



CUYAMA BASIN GROUNDWATER SUSTAINABILITY AGENCY STANDING ADVISORY COMMITTEE

Committee Members

Roberta Jaffe (Chair)
Brenton Kelly (Vice Chair)
Brad DeBranch

Louise Draucker
Jake Furstenfeld
Joe Haslett

Mike Post
Hilda Leticia Valenzuela
Jose Valenzuela

AGENDA

February 27, 2020

Agenda for a meeting of the Cuyama Basin Groundwater Sustainability Agency Standing Advisory Committee to be held on Wednesday, February 27, 2020 at 4:00 PM, at the Cuyama Valley Family Resource Center, 4689 CA-166, New Cuyama, CA 93254. To hear the session live, call (888) 222-0475, code: 6375195#.

Teleconference Locations:

Cuyama Valley Family Resource Center 4689 CA-166 New Cuyama, CA 93254	7870 Fairchild Ave Winnetka, CA 91306
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The order in which agenda items are discussed may be changed to accommodate scheduling or other needs of the Committee, the public or meeting participants. Members of the public are encouraged to arrive at the commencement of the meeting to ensure that they are present for Committee discussion of all items in which they are interested.

In compliance with the Americans with Disabilities Act, if you need disability-related modifications or accommodations, including auxiliary aids or services, to participate in this meeting, please contact Taylor Blakslee at (661) 477-3385 by 4:00 p.m. on the Friday prior to this meeting. Agenda backup information and any public records provided to the Committee after the posting of the agenda for this meeting will be available for public review at 4689 CA-166, New Cuyama, CA 93254. The Cuyama Basin Groundwater Sustainability Agency reserves the right to limit each speaker to three (3) minutes per subject or topic.

1. Call to Order
2. Roll Call
3. Pledge of Allegiance
4. Update on SAC Membership
5. Annual Appointment of Officers (Chair and Vice Chair)
6. Groundwater Sustainability Plan
 - a. Review Annual Report
 - b. Direction on Monitoring Network
 - i. Review of 40 Well Locations for Current Task Order
 - ii. Approach for Monitoring in FY 20-21
 - c. Direction on DWR TSS Well Location

- d. Update on Prop 68 Application
- e. Update on Newsletter
- 7. Groundwater Sustainability Agency
 - a. Report of the Executive Director
 - b. Board of Directors Agenda Review
 - c. Report of the General Counsel
- 8. Items for Upcoming Sessions
- 9. Committee Forum
- 10. Public comment for items not on the Agenda

At this time, the public may address the Committee on any item not appearing on the agenda that is within the subject matter jurisdiction of the Committee. Persons wishing to address the Committee should fill out a comment card and submit it to the Executive Director prior to the meeting.

- 11. Correspondence
- 12. Adjourn



TO: Standing Advisory Committee
Agenda Item No. 6

FROM: Brian Van Lienden, Woodard & Curran

DATE: February 27, 2020

SUBJECT: Groundwater Sustainability Plan

Issue

Update on the Cuyama Basin Groundwater Sustainability Agency Groundwater Sustainability Plan.

Recommended Motion

None – information only.

Discussion

Cuyama Basin Groundwater Sustainability Agency (CBGSA) Groundwater Sustainability Plan (GSP) consultant Woodard & Curran's (W&C) GSP update is provided as Attachment 1.

Cuyama Basin Groundwater Sustainability Agency

Groundwater Sustainability Plan Update

February 27, 2020



Dec – Feb Accomplishments

- ✓ Developed final GSP report and submitted to DWR
- ✓ Developed draft GSP annual report
- ✓ Drafted DWR Technical Support Services site-specific applications
- ✓ Developed plan for first phase of monitoring network implementation
- ✓ Finalized economic analysis report
- ✓ Received notice from DWR of SGM grant award (Prop 68)

Final GSP Public Review & Adoption Process ⁶





TO: Standing Advisory Committee
Agenda Item No. 6a

FROM: Brian Van Lienden, Woodard & Curran

DATE: February 27, 2020

SUBJECT: Review Annual Report

Issue

Review of the annual report.

Recommended Motion

Approve the annual report as presented in agenda item No. 6a to the Standing Advisory Committee.

Discussion

The Sustainable Groundwater Management Act requires an annual report be completed and submitted to the California Department of Water Resources (DWR) on April 1 of each year.

Below is a timeline of the report's development:

- **December 4, 2019** – Chair Yurosek appointed an ad hoc to work with staff on the development and review of the annual report.
- **January 21, 2020** – Ad hoc met with staff to review the annual report outline and approach.
- **February 14, 2020** – Woodard & Curran distributed the draft report to the ad hoc for review.
- **February 18, 2020** – The ad hoc met with staff to review the draft report and provided comments.
- **February 25, 2020** – W&C finalized the report.

Attachment 1 is an update on the annual report components and timeline. Attachment 2 is the draft Annual Report for your consideration of approval.

Cuyama Basin Groundwater Sustainability Agency

Review Annual Report

February 27, 2020



Annual Report Timeline

- DWR's GSP Emergency Regulations require that an Annual Report be submitted each year by April 1, 2020
- Milestones:
 - Feb 14: Draft Annual Report document provided to Ad-hoc committee for review
 - Feb 25: Revised Annual Report reflecting Ad-hoc committee comments provided to CBGSA Board for consideration
- Requesting approval of the Annual Report from the CBGSA Board at the March 4, 2020 Board meeting

Annual Report Components

1. Executive Summary

- a) A concise statement of the contents of the Annual Report

2. Introduction

- a) A description of the purpose of the Annual Report, CBGSA information, and a summary of the Cuyama Basin Plan Area

3. Updated Groundwater Conditions

- a) Representative monitoring network
- b) Updated groundwater contour maps
- c) Updated groundwater hydrographs

Annual Report Components

4. Estimated Water Use

- a) Includes estimates of groundwater extraction, surface water use and total water use for the preceding year (2019)

5. Change in Groundwater Storage

- 4. Includes water budget estimate and change in groundwater storage map for the preceding year (2019)

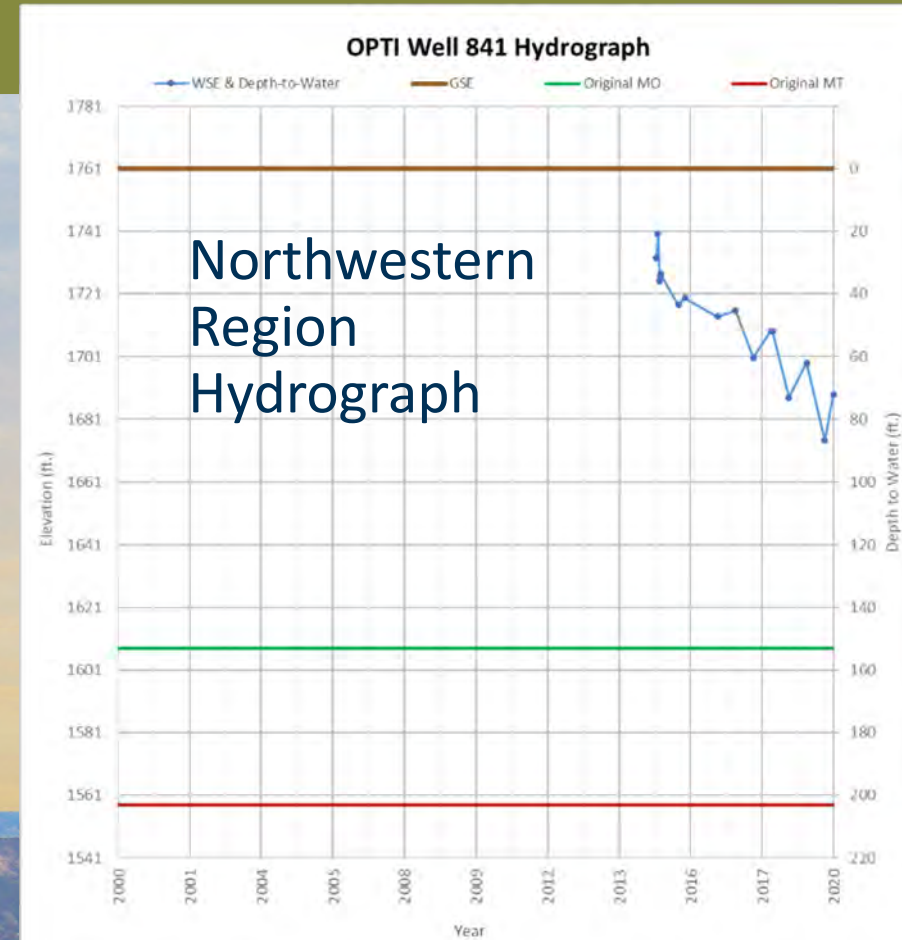
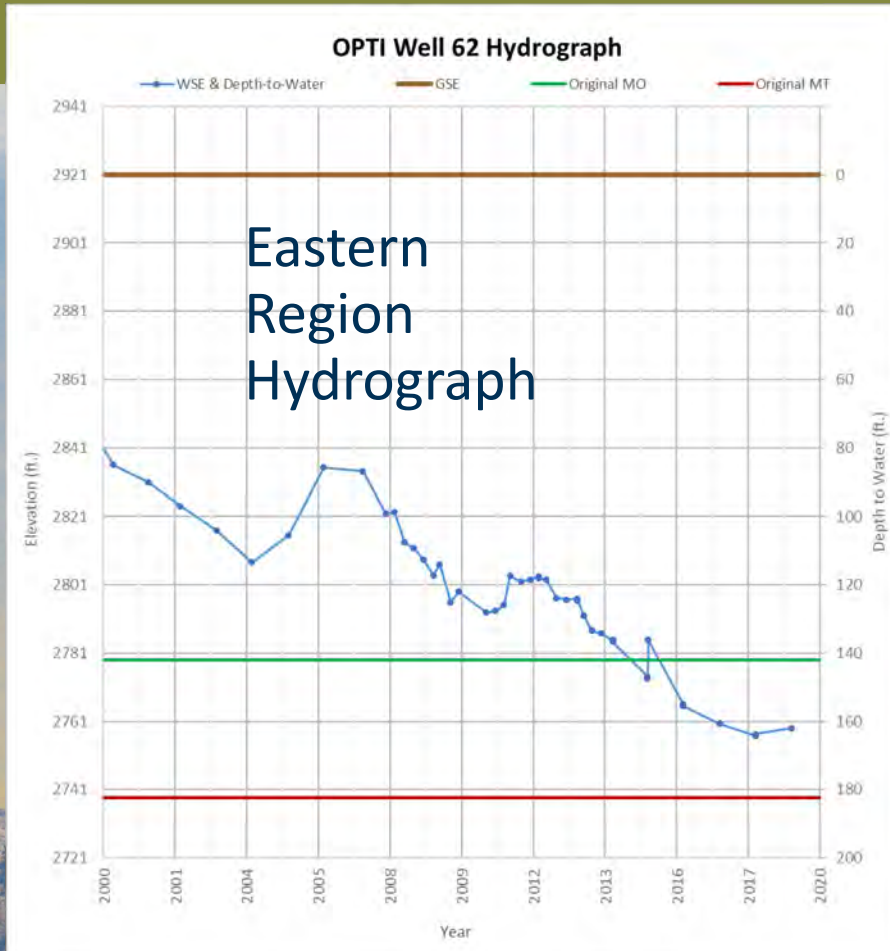
6. Plan Implementation Status

- a) Includes a description of the progress towards implementation of the GSP, including progress toward achieving interim milestones and implementation of GSP projects

Data and Model Updates

- Groundwater elevations:
 - Available data collected for all wells in monitoring network through 2019
- Groundwater Model Update
 - Historical model period extended through 2019 (previously was simulated for 1998-2017)
 - No change will be made to the model calibration
 - Updated land use, precipitation and evapotranspiration data collected for 2018 and 2019
 - Updated land use data has been provided for 2018-19 period by Bolthouse and Grimmway. Other key landowners have confirmed no change since 2017.

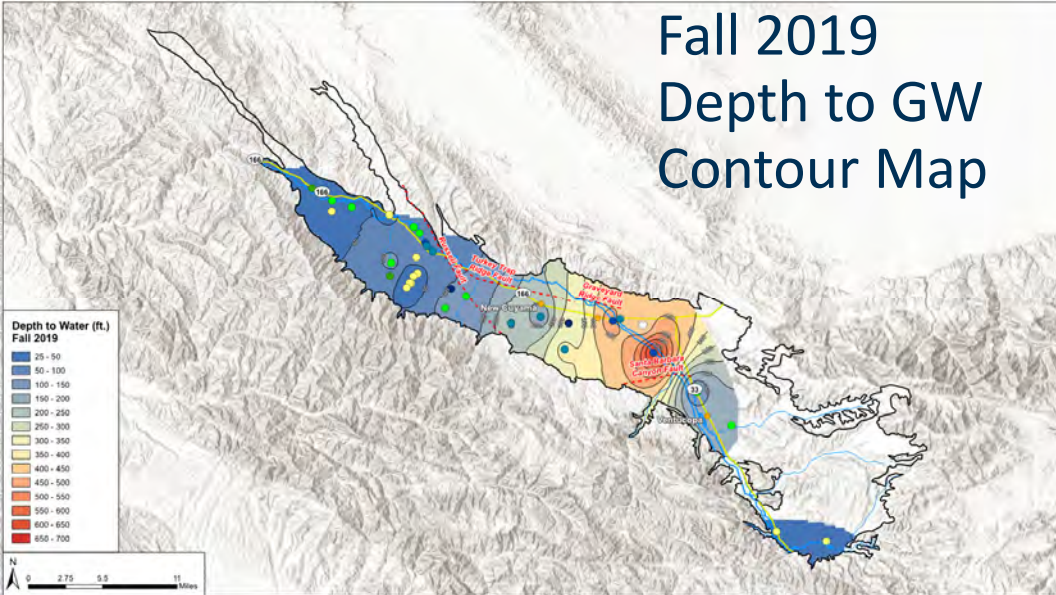
Updated Groundwater Conditions Figures



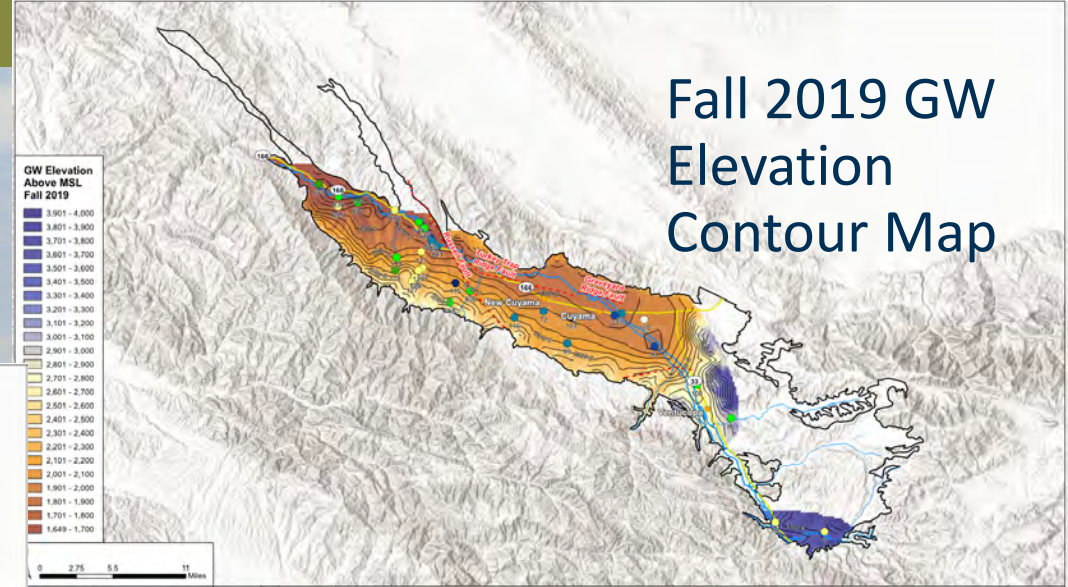
Updated Groundwater Conditions Figures

Updated Contour Maps were created for 2018 and 2019 (Spring and Fall)

Fall 2019 Depth to GW Contour Map

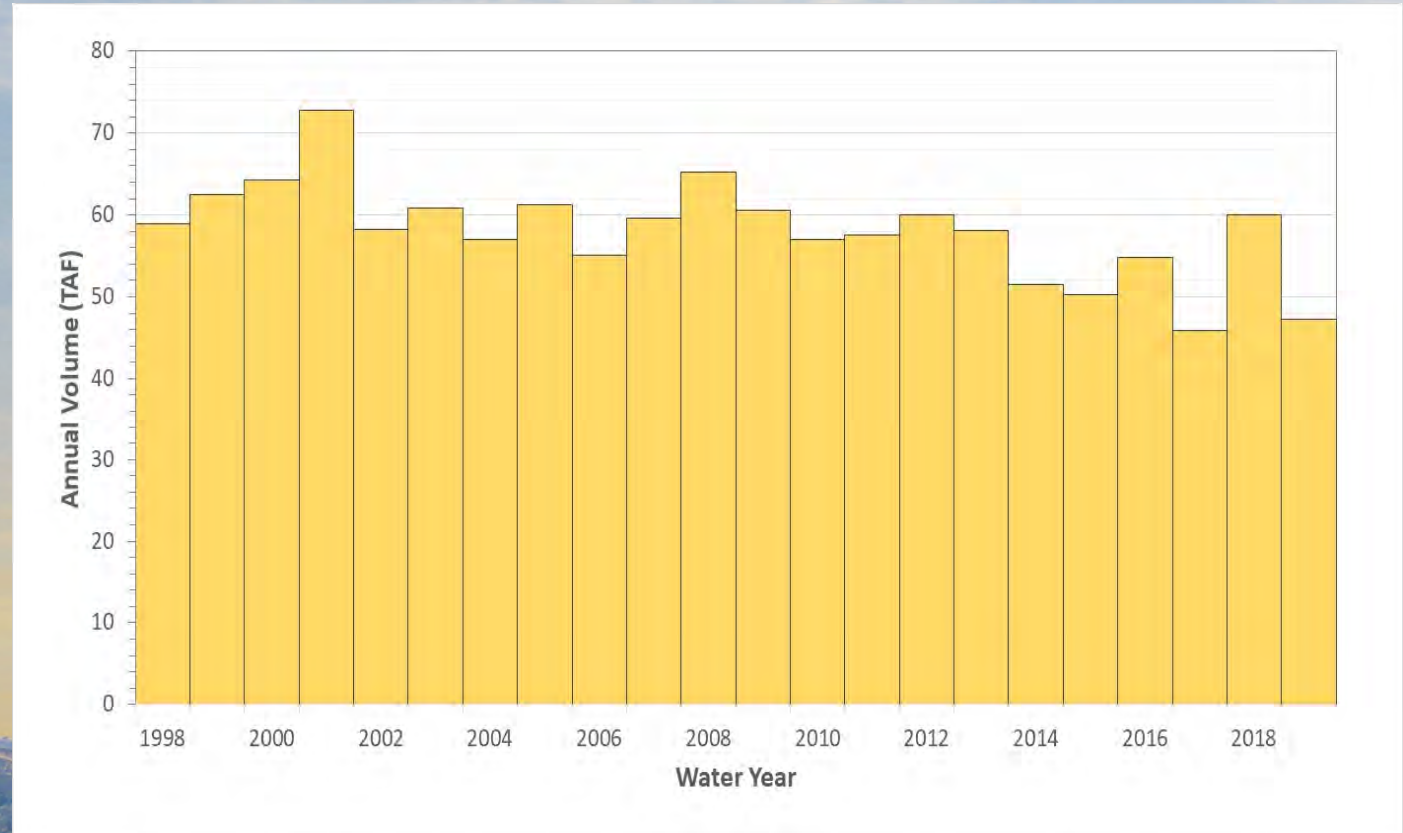


Fall 2019 GW Elevation Contour Map



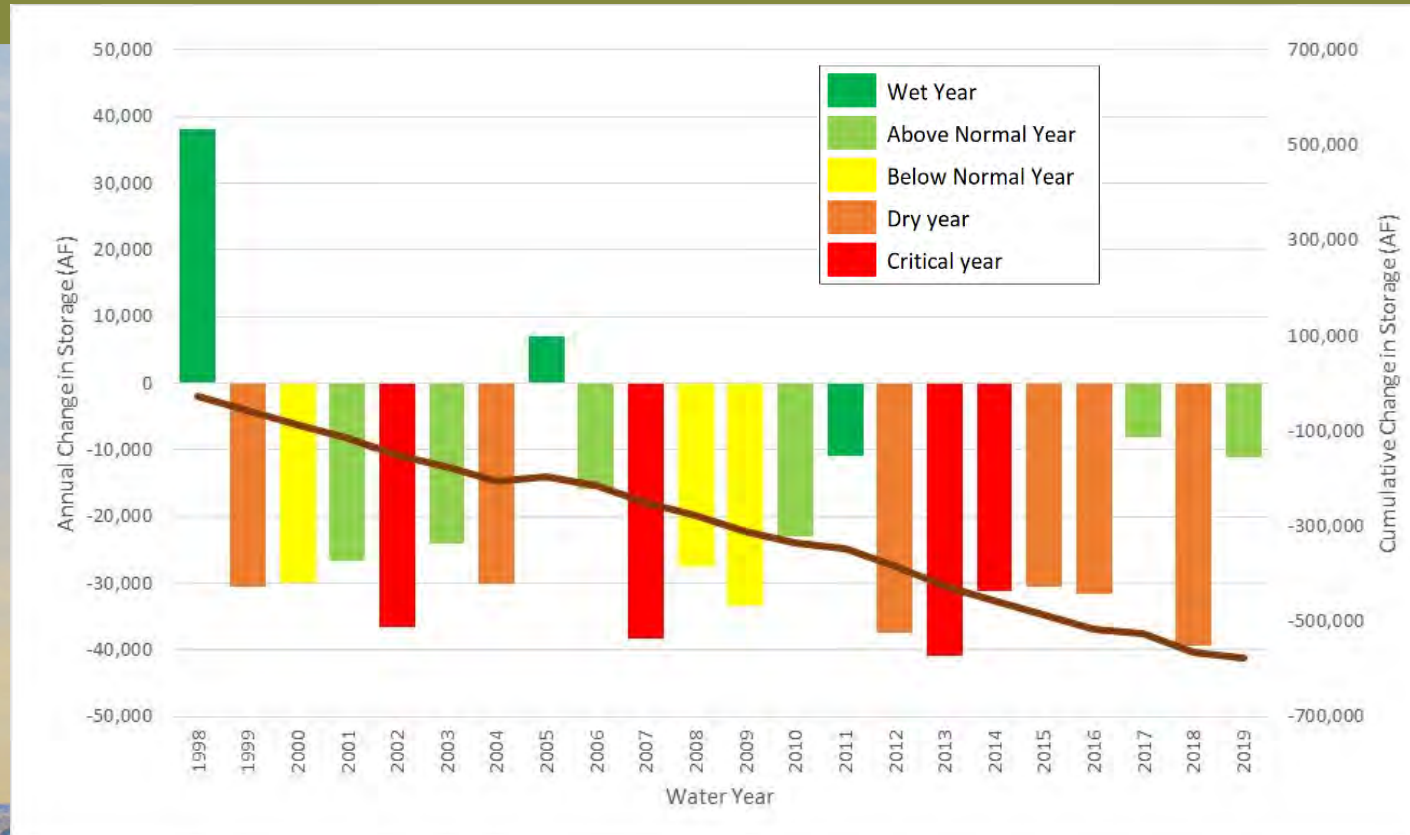
Estimated Groundwater Extraction

- Figure has been updated to include 2018 and 2019
- Estimated groundwater extractions
 - 2018: 60,000 AF
 - 2019: 47,200 AF



Change in Groundwater Storage

- Figure has been updated to include 2018 and 2019
- Estimated change in storage
 - 2018: -39,400 AF
 - 2019: -11,100 AF

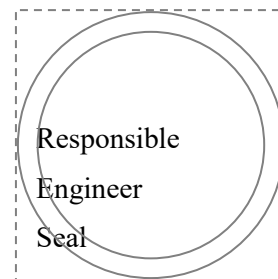


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Cuyama Groundwater Sustainability Plan 2020 Annual Report
Draft

Prepared by:



March 2020

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Appendices

Appendix A - Updated Hydrographs for Representative Wells

Appendix B - Basin-Wide Economic Analysis Report

List of Abbreviations

AF	Acre-feet
CBGSA	Cuyama Basin Groundwater Sustainability Agency
CBWD	Cuyama Basin Water District
CBWRM	Cuyama Basin Water Resources Model
CCSD	Cuyama Community Services District
DMS	Data Management System
DWR	California Department of Water Resources
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
SAC	Standing Advisory Committee
SBCWA	Santa Barbara County Water Agency
SGMA	Sustainability Groundwater Management Act
SR	State Route
TSS	Technical Support Services
USGS	United States Geological Survey

Executive Summary

§356.2 (a)	General information, including an executive summary and a location map depicting the basin covered by the report.
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ES-1 Introduction

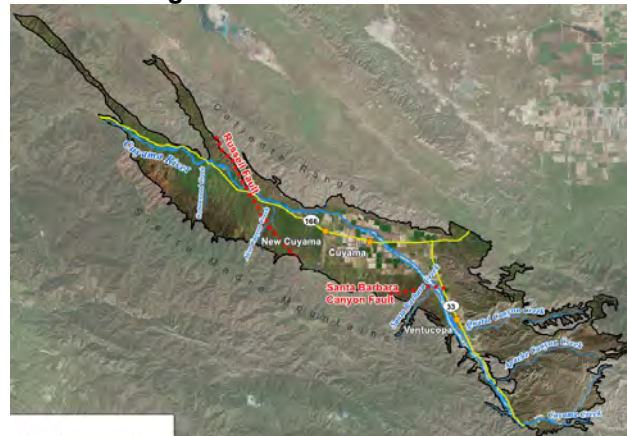
In 2014, the California legislature enacted the [Sustainable Groundwater Management Act \(SGMA\)](#) in response to continued overdraft of California’s groundwater resources. The Cuyama Groundwater Basin (Basin) is one of 21 basins and subbasins identified by the California Department of Water Resources (DWR) as being in a state of critical overdraft. SGMA requires that a Groundwater Sustainability Plan (GSP) be prepared to address the measures necessary to attain sustainable conditions in the Cuyama Groundwater Basin. Within the framework of SGMA, sustainability is generally defined as the conditions that result in long-term reliability of groundwater supply and the absence of undesirable results.

In response to SGMA, the Cuyama Basin Groundwater Sustainability Agency (CBGSA) was formed in 2017. The CBGSA is a joint-powers agency that is comprised of Kern, Santa Barbara, San Luis Obispo and Ventura Counties, plus the Cuyama Community Services District and the Cuyama Basin Water District. The CBGSA is governed by an 11-member Board of Directors, with one representative from Kern, San Luis Obispo and Ventura counties, two representatives from Santa Barbara County, one member from the Cuyama Community Services District, and five members from the Cuyama Basin Water District.

The Draft Cuyama Basin GSP was adopted on December 4, 2019 by the CBGSA and submitted to DWR on January 28, 2020. SGMA requires that the CBGSA develop a GSP that achieves groundwater sustainability in the Basin by the year 2040.

The jurisdictional area of the CBGSA is defined by DWR’s Bulletin 118, 2013, and the 2016 Interim Update. The Cuyama Groundwater Basin generally underlies the Cuyama Valley, as shown in Figure ES-1.

Figure ES-1: GSP Plan Area



ES-2 Groundwater Conditions

The annual report for 2019 includes groundwater contours for Fall of 2018 and Spring and Fall of 2019, and updated hydrographs for the groundwater level monitoring network identified in the Cuyama Basin GSP. The Cuyama Basin consists of a single principal aquifer, and water levels in Basin monitoring wells are considered representative of conditions in that aquifer. Groundwater levels in some portions of the Basin have been declining for many years while other areas of the Basin have experienced no significant change in groundwater levels. Groundwater levels vary across the Basin, with the highest depth to water occurring in the central portion of the Basin (Figure ES-2). The western and eastern portions of the Basin have

generally shallower depth to water. Generally, depth to water and groundwater elevation in 2019 have not changed substantially from 2018 levels and elevations.

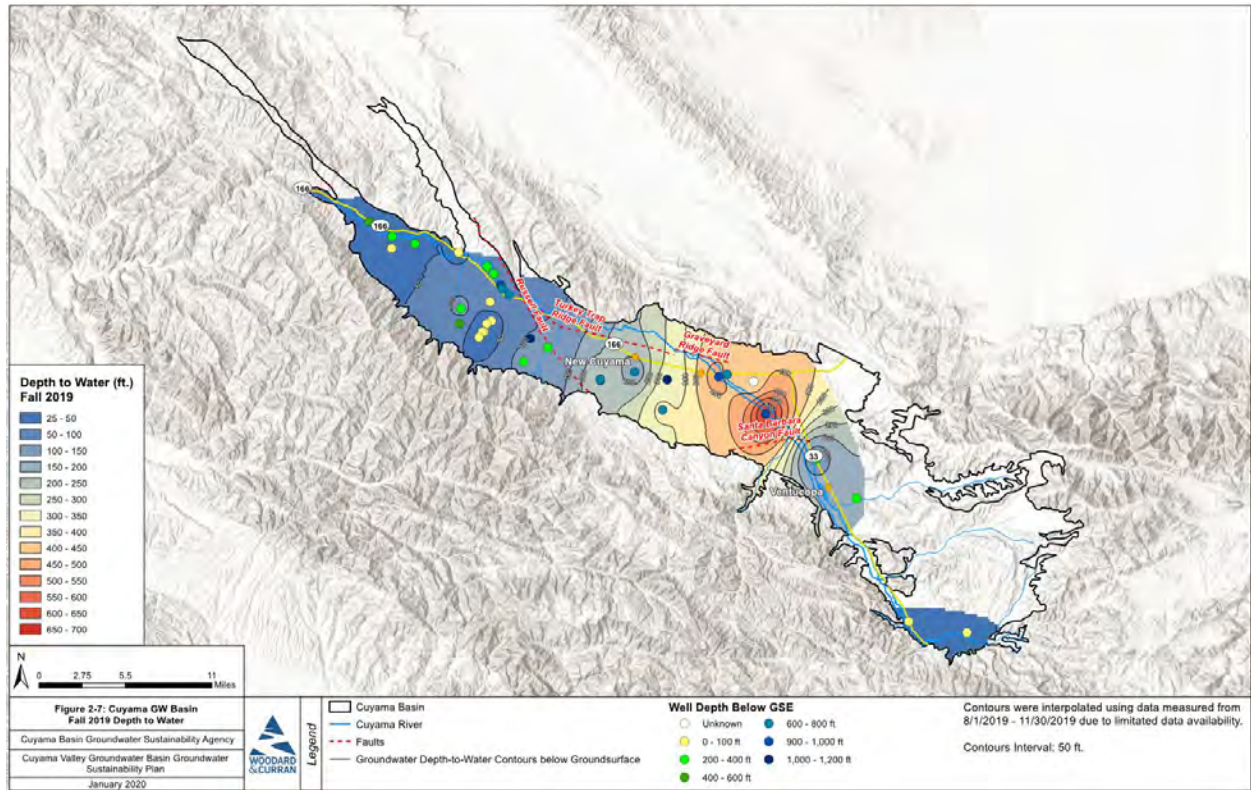


Figure ES-2: Cuyama Basin Depth to Water Contour Map (Fall 2019)

ES-3 Water Use

The Cuyama Groundwater Basin is supplied entirely by groundwater, with virtually no surface water use. Groundwater pumping in the Basin is estimated to have been about 60,000 AF in 2018 and about 47,000 AF in 2019. While the 2018 value is near the average of the long-term trend in groundwater pumping, estimated pumping in 2019 is among the lowest in the 22-year period since 1998. (See Figure ES-3).

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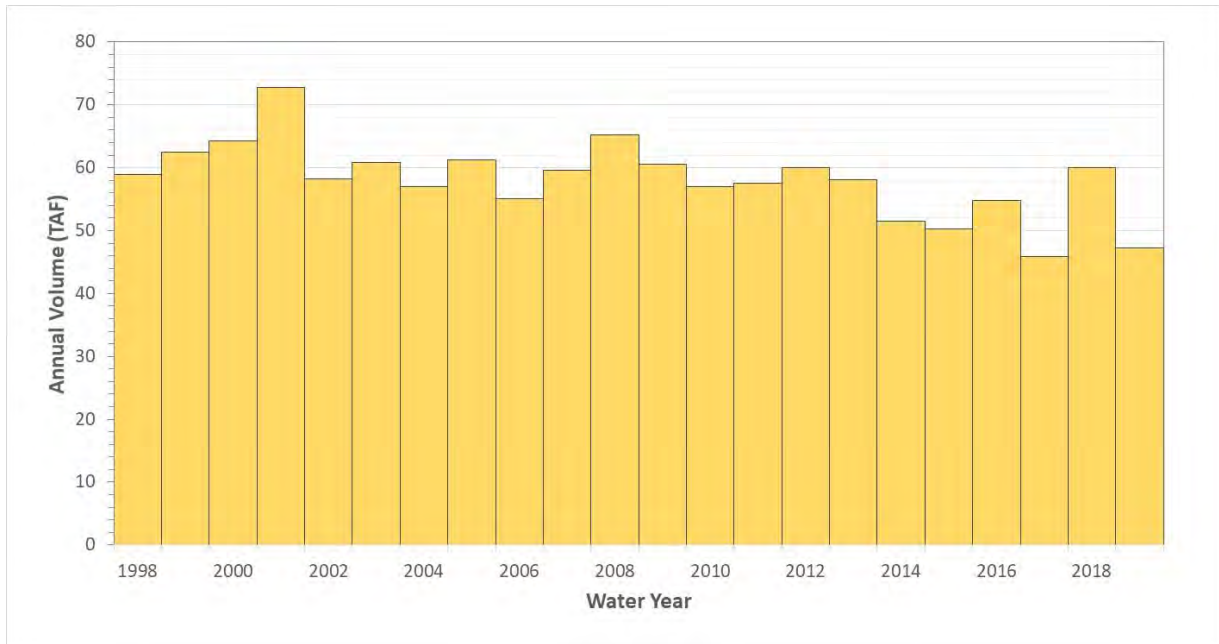


Figure ES-3: Annual Groundwater Extraction in the Cuyama Basin in Water Years 1998-2019

ES-4 Change in Groundwater Storage

It is estimated that there were reductions in Basin groundwater storage of 39,400 AF in 2018 and 11,100 AF in 2019. This continues the long-term trend in groundwater storage reduction in the Basin since 1999. Figure ES-4 shows the historical change in groundwater storage by year, water year type,¹ and cumulative water volume in each year for the period from 1998 through 2019.

¹ Water year types are customized for the Basin watershed based on annual precipitation as follows:

- Wet year = more than 19.6 inches
- Above normal year = 13.1 to 19.6 inches
- Below normal year = 9.85 to 13.1 inches
- Dry year = 6.6 to 9.85 inches
- Critical year = less than 6.6 inches.

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Figure ES-4: Change in Groundwater Storage by Year, Water Year Type, and Cumulative Water Volume

ES-5 Plan Implementation

The following plan implementation activities were accomplished in 2019:

- Approval of a groundwater extraction fee, which is expected to generate \$1,021,936 in revenue to cover the administrative costs of the CBGSA.
- A total of 21 public meetings were conducted at which GSP development and implementation was discussed.
- A Basin-wide, direct economic analysis of proposed GSP management actions was completed. The results of this analysis were presented to the GSP Board on December 4, 2019.
- The CBGSA Board approved a task to begin implementation of the groundwater levels monitoring network, which supplements ongoing efforts to install continuous monitoring equipment in wells and surface flow gages under an ongoing DWR grant. In addition, the CBGSA is pursuing DWR Technical Support Services assistance to install 3 new monitoring wells.

Section 1. Introduction

§356.2 (a)	General information, including an executive summary and a location map depicting the basin covered by the report.
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1.1 Introduction and Agency Information

This section describes the Cuyama Basin Groundwater Sustainability Agency (CBGSA), its authority in relation to the Sustainable Groundwater Management Act (SGMA), and the purpose of this Annual Report.

This Annual Report meets regulatory requirements established by the California Department of Water Resources (DWR) as provided in Article 7 of the California Code of Regulations, Title 23, Division 2, Chapter 1.5, Subchapter 2.

The CBGSA was created by a Joint Exercise of Powers Agreement among the following agencies:

- Counties of Kern, San Luis Obispo, and Ventura
- Santa Barbara County Water Agency (SBCWA), representing the County of Santa Barbara
- Cuyama Basin Water District (CBWD)
- Cuyama Community Services District (CCSD)

The CBGSA Board of Directors includes the following individuals:

- Derek Yurosek – Chairperson, CBWD
- Lynn Compton – Vice Chairperson, County of San Luis Obispo
- Byron Albano – CBWD
- Cory Bantilan – SBCWA
- Tom Bracken – CBWD
- George Cappello – CBWD
- Paul Chounet – CCSD
- Zack Scrivner – County of Kern
- Glenn Shephard – County of Ventura
- Das Williams – SBCWA
- Jane Wooster – CBWD

The CBGSA's established boundary corresponds to DWR's *California's Groundwater Bulletin 118 – Update 2003* (Bulletin 118) groundwater basin boundary for the Cuyama Valley Groundwater Basin (Basin) (DWR, 2003). No additional areas were incorporated.

1.1.1 Management Structure

The CBGSA is governed by an 11-member Board of Directors that meets monthly. A General Manager manages day-to-day operations of the CBWD, while Board Members vote on actions of the CBGSA; the Board is the CBGSA's decision-making body. The Board also formed a Standing Advisory Committee

comprised of 11 stakeholders to provide recommendations to the Board on key technical issues which also meets regularly.

1.1.2 Legal Authority

Per Section 10723.8(a) of the California Water Code, SBCWA gave notice to DWR on behalf of the CBGSA of its decision to form a GSA, which is Basin 3-013, per DWR's Bulletin 118.

1.1.3 Groundwater Sustainability Plan

The CBGSA Board of Directors approved the first iteration of the Cuyama Groundwater Sustainability Plan (GSP) on December 4, 2019. The GSP was submitted to DWR for approval on January 28, 2020 and is available for viewing online at <http://cuyamabasin.org/>.

1.2 Plan Area

Figure 1-1 shows the Basin and its key geographic features. The Basin encompasses an area of about 378 square miles² and includes the communities of New Cuyama and Cuyama, which are located along State Route (SR) 166, and Ventucopa, which is located along SR 33. The Basin encompasses an approximately 55-mile stretch of the Cuyama River, which runs through the Basin for much of its extent before leaving the Basin to the northwest and flowing towards the Pacific Ocean. The Basin also encompasses stretches of Wells Creek in its north-central area, Santa Barbara Creek in the south-central area, the Quatal Canyon drainage and Cuyama Creek in the southern area of the Basin. Most of the agriculture in the Basin occurs in the central portion east of New Cuyama, and along the Cuyama River near SR 33 through Ventucopa.

Figure 1-2 shows the CBGSA boundary. The CBGSA boundary covers all of the Cuyama Valley Groundwater Basin.

² The current Bulletin 118 section on the Cuyama Valley Groundwater Basin incorrectly states that the Basin area is 230 square miles. The estimate of 378 square miles shown here and in the GSP is consistent with the mapping shown on DWR's GSA Map Viewer.

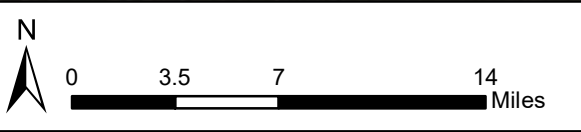
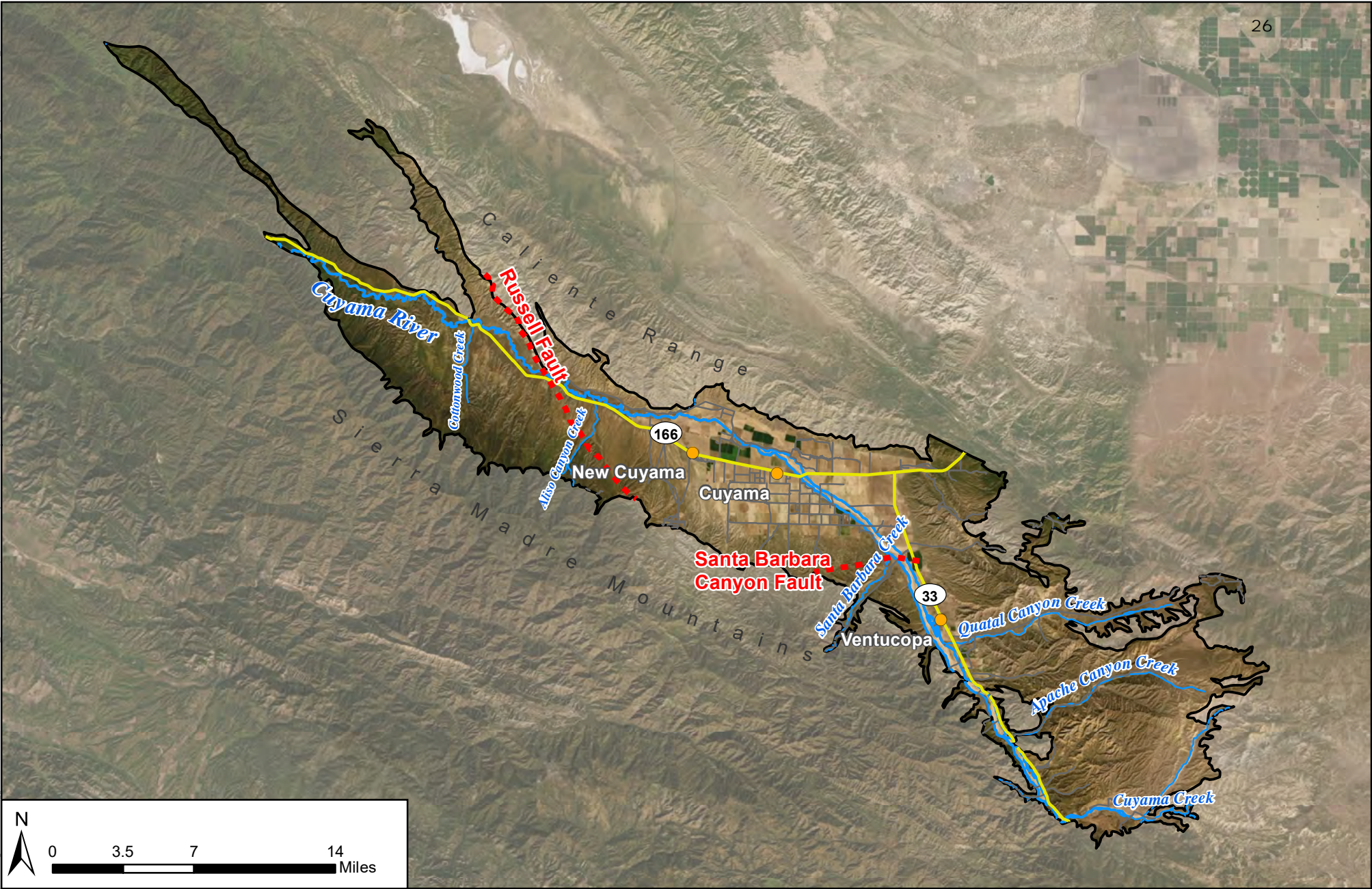


Figure 1-1 - Cuyama Valley Groundwater Basin
 Cuyama Basin Groundwater Sustainability Agency
 Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
 February 2020



Legend	
Cuyama Basin	Local Roads
Towns	Cuyama River
Faults	Streams/Creeks
Highways	

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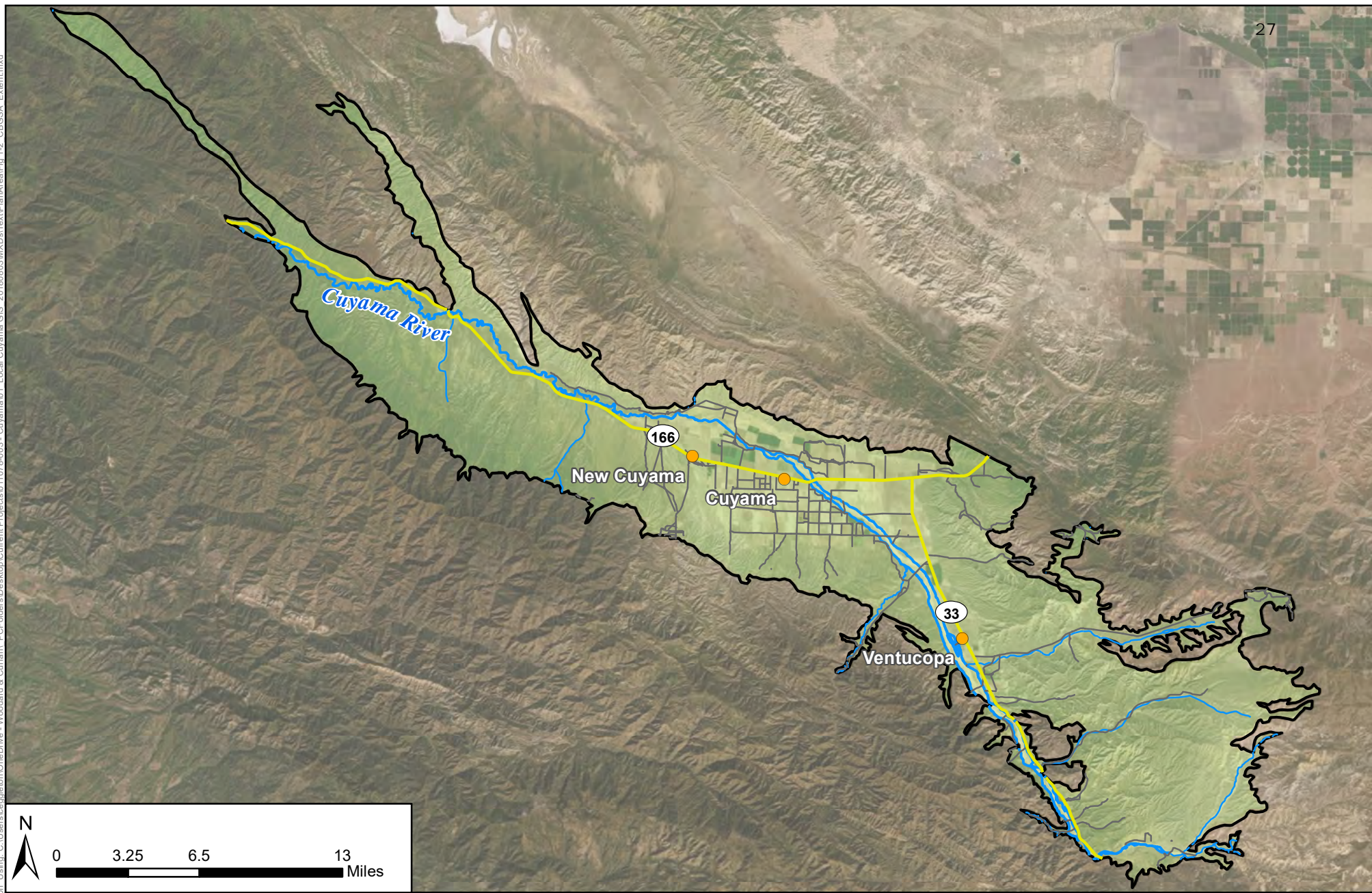


Figure 1-2 - Cuyama Valley Groundwater Sustainability Agency Boundary

Cuyama Basin Groundwater Sustainability Agency
Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
January 2020



Legend

- Towns
- Cuyama Basin GSA
- Highways
- Local Roads
- Cuyama River
- Streams/Creeks

Section 2. Groundwater Conditions

§356.2 (b) (1)	Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:
§356.2 (b) (1) (A)	Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.
§356.2 (b) (1) (B)	Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

2.1 Representative Monitoring Network

As required by DWR's SGMA regulations, a monitoring network and representative monitoring network were identified in the Cuyama Basin GSP utilizing existing wells. The groundwater levels representative monitoring network that was included in the GSP is shown on Figure 2-1. The Cuyama Basin consists of a single principal aquifer, and water levels in monitoring network wells are considered representative of conditions in that aquifer. The objective of the representative monitoring network is to detect undesirable results in the Basin related to groundwater levels using the sustainability thresholds described in the GSP. Other related objectives of the monitoring network are defined via the SGMA regulations as follows:

- Demonstrate progress toward achieving measurable objectives described in the GSP.
- Monitor impacts to the beneficial uses or users of groundwater.
- Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.
- Quantify annual changes in water budget components.

Monitoring that has occurred on the groundwater level monitoring network since the development of the Cuyama Basin GSP is included in this annual report. Collected groundwater level data has been analyzed to prepare contour maps and updated hydrographs, which are presented in the following sections.

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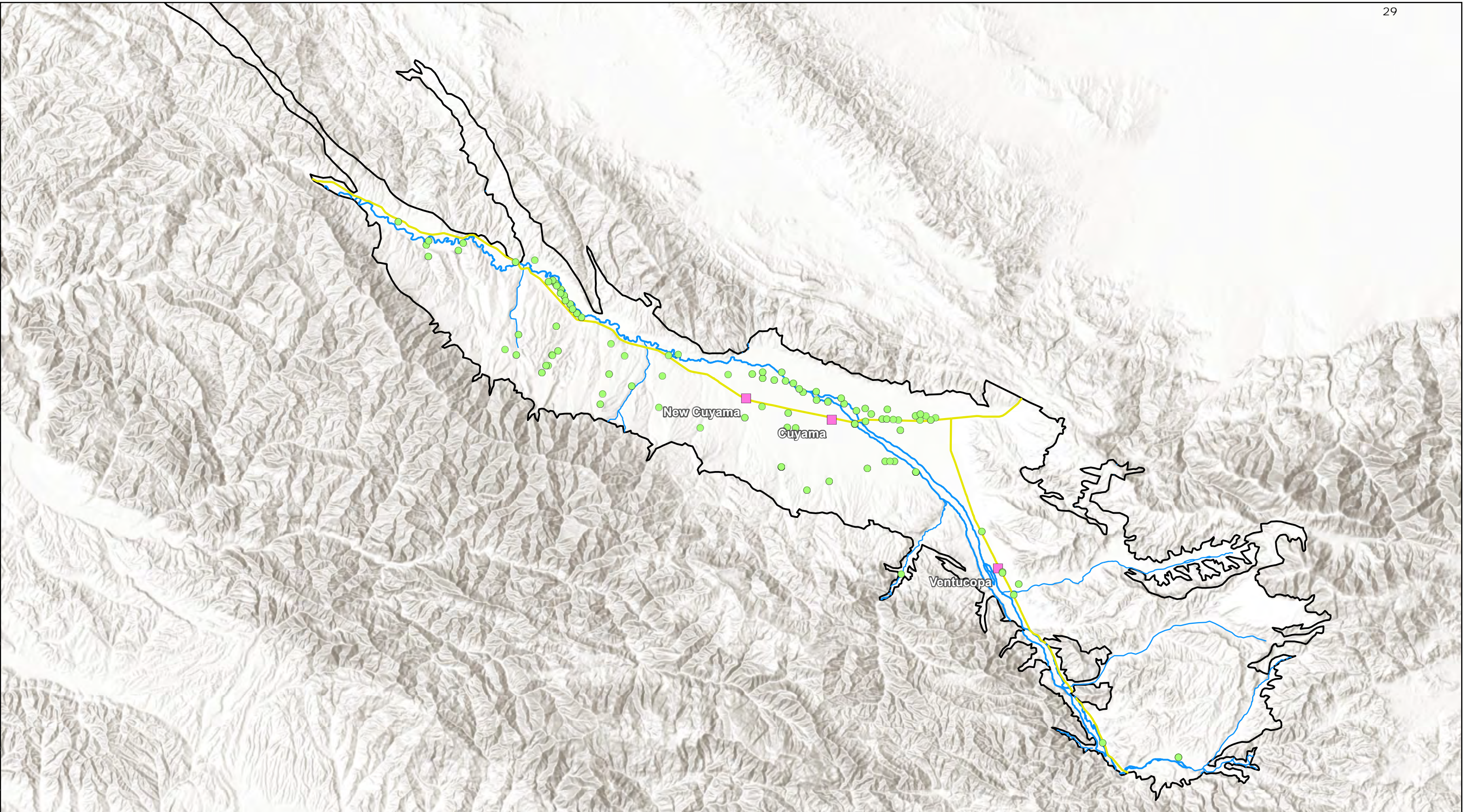
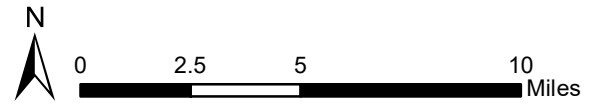


Figure 2-1: Cuyama GW Basin Groundwater Level & Storage Monitoring Network Wells
 Cuyama Basin Groundwater Sustainability Agency
 Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
 January 2020



Legend

- Cuyama Basin
 - Towns
 - Highways
 - Cuyama River
 - Streams
- Monitoring Network Wells**
- Monitoring Network Wells



2.2 Groundwater Contour Maps

The GSP included contour maps through the Spring of 2018. For the Annual Report, analysis was conducted to incorporate data from June 2018 to December 2019 that was received from the United States Geological Survey (USGS), DWR, private landowners, and local counties and agencies. Data was then added to the Data Management System (DMS) and processed to analyze the current groundwater conditions by creating seasonal groundwater contour/raster maps and hydrographs.

A contour map shows changes in groundwater elevations by interpolating groundwater elevations between monitoring sites. The elevations are shown on the map with the use of a contour line, which indicates that at all locations that line is drawn, the line represents groundwater at the elevation indicated. There are two versions of contour maps used in this section: one that shows the elevation of groundwater above mean sea level, which is useful because it can be used to identify the horizontal gradients of groundwater, and one that shows contours of depth to water, the distance from the ground surface to groundwater, which is useful because it can identify areas of shallow or deep groundwater.

Analysts prepared groundwater contour maps under the supervision of a Certified Hydrogeologist in the State of California for both groundwater elevation and depth to water for the following periods:

- Fall 2018
- Spring 2019
- Fall 2019

Each contour map is contoured at a 50-foot contour interval, with contour elevations indicated in white numeric label. The groundwater contours were also based on assumptions in order to accumulate enough data points to generate useful contour maps. Assumptions are as follows:

- Measurements from wells of different depths are representative of conditions at that location and there are no significant known vertical gradients. Due to the limited spatial amount of monitoring points, data from wells of a wide variety of depths were used to generate the contours.
- Measurements from dates that may be as far apart temporally as three months are representative of conditions during the spring or fall season, and conditions have not changed substantially from the time of the earliest measurement used to the latest. Due to the limited temporal amount of measurements in the Basin, data from a wide variety of measurement dates were used to generate the contours.

These assumptions generate contours that are useful at the planning level for understanding groundwater levels across the Basin, and to identify general horizontal gradients and regional groundwater level trends. The contour maps are not indicative of exact values across the Basin because groundwater contour maps approximate conditions between measurement points, and do not account for topography. Therefore, a well on a ridge may be farther from groundwater than one in a canyon, and the contour map will not reflect that level of detail.

Figure 2-2 shows groundwater elevation contours for fall of 2018. Data was collected from Santa Barbara County, Ventura County, DWR, USGS, and local landowners, however, data collected between August and November was limited and was not available for the south eastern portion of the Basin. However, available data shows a depression in the central portion of the Basin between Ventucopa and New Cuyama. Groundwater elevations then rise between Cuyama and New Cuyama, before decreasing again in a northwestern trend to the bottom of the Basin. Groundwater flows are to the northwest in the western portion of the basin, and towards the north east in the central portion of the basin

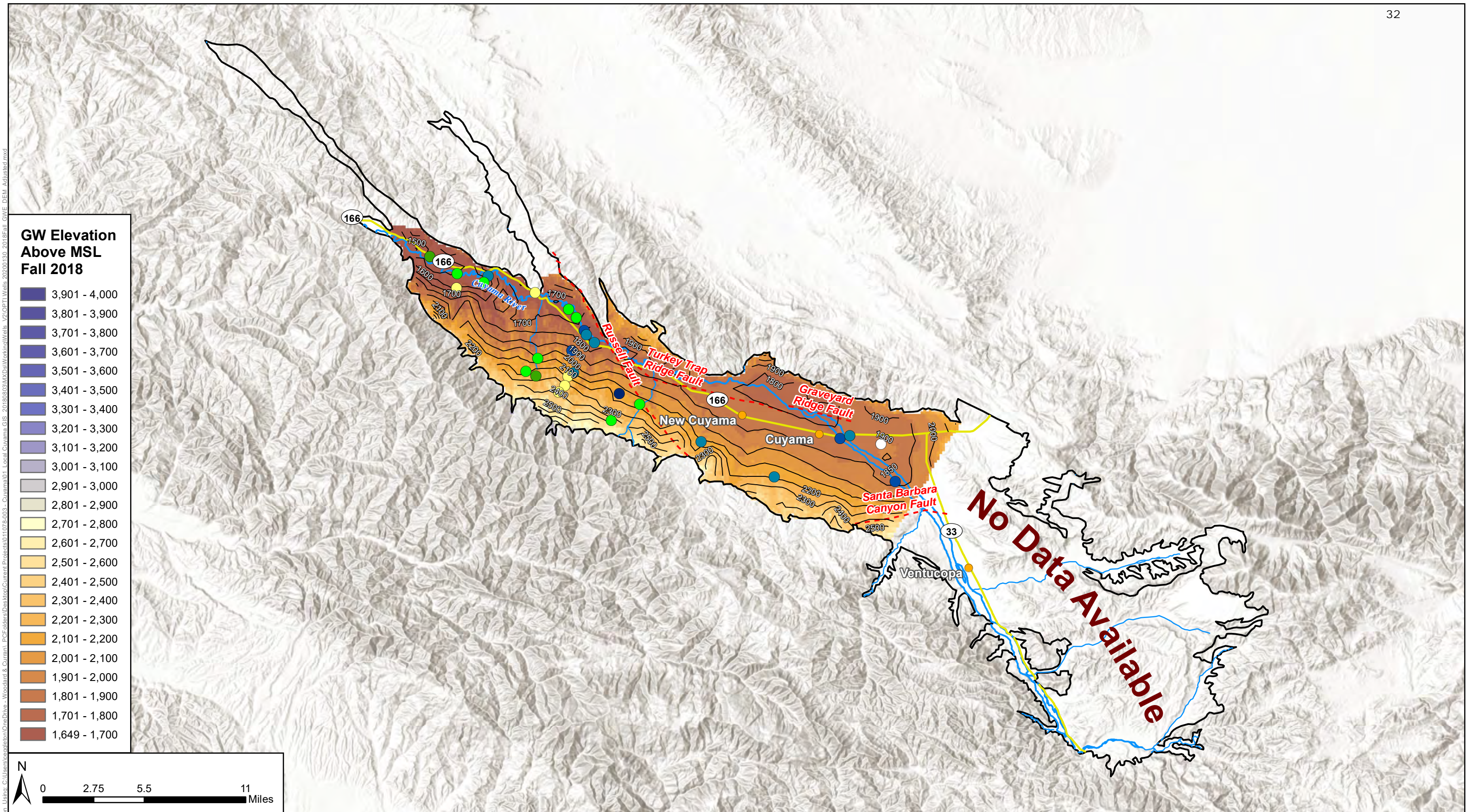
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Figure 2-3 shows the depth to groundwater contours for fall 2018 and shows a depression in the central portion of the Basin greater than 600 ft below ground surface. Groundwater levels then increase towards the west reaching depths above 100 ft in the western portion of the Basin. These levels align with trends seen in older counter maps provided in the Cuyama Valley Basin 2020 GSP.

Figure 2-4 shows the groundwater elevation contours for spring of 2019. Data for this time period provides greater Basin coverage than in fall of 2018. Groundwater elevations show a clear depression in the central portion of the Basin and a steep gradient between the central portion of the basin and the Ventucopa area, which is consistent with contour maps for 2015 and 2017 conditions. Groundwater elevations steadily increase towards the east through Ventucopa.

Figure 2-5 shows the depth to groundwater contours for the spring of 2019. Data collected in 2019 provided more spatial coverage than 2018 measurements did. The contours and also shows a depression in the central portion of the Basin, and a steep gradient between the central portion of the basin and the Ventucopa area, which is consistent with contour maps for 2015 and 2017 conditions. When compared with Figure 2-4, it is clear that Basin topography is not the sole factor of groundwater level changes because both groundwater elevations and depths below ground surface rise between Cuyama and Ventucopa. Groundwater level data was available in Fall of 2019 for two monitoring wells in the far east portion of the basin, and that data indicates that groundwater levels in that area are within 50 feet of the ground surface

Figure 2-6 and Figure 2-7 show the groundwater elevation contours and depth to groundwater levels for fall of 2019. These figures show the same trends as provided in figures Figure 2-2 through Figure 2-5, however some levels in these figures are even lower in the central portion of the Basin. Groundwater level data was available in Fall of 2019 for two monitoring wells in the far east portion of the basin, and that data indicates that groundwater levels in that area are within 50 feet of the ground surface.



GW Elevation Above MSL Fall 2018

- 3,901 - 4,000
- 3,801 - 3,900
- 3,701 - 3,800
- 3,601 - 3,700
- 3,501 - 3,600
- 3,401 - 3,500
- 3,301 - 3,400
- 3,201 - 3,300
- 3,101 - 3,200
- 3,001 - 3,100
- 2,901 - 3,000
- 2,801 - 2,900
- 2,701 - 2,800
- 2,601 - 2,700
- 2,501 - 2,600
- 2,401 - 2,500
- 2,301 - 2,400
- 2,201 - 2,300
- 2,101 - 2,200
- 2,001 - 2,100
- 1,901 - 2,000
- 1,801 - 1,900
- 1,701 - 1,800
- 1,649 - 1,700

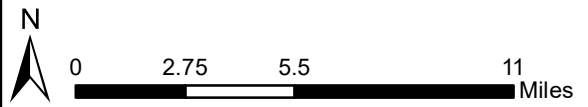


Figure 2-2: Cuyama GW Basin Fall 2018 Groundwater Elevation
 Cuyama Basin Groundwater Sustainability Agency
 Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
 January 2020



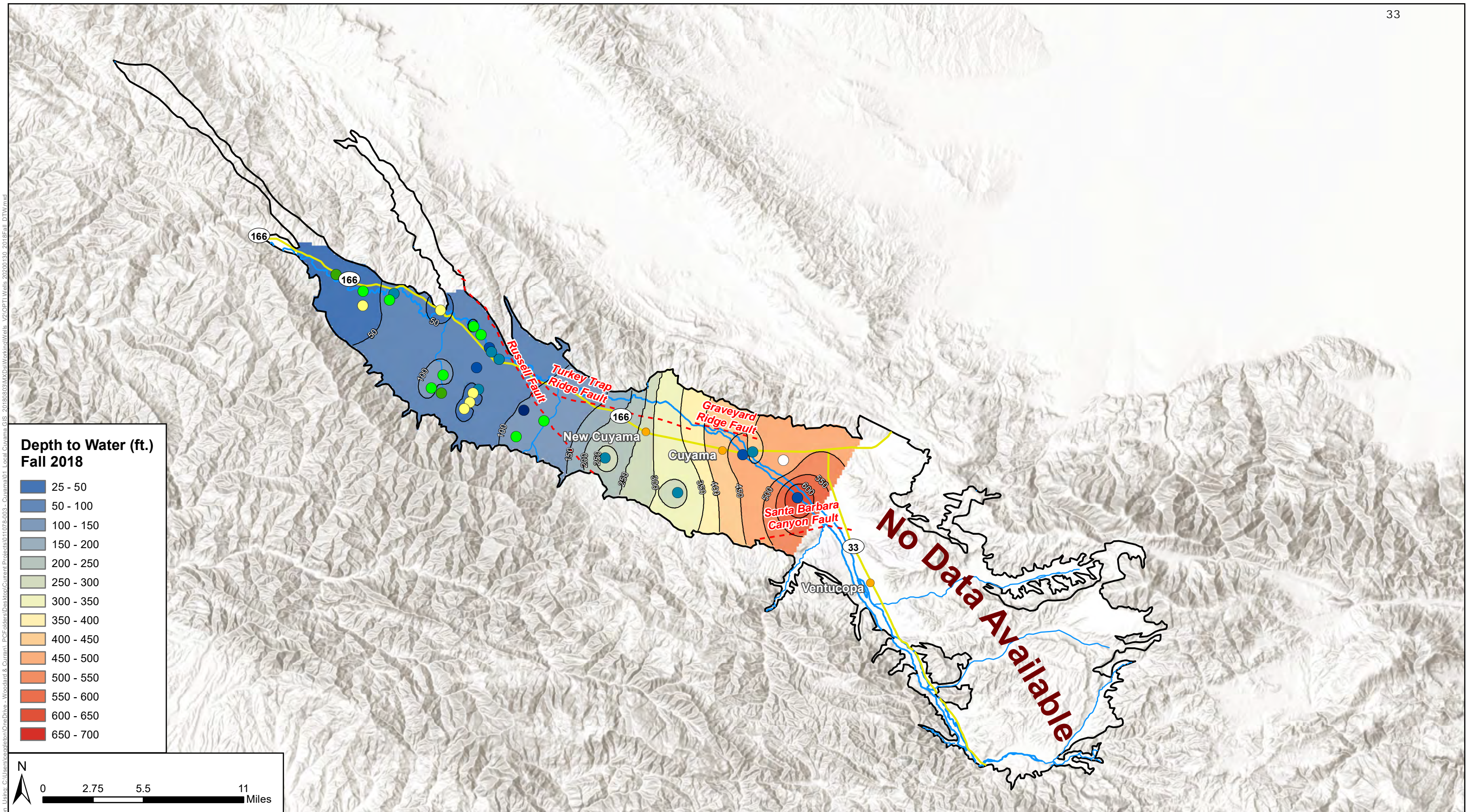
Legend

- Cuyama Basin
- Cuyama River
- - - Faults
- Groundwater Elevation Above MSL

- Well Depth Below GSE**
- Unknown
 - 0 - 200 ft
 - 200 - 400 ft
 - 400 - 600 ft
 - 600 - 800 ft
 - 800 - 1,000 ft
 - 1,000 - 1,200 ft

Contours were interpolated using data measured from 8/1/2018 - 11/30/2018 due to limited data availability.
 Contours Interval: 100 ft.

Figure Exported: 2/20/2020 10:20:20 AM by: cecilia.woodard Using: C:\Users\woodard\OneDrive - Woodard & Curran\PCF\Projects\Projects\01078-003 - Cuyama\01 - Local Cuyama GIS - 20180803\MXD\WorkshopWells_V2\OP\TI Wells 2020\0130_2018Fall_GWE_DEM_Adjusted.mxd



**Depth to Water (ft.)
Fall 2018**

- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300
- 300 - 350
- 350 - 400
- 400 - 450
- 450 - 500
- 500 - 550
- 550 - 600
- 600 - 650
- 650 - 700

N

0 2.75 5.5 11 Miles

**Figure 2-3: Cuyama GW Basin
Fall 2018 Depth to Water**

Cuyama Basin Groundwater Sustainability Agency

Cuyama Valley Groundwater Basin Groundwater Sustainability Plan

January 2020



Legend

- Cuyama Basin
- Cuyama River
- Faults
- Groundwater Depth-to-Water Contours below Groundsurface

Well Depth Below GSE

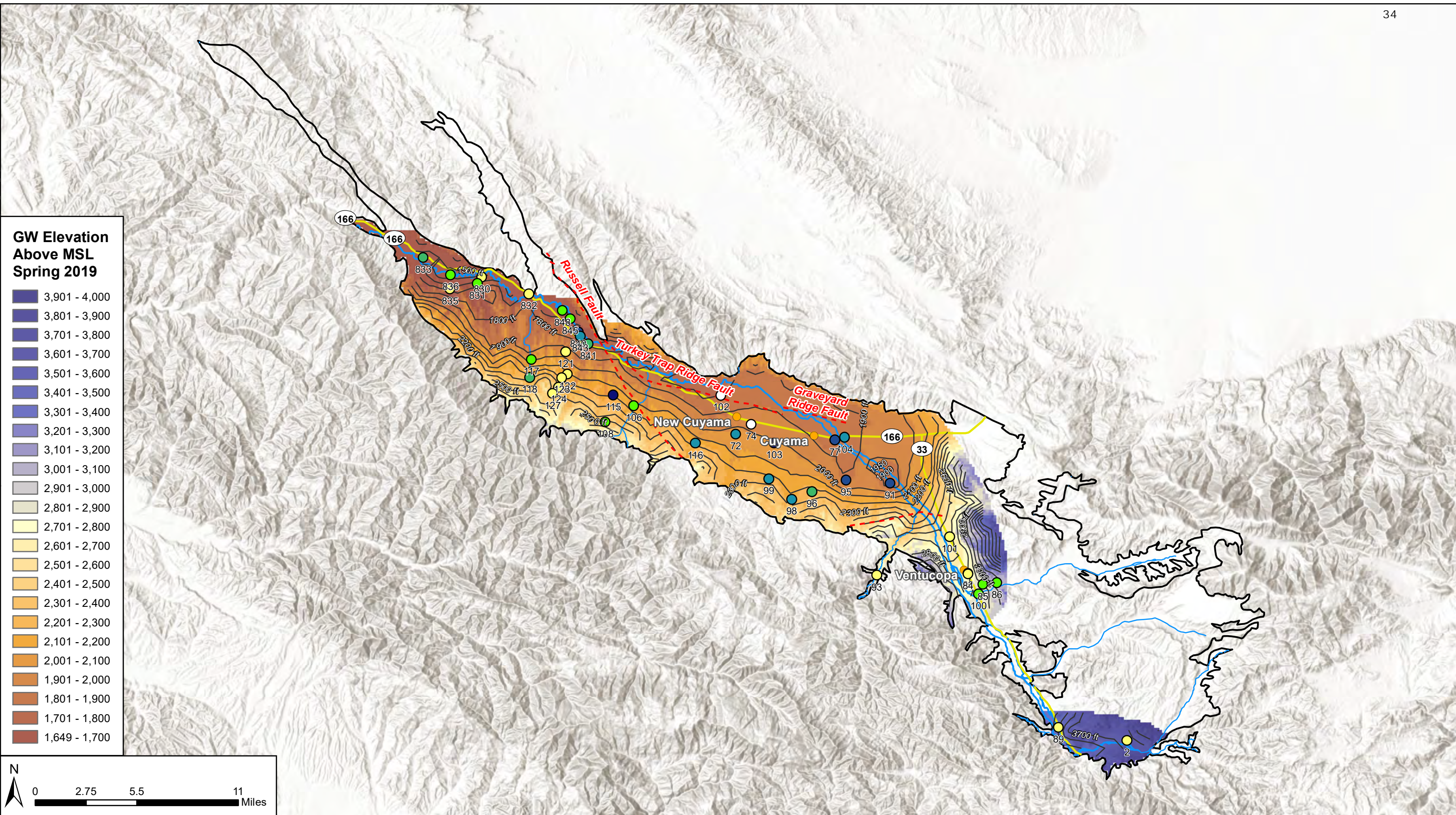
- Unknown
- 0 - 200 ft
- 200 - 400 ft
- 400 - 600 ft
- 600 - 800 ft
- 800 - 1,000 ft
- 1,000 - 1,200 ft

Contours were interpolated using data measured from 8/1/2018 - 11/30/2018 due to limited data availability.

Contours Interval: 50 ft.

