MY1 MONITORING REPORT FINAL

SLIVER MOON II SITE

Craven County, North Carolina
Neuse River Basin
Cataloging Unit 03020202

DMS Project No. 100077
Full Delivery Contract No. 7606
DMS RFP No. 16-007401
USACE Action ID No. SAW-2018-01761
DWR Project No. 2018-1156

Data Collection: January 2023 – November 2023
Submission: January 2024

Prepared for:

NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES
1652 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1652

Mitigation Services
ENVIRONMENTAL QUALITY

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Response to Monitoring Year 1 (2023) DMS Comments
Sliver Moon II (DMS Project No. 100077)
Neuse River Basin 03020202, Craven County
Full Delivery Contract No. 7606

DMS Comments Received (Black Text) & Responses (Blue Text)

Report & Field Visit:

1. CCPV – The Rain Gauge/ Soil Temperature Logger and Photo Point #7 were not where the CCVP depicts them. Please correct the coordinates to reference these in the correct location.
   The Rain Gauge/Soil Temperature Logger was moved to the correct location on the CCPV. We checked Photo Point #7 is shown in the correct location, the intent was to have it offset from the easement to provide a wider vantage of the easement boundary.

Digital:

1. No comments.
   Noted.

Sliver Moon II Year 1, 2023 Monitoring Summary

General Notes

- One area of encroachment was identified during the MY0 document review and was addressed prior to MY1 (2023) monitoring. In Fall 2022, mowing occurred along the southern project boundary and into the Site, totaling 0.892 acres. Restoration Systems (RS) contacted the Craven County Game Warden and alerted him of the situation. RS met with the boundary landowners and discovered the trespass issue was from others in the area, and they too were actively trying to remedy the situation. In response, RS added additional easement markings every 100 feet along the southern boundary and attached conservation easement signage plus no trespass signs with yellow and purple paint (Photo Log, Appendix A). Additionally, on January 30, 2023, RS conducted a replant of the 0.892-acre area with mitigation plan approved species. The additional easement marking has stopped the trespassing issue, and no additional problems have been observed.
- No evidence of nuisance animal activity (i.e., heavy deer browsing) was observed.
- DMS Boundary Inspection Report action items were addressed which included locating and documenting two corners (Photo Log, Appendix A and Appendix E).

Site Maintenance Report (2023)

Invasive Species Work	Maintenance work
None	01/30/2023: Easement Encroachment Replant 10/11/2023: Survey Work (locate two missing corners)

Wetlands

- Nine of the 26 groundwater gauges met success criteria during the Year 1 (2023) monitoring period (Appendix D). A detailed analysis is provided in Section 2.1.

Vegetation

- Measurements of all 26 plots resulted in an average of 605 planted stems/acre, with an average of 5 species per plot. Additionally, all individual plots met the MY3 interim performance standard.

Site Monitoring Activity and Reporting History

Activity or Deliverable	Vegetation Monitoring Complete	Wetland Monitoring	Data Collection Complete	Completion or Delivery
Construction Earthwork	--	--	--	October 27, 2021
Planting	--	--	--	December 20, 2021
As-Built Documentation	December 27, 2021	--	January 2022	May 2023
MY1 Monitoring Report	October 19, 2023	Feb.-Nov. 2023	November 2023	December 2023

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TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1. PROJECT SUMMARY

Restoration Systems, LLC (RS) has established the North Carolina Division of Mitigation Services (NCDMS) Sliver Moon II Site (Site).

1.1 Project Background, Components, and Structure

The Sliver Moon II Site (hereafter referred to as the "Site") encompasses 30.88 acres of primarily agricultural fields used for row crop production. The underlying tract is a single parcel totaling 31.85 acres. The Site is approximately 2.5 miles northwest of Cove City, 3.5 miles southeast of Dover, and slightly north of Old US-70 Highway (SR1005) in northwest Craven County.

Before construction, existing wetlands abutted the Site along its entire northern and much of its southern boundary, with direct ephemeral surface water inputs at several locations. Surface water inputs along the northern border were directed east and west offsite via ditches and a drain tile that cut across the Site. The eastern fifth of the Site's northern boundary abuts the Sliver Moon Mitigation Site, implemented in 2012, successful through five years of monitoring, and closed in 2018.

Just to the north of the Site is the rim of a Carolina Bay. The rim was mined for sand to construct the current NC Highway 70. The Site's eastern boundary, Daisy Lane, was built to access the sand and remains an unimproved road elevated 2-3 feet above Site grade. Soon after the Hwy 70 project, the area was cleared for row crop production, including the land east of Daisy Lane. Land abutting the Site to the south was in agricultural production before 1981. Currently, a vast majority of this land is unmanaged and has naturalized. Remnant spoil piles and historic ditches are still present. Agricultural production is still active along the Site's southwestern boundary, where a topographic crest in the landscape separates the properties hydrologically.

The Site was in agricultural production for roughly 35 years before construction. Typical crop rotation for the decade before construction was winter wheat and corn.

Proposed Site restoration activities generated 30.447 Non-riparian Wetland Mitigation Units (WMUs) – as described in Table 1. An access lane measuring 0.15 acres (15 feet wide) was surveyed and recorded as part of the conservation easement plat and deed. The lane allows for access from the south to north across the Site. The lane area is a part of the restoration plan and approach. No improvements to the lane were made during construction, and the land will not generate mitigation credit.

Additional activities that occurred at the Site included the following.

- Thinning existing wooded areas and replanting bare-root seedlings
- Planting 30.88 acres of the Site with 20,500 stems (planted species are included in Table 5A [Appendix B]).
- Mechanically removing small clusters of Chinese privet
- Applying a permanent seed mix across the Site. A species list is included in Table 5B (Appendix B).

The Project's design was completed on September 23, 2021. Construction started on September 27, 2021, and ended with a final walkthrough on October 27, 2021. The Site was planted on December 20, 2021. Completed project activities, reporting history, completion dates, and project contacts are summarized in Tables 8-9 (Appendix D).

Table 1. Sliver Moon II (ID-100077) Project Mitigation Quantities and Credits

Project Segment	Original Mitigation Plan Ft/Ac	As-Built Ft/Ac	Original Mitigation Category	Original Restoration Level	Original Mitigation Ratio (X:1)	Credits		Comments
Stream								
					Total:	**0.000**		
Wetland								
WR 1	30.447	30.447	R	REE	1.00000	30.447		0.15 acres is within access lane and generates no credit
					Total:	**30.447**		

Project Credits

	Stream			Riparian	Non-Rip	Coastal
Restoration Level	Warm	Cool	Cold	Wetland	Wetland	Marsh
Restoration						
Re-establishment					30.447	
Rehabilitation					0.000	
Enhancement					0.000	
Enhancement I						
Enhancement II						
Creation					0.000	
Preservation					0.000	
Totals					**30.447**	

Total Stream Credit **0.000**
Total Wetland Credit **30.447**

Wetland Mitigation Category

CM	Coastal Marsh
R	Riparian
NR	Non-Riparian

Restoration Level

HQP	High Quality Preservation
P	Preservation
E	Wetland Enhancement - Veg and Hydro
EII	Stream Enhancement II
EI	Stream Enhancement I
C	Wetland Creation
RH	Wetland Rehabilitation - Veg and Hydro
REE	Wetland Re-establishment Veg and Hydro
R	Restoration

Table 2. Summary: Goals, Performance, and Results

Goals	Objectives	Success Criteria
(1) HYDROLOGY		
• Re-establish appropriate wetland hydrology on-site	• Fill and plug agriculture ditches to restore jurisdictional hydrology • Plant native woody vegetation • Cease row crop production within the easement • Shallow disking (~4") of soils to reduce compaction and increase surface roughness • Protect the Site with a perpetual conservation easement	• Row crop production ceased within the easement • Monitoring wells will be successful if the water table is within 12 inches of the soil surface for 12% (32 consecutive days) of the growing season • Vegetation plots will be successful if the plant density is 210 stems per acre with an average plant height of 10 feet at 7 years following planting
(1) WATER QUALITY		
• Remove direct nutrient and pollutant inputs from the Site	• Reduce agricultural land/inputs • Fill and plug the ditch network to restore ground and surface hydrology in the Site • Plant woody vegetation • Restore jurisdictional wetlands	• Row crop production ceased within the easement • Monitoring wells will be successful if the water table is within 12 inches of the soil surface for 12% (32 consecutive days) of the growing season • Vegetation plots will be successful if the plant density is 210 stems per acre with an average plant height of 10 feet at 7 years following planting
(1) HABITAT		
• Improve wetland wildlife habitat within and adjacent to the Site	• Plant woody vegetation to provide organic matter and shade • Fill and plug ditches to provide groundwater hydrology and plant native woody vegetation • Protect the Site with a perpetual conservation easement • Restore jurisdictional wetlands	• Monitoring wells will be successful if the water table is within 12 inches of the soil surface for 12% (32 consecutive days) of the growing season • Vegetation plots will be successful if the plant density is 210 stems per acre with an average plant height of 10 feet at 7 years following planting

Table 3. Project Attribute Table			
Project Name	Sliver Moon II Wetland Restoration Site		
County	Craven County, North Carolina		
Project Area (acres)	30.88		
Project Coordinates (latitude and longitude decimal degrees)	35.2036ºN, 77.3654ºW		
Project Watershed Summary Information			
Physiographic Province	Middle Atlantic Coastal Plain		
River Basin	Neuse		
USGS Hydrologic Unit 8-digit	3020202		
DWR Sub-basin	03-04-08		
Project Drainage Area (acres)	NA		
Project Drainage Area Percentage of Impervious Area	NA		
Land Use Classification	Cultivated		
Wetland Summary Information			
Parameters	**Wetlands (WR 1)**		
Pre-project (acres)	0		
Post-project (acres)	30.597		
Wetland Type (non-riparian, riparian)	Non-riparian		
Mapped Soil Series	Pantego, Rains		
Soil Hydric Status	Hydric, hydric		
Regulatory Considerations			
Parameters	**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404	Yes	Yes	PJD
Water of the United States - Section 401	Yes	Yes	PJD
Endangered Species Act	Yes	Yes	CE Document
Historic Preservation Act	No	--	CE Document
Coastal Zone Management Act (CZMA or CAMA)	No	--	CE Document
Essential Fisheries Habitat	No	--	NA

1.2 Success Criteria

Monitoring and success criteria for wetland restoration should relate to project goals and objectives identified from NC WAM data collection. From a mitigation perspective, several goals and objectives are assumed functionally elevated by restoration activities without direct measurement. Other goals and objectives will be considered successful upon achieving success criteria. The following summarizes Site success criteria.

Table A. Success Criteria

Wetland Hydrology
• Saturation or inundation within the upper 12 inches of the soil surface for, at a minimum, 12 percent of the growing season during average climatic conditions based on the *Wilmington District Stream and Wetland Compensatory Mitigation Update* (USACE 2016, Table 1) for both the *Typic Paleaquult* (Rains) and the *Umbric Paleaquult* (Pantego) soil series as requested by the IRT during the pre-application site visit. Wetland hydrology is an annual success criterion and will be reported in each year's monitoring report. The 2016 USACE *Wilmington District Stream and Wetland Compensatory Mitigation Update* for monitoring states that the growing season, used to determine the number of days required to meet the wetland hydroperiod success criteria, shall not extend beyond March 1 and November 14 (259 days). Using this range as the maximum possible growing season, 12 percent (the wetland hydrology success criteria) would be 31.8 days (rounded to 32 days). Yearly reporting of on-site soil temperature and documented bud burst of two or more tree species (excluding red maple and elderberry) will occur - the growing season will remain fixed (March 1 and November 14).
Vegetation
• Within planted portions of the Site, a minimum of 320 stems per acre must be present at year 3; a minimum of 260 stems per acre must be present at year 5; and a minimum of 210 stems per acre must be present at year 7. • Trees must average 7 feet in height at year 5 and 10 feet in height at year 7 in each plot. • Planted and volunteer stems are counted, provided they are included in the approved planting list for the Site; natural recruits not on the planting list may be considered by the IRT on a case-by-case basis. • Any single species can only account for 50% of the required stems within any vegetation plot.

2. METHODS

Axiom Environmental, Inc. will conduct monitoring, and annual monitoring reports of the data collected will be submitted to the NCDMS by Restoration Systems by December 1 of each monitoring year. The monitoring schedule is summarized in the following table.

Table B. Monitoring Schedule

Resource	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Wetlands	X	X	X	X	X	X	X
Vegetation	X	X	X		X		X
Visual Assessment	X	X	X	X	X	X	X
Report Submittal	X	X	X	X	X	X	X

2.1 Monitoring

The monitoring parameters are summarized in the following table.

Table C. Monitoring Summary

Wetland Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Wetland Restoration	Groundwater gauges	Years 1, 2, 3, 4, 5, 6, and 7 throughout the year with the growing season defined as March 1-November 14	26 gauges spread throughout restored wetlands	Document soil temperature at the beginning of each monitoring period to verify the start of the growing season, documented bud burst, and groundwater/rain data for each monitoring period*
Vegetation Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Vegetation establishment and vigor	Permanent vegetation plots 0.0247 acre (100 square meters) in size; *CVS-EEP Protocol for Recording Vegetation*, *Version 4.2* (Lee et al. 2008)	As-built, Years 1, 2, 3, 5, and 7	26** plots spread across the Site	Documented bud burst, species, height, planted vs. volunteer, stems/acre
Visual Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Encroachment & stabilized outfalls	Visual	Years 1, 2, 3, 4, 5, 6, and 7	8 fixed photo points & Site boundary walking	Documented conditions in yearly monitoring report narrative, current condition figures, and reporting tables

*Soil temperature will be monitored using a continuous recording soil probe located at the rain gauge. The growing season will be initiated once bud burst has been documented on two or more species (excluding red maple and elderberry) and suitable soil temperatures have been documented with the soil probe. The earliest growing season initiation date will be March 1, assuming other growing season criteria have been met.

**25 of the vegetation plots are permanently monumented. One additional random vegetation transect will be measured during years 1-7.

3. MONITORING YEAR 1 – DATA ASSESSMENT

Annual monitoring and site visits were conducted between February 2023 and November 2023 to assess the condition of the project. Stream, wetland, and vegetation criteria for the Site follow the approved success criteria presented in the Mitigation Plan and summarized in Section 1.2; monitoring methods are detailed in Section 2.

3.1 Hydrology Assessment

Summary of Monitoring Period/Hydrology Success Criteria by Year

Year	Start Date of Growing Season*	Monitoring Period Used for Determining Success	12 Percent of Monitoring Period
2023 (Year 1)	March 1, 2023	March 1-November 14 (259 days)	**32 days**

*Based on documented bud burst and data collected from a soil temperature data logger located on the Site.

Nine of the 26 groundwater gauges met success criteria during MY1 (2023). When compared with 30-year 30-70th percentile rainfall, on-site rainfall amounts were low during the latter half of February and March (Figure D1, Appendix D), with only 1.27 inches recorded during the 39-day period between February 14 and March 24. Most of the gauges that did not meet success criteria dipped below 12 inches from the surface for just a few days during this period before rising again with each precipitation event. It is expected that with normal rainfall early in the growing season, the groundwater would be sufficiently recharged at the start of the growing season, and all gauges would have met hydrology success criteria.

3.2 Vegetative Assessment

The MY1 vegetative survey was completed on October 19, 2023. Vegetation monitoring resulted in a sitewide stem density average of 605 planted stems per acre, well above the interim requirement of 320 stems per acre required at MY3. Additionally, all 26 vegetation plots, including the one temporary transect in the 2023 replant area, met the interim stem density requirement.

In Fall 2022, encroachment and mowing occurred along the southern project boundary and into the Site, totaling 0.892 acres. RS contacted the Craven County Game Warden and alerted him of the situation. RS met with the boundary landowners and discovered the trespass issue was from others in the area and they too were actively trying to remedy the situation. In addition, RS added additional easement making every 100 feet along the southern boundary and attached conservation easement signage plus no trespass signs with yellow and purple paint (Photo Log, Appendix A). This action stopped the trespassing issue; no additional problems have been observed.

On January 30, 2023, RS conducted a replant of the 0.892 acres with mitigation plan approved species, summarized in the following table. Additionally, the replanted area is depicted on Figure 1 (Appendix A).

2023 Planting Effort

Scientific name	Common Name	Number of Stems
Betula nigra	River birch	100
Nyssa sylvatica	Black gum	100
Taxodium distichum	Bald cypress	300
Quercus lyrata	Overcup oak	100
Quercus michauxii	Swamp chestnut oak	100
Quercus nigra	Water oak	100
Quercus phellos	Willow oak	100
Liriodendron tulipifera	Tulip poplar	100
	Total:	**1,000**

3.3 Monitoring Year 1 Summary

Overall, the Site looks good, is performing as intended, and is on track to meet success criteria. Site vegetation is on track to exceed the MY3 interim requirement of 320 planted stems per acre and wetland development is evident.

4. REFERENCES

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation. Version 4.2. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, North Carolina.

North Carolina Ecosystem Enhancement Program (NCEEP). 2010. Neuse River Basin Restoration Priorities (online). Available: https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Neuse_River_Basin/FINAL%20RBRP%20Neuse%202010_%2020111207%20CORRECTED.pdf (February 19, 2018).

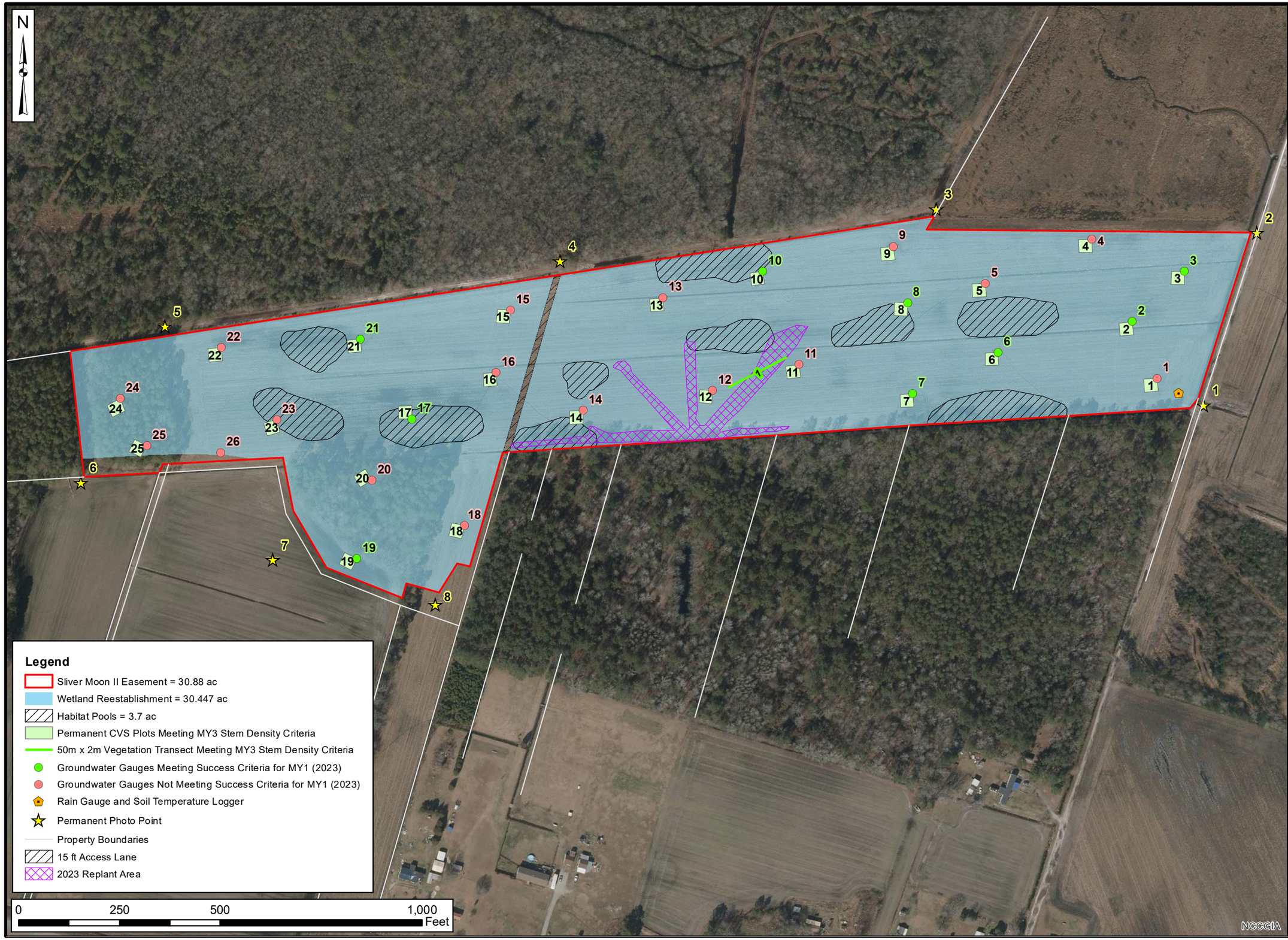
North Carolina Wetland Functional Assessment Team. (NC WFAT 2010). N.C. Wetland Assessment Method (NC WAM) User Manual. Version 4.1.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina: Third Approximation. North Carolina Natural Heritage Program, Division of Parks and Recreation, North Carolina Department of Environment, Health, and Natural Resources. Raleigh, North Carolina.

