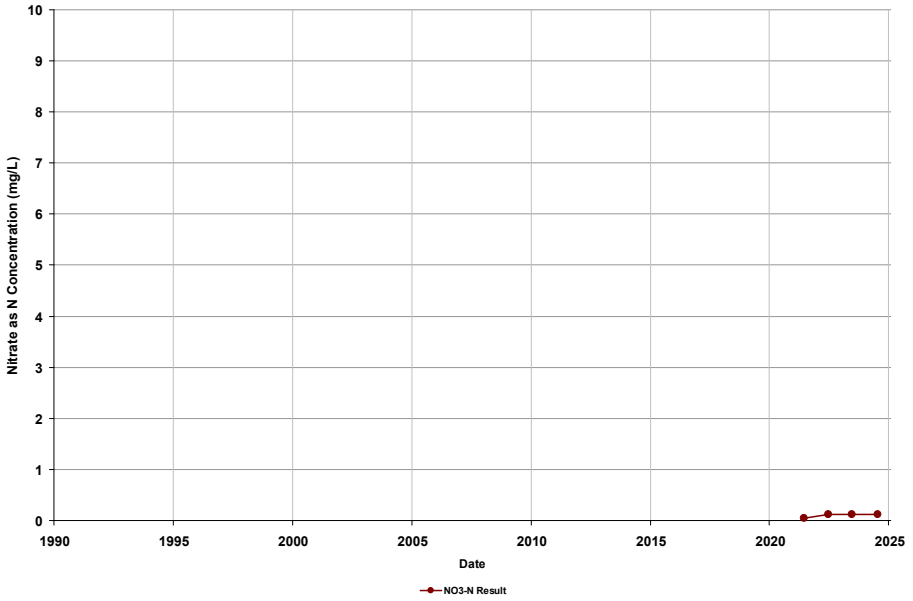
Total Depth (ft bgs): 725
Perf. Top (ft bgs): 520
Perf. Bottom (ft bgs): 715



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

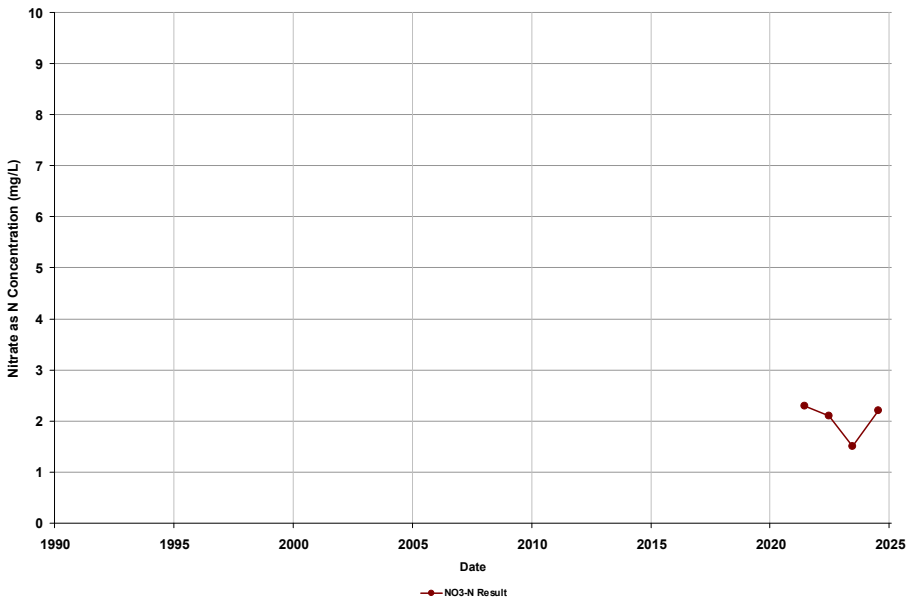
Total Depth (ft bgs): 955
Perf. Top (ft bgs): 880
Perf. Bottom (ft bgs): 945



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

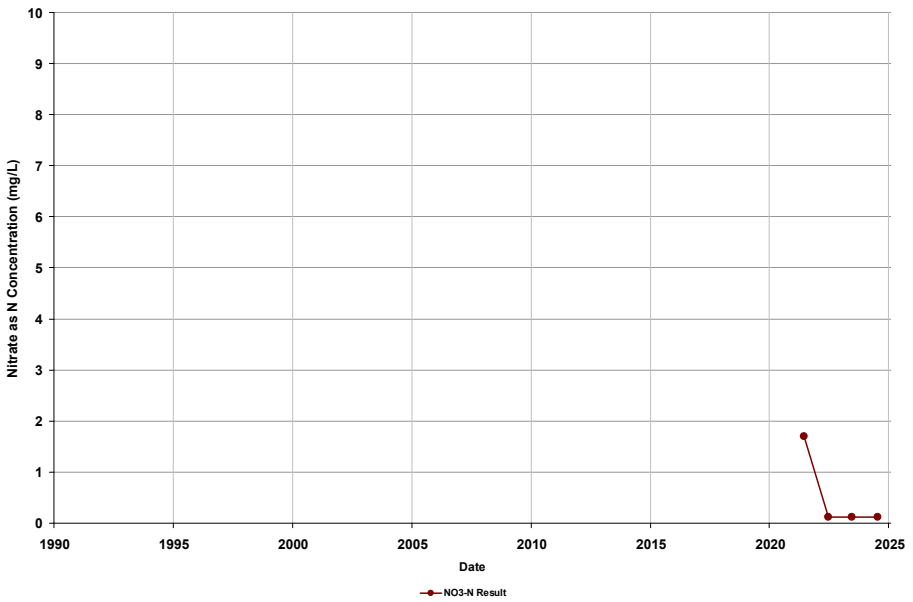
Total Depth (ft bgs): 510
Perf. Top (ft bgs): 400
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

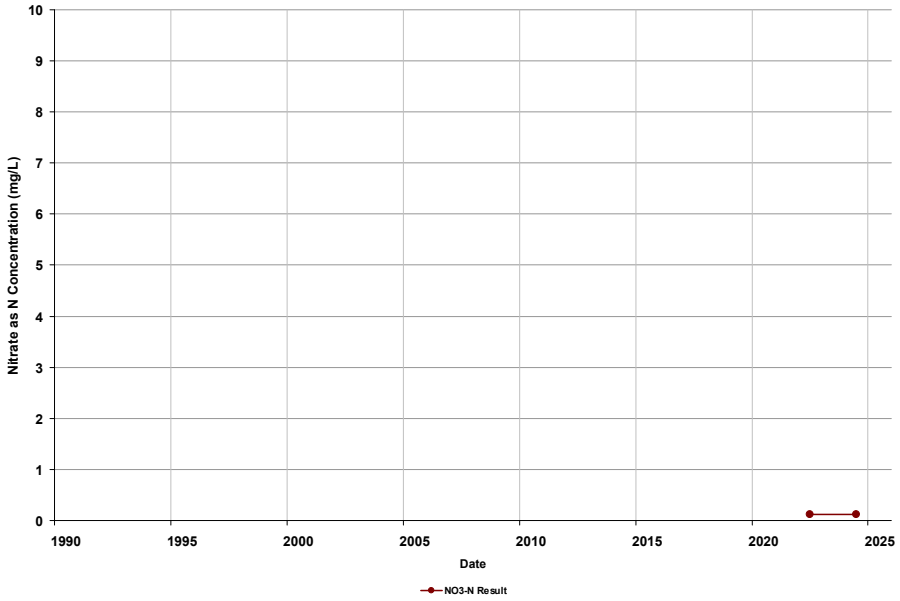
Total Depth (ft bgs): 880
Perf. Top (ft bgs): 790
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB11C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

Total Depth (ft bgs): 880
Perf. Top (ft bgs): 775
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

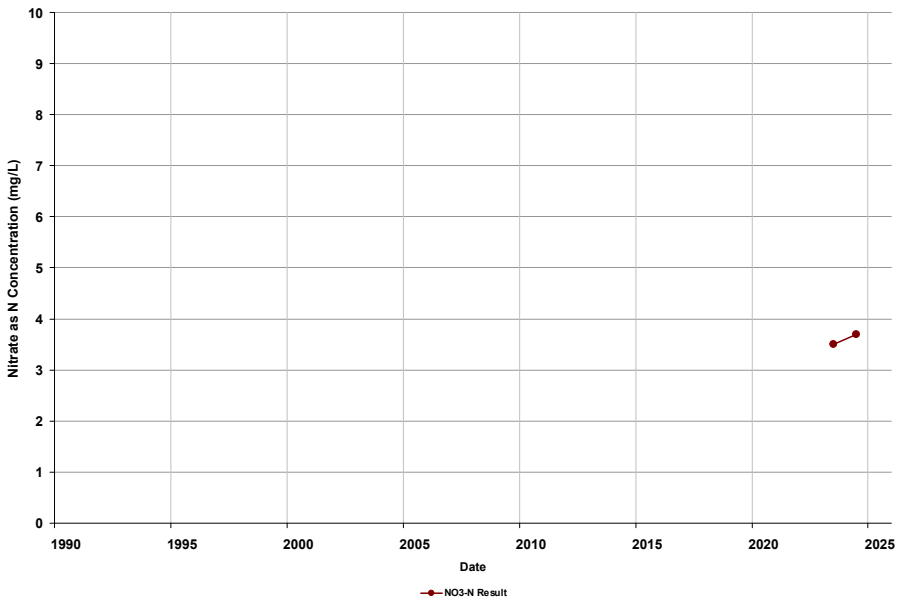
Well Name: MSB13A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

Total Depth (ft bgs): 290
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 280

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

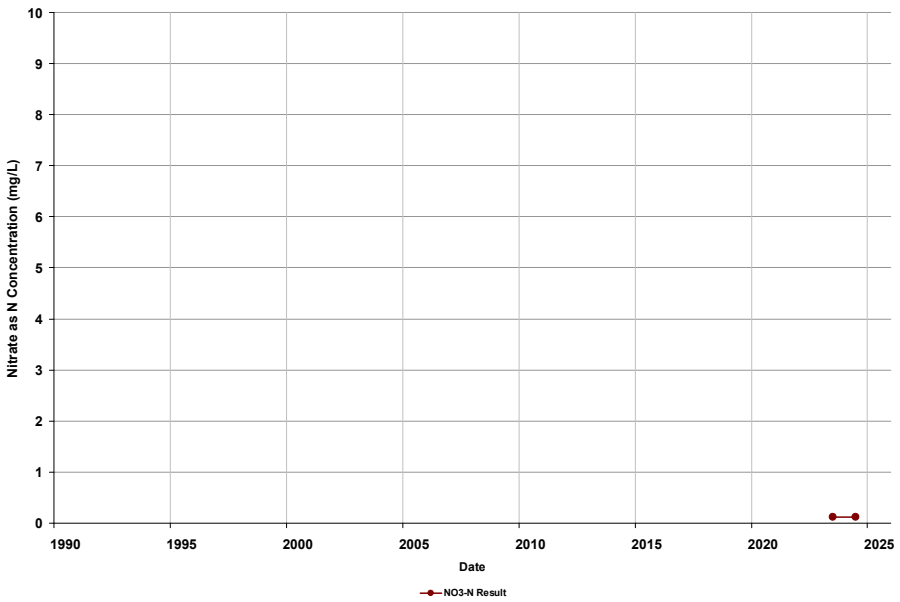
Total Depth (ft bgs): 446
Perf. Top (ft bgs): 396
Perf. Bottom (ft bgs): 436



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

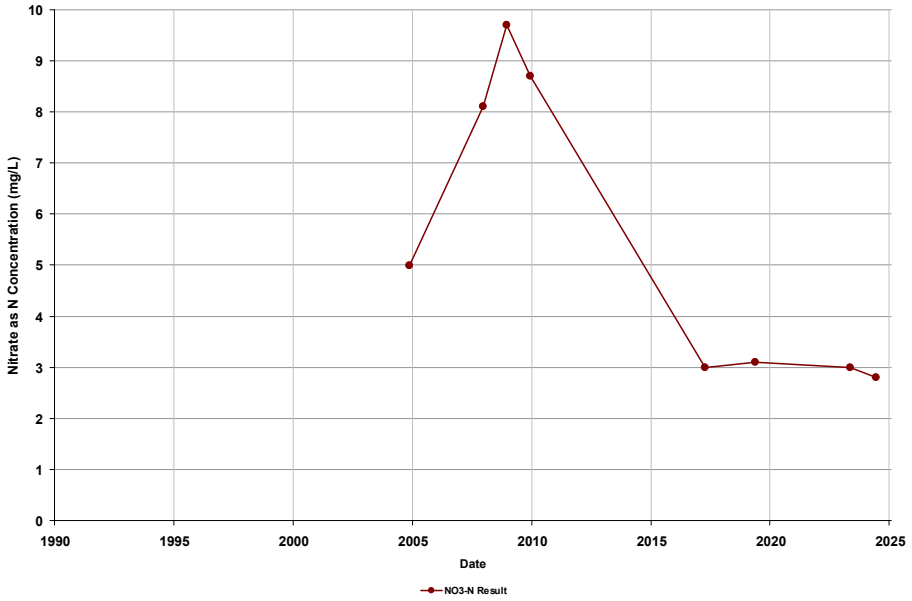
Total Depth (ft bgs): 532
Perf. Top (ft bgs): 522
Perf. Bottom (ft bgs): 532



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000507-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

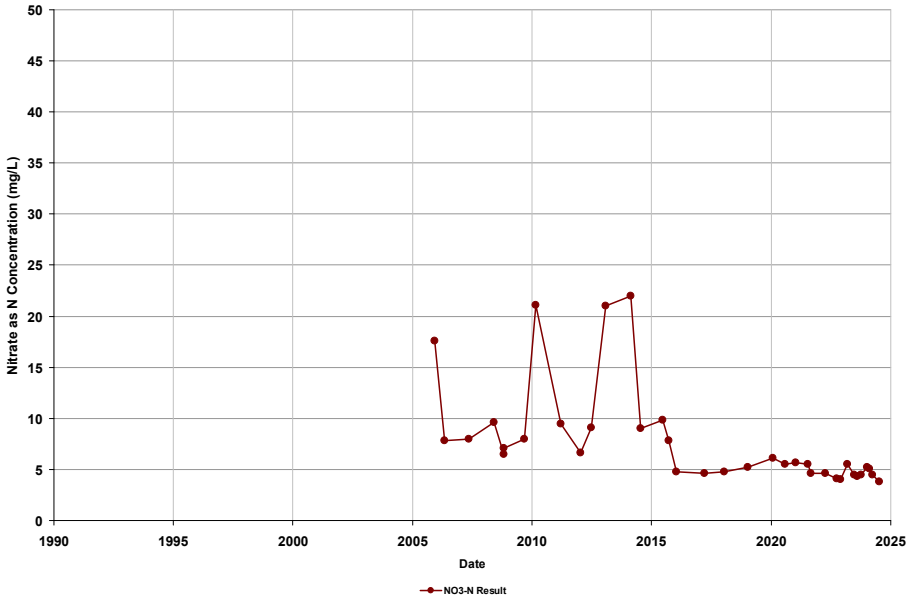
Total Depth (ft bgs):
Perf. Top (ft bgs): 372
Perf. Bottom (ft bgs): 372



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000553-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

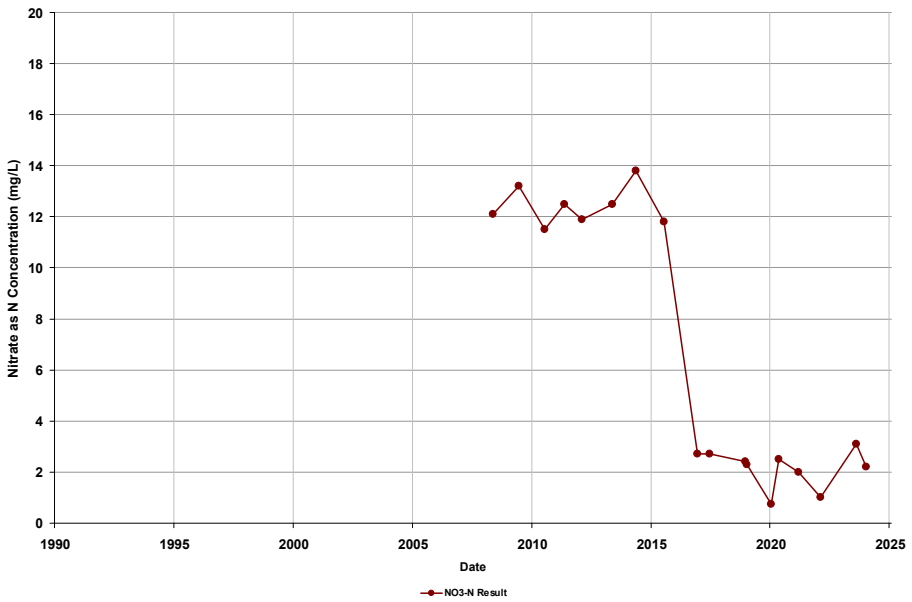
Total Depth (ft bgs):
Perf. Top (ft bgs): 450
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000682-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

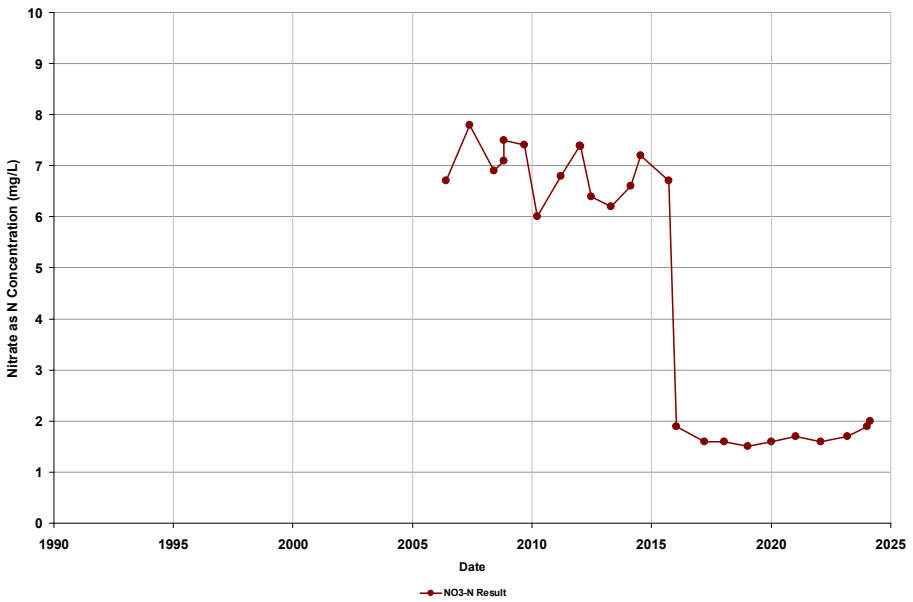
Total Depth (ft bgs):
Perf. Top (ft bgs): 295
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000727-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

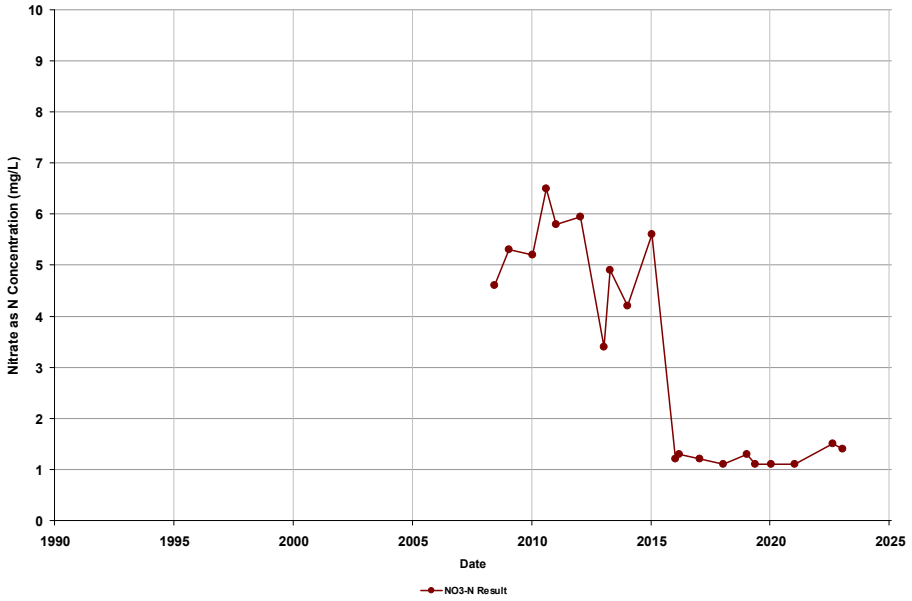
Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 360



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000938-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

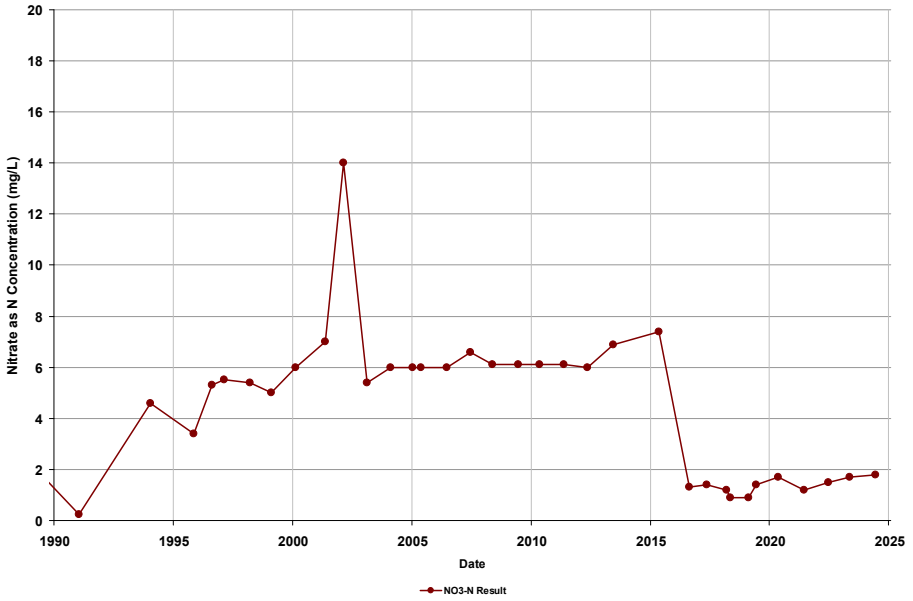
Total Depth (ft bgs):
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 560



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-014
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

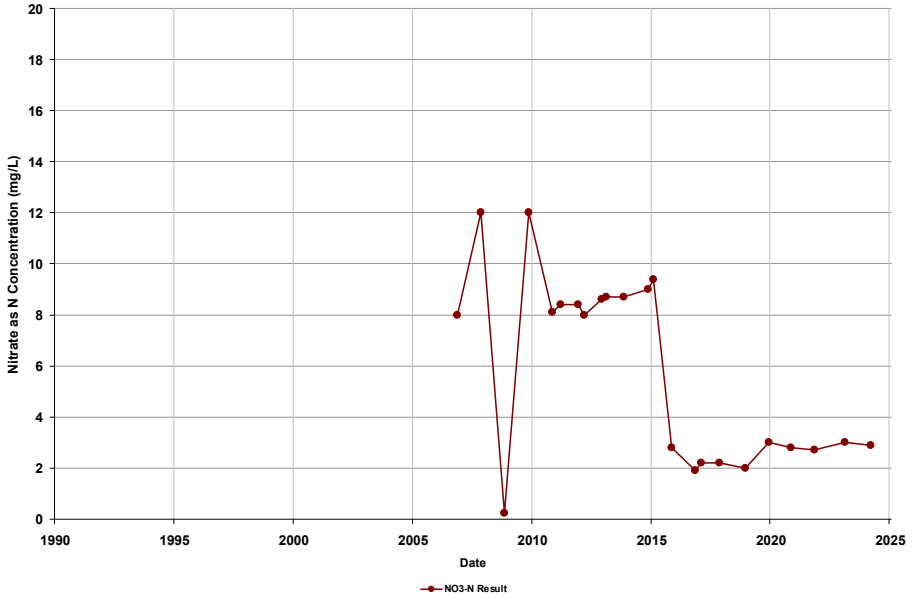
Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 610



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-032
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

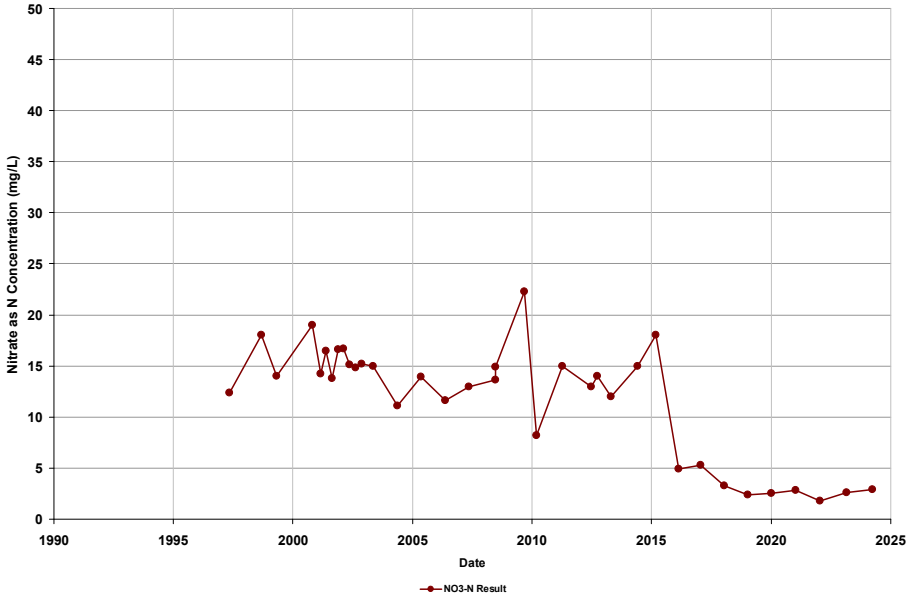
Total Depth (ft bgs):
Perf. Top (ft bgs): 310
Perf. Bottom (ft bgs): 600



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010008-005
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

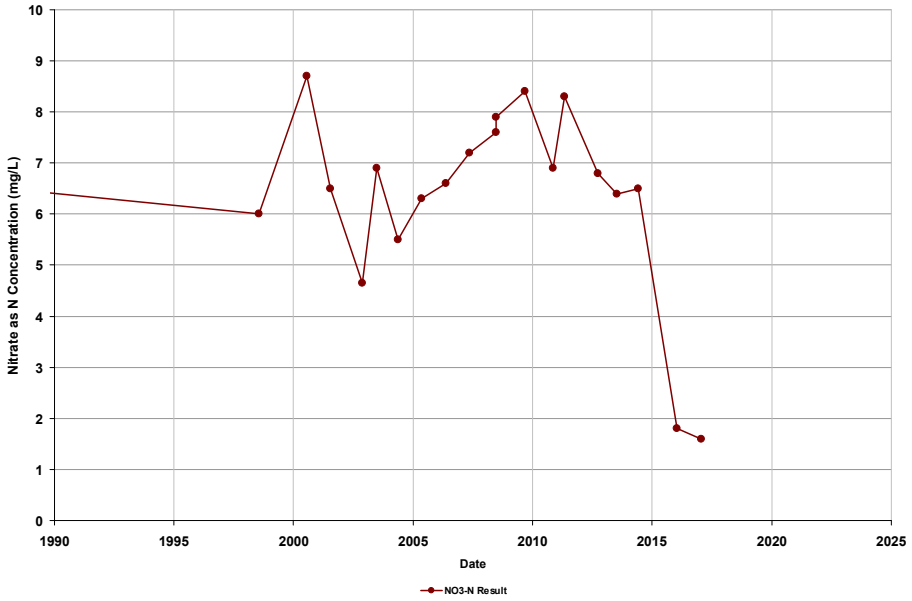
Total Depth (ft bgs):
Perf. Top (ft bgs): 250
Perf. Bottom (ft bgs): 465



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010009-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

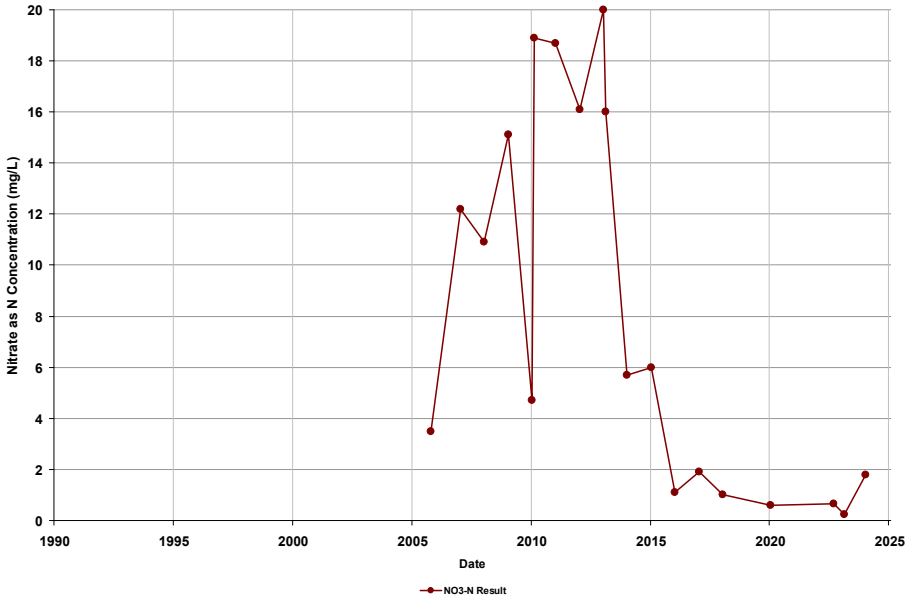
Total Depth (ft bgs):
Perf. Top (ft bgs): 324
Perf. Bottom (ft bgs): 369



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010010-007
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

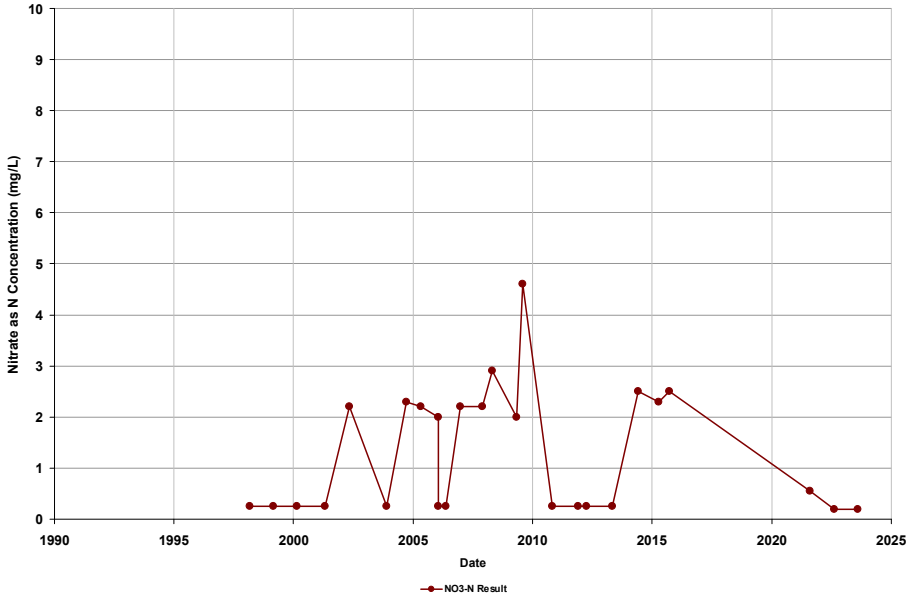
Total Depth (ft bgs):
Perf. Top (ft bgs): 242
Perf. Bottom (ft bgs): 374



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010801-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

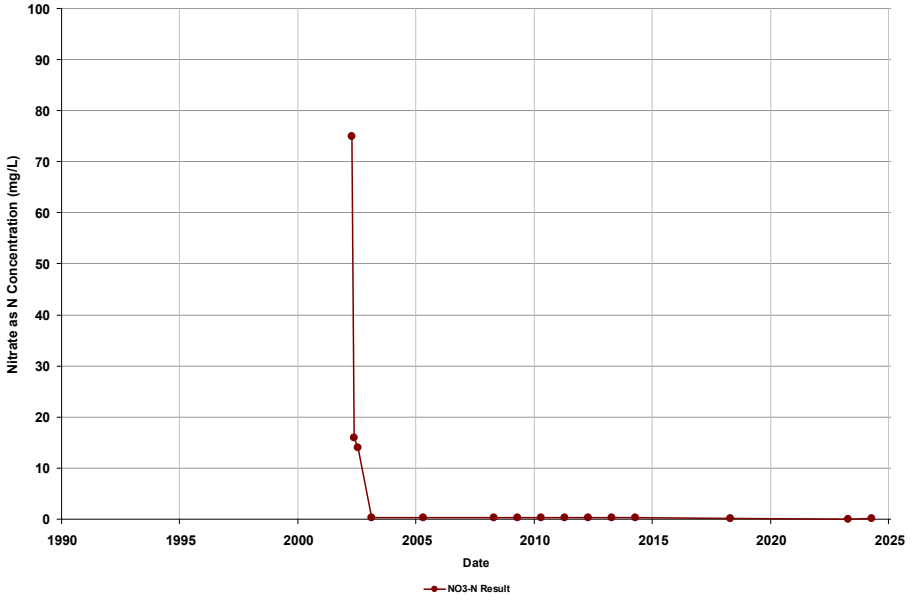
Total Depth (ft bgs):
Perf. Top (ft bgs): 375
Perf. Bottom (ft bgs): 760



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2801077-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 60
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: ESJ12
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

Total Depth (ft bgs): 276
Perf. Top (ft bgs): 160
Perf. Bottom (ft bgs): 172

NOTE: Non-Detect results shown as half the reporting limit.

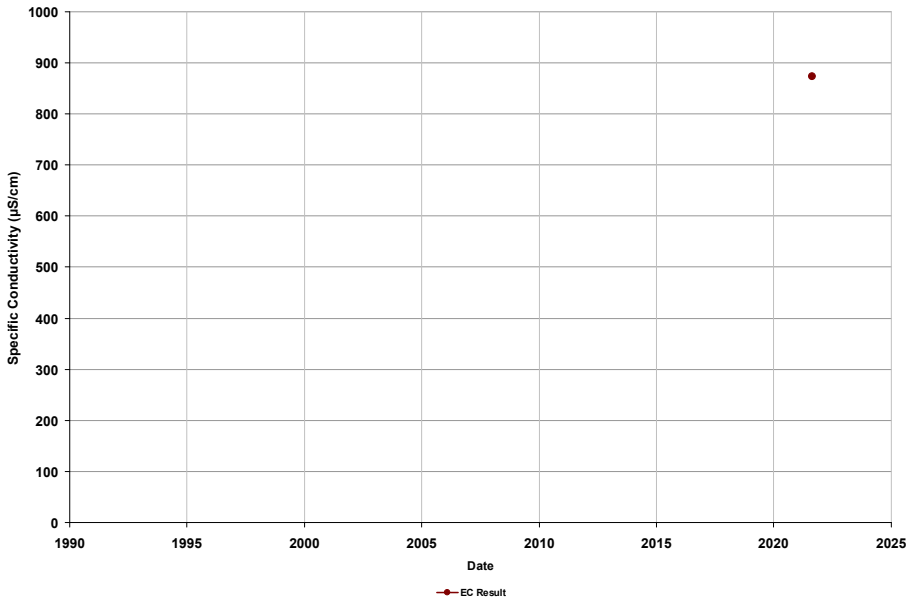
Well Name: ESJ17
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MCE RMS-3
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Unknown

Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-4
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 698
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 667

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-5B
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 514
Perf. Top (ft bgs): 245
Perf. Bottom (ft bgs): 496

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-6
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Industrial

Total Depth (ft bgs): 680
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 680

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-7
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 656
Perf. Top (ft bgs): 290
Perf. Bottom (ft bgs): 635

NOTE: Non-Detect results shown as half the reporting limit.

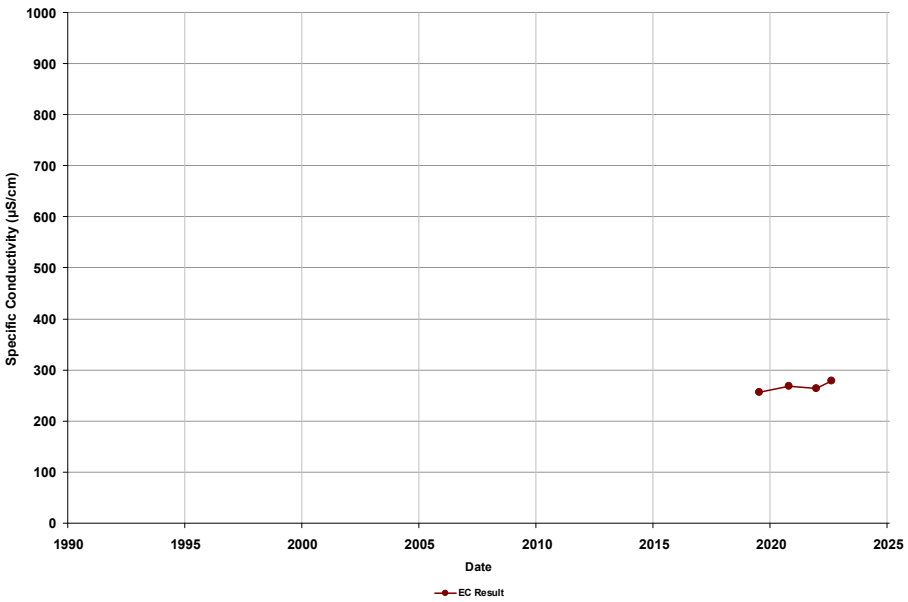
Well Name: MID RMS-13
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 600
Perf. Top (ft bgs): 228
Perf. Bottom (ft bgs): 552

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MWD RMS-1
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

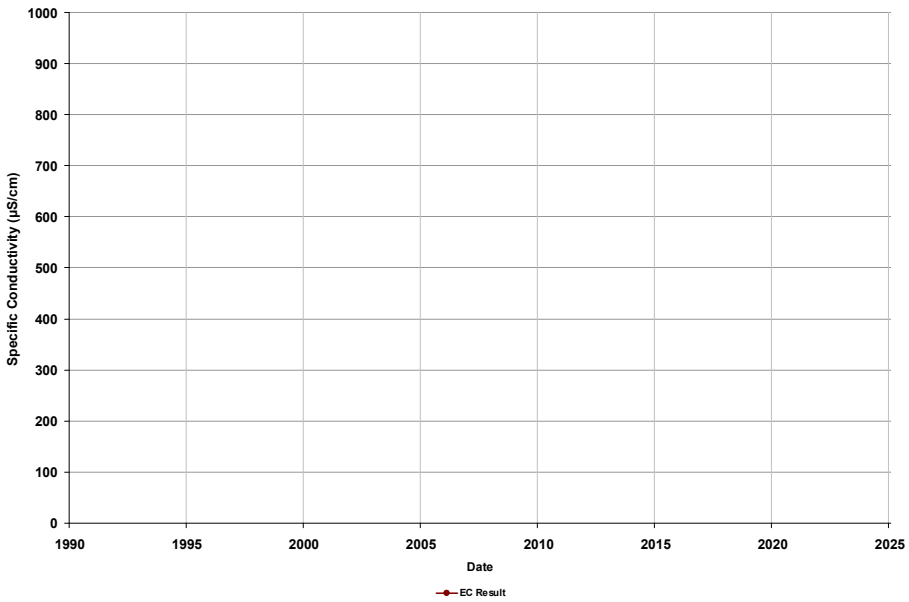
Total Depth (ft bgs): 504
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

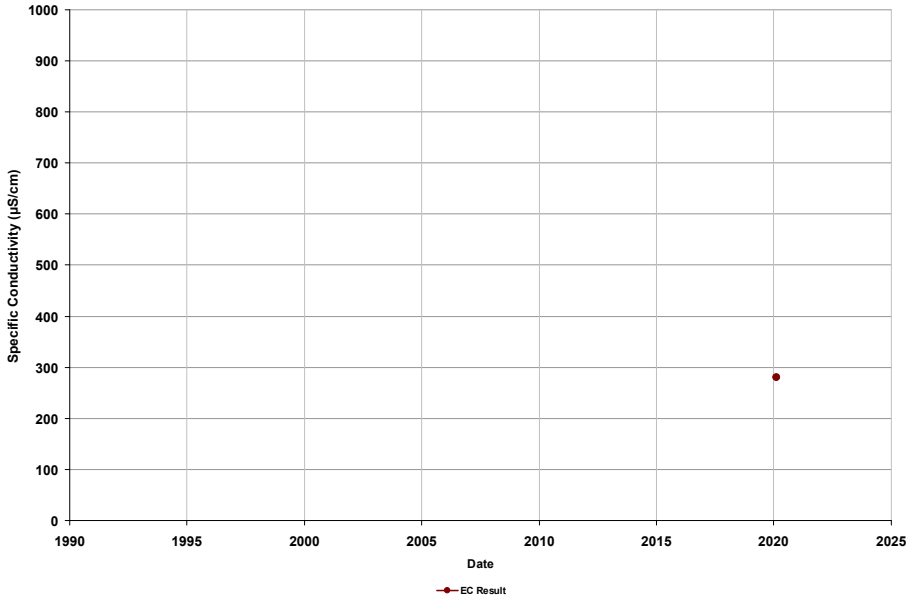
Total Depth (ft bgs): 139
Perf. Top (ft bgs): 74
Perf. Bottom (ft bgs): 134



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

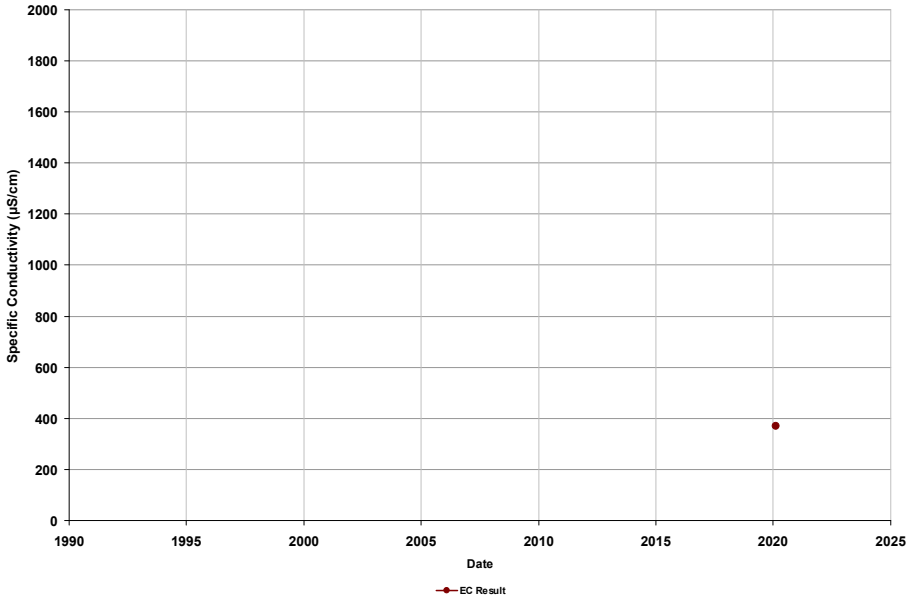
Total Depth (ft bgs): 295
Perf. Top (ft bgs): 215
Perf. Bottom (ft bgs): 285



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

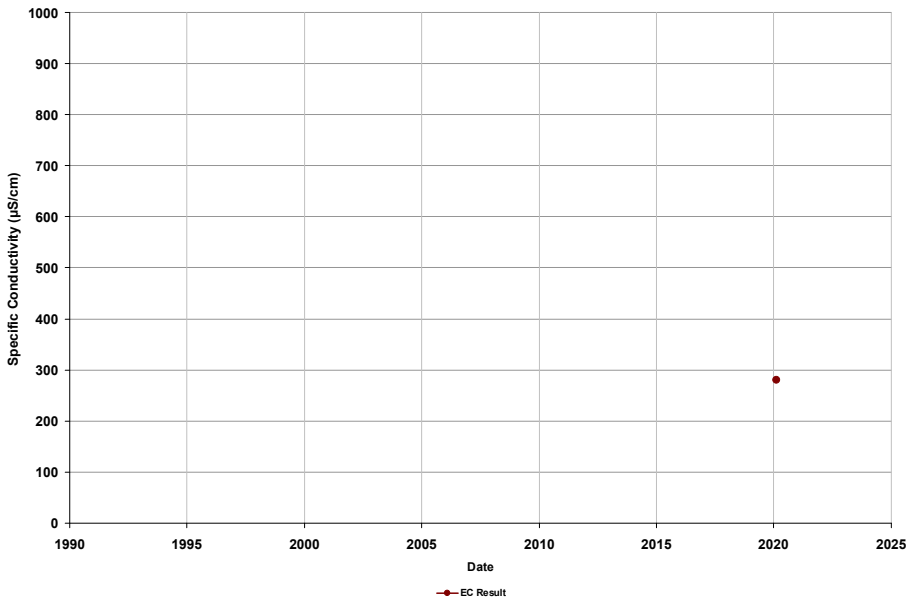
Total Depth (ft bgs): 430
Perf. Top (ft bgs): 355
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

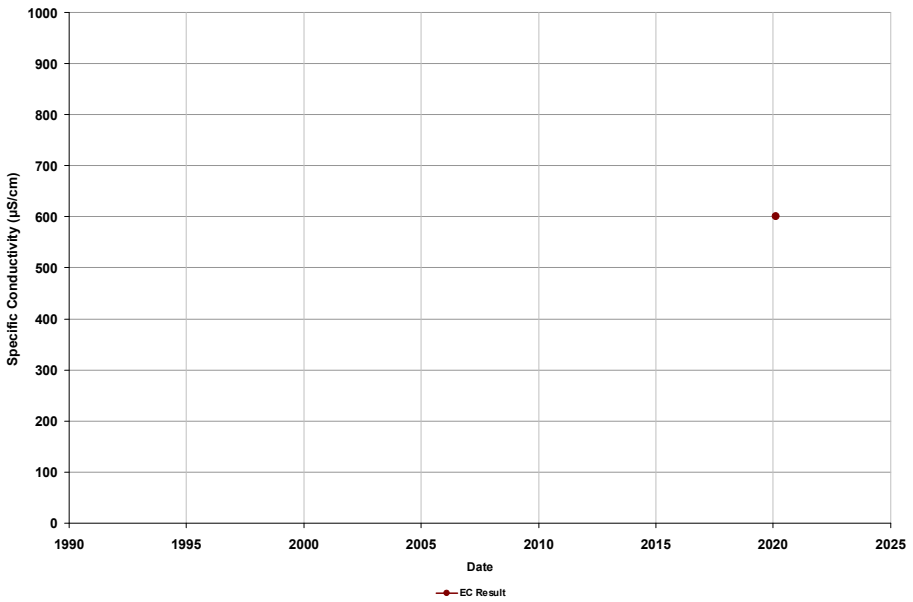
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 180
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

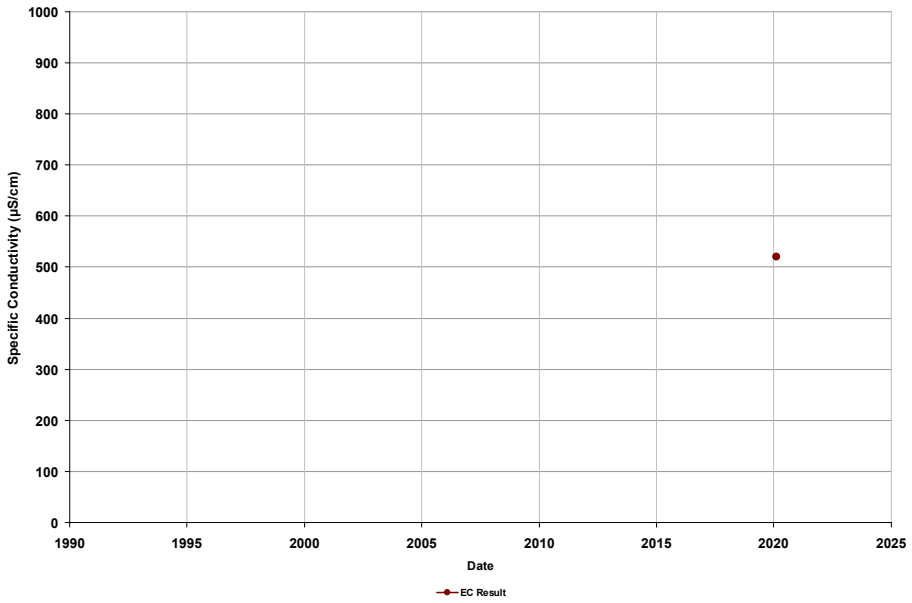
Total Depth (ft bgs): 695
Perf. Top (ft bgs): 530
Perf. Bottom (ft bgs): 685



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

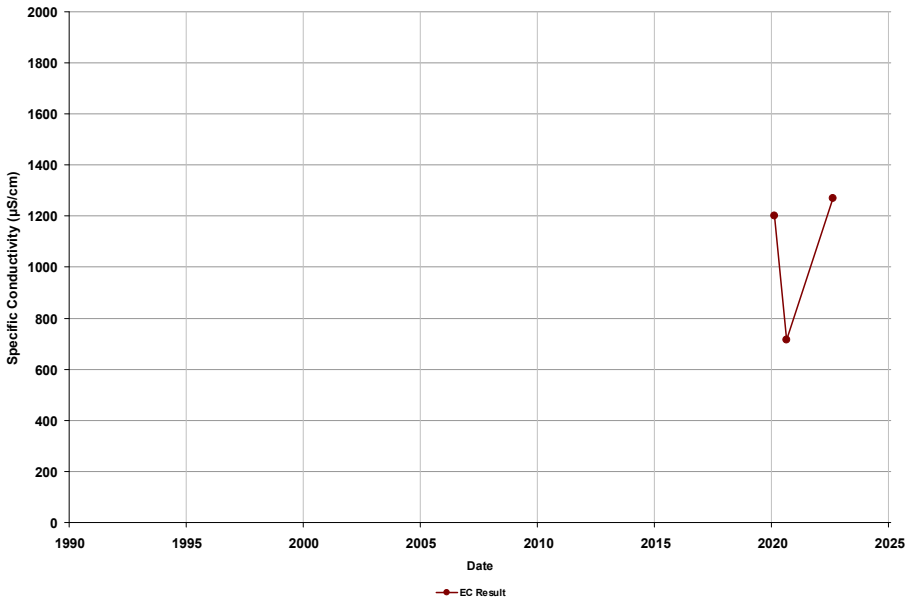
Total Depth (ft bgs): 905
Perf. Top (ft bgs): 750
Perf. Bottom (ft bgs): 895



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

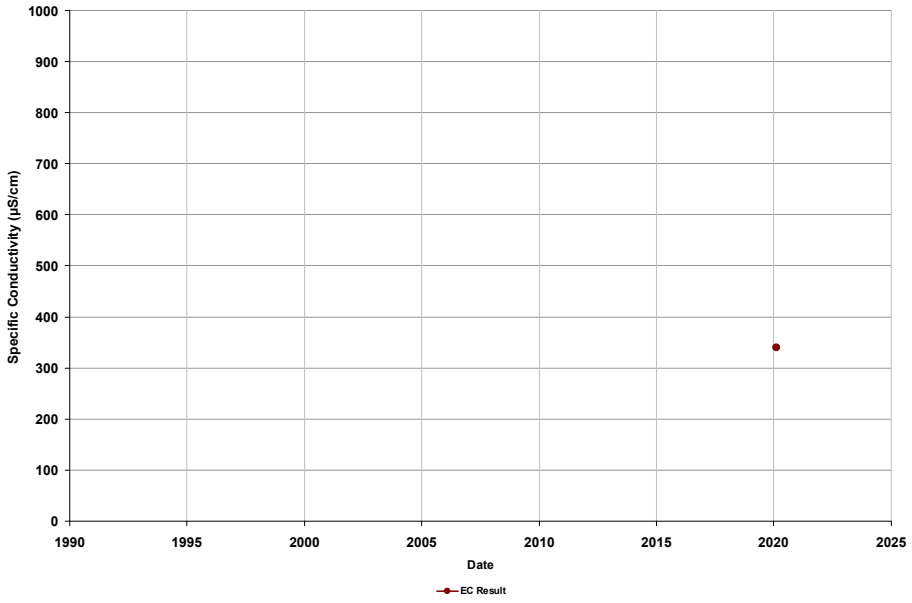
Total Depth (ft bgs): 210
Perf. Top (ft bgs): 140
Perf. Bottom (ft bgs): 200



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

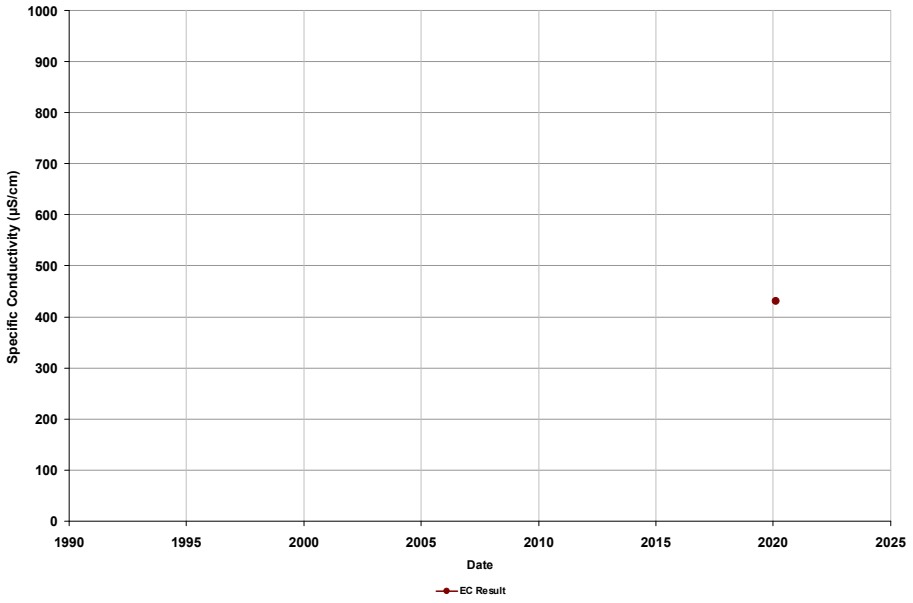
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 240
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

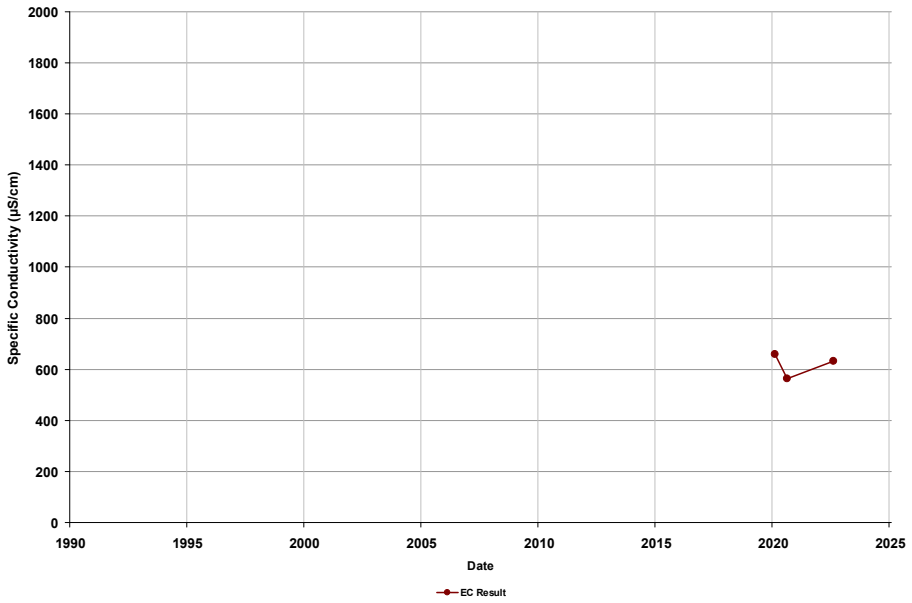
Total Depth (ft bgs): 585
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 585



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

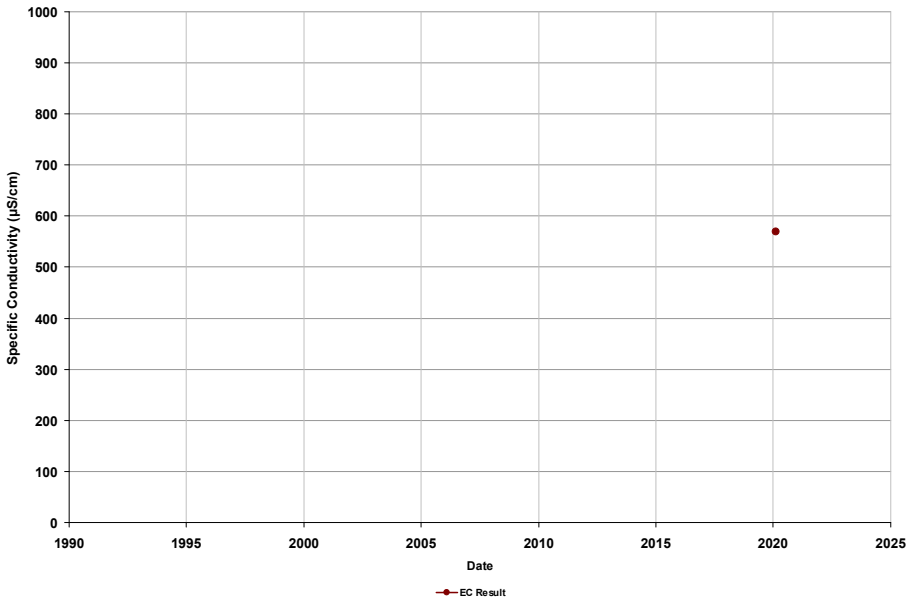
Total Depth (ft bgs): 350
Perf. Top (ft bgs): 135
Perf. Bottom (ft bgs): 340



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

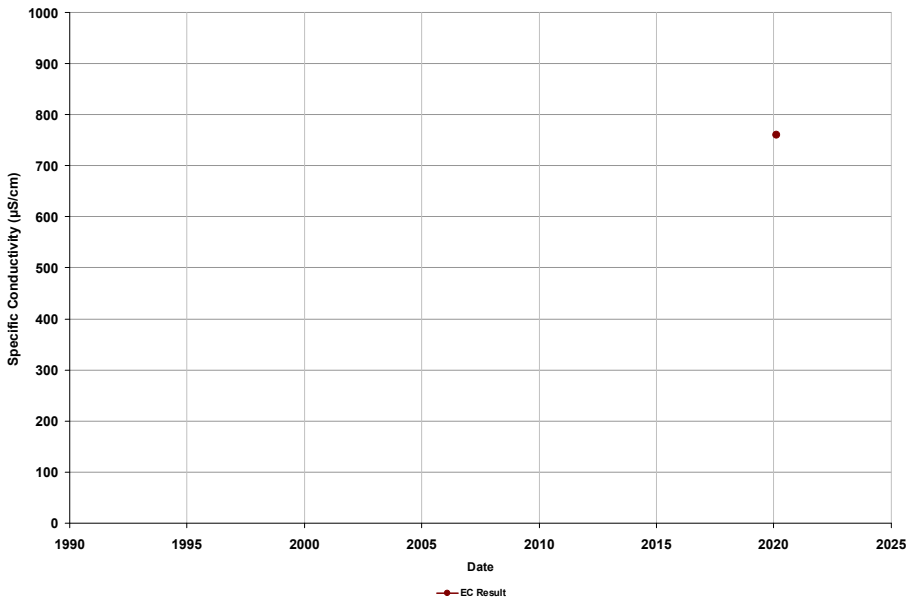
Total Depth (ft bgs): 520
Perf. Top (ft bgs): 425
Perf. Bottom (ft bgs): 510



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

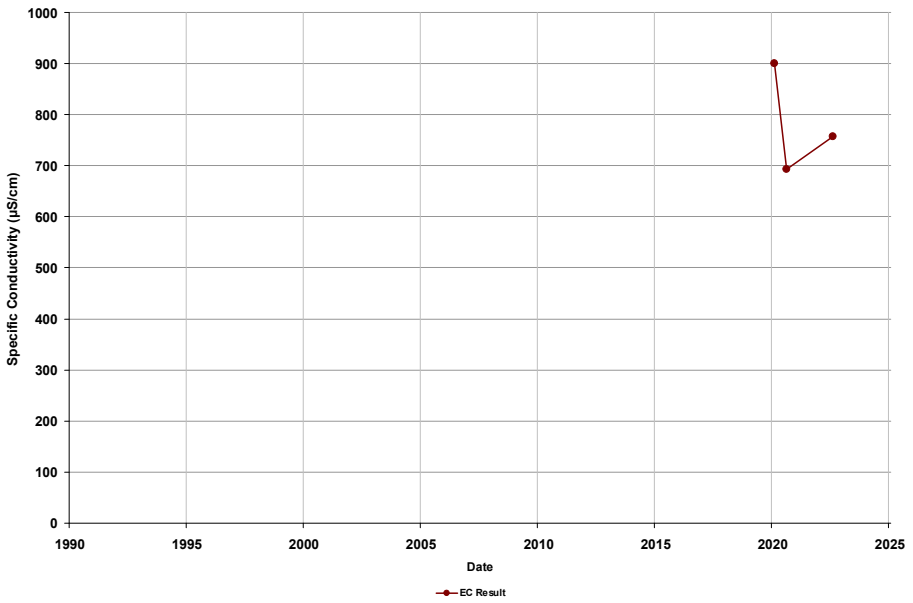
Total Depth (ft bgs): 715
Perf. Top (ft bgs): 630
Perf. Bottom (ft bgs): 705



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

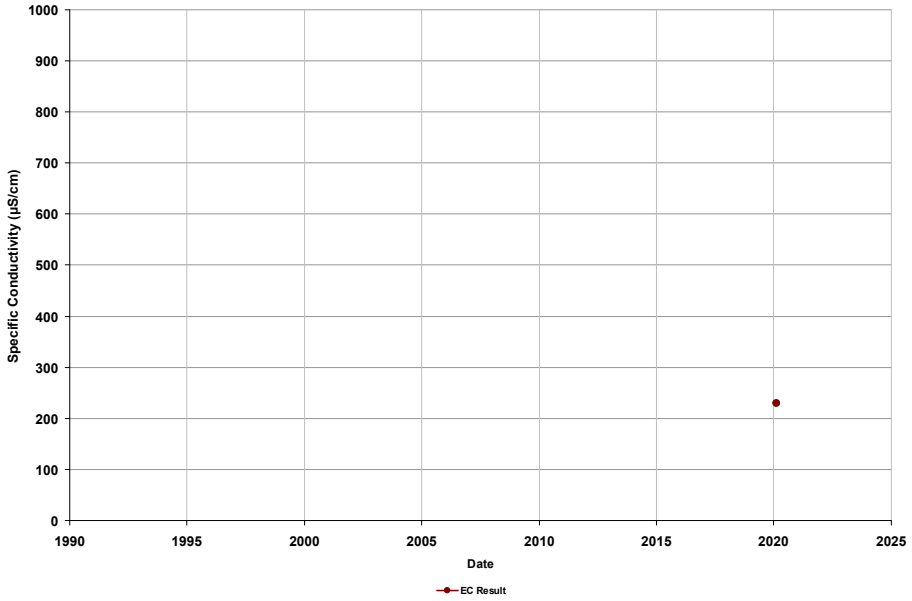
Total Depth (ft bgs): 320
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 310



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

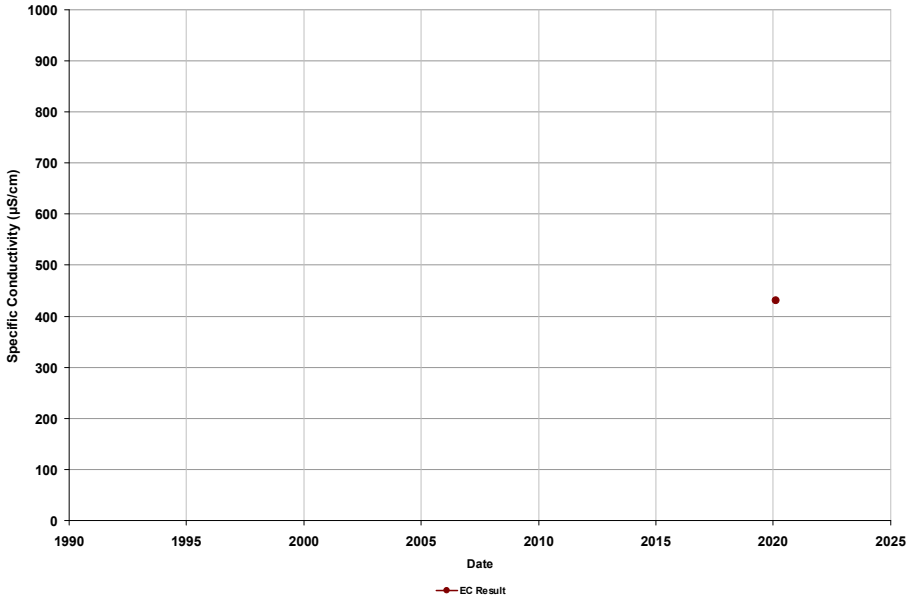
Total Depth (ft bgs): 725
Perf. Top (ft bgs): 520
Perf. Bottom (ft bgs): 715



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

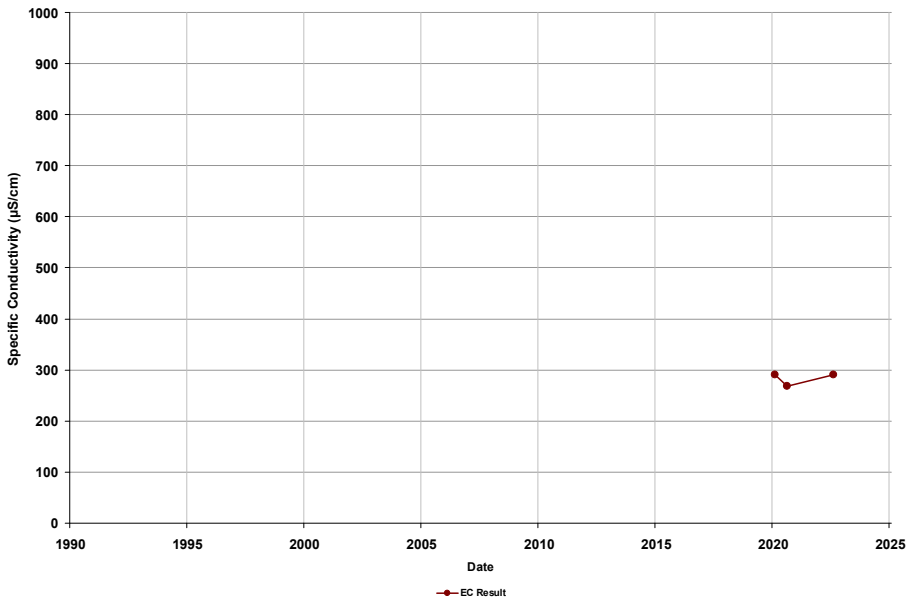
Total Depth (ft bgs): 955
Perf. Top (ft bgs): 880
Perf. Bottom (ft bgs): 945



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

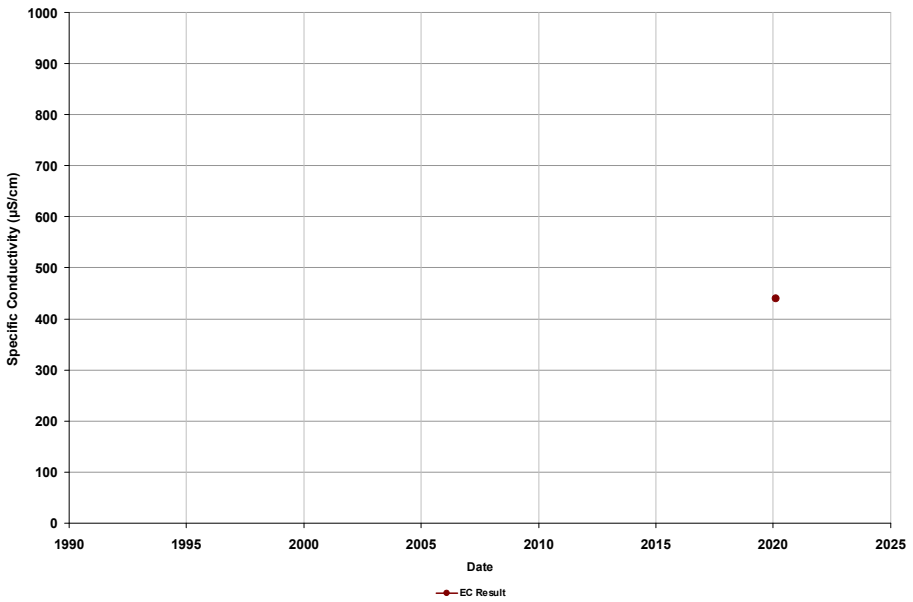
Total Depth (ft bgs): 510
Perf. Top (ft bgs): 400
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

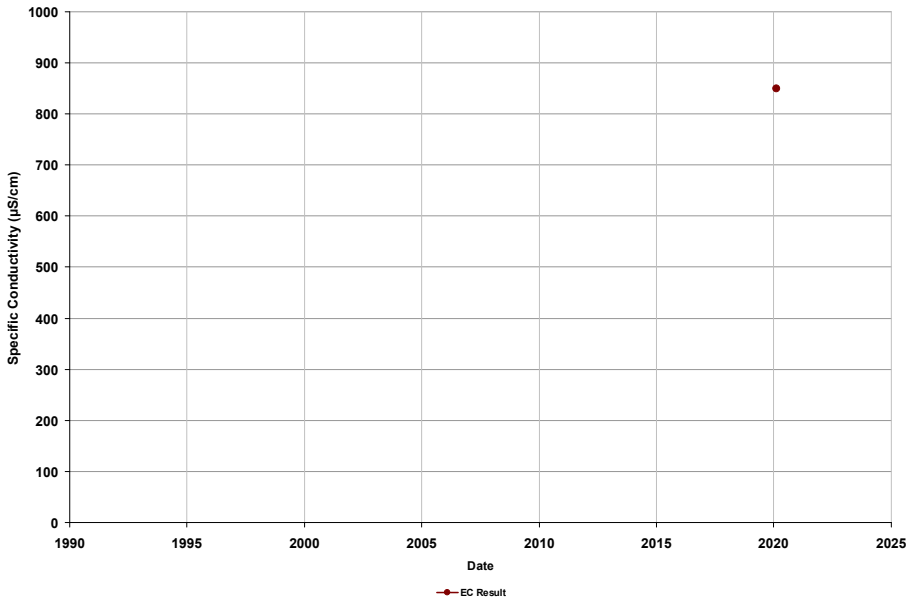
Total Depth (ft bgs): 880
Perf. Top (ft bgs): 790
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB11C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

Total Depth (ft bgs): 880
Perf. Top (ft bgs): 775
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

Total Depth (ft bgs): 290
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 280

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

Total Depth (ft bgs): 446
Perf. Top (ft bgs): 396
Perf. Bottom (ft bgs): 436

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

Total Depth (ft bgs): 532
Perf. Top (ft bgs): 522
Perf. Bottom (ft bgs): 532

NOTE: Non-Detect results shown as half the reporting limit.