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GW Elevation Above MSL Spring 2019

- 3,901 - 4,000
- 3,801 - 3,900
- 3,701 - 3,800
- 3,601 - 3,700
- 3,501 - 3,600
- 3,401 - 3,500
- 3,301 - 3,400
- 3,201 - 3,300
- 3,101 - 3,200
- 3,001 - 3,100
- 2,901 - 3,000
- 2,801 - 2,900
- 2,701 - 2,800
- 2,601 - 2,700
- 2,501 - 2,600
- 2,401 - 2,500
- 2,301 - 2,400
- 2,201 - 2,300
- 2,101 - 2,200
- 2,001 - 2,100
- 1,901 - 2,000
- 1,801 - 1,900
- 1,701 - 1,800
- 1,649 - 1,700

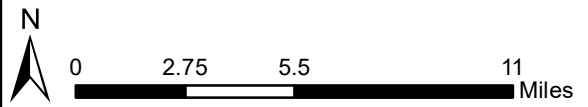


Figure 2-4: Cuyama GW Basin Spring 2019 Groundwater Elevation
 Cuyama Basin Groundwater Sustainability Agency
 Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
 January 2020

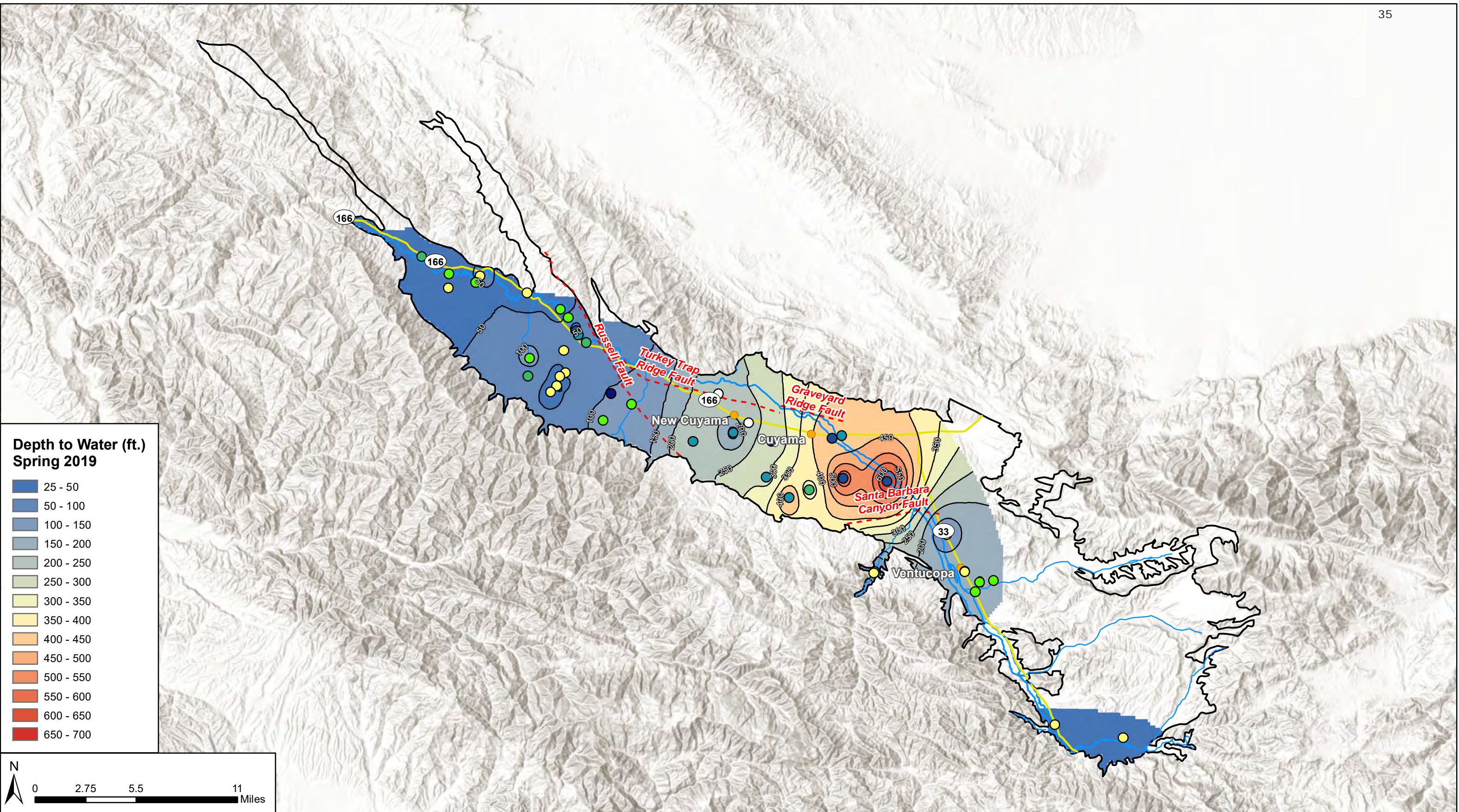


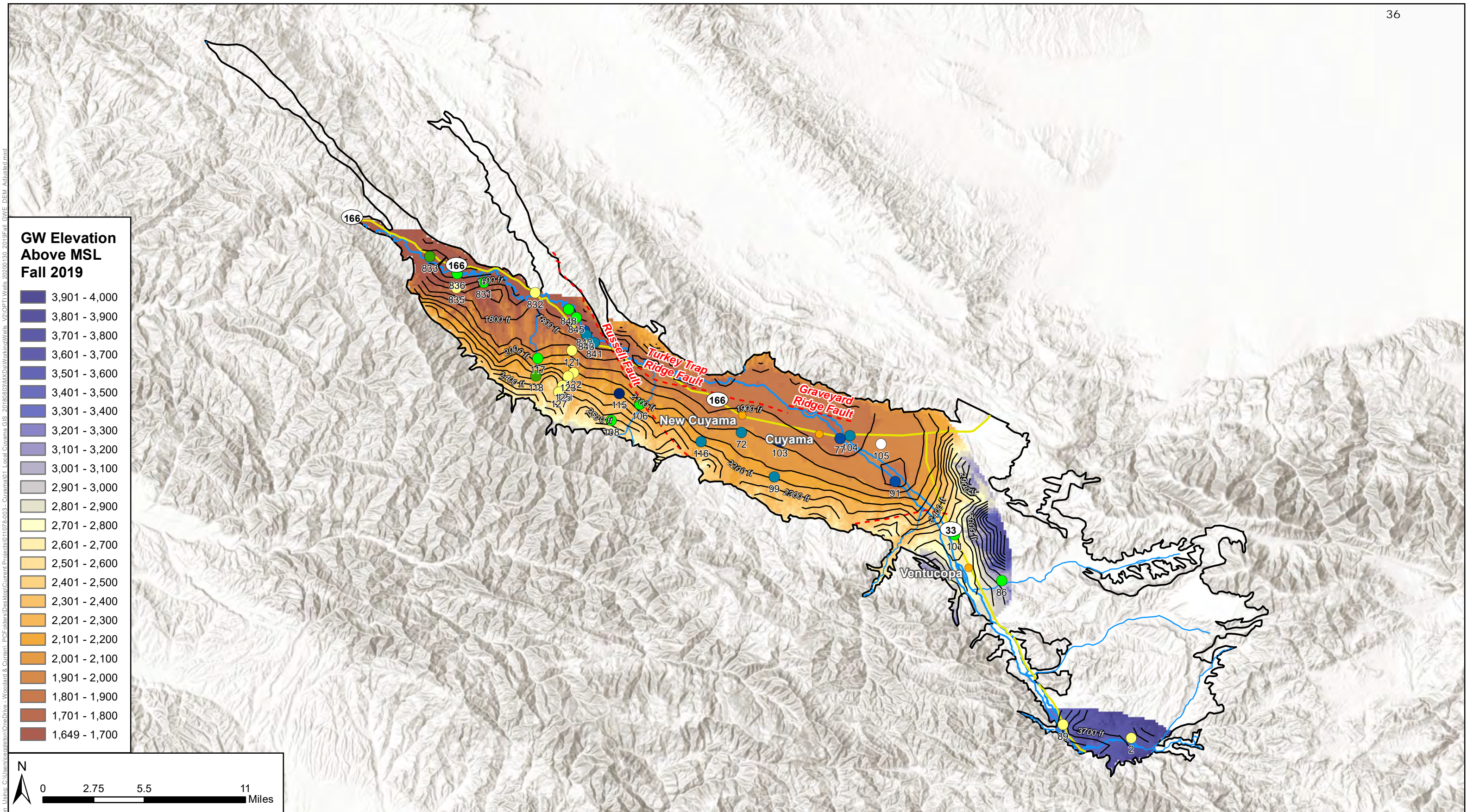
- Legend**
- Cuyama Basin
 - Cuyama River
 - - - Faults
 - Groundwater Elevation Above MSL

- Well Depth Below GSE**
- Unknown
 - 0 - 200 ft
 - 200 - 400 ft
 - 400 - 600 ft
 - 600 - 800 ft
 - 800 - 1,000 ft
 - 1,000 - 1,200 ft

Contours were interpolated using data measured from 2/1/2019 - 4/30/2019 due to limited data availability.
 Contours Interval: 100 ft.

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GW Elevation Above MSL Fall 2019

3,901 - 4,000
3,801 - 3,900
3,701 - 3,800
3,601 - 3,700
3,501 - 3,600
3,401 - 3,500
3,301 - 3,400
3,201 - 3,300
3,101 - 3,200
3,001 - 3,100
2,901 - 3,000
2,801 - 2,900
2,701 - 2,800
2,601 - 2,700
2,501 - 2,600
2,401 - 2,500
2,301 - 2,400
2,201 - 2,300
2,101 - 2,200
2,001 - 2,100
1,901 - 2,000
1,801 - 1,900
1,701 - 1,800
1,649 - 1,700



Figure 2-6: Cuyama GW Basin Fall 2019 Groundwater Elevation
 Cuyama Basin Groundwater Sustainability Agency
 Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
 January 2020



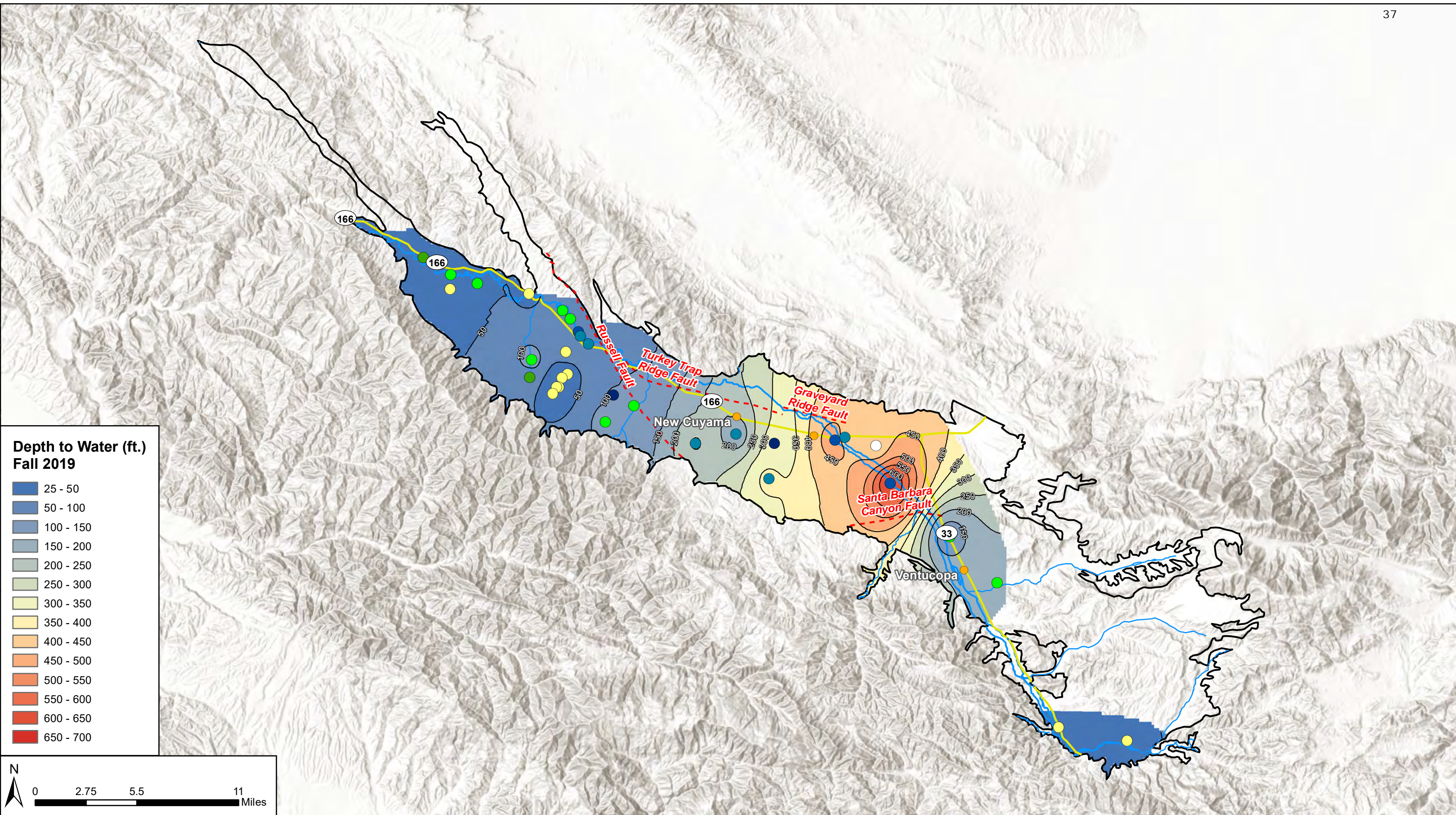
- Legend**
- Cuyama Basin
 - Cuyama River
 - - - Faults
 - Groundwater Elevation Above MSL

- Well Depth Below GSE**
- Unknown
 - 600 - 800 ft
 - 0 - 100 ft
 - 900 - 1,000 ft
 - 200 - 400 ft
 - 1,000 - 1,200 ft
 - 400 - 600 ft

Contours were interpolated using data measured from 8/1/2019 - 11/30/2019 due to limited data availability.
 Contours Interval: 100 ft.

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**Depth to Water (ft.)
Fall 2019**

- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- 200 - 250
- 250 - 300
- 300 - 350
- 350 - 400
- 400 - 450
- 450 - 500
- 500 - 550
- 550 - 600
- 600 - 650
- 650 - 700

N

0 2.75 5.5 11 Miles

**Figure 2-7: Cuyama GW Basin
Fall 2019 Depth to Water**

Cuyama Basin Groundwater Sustainability Agency
Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
January 2020



Legend

- Cuyama Basin
- Cuyama River
- Faults
- Groundwater Depth-to-Water Contours below Groundsurface

- Well Depth Below GSE**
- Unknown
 - 0 - 100 ft
 - 200 - 400 ft
 - 400 - 600 ft
 - 600 - 800 ft
 - 900 - 1,000 ft
 - 1,000 - 1,200 ft

Contours were interpolated using data measured from 8/1/2019 - 11/30/2019 due to limited data availability.
Contours Interval: 50 ft.

2.3 Hydrographs

Groundwater hydrographs were developed for each monitoring network well to provide indicators of groundwater trends throughout the Basin. Measurements from each well with historical monitoring data were compiled into one hydrograph for each well. A selection of wells from each threshold region are provided below, while hydrographs for every well are presented in Appendix A.

In many cases, changes in historical groundwater conditions at particular wells have been influenced by climactic patterns in the Basin. Historical precipitation is highly variable, with several relatively wet years and some multi-year droughts.

Groundwater conditions generally vary in different parts of the Basin. To provide a comparative analysis general groundwater trends are provided in Table 2-1 and are accompanied by hydrographs for each threshold regions. A map of threshold regions is provided in Figure 2-8, which also shows the locations of example wells used in each threshold region.

Table 2-1: Groundwater Trends by Threshold Region

Threshold Region	Groundwater Trend	Example Well
Northwestern Region	Slight downward trend influenced by seasonal fluctuations. This is expected as recent changes in land use have begun to pump groundwater. Levels are still approximately 80 ft above the Measurable Objective.	841 (Figure 2-9)
Western Region	Levels in this region have either stayed relatively flat or slightly increased.	108 (Figure 2-10)
Central Region	Levels have historically had a steady downward trend with some seasonal fluctuations. This pattern remains with trends continuing downward and, in some cases, levels surpassing minimum thresholds.	91 (Figure 2-11)
Eastern Region	This region has seen an overall decline over several decades, however, recent groundwater trends appear to be equilibrizing.	62 (Figure 2-12)
Southeastern Region	Levels in this relatively small region decreased slightly during the last drought but have recovered over the past few years and are well above the Measurable Objective.	89 (Figure 2-13)

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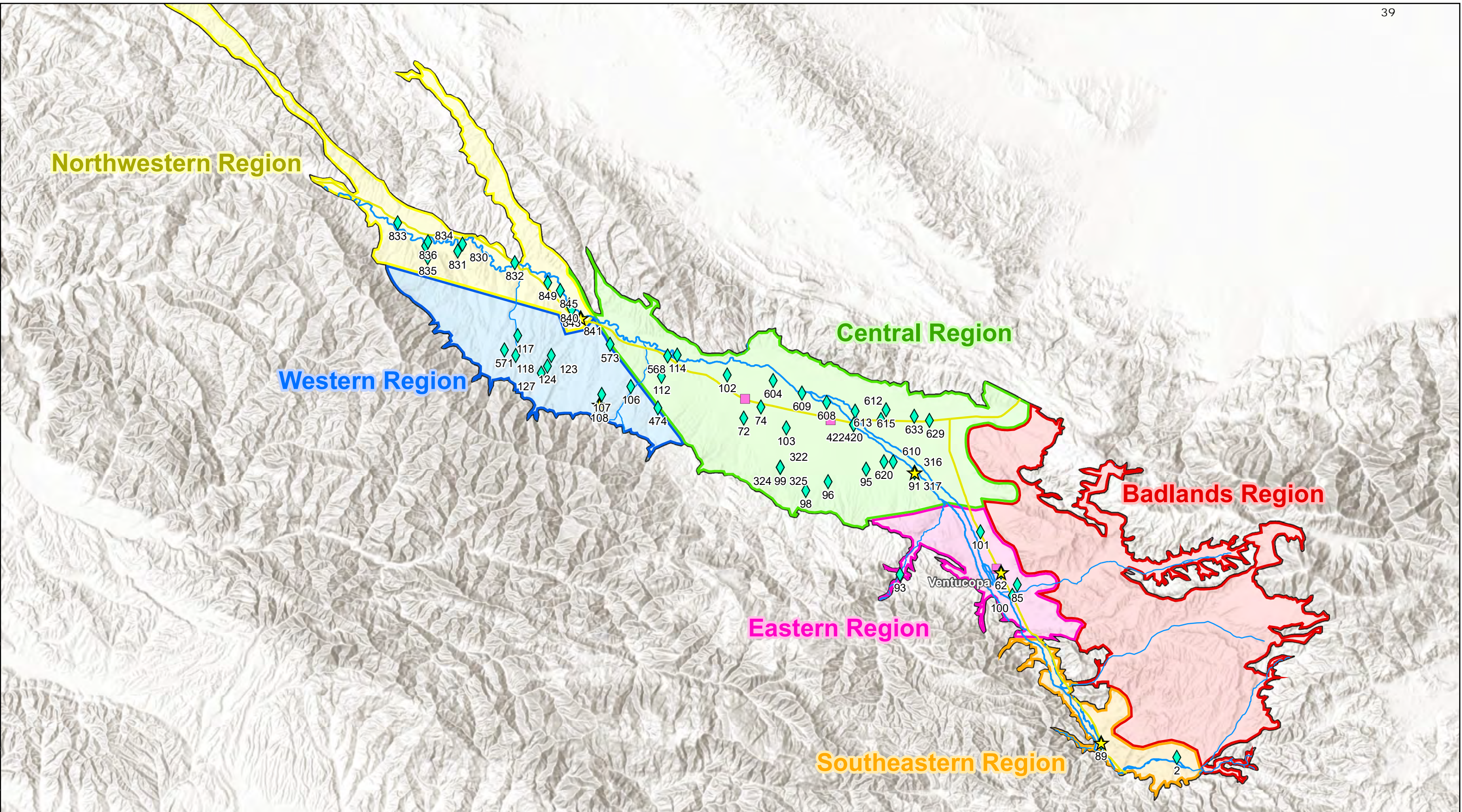


Figure 2-8: Cuyama GW Basin Representative Wells and Wells with Hydrographs in the Annual Report Text

Cuyama Basin Groundwater Sustainability Agency

Cuyama Valley Groundwater Basin Groundwater Sustainability Plan

January 2020



Legend

- Towns
- Highways
- Cuyama River
- Streams
- Cuyama Basin
- ◆ Representative Wells
- ★ Wells with Example Hydrographs in Annual Report

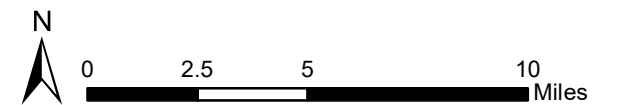


Figure 2-9: Example Well Hydrographs – Northwestern Region

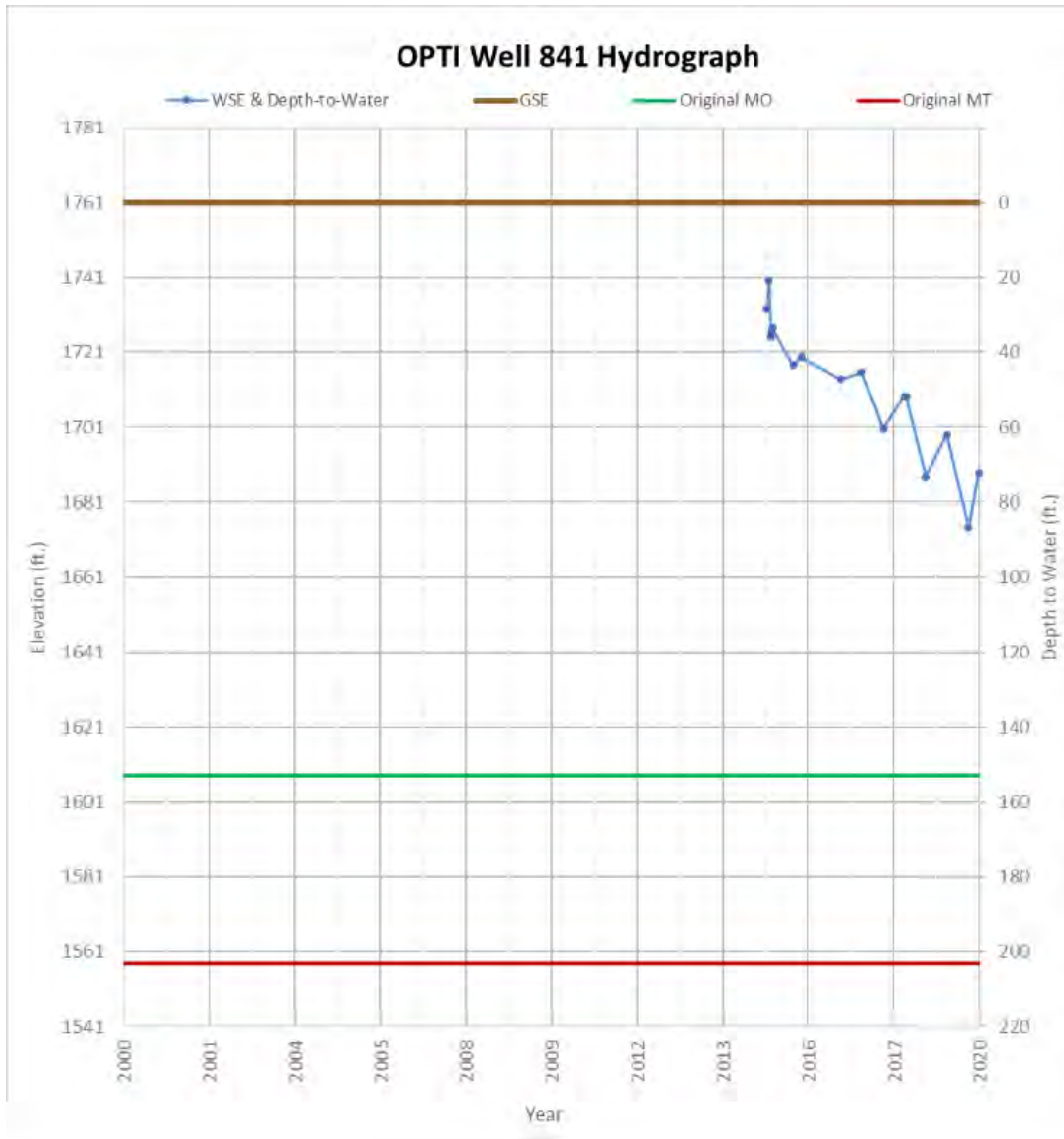


Figure 2-10: Example Well Hydrographs – Western Region

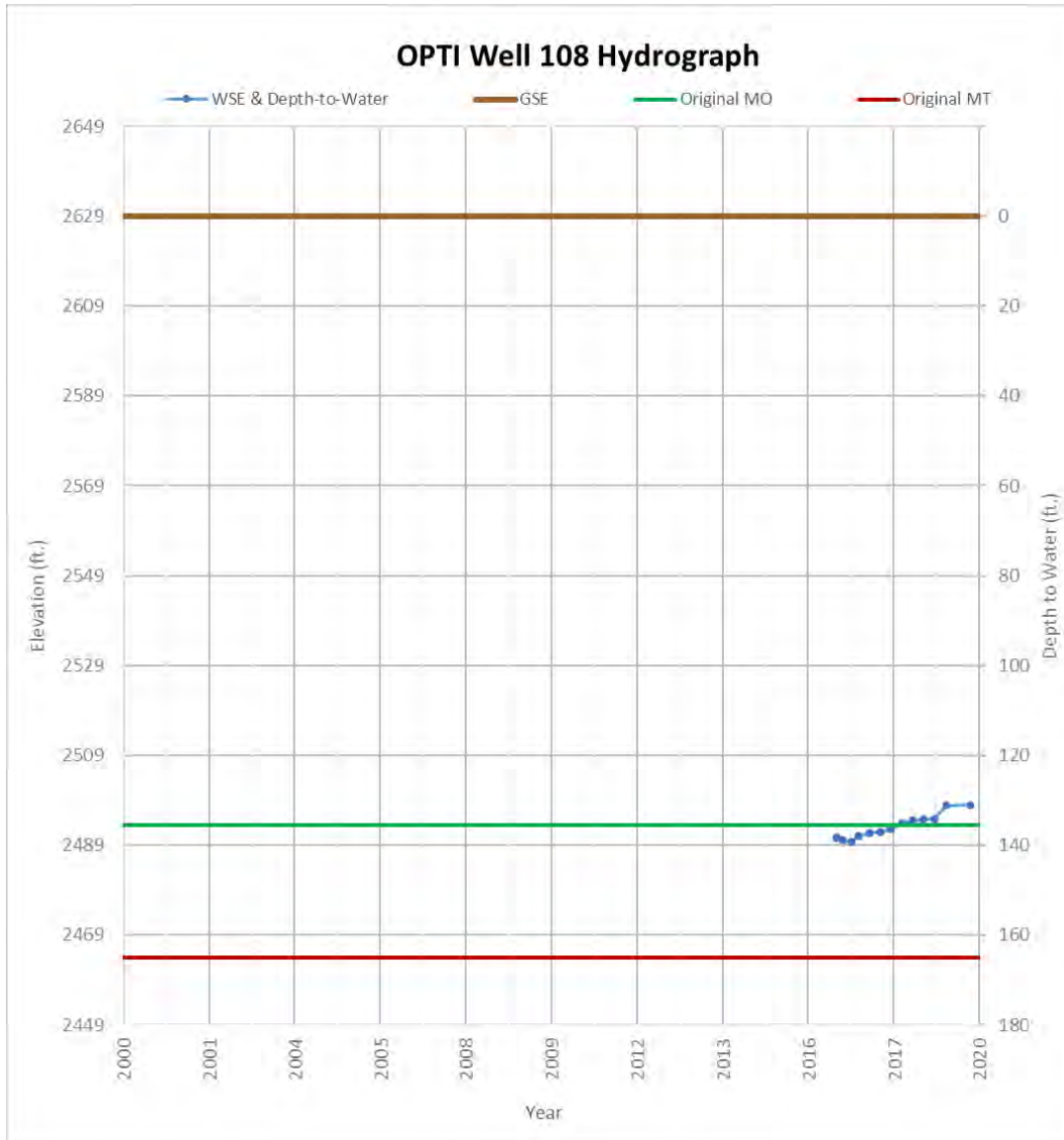


Figure 2-11: Example Well Hydrographs – Central Region

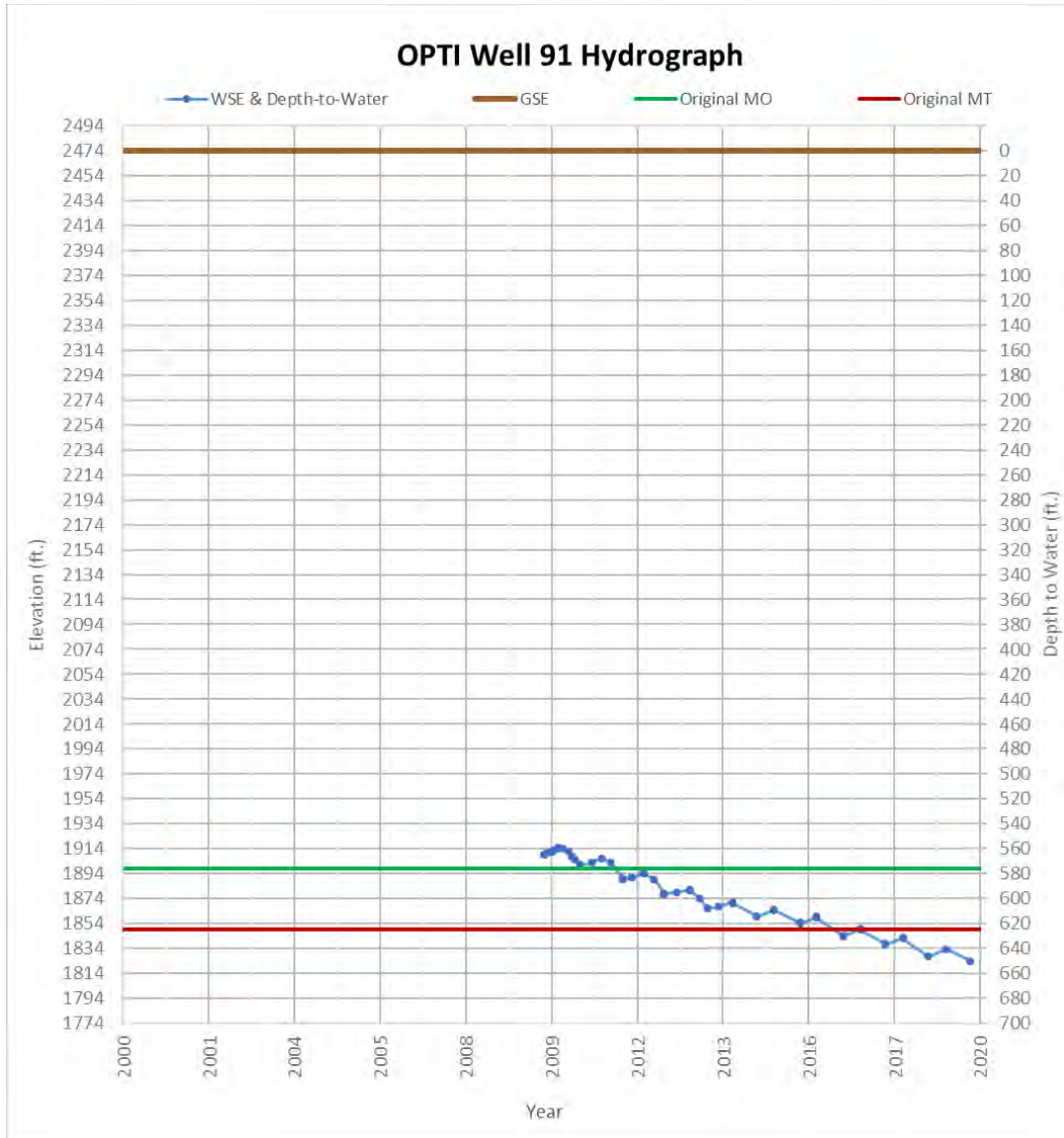


Figure 2-12: Example Well Hydrographs – Eastern Region

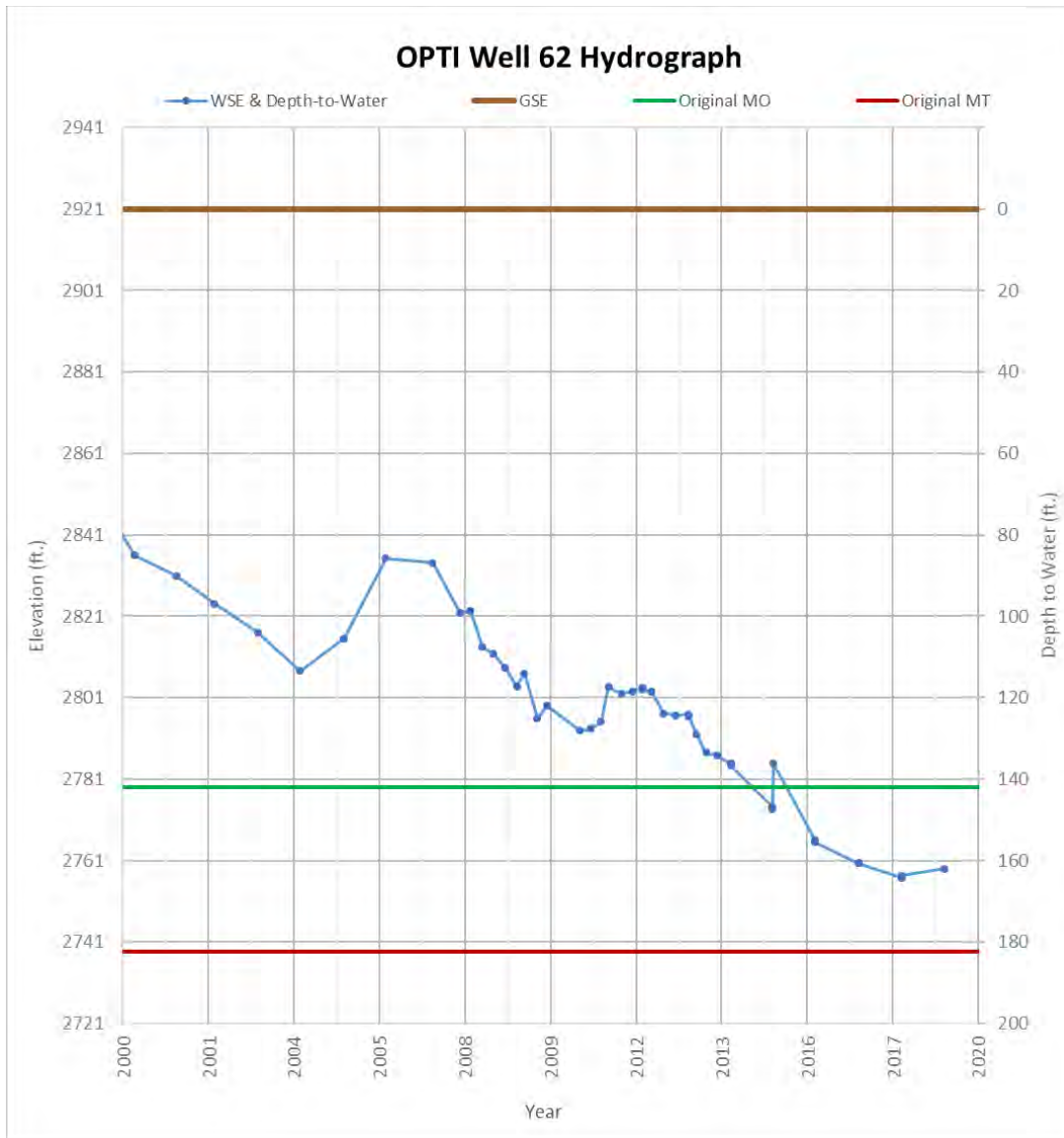
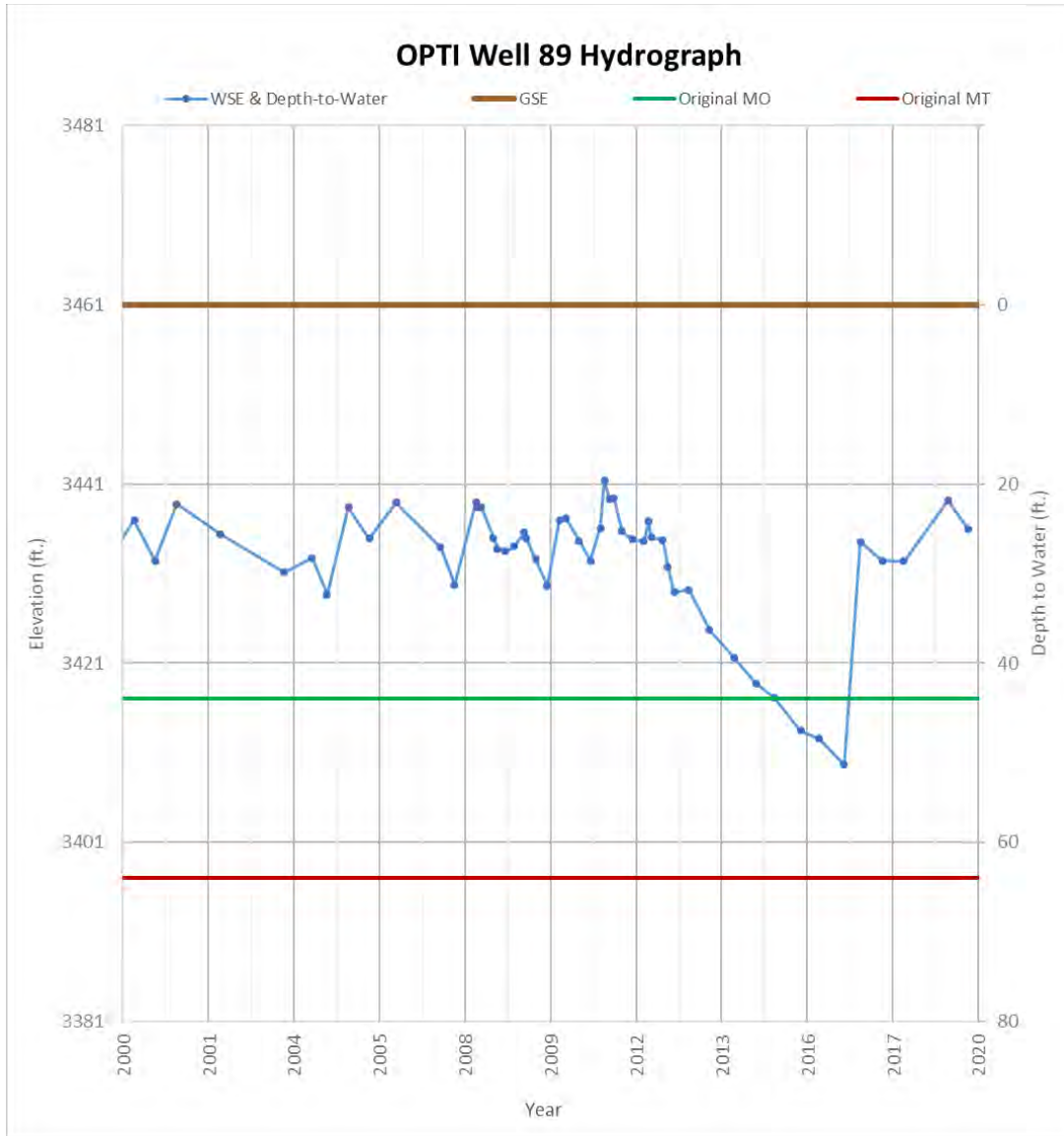


Figure 2-13: Example Well Hydrographs – Southeastern Region



Section 3. Water Use

§356.2 (b) (2)	Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.
§356.2 (b) (3)	Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.
§356.2 (b) (4)	Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements. Existing water use data from the most recent Urban Water Management Plans or Agricultural Water Management Plans within the basin may be used, as long as the data are reported by water year.

3.1 Groundwater Extraction

Water budgets in the Cuyama Basin GSP were developed using the Cuyama Basin Water Resources Model (CBWRM) model, which is a fully integrated surface and groundwater flow model covering the Basin. The CBWRM was used to develop a historical water budget that evaluated the availability and reliability of past surface water supply deliveries, aquifer response to water supply, and demand trends relative to water year type. For the GSP, the CBWRM was used to develop water budget estimates for the hydrologic period of 1998 through 2017. As discussed in the GSP, the model was developed based on the best available data and information as of June 2018. An assessment of model uncertainty included in the GSP estimated an error range in overall model results of about +/- 10%. It is expected that the model will be refined in the future as improved and updated monitoring information becomes available for the Basin. For the Annual Report, the CBWRM model was extended to include the 2018 and 2019 water years, utilizing updated land use, temperature and precipitation data from those years.

Figure 3-1 shows the annual time series of groundwater pumping for the water years 1998 through 2019. The CBWRM estimates the following total groundwater extraction amounts in the Cuyama Basin in the 2018 and 2019 water years:

- 2018 Water Year: 60,000 AF
- 2019 Water Year: 47,200 AF

Almost all groundwater extraction in the Basin is for agriculture use. There is approximately 300 AF of domestic use in each year, with the remainder in each year being for agricultural use.

DRAFT

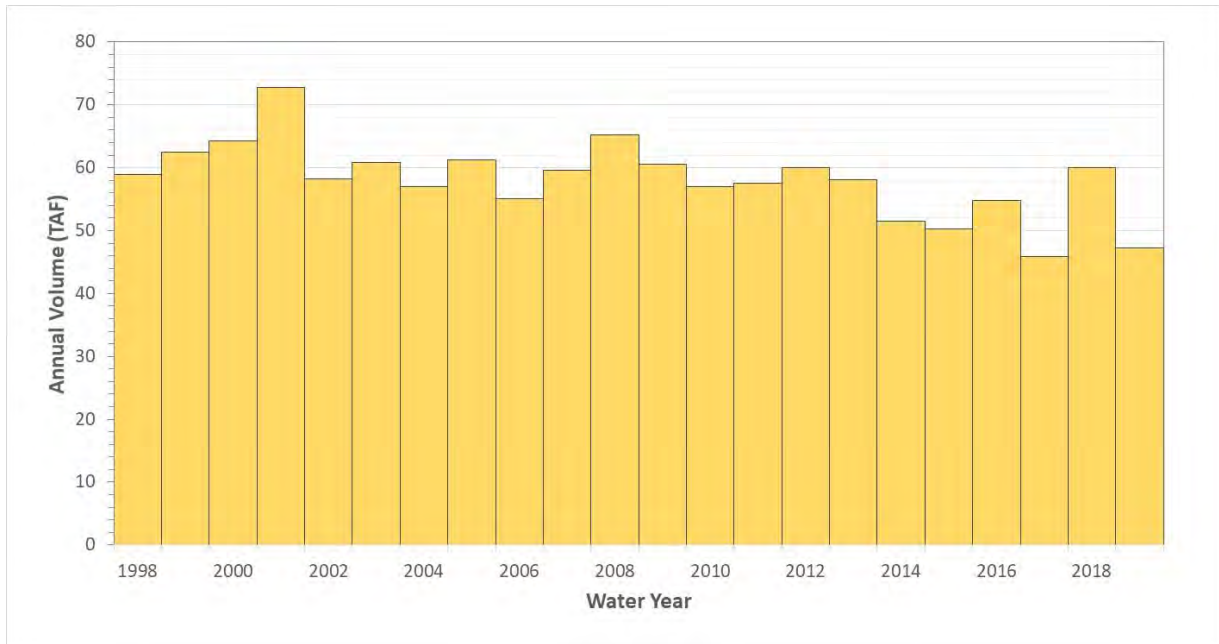


Figure 3-1: Annual Groundwater Extraction in the Cuyama Basin in Water Years 1998-2019

Figure 3-2 shows the locations where groundwater is applied in the Basin. The locations of groundwater use have not changed since completion of the GSP.

3.2 Surface Water Use

No surface water was used in the Cuyama Basin during the reporting period.

3.3 Total Water Use

Since there is no surface water use in the Cuyama Basin, the total water use equals the groundwater extraction in each year, as shown in Section 3.1.

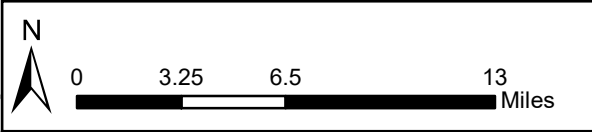
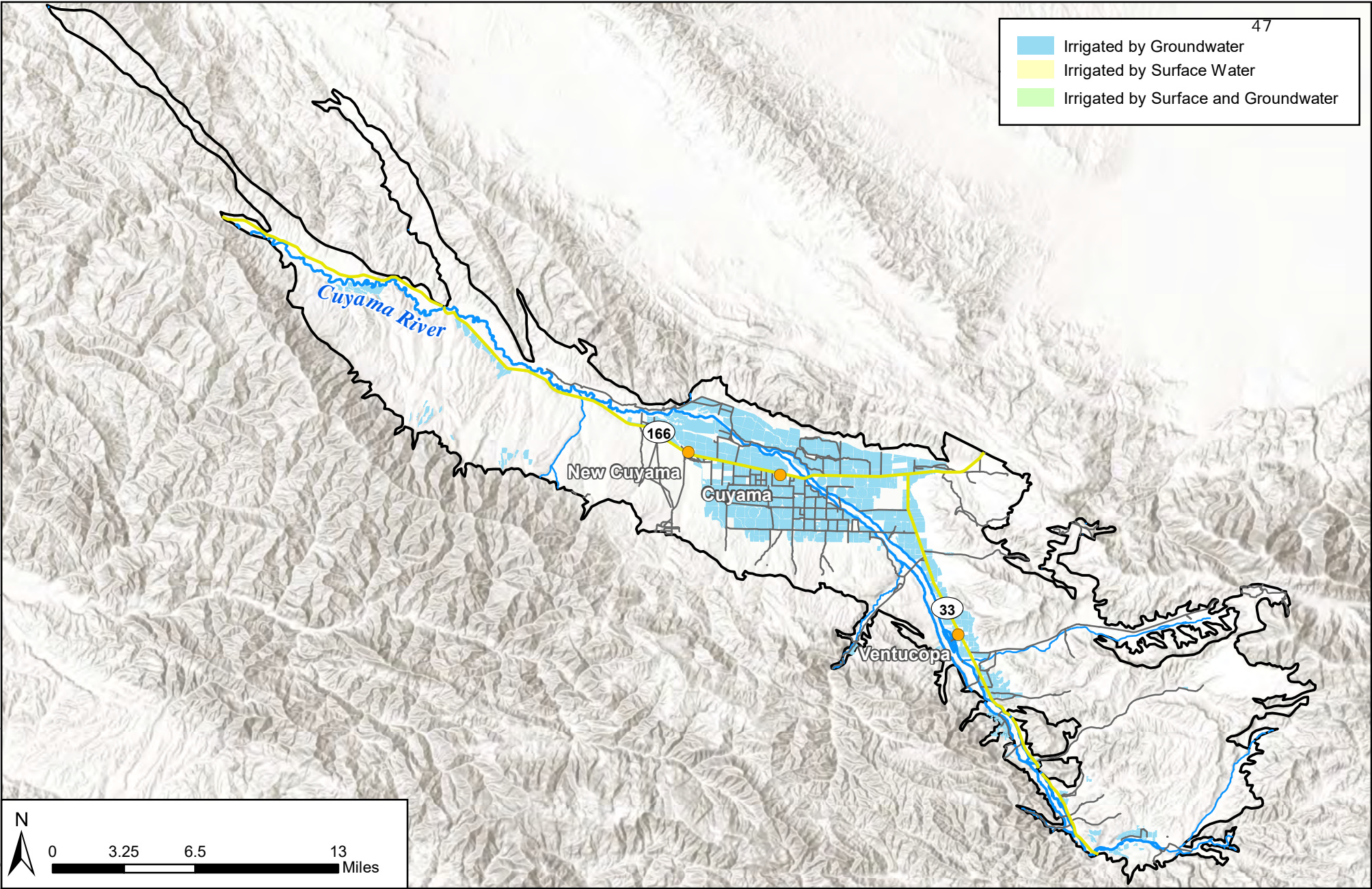
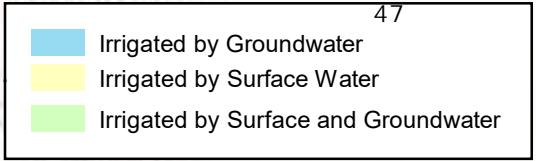
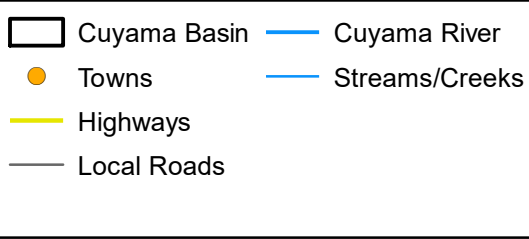


Figure 3-2 - Land Use by Water Source
 Cuyama Basin Groundwater Sustainability Agency
 Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
 January 2020



Legend



Source: California Department of Water Resources Statewide Crop Mapping, 2016 dataset, <https://gis.water.ca.gov/app/CADWRLandUseViewer/>

Figure Exported: 6/19/2018 8:00 AM By: mwricks Using: \\woodardcurran.net\shared\Projects\RM\O\SAC\01011078_00 - Cuyama Basin GSP\PC_GIS\MXDs\Text\PlanArea\Fig_1-14_Land Use by Water_Source.mxd

Section 4. Change in Groundwater Storage

§356.2 (b) (5)	Change in groundwater in storage shall include the following:
§356.2 (b) (5) (A)	Change in groundwater in storage maps for each principal aquifer in the basin.
§356.2 (b) (5) (B)	A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

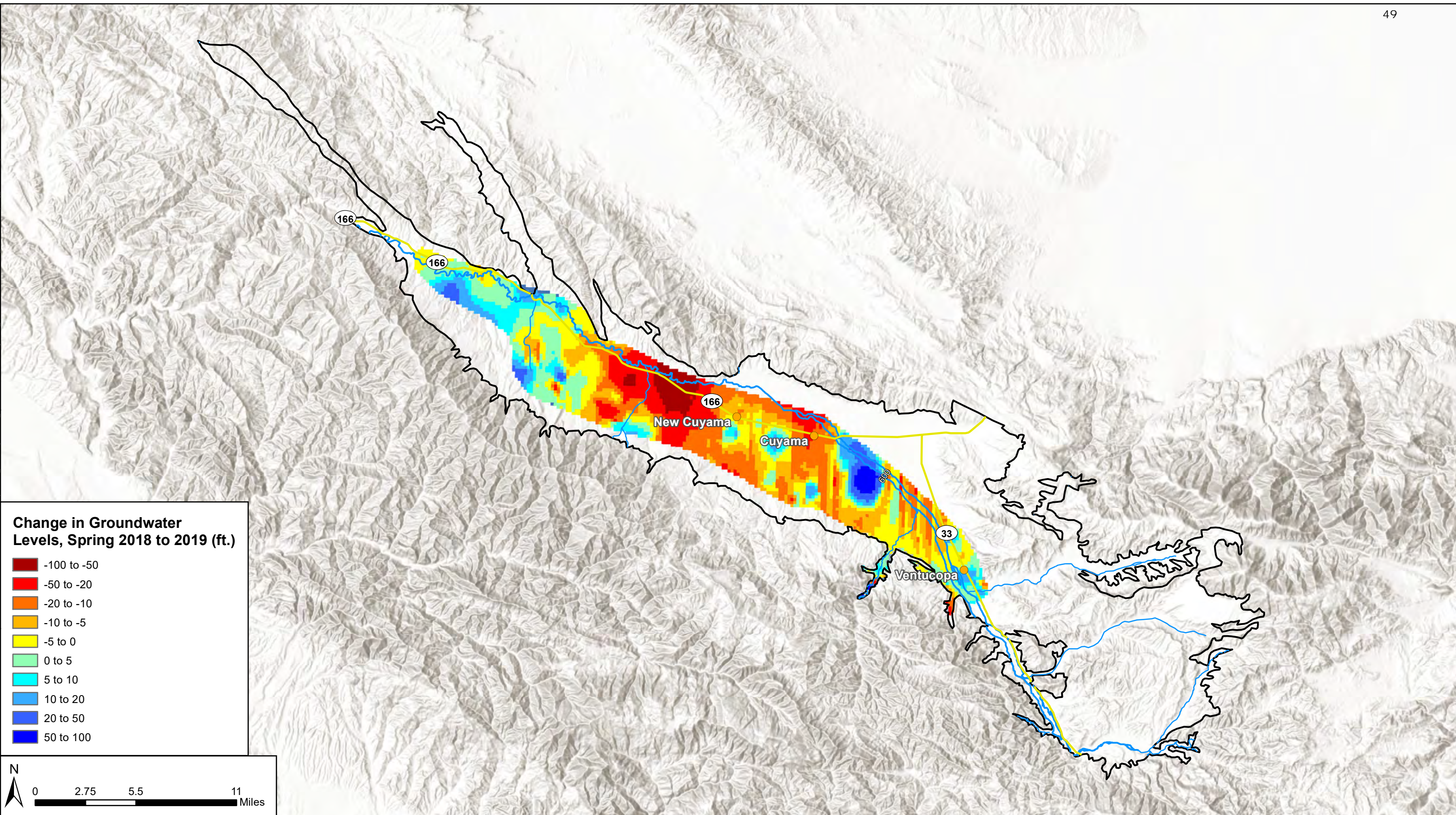
Figure 4-1 shows contours of the estimated change in groundwater levels in the Cuyama Basin between 2018 and 2019. The changes shown are based on historical measurements of groundwater elevations in Cuyama Basin representative wells in each year. Since the Cuyama Basin monitoring network has not yet been fully implemented, the change in groundwater levels are based on only a limited number of wells, especially in the Central Basin. It is expected that the estimated annual change in groundwater levels can be improved in the future as more comprehensive monitoring data becomes available in the Basin.

A quantitative estimate of the annual change in groundwater storage was estimated using the CBWRM model, which was extended to include the 2018 and 2019 water years as described in the groundwater extraction section above. The CBWRM was used to estimate the full groundwater budget for each year in the Cuyama Basin, which consists of a single principal aquifer. The estimated values for each water budget component in each year are shown in Table 4-1. The CBWRM estimates reductions in groundwater storage of 39,400 AF in 2018 and 11,100 AF in 2019.

Table 4-1: Groundwater Budget Estimates for Water Years 2018 and 2019

Component	Water Year 2018 (AFY)	Water Year 2019 (AFY)
<i>Inflows</i>		
Deep percolation	17,200	26,300
Stream seepage	2,000	8,000
Subsurface inflow	1,400	1,800
<i>Total Inflow</i>	20,600	36,100
<i>Outflows</i>		
Groundwater pumping	60,000	47,200
<i>Total Outflow</i>	60,000	47,200
<i>Change in Storage</i>	(39,400)	(11,100)

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Change in Groundwater Levels, Spring 2018 to 2019 (ft.)

- 100 to -50
- 50 to -20
- 20 to -10
- 10 to -5
- 5 to 0
- 0 to 5
- 5 to 10
- 10 to 20
- 20 to 50
- 50 to 100

N

0 2.75 5.5 11 Miles

Figure 4-1: Cuyama GW Basin Spring 2018 to 2019 GWL Change

Cuyama Basin Groundwater Sustainability Agency

Cuyama Valley Groundwater Basin Groundwater Sustainability Plan

January 2020



Legend

- Cuyama Basin
- Cuyama River

Rasters have been developed as an estimation tool. Areas of overlapping interpolation data for Spring 2019 and Spring 2018 were interpolated using data measured from February 1st and April 30th of each year due to limited data availability. It should be noted this information should be used with individual well hydrographs to make a more informative analysis of groundwater conditions.

Figure 4-2 shows the historical shows change in groundwater storage by year, water year type,³ and cumulative water volume in each year for the period from 1998 through 2019. The change in groundwater storage in each year was estimated by the CBWRM model. The color of bar for each year of change in storage correlates a water year type defined by Basin precipitation.

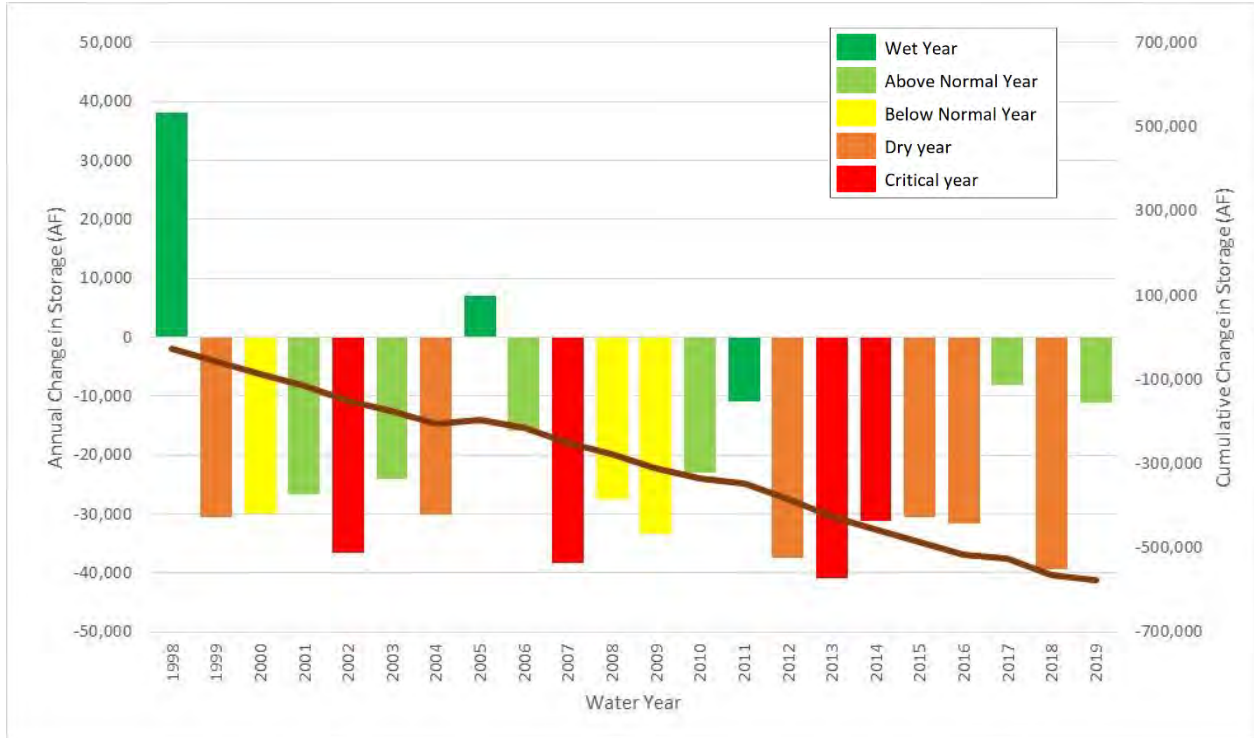


Figure 4-2: Change in Groundwater Storage by Year, Water Year Type, and Cumulative Water Volume

³ Water year types are customized for the Basin watershed based on annual precipitation as follows:

- Wet year = more than 19.6 inches
- Above normal year = 13.1 to 19.6 inches
- Below normal year = 9.85 to 13.1 inches
- Dry year = 6.6 to 9.85 inches
- Critical year = less than 6.6 inches.

Section 5. Plan Implementation

§356.2 (c)	A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report.
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This section describes management activities taken by the CBGSA to implement the Cuyama Basin GSP from adoption of the GSP through preparation of this annual report.

5.1 Funding to Support GSP Implementation

On November 6, 2019, the CBGSA Board approved the implementation of a groundwater extraction fee of \$19 per acre-foot of pumping in 2019 to provide revenue to fund CBGSA administration and GSP implementation activities. It is estimated that the extraction fee will provide approximately \$1,021,936 in revenue.

5.2 Stakeholder Outreach Activities in Support of GSP Implementation

The following is a list of public meetings where GSP development and implementation was discussed during 2019.

- CBGSA Board meetings: January 9, February 6, April 3, June 5, July 10, August 7, and December 4
- Standing Advisory Committee (SAC) meetings: January 8, January 31, February 28, March 28, April 25, May 30, and June 27
- Joint meetings of the CBGSA Board and SAC: March 6, May 1, and November 6
- Community workshops (in both English and Spanish): March 6 and May 1

5.3 Progress on Implementation of GSP Projects

Table 5-1 shows the projects and management actions that were included in the GSP. The following subsections describe the progress of implementation of each GSP project.

DRAFT

Activity	Current Status	Anticipated Timing	Estimated Cost ^a
Project 1: Flood and Stormwater Capture	Conceptual project evaluated in 2015	<ul style="list-style-type: none"> Feasibility study: 0 to 5 years Design/Construction: 5 to 15 years 	<ul style="list-style-type: none"> Study: \$1,000,000 Flood and Stormwater Capture Project: \$600-\$800 per AF (\$2,600,000 – 3,400,000 per year)
Project 2: Precipitation Enhancement	Initial Feasibility Study completed in 2016	<ul style="list-style-type: none"> Refined project study: 0 to 2 years Implementation of Precipitation Enhancement: 0 to 5 years 	<ul style="list-style-type: none"> Study: \$200,000 Precipitation Enhancement Project: \$25 per AF (\$150,000 per year)
Project 3: Water Supply Transfers/Exchanges	Not yet begun	<ul style="list-style-type: none"> Feasibility study/planning: 0 to 5 years Implementation in 5 to 15 years 	<ul style="list-style-type: none"> Study: \$200,000 Transfers/Exchanges: \$600-\$2,800 per AF (total cost TBD)
Project 4: Improve Reliability of Water Supplies for Local Communities	Preliminary studies/planning complete	<ul style="list-style-type: none"> Feasibility studies: 0 to 2 years Design/Construction: 1 to 5 years 	<ul style="list-style-type: none"> Study: \$100,000 Design/Construction: \$1,800,000
Management Action 1: Basin-Wide Economic Analysis	Completed	<ul style="list-style-type: none"> December 2020 	<ul style="list-style-type: none"> \$60,000
Management Action 2: Pumping Allocations in Central Basin Management Area	Preliminary coordination begun	<ul style="list-style-type: none"> Pumping Allocation Study completed: 2022 Allocations implemented: 2023 through 2040 	<ul style="list-style-type: none"> Plan: \$300,000 Implementation: \$150,000 per year
Adaptive Management	Not yet begun	Only implemented if triggered; timing would vary	TBD

^a Estimated cost based on planning documents and professional judgment
AF = acre-feet

Table 5-1: Summary of Projects and Management Actions Included in the GSP

5.3.1 Project 1: Flood and Stormwater Capture

No progress was made towards implementation of this project since completion of the GSP in January 2020.

5.3.2 Project 2: Precipitation Enhancement

No progress was made towards implementation of this project since completion of the GSP in January 2020.

5.3.3 Project 3: Water Supply Transfers or Exchanges

No progress was made towards implementation of this project since completion of the GSP in January 2020.

5.3.4 Project 4: Improve Reliability of Water Supplies for Local Communities

No progress was made towards implementation of this project in 2019.

5.4 Management Actions

Table 5-1 shows the projects and management actions that were included in the GSP. The following subsections describe the progress of implementation of each GSP management action.

5.4.1 Management Action 1: Basin-Wide Economic Analysis

A Basin-wide direct economic analysis of proposed GSP actions was completed. The results of this analysis were presented to the GSP Board on December 4, 2019, and the final report was completed in December 2019. The final basin-wide economic analysis report is provided in Appendix B. This management action is 100% complete.

5.4.2 Management Action 2: Pumping Allocations in Central Basin Management Area

An agreement was executed between the CBGSA and CBWD for the CBWD to administer management actions in the Central basin management area. Beyond that agreement, no significant progress was made towards implementation of this management action since completion of the GSP in January 2020.

5.5 Adaptive Management

No adaptive management activities have been conducted since completion of the GSP in January 2020.

5.6 Progress Towards Implementation of Monitoring Networks

- This section provides updates about implementation of the monitoring networks identified during GSP development.

5.6.1 Groundwater Levels Monitoring Network

On December 4, 2019, the CBGSA Board approved a task to begin implementation of the groundwater levels monitoring network. As part of this task, well information sheets will be prepared for 40 wells in the monitoring network to allow for implementation of regular monitoring at each well. Work on this task will be completed by the end of 2020, allowing for the initiation of monthly groundwater levels monitoring.

In addition, under a Category 1 grant from DWR, continuous monitoring equipment will be installed in 10 additional wells during 2020. Figure 5-1 shows the preliminary locations selected for installation.

Finally, the CBGSA has approved applications to be submitted to DWR's Technical Support Services (TSS) for installation of three new monitoring wells within the Basin.

Figure Exported: 2/20/2020, By: cengipton Using: C:\Users\cengipton\OneDrive - Woodard & Curran\PCF\Folders\Desktop\Current\Projects\0111078-003 - Cuyama01 - Local Cuyama GIS - 20180803\MXD\Da\Text\Annual Report\Cat_1 Wells.mxd

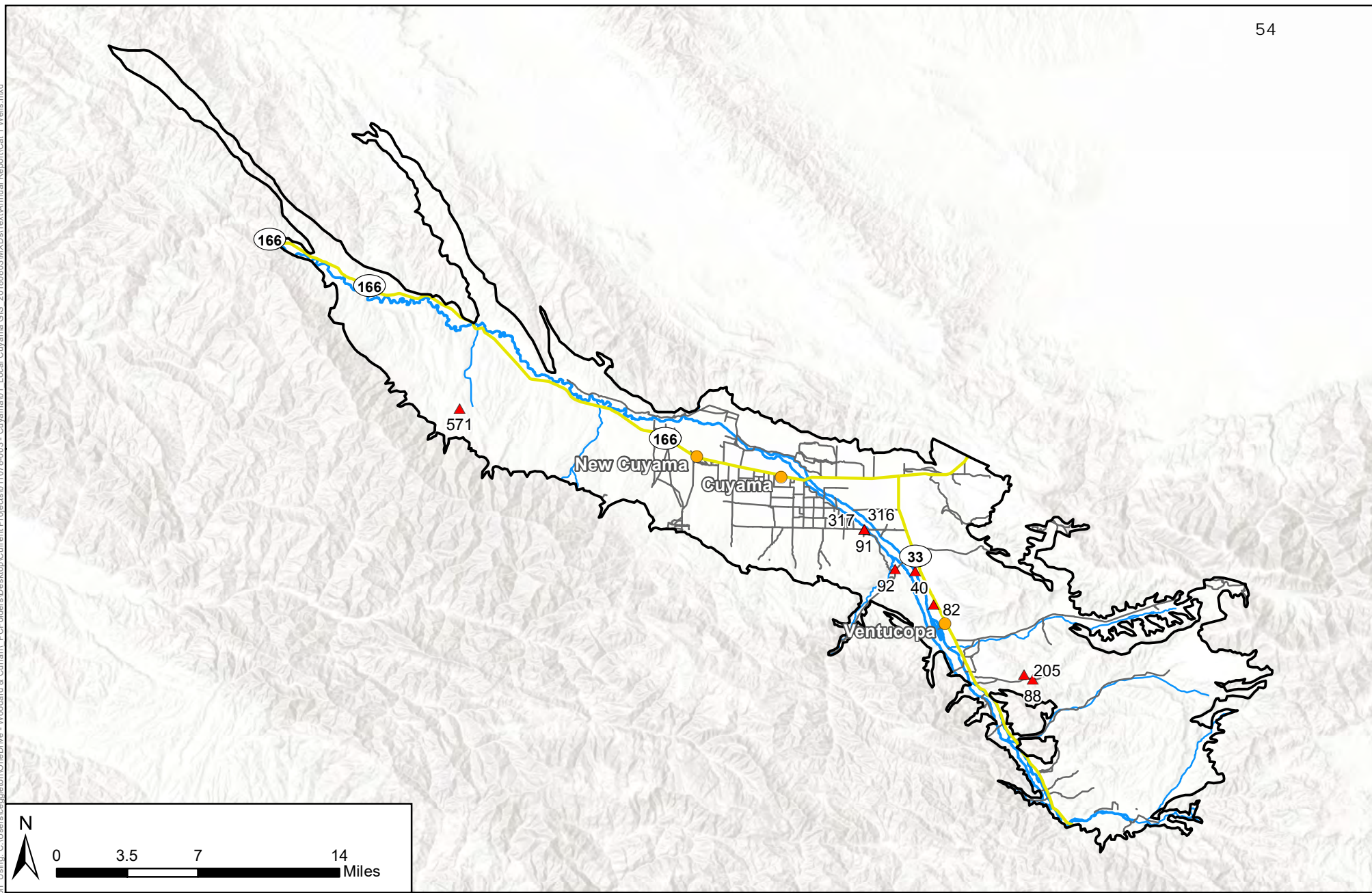


Figure 5-1 Cuyama Groundwater Basin Category 1 Wells

Cuyama Basin Groundwater Sustainability Agency
 Cuyama Valley Groundwater Basin Groundwater Sustainability Plan
 January 2020



Legend

- Cuyama GW Basin
- ▲ Category 1 Wells
- Highways
- Local Roads
- Cuyama River
- Streams

5.6.2 Surface Water Monitoring Network

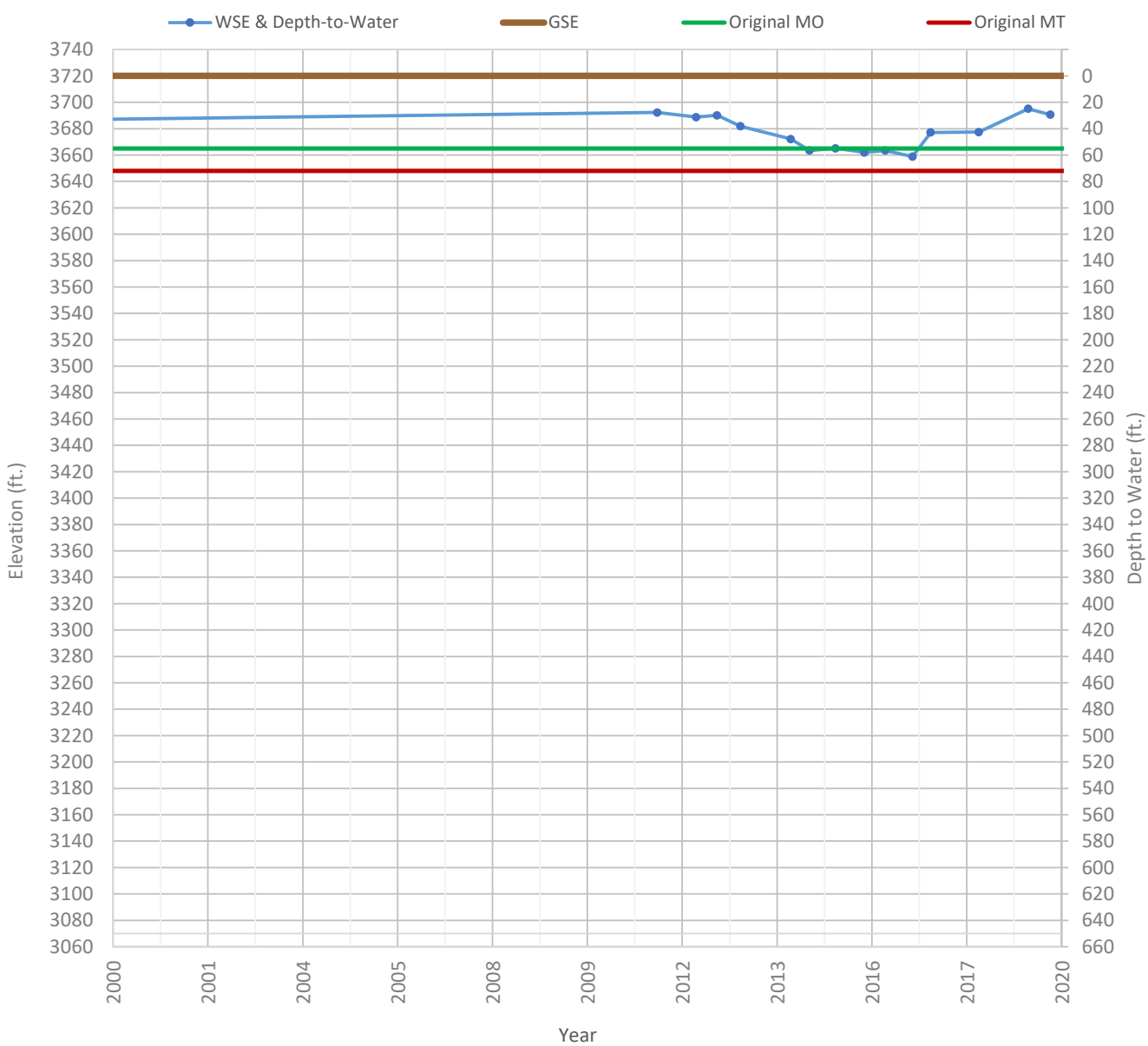
Under a Category 1 grant from DWR, it is expected that two new surface flow gages will be installed on the Cuyama River during 2020.

