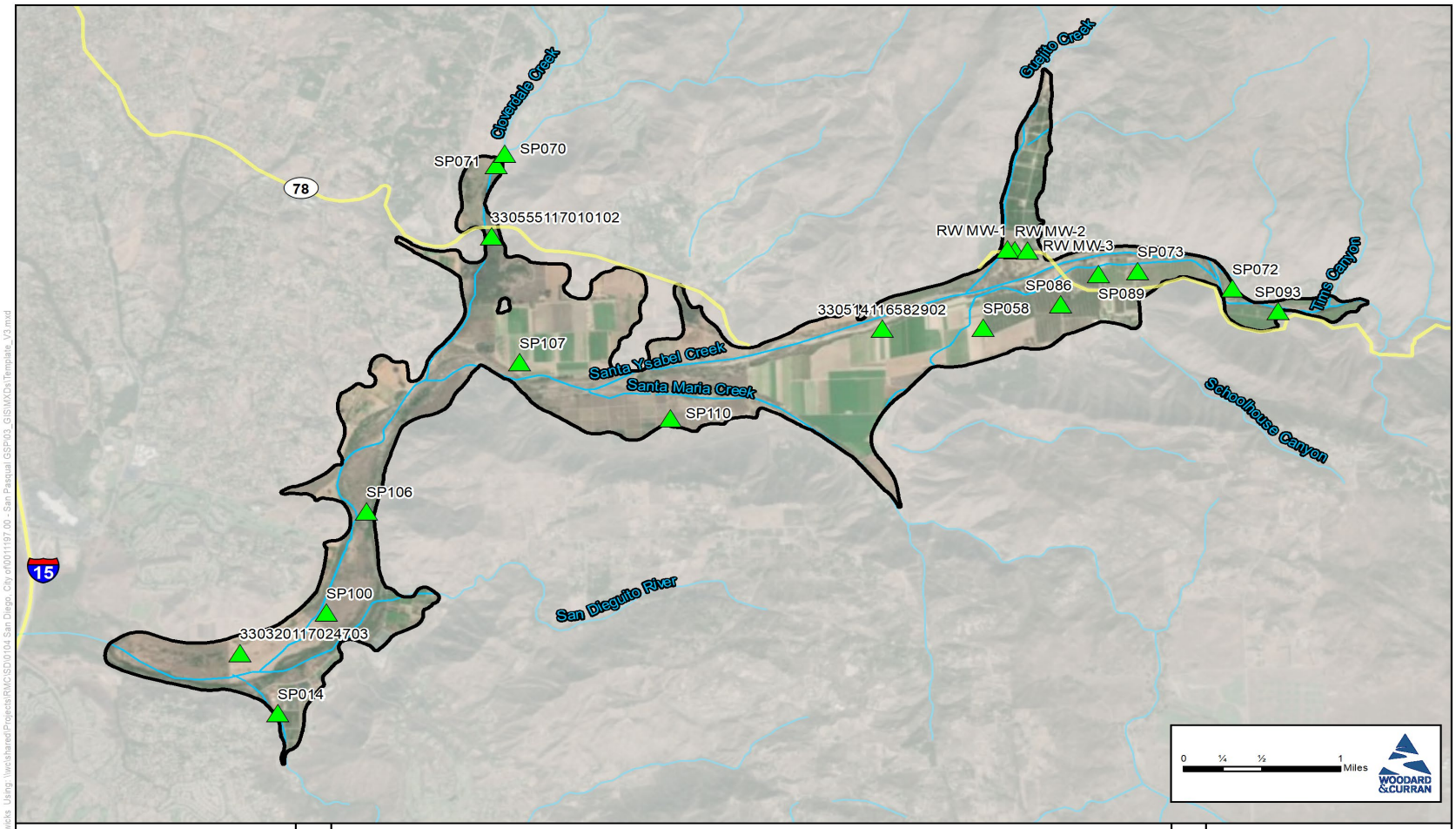
Public Utilities

Groundwater Sustainability Plan: Advisory Committee Minimum Thresholds and Measurable Objectives

Draft



SAN DIEGO

Project #: 0011197

Legend

Groundwater Level Monitoring Network Well

San Pasqual Valley Basin

DRAFT

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Figure WF4-1

San Pasqual Valley GSA

Representative Groundwater Level Monitoring Network

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk.

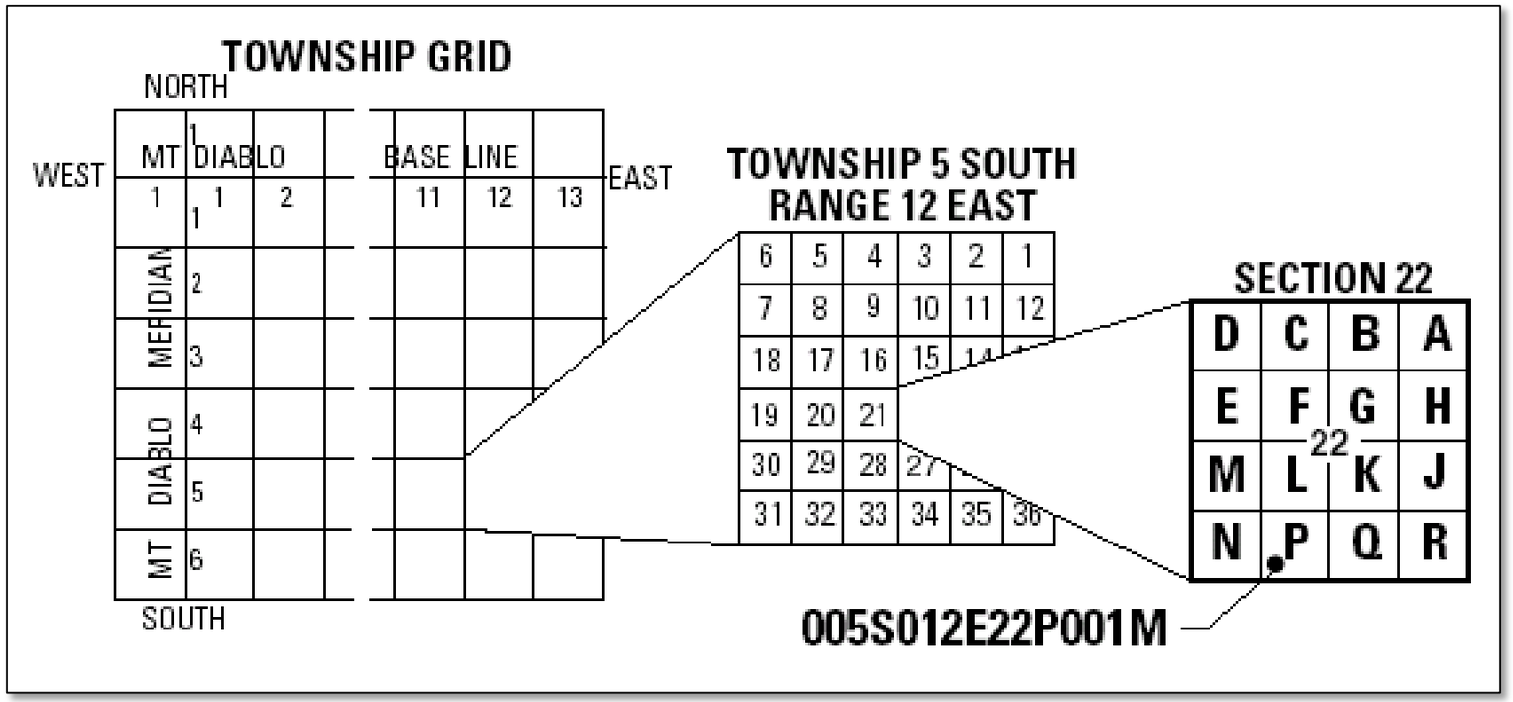
Sustainable Management Criteria
Minimum Thresholds Input

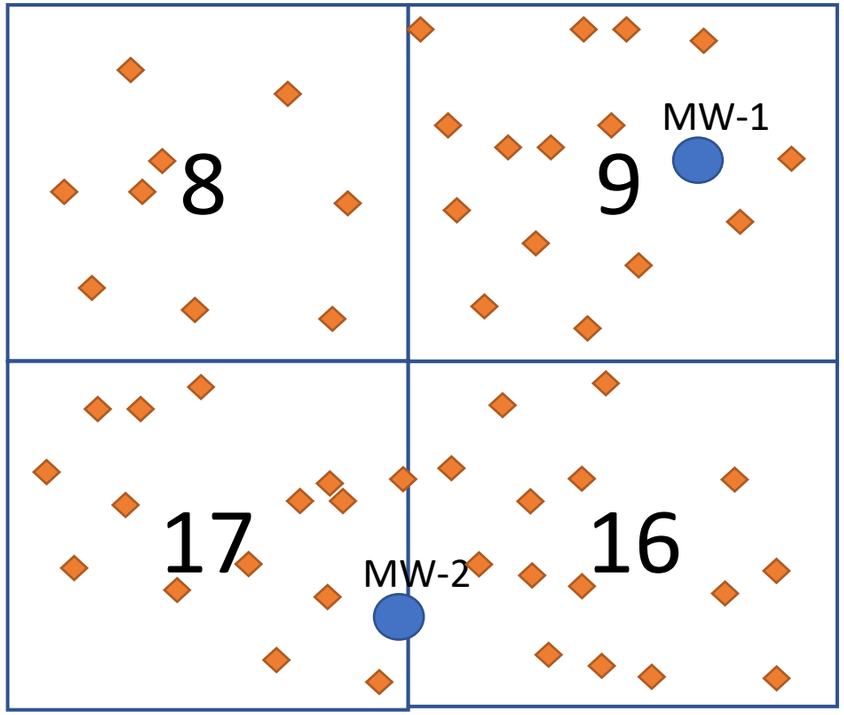
- Seeking TPR input on considerations for setting Minimum Thresholds
- Stakeholder input considered:
  - Well infrastructure
  - GDEs
- Consulting team considered for first cut:
  - Conditions at January 1, 2015
  - Historic Low
  - Number and depth of WCRs near each monitoring well
  - GDEs monitored with a different network
- Other Considerations?