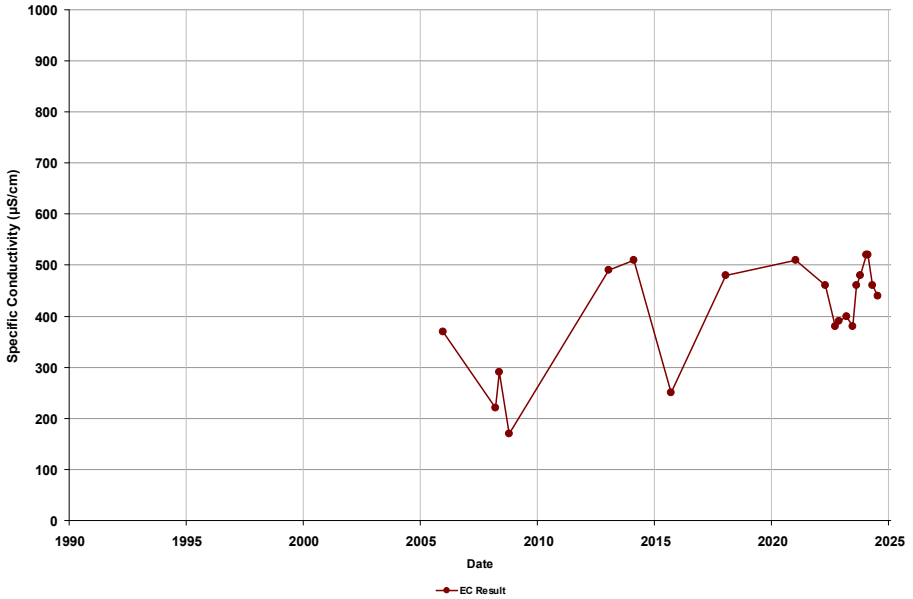
Well Name: 2000507-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 372
Perf. Bottom (ft bgs): 372

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000553-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

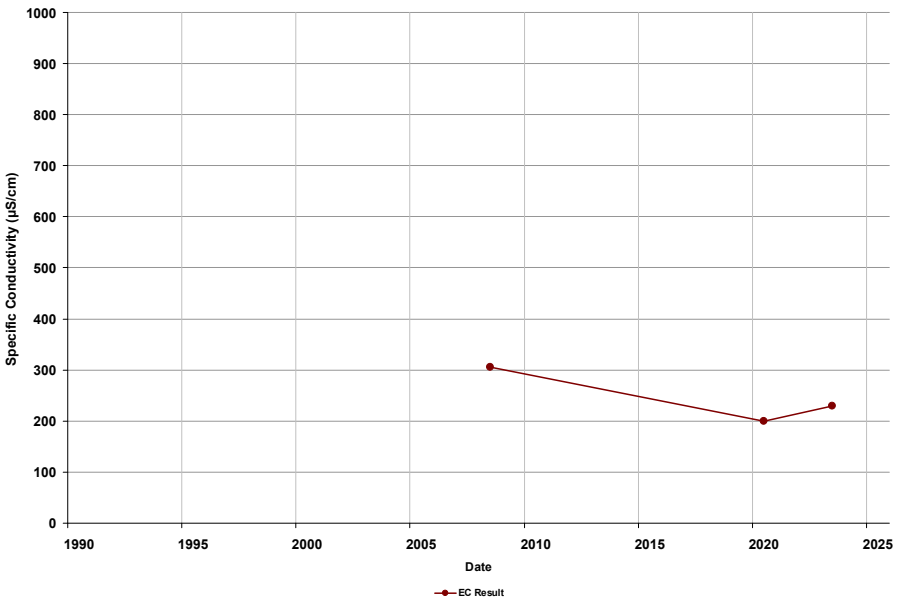
Total Depth (ft bgs):
Perf. Top (ft bgs): 450
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000682-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

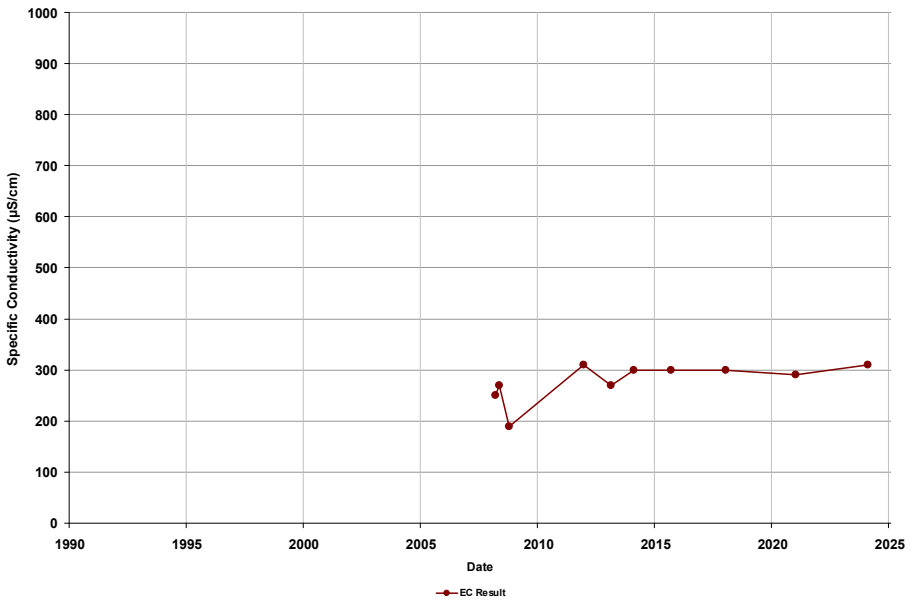
Total Depth (ft bgs):
Perf. Top (ft bgs): 295
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000727-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

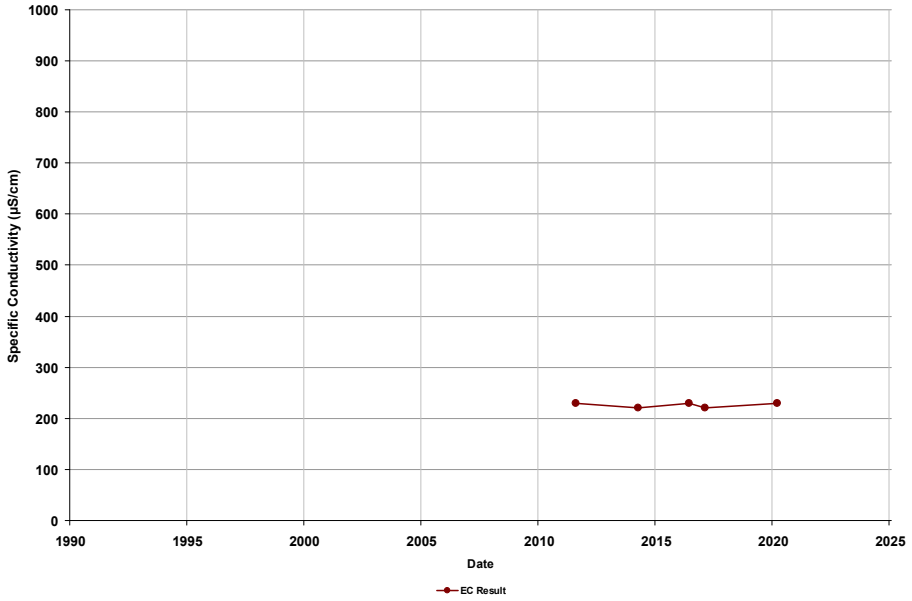
Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 360



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000938-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

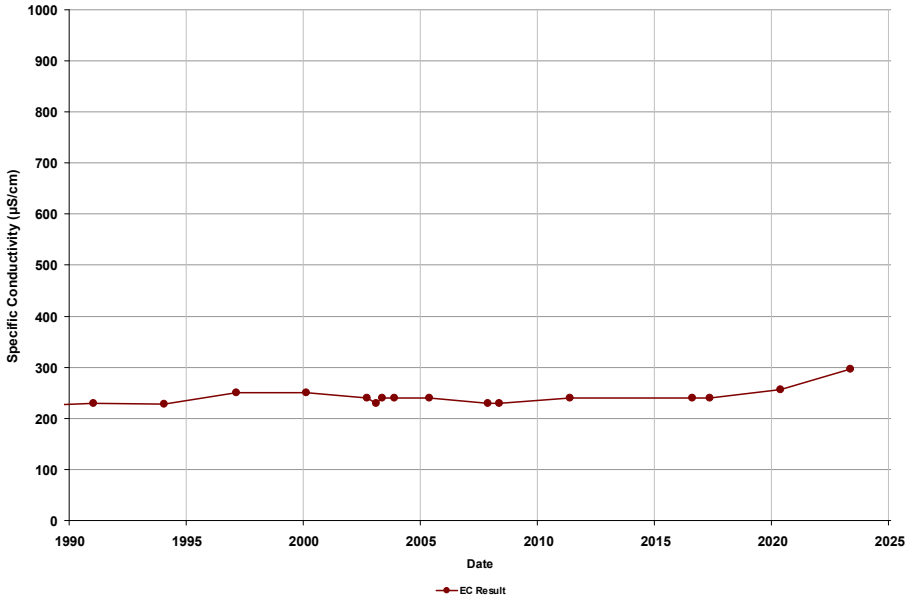
Total Depth (ft bgs):
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 560



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-014
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

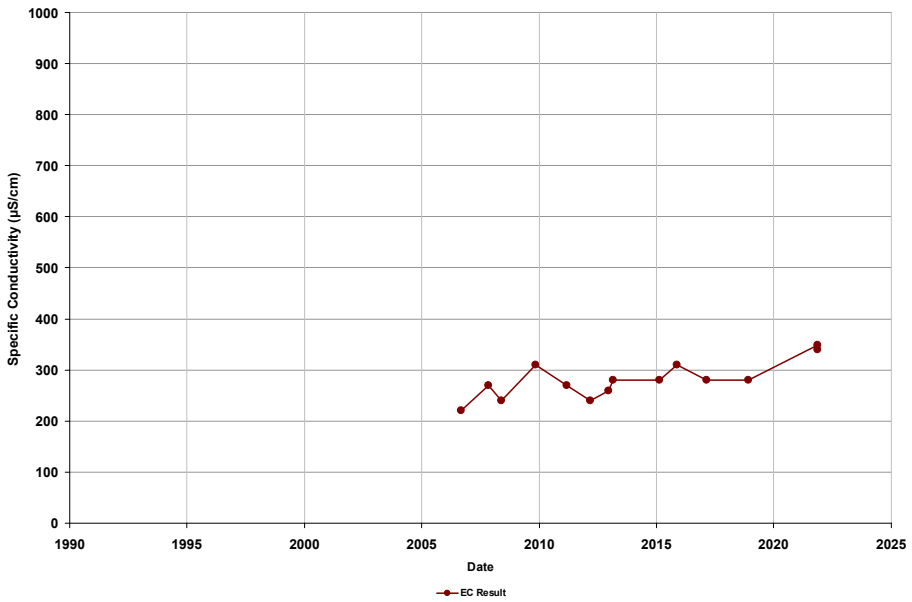
Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 610



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-032
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

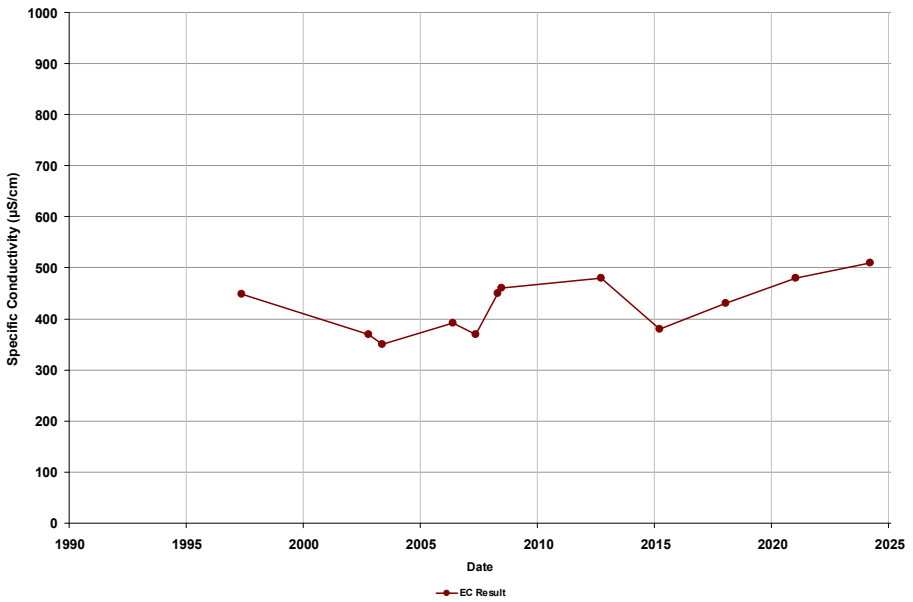
Total Depth (ft bgs):
Perf. Top (ft bgs): 310
Perf. Bottom (ft bgs): 600



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010008-005
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

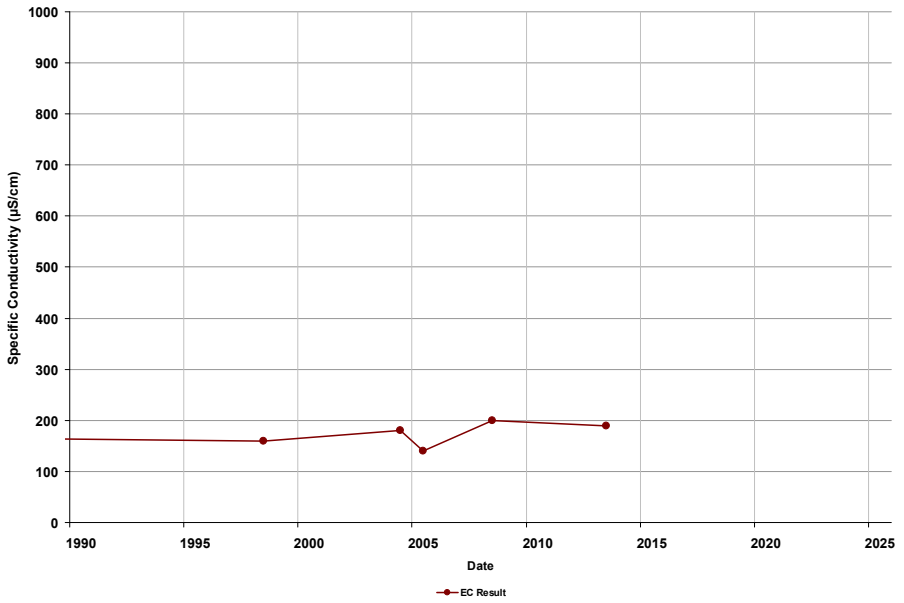
Total Depth (ft bgs):
Perf. Top (ft bgs): 250
Perf. Bottom (ft bgs): 465



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010009-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

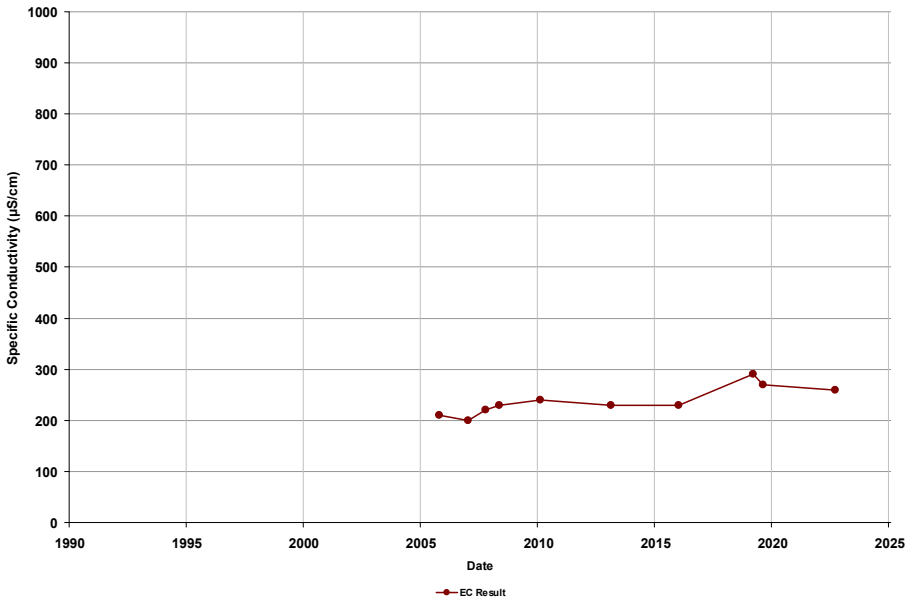
Total Depth (ft bgs):
Perf. Top (ft bgs): 324
Perf. Bottom (ft bgs): 369



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010010-007
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

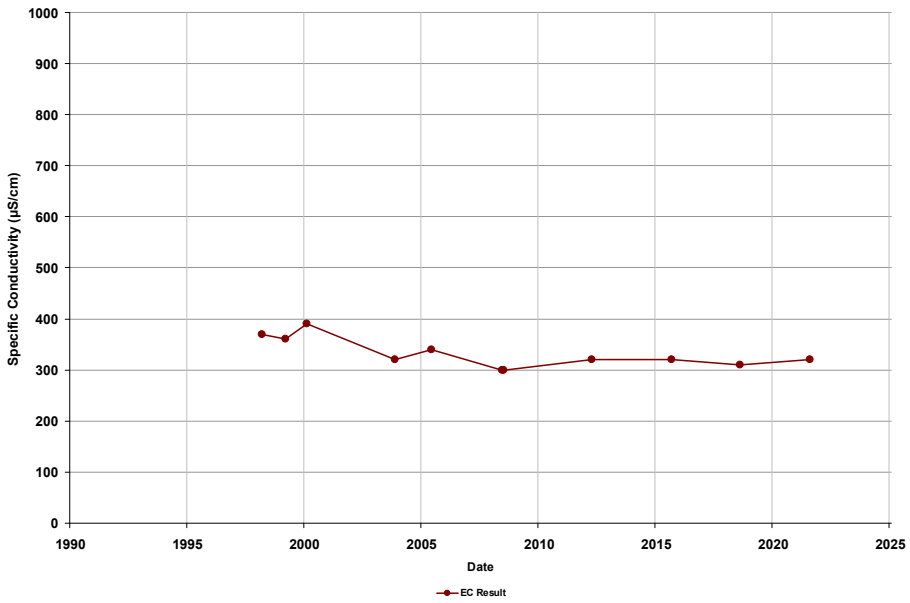
Total Depth (ft bgs):
Perf. Top (ft bgs): 242
Perf. Bottom (ft bgs): 374



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010801-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 375
Perf. Bottom (ft bgs): 760



NOTE: Non-Detect results shown as half the reporting limit.

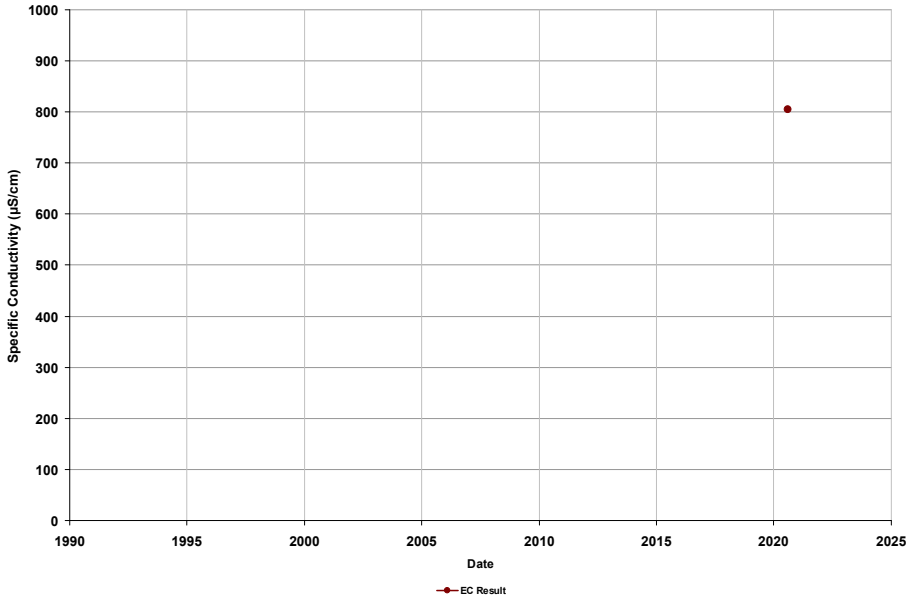
Well Name: 2801077-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 60
Perf. Bottom (ft bgs): 500

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: ESJ12
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

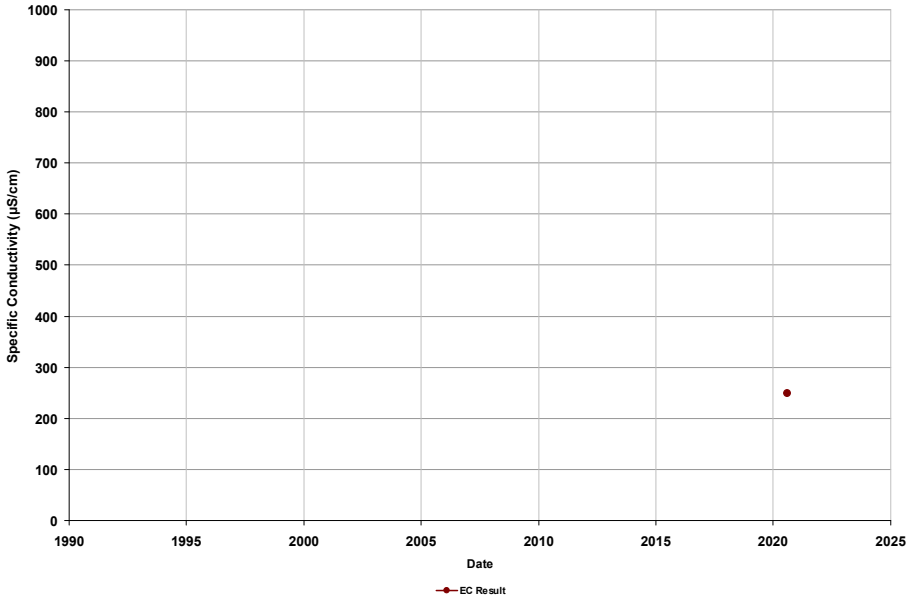
Total Depth (ft bgs): 276
Perf. Top (ft bgs): 160
Perf. Bottom (ft bgs): 172



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: ESJ17
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

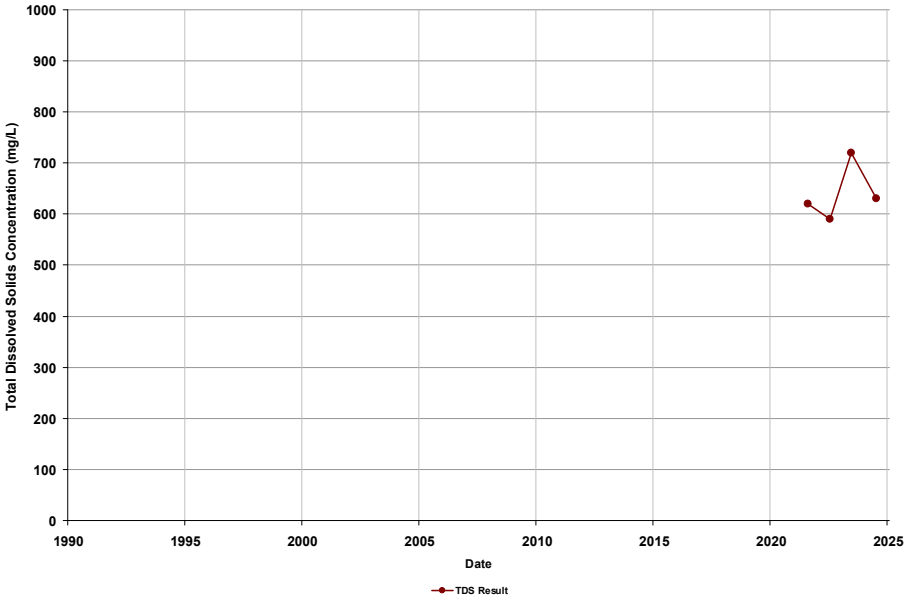
Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MCE RMS-3
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Unknown

Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-4
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 698
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 667

NOTE: Non-Detect results shown as half the reporting limit.

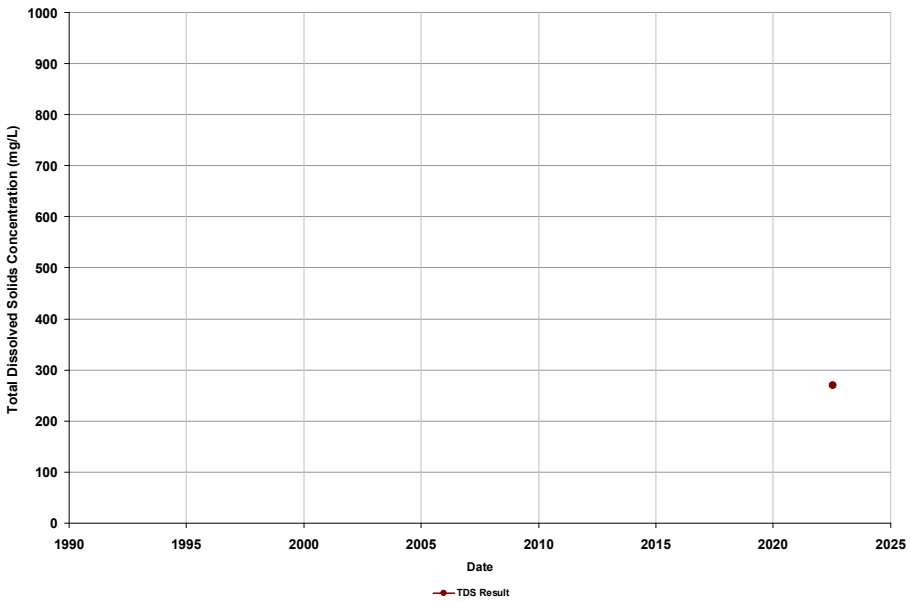
Well Name: MID RMS-5B
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 514
Perf. Top (ft bgs): 245
Perf. Bottom (ft bgs): 496

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-6
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Industrial

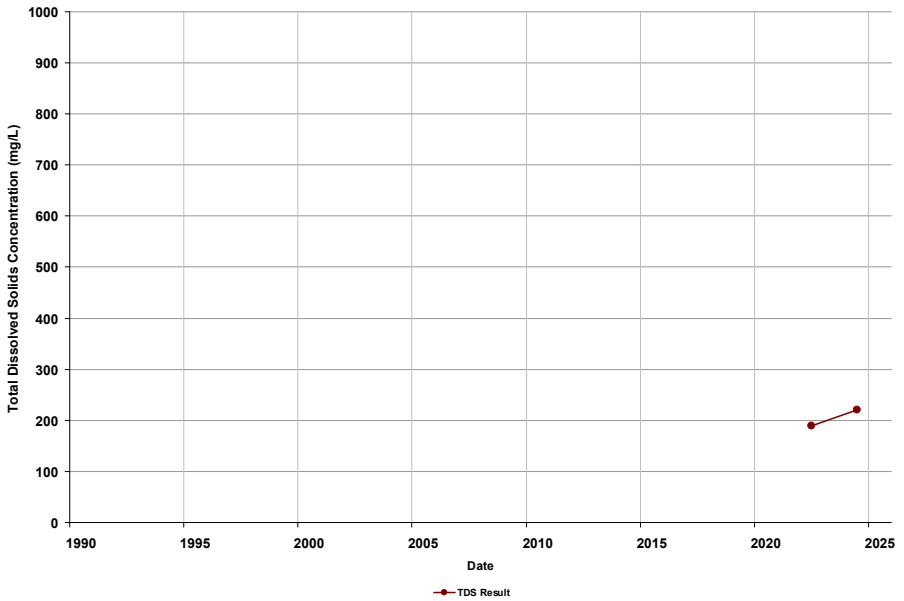
Total Depth (ft bgs): 680
Perf. Top (ft bgs): 320
Perf. Bottom (ft bgs): 680



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MID RMS-7
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 656
Perf. Top (ft bgs): 290
Perf. Bottom (ft bgs): 635



NOTE: Non-Detect results shown as half the reporting limit.

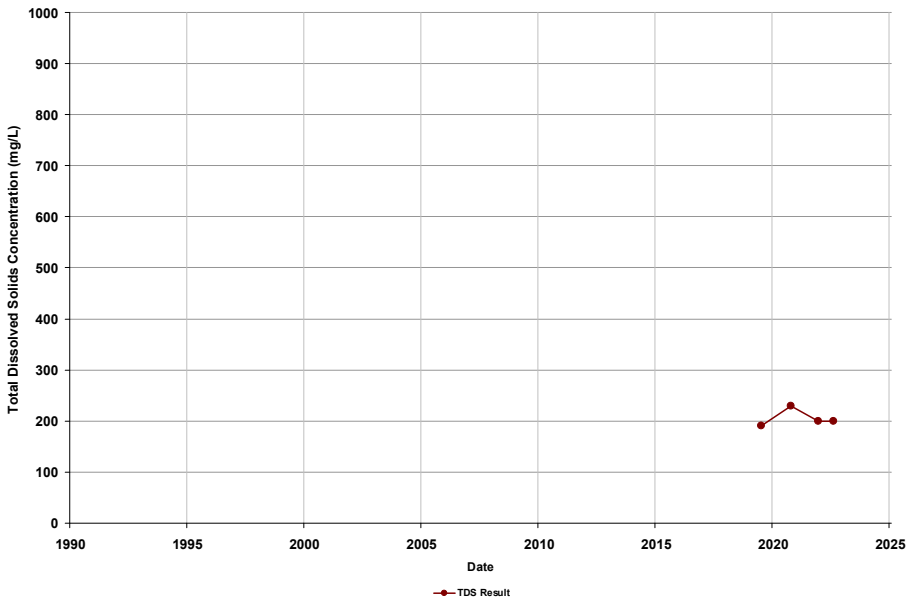
Well Name: MID RMS-13
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

Total Depth (ft bgs): 600
Perf. Top (ft bgs): 228
Perf. Bottom (ft bgs): 552

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MWD RMS-1
RMS Type: GSA-Current
Subbasin: Madera
Well Type: Irrigation

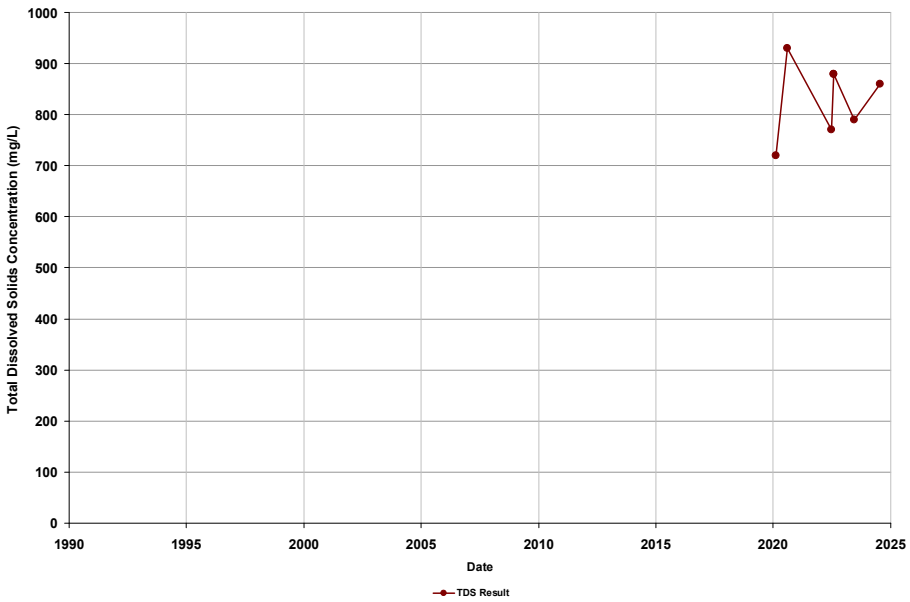
Total Depth (ft bgs): 504
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

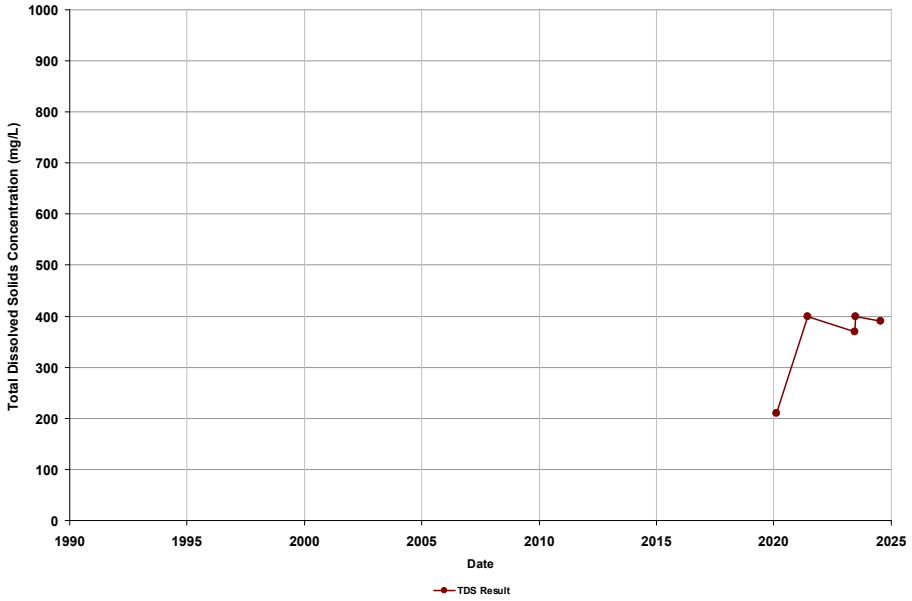
Total Depth (ft bgs): 139
Perf. Top (ft bgs): 74
Perf. Bottom (ft bgs): 134



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

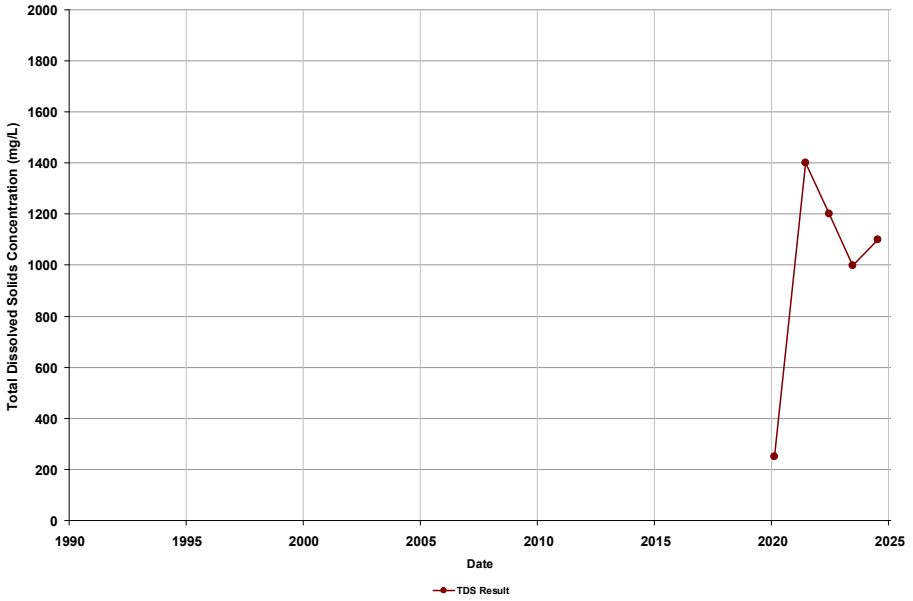
Total Depth (ft bgs): 295
Perf. Top (ft bgs): 215
Perf. Bottom (ft bgs): 285



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB03C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

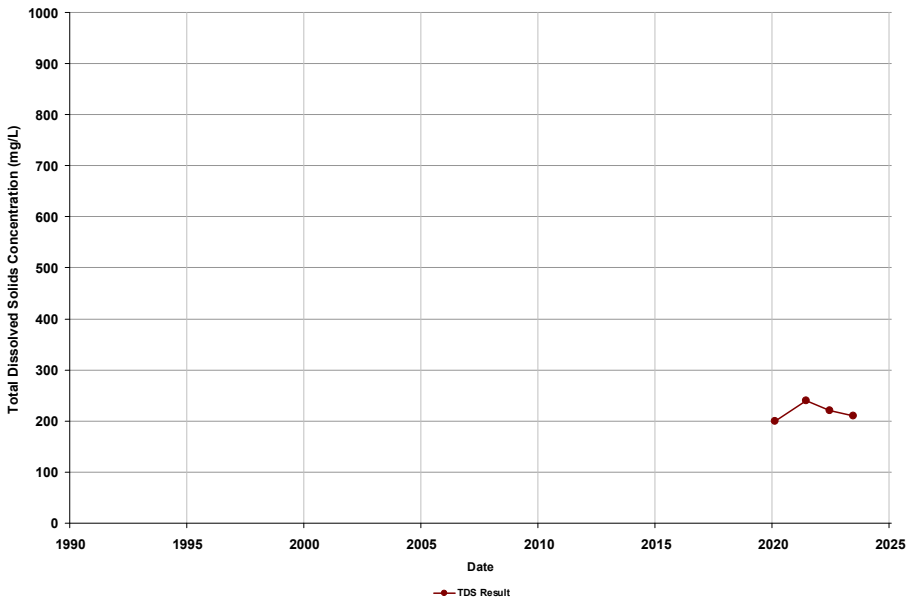
Total Depth (ft bgs): 430
Perf. Top (ft bgs): 355
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

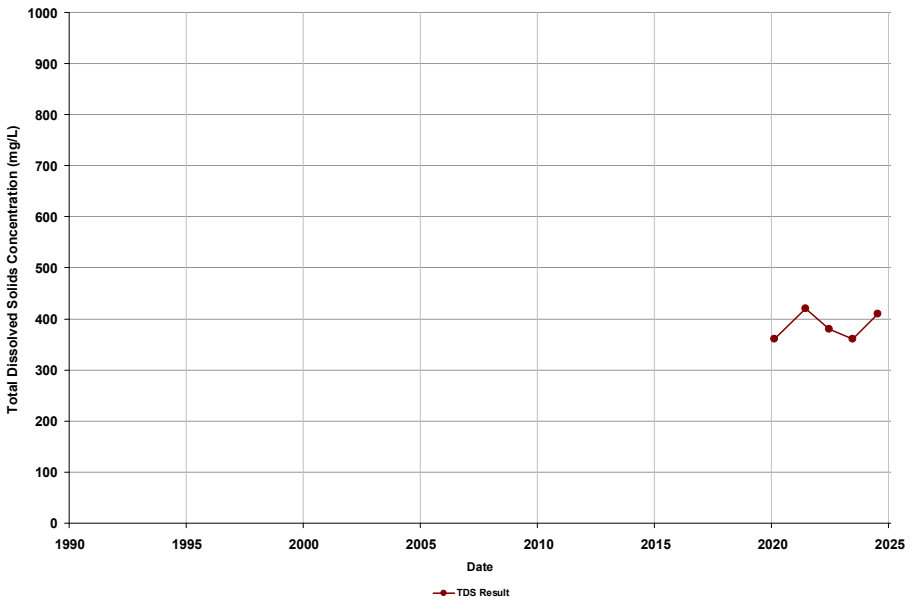
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 180
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

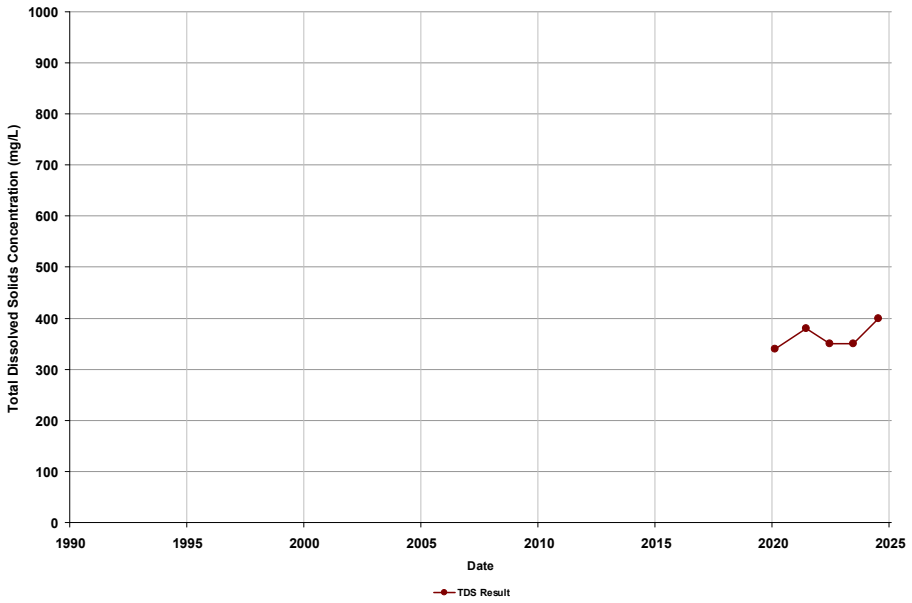
Total Depth (ft bgs): 695
Perf. Top (ft bgs): 530
Perf. Bottom (ft bgs): 685



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB04C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

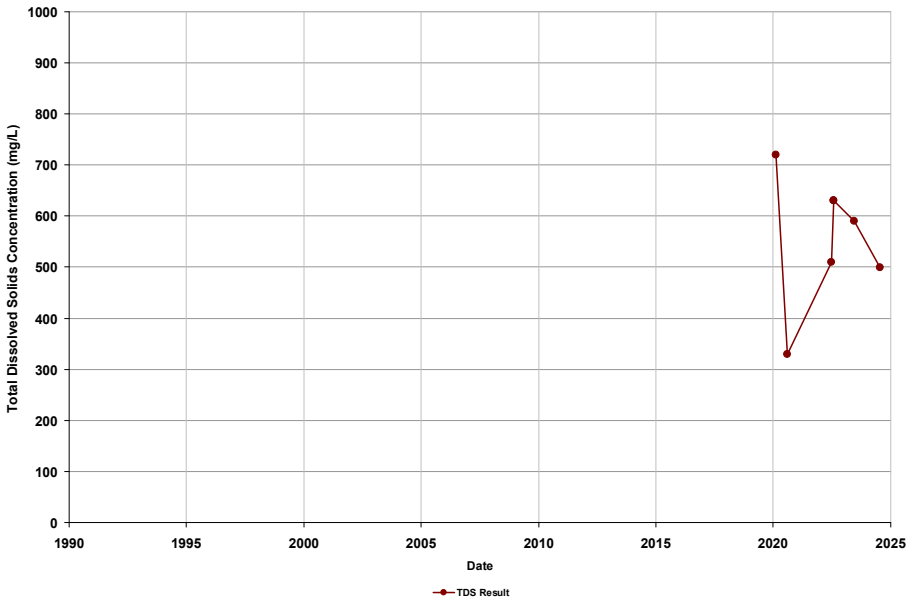
Total Depth (ft bgs): 905
Perf. Top (ft bgs): 750
Perf. Bottom (ft bgs): 895



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

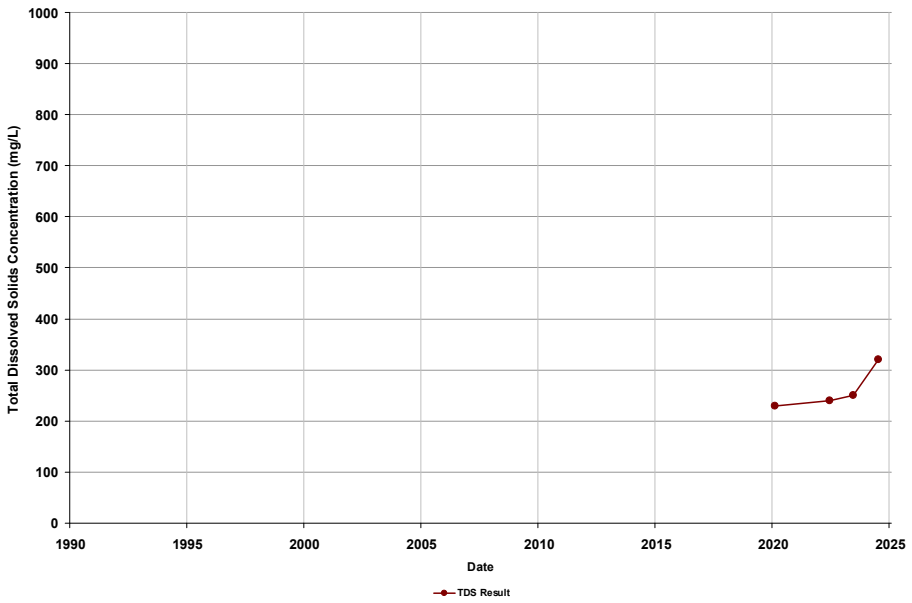
Total Depth (ft bgs): 210
Perf. Top (ft bgs): 140
Perf. Bottom (ft bgs): 200



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

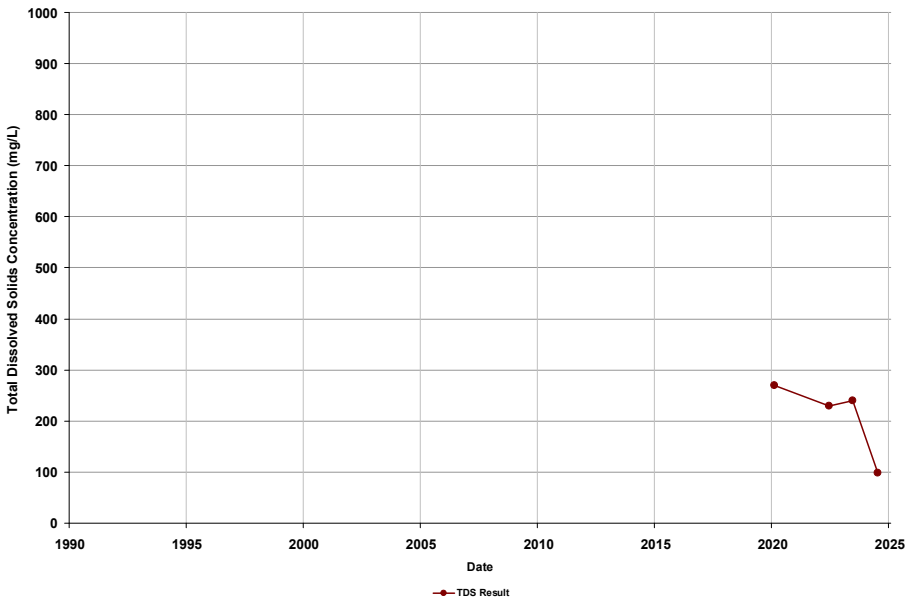
Total Depth (ft bgs): 375
Perf. Top (ft bgs): 240
Perf. Bottom (ft bgs): 365



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB05C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

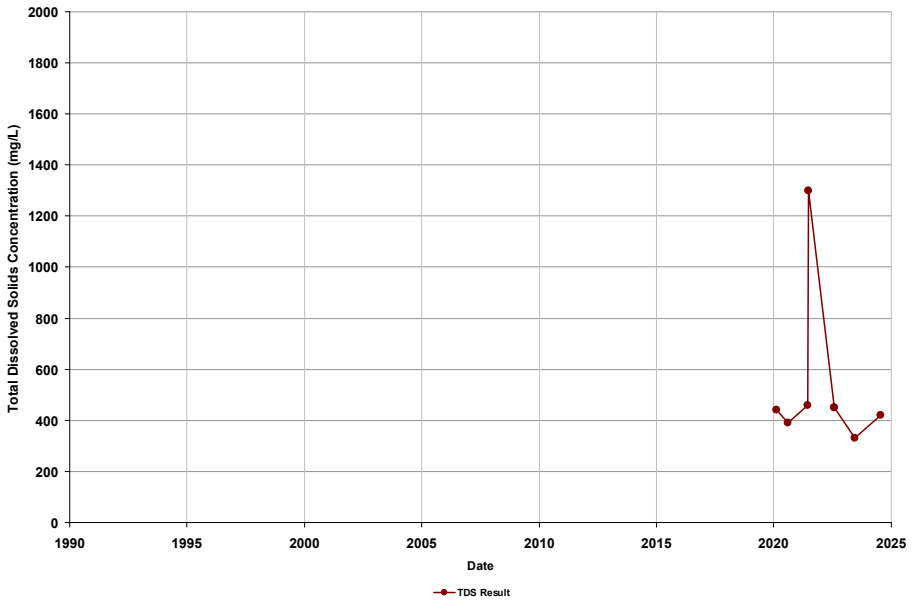
Total Depth (ft bgs): 585
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 585



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

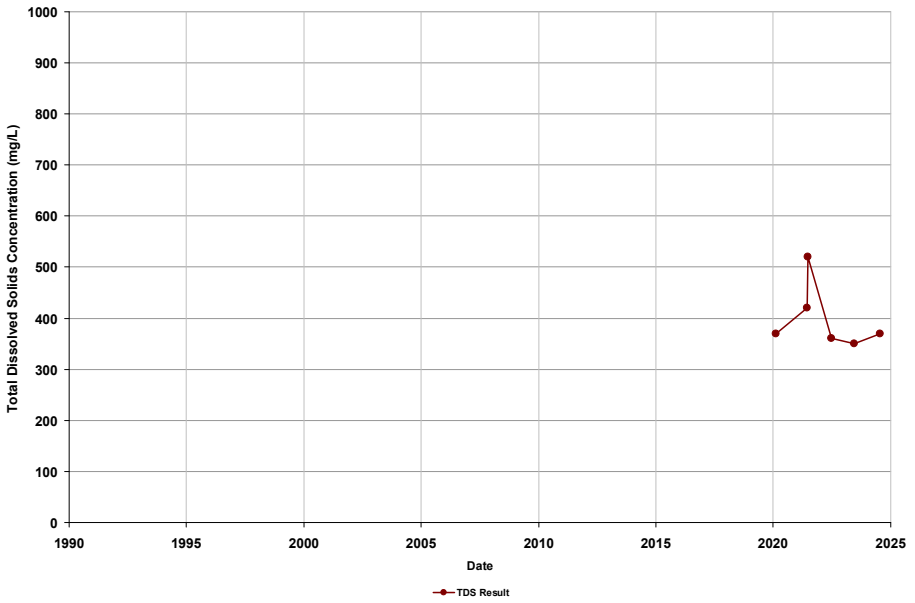
Total Depth (ft bgs): 350
Perf. Top (ft bgs): 135
Perf. Bottom (ft bgs): 340



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

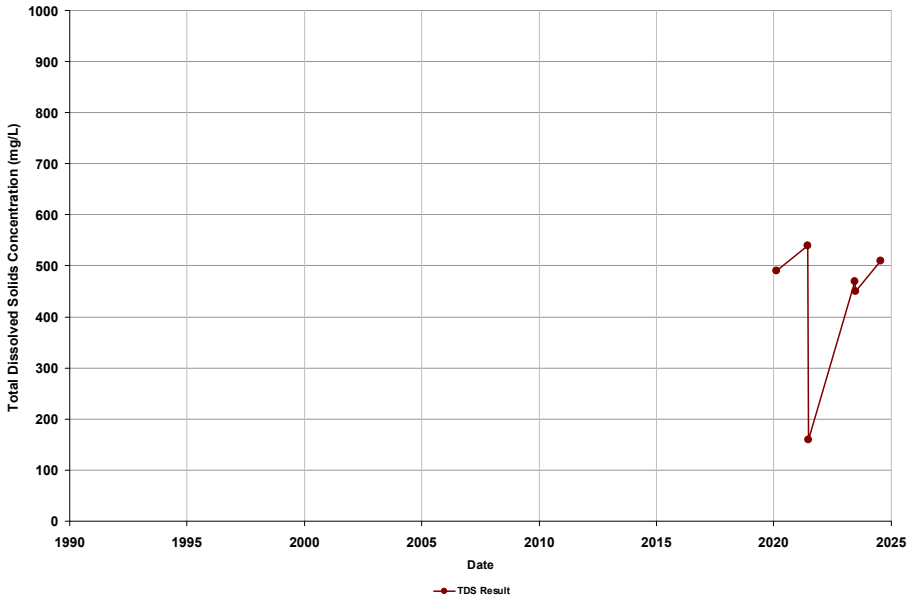
Total Depth (ft bgs): 520
Perf. Top (ft bgs): 425
Perf. Bottom (ft bgs): 510



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB06C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

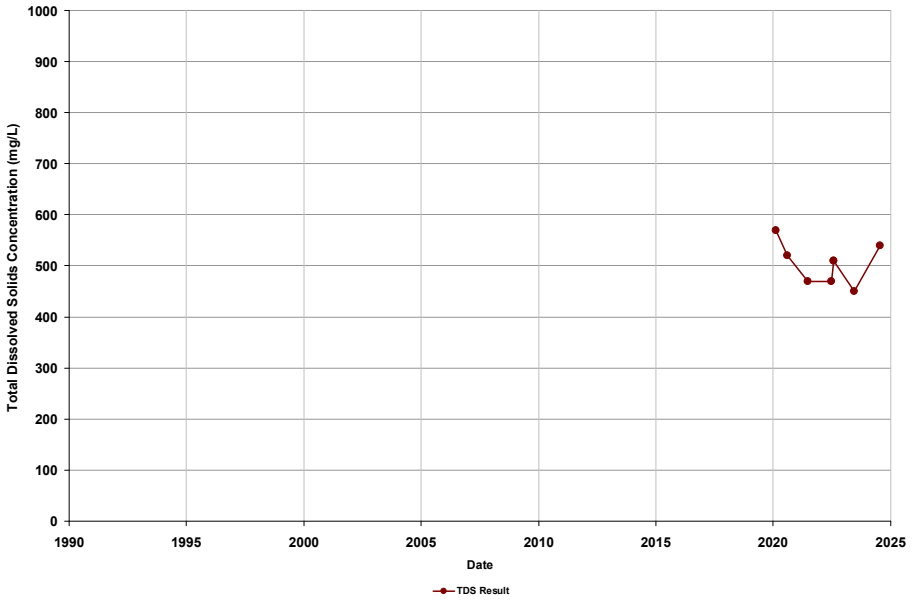
Total Depth (ft bgs): 715
Perf. Top (ft bgs): 630
Perf. Bottom (ft bgs): 705



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

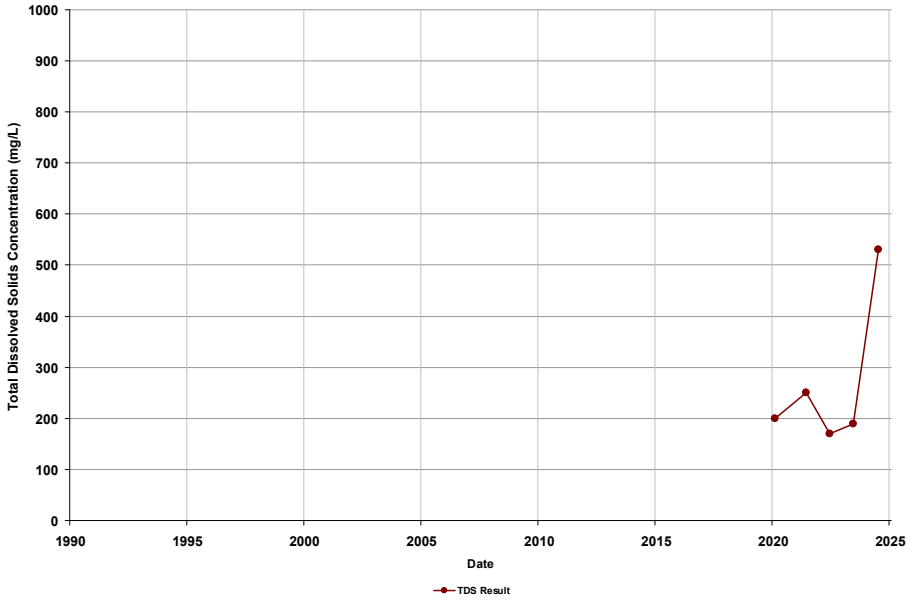
Total Depth (ft bgs): 320
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 310



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

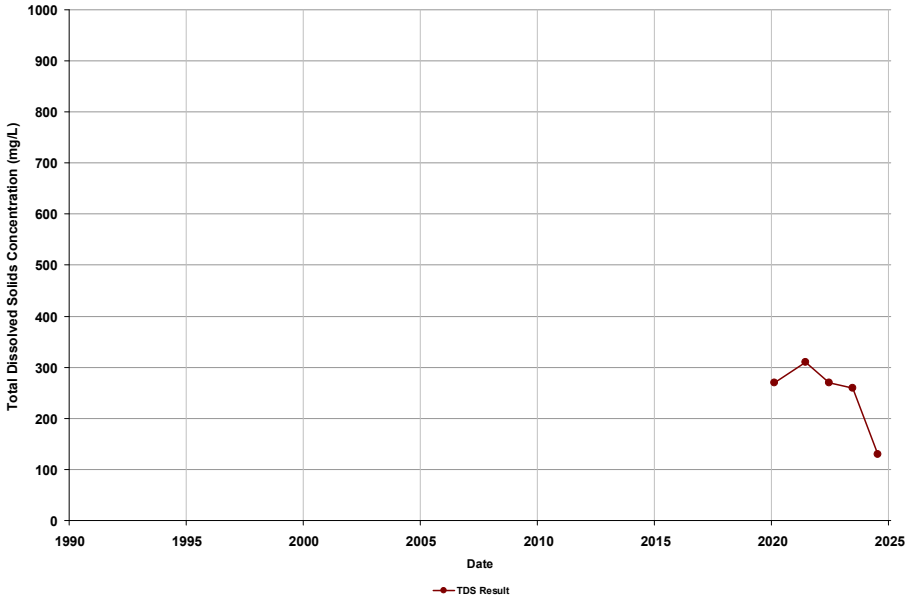
Total Depth (ft bgs): 725
Perf. Top (ft bgs): 520
Perf. Bottom (ft bgs): 715



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB09C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

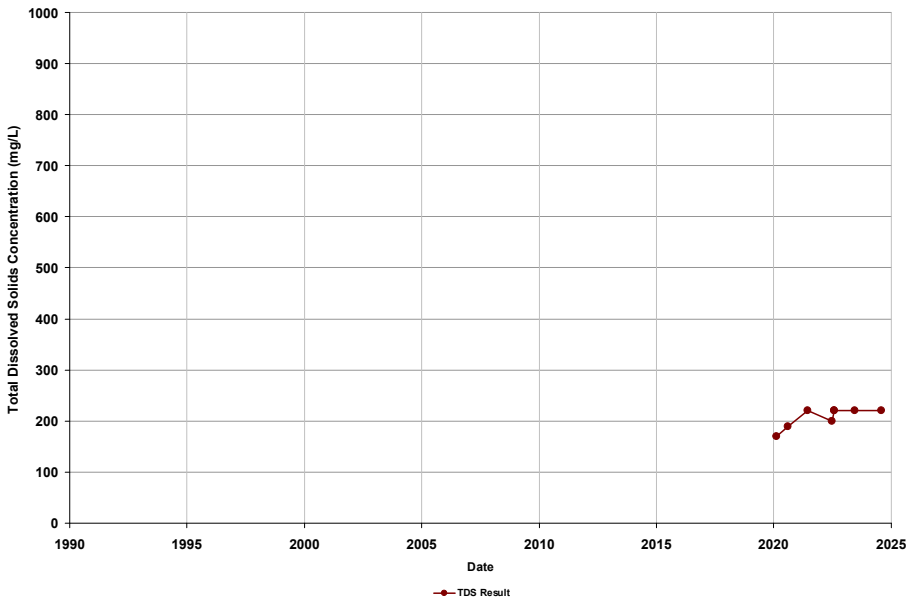
Total Depth (ft bgs): 955
Perf. Top (ft bgs): 880
Perf. Bottom (ft bgs): 945



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

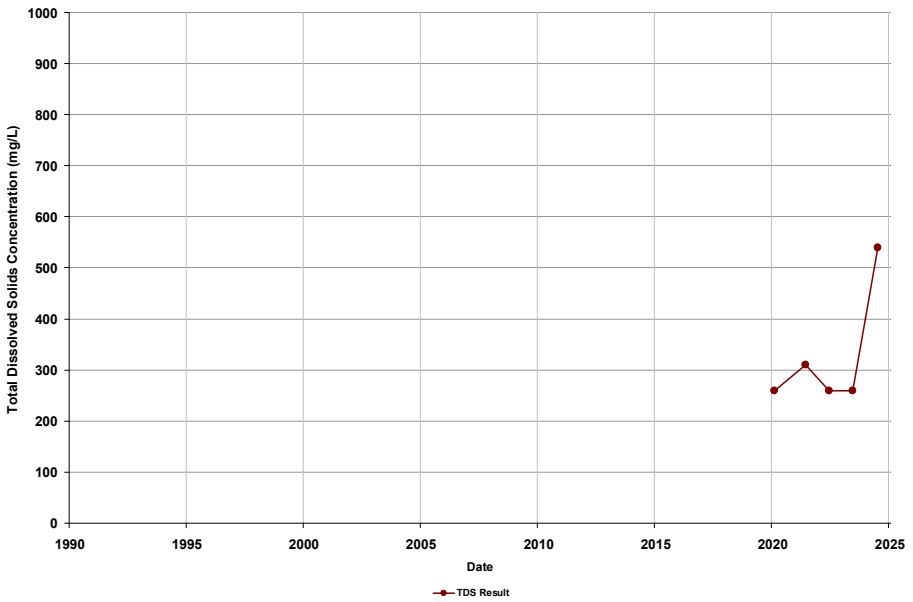
Total Depth (ft bgs): 510
Perf. Top (ft bgs): 400
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB10C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

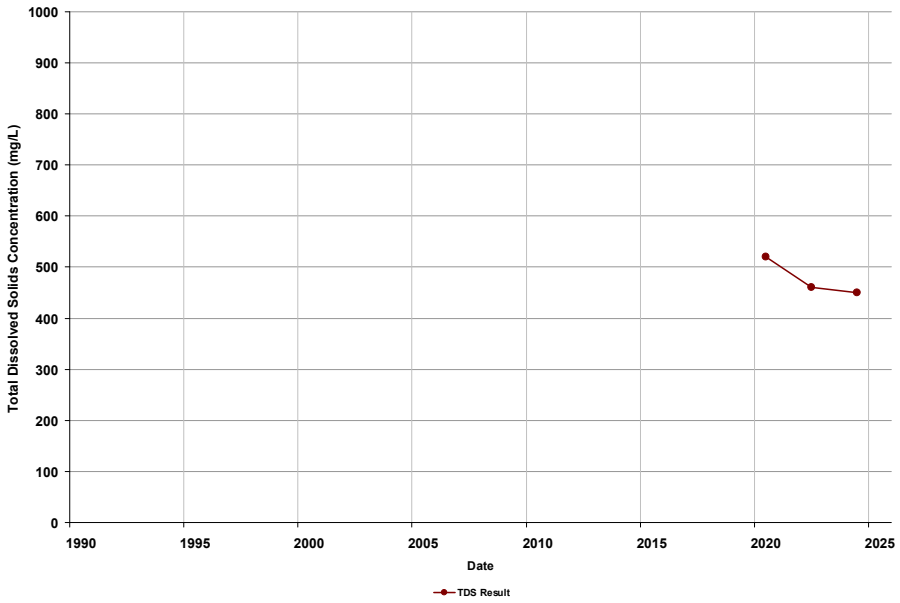
Total Depth (ft bgs): 880
Perf. Top (ft bgs): 790
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB11C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Observation

Total Depth (ft bgs): 880
Perf. Top (ft bgs): 775
Perf. Bottom (ft bgs): 870



NOTE: Non-Detect results shown as half the reporting limit.

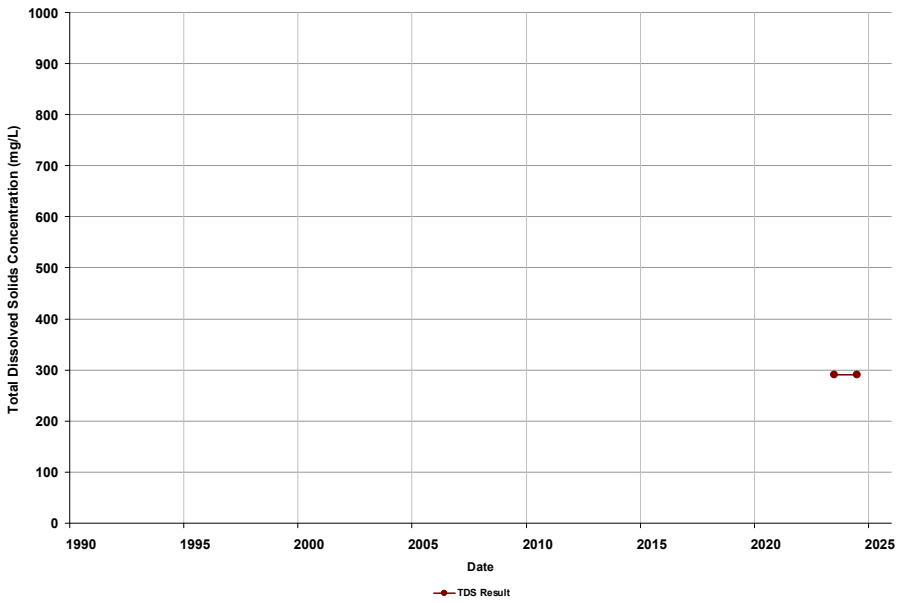
Well Name: MSB13A
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

Total Depth (ft bgs): 290
Perf. Top (ft bgs): 200
Perf. Bottom (ft bgs): 280

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13B
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

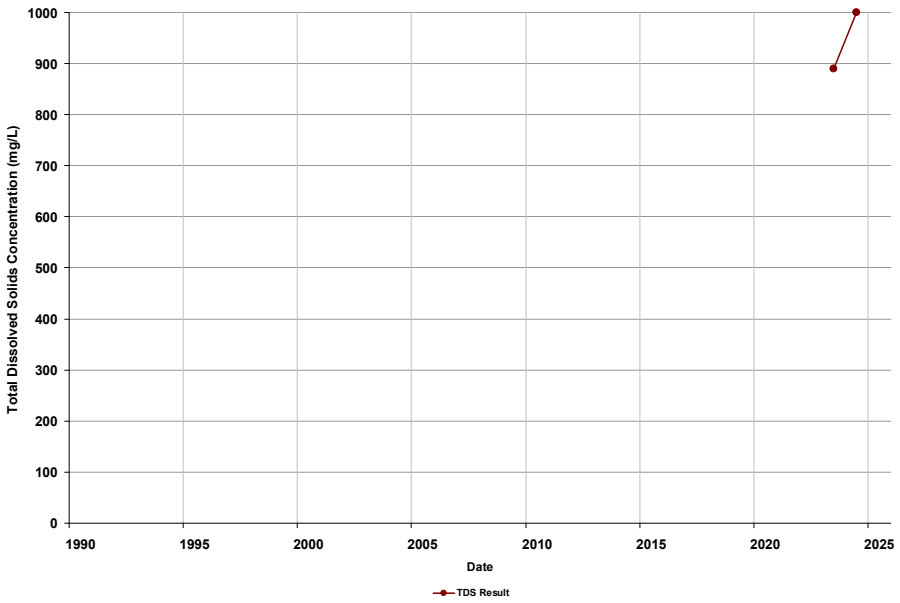
Total Depth (ft bgs): 446
Perf. Top (ft bgs): 396
Perf. Bottom (ft bgs): 436



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: MSB13C
RMS Type: GSA-Future
Subbasin: Madera
Well Type: Monitoring

Total Depth (ft bgs): 532
Perf. Top (ft bgs): 522
Perf. Bottom (ft bgs): 532



NOTE: Non-Detect results shown as half the reporting limit.

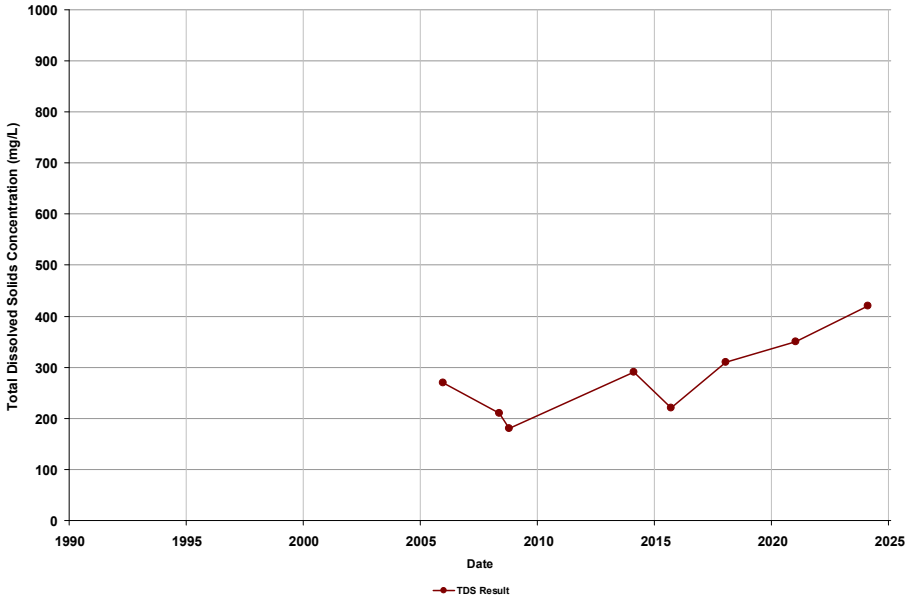
Well Name: 2000507-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 372
Perf. Bottom (ft bgs): 372

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000553-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

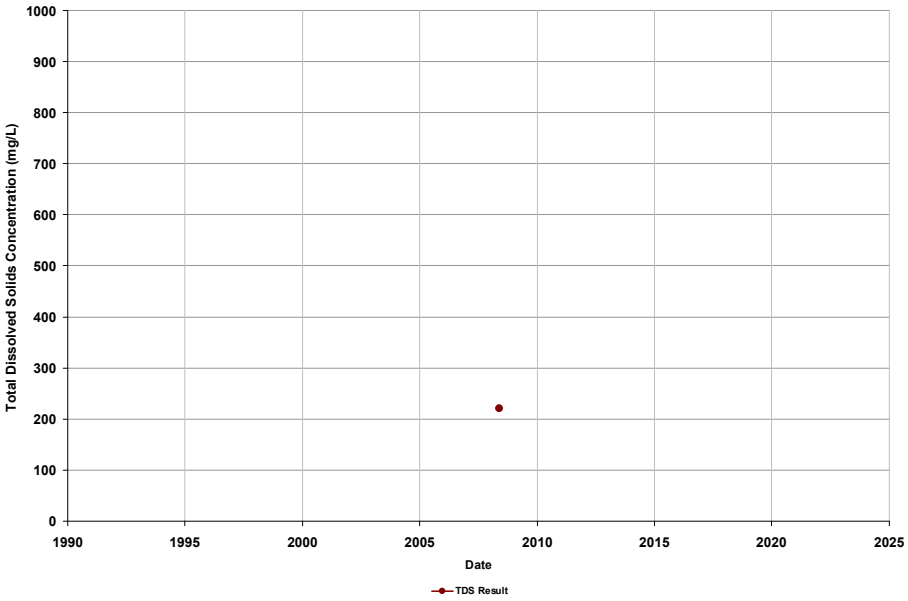
Total Depth (ft bgs):
Perf. Top (ft bgs): 450
Perf. Bottom (ft bgs): 500



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000682-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

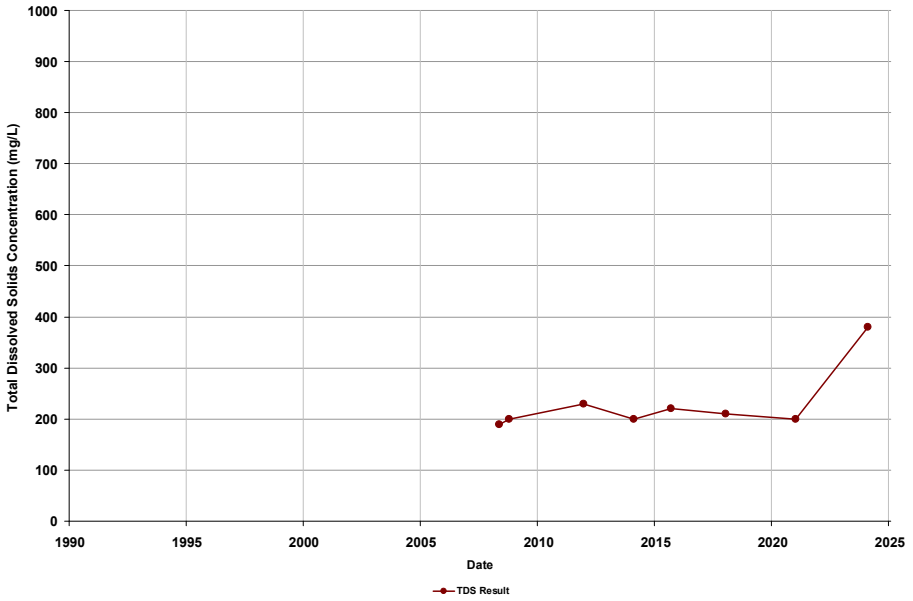
Total Depth (ft bgs):
Perf. Top (ft bgs): 295
Perf. Bottom (ft bgs): 420



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2000727-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 360



NOTE: Non-Detect results shown as half the reporting limit.

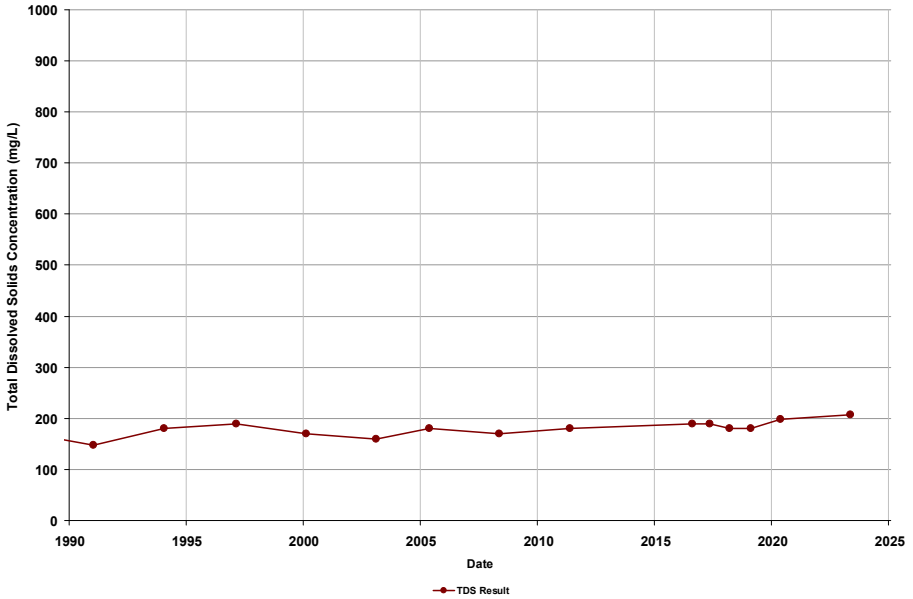
Well Name: 2000938-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 420
Perf. Bottom (ft bgs): 560

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-014
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

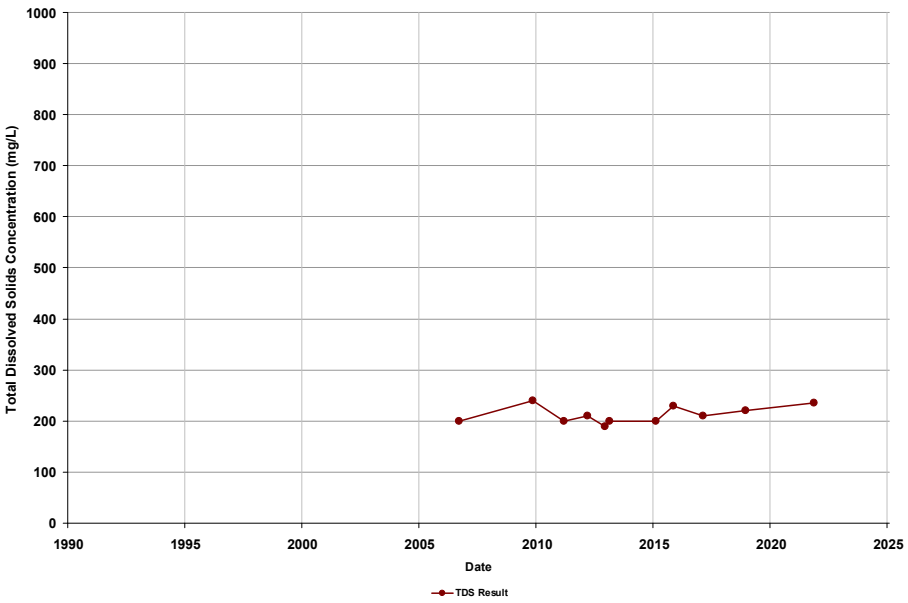
Total Depth (ft bgs):
Perf. Top (ft bgs): 280
Perf. Bottom (ft bgs): 610



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010002-032
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

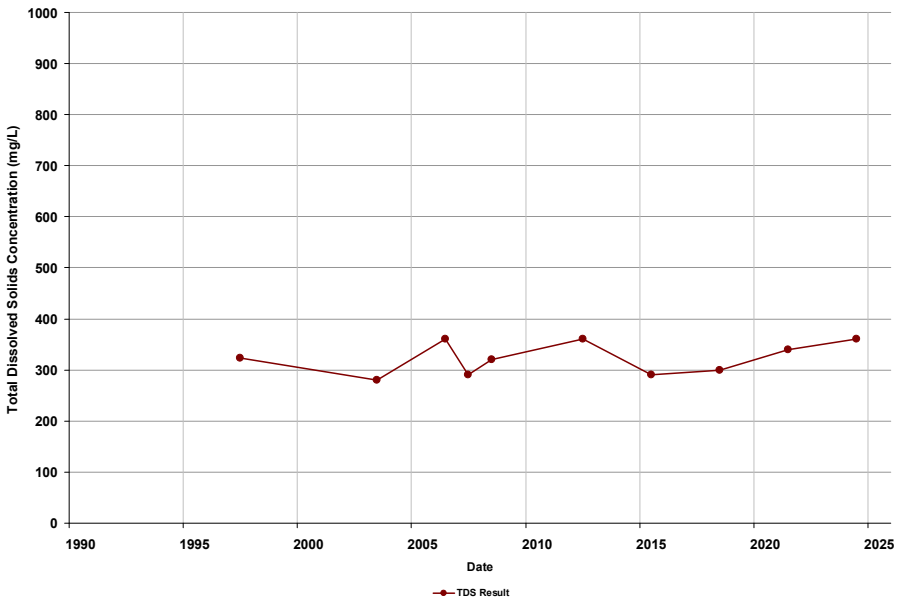
Total Depth (ft bgs):
Perf. Top (ft bgs): 310
Perf. Bottom (ft bgs): 600



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010008-005
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

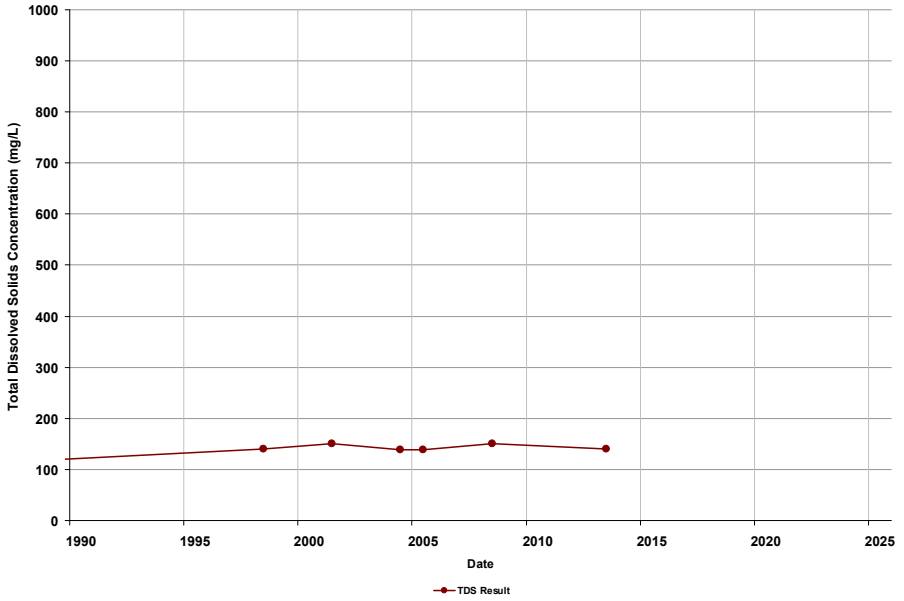
Total Depth (ft bgs):
Perf. Top (ft bgs): 250
Perf. Bottom (ft bgs): 465



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010009-002
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

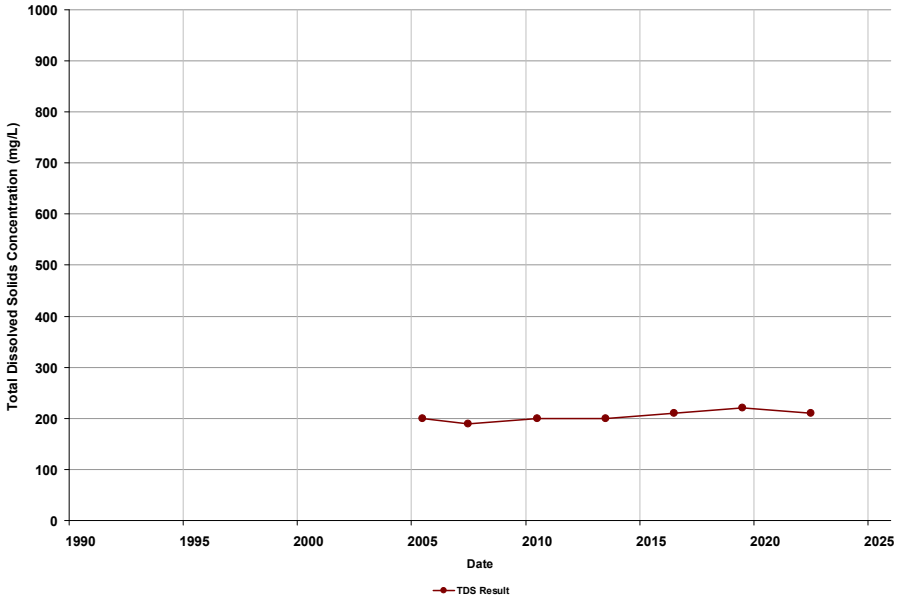
Total Depth (ft bgs):
Perf. Top (ft bgs): 324
Perf. Bottom (ft bgs): 369



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010010-007
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

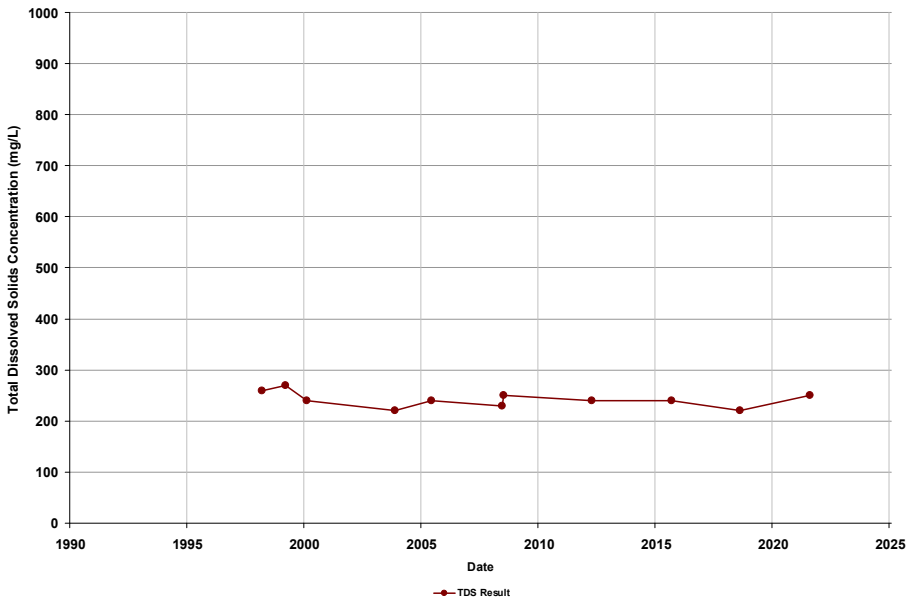
Total Depth (ft bgs):
Perf. Top (ft bgs): 242
Perf. Bottom (ft bgs): 374



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2010801-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 375
Perf. Bottom (ft bgs): 760



NOTE: Non-Detect results shown as half the reporting limit.

Well Name: 2801077-001
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Public Supply

Total Depth (ft bgs):
Perf. Top (ft bgs): 60
Perf. Bottom (ft bgs): 500

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: ESJ12
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

Total Depth (ft bgs): 276
Perf. Top (ft bgs): 160
Perf. Bottom (ft bgs): 172

NOTE: Non-Detect results shown as half the reporting limit.

Well Name: ESJ17
RMS Type: Non-GSA
Subbasin: Madera
Well Type: Domestic

Total Depth (ft bgs):
Perf. Top (ft bgs):
Perf. Bottom (ft bgs):

NOTE: Non-Detect results shown as half the reporting limit.

APPENDIX 3.C. ECONOMIC IMPACTS OF ACCELERATED DEMAND REDUCTION PROGRAM

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020

GSP Team:

Davids Engineering, Inc
Luhdorff & Scalmanini
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Stillwater Sciences and
California State University, Sacramento

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1 OVERVIEW

The Madera Subbasin GSAs and stakeholders have considered alternative implementation timelines to transition the Subbasin to sustainable groundwater conditions by 2040. The proposed implementation plan described in the GSP features a gradual transition to sustainability between now and 2040. This allows time for GSAs to study, develop, finance, and build an estimated $250 million in capital projects to bring new water supplies into the Subbasin by 2040. It also allows time for GSAs to develop monitoring, metering, and enforcement programs to limit groundwater pumping (implement a demand reduction program) in significant portions of the Subbasin.