Section 6. References

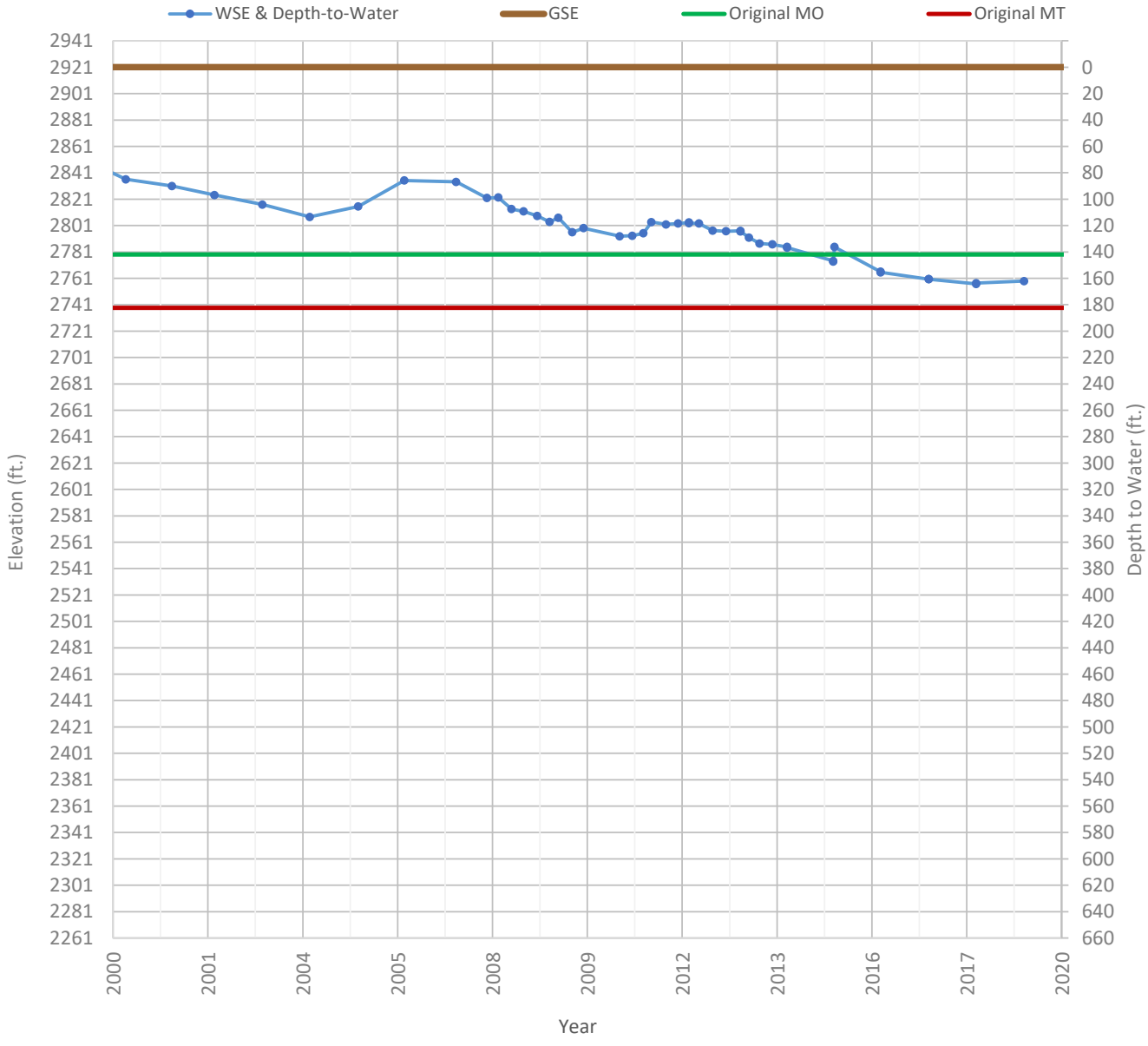
California Department of Water Resources (DWR). 2003. DWR's *California's Groundwater Bulletin 118 – Update 2003* (Bulletin 118). <https://water.ca.gov/LegacyFiles/groundwater/bulletin118/basindescriptions/3-13.pdf>

Appendix A - Updated Hydrographs for Representative Wells

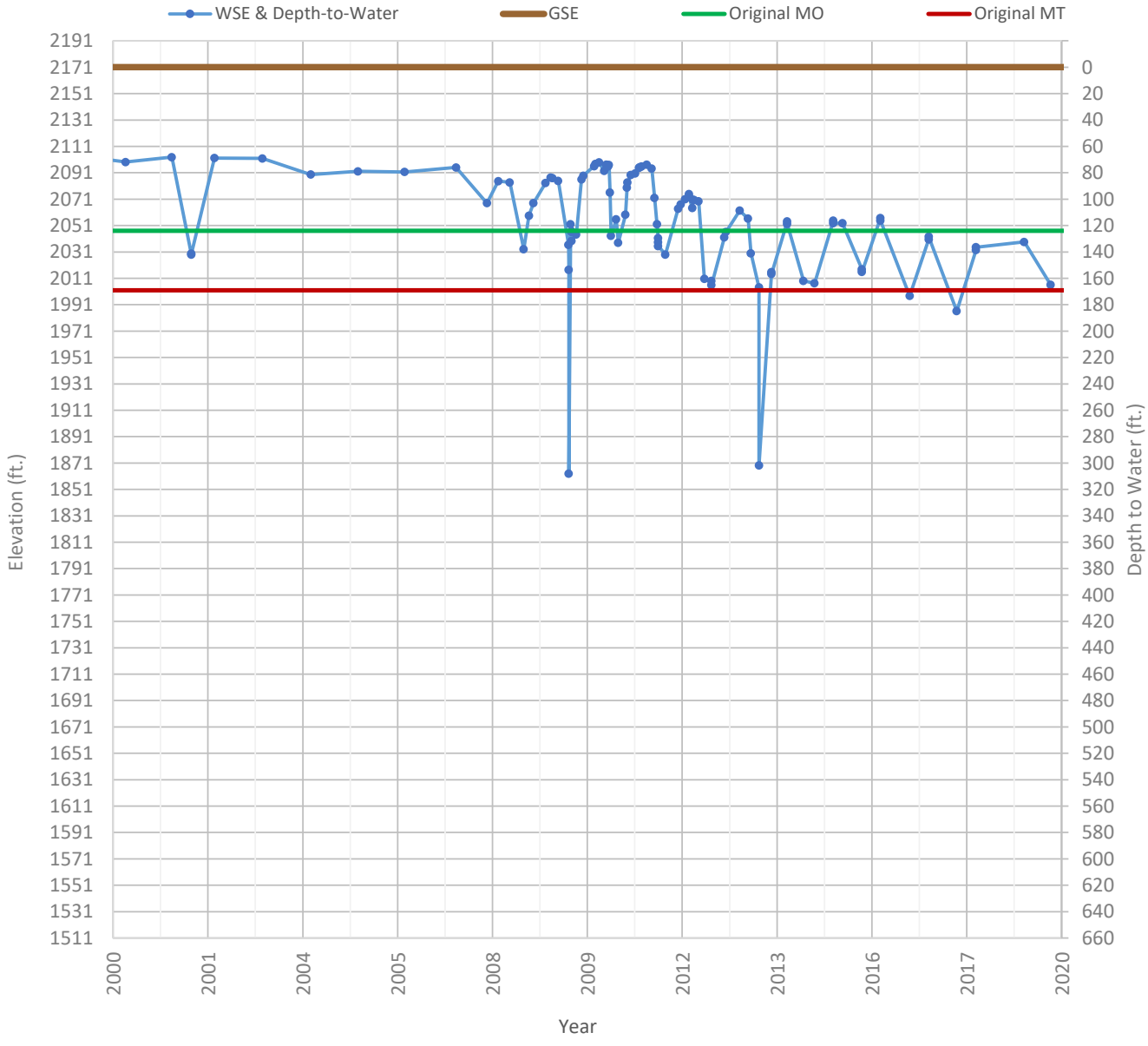
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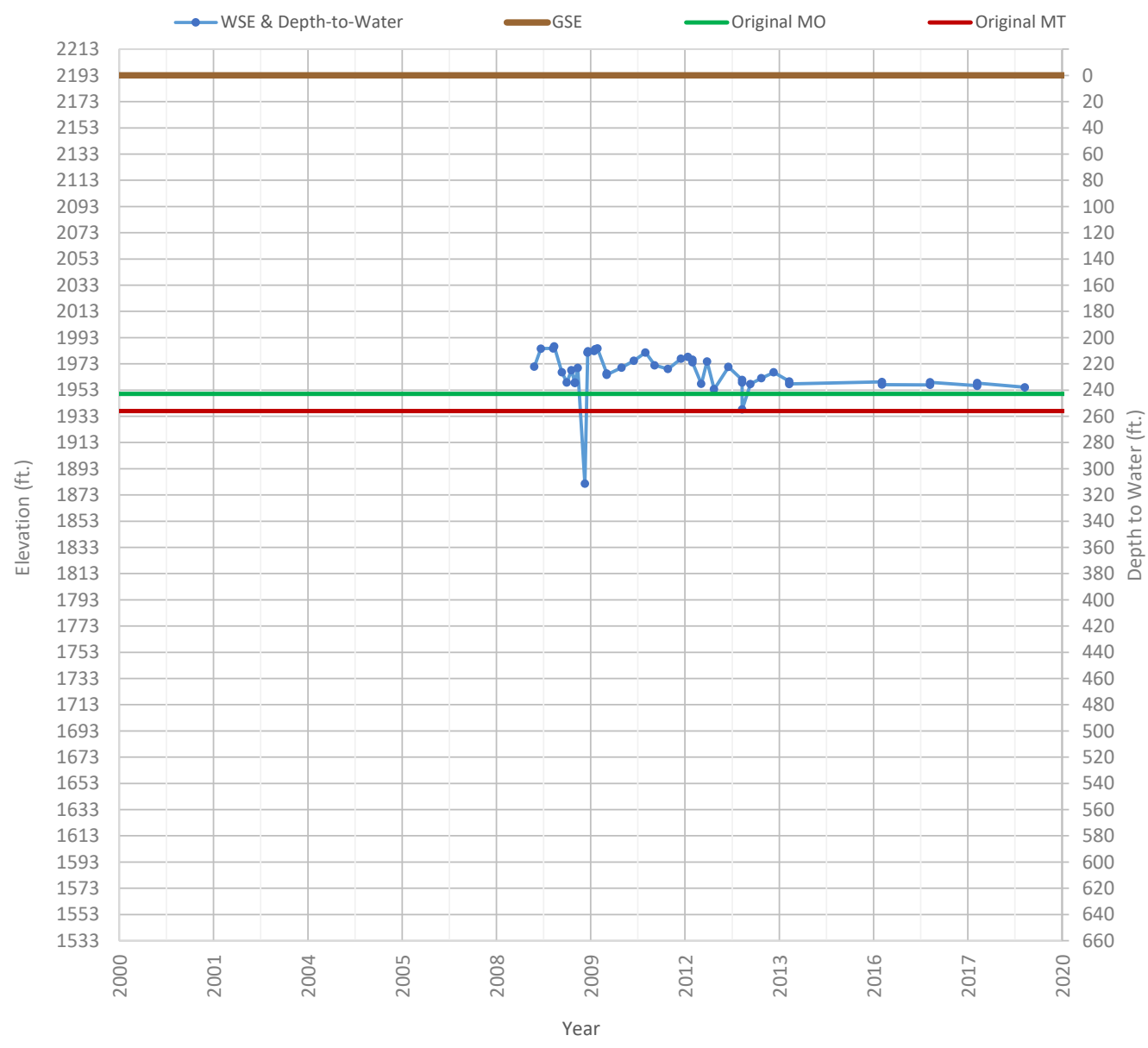
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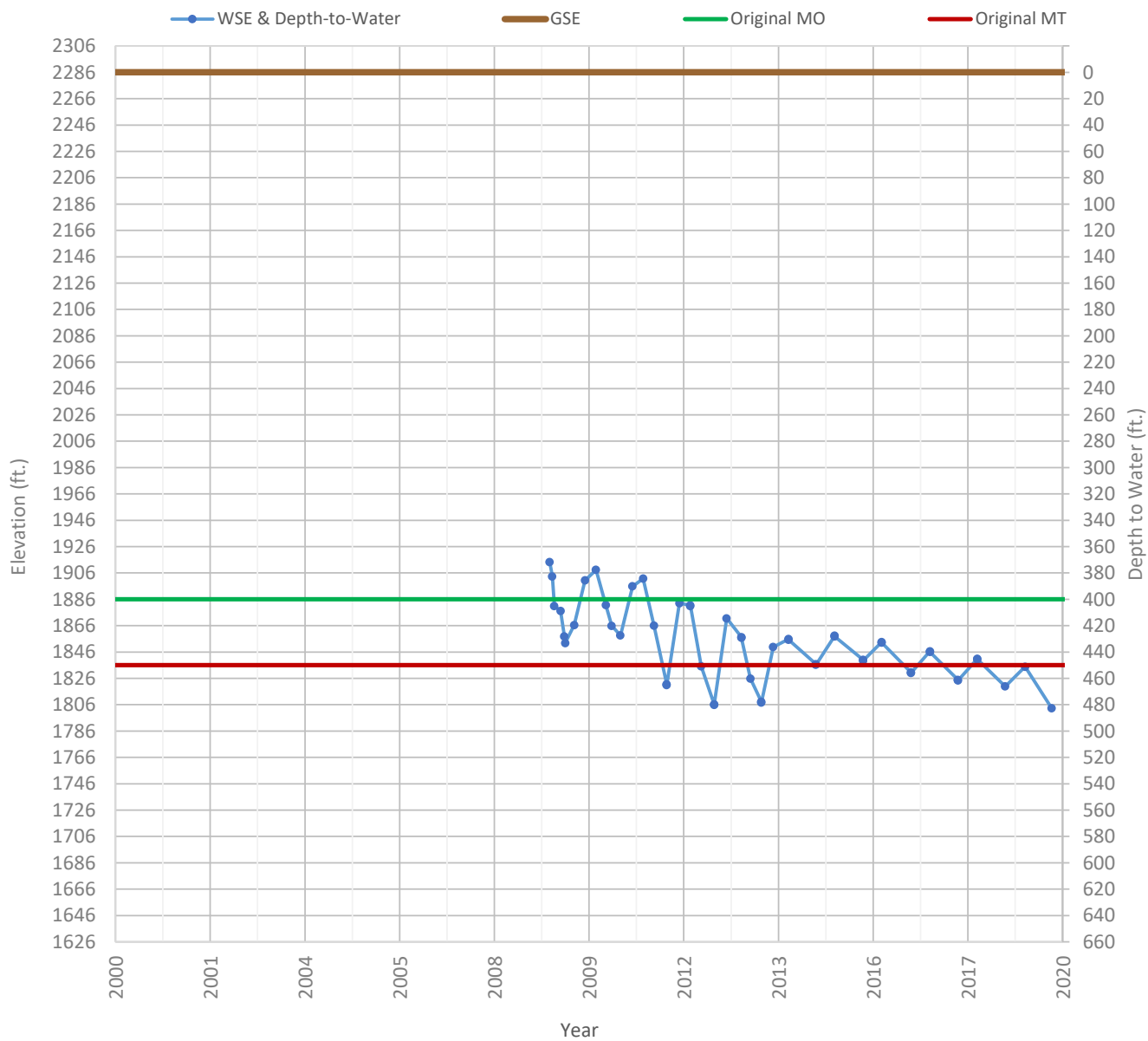
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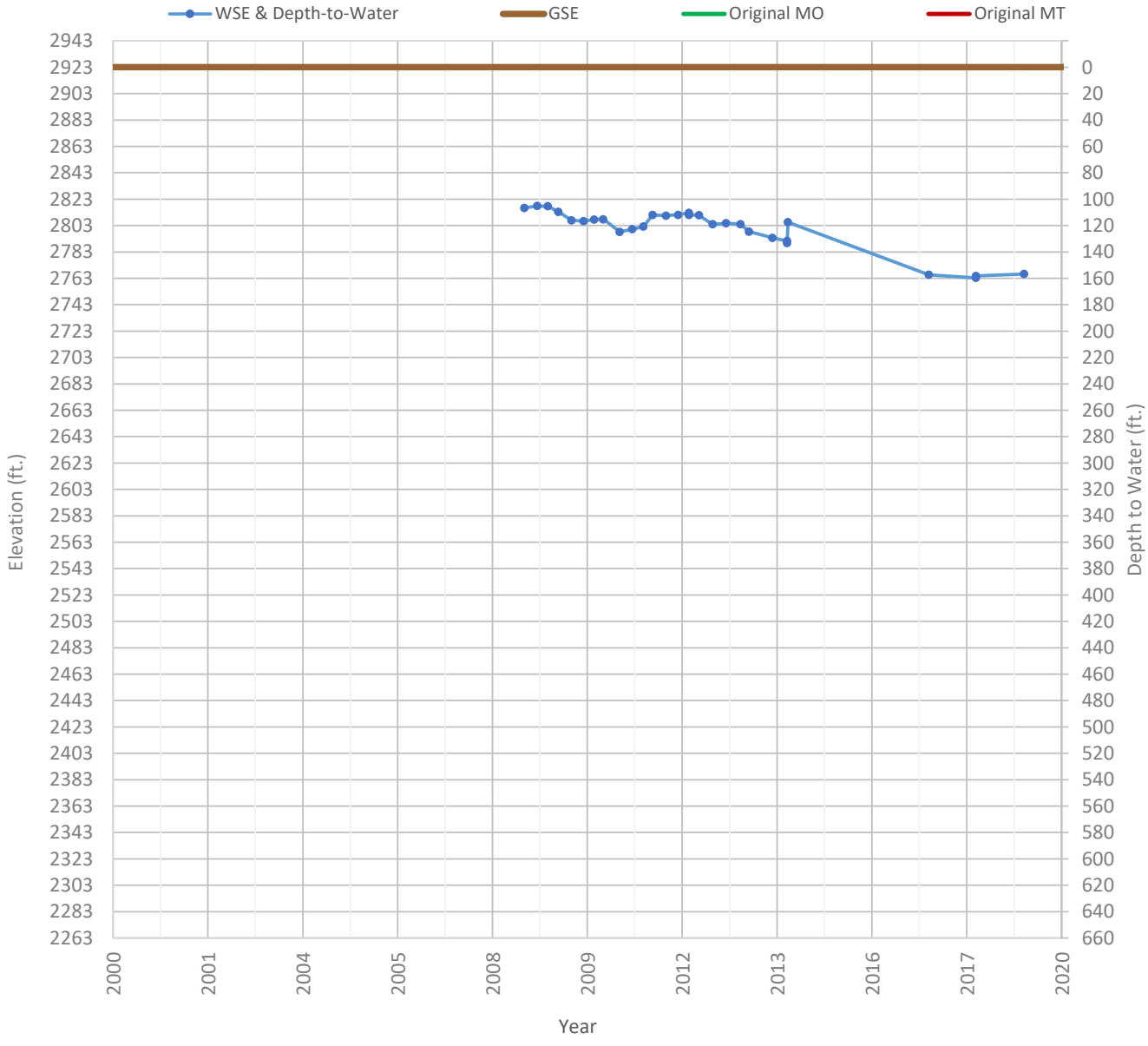
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OPTI Well 77 Hydrograph