Sustainability Indicator [1]	II. GROUNDWATER ELEVATION
Undesirable Results Consideration[2]	Chronic lowering of groundwater levels indicating unreasonable depletion of supply, which results in: a. Adverse impacts to the viability of agriculture, and the agricultural economy. b. Unusable and stranded groundwater extraction infrastructure. c. Need to deepen or construct new wells. d. Adverse impacts to domestic wells users. e. Adverse impacts on connected ecosystems.
Minimum Threshold Consideration [3]	• Local well infrastructure depths • Groundwater dependent ecosystems

Sustainable Management Criteria
Well Infrastructure

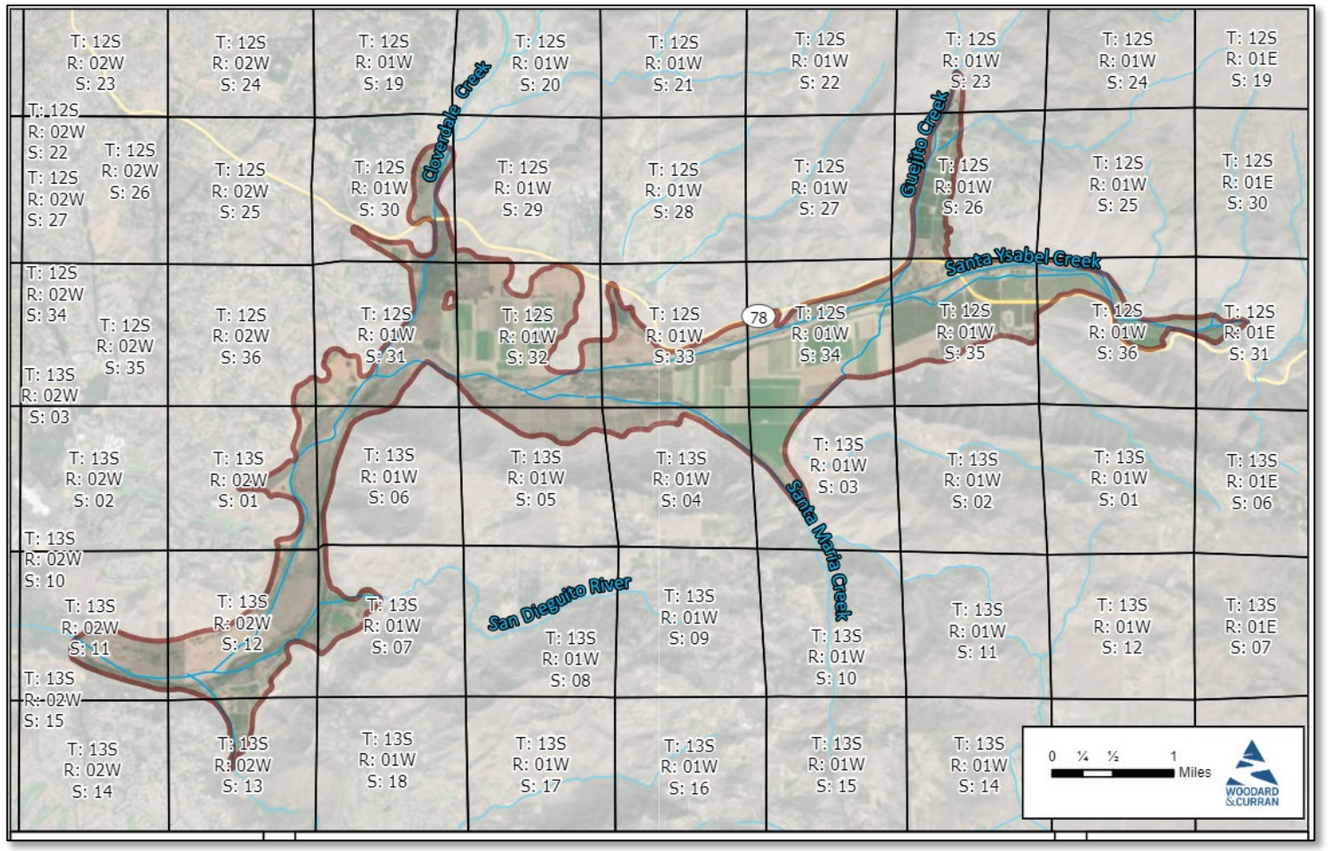
- Depth of Well Completion Reports
  - 15 wells in Section 9 are used to compare MW-1
  - 29 wells in Sections 16 and 17 are used to compare MW-2

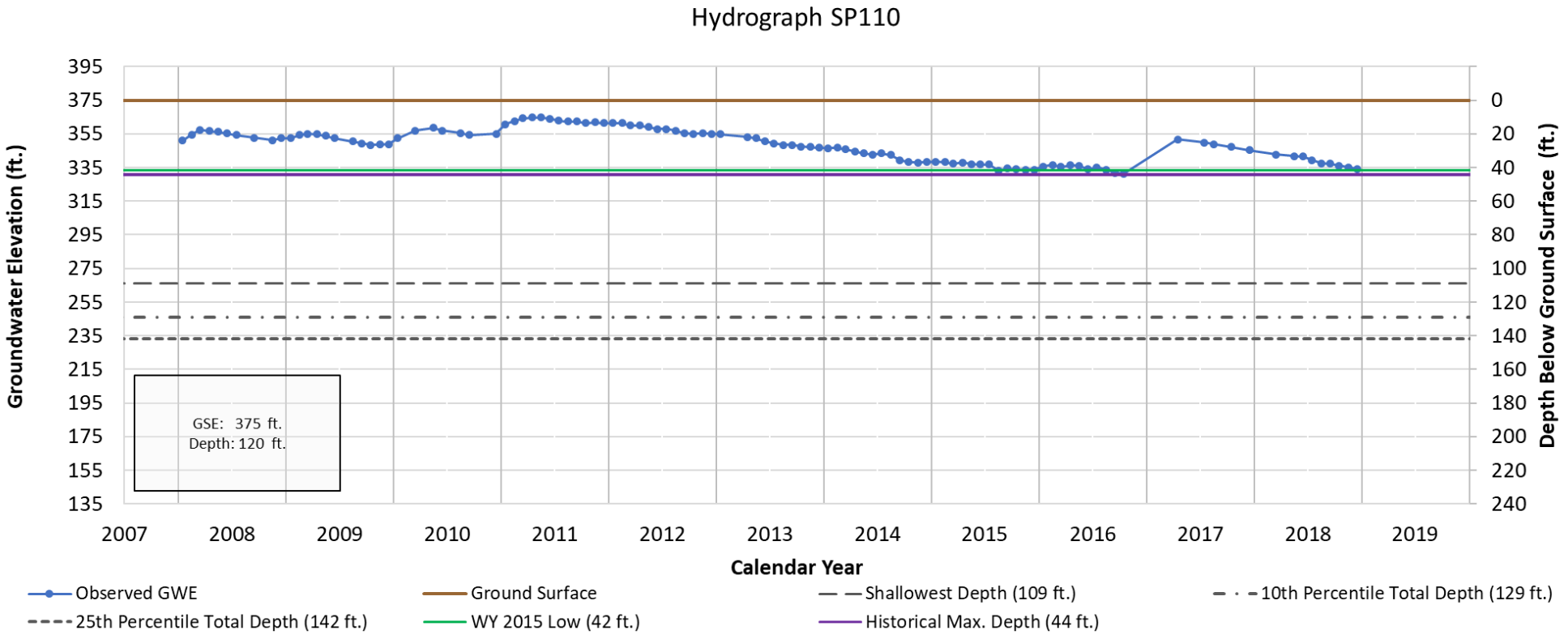


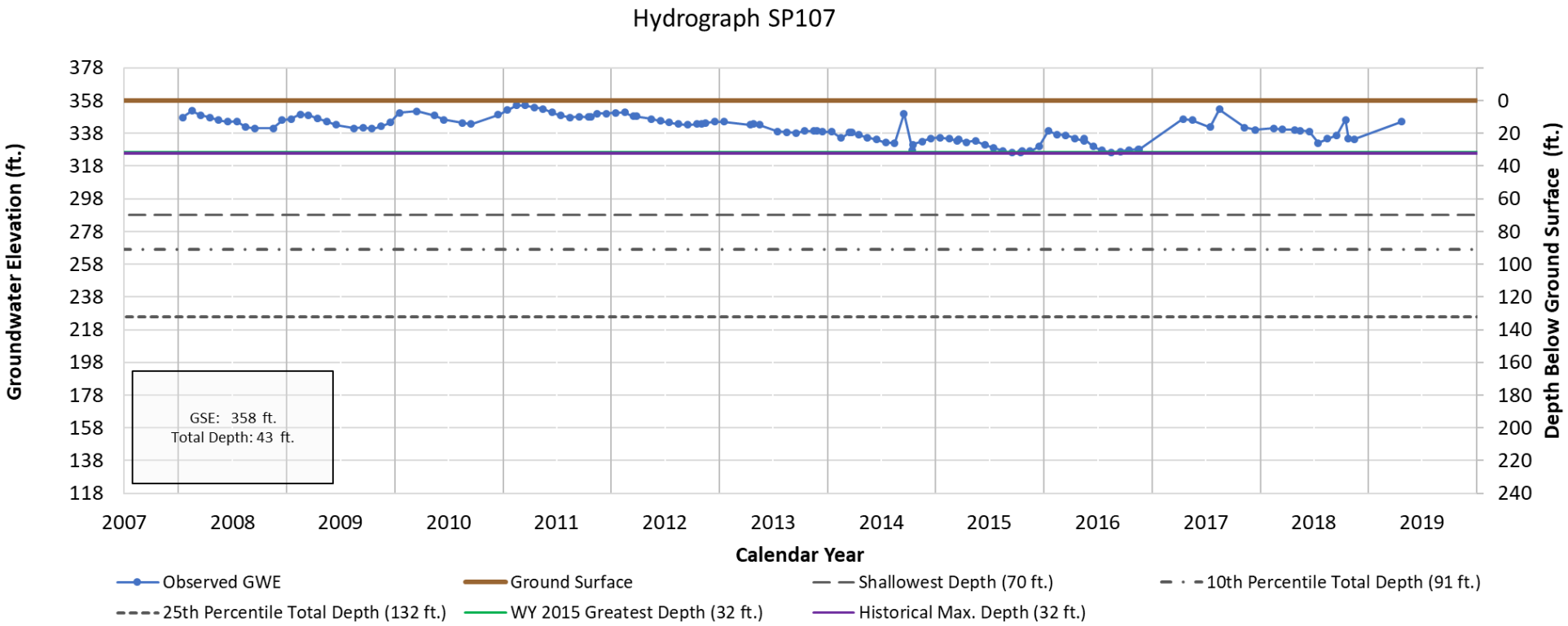


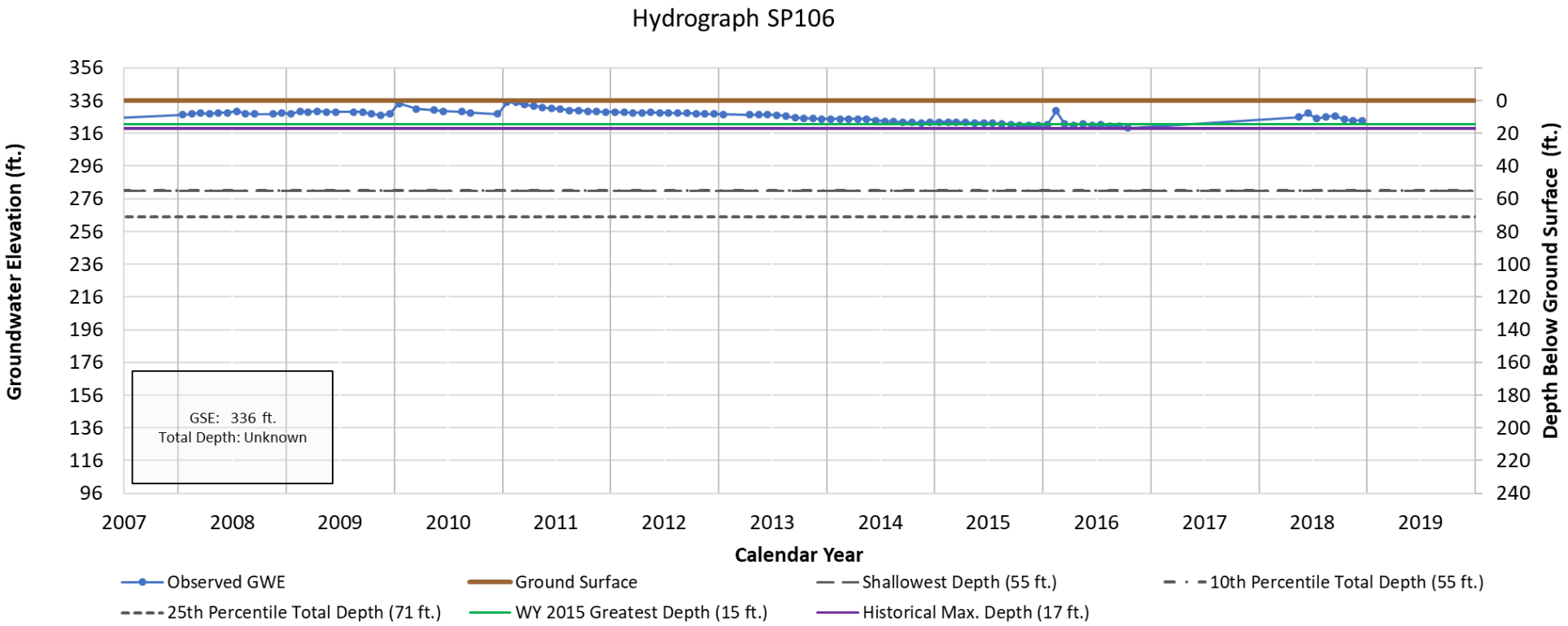
Sustainable Management Criteria
Well Infrastructure