United States Department of Agriculture (USDA). 2017. Web Soil Survey (online). Available: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm [February 19, 2018]. United States Department of Agriculture.

Appendix A: Visual Assessment Data

Figure 1. Current Conditions Plan View
Table 4. Visual Vegetation Assessment
Vegetation Plot Photographs
Site Photo Log



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

SLIVER MOON II MITIGATION SITE

Craven County, NC

Title:

CURRENT CONDITIONS PLAN VIEW

Drawn by: KRJ

Date: JAN 2024

Scale: 1:2700

Project No.: 18-015

FIGURE

1

Table 4. Visual Vegetation Assessment

Planted acreage **30.88**

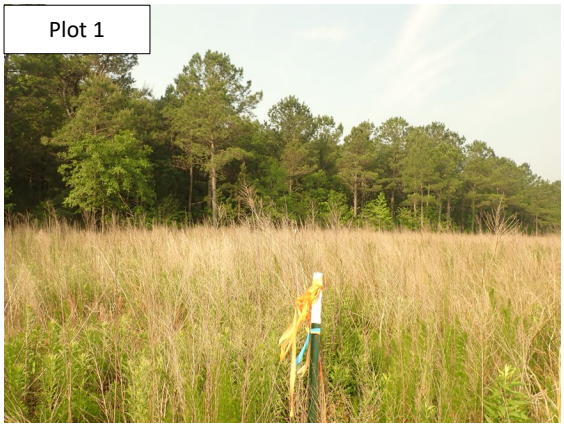
Vegetation Category	Definitions	Mapping Threshold	Combined Acreage	% of Planted Acreage
Bare Areas	None	0.10 acres	0.00	0.0%
Low Stem Density Areas	None	0.10acres	0.00	0.0%
	Total		0.00	0.0%
Areas of Poor Growth Rates	None	0.10 acres	0.00	0.0%
	Cumulative Total		0.00	0.0%

Easement Acreage **30.88**

Vegetation Category	Definitions	Mapping Threshold	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	None	0.10 acres	0.00	0.0%
Easement Encroachment Areas	None	none	0.00	

Sliver Moon II Site
MY1 (2023) Vegetation Monitoring Photographs

Plot 1



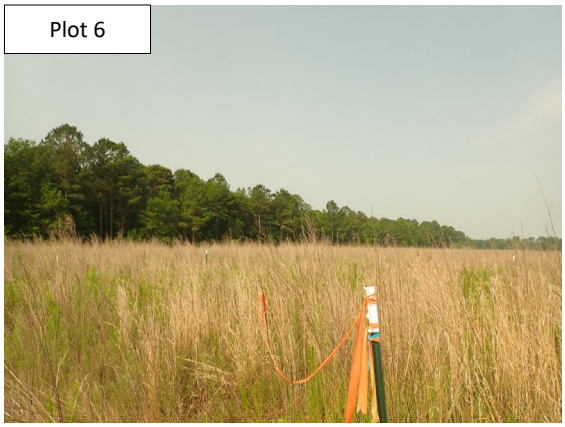
Plot 2

Plot 3

Plot 4

Plot 5

Plot 6



Plot 7

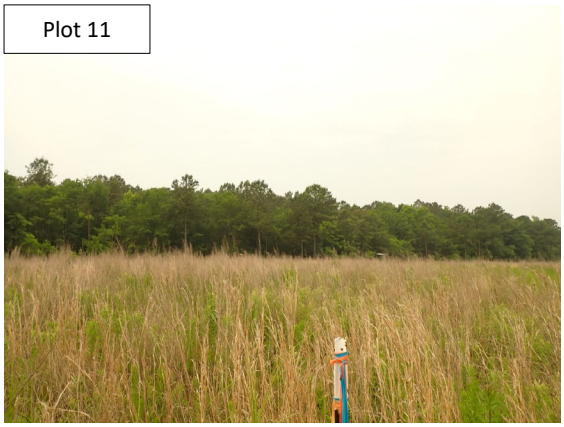
Plot 8

Sliver Moon II Site
MY1 (2023) Vegetation Monitoring Photographs

Plot 9

Plot 10

Plot 11



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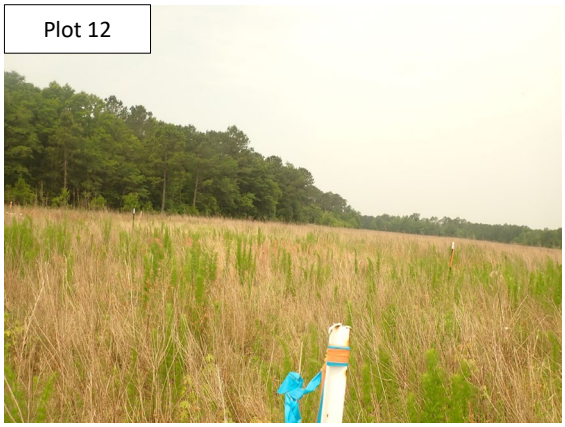

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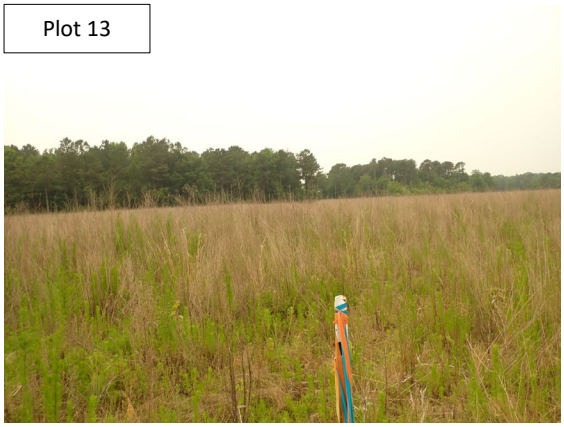
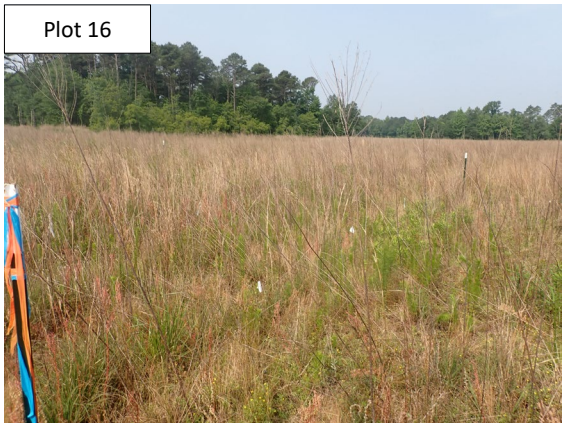


Plot 14

Plot 15

Plot 16



Sliver Moon II Site
MY1 (2023) Vegetation Monitoring Photographs

Plot 17

Plot 18

Plot 19

Plot 20

Plot 21

Plot 22

Plot 23

Plot 24

Sliver Moon II Site
MY1 (2023) Vegetation Monitoring Photographs

Plot 25

Sliver Moon II
MY-01 (2023) Photo Log

Photo 1: Photo Point-1

Photo 2: Photo Point-2

Sliver Moon II
MY-01 (2023) Photo Log

Photo 3: Photo Point-3

Photo 4: Photo Point-4

Sliver Moon II
MY-01 (2023) Photo Log

Photo 5: Photo Point-5

Photo 6: Photo Point-6

Sliver Moon II
MY-01 (2023) Photo Log

Photo 7: Photo Point-7

Photo 8: Photo Point-8

Sliver Moon II
MY-01 (2023) Photo Log

Photo 9: Inundated habitat pool and woody debris, February 2023

Photo 10: Dry habitat pool with vigorous herbaceous vegetation, June 2023

Sliver Moon II
MY-01 (2023) Photo Log

Photo 11: Southern easement boundary markers

Photo 12: Bare-root stem

Sliver Moon II
MY-01 (2023) Photo Log

Photo 13: Updated easement signage southwestern boundary

Photo 14: Updated easement signage northeastern boundary

Sliver Moon II
MY-01 (2023) Photo Log

Photo 15: *Betula nigra* bud burst, taken 2/28/23

Photo 16: *Betula nigra* bud burst, taken 2/28/23

Sliver Moon II
MY-01 (2023) Photo Log

Photo 17: *Diospyros virginiana* bud burst, taken 2/28/23

Photo 18: *Magnolia virginiana* bud burst, taken 2/28/23

Appendix B: Vegetation Data

Table 5. Planted Bare Root Woody Vegetation

Sliver Moon II Site

Vegetation Association	**Non-riverine Wet Hardwood Forest**			
Canopy Species (30.88 acres)	**Mit. Plan**	**AsBuilt # Planted**	**Indicator Status**	**AB % of total**
Tulip poplar (*Liriodendron tulipifera*)	2500	2500	FACU	11.11%
Black gum (*Nyssa sylvatica*)	2500	2500	FAC	11.11%
Swamp white oak (*Quercus bicolor*)	2000	2000	FACW	8.89%
~~Laurel oak (*Quercus laurifolia*)~~	~~2000~~	~~0~~*	~~FACW~~	~~0.00%~~
Overcup oak (*Quercus lyrata*)	2000	2500	OBL	11.11%
Swamp chestnut oak (*Quercus michauxii*)	2000	2500	FACW	11.11%
Water oak (*Quercus nigra*)	2000	2500	FAC	11.11%
Cherrybark oak (*Quercus pagoda*)	2000	2000	FACW	8.89%
Willow oak (*Quercus phellos*)	2000	2500	FACW	11.11%
Understory Species (30.88 acres)	**# planted**		**Indicator Status**	**AB % of total**
Hornbeam (*Carpinus caroliniana)*	800	800	FAC	3.56%
~~Sweetbay magnolia (*Magnolia virginiana*)~~	~~800~~	~~0~~*	~~FACW~~	~~0.00%~~
~~Swamp bay (*Persea palustris*)~~	~~700~~	~~0~~*	~~FACW~~	~~0.00%~~
Wet Foot Species (3.75 acres) – in addition to Site-wide planting	**# planted**		**Indicator Status**	**AB % of total**
River Birch (*Betula nigra*)	200	1000	FACW	4.44%
Water tupelo (*Nyssa aquatica*)	300	300	OBL	1.33%
Swamp tupelo (*Nyssa biflora*)	200	200	OBL	0.89%
Bald Cypress (*Taxodium distichum*)	500	1200	OBL	5.33%
TOTAL	**22500**	**22500**		**100.00%**

*Species were unavailable

Indicator Categories (USDA - https://plants.usda.gov/wetinfo.html)			
Code	**Indicator Status**	**Designation**	**Comment**
OBL	Obligate Wetland	Hydrophyte	Almost always occur in wetlands
FACW	Facultative Wetland	Hydrophyte	Usually occur in wetlands, but may occur in non-wetlands
FAC	Facultative	Hydrophyte	Occur in wetlands and non-wetlands
FACU	Facultative Upland	Nonhydrophyte	Usually occur in non-wetlands, but may occur in wetlands

Table 6. Permanent Seed Mix
Sliver Moon II Site

Common Name	Scientific Name	Lbs/Ac.	
		Mit. Plan	Actual
Common yarrow	*Achillea millefolium*	0.6	0.4
Redtop	*Agrostis alba*	9	6
Winter bentgrass	*Agrostis hyemalis*	3	2
Creeping bentgrass	*Agrostis stolonifera*	3	2
Clusterspike false indigo	*Amorpha herbacea*	0.6	0.4
~~Showy aster~~	~~*Aster spectabilis*~~	~~0.6~~	~~0~~
~~Spiked wild indigo~~	~~*Baptisia albescens*~~	~~0.6~~	~~0~~
Blue false indigo	*Baptisia australis*	1.2	0.8
Greenwhite sedge	*Carex albolutescens*	3.9	6
~~Lurid sedge~~	~~*Carex lurida*~~	~~1.5~~	~~0~~
Fox sedge	*Carex vulpinoidea*	0	2
Daisy	*Chrysanthemum leucanthemum*	3	2
Shasta daisy	*Chrysanthemum maximum*	1.8	1.2
Coreopsis lanceleaf	*Coreopsis lanceolata*	3	2
Coreopsis plains	*Coreopsis tinctoria*	3	2
Cosmos	*Cosmos bipinnatus*	0.6	0.8
Rocket larkspur	*Delphinium ajacis*	1.2	0.8
Showy ticktrefoil	*Desmodium canadense*	0.6	0.4
Coneflower	*Echinacea purpurea*	3.6	2.4
~~Riverbank wildrye~~	~~*Elymus riparius*~~	~~3.15~~	~~0~~
Virginia wildrye	*Elymus virginicus*	3	6
~~Mistflower~~	~~*Eupatorium coelestinum*~~	~~0.3~~	~~0~~
~~Joe Pye Weed~~	~~*Eupatorium fistulosum*~~	~~0.3~~	~~0~~
Perennial gaillardia	*Gallardia aristata*	1.2	0.8
~~Purplehead sneezeweed~~	~~*Helenium flexuosum*~~	~~0.3~~	~~0~~
Narrowleaf sunflower	*Helianthus angustifolius*	0.6	1.2
Oxeye sunflower	*Heliopsis helianthoides*	0.6	0.4
~~Crimsoneyed rosemallow~~	~~*Hibiscus moscheutos*~~	~~0.6~~	~~0~~
Soft rush	*Juncus effusus*	0.6	0.6
Path rush	*Juncus tenuis*	0.3	0.2
Narrowleaf primrose willow	*Ludwigia linearis*	0.39	0.2
~~Seaside primrose willow~~	~~*Ludwigia maritima*~~	~~0.39~~	~~0~~
Wild bergamot	*Monarda fistulosa*	0.3	0.2
~~Beaked panicgrass~~	~~*Panicum anceps*~~	~~7.77~~	~~0~~
~~Deertongue~~	~~*Panicum clandestinum*~~	~~3~~	~~0~~
Redtop panicgrass	*Panicum rigidulum*	9	6.2
Tall white beardtongue	*Penstemon digitalis*	0.6	0.4
Switchgrass	*Panicum virgatum*		2.4
~~Globe beaksedge~~	~~*Rhynchospora globularis*~~	~~1.2~~	~~0~~
Clasping coneflower	*Rudbeckia amplexicaulis*	0.6	0.4
Rudbeckia	*Rudbeckia hirta*	1.8	1.2
Woolgrass	*Scirpus cyperinus*	0.3	0.1
Purpletop	*Tridens flavus*	12	8
Blue vervain	*Verbena hastata*	0.6	0.4
New York ironweed	*Vernonia noveboracensis*	0.3	0.1

Table 7. Planted Vegetation Totals

Sliver Moon II Site

Plot #	Planted Stems/Acre	Success Criteria Met?
1	607	Yes
2	445	Yes
3	607	Yes
4	526	Yes
5	567	Yes
6	526	Yes
7	647	Yes
8	567	Yes
9	526	Yes
10	486	Yes
11	607	Yes
12	688	Yes
13	688	Yes
14	607	Yes
15	486	Yes
16	607	Yes
17	769	Yes
18	607	Yes
19	445	Yes
20	1619	Yes
21	445	Yes
22	445	Yes
23	526	Yes
24	607	Yes
25	567	Yes
1 R	526	Yes
Average Planted Stems/Acre	**605**	**Yes**

Table 8. Vegetation Plot Dat Table from Vegetation Data Entry Tool

Planted Acreage	30.88
Date of Initial Plant	2021-12-20
Date(s) of Supplemental Plant(s)	2023-01-30
Date(s) Mowing	NA
Date of Current Survey	2023-10-19
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW			3	3							1	1						
	Carpinus caroliniana	American hornbeam	Tree	FAC															3	3		
	Liriodendron tulipifera	tuliptree	Tree	FACU	1	1					3	3	2	2					2	2	2	2
	Magnolia virginiana	sweetbay	Tree	FACW																		
	Nyssa sylvatica	blackgum	Tree	FAC	1	1			9	9			1	1	3	3						
	Quercus bicolor	swamp white oak	Tree	FACW					2	2	4	4	9	9								
	Quercus lyrata	overcup oak	Tree	OBL					2	2					4	4	3	3				
	Quercus michauxii	swamp chestnut oak	Tree	FACW							1	1	1	1	1	1	1	1			3	3
	Quercus nigra	water oak	Tree	FAC	2	2	4	4									4	4				
	Quercus pagoda	cherrybark oak	Tree	FACW	2	2					5	5			1	1	6	6	1	1	1	1
	Quercus phellos	willow oak	Tree	FACW	9	9	2	2	2	2			1	1	2	2	1	1	1	1	4	4
	Taxodium distichum	bald cypress	Tree	OBL			2	2							1	1	1	1	7	7	3	3
Sum	Performance Standard				15	15	11	11	15	15	13	13	14	14	13	13	16	16	14	14	13	13
Post Mitigation Plan Species	*Pinus taeda*	*loblolly pine*	*Tree*	*FAC*																		
	Platanus occidentalis	*American sycamore*	*Tree*	*FACW*																		
Sum	Proposed Standard				15	15	11	11	15	15	13	13	14	14	13	13	16	16	14	14	13	13
Mitigation Plan Performance Standard	Current Year Stem Count					15		11		15		13		14		13		16		14		13
	Stems/Acre					607		445		607		526		567		526		647		567		526
	Species Count					5		4		4		4		5		7		6		5		5
	Dominant Species Composition (%)					60		36		60		38		64		31		38		50		31
	Average Plot Height (ft.)					1		2		2		1		2		2		2		2		2
	% Invasives					0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					15		11		15		13		14		13		16		14		13
	Stems/Acre					607		445		607		526		567		526		647		567		526
	Species Count					5		4		4		4		5		7		6		5		5
	Dominant Species Composition (%)					60		36		60		38		64		31		38		50		31
	Average Plot Height (ft.)					1		2		2		1		2		2		2		2		2
	% Invasives					0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 8. Vegetation Plot Dat Table from Vegetation Data Entry Tool (continued)

Planted Acreage	30.88
Date of Initial Plant	2021-12-20
Date(s) of Supplemental Plant(s)	2023-01-30
Date(s) Mowing	NA
Date of Current Survey	2023-10-19
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 10 F		Veg Plot 11 F		Veg Plot 12 F		Veg Plot 13 F		Veg Plot 14 F		Veg Plot 15 F		Veg Plot 16 F		Veg Plot 17 F		Veg Plot 18 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW			1	1														
	Carpinus caroliniana	American hornbeam	Tree	FAC																		
	Liriodendron tulipifera	tuliptree	Tree	FACU	3	3					1	1			6	6						
	Magnolia virginiana	sweetbay	Tree	FACW																		
	Nyssa sylvatica	blackgum	Tree	FAC					2	2	4	4			1	1	6	6				
	Quercus bicolor	swamp white oak	Tree	FACW	2	2	2	2					1	1	2	2					1	1
	Quercus lyrata	overcup oak	Tree	OBL			3	3	2	2	1	1			2	2			1	1	2	2
	Quercus michauxii	swamp chestnut oak	Tree	FACW	1	1	2	2			5	5	2	2	1	1	1	1	5	5	5	5
	Quercus nigra	water oak	Tree	FAC			2	2	3	3	3	3	1	1			2	2			1	1
	Quercus pagoda	cherrybark oak	Tree	FACW	2	2	2	2	2	2	2	2					2	2	1	1	2	2
	Quercus phellos	willow oak	Tree	FACW	4	4	1	1	8	8	1	1	11	11			4	4	4	4	4	4
	Taxodium distichum	bald cypress	Tree	OBL			2	2											8	8		
Sum	Performance Standard				12	12	15	15	17	17	17	17	15	15	12	12	15	15	19	19	15	15
Post Mitigation Plan Species	*Pinus taeda*	*loblolly pine*	*Tree*	*FAC*																		
	Platanus occidentalis	*American sycamore*	*Tree*	*FACW*														*1*				
Sum	Proposed Standard				12	12	15	15	17	17	17	17	15	15	12	12	15	15	19	19	15	15
Mitigation Plan Performance Standard	Current Year Stem Count					12		15		17		17		15		12		15		19		15
	Stems/Acre					486		607		688		688		607		486		607		769		607
	Species Count					5		8		5		7		4		5		5		5		6
	Dominant Species Composition (%)					33		20		47		29		73		50		38		42		33
	Average Plot Height (ft.)					1		2		2		2		2		1		2		2		2
	% Invasives					0		0		0		0		0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					12		15		17		17		15		12		15		19		15
	Stems/Acre					486		607		688		688		607		486		607		769		607
	Species Count					5		8		5		7		4		5		5		5		6
	Dominant Species Composition (%)					33		20		47		29		73		50		38		42		33
	Average Plot Height (ft.)					1		2		2		2		2		1		2		2		2
	% Invasives					0		0		0		0		0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 8. Vegetation Plot Dat Table from Vegetation Data Entry Tool (continued)