The GSP implementation plan balances the tradeoff between the benefits of sustainable groundwater management with the costs and practical limitations of more rapid implementation of projects and management actions needed to achieve sustainability. The benefit of transitioning the Subbasin to sustainability earlier would be avoiding further declines in groundwater levels across the Subbasin than expected under the current timeline. The cost would be the additional expenditure required to develop projects plus the cost of more rapid demand reduction (e.g., through fallowing) that would result in loss of jobs, tax revenue, and economic activity in Madera County. There are also practical limitations to more rapid GSP implementation. Projects take time to plan, finance, and build, and demand reduction requires measurement, metering, and enforcement mechanisms that are currently under development. Accelerating development of projects is not practical, but assuming that GSAs can measure and enforce groundwater pumping limits, the GSP implementation timeline could be accelerated by reducing groundwater pumping more rapidly than planned in the current GSP. Reductions in groundwater pumping would fall on agricultural users (currently accounting for over 95% of groundwater pumping in the Subbasin) and would require a combination of fallowing and changes in the crop mix toward lower water use crops.

This appendix does not evaluate the economic effects (impacts) of the proposed GSP itself. Rather, it evaluates the potential economic impact of accelerated demand reduction in the Madera Subbasin. Direct impacts are estimated for the Madera Subbasin, and indirect impacts are estimated for the broader County economy. The conclusions of the economic analyses are as follows:

- A conservative estimate (lower-bound) finds that approximately half of the Madera County economy and one in three jobs is a result of Madera County agriculture. This does not include some warehousing, transportation, storage, and other farm-related industries.
- Immediate implementation of demand reduction to avoid further lowering of groundwater levels would cause direct farm revenue losses of $182 million per year and require fallowing an average of 40,000 acres per year within the Subbasin. This would result in the following County economic impacts:
    - The Madera County economy would contract by $200 million per year, or about $3 billion in present value over the 20-year GSP implementation period.
    - Madera County tax revenues would fall by approximately $4.2 million per year (~10%), or about $60 million in present value over the 2020 – 2040 implementation period. The loss in tax revenue reflects local, discretionary revenue to the County. This discretionary spending supports important services in the County that would be impacted as revenues fall.
    - Labor income (wages) would fall by $76 million per year, including wages for many seasonal jobs that support County DACs. Full-time-equivalent jobs in Madera County

would decrease by 850 (or around 1,600 – 2,000 seasonal jobs), and many of these jobs generate income for DACs in the County.

The following section describes the general method, logic, and data underlying the economic analysis. This is followed by a summary of the contribution of agriculture to the Madera County economy to provide context for the subsequent economic impact analysis. The final section describes potential economic impacts to county farming, the regional economy, as well as potential fiscal (tax) impacts to Madera County.

2 ASSUMPTIONS AND METHODS OF ANALYSIS

An economic analysis is developed to evaluate the impact of an alternative GSP implementation plan (timeline) in which no further groundwater depletion would occur on average. The alternative assumes that GSAs would implement new supply and recharge projects in the amounts and at the times described in the proposed GSP implementation plan, plus additional reduction in the consumption of groundwater by irrigated agriculture (demand reduction) as required in each implementation year to avoid further lowering of groundwater levels (depletion of storage). This means that the Subbasin would begin implementing substantial demand reduction immediately in 2020. As new supply and recharge projects come on-line over time (as specified in the GSP), they would reduce the need for demand reduction, effectively allowing irrigated acreage to come back into production. The analysis does not evaluate the economic effects (impacts) of the proposed GSP itself.

Assumptions for the analysis of the alternative GSP implementation timeline are:

- Implementation of the GSP begins in 2020.
- All GSAs in the Madera Subbasin would be required to reduce pumping to prevent continued depletion of groundwater storage (lowering of groundwater levels) until additional projects can be built.
- The analysis is specific to implementation within the Madera Subbasin and does not consider the impact of additional demand management in the Chowchilla or Delta Mendota Subbasin portions of Madera County that may be required.
- New supply and recharge projects would occur in the amounts and at the times described in the proposed Madera Subbasin GSP implementation timeline. The analysis does not consider the additional cost of developing projects, which would primarily fall on agricultural water users in the County.
- Additional demand reduction would be implemented as needed to avoid any further long-term depletion of groundwater storage. The demand reduction needed is calculated from the water balance and groundwater analysis included in the GSP.
- Demand management is implemented as a reduction in the consumptive demand for irrigation water by crops. This includes crop switching and land fallowing. No specific mechanism for imposing or inducing demand reduction is assumed (and the analysis does not include any additional costs for developing/implementing such a program).
- An economic model of Madera Subbasin agricultural production, water use, and markets is used to predict how the agricultural sector would allocate the demand reduction among crops.
- This analysis does not compare all benefits and costs of GSP implementation. It shows the estimated costs of additional demand reduction required to prevent additional lowering of groundwater levels.

The direct impacts of the alternative implementation timeline for the Madera Subbasin are used to support additional analysis of the regional economic impacts on jobs, incomes, and total economic output in the County economy as a whole. For purposes of this analysis, impacts are estimated as a change from current (2019) conditions, not as an incremental change comparing the alternative implementation to the proposed GSP implementation. It is important to note that the Madera County GSA plans to implement significant demand reduction as a management action in the proposed GSP implementation plan. Therefore, a portion of the impact of demand reduction is also expected to occur under that proposed plan, although it would be substantially delayed as compared to the alternative (i.e., immediate) implementation plan. Under the proposed GSP, demand reduction would be scaled in slowly, allowing time for the agricultural sector, its workers, and related economic activities to adjust in order to minimize impacts to Madera County residents.

The economic analysis relies on the data and water supply information described in the Madera Subbasin GSP and presented at various stakeholder meetings in 2018 and 2019. The economic analysis uses two economic models calibrated to conditions in the Madera Subbasin. The first model is an economic optimization model[1] of Madera Subbasin agricultural production. The model quantifies the effect of changes in water supply availability and cost on farm income (e.g. net income and gross farm revenues) and simulates how the agricultural sector would respond to changes in water availability and cost. Responses include switching to higher value and/or lower water use crops and fallowing land. The decision to switch crops and/or idle land depends on agricultural market conditions in the Madera Subbasin simulated by the model under the alternative implementation plan. The economic analysis quantifies the direct economic cost of changing crops and idling land. The second model is a regional input-output model of Madera County developed using the Impacts for Planning and Analysis (IMPLAN[2]) data. The IMPLAN model translates changes in farming activity (direct impacts) in the Madera Subbasin to economic impacts (indirect and induced impacts) in other sectors of the Madera County economy (e.g. business that provide inputs to farming and farm jobs), as well as fiscal (tax) impacts.

The combined economic analysis quantifies:

- The current value of crops produced in Madera County and the contribution of farming to the regional economy
- Change in crop mix and fallowing within the Madera Subbasin under more aggressive implementation of demand reduction
- The direct economic impact to Madera Subbasin farmers (gross and net farm income)
- The regional (indirect and induced) economic impacts[3] to the Madera County economy (economic activity, jobs, and income)
- Fiscal impacts to Madera County (change in County tax revenues)

[1] The economic model of Madera Subbasin agriculture applies a similar economic methodology as the Statewide Agricultural Production Model (SWAP) that is widely applied by DWR, Reclamation, and various districts across the state to evaluate the effect of changes in water supply on agricultural operations. It is tailored to market conditions, costs, returns, and water supply in Madera Subbasin GSAs.

[2] This analysis applies the 2014 R3 IMPLAN model data for Madera County, with some adjustments to better reflect Madera County agriculture.

[3] Indirect and induced impacts are sometimes referred to as “multiplier” or “secondary” impacts. These are impacts that are in addition to the direct economic impact (in this case, loss of farm revenue).

3 ECONOMIC CONTRIBUTION OF AGRICULTURE TO MADERA COUNTY ECONOMY

The Madera County economy produces approximately $6.1 billion per year in economic value added[4] and generates around 63,000 full-time-equivalent (FTE[5]) jobs. As of the 2010 U.S. Census, per-capita income was approximately $20,435 (in current dollars), or about 35% below the U.S. average of $31,895. Approximately 21% of the county population of 150,000 was at or below the poverty line, compared to the U.S. average of 12%. Over 75% of the county (by area) is classified as a Disadvantaged Community (DAC)[6].

A significant share of the Madera County economy is from farming or agriculture-related industries. Table A3.C-1 summarizes the top 10 industry sectors[7] in Madera County by employment. These 10 sectors account for approximately half of the total FTE jobs in Madera County. Three of the top five industries are in farming, including support activities for agriculture (e.g. farm managers, consultants, crop advisers, and various input suppliers), fruit farming (e.g. vineyards), and tree nut farming (e.g. almonds and pistachios). Other top employers include local and state government, hospitals, and real estate. The total value added produced by these 10 industries is around $3.1 billion per year, or a little more than half of the Madera County economy.

Table A3.C-1. Top-Ten Madera County Industries by Employment

Rank	Industry	FTE Jobs	Annual Value Added ($ in Millions)
1	Support activities for agriculture	8,060	$295
2	Local government, education	4,420	$350
3	Hospitals	3,665	$350
4	Fruit farming	3,180	$540
5	Tree nut farming	2,615	$1,040
6	State government, non-education	2,355	$250
7	Real estate	2,085	$120
8	Local government, non-education	1,650	$135
9	Individual and family services	1,480	$15
10	Limited-service restaurants	1,435	$55
Total		**30,945**	**$3,150**

Source: IMPLAN 2014 R3 data, current dollars

An economic contribution analysis is developed to quantify the proportion of the Madera County economy that is dependent on farming and agriculture-related businesses. The analysis quantifies the

[4] Value added is a measure of the size of the Madera County economy that is analogous to the commonly cited measure of the U.S. economy, Gross Domestic Product (GDP).

[5] An FTE job is approximately equivalent to 2,080 hours of work. An FTE typically includes multiple (2-3) seasonal jobs, which is an important consideration for the farming industry where most jobs are seasonal. The total number of seasonal jobs in Madera County is significantly greater than 63,000 FTE.

[6] Using the Department of Water Resources (DWR) DAC Mapping Tool.

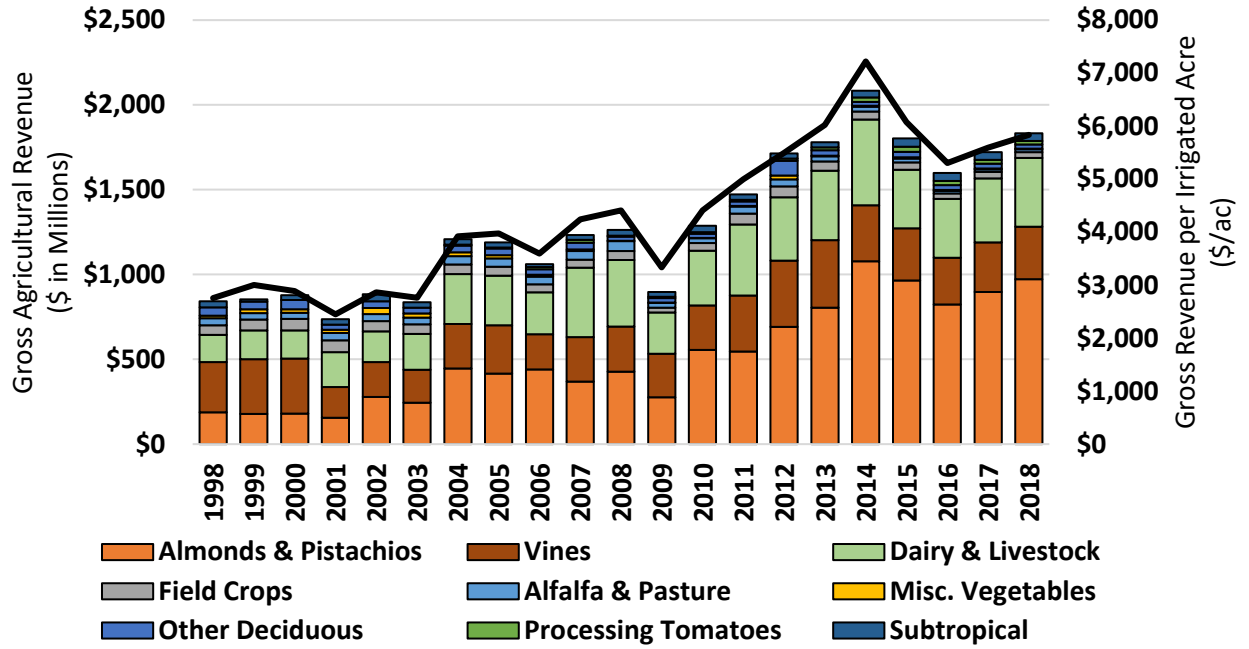
[7] Industry sectors are defined using the default IMPLAN model sectors.

share of jobs and economic activity (value added) that are directly or indirectly related to agriculture. For the purposes of this analysis, primary farming industries, support industries (e.g. pest advisers, farm managers, fertilizer suppliers), and selected post-harvest industries (e.g. processing) are included. The contribution analysis should be interpreted as a conservative (lower bound) estimate of the share of the Madera County economy dependent on agriculture. The analysis does not include all warehousing, shipping, storage, and other farming-dependent businesses in Madera County because these businesses are not identifiable[8] in the default IMPLAN model data.

Farming and agriculture-related industries generate multiplier effects in the Madera County economy. Growers purchase inputs from regional suppliers, employ workers, and rely on local trucking, storage, processing, and related businesses for post-harvest activities. Transportation, storage, processing, and other businesses purchase trucks, warehouses, machines, and hire workers required for their operations. The economic cluster of agriculture-dependent industries generates jobs in farming and other industries, and employees in all these related industries purchase housing, consumer items, and other goods and services in Madera County. It follows that sustainable groundwater management objectives specified in the GSP have significant implications for farming in Madera County, and ancillary jobs, taxes, and businesses in the region.

The gross value (gross farm revenue) of the crops produced in Madera County currently exceeds $1.8 billion dollars annually. Figure A3.C-1 illustrates trends in the gross value of the industry over the last 20 years. The industry has been growing in value in response to strong crop prices driven by a growing export market. As of 1998, approximately 35% of Madera County crop value was generated by grape production, 19% in dairy and livestock, and 22% in nuts (almonds and pistachios). As of 2018, approximately 53% of the gross value is generated by almond and pistachio production, 22% in dairy and livestock, and 16% in grapes. The trends in Madera County farming industries are consistent with trends seen across the Central Valley. Namely, movement toward higher value nut crops with strong market growth. As of 2018, approximately 75% of Madera County gross farm revenue is in permanent crops (vineyards and orchards). The average revenue per irrigated acre has decreased modestly since it peaked in 2014 (as a result of record nut prices) and is currently just under $6,000 dollars per acre.

[8] It is possible to prepare a more detailed economic contribution analysis by developing additional data for some of these agriculture-related industries in Madera County, and further modifying the IMPLAN model data. This is beyond the scope of this initial analysis.



Source: USDA.

Figure A3.C-1. Madera County Gross Agricultural Revenues, 1998 – 2018 (in current dollars)

The economic contribution analysis quantifies the total number of jobs, value added, and employee income that is attributable to farming in Madera County. Table A3.C-2 summarizes the results of the analysis. Madera County agriculture generates approximately 47% of the total Madera County economy, or approximately $2.9 billion in value added annually. Agriculture creates over 15,100 full-time-equivalent (FTE) direct farm jobs and supports an additional 3,700 FTE jobs in other sectors of the economy. The 18,800 FTE jobs created by Madera County agriculture represent approximately 30% of the 63,000 jobs in the county. However, these jobs account for more than 46% of total labor income (wages) in the County. In summary, the contribution analysis finds that nearly half of the Madera County economy and one in three jobs is directly or indirectly linked to Madera County agriculture. This does not include some warehousing, transportation, storage, and other farming-related industries that were not possible to include in this initial analysis due to data limitations. Including these sectors would increase the share of the Madera County economy that is dependent on agriculture.

Table A3.C-2. Madera County Agriculture Economic Contribution

Economy Indicator	Madera County Total	Madera County Agriculture	Share (%) Dependent on Agriculture
Employment (FTE)	63,300	18,785	30%
Annual Value Added ($ Millions)	$6,100	$2,850	47%
Annual Labor Income ($ Millions)	$2,700	$1,250	46%

Notes: The Economic Contribution includes both direct and multiplier (indirect and induced) effects.
The share dependent on agriculture should be interpreted as a conservative (lower bound) estimate.

Madera County includes portions of multiple groundwater subbasins. This analysis is concerned with the Madera Subbasin, which generates approximately 70% of annual gross agricultural revenues in Madera County. That is, farming in the Madera Subbasin portion of Madera County generates approximately $1.2 billion in value added annually, contributes nearly $2 billion in value added to the County economy, and supports approximately 12,800 FTE jobs.

4 ECONOMIC IMPACT OF ALTERNATIVE MADERA SUBBASIN GSP IMPLEMENTATION TIMELINE

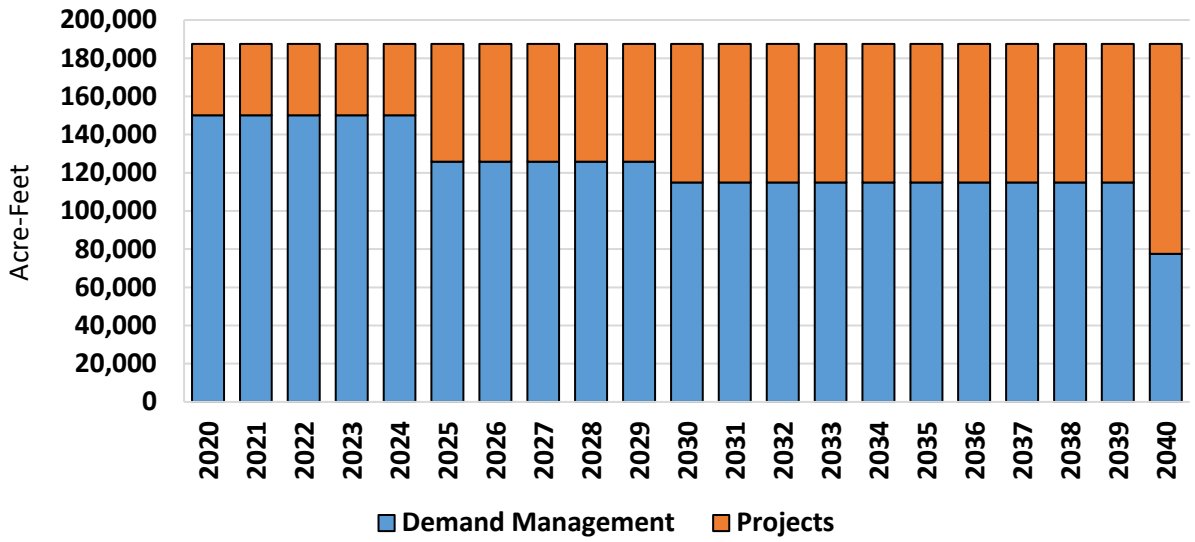
An economic analysis is developed to quantify impacts to farming, linked industries, and workers in Madera County from increasing demand reduction in the Madera Subbasin only. The analysis is specific to the Madera Subbasin portion of Madera County. Implementing demand reduction in the Chowchilla and Delta Mendota Subbasins would increase the economic impacts described below. As previously stated, the analysis does not evaluate the economic effects (impacts) of the proposed GSP itself.

The glide-path implementation timeline specified in the GSP helps minimize economic impacts by eliminating depletion of groundwater storage over a period of about twenty years as projects are developed, funded, and executed by GSAs. An alternative implementation plan is considered that would avoid further lowering of groundwater levels by implementing additional demand reduction in all GSAs starting in 2020. The alternative implementation plan assumes that all projects specified in the GSP are implemented by the respective GSAs. As projects are implemented, the required level of demand reduction is reduced. Figure A3.C-2 illustrates the level of demand reduction and projects over the alternative GSP implementation plan required to prevent additional lowering of groundwater levels. Demand reductions would be approximately 150,000 acre-feet per year starting in 2020, which would decrease as projects are implemented to approximately 90,000 acre-feet per year by 2040. If GSAs are not able to build some projects, or if the net benefit of projects is less than estimated, the level of demand reduction would increase.

The average annual direct economic impact (loss of crop revenue) attributable to implementing more rapid demand reduction in the Madera Subbasin would equal $182 million, as summarized in Table A3.C-3. The average annual fallowing would equal 39,000 acres. This represents an approximate 13% decrease in gross revenue over current conditions. The impacts would be greatest to the nut industry (largest share of acreage) and hay/silage production sectors. Impacts to the nut sector are high because demand management requires all GSAs to reduce pumping immediately and the scenario does not allow for trading of water across GSA boundaries. Therefore, in some GSAs where projects will not be developed for several years there would be significant fallowing of permanent crops, including almond and pistachio orchards, in order to reduce pumping. The economic impact analysis does not include the additional cost of stranded investments (e.g. removal of orchards before the end of their productive life), which would be in addition to the impacts presented below.

The present value of the direct economic impact (loss in farm revenue) over the 20-year implementation timeline of the GSP (2020 – 2040) would equal $2.8 billion dollars. That is, implementing immediate demand reduction to prevent any additional lowering of groundwater levels would result in a total impact of $2.8 billion dollars to the farming industry in Madera Subbasin over the implementation period.

It is important to note that economic impacts would be greater than the annual average in 2020 because projects are not yet developed by GSAs. Immediate fallowing in 2020 required to prevent lowering of groundwater levels would equal approximately 50,000 acres. The direct impact to Madera Subbasin agriculture would equal $220 million in 2020, representing an immediate 15% reduction in the Madera County farming industry.



Notes: Projects and Demand Management actions apply to all GSAs in the Madera Subbasin.
Project and Demand Management action benefits (acre-feet) are approximate.

Figure A3.C-2. Madera Subbasin Alternative GSP Implementation Timeline, 2020 – 2040

Table A3.C-3. Average Annual Direct Economic Impact to Madera Subbasin Agriculture

Agricultural Sector	Current Value Gross Farm Revenue ($ in Millions)	Average Annual Impact Gross Farm Revenue ($ in Millions)	*% change*
Dairy & Livestock	$326	($21.7)	-6.7%
Almonds & Pistachios	$588	($125.9)	-21.4%
Other Deciduous	$64	($4.0)	-6.3%
Grapes	$380	($9.6)	-2.5%
Misc. Row Crops	$30	($2.0)	-6.7%
Hay & Misc. Forage	$61	($18.2)	-30.0%
Total	**$1,449**	**($181.5)**	**-12.5%**

5 ECONOMIC IMPACT TO MADERA COUNTY AND DACS

Changes in Madera Subbasin farming would have ripple effects in the Madera County economy and affect all County residents. Fallowing cropland means that growers would purchase fewer inputs and this would affect industries that depend on farming activity. Farm jobs and jobs in other sectors of the County's economy would decrease as a result. Table A3.C-4 summarizes the total economic impact to the Madera County economy. The average annual impact of $182 million in lost crop revenue in the Madera Subbasin would cause total Madera County employment to fall by 840 FTE jobs. Most of these jobs are seasonal farm jobs. Converting loss in FTEs to the actual seasonal job loss means that total job impacts are likely to be closer to 1,600 – 2,000. Many of the jobs lost would be for farm workers who have few other employment options and are residents of the County's DACs. The Madera County economy would contract by $200 million per year. This includes a reduction of $76 million in labor income (wages) in Madera County.

Table A3.C-4. Average Annual Economic Impact to Madera County Economy

Impact	Employment (FTE)	Labor Income ($ in Millions)	Value Added ($ in Millions)
Direct	(535)	($64.1)	($176.9)
Indirect	(95)	($3.3)	($4.9)
Induced	(210)	($9.0)	($17.5)
Total Impact	**(840)**	**($76.3)**	**($199.3)**

The impacts to Madera County agriculture would also create fiscal impacts to Madera County. A detailed analysis of Madera County tax impacts requires a careful analysis of Madera County fiscal positions that is beyond the scope of this initial analysis. The default IMPLAN model fiscal impact routine is used to approximate the average annual impact to County tax revenues. Since the IMPLAN model does not account for changes in land values and other agricultural market adjustments that would occur under the alternative GSP implementation plan, it is likely that the tax impacts presented below represent a lower-bound.

County tax revenues would fall as agricultural production falls and business activity slows across the region. The average annual impact of a $200 million contraction in the Madera County economy would cause a decrease of approximately $4.2 million dollars in local tax revenue, or approximately $60 million dollars in present value over the 2020-2040 GSP implementation period. The loss in tax revenue reflects local, discretionary revenue to the County. This discretionary spending supports important services in the County that would be impacted as revenues fall. This does not include impacts to State and Federal taxes. A loss of $4.2 million dollars per year in County tax revenues is approximately 10% of current local, discretionary County tax revenues. This would have significant effects on the ability of the County to cover operating costs for public services and would create additional ripple effects in the County economy that are not evaluated in this initial impact analysis.

The economy that supports all residents of Madera County is directly linked to the viability of the local farming industry. The analysis shows the likely impacts from crop switching or land fallowing to meet demand reduction targets to growers, other agriculture-related businesses, jobs and wages for all Madera County residents, and local tax revenues. Given that most of Madera County is classified as a DAC, a significant share of wage and job losses would fall on these communities.

6 SUMMARY

Implementing projects and management actions to achieve the sustainability objectives specified in the GSP will increase irrigation water costs and limit the quantity of water available for farming in some parts of the Madera Subbasin. However, the GSP implementation schedule allows time for the Madera County economy to adjust in order to minimize economic impacts to disadvantaged communities, businesses, and other individuals in the region. This Appendix evaluates an alternative GSP implementation that would accelerate demand reduction and would result in additional, significant, and immediate economic impacts to Madera County. This immediate impact would create ripple effects across all sectors of the Madera County economy, including county tax revenues and jobs that support many of the county's disadvantaged communities.

The conclusions of the economic contribution analysis are as follows:

- A conservative estimate (lower-bound) finds that approximately half of the Madera County economy and one in three jobs is a result of Madera County agriculture. This does not include some warehousing, transportation, storage, and other farm-related industries.
- Agriculture generates around 19,000 FTE jobs in Madera County. An FTE can include 2-3 seasonal farm jobs.
- Approximately 75% of Madera County (by area) is classified as a DAC, and more than half of wage income in these communities is from Madera County farming and agriculture-related businesses.

The conclusions of the economic impact analysis of an accelerated demand reduction program are as follows:

- Immediate implementation of demand reduction to avoid further lowering of groundwater levels would cause direct farm revenue losses of $182 million per year and require fallowing an average of 40,000 acres per year.
- The Madera County economy would contract by $200 million per year, or about $3 billion in present value over the 20-year GSP implementation period.
- Madera County tax revenues would fall by approximately $4.2 million per year (~10%), or about $60 million in present value over the 2020 – 2040 implementation period. The loss in tax revenue reflects local, discretionary revenue to the County. This discretionary spending supports important services in the County that would be impacted as revenues fall.
- FTE jobs in Madera County would decrease by 850 (or 1,600 – 2,000 seasonal jobs), and many of these jobs generate income for DACs in the County.
- Labor income (wages) fall by $76 million per year, including wages for many seasonal jobs that support County DACs.

APPENDIX 3.D. ECONOMIC ANALYSIS AND FRAMEWORK FOR THE DOMESTIC WELL MITIGATION PROGRAM

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Revised March 2023

GSP Team:

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Stillwater Sciences and
California State University, Sacramento

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1 OVERVIEW

This appendix serves two purposes. The initial section, titled Benefits and Costs of Faster Implementation of Demand Management, assesses whether a faster trajectory toward sustainability during the implementation period would be economically justified. It compares the cost of implementing demand management more quickly against the benefits (avoided costs) of avoided well replacement and reduced pumping costs. The second section, titled Domestic Well Replacement Mitigation Program, estimates the total cost of replacing domestic wells potentially impacted by declining groundwater levels under the baseline conditions without SGMA and under the draft proposed SGMA implementation plan (with-SGMA). The second section can support discussions and consideration of potential mitigations for the cost of well replacement.

2 BENEFITS AND COSTS OF FASTER IMPLEMENTATION OF DEMAND MANAGEMENT

This section describes an initial analysis of how many domestic wells in the Madera Subbasin might be impacted by the continued overdraft of groundwater during the transition from 2020 until full implementation of projects and management actions specified in the (draft) GSP and thereafter through 50 years of sustainable management[1]. The purpose of this reconnaissance-level analysis is to assess the costs to different stakeholder groups (agricultural pumpers and domestic well users) and to consider if a faster trajectory to sustainable management at higher groundwater levels would be cost-effective in the aggregate. If the initial analysis indicates that avoiding well replacement costs might be warranted, a more detailed analysis could be conducted.

In order to provide an initial answer, this analysis uses data inputs for and results from the Madera Subbasin groundwater model. The units of analysis are domestic wells in each section (one square mile or 640 acres). Other key assumptions and simplifications for this initial analysis include:

- Projected depth to water simulated by the groundwater model for the 2020 – 2040 implementation period and subsequent 50-year sustainability period uses a scenario of hydrology developed based on historical hydrology.
- The cost analysis only considers the cost of replacing domestic wells. It does not consider replacement of agricultural wells or the cost of declining well yields before a well is replaced.
- Well Completion Report (WCR) from DWR are the basis for the quantity and characteristics of domestic wells in the Madera Subbasin used in the assessment. Wells not in DWR's WCR database are not included in the analysis. A sensitivity analysis is presented that evaluates how wells not in the WCR database may affect results of the analysis
- As a simplification, for all Public Land Survey System (PLSS) sections in the Subbasin, the analysis compares the minimum depth to the top of the perforated interval for domestic wells with the average simulated September depth to water (DTW) in the Lower Aquifer. The timing, quantity, and location of projects is the same as the with-GSP scenario and no other alternatives are considered.

[1] For purposes of this memorandum, sustainable management means the state in which the long-term trend of declining groundwater levels has stabilized.

The analysis compares costs associated with groundwater pumping, well replacement, and management actions needed to reach sustainable management for two scenarios: 1) baseline conditions (without-SGMA) and 2) baseline conditions with the draft proposed GSP implementation plan (with-SGMA). Assuming that the GSP already includes implementation of water supply and recharge projects as soon as practical, the analysis focuses on demand management implementation as a possible means to speed the trajectory toward groundwater sustainability.

The following costs related to groundwater levels and management over time are considered:

- Costs to replace dewatered domestic wells.
- Changes in variable costs to pump groundwater, for both domestic and agricultural users.
- Costs to growers in foregone net return for demand management needed (if any) to achieve sustainable management after implementing supply and recharge projects.

2.1 Assumptions and Results

Assumptions and results below are summarized for each of the cost categories considered.

2.1.1 Costs to replace dewatered domestic wells.

For purposes of this analysis, a replacement cost of $25,000[2] per well is used. This cost is triggered when a well is dewatered, defined as occurring when the groundwater level in the section the well is located in falls below the minimum depth to top perforation of the domestic wells in that cell. Once the wells in a section are replaced, that section is no longer tested against further changes in DTW. The simulated average September depth to water in the aquifer, by section, during each time period is used for each year's comparison, which typically reflects the lowest groundwater levels in a season.

The process for each scenario (without-SGMA and with-SGMA) is summarized as:

- For each section and year, compare the average DTW in the Lower Aquifer to the minimum depth to top of perforations of the domestic wells in that section.
- If DTW equals or exceeds the top perforation depth, all domestic wells in the section are assumed to be replaced.
- After a section's domestic wells are replaced, they are assumed to be drilled and screened deep enough to withstand any further increase in DTW (i.e., a section would not be replaced multiple times).
- If a section did not have the appropriate well construction information, it was not included in the analysis.

For the Madera Subbasin, the majority of wells are potentially impacted in the historical time period, prior to 2015. Between 2015 and 2090, 315 domestic wells are impacted in the without-SGMA analysis, but 87 of those appear to be impacted between 2015 and 2019, prior to the 2020 implementation start (DTW is greater than minimum depth to top perforation). After GSP implementation, 228 (315 minus 87) domestic wells are potentially affected in the comparison of scenarios. Most (218) of the replacements are estimated to occur between 2021 and 2067, and the present value (at 2020) of replacement costs for

[2] The cost of well replacement used in the analysis is based on feedback from well drillers that work in the area: (i) drilling a domestic well costs $35/foot, (ii) a sanitary seal for a domestic well is $2,000, and (iii) a pump for a domestic well is $4,500. This does not include permit costs. Assuming a well depth of approximately 500 feet results in an estimated cost of about $25,000 per well.

these impacted domestic wells is $3.39 million. In the with-SGMA analysis, the number of impacted domestic wells drops from 228 to 43, at a present value cost of $0.77 million. Many of those 43 impacted domestic wells would stay in production longer than in the without-SGMA scenario, so the replacement cost is delayed, further reducing the present value of replacement. Most (185 out of 228) of the domestic wells impacted in the without-SGMA scenario would not require replacement in the draft GSP implementation plan, and the present value of avoided replacement cost is $2.62 million ($3.39 minus $0.77). *Considering the cost of domestic well replacement relative to the cost of agricultural demand management (Table A3.D-1), it is fairly clear to conclude that accelerating the demand management (and so approaching sustainable management faster between now and 2040) would not avoid enough well replacement cost to be cost-effective from a subbasin-wide perspective.*

Table A3.D-1. Demand Management vs. Domestic Well Replacement - Summary Results for Madera Subbasin, Present Value (PV) $ in Millions

	Without SGMA	With-SGMA	Difference
Domestic Well Repl. Cost			
Number of Domestic Wells Replaced	228	43	-185
PV of Cost	$3.39	$0.77	-$2.62
Pumping Cost (Savings), PV			
Domestic	NA	-$19.70	-$19.70
Agricultural	NA	-$274.97	-$274.97
Demand Mgmt. Cost, PV	NA	$968.26	$968.26

Given the uncertainty in any analysis of domestic well impacts using the currently available database, a sensitivity analysis was conducted to consider the possibility of a greater number of domestic wells being impacted. The sensitivity analysis considered the replacement costs for 500 and 1,000 domestic wells during the 20-year Implementation Period. Based on the per well costs described above, the present value cost to replace 500 domestic wells is estimated to be $7.78 million and the present value cost to replace 1,000 domestic wells is estimated to be $15.55 million. The costs to replace 500 domestic wells is less than 1% and for 1,000 domestic wells less than 2% of the demand management costs cited in Table A3.D-1.

2.1.2 Changes in variable costs to pump groundwater, for both domestic and agricultural users.

This analysis applies an aggregate calculation of change in water depth and pumping cost, using an average depth over all sections (weighted by well count in each section). As DTW decreases in the with-SGMA scenario relative to without-SGMA, the benefit (reduced pumping lift and cost) grows year to year. Both domestic wells and agricultural users benefit from this, though the agricultural cost saving is many times greater simply due to volume pumped. A more precise estimate can be created using an estimate of agricultural and domestic pumping in each section.

For the Madera Subbasin, benefits after 10 years are about $272,000 per year in total for all domestic well pumping and $3.91 million per year for agricultural pumping. The present value of savings over the analysis period is about $19.70 million for domestic pumping and $274.97 million for agricultural pumping. *These savings are small relative to the loss of net return from demand management (Table 1), so the benefit of achieving them sooner does not appear to be justified by implementing demand management sooner.*

2.1.3 Costs to growers in foregone net return for demand management needed (if any) to achieve sustainable management after implementing supply and recharge projects.

This analysis uses the estimated demand reduction in acre-feet needed to achieve sustainable management after accounting for the yield of supply and recharge projects. The cost of that reduction is based on a separate economic analysis of net return lost from crop production developed for the GSP. This loss increases with the level of demand management, and ranges from about $300 per AF to over $1,000 per AF. In this example analysis, a constant cost of $500 per AF of demand management is used, which represents the approximate cost of demand management in the Madera Subbasin.

For the Madera Subbasin, the current water balance shows pumping to be about 545,000 AF/year on average. After implementation of projects specified in the GSP, pumping during sustainable management is estimated to be about 440,000 AF/year. This analysis assumes that the difference – 105,000 AF per year – would be spread equally from 2021 to 2040 as a reduction of 5,250 AF per year (note this is a simplifying assumption, the actual demand reduction occurs unevenly in the GSP implementation plan). At $500 per AF, this adds a demand management cost of about $2.6 million per year, which accumulates, so that by 2040 the annual demand management cost is about $52.5 million. These values are discounted back to the start of implementation, resulting in a present value in 2020 of about $968.3 million (see Table 1).

2.2 Discussion

Results indicate that the cost of implementing demand management on a faster trajectory (sooner in the implementation period) would not be cost effective from a subbasin-wide perspective. The avoided costs (fewer domestic wells requiring replacement) would be small ($0.77 million) relative to the lost agricultural net return $996 million (0.08 percent) for the Madera subbasin,). The general conclusions are robust to the assumptions used – that is, results are not sensitive to reasonable ranges in key assumptions, including the loss in net return per AF of demand management, the total level of demand management, when demand management begins to scale in, or the cost of replacing a domestic well.

The analysis also considered different measures for comparing depth to water to well characteristics and different hydrologic sequences (one beginning with a wet period and one with a dry period), and the conclusions hold. Even doubling the number of affected wells (based on the possibility that some domestic wells in use are not logged in the WCR database) does not change the conclusion. The conclusions are strong enough that no further groundwater analysis is recommended for the sole purpose of evaluating whether more rapid demand management is justified by the aggregate avoided domestic well replacement.

Although the conclusion is that more rapid demand management is not cost-effective from a basin-wide or County-wide perspective, the distribution of the costs imposed on domestic well users should be acknowledged. Continued drawdown of groundwater levels during the GSP implementation period would be caused primarily by pumping for irrigation (because domestic wells are a smaller share of subbasin pumping), whereas the cost of domestic well replacement would be borne by domestic well users.

The above results use demand management as the policy variable to assess the tradeoff of its costs with the costs of domestic well replacement. Rather than use demand management for the cost comparison, another analysis could compare avoided well replacement and pumping costs with the cost of implementing supply or recharge projects sooner during the implementation period. However, that comparison is not possible with current information and the GSP implementation schedule already reflects an aggressive timeline for project implementation. The additional cost of accelerating a recharge project by, say 5 years, would be the increased present value of the capital and O&M cost stream. The

benefit would be the change in expected present value of avoided well replacement and pumping costs. This benefit would need to be calculated based on a groundwater model analysis of the resulting expected DTW over time under the accelerated project implementation.

3 DOMESTIC WELL MITIGATION PROGRAM

Some GSAs in the Madera Subbasin have discussed a program to replace domestic wells that are impacted by falling groundwater levels over the GSP implementation timeline. The May 29, 2019 GSP summary presentation outlined the general parameters of a domestic well mitigation program. The program is expected to be further developed during the first year of GSP implementation. Well owners would be required to sign up for the program and mitigation actions may include replacing or lowering existing wells, and in cases where it is feasible, connecting groups of wells to a community water system. The program would be funded by fees and external support including grants and low interest loans.

3.1 Madera Subbasin Domestic Well Mitigation Program Costs

An analysis was developed to approximate the cost of a domestic well mitigation program in the Madera Subbasin. The example program/analysis assumes:

- All pumpers pay into the program to fund full replacement of impacted domestic wells ($25,000/well).
- The number of affected wells is the total number affected under the with-SGMA scenario, including those potentially already impacted. One hundred and twenty wells are impacted in Madera Subbasin, based on the analysis described earlier in this memorandum (namely, uses the WCR data). The number of impacted domestic wells is doubled to account for potential under-reporting in the WCR data.
- The program cost ($/af) is based on the sustainable level of pumping. Pumping fees cover admin, replacement, and contingency program costs and are charged to every acre foot of groundwater pumped. The fee is calculated as an annual amount that will raise the required total expected mitigation program cost (in present value terms). A cash flow analysis has not been prepared at this time. All costs are expressed in real dollars.
- An annual program administration cost is assumed to cover staff time to run the program, manage the fund, and conduct technical review of any applications. For this estimate a cost of $150,000 per year (to account for the greater number of wells) plus $5,000 per replaced well is assumed.
- An additional program cost contingency of 30% is added to the average annual well replacement cost to account for higher than expected costs per well and unexpected impacts (e.g. longer drought cycles).
- A sensitivity analysis of well replacement cost, admin cost, and contingency cost is used to develop a program fee range ($/af). The actual program cost depends on the timing of well impacts, which depends on unknown future hydrologic sequences.

Summary results are as follows:

- Madera Subbasin
    - **# impacted domestic wells**: 120 (doubled to 240 for cost estimation purposes)
    - **Average annual program cost**: $277,000

- **Domestic well mitigation program fee per acre-foot** of sustainable yield: $1.03/AF (sensitivity range ~$0.67 - $4/AF)

3.2 Draft Outline for Madera Subbasin Domestic Well Mitigation Program

This section provides a general outline of a domestic well mitigation program for the Madera Subbasin.

3.2.1 Domestic well mitigation program policy/purpose statement

Define the mission of the program. For example, the purpose of the Madera Subbasin Domestic Well Mitigation program is to a mitigate undesirable results on domestic wells due to GSP implementations.

3.2.2 Definition of undesirable results

Program should clearly define the types of impacts to domestic wells that will, and will not, be mitigated.

3.2.3 Inventory domestic wells

Develop a database and registration system and allow domestic well owners to sign up (if not already permitted/in the system)

3.2.4 Mitigation measures

Define mitigation measures. Other well mitigation programs suggest the following potential mitigation measures:

- Deepen or replace well – for domestic wells where municipal water service is not expected to exist in the near future
- Connect to public water system – for domestic wells near existing public water system service
- Develop public water system to serve the impacted community – high density of domestic wells impacted within a small geographic area

The mitigation measures should consider and coordinate with any mitigation actions being undertaken by other programs such as the Nitrate Control Program and Salt Control Program being implemented by the State Water Resources Control Board and Regional Water Quality Control Board as part of the Central Valley's Water Quality Control Plans (i.e., Basin Plans). In areas of the Central Valley where drinking water supplies have been impacted by water quality, the Basin Plan includes new regulatory actions focused on managing nitrates locally while providing interim and long-term solutions for providing safe drinking water supplies.

3.2.5 Define mitigation costs

Define how the mitigation fund will pay for each type of impacted domestic well. Other well programs suggest the following examples:

- Establish payment (e.g. $/AF) to deepen wells. If well cannot be deepened, establish standard cost to replace well e.g. $/well
- Decide how to compensate well owners that can connect to municipal system
- Establish "rapid response" approach for situations when wells go dry

3.2.6 Establish review process

Develop a board to review and approve domestic well mitigation claims consistent with the guidelines specified under (1 – 4). Establish process for expedient review.

3.2.7 Financing

Financing program through groundwater extraction fees (see above for estimated costs).

3.3 Domestic Well Mitigation Programs Reviewed

A review of existing domestic well mitigation programs identified two examples that could be used as a policy template:

3.3.1 Yuba County Water Agency

3.3.1.1 Motivation

Potential groundwater substitution water transfers under the Yuba River Accord, or other transfers out of the Yuba County Water Agency area, could cause third-party impacts to other water users, including impacts to domestic wells.

3.3.1.2 Program overview

The program goal is to compensate domestic well owners that are demonstrably impacted by groundwater substitution water transfers. It was specified as Mitigation Measure 6-2 in the Lower Yuba River Accord EIR/S. In general. well owners are required to report impacts and a process is established for validating each claim. Monitoring wells (specified in Mitigation Measure 6-1) measure groundwater elevations throughout the season which are used to assess whether water transfers resulted in third-party domestic well impacts. The program description includes provisions to compensate or fully replace affected wells.
http://www.hdrprojects.com/engineering/ProposedLowerYubaRiverAccord/Chapter%206%20-%20MMRP-ECP.pdf

3.3.1.3 Program financing and implementation

No information on program financing was identified. No information on number of affected wells or if the program was ever fully implemented beyond being specified as a Mitigation Measure. (web search only – have not contacted YCWA).

3.3.1.4 Applicability to Madera GSP

Limited applicability to the Madera Subbasin GSP. The YCWA program deals with short-term water transfer impacts, whereas the GSPs are concerned with long-term planned overdraft and cumulative impacts to domestic wells. The general program guidelines are applicable (compensate well owners that are impacted). However, the financing strategy is different. Compensation for third-party impacts can be included in the cost of a groundwater substitution transfer (the source of the impact), whereas the planned overdraft in the GSP is a benefit to all groundwater users in the subbasin.

3.3.2 Truckee Meadows Water Authority

3.3.2.1 Motivation

Nevada Legislature identified a need to avoid, or mitigate, impacts to domestic wells and granted authority to the State Engineer to limit pumping in areas to avoid impacts. Impacts to domestic wells from several sources (too many wells in the same area, new deep wells, etc.) in Washoe County. TMWA eventually developed and approved the Mt. Rose/Galena Fan Domestic Well Mitigation Program.

3.3.2.2 Program overview

The program compensates domestic well owners who can demonstrate impacts to their well operation. It is the responsibility of the well owner to report impacts and request compensation from TMWA (https://tmwa.com/doing-business-with-us/wellmitigation/). A Board is established to review claims and approve/deny each application. If the application is approved, the home owner is compensated out of an existing fund to deepen their well.

3.3.2.3 Program financing and implementation

Compensation is specified by the program – wells can be deepened by 150 ft. Compensation (as of FY 2013) was $66/ft – meaning ~$10,000 for each well. Property owners are responsible for covering the cost of any other appurtenances (estimated around $4,500/well). If a well cannot be deepened, then the program pays for a new well and covers the cost of all appurtenances.

3.3.2.4 Applicability to Madera GSP

Very applicable to the Madera GSP. The program is a result of similar issues identified in the GSP – continued pumping for the benefit of the entire region is causing impacts to some shallower domestic wells. A fund is established to pay for those impacts so that pumping can continue in other parts of the basin. All users fund the program and it is the responsibility of individual well owners to submit impact claims. An independent board reviews the claims and approves/denies payment. https://www.leg.state.nv.us/Interim/76th2011/Exhibits/OverseeWRWC/E062812B.pdf

Domestic Well Replacement Economic Analysis for the Madera Subbasin

Updated January 2022

As Part of the

Domestic Well Inventory for the Madera Subbasin

(See Appendix 2.G for the Complete Domestic Well Inventory for the Madera Subbasin)

APPENDIX 3.E. MADERA SUBBASIN DOMESTIC WELL MITIGATION PROGRAM MEMORANDUM OF UNDERSTANDING

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Revised March 2023

GSP Team:

Davids Engineering, Inc. (Revised GSP Team)
Luhdorff & Scalmanini (Revised GSP Team)
ERA Economics
Stillwater Sciences and
California State University, Sacramento

MEMORANDUM OF UNDERSTANDING ESTABLISHING A DOMESTIC WELL MITIGATION PROGRAM FOR THE MADERA SUBBASIN OF THE SAN JOAQUIN VALLEY GROUNDWATER BASIN

This Memorandum of Understanding ("MOU") is entered into this___day of _____2023 (the "Effective Date"), by and between the Groundwater Sustainability Agencies of the COUNTY OF MADERA ("COUNTY"), the CITY OF MADERA ("CITY"), the MADERA IRRIGATION DISTRICT ("MID"), , the MADERA WATER DISTRICT ("MWD"), and the GRAVELLY FORD WATER DISTRICT ("GFWD"), collectively hereinafter referred to as the "Parties," or individually as the "Party."

RECITALS

A. **WHEREAS**, groundwater and surface water resources within the Madera Subbasin of the San Joaquin Valley Groundwater Basin (DWR Bulletin 118 No. 5-22.06) (Subbasin) are vitally important resources, in that they provide the foundation to maintain and fulfill current and future environmental, agricultural, domestic, municipal, and industrial needs, and to maintain the economic viability, prosperity, and sustainable management of the Subbasin; and

B. **WHEREAS**, agriculture has been prominent in making Madera County one of the world's foremost agricultural areas and plays a major role in the economy of Madera County; and

C. **WHEREAS**, in 2014 the California Legislature passed a statewide framework for sustainable groundwater management, known as the Sustainable Groundwater Management Act, California Water Code § 10720-10737.8 (SGMA), pursuant to Senate Bill 1168, Senate Bill 1319, and Assembly Bill 1739, which was approved by the Governor on September 16, 2014. and went into effect on January 1, 2015; and

D. **WHEREAS**, the Subbasin has been designated by the California Department of Water Resources (DWR) as a high-priority subbasin in a condition of critical groundwater overdraft and is subject to the requirements of SGMA; and

E. **WHEREAS**, SGMA requires that all medium and high priority groundwater basins in California be managed by a Groundwater Sustainability Agency (GSA), or multiple GSAs, and that such management be implemented pursuant to an approved Groundwater Sustainability Plan (GSP), or multiple GSPs; and

F. **WHEREAS,** there are seven GSAs within the Subbasin as set-forth in Exhibit A; and

G. **WHEREAS**, County, City, MID, and MWD have developed one GSP; Root Creek Water District has developed one GSP; GFWD has developed one GSP; and New Stone Water District has developed one GSP, such that the Subbasin is governed by four separate GSPs unified through the Subbasin Coordination Agreement; and

H. **WHEREAS**, in January 2020, the Parties submitted four GSPs to DWR; and

I. **WHEREAS**, the Parties agree, and as SGMA allows, a transition to sustainability over the 20-year GSP Implementation Period is in the best overall interest of the Subbasin, although this approach is expected to result in some continued groundwater level declines during the GSP Implementation Period; and

J. **WHEREAS**, the Parties agree that as a result of the continued decline in groundwater levels anticipated to occur over the GSP Implementation Period, there may be adverse impacts to some domestic and municipal wells in the Subbasin; and

K. **WHEREAS**, the Parties acknowledge that the number of domestic and municipal wells dewatered during implementation of the GSP (prior to 2040) is heavily dependent on precipitation and snowpack during that time period; and

L. **WHEREAS**, the Parties acknowledge that wet conditions may result in few dewatered wells; and

M. **WHEREAS**, the Parties acknowledge that substantial numbers of domestic and municipal wells may be dewatered if prolonged drought occurs during implementation of the GSP, while project and management actions are still being developed and implemented; and

N. **WHEREAS**, the Parties acknowledge that they cannot control groundwater conditions not caused by regional groundwater conditions; and

O. **WHEREAS**, the Parties do not intend to resolve or otherwise mitigate for issues related to normal wear and tear; and

P. **WHEREAS**, the Parties as part of their future analysis agree to review potential impacts to both domestic and municipal wells in the Subbasin; and

Q. **WHEREAS**, the Parties have reviewed and considered the content and recommendations set-forth by Self-Help Enterprises, Leadership Counsel for Justice and Accountability, and the Community Water Center in their publication titled, "Framework for a Drinking Water Well Impact Mitigation Program."

R. **NOW, THEREFORE**, in consideration of the mutual promises, covenants and conditions contained herein and these Recitals, which are hereby incorporated herein by this reference, the Parties agree to review and consider mitigation for domestic and municipal well impacts resulting from declining groundwater levels that occur from groundwater management activities outlined in the four GSPs through development of a Domestic Well Mitigation Program (Program) as follows:

AGREEMENT

1. **POTENTIAL PROGRAM MITIGATION MEASURES.** Potential Program mitigation measures may include, but are not limited to:

    a. Short-term solutions in emergencies, such as delivery of bottled water and/or water tanks.
    b. Setting well pump at deeper depths, replacement of well pump, or well replacement.
    c. Residential water treatment equipment.
    d. Connection to or development of public water systems to serve impacted communities.
    e. Municipal service connections.

2. **PROPORTIONATE RESPONSIBILITY**. The Parties agree to work cooperatively together to determine the proportionate responsibility of each Party.

3. **FUNDING**. The Parties agree to fund the Program on an annual basis consistent with the final determination of each Party's proportionate responsibility.

4. **PROGRAM DEVELOPMENT COMMITTEE**. The Parties shall establish a Program Development Committee (Committee) that will oversee Program development. The Committee shall include at least one technical staff representative from each of the Parties. The Committee will define the purpose, objectives, roles, responsibilities, requirements, and potential outcomes of the Program. Items for consideration and development by the Committee include, but are not limited to:

    a. Definitions
    b. Property eligibility
    c. Property owner eligibility
    d. Program application process
    e. Preferred contractors
    f. Preliminary inspection process
    g. Program form development
    h. Priority
    i. Eligible mitigation
    j. Non-eligible mitigation
    k. Maximum mitigation award
    l. Recordation of mitigation award

5. **PROGRAM ORGANIZATIONAL STRUCTURE**. To aid the Committee in Program development and implementation, a DRAFT Program organizational structure is as shown in Exhibit B. That shown in Exhibit B is only a DRAFT and shall not limit or otherwise constrain the Committee in their analysis.

6. **PROGRAM IMPLEMENTATION.** To aid the Committee in Program development and implementation, a DRAFT implementation flowchart is as shown in Exhibit C. That shown in Exhibit C is only a DRAFT and shall not limit or otherwise constrain the Committee in their analysis.

7. **TERM**. The Program shall be developed within the first 5 years of GSP implementation (by 2025) and upon implementation, shall continue for the duration of the GSP Implementation Period, until groundwater sustainability is achieved and/or as otherwise directed by the Parties.

8. **PROGRAM MANAGEMENT**. Program management shall be facilitated by one of the Parties. If one of the Parties doesn't elect to program management duties and through recommendation of the Coordination Workgroup and approval of the Parties, Program management shall be facilitated through a third party.

9. **ENVIRONMENTAL REVIEW**. The Parties agree to cooperatively complete any environmental review as may be determined necessary for Program implementation. Any costs associated with environmental review shall be per the proportionate share as set-forth in this MOU.

10. **NOTICES**. All notices required or permitted by the MOU shall be made in writing, and may be delivered in person (by hand or by courier) or may be sent regular, certified, or registered mail or U.S. Postal Service Express Mail, with postage prepaid, or by facsimile transmission, or by electronic transmission (email) and shall be deemed sufficiently given if served in a manner specified in this Section 16. The addresses and addressees noted below are the Party's designated address and addressee for deliver or mailing notices.

To Madera County:	County of Madera Stephanie Anagnoson 200 W 4th Street, 4th Floor Madera, CA 93637
To MID:	Madera Irrigation District Thomas Greci 12152 Road 28 1/4 Madera, CA 93637
To GFWD:	Gravelly Ford Water District Don Roberts 18811 Road 27 Madera, CA 93638
To City:	City of Madera

Keith Helmuth
428 East Yosemite Avenue
Madera, CA 93638

To MWD: Madera Water District
Melanie J. Aldridge
1663 N. Schnoor Street, Suite 105
Madera, CA 93638

Any Party may, by written notice to each of the other Parties, specify a different address for notice. Any notice sent by registered or certified mail, return receipt requested, shall be deemed given on the date of delivery shown on the receipt card, or if no delivery date is shown, three days after the postmark date. If sent by regular mail, the notice shall be deemed given 48 hours after it is addressed as required in this section and mailed with postage prepaid. Notices delivered by United States Express Mail or overnight courier that guarantee next day delivery shall be deemed given 24 hours after delivery to the Postal Service or overnight courier. Notices transmitted by facsimile transmission or similar means (including email) shall be deemed delivered upon telephone or similar confirmation of delivery (conformation report from fax machine is sufficient), provided a copy is also delivered via personal delivery or mail. If notice is received after 4:00 p.m. or on a Saturday, Sunday or legal holiday, it shall be deemed received on the next business day.

IN WITNESS WHEREOF, the Parties have caused this MOU to be executed, each signatory hereto represents that he/she has been appropriately authorized to enter into this MOU on behalf of the Party whom he/she signs.

County of Madera

ROBERT L. POYTHRESS
CHAIRMAN PRO-TEM

3.21.23
Date

Madera Irrigation District

Thomas Greci

3/21/2023
Date

Gravelly Ford Water District

Don Roberts

3-21-23
Date

City of Madera

Santos Garcia, Mayor

March 21, 2023
Date

Madera Water District

Phil Janzen

3-21-23
Date

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EXHIBIT A

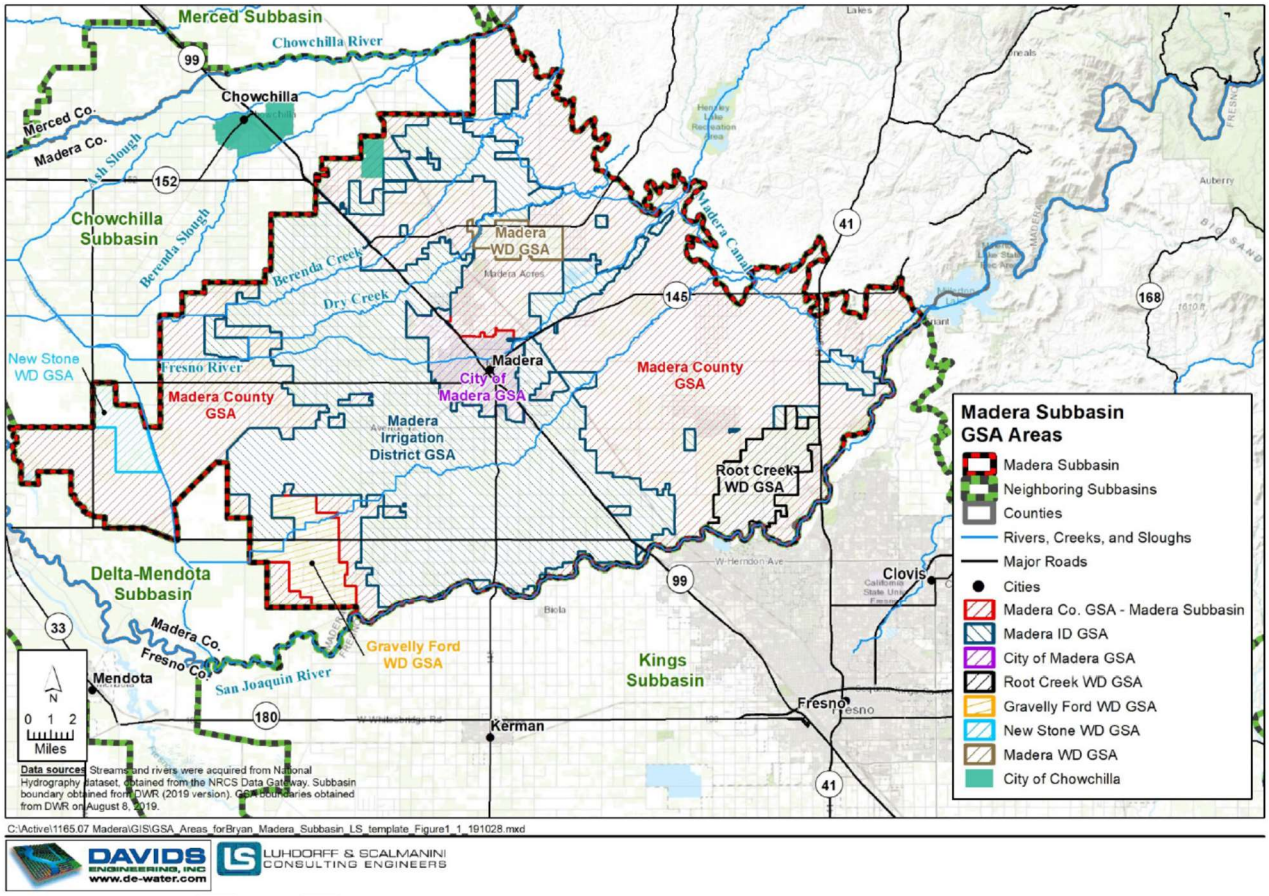
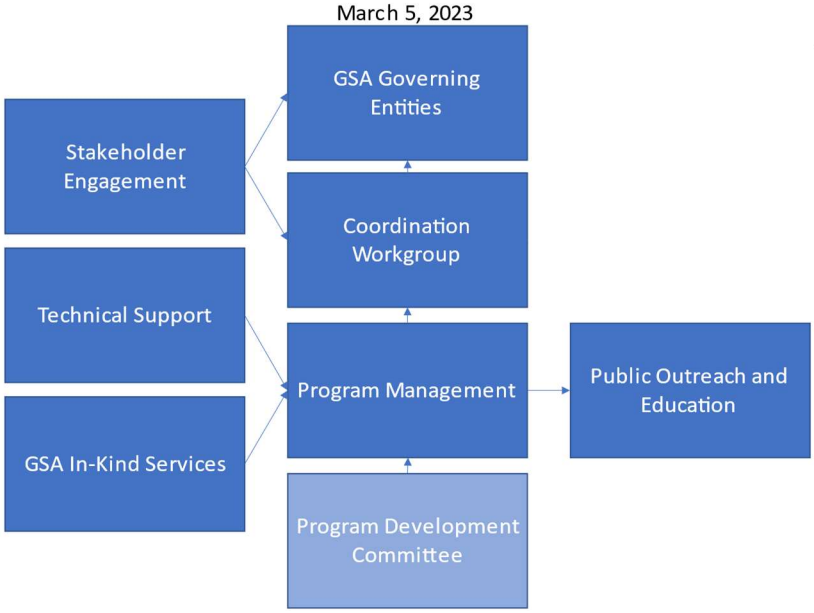

Merced Subbasin
Chowchilla River
Chowchilla
Merced Co.
Madera Co.
Ash Slough
Chowchilla Subbasin
Berenda Slough
Berenda Creek
Dry Creek
Madera WD GSA
Madera Canal
New Stone WD GSA
Fresno River
Madera County GSA
Madera City of Madera GSA
Madera Irrigation District GSA
Madera County GSA
Root Creek WD GSA
Delta-Mendota Subbasin
Madera Co.
Fresno Co.
San Joaquin River
Gravelly Ford WD GSA
Kings Subbasin
Mendota
Kerman
Fresno
Clovis
99
41
145
168
152
180
33
0 1 2 Miles
Data sources: Streams and rivers were acquired from National Hydrography dataset, obtained from the NRCS Data Gateway. Subbasin boundary obtained from DWR (2019 version). GSA boundaries obtained from DWR on August 8, 2019.
Madera Subbasin GSA Areas
Madera Subbasin
Neighboring Subbasins
Counties
Rivers, Creeks, and Sloughs
Major Roads
Cities
Madera Co. GSA - Madera Subbasin
Madera ID GSA
City of Madera GSA
Root Creek WD GSA
Gravelly Ford WD GSA
New Stone WD GSA
Madera WD GSA
City of Chowchilla
C:\Active\1165.07 Madera\GIS\GSA_Areas_forBryan_Madera_Subbasin_LS_template_Figure1_1_191028.mxd
DAVIDS ENGINEERING, INC www.de-water.com
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

EXHIBIT B

DRAFT

Madera Subbasin – Domestic Well Mitigation Program Organizational Structure
March 5, 2023



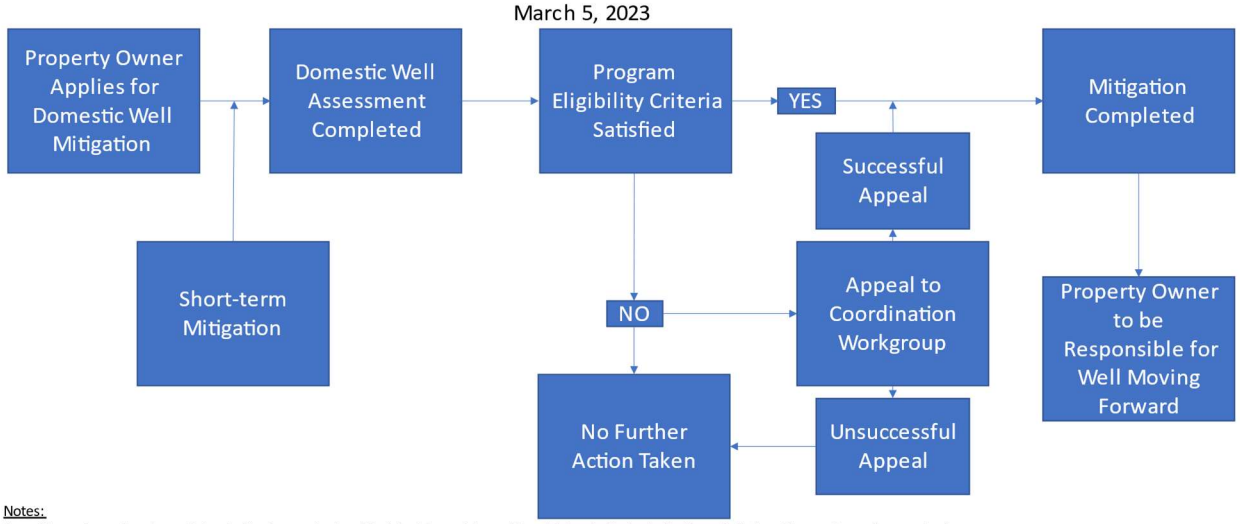
Notes:

1. That shown herein is subject to revision by the Parties.
2. Public Outreach and Engagement is a necessary component as outlined by Self-Help Enterprises, Leadership Counsel for Justice and Accountability, and the Community Water Center in their publication titled, "Framework for a Drinking Water Well Impact Mitigation Program."
3. The Madera Subbasin Coordination Workgroup is defined in the Madera Subbasin Coordination Agreement entered into January 22, 2020.

EXHIBIT C

DRAFT

Madera Subbasin – Domestic Well Mitigation Program Implementation Flowchart
March 5, 2023



Notes:

1. Steps shown herein are intended to demonstrate critical decision points and is not intended to be indicative of all steps tha t may be required.
2. That shown herein is subject to revision by the Madera Subbasin GSAs.
3. The GSAs have reviewed and considered the content and recommendations set -forth by Self-Help Enterprises, Leadership Counsel for Justice and Accountability, and the Community Water Center in their publication titled, "Framework for a Drinking Water Well Impact Mitigation Program."

APPENDIX 3.F. EMERGENCY TANK WATER PROGRAM FLYER

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020

GSP Team:

Davids Engineering, Inc
Luhdorff & Scalmanini
ERA Economics
Stillwater Sciences and
California State University, Sacramento

HAS YOUR WELL GONE DRY??

THE EMERGENCY TANK WATER PROGRAM (TW) CAN HELP!

The Madera County Sheriff's Office of Emergency Services has partnered with the Community Action Partnership of Madera County, Inc. and the Madera County Community and Economic Development Department to provide emergency water assistance!

You may be eligible to receive a water storage tank, non-potable water and drinking water.

- Homeowner whose well has gone dry
- Must meet eligibility requirements
- You must have a long-term solution in place

How to Apply:

Please call the Madera County
Department of Water and Natural Resources
200 W. 4th Street, Suite 3100
Madera, CA 93637
559-675-7703 Ext. 3225

Emergency Funding has been made available by the California Office of Emergency Services through the Emergency Tank Water Program (TW) to help homeowner's whose private wells have gone dry.

APPENDIX 3.G. MADERA SUBBASIN INFRASTRUCTURE SENSITIVITY ASSESSMENT

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Revised March 2023

GSP Team:

Davids Engineering, Inc. (Revised GSP Team)
Luhdorff & Scalmanini (Revised GSP Team)
ERA Economics
Stillwater Sciences and
California State University, Sacramento

Technical Memorandum

Date: 03/01/2023
To: Madera Subbasin Joint GSP GSAs
From: Davids Engineering, Inc.
Topic: Madera Subbasin Infrastructure Assessment

1 Introduction

This Infrastructure Assessment (Assessment) is intended to document insights about the characteristics of critical infrastructure in the Madera Subbasin, including the proximity, orientation, and relative vulnerability of infrastructure to adverse effects of land subsidence (referred to herein as "subsidence"). The assessment considers critical infrastructure and historical subsidence[1] throughout the entire Madera Subbasin, although the Assessment was prepared specifically to support development of the Madera Subbasin Revised Joint Groundwater Sustainability Plan (GSP). This information has been used by the Madera Subbasin Joint GSP Groundwater Sustainability Agencies (GSAs) to design subsidence-related Sustainable Management Criteria (SMC) with the goal of protecting this critical infrastructure from Undesirable Results (URs) of groundwater conditions during implementation of the Revised Joint GSP.

This Assessment first identifies the location and characteristics of critical infrastructure that must be considered when developing SMC in the Madera Subbasin, and then identifies recent subsidence conditions in areas of the Madera Subbasin that may create risks of adverse impacts to the beneficial uses and users of those critical infrastructure.

Critical infrastructure in the Madera Subbasin that were considered in this Assessment include:

- Roads and highway infrastructure
- Railroad infrastructure
- Waterways and surface water conveyance infrastructure
- Groundwater wells, including agricultural wells, domestic wells, and public supply wells
- Wastewater infrastructure

The Assessment considers how communities in and around the Madera Subbasin access and use critical infrastructure, how subsidence has or could affect those uses and users, and

[1] This assessment reviews historical subsidence conditions from 2015-2022. However, the GSAs recognize that residual subsidence has been observed in many areas of the San Joaquin Valley and is likely to occur to some extent in the Madera Subbasin in areas where historical subsidence was observed. Residual subsidence is associated with delayed compaction that occurs after groundwater levels have declined to a low point (the preconsolidation head), following a lag time of several years to decades in some cases.

identifies areas where subsidence has recently occurred and where critical infrastructure may be vulnerable to URs from subsidence in the future.

This Assessment has been developed based on the information available during the GSP revisions process in 2022-2023. However, the GSAs have developed a work plan to fill subsidence-related data gaps between 2023-2026. The work plan is discussed in Section 2.2.2.7 of the Madera Subbasin Revised Joint GSP. The GSAs are pursuing proposition 68 grant funds through the California Department of Water Resources (DWR) Sustainable Groundwater Management (SGM) Grant Program that would help to support implementation of the work plan. As the GSAs implement the work plan and more is learned about subsidence conditions in the Madera Subbasin, those findings and implications for critical infrastructure will be documented in Annual Reports and GSP updates.

2 Overview of Critical Infrastructure in the Madera Subbasin

This section provides a brief overview of critical infrastructure categories that were considered when establishing subsidence-related SMC in the Madera Subbasin. The locations of all critical infrastructure categories were considered with respect to the Madera Subbasin boundaries and the GSAs' boundaries (**Figure 1**). The orientation of all critical infrastructure categories was also considered with respect to the overall topography of the Madera Subbasin (**Figure 2**), where the ground surface elevation generally slopes downward from northeast (highest elevation) to southwest (lowest elevation).

Each subsection below generally summarizes what is encompassed in each critical infrastructure category, the general location and characteristics of that critical infrastructure (including its structure and orientation), and other core considerations for the beneficial uses and users of that infrastructure. Maps referenced in these subsections are provided at the end of the Assessment.

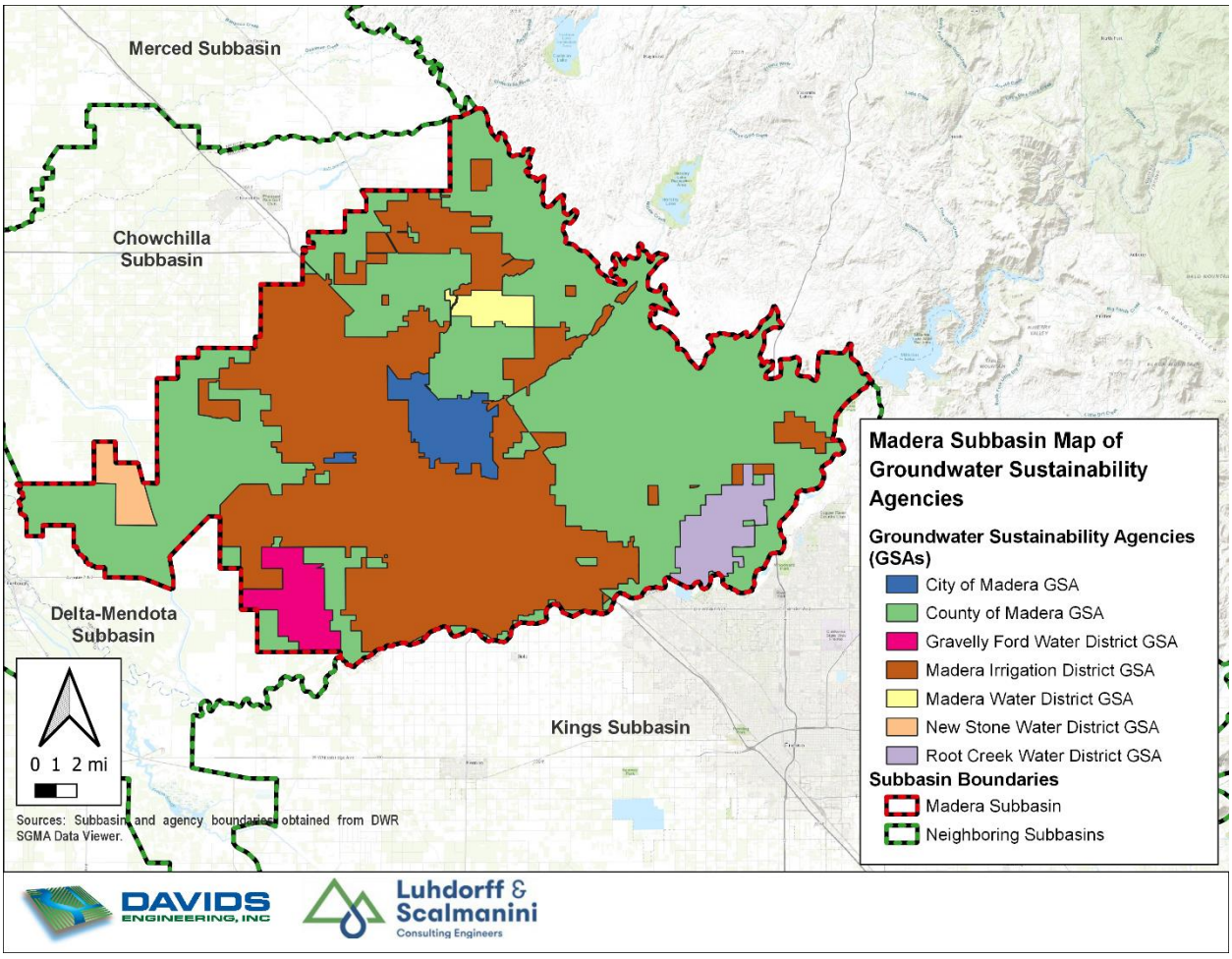


Figure 1. Map of Groundwater Sustainability Agencies in the Madera Subbasin.

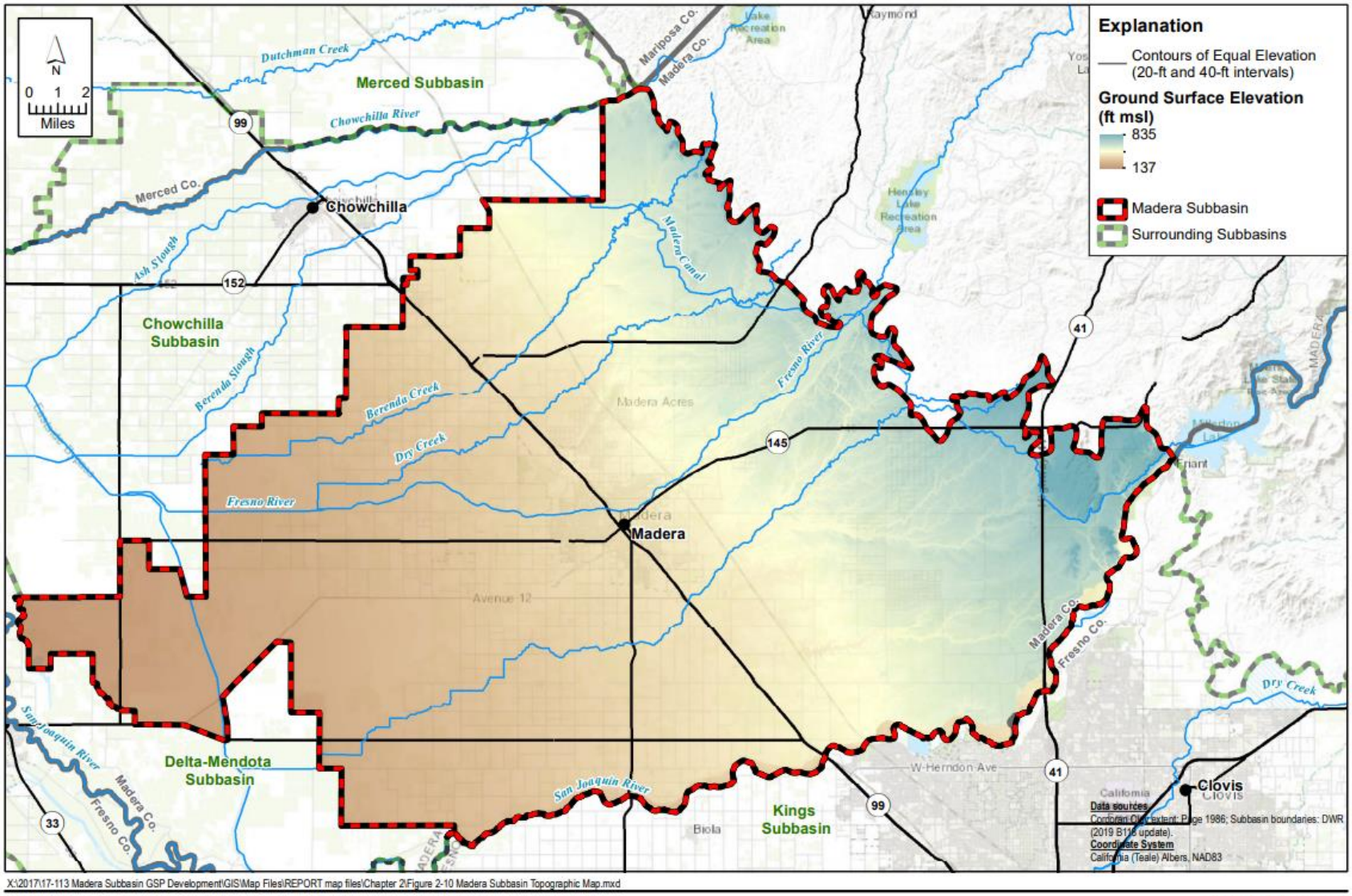


Figure 2. Madera Subbasin Topographic Map (Source: Madera Subbasin Revised Joint GSP, Figure 2-10).

2.1 Roads and Highway Infrastructure

Road and highway infrastructure considered when setting subsidence-related SMC in the Madera Subbasin primarily includes roadways and bridges within the boundaries of the Madera Subbasin. Maintaining the integrity of road and highway infrastructure is important for securing transportation and freight corridors within and through the Madera Subbasin.