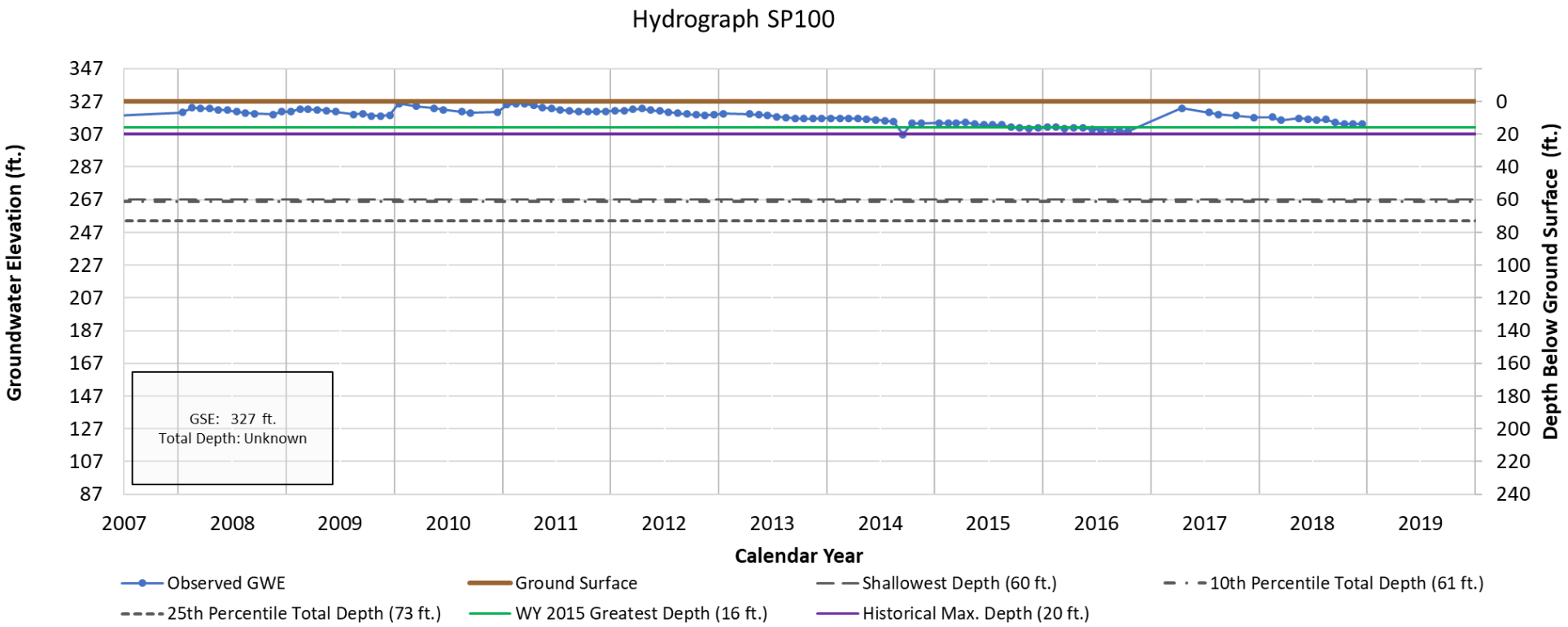
- Limits of Well Completion Reports
  - DWR's WCR database typically is missing 20% of wells
    - This was improved by adding City and County WCRs
  - Sections (1 square mile) often include areas outside of the basin
  - Wells in the WCR database are not commonly reported when may be not in service or destroyed

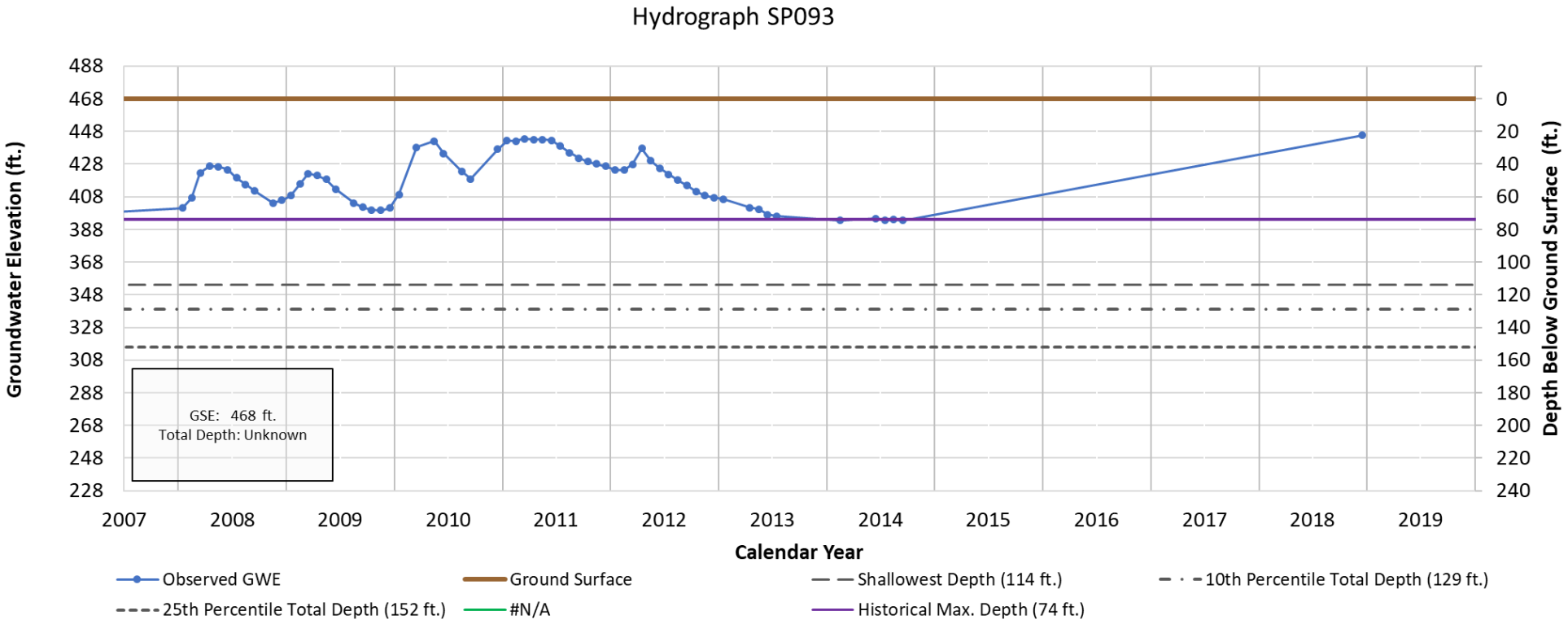


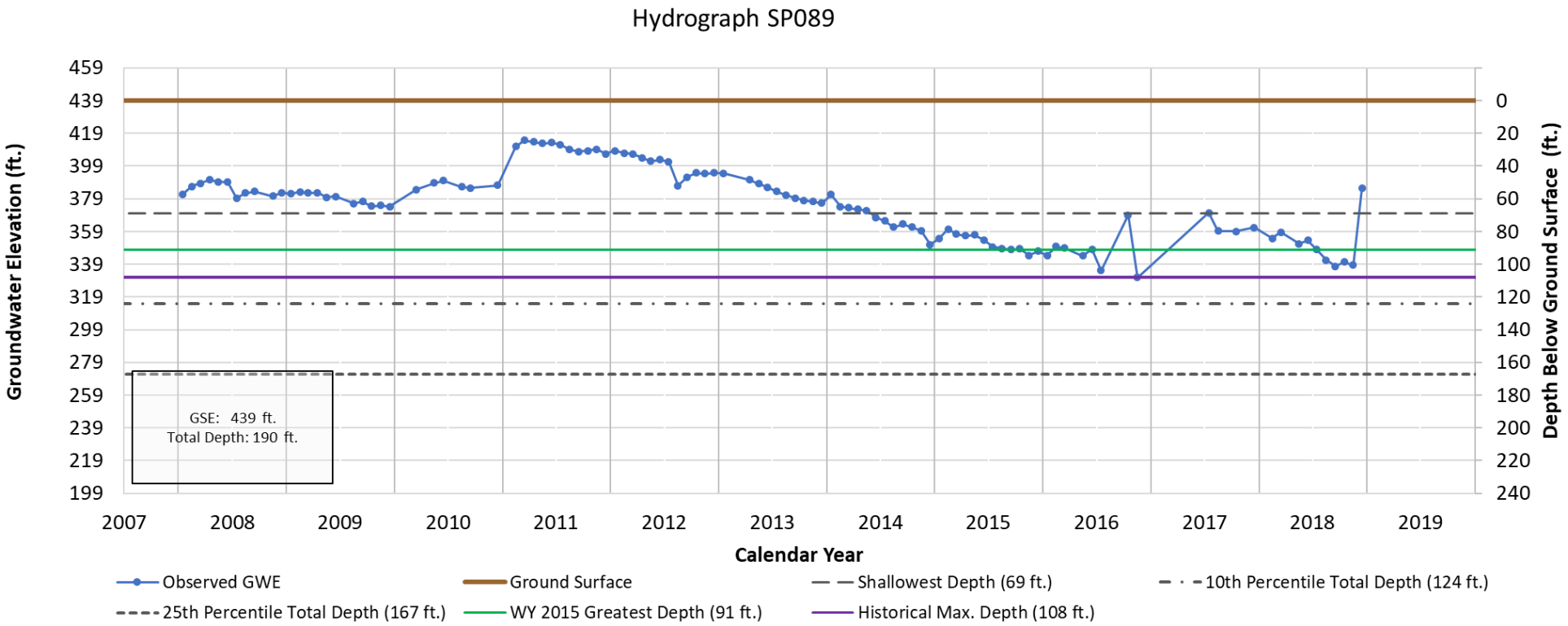

Hydrograph SP110
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
Calendar Year
395
375
355
335
315
295
275
255
235
215
195
175
155
135
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
GSE: 375 ft.
Depth: 120 ft.
Observed GWE
Ground Surface
Shallowest Depth (109 ft.)
10th Percentile Total Depth (129 ft.)
25th Percentile Total Depth (142 ft.)
WY 2015 Low (42 ft.)
Historical Max. Depth (44 ft.)