Planted Acreage	30.88
Date of Initial Plant	2021-12-20
Date(s) of Supplemental Plant(s)	2023-01-30
Date(s) Mowing	NA
Date of Current Survey	2023-10-19
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/S hrub	Indicator Status	Veg Plot 19 F		Veg Plot 20 F		Veg Plot 21 F		Veg Plot 22 F		Veg Plot 23 F		Veg Plot 24 F		Veg Plot 25 F		Veg Plot 1 R
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Total
Species Included in Approved Mitigation Plan	Betula nigra	river birch	Tree	FACW										2					3
	Carpinus caroliniana	American hornbeam	Tree	FAC															
	Liriodendron tulipifera	tuliptree	Tree	FACU				1						3					
	Magnolia virginiana	sweetbay	Tree	FACW				25											
	Nyssa sylvatica	blackgum	Tree	FAC				2									3	3	2
	Quercus bicolor	swamp white oak	Tree	FACW					2	2	1	1							
	Quercus lyrata	overcup oak	Tree	OBL	2	2			1	1	6	6							1
	Quercus michauxii	swamp chestnut oak	Tree	FACW	3	3			2	2	1	1			1	1	4	4	3
	Quercus nigra	water oak	Tree	FAC	2	2		1	2	2	1	1					1	1	2
	Quercus pagoda	cherrybark oak	Tree	FACW	1	1			1	1				1			1	1	
	Quercus phellos	willow oak	Tree	FACW	1	1		11	3	3	2	2		7	14	14	5	5	
	Taxodium distichum	bald cypress	Tree	OBL	2	2													2
Sum	Performance Standard				11	11	0	40	11	11	11	11	0	13	15	15	14	14	13
Post Mitigation Plan Species	*Pinus taeda*	*loblolly pine*	*Tree*	*FAC*				*3*											
	Platanus occidentalis	*American sycamore*	*Tree*	*FACW*				*1*											
Sum	Proposed Standard				11	11	0	40	11	11	11	11	0	13	15	15	14	14	13
Mitigation Plan Performance Standard	Current Year Stem Count					11		40		11		11		13		15		14	13
	Stems/Acre					445		1619		445		445		526		607		567	526
	Species Count					6		5		6		5		4		2		5	6
	Dominant Species Composition (%)					27		57		27		55		54		93		36	23
	Average Plot Height (ft.)					2		7		2		1		2		2		2	2
	% Invasives					0		0		0		0		0		0		0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count					11		40		11		11		13		15		14	13
	Stems/Acre					445		1619		445		445		526		607		567	526
	Species Count					6		5		6		5		4		2		5	6
	Dominant Species Composition (%)					27		57		27		55		54		93		36	23
	Average Plot Height (ft.)					2		7		2		1		2		2		2	2
	% Invasives					0		0		0		0		0		0		0	0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Appendix C: Hydrologic Data

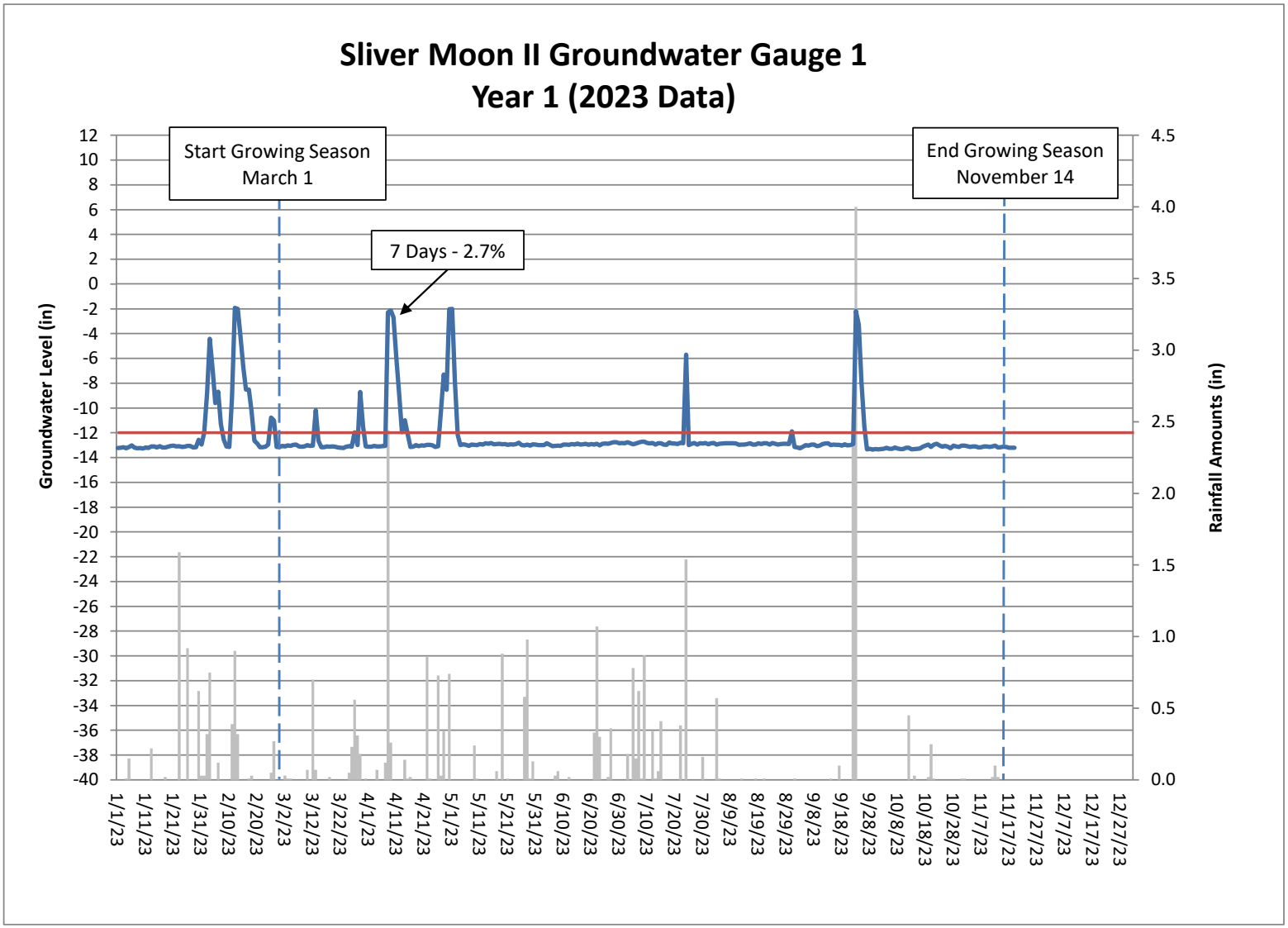
Table 9. Groundwater Hydrology Data
Groundwater Gauge Graphs
Soil Temperature Graph
Figure C1. 30-70th Percentile Graph for Rainfall

Table 9. Groundwater Hydrology Data

Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)						
	Year 1 (2023)	Year 2 (2024)	Year 3 (2025)	Year 4 (2026)	Year 5 (2027	Year 6 (2028)	Year 7 (2028)
1	No - 7 days (2.7%)						
2	Yes - 74 days (28.6%)						
3	Yes - 69 days (26.6%)						
4	No - 25 days (9.7%)						
5	No - 22 days (8.5%)						
6	Yes - 40 days (15.4%)						
7	Yes - 40 days (15.4%)						
8	Yes - 72 days (27.8%)						
9	No - 7 days (2.7%)						
10	Yes - 51 days (19.7%)						
11	No - 11 days (4.2%)						
12	No - 10 days (3.9%)						
13	No - 24 days (9.3%)						
14	No - 11 days (4.2%)						
15	No - 24 days (9.3%)						
16	No - 24 days (9.3%)						
17	Yes - 104 days (40.2%)						
18	No - 16 days (6.2%)						
19	Yes - 46 days (17.6%)						
20	No - 11 days (4.2%)						
21	Yes - 50 days (19.3%)						
22	No - 8 days (3.1%)						

Table 9. Groundwater Hydrology Data (continued)

Gauge	Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)						
	Year 1 (2023)	Year 2 (2024)	Year 3 (2025)	Year 4 (2026)	Year 5 (2027	Year 6 (2028)	Year 7 (2028)
23	No - 10 days (3.9%)						
24	No - 8 days (3.1%)						
25	No - 5 days (1.9%)						
26	No - 5 days (1.9%)						


Sliver Moon II Groundwater Gauge 1
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
7 Days - 2.7%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
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11/27/23
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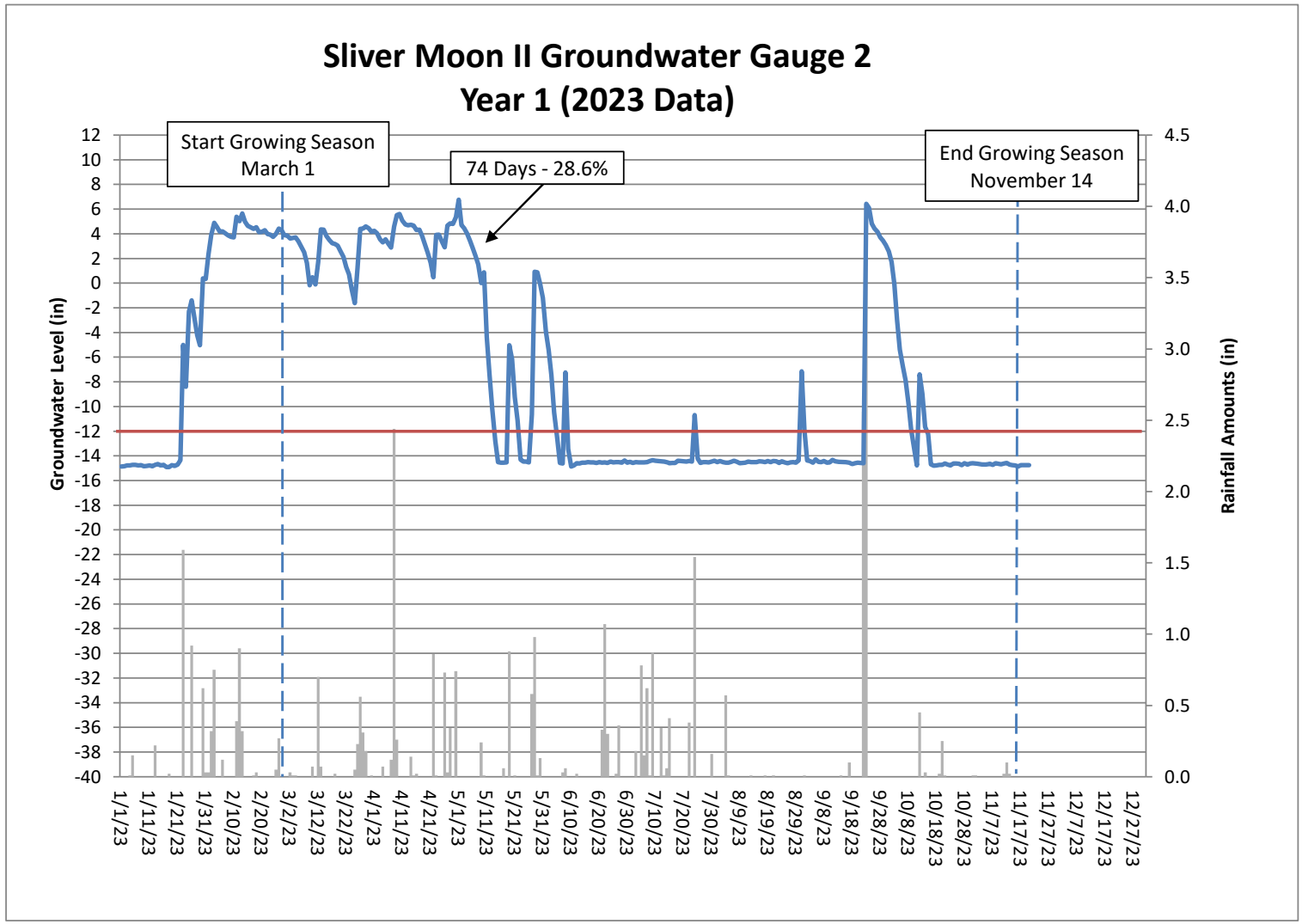
12/27/23


Sliver Moon II Groundwater Gauge 2
Year 1 (2023 Data)
Start Growing Season
March 1
74 Days - 28.6%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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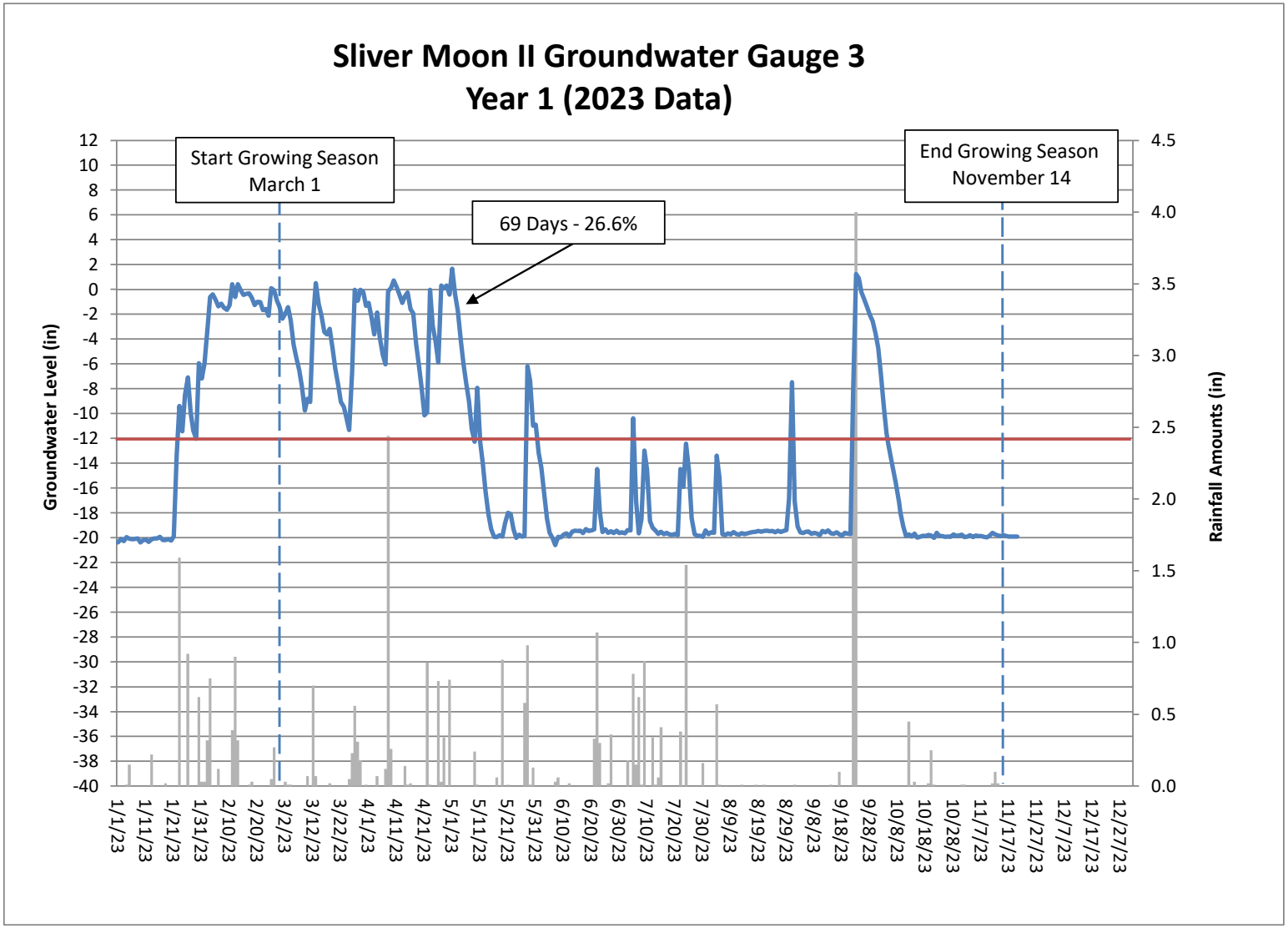
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 3
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
69 Days - 26.6%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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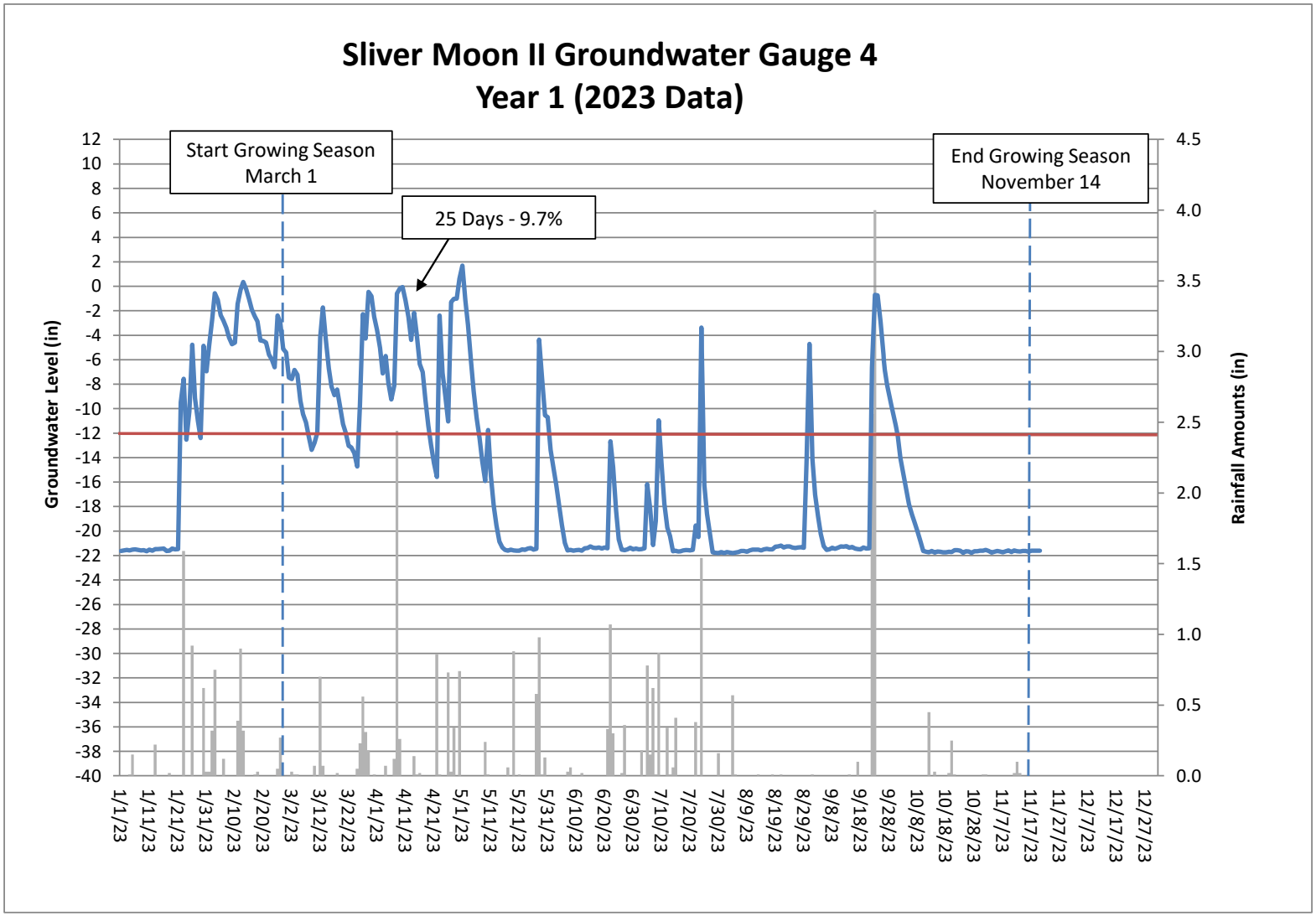
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 4
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
25 Days - 9.7%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
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4.5
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3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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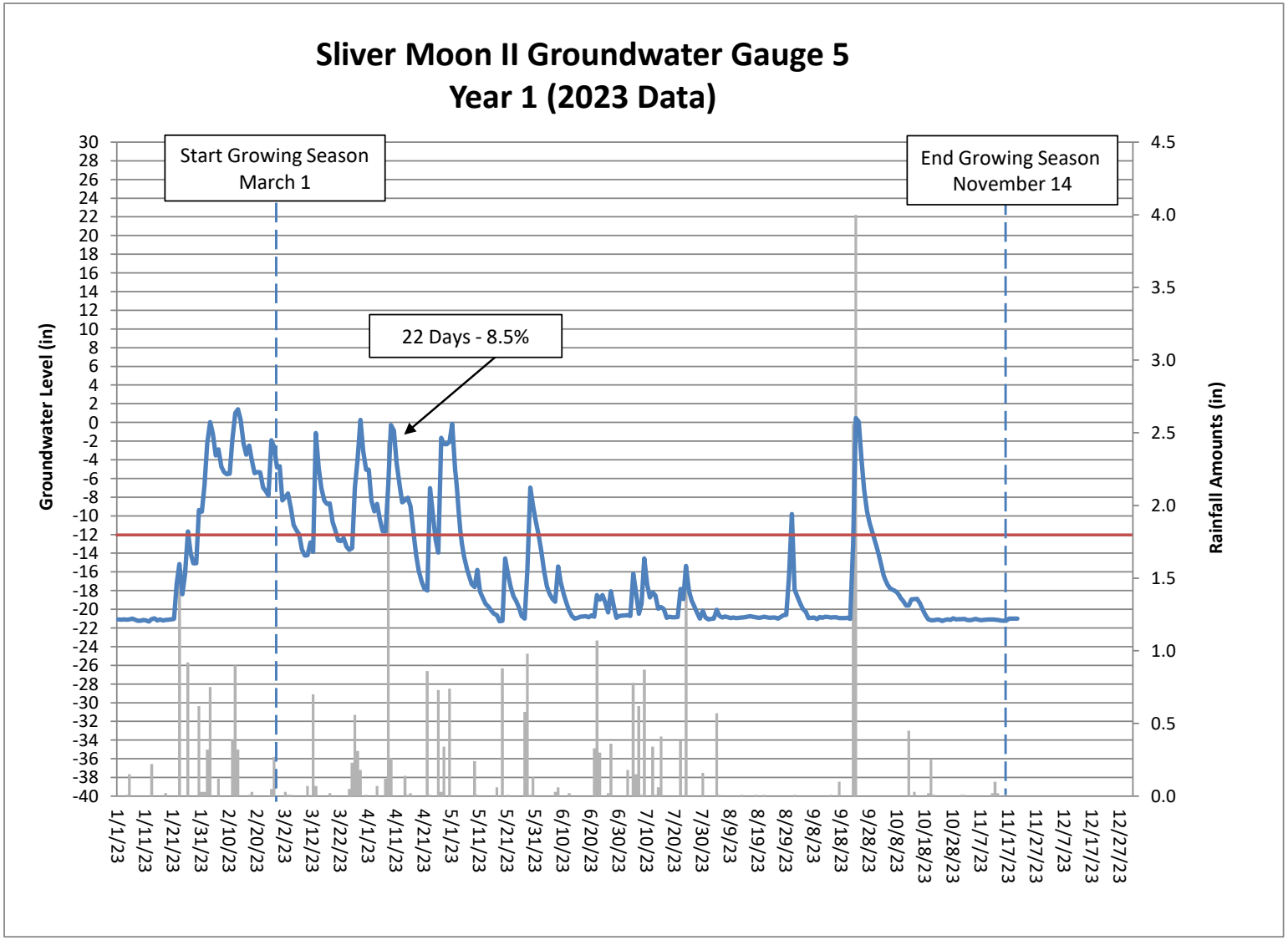
12/27/23