Figure 3 shows the locations of major highways and highway bridges in the Madera Subbasin, and **Figure 4** shows the annual average daily traffic volumes on those major highways. The largest highway corridors in the Madera Subbasin include California State Routes (SR) 99, 145, and 41. SR 99 crosses the center of the Madera Subbasin, passing through the City of Madera following a northwest-southeast path. SR 145 follows a north-south path to the south of the City of Madera, and follows a southwest-northeast path to the east of the City of Madera until it connects to SR 41 near the eastern edge of the Madera Subbasin. SR 41 crosses the eastern portion of the Madera Subbasin in a north-south path. Other smaller, local roadways are generally located in the City of Madera or traverse rural areas of the Madera Subbasin.

According to data available from the California Department of Transportation (Caltrans), SR 99 features the majority of highway bridges in the Madera Subbasin (29 of 43), and also experiences the majority of traffic (typically serving more than 40,000 vehicles per day, on average). Off of SR 99, traffic on SR 145 ranges from approximately 7,000-15,000 vehicles per day, on average, with higher volumes nearer to the City of Madera. On the eastern side of the Madera Subbasin, traffic on SR 41 ranges from approximately 16,000-18,000 vehicles per day.

2.2 Railroad Infrastructure

Railroad infrastructure was also considered in setting subsidence-related SMC in the Madera Subbasin. Like road and highway infrastructure, maintaining the integrity of railroad infrastructure is important for securing transportation and freight corridors through the Madera Subbasin. **Figure 5** shows the location of railroad infrastructure in the Madera Subbasin summarized from available Caltrans data. The Madera Subbasin contains two main railways: one that crosses the central portion of the Madera Subbasin and passes through the City of Madera following a northwest-southeast path, and the second following a roughly parallel path to the northeast of the first. A third short railway, the North Madera Industrial Lead, also branches off from the first railway within the City of Madera, following a short southwest-northeast path.

2.3 Waterways and Surface Water Conveyance Infrastructure

Waterways and surface water conveyance infrastructure considered when setting subsidence-related SMC in the Madera Subbasin are shown in **Figure 6**. Maintaining the integrity of waterways and surface water conveyance infrastructure is important for flood protection, irrigation, recharge, and other beneficial uses and users of surface water in and around the Madera Subbasin. More specific considerations for waterways and surface water conveyance infrastructure are described below.

2.3.1 General Flow Characteristics

Most waterways that flow into and through the Madera Subbasin begin in upslope lands east and northeast of the Madera Subbasin and flow downslope in a westerly direction. Besides the San Joaquin River, which flows along the southern edge of the Subbasin, waterways in the Madera Subbasin are considered intermittent or ephemeral streams, and have historically remained dry for at least several months each year.

The Madera Canal and reaches of the Fresno River, Berenda Creek, Cottonwood Creek, and Dry Creek within the Madera Subbasin are used for conveyance of surface water (generally in March-October at times when surface water supplies are available). Virtually all surface water flows on these waterways originate from either Hensley Lake releases at Hidden Dam or from Millerton Reservoir releases at Friant Dam that are delivered via the Madera Canal. These waterways are typically dry during the non-irrigation season except during storm runoff events and during periods when flood releases occur from the upstream reservoirs.

Flows on the San Joaquin River along the southern boundary of the Madera Subbasin originate from various upstream sources, including Millerton Reservoir releases at Friant Dam. Streamgage data from the United States Geological Survey (USGS)[2] shows flows along the San Joaquin River during most times of year, with greater flows typically occurring during spring months of wet water years.

2.3.2 Waterways within the Purview of the Central Valley Flood Protection Board

Core considerations for waterways within the purview of the Central Valley Flood Protection Board (CVFPB) are the freeboard and design profile, as defined in the corresponding Federal and State Operation and Maintenance Manuals (O&M Manuals).

In their comments to the Madera Subbasin GSAs, the CVFPB noted that any reduction in the freeboard or change to design profile, beyond the design criteria given in the O&M Manuals, may lead to increased flood risk and damage to Federal-State flood control facilities, and is considered unlawful for waterways in their purview.

The GSAs have recognized and considered the following design criteria of waterway reaches in the Madera Subbasin when establishing the subsidence-related SMC for the Madera Subbasin:

- Fresno River:
  - Bank levees freeboard of 3 feet
  - Design flows of 5,000 cubic feet per second (cfs)
- San Joaquin River:
  - Bank levees freeboard of 3 feet
  - Design flows of 8,000 cfs
- Chowchilla Bypass:
  - Bank levees freeboard of 4 feet

[2] USGS 11251000 SAN JOAQUIN R BL FRIANT CA. https://waterdata.usgs.gov/nwis/uv?site_no=11251000.

- Design flows of 5,500 cfs

2.4 Groundwater Wells

Groundwater well infrastructure in the Madera Subbasin encompasses the infrastructure of multiple types of wells, including agricultural wells, domestic wells, and public supply wells. Sustaining access to groundwater is crucial to upholding the Human Right to Water (as set forth in California Water Code § 106.3) and is also important to maintaining the economic vitality of the Madera Subbasin.

Figure 7 through **Figure 9** show the general locations of groundwater wells of each type (agricultural, domestic, and public supply), aggregated by section from Well Completion Report (WCR) data available from the California Department of Water Resources (DWR). WCR data includes only wells with well completion reports that have been submitted to DWR since 1970, and thus typically underestimates the total number of wells in each section. However, the data is expected to provide a reasonably accurate understanding of the relative location and distribution of wells in the Madera Subbasin. Agricultural wells are the most uniformly distributed across the entire Madera Subbasin, while domestic wells and public supply wells are distributed most densely in a strip generally following SR 99, especially in sections surrounding the City of Madera, and in sections around Bonadelle Ranchos-Madera Ranchos. Agricultural wells in the Madera Subbasin are typically deeper than domestic and public supply wells (see the Madera Subbasin Revised Joint GSP Figures 2-44 through 2-46).

2.5 Wastewater Infrastructure

Wastewater infrastructure in the Madera Subbasin primarily includes the wastewater treatment plant operated within the City of Madera. Like other municipal infrastructure, maintaining the integrity of wastewater infrastructure is important to maintaining sanitary conditions in urban communities. The importance of functional wastewater infrastructure is closely tied to the Human Right to Water.

3 Relationship between Subsidence Conditions and Infrastructure Concerns

This section summarizes the potential URs to critical infrastructure that may result from subsidence, and then evaluates the relationship between recent historical subsidence that has occurred in the Madera Subbasin and the potential vulnerability of critical infrastructure in the Madera Subbasin. Maps referenced in these subsections are provided at the end of the Assessment. **It is noted that the Joint GSP GSAs have set the subsidence minimum thresholds (MTs) at 0 feet/year in 2040[3] (see Section 3.3.3 of the Revised Joint GSP). Subsidence conditions in 2040 and thereafter are not expected to trigger undesirable results for any of the critical infrastructure.**

Figure 3 through **Figure 9** show the location of critical infrastructure and the historical cumulative subsidence between 2015-2020 in the Madera Subbasin. These figures show cumulative subsidence conditions (reported as total vertical displacement from InSAR[4] data) starting with the first available InSAR data (June 2015) and extending through June 2020. **Figure 10** through **Figure 16** similarly show the location of critical infrastructure and the historical cumulative subsidence between 2015-2022 in the Madera Subbasin, extending the summary of subsidence conditions through the most recently available InSAR data available at the time of this analysis (through June 2022). The subsections below summarize relevant findings related to each figure, in addition to other pertinent findings from other studies and surveys of subsidence impacts in the Madera Subbasin.

3.1 Roads and Highway Infrastructure

In general, subsidence has the potential to cause URs to users of road and highway infrastructure by causing deterioration or loss of access and use of that infrastructure through fractures, unevenness, or other issues with structural integrity.

There is currently no known subsidence-related issue that has resulted in loss of access and use of road and highway infrastructure in the Madera Subbasin. As shown in **Figure 3, Figure 4**, **Figure 10**, and **Figure 11**, SR 99 – the roadway with the greatest number of bridges and the highest volume of traffic in the Madera Subbasin – is located in the central and eastern portion of the Madera Subbasin where subsidence rates have generally been lower. Between 2015-2020, the total cumulative subsidence along SR 99 ranged from virtually zero subsidence (southeast of the City of Madera) to, at most, approximately 2 feet of total cumulative subsidence (less than approximately 0.4 feet per year over approximately five years). Along SR

[3] The land subsidence MT is set at a rate of 0 feet/year. However, compliance with this threshold will take into consideration the level of uncertainty associated with survey measurements. SJRRP has reported that survey measurements have a vertical accuracy of +/-2.5 centimeters. With two measurements necessary to calculate a rate (before and after), the total uncertainty in the subsidence rate value is 5 centimeters, or approximately -0.16 feet/year. Therefore, a rate of subsidence of less than -0.16 feet/year (values that are less negative) are considered to be within the uncertainty of the measurement and would be considered compliant with the MT of 0 feet/year.

[4] Interferometric Synthetic Aperture Radar (InSAR) data provides measurements of vertical ground surface displacement, and is available from the California Department of Water Resources (DWR) beginning in June 2015. https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence.

145, the total cumulative subsidence from 2015-2020 was less than 1 foot (approximately 0.2 feet per year over approximately five years). Along SR 41, the total cumulative subsidence from 2015-2020 was less than approximately 0.5 feet (.1 feet per year over approximately five years).

As described in Section 3.4.3 of the Madera Subbasin Revised Joint GSP, the GSAs are planning to mitigate subsidence, as needed, in the Madera Subbasin and do not expect residual subsidence conditions to cause URs to beneficial uses and users of roads and highway infrastructure. However, the GSAs will continue to monitor conditions and will adapt GSP implementation if URs are found to occur. Future findings and adaptations to GSP implementation will be described in Annual Reports, as applicable.

3.2 Railroad Infrastructure

Similar to roads and highways, subsidence has the potential to cause URs to users of railroads by causing deterioration or loss of access and use of railways and related infrastructure through fractures, unevenness, or other issues with structural integrity.

There is currently no known subsidence-related issue that has resulted in loss of access and use of railroad infrastructure in the Madera Subbasin. As shown in **Figure 5** and **Figure 12**, railroads in the Madera Subbasin are located in the northern and eastern portions of the Madera Subbasin where the cumulative subsidence from 2015-2020 was between 0.0 to 2 feet (approximately 0.0 to 0.4 feet per year over approximately five years). As described in Section 3.4.3 of the Madera Subbasin Revised Joint GSP, the GSAs are planning to mitigate subsidence, as needed, in the Madera Subbasin and do not expect residual subsidence conditions to cause URs to beneficial uses and users of railroad infrastructure. However, the GSAs will continue to monitor conditions and will adapt GSP implementation if URs are found to occur. Future findings and adaptations to GSP implementation will be described in Annual Reports, as applicable.

3.3 Waterways and Conveyance Infrastructure

Subsidence in the Madera Subbasin has the potential to cause URs to uses and users of waterways and conveyance infrastructure by potentially causing changes in the design profile and slope of gravity flow channels, affecting freeboard and channel capacity. Changes that reduce capacity can impact the ability of surface water suppliers to use those conveyance channels to meet demands. Changes that reduce capacity and diminish freeboard can also cause flooding along waterways during times of peak flow. The GSAs considered potential impacts to waterways in the Madera Subbasin resulting from subsidence in relation to the channel design criteria described in the respective O&M Manuals, including the channel freeboard and design profile.

3.3.1 East-West Oriented Waterways

As shown in **Figure 6** and **Figure 13**, the majority of waterways in the Madera Subbasin flow generally from east to west, in the same general direction as the cumulative “subsidence gradient” that has historically occurred in the Madera Subbasin. Along these “east-west”

oriented waterways – including the Fresno River, Berenda Creek, Cottonwood Creek, and Dry Creek – higher subsidence rates in the western portion of the Madera Subbasin have increased the existing slope of the ground surface (**Figure 2**), functionally increasing the capacity of those channels. Thus, despite there being higher rates of subsidence in the western portion of the Madera Subbasin where these waterways flow – as much as 3.0 feet in some areas between 2015-2020 (approximately 0.6 feet per year) and as much as 4.5 feet in some areas along the Chowchilla Subbasin boundary between 2015-2022 (approximately 0.9 feet per year) – the GSAs do not anticipate that subsidence conditions will cause URs to beneficial uses and users of these east-west oriented waterways in the Madera Subbasin in the near future.

For subsidence to substantially impact the freeboard and design profile of those east-west oriented waterways in opposition to the O&M Manuals, subsidence rates in the eastern portion of the Madera Subbasin would need to significantly increase relative to the western portion of the Madera Subbasin and reduce the existing ground surface slope. Considering historical subsidence conditions and differences in the underlying geologic structure of the Madera Subbasin from east-to-west, the GSAs consider URs to beneficial uses and users of the east-west oriented waterways to be unlikely. Nevertheless, as described in Section 3.4.3 of the Madera Subbasin Revised Joint GSP, the GSAs will continue to monitor conditions and will adapt GSP implementation if URs are found to occur. Future findings and adaptations to GSP implementation will be described in Annual Reports, as applicable.

3.3.2 Madera Canal

Besides those east-west oriented waterways that are used for conveyance of surface water supplies (Fresno River, Berenda Creek, Cottonwood Creek, Dry Creek), the primary conveyance infrastructure in the Madera Subbasin is the Madera Canal.

The Madera Canal flows along the far northeastern portion of the Madera Subbasin where the cumulative subsidence from 2015-2022 remained less than 0.5 feet in total (less than 0.1 feet per year). There is currently no known subsidence-related issue with capacity or flows along Madera Canal in the Madera Subbasin. The GSAs consider any future URs to the Madera Canal to be highly unlikely in view of the Madera Subbasin's topography and the location of the Madera Canal relative to where subsidence has historically occurred.

3.3.3 Chowchilla Bypass and San Joaquin River

During development of the Madera Subbasin GSPs and the Revised GSPs, the Madera Subbasin GSAs reviewed past analyses of subsidence-related capacity concerns conducted by DWR in May 2018 for the San Joaquin River Restoration Program (SJRRP). These analyses are documented in a report titled "Evaluation of the Effect of Subsidence on Flow Capacity in the Chowchilla and Eastside Bypasses, and Reach 4A of the San Joaquin River" (DWR, 2018). The analyses were conducted to evaluate the subsidence-related impacts to the flow capacity of the Chowchilla Bypass, the Eastside Bypass, and the San Joaquin River under recent historical subsidence conditions (as of 2016) and projected future subsidence conditions through 2026. Flows under the different subsidence-related topography changes were simulated using HEC-

RAS[5] with consideration for the channel design criteria in the O&M Manuals (described in Section 2.3.2, above).

Table 3 of the analysis (shown in **Table 1**, below) summarizes the estimated flow capacity in:

- Chowchilla Bypass (segment from the bifurcation structure at the San Joaquin River to the Fresno River; this segment flows primarily within the Madera Subbasin),
- Eastside Bypass (four segments from the end of the Chowchilla Bypass to the Mariposa Bypass; these segments primarily flow outside the Madera Subbasin)
- San Joaquin River (Reach 4A, which flows along the boundaries of the Chowchilla Subbasin, and the San Slough Connector Channel; these segments primarily flow outside the Madera Subbasin)

Results of the analysis were calculated assuming a fixed freeboard set according to the design criteria in the O&M Manuals. The extent of each reach considered in the analysis is shown in **Figure 17**, below. These analyses found that:

- Flow capacity in all reaches of the Chowchilla Bypass (within the Madera Subbasin) and two reaches of the Eastside Bypass (from Fresno River to Ash Slough, directly downstream of the Madera Subbasin) were within design flows in all historical and projected scenarios considered.
- Flow capacity in the San Joaquin River Reach 4A (outside the Madera Subbasin) and in the Eastside Bypass from Ash Slough to Sand Slough (outside the Madera Subbasin) were already considered to be below the design capacity beginning in the scenario considering historical subsidence conditions as of 2016.

These findings suggest that:

- The design profile and freeboard of the Chowchilla Bypass (within the Madera Subbasin) and upstream reaches of the Eastside Bypass (directly downstream of the Madera Subbasin) were not adversely impacted by subsidence conditions as of 2016, and were not anticipated to be impacted by future subsidence through 2026 (under the assumptions given below).
- The design profile and freeboard of the San Joaquin River Reach 4A (outside the Madera Subbasin) and the Eastside Bypass from Ash Slough to Sand Slough (outside the Madera Subbasin) were already impaired relative to the design criteria given in the O&M Manuals as of 2016. These impairments are far outside the boundaries of the Madera Subbasin and are not understood to be directly impacted by subsidence conditions within the Madera Subbasin. Additionally, these impairments precede the formation of the GSAs and the GSP implementation period in both the Madera Subbasin and neighboring subbasins.

The GSAs do recognize certain assumptions and limitations given for these analyses (DWR, 2018), mainly:

[5] United States Army Corps of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS). Available at: https://www.hec.usace.army.mil/software/hec-ras/.

- Flows were modeled using HEC-RAS, and were validated by flows in 2017 (assuming that those flows were close to design flows). Flow capacities were evaluated for two conditions: a run-of-the-river condition in which there were no concurrent tributary flows, and a backwater condition in which there were concurrent flows in tributary channels that added to downstream flows. Tributary flows to the Chowchilla/Eastside Bypass from Ash Slough, Berenda Slough, and other waterways were assumed to concurrently reach their design flows (per the O&M Manuals) in backwater model scenarios. The GSAs cannot be sure of the validity of the model or these assumptions.
- Projected future subsidence rates through 2026 were estimated using the average annual subsidence rates reported by the United States Bureau of Reclamation from 2011 to 2017. Those subsidence rates may not accurately reflect the actual rates observed from InSAR data in 2017-2020 in the Madera Subbasin and neighboring areas of the Chowchilla Subbasin. For instance, certain landowners in the southwestern portion of the Chowchilla Subbasin (near the Madera and Delta-Mendota Subbasins) entered into a Subsidence Control Measures Agreement in 2017 and have since made significant progress to reduce subsidence by reducing pumping from the Lower Aquifer. Those efforts have resulted in significantly reduced subsidence rates in the vicinity of the Chowchilla Bypass, Eastside Bypass, and the San Joaquin River, as compared to rates prior to 2017 (see Section 3.3.3 of the Chowchilla Subbasin Revised GSP).
- The conclusions of DWR's study are planning-level modeled estimates that do not consider factors besides subsidence (e.g., sediment transport). Sediment deposition is another factor that affects capacity, although sediment management and maintenance of the Chowchilla Bypass, Eastside Bypass, and the San Joaquin River is not the responsibility of the GSAs.

Considering these findings, the GSAs do not expect that subsidence conditions in the Madera Subbasin will impair the design profile or freeboard of the Chowchilla Bypass in the Madera Subbasin during the GSP implementation period. The GSAs also do not expect subsidence conditions in the Madera Subbasin to impair the design profile or freeboard of the Eastside Bypass or the San Joaquin River directly downstream of the Madera Subbasin beyond what conditions were already present prior to 2016.

Nevertheless, as described in Section 3.4.3 of the Madera Subbasin Revised Joint GSP, the GSAs will continue to monitor conditions and will adapt GSP implementation if URs are found to occur. Future findings and adaptations to GSP implementation will be described in Annual Reports, as applicable.

3.4 Groundwater Wells

In general, subsidence has the potential to cause URs to users of groundwater well infrastructure by causing deterioration or loss of access and use of that infrastructure through casing damage, collapse, or other issues with structural integrity. These potential issues are also affected or exacerbated by other factors besides subsidence, such as well age, construction, and materials.

As shown in **Figure 7** and **Figure 14**, agricultural wells are generally distributed evenly throughout the Madera Subbasin, in areas where both higher and lower rates of subsidence have occurred. A survey of agricultural well owners in portions of Madera County in spring 2022 found that wells near the Madera/Chowchilla Subbasin border were beginning to collapse, particularly in areas that have experienced approximately 3 feet of subsidence or more. However, the agricultural well owners that were surveyed also indicated that these effects and the costs of well deepening and replacement were considered a necessary side effect of maintaining the economic viability of their businesses during the current drought and early GSP implementation efforts, while projects and management actions – including demand management – ramp up. Those agricultural well owners surveyed did not consider these effects to be "undesirable results." The GSAs will continue to monitor conditions and engage with stakeholders, and will adapt GSP implementation if URs are found to occur. Future findings and adaptations to GSP implementation will be described in Annual Reports, as applicable.

As shown in **Figure 8**, **Figure 9**, **Figure 15**, and **Figure 16**, domestic wells and public supply wells in the Madera Subbasin are distributed most densely in the vicinity of SR 99, especially in sections surrounding the City of Madera, and in sections around Bonadelle Ranchos-Madera Ranchos. While these areas of the Madera Subbasin have historically experienced lower rates of subsidence, domestic wells in various parts of the Madera Subbasin have already experienced URs from loss of access to groundwater. SMC and GSP implementation efforts have been designed to directly address these issues and preserve the Human Right to Water, as described in Section 3.4.3 of the Madera Subbasin Revised Joint GSP.

Discussions and stakeholder input during public GSP development meetings indicated a clear desire to balance the water supply needs of all beneficial uses and users of groundwater to the greatest extent practicable. Stakeholders expressed clear intent to protect domestic well users that rely on groundwater, but also expressed a desire to protect the local agricultural economy – the economic lifeblood of the region – while GSP implementation ramps up. The GSAs considered many groundwater management approaches to achieve these goals of balancing diverse beneficial user interests. The minimum thresholds (MTs) established for groundwater levels in the Madera Subbasin reflect the outcome of this balanced approach, allowing groundwater use for agricultural production to continue, albeit at a gradually reducing rate, while GSP implementation ramps up, and recognizing that this would likely result in lowered groundwater levels impacting some well users in the Madera Subbasin. This approach was considered preferable to alternatives that would require immediate and substantial cutbacks in agricultural groundwater pumping in order to avoid significant and unreasonable adverse impacts on well users, especially domestic wells. Such an alternative would result in major economic impacts to the local communities and all stakeholders in the Madera Subbasin, including domestic well users and disadvantaged communities. The GSAs re-evaluated the economic tradeoffs of these alternatives in 2022 (Appendix 3.D of the Madera Subbasin Revised Joint GSP), and determined that the avoided costs resulting from immediate demand reduction (i.e., fewer domestic wells requiring replacement) would be comparatively small ($38.64

million) relative to the additional lost agricultural net return ($251.98 million) in the Madera Subbasin, even after accounting for the pumping cost savings ($92.52 million). These analyses considered the impacts of immediate demand reduction only on agricultural net return, but in reality the economic impacts would spread to other county businesses and industries, significantly increasing the net effect on all beneficial uses and users of groundwater in the Madera Subbasin, including domestic well owners.

With these findings, the GSAs determined that implementing a Domestic Well Mitigation Program would provide the best and most economically reasonable outcome for beneficial uses and users of groundwater in the Madera Subbasin by preserving the local economy and protecting domestic well users' access to groundwater. For this reason, the GSAs have elected to mitigate for potential impacts to domestic well users during the GSP implementation period or until groundwater sustainability is achieved. Implementation of the Domestic Well Mitigation Program will allow the GSAs to establish lower MTs that avoid URs to other groundwater users, while still preserving access to critical water supplies for domestic well users.

The GSAs within the Madera Subbasin have proceeded with coordination and focused planning efforts to develop a Domestic Well Mitigation Program, including the development of a memorandum of understanding (MOU). The Domestic Well Mitigation Program could provide assistance to domestic and municipal wells adversely impacted by groundwater conditions that interfere with groundwater production or quality and will be coordinated with the Madera County SB 552 Drought Plan that is also under development.

3.5 Wastewater Infrastructure

Subsidence has the potential to cause URs to users of wastewater infrastructure by causing deterioration or loss of functionality of the gravity flow characteristics of those systems and by causing other issues with structural integrity.

There is currently no known subsidence-related issue that has resulted in loss of functionality of wastewater infrastructure in the Madera Subbasin. The cumulative subsidence in the City of Madera service area (**Figure 1**) was approximately 1.5 feet or less between 2015-2022 (approximately 0.2 feet per year or less over approximately seven years). As described in Section 3.4.3 of the Madera Subbasin Revised Joint GSP, the GSAs are planning to mitigate subsidence, as needed, in the Madera Subbasin and do not expect residual subsidence conditions to cause URs to beneficial uses and users of wastewater infrastructure. However, the GSAs will continue to monitor conditions and will adapt GSP implementation if URs are found to occur. Future findings and adaptations to GSP implementation will be described in Annual Reports, as applicable.

4 References

DWR. 2018. Evaluation of the Effect of Subsidence on Flow Capacity in the Chowchilla and Eastside Bypasses, and Reach 4A of the San Joaquin River. May 2018. In Technical Memorandum: Channel Capacity Report 2018 Restoration Year. San Joaquin River Restoration Program. January 2019.

5 Figures and Tables

Figure 3 through **Figure 17** and **Table 1** are provided below.

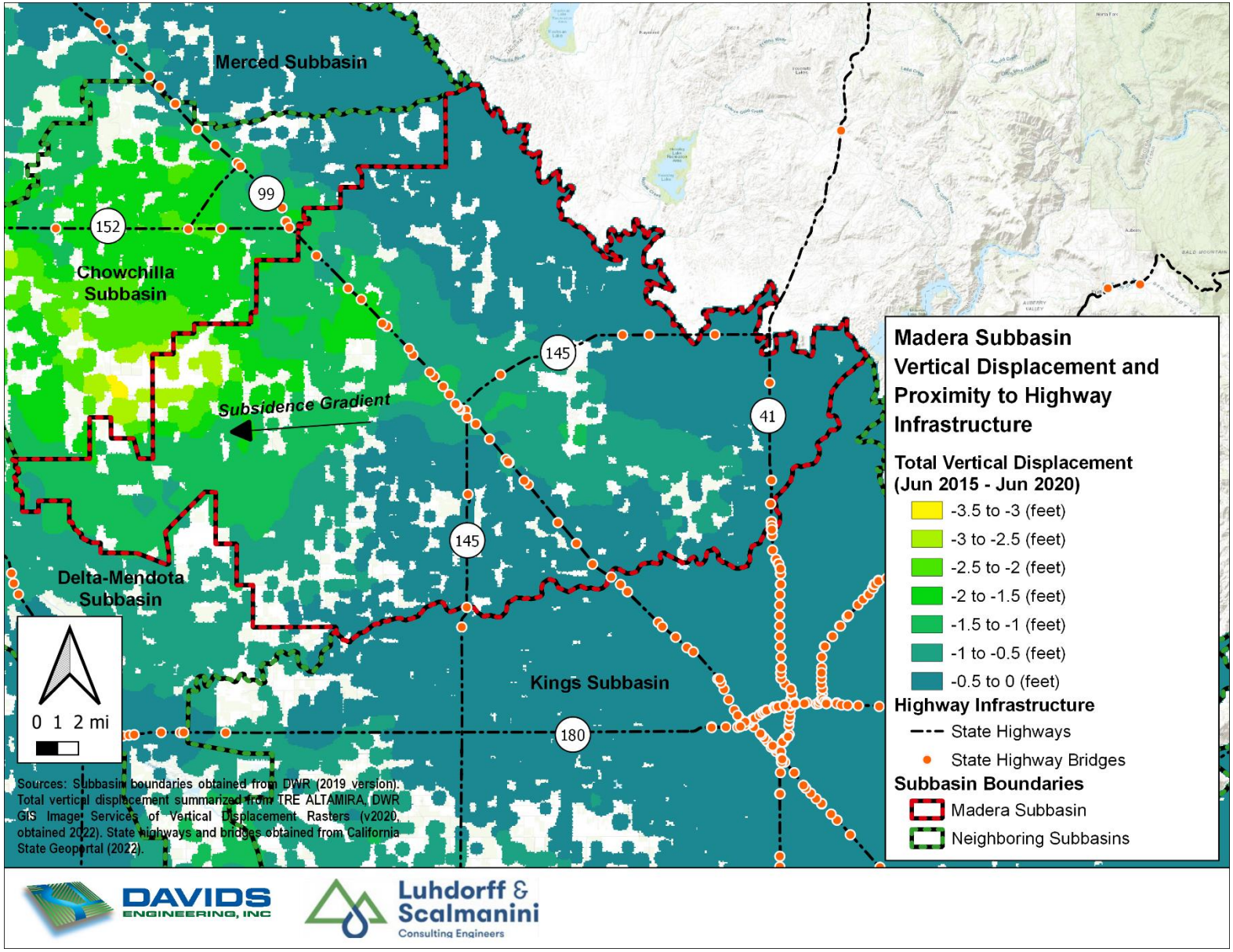


Figure 3. Vertical Displacement (June 2015 - June 2020) and Proximity to Highway Infrastructure.

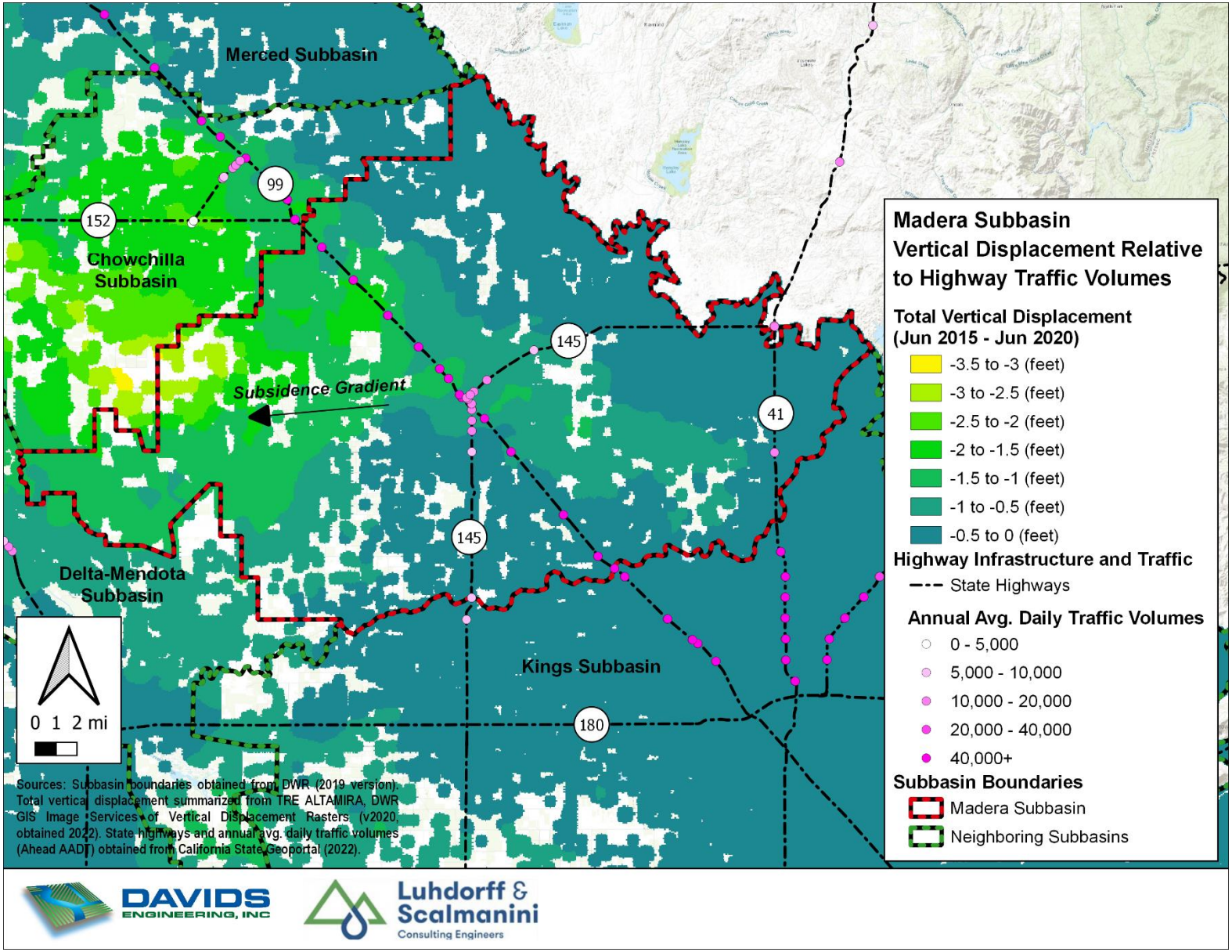


Figure 4. Vertical Displacement (June 2015 - June 2020) Relative to Highway Traffic Volumes.

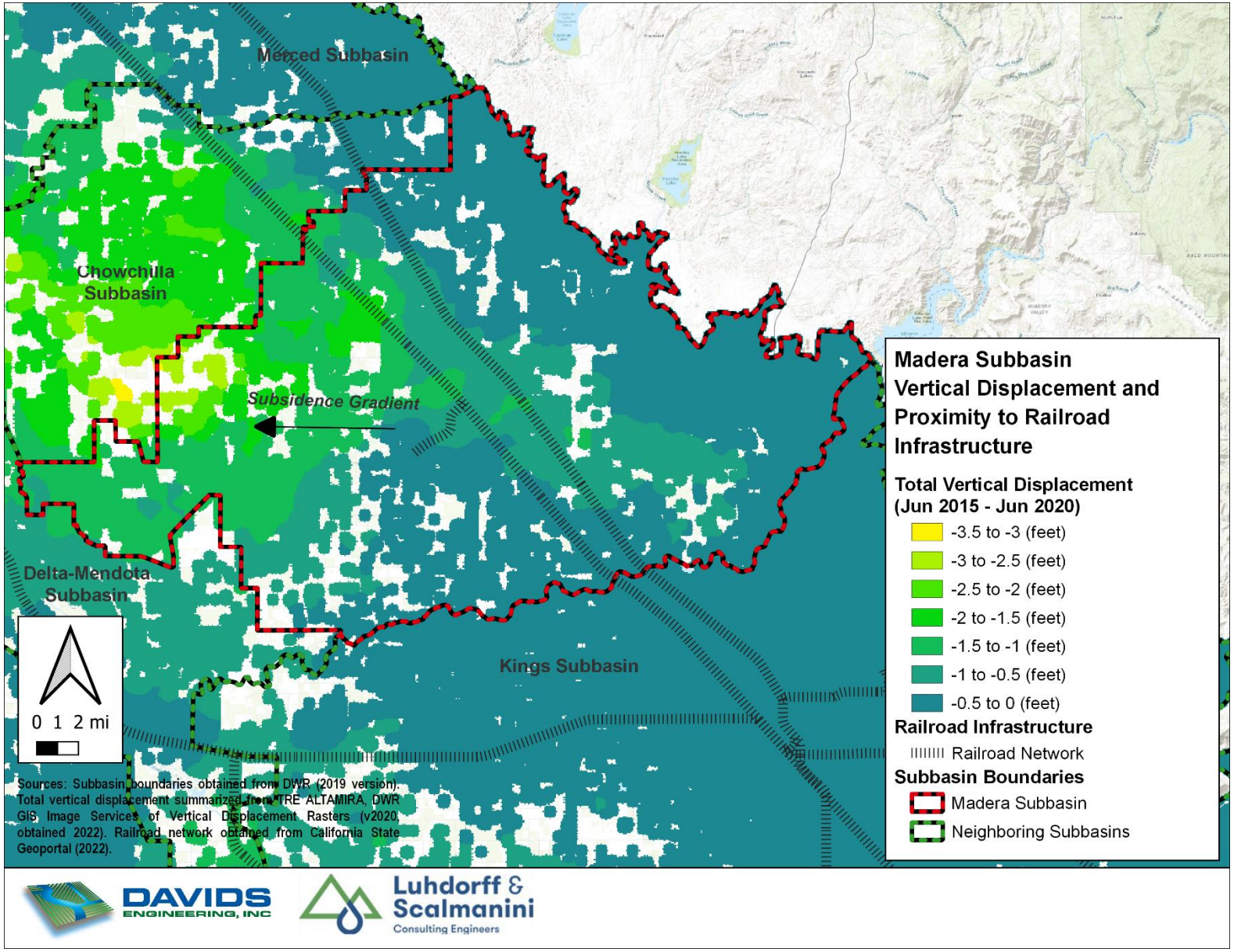


Figure 5. Vertical Displacement (June 2015 - June 2020) and Proximity to Railroad Infrastructure.

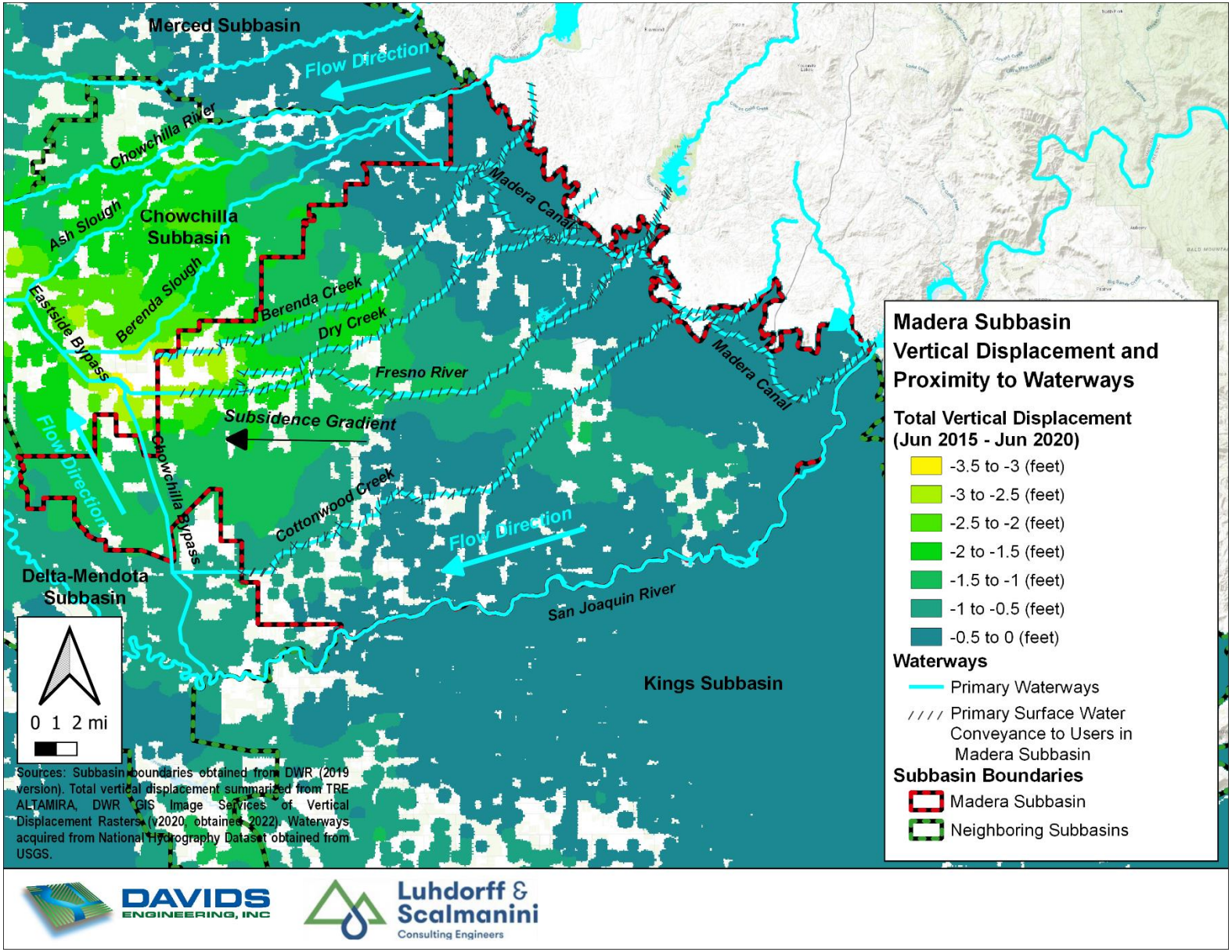


Figure 6. Vertical Displacement (June 2015 - June 2020) and Proximity to Waterways and Surface Water Conveyance Infrastructure.

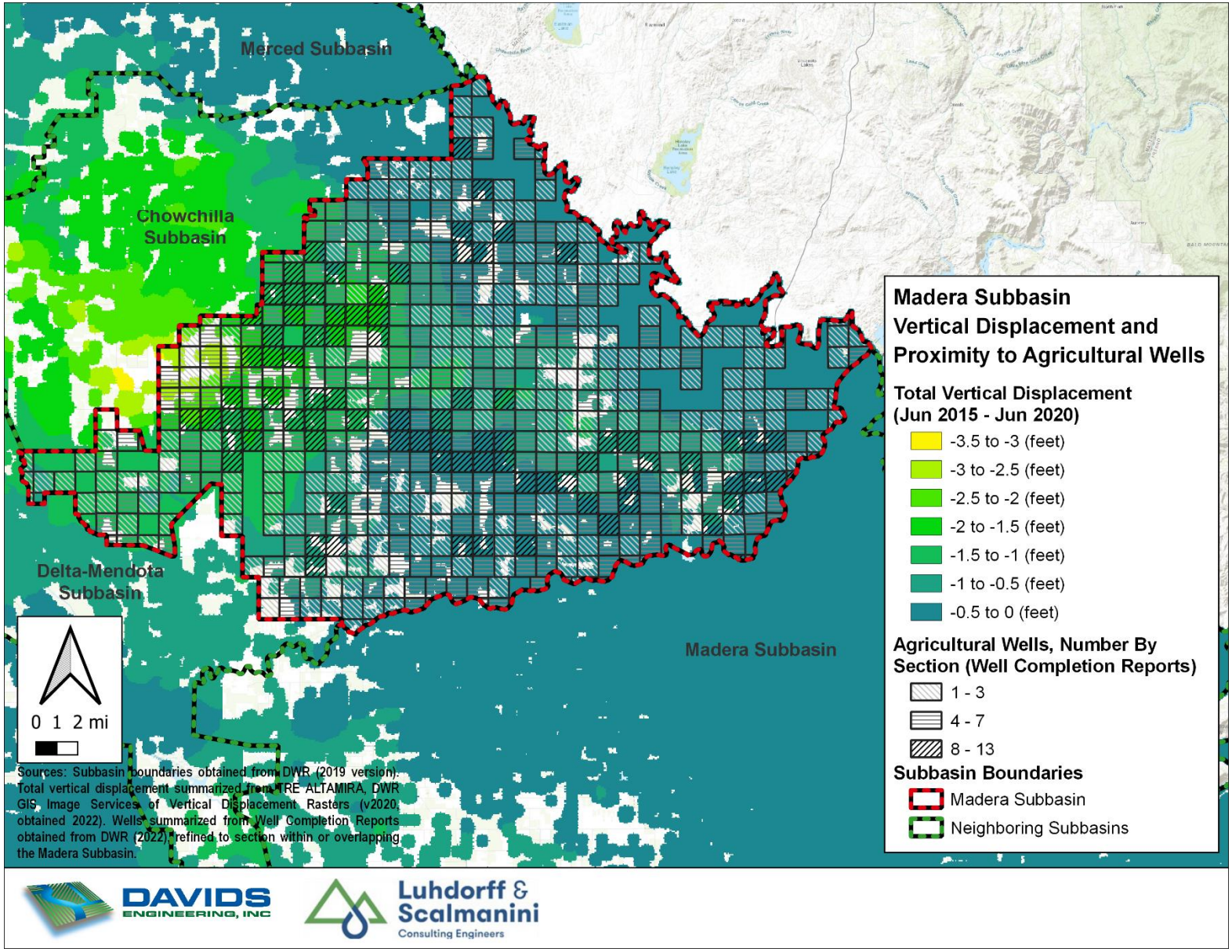


Figure 7. Vertical Displacement (June 2015 – June 2020) and Proximity to Agricultural Wells.

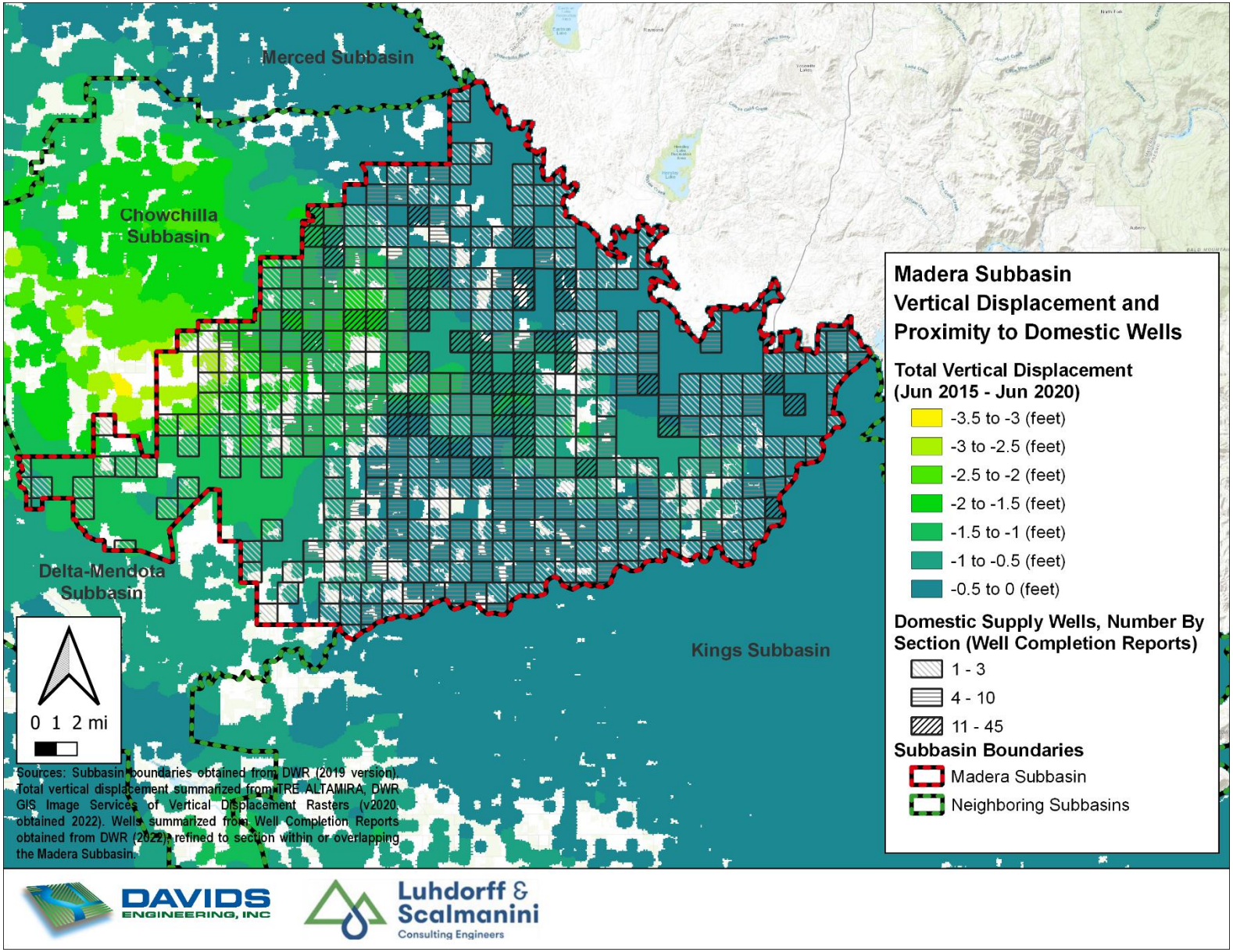


Figure 8. Vertical Displacement (June 2015 – June 2020) and Proximity to Domestic Wells.

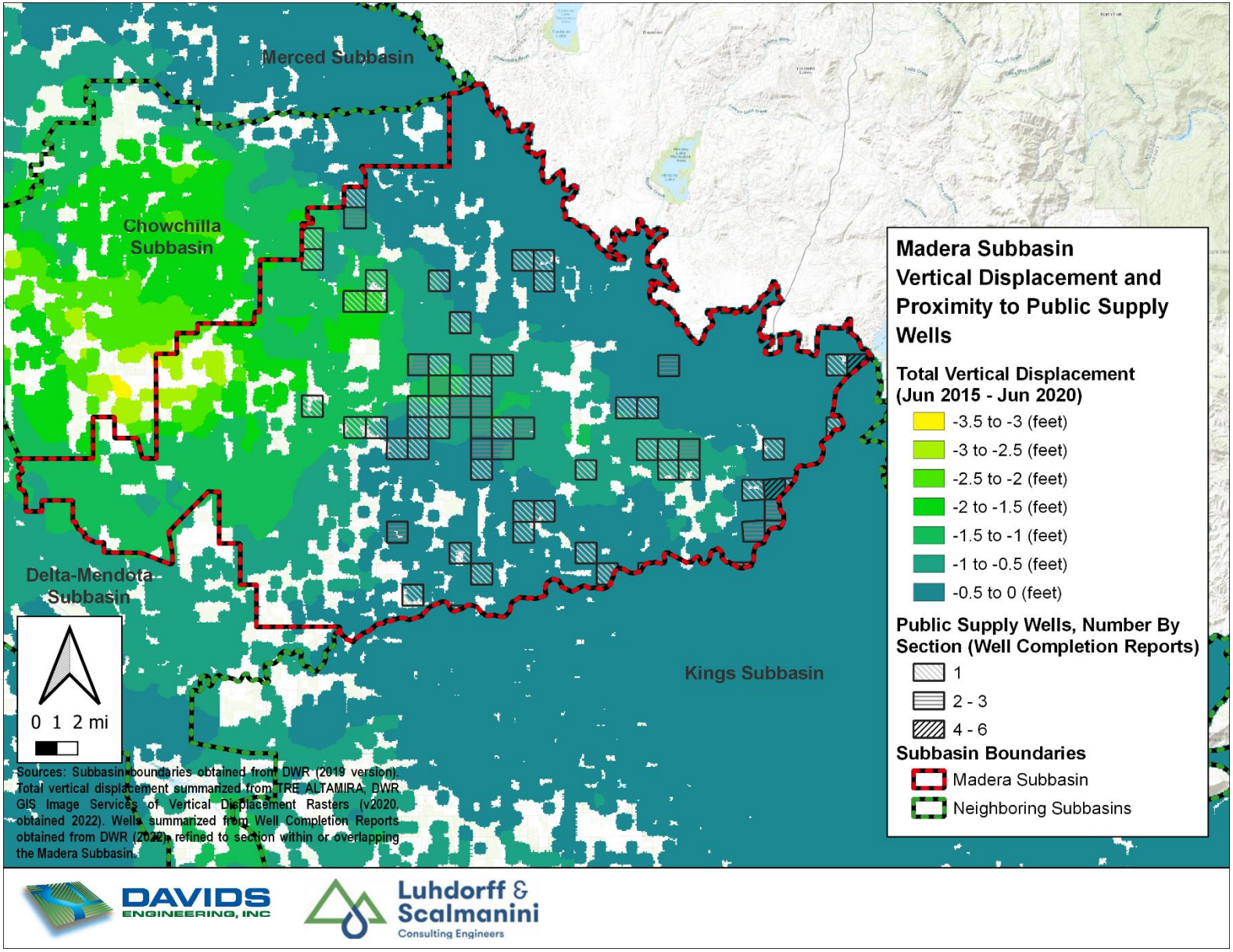


Figure 9. Vertical Displacement (June 2015 – June 2020) and Proximity to Public Supply Wells.

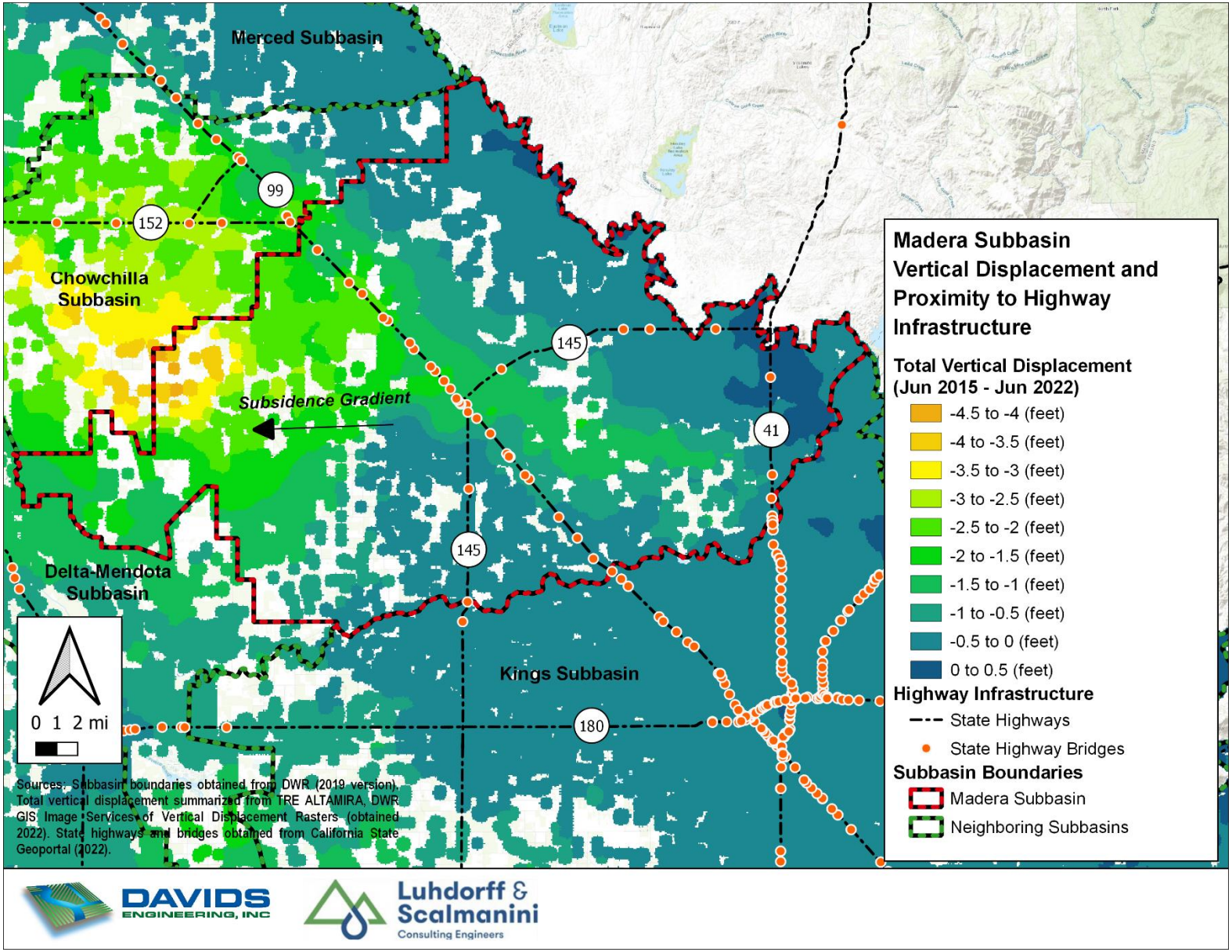


Figure 10. Vertical Displacement (June 2015 – June 2022) and Proximity to Highway Infrastructure.

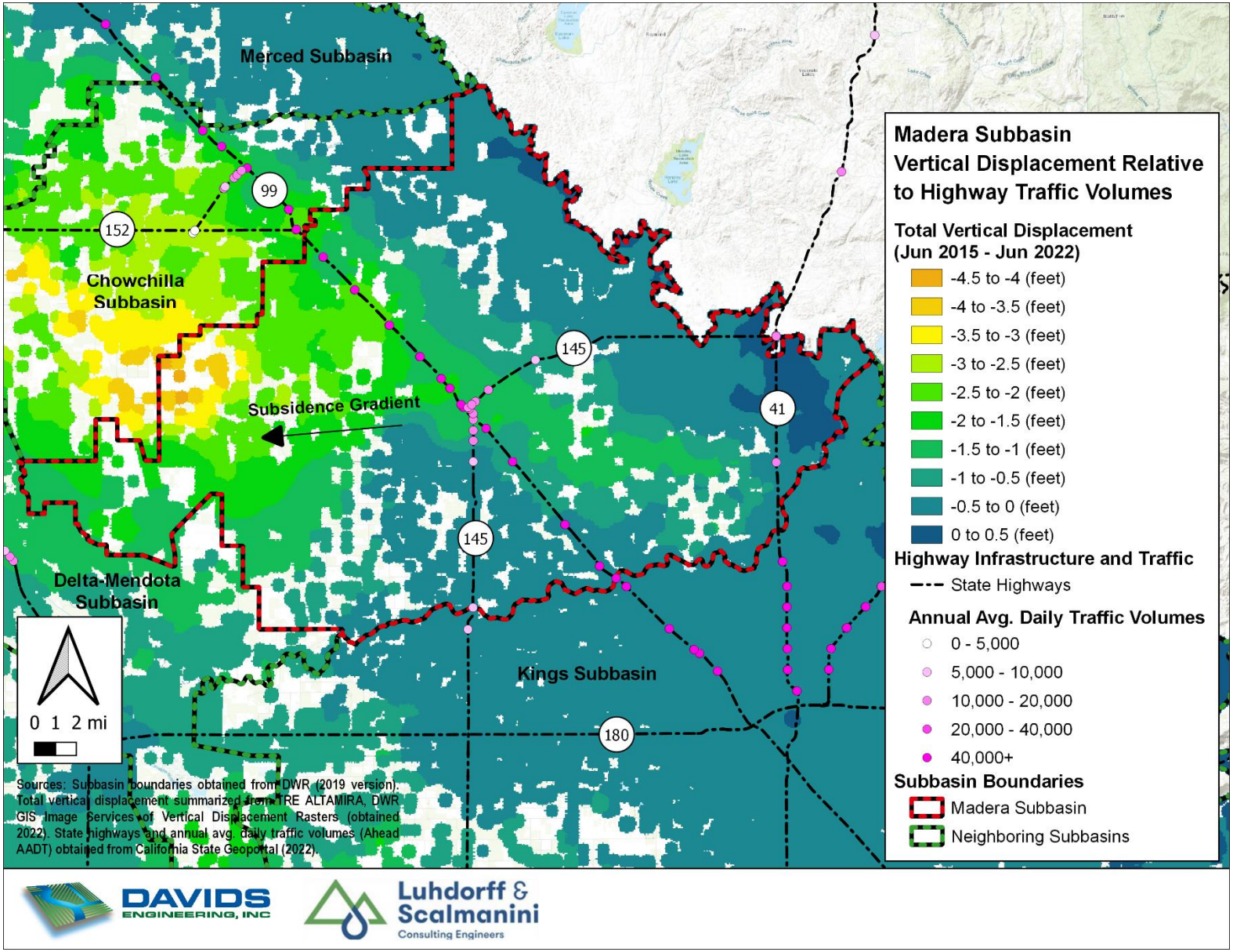


Figure 11. Vertical Displacement (June 2015 – June 2022) Relative to Highway Traffic Volumes.

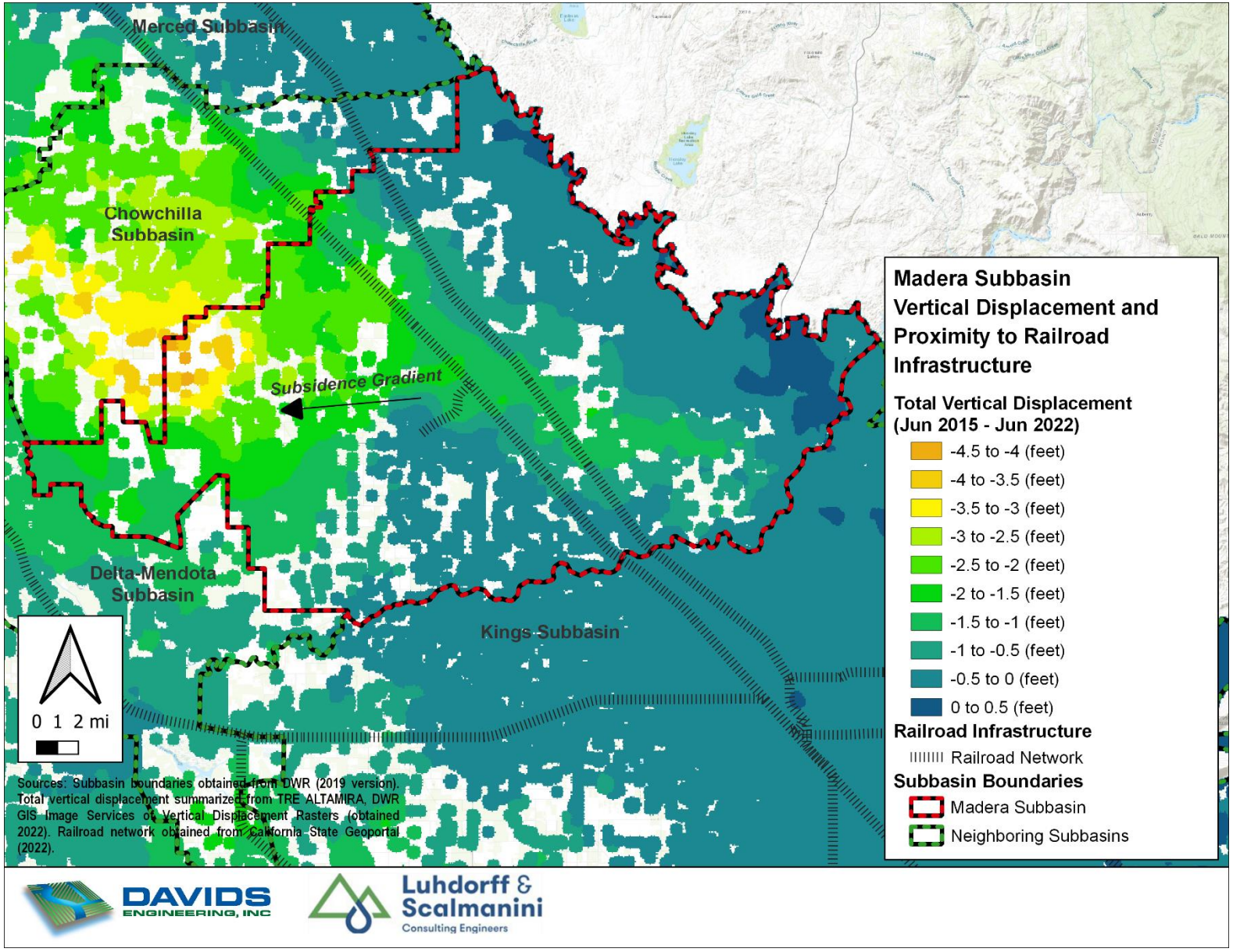


Figure 12. Vertical Displacement (June 2015 – June 2022) and Proximity to Railroad Infrastructure.

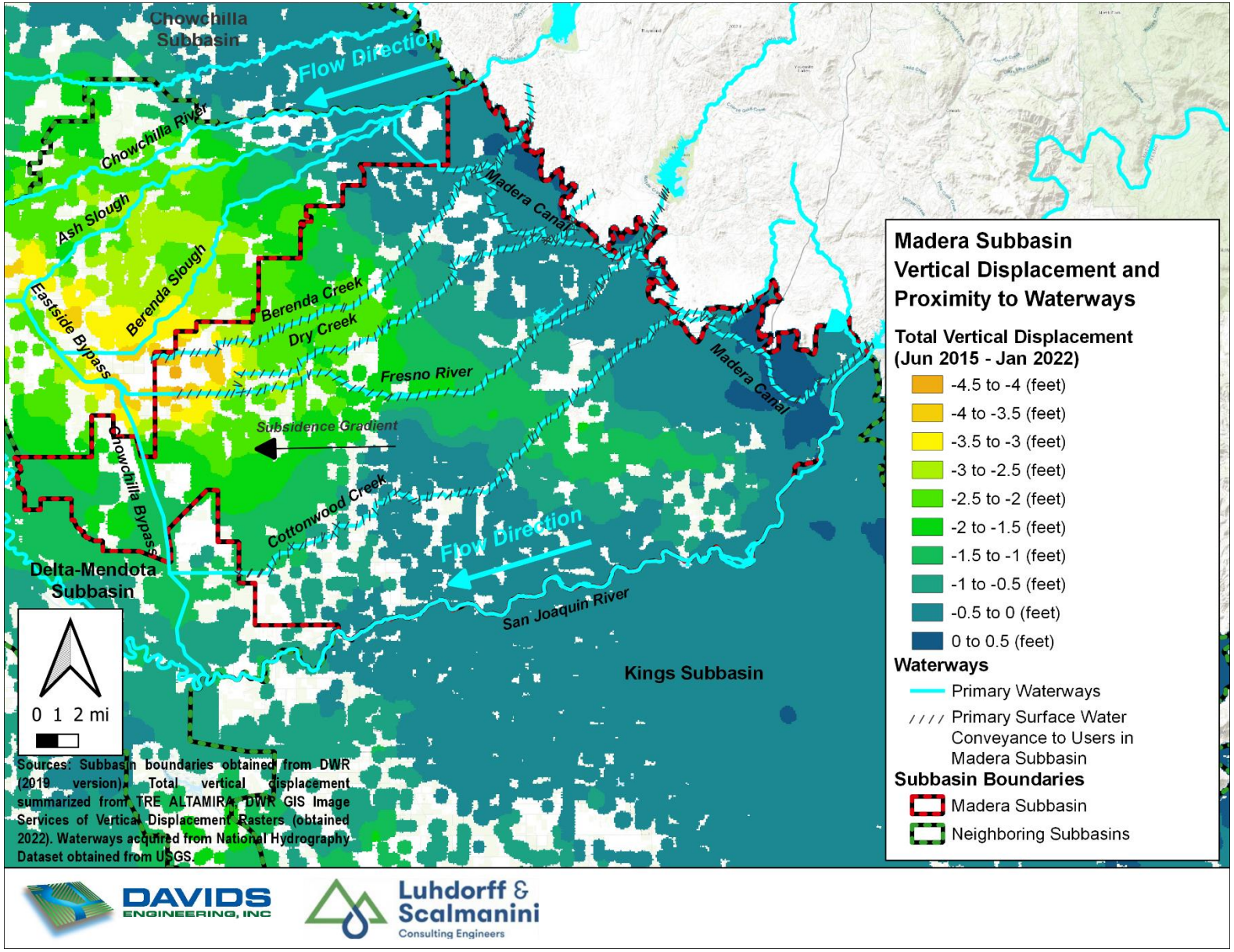


Figure 13. Vertical Displacement (June 2015 – June 2022) and Proximity to Waterways and Surface Water Conveyance Infrastructure.

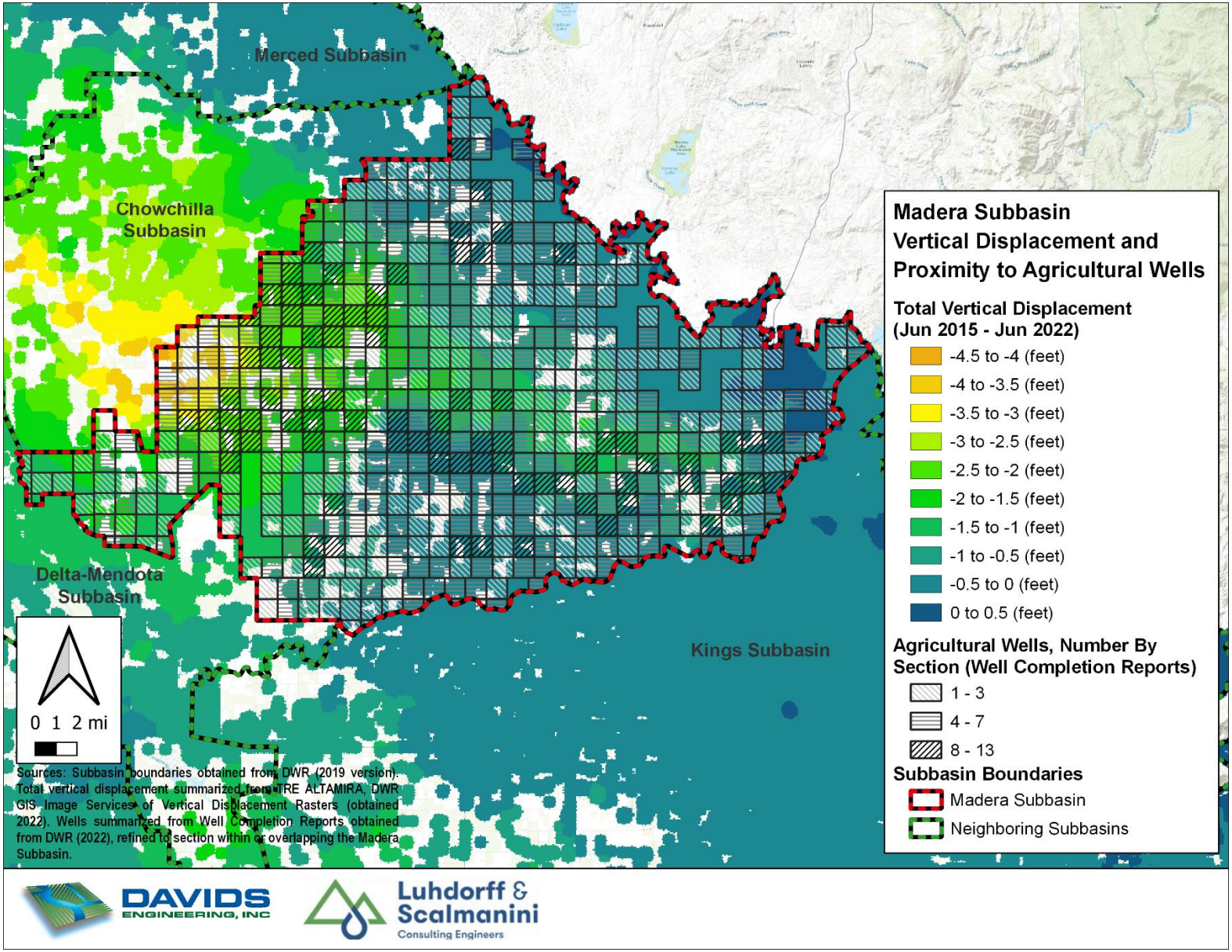


Figure 14. Vertical Displacement (June 2015 - June 2022) and Proximity to Agricultural Wells.

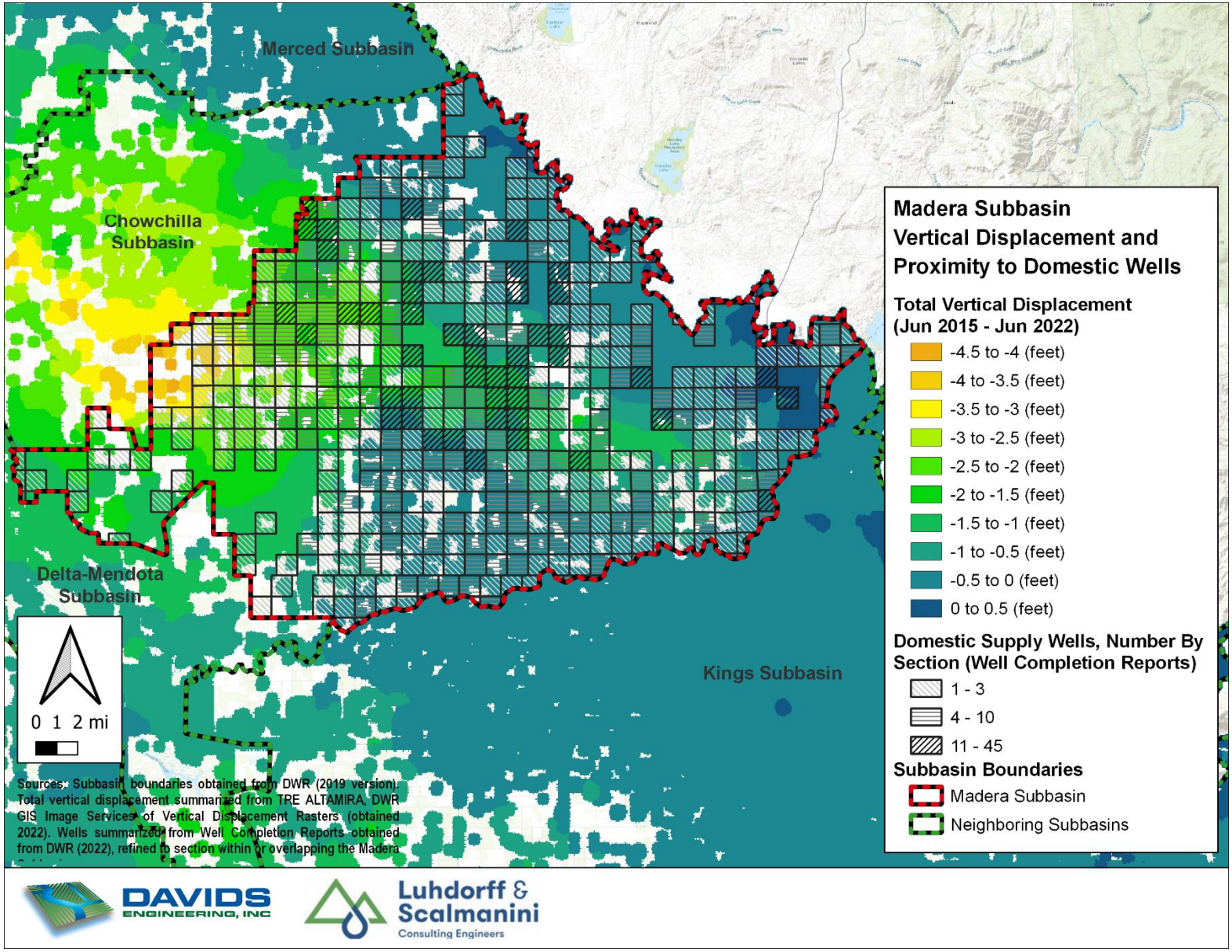


Figure 15. Vertical Displacement (June 2015 - June 2022) and Proximity to Domestic Wells.

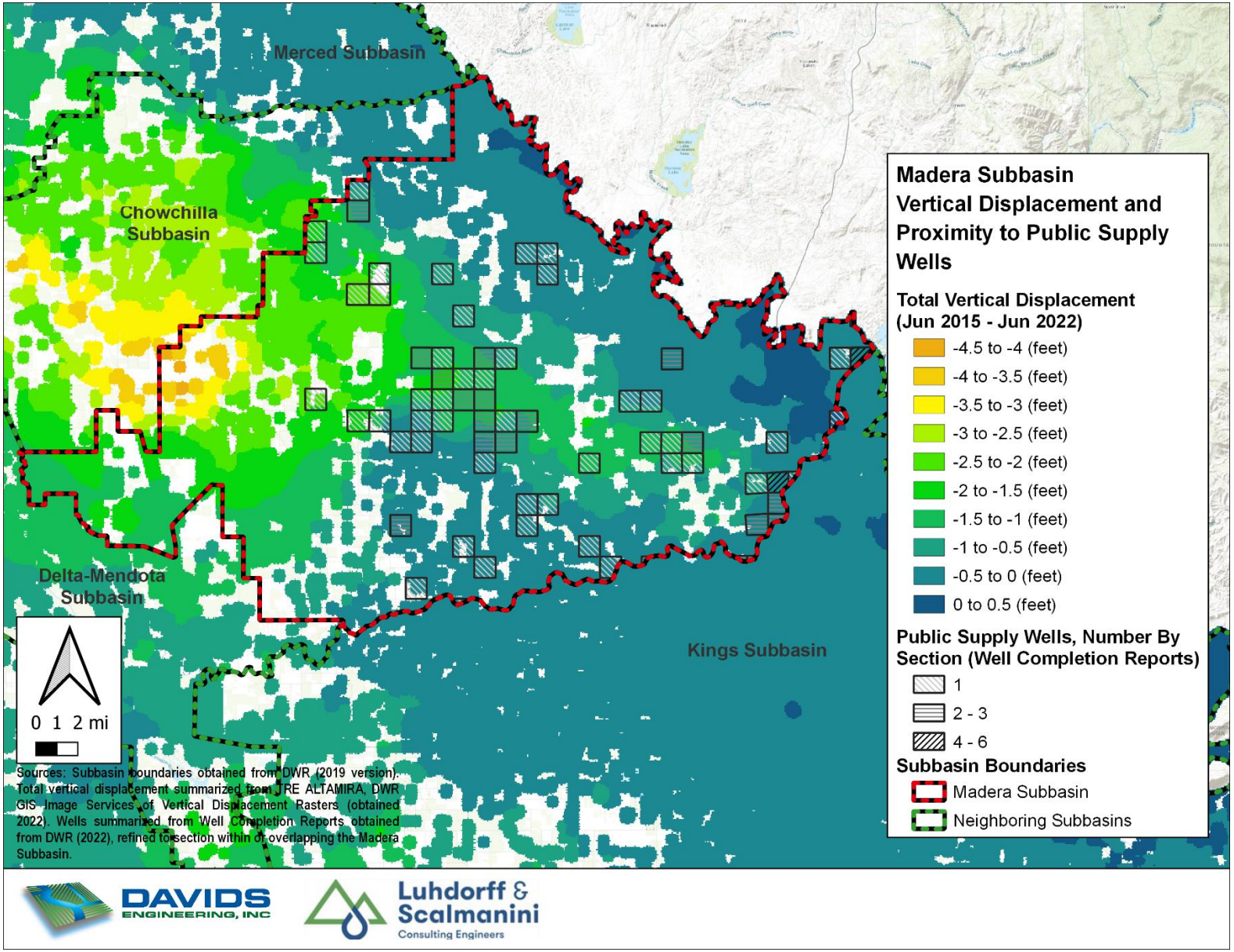


Figure 16. Vertical Displacement (June 2015 - June 2022) and Proximity to Public Supply Wells.