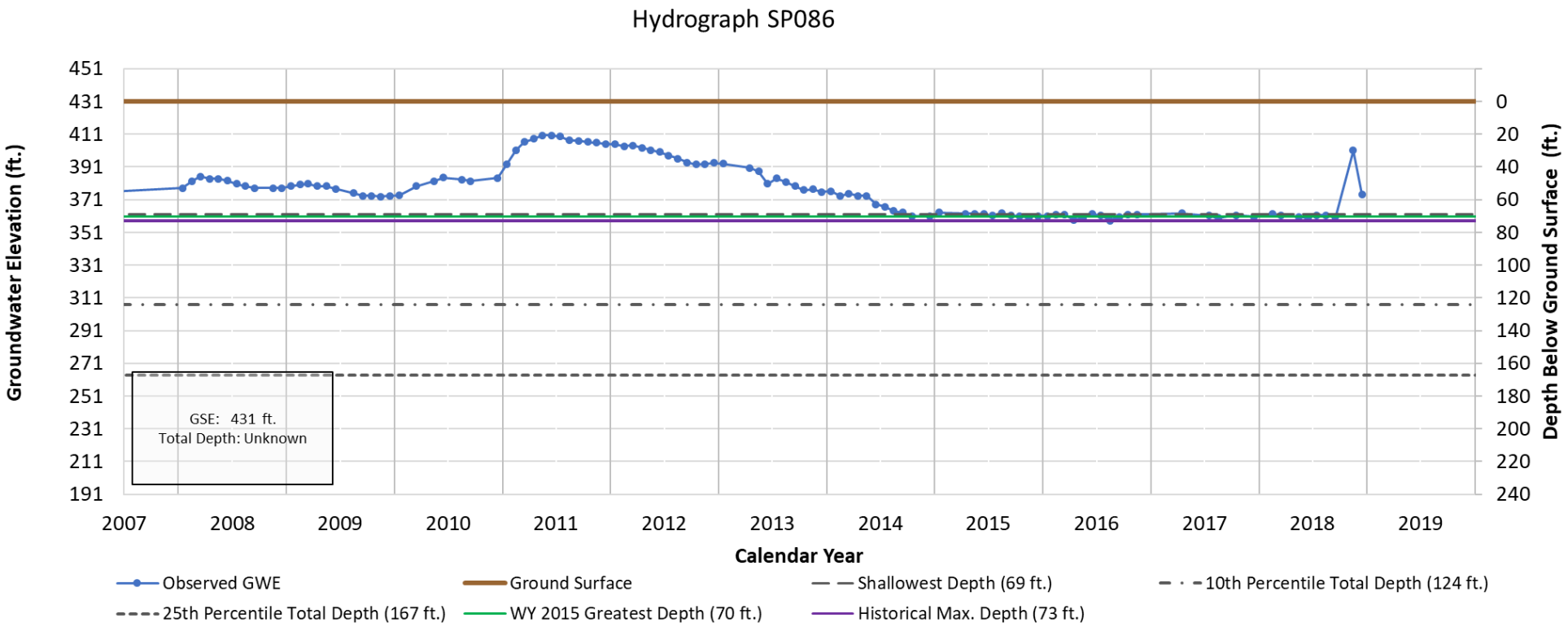

Hydrograph SP107
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
Calendar Year
GSE: 358 ft.
Total Depth: 43 ft.
Observed GWE
Ground Surface
Shallowest Depth (70 ft.)
10th Percentile Total Depth (91 ft.)
25th Percentile Total Depth (132 ft.)
WY 2015 Greatest Depth (32 ft.)
Historical Max. Depth (32 ft.)

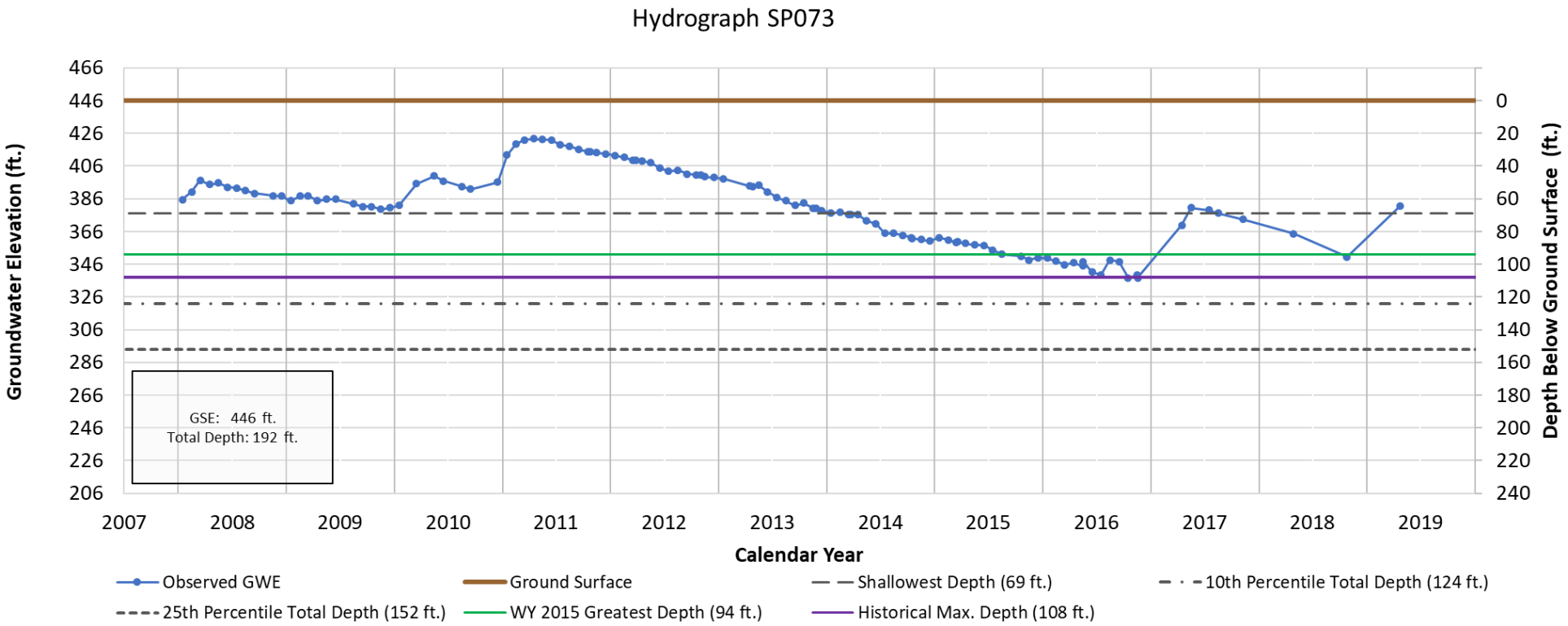

Hydrograph SP106
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
356
336
316
296
276
256
236
216
196
176
156
136
116
96
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 336 ft.
Total Depth: Unknown
Observed GWE
Ground Surface
Shallowest Depth (55 ft.)
10th Percentile Total Depth (55 ft.)
25th Percentile Total Depth (71 ft.)
WY 2015 Greatest Depth (15 ft.)
Historical Max. Depth (17 ft.)

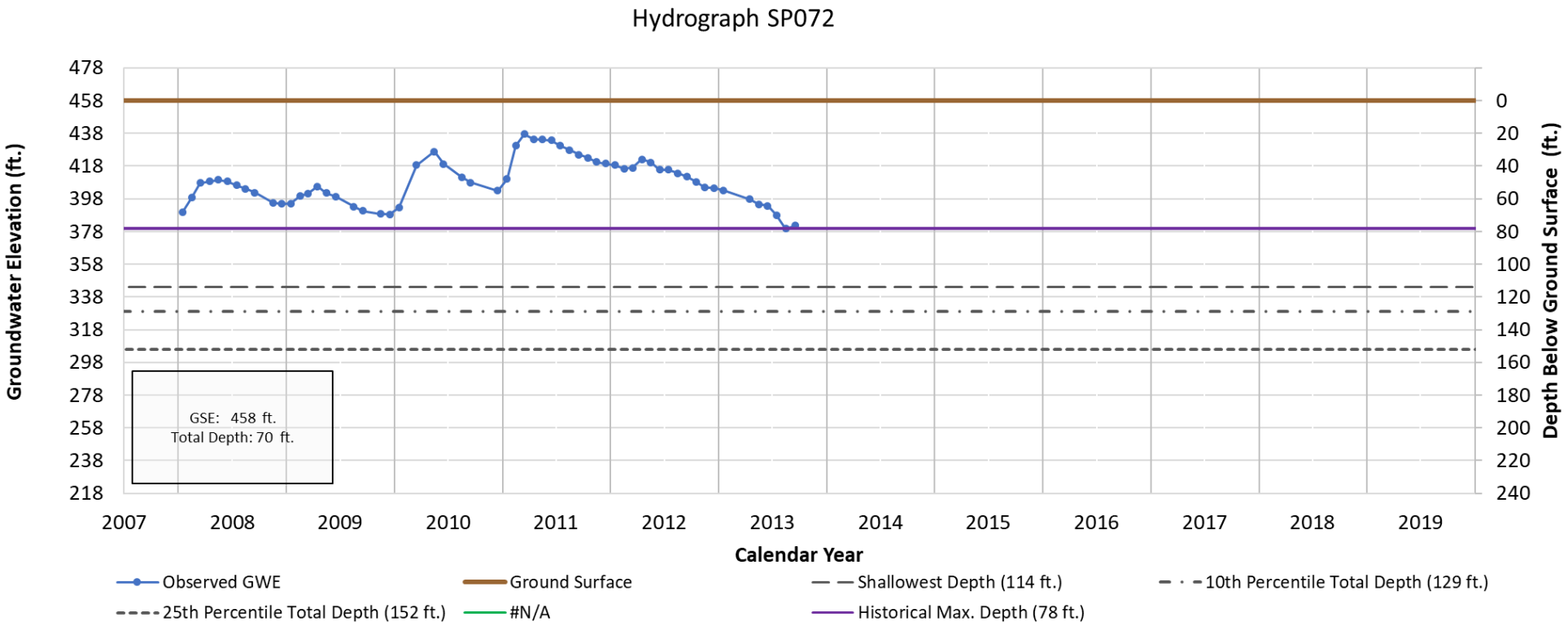

Hydrograph SP100
Groundwater Elevation (ft.)
347
327
307
287
267
247
227
207
187
167
147
127
107
87
Depth Below Ground Surface (ft.)
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 327 ft.
Total Depth: Unknown
Observed GWE
Ground Surface
Shallowest Depth (60 ft.)
10th Percentile Total Depth (61 ft.)
25th Percentile Total Depth (73 ft.)
WY 2015 Greatest Depth (16 ft.)
Historical Max. Depth (20 ft.)