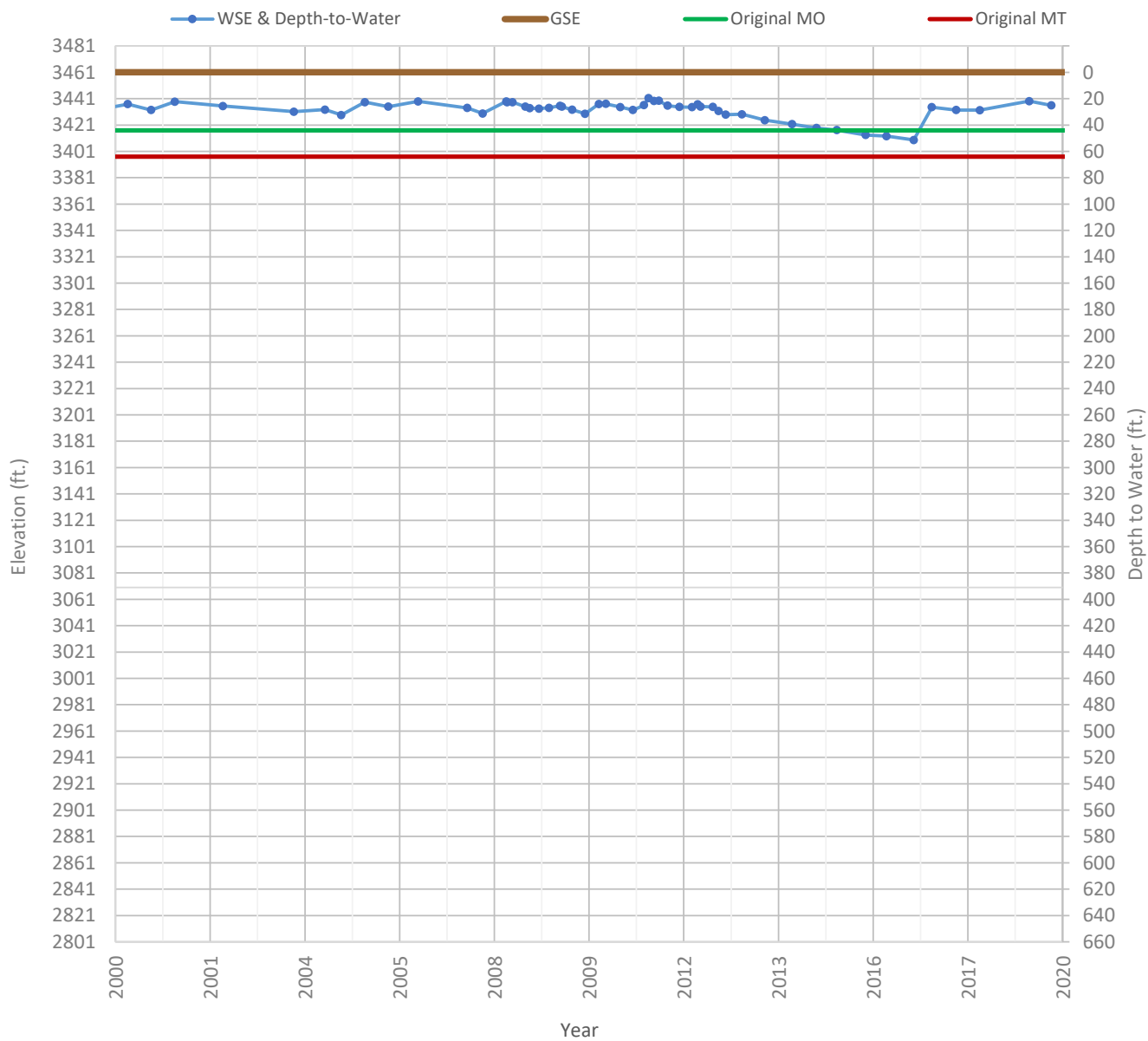
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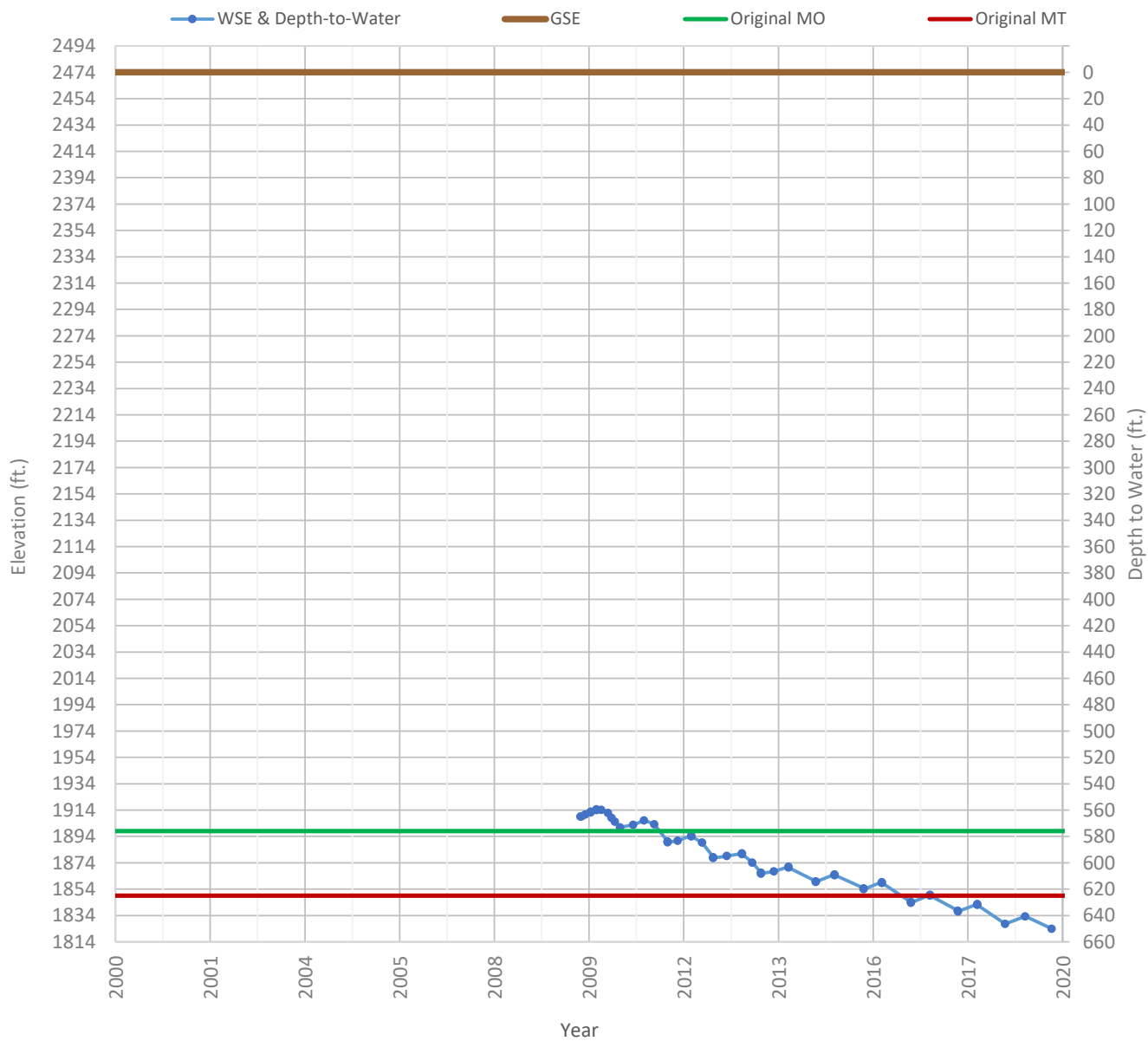
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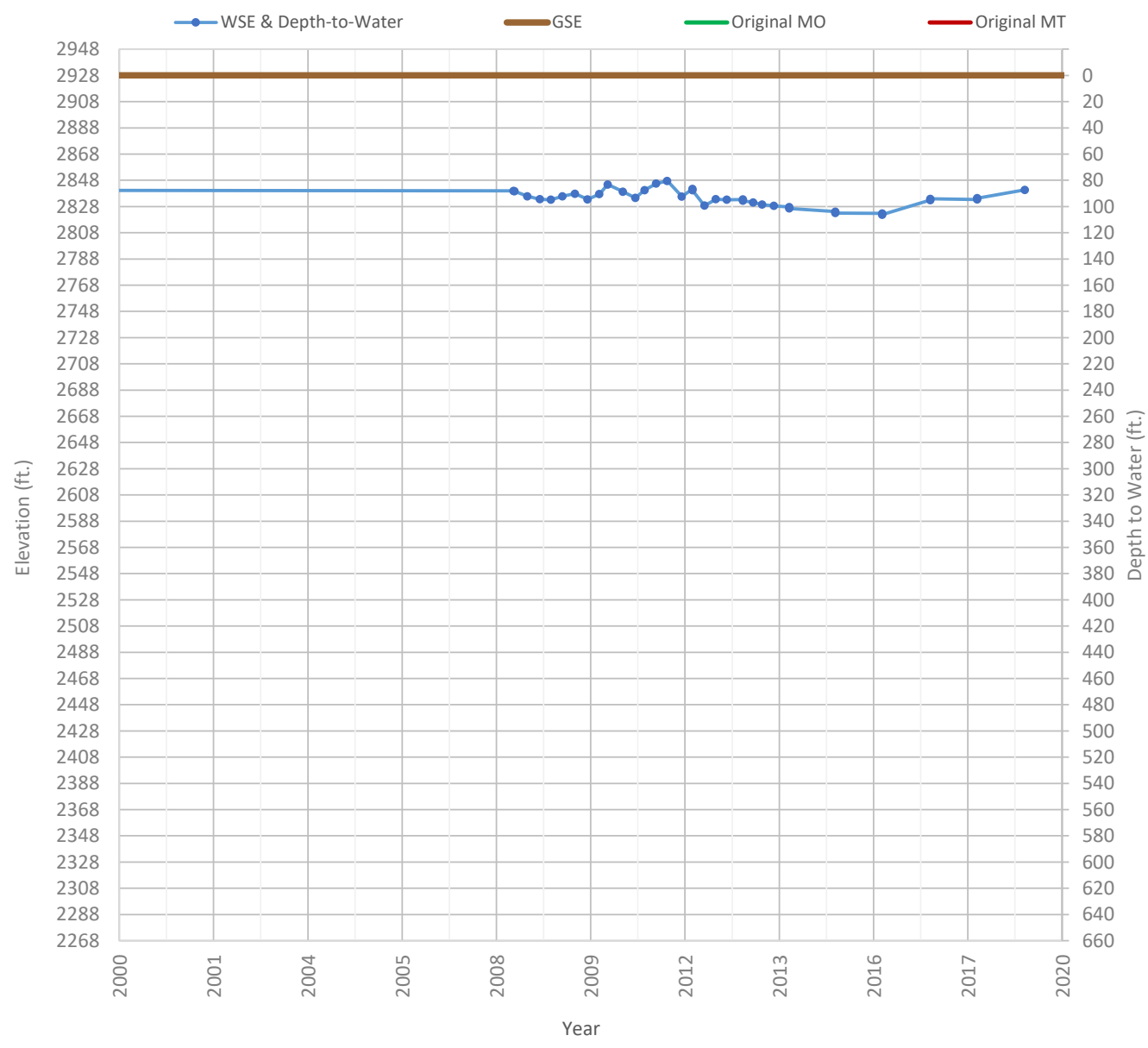
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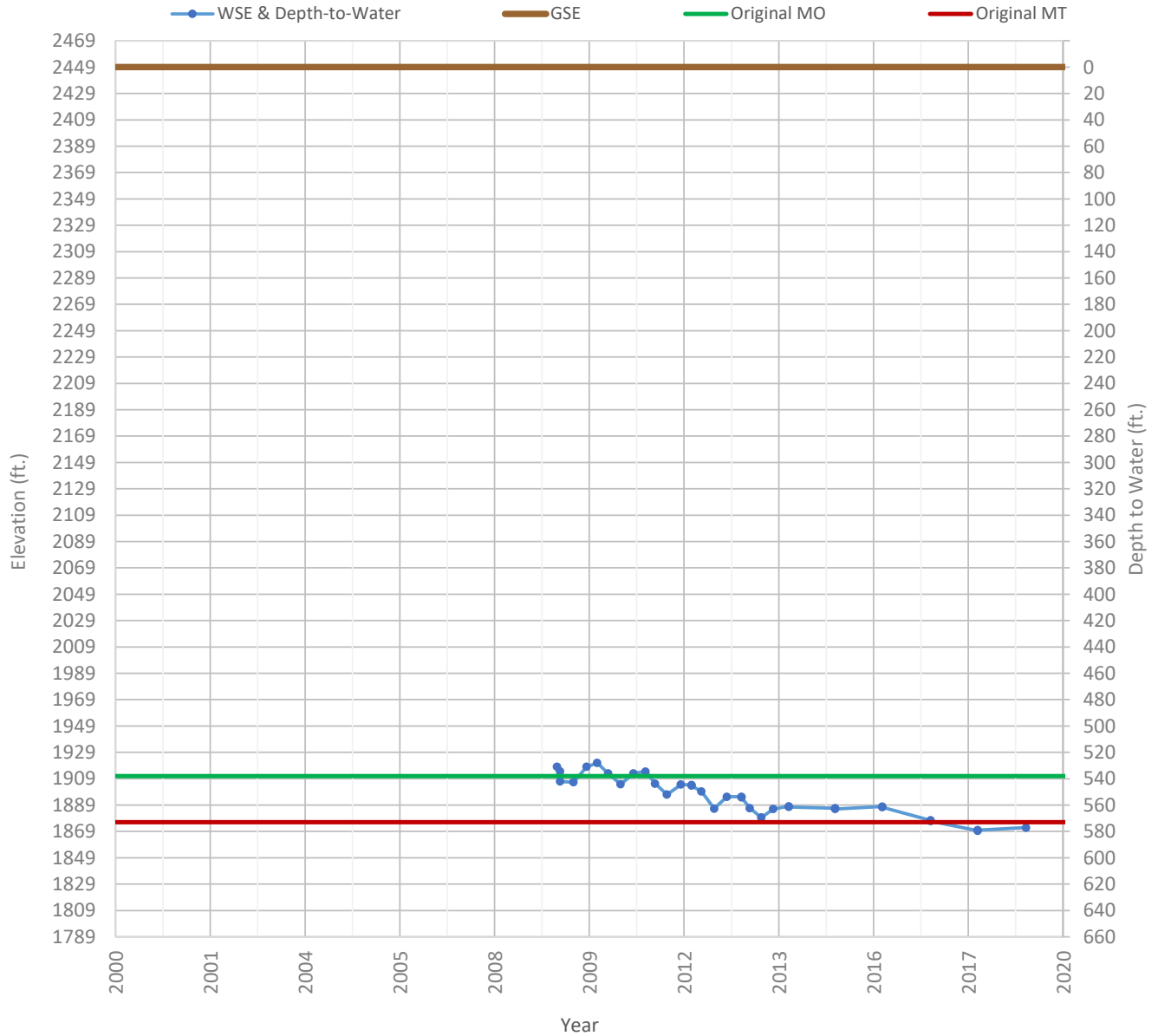
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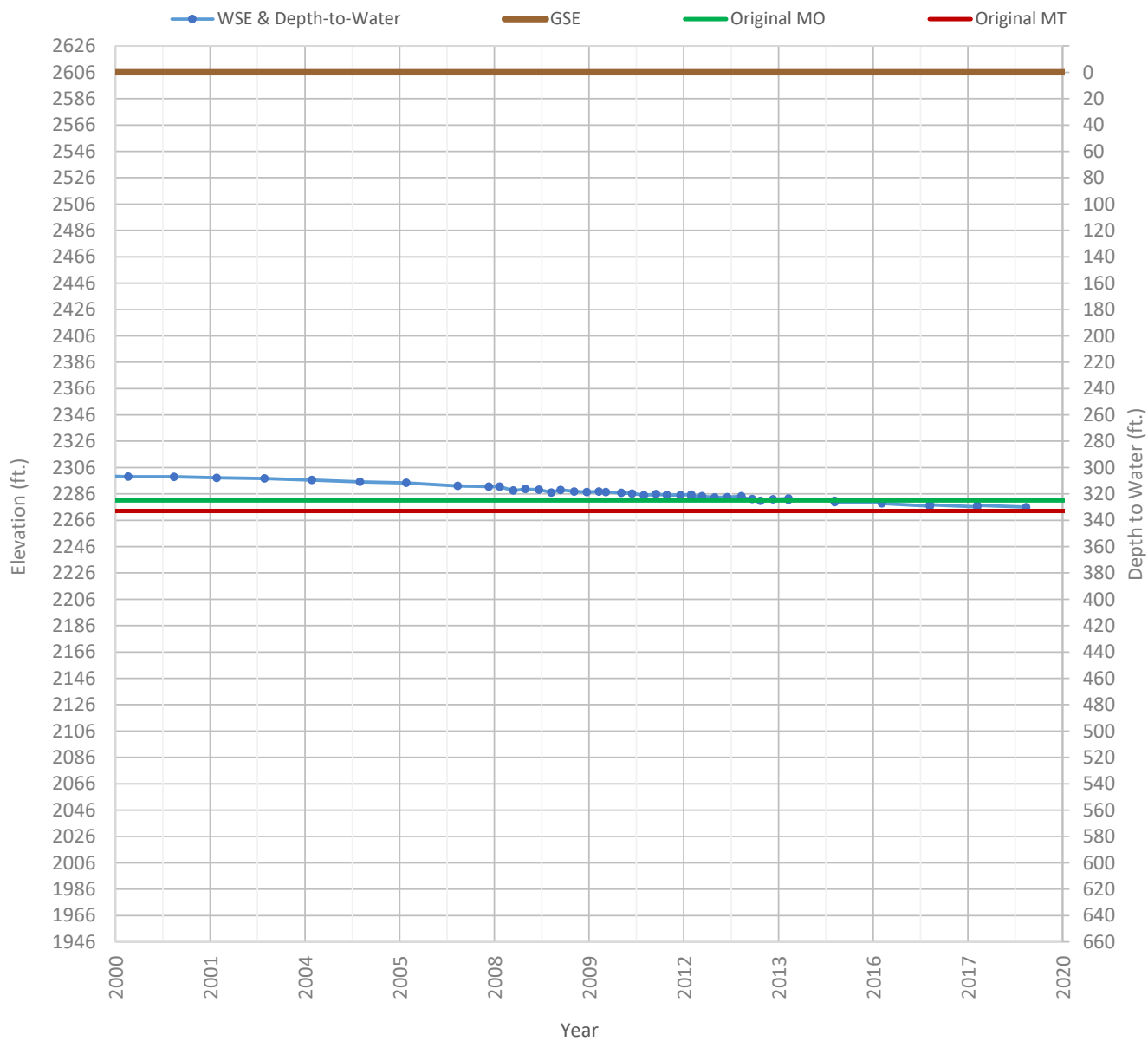
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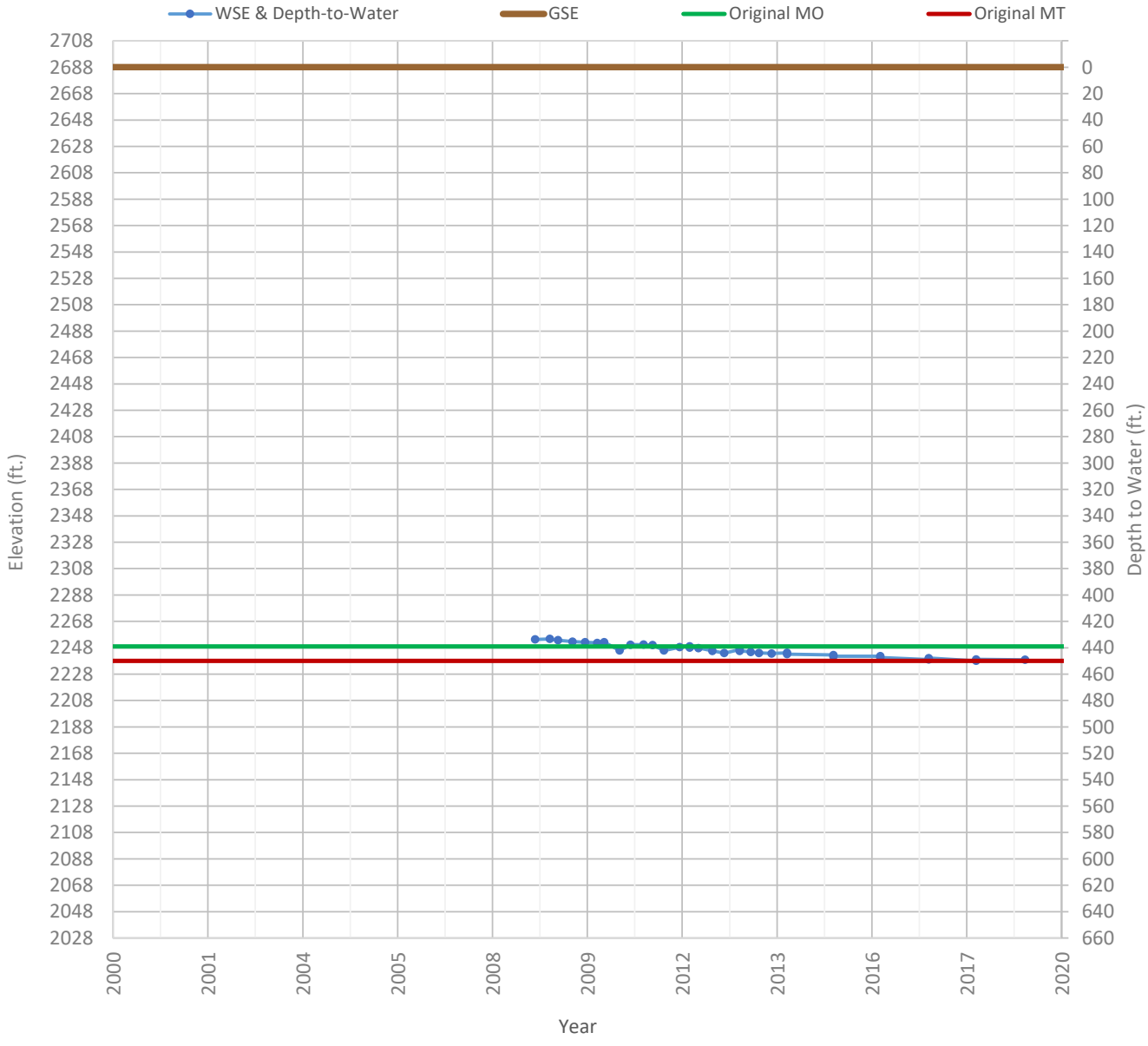
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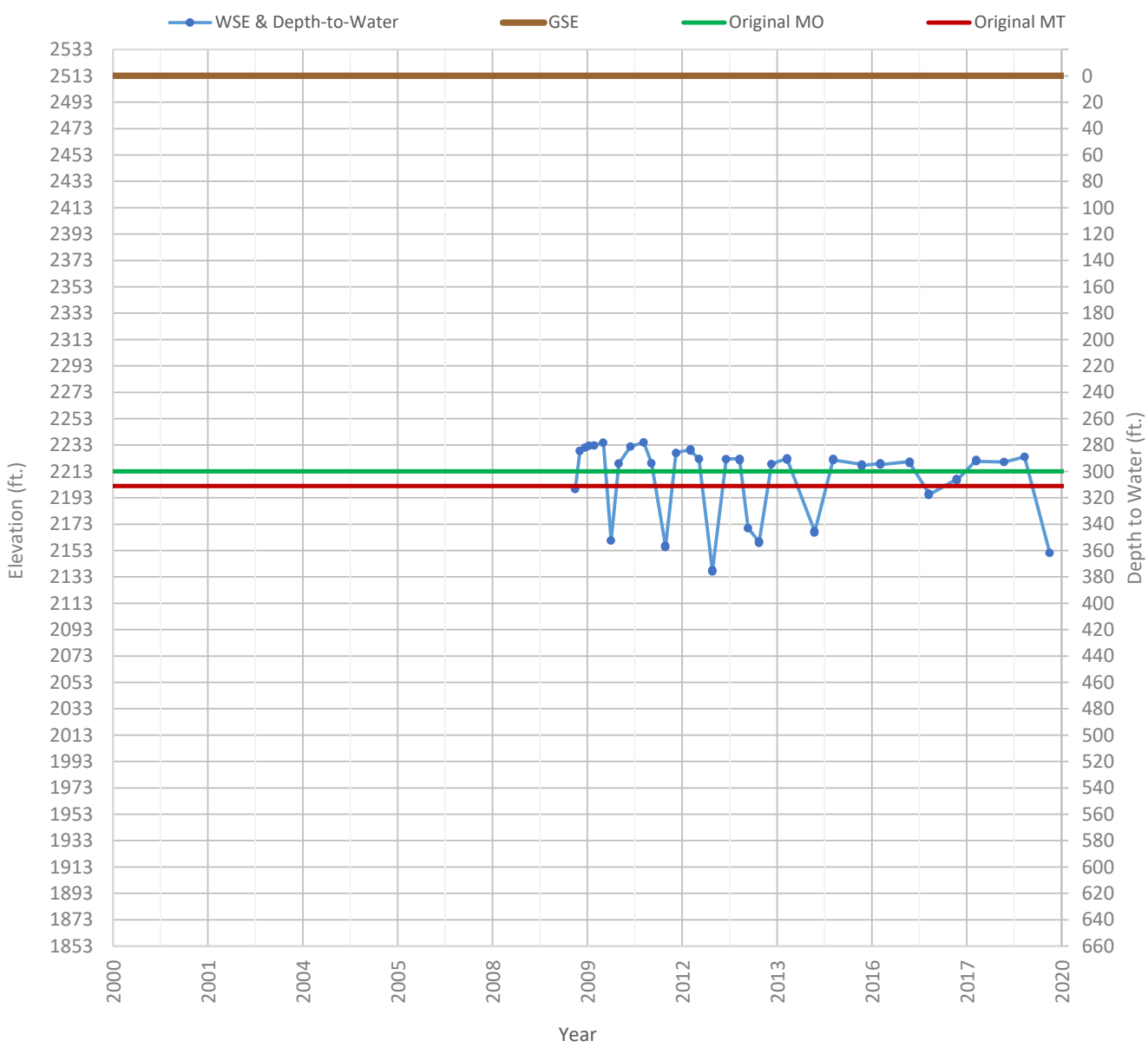
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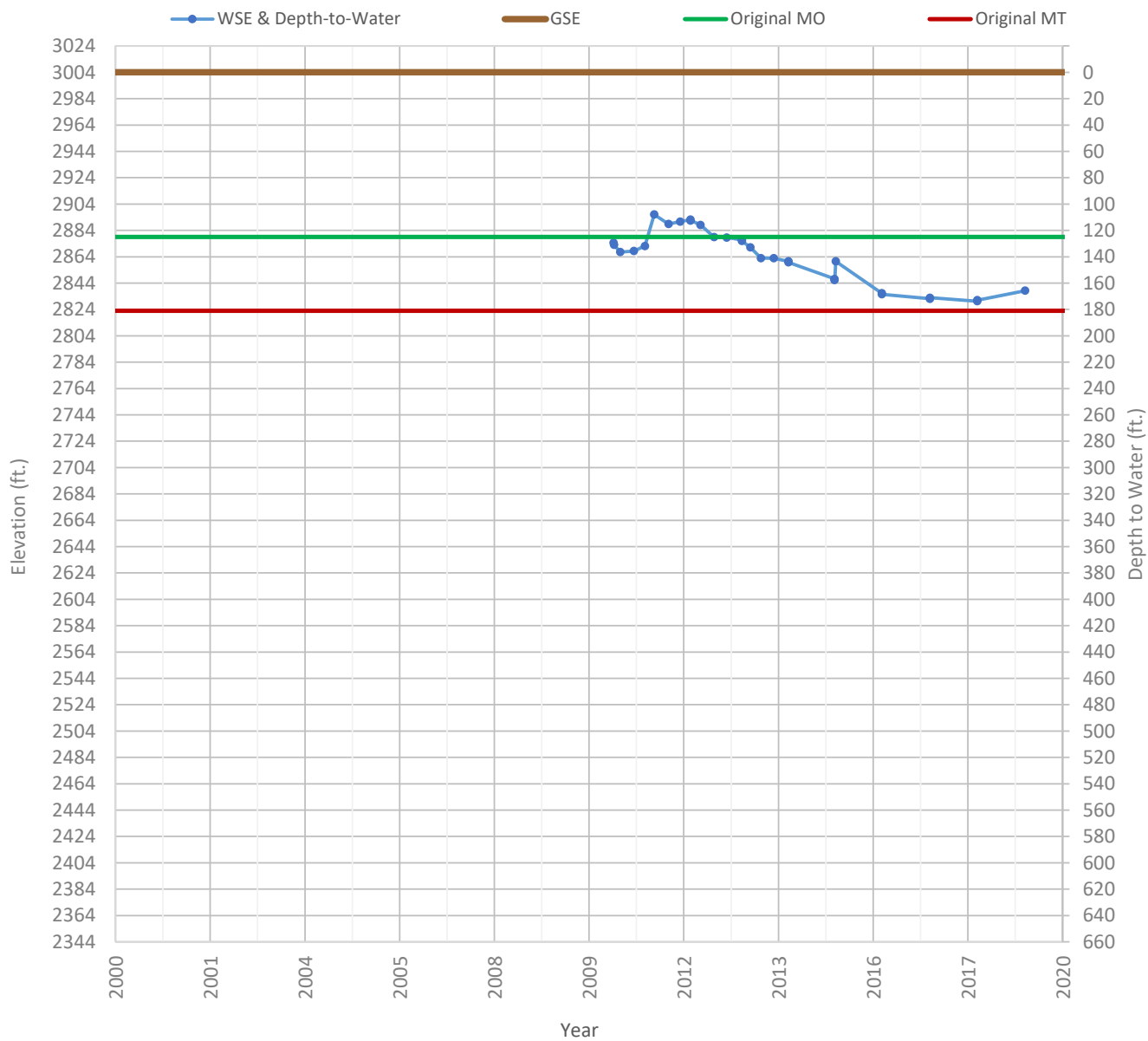
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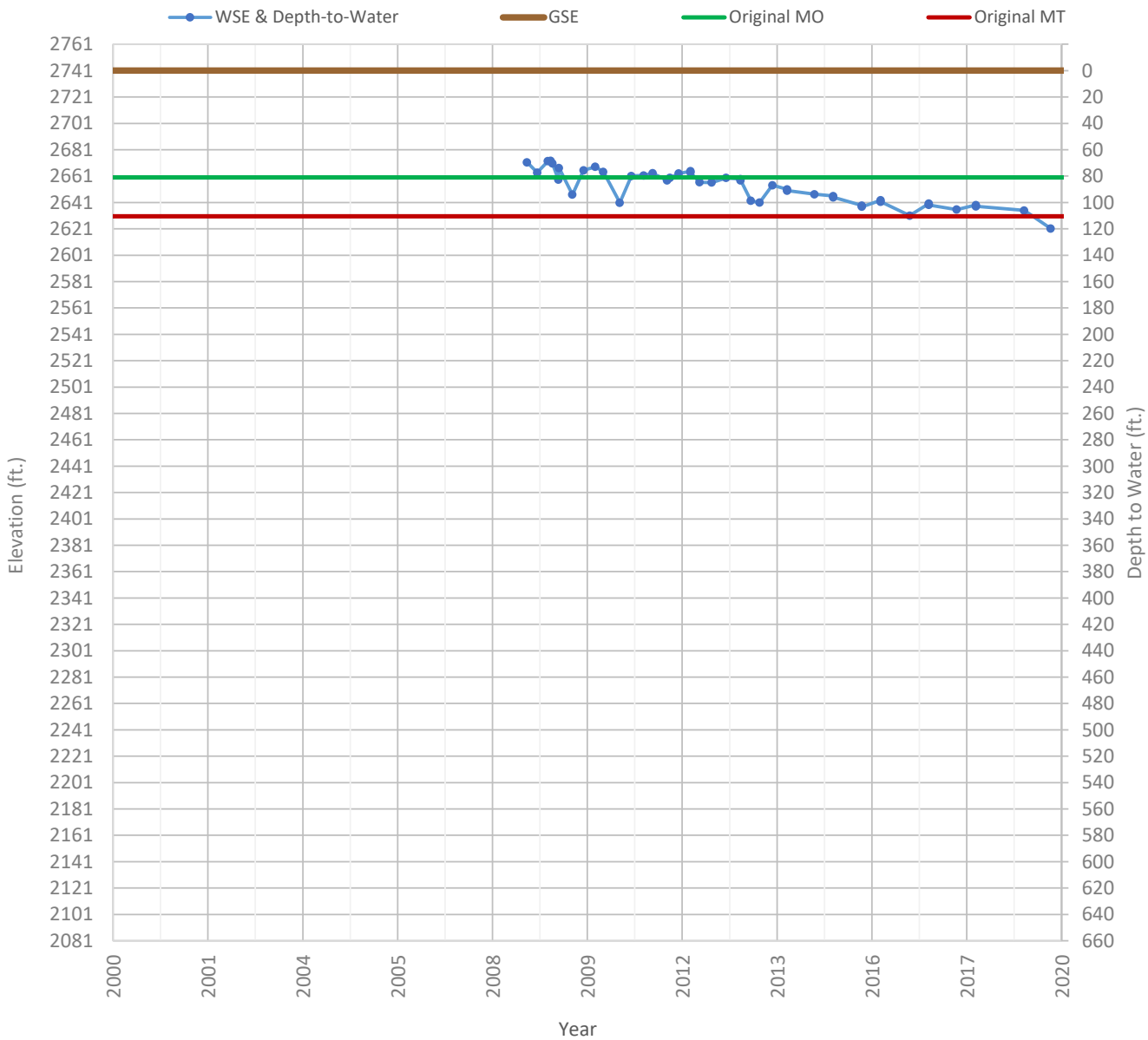
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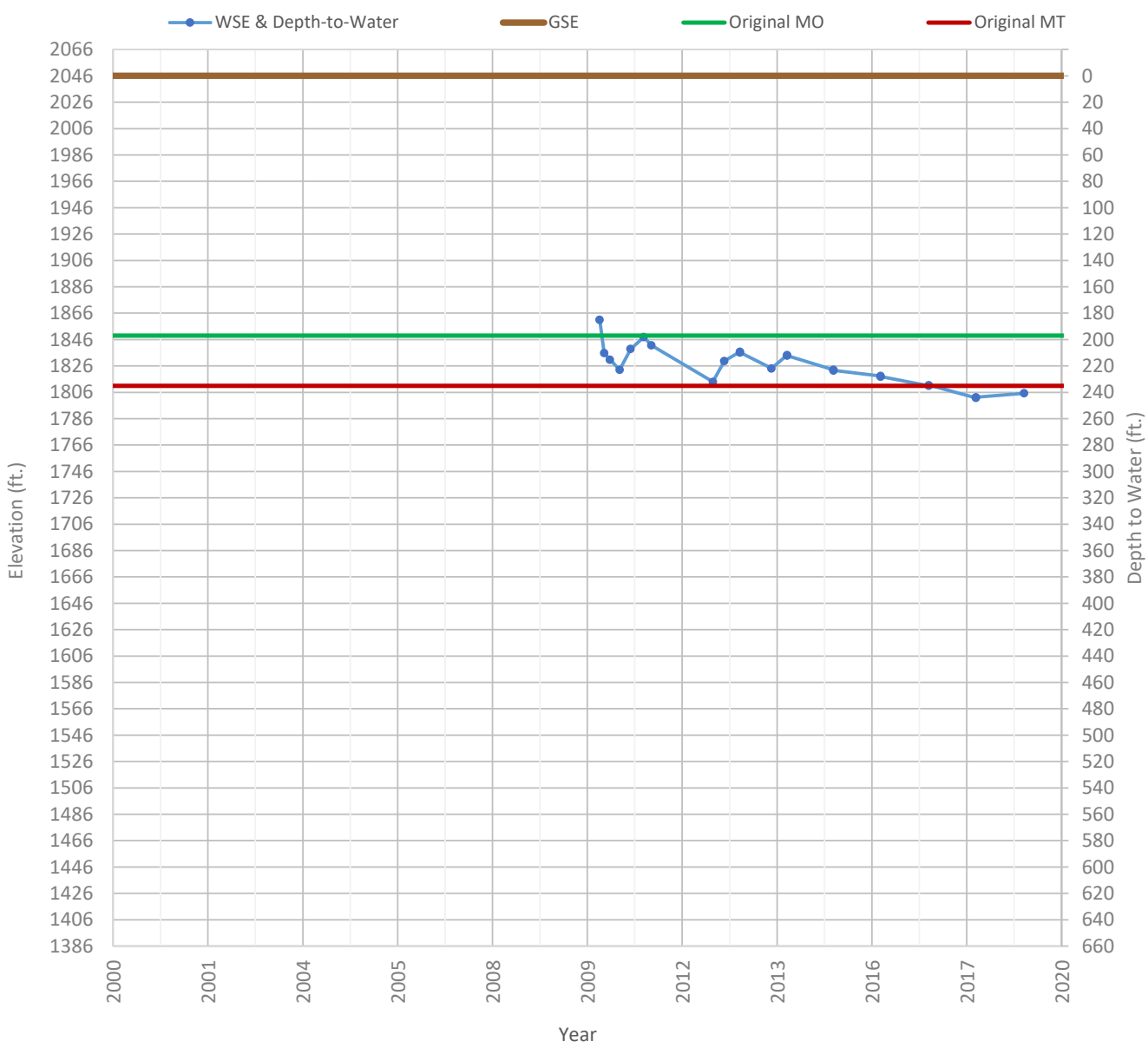
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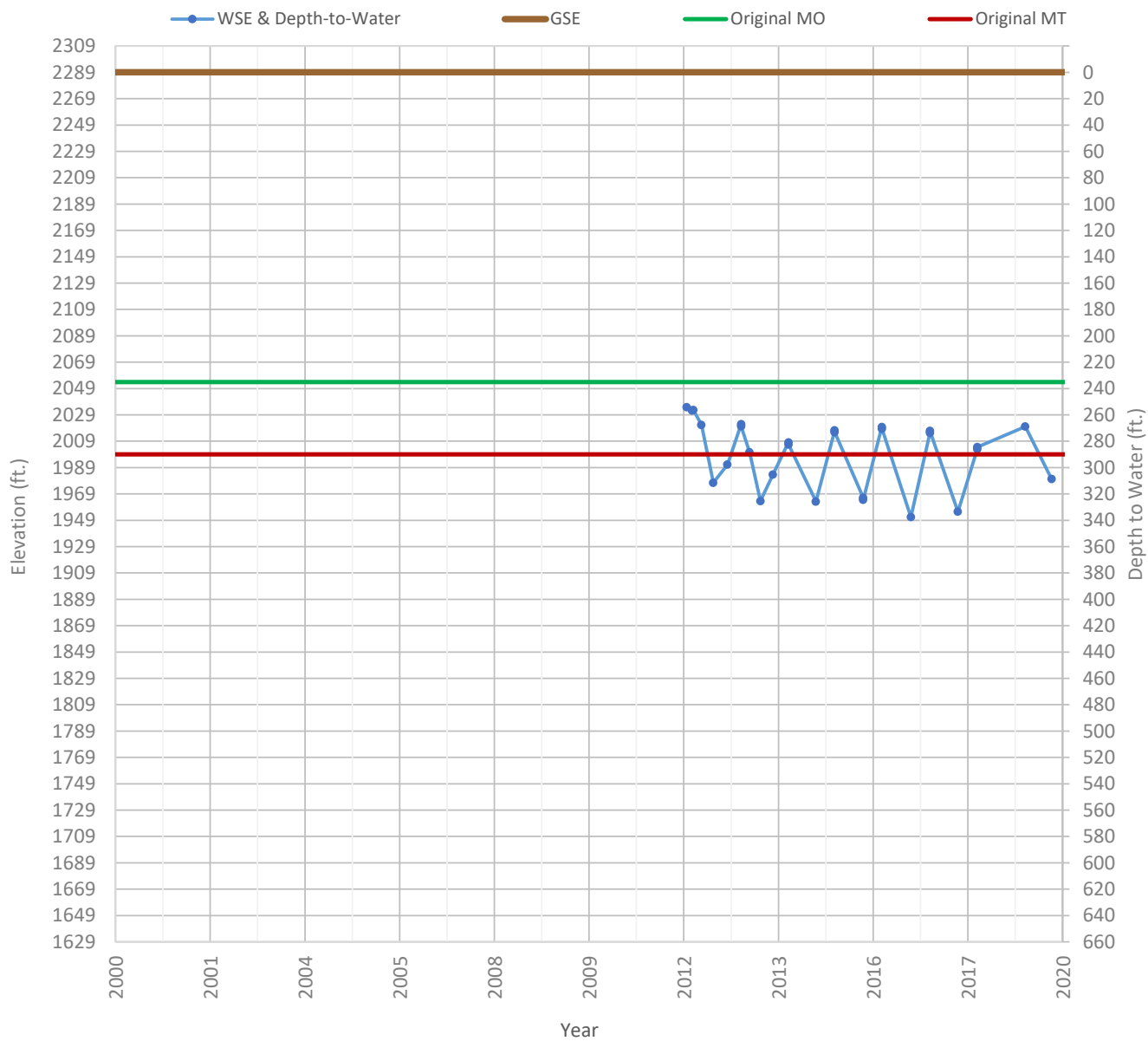
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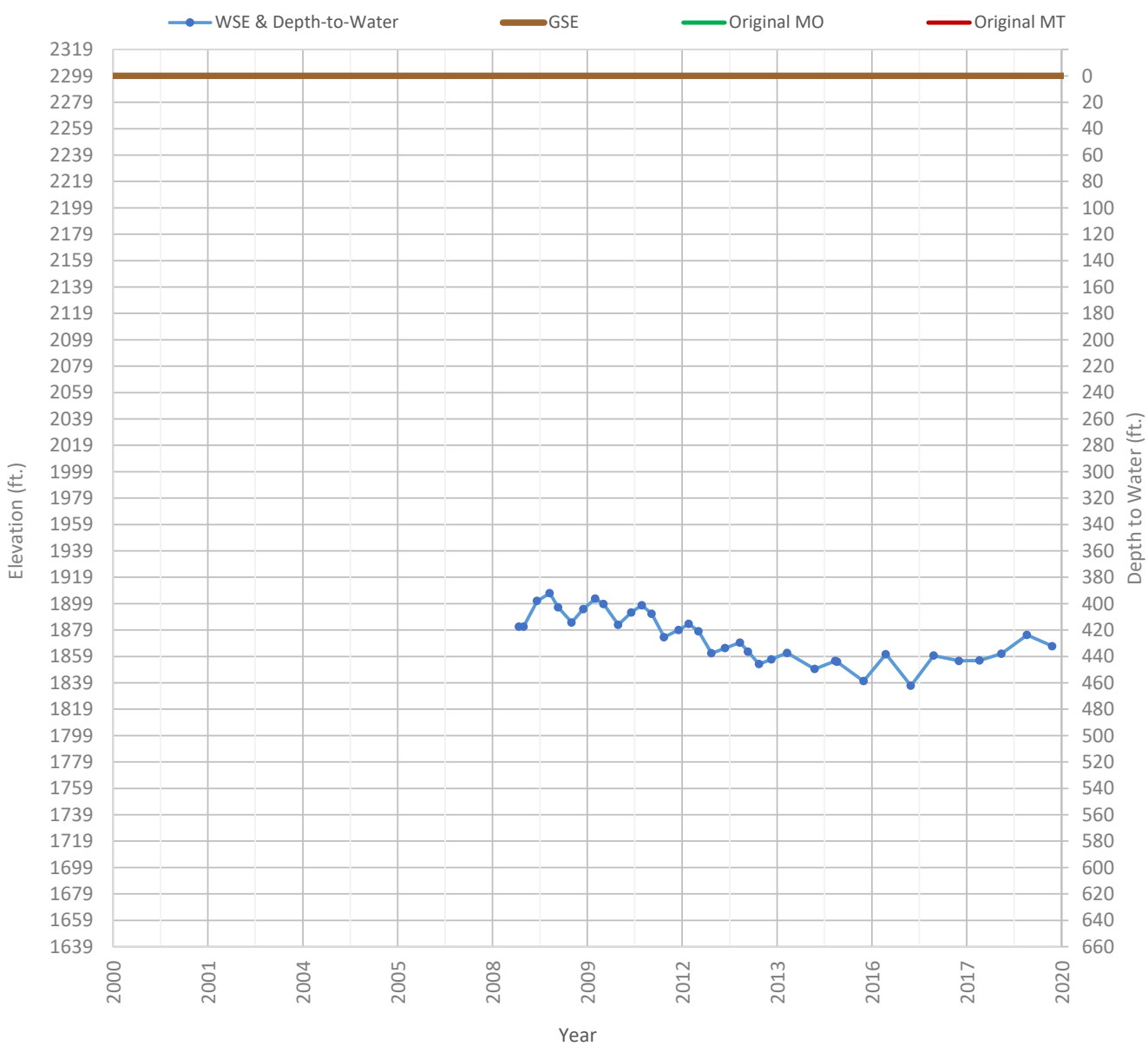
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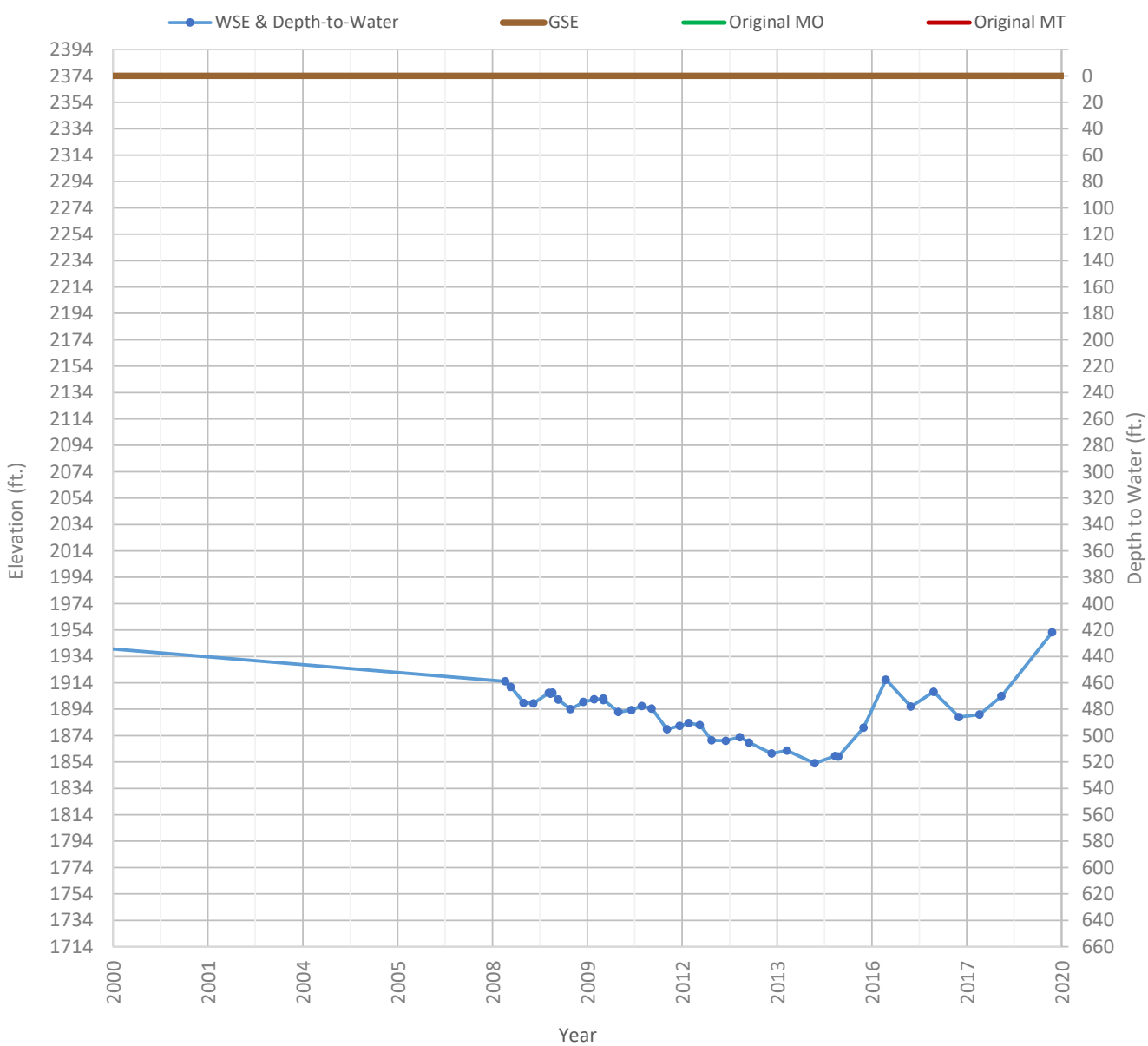
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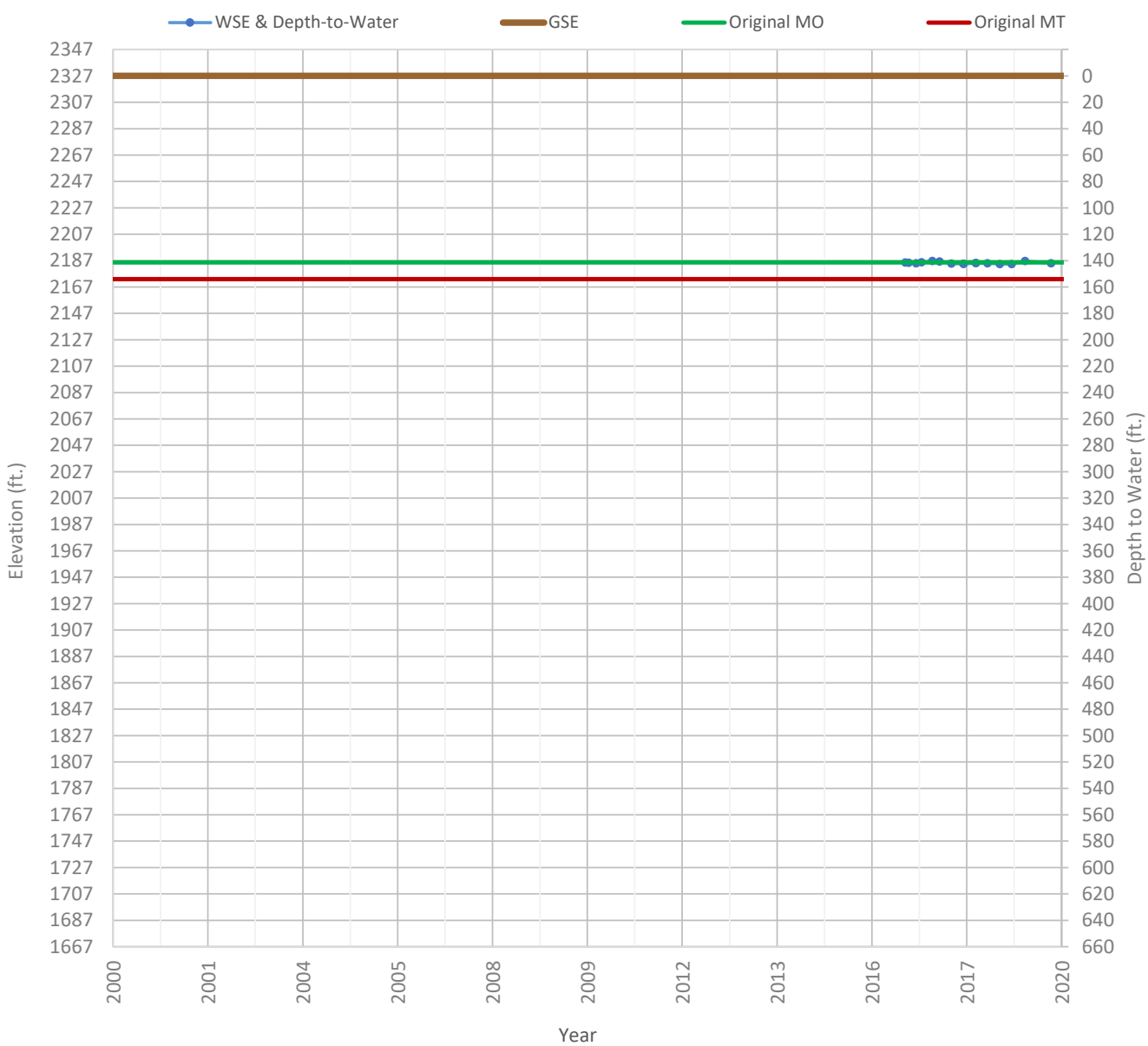
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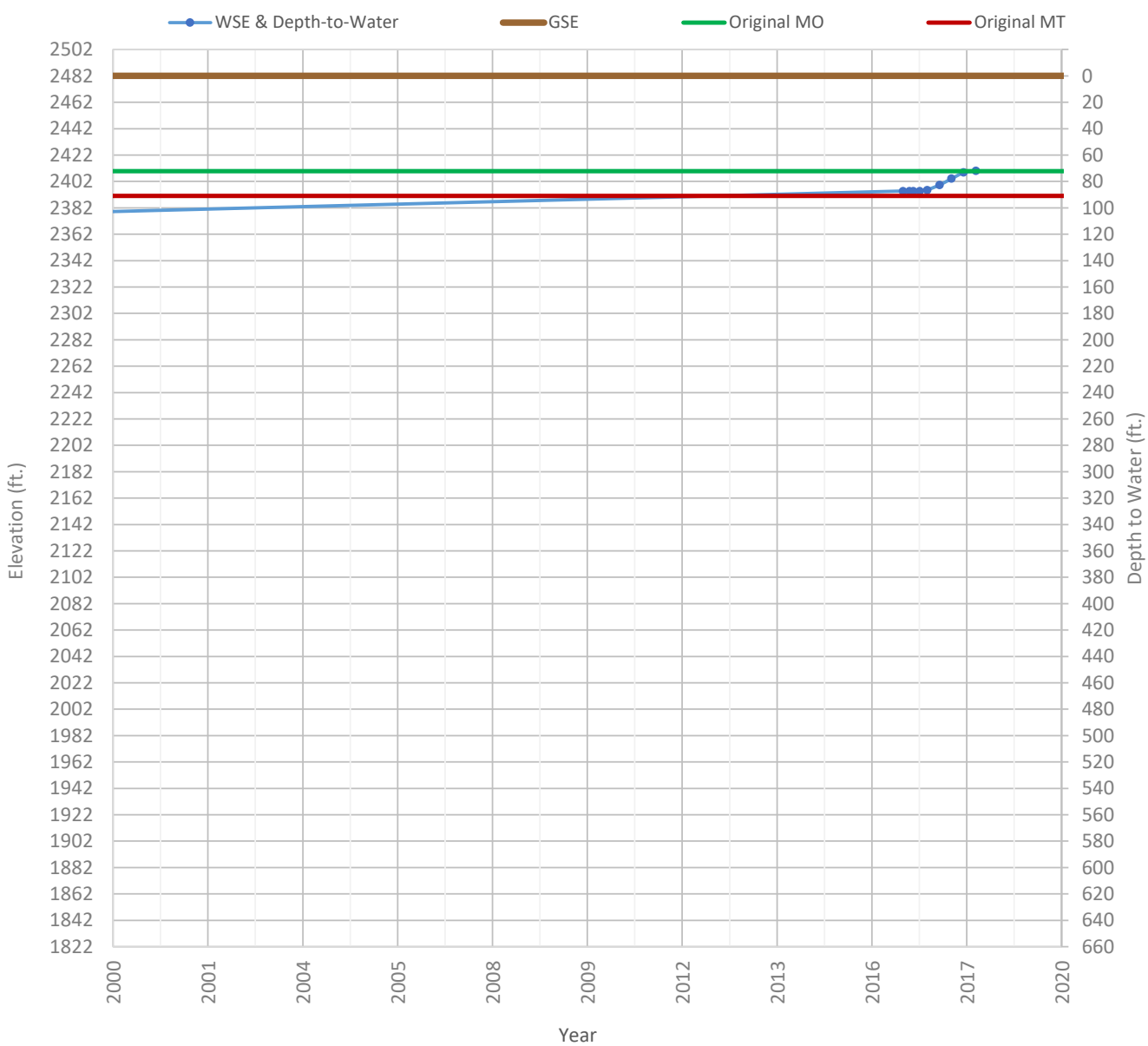
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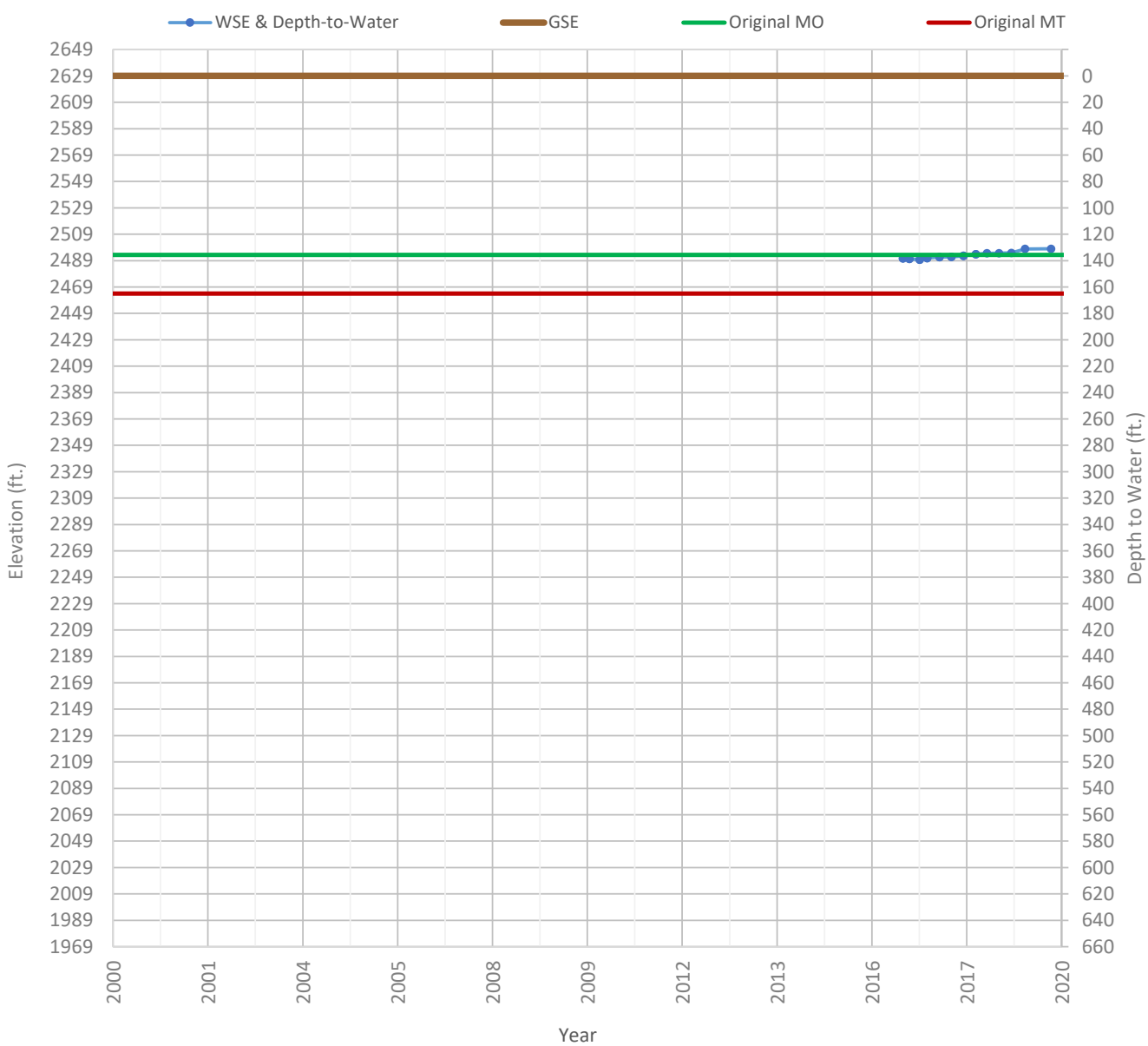
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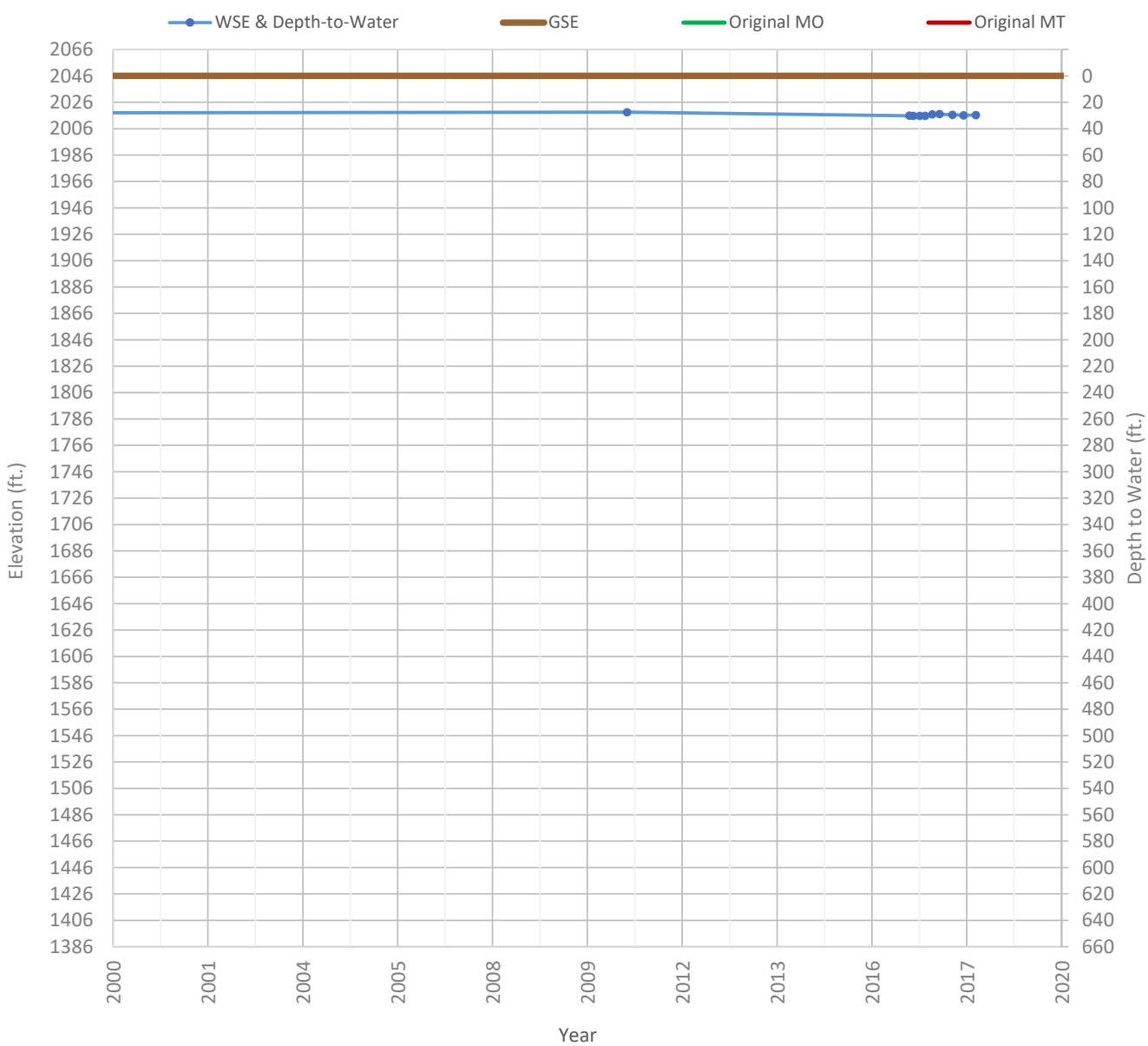
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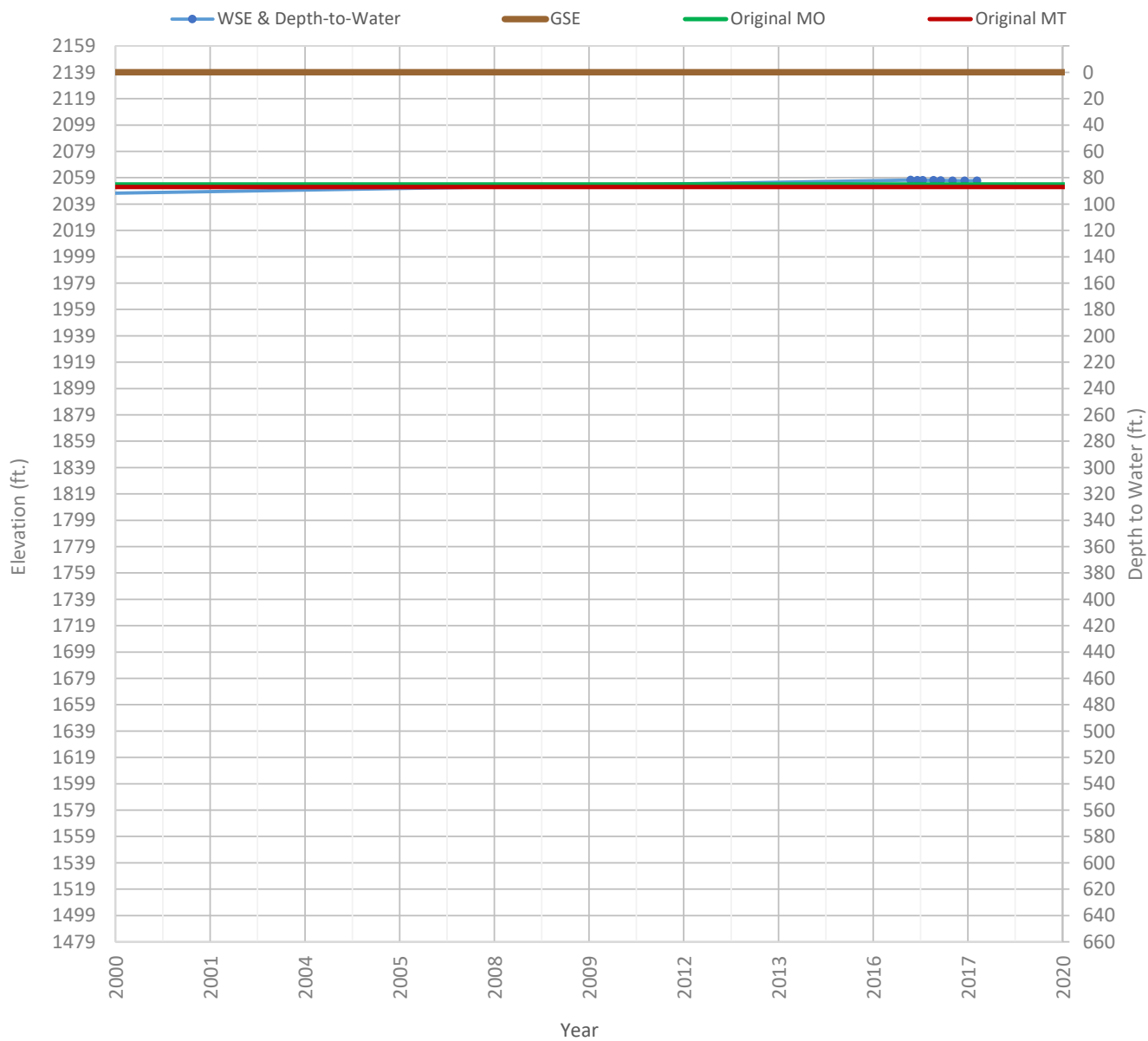
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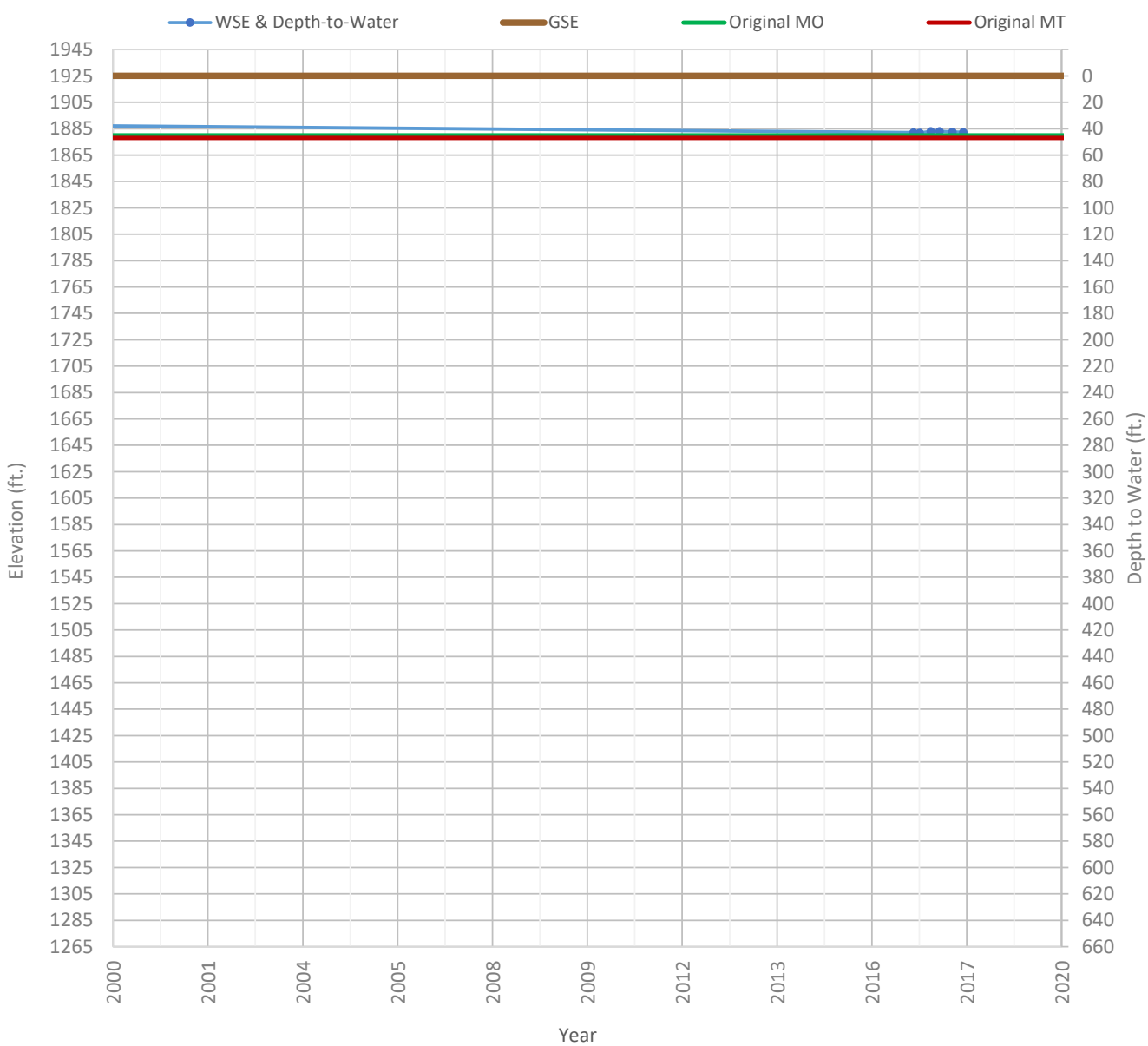
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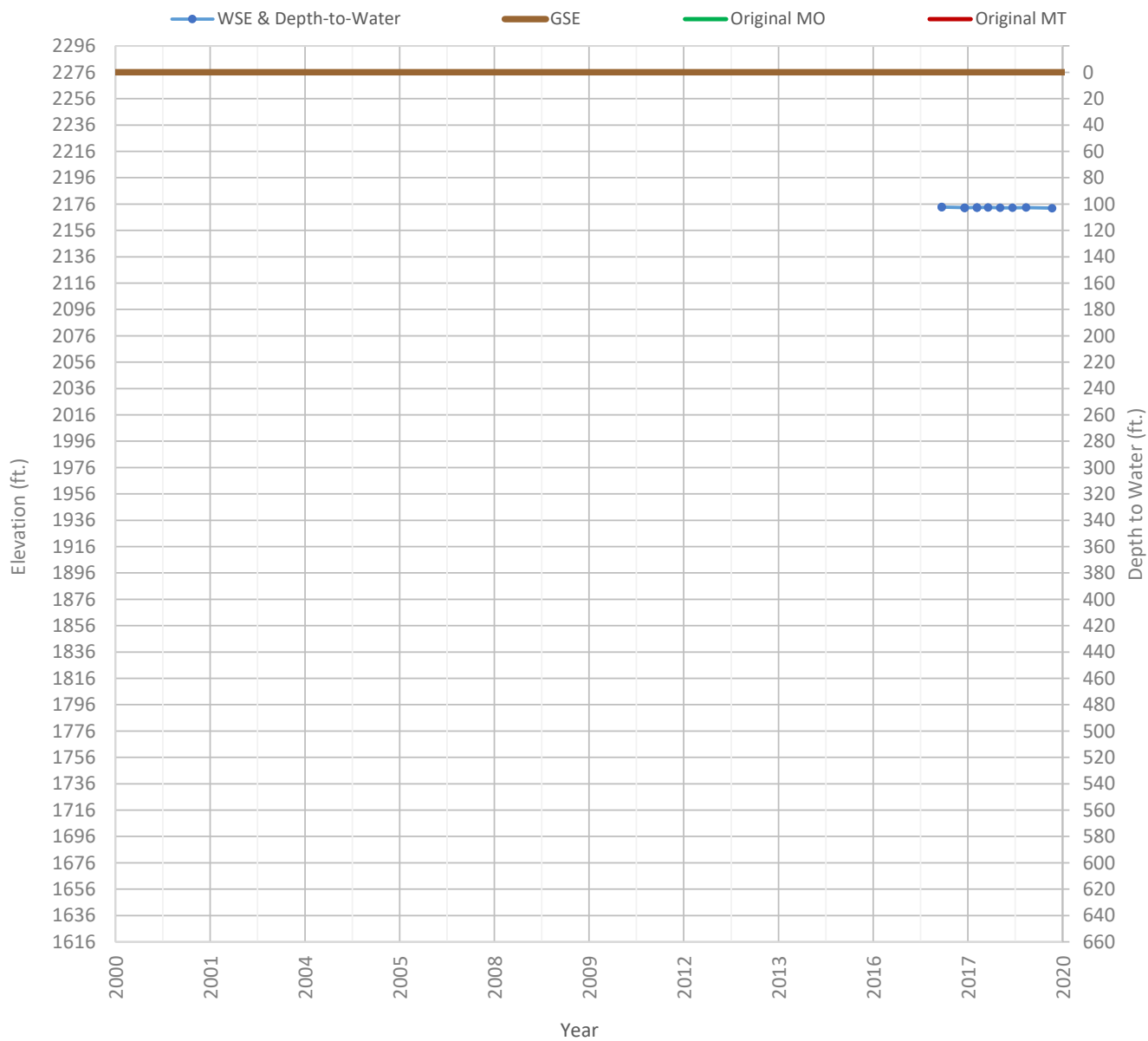
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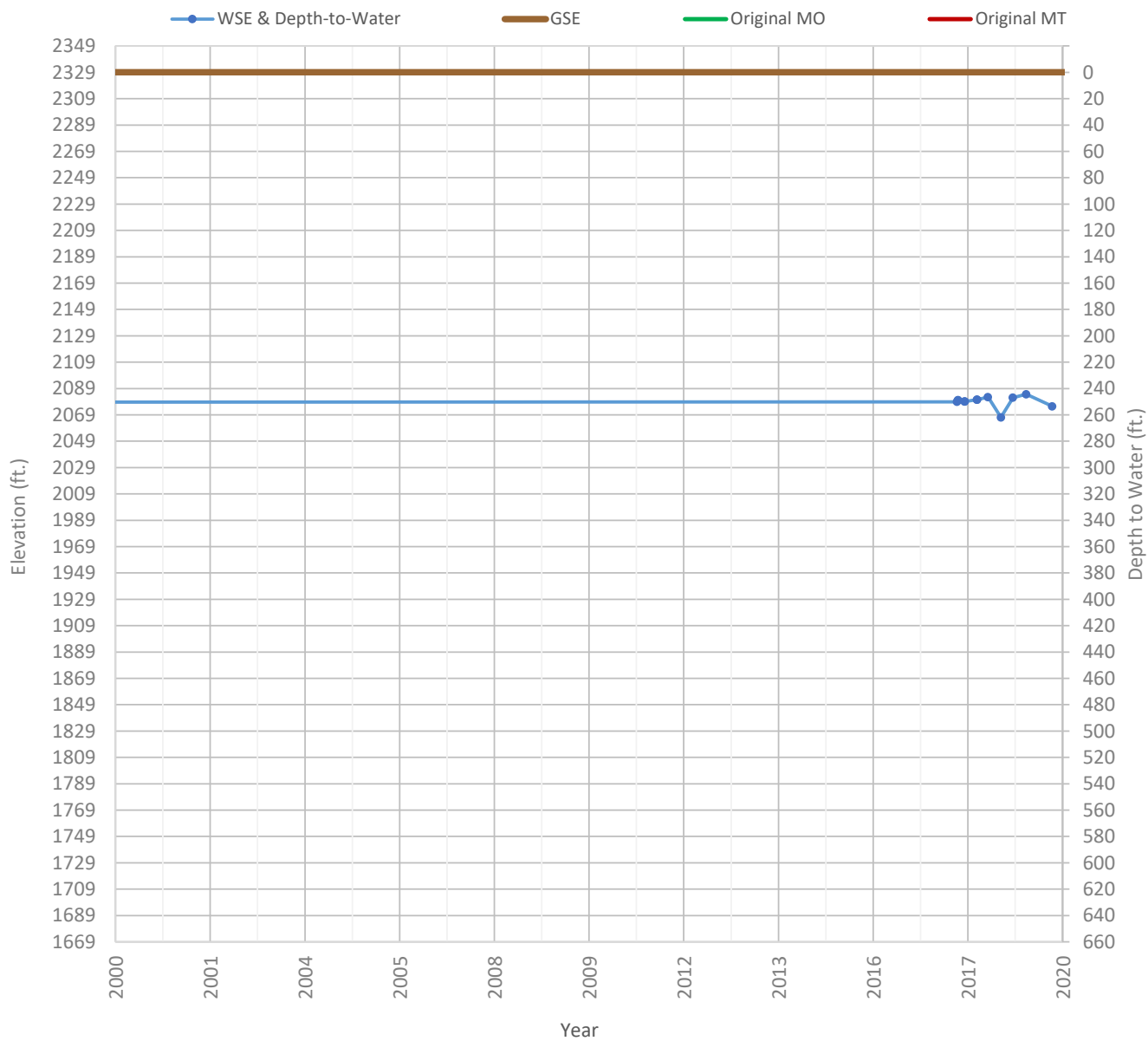
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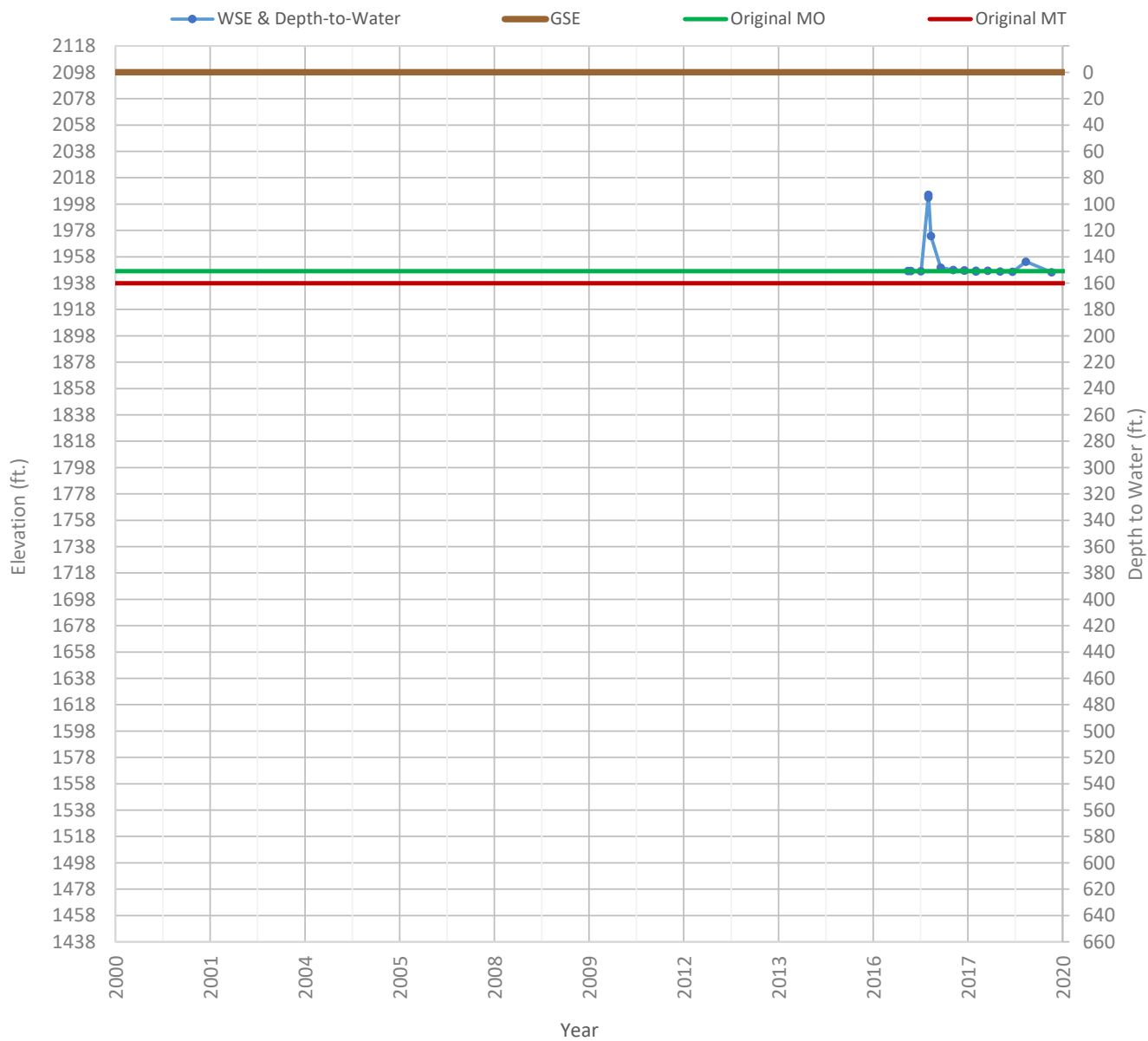
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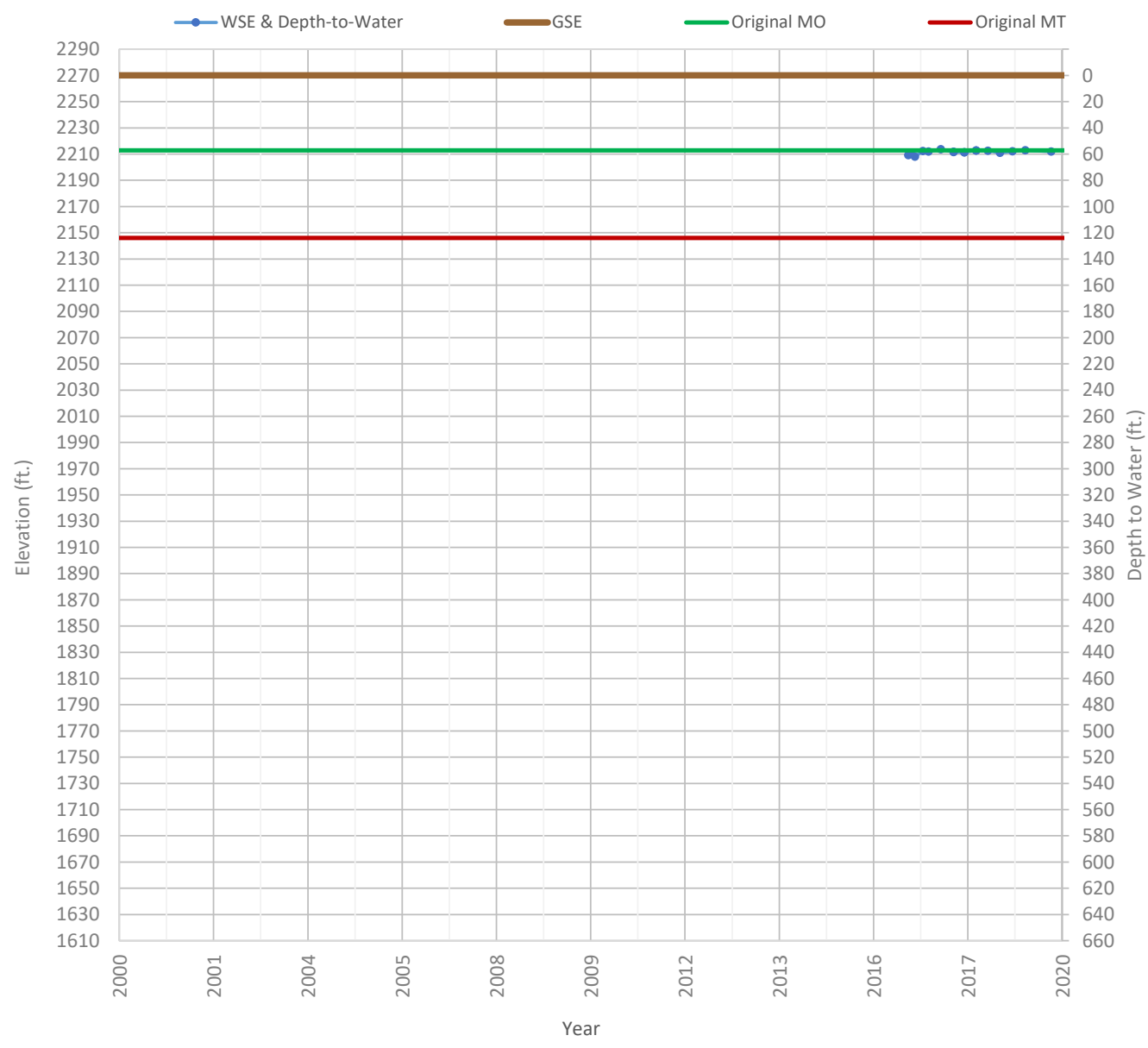
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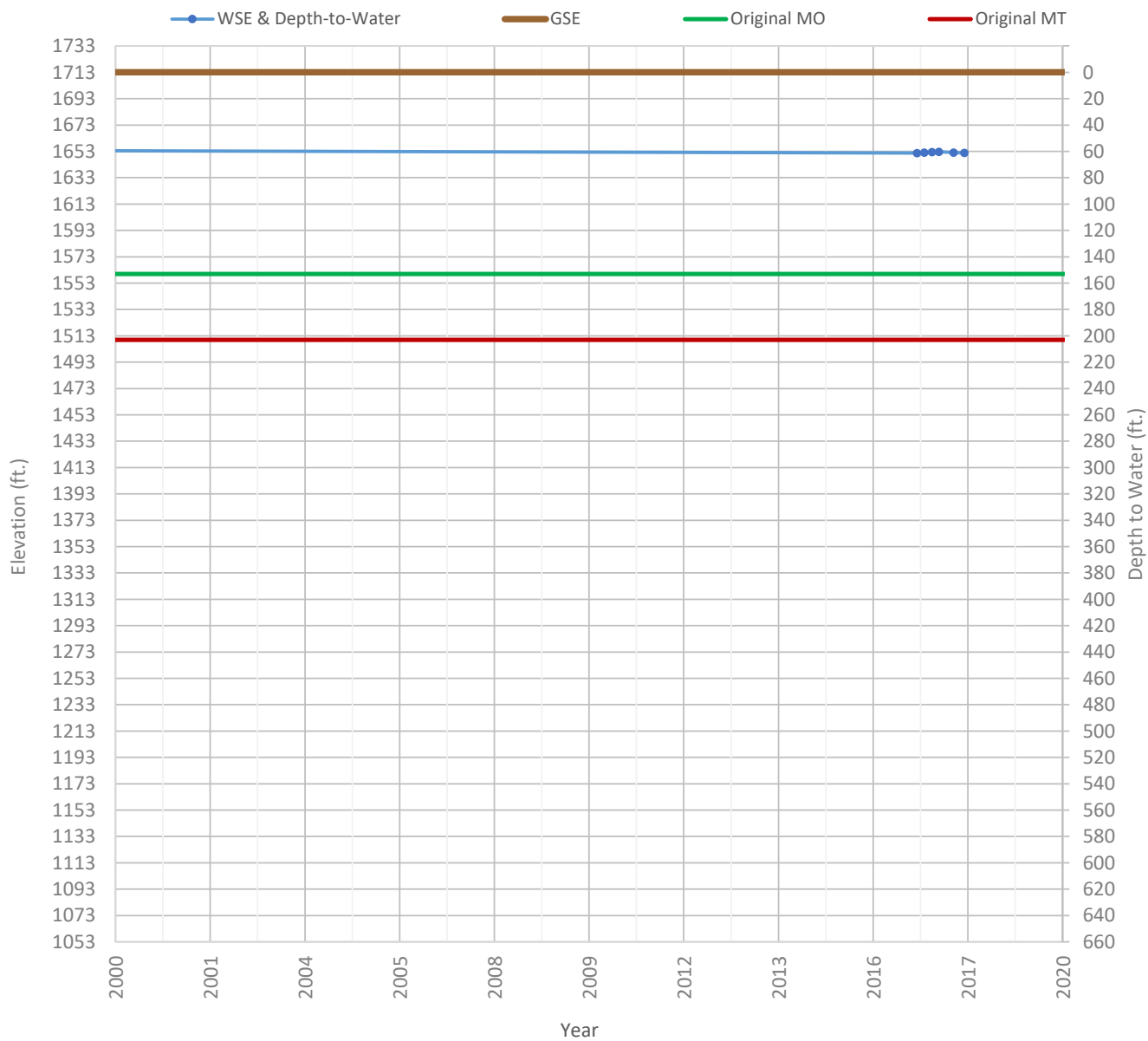
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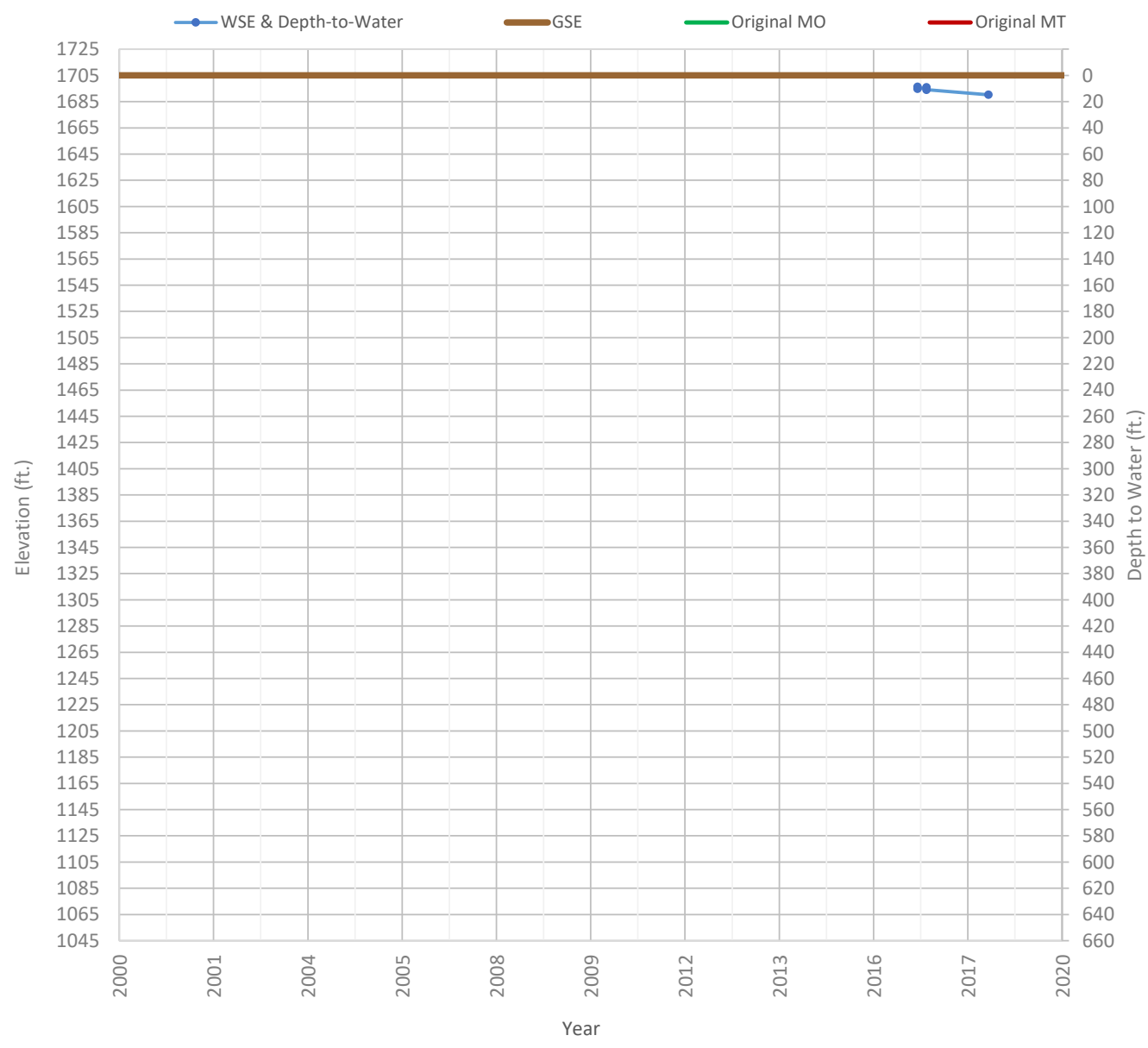
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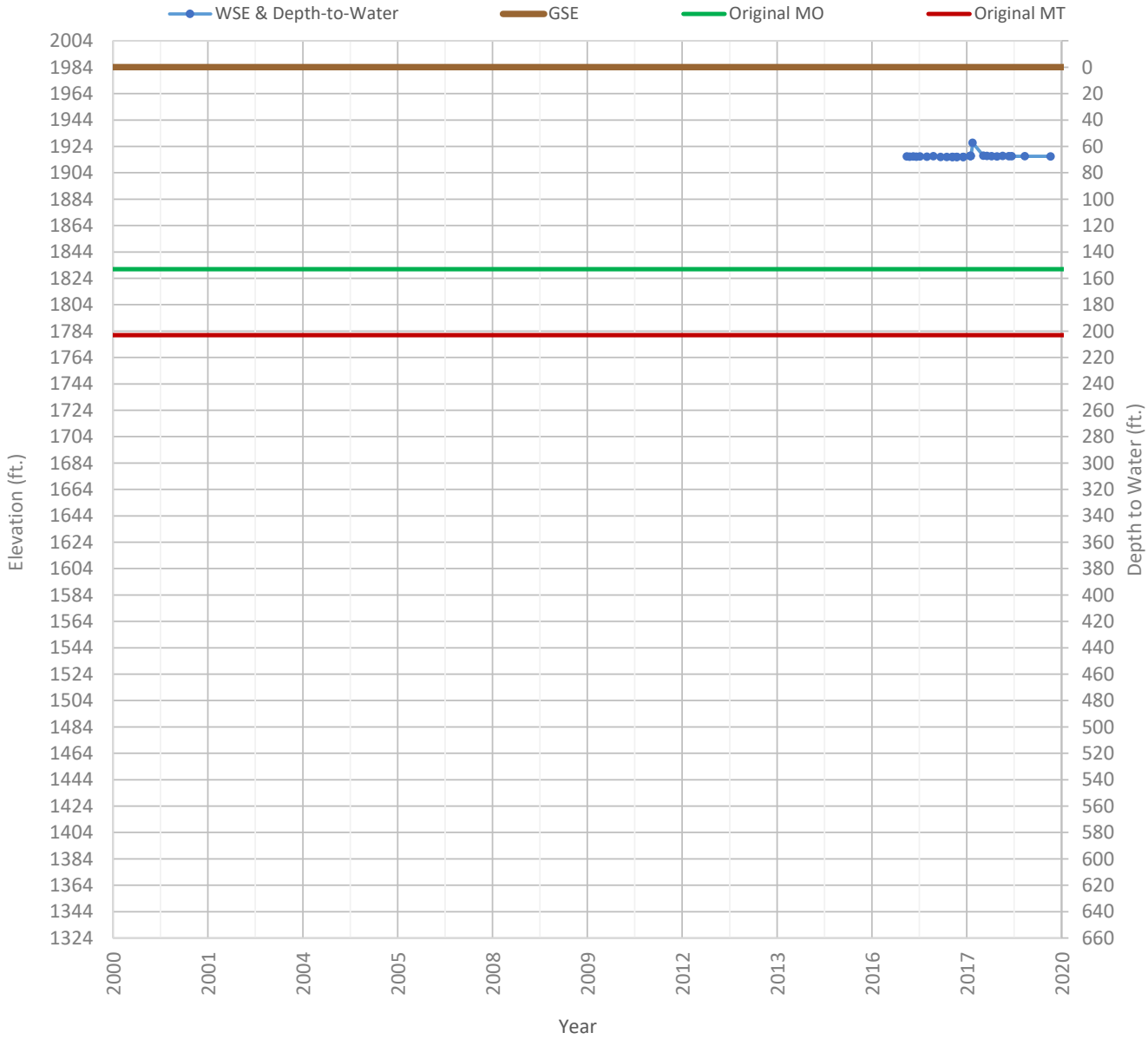
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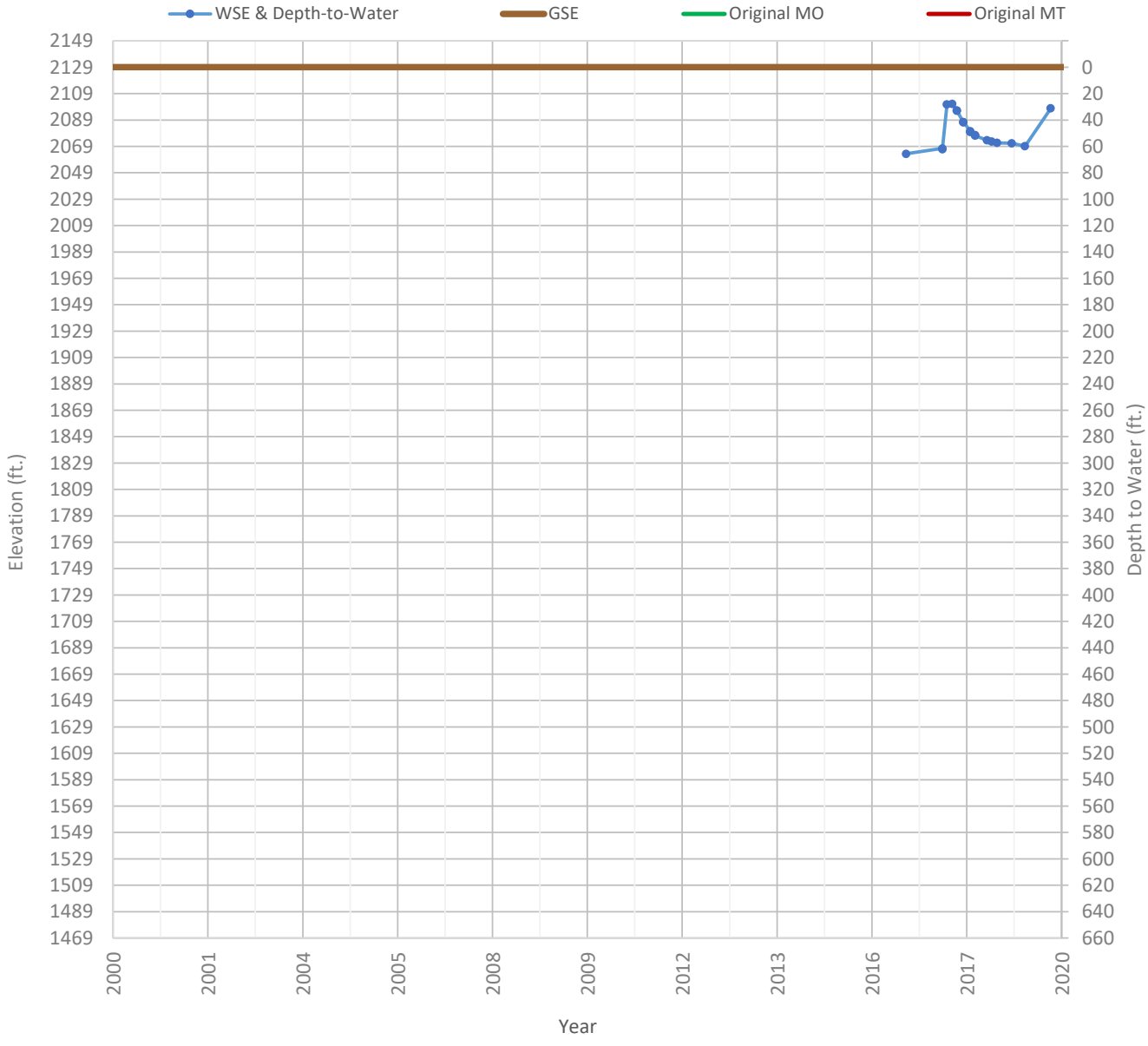
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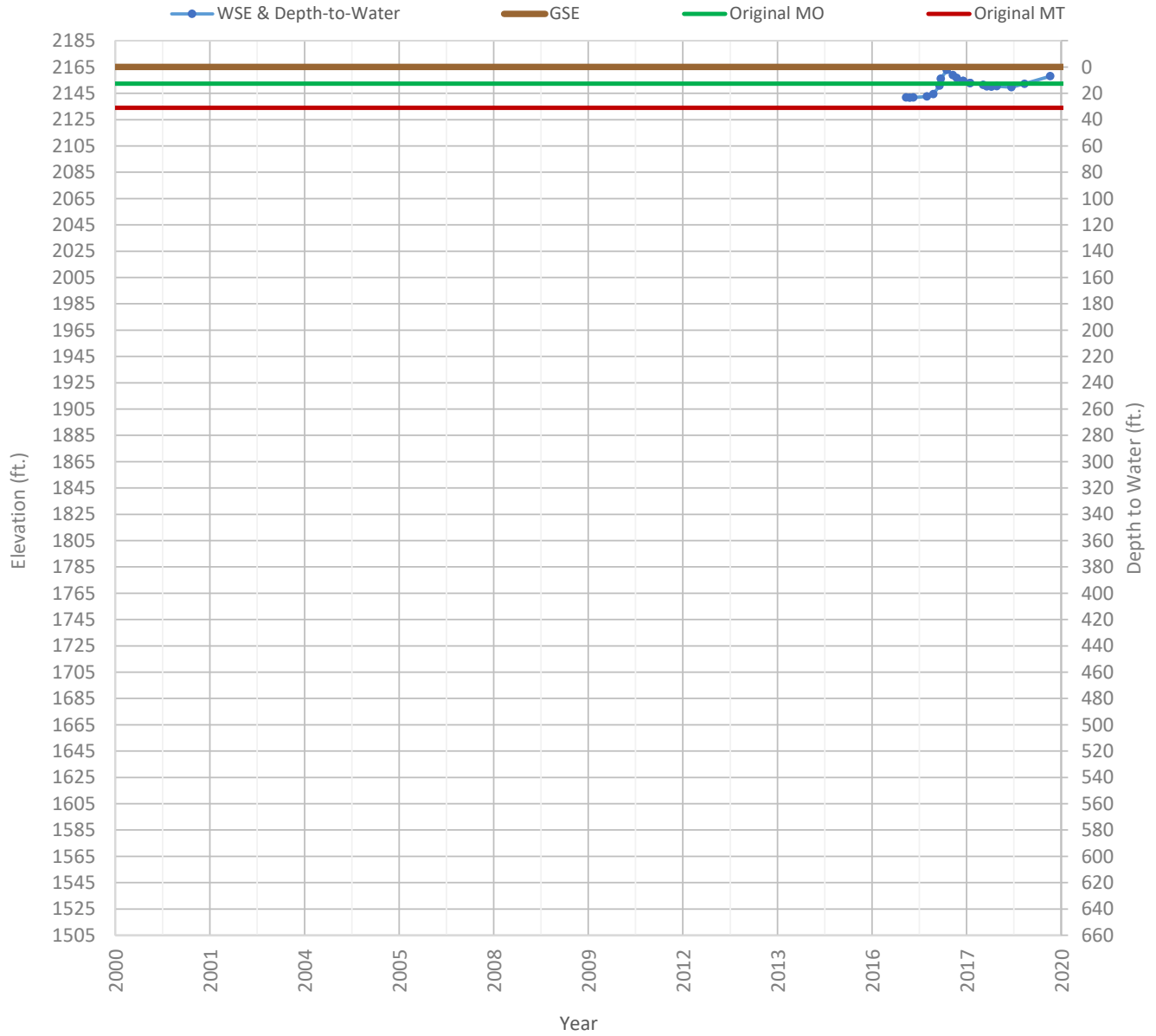
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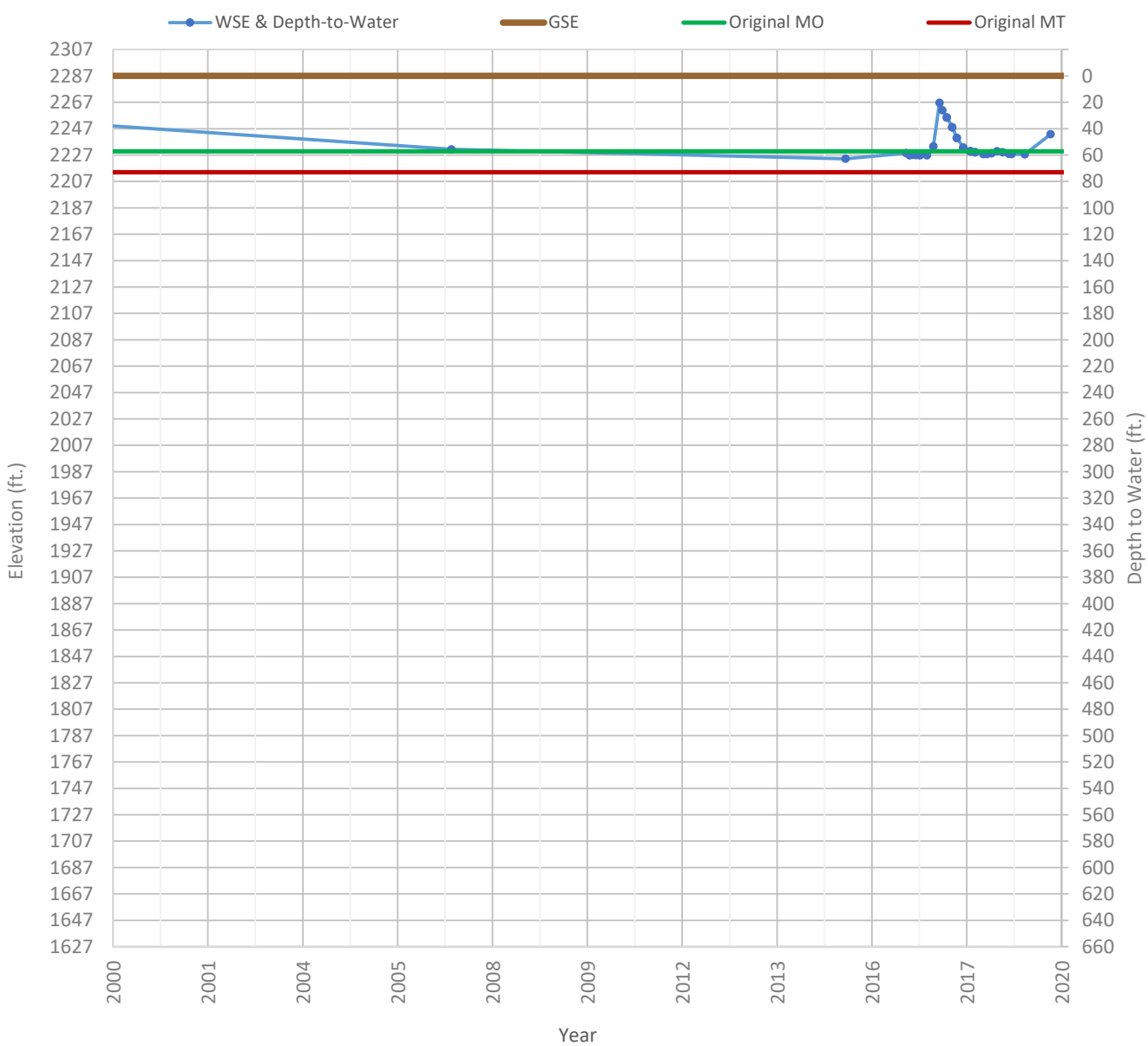
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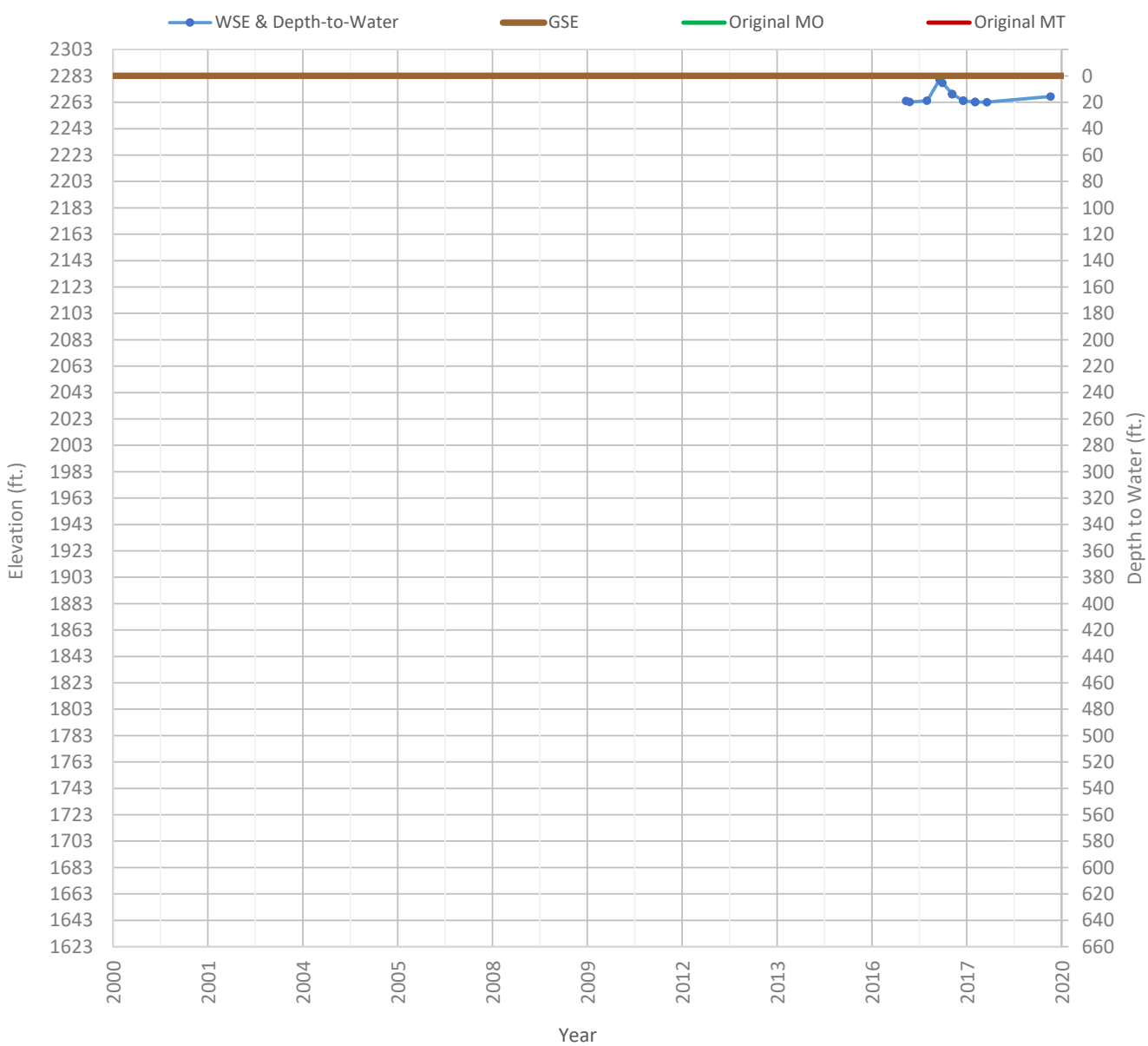
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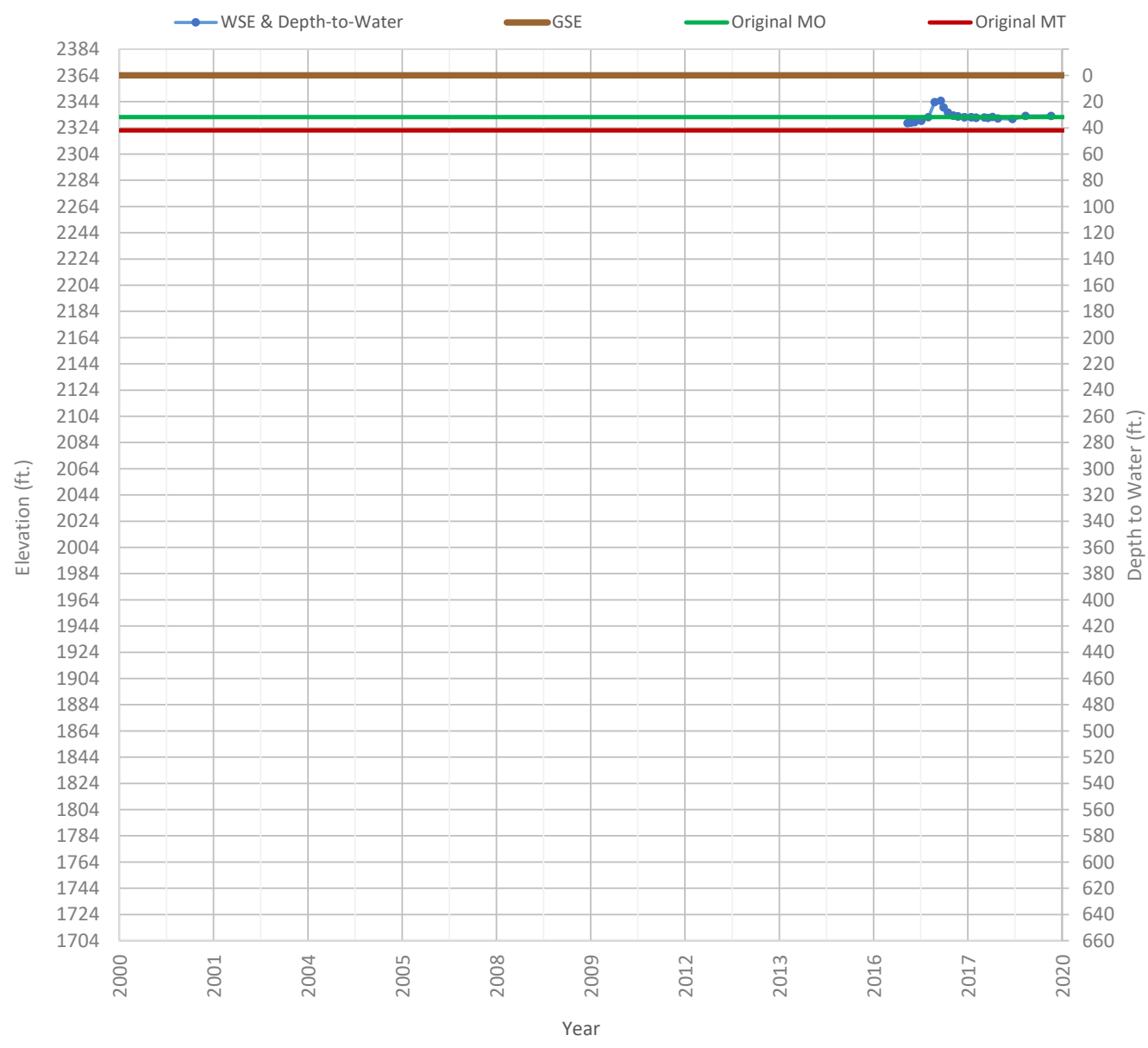
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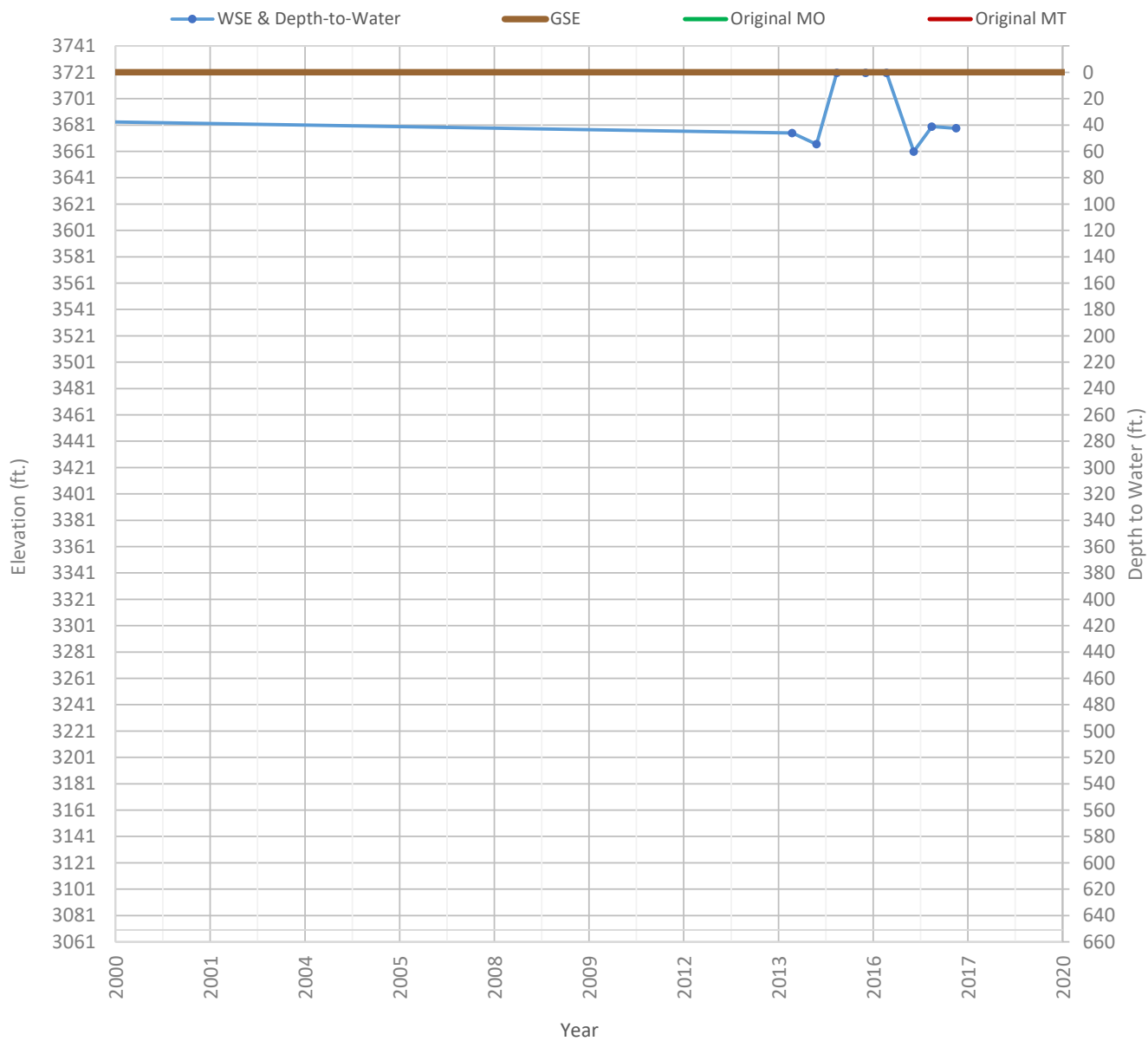
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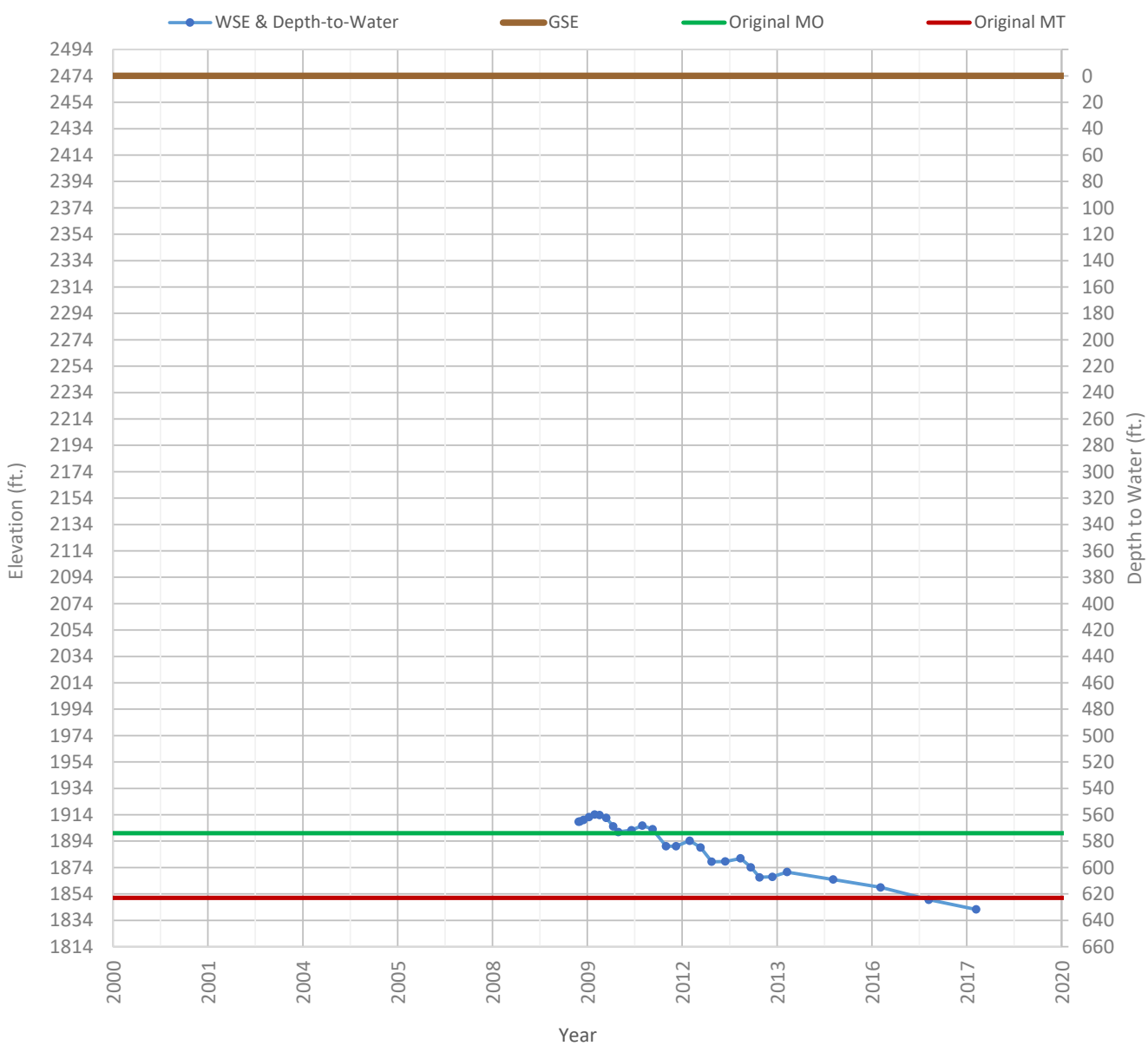
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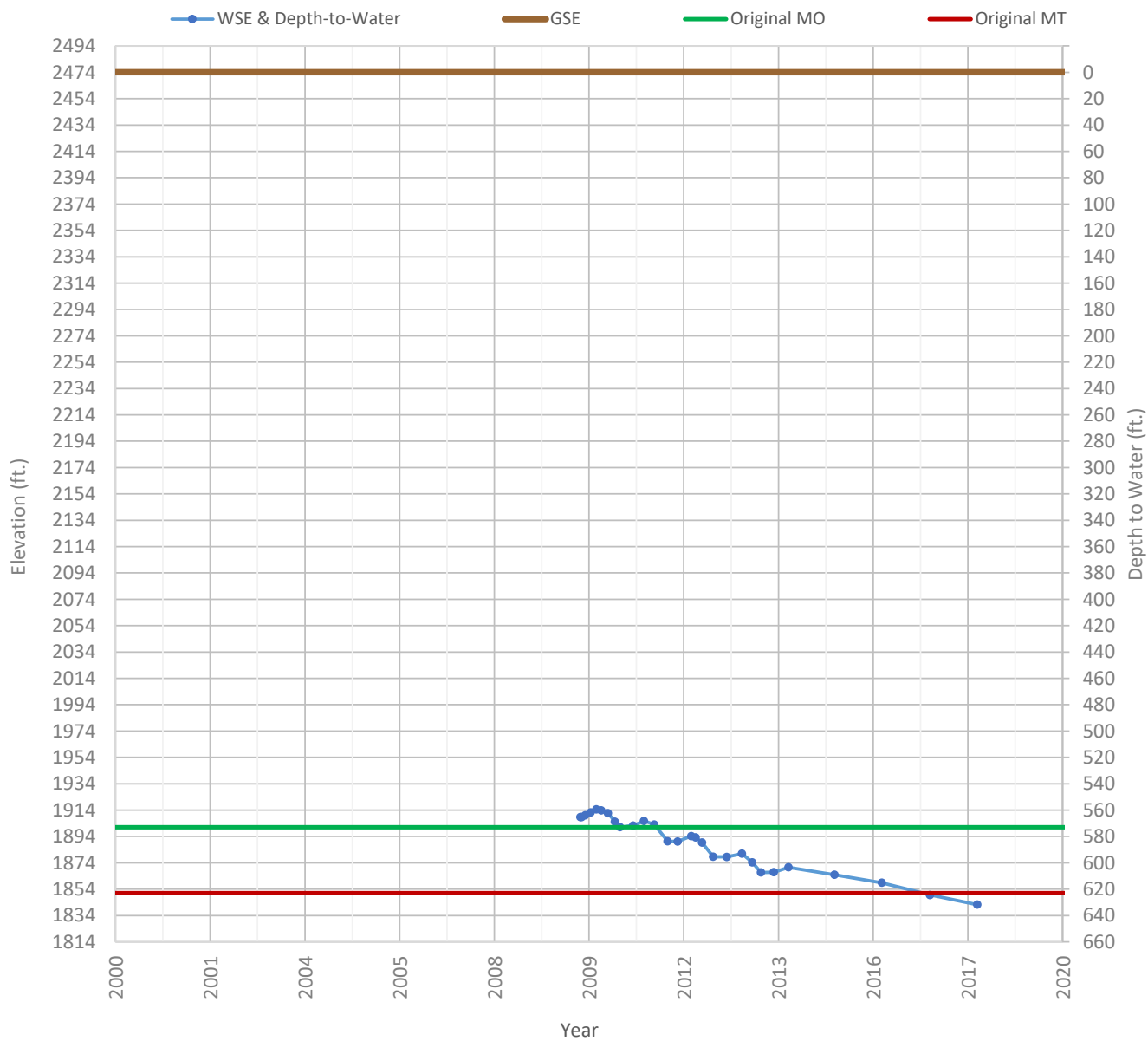
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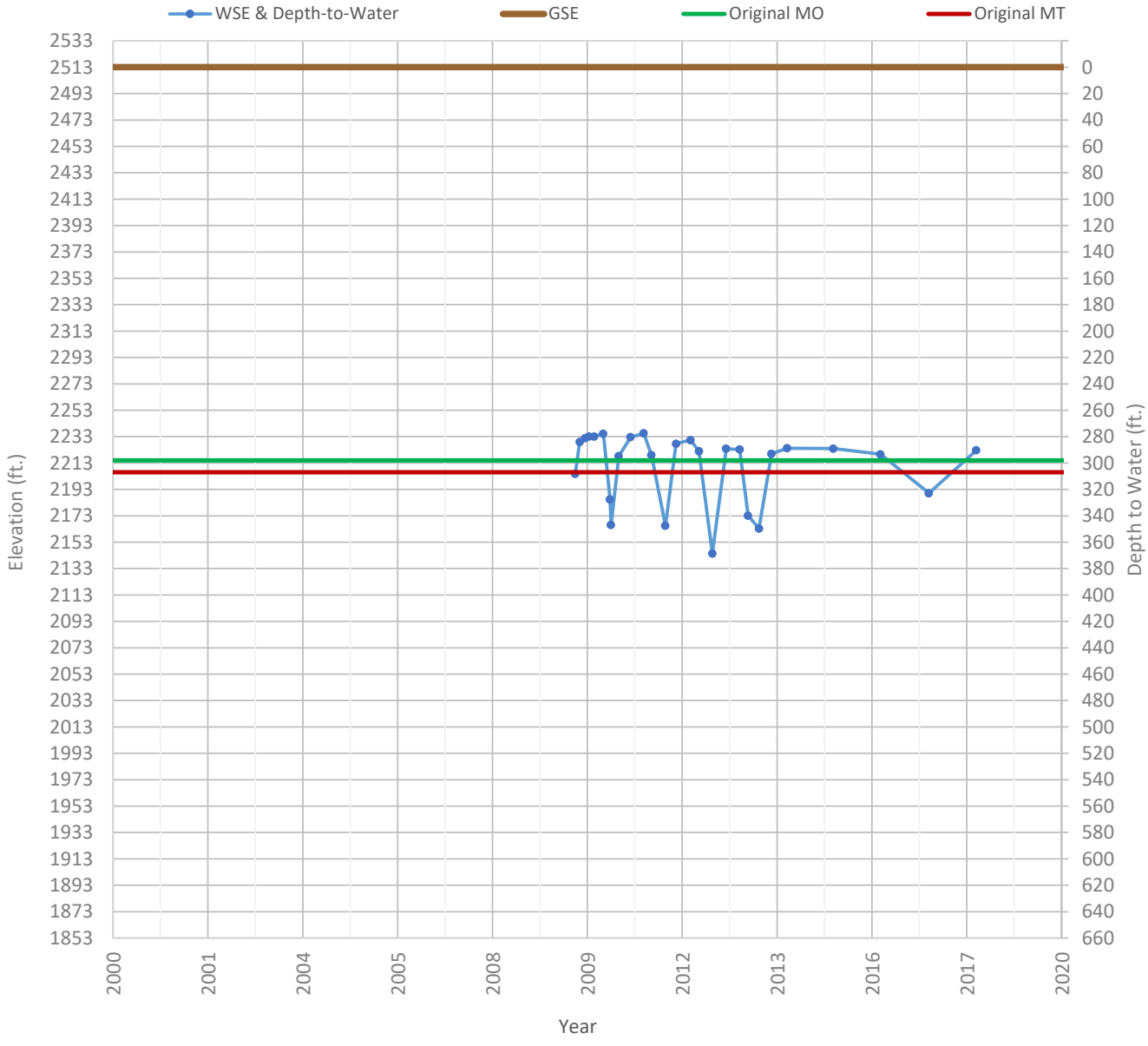
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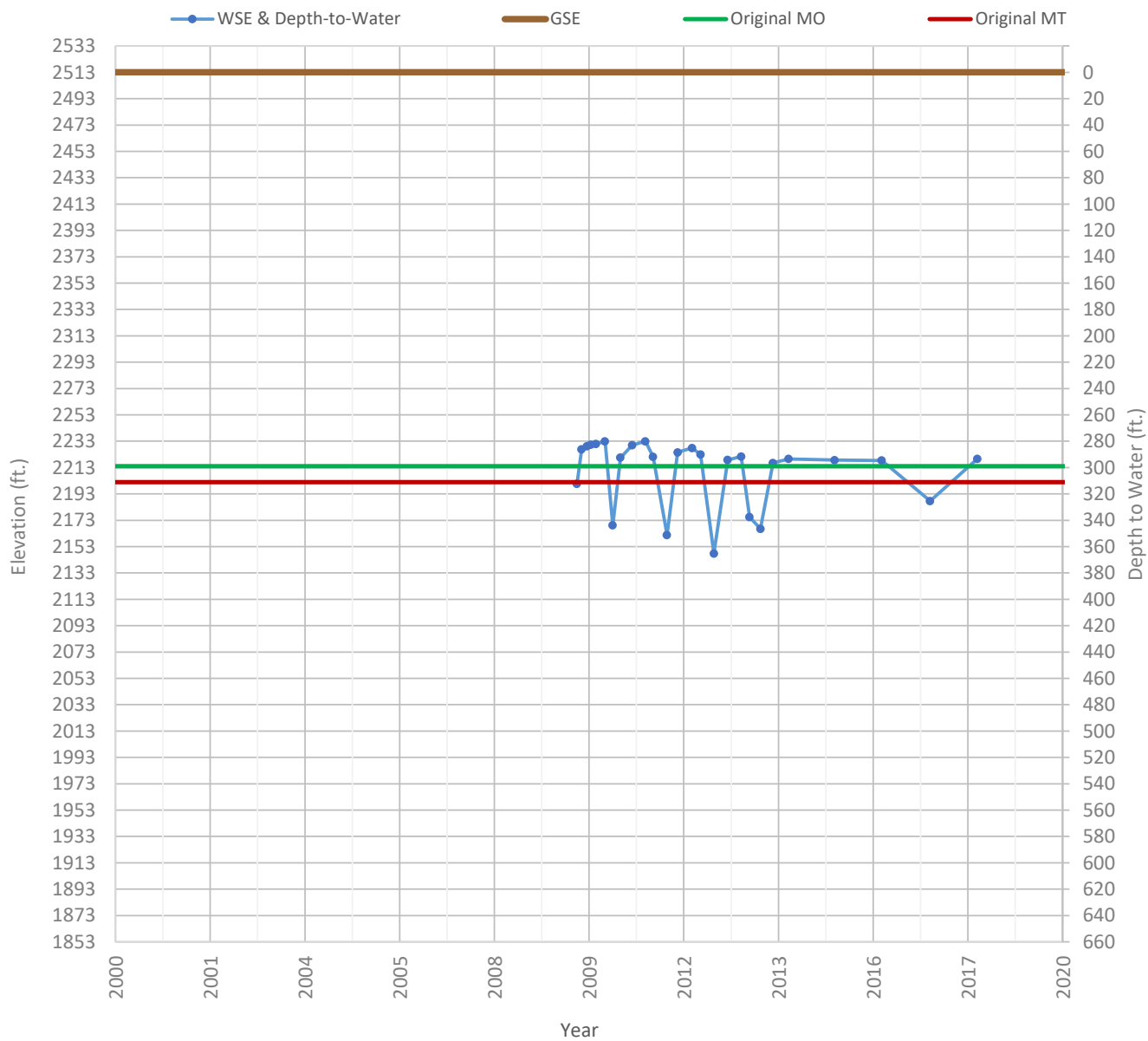
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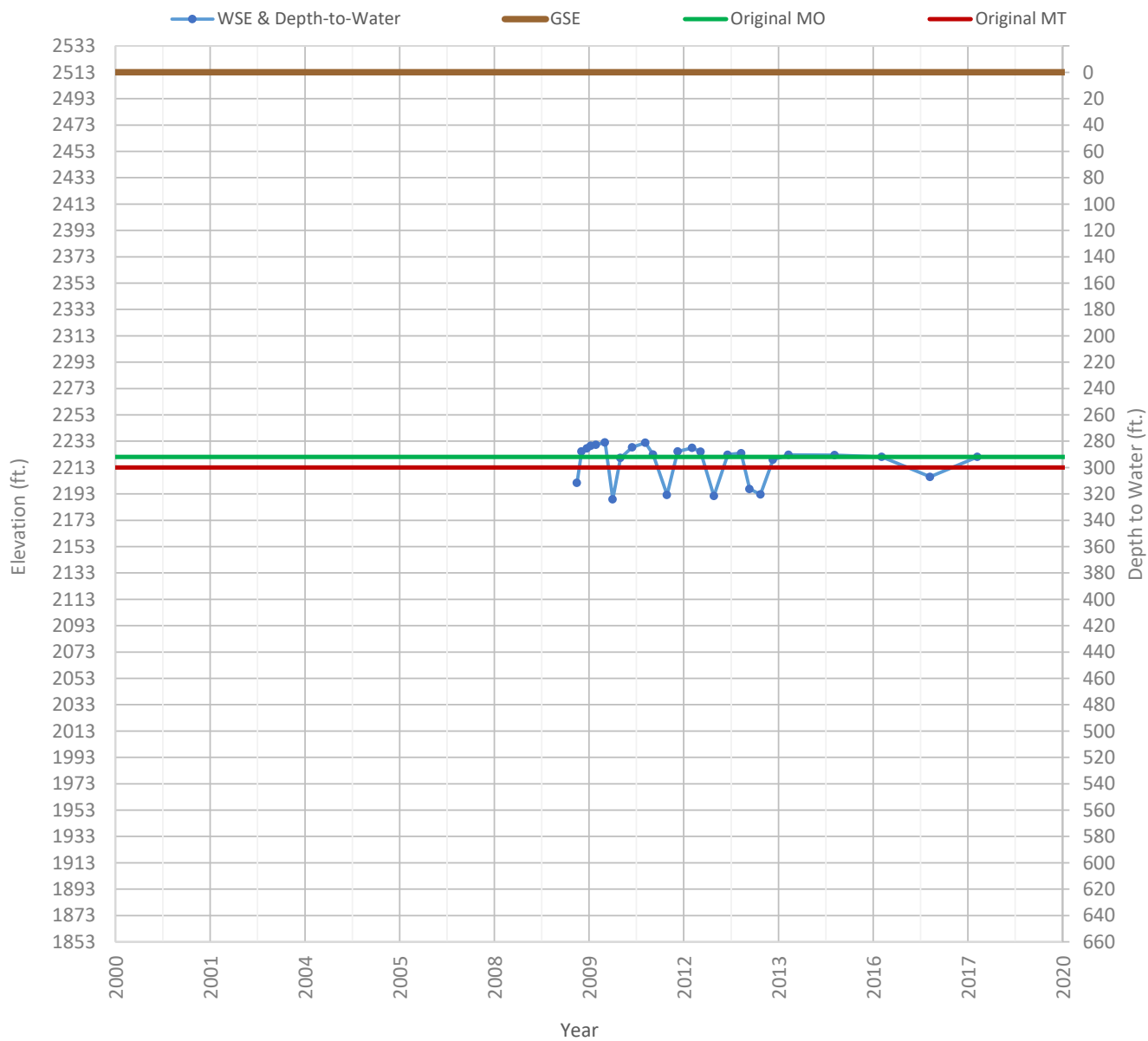
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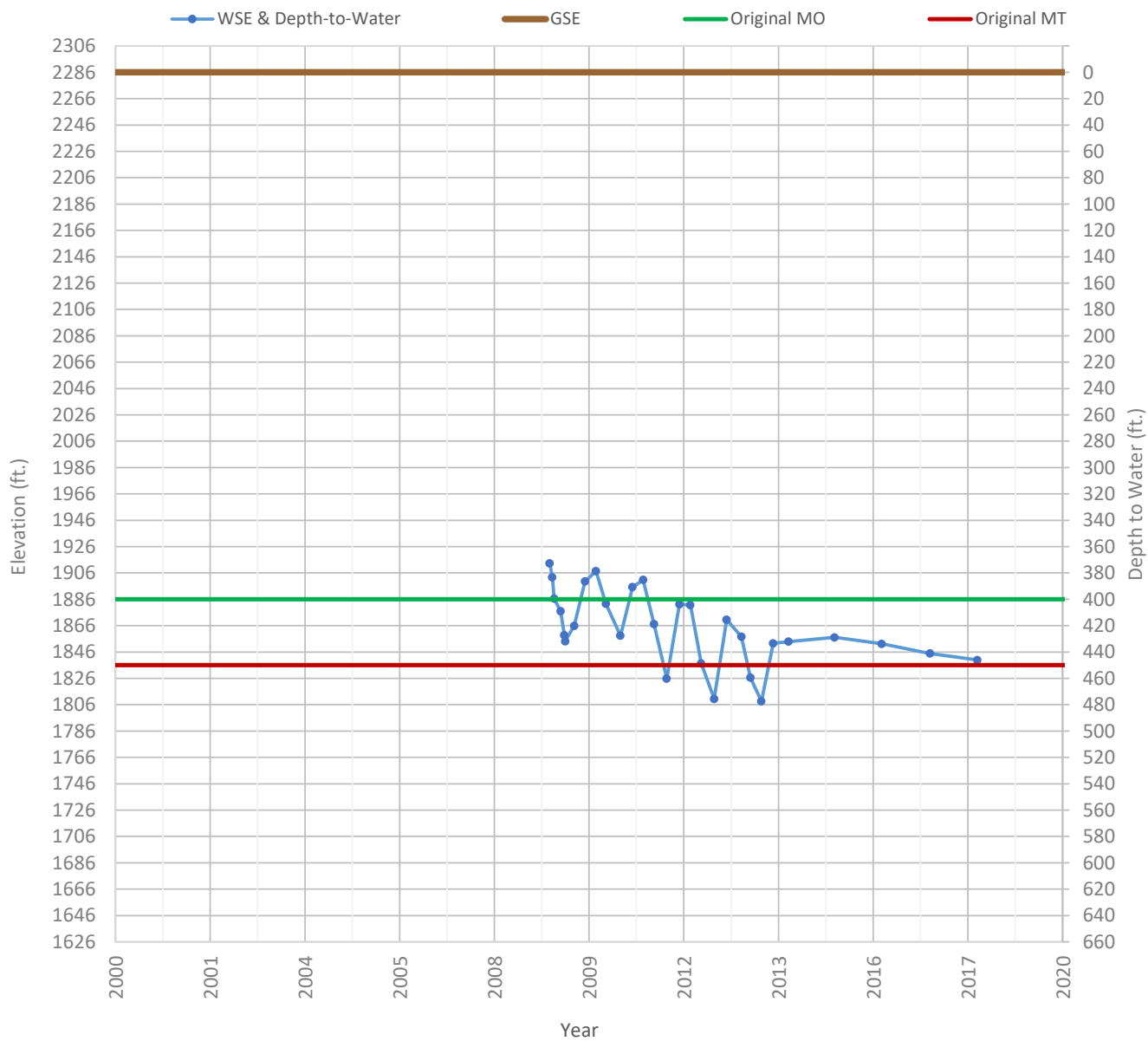
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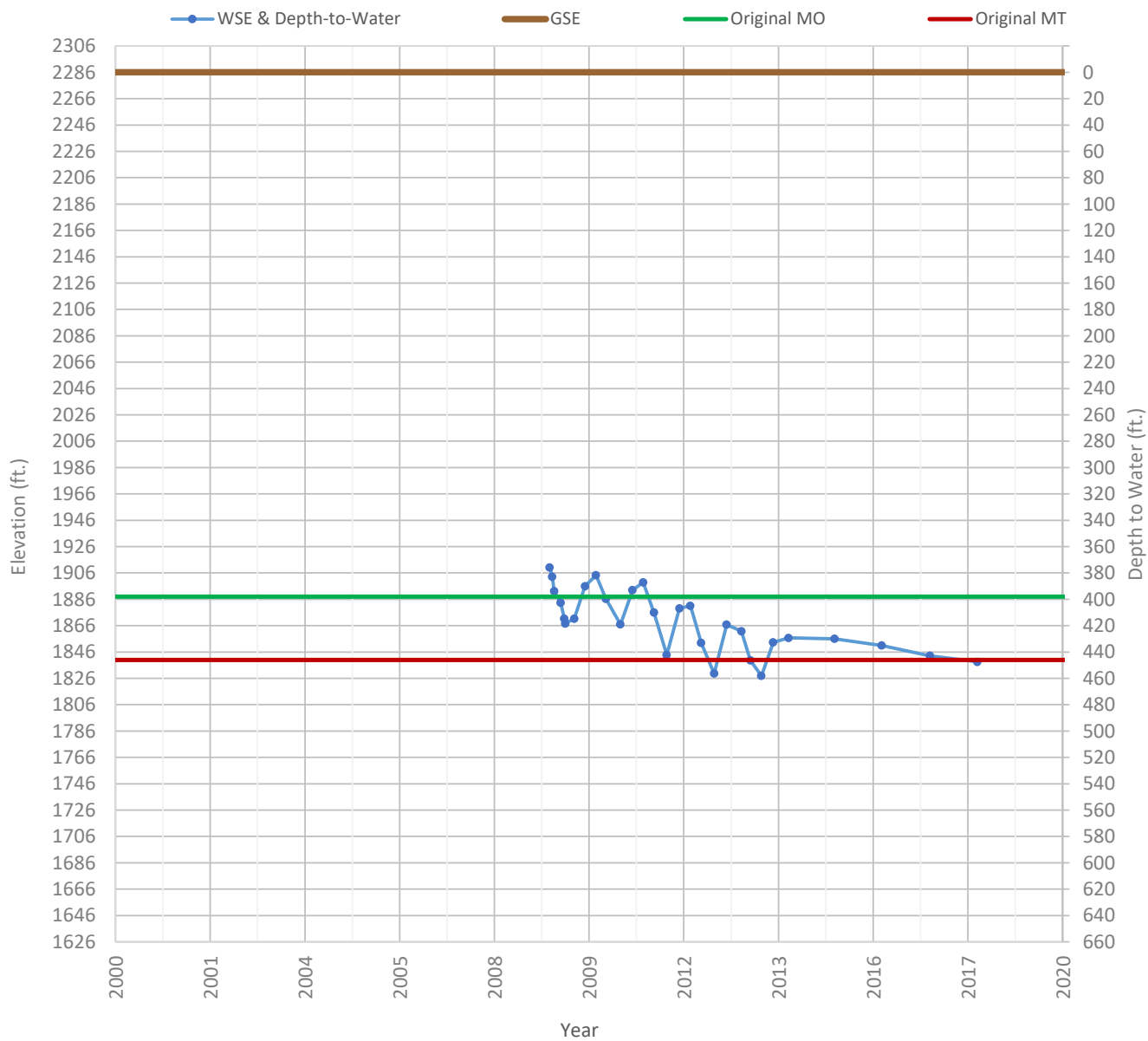
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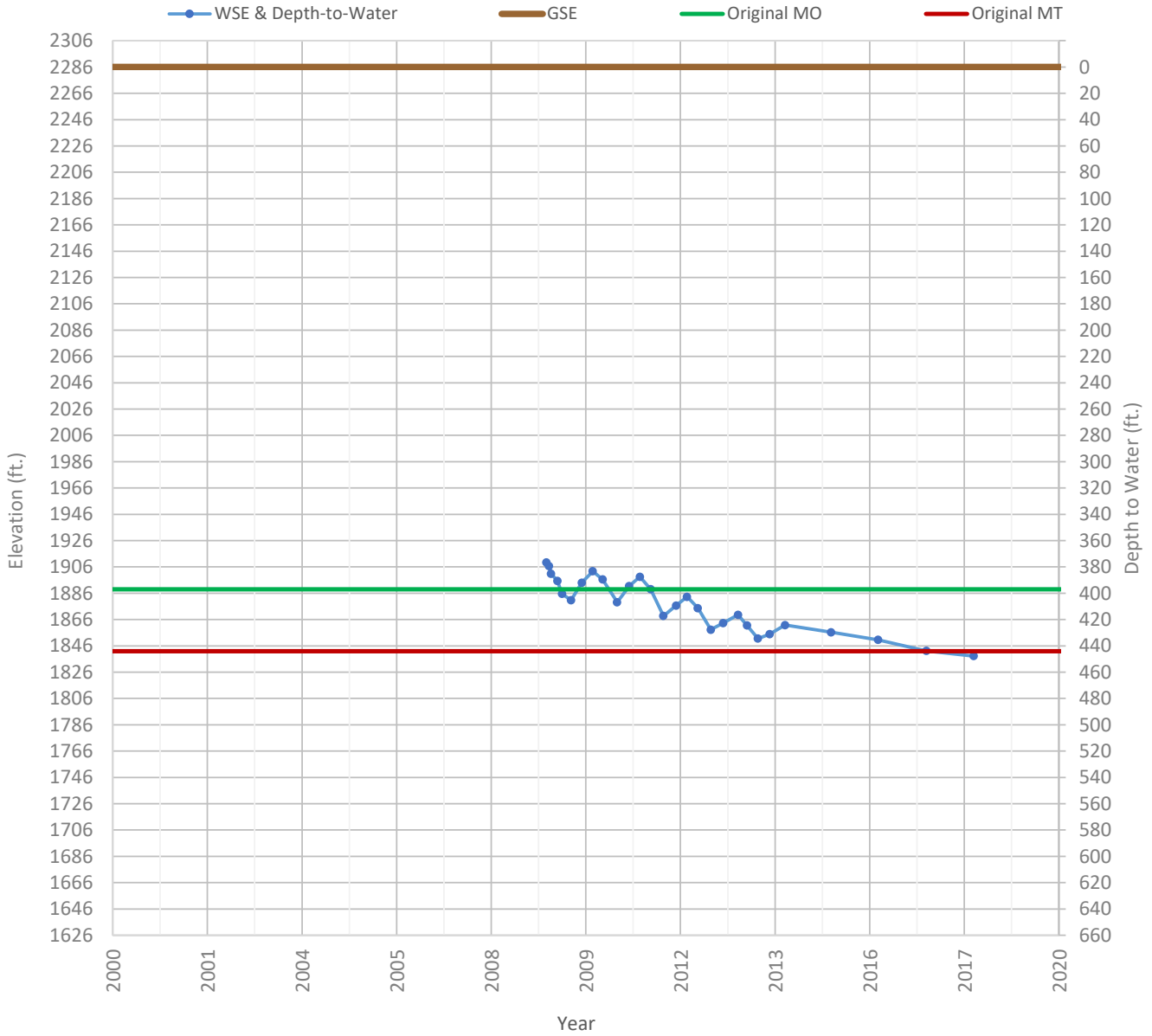
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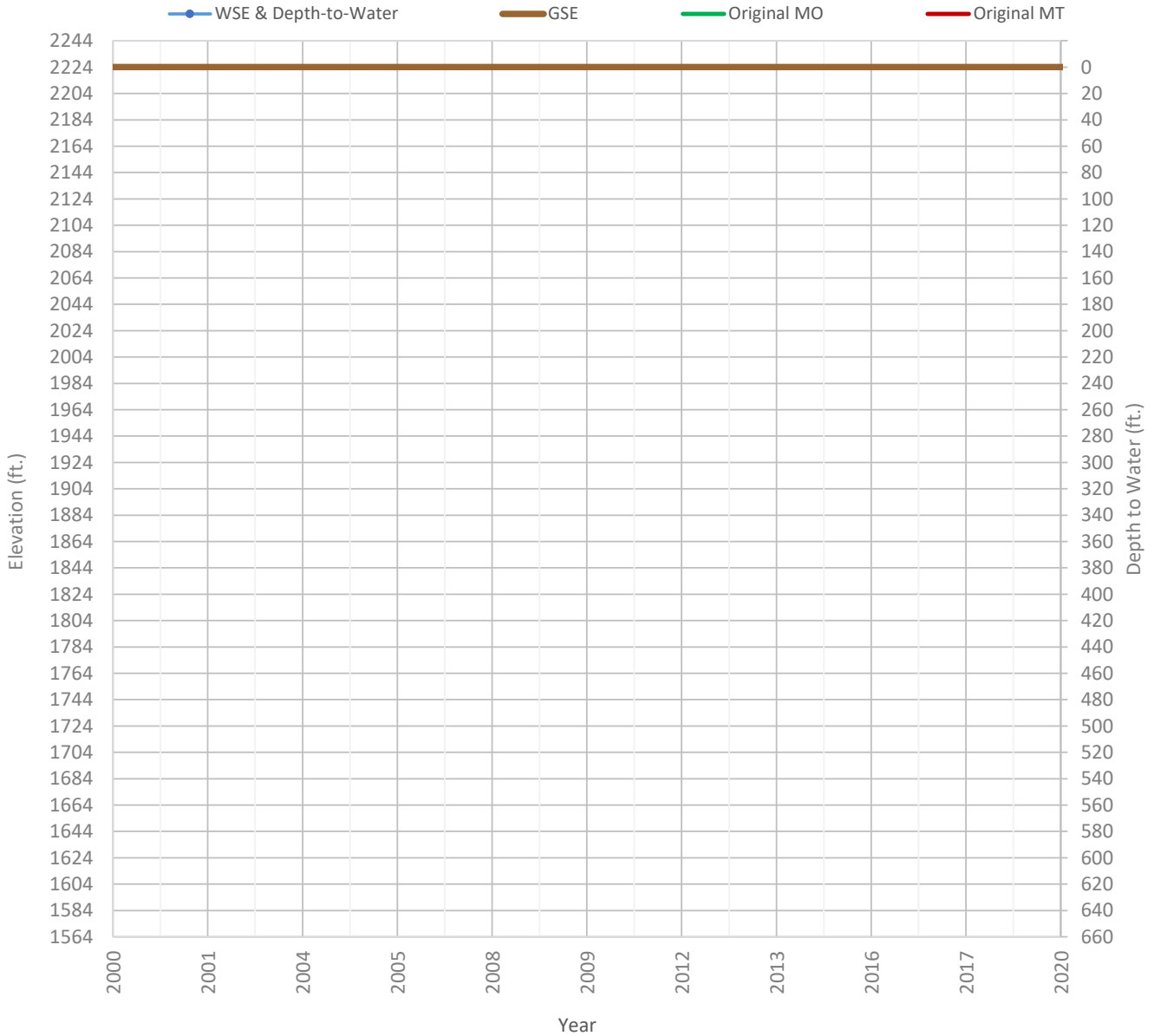
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OPTI Well 422 Hydrograph