Figure 1 Study Area

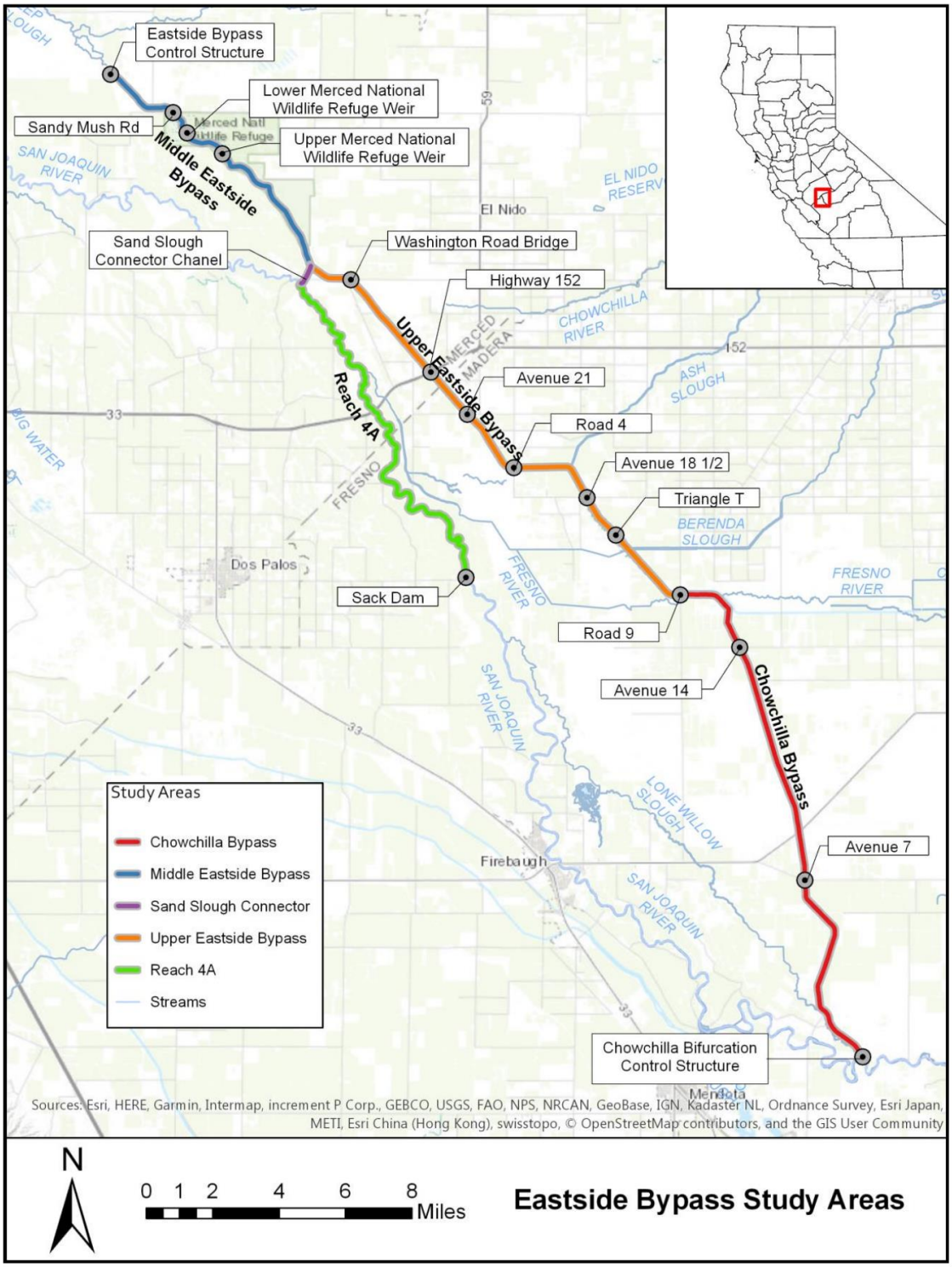


Figure 17. DWR Analysis Study Area, from "Evaluation of the Effect of Subsidence on Flow Capacity in the Chowchilla and Eastside Bypasses, and Reach 4A of the San Joaquin River" (DWR, 2018). A section of the Chowchilla Bypass flows through the eastern reach of the Madera Subbasin.

Table 1. DWR Analysis Results, from "Evaluation of the Effect of Subsidence on Flow Capacity in the Chowchilla and Eastside Bypasses, and Reach 4A of the San Joaquin River" (DWR, 2018). A portion of the Chowchilla Bypass flows through the eastern reach of the Madera Subbasin.

Table 3 Estimated Flow Capacity in Reach 4A and the Chowchilla and Eastside Bypasses based on Freeboard Criteria (in cfs)

Channel Segment	Flood Design Flow[a]	2008[b]	2011[b]	2016	2026
Chowchilla Bypass					
Bifurcation Structure to Fresno River	5,500	>5,500	>5,500	>5,500	>5,500
Eastside Bypass					
Fresno River to Berenda Slough	10,000	>10,000	>10,000	>10,000	>10,000
Berenda Slough to Ash Slough	12,000	>12,000	>12,000	>12,000	>12,000
Ash Slough to Sand Slough	17,500	9,500[c] – 12,500	7,500[c] – 11,500	5,700[c] – 9,500	3,400[c] - 7,500
Sand Slough to Mariposa Bypass[d]	16,500	16,000	14,500	12,500	9,800
San Joaquin River					
Reach 4A	4,500	ND	ND	3,700[e] – 4,300	2,500[e] – 3,800
Sand Slough Connector Channel	ND	ND	ND	2,100[e] – > 4,500	0[e] – > 4,500

Notes: cfs = cubic feet per second, ND = not determined as part of this study

[a] Referenced from the Lower San Joaquin River Flood Control Project Operation and Maintenance Manual.

[b] Results obtained from a previous study done by DWR in 2013.

[c] Reduced capacity assumes contribution of 4,500 cfs from Reach 4A of the San Joaquin River (creating backwater conditions).

[d] Capacity assumes diversions into the Mariposa Bypass based on the O&M Manual operating rules.

[e] Reduced capacity assumes contribution of 12,000 cfs through the Bypass Channel (creating backwater conditions).

APPENDIX 3.H. SUBSIDENCE DATA GAPS WORKPLAN

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Revised March 2023
Amended January 2025

GSP Team:

Davids Engineering, Inc. (Revised GSP Team)
Luhdorff & Scalmanini (Revised GSP Team)
ERA Economics
Stillwater Sciences and
California State University, Sacramento

Luhdorff & Scalmanini
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: October 4, 2024 Project No. 24-1-010

TO: Madera Subbasin Joint GSP GSAs

FROM: LSCE and DE

SUBJECT: Madera Subbasin Joint GSP - Land Subsidence Draft Workplan

Introduction and Background

Some areas of the Madera Subbasin (Subbasin) have experienced recent land subsidence, as documented in the Madera Subbasin Joint GSAs Groundwater Sustainability Plans (GSP) covering the Subbasin. The Joint GSP covers the largest fraction of the Subbasin and documents recent and historical land subsidence throughout the entire Subbasin. Much of the historical land subsidence in the Subbasin is believed to be caused by declining groundwater levels or piezometric head within the Lower Aquifer, mainly from areas below the Corcoran Clay[1], and associated release of water from fine-grained sediments, ultimately resulting in compaction of these fine-grained sediments. In other areas of the San Joaquin Valley with long-term historical monitoring of both land subsidence and groundwater levels, land subsidence has been correlated with declining groundwater levels in the Lower Aquifer. Furthermore, considerable lag time between declining groundwater levels and land subsidence has been observed in other areas of the San Joaquin Valley.

Within the Subbasin, limited long-term data are available for land subsidence, including data to evaluate potential relationships between land subsidence and groundwater levels. As a result, there are gaps in the understanding of mechanisms and conditions related to land subsidence in the Subbasin, especially as it relates to how historical groundwater level decline may continue to cause ongoing residual land subsidence in the Subbasin, even as groundwater levels stabilize or rise in the future, as is planned for in the revised GSPs for the Subbasin.

The Joint GSP establishes sustainable management criteria (SMC) for land subsidence with consideration of DWR review and input received in the initial GSP consultation letter. The revised SMC for subsidence are all established as rates of subsidence, measured from subsidence benchmarks and continuous GPS stations, with consideration for the total rate of subsidence. Additional characterization of land

[1] The Corcoran Clay (E-Clay of the Tulare Formation) is a laterally extensive and thick layer of clay present across large areas of the Subbasin and functions as a confining layer hydraulically separating the Upper Aquifer from the Lower Aquifer, where it exists.

subsidence conditions – including the relationship between groundwater levels and land subsidence and evaluation of mechanisms for mitigating future land subsidence are important for ensuring that the GSAs successfully achieve the Subbasin sustainability goal. This Workplan is intended to provide additional field data and technical analyses as input to facilitate implementation of projects and management actions (PMAs) and better characterizing land subsidence for future updates to the.

The Workplan outlines future efforts intended to address data gaps identified in the Joint GSP through enhanced monitoring and improving understanding of relationships between groundwater conditions and land subsidence in the Subbasin. The workplan also includes tasks to further evaluate sustainable management criteria (SMC) for land subsidence and support development of a coordinated approach to implementation of PMAs presented in the Joint GSP to address land subsidence and achieve sustainable groundwater management, as appropriate.

Information Summarized in Revised GSP

As summarized in the Joint GSP, historical documentation of land subsidence in the Subbasin indicated limited land subsidence prior to the early 1970s. More recent monitoring using remote sensing information and data collected from benchmark surveys conducted for the San Joaquin River Restoration Program (SJRRP) has shown an increase in land subsidence in parts of the Subbasin since the mid-2000s. Over the period from 2007 through 2021, cumulative vertical displacement ranged from almost zero to more than five feet, with most land subsidence during this period focused in the western part of the Subbasin (see revised GSPs and **Figure 1**). The Joint GSP highlights where greater amounts of historical subsidence have occurred and where more focused monitoring and management of groundwater is planned to track and mitigate impacts to critical infrastructure from future land subsidence.

Although there is historical monitoring of land subsidence in the Subbasin, most of this monitoring has occurred at infrequent temporal intervals and with varying spatial resolution and distribution. Historical monitoring of groundwater levels, especially to support understanding of relationships between groundwater levels and land subsidence, has also been limited in most of the Subbasin. The Joint GSP summarizes historical groundwater level and land subsidence monitoring and available data to directly compare groundwater levels and land subsidence. The available data do not indicate clear and consistent relationships between groundwater levels and land subsidence in the Subbasin, largely because of limitations in the temporal and spatial distribution of available historical monitoring data, and also because of the ongoing occurrence of residual land subsidence, which is discussed more below.

Under the Joint GSP, the GSAs will evaluate land subsidence by monitoring the vertical displacement of the land surface. The land subsidence monitoring network is comprised of elevation benchmark survey points monitored by the United States Bureau of Reclamation (USBR) as part of the SJRRP and a continuous GPS station monitored as part of the UNAVCO Plate Boundary Observatory (PBO).

Data Gaps Identified in the Joint GSP

As discussed in the Joint GSP, key aspects of land subsidence in the Subbasin that are not well understood or quantified relate to the mechanisms and conditions causing land subsidence in the Subbasin, including the relationship between land subsidence and declining groundwater levels, especially in the Lower Aquifer, within the local context of the Subbasin. Related to this is the need to collect additional field data

to better understand the portion of current and near-term future subsidence that may be related to ongoing groundwater level declines vs. residual subsidence that may be occurring even without further groundwater level declines (or even during periods of groundwater level recovery).

Robust land subsidence monitoring coupled with well-defined groundwater level monitoring will be important for tracking the different mechanisms related to land subsidence. Expansion of the land subsidence monitoring network will fill the temporal data gap noted in the Joint GSP and benefit the understanding and monitoring of potential subsidence in the Subbasin.

The Joint GSP notes the potential opportunities and benefits related to improving the understanding of relationships between groundwater levels and land subsidence from:

- Continued monitoring of existing benchmarks, including the many land subsidence benchmarks in the Subbasin that are monitored by the United States Bureau of Reclamation (USBR) as part of the SJRRP, and
- Potential establishment of additional land subsidence monitoring sites coupled with depth-specific monitoring of groundwater levels in the Upper Aquifer and also in the Lower Aquifer at key locations.

Workplan Objectives and Overview

This Workplan outlines a proposed scope of work to compile and review additional data and reports pertaining to land subsidence in the Subbasin, improve understanding of active production wells, establish or construct additional monitoring facilities, and conduct additional technical analyses. The Workplan incorporates consideration of comments and guidance provided by DWR during the initial GSP review and consultation stages. The purpose of this scope of work is to provide sufficient data and analyses to:

- Enhance monitoring and understanding of relationships between land subsidence and groundwater levels at different depths throughout the Subbasin;
- Expand the land subsidence monitoring network throughout the Subbasin (i.e., new elevation benchmark survey points);
- Improve quantification of groundwater pumping within each of the principal aquifers (e.g., Upper vs. Lower Aquifer);
- Assess the adequacy of the PMAs and sustainable management criteria (SMC) included in the Joint GSP to address undesirable results related to land subsidence in the Subbasin; and
- Provide technical analyses to support the development of approaches to managing groundwater pumping and/or enhancing recharge to mitigate additional future land subsidence through implementation of PMAs, including consideration of transitioning of groundwater pumping from the Lower Aquifer to the Upper Aquifer performed in conjunction with enhanced recharge efforts.

Scope of Work

The scope of work involved in completion of this Workplan includes six main tasks, including collection and analysis of existing data (beyond data compiled for the Joint GSP) and review of data gaps, installation of new monitoring facilities and collection of additional field data, completion of additional technical analyses, stakeholder outreach, and preparation of an updated assessment of the adequacy of the SMC

and PMAs in the revised GSPs to address land subsidence. The scope of work to implement the Workplan is described in more detail below. Implementation of the potential work set-forth herein is predicated on Groundwater Sustainability Agency (GSA) approval and allocation of the necessary funds as may be required (local funding and/or grants).

Task 1: Compile Additional Existing Data and Update Assessment of Available Data

Compile and Synthesize Supplemental Existing Data

In this task, data collected during preparation of the Joint GSP will be supplemented with other newly available data related to groundwater levels and land subsidence in the Subbasin and surrounding areas, with specific focus on the western part of the Subbasin. Available supplemental data that will be incorporated in this assessment may include the following:

- information presented in the GSPs for other subbasins and information presented in the different GSPs for the Madera Subbasin;
- new data from specific local landowners or entities previously not available for incorporation into the GSPs;
- DWR Well Completion Reports (WCRs) in key areas of the western Subbasin;
- additional data compiled by USBR for the SJRRP for areas in the Subbasin;
- additional data from coupled monitoring of groundwater levels and land subsidence at a site in the Mendota area with an extensometer, continuous GPS station, and dedicated monitoring wells;
- additional data from the United States Geological Survey (USGS) and modeling information for their study of the San Joaquin River; and
- other reports and data, including data or reports published as part of the implementation of the Subsidence Workplan planned for the Chowchilla Subbasin.

The available data will be compiled and reviewed to inform subsequent field work (Task 2) and used as inputs for technical analyses (Task 3). This task can be performed in coordination with similar efforts planned as part of implementation of the Interconnected Surface Water (ISW) Workplan proposed for the Subbasin.

AEM Data

Final data from airborne electromagnetic (AEM) surveys conducted in Spring 2022 to support additional characterization of subsurface conditions in the Subbasin and surrounding areas was made available from DWR in 2023. AEM data can provide helpful information on hydrogeologic conditions through measurements of the resistivity of subsurface materials. These surveys have the potential to improve the understanding of the configuration and composition of different subsurface materials. To the extent that AEM data were collected in the Subbasin, and specifically within the western part of the Subbasin, these data will be evaluated for their potential usefulness in helping to supplement the delineation of stratigraphy, especially within the Lower Aquifer where most of the historical and ongoing compaction is believed to occur. A quality assurance/quality control (QA/QC) analysis of the data will be conducted by

comparing AEM hydrostratigraphic interpretations to existing and new field data collected as described in this Workplan and in coordination with efforts related to implementation of the ISW Workplan developed for the Subbasin. Lithologic data from borehole logs along AEM section lines will be compared to evaluate if AEM interpretations are consistent with field data. If AEM data interpretations are found to be consistent and the resolution of stratigraphic interpretations from the AEM data are sufficient, the AEM data will be combined with field borehole lithologic data to develop refined characterization of subsurface geologic materials and stratigraphic configuration, including the depth and thickness of prominent clay layers, including the Corcoran Clay.

Task 2: Complete Additional Field Work

Enhancements to groundwater level monitoring facilities and activities, specifically within the western Subbasin and in proximity to sites with historical land subsidence monitoring (e.g., SJRRP or other subsidence benchmarks) and planned future land subsidence monitoring, are important for improving the understanding of the relationships between groundwater levels and land subsidence across the Subbasin. Developing continuous groundwater level monitoring at finer temporal scales and at different depths in key areas where land subsidence monitoring is conducted will support understanding of the relationship between groundwater levels at different depths and any associated land subsidence, and will help differentiate residual land subsidence caused by historical groundwater conditions from active land subsidence related to current and future conditions. Instrumentation of suitably-located existing wells and installation of additional dedicated monitoring wells are two approaches that will be pursued to enhance the groundwater level monitoring in key areas for relating with land subsidence. Use of existing wells provides a cost-effective approach to enhancing the groundwater monitoring program and can reduce the need for installation of new monitoring wells, which can be more costly.

Historical and current land subsidence monitoring in the Subbasin consists of periodic benchmark surveys, a continuous GPS station, and remote sensing data collection. These land subsidence monitoring techniques do not differentiate the depth interval at which land subsidence is occurring. Data from nearby land subsidence monitoring sites near Mendota conducted with a combination of extensometer readings and continuous GPS readings together with data from land subsidence monitoring across the San Joaquin Valley suggests the inelastic compaction that is leading to land subsidence is likely occurring in fine-grained materials within the Lower Aquifer. Field work to install land subsidence monitoring facilities at a key location in the Subbasin would benefit the understanding of how compaction at different depth zones (i.e., Upper and Lower Aquifer) contributes to the total land subsidence occurring in the Subbasin.

Identification and Instrumentation of Existing Wells

This task will include identifying and prioritizing existing wells in key land subsidence monitoring locations for instrumentation with automated continuous groundwater level monitoring equipment. Potential use of existing wells to enhance groundwater level monitoring in key areas of interest, especially near SJRRP land subsidence monitoring benchmarks, will be considered as the first step in efforts to improve groundwater monitoring for developing information to inform the assessment of the dynamics between groundwater levels and land subsidence. Use of existing wells for groundwater level monitoring is a cost-effective way to monitor groundwater conditions for the purpose of relating to land subsidence. This task involves working to identify existing wells with suitable well construction characteristics (e.g., well depth,

screen interval) in key areas of interest for potential instrumentation and continuous groundwater level monitoring. Existing wells of interest for instrumentation in key areas will target wells completed (screened) within the Lower Aquifer since land subsidence in the Subbasin is believed to be primarily a result of lowered groundwater levels in the Lower Aquifer. However, wells representing conditions within the Upper Aquifer will also be considered as potential opportunities to evaluate any relationships between groundwater levels in the Upper Aquifer and observed land subsidence.

Additionally, existing wells should be evaluated for inclusion in the land subsidence monitoring network. Wells that would be beneficial for inclusion in this network should be surveyed on a bi-annual basis. The identification and instrumentation of existing wells will enhance the understanding of relationships between groundwater levels and land subsidence for the purpose of evaluating land subsidence SMC. Furthermore, this work will also support enhancements to the Subbasin's RMS network (if necessary and beneficial) and other ongoing groundwater level monitoring activities used to support GSP annual reporting efforts in the future.

New Monitoring Facilities

This task will identify and install new monitoring wells and new land subsidence monitoring facilities in key areas of the Subbasin where data gaps exist. Providing robust coupled groundwater level and land subsidence monitoring is important in ensuring land subsidence metrics are appropriate and recognize the expected occurrence of some amount of residual subsidence, even if groundwater levels are stable. The presence of critical surface infrastructure in the western areas of the Subbasin also warrants enhanced monitoring of groundwater conditions in this area. Enhancements to existing land subsidence monitoring in the Subbasin also have the objective of differentiating land subsidence by depth zone, and would also benefit the understanding of relationships between groundwater levels and land subsidence. Current and continuing land subsidence monitoring being conducted by DWR using remote sensing and also as part of the SJRRP benchmark surveying provide broad spatial and temporal coverage of land subsidence, although they do not differentiate the depth where land subsidence is occurring and relationships to groundwater levels. Proposed field efforts related to addressing these objectives are described in more detail below.

New Monitoring Wells

Monitoring wells are recommended for installation at five locations based on considerations related to locations of critical infrastructure, historical land subsidence, existing SJRRP benchmark survey sites, and existing groundwater level monitoring (especially groundwater level RMS and dedicated monitoring well locations). These monitoring wells will augment existing groundwater level monitoring for enhanced monitoring of groundwater conditions in key areas of the Subbasin and to support improved understanding of the dynamics between groundwater levels and land subsidence. The five proposed locations are in areas where the greatest amount of historical land subsidence has occurred in the Subbasin. New monitoring wells will be designed to include nested monitoring wells for independent monitoring of conditions in the Upper and Lower Aquifers. The new monitoring wells are anticipated to extend to depths of approximately 700 to 800 feet and consist of three independent casing strings screened at different depths, depending on unique site conditions. Additionally, new monitoring wells should be surveyed upon installation, and on a bi-annual basis, for inclusion in the land subsidence

monitoring network. Preliminarily identified priority locations for potential new nested wells are shown in **Figure 1** along with key information considered in preliminary site identification. Final site selection will consider the outcome from review of additional data and evaluation of site suitability relating to access for construction and ongoing monitoring.

The monitoring wells are planned to be drilled using the direct rotary drilling method with sediment samples collected every ten feet and downhole geophysical logging completed over the entire depth of the boreholes. A lithologic log of the borehole will be prepared based on samples collected and results from geophysical logging under the supervision and guidance of a Professional Geologist, who will also provide recommendations regarding well construction details such as depth intervals for placement of well screen, filter pack, blank casing, and surface sanitary seal. Preliminarily, the new monitoring wells are planned to be constructed using 2-inch diameter Schedule 40 PVC materials, which will enable installation of automated groundwater level monitoring instrumentation and also provide access for groundwater quality sampling equipment. The new monitoring wells, and any existing wells instrumented as described above, will be surveyed to a consistent elevation datum. Water quality samples will be collected from the new monitoring wells for the purpose of characterizing general geochemical conditions, and they will be outfitted with pressure transducers for ongoing automated collection of groundwater level data.

New Land Subsidence Monitoring Facilities

The need and benefit of establishing new land subsidence benchmark monitoring sites for monitoring through periodic elevation surveys or alternatively by establishing sites for ongoing review of land surface elevation changes based on remote sensing InSAR data provided by DWR will be evaluated and implemented as determined appropriate. Any new land subsidence monitoring facilities would be intended to track land subsidence conditions at new monitoring well sites. The planning of any additional subsidence monitoring sites should be coordinated with other land subsidence monitoring efforts occurring in the area, including work being conducted as part of monitoring by the USGS, the California Department of Water Resources (DWR), USBR, and any other interested entities. There may be opportunities to support additional land subsidence monitoring through acquisition of grants or technical support services provided by DWR or through other avenues. The details of potential additional land subsidence monitoring sites should be developed in coordination with any cooperators and with consideration of any new data compiled and evaluated as part of implementation of this Workplan.

Inventory of Production Wells

Desktop Well Inventory

Documentation of active production wells in the western Subbasin is important for accurately assessing and planning groundwater management activities as they relate to mitigating land subsidence. Achieving groundwater sustainability in the Subbasin, especially in relation to land subsidence, involves ensuring that groundwater extractions do not cause chronic lowering of groundwater levels, especially in the Lower Aquifer. Accurately documenting the locations and construction characteristics of active production wells in the western areas of the Subbasin will provide important information for ensuring appropriate management actions are developed and implemented to address this issue. A desktop evaluation of available information on active production wells in the western Subbasin will seek to identify likely active

production wells and their construction characteristics, especially as they relate to screened interval and zone of production. The desktop well inventory will utilize data from WCRs, well permits, or other sources and will outline appropriate field work activities to refine information developed through the desktop inventory. To the extent possible, this task will coordinate with work being conducted for the ISW Workplan and will build on previous evaluations performed during the initial development and later revision of the GSPs and the domestic well inventory completed as part of a Proposition 68 grant project for the Subbasin along with ongoing mapping of wells conducted by the GSAs.

Field Survey of Active Production Wells

The desktop inventory of active production wells in the western Subbasin will provide the basis for outlining field work efforts to refine or confirm the information developed from the desktop inventory. The surveying of active production wells in the western Subbasin is anticipated to include targeted efforts through utilizing outreach and field reconnaissance. The field survey will likely focus on areas with higher well densities and/or greater levels of uncertainty relating to existing well status and construction characteristics as informed by evaluation of available data and results from the desktop inventory. The field survey may include focused review of aerial photographs, personal communication with landowners, field visits or other field reconnaissance activities, and other approaches to refine information developed from the desktop inventory.

Task 3: Technical Analyses

In this task, technical analyses will be conducted to synthesize the available information on dynamics between groundwater levels and land subsidence focused on the western Subbasin by evaluating fluctuations in groundwater levels and land subsidence and by evaluating relationships between groundwater pumping and land subsidence. This task will be completed in coordination with and utilizing new information from compilation of additional available data (Task 1) and field work related to additional monitoring and characterization of groundwater conditions and land subsidence (Task 2). Data from nearby land subsidence monitoring sites near Mendota conducted with a combination of extensometer readings and continuous GPS readings will be incorporated in technical analyses together with interpretations from land subsidence monitoring across the San Joaquin Valley highlighting relationships between inelastic compaction and land subsidence related to lowering of water levels and piezometric head in fine-grained materials within the Lower Aquifer.

Field and monitoring data will be evaluated relative to the relationship between groundwater levels in both the Upper and Lower Aquifers and land subsidence and consideration of ongoing residual land subsidence. Available information suggests that the lack of clear and consistent relationships between groundwater levels and land subsidence may be partly a result of the continued residual land subsidence resulting from historical conditions. Analyses presented in the Revised GSPs based on the limited available historical data suggest that there is limited correlation between shorter-term groundwater level changes and land subsidence, although historical groundwater conditions and the persistence of conditions over longer periods may be the most important drivers related to land subsidence.

Technical analyses will also include conducting refinements to existing available information on the mapped extent and thickness of the Corcoran Clay and other clay layers. This task will involve review of

new lithologic information collected through construction of new monitoring wells, including new wells installed at key land subsidence monitoring sites as described in Task 2, and also wells constructed for the ISW Workplan and for other the Subbasin monitoring efforts conducted through Proposition 1 and Proposition 68 grant projects. The ability to incorporate any data developed from the AEM surveys conducted by DWR in the Subbasin will also be considered in these refinements.

Task 4: Stakeholder Outreach and Interbasin Coordination

Implementation of the Workplan should involve outreach and coordination with key stakeholders and interested parties. This would include communication with stakeholders associated with critical infrastructure in and around the Subbasin. Outreach efforts should focus on efforts related to the need and benefit from additional groundwater level or land subsidence monitoring and prioritization of efforts to expand monitoring. An additional objective of outreach efforts includes coordination related to the understanding of critical land subsidence thresholds related to damage to infrastructure or other adverse impacts to infrastructure. Furthermore, outreach efforts may also benefit considerations related to the feasibility of potential PMAs to achieve sustainability. Outreach and coordination with adjacent subbasins about land subsidence issues will be a continuing aspect of tracking of groundwater level and land subsidence conditions.

Task 5: Assess the Adequacy of Revised GSP SMC

An important outcome from efforts conducted as part of this Workplan will be an assessment of the adequacy of current land subsidence SMC and the need for any revisions to these SMCs as part of updates to the Joint GSP. The assessment will consider data and analyses developed through implementation of Tasks 1 through 4 of the Workplan and relationships between groundwater levels and land subsidence and the differentiation of residual land subsidence from new active subsidence established through that work. The continued occurrence of residual land subsidence is an important consideration related to how land subsidence SMC are established for the Subbasin, since impacts from residual land subsidence are largely unavoidable. The amount of residual land subsidence is something the Joint GSP cannot address or prevent, although the Joint GSP does outline approaches to minimize future land subsidence in an effort to avoid adverse impacts.

The review and assessment of SMC completed under this task will inform decisions on revisions to land subsidence SMC for incorporation in future updates to the Joint GSP. Future GSP updates will draw upon the most recent data and technical analyses developed through implementation of this Workplan with consideration for the complexities of the impacts of residual land subsidence resulting from historical conditions that preceded submittal or implementation of the Joint GSP. The outcomes from assessment of SMC will be summarized in deliverable documents to be prepared as part of Task 7. A deliverable document prepared after completion of all field work will include a summary of all Workplan activities.

Task 6: Technical Support for Development of a Strategy for Managing Groundwater Pumping and Recharge in the Western Subbasin

An integral aspect of achieving sustainability in the Subbasin involves mitigating future land subsidence to the extent possible, which will require management of groundwater pumping in coordination with

enhancing groundwater recharge. Task 6 of the Workplan will involve efforts to refine the understanding of existing groundwater pumping and the vertical and lateral distribution of pumping as the foundation for developing management approaches to mitigate additional land subsidence caused by pumping. These efforts will rely on data from inventorying of existing active wells in the western Subbasin through desktop review and field verification coupled with technical analyses to support groundwater management planning in the Subbasin related to reducing pumping from the Lower Aquifer with the intent to mitigate future land subsidence. Key components of this effort are described below.

Refined Analyses of Pumping Distribution in the Western Subbasin

Using information assembled through the well inventory tasks in conjunction with data related to groundwater demands derived from groundwater modeling and other water budget analyses, refinements to the assessments of the volumes and spatial distribution (laterally and vertically) of pumping in the western Subbasin will be conducted. The primary objective of this task will be to refine estimates of the amount of groundwater pumping that is occurring in the Lower Aquifer as it relates to the sustainability planning for the Subbasin. The results from this task will inform efforts related to assessing PMAs planned to achieve groundwater sustainability.

Evaluation of Scenarios for PMA Implementation to Mitigate Land Subsidence

Task 6 will include conducting evaluations of approaches and mechanisms for redistributing pumping in the western Subbasin in a manner that is consistent with sustainability goals and metrics defined in the Revised GSPs, analysis of costs and other considerations relating to the feasibility of different approaches, and assessing the timing needs associated with implementation of potential management actions. These technical analyses will consider the lateral distribution of pumping within the western Subbasin and the vertical distribution between the Upper and Lower Aquifers. A key aspect of these technical analyses will involve consideration of management approaches that recognize the existing or planned groundwater recharge efforts, which focus on enhancing recharge in the Upper Aquifer, to achieve a distribution of groundwater pumping that is consistent with sustainability objectives defined in the Revised GSPs. Numerical groundwater modeling will be used to test PMA implementation scenarios and evaluate the effectiveness of different implementation strategies for mitigating land subsidence.

Prepare a Technical Summary Document to Inform Policymaking

A technical summary document will be provided at the conclusion of this task for use by the GSAs in developing management strategies to mitigate future subsidence. This document will synthesize technical information developed through completion of the task (and information available from completion of other tasks outlined in the Workplan) relating to how much, where, and when PMAs may be appropriate to achieve necessary reductions of Lower Aquifer pumping and potential mechanisms to achieve these reductions. The goal is to provide the GSAs with a technical basis for their development of policies and a plan related to implementation of PMAs to avoid undesirable results related to land subsidence in the Subbasin. The assessment conducted under this task will consider the importance of developing a strategy that coordinates the management of groundwater pumping in conjunction with enhanced groundwater recharge efforts. The technical summary document for Task 6 will be provided as an interim deliverable

intended to support the GSA development of management policies, which may need to be implemented prior to the completion of the entire Workplan.

Task 7: Prepare a Technical Memorandum or Report

A technical memorandum (TM) or report will be prepared to document all the tasks completed as part of implementation of this Workplan. A Final TM/Report will be prepared and submitted at the time of completion of all field work outlined in the Workplan. For each of the deliverables prepared as part of Task 7, a draft TM/Report will be submitted to the GSAs (and their technical representatives) for review. Comments and suggested edits received from the GSAs will be reviewed and incorporated as appropriate into final versions of the deliverable documents. The deliverable documents will include documentation of all data compiled, field work completed, technical analyses performed, modeling results, and evaluation of the nature of relationships between groundwater levels and land subsidence, and recommended updates to the Joint GSP SMC and potential management actions to ensure sustainable groundwater management is maintained in the Subbasin. In addition, the deliverable documents will include a review and summary of any remaining data gaps and recommendations for future monitoring and assessment, as needed.

Schedule

The overall implementation of this Workplan is envisioned as a longer-term effort to develop important monitoring data and facilities for tracking and understanding groundwater conditions related to land subsidence in the Subbasin. However, several tasks are intended to support shorter-term objectives, including the development of a plan for managing groundwater pumping and recharge to mitigate subsidence. Implementation of this workplan is underway and will likely continue through 2026. The longer-term tasks, including field work involving installation of monitoring facilities, will be phased with consideration of funding and cooperation from other entities needed to support these efforts. A general planned schedule for implementation of the Workplan is outlined below in **Table 1**.

Table 1. Summary of Proposed Schedule for Implementation of the Land Subsidence Workplan		
Task No.	**Task Description**	**Task Completion Timeframe**
1	Compile Additional Existing Data and Update Assessment of Available Data	Mid 2024 - Late 2024
2	Complete Additional Field Work	Late 2024 - 2026+ (field work may be phased depending on available funding)
3	Technical Analyses	Mid 2024 - Late 2025
5	Stakeholder Outreach and Interbasin Coordination	Mid 2024 - Late 2025+
6	Assess the Adequacy of Revised GSP SMC	Ongoing
7	Technical Support for Development of a Strategy for Managing Groundwater Pumping and Recharge in the Western Subbasin	Mid 2024 – Mid/Late 2025
8	Prepare a Technical Memorandum or Report	2026+ for final deliverable

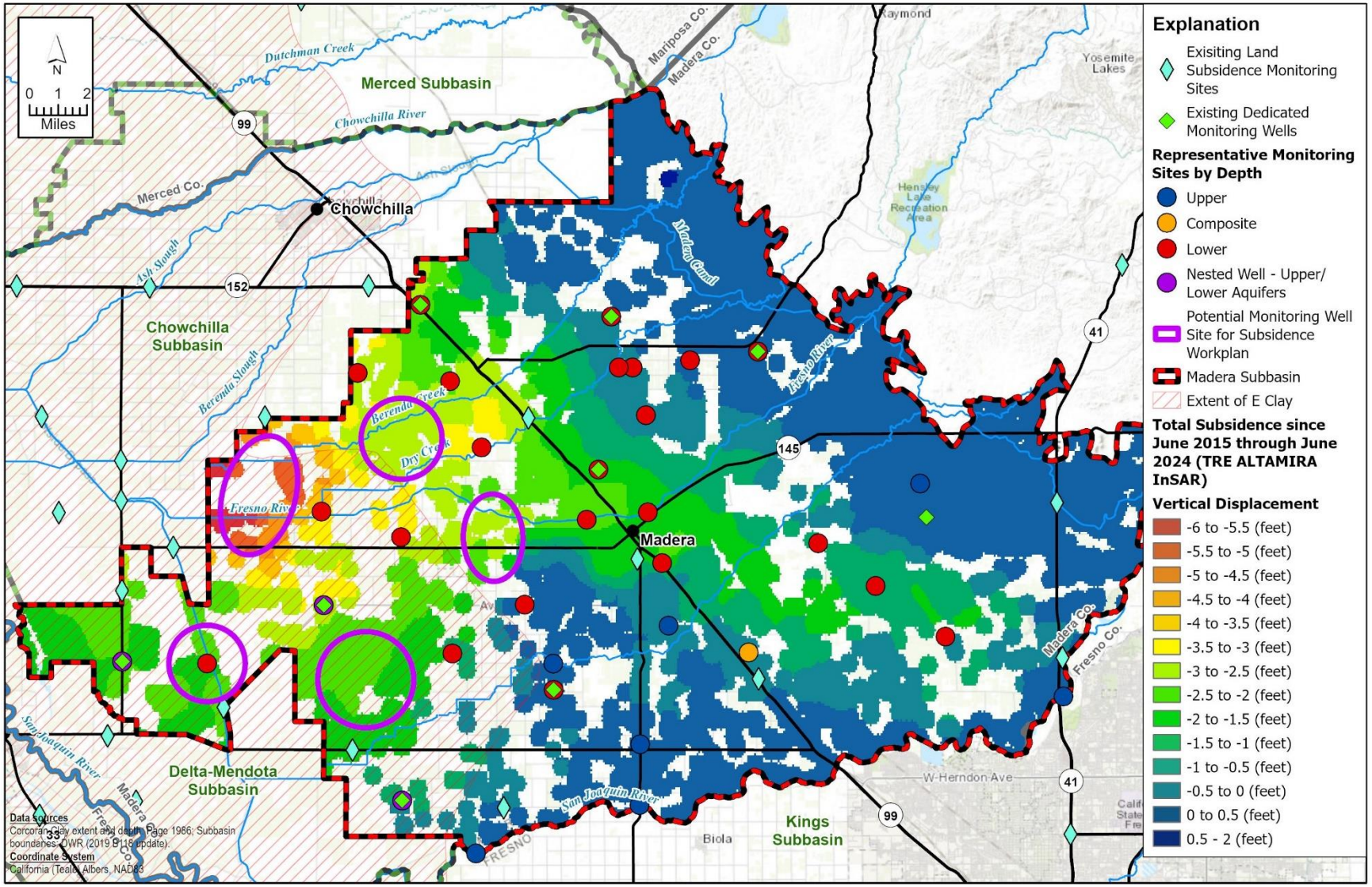


Figure 1. Potential New Nested Monitoring Well and Land Subsidence Monitoring Sites

APPENDIX 3.I. INTERCONNECTED SURFACE WATER UPDATES

3.I.a. Interconnected Surface Water Data Gaps Workplan

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Amended January 2025

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TECHNICAL MEMORANDUM

DATE: October 4, 2024 Project No. 24-1-010

TO: Madera Subbasin Joint GSP GSAs

FROM: LSCE and DE

SUBJECT: Madera Subbasin Joint GSP – Interconnected Surface Water Draft Workplan

Introduction and Background

The relationship between the San Joaquin River (SJ River) and shallow groundwater along the southern boundary of the Madera Subbasin (Subbasin) is complex and data to characterize the groundwater-surface water relationship in this area of the Subbasin are limited. Implementation of the Interconnected Surface Water Workplan (Workplan) is expected to better characterize the following conditions:

- Shallow subsurface conditions,
- The relationship between streamflow and fluctuations of shallow groundwater levels, and
- The relationship between groundwater pumping and streamflow.

Shallow monitoring wells (typically less than 30 feet deep, although some extend to greater depths) installed in areas along the SJ River as part of the San Joaquin River Restoration Program (SJRRP) provide much of the existing monitoring information related to shallow groundwater adjacent to the SJ River. These wells were initially installed to monitor for potential increases in shallow groundwater levels west of the river due to increased reservoir releases to and flows in the SJ River as part of implementing the San Joaquin River Restoration Program (SJRRP). Monitoring of these wells has been inconsistent since 2018, and part of implementation of this work plan will involve reengagement with well owners to restart monitoring of these wells. Additional field data collection and technical analyses will be completed at depths greater than 30 feet to better characterize the shallow subsurface along the SJ River along the southern boundary of the Subbasin, which is likely to improve overall understanding of the relationship between groundwater in the upper 30 feet, the zone between 30 and 100 feet below ground surface (bgs), and the remaining portion of the Upper Aquifer below a depth of 100 feet where most groundwater pumping currently occurs.

This Workplan outlines potential plans and a related scope of work to compile and review existing data and reports pertaining to the study area, construct/install new monitoring facilities, collect additional field data, and conduct additional technical analyses. The purpose of this scope of work is to provide sufficient data and analyses to:

- Make a more informed determination of whether or not ISW is present along the SJ River at the southern boundary of the Subbasin;
- Improve understanding of the relationship between streamflow and fluctuations in shallow groundwater levels;
- Improve understanding of the relationship between shallow groundwater and regional groundwater pumping from deeper zones within the Upper Aquifer that may be separated from shallowest groundwater by intervening clay layers;
- Improve understanding of the relationship between streamflow and regional groundwater pumping; and
- Provide an improved basis for setting sustainable management criteria (SMC) if it is determined that interconnected surface water conditions exist.

Previous Work Summarized in GSP

As summarized in the Revised Joint Groundwater Sustainability Plan (GSP) for the Subbasin, comparison of historical maps of unconfined groundwater elevations prepared by the Department of Water Resources (DWR) and the SJ River thalweg elevation indicated a connection between groundwater and surface water likely existed from 1958 (and likely before) through 1984. Subsequent data appeared to indicate groundwater elevations below (and disconnected from) the SJ River thalweg from 1989 to 2016. This analysis was based on contour maps of unconfined groundwater elevation prepared by DWR for the following years: Spring 1958, Spring 1962, Spring 1969, Spring 1970, Spring 1976, Spring 1984, Spring 1989 through Spring 2011 (see Revised GSP Appendix 2.E), Spring 2014 (Revised GSP Figure 2-48), and Spring 2016 (Revised GSP Figure 2-49).

Maps of depths to shallowest groundwater (including perched groundwater) for 2014 and 2016 are displayed on Revised GSP Figures 2-71 and 2-72. These maps incorporate very shallow monitoring wells (i.e., less than 50 feet deep), including SJRRP wells (many of which have well screens in the upper 30 feet). Depth to shallow groundwater maps were generated by contouring groundwater surface elevation and subtracting the contoured groundwater surface from the ground surface elevation as represented by the United States Geological Survey (USGS) National Elevation Dataset Digital Elevation Model. Some of the areas on the southern and southwestern boundaries of Madera Subbasin and along/adjacent to the San Joaquin River may be underlain by shallow clay layers that are above principal aquifers in the area. These clay layers impede the vertical movement of water within the shallowest part of the groundwater system and shallow groundwater in these areas can be considered perched/mounded as a result of the shallow clay layers, although there may be no unsaturated zone beneath them as exists in what is conventionally considered a perched groundwater condition. It is likely that seepage from the SJ River is the source of water combined with presence of shallow clay layers, which serves to maintain shallow groundwater levels at these locations. While groundwater levels in this perched zone appear to be approximately 10 to 30 feet below ground surface, water levels in the underlying regional groundwater system are typically much deeper, in excess of 50 feet below ground surface.

The SJRRP involves augmenting flow releases from Friant Dam with restoration flows. SJRRP restoration flows were initiated in October 2009 and referred to as “Interim” flows, while SJRRP “Restoration” flows were initiated in January 2014. The commencement of the SJRRP flows complicates the historical review and understanding of surface water – groundwater interaction and the potential effects (or lack thereof)

on surface water flow from groundwater pumping. A more detailed assessment of the timing and magnitude of SJRRP flow releases and relationships to shallow groundwater levels is something that should be taken into consideration.

Review of Revised GSP Figures 2-71 and 2-72 indicates that the SJ River was disconnected from the shallow perched/mounded groundwater during these time periods (Spring 2014 and Spring 2016). The 2014 and 2016 water years were considered Critical and Dry water years, respectively, according to the San Joaquin Valley Hydrologic Index (although water year 2016 was on the border of being classified as a Below Normal year). The relationship between stream seepage in the SJ River along the southern boundary of Subbasin and groundwater pumping along this portion of the SJ River within the Subbasin (i.e., within approximately 0.75 miles of the SJ River) is shown in Revised GSP Figure 2-73. The relationship between groundwater pumping from the Upper Aquifer withing five miles of the SJ River and stream seepage is shown in Revised GSP Figure 2-74. These figures suggest that at the highest end of the range of groundwater pumping (over 16,000 af/year in Revised GSP Figure 2-73 and over 200,000 AF/year in Revised GSP Figure 2-74), stream seepage increases with increased groundwater pumping. However, at the low to mid-range of groundwater pumping, the relationship is inconsistent. The highest amounts of groundwater pumping generally occur during drought periods when groundwater recharge is less, groundwater levels are lower, and groundwater would not be expected to be connected to the steam bed. In non-drought periods, when groundwater levels are higher and possibly connected to the streambed, there appears to be no strong relationship between groundwater pumping and stream seepage. This is supported by the relationship between streamflow entering the Subbasin at the upstream boundary of this river reach and stream seepage is shown in Revised GSP Figure 2-75. This figure indicates that stream seepage (i.e., infiltration) occurs during Critical, Dry, and Below Normal Years, and that the SJ River is a losing reach and likely not connected to groundwater at these times. During Above Normal and Wet Years, both stream seepage and groundwater discharge to streams occurs, indicating that the SJ River is connected to groundwater for some duration during these times. Additional evaluation of these relationships in the field and in the groundwater model will be conducted for the 2025 GSP Update.

Based on guidance received from DWR and because of limitations in available information to evaluate the interconnected nature of groundwater and surface water on the SJ River, for the Revised GSP it is assumed that conditions along the SJ River in the Subbasin constitute an ISW condition as defined by SGMA and under the GSP regulations. As a result, the Revised GSP established interim SMC for ISW until the shallow hydrogeologic conditions along the SJ River are more fully characterizing and a final determination regarding the presence/absence of ISW can be made.

In the Subbasin, an area identified as having a Groundwater Dependent Ecosystem (GDE) is located adjacent to the SJ River (see Revised GSP Figure 2-77). As noted above, the SJ River is in a net-losing condition and infiltrating surface water flows (stream seepage) likely contributes directly to the shallow groundwater system that supports the vegetation in the GDE unit (San Joaquin River GDE Unit). While it appears the source of shallow groundwater adjacent to the SJ River is stream seepage from the SJ River (when water is present) and shallow groundwater does not support surface water flows, there nevertheless is some potential for surface water flows and the shallow groundwater system supporting GDEs to be affected by regional pumping during certain times when shallow groundwater is present below the stream thalweg but within the root zone of GDEs. These GDEs/beneficial users include environmental

users such as riparian vegetation along the SJ River and the wildlife habitat and ecosystem functions it provides. The potential effects on the San Joaquin River Riparian GDE Unit are presented in Revised GSP Appendix 2.B.

As summarized above, the revised Madera Subbasin GSP established interim SMC for ISW based on DWR review/input received in the initial consultation letter. However, additional characterization of the relationship between groundwater and surface water along the SJ River is needed to provide an improved basis for making a final determination of the nature of the interconnection and appropriate SMC. Implementation of this Workplan is intended to provide additional field data and technical analyses as input to better characterizing ISW within the Subbasin.

Proposed Scope of Work

The proposed scope of work involves seven main tasks including collection and analysis of existing data (beyond data compiled for the Revised GSP), installation of new monitoring facilities and collection of additional field data, completion of additional technical analyses, and completion of an updated assessment of presence/absence of ISW with recommendations for updated SMC (if necessary). The proposed scope of work is described in more detail below. It should be noted that implementation of the potential work set-forth herein is predicated on Groundwater Sustainability Agency (GSA) approval and allocation of the necessary funds as may be required (local funding and/or grants).

Task 1. Compile Additional Existing Data/Analyses (Supplemental to GSP)

This task includes several aspects involving compiling and reviewing of supplemental existing data for incorporation in analyses and characterization of conditions relating to ISW in the Subbasin. This task can be performed in coordination with similar efforts planned as part of implementation of the Subsidence Workplan proposed for the Subbasin.

Compile and Review Supplemental Existing Data

In this task, data collected during preparation of the Revised GSP will be supplemented with other newly available data related to ISW along the SJ River including:

- information presented in GSPs for other subbasins adjacent to the SJ River in the area, such as the GSP prepared by the North Kings GSA;
- new data available from specific local landowners or entities previously not available for incorporation into the Revised GSP;
- DWR Well Completion Reports (WCRs) for the area immediately adjacent to the SJ River (i.e., a zone extending approximately one mile on either side of the River along the southern boundary of Madera Subbasin);
- additional data compiled by USBR for the SJRRP for areas in the Subbasin;
- additional data from USGS and modeling information for their study of the SJ River;
- and other reports and data that may now be available.

The available data will be compiled and reviewed to inform subsequent field work (Task 2) and as input for technical analyses (Task 3).

AEM Data

Data from airborne electromagnetic (AEM) surveys conducted in Spring 2022 to support additional characterization of subsurface conditions in the Subbasin and surrounding areas are expected to be available in 2023. AEM data can provide helpful information on hydrogeologic conditions through measurements of the resistivity of subsurface materials. These surveys have the potential to improve the understanding of the configuration and composition of different subsurface materials. To the extent that AEM data was collected in the vicinity of the southern boundary of Subbasin along the SJ River, these data will be evaluated for their potential usefulness in helping to supplement the delineation of shallow stratigraphy along the portion of SJ River that forms a portion of the southern boundary of Subbasin. One potential application of AEM that is of particular interest related to potential interconnectedness of surface water is delineation of any shallow clay layers under and adjacent to the SJ River. A quality assurance/quality control (QA/QC) analysis of the data will be conducted by comparing AEM hydrostratigraphic interpretations to existing and new field data collected as described in this Workplan. Lithologic data from borehole logs along AEM section lines will be compared to evaluate if AEM interpretations are consistent with field data. If AEM data interpretations are found to be consistent and the resolution of shallow aquifer stratigraphy from AEM data interpretations is sufficient, the AEM data will be combined with field borehole lithologic data to develop refined hydrogeologic cross-sections along the SJ River (as described below in Task 3).

Task 2. Complete Additional Field Work

Enhancements to groundwater level and surface water monitoring facilities and activities, specifically along the SJ River, are important for improving the understanding of the relationships between groundwater levels and surface water in the Subbasin. Additional field work tasks fall into two categories: instrumentation of existing wells, and new monitoring facilities and field data collection.

Instrumentation of Existing Wells

The monitoring frequency in some of the Representative Monitoring Site (RMS) wells designated for the ISW minimum thresholds (MTs) and measurable objectives (MOs) in the Revised GSP presents some limitations for characterizing groundwater level fluctuations and development of appropriate SMC. The RMS wells related to ISW include MCE RMS-9, MCW RMS-5, MID RMS-14, and MID RMS-17 (**Figure 1**). These wells do not currently have continuous and automated groundwater level monitoring with pressure transducers. This task involves working with the owners of key RMS wells to prioritize and implement instrumentation of wells with transducers for collecting continuous groundwater data. As part of this task, if the assessment and monitoring of ISW would benefit from more continuous monitoring at other RMS well locations, other RMS wells could be considered and prioritized for automated monitoring. If further characterization and evaluation of ISW during implementation of this Workplan determines there are important benefits to continuous monitoring of other (non-ISW SMC) RMS wells, and arrangements can be made with the well owner(s), additional well instrumentation could be prioritized for implementation. It is assumed for purposes of estimating the cost of implementing the Workplan that two additional RMS wells will be selected for instrumentation.

New Monitoring Facilities and Field Data Collection.

Several key data gaps related to ISW in the Subbasin include coupled monitoring of groundwater levels at different depths within the Upper Aquifer (including very shallow groundwater and more regional groundwater zone) and stream conditions of stage, flow, and channel configuration at locations adjacent to the SJ River. Construction of new monitoring facilities and additional field data collection efforts are anticipated to focus on, but are not limited to: supplemental monitoring wells; stream stage and flow; stream elevation profile/thalweg profiles; and possible aquifer or well pump testing if cooperation can be obtained from landowners with wells at suitable locations near the SJ River. Potential field efforts are described in more detail below.

Install New Monitoring Wells

Monitoring wells are recommended for installation at four locations near the SJ River to augment existing groundwater level monitoring to understand dynamics between surface water conditions in the SJ River, groundwater conditions at very shallow depths where there is greater potential for interconnection between groundwater and surface water, and groundwater conditions in the regional groundwater system where groundwater is extracted by wells for irrigation and other uses. Three locations will target sites near existing SJRRP monitoring wells MCE RMS-9, MCW RMS-5, and MID RMS-17, which are approximately 30 feet deep; the new monitoring wells at these three locations will be screened slightly deeper in a coarse-grained zone between depths of 50 to 90 feet below ground surface (bgs). In addition, one new location will be selected for installation of a nested monitoring well: one screened in the upper 30 feet and one screened at depths between 50 and 90 feet. Preliminarily identified locations for potential new nested wells are shown in **Figure 1**, pending the outcome from review of additional data and evaluation of site suitability relating to access for construction and ongoing monitoring. Target well locations may also include consideration of proximity to existing production wells that might be used in evaluating shallow groundwater level responses to pumping from deeper zones.

The monitoring wells are planned to be drilled using the hollow-stem auger drilling method with split spoon core sediment samples collected every five feet. A lithologic log of the borehole will be prepared based on samples collected and under the supervision and guidance of a Professional Geologist, who will also provide recommendations regarding well construction details such as depth intervals for placement of well screen, filter pack, blank casing, and surface sanitary seal. Preliminarily, the new monitoring wells are planned to be constructed using 2-inch diameter Schedule 40 PVC materials, which will enable installation of automated groundwater level monitoring instrumentation and also provide access for groundwater quality sampling equipment. The new monitoring wells and existing RMS wells listed above will be surveyed to a consistent elevation datum to ensure there are no recent changes in groundwater surface or reference point elevations related to any recent subsidence that may have occurred in the area. Water quality samples will be collected from the new monitoring wells, and they will be outfitted with pressure transducers for ongoing automated collection of groundwater level data.

Install Stream Stage Recording Device(s)

Accurate assessment of dynamics related to surface water-groundwater interaction requires detailed information on river stage for relating to groundwater levels. There is currently a number of active stream

stage monitoring locations along the SJ River within the Madera Subbasin (**Figure 1**), including a number that are in close proximity to the sites preliminarily recommended for installation of additional monitoring wells. Installation of stream stage recorders are recommended at several additional locations corresponding to the locations of nested monitoring wells described in this Workplan (assuming permission/access can be obtained) and where existing stream gages are not sufficient for characterizing surface water conditions. Various options for instrumentation should be considered for these stage monitoring sites, but options include constructing the stream stage recorders from small-diameter (1- or 2-inch) PVC slotted pipe, which could be secured to the riverbank and extended into the low flow channel to enable the pipe to remain submerged during low-flow conditions and also provide access to monitoring instrumentation during higher flow conditions. A transducer would be installed in the PVC pipe for automated collection of river stage at all flow conditions. The river stage recorders will be coupled with a staff gage for periodic manual readings of stage to ensure accuracy of all data collected through automated instrumentation. The staff gage and stream stage recorder will be surveyed to the same elevation datum as the new monitoring wells.

Complete Stream Profile Surveys

Stream channel elevation profiles will improve characterization of the SJ River channel elevation and shape, which relates to potential for interconnectivity between surface water and groundwater when compared with groundwater levels. To better characterize the potential surface water-groundwater interconnectivity along the SJ River, stream channel elevation profiles perpendicular to the river channel orientation will be obtained at key locations through surveying, using the same elevation datum used for the monitoring wells and river stage recorders. The stream channel profiles will be conducted near each of the four new nested monitoring well locations and will extend perpendicularly from the new/existing monitoring well locations on the east side of the river and across the SJ River to the opposite riverbank (and possibly to any existing nearby monitoring wells on the west side of the river). The stream channel surveys should be conducted at a time of low flow (or no flow) in the river in an effort to accurately survey as much of the streambed as possible.

Complete Aquifer Testing

One of the key aspects related to ISW that is not well characterized in the areas along the SJ River includes understanding of how groundwater pumping from the regional aquifer may influence groundwater levels in the very shallow part of the groundwater system (and in turn surface water), especially in areas where the movement of water between the shallow part of the groundwater and the deeper regional groundwater system may be impeded to a great degree by the presence of clay layers. Aquifer testing conducted through pumping of existing production wells while monitoring conditions in the shallow part of the groundwater system and in the nearby SJ River would help understand the cross-communication between different depth zones of the groundwater system and potential communication between shallow groundwater and streamflow. One of the goals of the proposed aquifer testing is to evaluate how clay layers located between the top of the pumping well screen and bottom of the streambed do or do not impede a connection between groundwater pumping and streamflow. If cooperation can be obtained with one or more landowners having a suitable production well near the SJ River in Madera Subbasin, one or more pumping tests will be performed to evaluate pumping effects on shallow groundwater levels and

streamflow. A suitable production well for this testing would be screened in the Upper Aquifer at a location sufficiently close to the SJ River and to adjacent shallow monitoring wells to potentially have an effect on streamflow and shallow groundwater levels in close proximity to the River within the planned pumping duration (if there is a connection between groundwater and surface water). The timing of the test will also be important with considerations being given to performing the test at a time with higher shallow groundwater elevations (to maximize chances of having a connection between streamflow and shallow groundwater levels) while having a lower range of stream discharge (to maximize opportunity to see effects on streamflow).

If cooperation with existing production well owners cannot be obtained, consideration will be given to implementing "passive" aquifer testing. This type of testing would involve conducting continuous groundwater level monitoring in proximity to a production well to observe whether influences from normal pumping cycles can be discerned in nearby shallow groundwater and surface water. In this type of testing there will be no controlled/coordinated start and stop of pumping or attempts to maintain a consistent pumping rate, but rather the well would be operated in accordance with normal use without any coordinated pumping period.

Complete GDE Evaluations

As part of GSP implementation, evaluation of groundwater-dependent ecosystems (GDEs) within the subbasin are planned periodically. These evaluations will include reconnaissance-level biological surveys and biological monitoring to evaluate potential beneficial or adverse effects on GDEs that may be related to changes in future groundwater conditions during the implementation and sustainability periods. Results of these GDE evaluations will be summarized and presented in subsequent Annual Reports.

Task 3. Technical Analyses

In coordination with and utilizing new information from compilation of additional available data and field work related to additional monitoring and characterization of surface and subsurface conditions related to the potential for interconnectivity between groundwater and surface water, technical analyses involving construction of detailed hydrogeologic cross sections along the SJ River, evaluation of fluctuations in shallow groundwater levels and river stage/flow, and evaluating relationships between groundwater pumping and streamflow are also planned to synthesize the available information and groundwater-surface water dynamics along the River.

Hydrogeologic cross-sections will be constructed using geologic/lithologic logs, geophysical logs, and AEM data relating to the stratigraphy within the Upper Aquifer, with particular focus on the upper 100 feet where there is potential for interconnectivity between groundwater and surface water. These cross-sections will include the most recent available data on groundwater levels, stream thalweg elevation (stream profiles conducted for this Workplan and available LiDAR data), and stream stage in conjunction with subsurface stratigraphy. The specific locations and orientation of the cross-sections will depend on where available data exist, including new data collected through Tasks 1 and 2, but are expected to include cross-sections oriented both parallel to and perpendicular to the SJ River. The perpendicular cross-sections will focus on locations aligned with new monitoring well locations.

Field data will be evaluated relative to the dynamic relationship between surface water and groundwater levels within the Upper Aquifer (in both the shallow and deeper zones of the Upper Aquifer). Available information indicates these dynamics vary over time and space depending on climatic/hydrologic conditions within a year (seasonal fluctuations) and from year to year (variations from wet years to dry years). Analyses presented in the Revised GSP based on the limited available historical data suggest that stream seepage (i.e., infiltration) occurs during Critical, Dry, and Below Normal Years, and that the SJ River is a losing reach and likely not connected to groundwater at these times. During Above Normal and Wet Years, both stream seepage and groundwater discharge to streams occurs, indicating that the SJ River is connected to groundwater for some duration during these times.

These additional technical analyses will focus on providing further assessment of the surface water-groundwater dynamics along four key profiles perpendicular to the river (at new monitoring well locations) where the SJ River forms the boundary of Madera Subbasin to improve understanding of groundwater conditions in relation to surface water.

Task 4. Outreach

Implementation of the Workplan will involve outreach and coordination with key stakeholders and interested parties. A key outreach effort is needed to restart consistent monitoring of SJRRP wells along the SJ River selected as RMS wells in the GSP. Additional outreach efforts will focus on efforts related to the need and benefit from additional groundwater level or surface water monitoring and prioritization of efforts to expand monitoring. In particular, there will be outreach and coordination with the adjacent Kings Subbasin, which is expected to be performing similar efforts related to ISW. In addition, it is anticipated there will be outreach to various entities that are likely to have interest in Madera Subbasin efforts related to ISW, including National Marina Fisheries Service (NMFS), United States Bureau of Reclamation (USBR), and The Nature Conservancy (TNC). The various outreach efforts may also benefit considerations related to the feasibility of potential PMAs to achieve sustainability.

Task 5. Groundwater Modeling

The groundwater model developed for the GSP (MCSim) was updated and recalibrated as part of the 5first plan amendment to the Joint GSP. This updated modeling will be used to further evaluate ISW conditions, both historically as well as current and expected future conditions, with the objective of characterizing groundwater-surface water interaction at a broader spatial scale within the southern part of the Subbasin. The groundwater model will be used to assist in evaluation of the potential for ISW to be present along the SJ River, and to further evaluate the potential for connection between regional groundwater pumping and surface water flows. Additional modeling will occur following the release of DWR's planned guidance document on ISW in order to comply with best management practices for this sustainability indicator. These analyses will directly support the evaluation and determination of appropriate SMC related to ISW (as described in the Revised GSP) under Task 6.

Task 6. Assessment of Presence of Interconnected Surface Water and Possible Revisions to SMC

The ultimate outcome from efforts conducted as part of this Workplan will be an assessment and (if needed) establishment of appropriate SMC related to ISW. In conducting this assessment, the data and analyses developed through implementation of Tasks 1 through 5 of the Workplan will be used to evaluate whether ISW exists along the southern boundary of Madera Subbasin and if there is need to include SMC for ISW in a Revised GSP for the Madera Subbasin. This analysis will result in potential refinements or modifications to interim SMC established in the Revised GSP, if determined appropriate.

Establishing final SMC for ISW will draw upon the guidance to be released by DWR and the most recent data and technical analyses developed through implementation of this Workplan with consideration for the complexities of the dynamic relationship between groundwater and surface water along the SJ River in the Subbasin under conditions prior to and after initiation of the SJRRP.

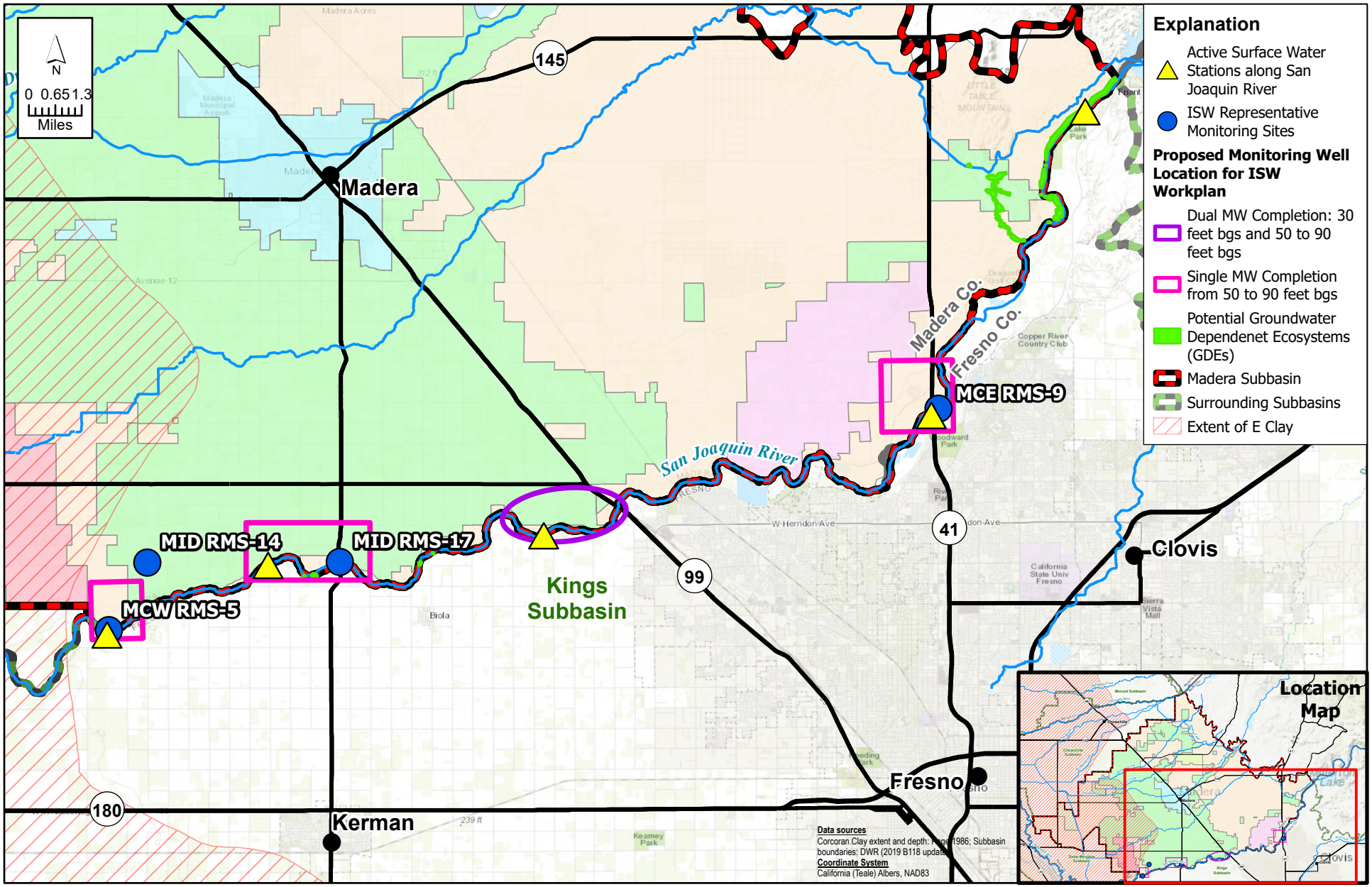
Task 7. Prepare a Technical Memorandum or Report

A technical memorandum (TM) or report will be prepared to document all the tasks completed as part of implementation of the ISW Workplan. A Draft TM/Report will be submitted for review by the GSAs (and their technical representatives). Comments and suggested edits received from GSAs will be reviewed and incorporated as appropriate into a Final TM/Report. The Report will include documentation of all data compiled, field work completed, technical analyses performed, modeling results, and evaluation of the nature of groundwater – surface water interactions and recommended updates to SMC. In addition, the TM/Report will include a review and summary of any remaining data gaps and recommendations for future monitoring and assessment, as needed.

Schedule

The overall implementation of this Workplan is envisioned as a longer-term effort to develop important monitoring data and facilities for tracking and understanding groundwater conditions related to ISW in the Subbasin. Task 1 and 4 are already underway with review of additional data and participation in coordination meeting with Kings Subbasin, USBR, and other relevant parties in the area. Opportunities to begin implementing the planned activities under Task 2 are being explored. The longer-term tasks, such as field work involving installation of monitoring facilities, will be phased with consideration of funding and cooperation from other entities needed to support these efforts. Additional technical analyses and modeling efforts, as described in Task 3 and 5, are dependent on the information gathered from other implementation efforts and subject to the release of DWR's guidance document on ISW. A general planned schedule for implementation of the Workplan is outlined below in **Table 1**.

Table 1. Summary of Proposed Schedule for Implementation of the Interconnected Surface Water Workplan		
Task No.	**Task Description**	**Task Completion Timeframe**
1	Compile Additional Existing Data/Analyses (Supplemental to GSP)	Mid 2023 - Mid 2025
2	Complete Additional Field Work	Late 2024 - 2026+ (field work may be phased depending on available funding)
3	Technical Analyses	Mid 2023 - Late 2025
4	Outreach	Early 2024 - Late 2025
5	Groundwater Modeling	Early 2024 - Late 2025+
6	Assessment of Presence of Interconnected Surface Water and Possible Revisions to SMC	Mid 2025 - Late 2025
7	Prepare a Technical Memorandum or Report	Mid 2025- Late 2025 for interim deliverable; 2026+ for final deliverable



X:\2022\22-020 Davids Engineering (22-1-020) - Madera Subbasin GSP DWR Consultation Letter\GIS\MAD_GSP_UPDATE\MAD_GSP_UPDATE.aprx; ISW_Workplan_Figure 1

FIGURE 1

DAVIDS ENGINEERING, INC

Luhdorff & Scalmanini Consulting Engineers

Proposed Monitoring Well Locations for Interconnected Surface Water Workplan

Madera Subbasin
Groundwater Sustainability Plan

APPENDIX 3.I. INTERCONNECTED SURFACE WATER UPDATES

3.I.b. Memorandum of Understanding Establishing an Interconnected Surface Water Working Group

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Amended January 2025

GSP Team:

Davids Engineering, Inc. (Amended GSP Team)
Luhdorff & Scalmanini (Amended GSP Team)
ERA Economics
Stillwater Sciences and
California State University, Sacramento

MEMORANDUM OF UNDERSTANDING ESTABLISHING AN INTERCONNECTED SURFACE WATER WORKING GROUP

This Memorandum of Understanding ("MOU") is entered into this ___day of _____2025 (the "Effective Date"), by and between the UNITED STATES BUREAU OF RECLAMATION ("USBR"), the FRIANT WATER AUTHORITY ("FWA"), SAN JOAQUIN RIVER RESTORATION PROGRAM RESTORATION ADMINISTRATOR ("SJRRP RA"), and the Groundwater Sustainability Agencies of the COUNTY OF MADERA ("MCGSA"), the CITY OF MADERA ("CMGSA"), the MADERA IRRIGATION DISTRICT ("MIDGSA"), the MADERA WATER DISTRICT ("MWDGSA"), the GRAVELLY FORD WATER DISTRICT ("GFWDGSA"), the ROOT CREEK WATER DISTRICT ("RCWDGSA"), the NEW STONE WATER DISTRICT ("NSWDGSA"), the MCMULLIN AREA ("MAGSA"), and the NORTH KINGS ("NKGSA"), collectively hereinafter referred to as the "Parties," and excluding USBR, FWA, and the SJRRP RA as the "GSA Parties" or singularly herein referred to as a "Party."

RECITALS

A. **WHEREAS**, groundwater and surface water resources within the Madera and Kings Subbasins of the San Joaquin Valley Groundwater Basin (DWR Bulletin 118 No. 5-22.06 and 5-22.08 respectively) ("Subbasins") are vitally important resources, in that they provide the foundation to maintain and fulfill current and future environmental, agricultural, domestic, municipal, and industrial needs, and to maintain the economic viability, prosperity, and sustainable management of the Subbasins; and

B. **WHEREAS**, agricultural production in Madera and Fresno Counties supports one of the world's foremost agricultural areas and plays a major role in the economy of Madera and Fresno Counties; and

C. **WHEREAS**, in 2014 the California Legislature passed a statewide framework for sustainable groundwater management, known as the Sustainable Groundwater Management Act, California Water Code § 10720-10737.8 ("SGMA"), pursuant to Senate Bill 1168, Senate Bill 1319, and Assembly Bill 1739, which was approved by the Governor on September 16, 2014, and went into effect on January 1, 2015; and

D. **WHEREAS**, the Subbasins have been designated by the California Department of Water Resources ("DWR") as high-priority subbasins in a condition of critical groundwater overdraft and subject to the requirements of SGMA; and

E. **WHEREAS**, SGMA requires that all medium and high priority groundwater basins in California be managed by a Groundwater Sustainability Agency ("GSA"), or multiple GSAs, and that such management be implemented pursuant to an approved Groundwater Sustainability Plan ("GSP"), or multiple GSPs; and

F. **WHEREAS**, the nine GSAs that are party to this MOU are as set-forth above and depicted in Exhibit A; and

G. **WHEREAS**, GSPs for the Subbasins have been approved by DWR; and

H. **WHEREAS**, the Subbasins are currently working on their first statutorily required Plan Amendments and/or Periodic Evaluations that are due to DWR in January 2025; and

I. **WHEREAS**, the Parties have been meeting in good faith to discuss interconnected surface water-groundwater ("ISW") since late 2023; and

J. **WHEREAS**, USBR, FWA, and the SJRRP RA have interest in groundwater sustainability in the Kings Subbasin and Madera Subbasin as memorialized in comment letters uploaded to the SGMA portal dated May 14, 2020, December 16, 2020, September 30, 2022, and June 2, 2023; and

K. **WHEREAS**, the Parties recognize that ISW and any resulting losses/gains in stream flow are impacted by numerous variables, many outside the control of the GSAs that are parties to this MOU; and

L. **WHEREAS**, FWA is a public agency formed by its members to, among other things, preserve and protect the rights and benefits of its members in the Central Valley Project; and

M. **WHEREAS**, both USBR and FWA member agencies are signatories to the Stipulation of Settlement dated September 13, 2006 with the plaintiff's coalition led by Natural Resources Defense Council (collectively referred to as the "Settling Parties"); and

N. **WHEREAS**, both USBR and FWA have certain obligations to maintain and protect flows in the San Joaquin River under the Stipulation of Settlement dated September 13, 2006; those flows are protected pursuant to California Water Code § 1707, and

O. **WHEREAS**, the SJRRP RA is jointly selected by the Natural Resources Defense Council and FWA and provides recommendations to the Secretary of Interior and the Governor of California regarding specific elements of the Stipulation of Settlement dated September 13, 2006 related to the San Joaquin River Restoration Program's Restoration Goal, and

P. **WHEREAS**, Madera Irrigation District is a signatory to the Stipulation of Settlement dated September 13, 2006; and

Q. **WHEREAS**, the GSAs set-forth herein are not signatories to the Stipulation of Settlement dated September 13, 2006; and

R. **WHEREAS**, nothing in this MOU changes, supersedes, or otherwise alters USBR and FWA obligations under the Stipulation of Settlement dated September 13, 2006; and

S. **WHEREAS**, the Parties agree that nothing in this MOU changes, supersedes, or otherwise alters any existing agreements and/or rights held by the GSAs, their underlying landowners, FWA, and/or USBR; and

T. **WHEREAS**, SGMA identifies undesirable results as the effects caused by groundwater conditions occurring throughout a subbasin related to six sustainability indicators, including depletions of interconnected surface water-groundwater that have significant and unreasonable adverse impacts on beneficial uses and users of the surface water; and

U. **WHEREAS**, DWR has released three papers on ISW and depletions of ISW aimed at providing GSAs and the California water resources community with informational resources to help identify, understand, and communicate the nature, occurrence, and estimation of depletions of ISW; and

V. **WHEREAS**, SGMA requires GSAs to develop and implement GSPs to avoid undesirable results and mitigate overdraft within 20 years; and

W. **WHEREAS**, the GSA Parties acknowledge that they cannot control groundwater conditions not caused by groundwater management activities outside of the geographical boundaries for the GSAs set-forth herein; and

X. **WHEREAS**, the Parties, individually, have undertaken efforts to analyze ISW along the San Joaquin River from Millerton to the Mendota Pool as depicted in Exhibit B; and

Y. **WHEREAS**, subject to the conditions below, the Parties desire to collaboratively study, review, and analyze ISW and any associated impacts (including during the implementation period of the GSPs) in a cooperative and coordinated manner.

Z. **NOW, THEREFORE**, in consideration of the mutual promises, covenants and conditions contained herein and these Recitals, which are hereby incorporated herein by this reference, the Parties agree to collectively analyze ISW along the San Joaquin River reaches depicted in Exhibit B for depletions of ISW as follows:

AGREEMENT

1. **WORK PLAN IMPLEMENTATION AND COLLABORATION.** The Parties agree to work collaboratively on potential refinement and subsequent implementation of separate but coordinated ISW Work Plans for the Subbasins.

2. **DATA SHARING.** The Parties agree that individual work products have been prepared and/or will be prepared as it relates to ISW along the San Joaquin River reaches depicted in Exhibit B. Such information may include, but is not limited to, groundwater levels, flow measurements, river channel bottom elevations, San Joaquin River stage data, estimate of river losses, analysis of existing Holding Contracts, and analysis of riparian diversions. To the extent provided by law and regulations and subject to any privileges directing non-release, the Parties agree to share such information as has been or will be prepared with each other.

3. **TECHNICAL COMMITTEE**. The Parties shall establish a Technical Committee ("Committee") that will assume various coordination and management responsibilities, potentially including, but not limited to:

    a. Potential refinements to the ISW Work Plans (described in Section 1)
    b. Facilitating data sharing and collaboration among the Parties
    c. Coordinating implementation of the Work Plans among the Parties (described in Section 1).

    The Committee shall include at least one technical staff representative from each of the Parties and shall meet no less than quarterly.

4. **TERM**. The Parties agree that the term of this MOU shall continue for the duration of the GSP implementation period until groundwater sustainability is achieved in the Subbasins by or before 2040 and/or until otherwise directed by the Parties. Any Party may withdraw from this MOU by providing written notice to the other Parties.

5. **RECOGNITION OF INTENT**. The Parties agree that execution of this MOU signals the mutual intent of the Partes to collaboratively work together and that such mutual intent shall be conveyed to DWR and/or the State Water Resources Control Board (SWRCB) as may be required.

6. **IN-KIND SERVICES**. Unless otherwise agreed to by the Committee and solely with respect to the GSA Parties, the Parties agree that time and resources associated with activities performed under this MOU shall be done so through in-kind services.

7. **ENVIRONMENTAL REVIEW**. The GSA Parties agree to cooperatively complete any environmental review as may be determined necessary for activities contemplated and/or planned under this MOU.

8. **NOTICES**. All notices required or permitted by the MOU shall be made in writing, and may be delivered in person (by hand or by courier) or may be sent by regular, certified, or registered mail or U.S. Postal Service Express Mail, with postage prepaid, or by facsimile transmission, or by electronic transmission (email) and shall be deemed sufficiently given if served in a manner specified in this Section 8. The addresses and addressees noted below are the Party's designated address and addressee for delivery or mailing notices.

To MCGSA:	County of Madera Stephanie Anagnoson 200 W 4th Street, 4th Floor Madera, CA 93637
To MIDGSA:	Madera Irrigation District Thomas Greci 12152 Road 28 1/4 Madera, CA 93637
To GFWDGSA:	Gravelly Ford Water District Don Roberts 18811 Road 27 Madera, CA 93638
To CMGSA:	City of Madera Keith Helmuth 428 East Yosemite Avenue Madera, CA 93638
To MWDGSA:	Madera Water District Phil Janzen 1663 N. Schnoor Street, Suite 105 Madera, CA 93637

To NSWDGSA:	New Stone Water District GSA Gabriella Lion 9500 South DeWolf Avenue Selma, CA 93662
To RCWDGSA:	Root Creek Water District Julia Berry PO Box 27950 Fresno, CA 93729
To NKGSA:	North Kings GSA Kassy Chauhan 2907 S. Maple Avenue Fresno, CA 93725
To MAGSA:	McMullin Area GSA Matt Hurley 275 S. Madera Avenue, Suite 301 Kerman, CA 93630
To USBR:	United States Bureau of Reclamation Donald E. Portz, PhD. 2800 Cottage Way, CGB-170 Sacramento, CA 95825-1898
To FWA:	Friant Water Authority Jason Phillips 854 N. Harvard Avenue Lindsay, CA 93247
To SJRRP RA:	Restoration Administrator Thomas R. Johnson 7090 Wells Avenue Loomis, CA 95650

Any Party may, by written notice to each of the other Parties, specify a different address for notice. Any notice sent by registered or certified mail, return receipt requested, shall be deemed given on the date of delivery shown on the receipt card, or if no delivery date is shown, three days after the postmark date. If sent by regular mail, the notice shall be deemed given 48 hours after it is addressed as required in this section and mailed with postage prepaid. Notices delivered by United States Express Mail or overnight courier that guarantee next day delivery shall be deemed given 24 hours after delivery to the Postal Service or overnight courier. Notices transmitted by facsimile transmission or similar means (including email) shall be deemed delivered upon telephone or similar confirmation of delivery (confirmation report from fax machine is sufficient), provided a copy is also delivered via personal delivery or mail. If notice is received after 4:00 p.m. or on a Saturday, Sunday or legal holiday, it shall be deemed received on the next business day.