Sliver Moon II Groundwater Gauge 5
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
22 Days - 8.5%
Groundwater Level (in)
Rainfall Amounts (in)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
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1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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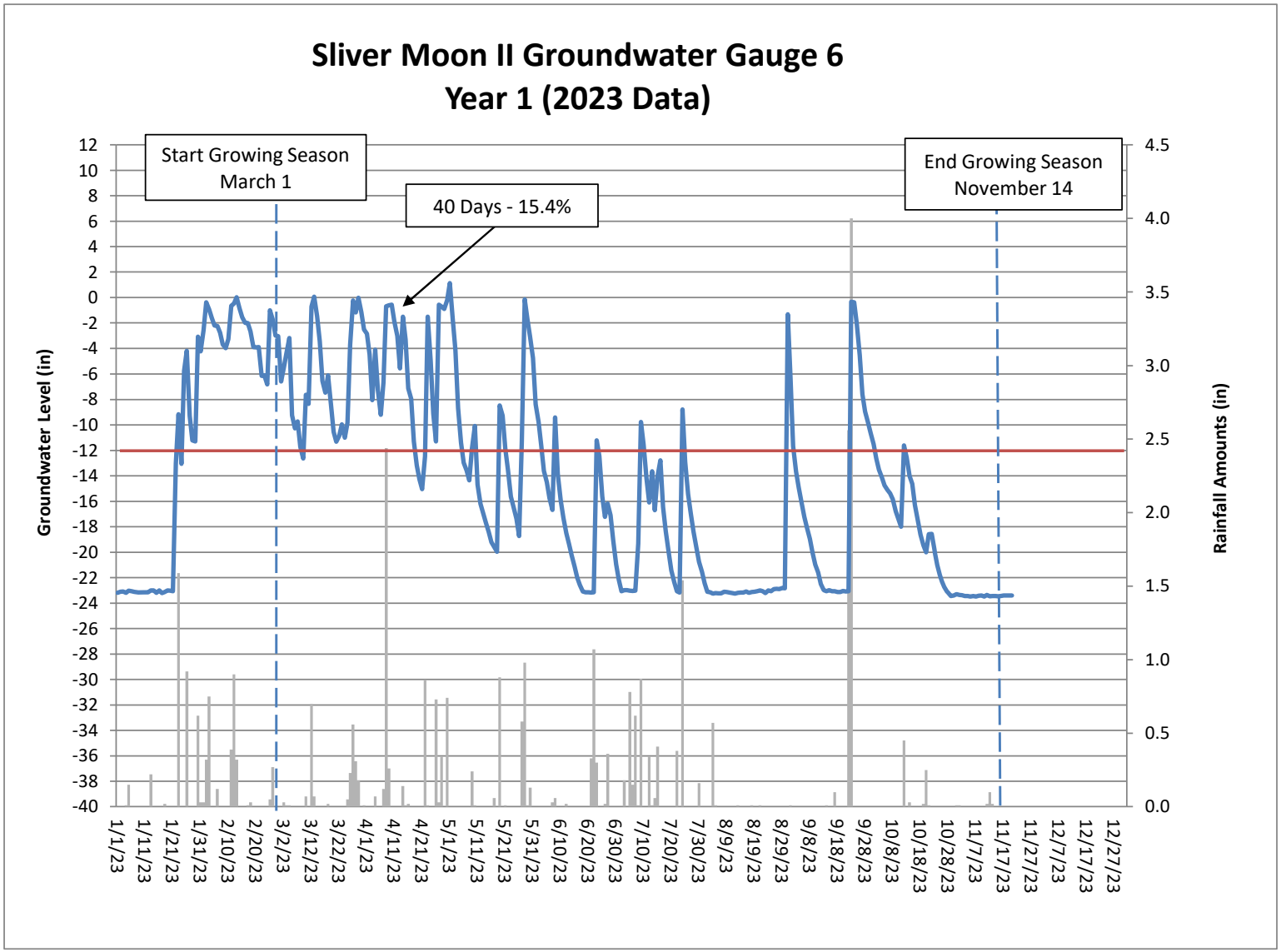
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 6
Year 1 (2023 Data)
Start Growing Season
March 1
40 Days - 15.4%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
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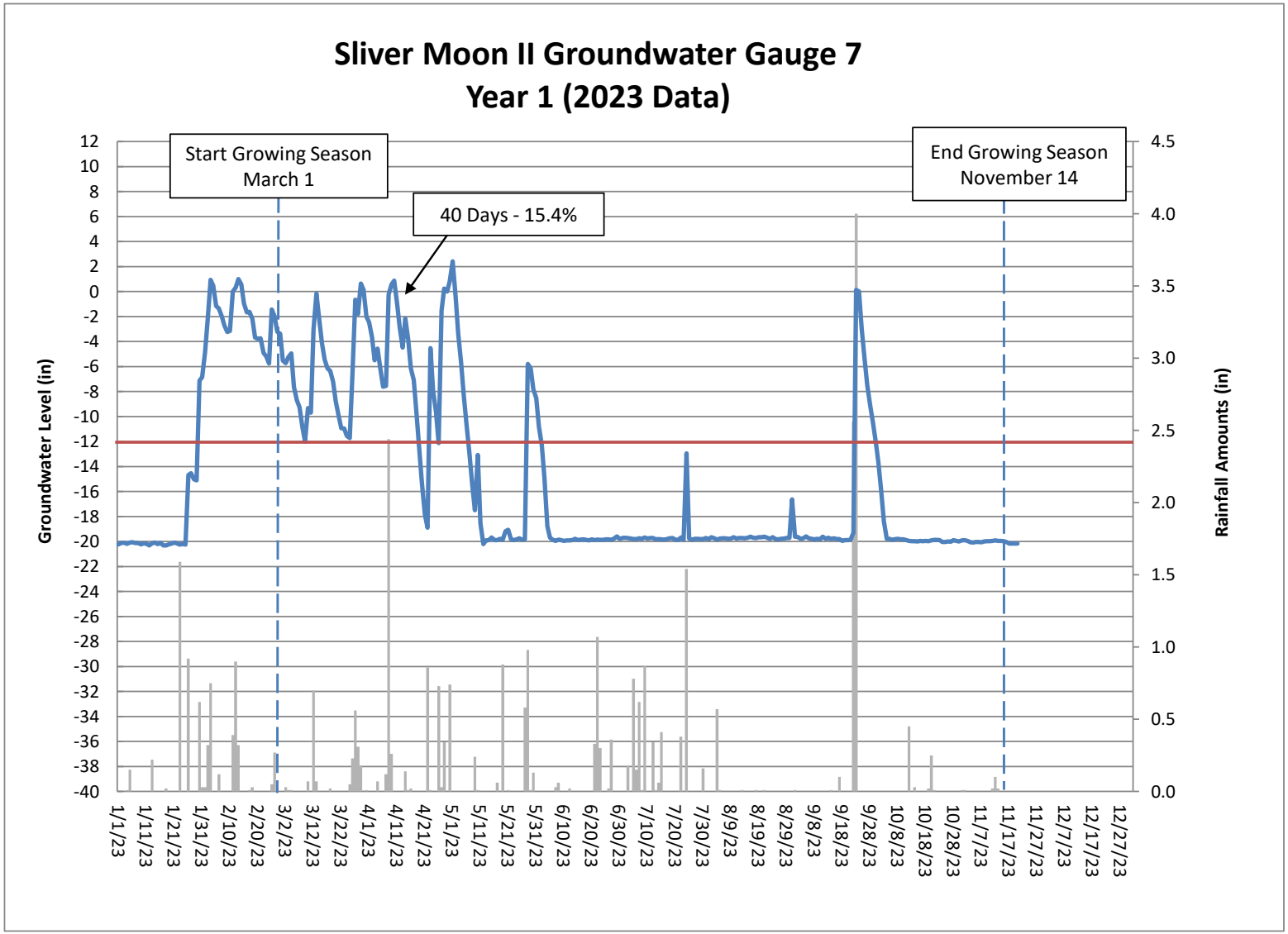
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 7
Year 1 (2023 Data)
Start Growing Season
March 1
40 Days - 15.4%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
10/18/23
10/28/23
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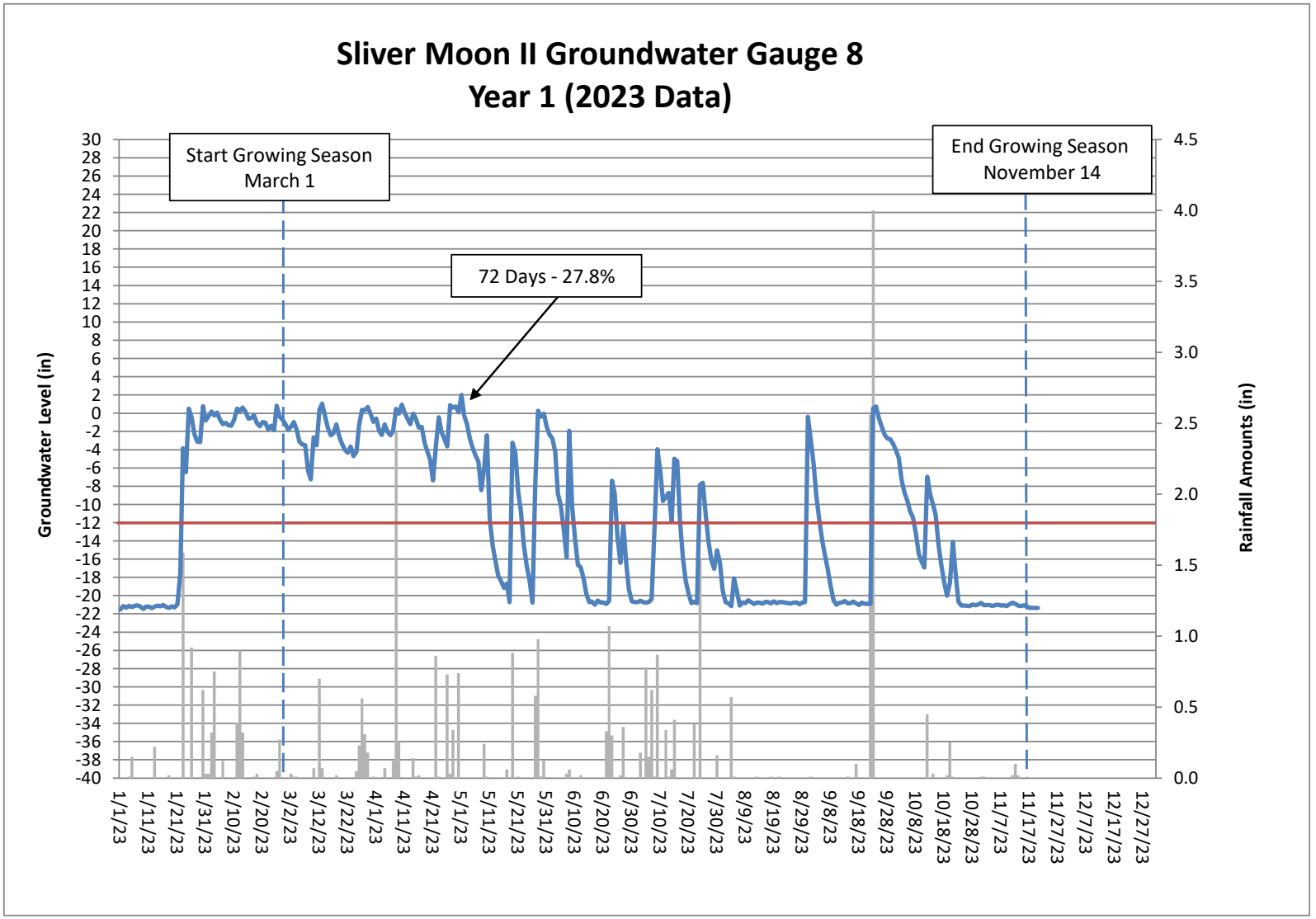
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 8
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
72 Days - 27.8%
Groundwater Level (in)
Rainfall Amounts (in)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
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10/28/23
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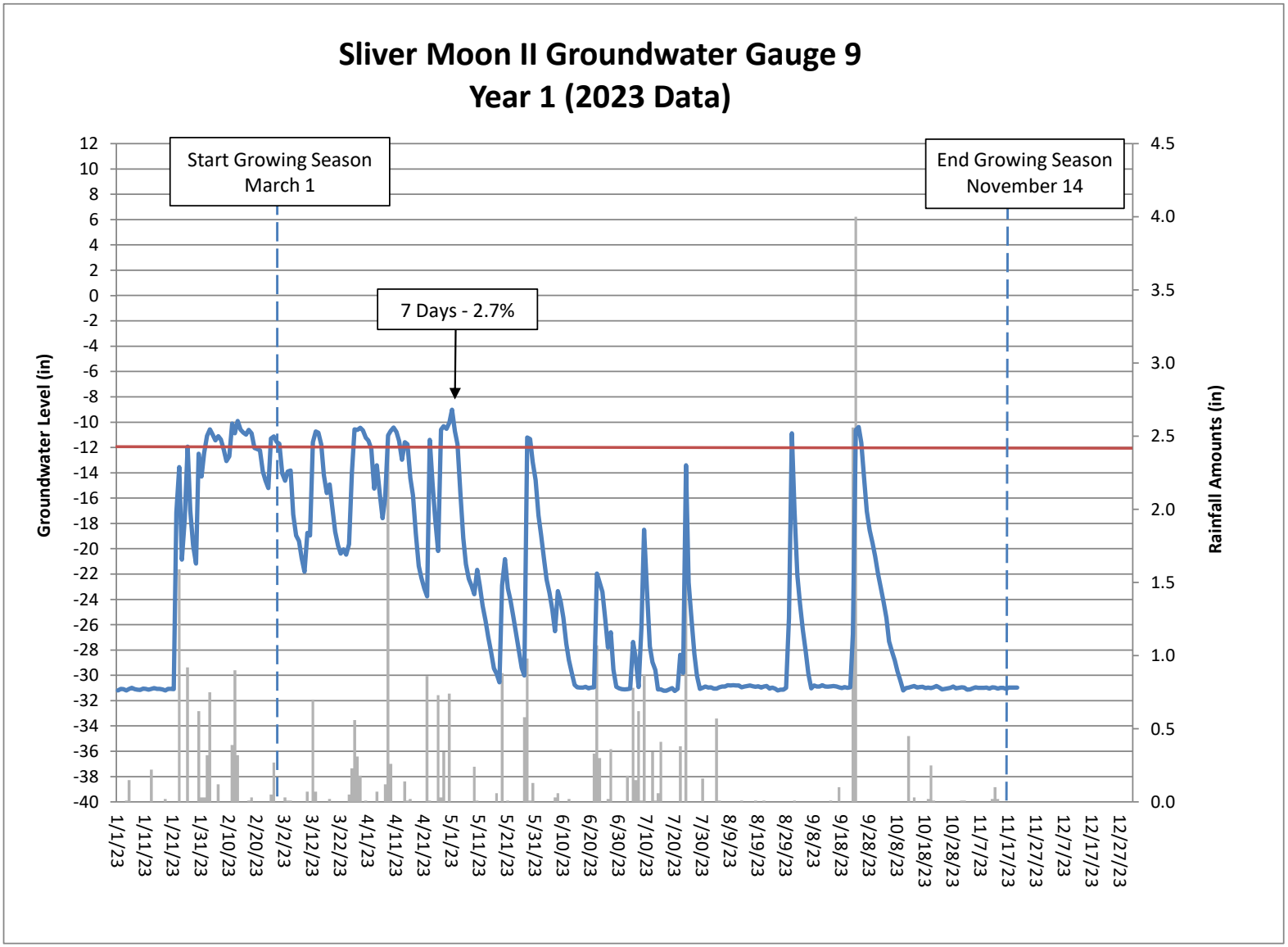
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 9
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
7 Days - 2.7%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
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-36
-38
-40
4.5
4.0
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1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
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10/28/23
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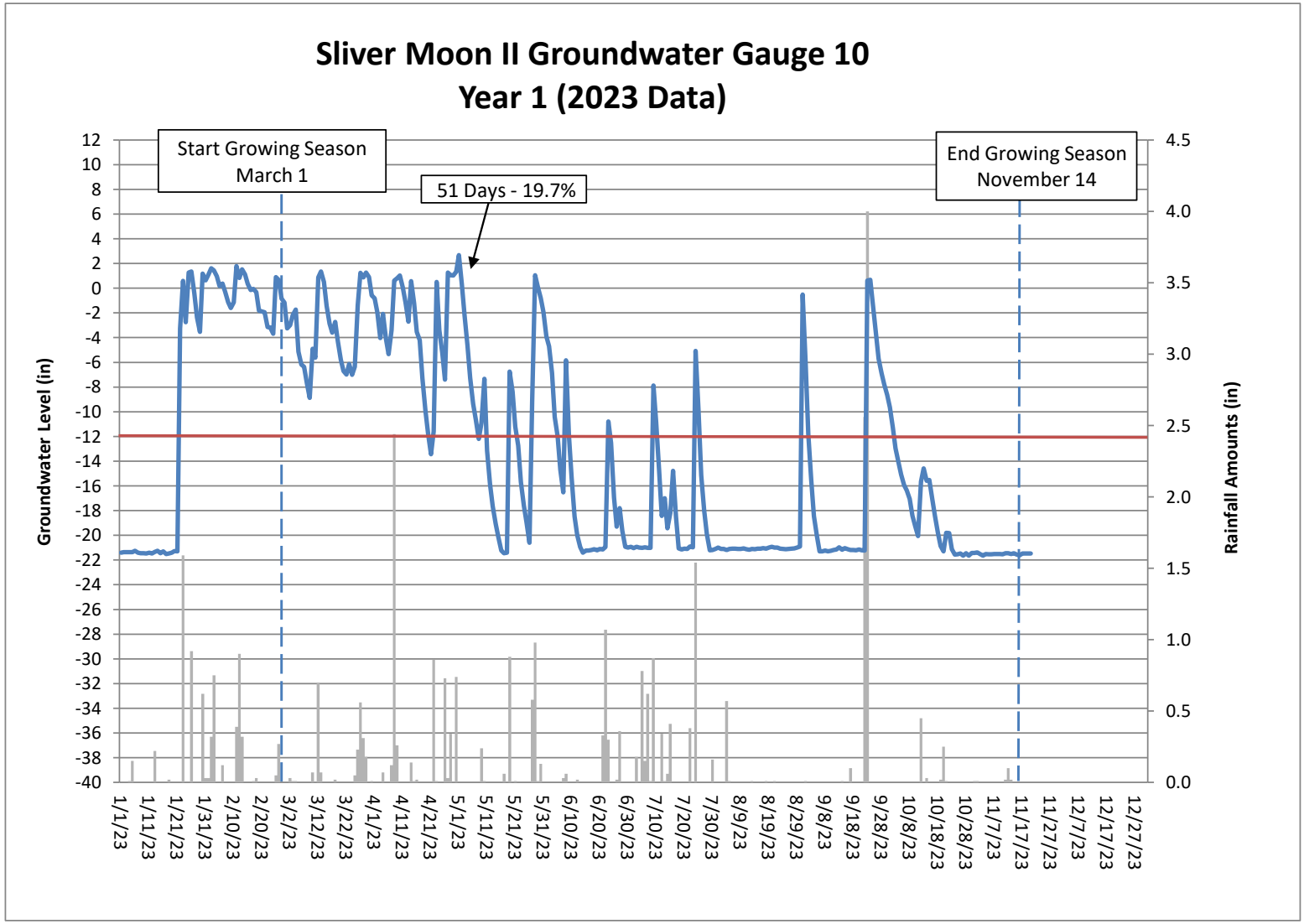
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 10
Year 1 (2023 Data)
Start Growing Season
March 1
51 Days - 19.7%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
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3.0