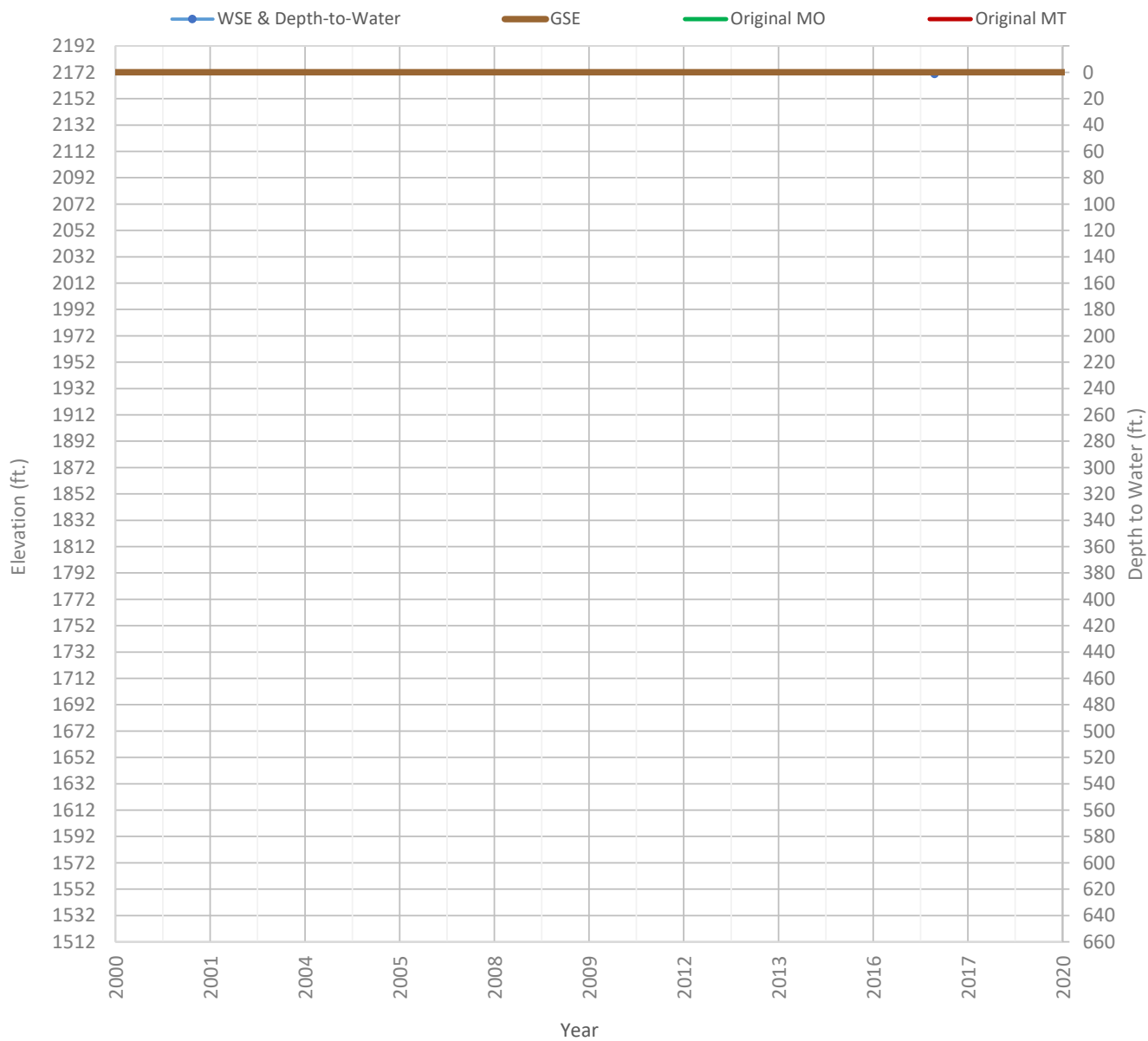
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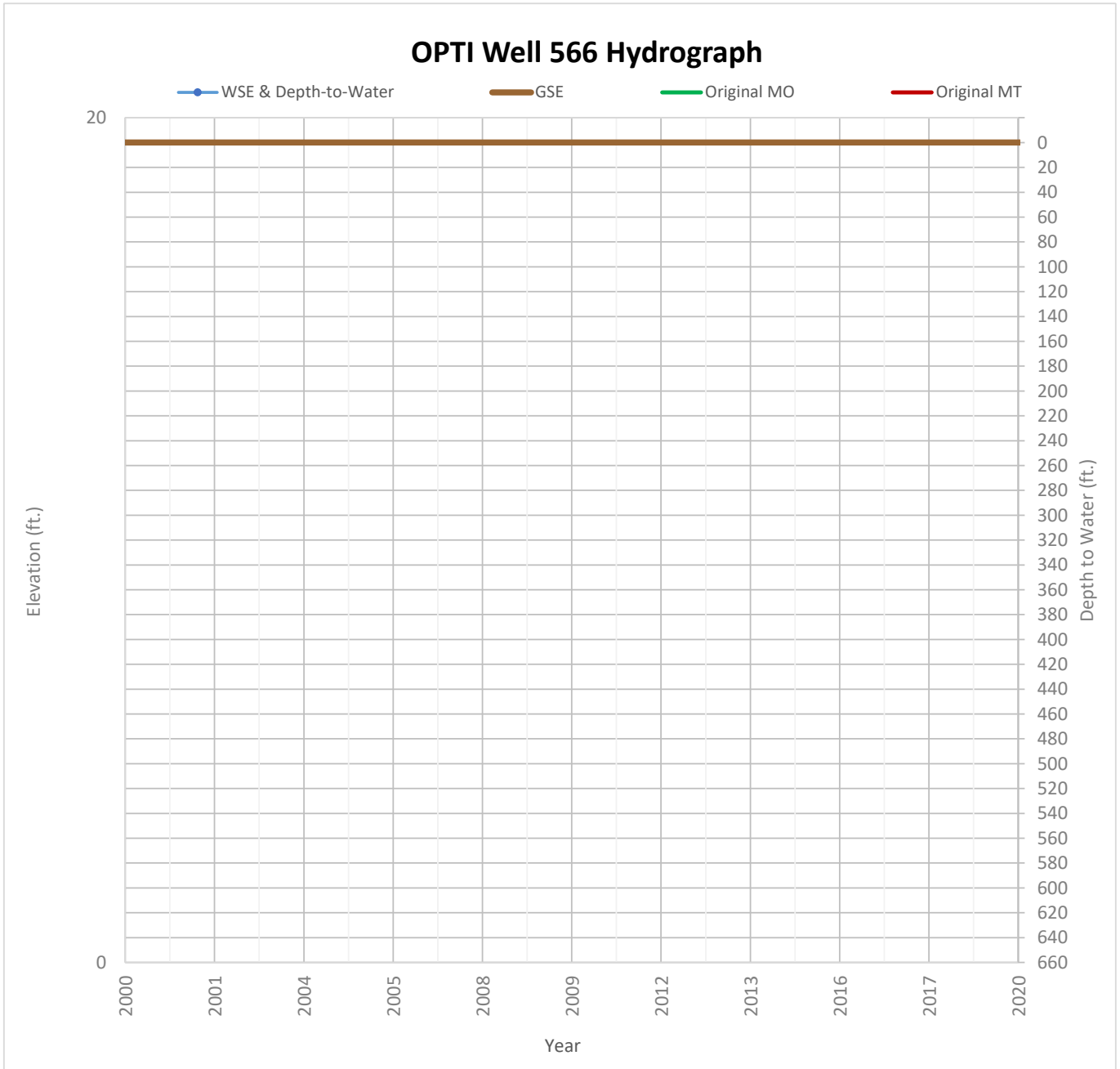


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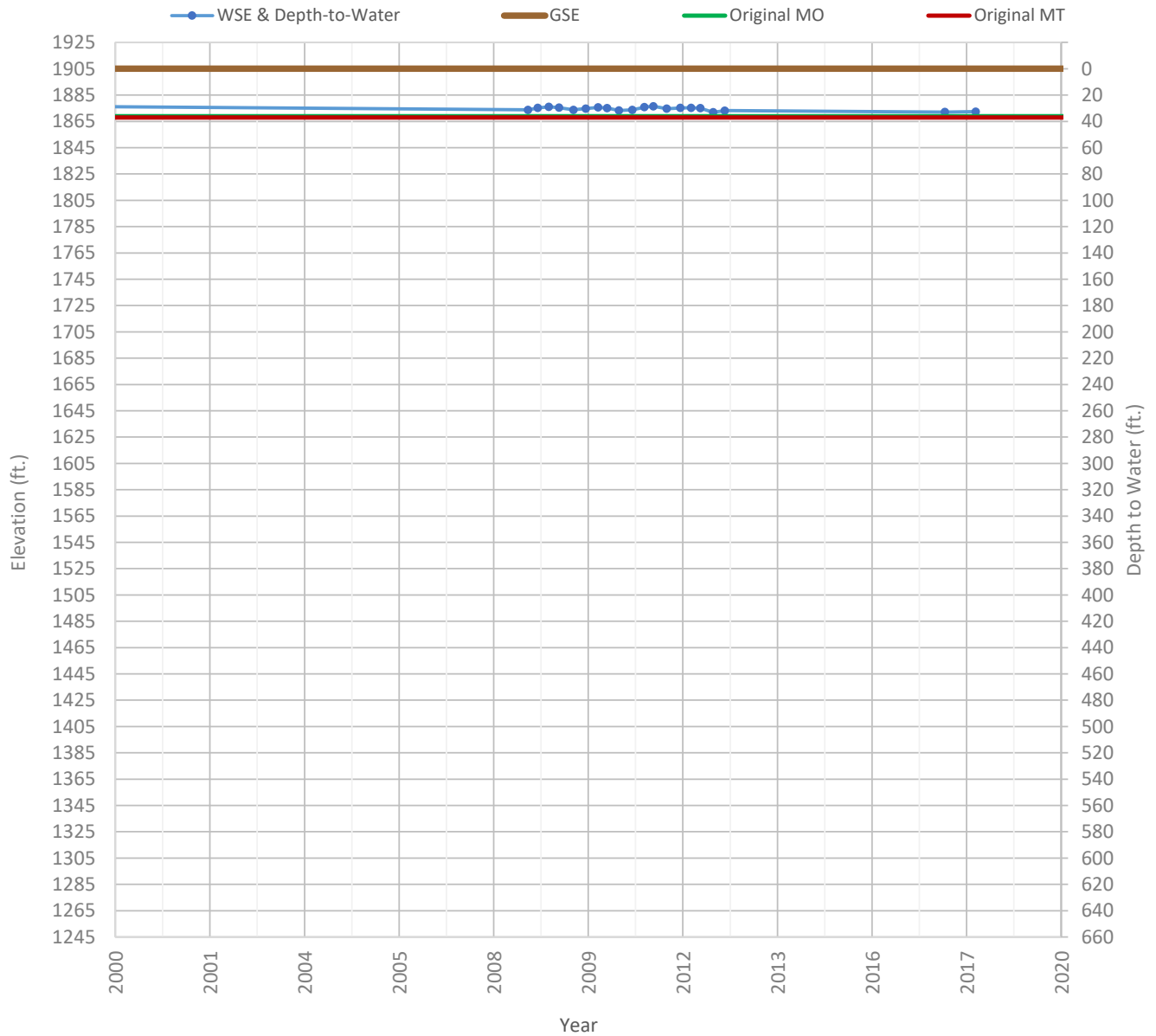


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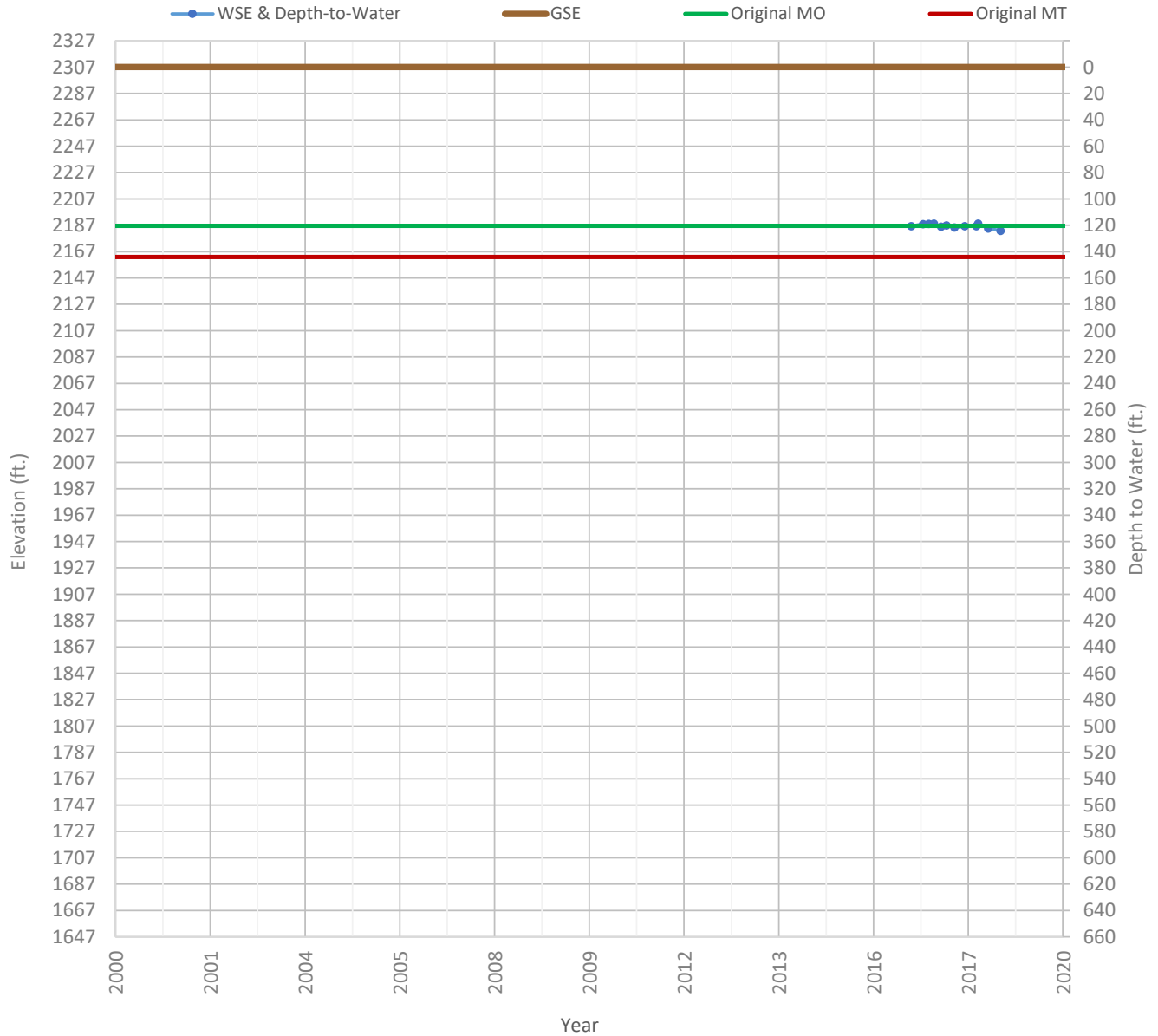




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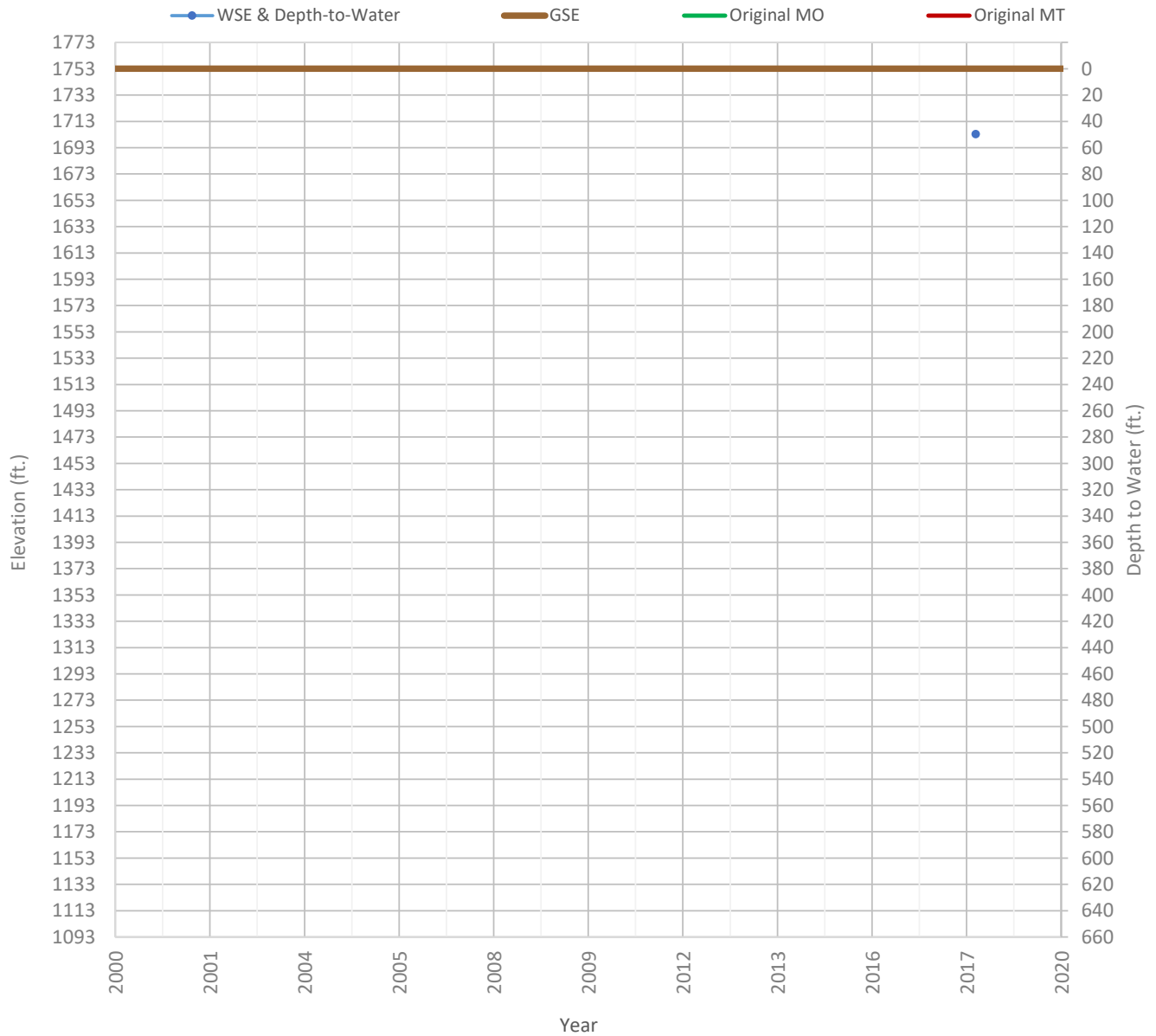
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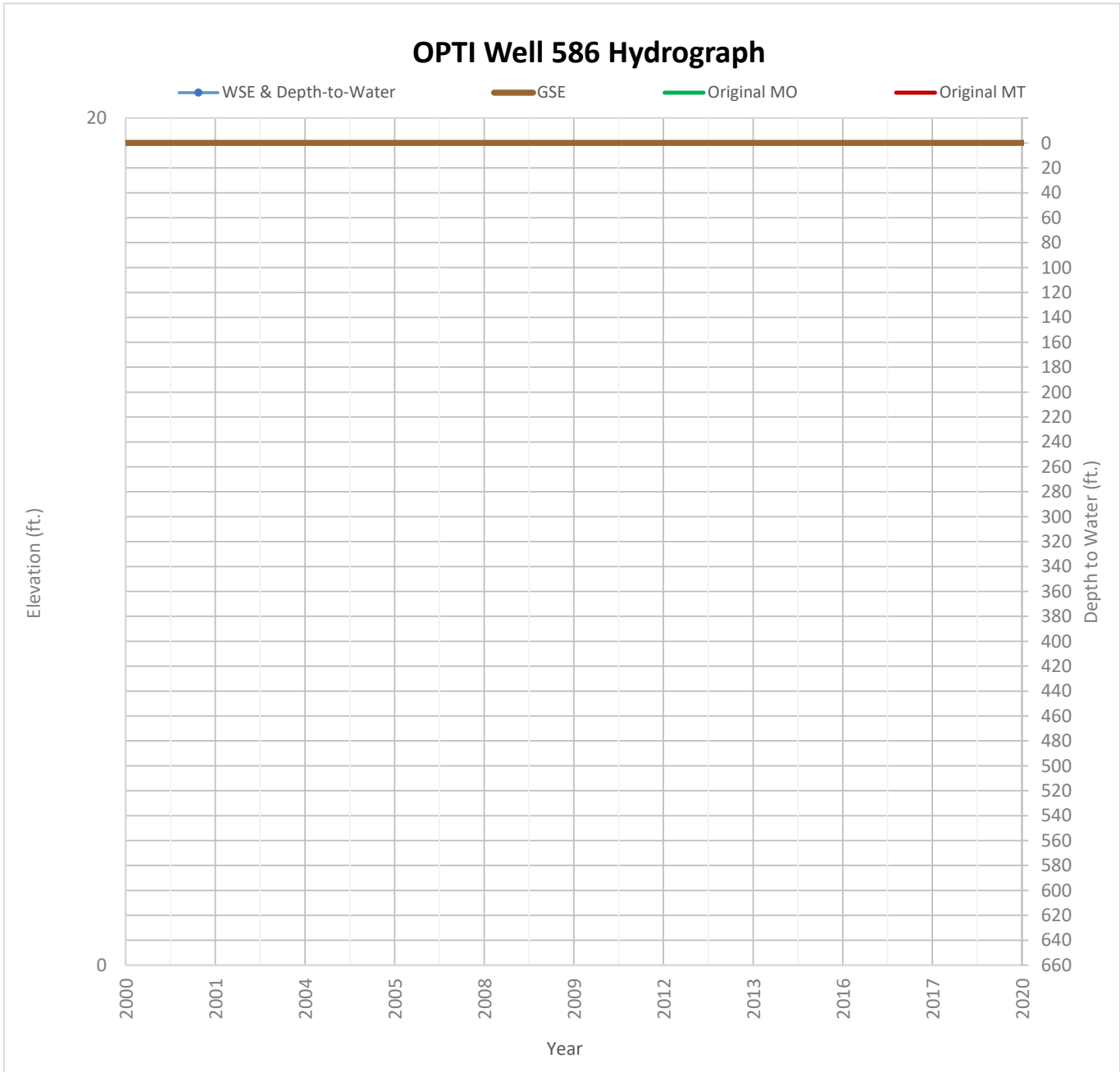


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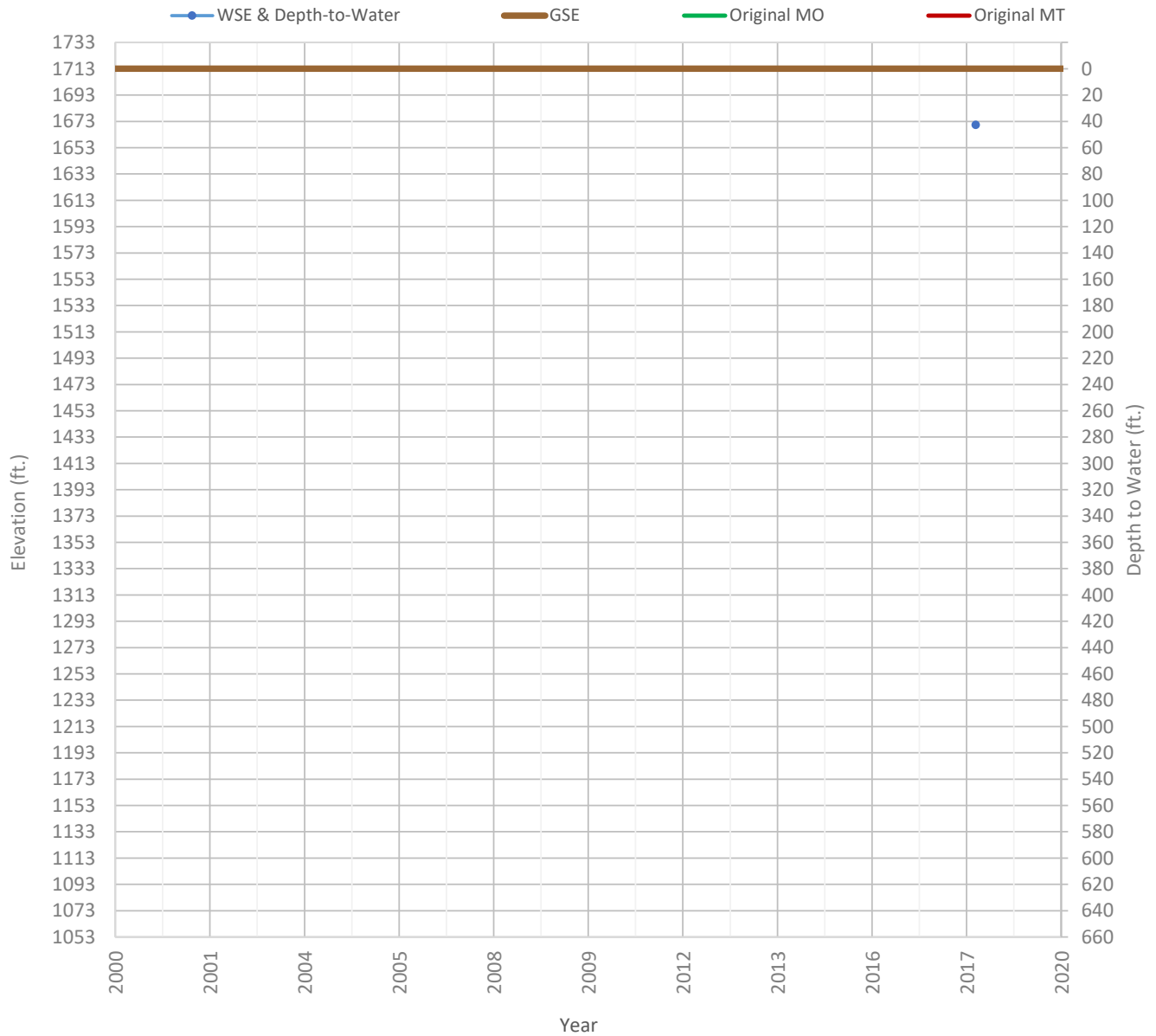


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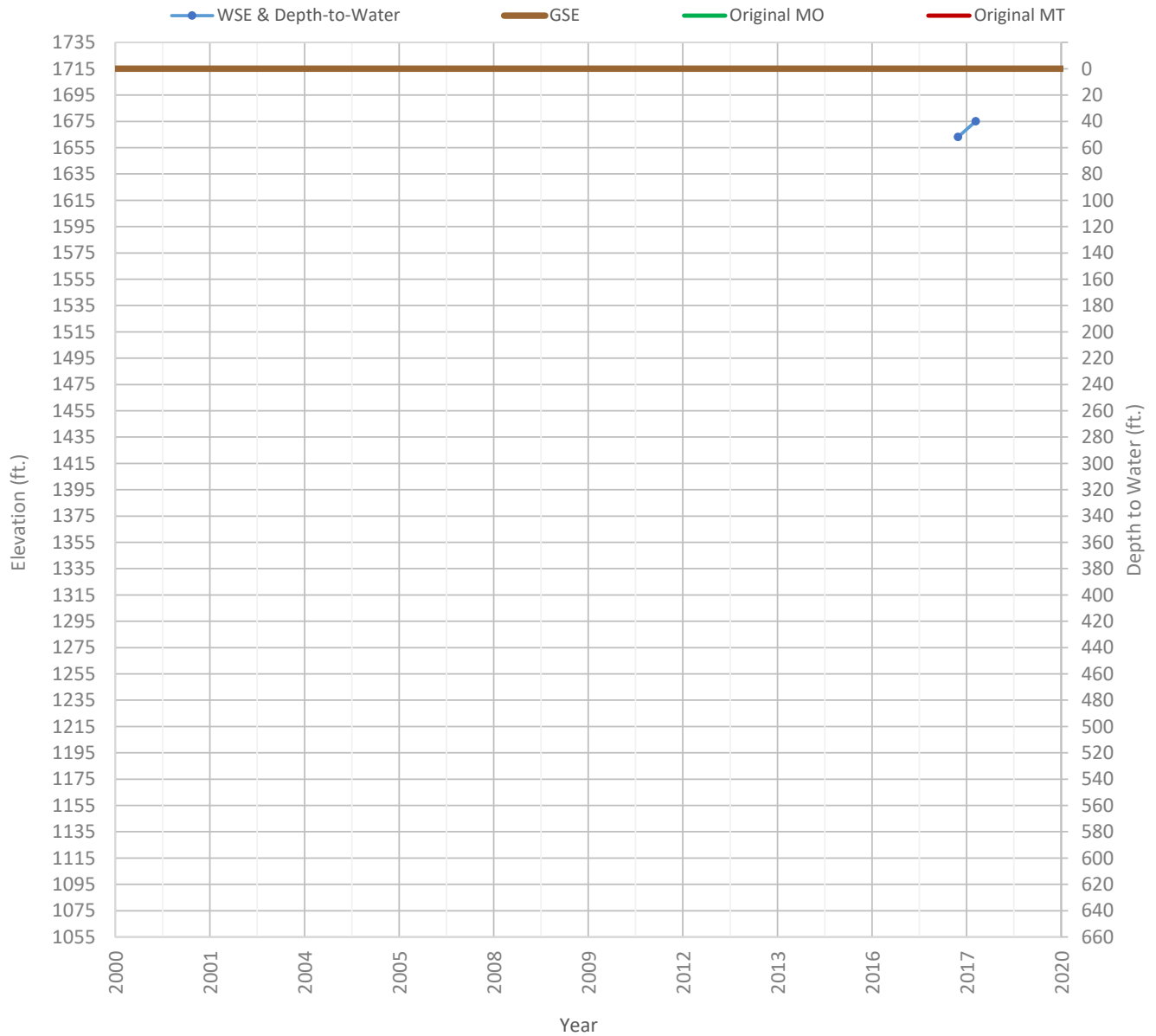