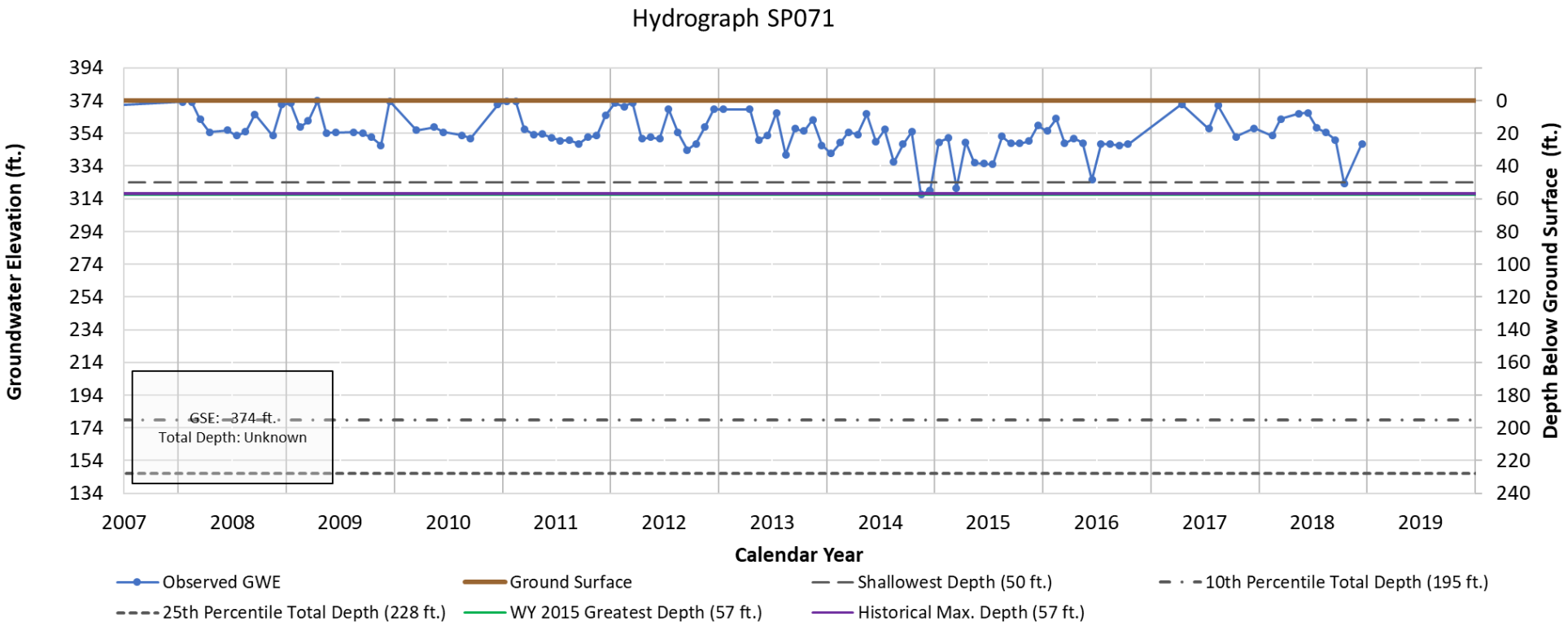

Hydrograph SP093
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
488
468
448
428
408
388
368
348
328
308
288
268
248
228
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 468 ft.
Total Depth: Unknown
Observed GWE
Ground Surface
Shallowest Depth (114 ft.)
10th Percentile Total Depth (129 ft.)
25th Percentile Total Depth (152 ft.)
#N/A
Historical Max. Depth (74 ft.)

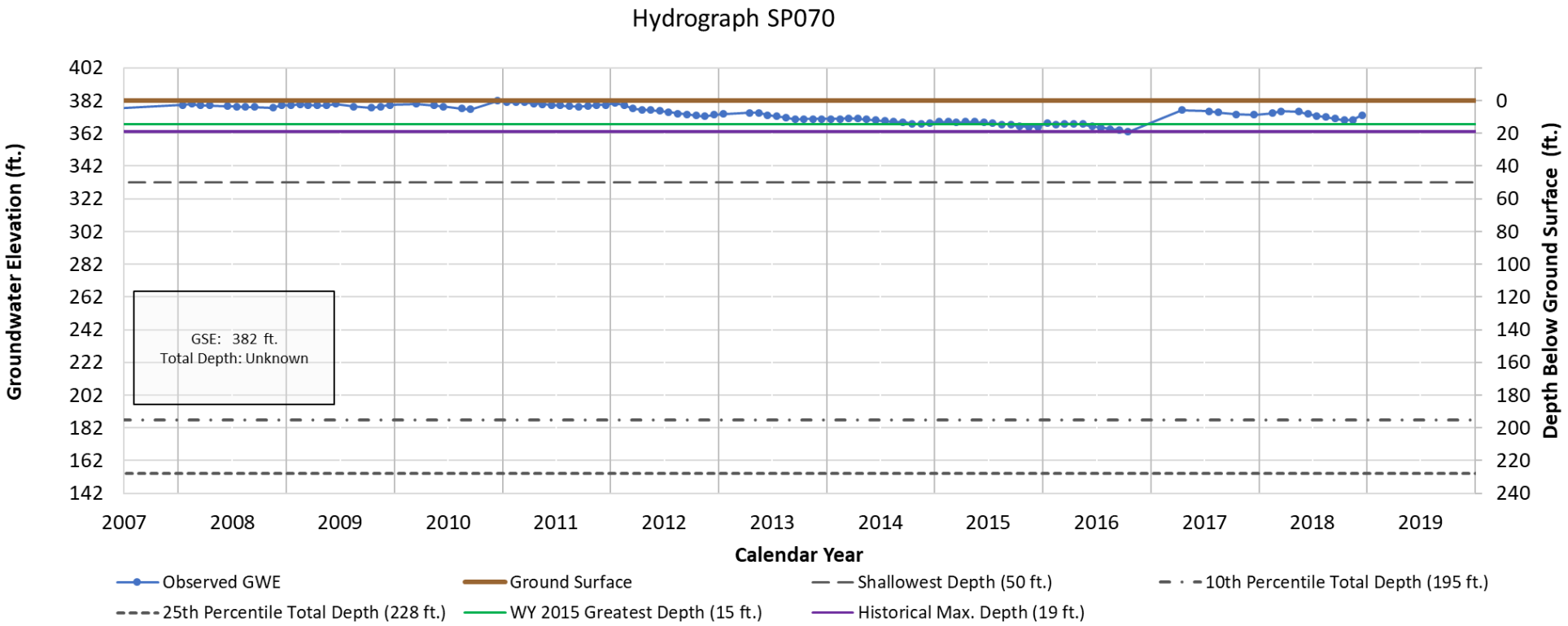

Hydrograph SP089
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
459
439
419
399
379
359
339
319
299
279
259
239
219
199
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 439 ft.
Total Depth: 190 ft.
Observed GWE
Ground Surface
Shallowest Depth (69 ft.)
10th Percentile Total Depth (124 ft.)
25th Percentile Total Depth (167 ft.)
WY 2015 Greatest Depth (91 ft.)
Historical Max. Depth (108 ft.)

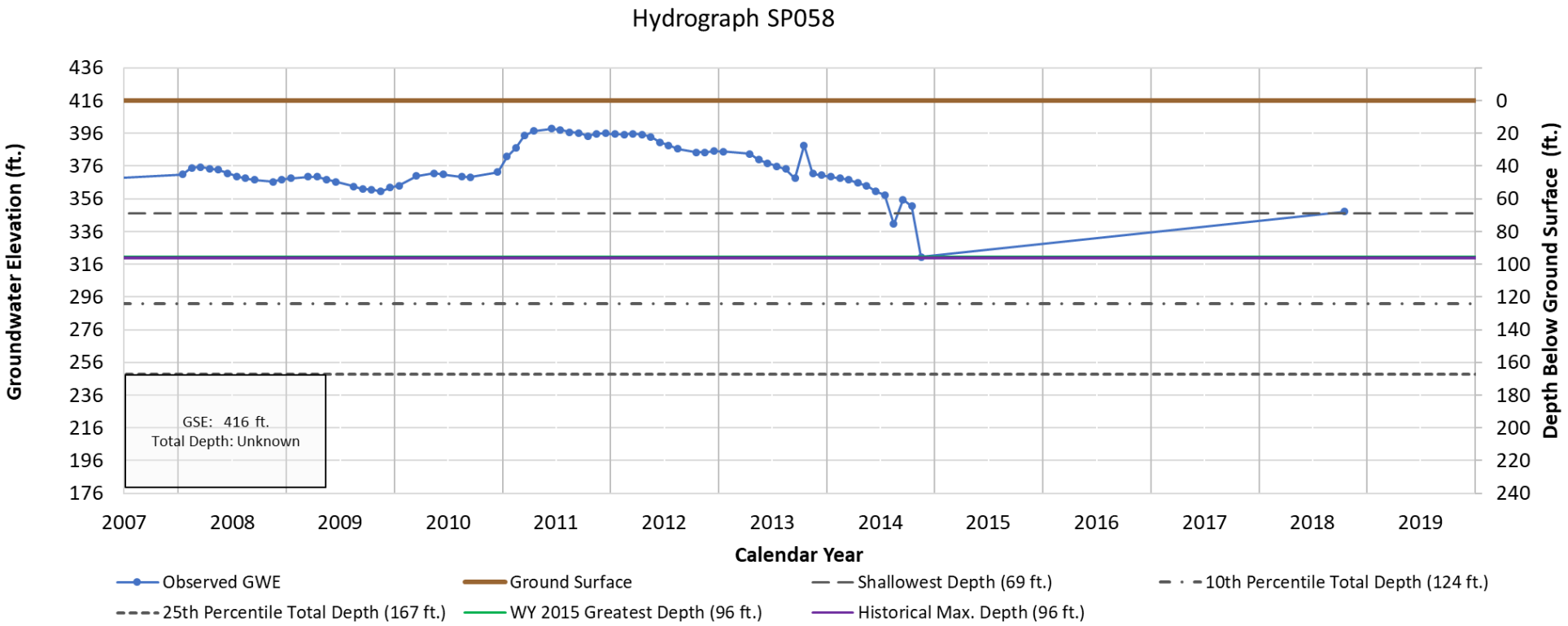

Hydrograph SP086
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
451
431
411
391
371
351
331
311
291
271
251
231
211
191
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 431 ft.
Total Depth: Unknown
Observed GWE
Ground Surface
Shallowest Depth (69 ft.)
10th Percentile Total Depth (124 ft.)
25th Percentile Total Depth (167 ft.)
WY 2015 Greatest Depth (70 ft.)
Historical Max. Depth (73 ft.)