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1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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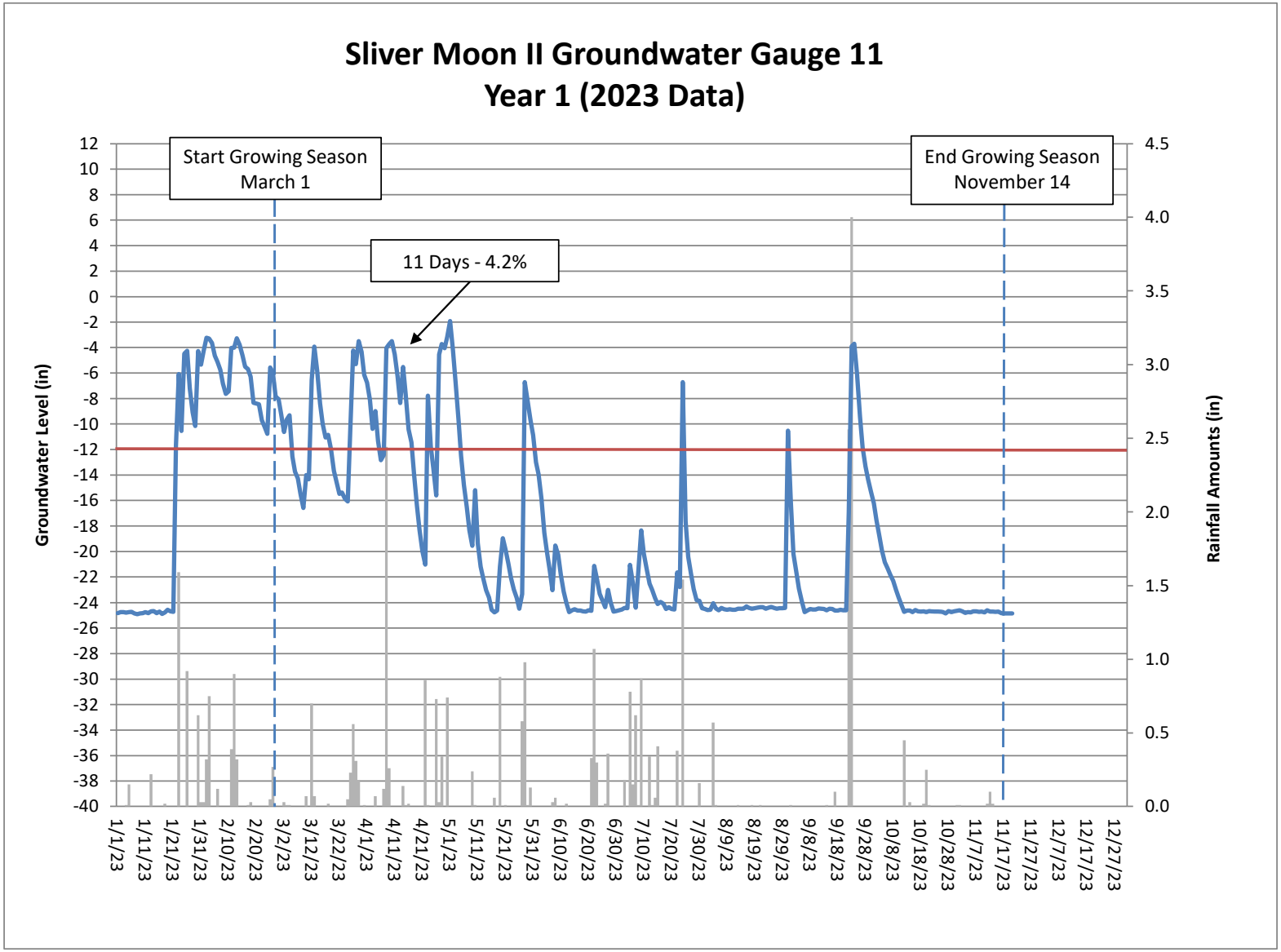
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 11
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
11 Days - 4.2%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
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-28
-30
-32
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-36
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-40
4.5
4.0
3.5
3.0
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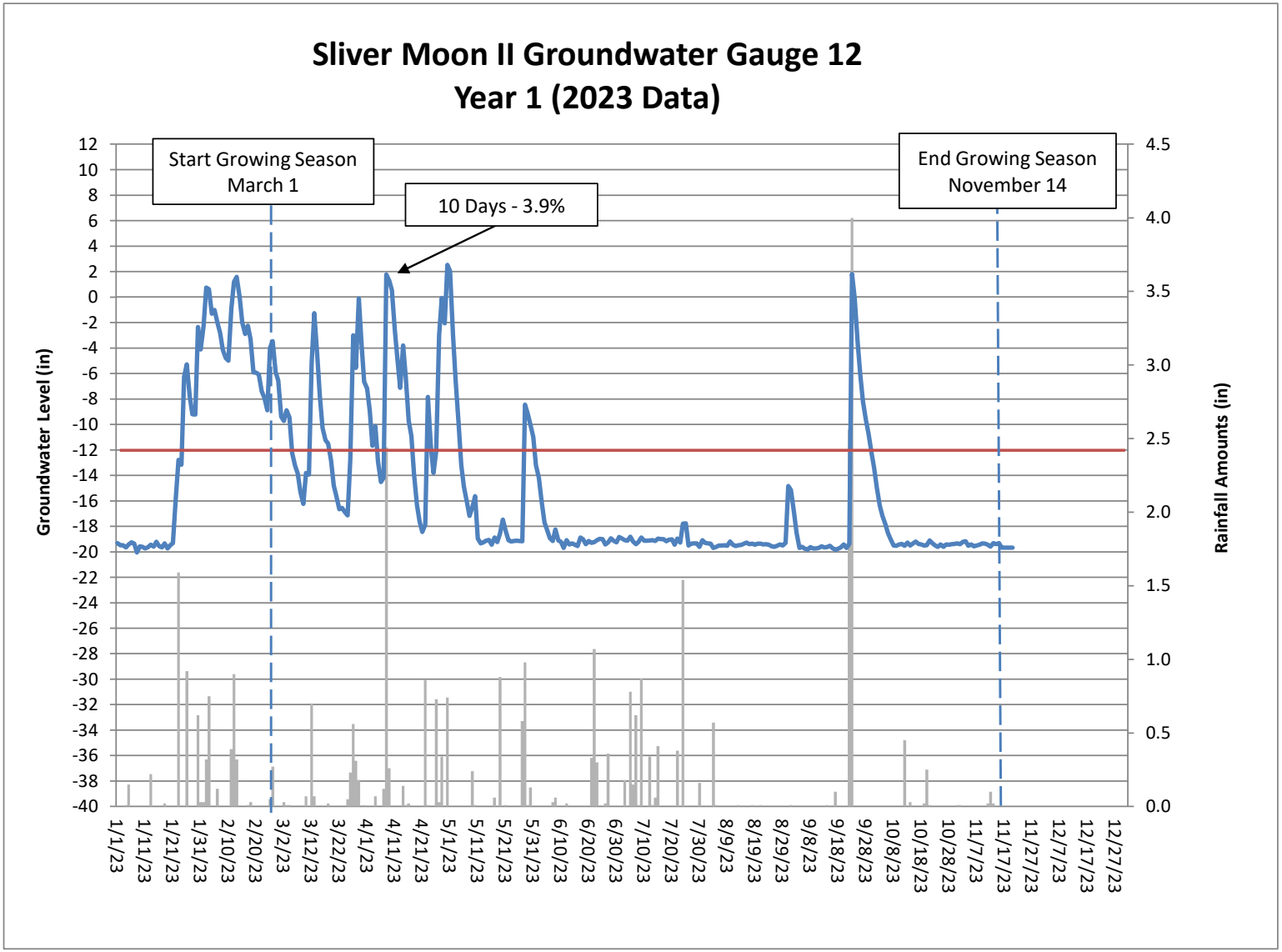
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
10/18/23
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 12
Year 1 (2023 Data)
Start Growing Season
March 1
10 Days - 3.9%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
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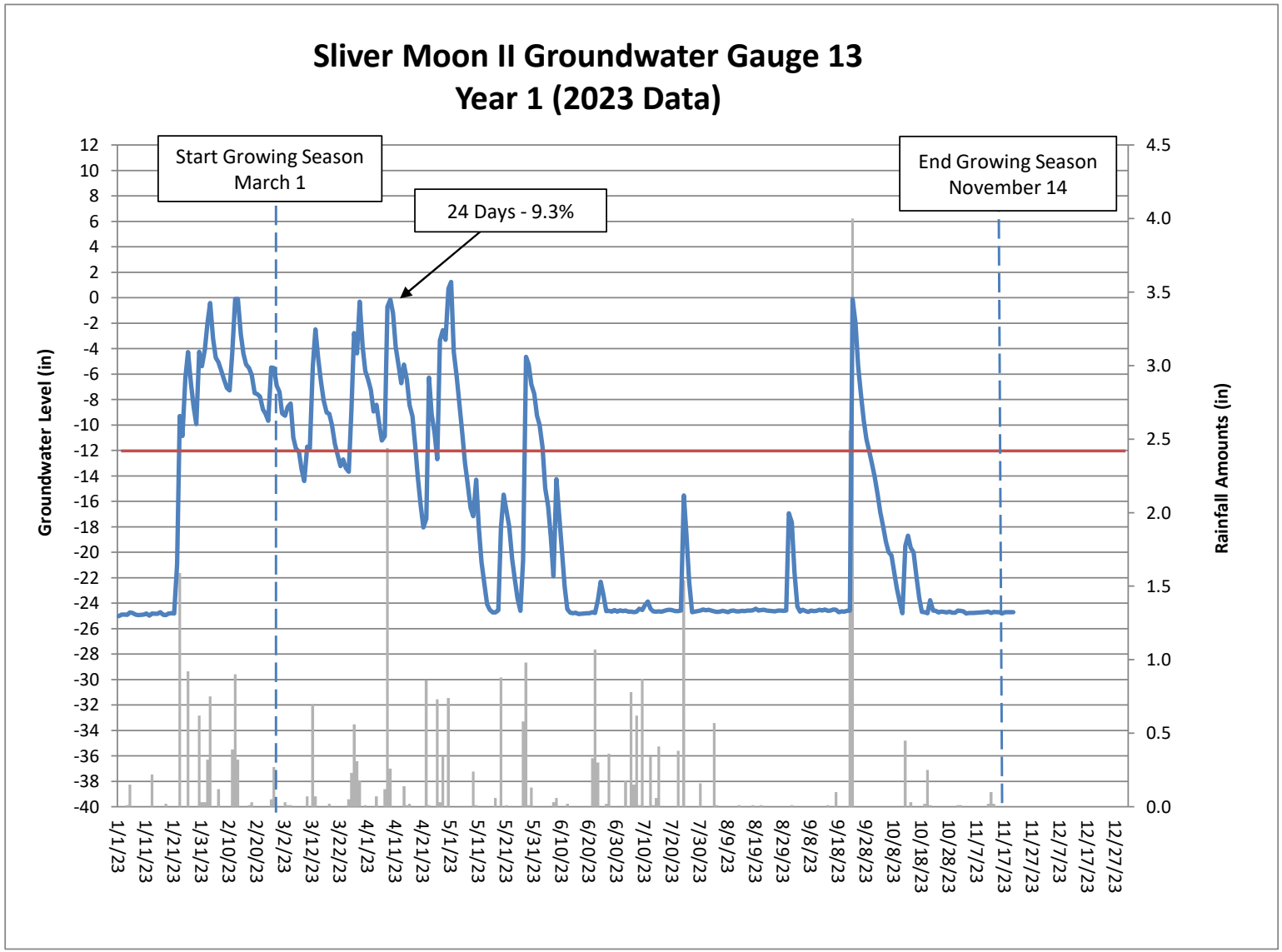
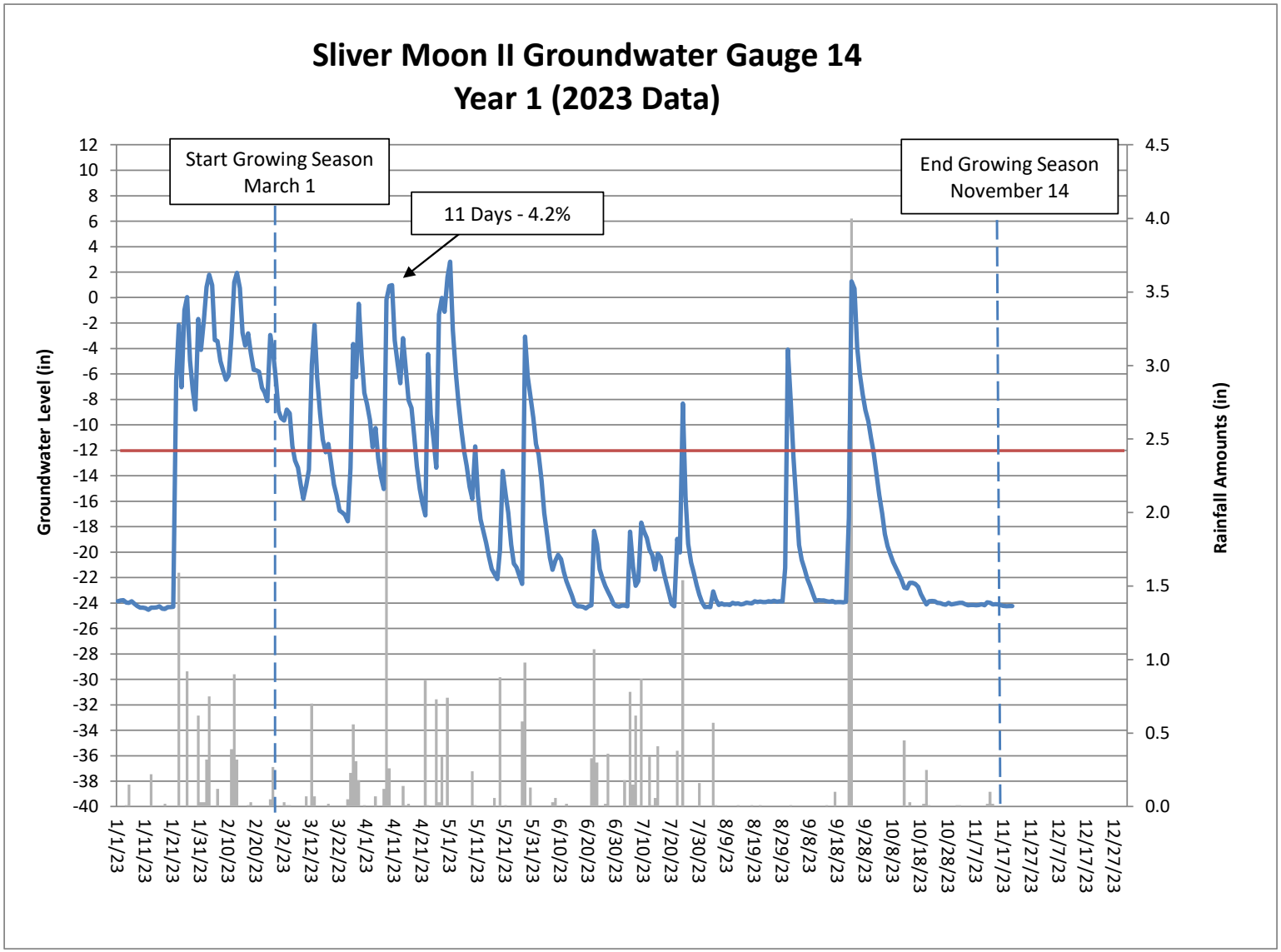
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 13
Year 1 (2023 Data)
Start Growing Season
March 1
24 Days - 9.3%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
10/18/23
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 14
Year 1 (2023 Data)
Start Growing Season
March 1
11 Days - 4.2%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
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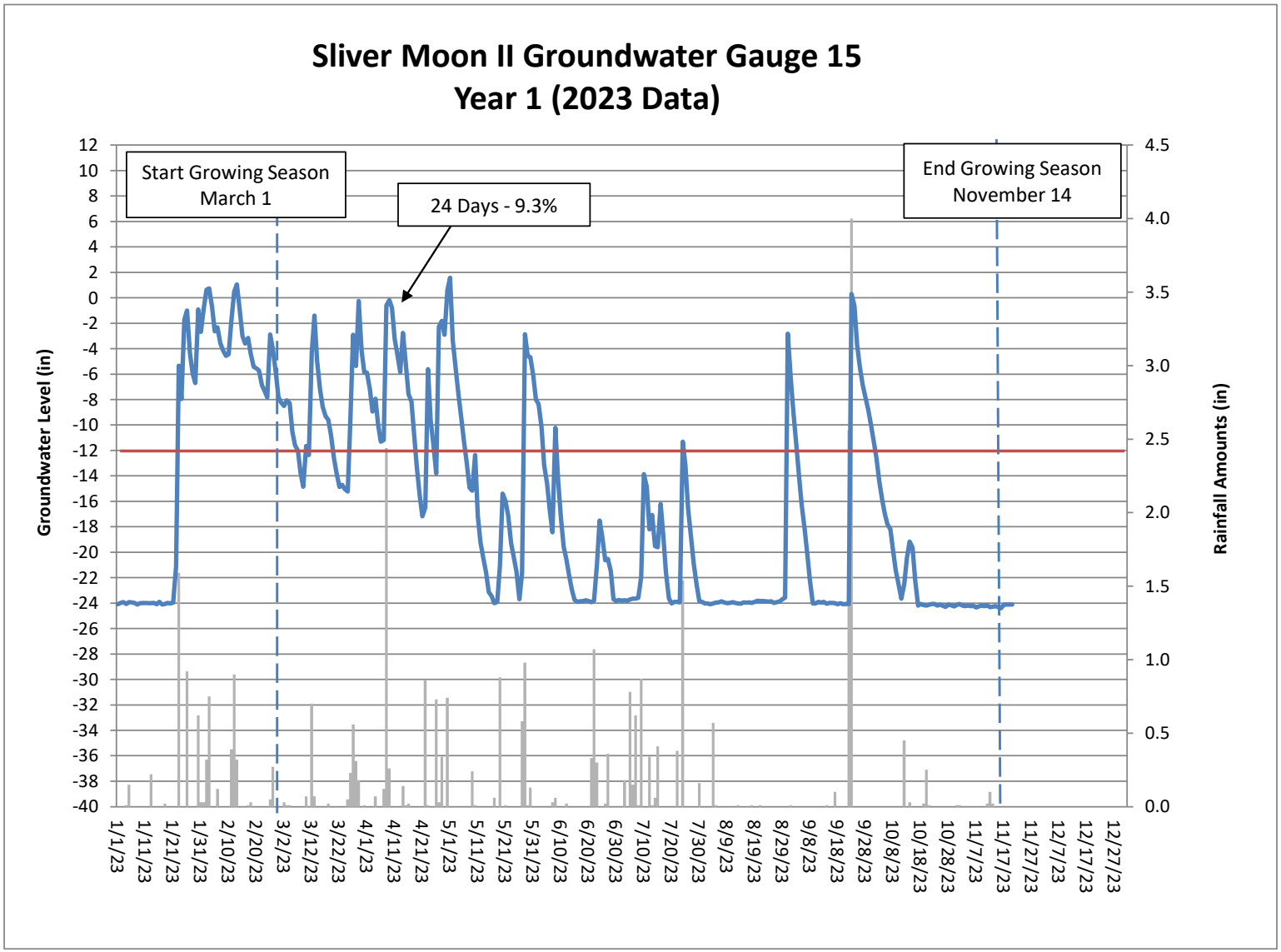
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 15
Year 1 (2023 Data)
Start Growing Season
March 1
24 Days - 9.3%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
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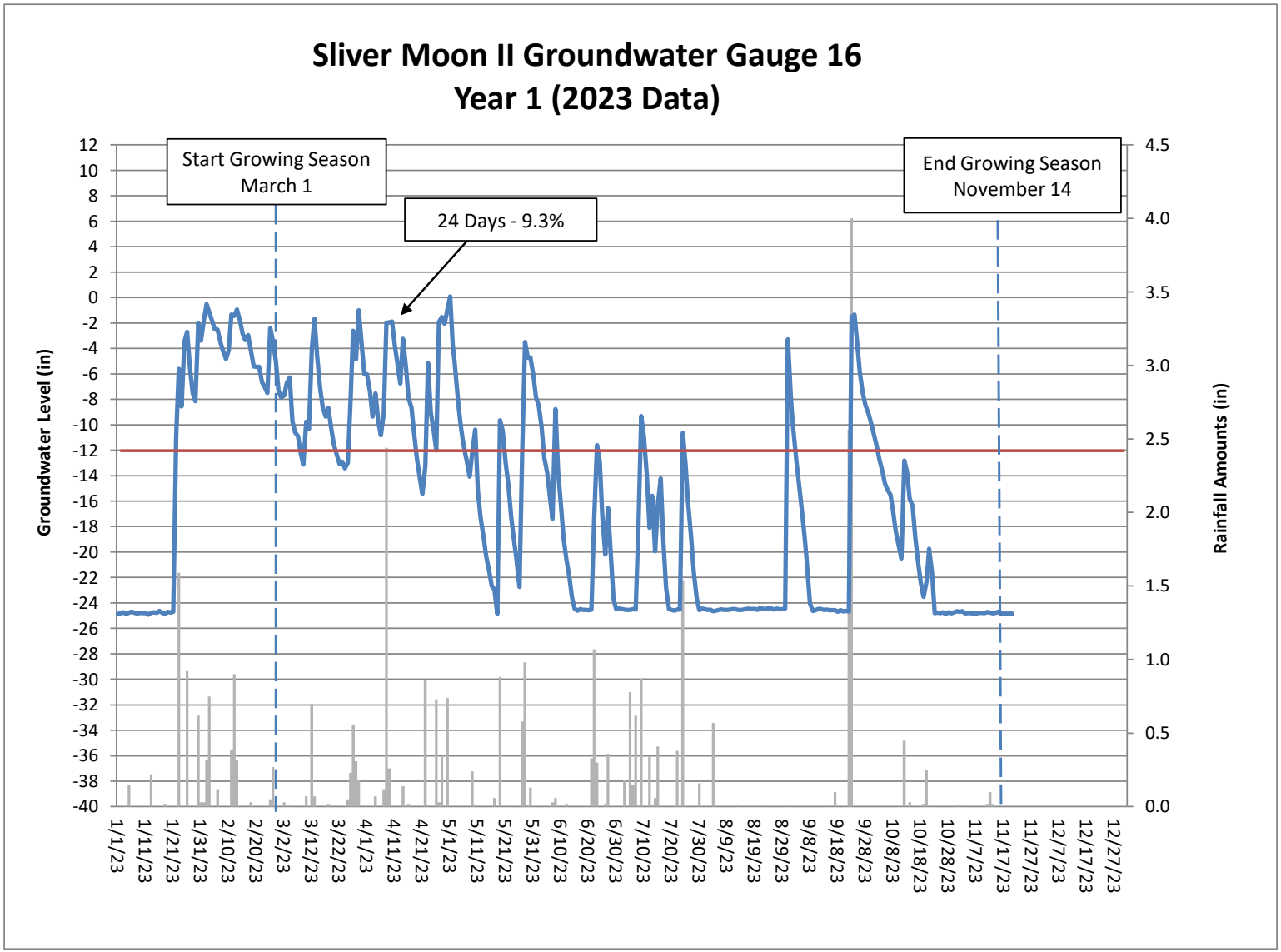
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 16
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
24 Days - 9.3%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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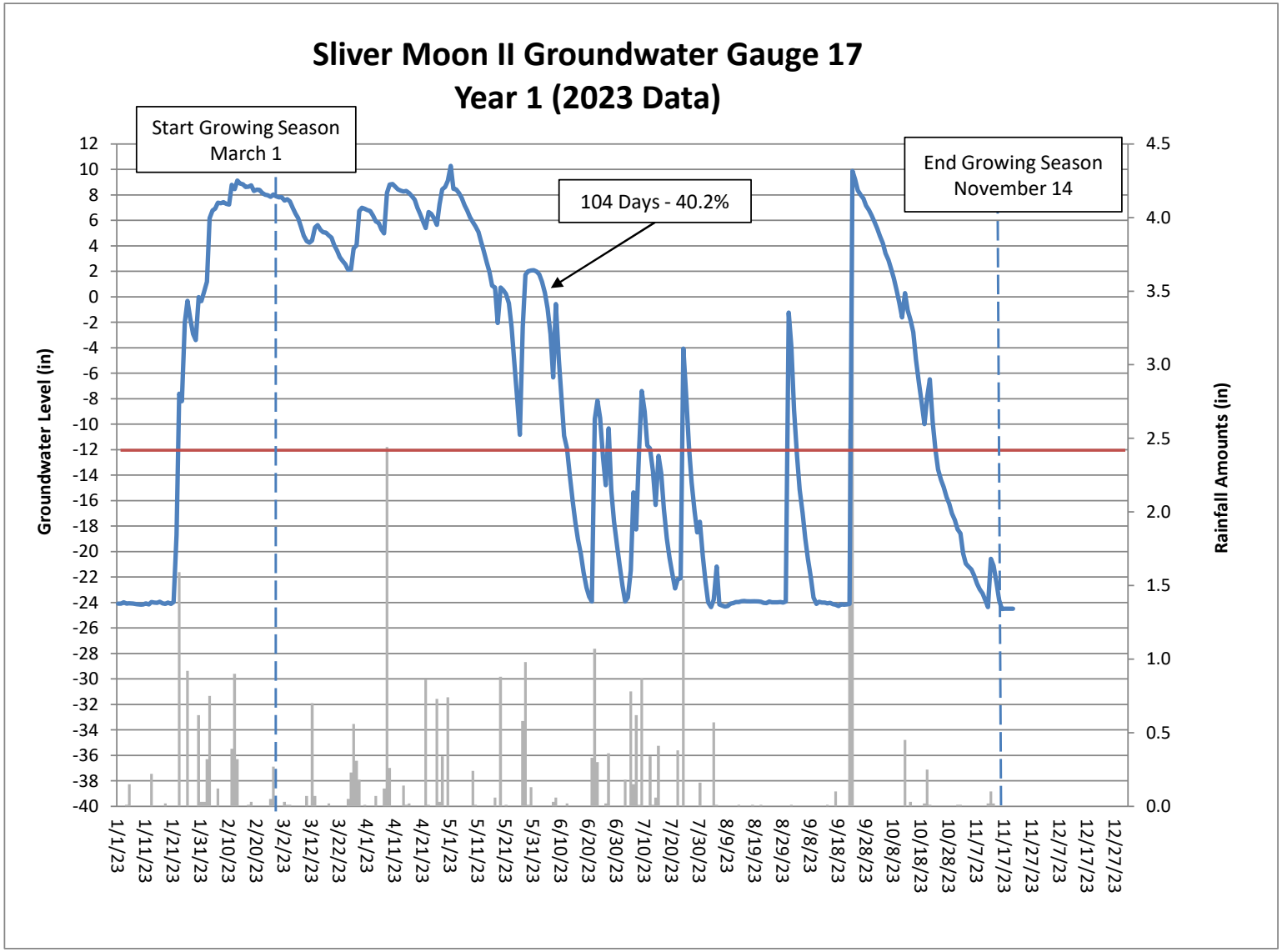
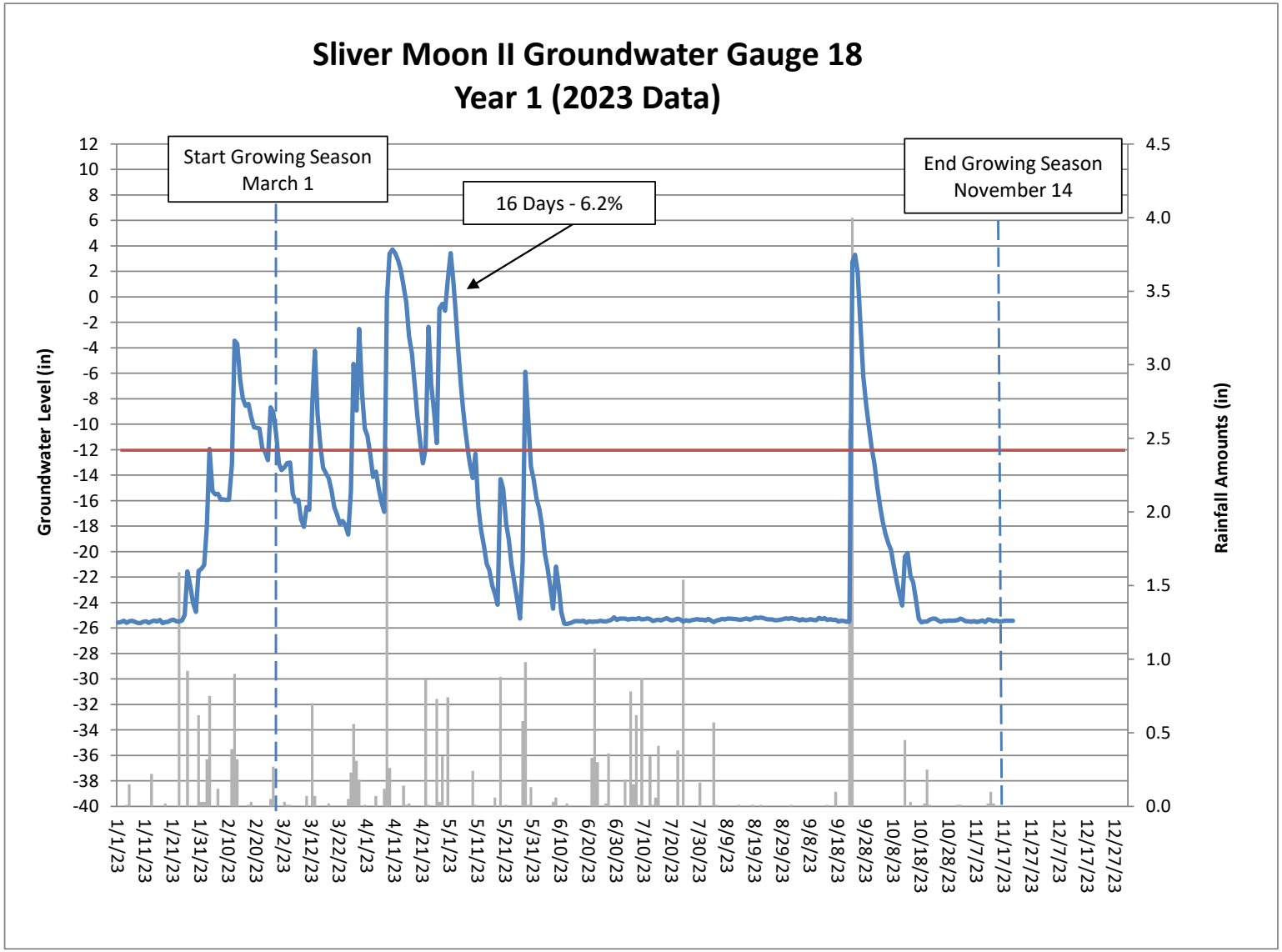
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 17