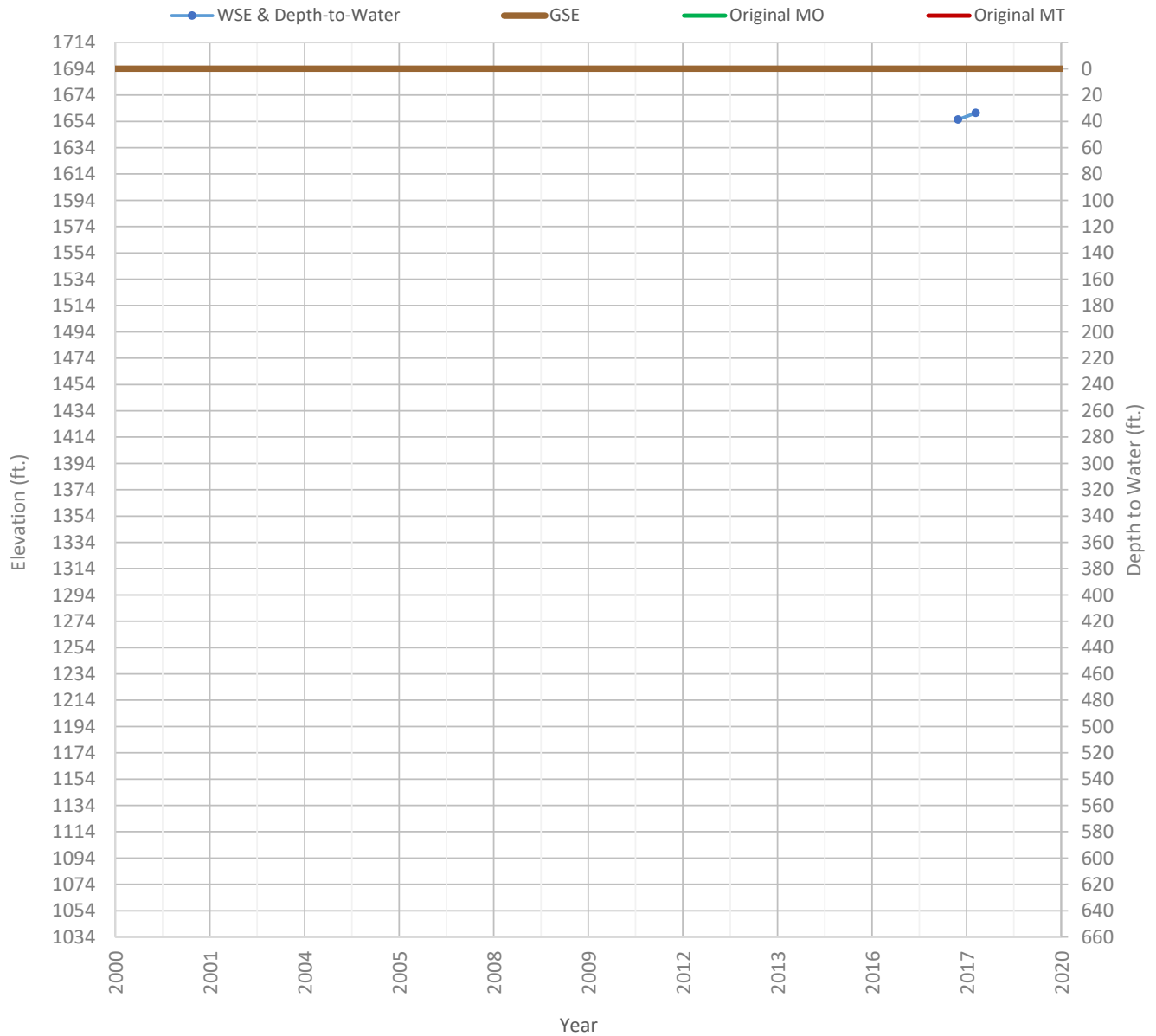
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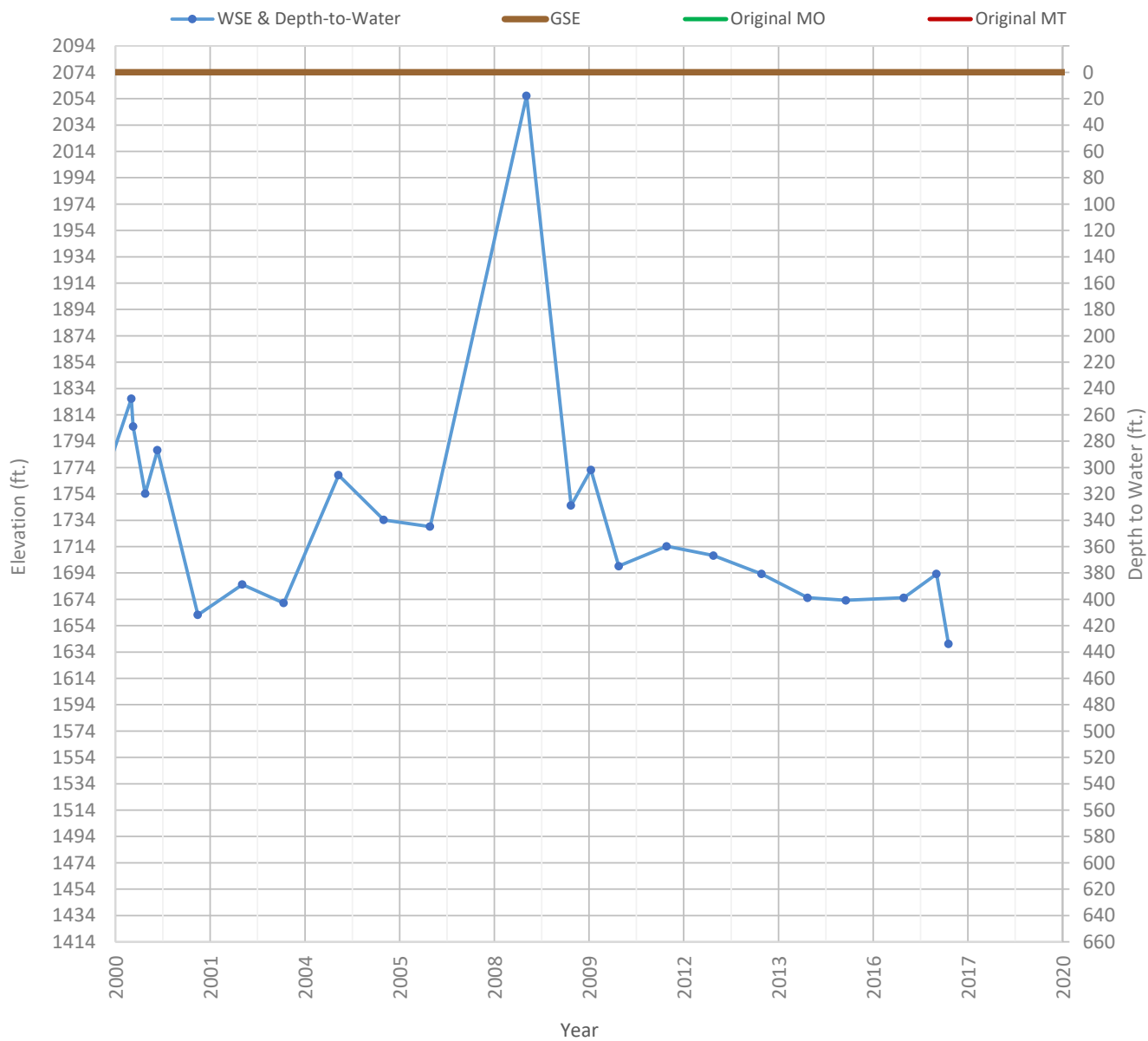
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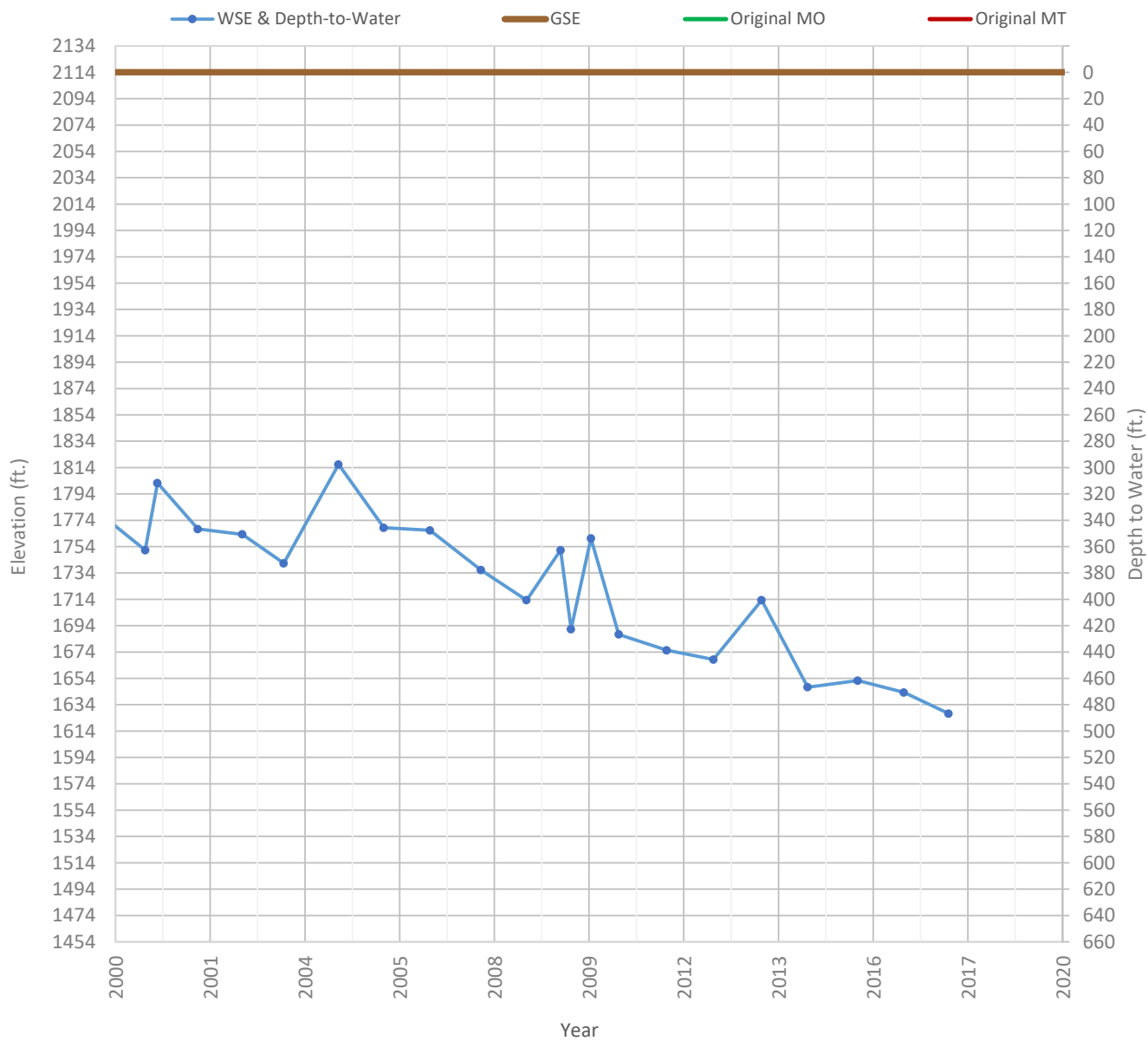
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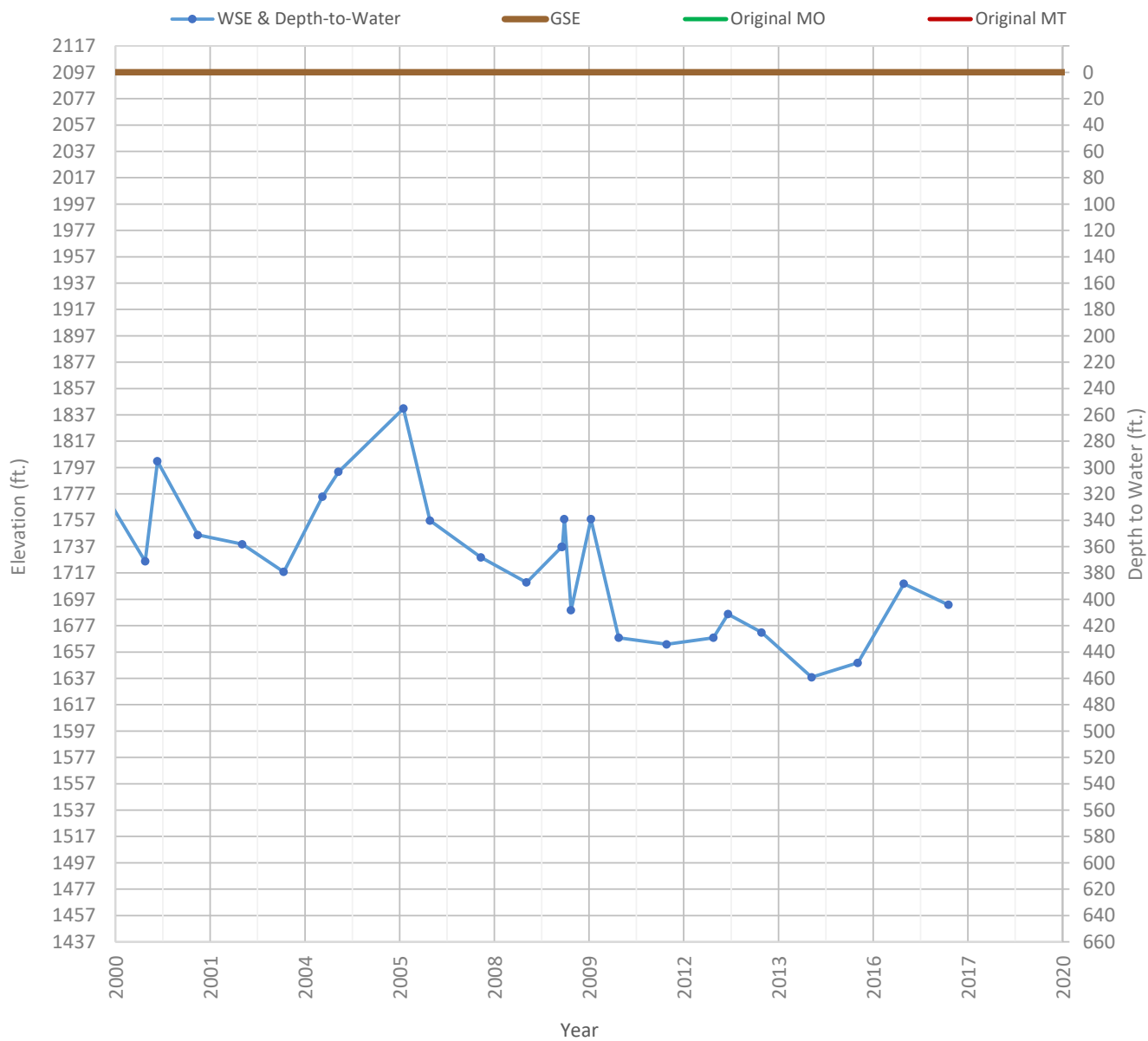
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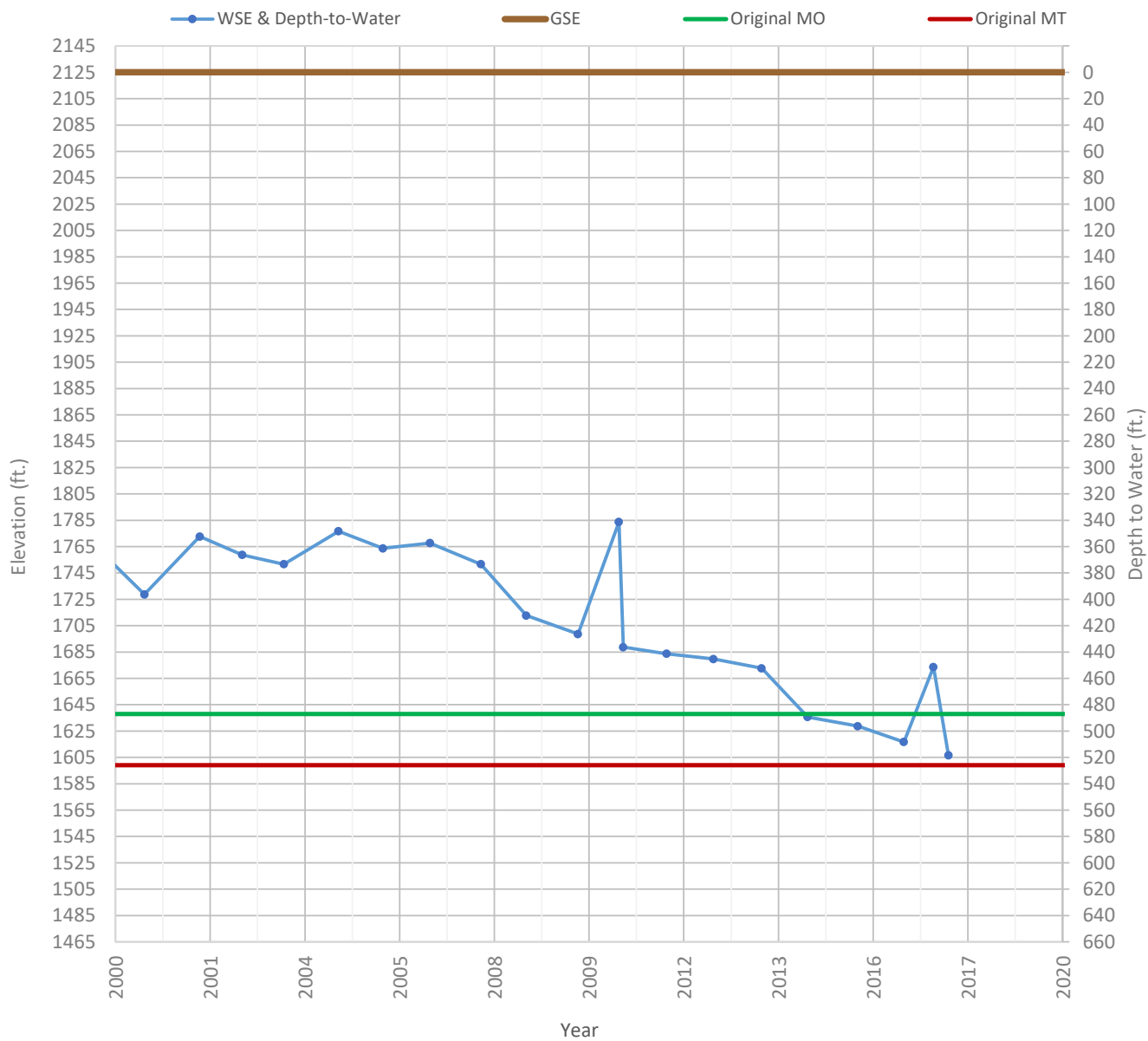
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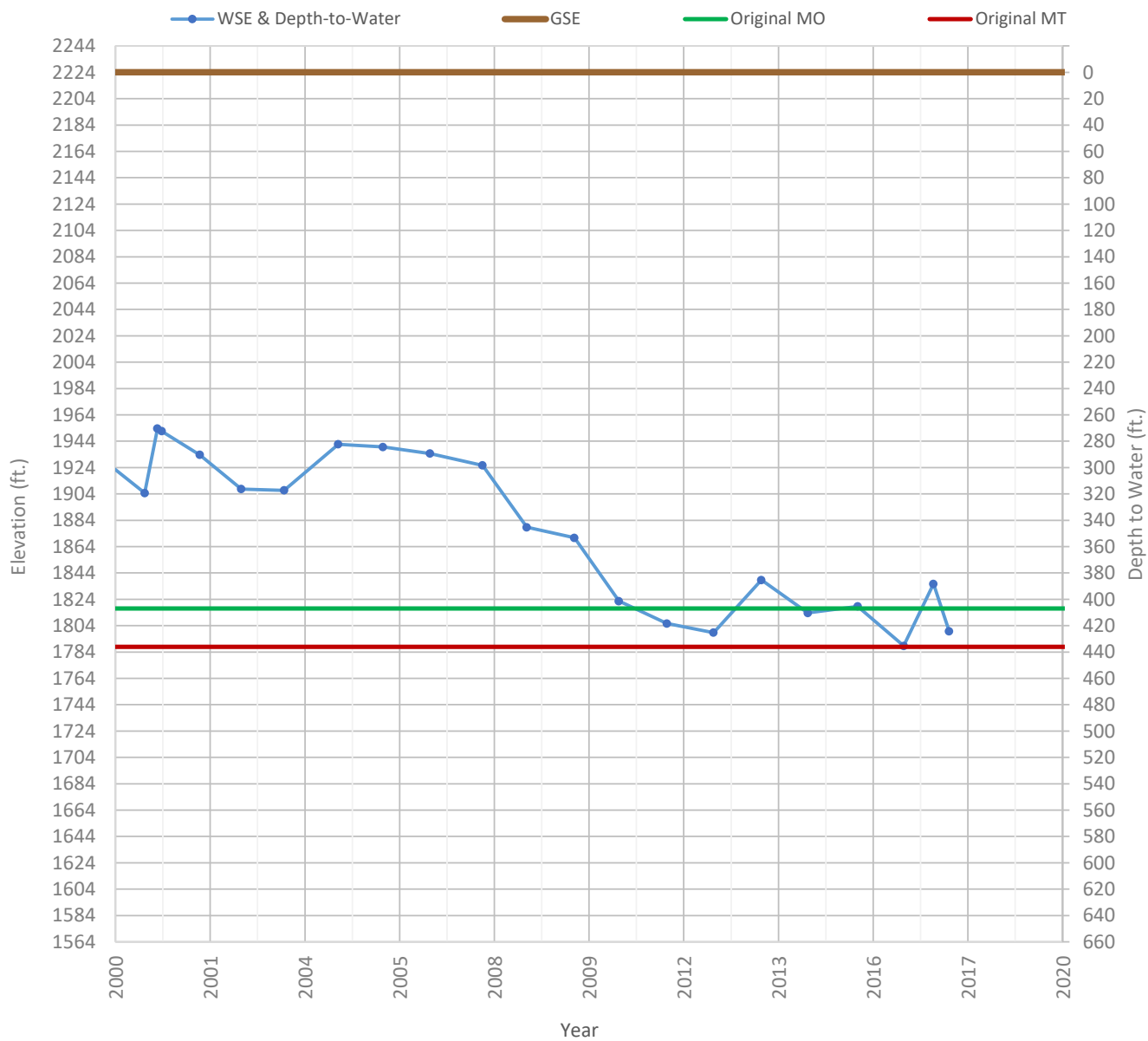
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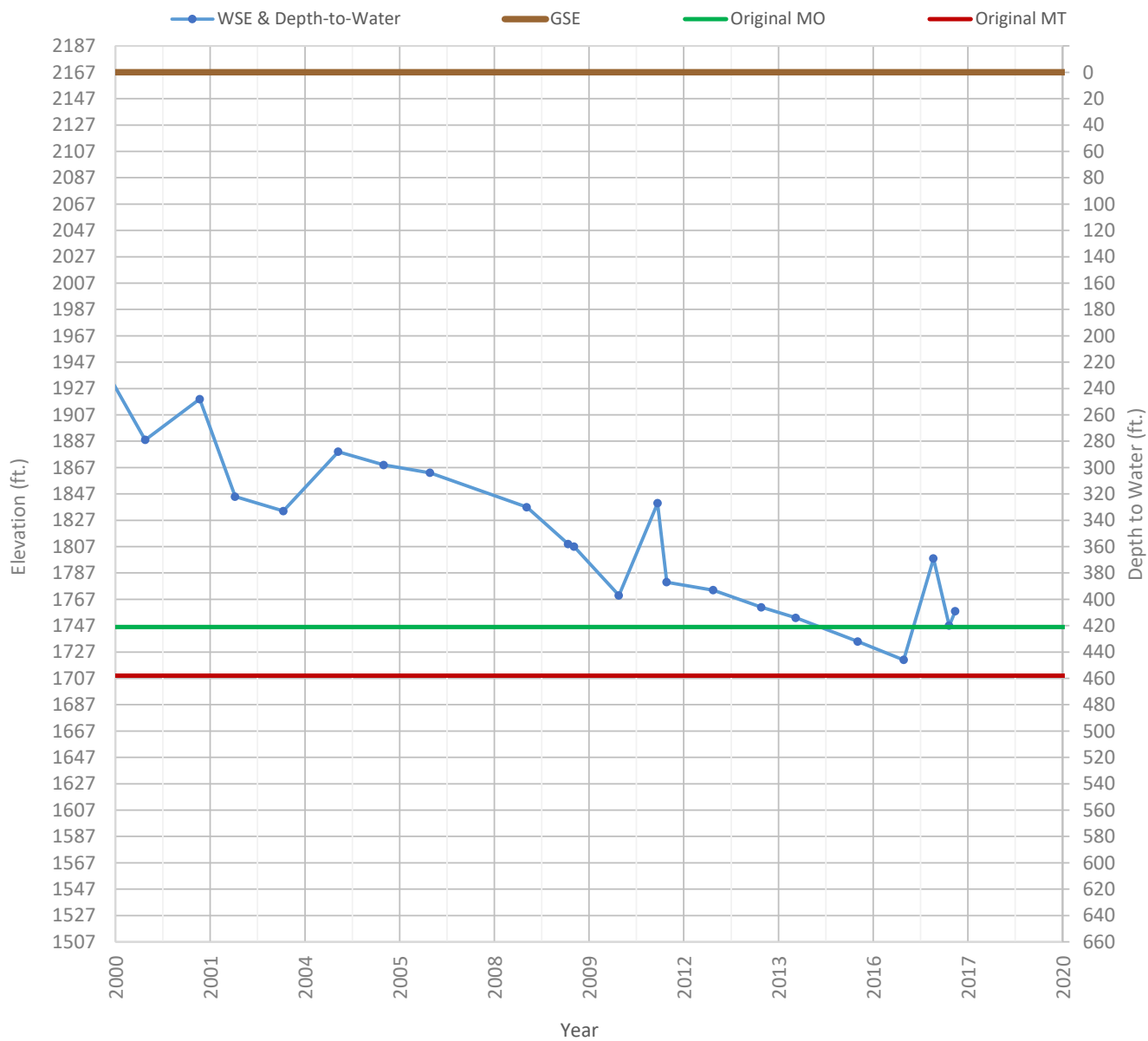
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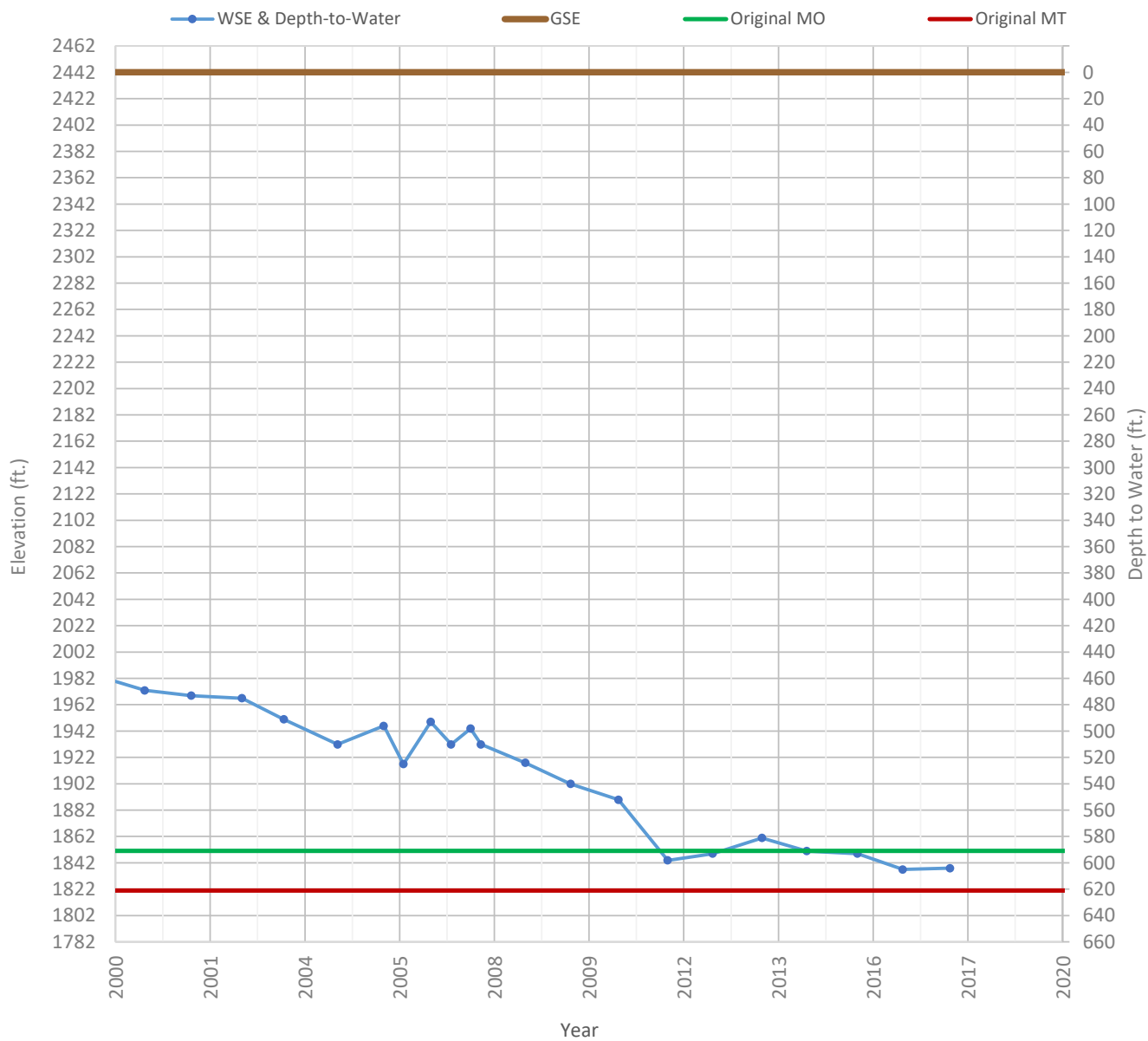
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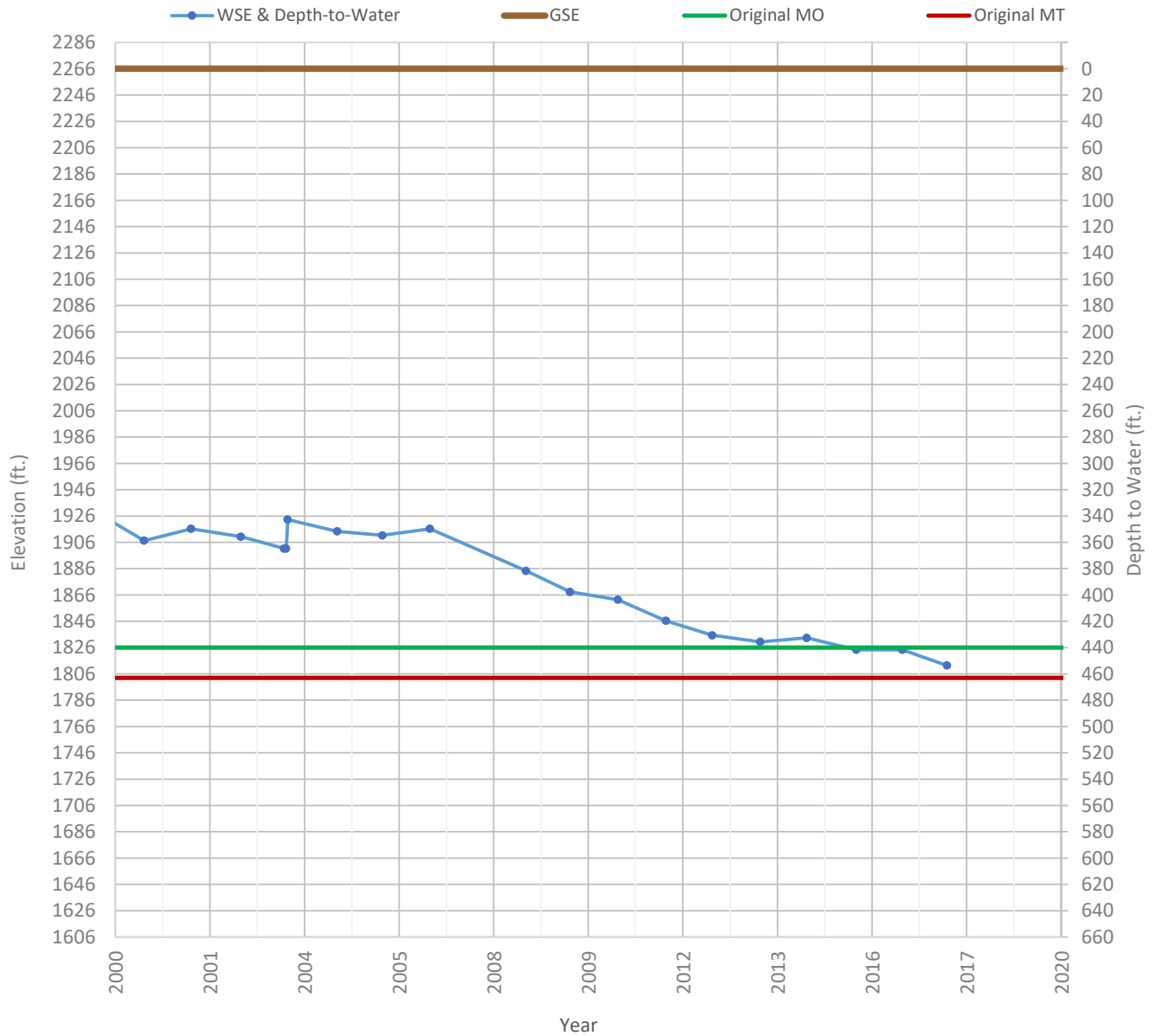
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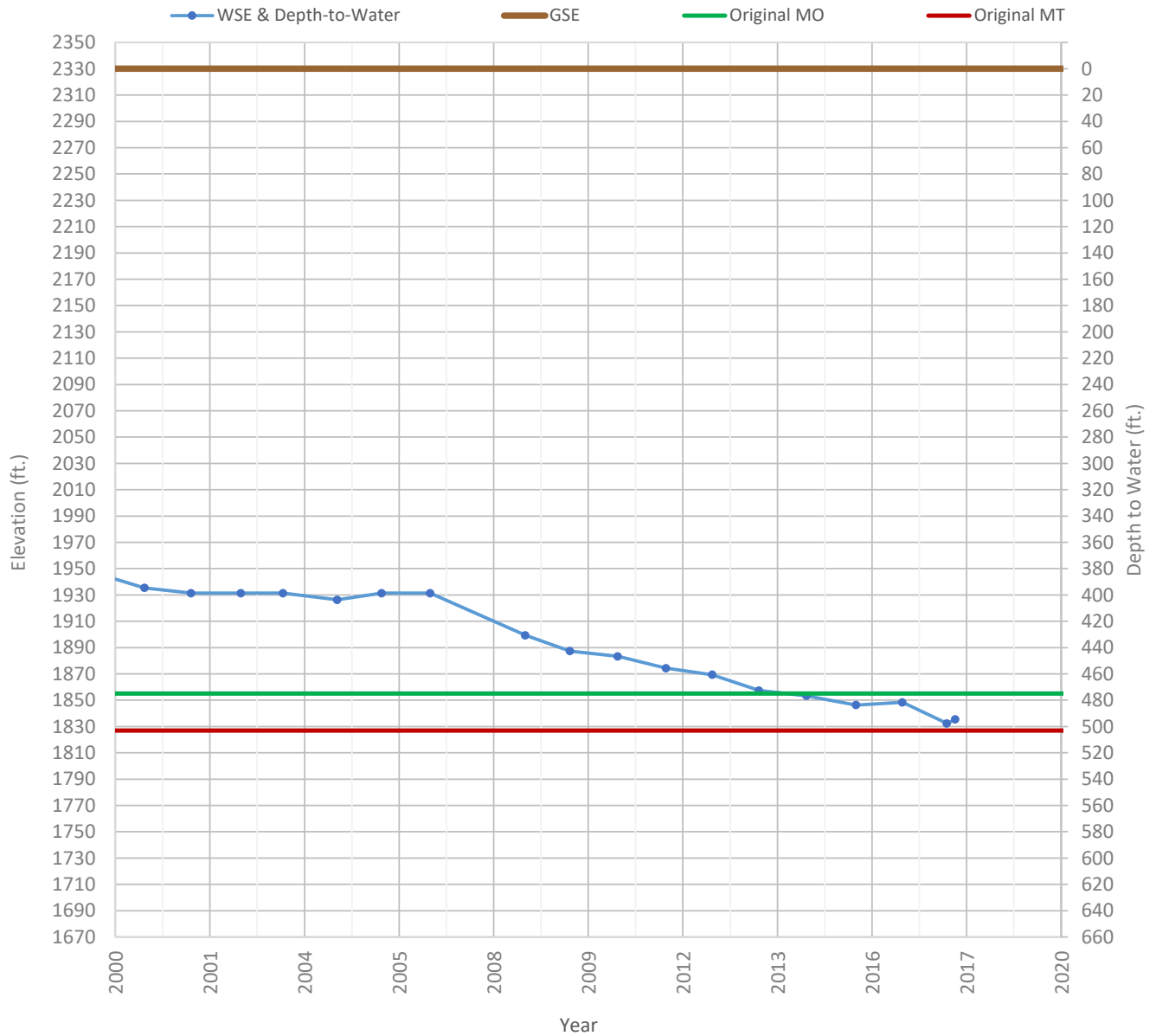
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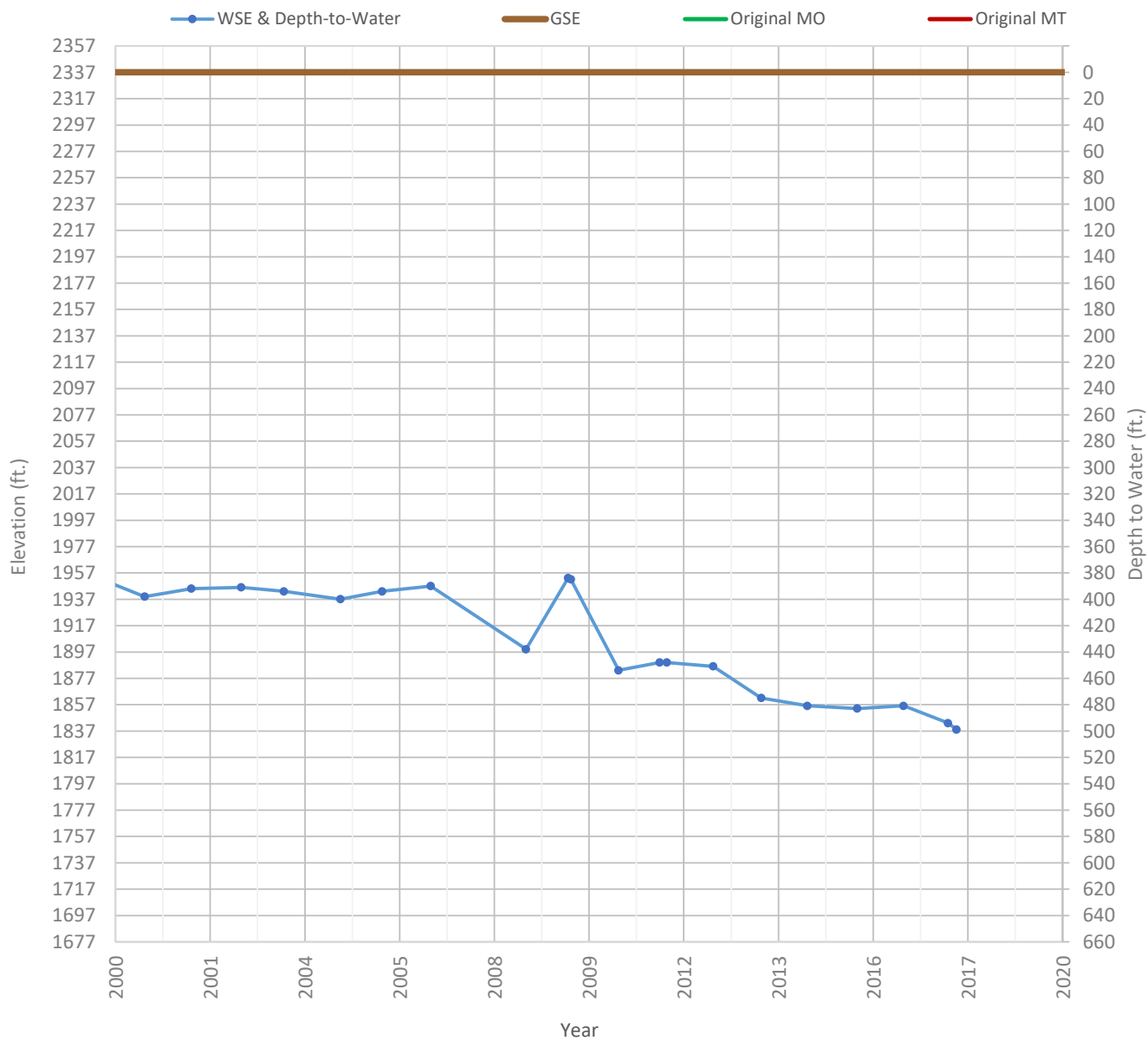
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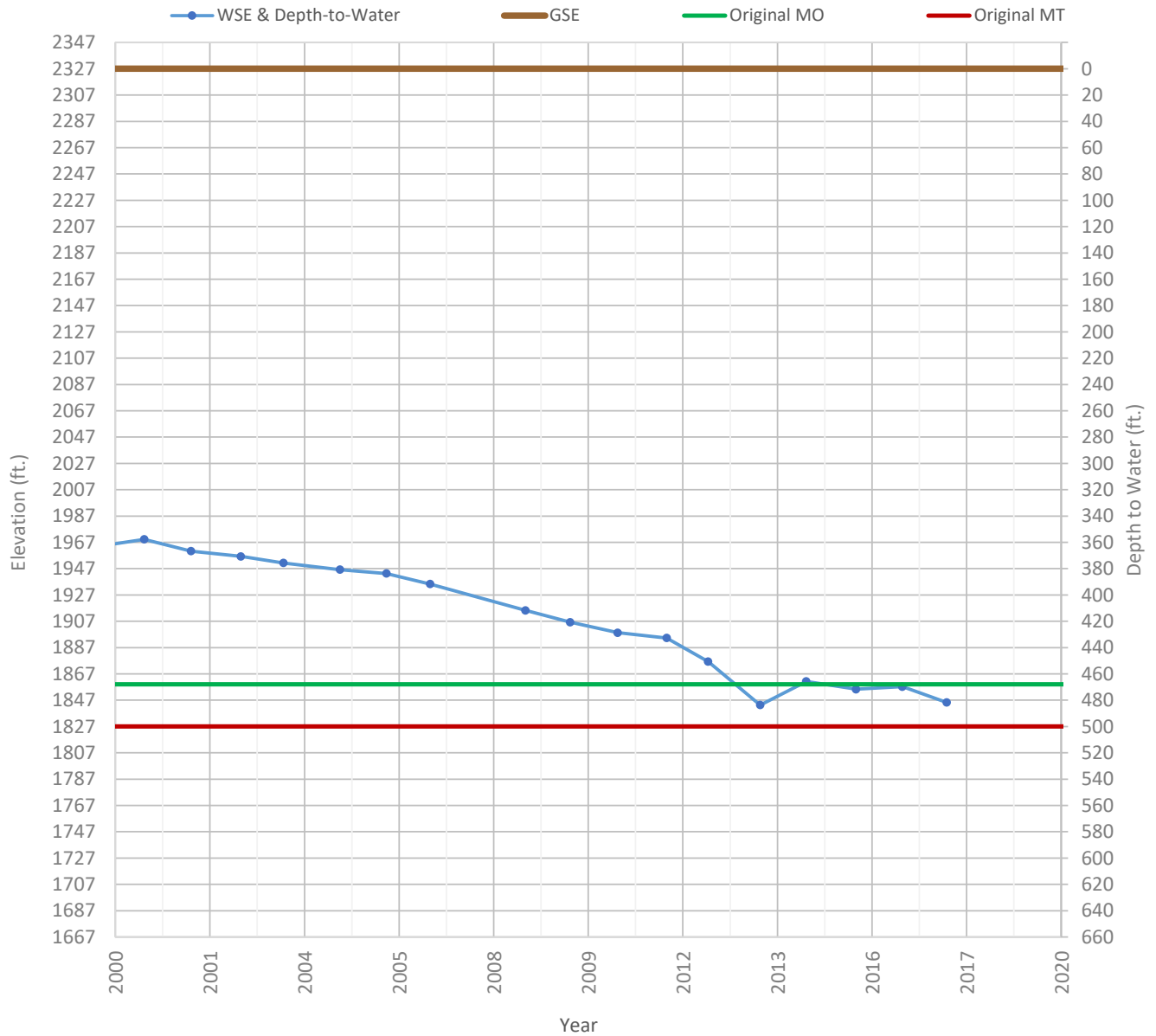
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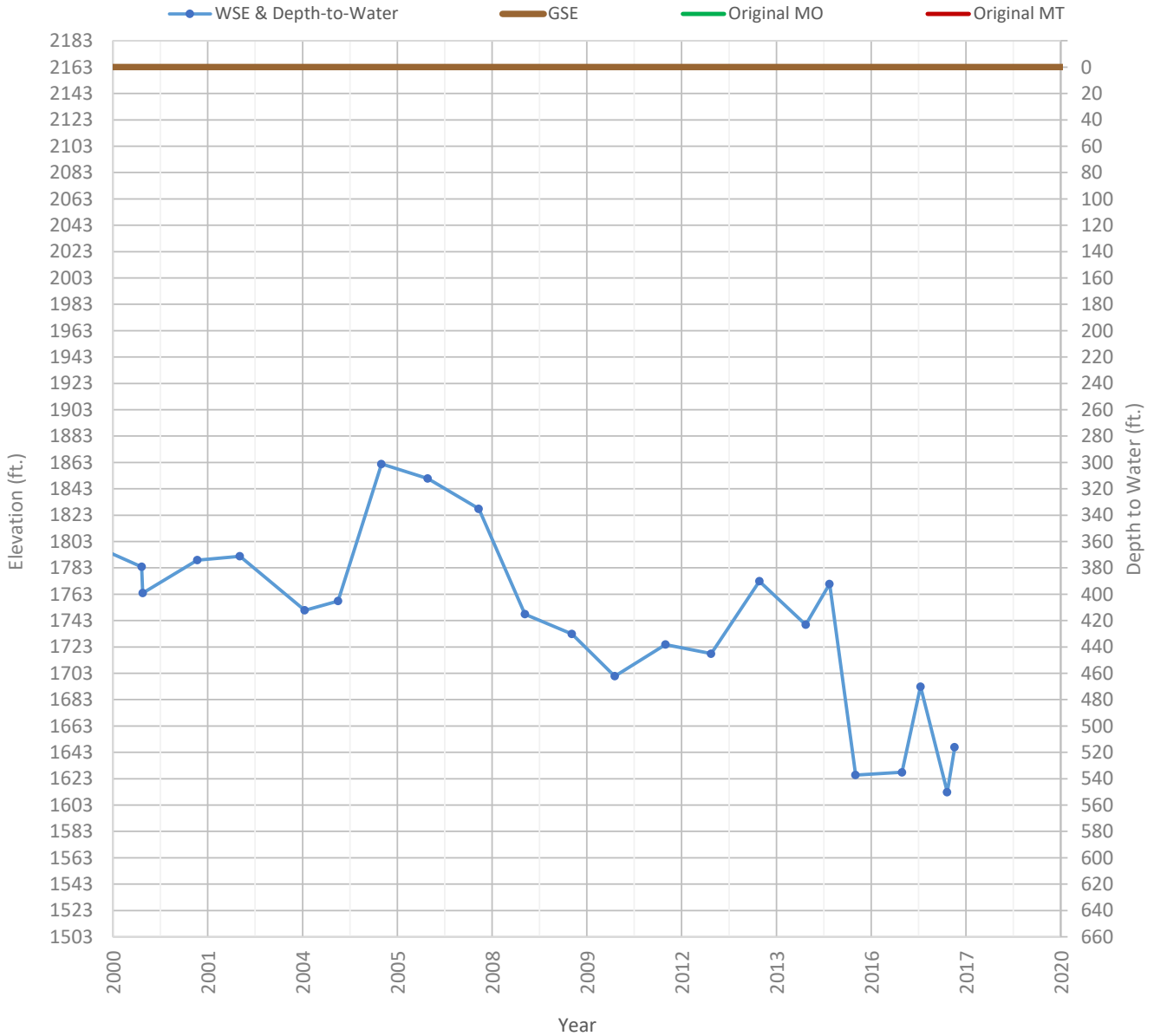
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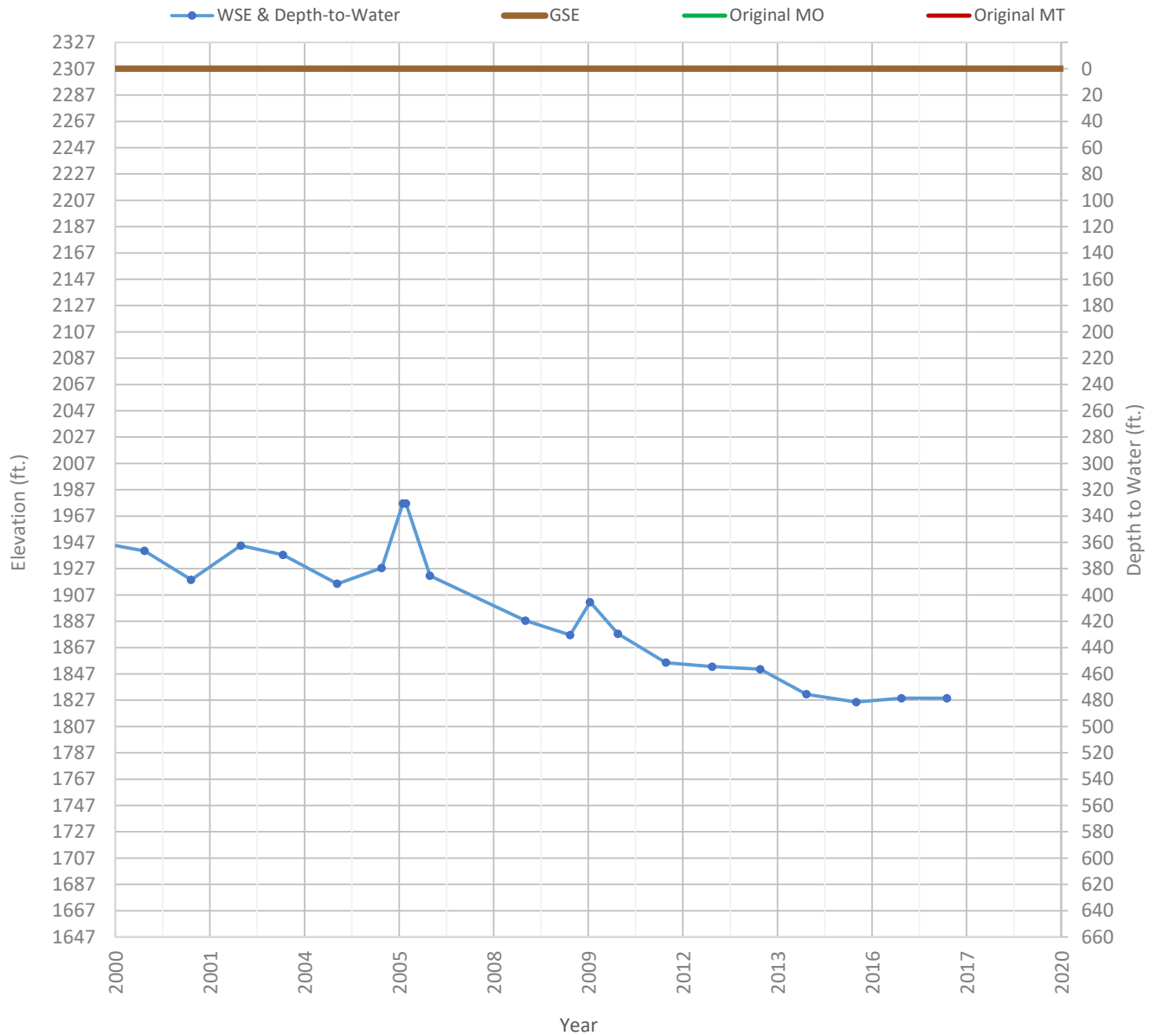
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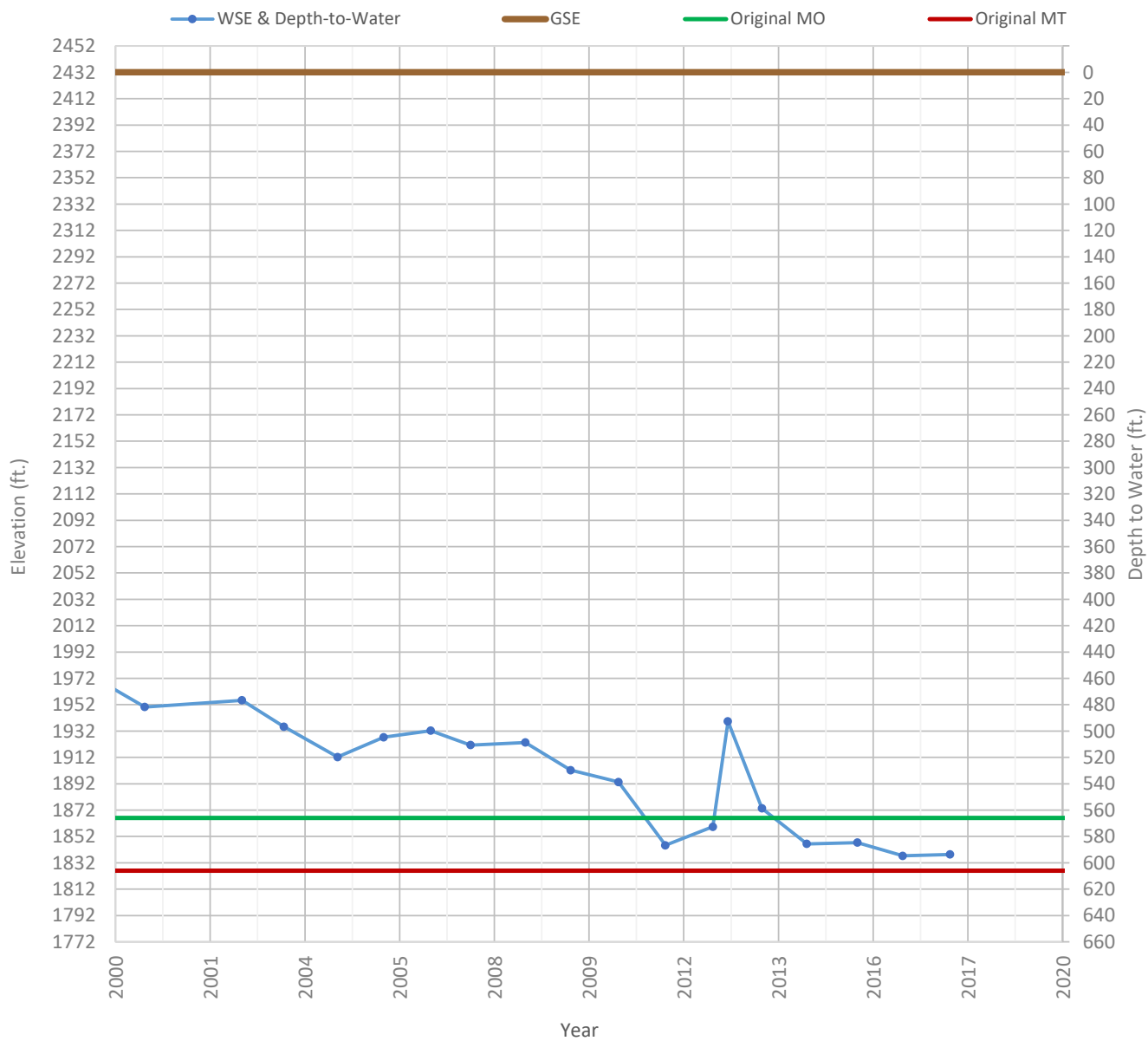
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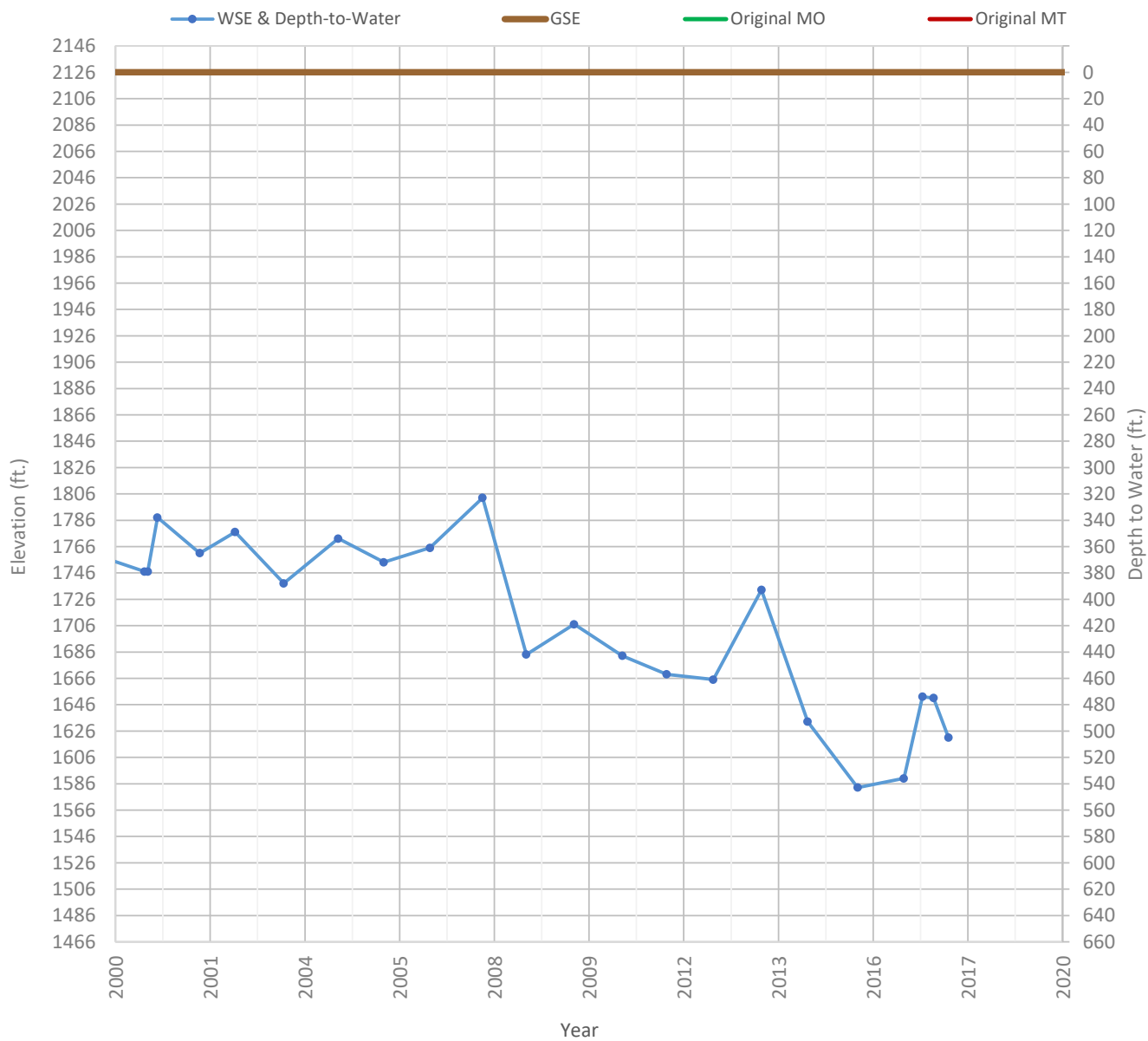
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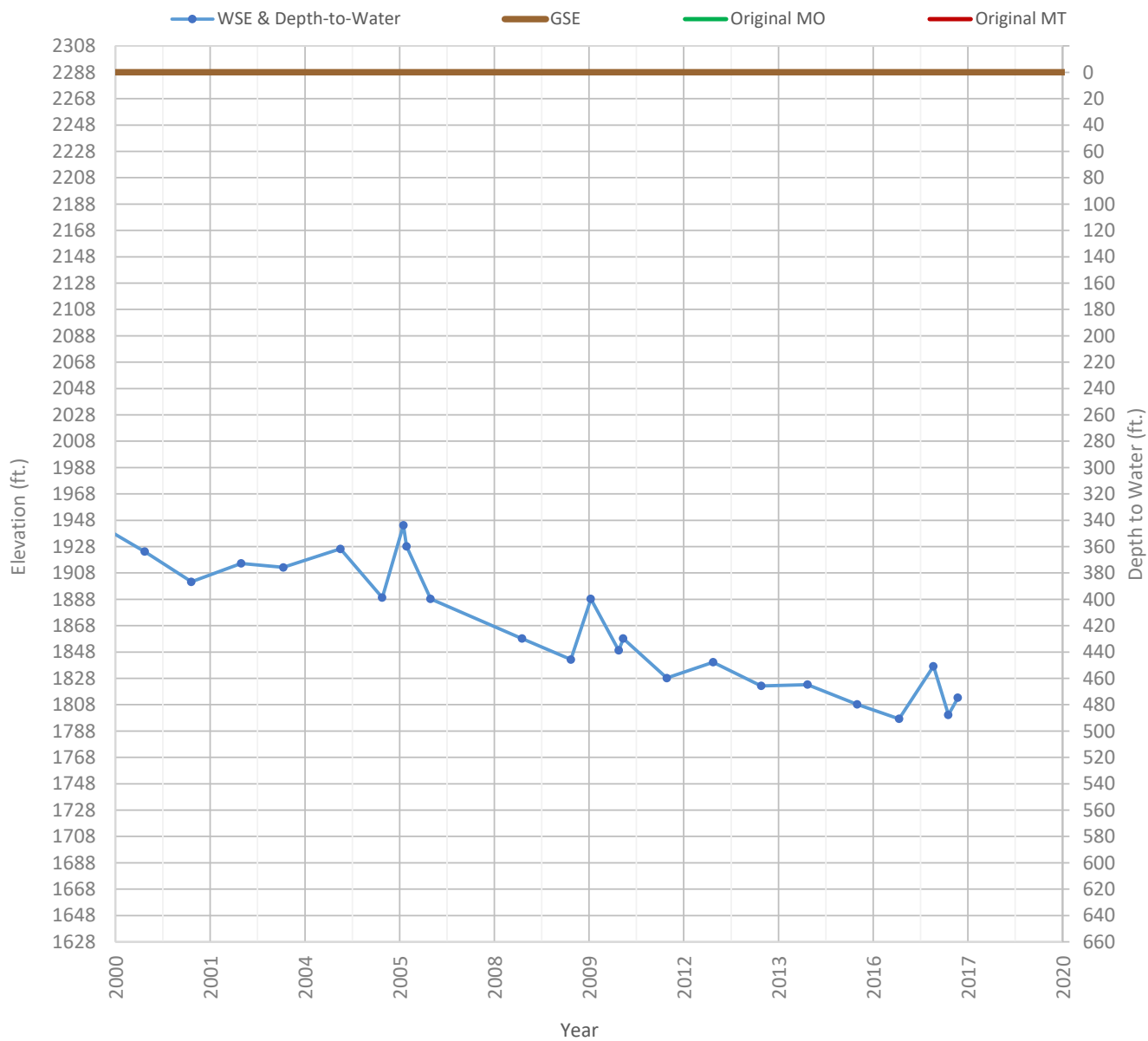
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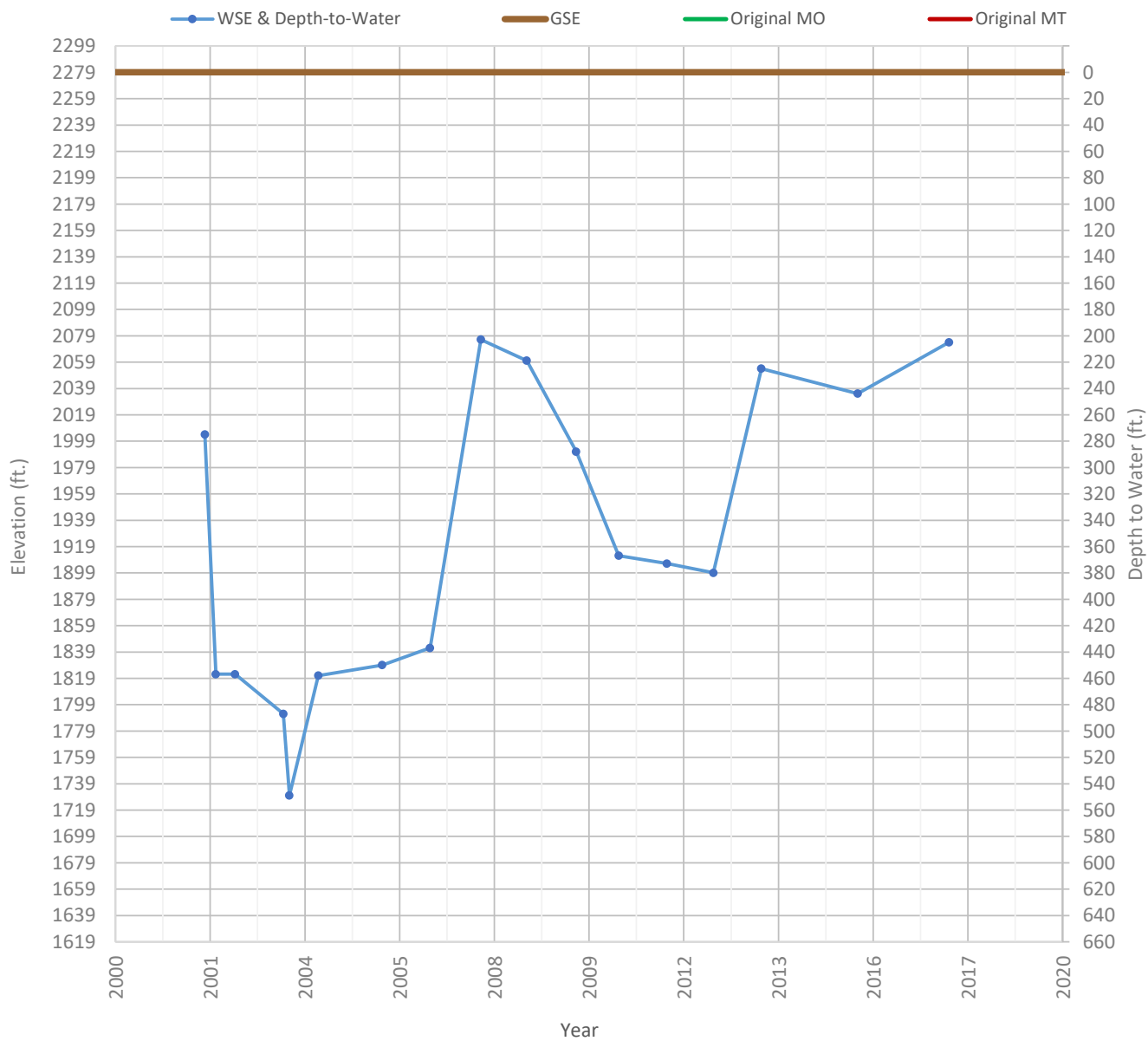
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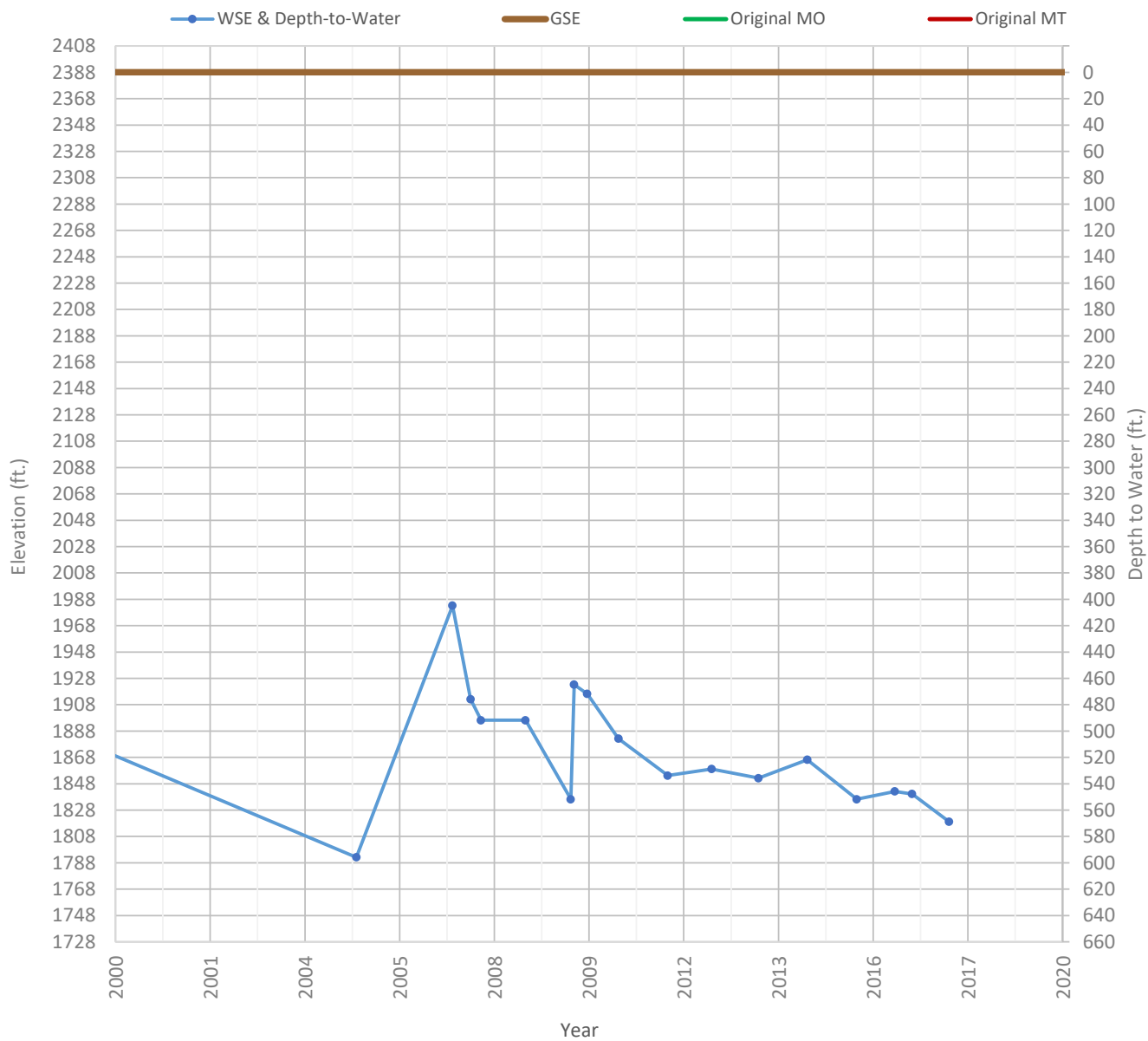
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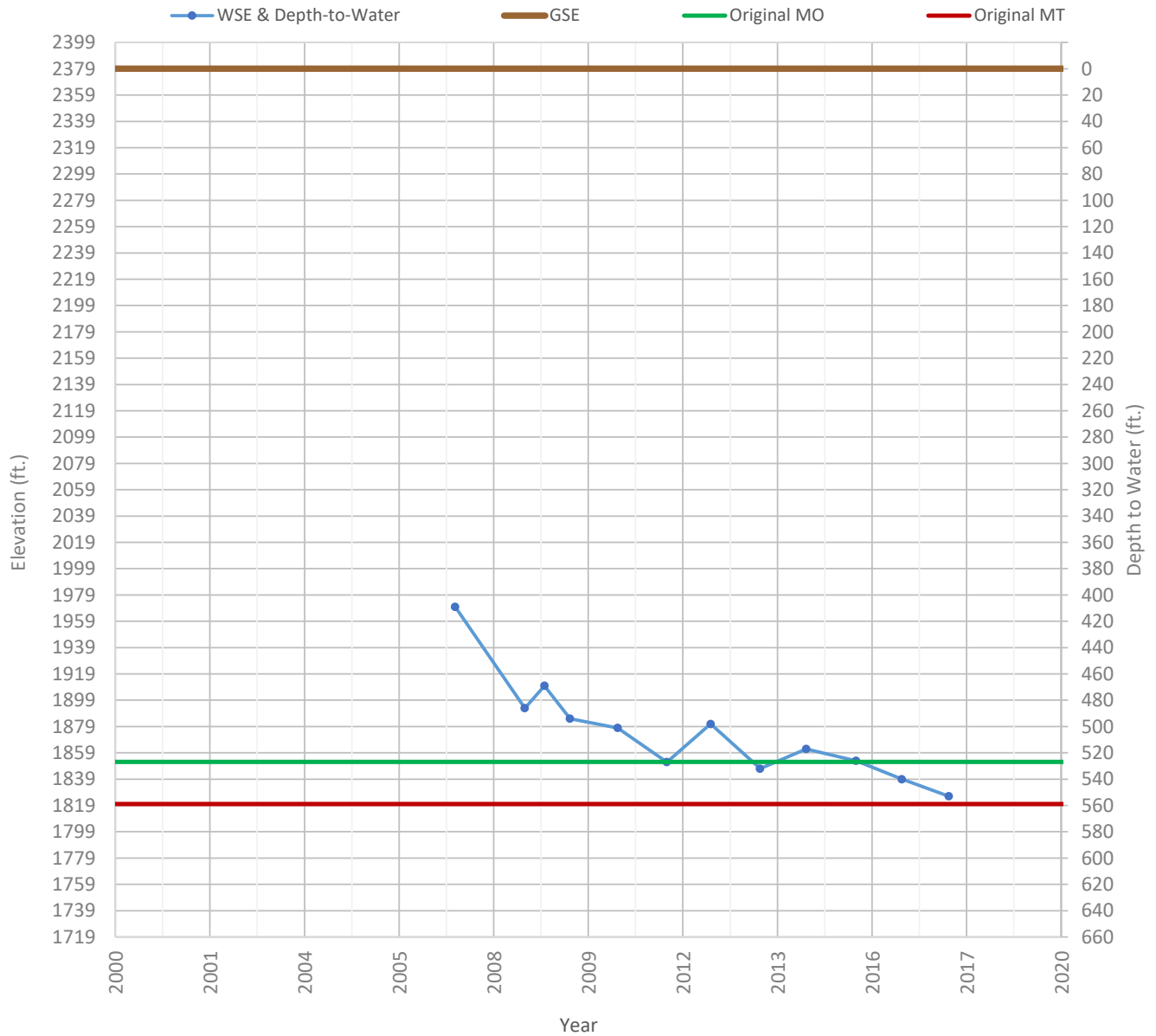
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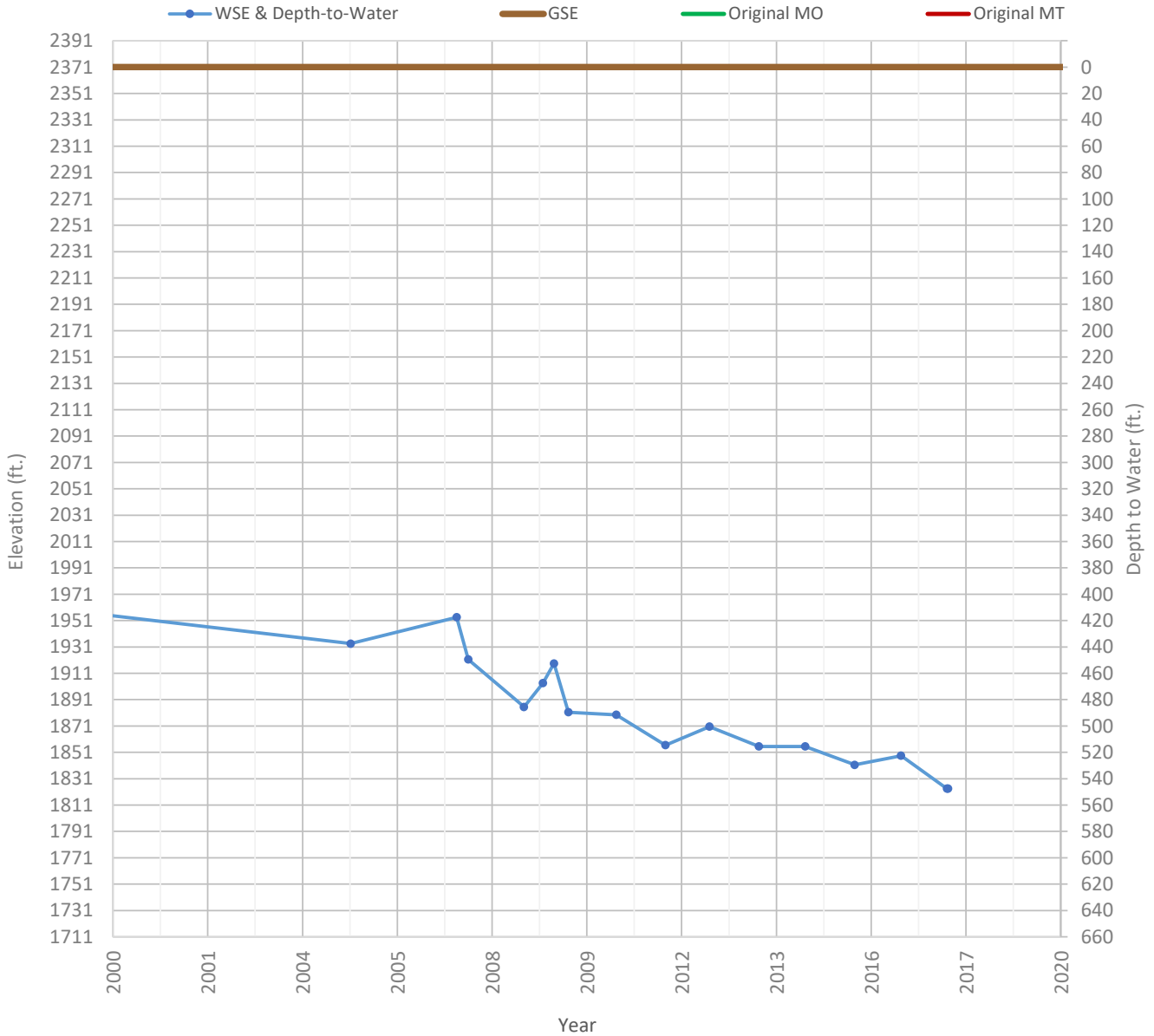
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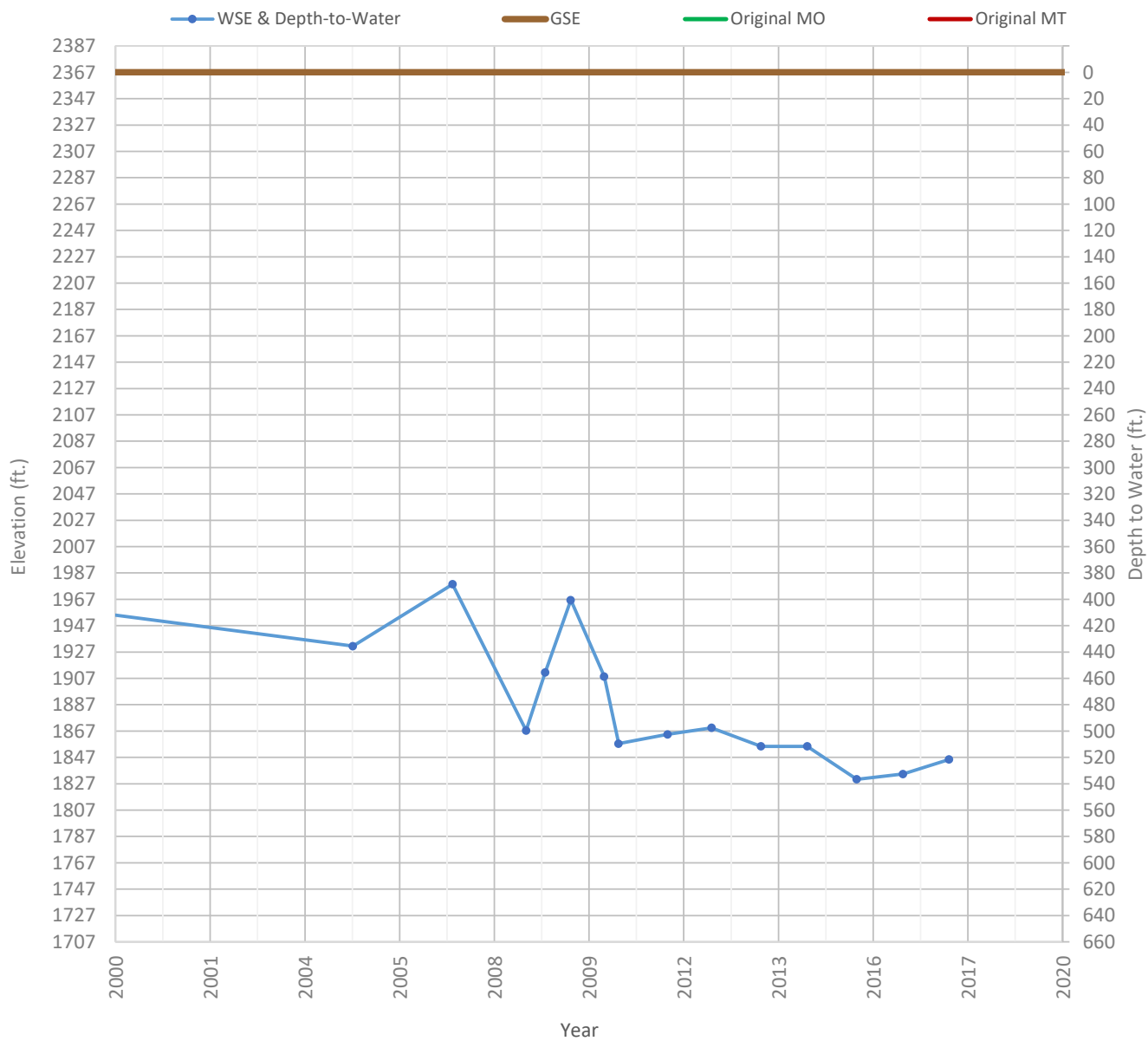
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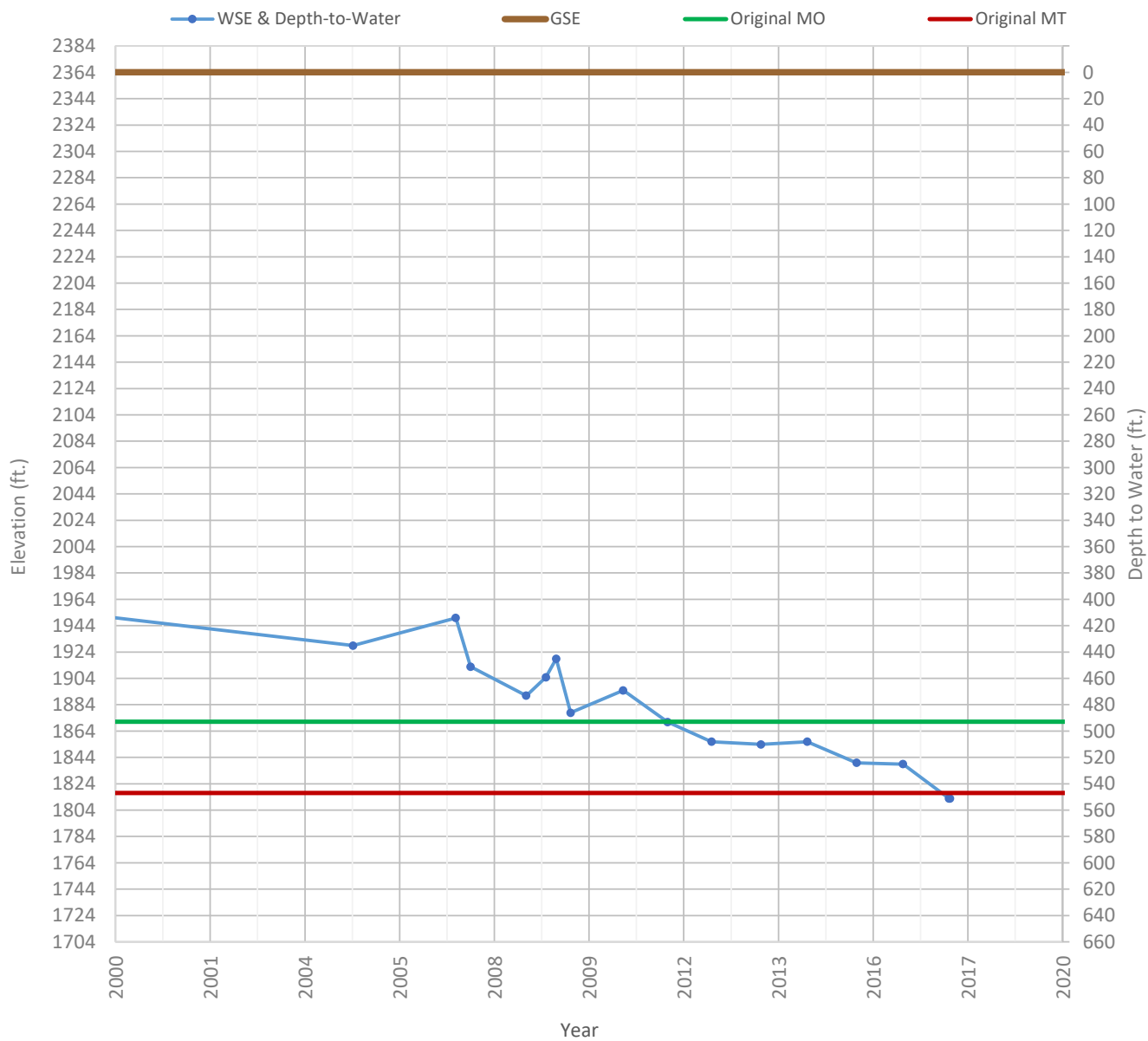
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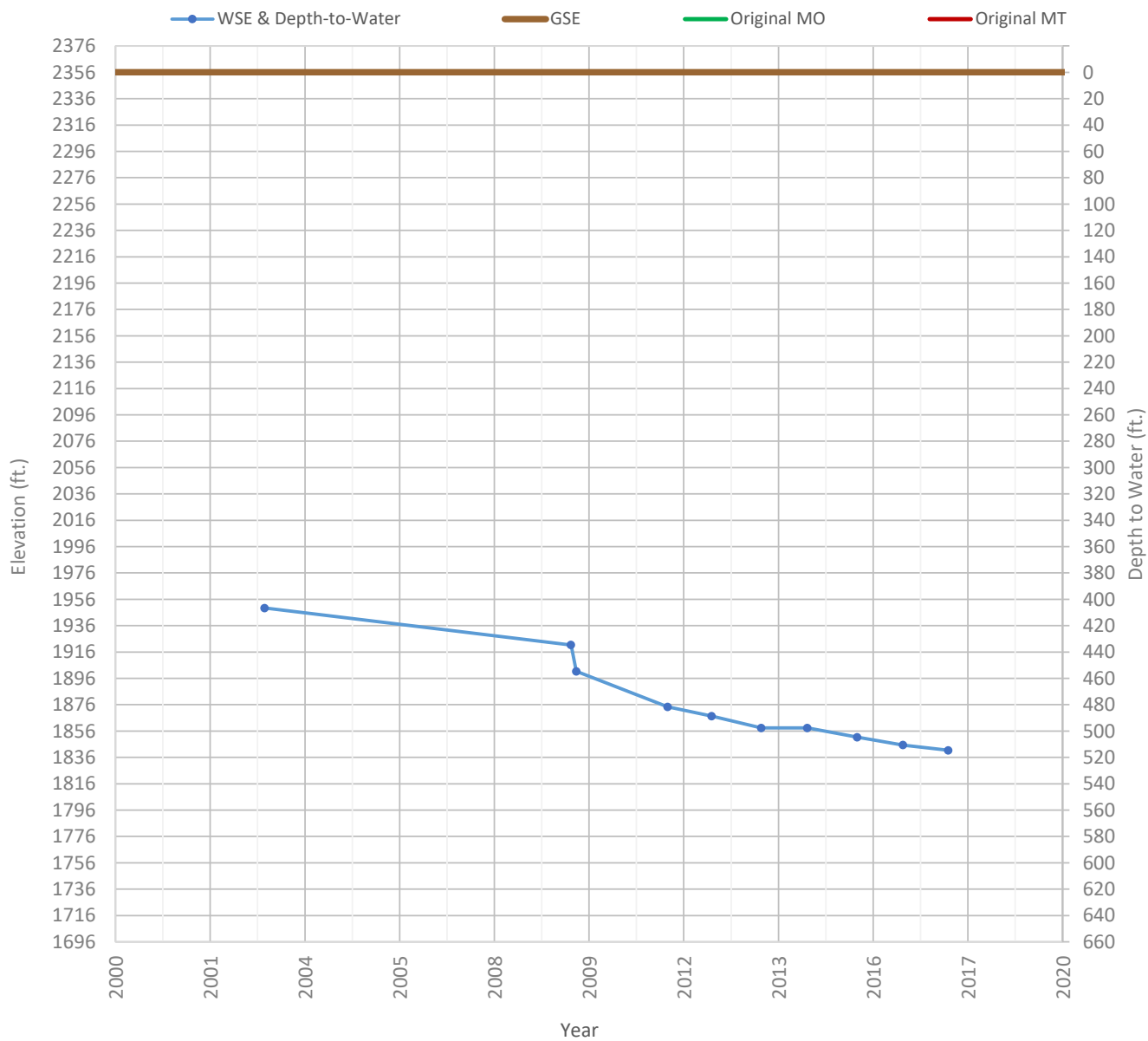
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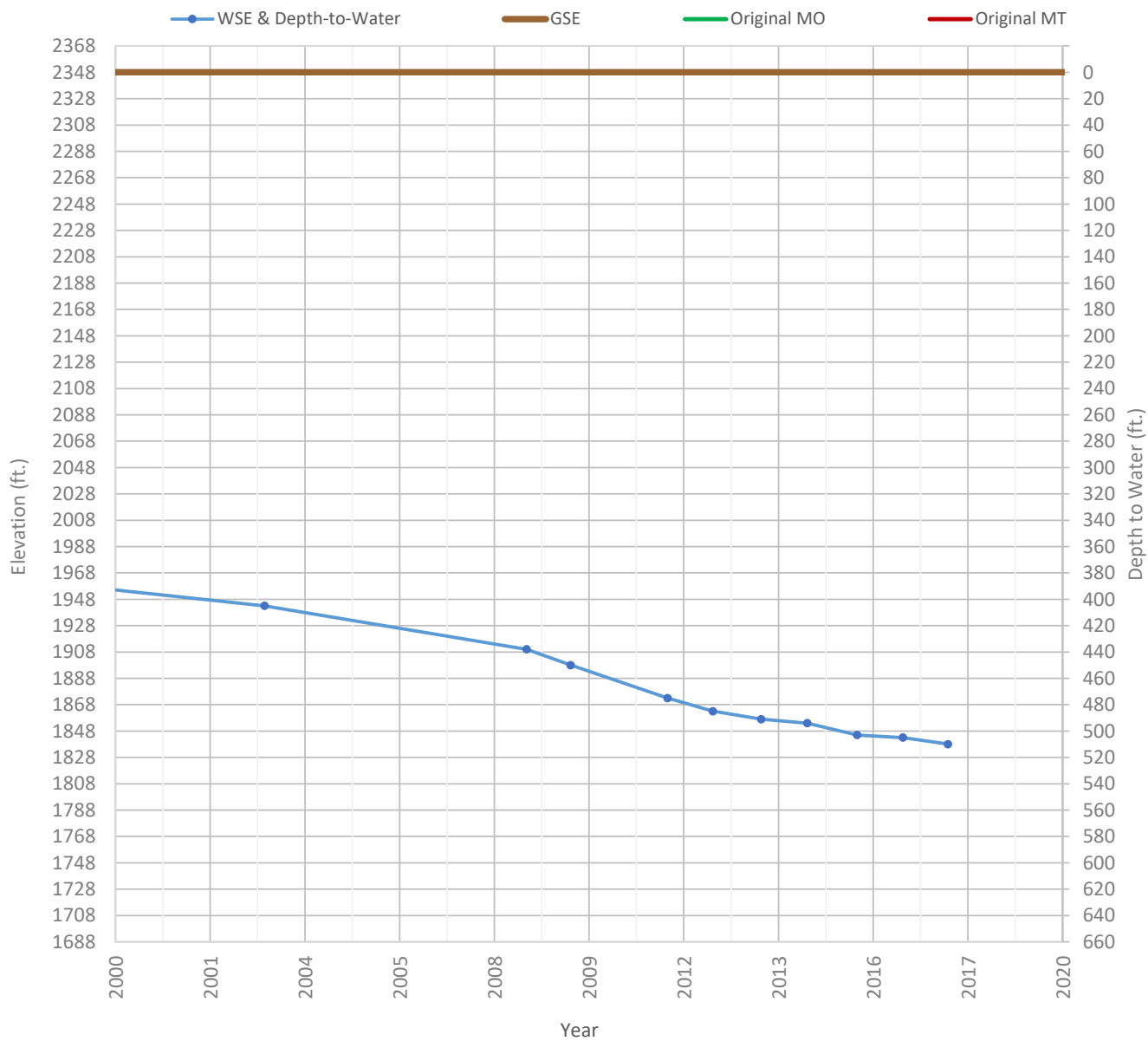
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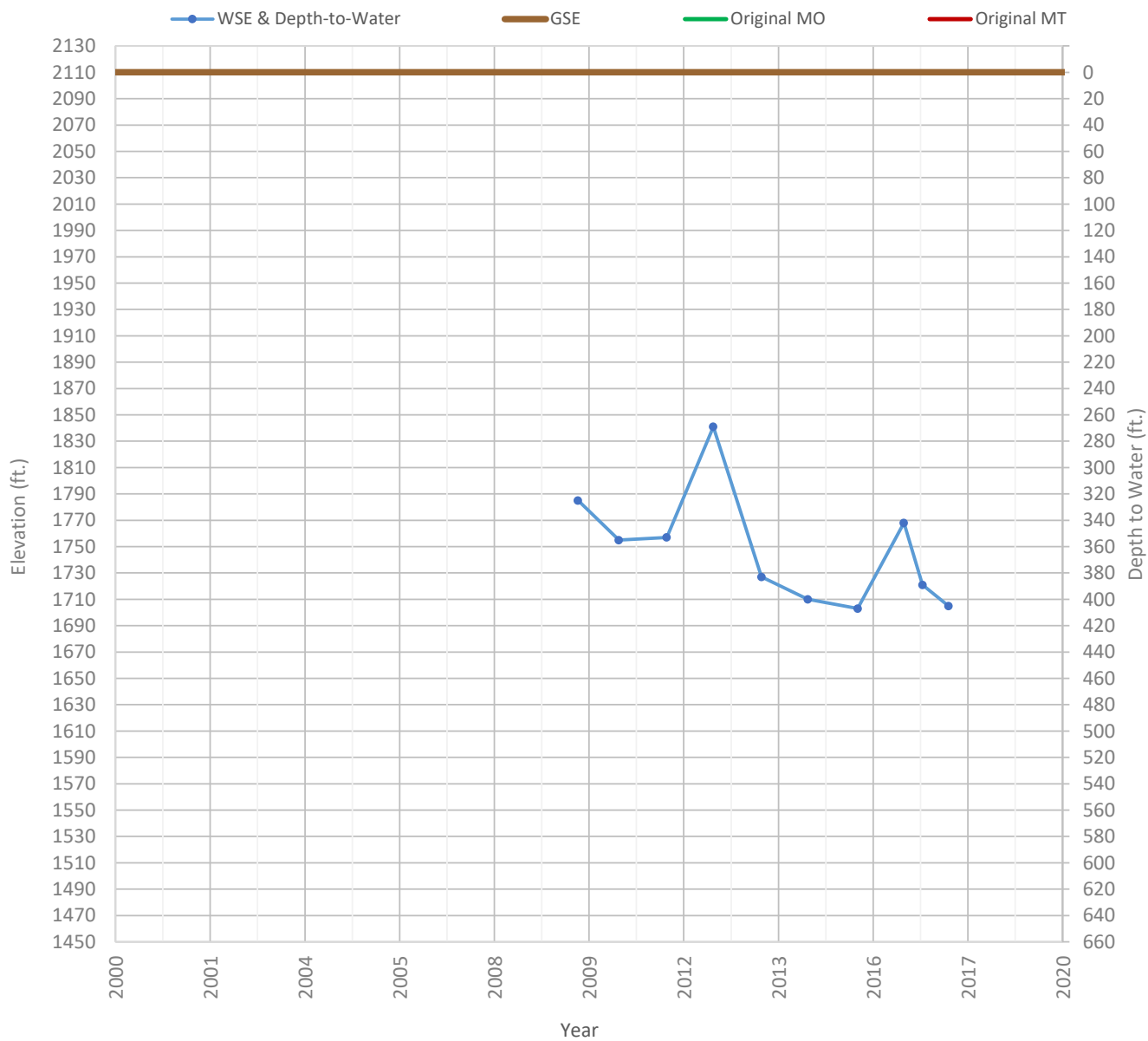
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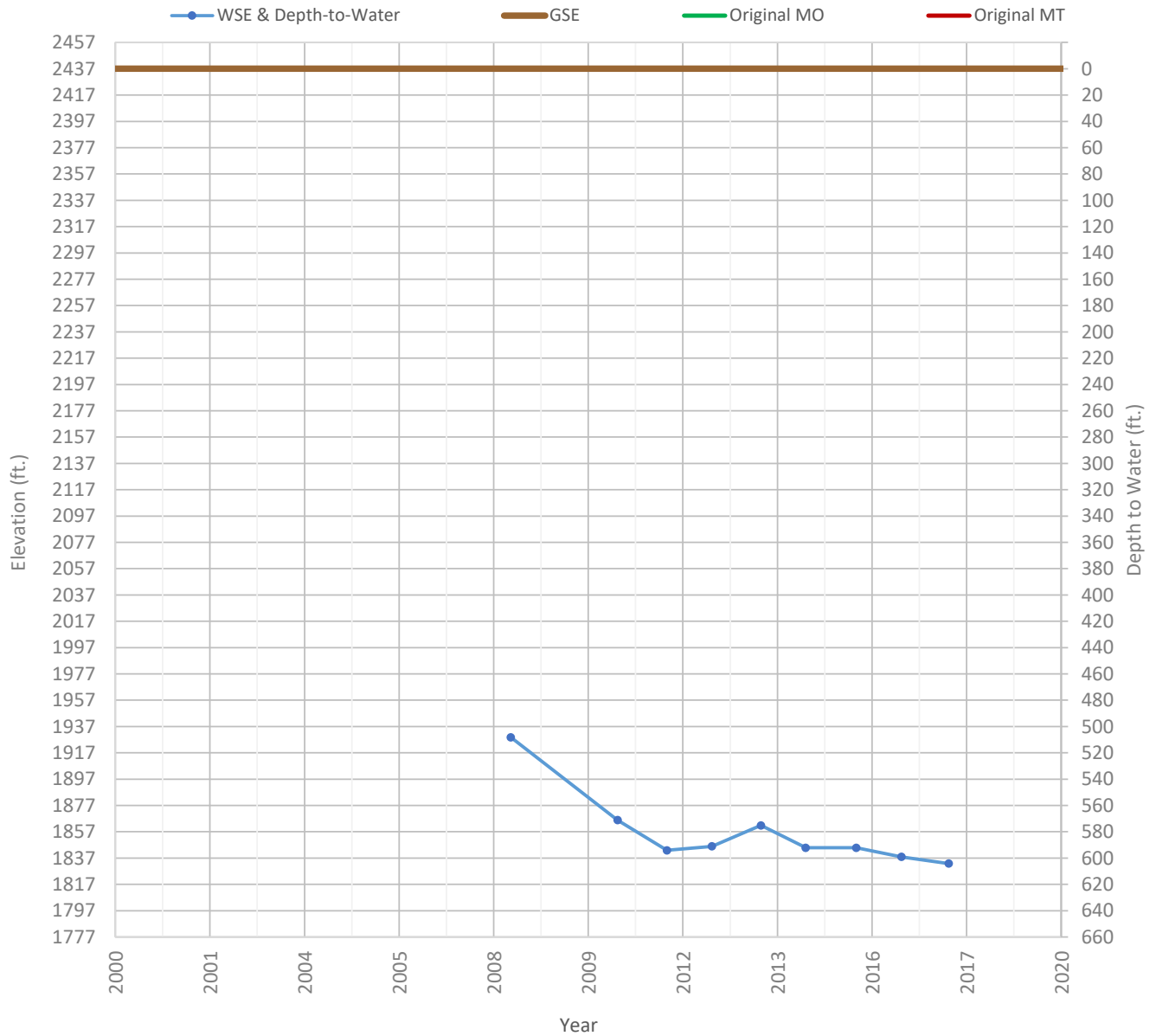
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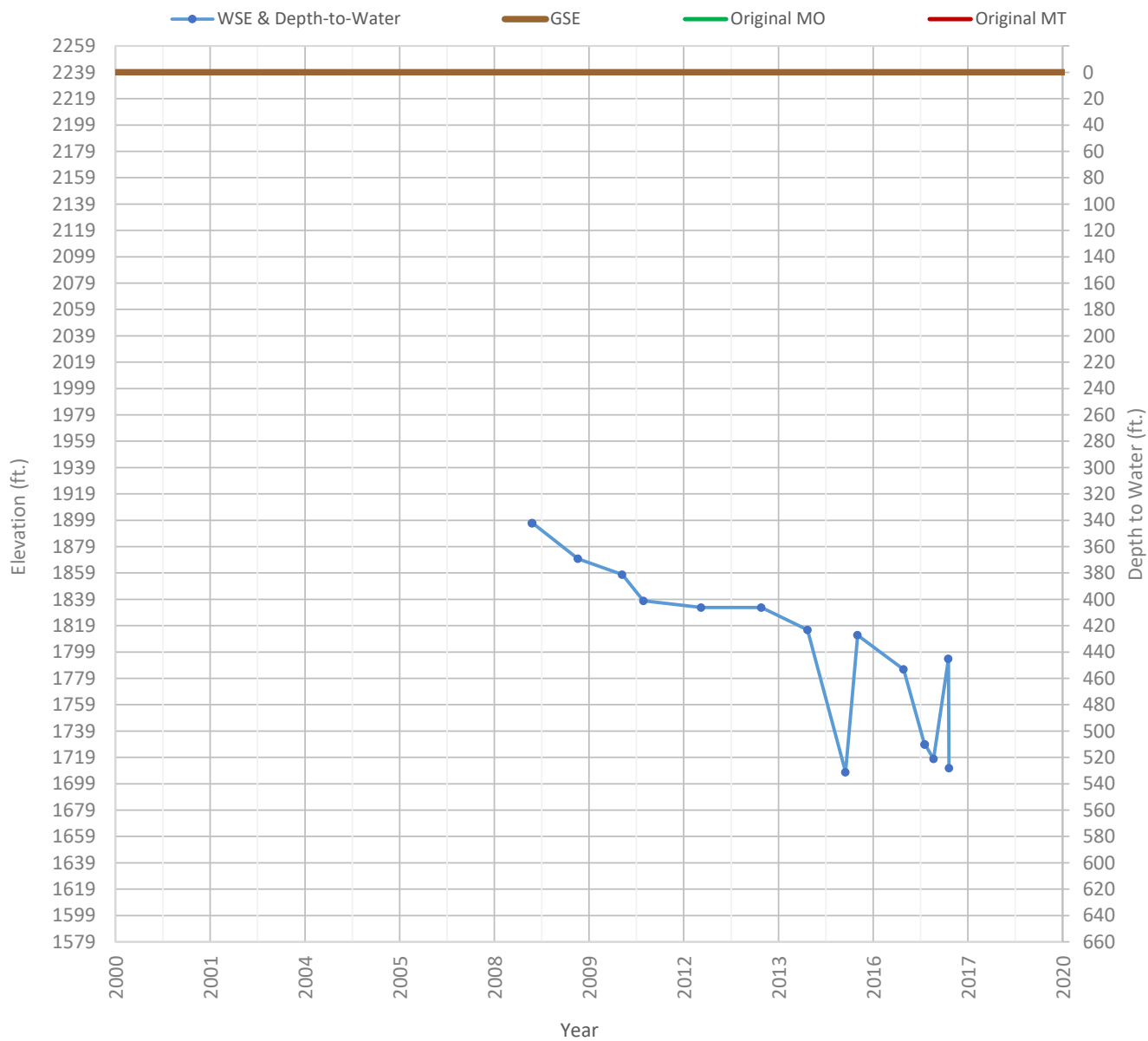
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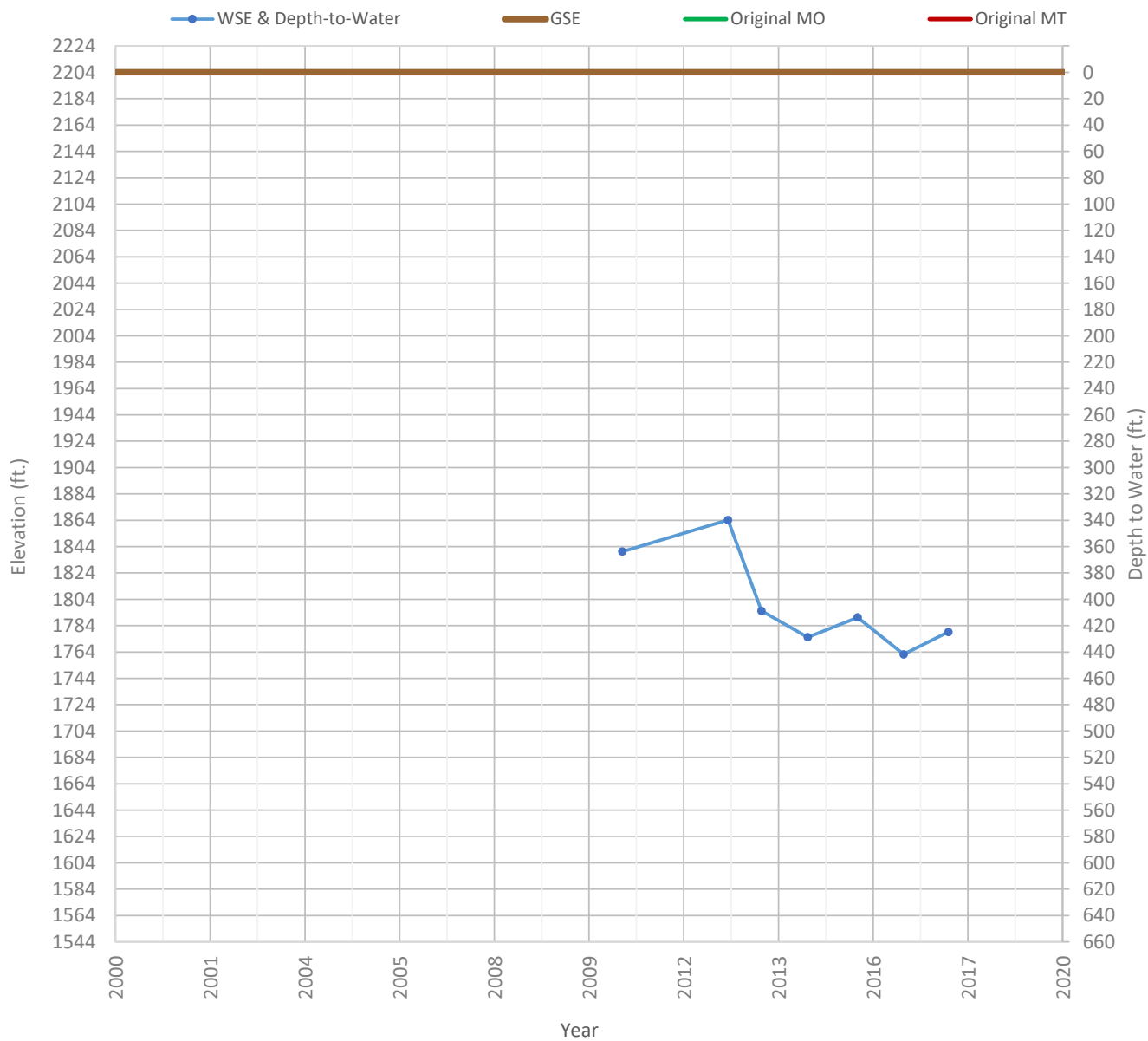
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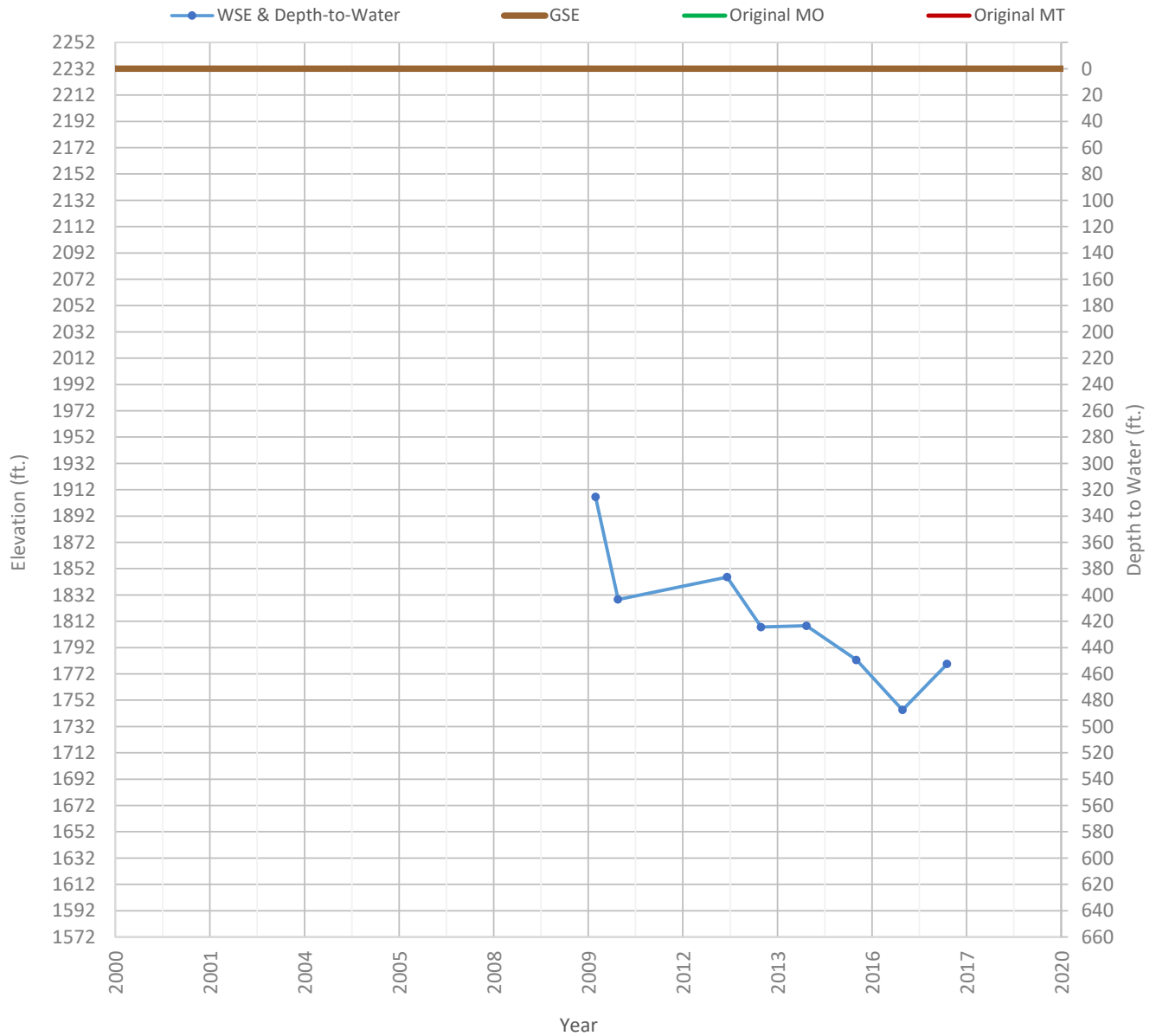
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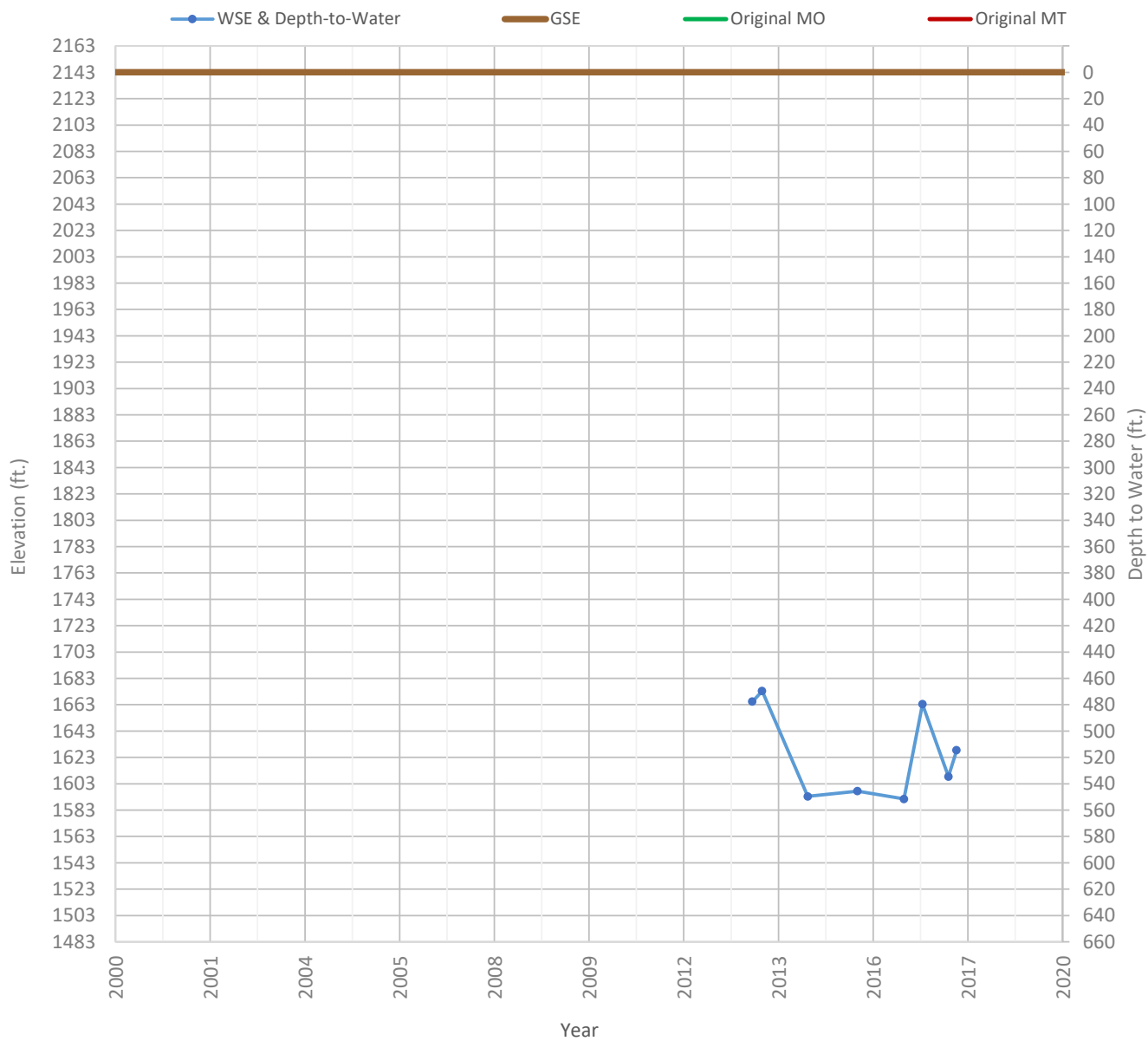
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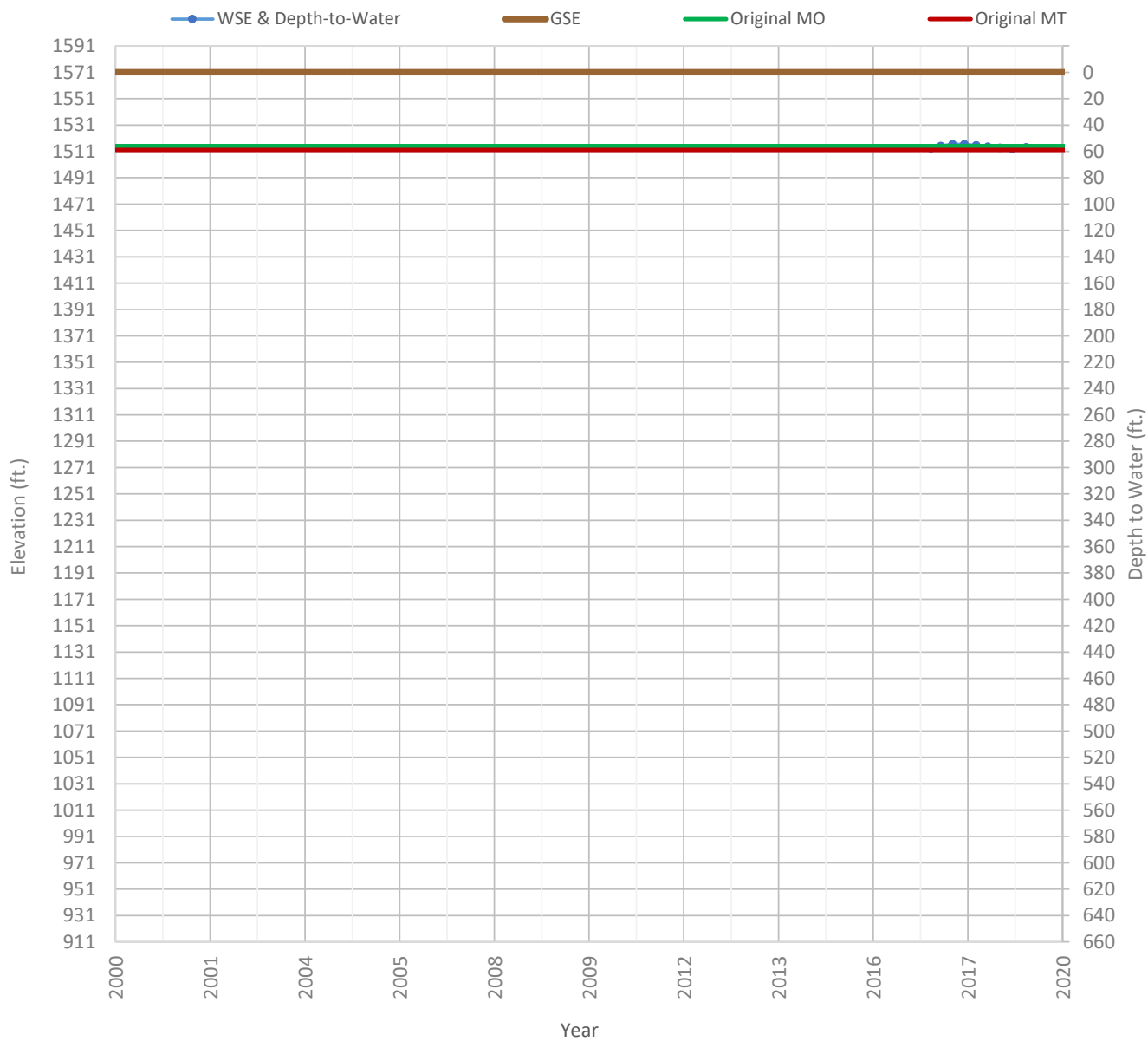
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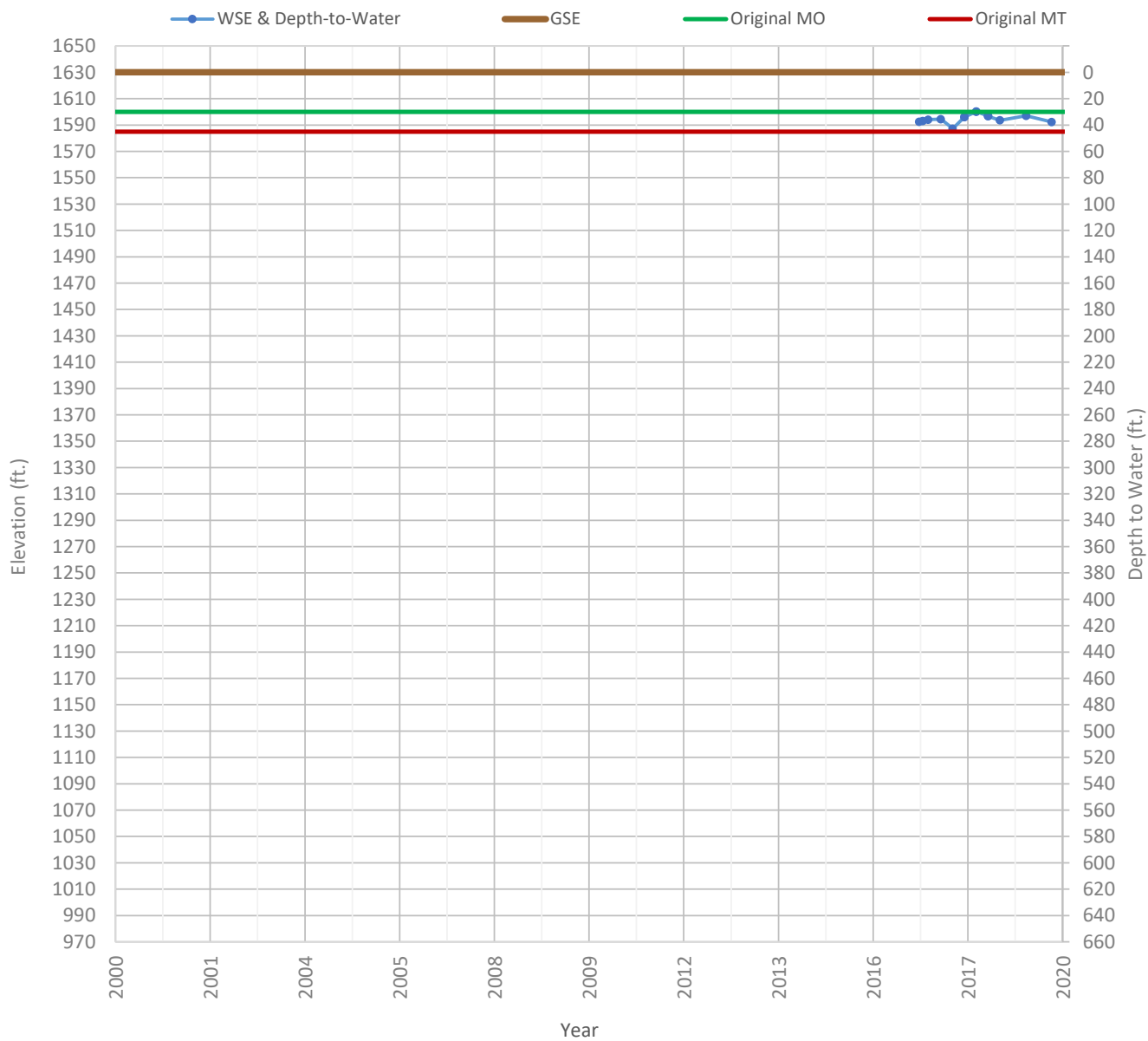
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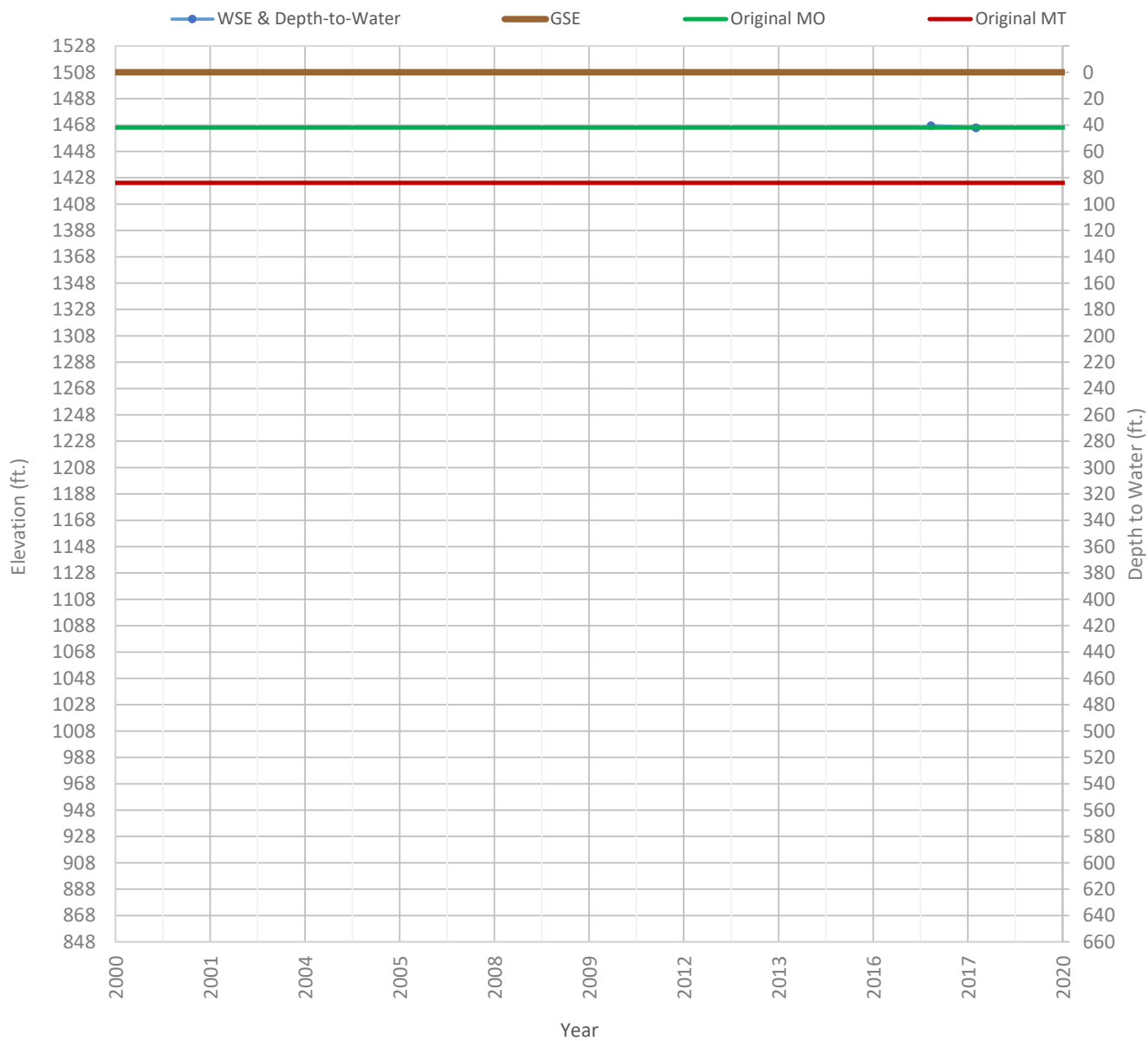
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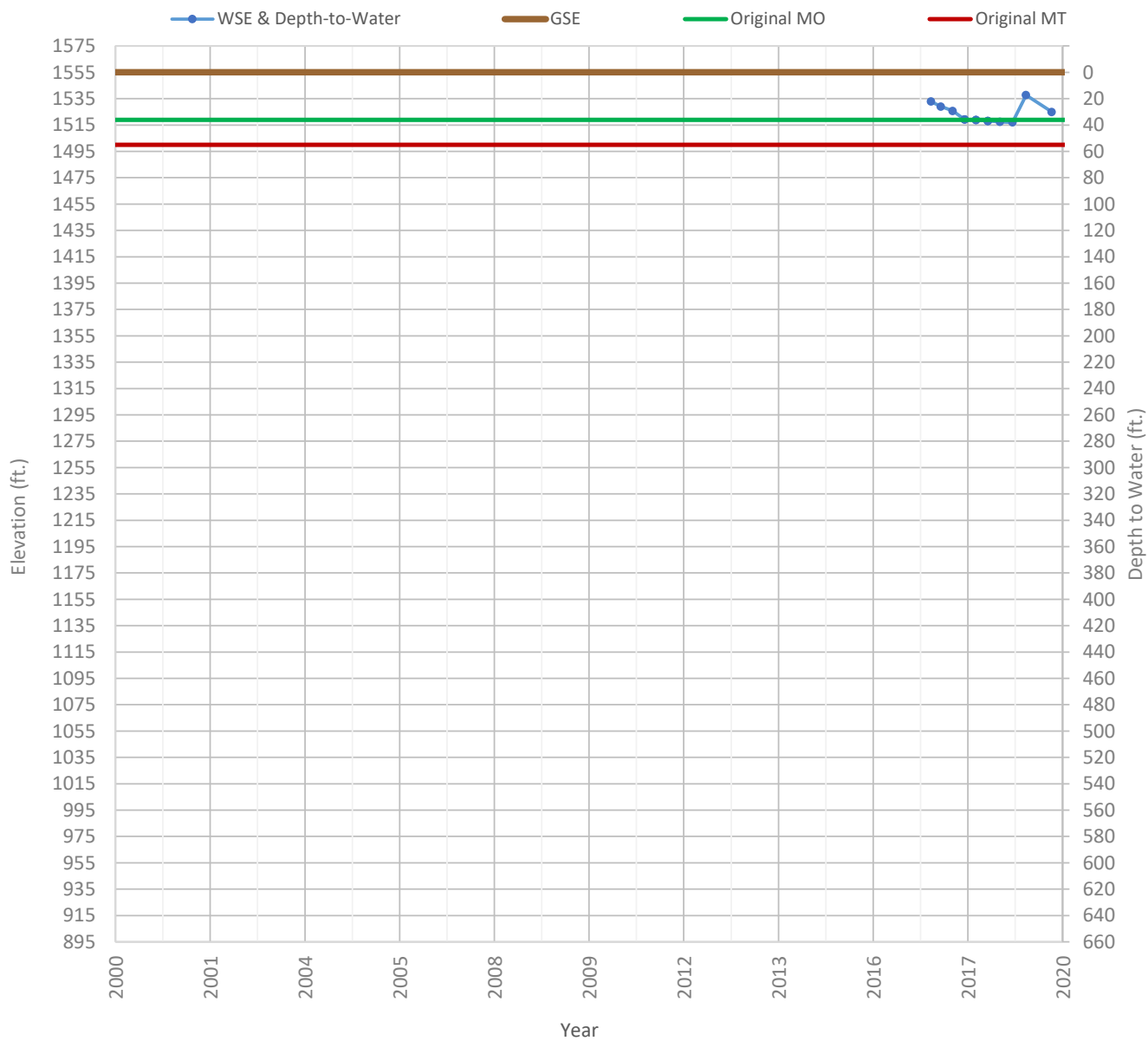
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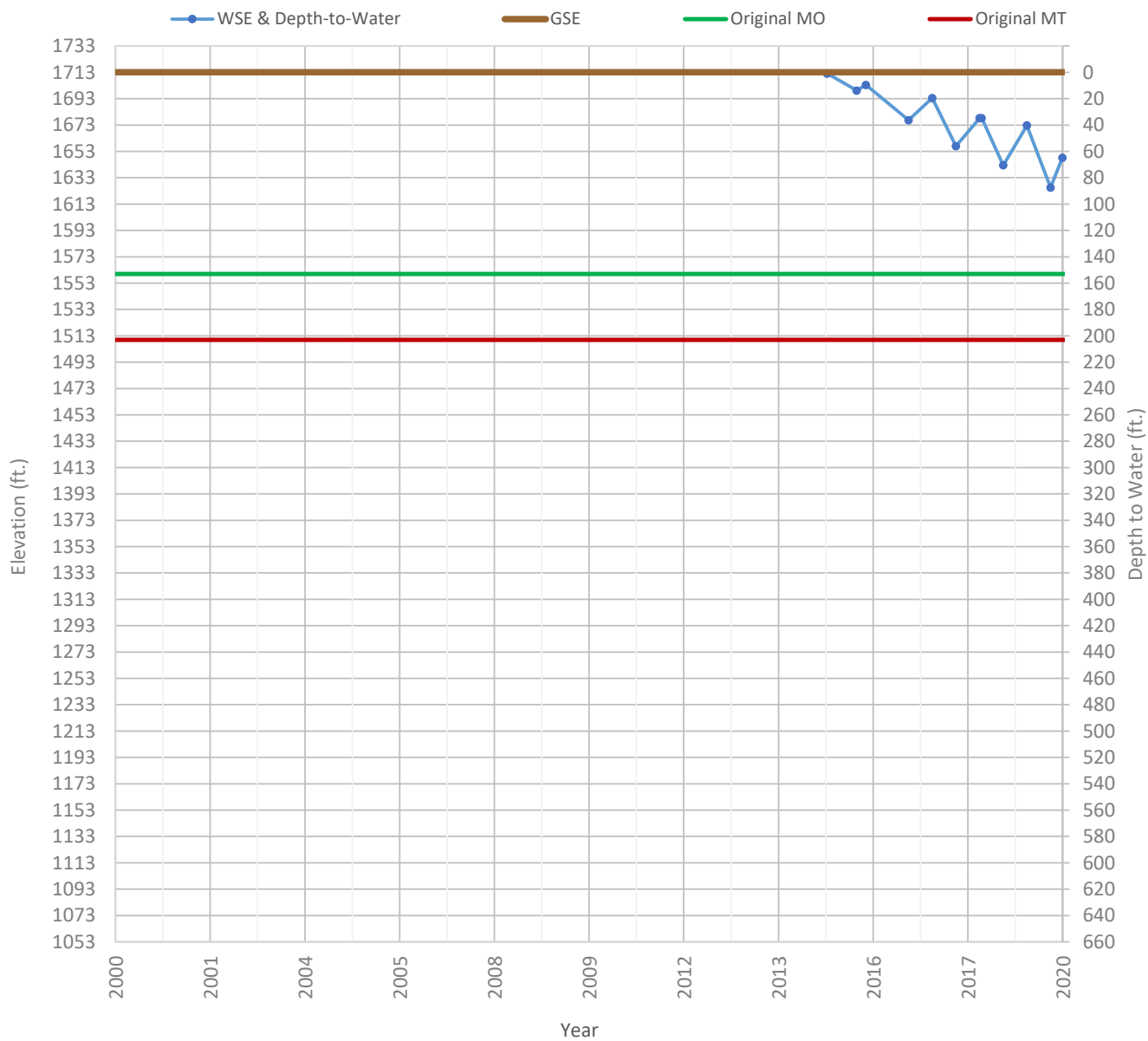
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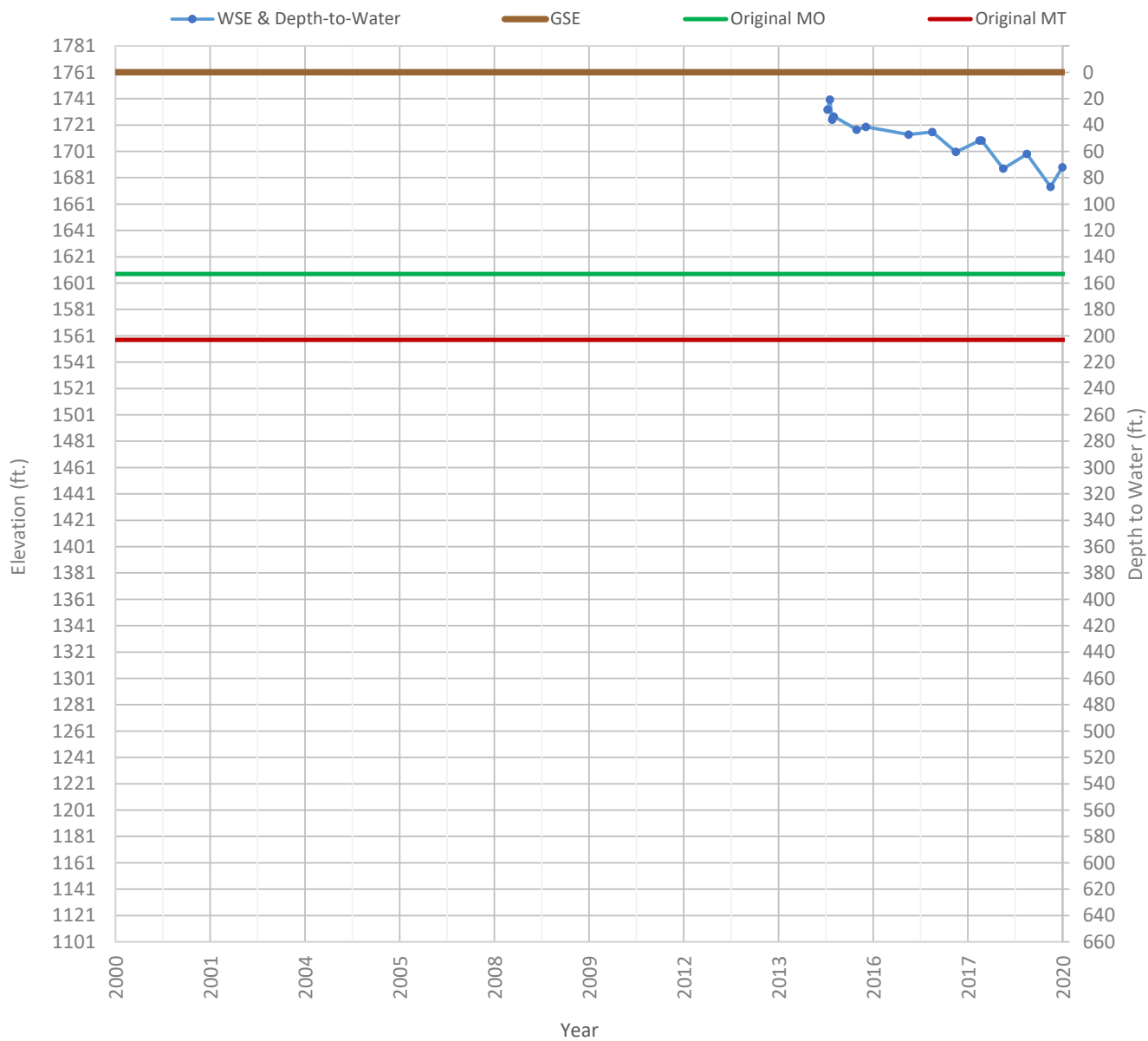
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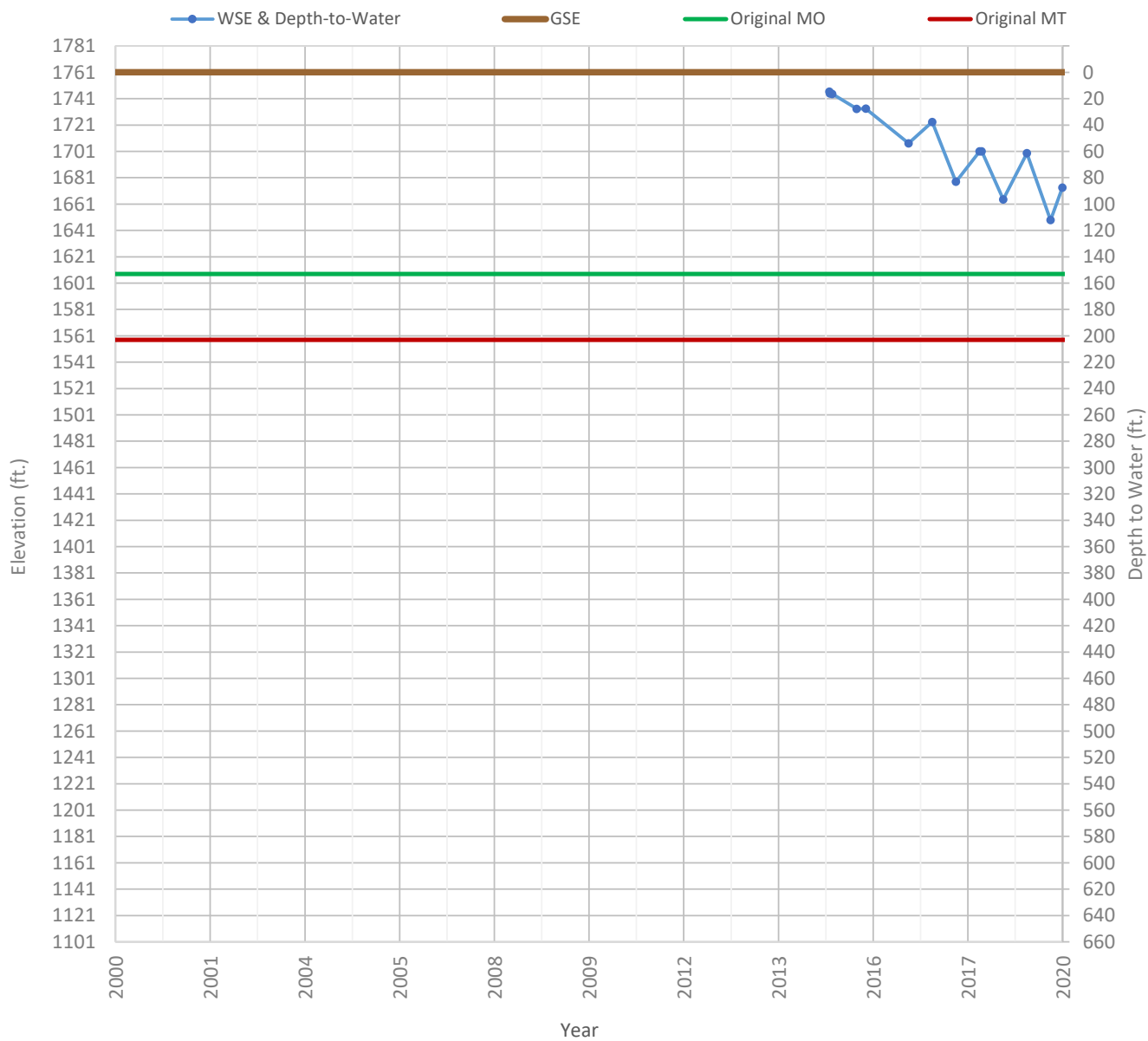
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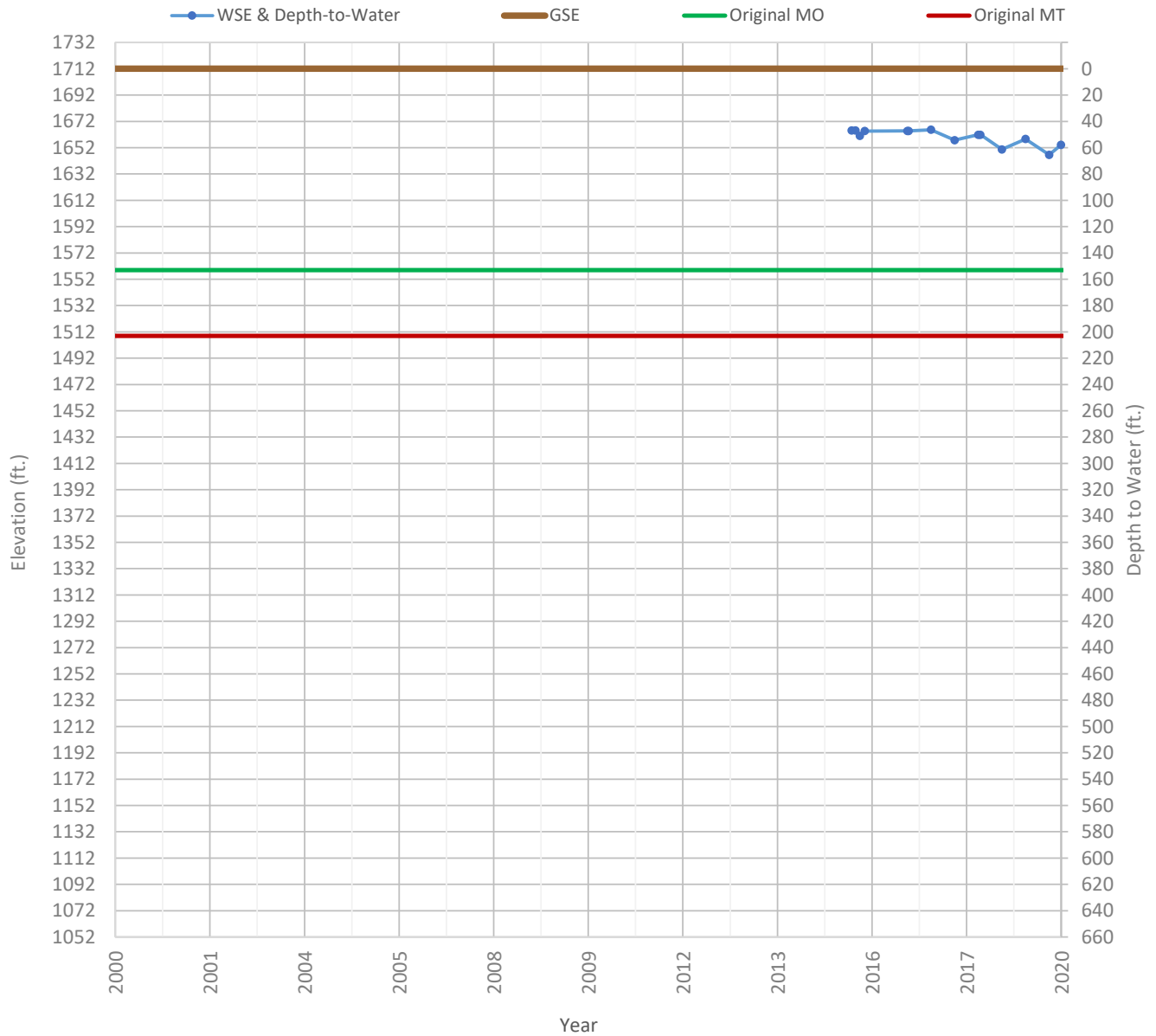
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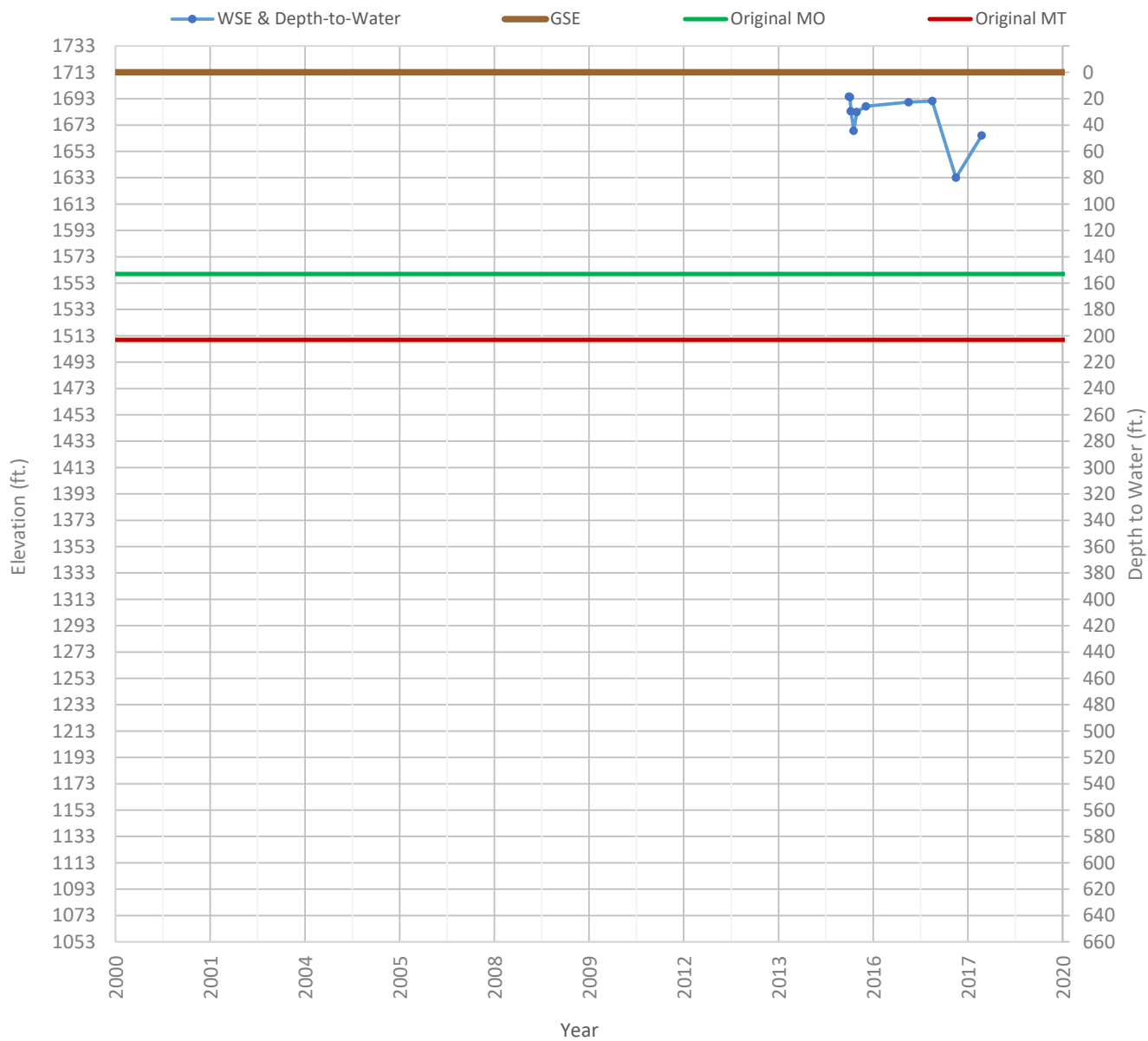
OPTI Well 843 Hydrograph