9. **NO EFFECT ON RIGHTS.** Nothing in this MOU may be construed as affecting the rights of the Parties to comment on or challenge as to legal compliance under SGMA or other applicable law any provision of a GSP or management action that a GSA Party may subsequently adopt, including with respect to matters pertaining to ISW.

10. **REPRESENTATION OF SIGNATORY AUTHORITY**. All Parties to this MOU warrant and represent that they have the power and authority to enter into this MOU and the names, titles, and capacities herein stated on behalf of any entities, persons, states, or firms represented or purported to be represented by such entities, persons, states or firms and that all ~~former~~ requirements necessary or required by the state or federal law in order to enter into the MOU have been fully complied with. This MOU may be signed in counterparts, electronic or digital or otherwise, each of which will constitute an original. This MOU may only be amended or modified by a written instrument executed by all of the Parties.

11. **ADDITION OF PARTIES**. Additional parties may be added to the MOU at any time through unanimous consent of the Parties. Such consent shall not be unreasonably withheld.

IN WITNESS WHEREOF, the Parties have caused this MOU to be executed and agree to be bound by the terms herein, as of the Effective Date listed above.

County of Madera GSA

Leticia Gonzales _____ Date _____

Madera Irrigation District GSA

Thomas Greci _____ Date _____

Gravelly Ford Water District GSA

Don Roberts _____ Date _____

City of Madera GSA

Cecelia Gallegos _____ Date _____

Madera Water District GSA

Phil Janzen _____ Date _____

Root Creek Water District GSA

Julia Berry _____ Date _____

New Stone Water District GSA

Gabriella Lion _____ Date _____

McMullin Area GSA

Matt Hurley _____ Date _____

North Kings GSA

Kassy Chauhan _____ Date _____

USBR

Donald E. Portz, Ph.D. _____ Date _____

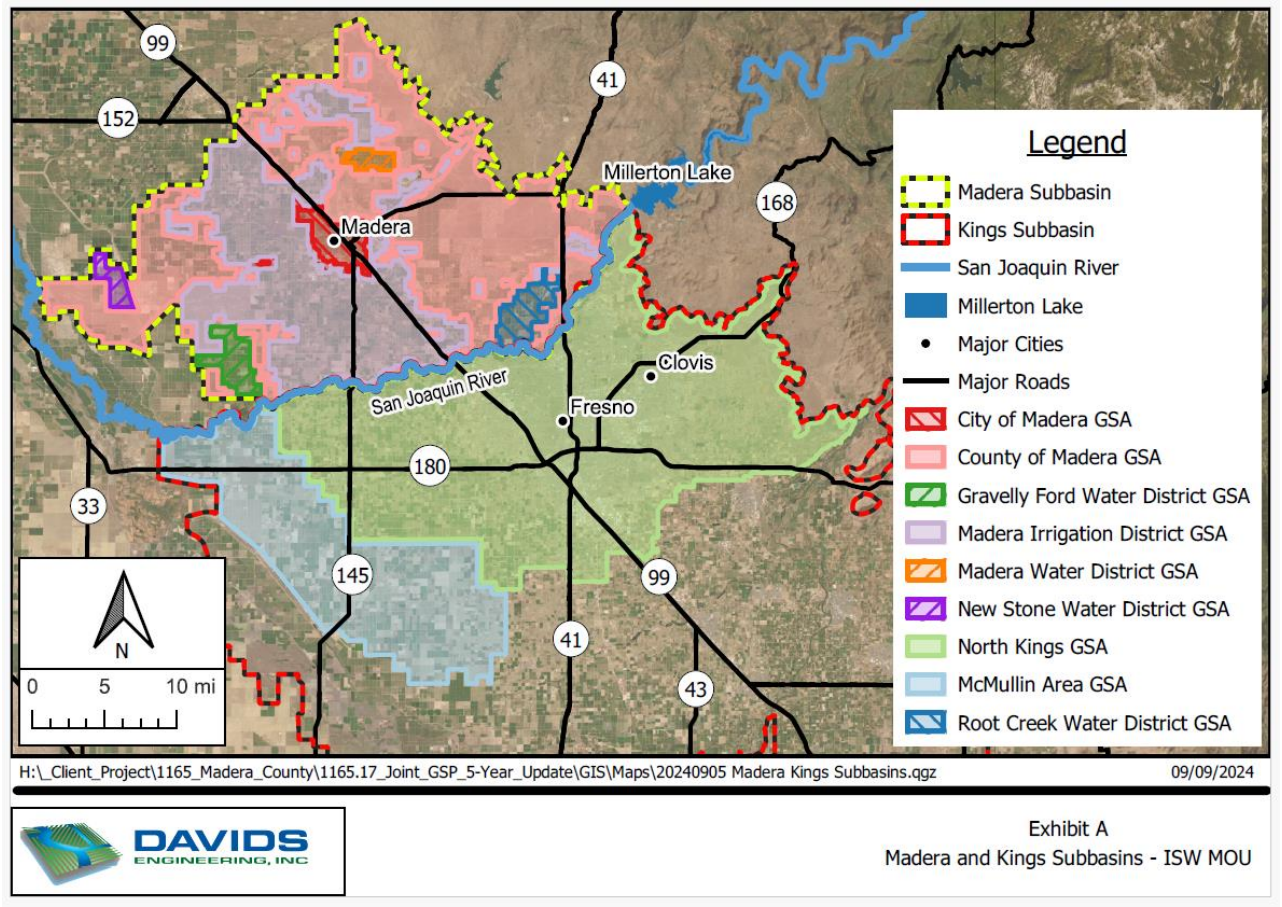
Friant Water Authority

Jason Phillips _____ Date _____

San Joaquin River Restoration Program Restoration Administrator

Thomas R. Johnson _____ Date _____

EXHIBIT A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Madera
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Fresno
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Legend
Madera Subbasin
Kings Subbasin
San Joaquin River
Millerton Lake
Major Cities
Major Roads
City of Madera GSA
County of Madera GSA
Gravelly Ford Water District GSA
Madera Irrigation District GSA
Madera Water District GSA
New Stone Water District GSA
North Kings GSA
McMullin Area GSA
Root Creek Water District GSA
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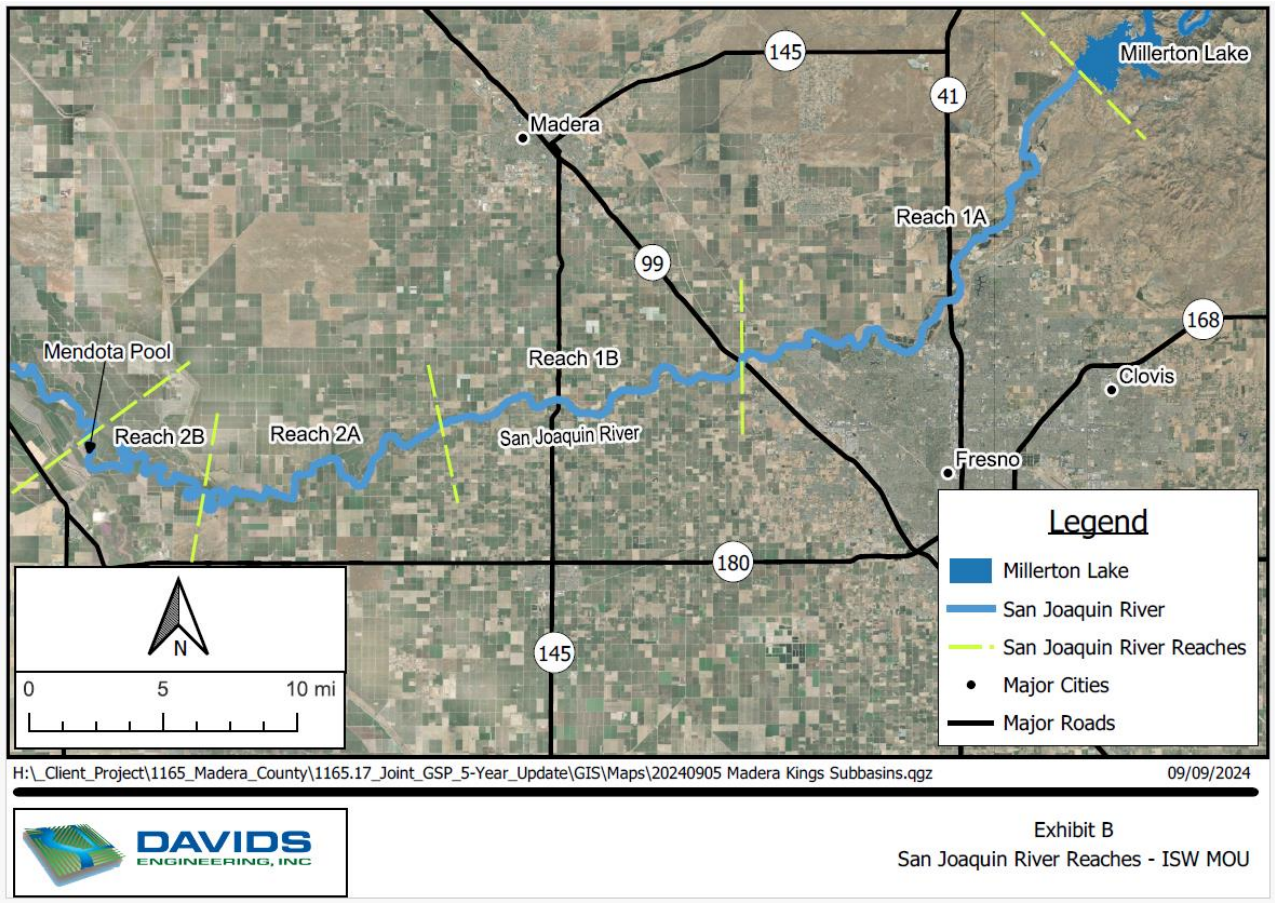
09/09/2024
DAVIDS ENGINEERING, INC
Exhibit A
Madera and Kings Subbasins - ISW MOU

EXHIBIT B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41
Madera
Reach 1A
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168
Mendota Pool
Reach 1B
Clovis
Reach 2B
Reach 2A
San Joaquin River
Fresno
180
145
N
0
5
10 mi
Legend
Millerton Lake
San Joaquin River
San Joaquin River Reaches
Major Cities
Major Roads
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DAVIDS
ENGINEERING, INC
Exhibit B
San Joaquin River Reaches - ISW MOU

APPENDIX 3.J. SUPPLEMENTAL MONITORING NETWORKS

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Amended January 2025

GSP Team:

Davids Engineering, Inc
Luhdorff & Scalmanini
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Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
09S17E25B001M	DWR	Unknown	09S/17E/25			3/6/1958	2/12/2009	85
09S17E26J001M	DWR	Unknown	09S/17E/26			3/2/1948	9/27/1974	37
09S17E32A001M	DWR	Unknown	09S/17E/32			10/7/1976	2/12/2009	41
09S17E34R	Madera-Chowchilla CASGEM Group	Irrigation	09S/17E/34	840	240-840	10/30/2015	10/17/2019	9
09S17E35J001M	DWR	Unknown	09S/17E/35			10/10/1941	12/10/1977	59
09S17E35K001M	Madera County	Irrigation	09S/17E/35	950	320-942	10/29/2015	3/30/2023	8
09S17E35L001M	DWR	Unknown	09S/17E/35			10/7/1976	3/25/2019	52
09S18E19Q001M	DWR	Unknown	09S/18E/19			12/7/1948	10/9/1957	14
09S18E28D001M	DWR	Unknown	09S/18E/28			12/7/1948	2/17/1969	31
09S18E31G001M	Madera-Chowchilla CASGEM Group	Irrigation	09S/18E/31	408	240-367	10/14/2015	10/24/2022	9
09S18E31H001M	Madera-Chowchilla CASGEM Group	Irrigation	09S/18E/31	724	105-350	10/14/2015	10/24/2022	12
09S18E31L001M	Madera-Chowchilla CASGEM Group	Irrigation	09S/18E/31	906	298-470	10/14/2015	10/24/2022	13
09S18E31M001M	Madera-Chowchilla CASGEM Group	Irrigation	09S/18E/31	680	240-400	10/14/2015	10/20/2022	13
09S18E31M002M	Madera-Chowchilla CASGEM Group	Irrigation	09S/17E/36		405-645	10/14/2015	10/24/2022	11
09S18E31M003M	Madera-Chowchilla CASGEM Group	Irrigation	09S/18E/31	880	430-840	10/14/2015	10/12/2022	10
09S18E33C001M	DWR	Unknown	09S/18E/33			12/7/1948	1/23/1987	60
09S18E33Q001M	DWR	Unknown	09S/18E/33			3/22/1949	1/23/1987	67
10S16E01E001M	DWR	Unknown	10S/16E/01			10/13/1954	2/20/2014	88
10S16E11G001M	DWR	Unknown	10S/16E/11			12/3/1959	3/3/1962	3
10S16E12K001M	DWR	Unknown	10S/16E/12			3/13/1952	2/20/2014	100
10S16E14J001M	DWR	Unknown	10S/16E/14			12/2/1937	2/20/2014	115
10S16E21J001M	DWR	Unknown	10S/16E/21			3/1/1956	2/20/2014	81
10S16E21N001M	Madera ID	Unknown	10S/16E/21	563	298-509	10/13/2015	10/16/2023	13
10S16E22A	Madera-Chowchilla CASGEM Group	Irrigation	10S/16E/22	628	305-596	10/30/2015	10/17/2019	9
10S16E22A001M	DWR	Unknown	10S/16E/22			11/14/1945	1/26/1977	47
10S16E24J001M	DWR	Unknown	10S/16E/24			10/22/1951	2/20/2014	98
10S16E25A001M	DWR	Unknown	10S/16E/25			12/10/1948	2/13/2014	102
10S16E25F003M	Madera-Chowchilla CASGEM Group	Irrigation	10S/16E/25	544	350-537	10/14/2015	10/12/2022	0
10S16E25F004M	Madera ID	Irrigation	10S/16E/25	516	260-507	10/4/1954	10/18/2023	114
10S16E25J001M	DWR	Unknown	10S/16E/25			12/10/1948	2/28/1962	14
10S16E25L001M	Madera-Chowchilla CASGEM Group	Irrigation	10S/16E/25	800	400-800	10/14/2015	10/18/2022	14
10S16E25Q001M	DWR	Unknown	10S/16E/25			12/5/1946	2/17/2011	105
10S16E26B001M	DWR	Unknown	10S/16E/26			10/21/1939	2/13/2014	116
10S16E28D001M	DWR	Unknown	10S/16E/28			3/18/1949	9/30/2009	86
10S16E33P001M	DWR	Unknown	10S/16E/33			3/18/1949	1/27/1983	62
10S16E34H001M	DWR	Unknown	10S/16E/34			10/8/1941	2/14/2014	117
10S16E35A002M	DWR	Unknown	10S/16E/35			12/10/1948	7/2/1961	17
10S16E36A001M	DWR	Unknown	10S/16E/36			3/8/1945	2/14/2014	89
10S16E36C002M	Madera-Chowchilla CASGEM Group	Other	10S/16E/36	440	360-440	10/13/2015	10/12/2022	14
10S16E36D001M	DWR	Unknown	10S/16E/36			12/8/1961	2/17/2011	75
10S16E36E001M	Madera-Chowchilla CASGEM Group	Irrigation	10S/16E/36	500		10/14/2015	10/18/2022	14
10S17E03F001M	DWR	Unknown	10S/17E/03			6/5/1957	2/14/2014	90
10S17E04E001M	DWR	Unknown	10S/17E/05			2/18/1963	2/17/2011	68
10S17E04J001M	DWR	Unknown	10S/17E/04			3/1/1927	9/11/1979	56
10S17E05H001M	DWR	Unknown	10S/17E/05			1/10/1956	2/28/1962	13
10S17E06A001M	DWR	Unknown	10S/17E/06			2/29/1960	9/21/1981	38
10S17E09A001M	DWR	Unknown	10S/17E/09			11/16/1936	10/2/1984	79
10S17E12C001M	Madera-Chowchilla CASGEM Group	Unknown	10S/17E/12			12/7/1948	10/24/2022	107
10S17E14C001M	DWR	Unknown	10S/17E/14			3/1/1960	1/23/1980	25
10S17E17A001M	DWR	Unknown	10S/17E/17			12/8/1961	9/21/1981	37
10S17E18H001M	DWR	Unknown	10S/17E/18			11/27/1935	2/10/1964	50
10S17E21M001M	DWR	Unknown	10S/17E/21			12/3/1959	2/14/2014	86
10S17E22D001M	Madera-Chowchilla CASGEM Group	Irrigation	10S/17E/22	250	140-250	3/1/1960	2/14/2014	89
10S17E23A001M	DWR	Unknown	10S/17E/23			3/2/1948	2/17/2011	109
10S17E27E001M	DWR	Unknown	10S/17E/27			10/29/1923	2/28/1962	53
10S17E28R001M	DWR	Unknown	10S/17E/28			2/18/1963	2/10/1964	2
10S17E30B002M	DWR	Unknown	10S/17E/30			11/30/1943	2/14/2014	121
10S17E31N001M	DWR	Unknown	10S/17E/31			12/13/1948	2/14/2014	101
10S17E32J001M	DWR	Unknown	10S/17E/32			3/1/1960	2/14/1964	3
10S17E32K001M	Madera-Chowchilla CASGEM Group	Irrigation	10S/17E/32	288		10/14/2015	10/18/2022	13
10S17E32N001M	DWR	Unknown	10S/17E/32			11/2/1944	12/2/1960	28
10S17E34A002M	DWR	Unknown	10S/17E/34			2/9/1968	2/14/2014	88
10S17E34R001M	DWR	Unknown	10S/17E/34			3/1/1960	2/6/1967	7
10S17E36E001M	DWR	Unknown	10S/17E/36			3/2/1948	12/8/1961	22
10S18E08L001M	DWR	Unknown	10S/18E/08			11/28/1941	1/25/1985	84
10S18E08L002M	DWR	Unknown	10S/18E/08			2/11/1964	1/26/1987	34

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Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
10S18E09A001M	Madera-Chowchilla CASGEM Group	Irrigation	10S/18E/09	890	400-716	10/15/2015	10/13/2022	7
10S18E09B001M	DWR	Unknown	10S/18E/09			10/9/1957	2/3/2006	60
10S18E09C001M	DWR	Unknown	10S/18E/09			2/11/1964	2/14/2014	74
10S18E10K001M	Madera-Chowchilla CASGEM Group	Irrigation	10S/18E/10			2/10/1964	2/14/2014	88
10S18E12D001M	DWR	Unknown	10S/18E/12			2/10/1964	1/30/2001	66
10S18E17B001M	Madera-Chowchilla CASGEM Group	Irrigation	10S/18E/17	481	260-408	10/14/2015	10/24/2022	8
10S18E20B001M	DWR	Unknown	10S/18E/20			10/29/1920	2/16/1971	74
10S18E20G001M	DWR	Unknown	10S/18E/20			9/18/1979	9/18/1979	1
10S18E20M001M	DWR	Unknown	10S/18E/20			10/29/1920	1/7/1980	72
10S18E20M002M	DWR	Unknown	10S/18E/20			2/11/1964	1/25/1985	31
10S18E21F001M	DWR	Unknown	10S/18E/21			9/18/1979	9/18/1979	1
10S18E21G001M	Unknown	Unknown	10S/18E/21			10/15/2015	3/15/2017	4
10S18E22B001M	DWR	Unknown	10S/18E/22			2/11/1964	2/11/1964	1
10S18E27N001M	Madera ID	Unknown	10S/18E/34			2/10/1969	3/15/2017	178
10S18E27N002M	Unknown	Unknown	10S/18E/27			10/15/2015	3/15/2017	4
10S18E27R001M	DWR	Unknown	10S/18E/34			2/10/1969	2/14/2014	80
10S18E29Q001M	DWR	Unknown	10S/18E/29			2/11/1964	2/14/2014	43
10S18E31E001M	Unknown	Unknown	10S/18E/31			10/15/2015	3/15/2017	4
10S18E34K001M	Unknown	Unknown	10S/18E/34			10/15/2015	3/15/2017	4
10S18E34M001M	Unknown	Unknown	10S/18E/34			10/15/2015	3/15/2017	4
10S19E16D001M	DWR	Unknown	10S/19E/16			3/15/1950	2/14/2014	113
10S19E17H001M	Madera County	Irrigation	10S/19E/17	92	32-92	10/13/1958	3/30/2023	98
10S19E32J001M	DWR	Unknown	10S/19E/32			2/10/1964	1/25/1985	15
11S15E01A001M	DWR	Unknown	11S/15E/01			12/4/1957	10/7/1988	45
11S15E01H002M	DWR	Unknown	11S/15E/01			2/6/1980	2/13/2014	51
11S15E02C001M	DWR	Unknown	11S/15E/02			2/2/1999	10/15/2009	16
11S15E02R001M	DWR	Unknown	11S/15E/02			3/20/1959	2/14/2014	77
11S15E10J001M	DWR	Unknown	11S/15E/10			3/20/1959	2/14/2014	85
11S15E14G001M	DWR	Unknown	11S/15E/14			3/20/1959	2/1/2006	71
11S15E14R001M	DWR	Unknown	11S/15E/14			12/2/1959	2/10/1967	6
11S15E24A001M	DWR	Unknown	11S/15E/24			3/31/1942	3/5/1957	25
11S15E25A001M	DWR	Unknown	11S/15E/25			12/2/1959	2/14/2014	88
11S15E26R001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/15E/35	425	190-418	10/11/1976	10/21/2019	53
11S15E27L001M	Madera County	Other	11S/15E/27	800		10/8/2015	3/30/2023	8
11S15E30A001M	DWR	Unknown	11S/15E/30	216	174-212	2/14/1964	3/13/2019	62
11S15E31J001M	DWR	Unknown	11S/15E/31			2/14/1964	2/28/2014	56
11S15E33E001M	DWR	Unknown	11S/15E/33			10/17/1958	10/6/1977	25
11S15E33P003M	DWR	Unknown	11S/15E/33			2/24/1961	10/6/1977	22
11S15E35P001M	DWR	Unknown	11S/15E/35			3/10/1959	2/27/2014	70
11S16E01D001M	DWR	Unknown	11S/16E/01			12/17/1936	2/21/1961	36
11S16E01D002M	DWR	Unknown	11S/16E/01			12/18/1960	9/26/1980	31
11S16E01J001M	DWR	Unknown	11S/16E/01			12/8/1947	3/24/1958	14
11S16E03A001M	DWR	Unknown	11S/16E/03			10/25/1920	2/14/2014	149
11S16E03C001M	DWR	Unknown	11S/16E/03			11/12/1931	2/14/2014	136
11S16E05H001M	DWR	Unknown	11S/16E/05			10/19/1950	2/14/2014	101
11S16E06A001M	DWR	Unknown	11S/16E/06			1/24/1934	6/1/1977	156
11S16E07D001M	DWR	Unknown	11S/16E/07			3/15/1939	12/8/1961	37
11S16E08L001M	DWR	Unknown	11S/16E/08			10/8/1941	2/14/2014	118
11S16E09F001M	DWR	Unknown	11S/16E/09			10/3/1944	1/24/1980	52
11S16E10P001M	DWR	Unknown	11S/16E/10			4/1/1927	2/3/1984	91
11S16E11E001M	DWR	Unknown	11S/16E/11			4/1/1927	2/18/2014	137
11S16E12K001M	DWR	Unknown	11S/16E/12			11/9/1937	2/18/2014	125
11S16E14A001M	DWR	Unknown	11S/16E/14			12/2/1941	2/19/1963	36
11S16E14N001M	DWR	Unknown	11S/16E/14			12/5/1961	2/7/1967	4
11S16E14R001M	DWR	Unknown	11S/16E/14			2/9/1968	2/18/2014	82
11S16E15L001M	DWR	Unknown	11S/16E/15			12/4/1959	2/18/2014	85
11S16E15P001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/16E/22	800	220-800	10/13/2015	10/12/2022	12
11S16E16D001M	DWR	Unknown	11S/16E/16			3/2/1960	1/27/2006	51
11S16E16K001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/16E/16	474	204-474	10/13/2015	10/21/2022	11
11S16E17D001M	DWR	Unknown	11S/16E/17			12/4/1959	2/18/2014	82
11S16E18D001M	DWR	Unknown	11S/16E/18			3/20/1959	2/17/2011	71
11S16E18R002M	Madera ID	Irrigation	11S/16E/18	698	320-667	10/13/2015	10/13/2023	16
11S16E19R001M	DWR	Unknown	11S/16E/19			12/10/1947	2/18/2014	102
11S16E21A001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/16E/21	514	245-496	12/4/1959	10/12/2022	103
11S16E21H001M	Madera-Chowchilla CASGEM Group	Unknown	11S/16E/21	600	400-600	10/13/2015	10/20/2022	13
11S16E22K002M	Madera-Chowchilla CASGEM Group	Industrial	11S/16E/22	570	270-570	3/24/1958	10/12/2023	120

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Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
11S16E24M001M	DWR	Unknown	11S/16E/24			3/20/1959	2/18/2014	86
11S16E25L001M	DWR	Unknown	11S/16E/25			12/1/1939	2/23/1961	37
11S16E26A001M	DWR	Unknown	11S/16E/26			11/2/1944	2/18/2014	108
11S16E26L001M	DWR	Unknown	11S/16E/26			11/6/1929	1/27/2006	101
11S16E27H001M	DWR	Unknown	11S/16E/27			12/4/1959	2/18/2014	89
11S16E28C001M	DWR	Unknown	11S/16E/28			11/3/1944	9/17/2009	94
11S16E29H001M	DWR	Unknown	11S/16E/29			11/6/1929	2/18/2014	127
11S16E32R001M	DWR	Unknown	11S/16E/32			4/14/1937	2/25/2011	131
11S16E34D001M	DWR	Unknown	11S/16E/34			12/5/1961	2/18/2014	82
11S16E34F001M	DWR	Unknown	11S/16E/34			3/3/1960	2/23/1961	1
11S16E35H001M	DWR	Unknown	11S/16E/35			11/18/1937	2/18/2014	119
11S16E36J001M	DWR	Unknown	11S/16E/36			10/15/1952	2/18/2014	98
11S16E36M001M	DWR	Unknown	11S/16E/36			11/6/1929	3/1/1962	47
11S16E36Q001M	DWR	Unknown	11S/16E/36			10/5/1955	2/18/2014	98
11S17E02Q001M	DWR	Unknown	11S/17E/02			11/9/1944	2/10/1966	34
11S17E04R001M	DWR	Unknown	11S/17E/04			12/7/1959	2/24/2011	76
11S17E05R001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/17E/04	700	265-696	10/14/2015	10/19/2022	14
11S17E06B001M	DWR	Unknown	11S/17E/06			3/11/1952	3/3/1959	5
11S17E06C001M	DWR	Unknown	11S/17E/06			12/11/1961	2/18/2014	85
11S17E06J001M	DWR	Unknown	11S/17E/06			3/13/1956	2/18/2014	96
11S17E06K001M	DWR	Unknown	11S/17E/06			12/8/1947	3/3/1960	20
11S17E06L001M	Madera ID	Irrigation	11S/17E/06	680	320-680	3/7/1957	10/18/2023	12
11S17E06L001M	Madera ID	Unknown	11S/17E/06			3/7/1957	10/18/2023	12
11S17E06L003M	Madera-Chowchilla CASGEM Group	Industrial	11S/17E/06	680	320-680	10/14/2015	10/25/2022	10
11S17E07A001M	DWR	Unknown	11S/17E/07			12/2/1941	2/1/1985	57
11S17E07D001M	DWR	Unknown	11S/17E/07			12/21/1948	10/4/1977	45
11S17E08H001M	DWR	Unknown	11S/17E/08			4/1/1928	1/27/2006	103
11S17E10Q001M	DWR	Unknown	11S/17E/10			12/7/1959	2/19/1963	5
11S17E12E001M	DWR	Unknown	11S/17E/12			12/3/1959	2/10/1964	7
11S17E14M001M	DWR	Unknown	11S/17E/14			10/30/1925	3/3/1959	52
11S17E14M002M	DWR	Unknown	11S/17E/14			3/3/1960	10/2/1986	42
11S17E16H001M	DWR	Unknown	11S/17E/16			12/7/1959	2/18/2014	85
11S17E17C001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/17E/17	580	260-504	2/8/1968	2/13/2014	79
11S17E17J001M	DWR	Unknown	11S/17E/17			5/27/1938	2/19/1963	44
11S17E18B001M	DWR	Unknown	11S/17E/18			10/23/1951	2/18/2014	104
11S17E18N001M	DWR	Unknown	11S/17E/18			10/17/1952	1/27/2006	63
11S17E19P001M	DWR	Unknown	11S/17E/19			12/1/1941	2/18/2014	119
11S17E20A003M	DWR	Unknown	11S/17E/20			4/11/1939	9/25/1980	65
11S17E21A001M	DWR	Unknown	11S/17E/21			3/3/1960	10/8/1971	15
11S17E24D001M	DWR	Unknown	11S/17E/24			11/9/1944	8/1/1977	36
11S17E24D002M	DWR	Unknown	11S/17E/23			12/7/1960	2/28/2011	80
11S17E26A001M	DWR	Unknown	11S/17E/26			10/23/1935	2/8/1967	45
11S17E27C001M	DWR	Unknown	11S/17E/27			9/1/1928	2/28/2011	129
11S17E27H001M	DWR	Unknown	11S/17E/27			3/1/1976	6/1/1977	4
11S17E28A001M	DWR	Unknown	11S/17E/28			12/7/1960	2/18/2014	88
11S17E29C001M	DWR	Unknown	11S/17E/29			11/1/1944	2/21/1961	26
11S17E30J001M	DWR	Unknown	11S/17E/30			12/1/1939	2/8/1967	40
11S17E32C001M	DWR	Unknown	11S/17E/32			5/25/1937	1/27/2006	102
11S17E32H001M	DWR	Unknown	11S/17E/32			10/17/1952	1/24/1980	43
11S17E32R002M	Unknown	Irrigation	11S/17E/32	656	290-635	11/18/1936	10/11/2023	142
11S17E33B001M	DWR	Unknown	11S/17E/33			10/16/1920	3/9/1962	59
11S17E33H001M	DWR	Unknown	11S/17E/33			10/16/1920	2/12/2014	139
11S17E33N002M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/04	600	280-593	10/12/2015	10/20/2022	13
11S17E35C001M	DWR	Unknown	11S/17E/35			12/10/1934	2/4/1988	93
11S17E35D001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/17E/35	460	200-460	10/12/2015	11/1/2018	2
11S17E36B001M	DWR	Unknown	11S/17E/36			10/23/1935	10/7/1976	64
11S17E36R001M	DWR	Unknown	11S/17E/36			11/21/1930	3/1/1962	50
11S18E01B001M	DWR	Unknown	11S/18E/01			2/23/1960	2/1/1968	11
11S18E01M001M	DWR	Unknown	11S/18E/01			9/18/1979	9/18/1979	1
11S18E02H001M	DWR	Unknown	11S/18E/02			9/19/1979	9/19/1979	1
11S18E02M001M	Madera-Chowchilla CASGEM Group	Other	11S/18E/02	360	300-360	10/15/2015	10/13/2022	14
11S18E02M002M	Madera-Chowchilla CASGEM Group	Other	11S/18E/02	400	320-400	10/15/2015	10/13/2022	14
11S18E03J001M	Madera County	Other	11S/18E/03	500	420-500	10/15/2015	3/6/2024	5
11S18E04E001M	DWR	Unknown	11S/18E/04			2/17/1964	1/23/2006	35
11S18E05G001M	DWR	Unknown	11S/18E/05			10/17/1952	3/28/1958	2
11S18E05J001M	DWR	Unknown	11S/18E/05			12/18/1960	10/3/1988	29

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
11S18E06P001M	DWR	Unknown	11S/18E/06			3/4/1960	9/28/1965	4
11S18E07L001M	DWR	Unknown	11S/18E/07			2/15/1965	2/28/2011	69
11S18E08Q001M	DWR	Unknown	11S/18E/08			10/29/1959	2/21/2008	96
11S18E08Q002M	DWR	Unknown	11S/18E/08			2/20/1961	2/21/2008	93
11S18E09A001M	DWR	Unknown	11S/18E/09			10/7/1941	9/29/1986	78
11S18E10H001M	DWR	Unknown	11S/18E/10			9/19/1979	9/19/1979	1
11S18E11A001M	DWR	Unknown	11S/18E/12			9/19/1979	9/19/1979	1
11S18E13C001M	DWR	Unknown	11S/18E/13			9/19/1979	9/19/1979	1
11S18E13P001M	DWR	Unknown	11S/18E/13			2/10/1964	2/1/1968	6
11S18E16K001M	DWR	Unknown	11S/18E/16			10/30/1920	12/1/1958	59
11S18E16L001M	DWR	Unknown	11S/18E/16			12/11/1961	2/20/1963	2
11S18E17L001M	DWR	Unknown	11S/18E/17			11/27/1934	3/9/1962	41
11S18E18A001M	DWR	Unknown	11S/18E/18			12/3/1959	1/23/2006	81
11S18E20N001M	DWR	Unknown	11S/18E/20			11/3/1920	2/15/2011	135
11S18E21E001M	DWR	Unknown	11S/18E/21			11/28/1941	12/8/1961	32
11S18E24G001M	DWR	Unknown	11S/18E/24			9/19/1979	9/19/1979	1
11S18E25D001M	DWR	Unknown	11S/18E/25			9/19/1979	9/19/1979	1
11S18E25M001M	DWR	Unknown	11S/18E/25			12/6/1948	2/20/1961	16
11S18E25M002M	DWR	Unknown	11S/18E/25			9/19/1979	9/19/1979	1
11S18E27F001M	Madera ID	Unknown	11S/18E/27			3/4/1960	2/14/2014	79
11S18E27M001M	DWR	Unknown	11S/18E/27			3/3/1959	2/15/2011	151
11S18E27N002M	DWR	Unknown	11S/18E/27			10/24/1956	3/28/1958	4
11S18E28P001M	DWR	Unknown	11S/18E/28			2/17/1964	2/15/2011	76
11S18E29H001M	DWR	Unknown	11S/18E/29			2/17/1964	2/15/2011	73
11S18E30D001M	DWR	Unknown	11S/18E/30			3/4/1960	1/23/2006	68
11S18E30R001M	DWR	Unknown	11S/18E/30			11/3/1920	1/25/1966	61
11S18E31A003M	DWR	Unknown	11S/18E/31			2/8/1968	2/15/2011	72
11S18E31C001M	DWR	Unknown	11S/18E/31			9/7/1925	2/10/1966	36
11S18E32J001M	DWR	Unknown	11S/18E/32			11/7/1929	2/9/1966	49
11S18E33D001M	DWR	Unknown	11S/18E/33			3/4/1960	2/15/2011	76
11S18E34B001M	DWR	Unknown	11S/18E/34			3/4/1960	2/15/2011	86
11S18E35C001M	DWR	Unknown	11S/18E/35			9/19/1979	9/19/1979	1
11S19E02M001M	DWR	Unknown	11S/19E/02			9/19/1979	9/19/1979	1
11S19E03N001M	DWR	Unknown	11S/19E/10			9/19/1979	9/19/1979	1
11S19E06F001M	DWR	Unknown	11S/19E/06			10/7/1941	2/23/1960	34
11S19E10J002M	Madera County	Unknown	11S/19E/10			1/19/1979	3/6/2024	43
11S19E17Q001M	DWR	Unknown	11S/19E/17			9/2/1945	12/15/1960	25
11S19E19F001M	DWR	Unknown	11S/19E/19			2/10/1964	2/15/2011	68
11S19E19N001M	Madera County	Unknown	11S/19E/19			2/10/1964	3/6/2024	74
11S19E20G001M	DWR	Unknown	11S/19E/20			10/12/1960	2/15/2011	72
11S19E28F001M	DWR	Unknown	11S/19E/28			2/10/1964	1/24/2006	72
11S19E32P001M	DWR	Unknown	11S/19E/32			1/20/1953	2/12/2014	105
11S19E32R001M	Madera-Chowchilla CASGEM Group	Irrigation	11S/19E/32			2/10/1964	10/17/2017	90
11S19E33J001M	DWR	Unknown	11S/19E/33			2/10/1964	1/24/2006	73
11S20E11G001M	DWR	Unknown	11S/20E/11			2/12/1964	9/30/1970	7
11S20E12E001M	DWR	Unknown	11S/20E/12			2/12/1964	3/4/1983	34
11S20E18L001M	DWR	Unknown	11S/20E/18			2/12/1964	3/21/2019	56
11S20E21P001M	DWR	Unknown	11S/20E/28			10/20/1936	2/11/1969	51
11S20E22M001M	DWR	Unknown	11S/20E/22			5/6/1936	2/3/1966	50
11S20E22M002M	DWR	Unknown	11S/20E/22			2/8/1967	10/2/1969	2
11S20E23M001M	DWR	Unknown	11S/20E/23			5/12/1936	9/30/1970	57
11S20E27N001M	DWR	Unknown	11S/20E/27			5/6/1936	2/12/1964	43
11S20E27N002M	Madera County	Unknown	11S/20E/27			10/7/1964	3/6/2024	69
11S20E29D001M	DWR	Unknown	11S/20E/29			8/15/1978	1/24/2003	32
11S20E30F001M	DWR	Unknown	11S/20E/30			2/12/1964	3/21/2019	52
11S20E31P001M	DWR	Unknown	11S/20E/31			2/12/1964	3/21/2019	67
11S20E31R001M	DWR	Unknown	11S/20E/31			5/6/1936	2/11/1963	52
11S20E33K001M	DWR	Unknown	11S/20E/33			2/12/1964	3/21/2019	59
11S20E33Q001M	DWR	Unknown	11S/20E/33			10/11/1961	2/10/1965	7
11S20E35L001M	DWR	Unknown	11S/20E/35			9/24/1936	2/11/1969	54
12S14E01N001M	DWR	Unknown	12S/14E/01			4/2/1941	2/18/2011	95
12S14E04P001M	DWR	Unknown	12S/14E/04			2/13/1947	3/13/2017	114
12S14E10L001M	DWR	Unknown	12S/14E/10			2/13/1964	10/3/1980	28
12S14E12N001M	DWR	Unknown	12S/14E/12			10/16/1958	1/26/1990	49
12S14E13P001M	DWR	Unknown	12S/14E/13			12/17/1941	3/9/1959	31
12S15E01R001M	DWR	Unknown	12S/15E/01			10/6/1976	3/13/2019	53

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
12S15E02A001M	DWR	Unknown	12S/15E/02			4/22/1940	3/10/1959	27
12S15E04Q001M	DWR	Unknown	12S/15E/04			10/14/1952	2/24/1961	5
12S15E09J001M	DWR	Unknown	12S/15E/09			1/12/1950	2/19/1963	14
12S15E11R001M	Madera County	Irrigation	12S/15E/11	216	205-212	10/6/1976	3/7/2024	61
12S15E13R001M	DWR	Unknown	12S/15E/13			10/12/1976	3/13/2019	54
12S15E14A001M	DWR	Unknown	12S/15E/14			2/14/1964	9/28/1974	12
12S15E14L001M	DWR	Unknown	12S/15E/14			10/17/1958	1/30/1981	32
12S15E15M001M	DWR	Unknown	12S/15E/15			1/12/1950	9/30/1981	48
12S15E16A001M	New Stone WD	Unknown	12S/15E/16			1/12/1950	3/7/2024	88
12S15E17E001M	DWR	Unknown	12S/15E/17			3/17/1952	3/13/2019	77
12S15E22F001M	DWR	Unknown	12S/15E/22			1/12/1950	1/23/1975	35
12S15E27C001M	DWR	Unknown	12S/15E/27			1/12/1950	2/24/2011	91
12S15E29C001M	DWR	Unknown	12S/15E/29			10/6/1976	3/13/2019	50
12S16E02N001M	DWR	Unknown	12S/16E/11			4/22/1941	2/12/2014	128
12S16E04A001M	DWR	Unknown	12S/16E/04			12/5/1961	2/17/2009	72
12S16E06A001M	DWR	Unknown	12S/16E/06			4/20/1940	3/13/2017	100
12S16E12A001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/16E/12	600	300-600	10/22/1920	10/25/2022	7
12S16E12H001M	DWR	Unknown	12S/16E/12			11/21/1932	2/12/2014	125
12S16E12L002M	Madera ID	Irrigation	12S/16E/12	615	315-615	10/12/2015	10/23/2023	18
12S16E13A001M	DWR	Unknown	12S/16E/13			12/9/1960	9/12/1979	6
12S16E13H002M	DWR	Unknown	12S/16E/13			12/21/1937	2/24/1961	40
12S16E15P001M	DWR	Unknown	12S/16E/15			7/28/1941	2/24/1961	32
12S16E16R001M	DWR	Unknown	12S/16E/21			12/9/1960	2/12/2014	84
12S16E17D001M	DWR	Unknown	12S/16E/18			4/25/1940	2/7/1974	59
12S16E17R001M	DWR	Unknown	12S/16E/20			4/25/1940	10/4/1984	75
12S16E19P001M	DWR	Unknown	12S/16E/19			10/12/1976	2/15/2011	45
12S16E23A001M	DWR	Unknown	12S/16E/23			11/28/1938	2/19/2009	97
12S16E23H001M	DWR	Unknown	12S/16E/23			12/21/1937	3/14/2019	122
12S16E24A002M	DWR	Unknown	12S/16E/24			12/19/1940	1/30/1985	75
12S16E25A001M	DWR	Unknown	12S/16E/25			4/2/1943	2/19/2009	83
12S16E25R001M	Madera County	Irrigation	12S/16E/25	580	220-580	10/13/2015	10/31/2023	10
12S16E25R002M	Madera-Chowchilla CASGEM Group	Irrigation	12S/16E/25	580	220-580	10/9/2017	10/21/2022	9
12S16E26H001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/16E/26	286	228-284	11/9/1944	10/21/2019	129
12S16E26R001M	DWR	Unknown	12S/16E/26			7/18/1949	3/14/2019	111
12S16E27R001M	DWR	Unknown	12S/16E/27			3/27/1950	10/12/1961	21
12S16E27R002M	DWR	Unknown	12S/16E/27			10/15/1958	10/8/1974	24
12S16E33H	Unknown	Unknown	12S/16E/33			9/15/2007	10/22/2014	57
12S16E34J001M	DWR	Unknown	12S/16E/34			7/18/1949	2/21/1961	11
12S16E35J001M	DWR	Unknown	12S/16E/35			1/10/1950	9/12/1979	24
12S16E35J002M	DWR	Unknown	12S/16E/35			2/21/1961	10/8/1974	16
12S16E36A001M	DWR	Unknown	12S/16E/36			10/5/1944	2/12/2014	112
12S17E01J002M	DWR	Unknown	12S/17E/01			12/3/1941	2/12/2014	114
12S17E02C001M	DWR	Unknown	12S/17E/02			10/23/1935	1/25/1983	73
12S17E02J001M	DWR	Unknown	12S/17E/02			11/30/1932	2/12/2014	129
12S17E02P001M	DWR	Unknown	12S/17E/02			12/7/1934	2/19/1963	47
12S17E03C001M	DWR	Unknown	12S/17E/03			1/2/1934	2/12/2014	121
12S17E03D001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/03	644	308-596	10/12/2015	10/12/2022	7
12S17E03F001M	DWR	Unknown	12S/17E/03			12/31/1936	2/12/2014	122
12S17E04L001M	DWR	Unknown	12S/17E/04			10/23/1935	2/1/2006	118
12S17E05B001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/05	724	430-715	10/12/2015	10/11/2022	12
12S17E05N001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/08	625	200-546	10/12/2015	10/11/2022	4
12S17E05P001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/08	680	300-680	10/12/2015	10/11/2022	14
12S17E06A003M	DWR	Unknown	12S/17E/06			12/10/1934	2/12/2014	126
12S17E06R001M	DWR	Unknown	12S/17E/07			11/18/1937	2/12/2014	111
12S17E08B001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/08	612	220-548	10/12/2015	10/11/2022	12
12S17E08G001M	DWR	Unknown	12S/17E/08			10/30/1959	2/12/2014	163
12S17E08G002M	DWR	Unknown	12S/17E/08			10/24/1961	2/12/2014	90
12S17E09J001M	DWR	Unknown	12S/17E/09			12/19/1940	2/12/2014	109
12S17E10H001M	DWR	Unknown	12S/17E/10			4/25/1935	2/12/2014	132
12S17E11D001M	DWR	Unknown	12S/17E/11			12/6/1961	2/12/2014	79
12S17E11J001M	DWR	Unknown	12S/17E/11			10/21/1952	2/28/2011	86
12S17E11P001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/11	660	300-660	10/13/2015	10/11/2022	14
12S17E12A001M	DWR	Unknown	12S/17E/12			12/6/1961	2/13/1969	9
12S17E12C001M	DWR	Unknown	12S/17E/12			10/18/1920	12/18/1960	58
12S17E13J001M	DWR	Unknown	12S/17E/13			12/11/1957	2/12/2014	82
12S17E13K001M	DWR	Unknown	12S/17E/13			12/9/1959	2/28/2011	83

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
12S17E14F001M	DWR	Unknown	12S/17E/14			11/7/1944	2/12/2014	124
12S17E15J001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/15			10/23/1935	2/12/2014	130
12S17E16A003M	Madera ID	Unknown	12S/17E/16	315		3/13/1962	10/10/2023	106
12S17E16D001M	DWR	Unknown	12S/17E/16			11/18/1937	2/14/1973	63
12S17E16D002M	DWR	Unknown	12S/17E/16			10/2/1957	2/11/1964	14
12S17E16H001M	DWR	Unknown	12S/17E/16			10/1/1928	2/20/1961	37
12S17E17M001M	DWR	Unknown	12S/17E/17			12/9/1959	10/11/1972	18
12S17E18A002M	DWR	Unknown	12S/17E/18			3/31/1942	2/2/2006	93
12S17E20A001M	DWR	Unknown	12S/17E/20			12/9/1959	3/12/1962	2
12S17E20P001M	DWR	Unknown	12S/17E/20			12/3/1958	2/12/2014	107
12S17E20Q001M	DWR	Unknown	12S/17E/20			5/20/1937	3/24/1958	35
12S17E21H001M	DWR	Unknown	12S/17E/21			3/23/1938	3/1/2011	108
12S17E21J001M	DWR	Unknown	12S/17E/21			12/31/1936	2/8/1967	41
12S17E23C001M	DWR	Unknown	12S/17E/23			10/8/1951	2/12/2014	97
12S17E24D001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/24	510	240-510	10/13/2015	10/24/2022	12
12S17E24H001M	DWR	Unknown	12S/17E/24			12/9/1959	2/12/2014	78
12S17E26A001M	DWR	Unknown	12S/17E/26			10/1/1928	2/12/2014	122
12S17E26C001M	DWR	Unknown	12S/17E/26			10/30/1959	2/12/2014	162
12S17E26N001M	DWR	Unknown	12S/17E/26			9/4/1951	2/12/2014	100
12S17E28G001M	DWR	Unknown	12S/17E/28			12/6/1961	2/9/1967	6
12S17E28H001M	DWR	Unknown	12S/17E/28			12/6/1941	3/8/1960	25
12S17E29H002M	DWR	Unknown	12S/17E/29			10/5/1944	3/1/2011	106
12S17E31A001M	DWR	Unknown	12S/17E/31			12/13/1940	2/12/2014	114
12S17E32H001M	DWR	Unknown	12S/17E/32			10/2/1937	2/12/2014	120
12S17E33K001M	Madera-Chowchilla CASGEM Group	Other	12S/17E/33	268		10/13/2015	10/10/2022	12
12S17E33N001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/33	580	230-580	10/13/2015	10/10/2022	13
12S17E34A001M	DWR	Unknown	12S/17E/34			4/17/1922	2/12/2014	146
12S17E34D001M	DWR	Unknown	12S/17E/34			5/8/1936	2/2/2006	111
12S17E34R001M	DWR	Unknown	12S/17E/34			10/10/1951	2/12/2014	174
12S17E35B001M	DWR	Unknown	12S/17E/35			12/4/1934	2/9/1967	41
12S17E35R001M	DWR	Unknown	12S/17E/35			2/7/1968	2/12/2014	74
12S17E36A001M	DWR	Unknown	12S/17E/36			10/20/1920	2/20/1961	50
12S17E36B001M	DWR	Unknown	12S/17E/36			12/6/1961	1/25/2006	57
12S17E36K001M	DWR	Unknown	12S/17E/36			9/1/1937	2/12/2014	124
12S17E36R001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/17E/36	299	200-293	10/15/2015	7/1/2019	4
12S18E01A001M	DWR	Unknown	12S/18E/01			12/12/1944	1/25/2006	83
12S18E01P001M	DWR	Unknown	12S/18E/01			12/5/1958	2/28/1962	5
12S18E03D001M	DWR	Unknown	12S/18E/04			2/6/2012	2/12/2014	1
12S18E04C001M	DWR	Unknown	12S/18E/04			10/14/1925	9/14/2009	112
12S18E04J001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/04	560	272-556	10/12/2015	10/17/2022	13
12S18E04L001M	DWR	Unknown	12S/18E/04			2/6/2012	2/12/2014	1
12S18E04R001M	DWR	Unknown	12S/18E/04			6/9/1937	1/24/2006	88
12S18E05A001M	DWR	Unknown	12S/18E/05			12/3/1940	2/12/2014	123
12S18E05C001M	DWR	Unknown	12S/18E/05			12/16/1936	1/24/2006	101
12S18E05F001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/05	570	240-570	10/12/2015	10/17/2022	11
12S18E06J001M	DWR	Unknown	12S/18E/06			11/30/1932	3/13/1962	43
12S18E06J002M	Madera ID	Irrigation	12S/18E/06	176		2/7/2012	10/19/2023	9
12S18E06J002M	Madera ID	Unknown	12S/18E/06			2/7/2012	10/19/2023	9
12S18E06J003M	Madera ID	Irrigation	12S/18E/06	176		10/15/2008	10/12/2022	24
12S18E07B001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/07	660	300-600	10/12/2015	10/12/2022	13
12S18E07H001M	DWR	Unknown	12S/18E/07			10/20/1920	2/12/2014	133
12S18E08Q001M	DWR	Unknown	12S/18E/08			2/7/2012	2/12/2014	3
12S18E09P001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/09			12/10/1959	2/11/2014	89
12S18E10D001M	DWR	Unknown	12S/18E/10			6/9/1937	2/12/2014	114
12S18E10K002M	Madera ID	Irrigation	12S/18E/10	600	228-552	10/12/2015	10/9/2023	14
12S18E10R001M	DWR	Unknown	12S/18E/15			4/1/1928	2/12/2014	122
12S18E12N001M	DWR	Unknown	12S/18E/12			11/7/1929	2/12/2014	115
12S18E13K001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/13	600	320-600	10/12/2015	10/12/2022	13
12S18E13L001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/13	510	240-510	10/12/2015	10/12/2022	10
12S18E13R001M	DWR	Unknown	12S/18E/24			10/30/1959	2/12/2014	165
12S18E13R002M	DWR	Unknown	12S/18E/24			2/20/1961	2/12/2014	94
12S18E16A002M	Madera ID	Irrigation	12S/18E/16	200		10/31/1951	10/12/2022	116
12S18E16K002M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/16	340	240-340	10/12/2015	10/17/2022	13
12S18E16Q001M	DWR	Unknown	12S/18E/16			12/4/1940	1/23/2006	82
12S18E17C001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/18E/17	600	280-600	10/12/2015	10/10/2022	14
12S18E17L001M	DWR	Unknown	12S/18E/17			12/10/1959	2/11/2014	77

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
12S18E19H001M	DWR	Unknown	12S/18E/19			12/10/1959	2/13/2014	85
12S18E20P001M	DWR	Unknown	12S/18E/20			12/2/1958	2/13/2014	79
12S18E21G001M	DWR	Unknown	12S/18E/21			11/3/1920	2/13/2014	145
12S18E21H001M	DWR	Unknown	12S/18E/21			10/8/1958	6/1/1977	108
12S18E21H002M	DWR	Unknown	12S/18E/21			1/27/1999	2/13/2014	14
12S18E25A001M	DWR	Unknown	12S/18E/25			10/12/1961	10/6/1964	6
12S18E25B001M	DWR	Unknown	12S/18E/25			12/5/1958	2/13/2014	78
12S18E25L001M	DWR	Unknown	12S/18E/25			12/5/1958	1/24/2006	72
12S18E25M001M	DWR	Unknown	12S/18E/25			12/5/1958	2/13/2014	84
12S18E26D001M	DWR	Unknown	12S/18E/26			12/5/1958	2/24/2011	79
12S18E26L001M	DWR	Unknown	12S/18E/26			2/6/2012	2/13/2014	3
12S18E26R001M	DWR	Unknown	12S/18E/35			2/7/2012	2/13/2014	0
12S18E28J001M	DWR	Unknown	12S/18E/28			10/15/1958	2/13/2014	83
12S18E30C001M	DWR	Unknown	12S/18E/30			10/15/1958	2/13/2014	82
12S18E30D001M	DWR	Unknown	12S/18E/30			12/5/1958	1/25/2006	71
12S18E31J001M	DWR	Unknown	12S/18E/31			12/7/1961	2/13/2014	80
12S18E33C001M	DWR	Unknown	12S/18E/33			12/8/1958	2/13/2014	80
12S18E34L001M	DWR	Unknown	12S/18E/34			12/8/1958	2/24/2011	84
12S18E35G001M	DWR	Unknown	12S/18E/35			2/7/2012	2/13/2014	3
12S19E01M001M	DWR	Unknown	12S/19E/01			10/13/1958	2/3/1966	15
12S19E01M002M	DWR	Unknown	12S/19E/01			2/8/1967	10/1/1973	11
12S19E01M003M	DWR	Unknown	12S/19E/01			1/24/1979	2/11/1985	3
12S19E02A001M	DWR	Unknown	12S/19E/02			1/24/1979	3/21/2019	27
12S19E03B001M	DWR	Unknown	12S/19E/03			10/29/1958	2/27/1959	2
12S19E03Q001M	DWR	Unknown	12S/19E/03			9/27/1978	3/21/2019	47
12S19E04D001M	DWR	Unknown	12S/19E/04			10/13/1958	1/24/1979	36
12S19E09H001M	DWR	Unknown	12S/19E/09			10/13/1958	1/22/1980	38
12S19E11B001M	Madera County	Unknown	12S/19E/11			8/14/1978	3/6/2024	55
12S19E13E001M	DWR	Unknown	12S/19E/14			8/14/1978	3/21/2019	48
12S19E14R001M	DWR	Unknown	12S/19E/14			10/8/1958	2/10/1965	14
12S19E16P001M	DWR	Unknown	12S/19E/21			10/13/1958	2/13/1964	1
12S19E18P001M	DWR	Unknown	12S/19E/18			10/13/1958	2/13/2014	101
12S19E20A001M	DWR	Unknown	12S/19E/20			10/13/1958	2/18/2011	99
12S19E20D001M	DWR	Unknown	12S/19E/20			10/13/1958	2/13/2014	96
12S19E21B001M	DWR	Unknown	12S/19E/21			10/11/1961	2/18/2011	90
12S19E21N002M	DWR	Unknown	12S/19E/21			10/13/1958	2/3/1966	17
12S19E23K001M	DWR	Unknown	12S/19E/23			8/14/1978	3/20/2019	43
12S19E25E001M	DWR	Unknown	12S/19E/25			10/13/1958	1/24/2006	72
12S19E26C001M	DWR	Unknown	12S/19E/26			9/27/1978	3/20/2019	39
12S19E28A001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/19E/28			10/26/1936	2/11/2014	139
12S19E28P001M	DWR	Unknown	12S/19E/28			5/13/1958	2/13/2014	100
12S19E29A001M	DWR	Unknown	12S/19E/29			6/29/1937	2/13/2014	147
12S19E31A001M	DWR	Unknown	12S/19E/31			5/7/1936	2/11/1969	59
12S19E31M001M	DWR	Unknown	12S/19E/31			9/27/1955	10/2/1974	5
12S19E31M002M	DWR	Unknown	12S/19E/31			11/6/1932	3/12/1962	42
12S19E31M003M	DWR	Unknown	12S/19E/31			10/12/1961	1/24/2006	72
12S20E04K001M	DWR	Unknown	12S/20E/04			2/10/2014	3/21/2019	3
12S20E05P001M	DWR	Unknown	12S/20E/05			1/24/1979	3/21/2019	32
12S20E07B001M	DWR	Unknown	12S/20E/07			1/24/1979	10/5/1982	6
12S20E09C001M	DWR	Unknown	12S/20E/09			10/6/1937	2/11/1969	46
12S20E16Q001M	DWR	Unknown	12S/20E/16			8/30/1951	9/27/1974	38
12S20E17A001M	DWR	Unknown	12S/20E/17			8/14/1978	3/20/2019	55
12S20E17H001M	DWR	Unknown	12S/20E/17			11/1/1937	1/26/1987	93
12S20E17H002M	DWR	Unknown	12S/20E/17			8/14/1978	3/20/2019	50
12S20E18B001M	DWR	Unknown	12S/20E/18			2/12/1964	3/20/2019	59
12S20E18B002M	DWR	Unknown	12S/20E/18			2/12/1964	2/10/1965	2
12S20E18N001M	DWR	Unknown	12S/20E/19			1/24/1979	3/20/2019	41
12S20E19R001M	DWR	Unknown	12S/20E/19			2/11/1969	10/1/1985	22
12S20E20A001M	Madera-Chowchilla CASGEM Group	Irrigation	12S/20E/20	116		9/25/1936	10/14/2019	132
12S20E30E001M	DWR	Unknown	12S/20E/30			5/5/1936	9/30/1970	60
12S20E30J001M	DWR	Unknown	12S/20E/30			5/5/1936	2/11/1969	54
13S16E01A001M	DWR	Unknown	13S/16E/01			11/9/1944	2/7/1974	49
13S16E02C001M	DWR	Unknown	13S/16E/02			10/12/1959	2/13/2014	158
13S16E02C003M	DWR	Unknown	13S/16E/02			2/21/1961	2/13/2014	91
13S16E02F001M	DWR	Unknown	13S/16E/02			3/27/1950	2/19/2014	79
13S16E03L001M	DWR	Unknown	13S/16E/03			3/7/1952	3/14/2019	85

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
13S16E11C001M	DWR	Unknown	13S/16E/11			2/4/1947	2/21/1958	17
13S16E11C002M	DWR	Unknown	13S/16E/11			2/21/1957	2/10/1966	11
13S17E01D001M	DWR	Unknown	13S/17E/01			5/7/1936	2/2/1965	46
13S17E02M001M	DWR	Unknown	13S/17E/02			5/8/1936	1/25/2006	118
13S17E03H001M	DWR	Unknown	13S/17E/03			10/4/1937	2/13/2014	130
13S17E03J002M	DWR	Unknown	13S/17E/03			10/2/1937	2/19/1963	42
13S17E04A002M	DWR	Unknown	13S/17E/04			11/19/1940	2/19/1963	36
13S17E04R001M	DWR	Unknown	13S/17E/04			2/7/2012	2/13/2014	3
13S17E05C001M	DWR	Unknown	13S/17E/05			6/15/1936	2/10/1967	54
13S17E05L002M	DWR	Unknown	13S/17E/05			12/6/1961	1/25/2006	71
13S17E05P002M	Madera-Chowchilla CASGEM Group	Irrigation	13S/17E/05			10/29/1936	2/11/2014	135
13S17E06A001M	DWR	Unknown	13S/17E/06			12/13/1940	9/12/1979	36
13S17E06H001M	Madera-Chowchilla CASGEM Group	Other	13S/17E/06	260		10/13/2015	10/10/2022	13
13S17E07A001M	DWR	Unknown	13S/17E/07			12/2/1930	2/13/2014	122
13S17E07J003M	DWR	Unknown	13S/17E/07			12/2/1930	2/13/2014	124
13S17E08F001M	Madera-Chowchilla CASGEM Group	Irrigation	13S/17E/08	310	202-300	10/15/2015	7/1/2019	5
13S17E08L001M	DWR	Unknown	13S/17E/08			2/21/1961	2/13/2014	91
13S17E08N001M	DWR	Unknown	13S/17E/17			5/12/1936	1/25/2006	98
13S17E08P001M	Madera-Chowchilla CASGEM Group	Irrigation	13S/17E/08	320	160-320	10/13/2015	10/10/2022	14
13S17E09A001M	DWR	Unknown	13S/17E/09			12/8/1958	2/13/2014	94
13S17E09H001M	DWR	Unknown	13S/17E/09			1/20/1939	3/11/1960	37
13S17E10A001M	DWR	Unknown	13S/17E/10			3/10/1949	10/11/1972	46
13S18E03B001M	DWR	Unknown	13S/18E/03			11/5/1931	2/12/1962	36
13S18E03C002M	DWR	Unknown	13S/18E/03			10/24/1952	1/25/2006	82
13S18E04A001M	DWR	Unknown	13S/18E/04			5/7/1936	2/15/2008	122
13S18E04B001M	DWR	Unknown	13S/18E/04			11/28/1930	2/13/2014	137
13S18E05E001M	Madera-Chowchilla CASGEM Group	Irrigation	13S/18E/05			11/29/1930	2/11/2014	137
13S18E05J001M	DWR	Unknown	13S/18E/05			11/28/1930	2/13/2014	105
13S18E05Q001M	DWR	Unknown	13S/18E/05			11/28/1930	2/18/1963	36
13S18E06F001M	DWR	Unknown	13S/18E/06			12/7/1961	2/13/2014	83
13S18E06K001M	DWR	Unknown	13S/18E/06			3/26/1936	2/13/2014	133
13S18E06N001M	DWR	Unknown	13S/18E/06			5/27/1938	2/18/1963	38
13S18E10H001M	Madera-Chowchilla CASGEM Group	Irrigation	13S/16E/10	360	245-340	10/15/2015	3/11/2019	3
City_of_Madera_15	City of Madera	Unknown	11S/17E/22	465	195-465	3/24/1978	11/16/2023	48
City_of_Madera_16	City of Madera	Public Supply	11S/18E/18	520	190-504	5/9/1979	3/20/2012	24
City_of_Madera_17	City of Madera	Unknown	11S/18E/30	620	260-620	3/6/1990	11/1/2021	39
City_of_Madera_18	City of Madera	Public Supply	11S/17E/13	610	285-605	1/20/1971	11/9/2023	30
City_of_Madera_20	City of Madera	Public Supply	11S/17E/14	600	201-576	10/17/1980	11/9/2023	46
City_of_Madera_21	City of Madera	Unknown	11S/18E/30	600	230-600	3/9/1982	11/7/2023	44
City_of_Madera_22	City of Madera	Unknown	11S/17E/24	520	240-520	3/21/2015	11/7/2023	13
City_of_Madera_23	City of Madera	Public Supply	11S/17E/12	790	210-770	1/7/1983	11/7/2023	43
City_of_Madera_24	City of Madera	Public Supply	11S/18E/18	520	210-510	7/25/1983	11/9/2023	48
City_of_Madera_25	City of Madera	Public Supply	11S/17E/14	513	275-505	5/24/1988	11/6/2023	42
City_of_Madera_26	City of Madera	Unknown	11S/17E/10	600	220-600	5/19/2000	11/14/2023	33
City_of_Madera_27	City of Madera	Unknown	//			6/1/1997	8/30/2012	0
City_of_Madera_28	City of Madera	Public Supply	11S/18E/18	522	270-540	9/29/1993	11/8/2023	39
City_of_Madera_29	City of Madera	Public Supply	11S/17E/23	590	370-590	4/2/1996	11/14/2023	36
City_of_Madera_30	City of Madera	Unknown	11S/17E/26	720	430-720	3/1/1994	11/7/2023	36
City_of_Madera_31	City of Madera	Unknown	11S/18E/19	520	265-500	7/28/2004	11/8/2023	32
City_of_Madera_32	City of Madera	Unknown	11S/17E/22	700	320-680	4/7/2008	11/14/2023	23
City_of_Madera_33	City of Madera	Public Supply	11S/18E/31	620	310-600	12/15/2006	11/16/2023	27
City_of_Madera_34	City of Madera	Unknown	11S/18E/30	588	433-568	9/25/2009	11/8/2023	23
City_of_Madera_38	City of Madera	Unknown	//			12/1/2020	11/6/2023	0
EO224174	DWR	Domestic	11S/18E/10		480-600	11/4/2019	4/8/2024	8
GFWD 201	Gravelly Ford WD	Irrigation	12S/16E/21	460	200-460	4/1/2015	3/1/2024	9
GFWD 202	Gravelly Ford WD	Irrigation	12S/16E/27	300	150-300	4/1/2015	3/1/2024	6
GFWD 203	Gravelly Ford WD	Unknown	12S/16E/26			4/1/2015	3/1/2024	9
GFWD 204	Gravelly Ford WD	Unknown	12S/16E/26	340	195-325	10/6/2020	10/25/2022	0
GFWD 205	Gravelly Ford WD	Unknown	12S/16E/27	520	240-520	10/6/2020	10/26/2022	3
GFWD 206	Gravelly Ford WD	Unknown	12S/16E/33	510	240-510	4/1/2015	3/1/2024	8
GFWD 207	Gravelly Ford WD	Unknown	12S/16E/32	510	240-510	10/6/2020	10/26/2022	5
GFWD 208	Gravelly Ford WD	Unknown	12S/16E/33	510	240-510	10/6/2020	10/26/2022	0
GFWD 209	Gravelly Ford WD	Irrigation	12S/16E/34	456	216-456	10/6/2020	10/25/2022	5
GFWD 210	Gravelly Ford WD	Unknown	12S/16E/35	648	250-635	10/6/2020	10/26/2022	2
GFWD 211	Gravelly Ford WD	Unknown	13S/16E/01			10/6/2020	10/25/2022	5
GFWD 212	Gravelly Ford WD	Unknown	13S/16E/03	439	215-430	10/6/2020	10/26/2022	0

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Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
GFWD 213	Gravelly Ford WD	Irrigation	13S/16E/04	423	240-423	4/1/2015	3/1/2024	8
GFWD 214	Gravelly Ford WD	Unknown	13S/16E/03	690	300-680	10/6/2020	10/28/2022	4
GFWD 215	Gravelly Ford WD	Unknown	13S/16E/10			10/6/2020	10/25/2022	4
GFWD 216	Gravelly Ford WD	Unknown	13S/16E/10	284	244-284	10/6/2020	10/25/2022	5
GFWD 217	Gravelly Ford WD	Irrigation	13S/16E/11			10/6/2020	10/25/2022	4
GFWD 218	Gravelly Ford WD	Unknown	13S/16E/01			10/6/2020	10/26/2022	2
GFWD 219	Gravelly Ford WD	Unknown	13S/16E/12			10/6/2020	10/25/2022	5
GFWD 220	Gravelly Ford WD	Irrigation	13S/16E/11			10/6/2020	10/26/2022	4
GFWD 221	Gravelly Ford WD	Unknown	13S/16E/10			10/6/2020	10/26/2022	3
GFWD 222	Gravelly Ford WD	Unknown	13S/16E/11			10/6/2020	10/26/2022	5
GFWD 223	Gravelly Ford WD	Irrigation	13S/16E/12	284	-284	10/6/2020	10/26/2022	4
GFWD 224	Gravelly Ford WD	Unknown	13S/16E/12			4/1/2015	3/1/2024	7
MD10A Charlton	Madera County	Other	11S/19E/34	610	250-600	2/5/2014	10/14/2019	133
MD10A Dublin	Madera County	Other	11S/19E/35	545	454-540	2/5/2014	11/30/2020	606
MD10A Fender	Madera-Chowchilla CASGEM Group	Other	12S/19E/03	670	275-660	10/19/2015	10/14/2019	8
MD10A Kensington	Madera County	Other	12S/19E/02	535	405-525	1/6/2014	1/24/2020	671
MD19A #3 Parkwood	Madera County	Other	11S/18E/31	456	240-456	7/9/2010	10/15/2019	26
MD28 Ripperdan	Madera County	Other	12S/17E/25	502	160-200	10/19/2015	10/25/2023	16
MD33 Fairmead	Madera County	Other	10S/16E/11	552	240-552	1/1/1900	11/18/2020	305
MD36 Eastin Arcola	Madera County	Other	12S/18E/21	360	280-360	3/12/2014	12/27/2020	280
MD37 EAST La Vina	Madera County	Other	12S/17E/21	392	320-392	3/12/2014	12/23/2020	267
MD37 WEST La Vina	Madera County	Other	12S/17E/21	393	297-393	6/16/2013	12/23/2020	245
MD95 Cont. Est. #1	Madera County	Other	11S/19E/33	550	450-550	5/19/2014	11/3/2023	301
MD95 Cont. Est. #4	Madera County	Other	11S/19E/33	559	449-554	4/21/2015	10/21/2020	241
MD95 Emergency	Madera-Chowchilla CASGEM Group	Other	11S/19E/33	547	447-547	10/19/2015	10/19/2015	1
MID 01	Madera ID	Unknown	//			1/15/2004	10/21/2014	91
MID 02	Madera-Chowchilla CASGEM Group	Irrigation	09S/18E/19	818	300-818	10/20/2011	2/14/2014	4
MID 03	Madera ID	Unknown	//			1/15/2004	10/17/2014	76
MID 04	Madera ID	Unknown	//			1/15/2004	10/23/2014	94
MID 05	Madera ID	Unknown	//			1/15/2004	10/21/2014	102
MID 06	Madera ID	Unknown	//			1/15/2004	10/22/2014	75
MID 07	Madera ID	Unknown	10S/18E/09		527-667	1/15/2004	10/20/2014	100
MID 08	Madera-Chowchilla CASGEM Group	Observation	10S/18E/21	1000		10/15/2015	10/13/2022	12
MID 09	Madera ID	Domestic	10S/18E/31	452	348-388	10/20/2011	10/23/2023	15
MID 10	Madera ID	Unknown	//			1/15/2004	10/23/2014	57
MID 11	Madera ID	Unknown	//			1/15/2004	10/22/2014	53
MID 12	Madera ID	Unknown	//			1/15/2004	10/23/2014	97
MID 13	Madera ID	Unknown	//			1/15/2004	10/23/2014	71
MID 14	Madera ID	Unknown	//			1/15/2004	10/17/2014	107
MID 15	Madera-Chowchilla CASGEM Group	Irrigation	11S/18E/21	510		10/20/2011	2/19/2014	3
MID 16	Madera ID	Unknown	//			1/15/2004	10/22/2014	30
MID 17	Madera ID	Unknown	//			1/15/2004	10/22/2014	100
MID 18	Madera ID	Unknown	//			1/15/2004	10/16/2014	70
MID 19	Madera ID	Unknown	//			1/15/2004	10/22/2014	99
MID 20	Madera ID	Unknown	12S/19E/04			1/15/2004	10/22/2014	107
MID 21	Madera ID	Unknown	//			1/15/2004	10/15/2014	98
MID 22	Madera ID	Unknown	//			11/15/2004	10/21/2014	69
MID 23	Madera ID	Unknown	//			11/15/2004	10/22/2014	74
MID 24	Madera ID	Unknown	//			11/15/2004	10/22/2014	75
MID 25	Madera ID	Unknown	//			12/15/2004	10/22/2014	77
MID 26A	Madera ID	Unknown	//			11/15/2004	10/23/2014	84
MID 27	Madera ID	Unknown	//			11/15/2004	10/14/2014	95
MID 28	Madera ID	Unknown	//			11/15/2004	10/23/2014	83
MID 29	Madera ID	Unknown	//			11/15/2004	10/23/2014	97
MID 30	DWR	Unknown	11S/16E/10			10/29/1959	2/18/2014	171
MID 31	Madera ID	Unknown	//			11/15/2004	10/22/2014	69
MID 32	Madera ID	Unknown	//			11/15/2004	10/23/2014	95
MID 33	Madera ID	Unknown	//			11/15/2004	10/20/2014	79
MID 34	Madera ID	Unknown	//			11/15/2004	10/20/2014	93
MID 35	Madera ID	Unknown	//			11/15/2004	10/20/2014	93
MID 36	Madera ID	Unknown	//			11/15/2004	10/23/2014	85
MID 37	Madera ID	Unknown	//			11/15/2004	10/23/2014	96
MID 38	Madera ID	Unknown	//			11/15/2004	10/22/2014	96
MID 39	Madera ID	Unknown	//			11/15/2004	10/23/2014	78
MID 40	Madera ID	Unknown	//			11/15/2004	10/22/2014	85
MID 41	Madera ID	Unknown	//			11/15/2004	10/23/2014	80

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
MID 42	Madera ID	Unknown	//			11/15/2004	10/22/2014	97
MID 43	Madera ID	Unknown	//			11/15/2004	10/16/2014	67
MID 44	Madera ID	Unknown	//			11/15/2004	10/16/2014	86
MID 45	Madera ID	Unknown	//			12/15/2004	10/16/2014	79
MID 46	Madera ID	Unknown	//			11/15/2004	10/16/2014	93
MID 47	Madera ID	Unknown	//			11/15/2004	10/23/2014	95
MID 48	Madera ID	Unknown	//			11/15/2004	10/16/2014	77
MID 49	Madera ID	Unknown	//			11/15/2004	10/15/2014	96
MID 50	Madera ID	Unknown	//			11/15/2004	10/15/2014	85
MID 52	Madera ID	Irrigation	10S/18E/26	800	360-800	1/15/2005	10/21/2014	59
MID 53	Madera ID	Unknown	//			1/15/2005	10/21/2014	66
MID 54	Madera ID	Unknown	//			1/15/2005	10/14/2014	0
MID 55	Madera ID	Unknown	//			1/15/2005	10/14/2014	0
MID 56	Madera ID	Unknown	//			1/15/2005	10/14/2014	0
MID 57	Madera ID	Unknown	//			2/15/2005	10/22/2014	86
MID 58	Madera ID	Unknown	//			6/15/2006	10/22/2014	71
MID 59	Madera ID	Unknown	//			9/15/2006	10/22/2014	72
MSB03A	Madera County	Observation	12S/15E/18	139	74-134	11/1/2019	3/7/2024	17
MSB03B	Madera County	Observation	12S/15E/18	295	215-285	11/2/2019	3/7/2024	15
MSB03C	Madera County	Observation	12S/15E/18	430	355-420	11/2/2019	3/7/2024	15
MSB04A	Madera County	Observation	11S/17E/11	375	180-365	9/9/2019	3/6/2024	19
MSB04B	Madera County	Observation	11S/17E/11	695	530-685	9/9/2019	3/6/2024	19
MSB04C	Madera County	Observation	11S/17E/11	905	750-895	9/9/2019	3/6/2024	19
MSB05A	Madera County	Observation	12S/16E/05	210	140-200	9/9/2019	3/19/2024	18
MSB05B	Madera County	Observation	12S/16E/05	375	240-365	9/9/2019	3/19/2024	18
MSB05C	Madera County	Observation	12S/16E/05	585	420-585	9/9/2019	3/19/2024	18
MSB06A	Madera County	Observation	13S/16E/03	350	135-340	12/16/2019	3/7/2024	14
MSB06B	Madera County	Observation	13S/16E/03	520	425-510	12/16/2019	3/7/2024	14
MSB06C	Madera County	Observation	13S/16E/03	715	630-705	12/16/2019	3/7/2024	14
MSB09A	Madera County	Observation	12S/17E/16	320	200-310	12/16/2019	3/7/2024	14
MSB09B	Madera County	Observation	12S/17E/16	725	520-715	12/16/2019	3/7/2024	14
MSB09C	Madera County	Observation	12S/17E/16	955	880-945	12/16/2019	3/7/2024	14
MSB10A	Madera County	Observation	10S/16E/11	330	190-320	8/9/2019	3/19/2024	20
MSB10B	Madera County	Observation	10S/16E/11	510	400-500	8/9/2019	3/5/2024	21
MSB10C	Madera County	Observation	10S/16E/11	880	790-870	8/9/2019	3/5/2024	21
MSB11A	Madera County	Observation	10S/17E/11	345	185-335	10/18/2019	3/6/2024	9
MSB11B	Madera County	Observation	10S/17E/11	700	550-690	10/18/2019	3/30/2023	7
MSB11C	Madera County	Observation	10S/17E/11	880	775-870	10/18/2019	3/6/2024	10
MSB12	Madera County	Observation	10S/18E/23	465	355-465	11/15/2022	3/6/2024	5
MSB13A	Madera County	Observation	11S/19E/15	290	200-280	11/16/2022	3/6/2024	0
MSB13B	Madera County	Observation	11S/19E/15	446	396-436	11/17/2022	3/6/2024	5
MSB13C	Madera County	Observation	11S/19E/15	532	522-532	11/18/2022	3/6/2024	5
MWD 01	Madera WD	Unknown	10S/18E/21			6/27/1994	4/1/2019	18
MWD 02	Madera WD	Unknown	10S/18E/28	500	200-500	10/20/1994	4/1/2019	18
MWD 03	Madera WD	Unknown	10S/18E/28			10/20/1994	4/1/2019	5
MWD 04	Madera WD	Irrigation	10S/18E/20	504	200-500	10/20/1994	3/26/2024	31
MWD 05	Madera WD	Unknown	10S/18E/20			10/19/1994	4/1/2019	18
MWD 06	Madera WD	Unknown	10S/18E/19	500	200-500	10/19/1994	4/1/2019	20
MWD 07	Madera WD	Unknown	10S/18E/30	500	200-500	10/20/1994	4/1/2019	20
MWD 08	Madera WD	Irrigation	10S/17E/24	537	200-537	9/12/2003	3/26/2024	29
MWD 09	Madera WD	Unknown	10S/17E/24	536	200-536	10/19/1994	4/1/2019	20
MWD 10	Madera WD	Unknown	10S/18E/19			3/15/2011	4/1/2019	18
MWD 11	Madera WD	Unknown	//			3/15/2011	4/1/2019	17
MWD 12	Madera WD	Unknown	//			11/1/2017	11/1/2017	1
MWD 13	Madera WD	Unknown	10S/18E/20			10/19/1994	11/1/2017	2
MWD 14	Madera WD	Unknown	10S/18E/19	780	300-770	7/8/2003	4/1/2019	17
MWD 15	Madera WD	Unknown	10S/18E/20	680	300-670	10/19/1994	4/1/2019	20
MWD 16	Madera WD	Unknown	10S/18E/21			10/20/1994	4/1/2019	8
MWD 17	Madera WD	Unknown	10S/18E/28			3/15/2011	4/1/2019	18
MWD 18	Madera WD	Unknown	10S/18E/21			3/15/2011	4/1/2019	18
MWD 19	Madera WD	Unknown	10S/18E/20			3/15/2011	4/1/2019	18
MWD 20	Madera WD	Irrigation	10S/17E/24	800	380-800	3/15/2011	3/26/2024	29
MWD 21	Madera WD	Unknown	10S/18E/30			10/15/2011	4/1/2019	16
MWD 22	Madera WD	Unknown	//			8/15/2014	4/1/2019	3
MWD 23	Madera WD	Unknown	10S/18E/20			10/15/2011	4/1/2019	16
MWD 24	Madera WD	Unknown	//			10/15/2013	4/1/2019	12