Year 1 (2023 Data)
Start Growing Season
March 1
104 Days - 40.2%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
10/18/23
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 18
Year 1 (2023 Data)
Start Growing Season
March 1
16 Days - 6.2%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
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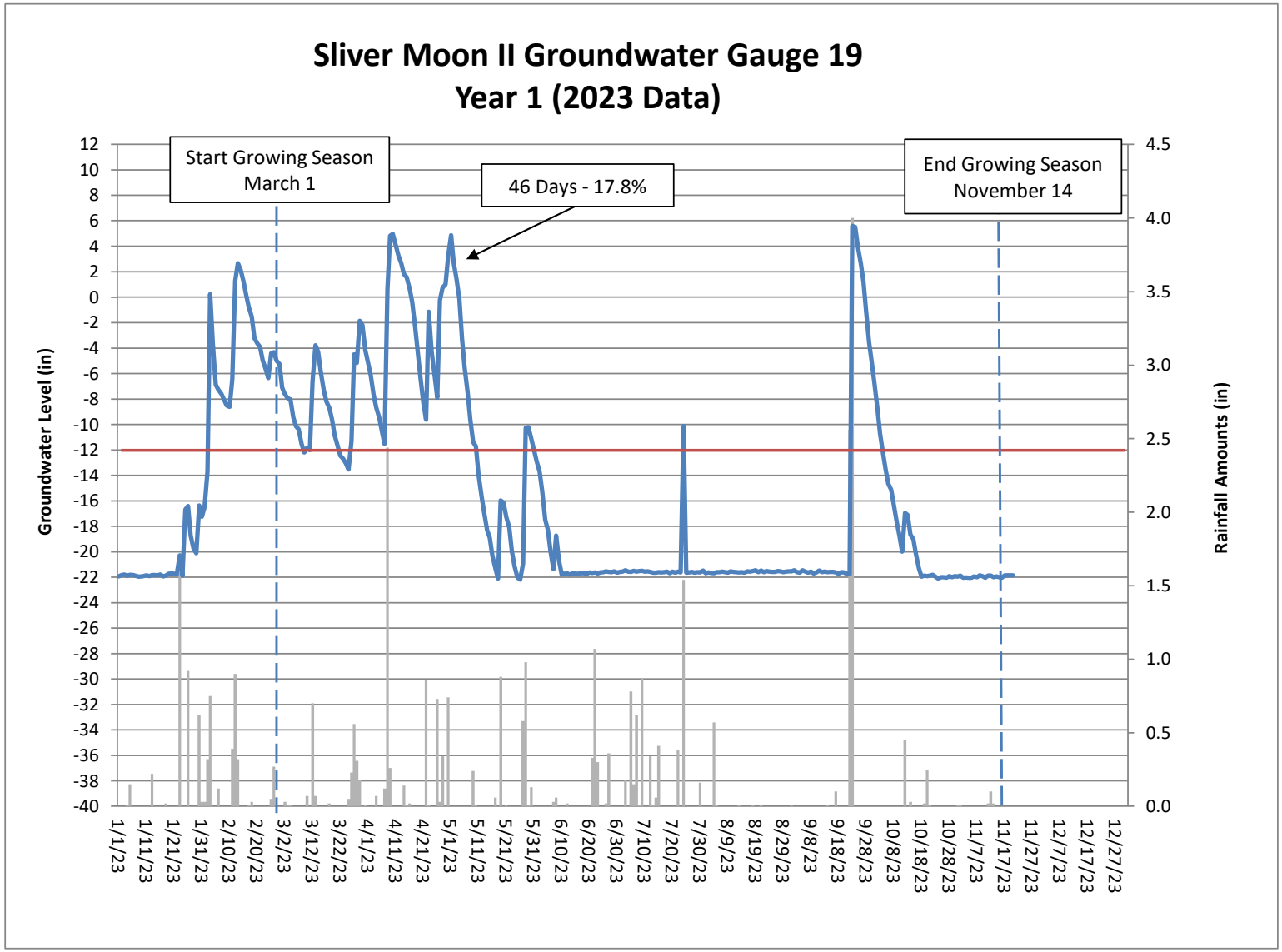
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 19
Year 1 (2023 Data)
Start Growing Season
March 1
46 Days - 17.8%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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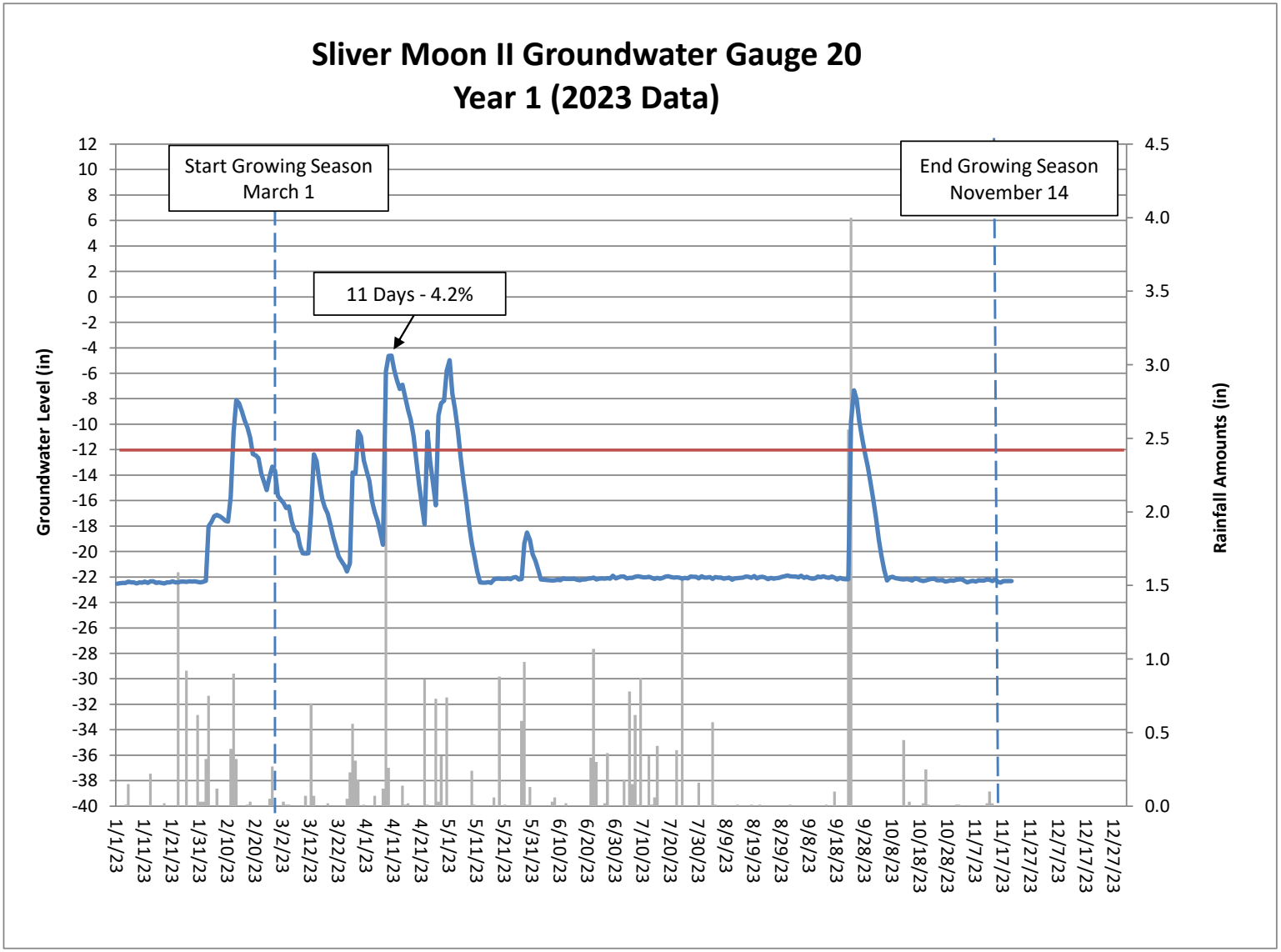
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 20
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
11 Days - 4.2%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
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8/29/23
9/8/23
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9/28/23
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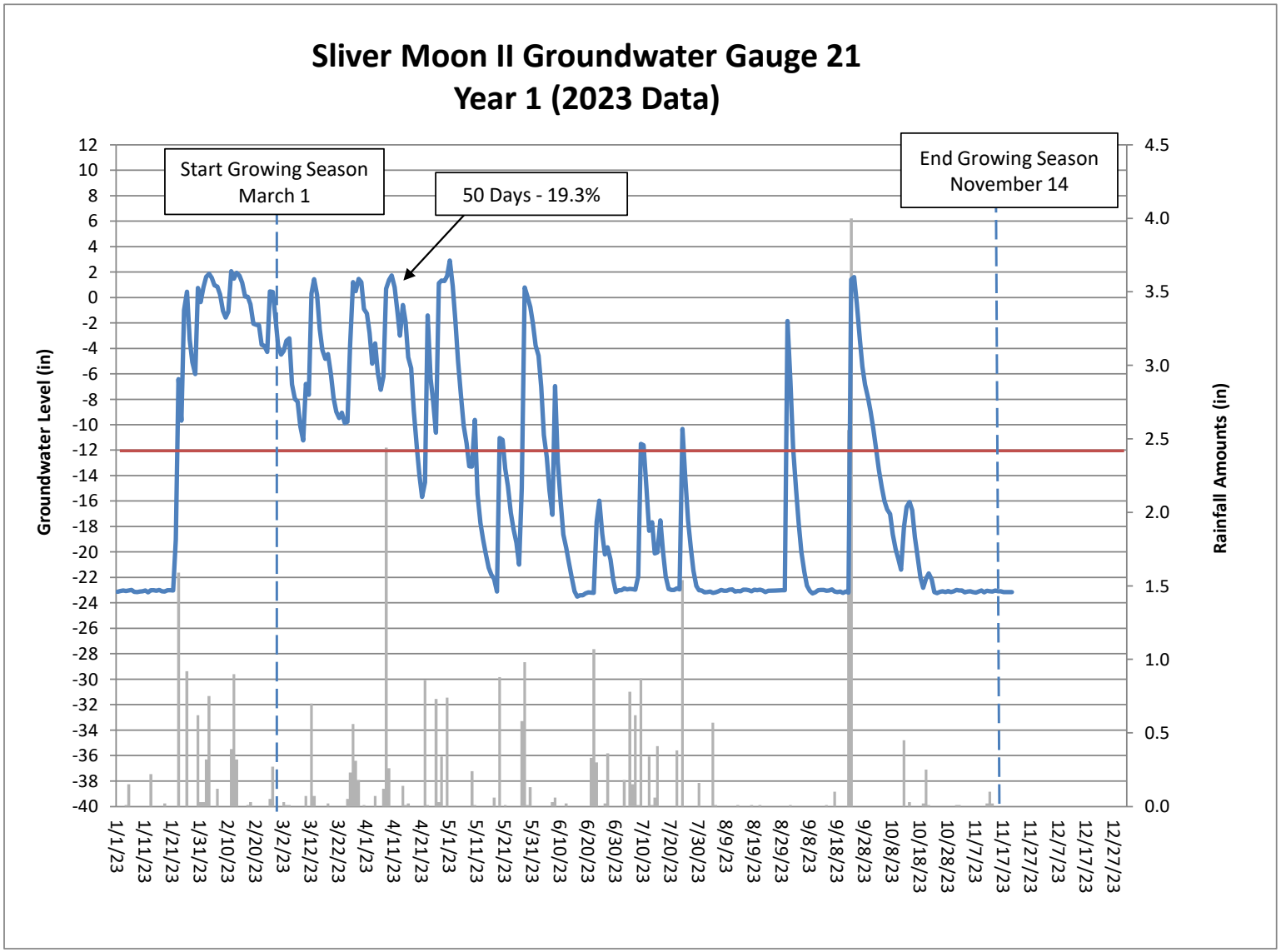
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 21
Year 1 (2023 Data)
Start Growing Season
March 1
50 Days - 19.3%
End Growing Season
November 14
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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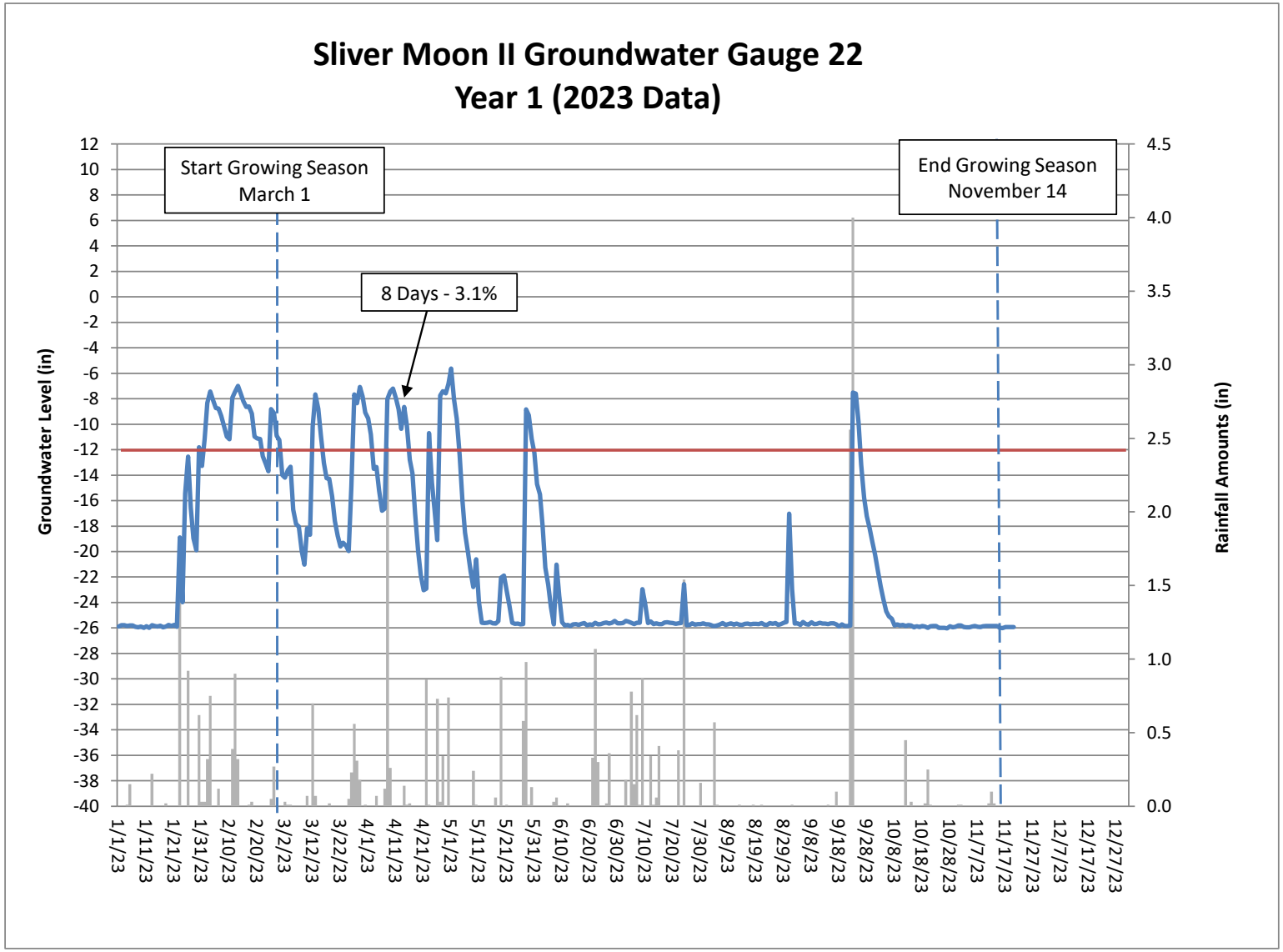
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 22
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
8 Days - 3.1%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
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9/28/23
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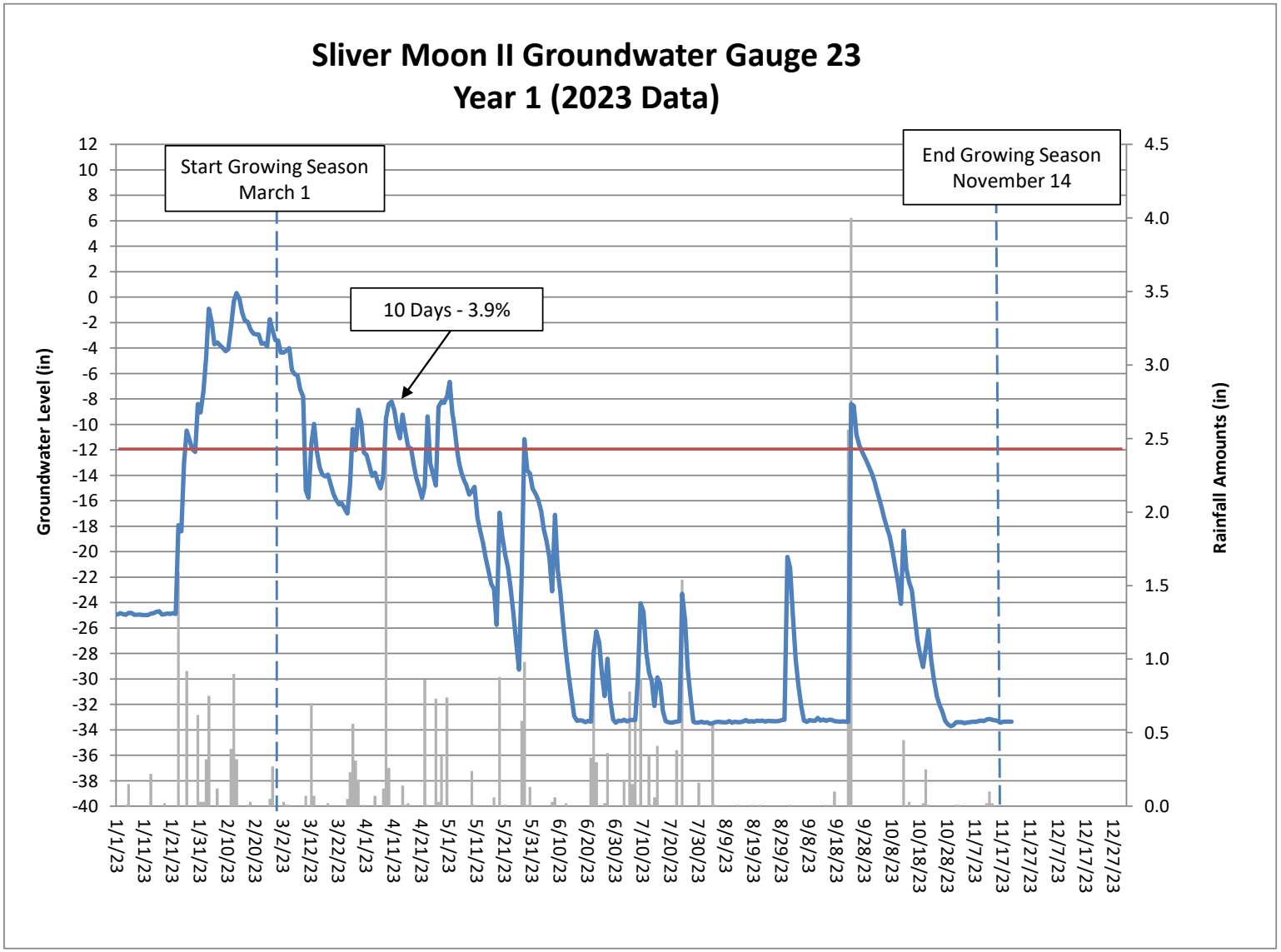
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 23
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
10 Days - 3.9%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
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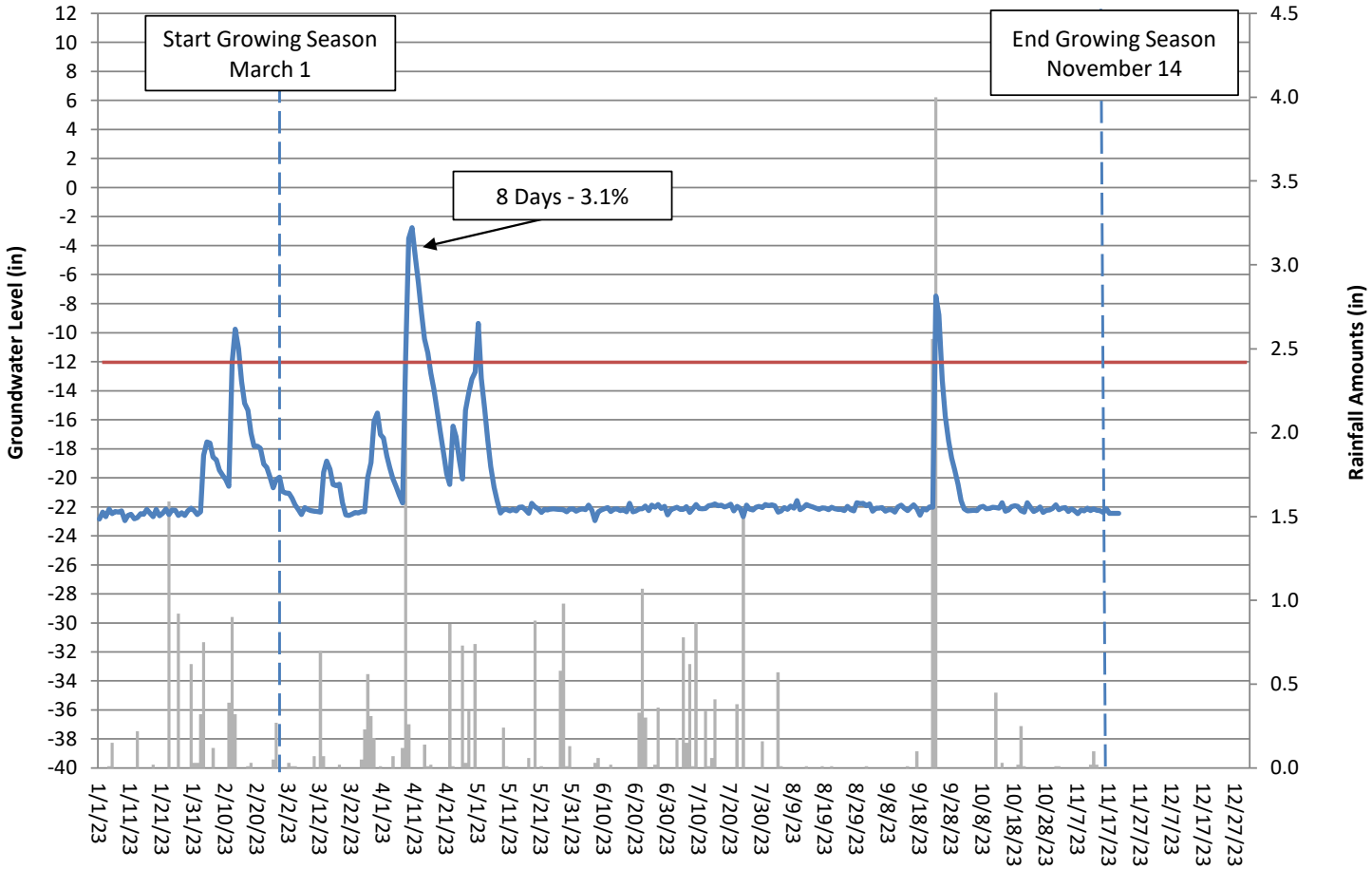
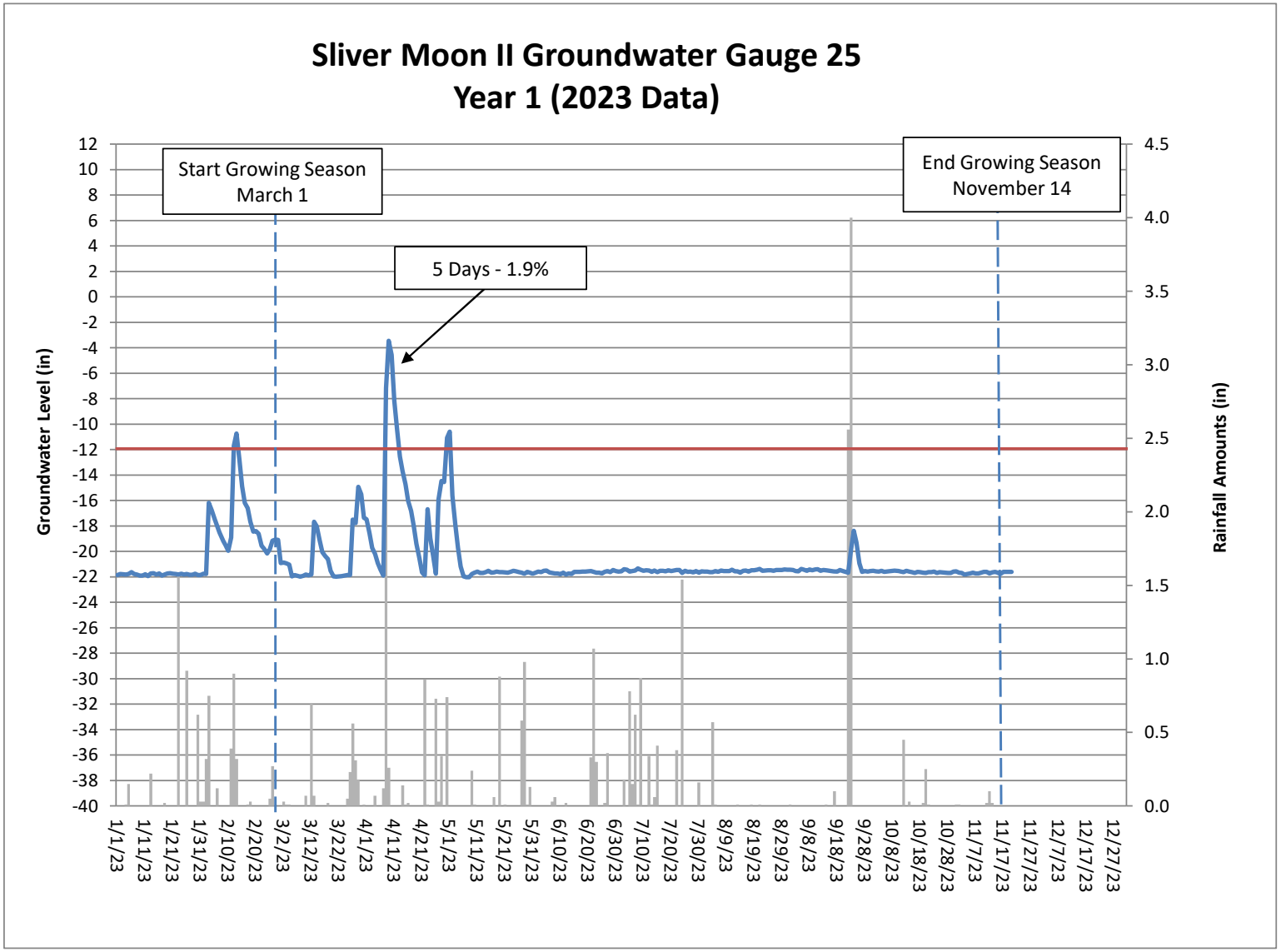
10/8/23
10/18/23
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23