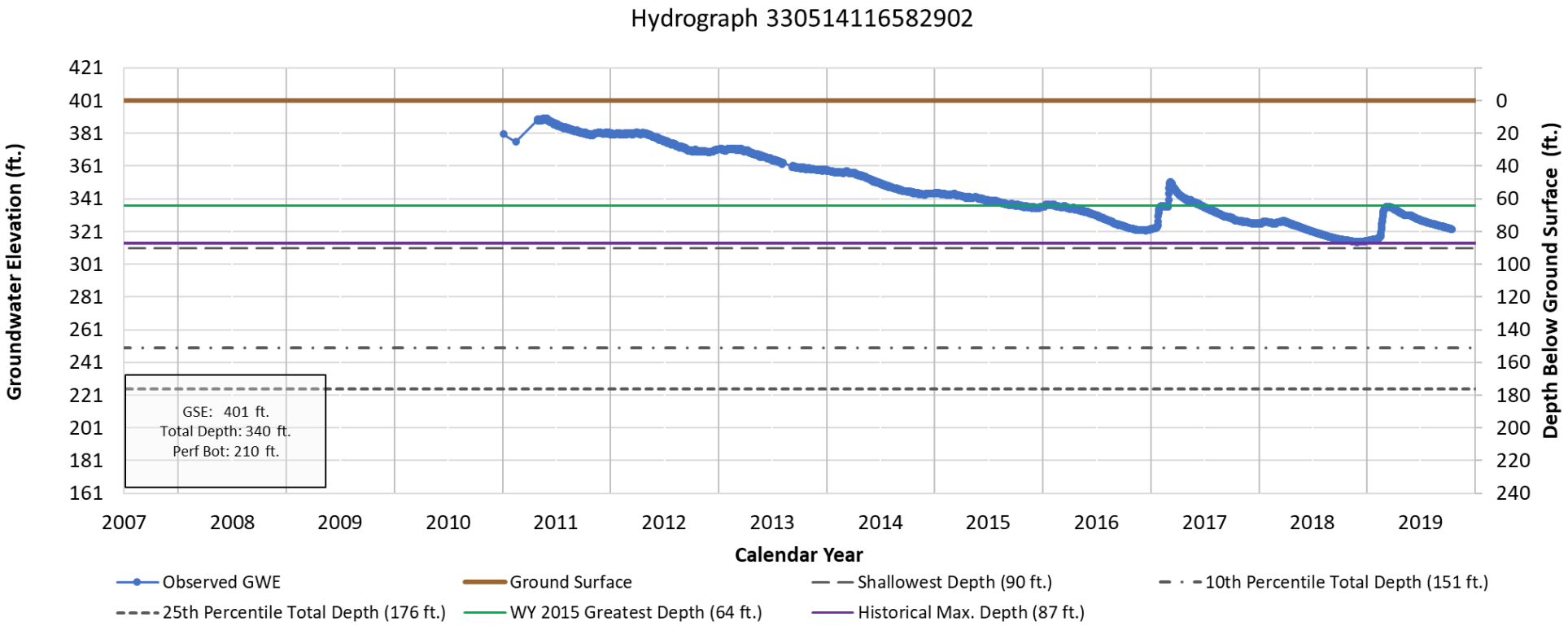

Hydrograph SP073
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
466
446
426
406
386
366
346
326
306
286
266
246
226
206
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 446 ft.
Total Depth: 192 ft.
Observed GWE
Ground Surface
Shallowest Depth (69 ft.)
10th Percentile Total Depth (124 ft.)
25th Percentile Total Depth (152 ft.)
WY 2015 Greatest Depth (94 ft.)
Historical Max. Depth (108 ft.)

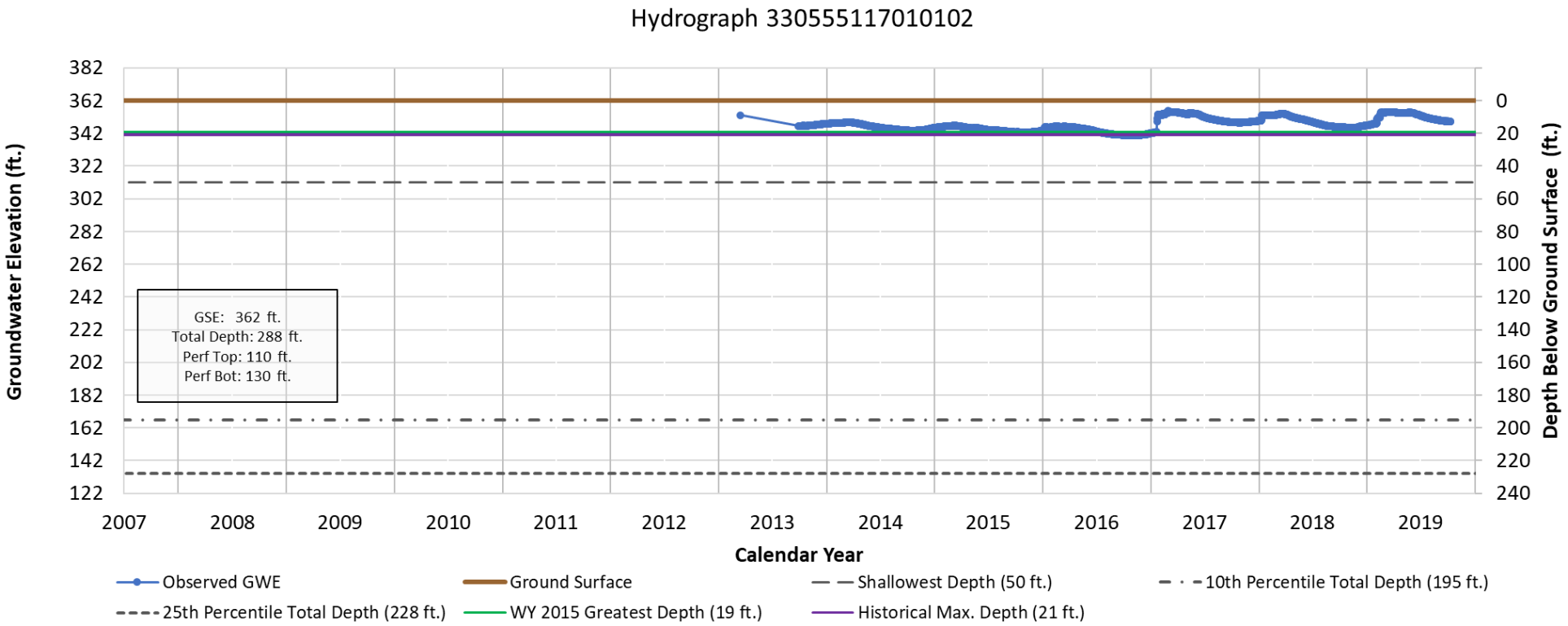

Hydrograph SP072
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
478
458
438
418
398
378
358
338
318
298
278
258
238
218
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 458 ft.
Total Depth: 70 ft.
Observed GWE
Ground Surface
Shallowest Depth (114 ft.)
10th Percentile Total Depth (129 ft.)
25th Percentile Total Depth (152 ft.)
#N/A
Historical Max. Depth (78 ft.)

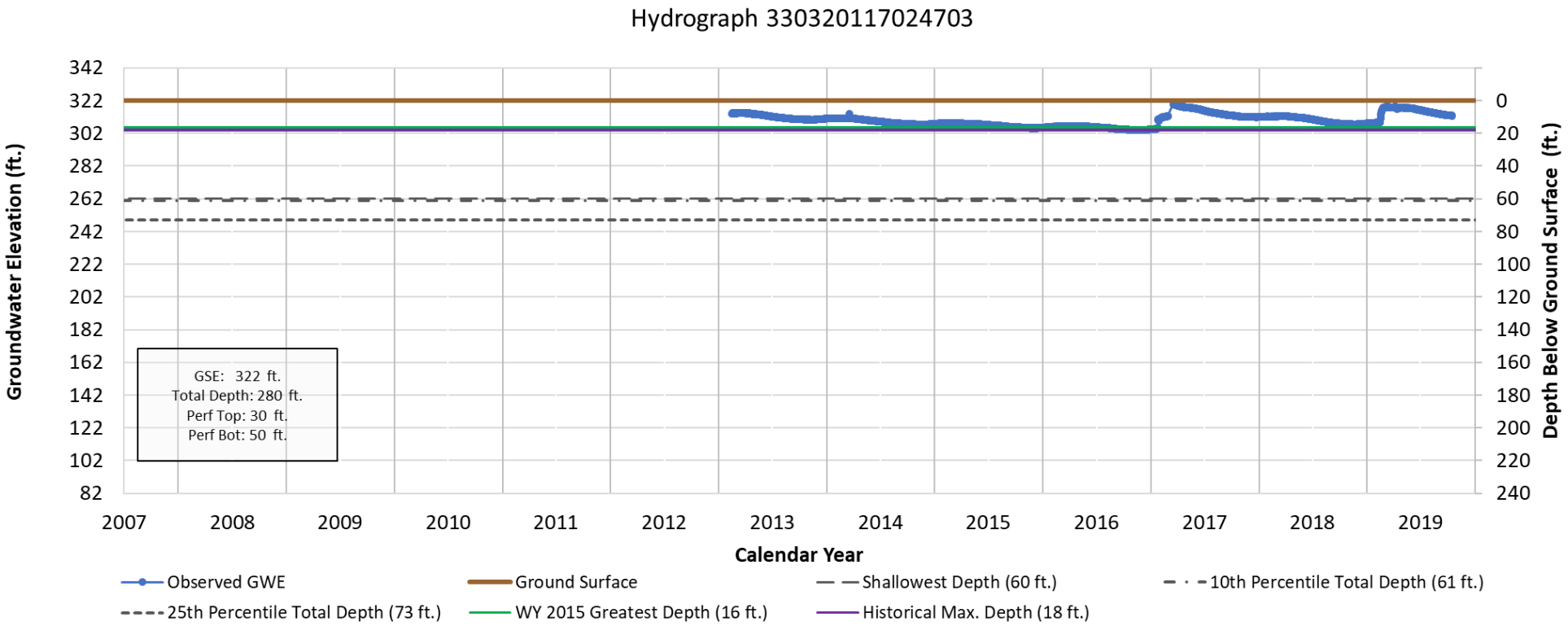

Hydrograph SP071
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
394
374
354
334
314
294
274
254
234
214
194
174
154
134
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 374 ft.
Total Depth: Unknown
Observed GWE
Ground Surface
Shallowest Depth (50 ft.)
10th Percentile Total Depth (195 ft.)
25th Percentile Total Depth (228 ft.)
WY 2015 Greatest Depth (57 ft.)
Historical Max. Depth (57 ft.)