OPTI Well 845 Hydrograph



OPTI Well 849 Hydrograph



Appendix B - Basin-Wide Economic Analysis Report

FINAL REPORT

Direct Economic Impact Analysis of the Cuyama Groundwater Basin Groundwater Sustainability Plan Demand Management Program**Prepared for**

Cuyama Basin Groundwater Sustainability Agency

December 19, 2019

Prepared by

ERA Economics LLC

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1. Executive Summary

The Cuyama Basin Groundwater Sustainability Agency (CBGSA) has developed a Groundwater Sustainability Plan (GSP) designed to achieve groundwater sustainability in the Cuyama Basin by 2040. The GSP considers several elements of groundwater sustainability including groundwater overdraft. To address groundwater overdraft, the plan proposes a series of supply enhancement projects and demand management actions. Implementation of projects and demand management imposes direct costs on water users in the basin. This analysis establishes the direct economic impact of the demand management actions specified in the GSP. Water supply projects specified in the GSP are described, but the additional water supply and project costs are not included in this economic impact assessment.

Farming in the Cuyama Basin is characterized by high-value, organic specialty crops produced for a wide range of domestic and export markets. The basin includes vertically integrated carrot farming operations, organic specialty apple farms, new vineyards, and a mix of other row crops, grains, and hays. Agricultural value has been increasing in the basin over the last several decades in response to strong market conditions for the crops produced in the basin. This economic activity supports the local economy, providing jobs, income, and tax revenue to the greater four-county region (Kern, Santa Barbara, San Luis Obispo, and Ventura) overlying portions of the basin.

Direct economic impacts of the GSP are quantified using an economic model of the Cuyama Basin representing crops, water use, and market conditions in the area. The economic model is developed using information gathered for the GSP, interviews with local producers, UC Cooperative Extension studies, and various production and price datasets compiled by CDFA and USDA. The economic model is calibrated to the markets, conditions, and water supply availability in the Cuyama Basin. To analyze the effects of demand management, a simulation of Cuyama Basin agriculture between 2020 -2040 is developed in which water availability is restricted, and water supply costs change, according to the demand management actions outlined in the GSP. The differences between the results of the simulation and current conditions represent the impacts associated with demand management implementation.

Current agricultural groundwater pumping in the basin is approximately 60,000 AF per year. The demand management program specified in the GSP includes a phased implementation period to achieve a total reduction in agricultural groundwater pumping of 40,000 AF per year by 2040 (average annual pumping of 20,000 AF). The program applies to regions of the Cuyama Basin where overdraft is deemed to be critical, which is primarily in the Central threshold region. The program is designed to make tiered reductions over a sixteen-year period, beginning with a 5% (2,000 AF) reduction of total overdraft in each of the first two years, followed by a 6.5% reduction of total overdraft annually over the remaining fourteen years.

As a result of the demand management program the size of the agricultural industry in the basin contracts by approximately two-thirds. The demand management results in average annual gross revenue losses of \$30 million. The present, discounted value of this stream of forgone revenue

during the GSP implementation period equals \$261 million in current dollars. When the demand management program is fully implemented in 2040, irrigated acres will have fallen 62%, annual gross revenue will have fallen 63%, and annual water use will have fallen 67%. Land idling as a result of the demand management program (not including any rotational fallowing) equals approximately 12,300 acres per year by 2040. Table ES-1 summarizes the economic impact results in terms of irrigated acreage (land idling), gross revenue, net revenue, and applied water (groundwater pumping).

Table ES-1. Cuyama Basin Demand Management Program Direct Economic Impact Summary

Impact Measure	Current	2020 - 2040 Average	Full Implementation (2040)
Irrigated Acres	18,300	12,800	7,000
Gross Revenue (millions)	\$121	\$91	\$45
Net Revenue (millions)	\$31	\$23	\$12
Applied Water (AF)	60,000	40,000	20,000

In addition to a reduction in the quantity of groundwater that can be pumped, the GSP imposes additional administrative costs that increase water costs in the basin. Reduced water availability and higher costs reduce net revenue and affect the relative shares of crops grown in the basin. Typically, lower value crops, including grains and hays in the basin, are significantly impacted because these crops have limited ability and willingness to pay for water. Higher-value vegetables and perennial crops are able to absorb small changes in water cost. However, the magnitude of the demand management program in the basin (reducing pumping by 67%) results in significant losses in these crops as well. As a result, net revenues per acre fall as water costs increase and the basin crop mix shifts towards crops that generate greater returns to water.

The Cuyama Basin economy is heavily dependent on farming and related activities. This (direct) impact analysis only considered the impact of the demand management program on primary farming activities. The average annual losses of \$30 million estimated in this analysis would have significant secondary (also called “multiplier” or “indirect and induced”) effects in the local economy. This includes retailers who sell inputs to producers and processors who handle the raw agricultural products produced in the basin. Local businesses will also see an impact as the individuals who work for farms and ancillary industries are forced to find work elsewhere. Exact quantification of these impacts to regional jobs, labor income (wages), and local tax revenues that support other public services in the area is a natural extension of this direct impact analysis.

Potential options for reducing economic costs are identified in the analysis. Examples include delayed pumping reduction schedules, inter-region water trading, flexibility in pumping reduction schedules, and value-based groundwater allocations. For example, delaying the pumping reduction schedule may allow producers to recover capital investments, avoid rapid changes in the agricultural footprint, and provide jobs, income, and tax revenue for the local economy. Detailed analysis of these options is a second natural extension of this study.

2. Introduction

The Cuyama Basin Groundwater Sustainability Agency (CBGSA) has prepared a draft Groundwater Sustainability Plan (GSP). The GSP provides a list of projects and management actions that may be implemented to ensure the basin achieves groundwater sustainability by 2040. Initial estimates indicate that groundwater pumping reductions on the order of 50 to 67 percent may be required to achieve sustainability in parts of the basin. This magnitude of reduction will undoubtedly change the economic conditions within the basin. In order to understand what future conditions in the basin will look like, assess the magnitude of potential economic impacts, and identify ways to minimize adjustment costs, the CBGSA commissioned this economic analysis of the effects the proposed GSP on the basin.

The goal of the CBGSA GSP is to provide a framework for achieving groundwater sustainability while minimizing the economic and social consequences of any necessary reductions in agricultural production. Implementation of the GSP will include possible projects and demand management actions that over time will balance the water budget within the basin. Projects are implemented to increase water supply in the basin. Demand management actions are programs designed to reduce pumping that, together with basin projects, ensure that basin groundwater pumping is sustainable. This report focuses on the impacts of the demand management program; however, preliminary analysis of proposed projects showed relatively small changes in the outcomes presented in this report resulting from project implementation.

This analysis concludes that GSP implementation will have substantial direct impacts on the economic footprint of agriculture in the basin. Results are presented in terms of five key measures of direct impact that are either directly relevant for current policy/planning purposes (e.g. rate studies, feasibility studies, grant applications) or feed naturally into additional analysis of secondary impacts in the basin and local economy:

- Land idling as a result of the demand management program over the 2020 – 2040 implementation period
- Change in crop mix in response to changes in water supply availability and cost, and the resulting effect of the shift in crop mix on basin agricultural value
- The total cost of water and any changes in regional applied water demands; changes in water cost include GSP administration costs, demand management administration cost, and the effect of changes in pumping lift on irrigation variable costs
- Change in gross agricultural returns as a result of land idling, market conditions, and shifts in the crop mix
- Change in net agricultural returns as a result of land idling, water costs, other administrative costs, market conditions, and shifts in the crop mix

The report is structured as follows. The following section describes the current economic footprint of agriculture in the basin and the drivers behind its value. This is followed by an

overview of management actions outlined in the GSP. The next sections present the methods and results of the economic impact analysis of the GSP. A concluding section summarizes limitations and extensions of this initial work. Additional details on the technical approach to the analysis are included in a technical appendix.

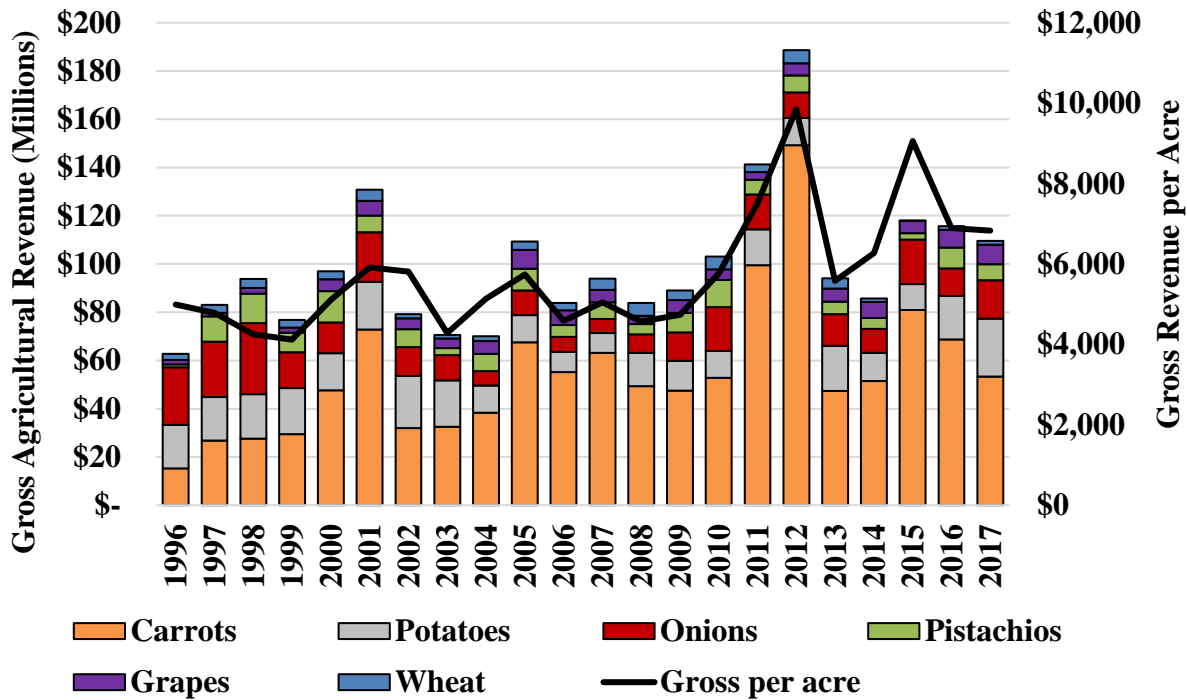
3. Economic Contribution of Agriculture

Agriculture is the most important industry in the Cuyama Basin. Historically the basin has benefited from a large oil and gas field; however, since 2008 few wells have remained in production, making agriculture the dominant industry in the region. Three unincorporated communities in the basin are recognized by the state as Economically Disadvantaged Communities (DACs).

In 2016 the Cuyama Basin had a total of 32,294 acres of irrigable land. Of this total, only 50% (16,045 acres) was actively being used for crop production. High value vegetable crops account for roughly three quarters of the basin's acreage. Carrots, which the basin is known for, are commonly rotated with onions and potatoes. Other crops like wine grapes, pistachios, apples, and wheat make up the remaining agriculture in the region. Apples historically held a larger share of acreage in the basin, but changes in market conditions have caused production to shift to the Pacific Northwest. Other perennial crops such as pistachios and olives have increased in recent years. Wine grape acreage has also increased significantly in recent years, including the establishment of an 800-acre vineyard in 2018.