Sliver Moon II Groundwater Gauge 24
Year 1 (2023 Data)




Sliver Moon II Groundwater Gauge 25
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
5 Days - 1.9%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
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3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
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6/30/23
7/10/23
7/20/23
7/30/23
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8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
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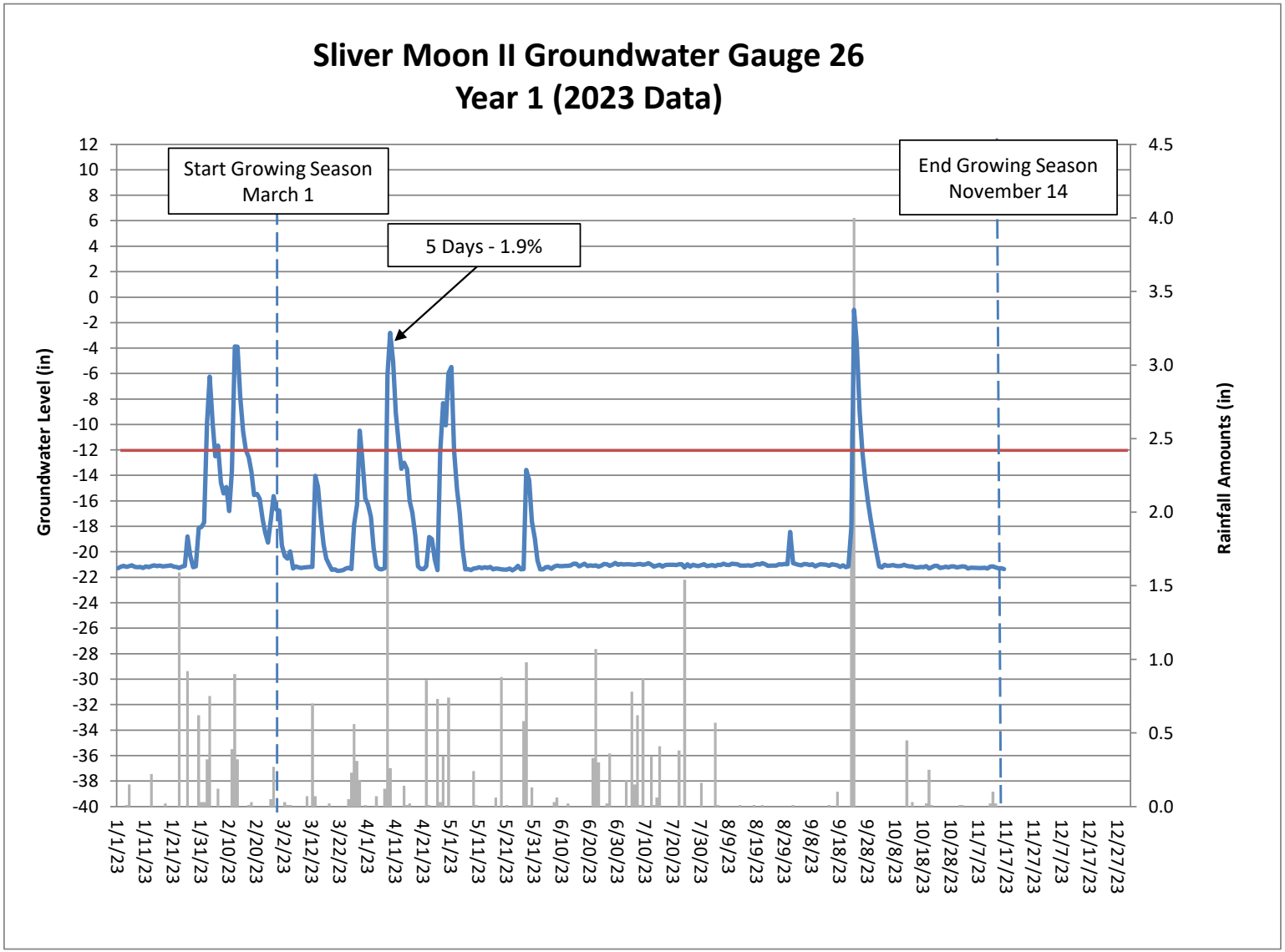
11/27/23
12/7/23
12/17/23
12/27/23