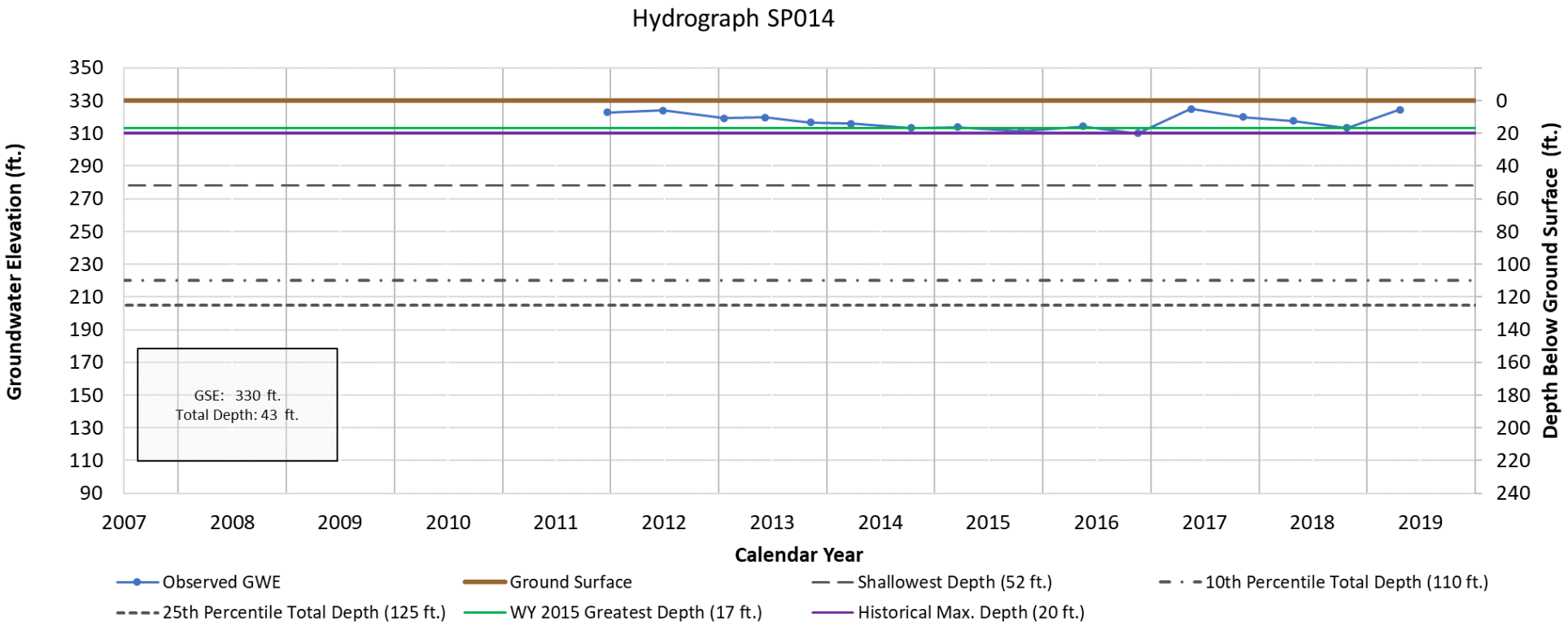

Hydrograph SP070
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
402
382
362
342
322
302
282
262
242
222
202
182
162
142
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 382 ft.
Total Depth: Unknown
Observed GWE
Ground Surface
Shallowest Depth (50 ft.)
10th Percentile Total Depth (195 ft.)
25th Percentile Total Depth (228 ft.)
WY 2015 Greatest Depth (15 ft.)
Historical Max. Depth (19 ft.)

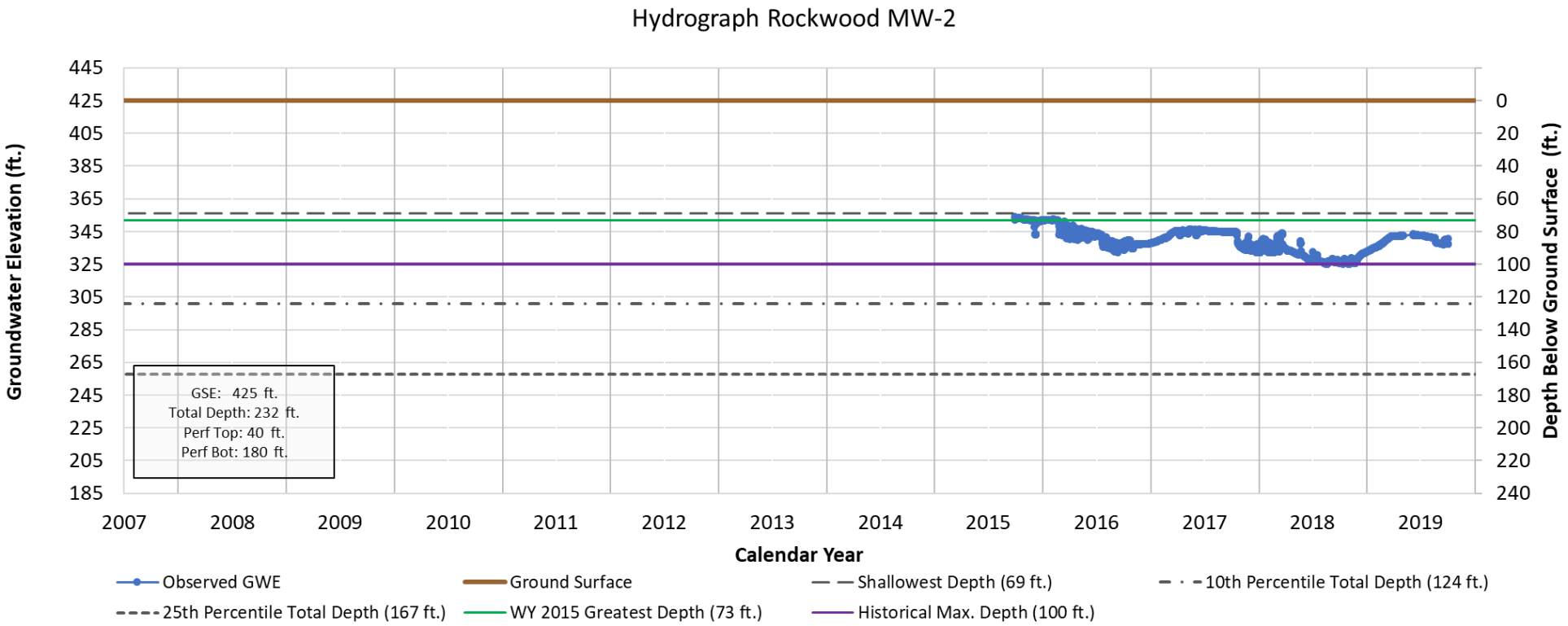

Hydrograph SP058
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
436
416
396
376
356
336
316
296
276
256
236
216
196
176
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 416 ft.
Total Depth: Unknown
Observed GWE
Ground Surface
Shallowest Depth (69 ft.)
10th Percentile Total Depth (124 ft.)
25th Percentile Total Depth (167 ft.)
WY 2015 Greatest Depth (96 ft.)
Historical Max. Depth (96 ft.)

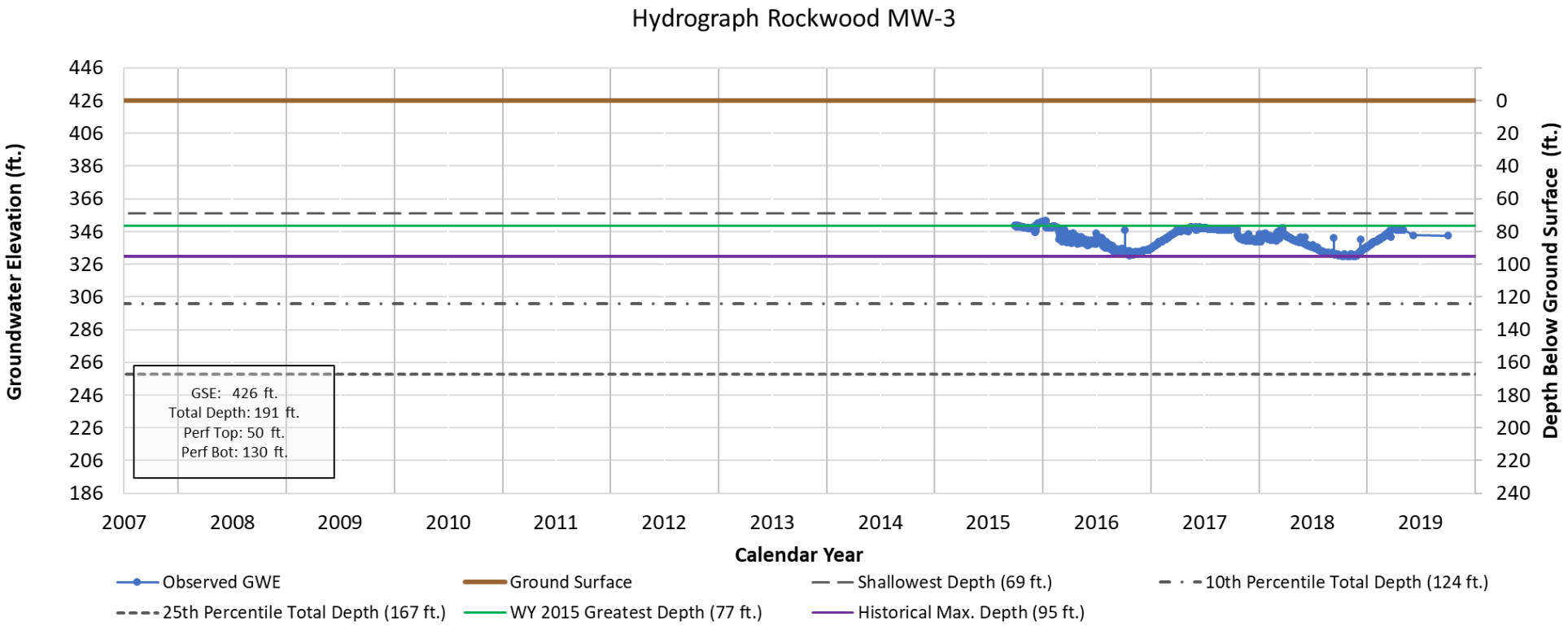

Hydrograph 330514116582902
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
421
401
381
361
341
321
301
281
261
241
221
201
181
161
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 401 ft.
Total Depth: 340 ft.
Perf Bot: 210 ft.
Observed GWE
Ground Surface
Shallowest Depth (90 ft.)
10th Percentile Total Depth (151 ft.)
25th Percentile Total Depth (176 ft.)
WY 2015 Greatest Depth (64 ft.)
Historical Max. Depth (87 ft.)