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
MWD 25	Madera WD	Unknown	//			10/15/2013	4/1/2019	12
MWD 26	Madera WD	Unknown	//			10/15/2013	4/1/2019	12
MWD 27	Madera WD	Unknown	//			10/15/2015	4/1/2019	7
MWD 28	Madera WD	Unknown	//			10/15/2015	4/1/2019	7
MWD 29	Madera WD	Unknown	//			10/15/2015	4/1/2019	8
MWD 30	Madera WD	Unknown	//			11/1/2016	4/1/2019	6
NSWD 10	New Stone WD	Irrigation	12S/15E/17	600	280-600	10/24/2019	2/14/2024	11
NSWD 34	New Stone WD	Irrigation	11S/15E/31	570	270-570	2/14/1964	2/14/2024	29
NSWD 37	New Stone WD	Irrigation	12S/15E/05	613	293-613	10/24/2019	2/14/2024	10
RCWD 10	Root Creek WD	Irrigation	12S/19E/25		100-148	10/17/2023	10/17/2023	1
RCWD 103	Root Creek WD	Irrigation	12S/20E/06		264-440	10/17/2023	10/17/2023	1
RCWD 105	Root Creek WD	Irrigation	12S/20E/08	476	212-476	1/28/1998	2/20/2019	42
RCWD 107	Root Creek WD	Irrigation	12S/19E/12		240-528	10/16/2023	10/16/2023	1
RCWD 113	Root Creek WD	Irrigation	12S/20E/07	495	240-492	6/20/1976	2/22/2024	71
RCWD 120	Root Creek WD	Irrigation	12S/19E/14		260-600	10/16/2023	10/16/2023	1
RCWD 123	Root Creek WD	Irrigation	12S/20E/07		330-755	10/16/2023	10/16/2023	1
RCWD 129	Root Creek WD	Irrigation	12S/19E/12		310-750	10/16/2023	10/16/2023	1
RCWD 130	Root Creek WD	Irrigation	12S/20E/06	760	370-750	1/28/1998	2/22/2024	53
RCWD 14	Root Creek WD	Irrigation	12S/19E/14			10/16/2023	10/16/2023	1
RCWD 141	Root Creek WD	Irrigation	12S/20E/07		280-580	11/9/2023	11/9/2023	0
RCWD 142	Root Creek WD	Irrigation	11S/20E/33	521	309-517	1/26/1998	11/9/2023	44
RCWD 145	Root Creek WD	Irrigation	12S/20E/18	452	224-244	3/10/2004	10/16/2023	32
RCWD 146	Root Creek WD	Irrigation	12S/19E/22		240-472	1/26/1998	10/17/2023	40
RCWD 153	Root Creek WD	Unknown	12S/20E/05			3/10/2004	1/15/2016	24
RCWD 156	Root Creek WD	Irrigation	12S/20E/08		374-796	10/16/2023	10/16/2023	1
RCWD 157	Root Creek WD	Irrigation	12S/19E/12		588-788	10/16/2023	10/16/2023	0
RCWD 16	Root Creek WD	Irrigation	12S/20E/08		324-468	7/15/1975	10/16/2023	27
RCWD 169	Root Creek WD	Irrigation	12S/20E/05		450-780	5/11/2023	10/17/2023	161
RCWD 17	Root Creek WD	Irrigation	12S/20E/06		200-380	10/16/2023	10/16/2023	0
RCWD 18	Root Creek WD	Irrigation	12S/20E/19			10/17/2023	10/17/2023	1
RCWD 180	Root Creek WD	Irrigation	12S/20E/18		340-485	11/9/2023	11/9/2023	1
RCWD 182	Root Creek WD	Irrigation	12S/20E/18		414-772	7/12/1974	10/16/2023	64
RCWD 2	Root Creek WD	Irrigation	12S/20E/18			10/16/2023	10/16/2023	1
RCWD 203	Root Creek WD	Irrigation	12S/19E/12			11/9/2023	11/9/2023	1
RCWD 204	Root Creek WD	Irrigation	12S/19E/12			10/16/2023	10/16/2023	1
RCWD 209	Root Creek WD	Irrigation	12S/20E/19			10/17/2023	10/17/2023	1
RCWD 210	Root Creek WD	Irrigation	12S/20E/19		500-644	10/16/2023	10/16/2023	1
RCWD 211	Root Creek WD	Irrigation	12S/20E/17		256-468	10/16/2023	10/16/2023	1
RCWD 213	Root Creek WD	Irrigation	12S/19E/13			10/16/2023	10/16/2023	1
RCWD 215	Root Creek WD	Irrigation	12S/19E/13			10/16/2023	10/16/2023	1
RCWD 216	Root Creek WD	Irrigation	12S/19E/13			10/16/2023	10/16/2023	1
RCWD 217	Root Creek WD	Irrigation	12S/19E/11			11/9/2023	11/9/2023	1
RCWD 22	Root Creek WD	Irrigation	12S/20E/19	236	160-228	7/12/1974	2/22/2024	73
RCWD 23	Root Creek WD	Irrigation	12S/20E/19	236	160-228	7/12/1974	10/17/2023	67
RCWD 24	Root Creek WD	Irrigation	11S/20E/32	475	104-428	1/15/2007	10/16/2023	20
RCWD 25	Root Creek WD	Unknown	//			1/1/2002	1/1/2002	2
RCWD 266	Root Creek WD	Irrigation	12S/19E/26			10/17/2023	10/17/2023	1
RCWD 268	Root Creek WD	Irrigation	12S/20E/19		320-580	11/9/2023	11/9/2023	1
RCWD 269	Root Creek WD	Irrigation	12S/19E/24		300-440	11/9/2023	11/9/2023	1
RCWD 270	Root Creek WD	Irrigation	12S/20E/19		260-580	10/16/2023	10/16/2023	1
RCWD 271	Root Creek WD	Irrigation	12S/20E/07		280-520	10/16/2023	10/16/2023	0
RCWD 29	Root Creek WD	Irrigation	11S/20E/31		124-454	10/16/2023	10/16/2023	1
RCWD 3	Root Creek WD	Irrigation	12S/20E/18		261-503	1/26/1998	10/16/2023	27
RCWD 30	Root Creek WD	Irrigation	12S/19E/13		116-472	6/25/1974	10/16/2023	23
RCWD 34	Root Creek WD	Irrigation	12S/19E/13		180-240	10/16/2023	10/16/2023	1
RCWD 38	Root Creek WD	Irrigation	12S/19E/13		238-486	8/14/1978	10/17/2023	40
RCWD 39	Root Creek WD	Irrigation	12S/19E/13		183-295	1/28/1998	10/17/2023	40
RCWD 4	Root Creek WD	Irrigation	12S/19E/24		254-650	11/9/2023	11/9/2023	1
RCWD 5	Root Creek WD	Domestic	12S/20E/18		112-381	10/16/2023	10/16/2023	1
RCWD 50	Root Creek WD	Unknown	12S/20E/05			3/10/2004	1/15/2017	27
RCWD 65	Root Creek WD	Irrigation	12S/20E/05	496	290-400	1/24/1979	2/22/2024	1392
RCWD 66	Root Creek WD	Irrigation	12S/20E/09		256-497	7/1/1974	10/16/2023	66
RCWD 68	Root Creek WD	Irrigation	11S/20E/32	448	230-415	1/15/2010	10/17/2023	17
RCWD 70	Root Creek WD	Irrigation	12S/20E/06		245-519	6/26/1974	11/9/2023	29
RCWD 73	Root Creek WD	Irrigation	11S/20E/32	470	260-440	1/15/2007	10/16/2023	25
RCWD 76	Root Creek WD	Irrigation	12S/19E/14	636	232-628	1/27/1998	10/16/2023	41

Table 3.J-1 - Supplemental Groundwater Level Monitoring Network, Madera Subbasin

Well ID	Monitoring Entity	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Level Measurement Date	Most Recent Groundwater Level Measurement Date	Count of Groundwater Level Measurements
RCWD 77	Root Creek WD	Irrigation	12S/19E/01		210-410	7/3/1974	10/16/2023	34
RCWD 78	Root Creek WD	Unknown	//			7/3/1974	1/20/2005	35
RCWD 8	Root Creek WD	Irrigation	12S/19E/12			10/16/2023	10/16/2023	1
RCWD 83	Root Creek WD	Irrigation	12S/19E/23	492	240-492	7/3/1975	2/22/2024	74
RCWD 85	Root Creek WD	Irrigation	12S/19E/11	412	250-420	6/25/1975	2/22/2024	78
RCWD 86	Root Creek WD	Irrigation	12S/19E/12		240-444	11/9/2023	11/9/2023	0
RCWD 88	Root Creek WD	Irrigation	12S/19E/14		258-480	10/28/1975	10/16/2023	61
RCWD 91	Root Creek WD	Irrigation	12S/19E/24	414	240-414	1/26/1998	10/17/2023	43
RCWD 92	Root Creek WD	Irrigation	12S/19E/26		240-450	9/15/1976	11/9/2023	28
RCWD CO1	Root Creek WD	Irrigation	12S/19E/25		98-152	10/17/2023	10/17/2023	0
RCWD M5	Root Creek WD	Public Supply	11S/20E/32			10/16/2023	10/16/2023	1
SA19 Rolling Hills	Madera County	Other	12S/20E/09	840	370-820	10/19/2015	3/30/2023	5
SA3 Parksdale	Madera-Chowchilla CASGEM Group	Other	11S/18E/33	480	216-480	10/19/2015	10/16/2019	8
SJRRP_MW-09-1	USBR SJRRP	Observation	12S/20E/21	37	17-37	10/27/2009	12/6/2019	175
SJRRP_MW-09-2	USBR SJRRP	Monitoring	12S/20E/21	28.6	8-28	10/27/2009	12/6/2019	183
SJRRP_MW-09-25	USBR SJRRP	Observation	13S/18E/06	47	26-46	10/27/2009	6/14/2023	324
SJRRP_MW-09-26	USBR SJRRP	Monitoring	13S/18E/06	57.5	37-57	10/27/2009	6/14/2023	140
SJRRP_MW-09-27	USBR SJRRP	Monitoring	13S/18E/06	70	50-70	10/27/2009	6/14/2023	171
SJRRP_MW-10-117	USBR SJRRP	Monitoring	12S/15E/06	31.1	15.1-30.1	2/3/2012	10/18/2012	0
SJRRP_MW-11-158	USBR SJRRP	Observation	13S/17E/18	30		2/10/2012	6/20/2018	144
SJRRP_MW-11-159	USBR SJRRP	Unknown	13S/17E/18			2/10/2012	5/22/2024	54
SJRRP_R1-1	USBR SJRRP	Unknown	13S/18E/03			3/19/2010	10/22/2010	16
SJRRP_R1-2	USBR SJRRP	Unknown	13S/18E/03			3/19/2010	10/22/2010	25

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
CA0202503_002_002	DDW	Municipal	12S/19E/09		62 - 142	1/22/2003	7/18/2023	140
CA0202503_002_002	DDW	Municipal	12S/19E/09		62 - 142	1/22/2003	7/18/2023	140
CA1009256_002_002	DDW	Municipal	11S/18E/03			5/5/2015	5/5/2015	1
CA2000150_001_001	DDW	Municipal	12S/19E/04			1/22/2010	6/21/2023	83
CA2000150_002_002	DDW	Municipal	12S/19E/03			8/29/2007	12/27/2019	187
CA2000206_001_001	DDW	Municipal	11S/17E/13			6/7/2006	7/6/2023	163
CA2000220_001_001	DDW	Municipal	11S/19E/28			11/14/2001	3/5/2020	10
CA2000245_001_001	DDW	Municipal	12S/20E/21		140 - 200	1/19/2004	10/31/2023	34
CA2000245_001_001	DDW	Municipal	12S/20E/16		140 - 200	1/19/2004	10/31/2023	34
CA2000275_001_001	DDW	Municipal	12S/20E/21			5/3/1996	7/22/2024	312
CA2000275_001_001	DDW	Municipal	12S/20E/16			5/3/1996	7/22/2024	312
CA2000275_002_002	DDW	Municipal	12S/20E/21			5/3/1996	7/10/2024	190
CA2000275_002_002	DDW	Municipal	12S/20E/16			5/3/1996	7/10/2024	190
CA2000275_004_004	DDW	Municipal	12S/20E/21			3/7/2019	7/10/2024	108
CA2000275_004_004	DDW	Municipal	12S/20E/16			3/7/2019	7/10/2024	108
CA2000286_001_001	DDW	Municipal	12S/18E/15			12/23/2004	12/28/2021	17
CA2000294_001_001	DDW	Municipal	12S/18E/31			12/9/2009	2/7/2024	12
CA2000294_001_001	DDW	Municipal	12S/18E/31			12/9/2009	2/7/2024	12
CA2000315_001_001	DDW	Municipal	11S/17E/14			8/5/2002	3/23/2017	15
CA2000315_007_007	DDW	Municipal	11S/17E/13			1/4/2017	1/3/2024	8
CA2000320_001_001	DDW	Municipal	12S/20E/02			1/6/2002	10/25/2023	68
CA2000320_001_001	DDW	Municipal	11S/20E/35			1/6/2002	10/25/2023	68
CA2000352_001_001	DDW	Municipal	12S/18E/05			8/13/1998	7/11/2024	259
CA2000370_002_002	DDW	Municipal	11S/17E/05		240 - 240	1/19/2000	1/3/2024	366
CA2000384_001_001	DDW	Municipal	10S/16E/14		296 - 305	3/4/1999	1/8/2024	72
CA2000384_001_001	DDW	Municipal	10S/16E/14		296 - 305	3/4/1999	1/8/2024	72
CA2000504_001_001	DDW	Municipal	12S/17E/21			3/3/2003	1/3/2024	54
CA2000507_001_001	DDW	Municipal	10S/17E/30		372 - 372	12/2/1999	6/28/2024	42
CA2000507_002_002	DDW	Municipal	10S/17E/30			1/13/2017	6/28/2024	42
CA2000531_001_001	DDW	Municipal	11S/17E/33			7/29/2002	8/24/2020	33
CA2000531_004_004	DDW	Municipal	11S/17E/34			3/10/2015	4/9/2024	30
CA2000531_004_004	DDW	Municipal	11S/17E/33			3/10/2015	4/9/2024	30
CA2000545_001_001	DDW	Municipal	11S/17E/14		0 - 10	7/11/2002	1/8/2024	21
CA2000547_002_002	DDW	Municipal	12S/18E/05			1/3/2007	1/5/2024	19
CA2000553_001_001	DDW	Municipal	12S/18E/31		450 - 500	10/9/1986	7/9/2024	842
CA2000553_001_001	DDW	Municipal	12S/17E/25		450 - 500	10/9/1986	7/9/2024	842
CA2000554_001_001	DDW	Municipal	10S/16E/11		240 - 430	8/20/1986	2/21/2024	242
CA2000554_005_005	DDW	Municipal	10S/16E/11			4/7/2021	2/21/2024	126
CA2000554_005_005	DDW	Municipal	10S/16E/11			4/7/2021	2/21/2024	126
CA2000595_001_001	DDW	Municipal	11S/17E/11			8/19/1986	3/1/2021	202
CA2000595_004_004	DDW	Municipal	11S/17E/14			12/18/2007	5/7/2024	478
CA2000595_004_004	DDW	Municipal	11S/17E/10			12/18/2007	5/7/2024	478
CA2000597_001_001	DDW	Municipal	11S/15E/02		300 - 300	9/3/1986	7/17/2024	254
CA2000600_002_002	DDW	Municipal	11S/17E/30			11/3/1999	5/15/2024	182
CA2000601_002_002	DDW	Municipal	12S/17E/21			11/3/1999	12/4/2023	123
CA2000602_001_001	DDW	Municipal	12S/17E/36			8/20/1986	6/18/2024	128
CA2000608_001_001	DDW	Municipal	12S/20E/21			8/21/1986	6/12/2024	205
CA2000637_001_001	DDW	Municipal	12S/18E/31			8/12/2002	3/26/2024	8
CA2000641_001_001	DDW	Municipal	10S/17E/09			9/3/1986	7/29/2021	47
CA2000641_021_021	DDW	Municipal	10S/17E/09			9/2/2015	8/9/2023	13
CA2000653_001_001	DDW	Municipal	12S/18E/06			7/2/2002	1/8/2024	41
CA2000655_001_001	DDW	Municipal	11S/18E/17		340 - 340	9/3/1986	12/16/2016	18
CA2000655_002_002	DDW	Municipal	11S/18E/17			3/15/1999	6/27/2024	17
CA2000655_003_003	DDW	Municipal	11S/18E/17			1/20/2021	6/27/2024	64
CA2000655_003_003	DDW	Municipal	11S/18E/17			1/20/2021	6/27/2024	64
CA2000659_001_001	DDW	Municipal	11S/17E/34			9/4/1986	4/16/2024	324
CA2000659_001_001	DDW	Municipal	11S/17E/34			9/4/1986	4/16/2024	324
CA2000659_003_003	DDW	Municipal	11S/17E/34			8/16/2001	4/16/2024	94
CA2000659_003_003	DDW	Municipal	11S/17E/34			8/16/2001	4/16/2024	94
CA2000659_004_004	DDW	Municipal	11S/17E/34			8/16/2001	1/21/2022	88
CA2000659_006_006	DDW	Municipal	11S/17E/34		244 - 484	2/8/2001	4/16/2024	208
CA2000659_006_006	DDW	Municipal	11S/17E/34		244 - 484	2/8/2001	4/16/2024	208
CA2000660_007_007	DDW	Municipal	12S/17E/03			1/26/2012	6/5/2024	89
CA2000672_001_001	DDW	Municipal	12S/17E/36			9/24/1986	2/26/2024	172
CA2000675_001_001	DDW	Municipal	12S/17E/24			9/24/1986	11/24/2020	28

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
CA2000682_001_001	DDW	Municipal	11S/17E/03		400 - 400	9/4/1986	1/16/2024	117
CA2000682_002_002	DDW	Municipal	11S/17E/03		295 - 420	7/15/1999	1/16/2024	94
CA2000682_003_003	DDW	Municipal	11S/17E/03			2/22/2007	1/16/2024	168
CA2000682_003_003	DDW	Municipal	10S/17E/33			2/22/2007	1/16/2024	168
CA2000692_001_001	DDW	Municipal	11S/19E/33			9/11/1998	1/6/2021	398
CA2000692_001_001	DDW	Municipal	11S/19E/33			9/11/1998	1/6/2021	398
CA2000692_002_002	DDW	Municipal	11S/19E/33			9/11/1998	8/11/2015	59
CA2000692_009_009	DDW	Municipal	11S/19E/33			2/23/2016	3/25/2024	122
CA2000692_009_009	DDW	Municipal	11S/19E/33			2/23/2016	3/25/2024	122
CA2000695_001_001	DDW	Municipal	12S/18E/03		330 - 540	8/15/2001	5/7/2024	62
CA2000695_001_001	DDW	Municipal	11S/18E/34		330 - 540	8/15/2001	5/7/2024	62
CA2000724_001_001	DDW	Municipal	10S/18E/29		0 - 15	8/20/1986	12/10/2020	167
CA2000724_002_002	DDW	Municipal	10S/18E/29			5/26/2016	2/21/2024	290
CA2000724_002_002	DDW	Municipal	10S/18E/29			5/26/2016	2/21/2024	290
CA2000727_001_001	DDW	Municipal	12S/18E/28		280 - 360	9/9/1998	7/9/2024	462
CA2000727_001_001	DDW	Municipal	12S/18E/21		280 - 360	9/9/1998	7/9/2024	462
CA2000727_002_002	DDW	Municipal	12S/18E/27			2/21/2006	7/9/2024	384
CA2000727_002_002	DDW	Municipal	12S/18E/21			2/21/2006	7/9/2024	384
CA2000728_001_001	DDW	Municipal	12S/17E/22			9/2/1998	6/20/2024	233
CA2000728_002_002	DDW	Municipal	12S/17E/22			9/2/1998	6/20/2024	293
CA2000760_002_002	DDW	Municipal	11S/16E/02			10/19/2000	12/4/2023	161
CA2000770_001_001	DDW	Municipal	12S/18E/05		349 - 379	11/15/2002	1/5/2023	130
CA2000780_001_001	DDW	Municipal	11S/17E/09			12/14/2006	12/27/2023	22
CA2000785_002_002	DDW	Municipal	12S/19E/09		320 - 600	11/13/2000	6/6/2023	299
CA2000794_001_001	DDW	Municipal	12S/20E/17			2/9/2001	4/9/2024	335
CA2000811_002_002	DDW	Municipal	10S/18E/23			12/27/2012	9/19/2023	19
CA2000846_003_003	DDW	Municipal	11S/19E/15			4/4/2017	1/22/2024	34
CA2000850_001_001	DDW	Municipal	11S/20E/21		240 - 320	9/2/2009	2/8/2023	7
CA2000852_001_001	DDW	Municipal	11S/18E/09			11/15/2002	6/5/2015	6
CA2000855_001_001	DDW	Municipal	12S/18E/06		0 - 35	12/9/2014	8/5/2019	2
CA2000855_002_002	DDW	Municipal	12S/18E/06		0 - 75	12/15/2008	12/5/2023	94
CA2000855_002_002	DDW	Municipal	12S/18E/06		0 - 75	12/15/2008	12/5/2023	94
CA2000855_005_005	DDW	Municipal	12S/18E/06			3/23/2009	6/13/2024	100
CA2000855_005_005	DDW	Municipal	12S/18E/06			3/23/2009	6/13/2024	100
CA2000855_007_007	DDW	Municipal	12S/18E/06			12/1/2015	12/5/2023	34
CA2000855_007_007	DDW	Municipal	12S/18E/06			12/1/2015	12/5/2023	34
CA2000866_001_001	DDW	Municipal	10S/17E/10			4/19/2001	7/8/2024	435
CA2000885_001_001	DDW	Municipal	13S/18E/06			6/26/2006	7/22/2024	96
CA2000920_005_005	DDW	Municipal	11S/17E/17			9/6/2016	7/8/2024	45
CA2000931_001_001	DDW	Municipal	12S/17E/27			12/19/2012	12/11/2023	6
CA2000932_002_002	DDW	Municipal	10S/16E/14			10/19/2018	4/11/2024	34
CA2000938_001_001	DDW	Municipal	12S/18E/02		420 - 560	6/25/2008	1/17/2023	82
CA2000938_003_003	DDW	Municipal	12S/18E/02			12/6/2017	4/16/2024	98
CA2000938_003_003	DDW	Municipal	12S/18E/02			12/6/2017	4/16/2024	98
CA2000944_001_001	DDW	Municipal	11S/16E/26			7/7/2009	7/2/2024	330
CA2000944_001_001	DDW	Municipal	11S/16E/26			7/7/2009	7/2/2024	330
CA2000950_001_001	DDW	Municipal	12S/20E/17			10/3/2012	7/23/2024	13
CA2000951_001_001	DDW	Municipal	12S/18E/36			3/6/2015	1/6/2022	35
CA2000951_002_002	DDW	Municipal	12S/18E/36			9/13/2021	4/8/2024	68
CA2000951_002_002	DDW	Municipal	12S/18E/25			9/13/2021	4/8/2024	68
CA2000952_001_001	DDW	Municipal	12S/19E/22			12/26/2017	2/7/2024	7
CA2000955_001_001	DDW	Municipal	12S/19E/33			3/4/2015	6/5/2024	39
CA2000956_001_001	DDW	Municipal	11S/17E/34			7/15/2020	7/8/2024	36
CA2000961_001_001	DDW	Municipal	12S/18E/04			3/19/2018	7/8/2024	48
CA2000962_001_001	DDW	Municipal	12S/19E/21			10/4/2017	3/21/2022	9
CA2000963_001_001	DDW	Municipal	11S/17E/04			8/23/2018	1/8/2024	7
CA2000963_002_002	DDW	Municipal	11S/17E/05			8/23/2018	1/8/2024	8
CA2000968_001_001	DDW	Municipal	12S/18E/05			3/10/2020	7/18/2024	68
CA2000968_001_001	DDW	Municipal	11S/18E/32			3/10/2020	7/18/2024	68
CA2000968_002_002	DDW	Municipal	12S/18E/05			10/16/2019	7/18/2024	74
CA2000968_002_002	DDW	Municipal	11S/18E/32			10/16/2019	7/18/2024	74
CA2000969_2000969-001_001	DDW	Municipal	11S/17E/21			7/7/2021	7/7/2021	9
CA2010002_001_001	DDW	Municipal	11S/17E/10		0 - 360	7/10/1984	6/3/2024	664
CA2010002_001_001	DDW	Municipal	11S/17E/10		0 - 360	7/10/1984	6/3/2024	664
CA2010002_011_011	DDW	Municipal	11S/17E/26		195 - 465	3/4/1986	6/3/2024	758

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
CA2010002_011_011	DDW	Municipal	11S/17E/22		195 - 465	3/4/1986	6/3/2024	758
CA2010002_013_013	DDW	Municipal	11S/18E/30		0 - 360	7/10/1984	6/3/2024	345
CA2010002_014_014	DDW	Municipal	11S/17E/24		280 - 610	7/10/1984	6/3/2024	628
CA2010002_014_014	DDW	Municipal	11S/17E/13		280 - 610	7/10/1984	6/3/2024	628
CA2010002_016_016	DDW	Municipal	11S/17E/13		0 - 370	7/10/1984	3/25/2024	600
CA2010002_016_016	DDW	Municipal	11S/17E/14		0 - 370	7/10/1984	3/25/2024	600
CA2010002_017_017	DDW	Municipal	11S/18E/30		0 - 370	7/10/1984	3/25/2024	896
CA2010002_017_017	DDW	Municipal	11S/18E/30		0 - 370	7/10/1984	3/25/2024	896
CA2010002_018_018	DDW	Municipal	11S/17E/24		0 - 280	3/4/1986	6/3/2024	814
CA2010002_018_018	DDW	Municipal	11S/17E/24		0 - 280	3/4/1986	6/3/2024	814
CA2010002_019_019	DDW	Municipal	11S/17E/13		0 - 560	3/4/1986	11/9/2023	886
CA2010002_019_019	DDW	Municipal	11S/17E/12		0 - 560	3/4/1986	11/9/2023	886
CA2010002_020_020	DDW	Municipal	11S/18E/18		0 - 300	3/4/1986	6/3/2024	708
CA2010002_020_020	DDW	Municipal	11S/18E/18		0 - 300	3/4/1986	6/3/2024	708
CA2010002_021_021	DDW	Municipal	11S/17E/14		0 - 230	3/4/1986	6/3/2024	734
CA2010002_021_021	DDW	Municipal	11S/17E/14		0 - 230	3/4/1986	6/3/2024	734
CA2010002_023_023	DDW	Municipal	11S/18E/17		0 - 750	8/20/1992	6/3/2024	576
CA2010002_023_023	DDW	Municipal	11S/18E/18		0 - 750	8/20/1992	6/3/2024	576
CA2010002_024_024	DDW	Municipal	11S/17E/23		370 - 575	2/27/1995	3/25/2024	462
CA2010002_024_024	DDW	Municipal	11S/17E/23		370 - 575	2/27/1995	3/25/2024	462
CA2010002_025_025	DDW	Municipal	11S/17E/26		430 - 720	2/7/1995	3/25/2024	550
CA2010002_025_025	DDW	Municipal	11S/17E/26		430 - 720	2/7/1995	3/25/2024	550
CA2010002_030_030	DDW	Municipal	11S/18E/29		265 - 500	3/8/2001	3/25/2024	354
CA2010002_030_030	DDW	Municipal	11S/18E/19		265 - 500	3/8/2001	3/25/2024	354
CA2010002_031_031	DDW	Municipal	11S/17E/22		0 - 360	9/22/2004	3/25/2024	268
CA2010002_031_031	DDW	Municipal	11S/17E/22		0 - 360	9/22/2004	3/25/2024	268
CA2010002_032_032	DDW	Municipal	11S/18E/31		310 - 600	11/18/2005	3/25/2024	474
CA2010002_032_032	DDW	Municipal	11S/18E/31		310 - 600	11/18/2005	3/25/2024	474
CA2010002_033_033	DDW	Municipal	11S/18E/30		433 - 568	9/10/2009	9/21/2023	308
CA2010002_033_033	DDW	Municipal	11S/18E/30		433 - 568	9/10/2009	9/21/2023	308
CA2010002_050_050	DDW	Municipal	11S/17E/10			1/11/2024	4/30/2024	15
CA2010004_002_002	DDW	Municipal	11S/18E/31		0 - 60	11/19/1984	2/2/2018	361
CA2010004_003_003	DDW	Municipal	11S/18E/31		240 - 456	11/8/1985	7/9/2024	1,344
CA2010004_003_003	DDW	Municipal	11S/18E/31		240 - 456	11/8/1985	7/9/2024	1,344
CA2010006_001_001	DDW	Municipal	11S/18E/29		0 - 15	11/19/1984	1/21/2022	423
CA2010006_002_002	DDW	Municipal	11S/18E/28		0 - 15	11/8/1985	3/11/2024	630
CA2010006_002_002	DDW	Municipal	11S/18E/28		0 - 15	11/8/1985	3/11/2024	630
CA2010006_003_003	DDW	Municipal	11S/18E/33			12/15/2005	4/17/2024	626
CA2010006_003_003	DDW	Municipal	11S/18E/33			12/15/2005	4/17/2024	626
CA2010006_004_004	DDW	Municipal	11S/18E/33		235 - 490	9/3/2009	2/26/2024	386
CA2010006_004_004	DDW	Municipal	11S/18E/33		235 - 490	9/3/2009	2/26/2024	386
CA2010008_004_004	DDW	Municipal	12S/19E/03		306 - 389	9/19/1997	3/25/2024	838
CA2010008_004_004	DDW	Municipal	12S/19E/03		306 - 389	9/19/1997	3/25/2024	838
CA2010008_005_005	DDW	Municipal	11S/19E/34		250 - 465	5/1/1997	3/25/2024	884
CA2010008_005_005	DDW	Municipal	11S/19E/34		250 - 465	5/1/1997	3/25/2024	884
CA2010008_006_006	DDW	Municipal	12S/19E/02		0 - 120	2/3/2010	1/21/2022	164
CA2010008_007_007	DDW	Municipal	11S/19E/35			12/16/2013	3/25/2024	246
CA2010008_007_007	DDW	Municipal	11S/19E/35			12/16/2013	3/25/2024	246
CA2010008_008_008	DDW	Municipal	11S/19E/35			4/1/2024	6/27/2024	4
CA2010009_002_002	DDW	Municipal	12S/20E/04		324 - 369	11/19/1984	4/18/2018	427
CA2010009_003_003	DDW	Municipal	12S/20E/16		240 - 526	10/22/1985	4/9/2024	886
CA2010009_003_003	DDW	Municipal	12S/20E/09		240 - 526	10/22/1985	4/9/2024	886
CA2010009_007_007	DDW	Municipal	12S/20E/16			11/10/2009	7/8/2024	782
CA2010009_007_007	DDW	Municipal	12S/20E/09			11/10/2009	7/8/2024	782
CA2010009_010_010	DDW	Municipal	12S/20E/09			7/28/2020	4/9/2024	204
CA2010009_010_010	DDW	Municipal	12S/20E/09			7/28/2020	4/9/2024	204
CA2010010_001_001	DDW	Municipal	11S/17E/11		0 - 300	11/14/1985	1/2/2024	1,274
CA2010010_001_001	DDW	Municipal	11S/17E/11		0 - 300	11/14/1985	1/2/2024	1,274
CA2010010_002_002	DDW	Municipal	10S/17E/35		0 - 200	11/14/1985	1/5/2015	582
CA2010010_003_003	DDW	Municipal	10S/17E/36		0 - 238	8/9/1985	1/5/2015	586
CA2010010_004_004	DDW	Municipal	11S/17E/02		0 - 250	7/20/1990	5/13/2024	1,144
CA2010010_004_004	DDW	Municipal	10S/17E/35		0 - 250	7/20/1990	5/13/2024	1,144
CA2010010_005_005	DDW	Municipal	11S/17E/01		0 - 136	12/30/1993	5/13/2024	1,156
CA2010010_005_005	DDW	Municipal	10S/17E/36		0 - 136	12/30/1993	5/13/2024	1,156
CA2010010_006_006	DDW	Municipal	11S/17E/01		230 - 409	8/21/2002	5/13/2024	784

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
CA2010010_006_006	DDW	Municipal	11S/17E/02		230 - 409	8/21/2002	5/13/2024	784
CA2010010_007_007	DDW	Municipal	11S/18E/06		242 - 374	10/18/2005	1/2/2024	588
CA2010010_007_007	DDW	Municipal	10S/17E/36		242 - 374	10/18/2005	1/2/2024	588
CA2010016_001_001	DDW	Municipal	12S/20E/05			5/27/2016	6/4/2024	226
CA2010016_001_001	DDW	Municipal	12S/20E/06			5/27/2016	6/4/2024	226
CA2010016_002_002	DDW	Municipal	12S/20E/05			5/27/2016	7/9/2024	618
CA2010016_002_002	DDW	Municipal	12S/20E/06			5/27/2016	7/9/2024	618
CA2010016_003_003	DDW	Municipal	12S/20E/05			6/27/2016	7/6/2021	73
CA2010016_007_007	DDW	Municipal	11S/20E/32			1/8/2024	4/8/2024	30
CA2010018_001_001	DDW	Municipal	11S/21E/06			10/28/2019	5/21/2024	164
CA2010018_001_001	DDW	Municipal	11S/21E/06			10/28/2019	5/21/2024	164
CA2010018_002_002	DDW	Municipal	11S/21E/06			7/30/2019	5/21/2024	164
CA2010018_002_002	DDW	Municipal	11S/21E/06			7/30/2019	5/21/2024	164
CA2010018_003_003	DDW	Municipal	11S/21E/06			8/28/2020	8/28/2020	20
CA2010018_004_004	DDW	Municipal	11S/21E/06			11/14/2019	5/21/2024	174
CA2010018_004_004	DDW	Municipal	11S/21E/06			11/14/2019	5/21/2024	174
CA2010800_001_001	DDW	Municipal	10S/17E/06		0 - 290	12/27/1989	8/4/2015	241
CA2010800_002_002	DDW	Municipal	10S/17E/05		0 - 375	1/6/1990	7/30/2024	756
CA2010800_002_002	DDW	Municipal	10S/17E/06		0 - 375	1/6/1990	7/30/2024	756
CA2010800_003_003	DDW	Municipal	10S/17E/05		0 - 280	12/6/1989	7/2/2024	684
CA2010800_003_003	DDW	Municipal	10S/17E/06		0 - 280	12/6/1989	7/2/2024	684
CA2010801_001_001	DDW	Municipal	09S/17E/31		375 - 760	3/4/1998	7/2/2024	782
CA2010801_001_001	DDW	Municipal	09S/17E/31		375 - 760	3/4/1998	7/2/2024	782
CA2010801_002_002	DDW	Municipal	09S/17E/31		410 - 800	3/4/1998	8/15/2023	712
CA2010801_002_002	DDW	Municipal	09S/17E/31		410 - 800	3/4/1998	8/15/2023	712
CA2010801_007_007	DDW	Municipal	10S/17E/06			3/8/2016	7/2/2024	456
CA2010801_007_007	DDW	Municipal	10S/17E/06			3/8/2016	7/2/2024	456
CA2801077_001_001	DDW	Municipal	11S/18E/17		60 - 500	4/3/2002	4/24/2024	18
CA2801077_001_001	DDW	Municipal	11S/18E/17		60 - 500	4/3/2002	4/24/2024	18
113580	DPR	Domestic	12S/17E/34			6/5/2017	6/5/2017	0
113589	DPR	Domestic	12S/17E/35	184		6/5/2017	6/5/2017	0
AGC100012331-ESJQC00012	GeoTracker	Domestic	12S/17E/02	276		10/30/2018	7/25/2022	116
AGC100012331-ESJQC00012	GeoTracker	Domestic	11S/17E/35	276		10/30/2018	7/25/2022	116
AGC100012331-ESJQC00017	GeoTracker	Domestic	12S/18E/17			7/22/2019	7/27/2021	27
AGC100012331-ESJQC00027	GeoTracker	Monitoring	12S/15E/18	139		8/4/2020	8/3/2022	68
AGC100012331-ESJQC00027	GeoTracker	Monitoring	12S/15E/18	139		8/4/2020	8/3/2022	68
AGC100012331-ESJQC00033	GeoTracker	Monitoring	11S/16E/06	375		8/4/2020	8/3/2022	34
AGC100012331-ESJQC00035	GeoTracker	Monitoring	12S/16E/05	210		8/4/2020	8/3/2022	68
AGC100012331-ESJQC00035	GeoTracker	Monitoring	12S/16E/05	210		8/4/2020	8/3/2022	68
AGC100012331-ESJQC00036	GeoTracker	Monitoring	13S/16E/11	350		8/4/2020	8/3/2022	68
AGC100012331-ESJQC00036	GeoTracker	Monitoring	13S/16E/03	350		8/4/2020	8/3/2022	68
AGC100012331-ESJQC00037	GeoTracker	Monitoring	12S/17E/22	320		8/4/2020	8/3/2022	86
AGC100012331-ESJQC00037	GeoTracker	Monitoring	12S/17E/16	320		8/4/2020	8/3/2022	86
AGC100012331-ESJQC00039	GeoTracker	Monitoring	10S/16E/11	510		8/4/2020	8/2/2022	68
AGC100012331-ESJQC00039	GeoTracker	Monitoring	10S/16E/11	510		8/4/2020	8/2/2022	68
AGW080010122-ALMOND_PLANT	GeoTracker	Domestic	11S/17E/04			12/19/2018	12/19/2018	1
AGW080010123-R4_SHOP	GeoTracker	Domestic	11S/17E/18			12/19/2018	12/14/2022	6
AGW080010123-R4_SHOP	GeoTracker	Domestic	11S/17E/18			12/19/2018	12/14/2022	6
AGW080010124-R5_SHOP	GeoTracker	Domestic	11S/17E/17			12/19/2018	12/19/2022	4
AGW080010124-R5_SHOP	GeoTracker	Domestic	11S/17E/17			12/19/2018	12/19/2022	4
AGW080010125-R20_OLIVE	GeoTracker	Domestic	12S/18E/25			12/19/2018	11/29/2022	6
AGW080010125-R20_OLIVE	GeoTracker	Domestic	12S/18E/25			12/19/2018	11/29/2022	6
AGW080010126-HOME_DOM	GeoTracker	Domestic	13S/17E/18			1/3/2019	1/3/2019	1
AGW080010127-GARCIA_DOM	GeoTracker	Domestic	12S/17E/36			1/10/2019	1/10/2019	1
AGW080010128-SHOP_DOM	GeoTracker	Domestic	13S/17E/18			1/3/2019	1/3/2019	1
AGW080010131-HOME_DOM	GeoTracker	Domestic	13S/17E/07			1/3/2019	1/3/2019	1
AGW080010132-NICHOLAS	GeoTracker	Domestic	13S/17E/08			1/3/2019	1/3/2019	1
AGW080010208-AV6_WELL1_PUMP	GeoTracker	Domestic	12S/17E/31			1/21/2019	3/18/2020	2
AGW080010209-AV6_WELL2	GeoTracker	Domestic	13S/17E/05			1/10/2019	11/15/2022	8
AGW080010209-AV6_WELL2	GeoTracker	Domestic	12S/17E/31			1/10/2019	11/15/2022	8
AGW080010213-7558ROAD25	GeoTracker	Domestic	12S/17E/26			1/10/2019	1/28/2021	3
AGW080010214-25697AVE7	GeoTracker	Domestic	12S/17E/26			1/10/2019	1/28/2021	3
AGW080010220-HOUSE WELL	GeoTracker	Domestic	10S/18E/04			1/9/2019	1/9/2019	0
AGW080010244-SR1WELL	GeoTracker	Domestic	12S/18E/30			1/10/2019	3/19/2020	2
AGW080010245-SR2WELL	GeoTracker	Domestic	12S/17E/25			3/4/2019	3/4/2019	1

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080010255-R-28	GeoTracker	Domestic	12S/18E/17			1/11/2019	12/2/2021	4
AGW080010256-R-17	GeoTracker	Domestic	10S/16E/28			1/11/2019	12/2/2021	4
AGW080010257-R-31	GeoTracker	Domestic	12S/18E/27			1/11/2019	11/11/2020	3
AGW080010270-HOME_DOM	GeoTracker	Domestic	12S/17E/27			1/21/2019	12/6/2021	3
AGW080010271-AVE6_WELL	GeoTracker	Domestic	13S/18E/05			1/24/2019	1/24/2019	1
AGW080010272-MD_WELL	GeoTracker	Domestic	13S/18E/05			1/24/2019	1/24/2019	1
AGW080010273-HOUSE_PUMP	GeoTracker	Domestic	12S/18E/28			1/24/2019	12/21/2020	2
AGW080010278-HOUSE_PUMP	GeoTracker	Domestic	12S/18E/28			1/24/2019	1/24/2019	1
AGW080010309-BPERKHOME	GeoTracker	Domestic	12S/19E/09			1/25/2019	2/18/2020	2
AGW080010342-20286AVE14	GeoTracker	Domestic	11S/16E/01			2/5/2019	2/5/2019	1
AGW080010343-20540AVE14	GeoTracker	Domestic	11S/17E/28			2/5/2019	2/5/2019	1
AGW080010348-WELL 1	GeoTracker	Domestic	11S/17E/27			2/5/2019	2/5/2019	2
AGW080010377-GINA_80_AC	GeoTracker	Domestic	11S/17E/19			2/7/2019	2/7/2019	1
AGW080010378-GARY_40_AC	GeoTracker	Domestic	11S/17E/19			2/7/2019	2/7/2019	1
AGW080010403-RIVER_RCH	GeoTracker	Domestic	13S/18E/04			2/14/2019	2/14/2019	1
AGW080010404-RANCH_28	GeoTracker	Domestic	13S/18E/06			2/14/2019	2/14/2019	1
AGW080010405-7468_RD_23	GeoTracker	Domestic	12S/17E/28			2/14/2019	2/14/2019	1
AGW080010406-10671_RD_29	GeoTracker	Domestic	12S/18E/16			2/14/2019	2/14/2019	1
AGW080010407-18713_RD22	GeoTracker	Domestic	10S/17E/32			2/14/2019	2/14/2019	1
AGW080010408-HOME DOM	GeoTracker	Domestic	11S/18E/03			1/24/2019	3/17/2021	4
AGW080010422-5423_RD_26	GeoTracker	Domestic	13S/17E/01			2/21/2019	10/21/2021	3
AGW080010423-5349_RD_26	GeoTracker	Domestic	13S/17E/01			2/21/2019	10/21/2021	3
AGW080010424-HOUSEWELL	GeoTracker	Domestic	12S/18E/19			2/14/2019	2/14/2019	2
AGW080010425-5444_RD_26	GeoTracker	Domestic	13S/17E/01			2/21/2019	10/21/2021	3
AGW080010426-5348_RD_26	GeoTracker	Domestic	13S/17E/01			2/21/2019	10/21/2021	3
AGW080010427-26493_AV_5	GeoTracker	Domestic	13S/17E/01			2/21/2019	10/21/2021	3
AGW080010435-BASILA_1	GeoTracker	Domestic	12S/17E/27			2/19/2019	2/19/2019	1
AGW080010436-BASILA_2	GeoTracker	Domestic	12S/17E/28			2/19/2019	2/19/2019	1
AGW080010447-TRT_H_WELL	GeoTracker	Domestic	12S/17E/27			2/21/2019	4/7/2021	3
AGW080010448-WELL_ONE	GeoTracker	Domestic	12S/18E/31			2/19/2019	2/19/2019	1
AGW080010449-HOUSE WELL	GeoTracker	Domestic	12S/16E/26			3/1/2019	3/1/2019	2
AGW080010450-WELL_#17	GeoTracker	Domestic	11S/16E/13			2/13/2019	1/10/2022	4
AGW080010451-WELL_#18	GeoTracker	Domestic	11S/16E/12			2/13/2019	1/6/2021	3
AGW080010452-WELL_#19	GeoTracker	Domestic	11S/16E/12			2/13/2019	1/10/2022	4
AGW080010453-WELL_#20	GeoTracker	Domestic	11S/16E/12			2/13/2019	1/10/2022	4
AGW080010454-WELL_#21	GeoTracker	Domestic	11S/16E/11			2/13/2019	1/10/2022	4
AGW080010455-WELL_#24	GeoTracker	Domestic	11S/16E/16			2/13/2019	1/10/2022	32
AGW080010455-WELL_#24	GeoTracker	Domestic	11S/16E/11			2/13/2019	1/10/2022	32
AGW080010456-WELL_#25	GeoTracker	Domestic	11S/17E/21			2/13/2019	1/10/2022	4
AGW080010458-DOM_WELL	GeoTracker	Domestic	10S/17E/21			2/20/2019	2/20/2019	1
AGW080010462-DW_SHOP	GeoTracker	Domestic	11S/18E/05			2/25/2019	12/15/2021	3
AGW080010463-DW_124	GeoTracker	Domestic	11S/18E/04			2/25/2019	12/15/2021	3
AGW080010490-NO HOME #1	GeoTracker	Domestic	12S/18E/19			3/12/2019	3/12/2019	2
AGW080010491-SO SHOP #1	GeoTracker	Domestic	12S/18E/19			3/12/2019	3/12/2019	2
AGW080010497-FRONT_DOM	GeoTracker	Domestic	12S/19E/21			3/5/2019	9/27/2021	3
AGW080010498-SHOP_DOM	GeoTracker	Domestic	12S/19E/28			3/5/2019	9/27/2021	3
AGW080010499-DOM WELL	GeoTracker	Domestic	12S/18E/25			3/14/2019	3/14/2019	2
AGW080010502-GRAPES	GeoTracker	Domestic	12S/18E/26			3/5/2019	3/5/2019	1
AGW080010503-PISTACHIOS	GeoTracker	Domestic	13S/17E/01			3/5/2019	3/5/2019	1
AGW080010506-DOM_WELL	GeoTracker	Domestic	11S/17E/28			3/5/2019	12/28/2023	3
AGW080010508-7.5_HP_BK	GeoTracker	Domestic	10S/17E/31			3/7/2019	2/12/2021	2
AGW080010510-PUMP_2	GeoTracker	Domestic	12S/17E/11			2/28/2019	2/28/2019	1
AGW080010511-A2_SOUTH	GeoTracker	Domestic	12S/18E/22			3/7/2019	2/25/2020	2
AGW080010512-JB_HOME	GeoTracker	Domestic	11S/17E/35			3/11/2019	3/11/2019	1
AGW080010516-30_7	GeoTracker	Domestic	12S/17E/36			3/15/2019	3/15/2019	1
AGW080010549-DM_95	GeoTracker	Domestic	13S/17E/09			3/21/2019	11/14/2023	6
AGW080010549-DM_95	GeoTracker	Domestic	13S/17E/09			3/21/2019	11/14/2023	6
AGW080010551-SHOP	GeoTracker	Domestic	10S/16E/12			3/21/2019	6/2/2021	2
AGW080010552-HOUSE	GeoTracker	Domestic	10S/16E/01			3/21/2019	6/2/2021	2
AGW080010597-OLDAGWELL	GeoTracker	Domestic	11S/17E/21			2/14/2019	2/14/2019	2
AGW080010620-5394	GeoTracker	Domestic	13S/18E/05			2/4/2019	2/4/2019	2
AGW080010622-5592	GeoTracker	Domestic	13S/18E/05			2/4/2019	2/4/2019	0
AGW080010623-28573	GeoTracker	Domestic	13S/18E/05			2/4/2019	2/4/2019	2
AGW080010628-DOMESTIC	GeoTracker	Domestic	11S/19E/31			2/22/2019	2/22/2019	2
AGW080010648-RD20	GeoTracker	Domestic	10S/16E/26			3/6/2019	3/10/2021	4

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080010649-MARTINELLI	GeoTracker	Domestic	10S/16E/34			3/6/2019	3/10/2021	4
AGW080010650-PISTACHIOE	GeoTracker	Domestic	10S/16E/34			3/6/2019	3/10/2021	5
AGW080010651-PISTACHIOW	GeoTracker	Domestic	10S/16E/34			3/6/2019	3/6/2019	2
AGW080010652-BLECH	GeoTracker	Domestic	10S/16E/21			3/6/2019	3/10/2021	5
AGW080010653-SIMPSON	GeoTracker	Domestic	11S/16E/02			3/6/2019	3/10/2021	4
AGW080010654-BIANCHI	GeoTracker	Domestic	12S/18E/14			3/7/2019	3/10/2021	4
AGW080010655-10-5 WELL	GeoTracker	Domestic	12S/19E/07			3/12/2019	1/13/2022	3
AGW080010681-25121A12.5	GeoTracker	Domestic	11S/17E/35			3/27/2019	3/27/2019	1
AGW080010682-25235A12.5	GeoTracker	Domestic	11S/17E/35			3/27/2019	3/27/2019	1
AGW080010683-25348A12.5	GeoTracker	Domestic	11S/17E/35			3/27/2019	3/27/2019	1
AGW080010689-HOME #11	GeoTracker	Domestic	11S/18E/20			4/10/2019	3/10/2021	3
AGW080010690-FRED #3	GeoTracker	Domestic	11S/17E/33			4/10/2019	2/11/2020	2
AGW080010691-POLLOS #10	GeoTracker	Domestic	12S/18E/10			4/10/2019	3/10/2021	3
AGW080010702-HOUSE WELL	GeoTracker	Domestic	11S/17E/35			4/29/2019	4/29/2019	1
AGW080010703-DOM_WELL	GeoTracker	Domestic	11S/16E/34			4/29/2019	4/29/2019	1
AGW080010711-WELL_1	GeoTracker	Domestic	10S/16E/02			5/15/2019	12/10/2020	2
AGW080010712-GOMES	GeoTracker	Domestic	11S/18E/16			5/14/2019	1/26/2021	3
AGW080010713-BEAVERS	GeoTracker	Domestic	11S/17E/15			5/14/2019	1/26/2021	3
AGW080010714-COWGER	GeoTracker	Domestic	11S/18E/16			5/14/2019	1/26/2021	3
AGW080010725-DOM-WELL-1	GeoTracker	Domestic	12S/17E/31			5/17/2019	1/20/2021	2
AGW080010734-DOM_18_AC	GeoTracker	Domestic	13S/18E/08			5/22/2019	5/22/2019	1
AGW080010747-WELL #2	GeoTracker	Domestic	13S/17E/06			5/28/2019	5/28/2019	1
AGW080010748-WELL #7	GeoTracker	Domestic	13S/17E/06			5/28/2019	5/28/2019	1
AGW080010749-WELL #33	GeoTracker	Domestic	12S/17E/19			5/28/2019	5/28/2019	1
AGW080010750-WELL #24	GeoTracker	Domestic	12S/17E/19			5/28/2019	5/28/2019	1
AGW080010751-WELL #81	GeoTracker	Domestic	12S/17E/21			5/28/2019	5/28/2019	1
AGW080010752-WELL #83	GeoTracker	Domestic	12S/17E/21			5/28/2019	5/28/2019	1
AGW080010753-WELL #73	GeoTracker	Domestic	12S/17E/22			5/28/2019	5/28/2019	1
AGW080010754-WELL #91	GeoTracker	Domestic	12S/17E/27			5/28/2019	5/28/2019	1
AGW080010847-DOM_1	GeoTracker	Domestic	11S/16E/13			8/2/2019	11/29/2022	8
AGW080010847-DOM_1	GeoTracker	Domestic	11S/16E/11			8/2/2019	11/29/2022	8
AGW080010848-DOM-2	GeoTracker	Domestic	11S/16E/11			8/2/2019	8/2/2019	1
AGW080010849-DOM-3 (X2)	GeoTracker	Domestic	11S/16E/12			8/2/2019	11/29/2022	8
AGW080010849-DOM-3 (X2)	GeoTracker	Domestic	11S/16E/11			8/2/2019	11/29/2022	8
AGW080010866-HOME RANCH	GeoTracker	Domestic	13S/17E/01			8/23/2019	12/27/2023	5
AGW080010912-MADERA 1	GeoTracker	Domestic	12S/17E/26			8/5/2019	8/5/2019	2
AGW080010913-MADERA 2	GeoTracker	Domestic	12S/17E/23			8/5/2019	8/5/2019	2
AGW080010914-MADERA 3	GeoTracker	Domestic	12S/17E/23			8/5/2019	8/5/2019	2
AGW080010915-HEADQUARTE	GeoTracker	Domestic	12S/18E/29			8/5/2019	8/5/2019	2
AGW080010926-DIX 3	GeoTracker	Domestic	11S/16E/24			5/31/2019	5/31/2019	1
AGW080010927-MERLOT	GeoTracker	Domestic	11S/17E/27			5/10/2019	5/10/2019	1
AGW080010928-DONNA	GeoTracker	Domestic	11S/16E/24			5/10/2019	5/10/2019	1
AGW080010929-HOME	GeoTracker	Domestic	11S/16E/24			5/10/2019	5/10/2019	1
AGW080010950-HOUSE WELL	GeoTracker	Domestic	12S/18E/30			9/3/2019	9/3/2019	1
AGW080010994-GRAPE FARM	GeoTracker	Domestic	12S/17E/08			2/28/2019	2/28/2019	1
AGW080011122-HOME RANCH	GeoTracker	Domestic	12S/18E/10			8/15/2019	12/15/2021	8
AGW080011135-D&D HOME	GeoTracker	Domestic	13S/17E/08			10/8/2019	1/3/2023	4
AGW080011135-D&D HOME	GeoTracker	Domestic	13S/17E/06			10/8/2019	1/3/2023	4
AGW080011136-D&D GRAPES	GeoTracker	Domestic	13S/17E/07			10/8/2019	1/3/2023	8
AGW080011136-D&D GRAPES	GeoTracker	Domestic	13S/17E/06			10/8/2019	1/3/2023	8
AGW080011137-RIVER RCH	GeoTracker	Domestic	13S/17E/07			10/8/2019	12/20/2021	3
AGW080011138-HELMUTH	GeoTracker	Domestic	13S/17E/06			10/8/2019	12/20/2021	3
AGW080011139-BALDRICA	GeoTracker	Domestic	12S/17E/33			10/8/2019	1/3/2023	8
AGW080011139-BALDRICA	GeoTracker	Domestic	12S/17E/28			10/8/2019	1/3/2023	8
AGW080011140-AVE 7 WEST	GeoTracker	Domestic	12S/17E/28			10/8/2019	12/20/2021	3
AGW080011141-AVE 7 EAST	GeoTracker	Domestic	12S/17E/28			10/8/2019	12/20/2021	3
AGW080011142-AVE 8 RENT	GeoTracker	Domestic	12S/17E/25			10/8/2019	12/20/2021	3
AGW080011143-AVE 8 HOME	GeoTracker	Domestic	12S/17E/25			10/8/2019	10/8/2019	1
AGW080011148-MAIN_DOM	GeoTracker	Domestic	12S/18E/31			10/10/2019	12/13/2021	3
AGW080011166-DOSANJH	GeoTracker	Domestic	11S/16E/24			10/4/2019	10/4/2019	2
AGW080011176-HOME	GeoTracker	Domestic	11S/18E/03			10/15/2019	10/15/2019	1
AGW080011177-JENKINS	GeoTracker	Domestic	11S/16E/02			10/15/2019	10/20/2020	2
AGW080011178-CLAY	GeoTracker	Domestic	11S/16E/02			10/15/2019	10/20/2020	2
AGW080011200-HOME_WELL	GeoTracker	Domestic	11S/18E/36			10/15/2019	11/11/2020	2
AGW080011207-SEVEN_K	GeoTracker	Domestic	10S/16E/27			10/17/2019	11/2/2021	3

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Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080011208-FIELD #4	GeoTracker	Domestic	12S/19E/16			10/17/2019	11/3/2021	3
AGW080011209-HOME	GeoTracker	Domestic	11S/18E/27			10/17/2019	6/12/2024	10
AGW080011209-HOME	GeoTracker	Domestic	11S/18E/22			10/17/2019	6/12/2024	10
AGW080011210-A1_RD_22	GeoTracker	Domestic	10S/17E/07			10/17/2019	1/14/2022	3
AGW080011211-RIVER	GeoTracker	Domestic	12S/19E/31			10/17/2019	11/3/2021	3
AGW080011212-KISMET	GeoTracker	Domestic	10S/17E/22			10/17/2019	10/26/2020	2
AGW080011213-CROW	GeoTracker	Domestic	10S/18E/20			10/17/2019	11/2/2021	3
AGW080011214-GRAPES	GeoTracker	Domestic	10S/16E/34			10/17/2019	11/2/2021	3
AGW080011215-10134_WELL	GeoTracker	Domestic	12S/17E/13			10/17/2019	3/1/2021	3
AGW080011216-HOME_WELL	GeoTracker	Domestic	10S/16E/22			10/17/2019	9/30/2021	3
AGW080011218-RD_19_WELL	GeoTracker	Domestic	13S/16E/03			10/17/2019	8/31/2021	3
AGW080011219-RD_20_WELL	GeoTracker	Domestic	13S/16E/11			10/17/2019	8/31/2021	3
AGW080011220-RD_23_WELL	GeoTracker	Domestic	13S/17E/05			10/17/2019	8/31/2021	3
AGW080011221-AVE_12_WEL	GeoTracker	Domestic	12S/15E/12			10/17/2019	8/31/2021	3
AGW080011245-18M	GeoTracker	Domestic	10S/16E/35			12/26/2018	12/26/2018	0
AGW080011249-MADERA	GeoTracker	Domestic	12S/18E/08			12/26/2018	12/26/2018	1
AGW080011255-LINKS	GeoTracker	Domestic	11S/17E/16			12/26/2018	12/26/2018	1
AGW080011269-HOME_RANCH	GeoTracker	Domestic	12S/19E/13			10/23/2019	11/16/2022	6
AGW080011269-HOME_RANCH	GeoTracker	Domestic	12S/19E/13			10/23/2019	11/16/2022	6
AGW080011271-DOM1	GeoTracker	Domestic	12S/17E/17			10/25/2019	11/15/2021	5
AGW080011285-HOME_WELL	GeoTracker	Domestic	10S/16E/23			10/28/2019	9/9/2021	3
AGW080011334-DOM WELL	GeoTracker	Domestic	11S/17E/27			11/1/2019	12/8/2023	20
AGW080011334-DOM WELL	GeoTracker	Domestic	11S/17E/27			11/1/2019	12/8/2023	20
AGW080011352-CCHM_OFC	GeoTracker	Domestic	11S/18E/11			10/31/2019	4/21/2022	3
AGW080011353-CC_MOBILE	GeoTracker	Domestic	11S/18E/13			10/31/2019	4/21/2022	3
AGW080011355-WELL_1	GeoTracker	Domestic	11S/17E/28			11/1/2019	11/5/2021	3
AGW080011356-WELL_2	GeoTracker	Domestic	11S/17E/28			11/1/2019	11/5/2021	3
AGW080011359-HOME_WELL	GeoTracker	Domestic	11S/18E/28			11/1/2019	11/3/2021	3
AGW080011360-ALMA_WELL	GeoTracker	Domestic	11S/18E/20			11/1/2019	10/28/2020	2
AGW080011361-MCK_DOM	GeoTracker	Domestic	11S/19E/06			10/31/2019	4/21/2022	3
AGW080011394-10517_AV24	GeoTracker	Domestic	10S/16E/15			11/6/2019	9/9/2021	3
AGW080011395-12200_AV26	GeoTracker	Domestic	10S/16E/11			11/6/2019	9/10/2021	3
AGW080011398-12694_AV26	GeoTracker	Domestic	10S/16E/11			11/6/2019	9/9/2021	3
AGW080011399-12180_AV25	GeoTracker	Domestic	10S/16E/14			11/6/2019	9/9/2021	3
AGW080011400-12192_AV26	GeoTracker	Domestic	10S/16E/11			11/6/2019	11/6/2019	1
AGW080011401-11494_AV26	GeoTracker	Domestic	10S/16E/11			11/6/2019	9/9/2021	3
AGW080011403-10397_AV24	GeoTracker	Domestic	10S/16E/15			11/6/2019	9/9/2021	3
AGW080011407-HOME_WELL	GeoTracker	Domestic	11S/16E/21			11/6/2019	11/6/2019	1
AGW080011408-FARM_WELL	GeoTracker	Domestic	11S/16E/21			11/6/2019	11/6/2019	1
AGW080011441-18558_AV16	GeoTracker	Domestic	11S/16E/10			11/6/2019	9/8/2021	3
AGW080011443-18484_RD17	GeoTracker	Domestic	10S/16E/32			11/6/2019	11/6/2019	1
AGW080011444-18616_AV20	GeoTracker	Domestic	10S/16E/22			11/6/2019	9/8/2021	3
AGW080011445-20759_RD19	GeoTracker	Domestic	10S/16E/23			11/6/2019	9/8/2021	3
AGW080011446-16417_AV18	GeoTracker	Domestic	10S/16E/32			11/6/2019	11/6/2019	1
AGW080011447-20720_RD19	GeoTracker	Domestic	10S/16E/22			11/6/2019	9/8/2021	3
AGW080011448-15788_AV18	GeoTracker	Domestic	10S/16E/31			11/6/2019	9/8/2021	3
AGW080011449-15432_AV18	GeoTracker	Domestic	11S/16E/06			11/6/2019	11/6/2019	1
AGW080011450-11400_AV25	GeoTracker	Domestic	10S/16E/14			11/6/2019	9/9/2021	3
AGW080011451-11564_AV26	GeoTracker	Domestic	10S/16E/11			11/6/2019	9/9/2021	3
AGW080011452-24749_RD11	GeoTracker	Domestic	10S/16E/14			11/6/2019	12/14/2022	4
AGW080011453-26230_RD12	GeoTracker	Domestic	10S/16E/11			11/6/2019	9/9/2021	3
AGW080011454-11403_AV25	GeoTracker	Domestic	10S/16E/14			11/6/2019	9/9/2021	3
AGW080011455-DOMESTIC	GeoTracker	Domestic	11S/16E/04			11/6/2019	11/6/2019	1
AGW080011513-MADERA	GeoTracker	Domestic	13S/17E/02			11/14/2019	11/2/2021	3
AGW080011515-HOME_1	GeoTracker	Domestic	10S/16E/26			11/12/2019	11/12/2019	1
AGW080011516-DAIRY_1	GeoTracker	Domestic	10S/16E/26			11/12/2019	11/12/2019	1
AGW080011517-HOME_1	GeoTracker	Domestic	10S/16E/23			11/12/2019	11/12/2019	1
AGW080011518-HOME_2	GeoTracker	Domestic	10S/16E/23			11/12/2019	11/12/2019	1
AGW080011519-CLARK_1	GeoTracker	Domestic	10S/16E/26			11/12/2019	11/12/2019	1
AGW080011525-HOME_1	GeoTracker	Domestic	10S/16E/26			11/12/2019	11/12/2019	1
AGW080011526-CLAYTON_1	GeoTracker	Domestic	10S/16E/22			11/12/2019	11/12/2019	1
AGW080011550-ROAD 25	GeoTracker	Domestic	12S/17E/27			11/14/2019	11/4/2021	6
AGW080011551-YARD/HOUSE	GeoTracker	Domestic	12S/19E/16			11/14/2019	11/4/2021	6
AGW080011552-FRANK DALE	GeoTracker	Domestic	12S/19E/30			11/14/2019	11/4/2021	3
AGW080011682-HOME_1	GeoTracker	Domestic	13S/17E/10			12/3/2019	12/3/2019	1

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080011684-DOM_WELL	GeoTracker	Domestic	12S/18E/17			11/21/2019	11/5/2020	2
AGW080011687-BL_8_GOTO	GeoTracker	Domestic	12S/18E/32			11/21/2019	11/21/2019	1
AGW080011688-BL_5_NIJNO	GeoTracker	Domestic	12S/18E/31			11/21/2019	11/21/2019	1
AGW080011689-FLD_1_HSE	GeoTracker	Domestic	12S/19E/08			12/2/2019	12/2/2019	1
AGW080011690-BOB_WELL	GeoTracker	Domestic	12S/19E/17			11/26/2019	10/27/2020	2
AGW080011691-STE_8_WELL	GeoTracker	Domestic	11S/18E/33			11/26/2019	10/27/2020	2
AGW080011692-ESTER_WELL	GeoTracker	Domestic	12S/19E/08			11/26/2019	10/27/2020	2
AGW080011693-BRIAN_WELL	GeoTracker	Domestic	12S/19E/17			11/26/2019	10/27/2020	2
AGW080011694-STE_11_WEL	GeoTracker	Domestic	12S/19E/20			11/26/2019	10/27/2020	2
AGW080011695-AVE_12	GeoTracker	Domestic	11S/16E/36			12/2/2019	12/6/2021	2
AGW080011696-RICKS	GeoTracker	Domestic	11S/16E/36			12/2/2019	12/6/2021	2
AGW080011697-HOME	GeoTracker	Domestic	11S/16E/14			12/2/2019	10/26/2023	6
AGW080011697-HOME	GeoTracker	Domestic	11S/16E/15			12/2/2019	10/26/2023	6
AGW080011698-RYAN	GeoTracker	Domestic	11S/16E/15			12/2/2019	12/6/2021	2
AGW080011699-N_18	GeoTracker	Domestic	12S/16E/04			12/2/2019	12/6/2021	2
AGW080011700-A_16.5	GeoTracker	Domestic	11S/16E/10			12/2/2019	2/25/2021	2
AGW080011704-VR_16	GeoTracker	Domestic	11S/16E/18			12/2/2019	12/6/2021	2
AGW080011789-34307 AV_9	GeoTracker	Domestic	12S/19E/17			12/6/2019	12/6/2019	1
AGW080011790-34545 AV_9	GeoTracker	Domestic	12S/19E/17			12/6/2019	12/6/2019	1
AGW080011791-10266 RT_C	GeoTracker	Domestic	12S/19E/09			12/6/2019	12/6/2019	1
AGW080011804-HOME_DOM	GeoTracker	Domestic	12S/18E/09			12/5/2019	12/15/2021	3
AGW080011805-CABATIA_D	GeoTracker	Domestic	12S/18E/04			12/5/2019	12/15/2021	3
AGW080011806-FISHER_DOM	GeoTracker	Domestic	12S/18E/04			12/5/2019	12/15/2021	3
AGW080011807-WEBER_DOM	GeoTracker	Domestic	12S/18E/09			12/5/2019	12/15/2021	3
AGW080011808-HIRAHARA	GeoTracker	Domestic	12S/18E/17			12/5/2019	12/5/2019	1
AGW080011810-MITCHELL	GeoTracker	Domestic	12S/18E/04			12/5/2019	12/15/2021	3
AGW080011811-HOUSLEY	GeoTracker	Domestic	12S/18E/08			12/5/2019	12/15/2021	3
AGW080011812-MADERA_DOM	GeoTracker	Domestic	10S/17E/28			12/5/2019	12/15/2021	3
AGW080011813-CHOWCHILLA	GeoTracker	Domestic	10S/16E/23			12/5/2019	12/15/2021	3
AGW080011821-POMONA_DOM	GeoTracker	Domestic	12S/18E/05			12/5/2019	12/15/2021	3
AGW080011864-ALMOND	GeoTracker	Domestic	11S/16E/12			12/9/2019	12/9/2019	1
AGW080011866-21504_WELL	GeoTracker	Domestic	11S/17E/19			12/9/2019	12/9/2019	1
AGW080011867-20841_WELL	GeoTracker	Domestic	11S/16E/13			12/9/2019	12/9/2019	1
AGW080011868-20435_WELL	GeoTracker	Domestic	11S/16E/13			12/9/2019	12/9/2019	1
AGW080011869-14484_WELL	GeoTracker	Domestic	11S/16E/24			12/9/2019	12/9/2019	1
AGW080011870-11514_WELL	GeoTracker	Domestic	12S/17E/01			12/9/2019	12/9/2019	1
AGW080011871-CARODEN_FM	GeoTracker	Domestic	11S/17E/21			12/10/2019	11/23/2021	3
AGW080011872-6382_GOLD	GeoTracker	Domestic	12S/19E/31			12/9/2019	11/17/2021	3
AGW080011873-19290_AV13	GeoTracker	Domestic	11S/16E/35			12/9/2019	11/17/2021	3
AGW080011874-22649_AV12	GeoTracker	Domestic	11S/17E/32			12/9/2019	11/17/2021	3
AGW080011875-SHOP_WELL	GeoTracker	Domestic	11S/18E/25			12/9/2019	12/14/2020	2
AGW080011885-BURLEYS	GeoTracker	Domestic	12S/17E/25			12/6/2019	12/6/2019	2
AGW080011887-SKIPS	GeoTracker	Domestic	12S/17E/27			12/6/2019	12/6/2019	2
AGW080011888-GINOS	GeoTracker	Domestic	12S/17E/27			12/6/2019	12/6/2019	2
AGW080012038-D&D_NORTH	GeoTracker	Domestic	13S/17E/06			12/11/2019	12/20/2021	3
AGW080012039-AV12_NORTH	GeoTracker	Domestic	12S/17E/06			12/11/2019	12/20/2021	3
AGW080012040-AV12_SOUTH	GeoTracker	Domestic	12S/17E/06			12/11/2019	12/20/2021	3
AGW080012066-6425	GeoTracker	Domestic	12S/18E/33			11/12/2019	11/11/2021	7
AGW080012067-DW1	GeoTracker	Domestic	11S/19E/35			11/30/2020	6/15/2021	6
AGW080012072-HM WELL 1	GeoTracker	Domestic	12S/18E/32			12/11/2019	12/21/2022	16
AGW080012072-HM WELL 1	GeoTracker	Domestic	12S/18E/31			12/11/2019	12/21/2022	16
AGW080012073-HM WELL 2	GeoTracker	Domestic	12S/18E/31			12/11/2019	12/13/2021	6
AGW080012074-HM WELL 3	GeoTracker	Domestic	11S/17E/31			12/11/2019	12/21/2022	16
AGW080012074-HM WELL 3	GeoTracker	Domestic	11S/17E/31			12/11/2019	12/21/2022	16
AGW080012075-HM WELL 4	GeoTracker	Domestic	12S/18E/06			12/11/2019	12/13/2021	6
AGW080012076-HM WELL 5	GeoTracker	Domestic	12S/18E/06			12/11/2019	12/13/2021	6
AGW080012077-HM WELL 6	GeoTracker	Domestic	12S/18E/05			12/11/2019	12/13/2021	6
AGW080012078-HM WELL 7	GeoTracker	Domestic	12S/18E/03			12/11/2019	12/13/2021	6
AGW080012079-HM WELL 8	GeoTracker	Domestic	12S/18E/11			12/11/2019	12/13/2021	6
AGW080012080-HM WELL 9	GeoTracker	Domestic	12S/18E/29			12/11/2019	12/13/2021	6
AGW080012081-HM WELL 10	GeoTracker	Domestic	12S/18E/32			12/11/2019	12/13/2021	6
AGW080012123-HOUSE_BLK5	GeoTracker	Domestic	12S/17E/31			12/16/2019	10/27/2020	2
AGW080012124-HOUSE_BLK4	GeoTracker	Domestic	12S/17E/32			12/12/2019	8/31/2021	3
AGW080012127-HOME_WELL	GeoTracker	Domestic	12S/18E/21			12/13/2019	12/13/2019	1
AGW080012128-AV_8.5 RCH	GeoTracker	Domestic	12S/17E/23			12/12/2019	12/12/2019	1

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080012129-AV_4.5_RCH	GeoTracker	Domestic	13S/16E/12			12/12/2019	12/12/2019	1
AGW080012131-TREVINO	GeoTracker	Domestic	10S/16E/12			12/12/2019	9/2/2021	3
AGW080012132-ROSS5	GeoTracker	Domestic	10S/16E/14			12/12/2019	9/2/2021	3
AGW080012133-ALS40	GeoTracker	Domestic	10S/16E/23			12/12/2019	9/2/2021	3
AGW080012134-ROSSHOME	GeoTracker	Domestic	10S/16E/14			12/12/2019	9/2/2021	3
AGW080012135-SHOP	GeoTracker	Domestic	10S/16E/14			12/12/2019	9/2/2021	3
AGW080012363-HOUSE	GeoTracker	Domestic	12S/17E/01			12/16/2019	11/30/2021	3
AGW080012425-AVE_9_HSE	GeoTracker	Domestic	12S/19E/18			12/2/2019	12/2/2019	1
AGW080012435-SITE_2_WEL	GeoTracker	Domestic	10S/16E/25			11/18/2020	12/13/2022	6
AGW080012435-SITE_2_WEL	GeoTracker	Domestic	10S/16E/25			11/18/2020	12/13/2022	6
AGW080012436-SITE_3_WEL	GeoTracker	Domestic	10S/16E/26			10/19/2020	8/30/2021	2
AGW080012437-SITE_6_WEL	GeoTracker	Domestic	10S/16E/36			10/19/2020	12/13/2022	6
AGW080012437-SITE_6_WEL	GeoTracker	Domestic	10S/16E/25			10/19/2020	12/13/2022	6
AGW080012444-HOUSE	GeoTracker	Domestic	12S/19E/19			12/30/2019	4/3/2023	4
AGW080012444-HOUSE	GeoTracker	Domestic	12S/19E/18			12/30/2019	4/3/2023	4
AGW080012493-HOME WELL	GeoTracker	Domestic	12S/17E/25			12/27/2019	12/27/2019	2
AGW080012546-AVE 18	GeoTracker	Domestic	11S/16E/02			12/2/2019	3/16/2023	14
AGW080012546-AVE 18	GeoTracker	Domestic	10S/16E/34			12/2/2019	3/16/2023	14
AGW080012548-WELL	GeoTracker	Domestic	11S/18E/28			12/9/2019	11/30/2020	4
AGW080012551-14286	GeoTracker	Domestic	11S/17E/19			12/12/2019	12/12/2019	2
AGW080012552-21333	GeoTracker	Domestic	11S/17E/19			12/12/2019	12/12/2019	2
AGW080012553-HOME PLACE	GeoTracker	Domestic	12S/18E/29			12/17/2019	12/9/2021	7
AGW080012558-JUDY	GeoTracker	Domestic	11S/17E/35			12/19/2019	12/19/2019	2
AGW080012559-DEBBIE	GeoTracker	Domestic	12S/17E/09			12/19/2019	12/19/2019	2
AGW080012560-JIM	GeoTracker	Domestic	12S/17E/08			12/19/2019	12/19/2019	2
AGW080012561-01-873-1	GeoTracker	Domestic	10S/17E/14			12/19/2019	12/19/2019	2
AGW080012562-03-847-2	GeoTracker	Domestic	09S/17E/34			12/19/2019	12/19/2019	2
AGW080012564-09-905-1	GeoTracker	Domestic	10S/18E/14			12/17/2019	12/17/2019	2
AGW080012565-04-531-0	GeoTracker	Domestic	10S/18E/20			12/17/2019	12/17/2019	2
AGW080012566-AFC OFFICE	GeoTracker	Domestic	10S/17E/04			12/17/2019	12/17/2019	0
AGW080012578-WELL 1	GeoTracker	Domestic	11S/16E/05			12/31/2019	12/31/2019	2
AGW080012579-WELL 2	GeoTracker	Domestic	11S/16E/05			12/31/2019	12/28/2021	4
AGW080012580-WELL 3	GeoTracker	Domestic	11S/16E/06			12/31/2019	12/31/2019	2
AGW080012581-WELL 4	GeoTracker	Domestic	11S/16E/05			12/31/2019	12/31/2019	2
AGW080012582-WELL 5	GeoTracker	Domestic	11S/16E/05			12/31/2019	12/28/2021	4
AGW080012584-SW AVE 82	GeoTracker	Domestic	12S/17E/25			12/26/2019	12/26/2019	2
AGW080012585-7824 H145	GeoTracker	Domestic	12S/17E/25			12/26/2019	12/26/2019	2
AGW080012586-7598 H145	GeoTracker	Domestic	12S/17E/25			12/26/2019	12/26/2019	2
AGW080012587-7328 R26.5	GeoTracker	Domestic	12S/17E/25			12/26/2019	12/26/2019	2
AGW080012592-VOLCAN	GeoTracker	Domestic	11S/19E/31			12/27/2019	12/27/2019	2
AGW080012629-B/P ALMOND	GeoTracker	Domestic	11S/16E/10			12/29/2020	12/29/2020	2
AGW080012630-NP-C	GeoTracker	Domestic	10S/16E/33			12/29/2020	12/29/2020	2
AGW080012631-INDP	GeoTracker	Domestic	10S/16E/33			12/29/2020	12/29/2020	2
AGW080012711-BULLDOG	GeoTracker	Domestic	12S/16E/34			12/30/2019	11/21/2022	12
AGW080012711-BULLDOG	GeoTracker	Domestic	12S/16E/27			12/30/2019	11/21/2022	12
AGW080012723-QUALLS	GeoTracker	Domestic	11S/16E/16			12/17/2019	12/17/2019	2
AGW080012731-10668	GeoTracker	Domestic	12S/17E/12			12/30/2020	12/30/2020	2
AGW080012900-HOME WELL	GeoTracker	Domestic	12S/17E/03			12/26/2019	12/26/2019	1
AGW080012922-SHOP	GeoTracker	Domestic	10S/16E/33			12/19/2019	12/19/2019	2
AGW080012923-AVE 15	GeoTracker	Domestic	11S/16E/22			12/19/2019	12/15/2022	20
AGW080012923-AVE 15	GeoTracker	Domestic	11S/16E/16			12/19/2019	12/15/2022	20
AGW080012924-N. SAHOTA	GeoTracker	Domestic	10S/16E/33			12/19/2019	12/19/2019	2
AGW080012925-GUNTER	GeoTracker	Domestic	10S/16E/36			12/19/2019	10/14/2021	7
AGW080012972-22334 ROAD	GeoTracker	Domestic	10S/18E/07			12/27/2019	12/27/2019	1
AGW080012973-21863AVE12	GeoTracker	Domestic	11S/17E/31			12/27/2019	12/27/2019	1
AGW080012974-8492ROAD20	GeoTracker	Domestic	12S/16E/23			12/27/2019	12/27/2019	1
AGW080012975-7890ROAD21	GeoTracker	Domestic	12S/16E/25			12/27/2019	12/27/2019	1
AGW080012976-20555 AVE8	GeoTracker	Domestic	12S/16E/24			12/27/2019	12/27/2019	1
AGW080012977-20290 AVE9	GeoTracker	Domestic	12S/16E/24			12/27/2019	12/27/2019	1
AGW080012991-SCHAFER	GeoTracker	Domestic	11S/17E/08			12/9/2019	5/10/2021	7
AGW080013025-145RANCHHW	GeoTracker	Domestic	12S/17E/12			12/26/2019	12/26/2019	1
AGW080013027-BERENDA HW	GeoTracker	Domestic	10S/17E/05			12/26/2019	12/26/2019	1
AGW080013087-BROOKE	GeoTracker	Domestic	12S/17E/09			12/19/2019	12/19/2019	2
AGW080013088-DELLO	GeoTracker	Domestic	12S/17E/01			12/19/2019	12/19/2019	2
AGW080013089-KYLE	GeoTracker	Domestic	11S/17E/29			12/19/2019	12/19/2019	2