The gross value (gross farm revenue) of crops produced in the Cuyama Basin was estimated at approximately \$110 million in 2017. Between 1996 and 2017 value increased 75%, from \$63 million to \$110 million. Figure 1 illustrates trends in the gross value of agriculture in the basin between 1996 and 2017, grouped into six crop categories. Carrots make up the bulk of the revenue in the region. In 2017, carrots made up 49% of production value, potatoes made 22% of production value, and onions made up 14% of production value. The remainder of agricultural value came from three smaller crop groups: wine grapes (7%), pistachios and other orchards (6%), and wheat (2%). Figure 1 also illustrates a modest increase in production value per acre, consistent with trends across the state. Production value per acre is similar to nearby production regions in the Central Valley such as Kern County and is well above the statewide average of \$4,000 per acre in 2017 (NASS).

Figure 1. Production Value and Value per Acre, 1996-2017 (in millions of 2018\$)



Source: Calculations using USDA National Agricultural Statistics Service and GSP Acreage Data

Positive trends in markets and price, increased yields, and widespread changes in production practices have also benefitted the basin. Carrot yields were 50% higher in 2017 than they were in 1996 with prices being only 10% lower. At the same time, producers have shifted a large share of acreage to organic production. Apple growers raise special fresh market varieties branded with the name of the basin. Grape production has expanded, with over 15 varieties of wine grapes produced for regional wine markets. These investments have created a reputation for Cuyama as a region with high quality agricultural products.

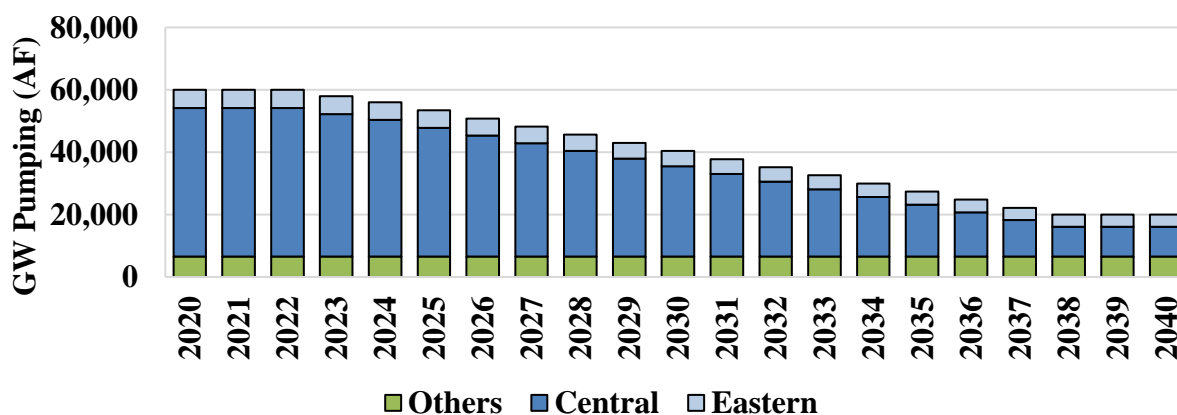
In addition to direct contribution from agricultural revenue, agriculture also provides secondary contributions to the basin local economy and surrounding areas. These indirect and induced benefits include the other income and jobs created by farm spending, additional income and jobs supported by the employed individuals, and the tax revenue created by all of this economic activity. Using default, uncalibrated economic data suggests that basin farming supports more than 1,150 full time equivalent jobs (2,300 – 3,500 seasonal jobs). A detailed assessment of the contribution of basin farming to regional jobs is beyond the scope of this direct impact analysis. A more detailed assessment of the secondary effects of basin agriculture, contribution to the regional economy, and evaluation of secondary impacts is recommended under subsequent analysis (see Section 7).

4. Cuyama Basin GSP Overview

The Sustainable Groundwater Management Act (SGMA) requires that sustainable management of groundwater be achieved by 2040, which is defined as avoiding six impacts of groundwater overdraft. The GSP identifies five sustainability indicators, most of which are expressed in terms of changes in groundwater levels or storage. The basin is divided into six threshold regions¹ for the purposes of identifying and quantifying sustainability criteria. In order to achieve and maintain sustainability, the GSP includes a mix of demand management (pumping restrictions) and supply enhancement projects to bring pumping in balance with the sustainable yield. The sustainable yield is the estimated annual groundwater pumping the basin can sustain without causing one or more of the six impacts. The GSP estimates sustainable yield in the basin to be 20,000 AF per year. Currently, agricultural users in the basin pump 60,000 AF per year creating an overdraft of 40,000 AF² per year.

The CBGSA plans to reduce groundwater pumping by 40,000 AF per year by implementing a demand management program. This program will only be implemented in the Central and Eastern regions of the basin, because these are the only regions with projected overdraft. The program is implemented over a sixteen-year period, beginning with a 5% (2,000 AF) reduction of total overdraft in each of the first two years, followed by a 6.5% reduction of total overdraft annually over the remaining fourteen years. Reductions in the Central region will account for 95% (38,000 AF) of overdraft and reductions may be enforced in the Eastern region to make up the other 5% (2,000 AF). This equates to annual reductions in the Central region of 1,900 AF in each of the first two years and 2,470 AF in each of the following fourteen. In the Eastern region, annual reductions of 100 AF are required in each of the first two years and 130 AF in each of the following fourteen. A regional visualization of these reductions is shown in Figure 2 below.

Figure 2. Proposed Groundwater Pumping Reductions

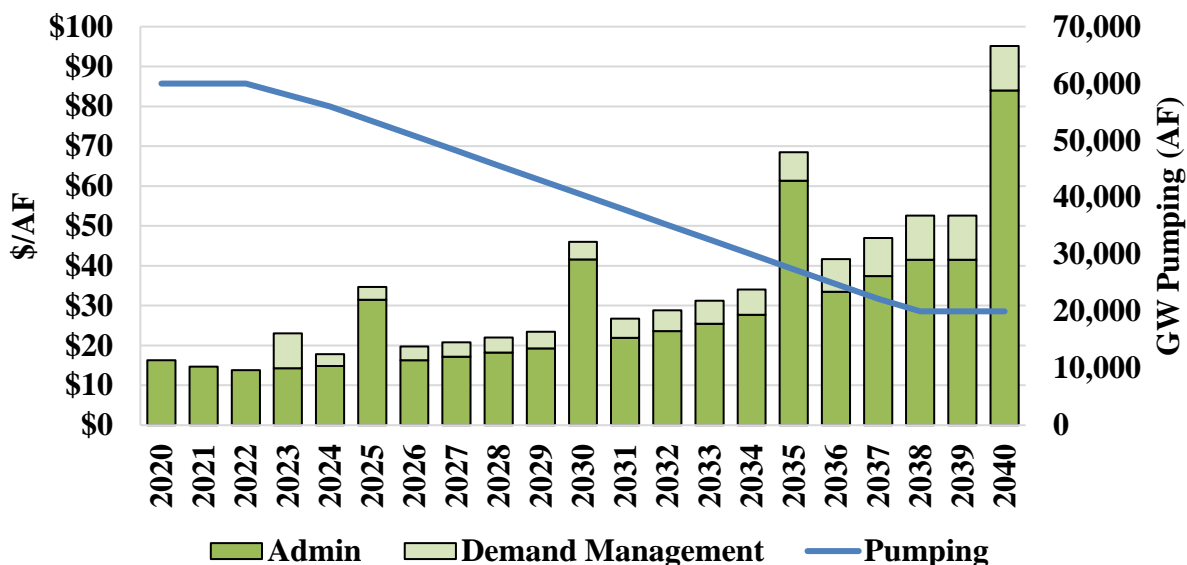


¹ Regions are defined in Section 5.2.1 of the GSP and include the Central, Eastern, Northwestern, Western, Southeastern, and Badlands threshold regions. Most irrigated agriculture is in the Central region. The Badlands regions includes no irrigated agriculture and is excluded from the analysis.

² All water quantities shown in this analysis are gross applied water values.

Demand management and GSP administration will impose direct costs on water users in the basin. These costs are calculated over the GSP implementation timeline (2020-2040) and broken down by individual activity. Administrative costs for the GSP plus any demand management program administration costs are approximately \$1 million annually, to be raised by an assessment on each acre foot of groundwater that agricultural users withdraw. These costs include the administration³ of the GSP and the demand management program, and do not include any additional fees or direct costs associated with the demand management program (e.g. cost of land idling). GSP administration costs are the same for all groundwater pumpers in the basin. Demand management program administration costs would be covered by the Central and Eastern regions. Figure 3 illustrates the timeline of administration costs over the GSP implementation period. Administrative costs range from \$16 to \$90 per AF pumped⁴. This increase is driven by the decrease in total AF pumped in the basin. However, the GSP has not specified a final schedule of fees needed to cover these costs.

Figure 3. GSP Implementation Costs per Acre Foot Pumped (2018\$)



5. GSP Direct Economic Impact Analysis Methodology

The direct economic impacts of changes in water use and costs caused by the GSP demand management program are estimated using an economic model of basin agriculture and water use. This section provides a brief overview of the economic model and Appendix A provides additional technical details. The economic model calibrates to current market conditions and water use in the basin. It is used to simulate the response of the agricultural sector to changes in groundwater availability and cost imposed by the GSP. The basic assumptions of the model

³ GSP administration includes annual and 5-year updates, and all required technical analysis, to the GSP to comply with the GSP regulations.
⁴ These values do not reflect the total cost to producers to pump groundwater, which also includes the cost of extraction (well capital, operating, and maintenance costs for pumping).

follow standard economic practice. Producers maximize profit by producing the crops that provide the greatest return subject to costs, resources, and other technical constraints. Producers sell to a competitive market and are therefore unable to have much or any effect on the price of the product.

The diverse mix of crops grown in the basin were grouped into six crop categories (groups) for the purposes of the direct impact analysis. Costs and returns for each crop group were defined by the characteristics of a proxy crop chosen to represent all production in the crop group. Proxy crops identified for the analysis include carrots, onions, potatoes, wheat (grains and other misc. hays), pistachios, and grapes. The six crops chosen as proxy crops represent 80% of basin acreage and 84% of basin value. Table 1A in Appendix A summarizes each crop group and proxy crop.

Irrigated acreage in the basin varies from year-to-year due to market conditions, rotations, and variability in weather. The economic model was calibrated to average annual cropping patterns using the period 2010 – 2018. Trends in permanent crop plantings since 1994 were reviewed to assess establishment patterns, and capital outlays for establishment costs. Perennial crops, including pistachios, apples, and olives, have long productive economic life cycles, roughly 40 years, and establishment costs are spread across this life cycle. For a crop like pistachios, recouping establishment costs can be more than 10% of annual production costs. Following an orchard early creates a significant loss in investment, therefore this acreage is less responsive to changes in the cost of water.

Land use and production information was also used to infer (calculate) other technical characteristics of crop production in the basin that are not easily represented in observed farming costs and revenues. For example, factors such as risk aversion, unique soil or microclimate, labor availability, and producer skill/preferences affect regional farming, profitability, and response to changes in water availability and cost. Appendix A provides an overview of how these factors are represented in an economic model, as well as the data used to characterize market supply and demand in the basin.

6. Cuyama Basin GSP Direct Economic Impacts

The economic model is used to estimate the direct effect of the GSP demand management program on agriculture in the subbasin. Direct impacts are a result of reduced water availability (under the demand management program) and higher water costs (as a result of GSP and demand management program administrative fees). As water scarcity increases, the mix of crops grown in the basin adjusts, land idling increases, and farm gross and net revenues fall. All dollar impacts are expressed in constant 2018 dollars, indexed using the GDP Implicit Price Deflator. Economic impacts are expressed in the following terms and summarized in Table 1:

- Gross crop revenue
- Net crop revenue

- Irrigated acreage and changes in the crop mix
- Land idling
- Groundwater pumping costs and the opportunity cost of land idling

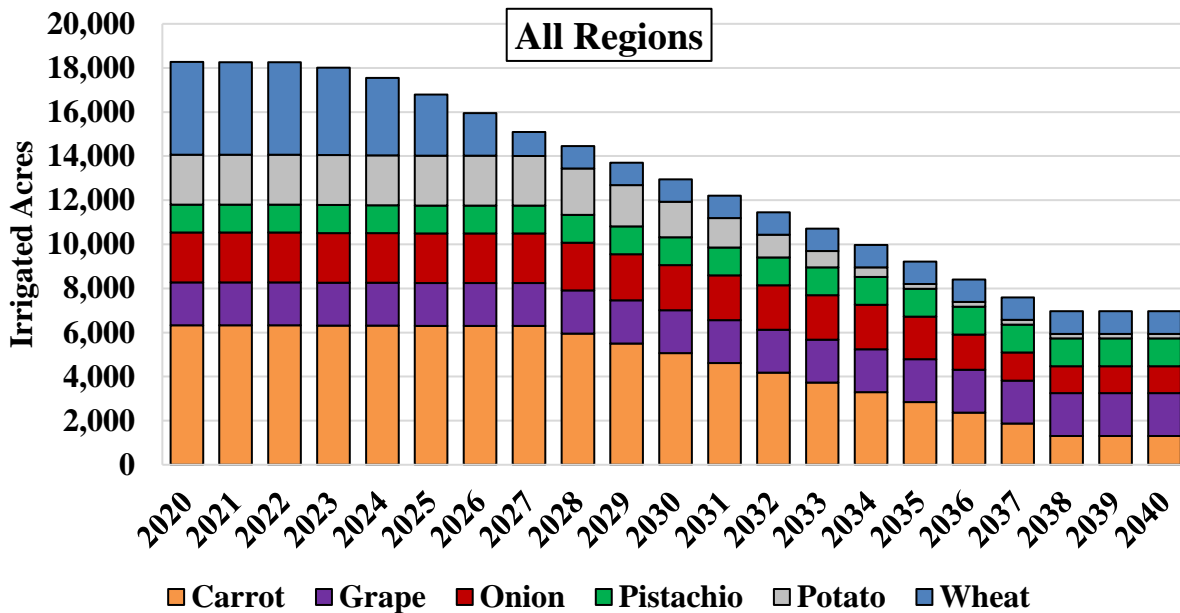
Table 1. Cuyama Basin Economic Impact Summary

Impact Measure	Units	Current	2020 - 2040 Average	Full Implementation (2040)	Percent Change (2040)
Gross Revenue	\$M	\$121	\$91	\$45	(63%)
Net Revenue	\$M	\$31	\$23	\$12	(63%)
Irrigated Acres	Acres	18,300	12,800	7,000	(62%)
Land Idling	Acres	0	5,500	11,300	
Applied Water	AF	60,000	40,000	20,000	(66%)
Pumping Cost	\$/AF	\$98	\$110	\$137	40%
Land Idling Cost	\$/AF	\$0	\$263	\$484	-

The costs of the demand management program to the basin are estimated to average \$30 million per year, increase nonlinearly over time, and will reach \$76 million per year in 2040 at full implementation. This is a 63% decrease in farm revenue over current conditions. These changes are non-linear, reflecting the phase-in period of the demand management program with small annual changes at the beginning of implementation and large annual value differences near the end of implementation. The present, discounted value of this stream of forgone gross revenue during the implementation period equals \$261 million in current dollars. This revenue loss is a result of the land idling that occurs as groundwater pumping is gradually reduced.

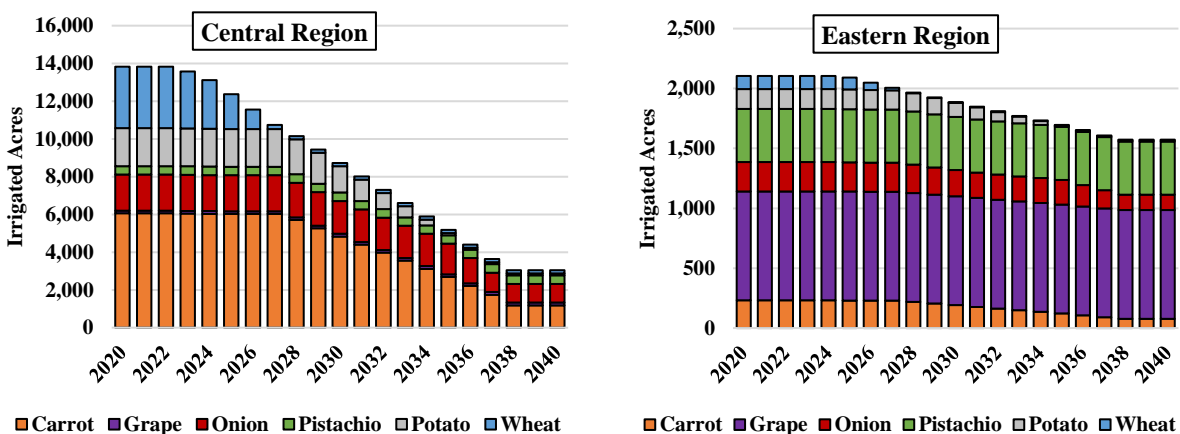
Total irrigated acreage in the basin declines from 18,264 acres to 6,960 acres, with significant changes occurring in the Central and Eastern regions. Under the demand management program specified in the GSP, by 2040 the Central region is only expected to have 3,048 acres in production, 22% of its current acreage. In the Eastern region, where demand management is more modest, there is an estimated 1,572 irrigated acres by 2040, or about 75% of its current acreage. Changes in permanent crops are more modest due to the significant capital investment in these lands. Most of the acreage decline comes from the carrots, other vegetables, rotational crops, and wheat/hay crop groups. Figure 4 illustrates changes in acreage by year for the entire basin. Wheat acreage is most affected early, followed by carrots and potatoes which begin to decline in about 2028.

Figure 4. Estimated Acreage by Crop Group, 2020-2040



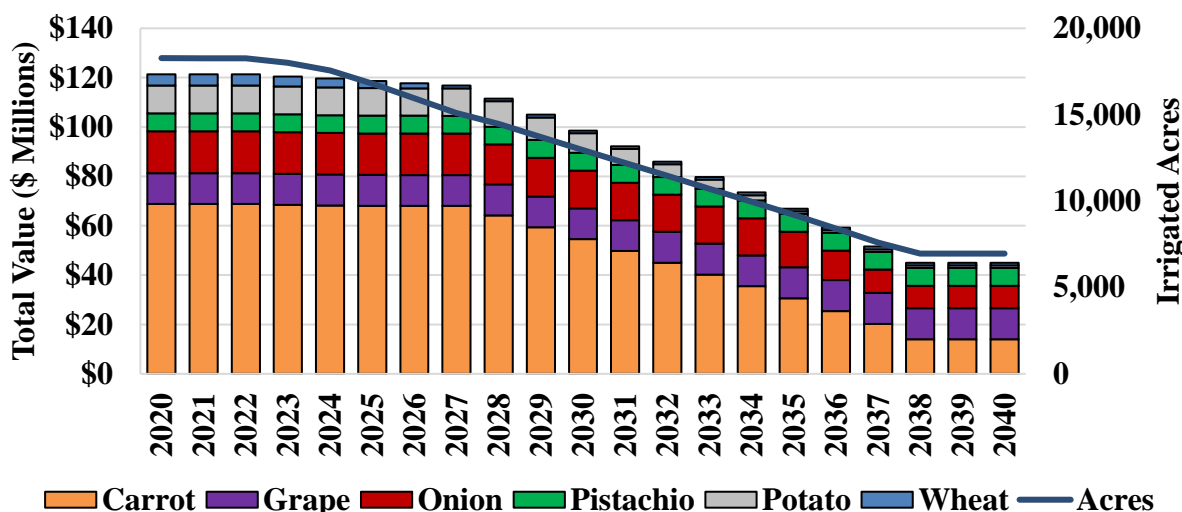
All basin crops are affected as water use is reduced, but the impact is not distributed evenly across crops, or across threshold regions in the basin. Carrots decline the most by 2040, dropping from 35% of basin acreage today to less than 18% by 2040. This is because carrots (and other rotational crops) account for a significant share of current groundwater pumping in the Central region. The reduction in grain/hay (wheat crop group) acreage is more modest, falling by around 33%, because much of its irrigated area is not in the Central and Eastern regions subject to the demand management program. Wheat acreage within the Central region falls by 95%. The share of permanent crop acreage in the basin increases from 18% to 46% by 2040, not because more acreage is planted, but rather because acreage remains more stable as other crop acreage declines. Figure 5 illustrates the change in crop mix in the Central and Eastern regions.

Figure 5. Estimated Acreage by Region and Crop Group, 2020-2040



While annual declines in acreage remain somewhat constant during the GSP implementation period, the decline in value of production is modest in early years but becomes more significant later. In response to higher water costs and increasing scarcity, lower return (low value per unit water) crops are typically idled first. Figure 5 illustrates the decline in value (gross revenue), which is initially small, but increases rapidly as progressively more valuable crops must be taken out of production. By 2040, carrots are still the highest-value crop in the region, however the share of total value is spread much more evenly across crop groups. A reduction of this magnitude in irrigated acreage in the basin would have additional impacts on farming operations. In particular, the ability to maintain a minimum viable industry scale is not guaranteed. Vertically integrated farming operations may consider moving production to other regions in the state, and this would have additional impacts in addition to the direct impacts shown in Figure 6. These secondary impacts can be evaluated under subsequent analyses.

Figure 6. Estimated Value by Crop Group, 2020-2040 (in millions of 2018\$)



Net farm revenues in the basin are also affected as a result of reduced acreage, changes in water costs, yields, and cultural practices. For example, pumping limits could cause some growers to invest in technology to optimize water⁵ and other input use efficiency. Table 2 below summarizes changes in average net revenue per acre by crop group under current conditions (2020) and at full implementation of the demand management program (2040). Net revenues are based on basin average returns and correspond to the return over operating costs (not including any amortized capital costs). On a percentage basis, the decline in net revenue per acre is largest for wheat, grapes, and potatoes. In contrast, carrots, onions, and pistachios decline by less than 2 percent. Total net revenue declines by 63% percent from \$31 million to \$12 million.

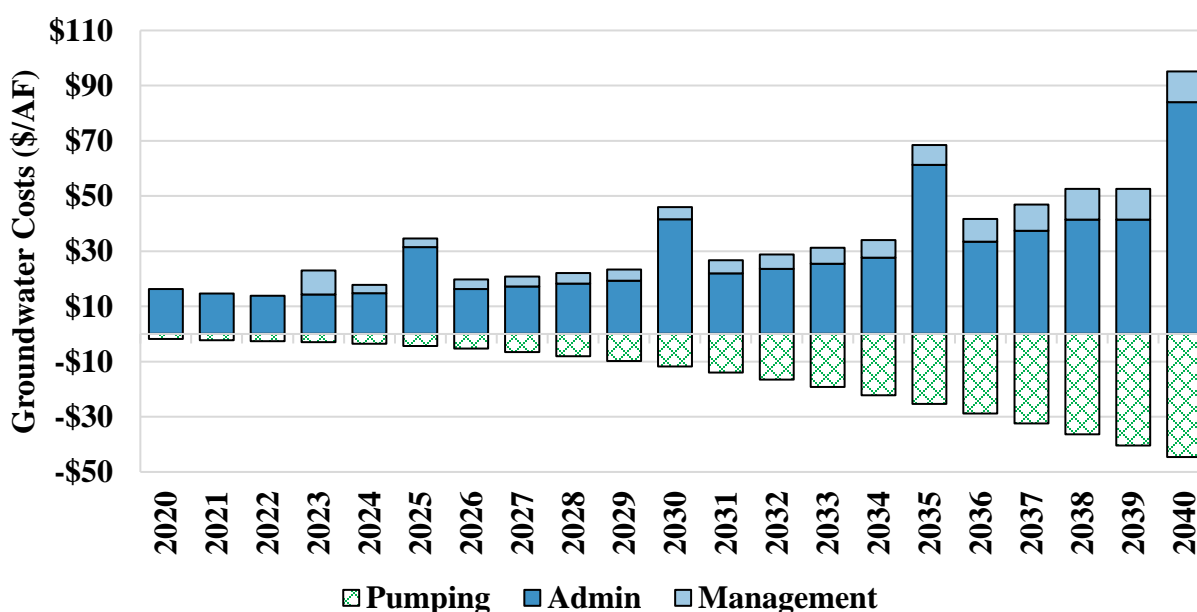
⁵ Pumping reductions specified in the demand management program are expressed in terms of applied water, and therefore account for any return flows. An improvement in water use efficiency only adds groundwater to the basin if it reduces crop consumptive water use.

Table 2. Change in Net Revenue by Crop Group, 2020-2040 (2018\$)

	Carrot	Grape	Onion	Pistachio	Potato	Wheat
Per Acre Change						
2020	\$2,680	\$755	\$2,455	\$2,615	\$1,260	\$375
2040	\$2,635	\$720	\$2,410	\$2,570	\$1,210	\$355
Change	(1.6%)	(5.1%)	(1.9%)	(1.7%)	(3.7%)	(5.4%)
Total Change (millions)						
2020	\$16.8	\$1.5	\$5.5	\$3.3	\$2.8	\$1.5
2040	\$3.3	\$1.4	\$2.9	\$3.2	\$0.3	\$0.4
Change	(80.4%)	(6.7%)	(47.3%)	(3.0%)	(89.3%)	(73.3%)

As the GSP demand management program is implemented, the cost of water per AF changes for two reasons. First, the cost of GSP implementation (administration for the GSP and the demand management program) is spread over smaller volumes of pumped water, so the cost per AF rises. Second, reduced pumping improves groundwater storage and reduces depth to water. Changes in pumping depths are estimated using the relationship between historical overdraft and depth to groundwater as reported in the GSP. These two effects somewhat offset and are presented for the Central region in Figure 7 below. The GSP administration (admin) and demand management program administrative (management) costs are shown as positive values, and the cross-hatched areas represent the reduced pumping lift and cost (shown as a negative cost savings). The net effect of the GSP demand management program is an increase in the cost of groundwater to irrigators in the basin.

Figure 7. Estimated Groundwater Pumping Costs, Central Region



In addition to the changes in water costs, groundwater pumpers in the basin also incur a cost per acre foot of forgone net revenue, otherwise known as the opportunity cost. This opportunity cost is equal to the loss in net revenue as a result of land idling and changes in crop mix divided by the quantity of groundwater pumped. Therefore, this cost increases over the implementation period for two reasons. First, the quantity of water pumped is reduced as the demand management program is implemented. Second, the cost of land idling increases with the magnitude of the demand reduction as increasingly more valuable land/crops are removed from production (see Figures 4 and 6, above). The net effect of the demand management program is an increase in land idling, which is reflected in increasing groundwater cost (see Figure 7).

Figure 8. Estimated Opportunity Cost of Implementation, Central Region

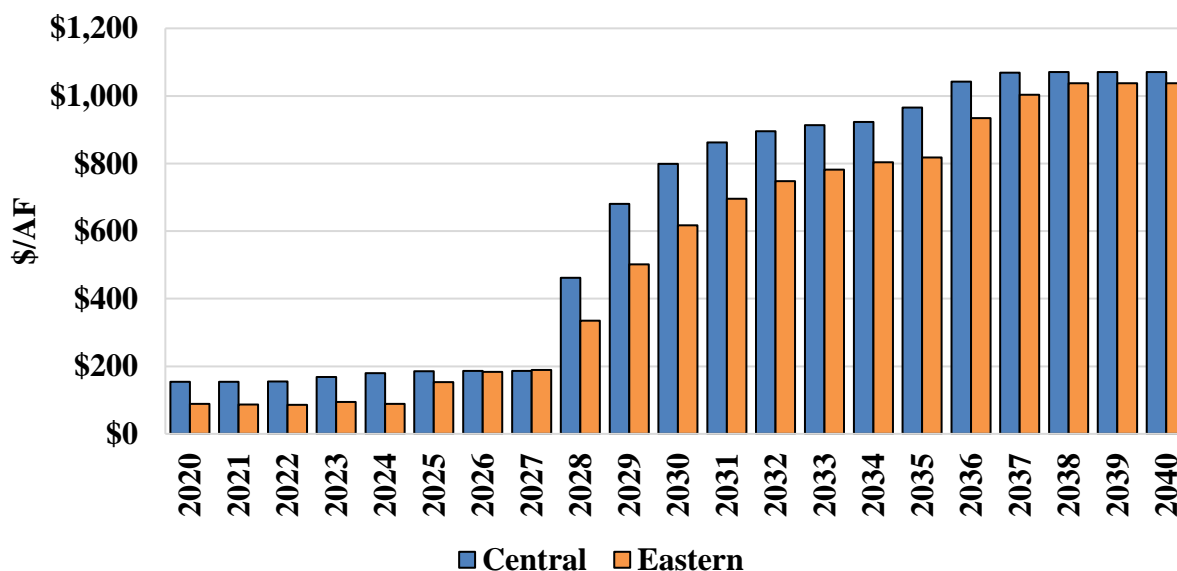


The value of water in different regions of the basin increases significantly as the demand management program is implemented (scarcity increases). The increasing value of water is important for broader planning purposes, in particular comparing the benefit of avoiding additional demand management against the cost of implementing capital water supply projects in the basin. The incremental value of water is the value in production of one additional AF of water. The value of an additional AF is not to be confused with the price or cost of water, rather it is the incremental benefit that the basin would receive if another unit of water was available. This value can also be thought of as the amount a producer would be willing to pay for one additional unit of water.

The incremental value of water is calculated using the economic model over the implementation period. The value varies by region in responses to difference in the economic return to water across the basin and is greatest in the Central and Eastern regions. Figure 9 illustrates values in these regions over the implementation period. A notable change in water value occurs between 2027 and 2028. This is the point during the GSP implementation period when the required

groundwater pumping reduction starts to affect higher-valued annual crops (e.g. carrots, other vegetable crops). That is, many of the crops/land that generates lower return to water has already been idled. By 2040 the incremental value of water exceeds \$1,000 per AF in both the Central and Eastern regions. This value likely exceeds the current average return to water for many crops and growers – instead it represents the most valuable use of new water after the cuts imposed by full implementation of GSP demand management. The incremental value of water is below \$200 per AF in the other regions that are not affected by the demand management program. These values are generally comparable, slightly above, values observed in other agricultural areas in the state.

Figure 9. Incremental Value of Additional Water, Central and Eastern Regions (2018\$)



The net effect of the GSP demand management program and associated GSP administrative costs is a reduction in the economic footprint of basin agriculture by more than two-thirds. This would have profound effects on the basin local economy, and the broader regional economy. Impacts increase non-linearly over the implementation period, equaling \$73 million per year by 2040, or over \$261 million in present value over the implementation period. The incremental value of water under the demand management program exceeds \$1,000 per AF at full implementation, suggesting that some water supply projects may be an economically feasible way to reduce overall implementation costs. Additional suggestions for reducing demand management program implementation costs are summarized under Section 7, below.

7. Other Considerations, Limitations, and Extensions

Quantification of direct impacts supports GSP implementation planning, however consideration of elements outside of the scope of this analysis may be equally important in protecting broader welfare considerations for basin growers, workers, and disadvantaged communities. This section provides a brief discussion of other considerations that were raised by stakeholders during

interviews and meetings. These include limitations and scalability of the economic model, multiplier effects (the indirect and induced impacts resulting from the direct impacts), and resource and environmental externalities (third-party costs) created or mitigated by agriculture in the basin.

The economic model used here is based on and calibrated to recent information on agricultural production in the basin. To the extent that projected conditions fall far outside what has been recently observed, the model may not capture all the impacts. A reduction in gross economic value as great as the one projected in this analysis may cause changes that the model is not able to forecast. For example, viable farming operations require a minimum scale to continue operating, which may be approached or exceeded under the demand management program. Additionally, acreage is concentrated among a few producers in a relatively small area in the basin. As a result, this may cause sudden changes rather than the gradual shifts projected in the model.

The economic analysis used estimates of projected pumping reductions described in the GSP that are based on the best available data and information as of June 2018. As noted in the GSP, it is expected that the groundwater model will be refined in the future as improved and updated monitoring information becomes in the Basin. These refinements may result in changes in the sustainable yield estimates included in the GSP and consequently would affect the results of this economic impact analysis.

A natural extension to the analysis provided here would be a multiplier analysis of indirect and induced (secondary) economic impacts. However, off-the-shelf impact multiplier models often prove to be inadequate for estimating indirect and induced impacts in small regions undergoing large changes. They do not incorporate site-specific information on labor and production practices or on relationships among sectors. In addition, such models assume proportionality between direct and indirect impacts and cannot assess the effect of major structural economic changes. A careful and policy-relevant analysis of the total impact this type of shift would require more detailed information on the labor practices within the basin, dependence of forward-linked industries (e.g., processors) on products from the basin, and the dependence of related industries on economic activity generated by agriculture in the basin. The CBGSA is currently evaluating options to commission this additional analysis.

Finally, this analysis does not assess changes to environmental, natural, and cultural resources within and outside the basin. These changes create both economic and non-economic costs and benefits. Changes include but are not limited to improved water quality, preservation or loss of open space, and cultural and social changes that could result from population leaving the basin. These externalities associated with groundwater pumping in the basin are an additional consideration in overall basin sustainability.

The current demand management program is a conservative approach to achieving sustainability in the basin. Future analysis could explore policy alternatives to the demand management program that reduce the direct economic impact of implementation in the basin. Examples of possible value enhancing policies identified through this analysis include the following:

1. Cuyama Basin sustainability is specified in the GSP terms of physical objectives – avoiding six undesirable results of groundwater overdraft. Meeting these objectives is only possible if pumping is reduced, resulting in economic impacts for the basin. A seventh sustainability indicator, economic viability of the basin, could be considered. Delaying the pumping reduction schedule may allow producers to recover capital investments, avoid rapid changes in the agricultural footprint, and provide jobs, income, and tax revenue for the local economy. This would come at the cost of additional depletion of groundwater storage, but the benefits may outweigh any costs.
2. The economic analysis shows that there is intra- and inter-regional variability in the value of water. This suggests there are potential gains from trading (allowing water to move to its highest and best use). An inter-region water trading program that allows groundwater to be transferred between regions would allow for water to move from lower to higher value uses, providing benefits to both buyers and sellers.
3. The pumping reduction specified in the demand management program is linear. That is, the same percentage reduction is applied every year regardless of conditions in the basin. A dynamic pumping reduction schedule that allows producers to react to market and weather trends could be considered to lower costs. For example, allowing flexibility for growers to increase pumping above the sustainable yield in years with high prices or decreased rainfall, so long as it is replenished in future years, could mitigate some of the losses associated with demand management.
4. The concept of groundwater allocations is implicit to this analysis. That is, the demand management program requires a pumping quota which would include assignment of allocations (how much individuals can pump). How allocations are developed and assigned affects the distribution of costs between groundwater pumpers as well as the overall implementation costs to the local economy. A careful economic analysis of alternative allocation approaches using the framework applied in this analysis could identify ways to reduce GSP implementation costs.

Analysis of value enhancing policies could benefit from further analysis of indirect and induced effects of demand management implementation. 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 the basin and regional economy. Quantifying these relationships would provide data

and information to mitigate losses associated with GSP implementation and ensure that GSP implementation is not only efficient, but also equitable.

8. Appendix A: Economic Model Technical Overview

This appendix summarizes the agricultural economic model of the Cuyama Basin that was applied to analyze the direct agricultural impacts of reducing groundwater pumping and, or, other supply augmentation projects, as discussed in the Cuyama Basin Groundwater Sustainability Plan (GSP). The following sections summarize model calibration and application to this analysis.

8.1 Cuyama Basin Economic Model Overview

The Cuyama Basin model is a regional agricultural production and economic optimization model that simulates the markets for Cuyama Basin crops. It applies the same calibration methodology and economic approach as the Statewide Agricultural Production model (SWAP), which has been subject to peer review and applied to a range of water and agricultural impact analyses in California over the last several decades (Howitt et al. 2012).

The fundamental economic logic underlying the Cuyama Basin model is as follows. Crops are produced in competitive input and output markets. That is, no individual grower/operation can affect or control the price of any commodity. The model simulates inputs, costs, returns, water supplies, and other farm inputs, subject to water availability (e.g. the demand management program) and water costs (e.g. GSP administrative costs).

Agricultural production in the Cuyama Basin is solely dependent on groundwater. As conditions change within a Cuyama Basin region (e.g., a reduction in the amount of groundwater that can be pumped), the model optimizes production by adjusting the crop mix, water quantities used, and other inputs. It also fallsow land when that appears to be the most cost-effective response to resource conditions. The model can be extended to compare the long-run response of agriculture to other conditions affecting surface or groundwater conditions, markets, or other economic values or restrictions in the Cuyama Basin.

8.2 Model Calibration

The model calibrates using a procedure based on Positive Mathematical Programming (PMP) (Howitt 1995) and the assumption that crops are produced in competitive markets. This allows incorporating information on the local market conditions (factors that affect supply and demand), allowing the model to exactly replicate a base year of observed input use and output. Conditions include a mix of management skill, inter-temporal effects of crop rotation, proximity to processing facilities, management skills, farm-level effects such as risk and input smoothing, and differences in soil and other physical capital/inputs. Model calibration translates these factors, in addition to observed average conditions, into an economic representation of production (supply) and market demand conditions (Howitt et al. 2012).

On the crop demand side, the model is specified with downward-sloping California statewide demand functions. That is, the model is specific to the Cuyama Basin but recognizes that Cuyama Basin farmers compete in the statewide (and global export) market for crops. The

demand curve is estimated from historical data on crop prices and quantities that reflects the consumer's willingness-to-pay for a given level of crop production.

8.2.1 Cuyama Regions and Crop Definitions

The Cuyama Basin model is modeled with five of the six regions defined in the GSP: Central, Eastern, Northwest, Southeast, and Western. Of the five regions modeled, the Central region accounts for nearly 80% of all agricultural acreage and is the only region subject to major changes in the GSP (e.g. the demand management program).

The economic model calibrates to average land use between 2010 and 2018. Crops are aggregated into 6 crop groups. Each crop group may represent several individual crops, but many are dominated by a single crop. Irrigated acres represent acreage of all crops within the group, production costs and returns are represented by a single proxy crop for each group. The current 6 crop groups were defined using the information provided Attachment C-1 of the Cuyama Basin GSP, which reports land use and consumptive water use in the Basin and information taken from interviews of local growers. Crop group and the corresponding proxy crop are shown in Table 1A.

Table 1A. Cuyama Basin Model Crop Groups

Crop Group	Proxy Crop	Other Crops
Carrots	Carrots	N/A
Potatoes	Potatoes	N/A
Grapes	Wine	N/A
	Grapes	
Onions	Onions	Bush berries, Cole crops, Lettuce/leafy greens, Melons, Squash, Cucumbers
Pistachios	Pistachios	Apples, Citrus, Miscellaneous Deciduous, Miscellaneous Subtropical Fruit, Olives, Peaches/nectarines
Field	Wheat	Alfalfa & Alfalfa Mixtures, Beans (dry), Corn, Sorghum & Sudan, Miscellaneous Field Crops, Miscellaneous Grain and Hay, Miscellaneous Grasses, Mixed Pasture

8.2.2 Crop Acres

Most crop acreage in the basin has historically been divided between four of the six major crop groups: wheat, carrots, onions, and potatoes. In 2016, carrots accounted for 40% of non-idle cropland, however in 2017 carrots only accounted for 31% of non-idle cropland. This is not a result of sudden market changes, but rather a reflection of typical crop rotations in the area. Therefore, the model calibrates to 2010-2018 data to capture the most recent data while maintaining the effects of rotation.

While carrots may form the backbone of high-value agricultural production in the basin, other crop groups such as wine grapes are increasing. Wine grapes have steadily increased their share of acreage from 1% in 1996 to 7% of non-idle crop acreage in 2017. In addition, the planting of an 850-acre vineyard in 2018 increases this share closer to 13% of non-idle crop acreage. Figure 1A illustrates annual acreage distributions of non-idle cropland and Figure A2 illustrates the distribution of crop land use in the basin in 2014.

Figure A1. Annual Changes in Non-Idle Crop Acreage

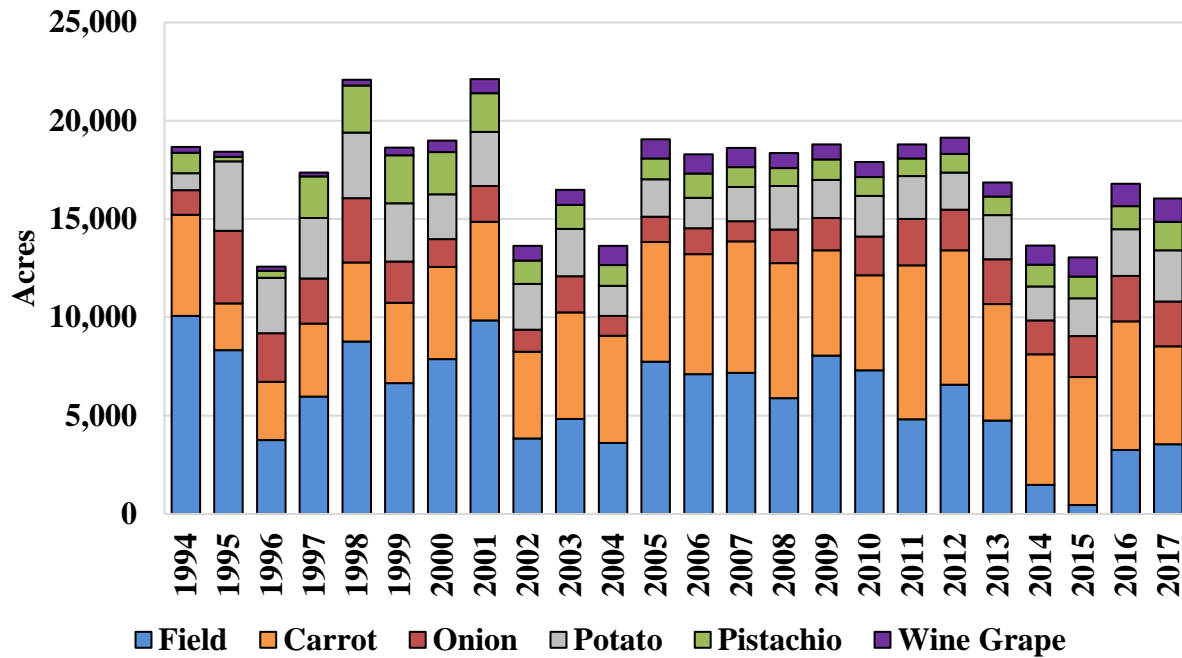
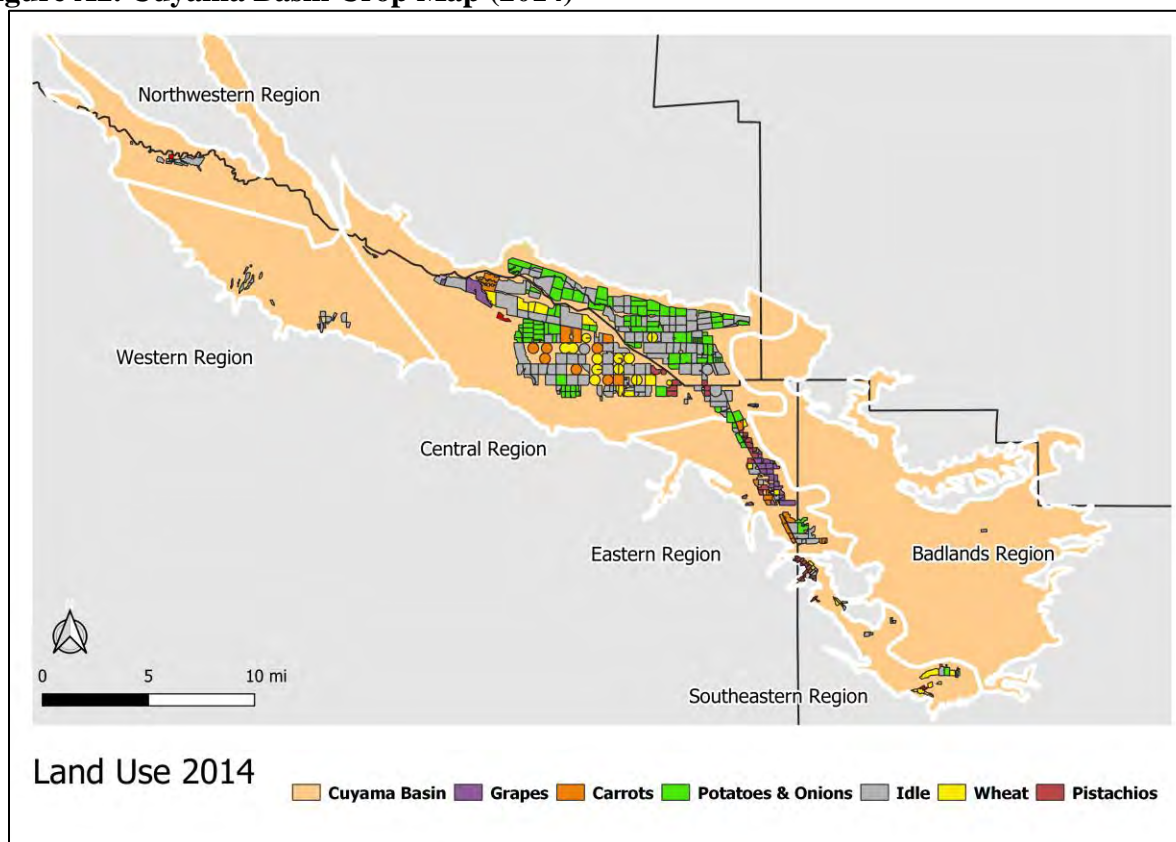


Figure A2. Cuyama Basin Crop Map (2014)

8.2.3 Crop Returns

The economic model is designed to calibrate to the current conditions (market, prices, etc.). The model uses crop price data from a combination of county reports from Santa Barbara, San Luis Obispo, Kern, and Ventura counties, statewide and national price data, local UC estimates, and feedback from individuals familiar with farming in the basin.

Crop yields for each crop group in the model correspond to the proxy crops listed in Table A1 and are based on county averages, refined based on industry feedback. The corresponding costs of production, discussed in a subsequent section, are based on cost studies that reflect best management practices. Thus, crop yields in the economic model may be slightly higher than those estimated by calculating county averages but are more consistent with the production costs. An average of yields in the surrounding counties or statewide values are used when UCCE budget yields are not representative of production in the Cuyama Basin.

8.2.4 Crop Cost of Production Budgets

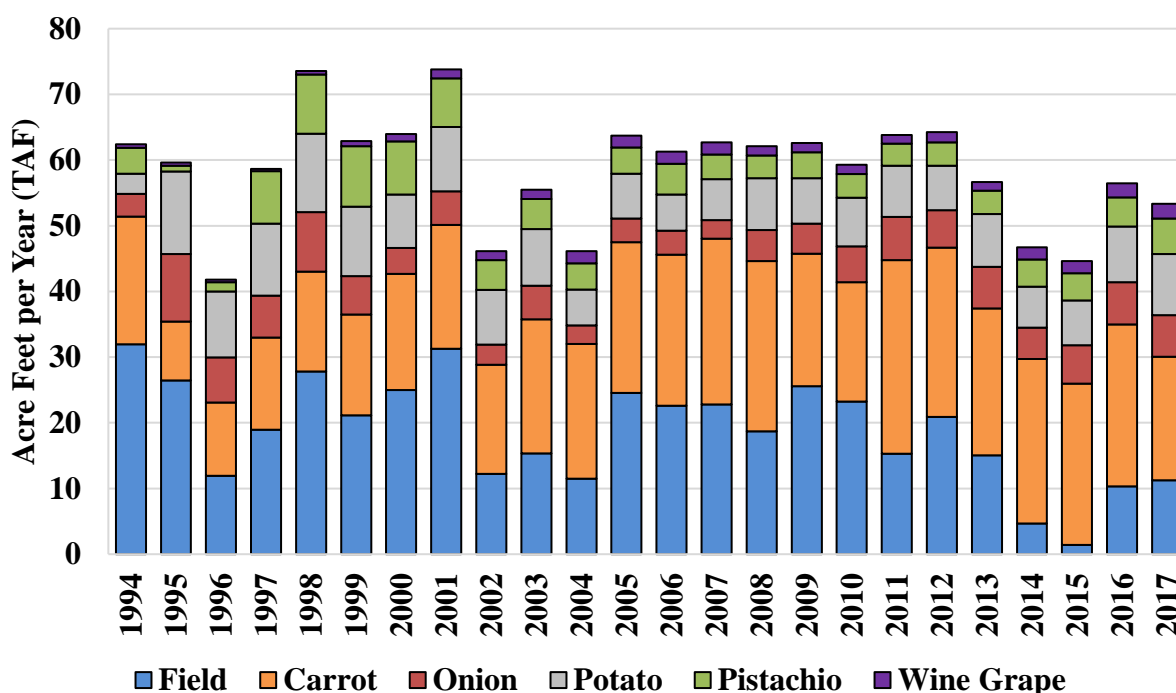
Land, labor, and other supply costs of production are estimated using internal data, UC budgets, and expert feedback to adjust for local conditions. All capital recovery and interest rates are adjusted for consistency to current conditions. Land costs are derived from county data and include land-related cash overhead plus rent and land capital recovery costs. Where appropriate,

interest rates are adjusted as described above. Other operating costs are developed based on UC budgets and interviews with experts in the region.

8.2.5 Water Supplies

Agricultural production in the Cuyama Basin is solely dependent on groundwater. Groundwater pumping capacity estimates are derived from the Cuyama Basin GSP. The GSP’s water budget (Table 2-5 GSP) estimates that agriculture pumps approximately 60,000 acre-feet per year (AFY). The GSP defines the “sustainable yield” for the GSA as the maximum average that the region can pump in a year given the aquifer characteristics and existing well capacities. Sustainable yield in the region is estimated at 20,000 acre-feet. Figure A3 illustrates annual groundwater pumping to meet crop demand between 1994 and 2017.

Figure A3. Cuyama Basin Groundwater Applied Water Demand by Crop and Year



Groundwater pumping costs are broken out into fixed, energy, and operations and maintenance (O&M) components in the economic model. Energy and O&M components are variable. Energy costs depend on the price of electricity. Base electricity costs are derived local data. Overall well efficiency is assumed to be 70 percent. As groundwater elevations change within the basin, variable pumping costs adjust accordingly.

8.2.1 Crop Water Requirements

Applied water is the amount of water applied by the irrigation system to an acre of a given crop for production in a typical year. Variation in rainfall and other climate effects will alter this requirement. Additionally, farmers may deficit irrigate crops or substitute other inputs in order to reduce applied water. Applied water per acre (base) requirements for crops in the model are

derived from Davids Engineering estimates of Evapotranspiration Applied Water presented in Attachment C-4 of the Cuyama GSP Appendix, land use estimates presented in Attachment C-1 of the Cuyama GSP Appendix, and total water use estimates presented in Table 2-5 of the Cuyama GSP. Applied water (AW) values and evapotranspiration applied water (ETAW) are presented in Table A2.

Table A2. Applied Water (AW) and Evapotranspiration Applied Water (ETAW) by Crop

Crop Group	Proxy Crop	AW	ETAW
		<i>acre-feet</i>	
Carrots	Carrots	3.77	3.17
Grapes	Wine Grapes	1.88	1.58
Onions	Onions	2.78	2.33
Pistachios	Pistachios	3.77	3.17
Potatoes	Potatoes	3.57	2.67
Field	Wheat	3.17	2.67

8.2.2 Other Economic Data

The Cuyama Basin model requires a number of economic response parameters, called elasticities, to estimate rates of change in variables. An elasticity is the percent change in a variable, per unit of percent change in another variable or parameter. For example, acreage response elasticity is one component of supply response. It is the percentage change in acreage of a crop from a one percent change in that crop's price. The model contains both long run and short run estimates. Long run acreage response elasticities are used for this analysis. Other elasticities including income, demand price, and population (among others) are representative of statewide market conditions in California, or in the export market as appropriate.

8.3 References

- Agricultural Commissioner of Kern County, Ventura County, Santa Barbara County, and San Luis Obispo. Various years. Agricultural Crop Report. County Department of Agriculture and Measurement Standards.
- California Department of Food and Agriculture. California Agricultural Statistics Review, 2017-2018. Agricultural Statistical Overview.
- Howitt, R.E. 1995. Positive Mathematical-Programming, American Journal of Agricultural Economics, 77(2), 329-342.
- Howitt, R.E., J. Medellin-Azuara, D. MacEwan, and J.R. Lund. 2012. "Calibrating Disaggregate Models of Irrigated Production and Water Use: The California Statewide Agricultural Production Model." Journal of Environmental Modeling and Software.
- United States Department of Agriculture National Agricultural Statistics Service (NASS). Various Years. County Agricultural Commissioners' Data.

University of California Cooperative Extension (UCCE). Various years. Cost of Production Studies.



TO: Standing Advisory Committee
Agenda Item No. 6b I & ii

FROM: Brian Van Lienden, Woodard & Curran

DATE: February 27, 2020

SUBJECT: Direction on Monitoring Network

Issue

Direction on the monitoring network.

Recommended Motion

None – Direction from the Standing Advisory Committee.

Discussion

Provided as Attachment 1 is a presentation describing the 2 phases being planned for the monitoring network. Several issues related to this phasing need to be addressed and staff is looking for direction from the Standing Advisory Committee for discussion at the March 4, 2020 Board meeting.

Cuyama Basin Groundwater Sustainability Agency

Direction on Monitoring Network

February 27, 2020



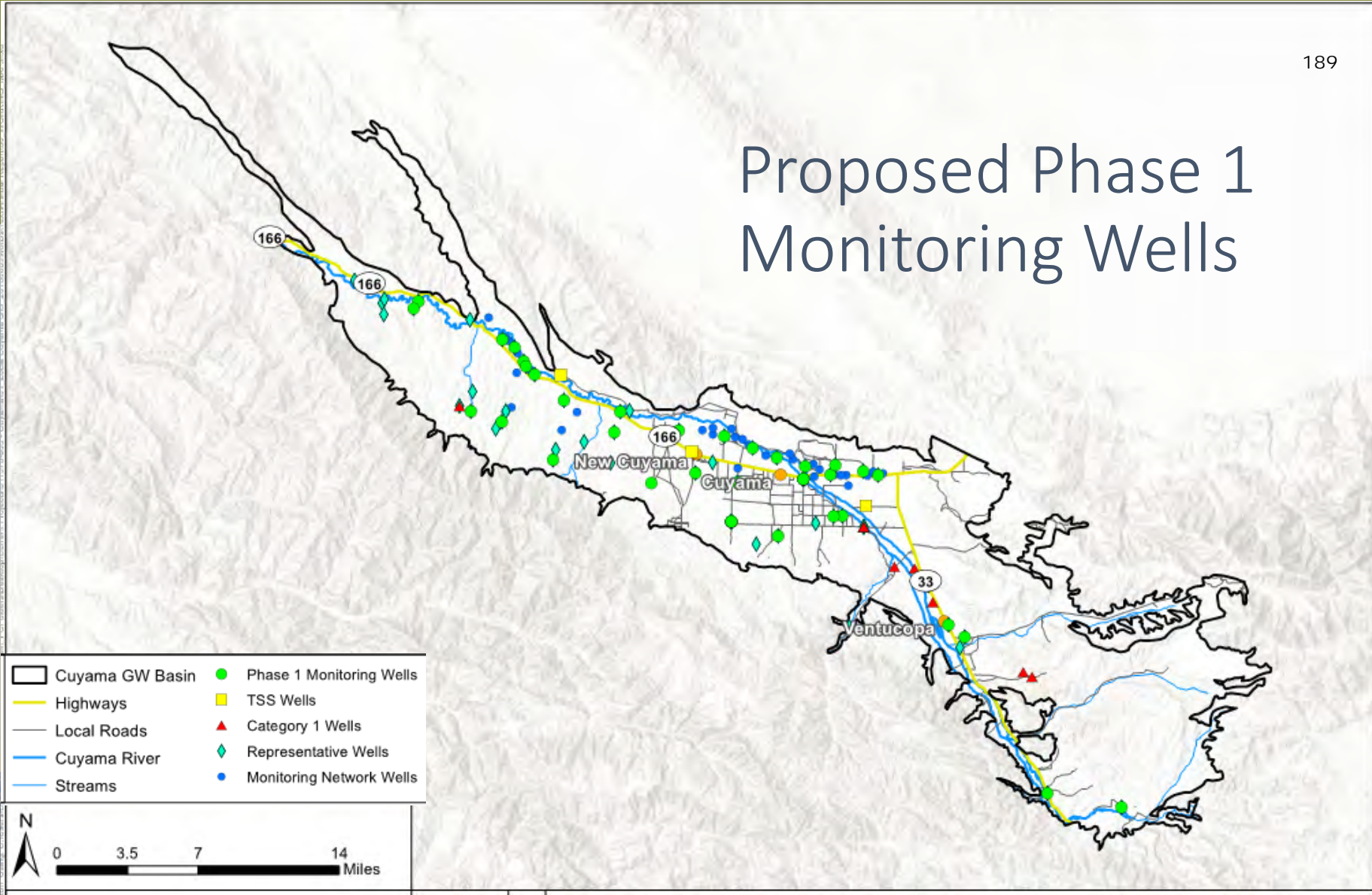
Groundwater Levels Monitoring Network Implementation

- **Feb 6, 2019** – Board approves the Groundwater Monitoring section of the GSP which specifies that the CBGSA will perform monthly monitoring for the 100 wells in its monitoring network.
- **Jul 10, 2019** – Board adopts the FY 19-20 budget which includes roughly \$30,000 for water level monitoring set up and \$30,000 for water quality monitoring set up.
- **Dec 4, 2019** – Board executes Task Order 7 with Woodard & Curran where they request to combine the budget authorization for water levels and quality (combined total of \$60k) to focus on setting up the monitoring network for levels.

Groundwater Levels Monitoring Network Implementation

- W&C determined the \$60,000 was not adequate to set up the entire monitoring network and planned to roll out the network in two (2) phases.
- **Phase 1** – Covers the below tasks for 40 wells and is planned for completion on June 30, 2020 under W&C's existing Task Order 7 (subtask for \$60,000)
 - Coordination with existing monitoring entities (i.e. USGS, DWR, counties)
 - Collection of well information and field validation of monitoring sites (determination of well suitability)
 - Execution of permission agreements with well owners
 - Initial water level measurement for each of the 40 wells using manual equipment
- **Phase 2** – This involves the strategy for setting up the remaining 60 wells and doing monthly monitoring of all 100 wells. Several considerations are presented in the following slides that will be incorporated during the FY 20-21 budget process.

Proposed Phase 1 Monitoring Wells



Sample Monitoring Well Information Sheet

Monitoring Well Information Sheet

Local Well ID	Smith #1	State Well Number	11W255 15A01	Important notes: fence gate is not locked, but arrange chain to look locked.	
Well Depth (ft)	400	Casing Material	Steel		
Screen Top	200	Date Constructed	2/15/1978		
Screen Bot	400	Casing Diameter	6"		
Latitude	38.97913	Date Surveyed	4/5/1995		
Longitude	-121.37269	Well Type	Industrial		
RP Elev	108.5	Well Completion Report	5555555		
GS Elev	107.00				
Well Owner Information	Name	Joe Smith	Email		joe@smith.com
	Phone	555-555-5555	Address		5555 Fifth Street, Wasco, CA 55555
Well Monitoring Contact Point	Name	Joe Smith	Email	joe@smith.com	
	Phone	555-555-5555	Address	5555 Fifth Street, Wasco, CA 55555	
Initial Measurement	Depth to Water	50 feet			
	Groundwater				
	Surface Elevation	58.5 feet			

Location Description:

In the Town of Wasco. Two block north of Highway 43 on east side of F Street.

Map:



Site Photos:



RP location

Approach for Monitoring in FY 2020-21 – Phase 2

- We will need to establish the remainder of the monitoring well network (60 wells)
 - Similar to activity for current 40 wells
- Options for monthly monitoring
 - Manual measurement for each well
 - Install data collection instruments in individual monitoring wells
 - A combination of instrumenting wells and manual measurement
- Goal: select most cost-effective method that provides required quality of measured data

Manual Measurement vs Instrumenting Comparison

192

- **Manual measurement:**
 - Physical measurement of the level at each well once a month
 - Monthly data uploading
 - Estimated cost for 100 wells: ~\$80-100,000 per year (by a 3rd party)
- **Instrumenting:**
 - Install data collection instruments in first year
 - Data would be collected at a higher density (e.g. every minute or every hour, or when the levels change suddenly) with automatic data uploading
 - Estimated cost for 100 wells:
 - Cost in first year: ~\$500,000-600,000
 - Annual cost in subsequent years: ~\$25,000-30,000

Other Considerations

- We may not need to do monthly monitoring at all 100 monitoring well locations in the future:
 - Staff recommendation: do monthly at every well in first year, then assess whether frequency can be reduced in some wells
 - We could do monthly or continuous monitoring for a subset of wells, and only do 2 measurements a year at other locations
- Who is doing the monitoring?
 - Do we hire a consultant to perform monthly monitoring?
 - Can we have volunteers take measurement at some well locations?



TO: Standing Advisory Committee
Agenda Item No. 6c

FROM: Brian Van Lienden, Woodard & Curran

DATE: February 27, 2020

SUBJECT: Update on DWR TSS Well Location

Issue

Update on the DWR TSS well location.

Recommended Motion

To be determined by the ad hoc.

Discussion

On December 4, 2019, the Cuyama Basin Groundwater Sustainability Agency Board of Directors voted to approve the locations of three well locations for the California Department of Water Resources Technical Support Services Program. Staff was recently contacted by the landowner for the proposed location of the well near the central region and declined a monitoring well being installed on their property at this time.

An ad hoc meeting is being schedule prior to the Standing Advisory Committee and this memo will be updated with their recommendation for an alternative location.

Attachment 1 shows the previously approved locations for these wells.



TO: Standing Advisory Committee
Agenda Item No. 6d

FROM: Brian Van Lienden, Woodard & Curran

DATE: February 27, 2020

SUBJECT: Update on Prop 68 Application

Issue

Update on the Prop 68 application.

Recommended Motion

None – information only.

Discussion

Provided as Attachment 1 is an update on the Prop 68 Grant Application that was submitted on November 14, 2019.

Cuyama Basin Groundwater Sustainability Agency

Update on Prop 68 Application Update

February 27, 2020



Update on Prop 68 Grant Application

- A grant proposal was submitted on November 14 for funding under DWR's Sustainable Groundwater Management Round 3 Grant Program
- DWR's Draft Funding list recommends full funding (\$500,000) for Cuyama Basin
- Cuyama Basin proposal includes the following components (as approved by the ad-hoc committee):
 - Supplemental GSP development funding
 - Development of a groundwater extraction fee structure
 - Economic analysis of the Cuyama Basin
 - Initial Work to establish a groundwater levels monitoring network



TO: Standing Advisory Committee
Agenda Item No. 6e

FROM: Brian Van Lienden, Woodard & Curran

DATE: February 27, 2020

SUBJECT: Update on Newsletter

Issue

Update on the newsletter.

Recommended Motion

None – information only.

Discussion

Provided as Attachment 1 is an update on the planning for the next newsletter.

Cuyama Basin Groundwater Sustainability Agency

Update on Newsletter

February 27, 2020



Update on Newsletter

- The next GSA newsletter is expected to go out in the spring by email and with hard copies at USPS and throughout the Valley
- Newsletter topics:
 - GSP submittal
 - Annual report
 - GSP implementation



TO: Standing Advisory Committee
Agenda Item No. 7b

FROM: Jim Beck, Executive Director

DATE: February 27, 2020

SUBJECT: Board of Directors Agenda Review

Issue

Review of the March 4, 2020 Cuyama Basin Groundwater Sustainability Agency Board of Directors meeting agenda.

Recommended Motion

None – information only.

Discussion

The March 4, 2020 Cuyama Basin Groundwater Sustainability Agency Board of Directors meeting agenda is provided as Attachment 1 for review.



CUYAMA BASIN GROUNDWATER SUSTAINABILITY AGENCY BOARD OF DIRECTORS

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Lynn Compton Vice Chairperson, County of San Luis Obispo
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Paul Chounet Cuyama Community Services District
George Cappello Cuyama Basin Water District
Byron Albano Cuyama Basin Water District
Jane Wooster Cuyama Basin Water District
Tom Bracken Cuyama Basin Water District

AGENDA

March 4, 2020

Agenda for a meeting of the Cuyama Basin Groundwater Sustainability Agency Board of Directors to be held on Wednesday, March 4, 2020 at 4:00 PM at the Cuyama Valley Family Resource Center, 4689 CA-166, New Cuyama, CA 93254. To hear the session live call (888) 222-0475, code: 6375195#.

The order in which agenda items are discussed may be changed to accommodate scheduling or other needs of the Board or Committee, the public, or meeting participants. Members of the public are encouraged to arrive at the commencement of the meeting to ensure that they are present for discussion of all items in which they are interested.

In compliance with the Americans with Disabilities Act, if you need disability-related modifications or accommodations, including auxiliary aids or services, to participate in this meeting, please contact Taylor Blakslee at (661) 477-3385 by 4:00 p.m. on the Friday prior to this meeting. Agenda backup information and any public records provided to the Board after the posting of the agenda for this meeting will be available for public review at 4689 CA-166, New Cuyama, CA 93254. The Cuyama Basin Groundwater Sustainability Agency reserves the right to limit each speaker to three (3) minutes per subject or topic.

1. Call to Order
2. Roll Call
3. Pledge of Allegiance
4. Election of Officers
5. Appointment of SAC Members
6. Approval of Minutes
 - a. December 4, 2019 – Joint Special Board Meeting
7. Report of the Standing Advisory Committee
8. Groundwater Sustainability Plan
 - a. Approval of Annual Report
 - b. Update on Groundwater Extraction Fee
 - c. Direction on Monitoring Network
 - i. Review of 40 Well Locations for Current Task Order

- ii. Approach for Monitoring in FY 20-21
 - d. Direction on DWR TSS Well Location
 - e. Update on Prop 68 Application
 - f. Update on Newsletter
- 9. Groundwater Sustainability Agency
 - a. Report of the Executive Director
 - b. Progress & Next Steps
 - c. Report of the General Counsel
- 10. Financial Report
 - a. Adopt Audit
 - b. Update on FY 20-21 Budget Process
 - c. Update on Funding Mechanism for 2021
 - d. Financial Management Overview
 - e. CBGSA Voluntary Contribution Reimbursement Update
 - f. Financial Report
 - g. Payment of Bills
- 11. Reports of the Ad Hoc Committees
- 12. Directors' Forum
- 13. Public comment for items not on the Agenda

At this time, the public may address the Board on any item not appearing on the agenda that is within the subject matter jurisdiction of the Board. Persons wishing to address the Board should fill out a comment card and submit it to the Board Chair prior to the meeting.
- 14. Correspondence
- 15. Adjourn

https://santamariatimes.com/news/local/govt-and-politics/santa-barbara-county-planning-commissioner-s-proposed-cannabis-overlay-wins/article_db1f0d3f-f308-57db-acc3-359a55f2f8d1.html

ALERT TOP STORY

Santa Barbara County planning commissioner's proposed cannabis overlay wins support

Mike Hodgson
Feb 6, 2020

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A cannabis overlay concept that would provide incentives for growers to cultivate in areas that would avoid conflicts with residents and vineyards won support Wednesday at the Santa Barbara County Planning Commission meeting.

But the discussion of potential amendments to the ordinances regulating the industry was continued yet again to allow commissioners to consider additional information before making decisions.

Commissioners unanimously voted to continue the hearing at the March 4 meeting, when Barney Melekian, assistant county executive officer in charge of the County Executive Office's cannabis program, is scheduled to give a briefing on the enforcement program.

That will also be after Dan Klemann, deputy director in charge of the Planning and Development Department's Long Range Planning Division, presents the commission with his division's work plan at the Feb. 26 meeting.²⁰⁷





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County plans to increase focus on cannabis tax compliance, illegal grows

Both meetings are scheduled to take place in Santa Barbara, as did Wednesday's meeting.

Klemann said the commission may want to consider the work plan before directing the staff to take on a major increase in its workload, like splitting off an amendment to address odor problems and making it a priority.

"We [already] have more work than we have staff resources," Klemann advised the commission.

Planners have been wrangling with potential changes to the county's cannabis ordinances because the Board of Supervisors last year directed the commission to come up with potential amendments that could solve some of the problems the industry has caused.

Those problems include conflicts with residential areas caused by odor and traffic and with agricultural operations, particularly wine grape growers, over terpene contamination and other growers over pesticide drift.

At last week's commission meeting, 3rd District Commissioner John Parke suggested creating a cannabis overlay²¹⁰ such that any cultivation operations proposed within it would have a much easier path to a land use permit because it would have little if any impacts on residents, vineyards and other crops.



Santa Barbara County Planning Commission wants cannabis odor tackled now, but decision on how postponed

Parke took it upon himself to create a potential overlay, which he delivered Wednesday, although he admitted it was less detailed than he wished.

“The concept is we have a wine industry that’s very upset ... ,” Parke explained. “I’m hearing from the wine industry²¹² that they can’t sell their grapes if they’re [grown] close to cannabis [cultivation].”

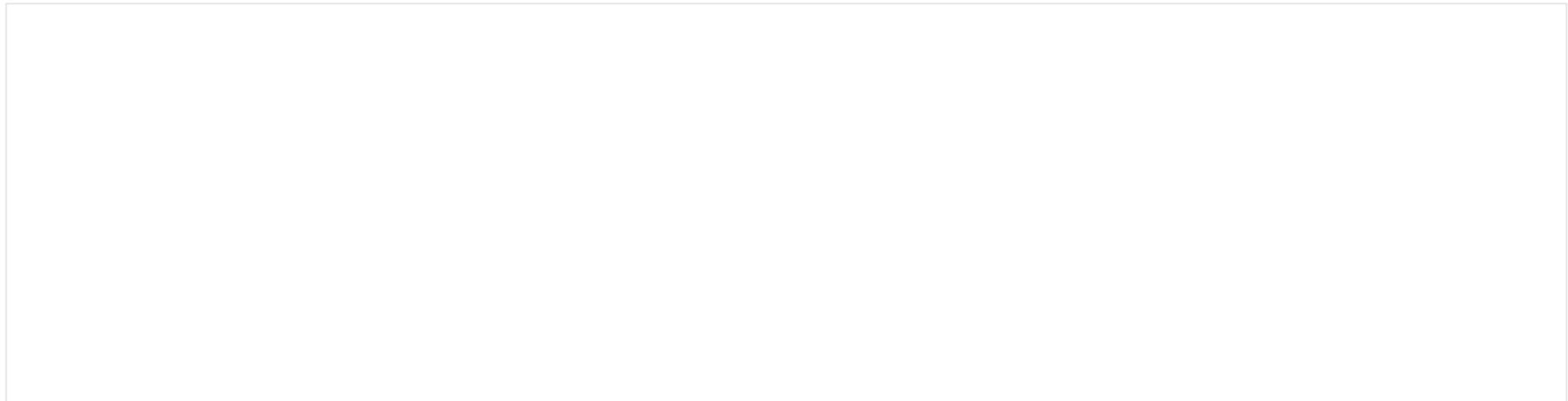
His overlay consisted of four areas — two of which he intended to be a single area.

One he dubbed the Cuyama Segment consisted of most of the Cuyama Valley northeast of Los Padres National Forest to the San Luis Obispo County line, with a few “carve-outs” around Cuyama and New Cuyama field crop areas, and east to the Ventura County line.

Another he called the Cachuma Segment sweeps along the southwest edge of the Los Padres from the east end of the Santa Maria Valley to near Old Man Mountain, staying to the east of the Santa Ynez Valley but encompassing Cachuma Lake, then curving to sweep westward along a narrow band south of Santa Ynez, Solvang and Buellton to Highway 101.

There it butts up against the Jalama Segment — the two intended to be one segment — that expands toward Vandenberg Air Force Base, skirting the Pacific to Point Concepcion, staying south of Lompoc Valley and extending west to near Space Launch Complex 3 East on the base.

The fourth Palmer Segment is a separate Nebraska-shaped area stretching from Highway 135 south of Orcutt eastward to Foxen Canyon and following a line north of Los Alamos to a point near Cañada Arena.





Experts give insights into cannabis economics at annual forum in Solvang

Parke said he realized such an overlay would take a General Plan amendment, which would be a lot of work for staff,²¹⁵ but he said spending 100-plus hours on cannabis hearings is also a lot of work.

He asked that staff and the public consider his proposal to see if it's a good idea and make any recommendations they might have for improving it.

Members of the public who spoke generally supported the idea, provided it directs groves away from people and vineyards, but they also emphasized their desire for the commission deal with the odor problem.

Nancy Emerson of WE Watch in the Santa Ynez Valley noted Buellton is calling for a 1-mile buffer around the city limits.

“I think we need at least half a mile,” she said.

Mike Hodgson

County Reporter/Associate Editor

Lee Central Coast Newspapers associate editor Mike Hodgson covers Santa Barbara County government and events and issues in Santa Ynez Valley. Follow him on Twitter @MHodgsonSYVNews.