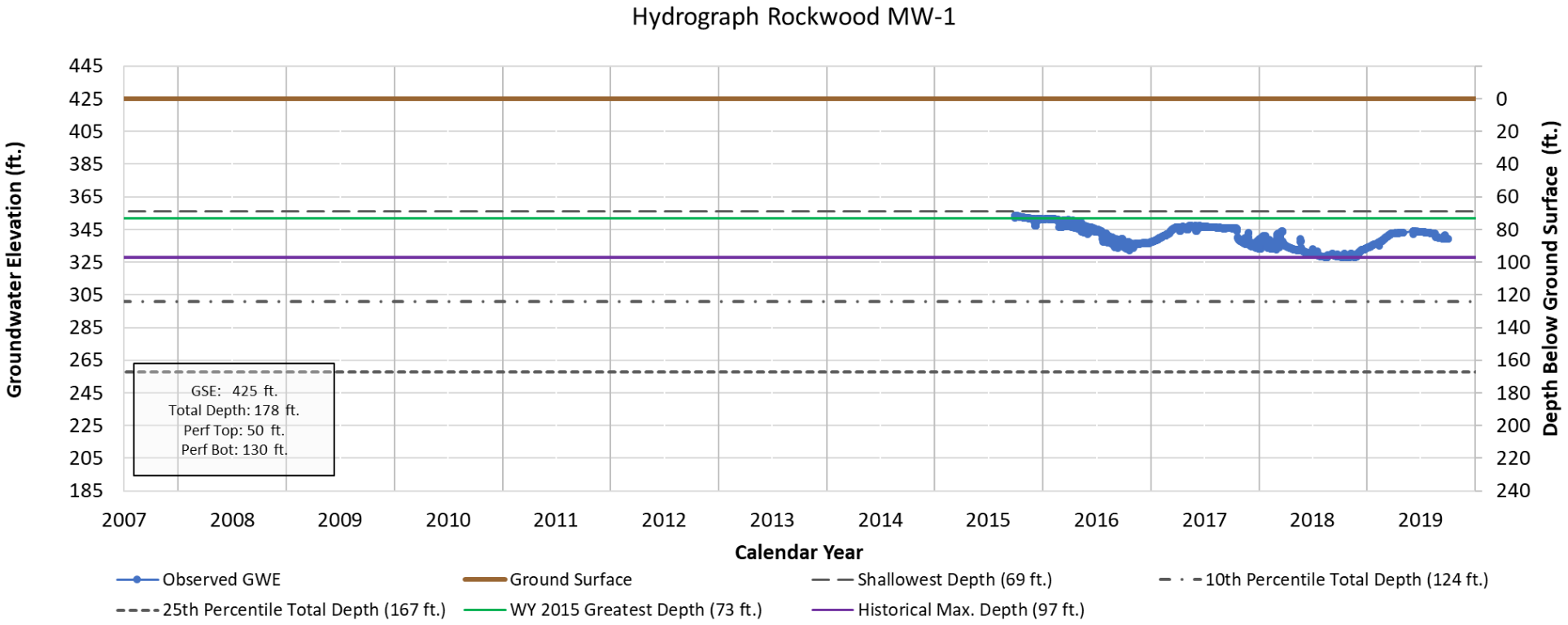

Hydrograph 330555117010102
Groundwater Elevation (ft.)
382
362
342
322
302
282
262
242
222
202
182
162
142
122
Depth Below Ground Surface (ft.)
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 362 ft.
Total Depth: 288 ft.
Perf Top: 110 ft.
Perf Bot: 130 ft.
Observed GWE
Ground Surface
Shallowest Depth (50 ft.)
10th Percentile Total Depth (195 ft.)
25th Percentile Total Depth (228 ft.)
WY 2015 Greatest Depth (19 ft.)
Historical Max. Depth (21 ft.)

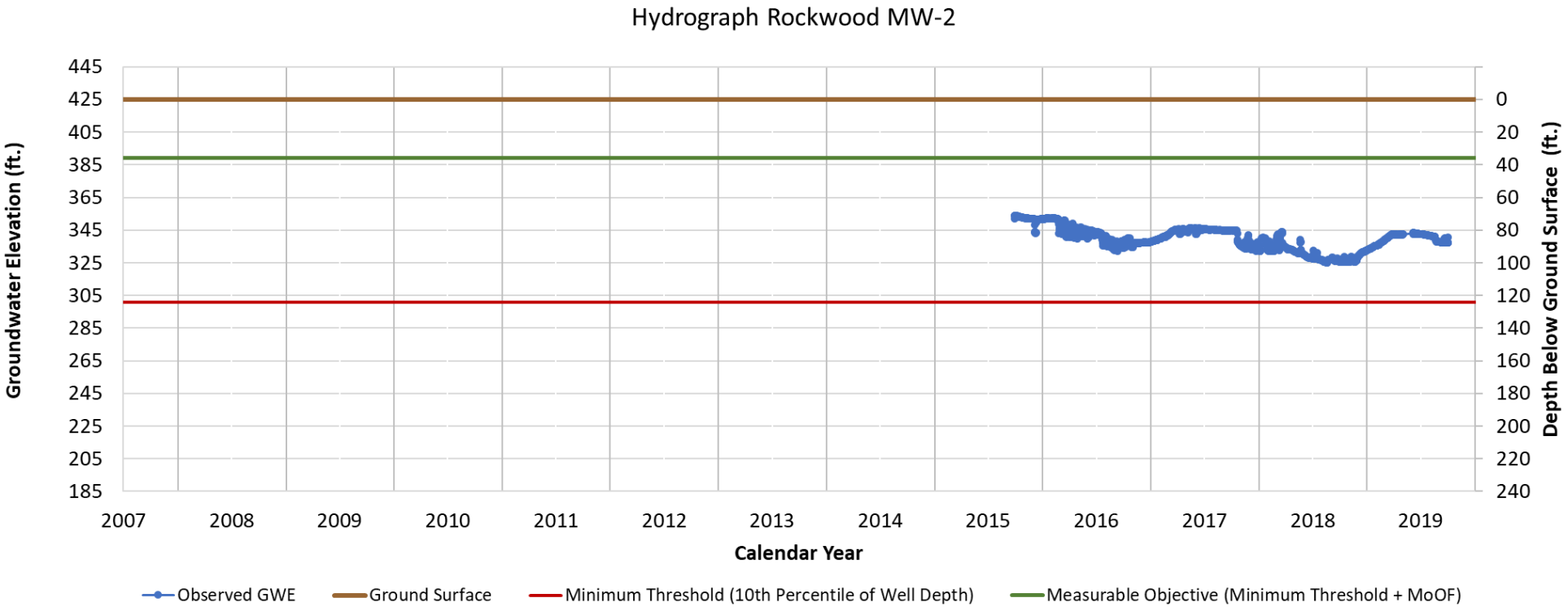

Hydrograph 330320117024703
Groundwater Elevation (ft.)
342
322
302
282
262
242
222
202
182
162
142
122
102
82
Depth Below Ground Surface (ft.)
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 322 ft.
Total Depth: 280 ft.
Perf Top: 30 ft.
Perf Bot: 50 ft.
Observed GWE
Ground Surface
Shallowest Depth (60 ft.)
10th Percentile Total Depth (61 ft.)
25th Percentile Total Depth (73 ft.)
WY 2015 Greatest Depth (16 ft.)
Historical Max. Depth (18 ft.)

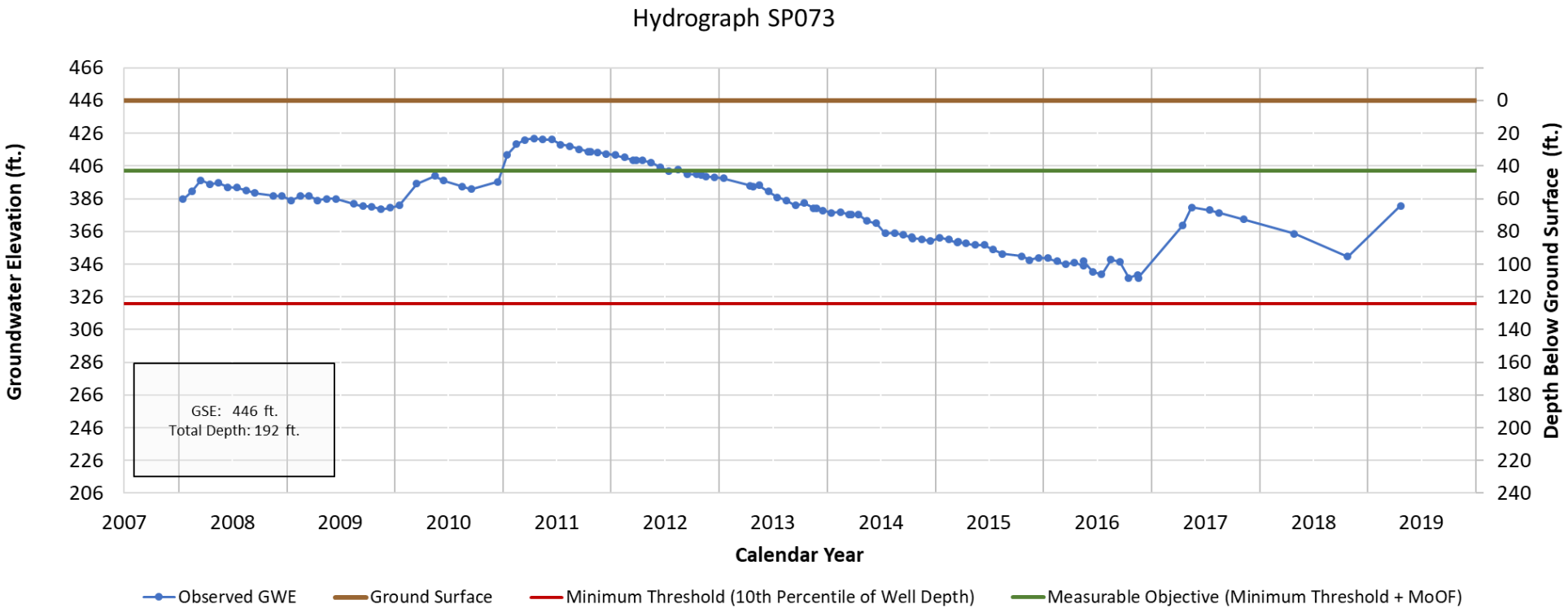

Hydrograph SP014
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
350
330
310
290
270
250
230
210
190
170
150
130
110
90
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 330 ft.
Total Depth: 43 ft.
Observed GWE
Ground Surface
Shallowest Depth (52 ft.)
10th Percentile Total Depth (110 ft.)
25th Percentile Total Depth (125 ft.)
WY 2015 Greatest Depth (17 ft.)
Historical Max. Depth (20 ft.)


Hydrograph Rockwood MW-2
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
445
425
405
385
365
345
325
305
285
265
245
225
205
185
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 425 ft.
Total Depth: 232 ft.
Perf Top: 40 ft.
Perf Bot: 180 ft.
Observed GWE
Ground Surface
Shallowest Depth (69 ft.)
10th Percentile Total Depth (124 ft.)
25th Percentile Total Depth (167 ft.)
WY 2015 Greatest Depth (73 ft.)
Historical Max. Depth (100 ft.)


Hydrograph Rockwood MW-3
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
446
426
406
386
366
346
326
306
286
266
246
226
206
186
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 426 ft.
Total Depth: 191 ft.
Perf Top: 50 ft.
Perf Bot: 130 ft.
Observed GWE
Ground Surface
Shallowest Depth (69 ft.)
10th Percentile Total Depth (124 ft.)
25th Percentile Total Depth (167 ft.)
WY 2015 Greatest Depth (77 ft.)
Historical Max. Depth (95 ft.)


Hydrograph Rockwood MW-1
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
445
425
405
385
365
345
325
305
285
265
245
225
205
185
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 425 ft.
Total Depth: 178 ft.
Perf Top: 50 ft.
Perf Bot: 130 ft.
Observed GWE
Ground Surface
Shallowest Depth (69 ft.)
10th Percentile Total Depth (124 ft.)
25th Percentile Total Depth (167 ft.)
WY 2015 Greatest Depth (73 ft.)
Historical Max. Depth (97 ft.)


Hydrograph Rockwood MW-2
Groundwater Elevation (ft.)
445
425
405
385
365
345
325
305
285
265
245
225
205
185
Depth Below Ground Surface (ft.)
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
Observed GWE
Ground Surface
Minimum Threshold (10th Percentile of Well Depth)
Measurable Objective (Minimum Threshold + MoOF)


Hydrograph SP073
Groundwater Elevation (ft.)
Depth Below Ground Surface (ft.)
466
446
426
406
386
366
346
326
306
286
266
246
226
206
0
20
40
60
80
100
120
140
160
180
200
220
240
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Calendar Year
GSE: 446 ft.
Total Depth: 192 ft.
Observed GWE
Ground Surface
Minimum Threshold (10th Percentile of Well Depth)
Measurable Objective (Minimum Threshold + MoOF)