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Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080013090-DENIS	GeoTracker	Domestic	12S/17E/01			12/19/2019	12/19/2019	2
AGW080013091-JUAN	GeoTracker	Domestic	12S/17E/01			12/19/2019	12/19/2019	2
AGW080013092-DAN	GeoTracker	Domestic	12S/17E/16			12/19/2019	12/19/2019	2
AGW080013093-BILL	GeoTracker	Domestic	12S/17E/16			12/19/2019	12/19/2019	2
AGW080013094-NORMA	GeoTracker	Domestic	12S/17E/22			12/19/2019	12/19/2019	2
AGW080013095-STAGERANCH	GeoTracker	Domestic	12S/17E/16			12/19/2019	12/19/2019	2
AGW080013115-RANCH 1	GeoTracker	Domestic	11S/18E/09			12/17/2019	12/15/2021	4
AGW080013116-RANCH 6	GeoTracker	Domestic	12S/17E/01			12/17/2019	12/15/2021	7
AGW080013119-33379_AV_8	GeoTracker	Domestic	12S/19E/30			12/6/2019	12/13/2022	4
AGW080013119-33379_AV_8	GeoTracker	Domestic	12S/19E/19			12/6/2019	12/13/2022	4
AGW080013167-F12-HS1	GeoTracker	Domestic	12S/17E/12			2/4/2020	2/4/2020	2
AGW080013168-KREPS	GeoTracker	Domestic	11S/18E/03			2/5/2020	2/5/2020	2
AGW080013211-HOUSE_WELL	GeoTracker	Domestic	13S/18E/01			1/8/2020	2/17/2021	2
AGW080013212-VINEYARD	GeoTracker	Domestic	13S/18E/01			1/8/2020	2/17/2021	2
AGW080013215-AVE_10_DOM	GeoTracker	Domestic	12S/18E/10			1/15/2020	3/3/2022	3
AGW080013217-NS_SHOP	GeoTracker	Domestic	11S/15E/31			1/15/2020	3/3/2022	3
AGW080013218-NS_REDBARN	GeoTracker	Domestic	12S/15E/04			1/15/2020	3/3/2022	3
AGW080013224-RIVER_RCH	GeoTracker	Domestic	13S/18E/04			1/14/2020	1/4/2021	2
AGW080013225-AVE_9_DOM	GeoTracker	Domestic	12S/19E/24			1/15/2020	3/3/2022	3
AGW080013250-NORTH_HSE	GeoTracker	Domestic	13S/18E/06			1/28/2020	1/28/2020	1
AGW080013251-SOUTH_HSE	GeoTracker	Domestic	11S/18E/31			1/28/2020	1/28/2020	1
AGW080013261-WELL 1	GeoTracker	Domestic	12S/19E/19			2/12/2020	2/12/2020	2
AGW080013264-DW WELL	GeoTracker	Domestic	12S/18E/14			2/13/2020	7/20/2021	5
AGW080013311-DP122-1	GeoTracker	Domestic	12S/18E/25			2/24/2020	2/24/2020	2
AGW080013312-DP125-1	GeoTracker	Domestic	12S/18E/26			2/24/2020	2/24/2020	2
AGW080013313-DP121-1	GeoTracker	Domestic	12S/18E/15			2/24/2020	2/24/2020	2
AGW080013315-DP188-1	GeoTracker	Domestic	12S/18E/01			2/24/2020	2/24/2020	2
AGW080013348-DOMESTIC	GeoTracker	Domestic	10S/17E/31			2/18/2020	2/18/2020	2
AGW080013354-HOME	GeoTracker	Domestic	12S/17E/15			2/7/2020	2/7/2020	3
AGW080013355-RENT	GeoTracker	Domestic	12S/17E/15			2/7/2020	2/7/2020	3
AGW080013361-JASON_HSE	GeoTracker	Domestic	10S/18E/15			1/30/2020	1/30/2020	1
AGW080013362-JOE_HOUSE	GeoTracker	Domestic	10S/18E/15			1/30/2020	1/30/2020	1
AGW080013363-SHOP	GeoTracker	Domestic	10S/18E/15			1/30/2020	1/30/2020	1
AGW080013364-HOUSE_WELL	GeoTracker	Domestic	12S/19E/18			2/3/2020	2/3/2020	1
AGW080013390-NONIS_HSE	GeoTracker	Domestic	12S/18E/04			2/11/2020	2/19/2021	2
AGW080013391-MAX_RANCH	GeoTracker	Domestic	12S/18E/04			2/11/2020	2/11/2020	1
AGW080013392-MASTER_R	GeoTracker	Domestic	12S/18E/26			3/17/2020	3/17/2020	1
AGW080013393-MASTER_T	GeoTracker	Domestic	12S/18E/26			2/11/2020	3/8/2022	2
AGW080013394-JOES_40	GeoTracker	Domestic	12S/17E/22			3/17/2020	3/17/2020	1
AGW080013395-HOME_RANCH	GeoTracker	Domestic	12S/17E/28			2/11/2020	2/19/2021	2
AGW080013396-JOES_20	GeoTracker	Domestic	12S/17E/28			2/11/2020	2/19/2021	2
AGW080013397-SIMI	GeoTracker	Domestic	12S/17E/22			2/11/2020	2/19/2021	2
AGW080013398-ISLAND_DR	GeoTracker	Domestic	11S/18E/04			2/11/2020	3/8/2022	3
AGW080013399-BERTOZZI	GeoTracker	Domestic	12S/17E/21			2/11/2020	3/8/2022	3
AGW080013400-TOCHANNI	GeoTracker	Domestic	12S/17E/27			2/11/2020	3/8/2022	3
AGW080013402-HOAG	GeoTracker	Domestic	10S/16E/16			11/19/2019	3/8/2022	2
AGW080013403-GUILLERMOS	GeoTracker	Domestic	11S/18E/33			3/17/2020	3/17/2020	1
AGW080013404-ARCO	GeoTracker	Domestic	11S/17E/06			3/17/2020	3/17/2020	1
AGW080013405-LAKE_ST	GeoTracker	Domestic	11S/18E/06			11/19/2019	3/8/2022	2
AGW080013407-REDTOP	GeoTracker	Domestic	11S/17E/06			3/17/2020	3/17/2020	1
AGW080013409-DOM_WELL	GeoTracker	Domestic	11S/17E/17			2/15/2020	3/16/2022	3
AGW080013410-TOM_13D	GeoTracker	Domestic	12S/18E/34			2/17/2020	12/16/2022	3
AGW080013411-REIMER_4D	GeoTracker	Domestic	12S/18E/35			2/17/2020	12/16/2022	6
AGW080013411-REIMER_4D	GeoTracker	Domestic	12S/18E/34			2/17/2020	12/16/2022	6
AGW080013412-HENRY_8D	GeoTracker	Domestic	12S/18E/36			2/17/2020	12/16/2022	6
AGW080013412-HENRY_8D	GeoTracker	Domestic	12S/18E/35			2/17/2020	12/16/2022	6
AGW080013413-AVE13_7D	GeoTracker	Domestic	11S/17E/35			2/17/2020	12/16/2022	6
AGW080013413-AVE13_7D	GeoTracker	Domestic	11S/17E/35			2/17/2020	12/16/2022	6
AGW080013437-7701_RD29	GeoTracker	Domestic	12S/18E/28			2/12/2020	2/12/2020	1
AGW080013438-10290_RD28	GeoTracker	Domestic	12S/18E/08			2/12/2020	2/12/2020	1
AGW080013444-HOUSE_WELL	GeoTracker	Domestic	11S/16E/27			2/12/2020	2/12/2020	1
AGW080013480-9689	GeoTracker	Domestic	12S/18E/15			2/20/2020	3/3/2021	6
AGW080013481-HOMEWELL	GeoTracker	Domestic	11S/17E/36			2/24/2020	2/24/2020	1
AGW080013499-DOM_WELL	GeoTracker	Domestic	11S/19E/31			2/25/2020	10/1/2021	2
AGW080013503-WELL_1	GeoTracker	Domestic	12S/17E/08			2/27/2020	2/27/2020	1

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080013504-WELL_2	GeoTracker	Domestic	12S/17E/05			2/27/2020	2/27/2020	1
AGW080013505-WELL_3	GeoTracker	Domestic	11S/16E/24			2/27/2020	2/27/2020	1
AGW080013685-WELL_1	GeoTracker	Domestic	11S/18E/16			5/14/2019	5/14/2019	1
AGW080013685-WELL_NO1	GeoTracker	Domestic	11S/18E/16			4/22/2020	1/26/2021	2
AGW080013686-WELL_2	GeoTracker	Domestic	11S/18E/16			5/14/2019	5/14/2019	1
AGW080013686-WELL_NO2	GeoTracker	Domestic	11S/18E/16			4/22/2020	1/26/2021	2
AGW080013726-R11B1	GeoTracker	Domestic	12S/19E/22			5/18/2020	11/29/2022	4
AGW080013726-R11B1	GeoTracker	Domestic	12S/19E/22			5/18/2020	11/29/2022	4
AGW080013727-R11B3	GeoTracker	Domestic	12S/19E/15			5/18/2020	5/18/2020	1
AGW080013728-R11B9	GeoTracker	Domestic	12S/19E/10			5/18/2020	5/18/2020	1
AGW080013729-R11B10	GeoTracker	Domestic	12S/19E/15			5/18/2020	5/18/2020	1
AGW080013815-6372	GeoTracker	Domestic	12S/18E/34			6/12/2020	7/18/2022	2
AGW080013816-6558	GeoTracker	Domestic	12S/18E/34			6/12/2020	7/18/2022	2
AGW080013817-31296	GeoTracker	Domestic	12S/18E/35			6/12/2020	7/18/2022	6
AGW080013818-30850	GeoTracker	Domestic	12S/18E/34			6/12/2020	7/18/2022	2
AGW080014692-DOMESTIC	GeoTracker	Domestic	12S/19E/23			10/27/2020	10/27/2020	1
AGW080015181-MADERA1	GeoTracker	Domestic	12S/17E/26			11/13/2020	10/26/2022	6
AGW080015181-MADERA1	GeoTracker	Domestic	12S/17E/26			11/13/2020	10/26/2022	6
AGW080015182-HEADQTR	GeoTracker	Domestic	12S/18E/32			11/13/2020	10/25/2022	6
AGW080015182-HEADQTR	GeoTracker	Domestic	12S/18E/29			11/13/2020	10/25/2022	6
AGW080015183-MADERA2	GeoTracker	Domestic	12S/17E/23			11/13/2020	7/27/2021	2
AGW080015184-MADERA3	GeoTracker	Domestic	12S/17E/24			11/13/2020	10/19/2023	8
AGW080015184-MADERA3	GeoTracker	Domestic	12S/17E/23			11/13/2020	10/19/2023	8
AGW080015185-SCHMALL	GeoTracker	Domestic	12S/18E/30			11/13/2020	11/13/2020	1
AGW080015428-7890 RD 21	GeoTracker	Domestic	12S/16E/25			11/24/2020	11/24/2020	2
AGW080015429-8492 RD 20	GeoTracker	Domestic	12S/16E/23			11/24/2020	11/24/2020	2
AGW080015430-21863 AV12	GeoTracker	Domestic	11S/17E/31			11/24/2020	11/24/2020	2
AGW080015431-22334 RD28	GeoTracker	Domestic	10S/18E/08			11/24/2020	11/24/2020	2
AGW080015432-20555 AV 8	GeoTracker	Domestic	12S/16E/24			11/24/2020	11/24/2020	2
AGW080015434-20290 AV 9	GeoTracker	Domestic	12S/16E/24			11/24/2020	11/24/2020	2
AGW080015446-8493	GeoTracker	Domestic	12S/18E/21			11/13/2020	11/13/2020	1
AGW080015778-MOORE WELL	GeoTracker	Domestic	10S/16E/11			12/8/2020	11/28/2023	5
AGW080015785-AVE 5	GeoTracker	Domestic	13S/17E/07			12/8/2020	12/8/2020	2
AGW080015786-MADERARNCH	GeoTracker	Domestic	12S/18E/21			12/1/2020	3/10/2023	6
AGW080015786-MADERARNCH	GeoTracker	Domestic	12S/18E/16			12/1/2020	3/10/2023	6
AGW080015989-MADERA5	GeoTracker	Domestic	10S/16E/35			12/15/2020	12/15/2020	2
AGW080015990-J+L FARMS	GeoTracker	Domestic	11S/16E/03			12/15/2020	12/15/2020	2
AGW080015991-MADERA6	GeoTracker	Domestic	11S/16E/03			12/15/2020	12/15/2020	2
AGW080016012-#1 MF SHOP	GeoTracker	Domestic	11S/17E/29			12/19/2019	12/19/2019	2
AGW080016013-#2 MF HOME	GeoTracker	Domestic	11S/17E/29			12/19/2019	12/19/2019	2
AGW080016014-#3 MF20-14	GeoTracker	Domestic	11S/16E/24			12/19/2019	12/19/2019	2
AGW080016015-#4 SPF	GeoTracker	Domestic	11S/17E/29			12/19/2019	12/19/2019	2
AGW080016016-#5 AM74	GeoTracker	Domestic	11S/16E/24			12/19/2019	12/19/2019	2
AGW080016141-FREEMAN	GeoTracker	Domestic	12S/17E/06			12/4/2020	12/13/2022	6
AGW080016141-FREEMAN	GeoTracker	Domestic	12S/17E/06			12/4/2020	12/13/2022	6
AGW080016198-DOM_WELL	GeoTracker	Domestic	12S/17E/08			12/11/2018	12/15/2021	3
AGW080016315-TAYLOR 7	GeoTracker	Domestic	11S/16E/01			12/29/2020	12/29/2020	1
AGW080016577-JOHN	GeoTracker	Domestic	12S/17E/28			12/21/2020	12/21/2020	2
AGW080016578-NONI	GeoTracker	Domestic	12S/17E/27			12/21/2020	12/21/2020	2
AGW080016671-20841SHOP	GeoTracker	Domestic	11S/17E/18			12/21/2020	2/8/2022	8
AGW080016672-20435GUNI	GeoTracker	Domestic	11S/16E/13			12/21/2020	12/16/2021	5
AGW080016673-14481OLD	GeoTracker	Domestic	11S/16E/24			12/21/2020	12/16/2021	5
AGW080016674-21504RAM	GeoTracker	Domestic	11S/17E/19			12/21/2020	12/16/2021	5
AGW080016675-11514MOMS	GeoTracker	Domestic	12S/17E/01			12/21/2020	12/16/2021	5
AGW080016875-HOME RANCH	GeoTracker	Domestic	11S/16E/25			12/29/2020	12/19/2022	10
AGW080016875-HOME RANCH	GeoTracker	Domestic	11S/16E/24			12/29/2020	12/19/2022	10
AGW080016876-HOME 2	GeoTracker	Domestic	11S/16E/25			12/29/2020	12/19/2022	10
AGW080016876-HOME 2	GeoTracker	Domestic	11S/16E/24			12/29/2020	12/19/2022	10
AGW080016877-DIXIELAND3	GeoTracker	Domestic	11S/16E/02			12/29/2020	12/19/2022	8
AGW080016877-DIXIELAND3	GeoTracker	Domestic	11S/16E/03			12/29/2020	12/19/2022	8
AGW080016878-MERLOT	GeoTracker	Domestic	11S/17E/27			12/29/2020	12/19/2022	10
AGW080016878-MERLOT	GeoTracker	Domestic	11S/17E/27			12/29/2020	12/19/2022	10
AGW080017006-R2_DOM	GeoTracker	Domestic	11S/17E/03			12/11/2020	12/14/2022	4
AGW080017006-R2_DOM	GeoTracker	Domestic	11S/17E/04			12/11/2020	12/14/2022	4
AGW080017007-HULLER	GeoTracker	Domestic	11S/17E/04			12/11/2020	12/11/2020	1

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Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
AGW080017008-R4_SHOP	GeoTracker	Domestic	11S/17E/18			12/11/2020	12/11/2020	1
AGW080017009-R5_HOUSE	GeoTracker	Domestic	11S/17E/16			12/11/2020	12/14/2022	4
AGW080017009-R5_HOUSE	GeoTracker	Domestic	11S/17E/17			12/11/2020	12/14/2022	4
AGW080017012-R11_SHOP	GeoTracker	Domestic	12S/19E/15			12/14/2020	12/14/2020	1
AGW080017013-R18_SHOP	GeoTracker	Domestic	12S/19E/28			12/14/2020	12/14/2020	1
AGW080017014-MILL	GeoTracker	Domestic	12S/18E/25			12/14/2020	12/14/2020	1
AGW080017030-145 MADERA	GeoTracker	Domestic	13S/18E/06			12/16/2020	12/16/2020	1
AGW080017097-DOM WELL 1	GeoTracker	Domestic	12S/17E/28			12/31/2020	12/28/2022	12
AGW080017097-DOM WELL 1	GeoTracker	Domestic	12S/17E/21			12/31/2020	12/28/2022	12
AGW080017260-R-62	GeoTracker	Domestic	12S/18E/08			11/10/2020	11/10/2020	3
AGW080017261-R-78	GeoTracker	Domestic	12S/18E/17			12/29/2020	12/29/2020	3
AGW080017262-R-59	GeoTracker	Domestic	12S/18E/21			11/10/2020	11/10/2020	3
AGW080017322-RD_22	GeoTracker	Domestic	12S/17E/30			12/7/2020	12/7/2020	1
AGW080017323-MARTIN	GeoTracker	Domestic	12S/17E/29			12/7/2020	12/7/2020	1
AGW080017324-M_MOM	GeoTracker	Domestic	12S/17E/29			12/7/2020	12/7/2020	1
AGW080017325-GEORGE	GeoTracker	Domestic	12S/17E/29			12/7/2020	12/7/2020	1
AGW080017326-SCHOOL	GeoTracker	Domestic	12S/17E/20			12/7/2020	12/7/2020	1
AGW080017330-GUY_HOUSE	GeoTracker	Domestic	11S/19E/36			12/17/2020	12/17/2020	1
AGW080017331-FOREMAN_HS	GeoTracker	Domestic	11S/20E/31			12/17/2020	12/17/2020	1
AGW080017428-HOME	GeoTracker	Domestic	11S/18E/20			12/18/2020	11/29/2022	6
AGW080017428-HOME	GeoTracker	Domestic	11S/18E/17			12/18/2020	11/29/2022	6
AGW080017429-BURSEY	GeoTracker	Domestic	12S/18E/17			12/18/2020	11/29/2022	6
AGW080017429-BURSEY	GeoTracker	Domestic	12S/18E/08			12/18/2020	11/29/2022	6
AGW080017430-SHAMP	GeoTracker	Domestic	12S/18E/21			12/18/2020	12/18/2020	1
AGW080017453-DV	GeoTracker	Domestic	12S/18E/28			12/21/2020	12/21/2020	1
AGW080017454-DM	GeoTracker	Domestic	12S/18E/28			12/21/2020	12/21/2020	1
AGW080017640-DOMESTIC	GeoTracker	Domestic	12S/18E/27			12/29/2020	1/10/2023	6
AGW080017640-DOMESTIC	GeoTracker	Domestic	12S/18E/22			12/29/2020	1/10/2023	6
AGW080017760-AVE17	GeoTracker	Domestic	11S/16E/10			1/4/2021	12/20/2022	4
AGW080017760-AVE17	GeoTracker	Domestic	11S/16E/09			1/4/2021	12/20/2022	4
AGW080017853-HOBE_145	GeoTracker	Domestic	12S/17E/36			1/14/2021	1/14/2021	1
AGW080017889-HOME	GeoTracker	Domestic	12S/18E/05			1/26/2021	1/26/2021	1
AGW080017948-COUNTRYCLB	GeoTracker	Domestic	10S/17E/25			2/11/2021	1/12/2022	2
AGW080018034-NELSON_RCH	GeoTracker	Domestic	13S/17E/09			12/4/2020	11/15/2022	3
AGW080018371-17632	GeoTracker	Domestic	11S/18E/03			3/17/2021	3/17/2021	1
AGW080018372-RENTER	GeoTracker	Domestic	11S/18E/03			3/17/2021	3/17/2021	1
AGW080018696-NORTH	GeoTracker	Domestic	10S/17E/33			6/11/2021	6/11/2021	1
AGW080018697-MULTICROP	GeoTracker	Domestic	10S/17E/21			6/11/2021	6/11/2021	1
AGW080018748-BJR-1	GeoTracker	Domestic	12S/17E/04			12/15/2020	12/15/2020	2
AGW080019869-B_HOME	GeoTracker	Domestic	12S/19E/31			12/6/2021	5/10/2023	2
AGW080020230-WELL_#1	GeoTracker	Domestic	09S/17E/27			12/16/2021	12/16/2021	1
AGW080020704-DW2	GeoTracker	Domestic	11S/18E/17			6/15/2020	3/23/2022	18
AGW080020704-DW2	GeoTracker	Domestic	11S/18E/17			6/15/2020	3/23/2022	18
AGW080020707-DW3	GeoTracker	Domestic	11S/20E/32			6/15/2020	4/23/2021	6
AGW080020803-HOME RANCH	GeoTracker	Domestic	12S/17E/23			12/8/2021	11/28/2022	6
AGW080020804-BLOCK 6	GeoTracker	Domestic	12S/17E/27			12/8/2021	11/28/2022	12
AGW080020804-BLOCK 6	GeoTracker	Domestic	12S/17E/22			12/8/2021	11/28/2022	12
AGW080020805-BLOCK 7	GeoTracker	Domestic	12S/17E/22			12/8/2021	11/28/2022	6
AGW080020806-BLOCK 8	GeoTracker	Domestic	12S/17E/22			12/8/2021	11/28/2022	6
AGW080024228-RD_28	GeoTracker	Domestic	13S/18E/05			12/28/2023	12/28/2023	1
SL205184269-MW-11-SR	GeoTracker	Monitoring	11S/17E/35		165 - 195	2/27/2016	5/25/2022	44
SL205184269-MW-11-SR	GeoTracker	Monitoring	11S/17E/34		165 - 195	2/27/2016	5/25/2022	44
SL205184269-MW-17R	GeoTracker	Monitoring	11S/17E/35		165 - 195	2/27/2016	8/9/2023	42
SL205184269-MW-17R	GeoTracker	Monitoring	11S/17E/26		165 - 195	2/27/2016	8/9/2023	42
SL205184269-MW-19R	GeoTracker	Monitoring	11S/17E/35		195 - 225	2/26/2016	5/24/2022	54
SL205184269-MW-19R	GeoTracker	Monitoring	11S/17E/34		195 - 225	2/26/2016	5/24/2022	54
SL205184269-MW-22	GeoTracker	Monitoring	11S/17E/35		210 - 220	8/31/2005	8/9/2023	130
SL205184269-MW-22	GeoTracker	Monitoring	11S/17E/34		210 - 220	8/31/2005	8/9/2023	130
SL205184269-MW-28	GeoTracker	Monitoring	11S/17E/35		199.48 - 229.48	9/29/2021	2/14/2024	60
SL205184269-MW-28	GeoTracker	Monitoring	11S/17E/34		199.48 - 229.48	9/29/2021	2/14/2024	60
SL205184269-MW-29	GeoTracker	Monitoring	11S/17E/35		191.94 - 221.94	9/28/2021	2/14/2024	82
SL205184269-MW-29	GeoTracker	Monitoring	11S/17E/34		191.94 - 221.94	9/28/2021	2/14/2024	82
SL205184269-MW-30	GeoTracker	Monitoring	11S/17E/35		189.53 - 219.53	9/28/2021	2/15/2024	72
SL205184269-MW-30	GeoTracker	Monitoring	11S/17E/34		189.53 - 219.53	9/28/2021	2/15/2024	72
SL205184269-MW-31	GeoTracker	Monitoring	11S/17E/35		192.39 - 222.39	9/29/2021	2/14/2024	66

Table 3.J-2 - Supplemental Groundwater Quality Monitoring Network, Madera Subbasin

Well ID	Data Source	Well Type	T/R/S	Well Depth	Screen Interval	Earliest Groundwater Quality Measurement Date	Most Recent Groundwater Quality Measurement Date	Count of Groundwater Quality Measurements
SL205184269-MW-31	GeoTracker	Monitoring	11S/17E/34		192.39 - 222.39	9/29/2021	2/14/2024	66
SL205184269-MW-8-SR	GeoTracker	Monitoring	11S/17E/35		165 - 195	2/26/2016	5/24/2022	50
SL205184269-MW-8-SR	GeoTracker	Monitoring	11S/17E/34		165 - 195	2/26/2016	5/24/2022	50
T10000012877-MW-1	GeoTracker	Monitoring	11S/18E/30		115 - 135	6/26/2020	6/16/2022	34
T10000012877-MW-1	GeoTracker	Monitoring	11S/18E/30		115 - 135	6/26/2020	6/16/2022	34
T10000012877-MW-2	GeoTracker	Monitoring	11S/18E/30		115 - 135	6/26/2020	6/16/2022	74
T10000012877-MW-2	GeoTracker	Monitoring	11S/18E/30		115 - 135	6/26/2020	6/16/2022	74
T10000012877-MW-3	GeoTracker	Monitoring	11S/18E/30		115 - 135	6/26/2020	6/16/2022	64
T10000012877-MW-3	GeoTracker	Monitoring	11S/18E/30		115 - 135	6/26/2020	6/16/2022	64
T10000012877-MW-4	GeoTracker	Monitoring	11S/18E/30		124 - 144	6/26/2020	6/16/2022	66
T10000012877-MW-4	GeoTracker	Monitoring	11S/18E/30		124 - 144	6/26/2020	6/16/2022	66
T10000012877-MW-5	GeoTracker	Monitoring	11S/18E/30		130 - 150	6/16/2021	6/16/2022	34
T10000012877-MW-5	GeoTracker	Monitoring	11S/18E/30		130 - 150	6/16/2021	6/16/2022	34
T10000012877-SB-3	GeoTracker	Monitoring	11S/18E/30			8/29/2019	8/29/2019	6
ESJQC00012	ILRP	Monitoring	11S/17E/35	276	160 - 172	8/4/2020	7/27/2021	11
ESJQC00027	ILRP	Monitoring	12S/15E/18	139	74 - 134	8/4/2020	8/3/2022	31
ESJQC00035	ILRP	Monitoring	12S/16E/05	210	140 - 200	8/4/2020	8/3/2022	31
ESJQC00036	ILRP	Monitoring	13S/16E/03	350	135 - 340	8/4/2020	8/3/2022	32
ESJQC00037	ILRP	Monitoring	12S/17E/16	320	200 - 310	8/4/2020	8/3/2022	31
ESJQC00037-DUP	ILRP	Monitoring	12S/17E/16	320	200 - 310	8/4/2020	8/4/2020	12
ESJQC00039	ILRP	Monitoring	10S/16E/11	510	400 - 500	8/4/2020	8/2/2022	31
11S17E32R002M	LSCE	Irrigation	11S/17E/32	656	290 - 635	7/25/2024	7/25/2024	10
11S19E19N001M	LSCE	Monitoring	11S/19E/19			8/18/2021	6/20/2023	30
MSB03A	LSCE	Monitoring	12S/15E/18	139	74 - 134	2/12/2020	7/23/2024	40
MSB03B	LSCE	Monitoring	12S/15E/18	295	215 - 285	2/12/2020	7/23/2024	41
MSB03C	LSCE	Monitoring	12S/15E/18	430	355 - 420	2/12/2020	7/23/2024	36
MSB04A	LSCE	Monitoring	11S/17E/11	375	180 - 365	2/13/2020	6/15/2023	75
MSB04B	LSCE	Monitoring	11S/17E/11	695	530 - 685	2/13/2020	7/24/2024	37
MSB04C	LSCE	Monitoring	11S/17E/11	905	750 - 895	2/13/2020	7/24/2024	36
MSB05A	LSCE	Monitoring	12S/16E/05	210	140 - 200	2/12/2020	7/23/2024	34
MSB05B	LSCE	Monitoring	12S/16E/05	375	240 - 365	2/12/2020	7/23/2024	35
MSB05C	LSCE	Monitoring	12S/16E/05	585	420 - 585	2/12/2020	7/23/2024	30
MSB06A	LSCE	Monitoring	13S/16E/03	350	135 - 340	2/12/2020	7/23/2024	70
MSB06B	LSCE	Monitoring	13S/16E/03	520	425 - 510	2/12/2020	7/23/2024	48
MSB06C	LSCE	Monitoring	13S/16E/03	715	630 - 705	2/12/2020	7/23/2024	47
MSB09A	LSCE	Monitoring	12S/17E/16	320	200 - 310	2/11/2020	7/25/2024	39
MSB09B	LSCE	Monitoring	12S/17E/16	725	520 - 715	2/11/2020	7/25/2024	38
MSB09C	LSCE	Monitoring	12S/17E/16	955	880 - 945	2/11/2020	7/25/2024	33
MSB10B	LSCE	Monitoring	10S/16E/11	510	400 - 500	2/13/2020	7/26/2024	40
MSB10C	LSCE	Monitoring	10S/16E/11	880	790 - 870	2/13/2020	7/26/2024	36
MSB11A	LSCE	Monitoring	10S/17E/11	345	185 - 335	2/11/2020	2/11/2020	24
MSB11B	LSCE	Monitoring	10S/17E/11	700	550 - 690	2/11/2020	2/11/2020	20
MSB11C	LSCE	Monitoring	10S/17E/11	880	775 - 870	2/11/2020	7/31/2024	28
MSB12	LSCE	Monitoring	10S/18E/23	465	355 - 465	6/15/2023	7/24/2024	5
MSB13B	LSCE	Monitoring	11S/19E/15	446	396 - 436	6/15/2023	7/24/2024	6
MSB13C	LSCE	Monitoring	11S/19E/15	532	522 - 532	6/15/2023	7/24/2024	4
MWD 04	MWD	Irrigation	10S/18E/20	504	200 - 500	7/18/2019	8/19/2022	43
RCWD MW1	RCWD	Monitoring	12S/19E/23			6/1/2017	6/1/2023	29
RCWD MW2	RCWD	Monitoring	12S/19E/14			6/1/2017	6/1/2023	33
RCWD MW3	RCWD	Monitoring	12S/19E/12			6/1/2017	6/1/2023	35
RCWD MW4	RCWD	Monitoring	12S/20E/07			6/1/2017	6/1/2023	38
RCWD MW5	RCWD	Monitoring	12S/20E/07			6/1/2017	6/1/2023	38
MADCHOW-03	USGS	Municipal	11S/17E/24	635	240 - 520	4/15/2008	6/5/2018	405
MADCHOW-05	USGS	Municipal	10S/18E/15	350		4/16/2008	6/5/2018	406
S3-MACK-M09	USGS	Domestic	11S/16E/08	500		11/21/2013	2/6/2019	206
S3-MACK-M11	USGS	Domestic	12S/17E/27	300	240 - 300	12/3/2013	2/6/2019	204
S3-MACK-M24	USGS	Domestic	11S/20E/21	320	200 - 320	12/9/2013	2/5/2019	208
S3-MACK-M28	USGS	Domestic	09S/17E/26			4/9/2014	2/4/2019	206
USGS_365100120060001	USGS_NWIS	Water Supply	12S/17E/27	300		12/3/2013	2/6/2019	215
USGS_365700119470002	USGS_NWIS	Water Supply	11S/20E/21	320		12/9/2013	2/5/2019	214
USGS_365747120034901	USGS_NWIS	Water Supply	11S/17E/24	540		4/15/2008	6/5/2018	407
USGS_365900120140001	USGS_NWIS	Water Supply	11S/16E/08	500		11/21/2013	2/6/2019	213
USGS_370039120053102	USGS_NWIS	Water Supply	11S/17E/03	340		6/20/1995	8/13/2015	368
USGS_370300119590001	USGS_NWIS	Water Supply	10S/18E/15	350		4/16/2008	6/5/2018	405
USGS_370700120040001	USGS_NWIS	Water Supply	09S/17E/26	340		5/22/2008	2/4/2019	377

Table 3.J-3 - Supplemental Subsidence Monitoring Network, Madera Subbasin

Station ID	Data Source	Station Type	Latitude	Longitude	Subbasin	Earliest Elevation Measurement Date	Most Recent Elevation Measurement Date	Count of Elevation Measurements
P307	UNAVCO PBO	Continuous GPS	36.94727	-120.05792	Madera	10/18/2005	9/30/2024	6,908
SJRRP_1007R	USBR SJRRP	GPS Station	36.93077	-120.38220	Madera	7/1/2012	7/22/2024	24
SJRRP_127	USBR SJRRP	GPS Station	36.85100	-120.23691	Madera	12/1/2011	7/22/2024	25
SJRRP_141	USBR SJRRP	GPS Station	36.88701	-119.98164	Madera	12/1/2011	7/22/2024	25
SJRRP_142	USBR SJRRP	GPS Station	36.97544	-119.79377	Madera	12/1/2011	7/22/2024	25
SJRRP_160R	USBR SJRRP	GPS Station	36.82212	-120.14183	Madera	12/1/2011	7/22/2024	25
SJRRP_165	USBR SJRRP	GPS Station	36.89749	-119.79053	Madera	12/1/2017	7/22/2024	13
SJRRP_201R	USBR SJRRP	GPS Station	36.87225	-120.31803	Madera	7/1/2017	7/22/2024	14
SJRRP_29	USBR SJRRP	GPS Station	37.01818	-120.12658	Madera	7/1/2012	7/22/2024	24
SJRRP_1053R	USBR SJRRP	GPS Station	36.97608	-120.38299	Chowchilla	7/1/2012	7/22/2024	24
SJRRP_1054R	USBR SJRRP	GPS Station	36.99619	-120.38326	Chowchilla	7/1/2012	7/22/2024	24
SJRRP_1055R	USBR SJRRP	GPS Station	37.04002	-120.47371	Chowchilla	7/1/2012	7/22/2024	24
SJRRP_123	USBR SJRRP	GPS Station	36.95262	-120.35002	Chowchilla	12/1/2011	7/22/2024	25
SJRRP_124	USBR SJRRP	GPS Station	37.08372	-120.44934	Chowchilla	12/1/2011	7/22/2024	25
SJRRP_135	USBR SJRRP	GPS Station	37.08448	-120.22754	Chowchilla	12/1/2011	7/22/2024	25
SJRRP_2062	USBR SJRRP	GPS Station	36.96987	-120.42216	Chowchilla	7/1/2012	7/22/2024	21
SJRRP_2076	USBR SJRRP	GPS Station	37.08357	-120.36553	Chowchilla	7/1/2012	7/22/2024	24
SJRRP_2362	USBR SJRRP	GPS Station	37.01822	-120.43323	Chowchilla	7/1/2012	7/22/2024	24
SJRRP_2378	USBR SJRRP	GPS Station	37.01833	-120.29258	Chowchilla	7/1/2012	7/22/2024	24
SJRRP_1009	USBR SJRRP	GPS Station	36.95265	-120.50341	Delta-Mendota	7/1/2012	7/22/2024	24
SJRRP_101	USBR SJRRP	GPS Station	36.89756	-120.46507	Delta-Mendota	12/1/2011	7/22/2024	23
SJRRP_104	USBR SJRRP	GPS Station	36.77409	-120.28435	Delta-Mendota	12/1/2011	7/22/2024	15
SJRRP_121	USBR SJRRP	GPS Station	36.98302	-120.50085	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_122	USBR SJRRP	GPS Station	36.77004	-120.39229	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_129	USBR SJRRP	GPS Station	36.85731	-120.46283	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_132R	USBR SJRRP	GPS Station	36.99631	-120.50329	Delta-Mendota	12/1/2018	7/22/2024	11
SJRRP_147	USBR SJRRP	GPS Station	36.96627	-120.56497	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_153	USBR SJRRP	GPS Station	36.81756	-120.43338	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_157	USBR SJRRP	GPS Station	37.03363	-120.57224	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_158	USBR SJRRP	GPS Station	36.85771	-120.39086	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_159	USBR SJRRP	GPS Station	36.82489	-120.37282	Delta-Mendota	12/1/2011	7/22/2024	25
SJRRP_2348	USBR SJRRP	GPS Station	37.01496	-120.63601	Delta-Mendota	7/1/2012	7/22/2024	24
SJRRP_2562	USBR SJRRP	GPS Station	36.95188	-120.47906	Delta-Mendota	7/1/2012	7/22/2024	23
SJRRP_145	USBR SJRRP	GPS Station	36.86675	-119.56148	Kings	12/1/2011	7/22/2024	25
SJRRP_154	USBR SJRRP	GPS Station	36.72607	-120.02467	Kings	12/1/2011	7/22/2024	25
SJRRP_202	USBR SJRRP	GPS Station	36.80869	-119.78571	Kings	12/1/2017	7/22/2024	13
SJRRP_131	USBR SJRRP	GPS Station	37.22832	-120.27054	Merced	12/1/2011	7/22/2024	25
SJRRP_133	USBR SJRRP	GPS Station	37.06187	-120.54343	Merced	12/1/2011	7/22/2024	25
SJRRP_156	USBR SJRRP	GPS Station	37.11342	-120.58832	Merced	12/1/2011	7/22/2024	25
SJRRP_162	USBR SJRRP	GPS Station	37.09214	-120.51024	Merced	12/1/2011	7/22/2024	25
SJRRP_2065	USBR SJRRP	GPS Station	37.19817	-120.48806	Merced	7/1/2012	7/22/2024	24
P725	UNAVCO PBO	Continuous GPS	37.08889	-119.74559		10/20/2006	9/30/2024	6,429
SJRRP_120	USBR SJRRP	GPS Station	36.99646	-119.70151		12/1/2011	7/22/2024	22
SJRRP_143	USBR SJRRP	GPS Station	37.09489	-119.75235		12/1/2011	7/22/2024	22

Additional subsidence monitoring data is downloaded and reviewed periodically from DWR's TRE ALTAMIRA InSAR Subsidence Dataset: https://data.cnra.ca.gov/dataset/tre-altamira-insar-subsidence

APPENDIX 3.K. Madera Subbasin Joint GSP First Periodic Update – Groundwater Level Representative Monitoring Site (RMS) Network Update.

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Amended January 2025

GSP Team:

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ERA Economics
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Luhdorff & Scalmanini
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: October 4, 2024 Project No. 24-1-010

TO: Madera Subbasin Joint GSP GSAs

FROM: LSCE and DE

SUBJECT: Madera Subbasin Joint GSP First Periodic Update – Groundwater Level Representative Monitoring Site (RMS) Network Update

Introduction and Background

The Joint Groundwater Sustainability Agencies (GSAs) (City of Madera GSA, County of Madera GSA – Madera, Madera Irrigation District GSA, and Madera Water District GSA) developed a Groundwater Level Representative Monitoring Sites (RMS) network as part of the development of a Groundwater Sustainability Plan (GSP) for the Madera Subbasin that was originally submitted in January 2020. During the implementation of the GSP, various issues have arisen that have affected the consistency of groundwater level measurements at a number of these RMS. As part of the first periodic update to the GSP, the groundwater level RMS network was evaluated and updated to ensure consistent measurements that will satisfy Sustainable Groundwater Management Act (SGMA) monitoring requirements and support GSP activities in the Subbasin. This TM describes the comprehensive review of the monitoring network that was conducted as part of the 2025 GSP Plan Amendment and the development of a revised monitoring network.

January 2020 Groundwater Level RMS Network Evaluation

The first iteration of the Joint GSP Groundwater Level RMS network in Madera Subbasin (**Figure 1**), developed as part of the January 2020 GSP submission, consisted of 37 wells: 11 screened in the Upper Aquifer, 22 screened in the Lower Aquifer, and 4 screened across both aquifers (composite). The monitoring network was initially developed using existing wells in the GSP Area. The database for existing wells was reviewed with the following criteria in mind:

- CASGEM wells preferred;
- Known construction (screen intervals, depth) preferred;
- Long histories of water level data (including recent data) preferred;

- Relatively good match between observed and modeled water levels preferred;
- Good spatial distribution preferred;
- Representation of both Upper (where present in western portion of Plan Area) and Lower Aquifers preferred.

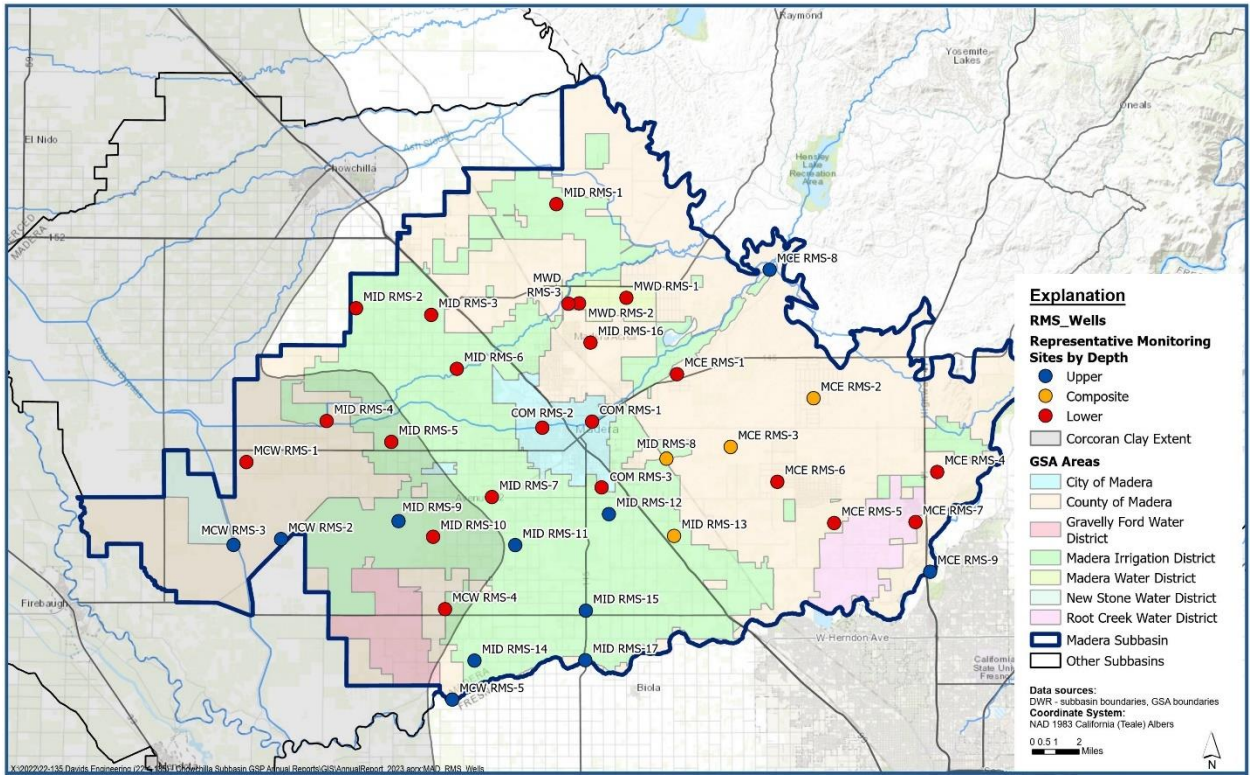

Figure 1. January 2020 Groundwater Level Representative Monitoring Sites (RMS) Network

As required by SGMA, groundwater level RMS are to be measured on a semi-annual basis at a minimum during periods which will capture seasonal highs and lows (i.e., spring and fall). A summary of annual monitoring activities is provided in each year's Annual Report for the Joint GSP. As part of the comprehensive monitoring network evaluation, the monitoring history of each RMS well was reviewed and wells with no recent measurements or inconsistent measurements were identified for removal from the network. **Table 1** provides a summary of this network review and lists the wells identified for removal and rationale for removal from the network.

Table 1. Summary of Review of January 2020 Madera Subbasin Joint GSP Groundwater Level Representative Monitoring Site (RMS) Network Evaluation				
GSA	**RMS ID**	**AQUIFER**	**NETWORK STATUS**	**RATIONALE FOR REMOVAL**
City of Madera	COM RMS-1	Lower	Remain in Network	
City of Madera	COM RMS-2	Lower	Remain in Network	
City of Madera	COM RMS-3	Lower	Remove from Network	No Recent Measurements; unable to sound
County of Madera	MCE RMS-1	Lower	Remove from Network	No Recent Measurements; unable to obtain access from owner
County of Madera	MCE RMS-2	Composite	Remain in Network	
County of Madera	MCE RMS-3	Composite	Remain in Network	
County of Madera	MCE RMS-4	Lower	Remove from Network	Inconsistent Measurements
County of Madera	MCE RMS-5	Lower	Remain in Network	
County of Madera	MCE RMS-6	Lower	Remain in Network	
County of Madera	MCE RMS-7	Lower	Remove from Network	No Recent Measurements; well has been destroyed
County of Madera	MCE RMS-8	Upper	Remove from Network	No Recent Measurements; owner will not allow access
County of Madera	MCE RMS-9	Upper	Remain in Network	
County of Madera	MCW RMS-1	Lower	Remove from Network	No Recent Measurements; well has been destroyed
County of Madera	MCW RMS-2	Upper	Remove from Network	No Recent Measurements; well covered by steel plate and unable to obtain access
County of Madera	MCW RMS-3	Upper	Remain in Network	
County of Madera	MCW RMS-4	Lower	Remove from Network	Inconsistent Measurements; unable to obtain access from owner
County of Madera	MCW RMS-5	Upper	Remain in Network	
Madera Irrigation District	MID RMS-1	Lower	Remove from Network	No Recent Measurements; no well at this site

Table 1. Summary of Review of January 2020 Madera Subbasin Joint GSP Groundwater Level Representative Monitoring Site (RMS) Network Evaluation				
GSA	**RMS ID**	**AQUIFER**	**NETWORK STATUS**	**RATIONALE FOR REMOVAL**
Madera Irrigation District	MID RMS-2	Lower	Remain in Network	
Madera Irrigation District	MID RMS-3	Lower	Remain in Network	
Madera Irrigation District	MID RMS-4	Lower	Remain in Network	
Madera Irrigation District	MID RMS-5	Lower	Remain in Network	
Madera Irrigation District	MID RMS-6	Lower	Remain in Network	
Madera Irrigation District	MID RMS-7	Lower	Remain in Network	
Madera Irrigation District	MID RMS-8	Composite	Remove from Network	No Recent Measurements; unable to obtain access from owner
Madera Irrigation District	MID RMS-9	Upper	Remove from Network	No Recent Measurements; unable to obtain access from owner
Madera Irrigation District	MID RMS-10	Lower	Remain in Network	
Madera Irrigation District	MID RMS-11	Upper	Remain in Network	
Madera Irrigation District	MID RMS-12	Upper	Remain in Network	
Madera Irrigation District	MID RMS-13	Composite	Remain in Network	
Madera Irrigation District	MID RMS-14	Upper	Remove from Network	No Recent Measurements; unable to obtain access from owner
Madera Irrigation District	MID RMS-15	Upper	Remain in Network	
Madera Irrigation District	MID RMS-16	Lower	Remain in Network	
Madera Irrigation District	MID RMS-17	Upper	Remain in Network	
Madera Water District	MWD RMS-1	Lower	Remain in Network	
Madera Water District	MWD RMS-2	Lower	Remain in Network	

Table 1. Summary of Review of January 2020 Madera Subbasin Joint GSP Groundwater Level Representative Monitoring Site (RMS) Network Evaluation				
GSA	RMS ID	AQUIFER	NETWORK STATUS	RATIONALE FOR REMOVAL
Madera Water District	MWD RMS-3	Lower	Remain in Network	

September 2024 Groundwater Level RMS Network Update

A total of 12 wells have been selected for addition to the Madera Subbasin Joint GSP Groundwater Level RMS network. These wells have been selected for inclusion in the network to either replace RMS wells removed from network, fill spatial data gaps, and/or fill vertical data gaps. **Table 2** provides a summary of the wells identified for inclusion and rationale for inclusion from the network.

Table 2. Summary of Wells Proposed for Inclusion in the Madera Subbasin Joint GSP Groundwater Level Representative Monitoring Site (RMS) Network				
GSA	RMS ID	AQUIFER	NETWORK STATUS	RATIONALE FOR REMOVAL
City of Madera	COM RMS-4	Lower	Addition to Network	RMS Replacement
County of Madera	MSB03B	Upper	Addition to Network	RMS Replacement
County of Madera	MSB03C	Lower	Addition to Network	Lower Aquifer Data Gap Fill
County of Madera	MSB04B	Lower	Addition to Network	Lower Aquifer Data Gap Fill
County of Madera	MSB05A	Upper	Addition to Network	Upper Aquifer Data Gap Fill
County of Madera	MSB05B	Lower	Addition to Network	RMS Replacement
County of Madera	MSB06A	Upper	Addition to Network	Upper Aquifer Data Gap Fill
County of Madera	MSB06C	Lower	Addition to Network	RMS Replacement
County of Madera	MSB10C	Lower	Addition to Network	Lower Aquifer Data Gap Fill
County of Madera	MSB11C	Lower	Addition to Network	RMS Replacement
County of Madera	MSB12	Lower	Addition to Network	Data Gap Fill
Madera Irrigation District	MSB09C	Lower	Addition to Network	Lower Aquifer Data Gap Fill

The updated water level RMS network will include a total of 37 wells: 10 upper aquifer wells, 26 lower aquifer wells, and 1 composite well. The updated Madera Subbasin Joint GSP Groundwater Level RMS network is shown in **Figure 2** and summarized in **Table 3**.

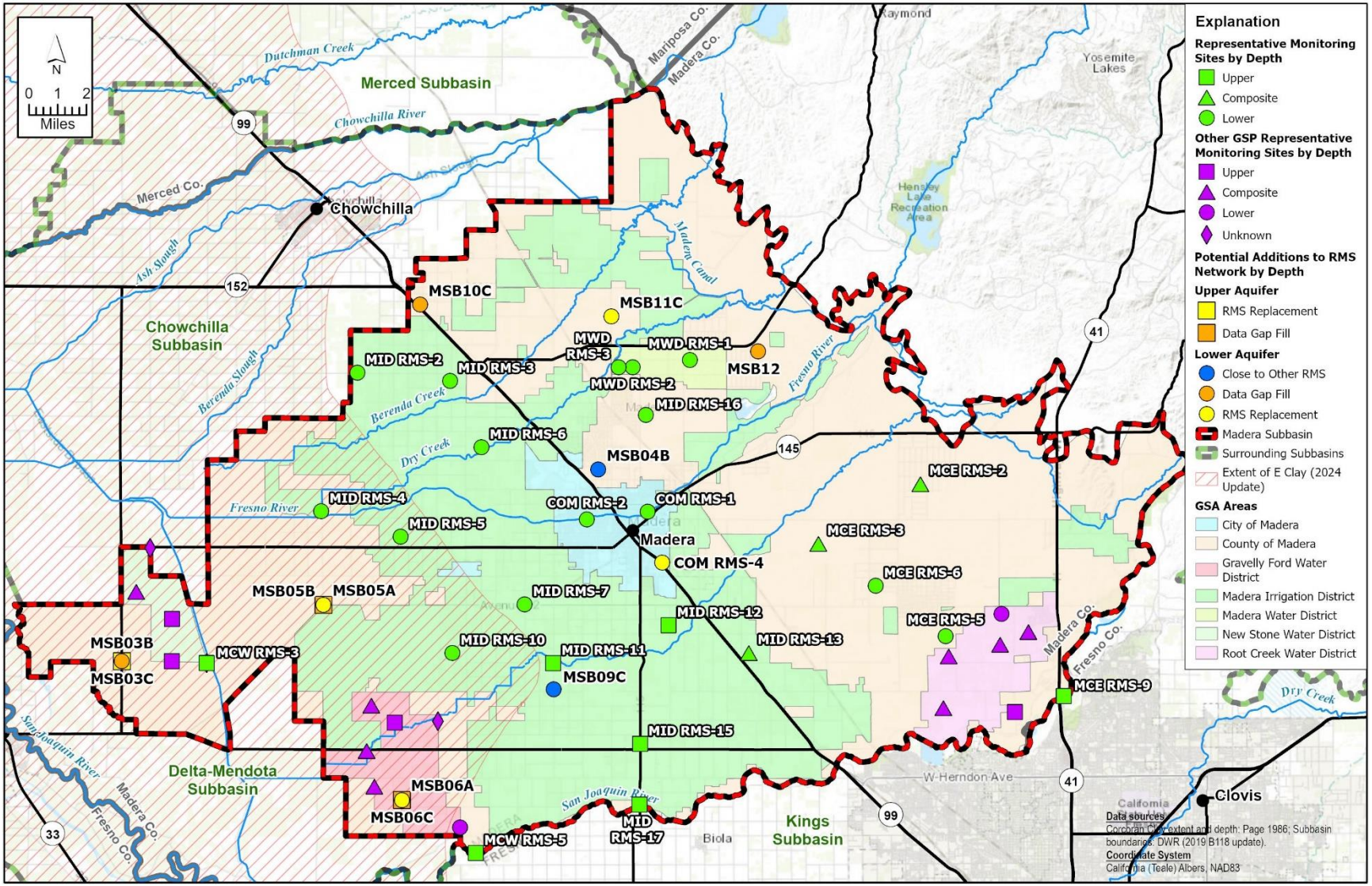

Figure 2. Updated Madera Subbasin Joint GSP Groundwater Level RMS Network (September 2024)

Table 3. Summary of Updated Madera Subbasin Joint GSP Groundwater Level Representative Monitoring Site (RMS) Network									
GSA	RMS ID	Aquifer	Well Type	Ground Surface Elevation (feet msl)	Total Depth (feet bgs)	Top of Well Screen (feet bgs)	Bottom of Well Screen (feet bgs)	Latitude	Longitude
City of Madera	COM RMS-1	Lower[2]	Public Supply	278	520	210	510	36.9708	-120.0513
City of Madera	COM RMS-2	Lower[2]	Public Supply	262	590	370	590	36.9670	-120.0898
City of Madera	COM RMS-4	Lower[2]	Public Supply	268	588	433	568	36.9452	-120.0423
County of Madera	MCE RMS-2	Upper[2]	Public Supply	378				36.9852	-119.8799
County of Madera	MCE RMS-3	Lower [2]	Irrigation	325				36.9552	-119.9441
County of Madera	MCE RMS-5	Lower[2]	Irrigation	340				36.9082	-119.8641
County of Madera	MCE RMS-6	Lower[2]	Domestic	328	550	450	550	36.9337	-119.9080
County of Madera	MCE RMS-9	Upper[2]	Observation	271	37	17	37	36.8780	-119.7900
County of Madera	MCW RMS-3	Lower[1]	Irrigation	162				36.8943	-120.3285
County of Madera	MCW RMS-5	Upper[2]	Observation	202	30			36.7991	-120.1592
County of Madera	MSB03B	Upper[1]	Observation	148	295	215	285	36.8951	-120.3818
County of Madera	MSB03C	Lower[1]	Observation	148	430	355	420	36.8951	-120.3818
County of Madera	MSB04B	Lower[2]	Observation	271	695	530	685	36.9922	-120.0825
County of Madera	MSB05A	Upper[1]	Observation	177	210	140	200	36.9238	-120.2552
County of Madera	MSB05B	Lower[1]	Observation	177	375	240	365	36.9238	-120.2552

Table 3. Summary of Updated Madera Subbasin Joint GSP Groundwater Level Representative Monitoring Site (RMS) Network									
GSA	RMS ID	Aquifer	Well Type	Ground Surface Elevation (feet msl)	Total Depth (feet bgs)	Top of Well Screen (feet bgs)	Bottom of Well Screen (feet bgs)	Latitude	Longitude
County of Madera	MSB06A	Upper[1]	Observation	192	350	135	340	36.8257	-120.2057
County of Madera	MSB06C	Lower[1]	Observation	192	715	630	705	36.8257	-120.2057
County of Madera	MSB10C	Lower[2]	Observation	233	880	790	870	37.0750	-120.1948
County of Madera	MSB11C	Lower[2]	Observation	251	880	775	870	37.0692	-120.0745
County of Madera	MSB12	Lower[2]	Observation	306	465	355	465	37.0516	-119.9820
Madera Irrigation District	MID RMS-2	Lower[2]	Unknown	350	563	298	509	37.0407	-120.2342
Madera Irrigation District	MID RMS-3	Lower[2]	Irrigation	218	516	260	507	37.0366	-120.1760
Madera Irrigation District	MID RMS-4	Lower[1]	Irrigation	241	698	320	667	36.9709	-120.2568
Madera Irrigation District	MID RMS-5	Lower[1]	Industrial	190	570	270	570	36.9581	-120.2067
Madera Irrigation District	MID RMS-6	Lower[2]	Industrial	204	680	320	680	37.0033	-120.1561
Madera Irrigation District	MID RMS-7	Lower[2]	Irrigation	237	656	290	635	36.9243	-120.1288
Madera Irrigation District	MID RMS-10	Lower[1]	Irrigation	237	615	315	615	36.8996	-120.1742
Madera Irrigation District	MID RMS-11	Upper[2]	Unknown	213	315			36.8946	-120.1108
Madera Irrigation District	MID RMS-12	Upper[2]	Irrigation	232	176			36.9138	-120.0383
Madera Irrigation District	MID RMS-13	Composite[2]	Irrigation	262	600	228	552	36.9003	-119.9879

Table 3. Summary of Updated Madera Subbasin Joint GSP Groundwater Level Representative Monitoring Site (RMS) Network									
GSA	RMS ID	Aquifer	Well Type	Ground Surface Elevation (feet msl)	Total Depth (feet bgs)	Top of Well Screen (feet bgs)	Bottom of Well Screen (feet bgs)	Latitude	Longitude
Madera Irrigation District	MID RMS-15	Upper[2]	Public Supply	271	502	160	200	36.8541	-120.0561
Madera Irrigation District	MID RMS-16	Lower[2]	Domestic	247	452	348	388	37.0196	-120.0526
Madera Irrigation District	MID RMS-17	Upper[2]	Observation	308	47	26	46	36.8235	-120.0565
Madera Irrigation District	MSB09C	Lower[2]	Observation	224	955	880	945	36.8814	-120.1105
Madera Water District	MWD RMS-1	Lower[2]	Irrigation	330	504	200	500	37.0472	-120.0248
Madera Water District	MWD RMS-2	Lower[2]	Irrigation	310	537	200	537	37.0436	-120.0610
Madera Water District	MWD RMS-3	Lower[2]	Irrigation	295	800	380	800	37.0436	-120.0697

[1] Well is located within the Corcoran Clay Extent
[2] Well is located outside of the Corcoran Clay Extent

APPENDIX 3.L. Madera Subbasin Joint GSP First Periodic Update – Groundwater Quality Representative Monitoring Site (RMS) Network Update

Prepared as part of the

Joint Groundwater Sustainability Plan
Madera Subbasin

January 2020
Amended January 2025

GSP Team:

Davids Engineering, Inc. (Amended GSP Team)
Luhdorff & Scalmanini (Amended GSP Team)
ERA Economics
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California State University, Sacramento

Luhdorff & Scalmanini
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: October 4, 2024 Project No. 24-1-010

TO: Madera Subbasin Joint GSP GSAs

FROM: LSCE and DE

SUBJECT: Madera Subbasin Joint GSP First Periodic Update – Groundwater Quality Representative Monitoring Site (RMS) Network Update

Introduction and Background

The Joint Groundwater Sustainability Agencies (GSAs) (City of Madera GSA, County of Madera GSA – Madera, Madera Irrigation District GSA, and Madera Water District GSA) developed a Groundwater Quality Representative Monitoring Sites (RMS) network as part of the development of a Groundwater Sustainability Plan (GSP) for the Madera Subbasin that was originally submitted in January 2020. During the implementation of the GSP, various issues have arisen that have affected the consistency of groundwater quality sampling at a number of these RMS. As part of the first periodic update to the GSP, the groundwater quality RMS network was evaluated and updated to ensure consistent sampling that will satisfy Sustainable Groundwater Management Act (SGMA) monitoring requirements and support GSP activities in the Subbasin. This TM describes the comprehensive review of the monitoring network that was conducted as part of the 2025 GSP Plan Amendment and the development of a revised monitoring network.

January 2020 Groundwater Quality RMS Network Evaluation

The first iteration of the Joint GSP Groundwater Quality RMS network in Madera Subbasin (**Figure 1**), developed as part of the January 2020 GSP submission, consisted of 48 wells: 8 screened in the Upper Aquifer, 35 screened in the Lower Aquifer, and 5 screened across both aquifers (composite). The monitoring network was initially developed using existing wells in the GSP Area, including those monitored as part of existing groundwater quality networks, and planned dedicated monitoring wells.

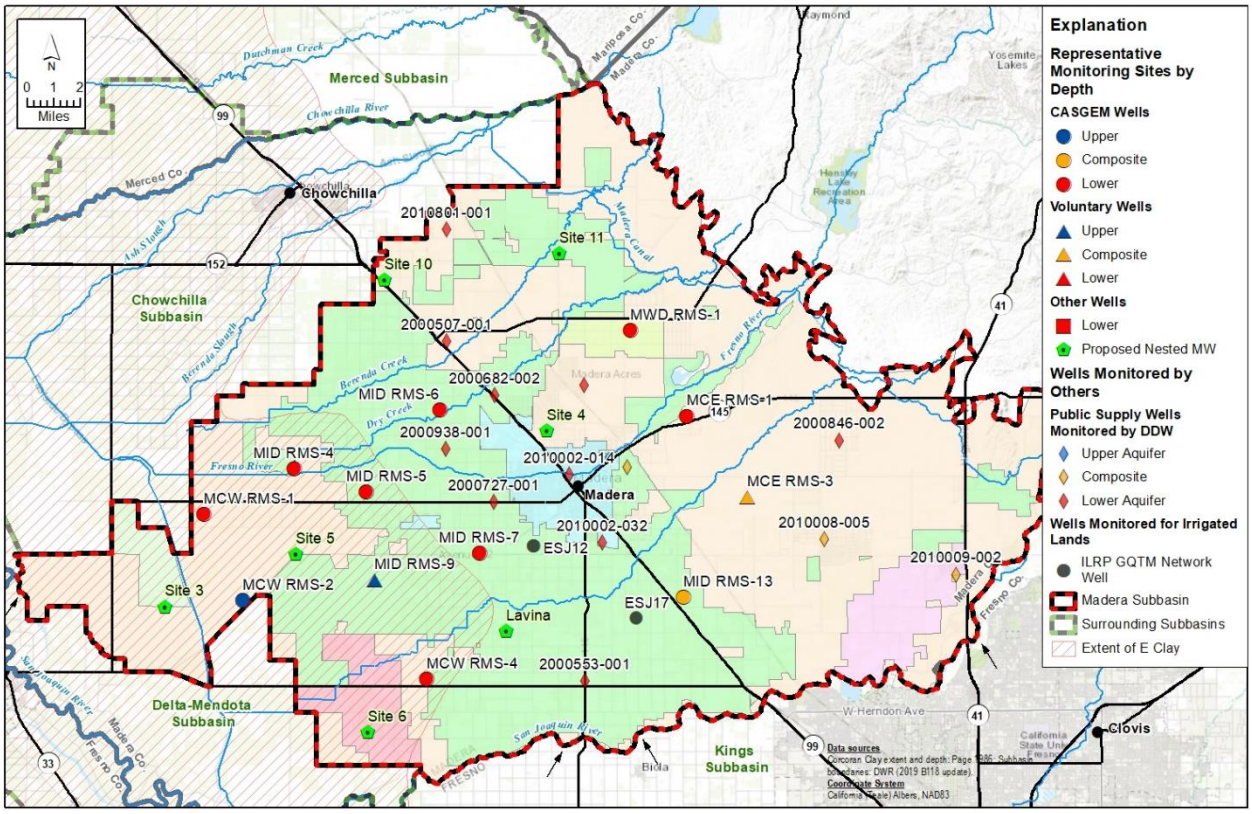

Figure 1. January 2020 Groundwater Quality Representative Monitoring Sites (RMS) Network

As required by SGMA, groundwater quality RMS are to be measured on an annual basis at a minimum. As part of the comprehensive monitoring network evaluation, the monitoring history of each RMS well was reviewed and wells with no recent samples or inconsistent sample collection were identified for removal from the network. **Table 1** provides a summary of this network review and lists the wells identified for removal and rationale for removal from the network.

Table 1. Summary of Review of January 2020 Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network Evaluation

GSA	RMS ID	AQUIFER	NETWORK STATUS	RATIONALE FOR REMOVAL
GSA-Current	MCE RMS-1	Lower	Remove from Network	Well is inaccessible; unable to obtain access from owner
GSA-Current	MCE RMS-3	Lower	Remain in Network	
GSA-Current	MCW RMS-1	Lower	Remove from Network	Well has been destroyed
GSA-Current	MCW RMS-2	Upper	Remove from Network	Well is inaccessible; well covered by steel plate and

Table 1. Summary of Review of January 2020 Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network Evaluation				
GSA	**RMS ID**	**AQUIFER**	**NETWORK STATUS**	**RATIONALE FOR REMOVAL**
				unable to obtain access
GSA-Current	MCW RMS-4	Composite	Remove from Network	Well is inaccessible; unable to obtain access from owner
GSA-Current	MID RMS-4	Lower	Remain in Network	
GSA-Current	MID RMS-5	Lower	Remove from Network	Well is inaccessible; unable to obtain access from owner
GSA-Current	MID RMS-6	Lower	Remain in Network	
GSA-Current	MID RMS-7	Lower	Remain in Network	
GSA-Current	MID RMS-9	Lower	Remove from Network	Inconsistent measurements; unable to obtain access from owner
GSA-Current	MID RMS-13	Composite	Remain in Network	
GSA-Current	MWD RMS-1	Lower	Remain in Network	
GSA-Future	MSB03A	Upper	Remain in Network	
GSA-Future	MSB03B	Upper	Remain in Network	
GSA-Future	MSB03C	Lower	Remain in Network	
GSA-Future	MSB04A	Lower	Remain in Network	
GSA-Future	MSB04B	Lower	Remain in Network	
GSA-Future	MSB04C	Lower	Remain in Network	
GSA-Future	MSB05A	Upper	Remain in Network	
GSA-Future	MSB05B	Lower	Remain in Network	
GSA-Future	MSB05C	Lower	Remain in Network	
GSA-Future	MSB06A	Upper	Remain in Network	

Table 1. Summary of Review of January 2020 Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network Evaluation				
GSA	**RMS ID**	**AQUIFER**	**NETWORK STATUS**	**RATIONALE FOR REMOVAL**
GSA-Future	MSB06B	Lower	Remain in Network	
GSA-Future	MSB06C	Lower	Remain in Network	
GSA-Future	MSB09A	Upper	Remain in Network	
GSA-Future	MSB09B	Lower	Remain in Network	
GSA-Future	MSB09C	Lower	Remain in Network	
GSA-Future	MSB10A	Lower	Remove from Network	Well has gone dry
GSA-Future	MSB10B	Lower	Remain in Network	
GSA-Future	MSB10C	Lower	Remain in Network	
GSA-Future	MSB11A	Lower	Remove from Network	Well has gone dry
GSA-Future	MSB11B	Lower	Remove from Network	Well has been abandoned
GSA-Future	MSB11C	Lower	Remain in Network	
Non-GSA	2000507-001	Lower	Remain in Network	
Non-GSA	2000553-001	Lower	Remain in Network	
Non-GSA	2000682-002	Lower	Remain in Network	
Non-GSA	2000727-001	Lower	Remain in Network	
Non-GSA	2000846-002	Lower	Remove from Network	Well is no longer monitored
Non-GSA	2000938-001	Lower	Remain in Network	
Non-GSA	2010002-014	Lower	Remain in Network	
Non-GSA	2010002-032	Lower	Remain in Network	

Table 1. Summary of Review of January 2020 Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network Evaluation				
GSA	**RMS ID**	**AQUIFER**	**NETWORK STATUS**	**RATIONALE FOR REMOVAL**
Non-GSA	2010008-005	Composite	Remain in Network	
Non-GSA	2010009-002	Composite	Remain in Network	
Non-GSA	2010010-007	Lower	Remain in Network	
Non-GSA	2010801-001	Lower	Remain in Network	
Non-GSA	2801077-001	Composite	Remain in Network	
Non-GSA	ESJ12	Upper	Remain in Network	
Non-GSA	ESJ17	Upper	Remain in Network	

September 2024 Groundwater Quality RMS Network Update

A total of 4 wells have been selected for addition to the Madera Subbasin Joint GSP Groundwater Quality RMS network to replace RMS wells removed from network. **Table 2** provides a summary of the wells identified for inclusion and rationale for inclusion from the network.

Table 2. Summary of Wells Proposed for Inclusion in the Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network				
GSA	**RMS ID**	**AQUIFER**	**NETWORK STATUS**	**RATIONALE FOR REMOVAL**
GSA-Current	MID RMS-5B	Lower	Addition to Network	Replacement for MID RMS-5
GSA-Future	MSB13A	Upper	Addition to Network	Replacement for 2000846-002
GSA-Future	MSB13B	Lower	Addition to Network	Replacement for 2000846-002
GSA-Future	MSB13C	Lower	Addition to Network	Replacement for 2000846-002

The updated water quality RMS network will include a total of 42 wells: 8 upper aquifer wells, 30 lower aquifer wells, and 4 composite wells. The updated Madera Subbasin Joint GSP Groundwater Quality RMS network is shown in **Figure 2** and summarized in **Table 3**.

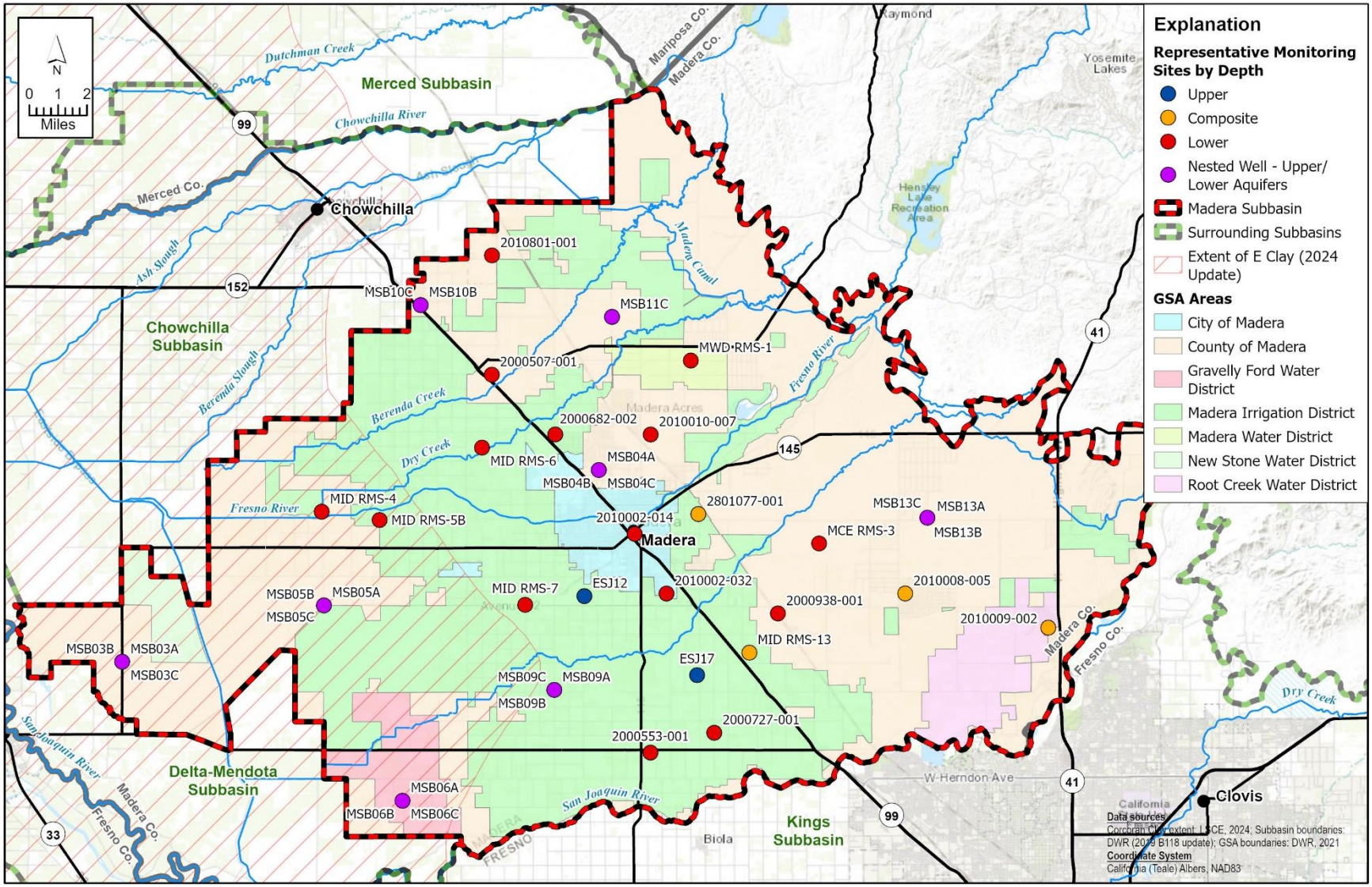

Figure 2. Updated Madera Subbasin Joint GSP Groundwater Quality RMS Network (September 2024)

Table 3. Summary of Updated Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network								
GSA	RMS ID	Aquifer	Well Type	Total Depth (feet bgs)	Top of Well Screen (feet bgs)	Bottom of Well Screen (feet bgs)	Latitude	Longitude
GSA-Current	MCE RMS-3	Lower[2]	Unknown				36.9552	-119.9441
GSA-Current	MID RMS-4	Lower[1]	Irrigation	698	320	667	36.9709	-120.2568
GSA-Current	MID RMS-5B	Lower[1]	Irrigation	514	245	496	36.9668	-120.2204
GSA-Current	MID RMS-6	Lower[2]	Industrial	680	320	680	37.0033	-120.1561
GSA-Current	MID RMS-7	Lower[2]	Irrigation	656	290	635	36.9243	-120.1288
GSA-Current	MID RMS-13	Composite[2]	Irrigation	600	228	552	36.9003	-119.9879
GSA-Current	MWD RMS-1	Lower[2]	Irrigation	500	200	500	37.0472	-120.0248
GSA-Future	MSB03A	Upper[1]	Monitoring	139	74	134	36.8951	-120.3818
GSA-Future	MSB03B	Upper[1]	Monitoring	295	215	285	36.8951	-120.3818
GSA-Future	MSB03C	Lower[1]	Monitoring	430	355	420	36.8951	-120.3818
GSA-Future	MSB04A	Lower[2]	Monitoring	375	180	365	36.9922	-120.0825
GSA-Future	MSB04B	Lower[2]	Monitoring	695	530	685	36.9922	-120.0825
GSA-Future	MSB04C	Lower[2]	Monitoring	905	750	895	36.9922	-120.0825
GSA-Future	MSB05A	Upper[1]	Monitoring	210	140	200	36.9238	-120.2552
GSA-Future	MSB05B	Lower[1]	Monitoring	375	240	365	36.9238	-120.2552
GSA-Future	MSB05C	Lower[1]	Monitoring	585	420	585	36.9238	-120.2552

Table 3. Summary of Updated Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network								
GSA	RMS ID	Aquifer	Well Type	Total Depth (feet bgs)	Top of Well Screen (feet bgs)	Bottom of Well Screen (feet bgs)	Latitude	Longitude
GSA-Future	MSB06A	Upper[1]	Monitoring	350	135	340	36.8257	-120.2057
GSA-Future	MSB06B	Lower[1]	Monitoring	520	425	510	36.8257	-120.2057
GSA-Future	MSB06C	Lower[1]	Monitoring	715	630	705	36.8257	-120.2057
GSA-Future	MSB09A	Upper[2]	Monitoring	320	200	310	36.8814	-120.1105
GSA-Future	MSB09B	Lower[2]	Monitoring	725	520	715	36.8814	-120.1105
GSA-Future	MSB09C	Lower[2]	Monitoring	955	880	945	36.8814	-120.1105
GSA-Future	MSB10B	Lower[2]	Monitoring	510	400	500	37.0750	-120.1948
GSA-Future	MSB10C	Lower[2]	Monitoring	880	790	870	37.0750	-120.1948
GSA-Future	MSB11C	Lower[2]	Monitoring	880	775	870	37.0692	-120.0745
GSA-Future	MSB13A	Upper[2]	Monitoring	290	200	280	36.9682	-119.8760
GSA-Future	MSB13B	Lower[2]	Monitoring	446	396	436	36.9682	-119.8760
GSA-Future	MSB13C	Lower[2]	Monitoring	532	522	532	36.9682	-119.8760
Non-GSA	2000507-001	Lower[2]	Public Supply		372		37.0400	-120.1500
Non-GSA	2000553-001	Lower[2]	Public Supply		450	500	36.8500	-120.0500
Non-GSA	2000682-002	Lower[2]	Public Supply		295	420	37.0100	-120.1100
Non-GSA	2000727-001	Lower[2]	Public Supply		280	360	36.8600	-120.0100
Non-GSA	2000938-001	Lower[2]	Public Supply		420	560	36.9200	-119.9700

Table 3. Summary of Updated Madera Subbasin Joint GSP Groundwater Quality Representative Monitoring Site (RMS) Network								
GSA	RMS ID	Aquifer	Well Type	Total Depth (feet bgs)	Top of Well Screen (feet bgs)	Bottom of Well Screen (feet bgs)	Latitude	Longitude
Non-GSA	2010002-014	Lower[2]	Public Supply		280	610	36.9600	-120.0600
Non-GSA	2010002-032	Lower[2]	Public Supply		310	600	36.9300	-120.0400
Non-GSA	2010008-005	Composite[2]	Public Supply		250	465	36.9300	-119.8900
Non-GSA	2010009-002	Composite[2]	Public Supply		324	369	36.9127	-119.8001
Non-GSA	2010010-007	Lower[2]	Public Supply		242	374	37.0100	-120.0500
Non-GSA	2010801-001	Lower[2]	Public Supply		375	760	37.1000	-120.1500
Non-GSA	2801077-001	Composite[2]	Public Supply		60	500	36.9700	-120.0200
Non-GSA	ESJ12	Upper[2]	Domestic	276	160	172	36.9287	-120.0916
Non-GSA	ESJ17	Upper[2]	Domestic				36.8890	-120.0208

[1] Well is located within the Corcoran Clay Extent
[2] Well is located outside of the Corcoran Clay Extent