Sliver Moon II Groundwater Gauge 26
Year 1 (2023 Data)
Start Growing Season
March 1
End Growing Season
November 14
5 Days - 1.9%
Groundwater Level (in)
Rainfall Amounts (in)
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
-32
-34
-36
-38
-40
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
10/18/23
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23

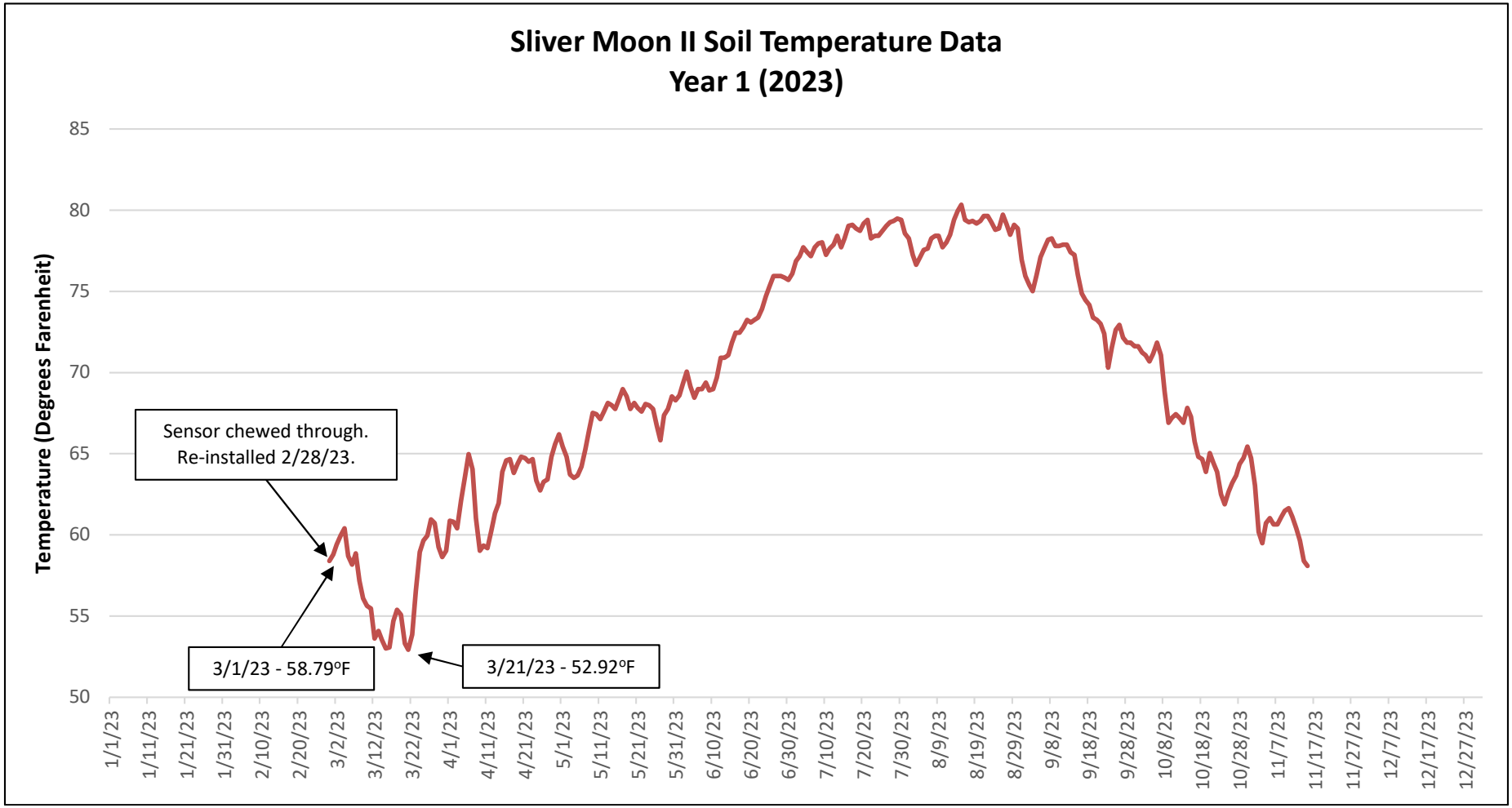
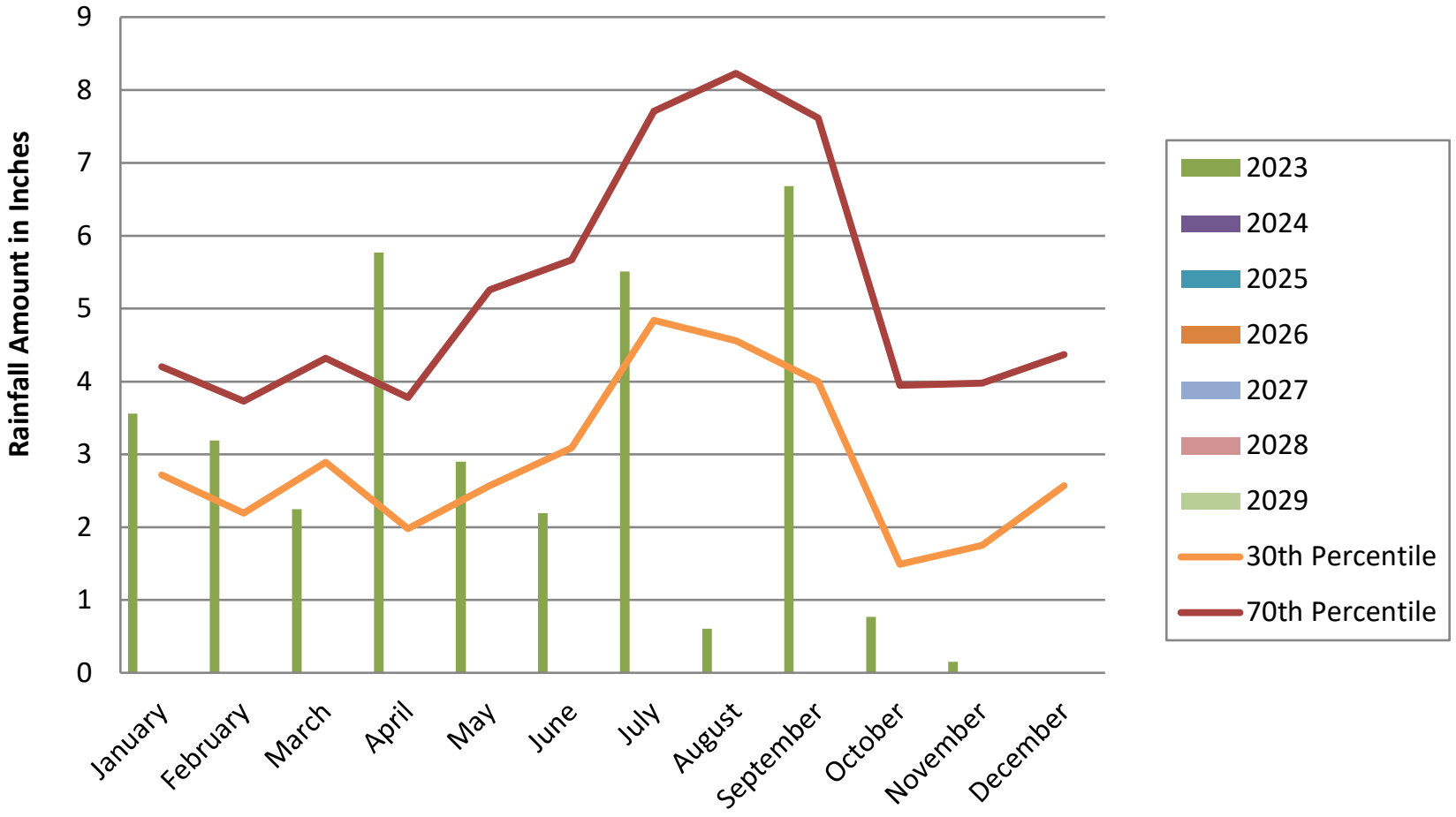

Sliver Moon II Soil Temperature Data
Year 1 (2023)
Temperature (Degrees Farenheit)
85
80
75
70
65
60
55
50
Sensor chewed through.
Re-installed 2/28/23.
3/1/23 - 58.79°F
3/21/23 - 52.92°F
1/1/23
1/11/23
1/21/23
1/31/23
2/10/23
2/20/23
3/2/23
3/12/23
3/22/23
4/1/23
4/11/23
4/21/23
5/1/23
5/11/23
5/21/23
5/31/23
6/10/23
6/20/23
6/30/23
7/10/23
7/20/23
7/30/23
8/9/23
8/19/23
8/29/23
9/8/23
9/18/23
9/28/23
10/8/23
10/18/23
10/28/23
11/7/23
11/17/23
11/27/23
12/7/23
12/17/23
12/27/23

Figure C1: Sliver Moon II
30-70 Percentile Graph for Rainfall

Current year data from onsite rain gauge
30-70th percentile data from WETS Station: New Bern



Appendix D: Project Timeline and Contact Info

Table 10. Project Timeline

Activity or Deliverable	Data Collection Complete	Task Completion or Deliverable Submission
Project Instituted	NA	15-Jun-18
Mitigation Plan Approved	NA	16-Oct-20
Construction (Grading) Completed	NA	27-Oct-21
Planting Completed	NA	20-Dec-21
MY-0 Baseline Report	3-Jan-22	Mar-22
MY-1 (2023) Monitoring Report	Nov-23	Dec-23
MY-2-7 Monitoring Reports	On Schedule	On Schedule

Table 11. Project Contacts

Sliver Moon II/100077	
Provider	Restoration Systems 1101 Haynes Street, Suite 211 Raleigh, North Carolina 27604 Raymond Holz 919-755-9490
Designer	Axiom Environmental, Inc. 218 Snow Avenue Raleigh, NC 27603 Grant Lewis 919-215-1693
Surveyor & Land Quality Permit	k2 Design Group 5688 U.S. Hwy. 70 East Goldsboro, NC 27534 John Rudolph (L-4194) 919-394-2547
Planting Contractor	Restoration Systems 1101 Haynes Street, Suite 211 Raleigh, North Carolina 27604 Josh Merritt 919-755-9490
Construction Contractor	Land Mechanic Design 126 Circle G Lane Willow Spring, NC 27592 Charles Hill (919) 639-6132
General Contractor	Restoration Systems 1101 Haynes Street, Suite 211 Raleigh, North Carolina 27604 Worth Creech (GC #64807) 919-755-9490

Appendix E. Project Notes

IRT As-Built Review – Aug. 7, 2023 and Comment Response

DMS Boundary Inspection Report – Sept. 7, 2023 and Comment Response

From:	Tugwell, Todd J CIV USARMY CESAW (USA)
To:	Dow, Jeremiah J
Cc:	Holz, Raymond; Merritt, Josh; Baldwin, Alex; Davis, Erin B CIV USARMY CESAW (USA); Wilson, Travis W.; Polizzi, Maria; Haupt, Mac; Bowers, Todd
Subject:	RE: Notice of As-Built Review/ NCDMS Sliver Moon II Site/ SAW-2018-01761/ Craven County
Date:	Monday, August 7, 2023 12:59:27 PM
Attachments:	image001.png Sliver Moon II_100077_NS 02_NRW_Initial Release.pdf

Jeremiah,

The 15-Day As-Built/MY0 review for the NCDMS Sliver Moon II Mitigation Site (SAW-2018-01761) ended July 5, 2023. Per Section 332.8(o)(9) of the 2008 Mitigation Rule, this review followed the streamlined review process. All comments received from the NCIRT are incorporated in the email below. There were no objections to issuing the initial 30% credit release of 9.134 wetland mitigation units. Please find attached the current signed ledger. The IRT is not requesting a site visit at this time.

Erin Davis, USACE:

1. Regarding the 2022 encroachment and replant, please reference the occurrence, resolution and provide a status update in the MY1 report.
2. Veg plots 8, 17 and 23 were all shown in the draft and final mitigation plan as being located within designed depression wet areas but have been shifted outside of these areas on As-built Sheet 3. Currently there are no representative veg plots withing these planted depression areas, which the IRT would have commented on had it not been addressed in the draft mitigation plan. Please relocate these three plots to representative depression areas prior to completing the MY1 survey.
3. CCPV Figure 1 – It would be helpful for future reviews to have the depression wet areas included on this figure.
4. Redline Grading Plan (Sheet 2) – The northern ditch callout was redlined from plugs and ditch backfill to partial ditch backfill. Does this change mean that plugs weren't installed along this ditch? For the partial backfill, what was the max ditch depth from surrounding grade left open?
5. DMS' comments and RS' responses were helpful and appreciated. The additional construction photos and drone images provided were useful for this this review.

Please reach out with any questions.

Regards,

Todd Tugwell
Chief, Mitigation Branch
Regulatory Division
Wilmington District, USACE
(919) 210-6265

From: Dow, Jeremiah J <jeremiah.dow@deq.nc.gov>

Sent: Monday, June 12, 2023 2:47 PM
To: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Davis, Erin B CIV USARMY CESAW (USA) <Erin.B.Davis@usace.army.mil>; Wilson, Travis W. <travis.wilson@ncwildlife.org>; Polizzi, Maria <maria.polizzi@deq.nc.gov>; Haupt, Mac <mac.haupt@deq.nc.gov>; Bowers, Todd <bowers.todd@epa.gov>
Cc: Holz, Raymond <Raymond.Holz@davey.com>; Merritt, Josh <Joshua.Merritt@davey.com>; Baldwin, Alex <Alexander.Baldwin@davey.com>
Subject: [Non-DoD Source] Notice of As-Built Review/ NCDMS Sliver Moon II Site/ SAW-2018-01761/ Craven County

The final baseline (as-built) report and record drawings were uploaded to RIBITS and DWR Laserfiche for IRT review:

Project Information

Name:	Sliver Moon II
USACE ID:	SAW-2018-01761
DWR ID:	20181156
DMS Project #:	100077
RFP:	16-007401—Issued 12/07/2017
Institution:	06/15/2018—Full Delivery
River Basin:	Neuse 03020202
County:	Craven
Mitigation Plan Assets:	30.447 NRWMU's
Provider:	Restoration Systems, LLC, Ray Holz, 919-604-9314
DMS PM:	Jeremiah Dow, 919-218-0226

Please note:
Construction was completed in October 2021 and planting was completed in December 2021. The MY0 report was completed in the fall of 2022, but due to an easement encroachment discovered at that time resulting in the need to replant 0.892 acres and install additional easement marking, the MY0 report was delayed to the following spring in 2023. 2023 will be Monitoring Year 1 for this project. There is no change in wetland acreage from mitigation plan to as-built – 30.447 acres – and no change in project credits is requested.

The credit ledger for the 30% release is attached for review and signature.

Thank you,

Jeremiah Dow
Eastern Regional Supervisor, Division of Mitigation Services
North Carolina Department of Environmental Quality
Cell: (919) 218-0226
jeremiah.dow@ncdenr.gov

Restoration Systems, LLC
1101 Haynes St. Suite 211
Raleigh, North Carolina
Ph: (919) 755-9490
Fx: (919) 755-9492

Response to IRT As-Built Review Comments

Sliver Moon II, Project ID #100045, DMS Contract #7606
USACE Action ID No. SAW-2018-01761
DWR Project No. 2018-1156
Neuse River Basin 03020202, Craven County

Comments Received (Black Text) & Responses (Blue Text)

Boundary Inspection Action Items:

1. Regarding the 2022 encroachment and replant, please reference the occurrence, resolution and provide a status update in the MY1 report.
   The 2022 encroachment and replant are documented and detailed in the MY1 report.

2. Veg plots 8, 17 and 23 were all shown in the draft and final mitigation plan as being located within designed depression wet areas but have been shifted outside of these areas on As-built Sheet 3. Currently there are no representative veg plots withing these planted depression areas, which the IRT would have commented on had it not been addressed in the draft mitigation plan. Please relocate these three plots to representative depression areas prior to completing the MY1 survey.
   Understood, during construction the shape of depression areas were slightly altered relative to the mitigation plan. Veg plots 8, 17, and 23 are in or partially in the depression areas. Moving forward we will include random transects to capture woody stem development in these areas.

3. CCPV Figure 1 – It would be helpful for future reviews to have the depression wet areas included on this figure.
   Completed.

4. Redline Grading Plan (Sheet 2) – The northern ditch callout was redlined from plugs and ditch backfill to partial ditch backfill. Does this change mean that plugs weren't installed along this ditch? For the partial backfill, what was the max ditch depth from surrounding grade left open?
   No ditch plugs were installed along this ditch, it was partially backfilled and the ditch depth tapers from 0.41-feet on the eastern end to 0.70-feet in the middle and the max ditch depth is 1.87-feet at the outfall on the western end. Rock was added at the outfall for stabilization.

5. DMS' comments and RS' responses were helpful and appreciated. The additional construction photos and drone images provided were useful for this this review.
   Thank you.

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
MARC RECKTENWALD
Director

NORTH CAROLINA
Environmental Quality

September 7, 2023

Josh Merritt
Restoration Systems, LLC
1101 Haynes Street, Ste. 211
Raleigh, NC 27604

Subject: Boundary Inspection Report – MY0
Site: Sliver Moon II NRW Mitigation Site, Guilford County, NC; DMS ID No. 100045

Josh,

The MY0 boundary inspection was conducted by DMS and SP on September 5, 2023. The inspection was conducted in accordance with the DMS Property Checklist which included an office review and a site visit to document site conditions. The entire easement boundary was inspected during the site visit to validate easement integrity and identify any potential issues on the site. This report summarizes those inspection results.

Office Review: No items noted.

Field Inspection:

- All but the monuments listed in the KML file as #1 and #2 met the RFP and recorded survey plat standards. We were not able to locate these two monuments. They are listed as corner #106 and 107 respectively on the plat.
- Witness posts were consistently marked and located near the CE corners and monuments were installed per RFP.

Action Items:

- Locate the monuments for corners #106 and #107 and send a photo to the project manager and property specialist.

Let me know if you have any questions or need additional information.

Sincerely,
Jeffrey Horton
Project Specialist
NCDEQ-DMS

cc: Ray Holz, Restoration Systems

Restoration Systems, LLC
1101 Haynes St. Suite 211
Raleigh, North Carolina
Ph: (919) 755-9490
Fx: (919) 755-9492

Response to DMS As-Built Boundary Inspection Comments

Sliver Moon II, Project ID #100045, DMS Contract #7606
USACE Action ID No. SAW-2018-01761
DWR Project No. 2018-1156
Neuse River Basin 03020202, Craven County
DMS Reviewers: Jeffrey Horton

Comments Received (Black Text) & Responses (Blue Text)

Boundary Inspection Action Items:

1. Locate the monuments for corners #106 and #107 and send a photo to the project manager and property specialist.
   RS had a surveyor go out to locate the two missing corners and repaint/reflag t-posts. See attached survey report for documentation.

k2 design group
774 S Beston Road
La Grange, NC 28551
252.582.3097
www.k2designgroup.com

Report of Survey

Date: **October 11, 2023**

Project: **DMS ID 100077, SPO 25-BX – Sliver Moon 2 Mitigation Site**
No. 3 Twsp., Craven County, NC

I certify that this survey was done under my responsible charge in compliance with the Standards of Practice for Land Surveying (21-56.1600) for the purpose of locating corners number 106 and 107

That before I performed the survey, I examined the following documents of record:

Plat Book I, Page(s) 164A and 164B Craven County Registry of Deeds

That after examining the above referenced documents the following corners were uncovered and T-post were repainted and flagged.

106	532432.9523 N	2487522.0503 E	No 5 Rebar with DMS Aluminum cap (typical)
107	532397.8826 N	2487512.3126 E	No 5 Rebar with DMS Aluminum cap (typical)

106 closeup is shown below:

106 overall:

107 closeup is shown below:

107 overall:

Upon completion of the survey, no visible encroachments were observed along the line from 106 to 107.

This 11th day of October, 2023

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH