ANNUAL ENVIRONMENTAL ASSESSMENT REPORT

CROSS BAR RANCH ECOSYSTEM MANAGEMENT

WY 2021

WUP PERMIT No. 20004649.007

PROJECT No. 617-259914-0840

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EXECUTIVE SUMMARY

This Annual Environmental Assessment Report summarizes the hydrological and ecological conditions for ten (10) augmented areas that consist of eight (8) wetlands and two (2) lakes at Cross Bar Ranch (Cross Bar) during Water Year (WY) 2021 (October 1, 2020 - September 30, 2021). Augmentation is permitted by Southwest Florida Water Management District (SWFWMD) (District) Water Use Permit (WUP) No. 20004649.007 issued to Pinellas County. This permit had previously been renewed on May 24, 2011 and remained in effect until 2021. This is the twenty-first (21st) annual report as required by Condition #10 of the previous permit and the eleventh (11th) under condition #2 of the subsequent (renewed) permit. (WUP No. 20004649.007 has been renewed for five (5) years as permit WUP No. 20004649.008 as of December 10, 2021; this annual report covers the final water year-term of WUP No. 20004649.007). Two (2) of the augmented sites, Goose Lake and Clear Lake, have been augmented since 1986 and 1987, respectively, under the former West Coast Regional Water Supply Authority (WUP) permit for Cross Bar Ranch Wellfield. These two lakes are also currently augmented and monitored under Tampa Bay Water's (TBW) consolidated water use permit. Augmentation was initiated for Sites 13A and 13B in March 2002. The remaining six (6) sites were augmented beginning January 2003. Two (2) augmentation wells, District I.D. Nos. Well 1 and Well 4, are permitted for withdrawals in order to augment eight (8) wetland areas and two (2) lakes under Pinellas County's WUP as addressed by this report.

The average daily withdrawal from Well 1 during WY 2021 was 52,290 gallons per day (gpd). A total of 19,086,000 gallons or 19.1 MG were withdrawn from Well 1 during WY 2021 for distribution to six (6) of eight (8) total sites. Augmentation water was sent to Goose Lake and sites 7B, 7C, 7D, 8 and 10 from Well 1.

The average daily withdrawal from Well 4 during WY 2021 was 75,885 gpd. A total of 27,698,200 gallons or 27.7 MG were withdrawn from Well 4 during WY 2021 for augmentation of Sites 13A and 13B.

The summation of the total average annual withdrawal was 128,176 gpd and is well below the authorized 800,000 gpd. The peak monthly withdrawal was 294,537 gpd and is less than the authorized 1.5 mgd.

Surficial aquifer levels are measured in monitor wells and surface water levels are measured at staff gauges twice a month at eleven (11) surface water locations within the ranch. Range in fluctuation of the surficial aquifer, as measured in the monitor wells, was between 2.34 and 4.71 feet. Depth to groundwater ranged from 1.45 feet (Site 13A) to 9.36 feet (Goose Lake); water table elevation ranged between a minimum of 65.58 feet National Geodetic Vertical Datum (NGVD) (Clear Lake) and a maximum of 77.18 feet NGVD (Site 13A).

All wetland sites held water throughout the year. Maximum depth of surface water was recorded at 5.92 feet at Goose Lake; surface water level fluctuation ranged from 1.09 feet at Site 13B to 4.00 feet at Goose Lake.

A composite average of 58.92 inches of rainfall was recorded from five (5) rainfall stations on Cross Bar Ranch: CBR-CB-1, CBR-CB-13, CBR-S1-S, CBR GREGG, and CBR FISH, for WY 2021. Rainfall accumulation was highest during the months June through September 2021. The composite average rainfall for WY 2021 is higher than Cross Bar's period of record composite rainfall average of 55.70 inches (WY 2001 through 2021). Rainfall during WY 2021 is the sixth (6^{th}) highest amount in the range of recorded rainfall since augmentation commenced in 2002. WY 2003 composite average rainfall of 77.84 inches was the highest, followed by WY 2015 with 68.18 inches. Rainfall at the nearby St. Leo rain gauge was 57.36 inches for WY 2021, approximately one and a half inches lower than the amount of rainfall as recorded at the Cross Bar stations in WY 2021. Water years 2005 and 2006 (41.1 and 39.37 inches) have been the two driest recorded at Cross Bar Ranch since Pinellas County initiated augmentation at Al Bar Ranch in WY 2002.

Quarterly groundwater quality sampling from the augmentation wells was required under the previous WUP and was initiated in WY 2001. Annual sampling commenced in accordance with permit condition #5, which was issued with the renewal of Permit No. 20004649.007 on May 24, 2011; annual sampling of both augmentation wells occurred in May 2021. Water samples are analyzed for hardness and field readings are taken for specific conductance and pH. Annual groundwater quality results for both Well 1 and Well 4 in 2021 show pH was slightly higher, hardness was lower, and conductivity was the same as compared to the previous May.

The Wetland Assessment Procedure (WAP) (Southwest Florida Water Management District & Tampa Bay Water, 2000) was utilized for ecological monitoring in April and September 2021. There are nine (9) ecological monitoring stations that are monitored with the WAP Assessment. Clear Lake and Goose Lake monitoring is restricted to hydrologic data and photographic documentation. The total maximum wetland score was not achieved at any of the ecological monitoring stations due to varying levels of changes in wetland conditions. Wetland Stations 7D, 8W, 13A, and 13B all received the highest score of 37 (out of 42) in April 2021, during the dry season monitoring event. Wetland Stations 7D, 13A, and 13B, received the highest score of 38 (out of 42) in September 2021, during the wet season monitoring events. Stations 7B and 8E received the second highest score of 34 (out of 42) during the April 2021 event, and stations 8E and 8W received the second highest score of 37 (out of 42) during the September 2021 event. Wetland Station 10 received the lowest score of 30 during the April 2021 monitoring event. Wetland station 10 also received the lowest score of 30 during the September 2021 event. This low score was due to a plant composition dominated by facultative and upland species in the transition zone. The average WAP score for each of the 14 assessed categories and nine (9) ecological monitoring stations was 34.33 for April 2021, and 35.11 for September 2021. These scores continue to show an increase from the initial monitoring events of April 2001, which had an average WAP score of 29.4 and May 2002, which had an average WAP score of 28.78. The August 2001 average WAP score was 29.33 and September 2002 was 28.78. The continuously higher WAP scores since initial monitoring are primarily a result of the overall improved wetland conditions, including species composition, species zonation, and improved hydrology.

ANNUAL ENVIRONMENTAL ASSESSMENT REPORT
CROSS BAR RANCH ECOSYSTEM MANAGEMENT

1.0 INTRODUCTION

The Cross Bar Ranch consists of approximately 8,060-acres in Pasco County (see **Appendix A, Figure 1**). The Cross Bar Ranch property is covered by two (2) existing permits: Water Use Permit (WUP) No. 2011771.01 issued for Tampa Bay Water for public supply use which includes environmental mitigation activities and WUP

204649.007 issued to Pinellas County Utilities for ecosystem management. On December 31, 2001 the District authorized the renewal with modification to change the WUP 204649.02 from agricultural irrigation to environmental augmentation of lakes and wetlands in coordination with Cross Bar Ranch Ecosystem Management. The specific changes to this permit included increasing the annual average quantity from 490,000 gallons per day to 800,000 gallons per day and to decrease the peak monthly quantities from 3,020,000 GPD to 1,500,000 GPD.

The WUP was modified on February 1, 2002 to change the casing diameter and withdrawal quantities for Well 4 and to delete Well 5 from the permit. The existing 12-inch well (Well 1), was previously used for agricultural activities and is now used to augment eight (8) sites. One (1) 8-inch well (Well 4) was installed to augment two (2) wetlands on Cross Bar Ranch (**Appendix A, Figure 2**). The WUP was renewed through SWFWMD effective May 24, 2011 (WUP No. 20004649.007) as the previous permit expired December 2010.

This report addresses and summarizes the hydrological and ecological monitoring and data requirements for the Cross Bar Ranch Ecosystem Management permit, provided in **Appendix B**. The hydrologic section of this report summarizes (1) augmentation well withdrawals; (2) surface and surficial aquifer water levels; (3) rainfall; and (4) Floridan aquifer augmentation water quality. **Appendix B** also provides construction and survey details of monitoring wells and staff gauges.

Hydrologic data provided in this report (**Appendix A – Figures and Hydrographs** and **Appendix C – Data Tables**) was collected by Pinellas County Utilities representatives; and rainfall data was collected by Tampa Bay Water.

The Ecological Monitoring section summarizes the results of qualitative monitoring using the approved Wetlands Assessment Procedure (WAP). The ecological monitoring is a requirement of the WUP to document results of augmentation by vegetation analyses, general hydrological and soils assessment, incidental wildlife observations along with photographic documentation. Wetland assessments were performed by Quest Ecology, Inc. Data from the ecological monitoring, collected by Quest Ecology, Inc. is provided in **Appendix E** with photographs in **Appendix F.**

2.0 METHODS

2.1 Hydrologic Monitoring

2.1.1 Augmentation Well Production

There are two (2) Floridan aquifer production wells (1 and 4) that provide groundwater for the two (2) lakes and eight (8) augmented wetland areas (**Appendix A, Figure 2**). Well 1 is 12 inches (12") in diameter and Well 4 is eight inches (8") in diameter; both are constructed into the upper Floridan aquifer.

The authorized average annual quantity is 800,000 GPD with a peak monthly of 1,500,000 GPD. Augmentation quantities required by permit conditions No. 8 and 13 were measured and recorded with flow meters. Total withdrawal is calculated from meter readings that are recorded on a monthly basis. The augmentation quantities in graph form for WY 2021 are provided in **Appendix A – Figures and Hydrographs**. Pinellas County site designations and District designations are provided for clarification on a summary sheet in **Appendix B**.

There were no flow meter failures at any of the wells; however, an LED segment on the digital display for Well 1 failed and the display was replaced in October 2021. The flow meters for the District IDs 1 and 4 (Permitee IDs G-1 and G-3) passed accuracy tests on August 11, 2021 in accordance with WUP Special Condition #13 and Exhibit B, Metering Instructions, 5.B.

When discharge values at the well meter appear to be incorrect and meter malfunction is suspected and/or confirmed, the SWFWMD is notified. Discharges are calculated for the period the meter is malfunctioning or out of service from the sum of registered amounts on the augmented wetland site meter(s), as available. Or alternatively, discharges are estimated from normal discharge rates multiplied by the amount of time the pump was running.

2.1.2 Surficial Aquifer Groundwater Levels

Groundwater levels in the surficial aquifer are measured and recorded at two (2) week intervals (twice/month) in monitor wells at eleven (11) locations and are referenced to the National Geodetic Vertical Datum (NGVD). Water Year 2021 groundwater monitoring

data is provided in **Appendix A – Figures and Hydrographs and Appendices C and D – Data Tables**.

2.1.3 Surface Water Levels

Staff gauges have been installed at each of eleven (11) stations and surveyed for location and reference elevation. Surface water levels are measured on staff gauges at two week intervals (twice/month) at the stations and referenced to NGVD. The WY 2021 water levels from each staff gauge are provided in **Appendix A – Figures and Hydrographs and Appendices C and D – Data Tables.**

2.1.4 Rainfall

Rainfall data is provided from Tampa Bay Water at five (5) continuous-recording rain gauges located within the Cross Bar Ranch boundaries; CB-1, CB-13, S1-S, CBR GREGG, and CBR FISH located at Big Fish Lake, as depicted on **Figure 3 – Appendix A**. Rainfall data for WY 2021 is provided in **Appendix C – Table 1** and depicted in **Figures 4 and 5, Appendix A.**

2.1.5 Water Quality

Water samples were collected from Well 1 and Well 4 in May 2021. The samples were analyzed for hardness and field readings for pH and specific conductance were taken. The results of water quality monitoring are provided in **Appendix C – Table 2.**

2.2 Ecological Monitoring

2.2.1 Qualitative Vegetation Monitoring

The locations of augmented wetlands and ecological monitoring stations are depicted on **Figure 2**, **Appendix A**. Qualitative monitoring of the hydrologically augmented wetlands was performed in April and September 2021 using the Wetland Assessment Procedure (WAP) developed by the Southwest Florida Water Management District and Tampa Bay Water in 2000 and described in the Environmental Management Plan (EMP). The WAP is a semi-quantitative vegetation, soils and hydrological analysis of wetland conditions. The WAP includes collection of pertinent information on vegetation, hydrology and soils in order to characterize the current biological condition and health of the wetland. This data provides a basis for evaluating future wetland recovery through augmentation.

WAP monitoring was conducted along the following nine (9) transects per the original 1996 WUP and subsequent modifications: 7A, 7B, 7C, 7D, 8E, 8W, 10, 13A and 13B. Nomenclature of vegetative taxa encountered along the transects follows Wunderlin et al (2019). WAP assessments are not conducted under the County's WUP for Clear and Goose Lakes since these are monitored under the Tampa Bay Water Consolidated WUP.

2.2.2 Ecological Data Analysis

As described in Section 2.2.1, data is collected as part of the WAP to assess the health and general condition of each augmented wetland. Fifteen (15) categories are used to assess the health or condition of each wetland system, as shown on **Tables 9 and 10 (Appendix E)**. As part of the evaluation process, each of the applicable categories is ranked one (1), two (2), or three (3) depending upon the evaluation criteria and the condition of the wetland system. A rank of three (3) represents normal wetland conditions with minimal disturbances. A rank of one (1) represents atypical wetland conditions.

To facilitate comparisons of wetland conditions over time, a total WAP score was calculated for each of the monitored wetland systems. The total WAP score represents the sum of the ranking of the WAP categories. If a wetland system can be ranked on all 15 major categories of the WAP, the maximum score would be 45 (15 times 3). However, individual categories can be eliminated if the specific parameter is not applicable. Under these scenarios, the maximum score would be less than 45. For example, if water depths in wetlands were too deep to assess soil subsidence, this category would not be ranked. In this case, the maximum WAP score would be 42.

Due to this variability in the maximum WAP score, comparisons of total WAP scores between all wetland systems are not considered appropriate. To assist in the evaluation of total WAP scores for individual wetlands, factors contributing to a particular score have been noted.

Due to the variability in the maximum WAP score that is based on the presence or absence of wetland components versus a change in wetland condition, the percent of maximum WAP score was calculated to facilitate comparisons between wetlands of similar community types. The percent of maximum WAP score is

considered to represent the overall wetland health and is calculated by dividing the total WAP score by the maximum possible WAP score. Wetlands with normal vegetation trends and hydrology are expected to have the highest percent of maximum WAP score.

WAP scores were compiled and summarized in tables for individual wetlands. Descriptive graphs were used to analyze any changes in wetland WAP score between June and September monitoring.

2.3 Ground Photography

Photographs of the augmentation sites were taken from fixed points along each transect during April and September monitoring events (**Appendix F**).

2.4 Wildlife Observations

Wildlife utilization was assessed for each monitoring location during each monitoring event based on visual observations or indications of presence based on sound, burrows, tracks, scat, etc. Wildlife observations are recorded on the WAP datasheets and summarized on **Table 12 (Appendix E).**

3.0 RESULTS AND DATA ASSESSMENT

3.1 Hydrology

3.1.1 Augmentation Wells Withdrawals

During WY 2021 Well 1 augmentation quantities totaled 19.09 MG for the year (**Appendix A - Figure 6** and **Appendix C** - **Table 3**). The average daily withdrawal from Well 1 was 52,290 gpd. This well was pumped in December 2020 and January 2021; and March through August 2021. Goose Lake, Sites 7B, 7C and 7D were the recipients of substantial augmentation water during these months. The amount discharged in August was de minimis. Water levels in these wetlands generally rose and fell predominately with rainfall because the withdrawals from this well were not substantial, although amounts were slightly higher than the previous water year. (**Appendix A Figure 7,** and **Figures 9 through 14, Appendix C – Table 4**).

Well 4 augmentation quantities for WY 2021 totaled 27.70 MG (**Appendix A - Figure 15**). These quantities were distributed to Site 13A and Site 13B (**Appendix A – Figures 7, 16 and 17**). The average daily withdrawal for Well 4 was 75,885 gpd. Well 4 was pumped

every month of the water year (**Appendix A - Figure 15**). The total augmentation quantities for each site are provided in **Appendix A – Figure 7**.

3.1.2 Wetland Augmentation

Sites 13B and 13A by far received the largest volumes of augmentation water, followed by Goose Lake, sites 7D and 7B, respectively (**Appendix A – Figure 7**). It should be noted that Clear Lake and Goose Lake are also augmented by Tampa Bay Water (these amounts are not included in this report). Clear Lake received de minimis amounts of augmentation water in December, January and April; Site 8 received de minimis augmentation water in all months this well was pumped; Site 10 received small volumes of water in June and July, and de-minimis amounts of water during December, January and August. Sites 13A and 13B were augmented in every month of the water year, the highest amounts being received in May and February. **Figure 7** in **Appendix A** graphically depicts total wetland augmentation quantities, **Figure 8** shows monthly augmentation withdrawals, and **Table 4** in **Appendix C** presents wetland augmentation data.

3.1.3 Surficial Aquifer Groundwater Levels

The results of groundwater level data are discussed below using Pinellas County I.D. for site designations. District I.D. numbers for each of these sites are provided in **Appendix B** and also on the referenced **Figures**. Groundwater levels are measured twice-monthly at eleven (11) monitoring wells. **Appendix A – Figures 18 through 28** graphically depict surficial aquifer elevation data, and **Table 5** in **Appendix C** lists the data in tabular form.

Surficial aquifer water level for Clear Lake ranged from a minimum 65.58 feet NGVD in May 2021 to a maximum of 70.29 feet NGVD in September 2021, a water level fluctuation of 4.71 feet (**Table 5**). In comparison with WY 2020, water level elevation ranged from 66.49 feet NGVD to 69.67 feet NGVD. Water level fluctuated with rainfall; Clear Lake was not augmented by Pinellas County but may have been augmented by Tampa Bay Water (**Appendix A** - **Figure 18**).

Goose Lake surficial aquifer water level fluctuated 3.85 feet during WY 2021 with elevation ranging from 70.80 feet NGVD in May 2021 to 74.65 feet NGVD in September 2021. In comparison with WY 2020, water elevation ranged from 71.61 feet NGVD to

74.82 feet NGVD. Groundwater elevation fluctuated largely with rainfall; Goose Lake was augmented by Pinellas County primarily from March through July 2021 and may have also been augmented by Tampa Bay Water (**Appendix A – Figure 19**).

Site 7A recorded groundwater level fluctuated 3.28 feet with water elevation ranging from 68.41 feet NGVD in May 2021 to 71.69 feet NGVD in September 2021. By way of comparison with WY 2019, water elevation ranged from 69.06 feet NGVD to 71.28 feet NGVD. This site was not augmented in WY 2021, so groundwater elevation was influenced by rainfall (**Appendix A - Figure 20**).

Site 7B groundwater level fluctuated 3.42 feet with elevation ranging from 69.55 feet NGVD in late May 2021 to 72.97 feet NGVD in September 2021. In comparison with WY 2019, water elevation ranged from 69.98 feet NGVD to 72.41 feet NGVD. This site was augmented minimally from March through May 2021, so groundwater elevation was primarily influenced by rainfall (**Appendix A - Figure 21**).

Site 7C measured groundwater level fluctuated 2.56 feet with water elevations ranging from 68.87 feet NGVD in May 2021 to 71.43 feet NGVD in September 2021. By comparison with WY 2020, water elevation ranged from 69.58 feet NGVD to 71.28 feet NGVD. Groundwater elevation was primarily influenced by rainfall as this site was lightly augmented from March through July 2020 (**Appendix A - Figure 22**).

Site 7D groundwater level fluctuated 2.66 feet with water elevation ranging from 68.61 feet NGVD in May 2021 to 71.27 feet NGVD in August 2021. By comparison with WY 2019, water elevation ranged from 69.01 feet NGVD to 70.81 feet NGVD. Groundwater elevation was primarily influenced by rainfall as this site was lightly augmented from March through July 2021 (**Appendix A - Figure 23**).

Site 8-1(NE) (north monitor well) groundwater level fluctuated 3.53 feet with water elevation ranging from 69.60 feet NGVD in late May 2021 to 73.13 feet NGVD in September 2021. In comparison with WY 2020, water level ranged from 70.27 feet NGVD to 73.30 feet NGVD. This site was not substantially augmented in WY 2021 so groundwater elevation was influenced by rainfall (**Appendix A - Figure 24**).

Site 8-2(SW) (south monitor well) groundwater level fluctuated 3.64 feet with water elevation ranging from 69.46 feet NGVD in May 2021 to 73.10 feet NGVD in August 2021. In WY 2020, water elevation ranged from 72.76 feet NGVD to 70.45 feet NGVD. Site 8-2(SW) was not augmented in WY 2021 so groundwater elevation was driven by rainfall (**Appendix A - Figure 25**).

Site 10 groundwater levels fluctuated 3.48 feet with water elevation ranging from 68.96 feet NGVD in May 2021 to 72.44 feet NGVD in September 2021. By comparison with WY 2020, water elevation ranged from 69.77 feet NGVD to 72.07 feet NGVD (**Appendix A - Figure 26**). This site had very small amounts in June and July only so groundwater elevation was primarily influenced by rainfall.

Site 13A groundwater level fluctuated 3.48 feet with water elevations ranging from 72.92 feet NGVD in May 2021 to 77.18 feet NGVD in August 2021. By comparison with WY 2020, water elevation ranged from 72.52 feet NGVD to 75.86 feet NGVD. This site was augmented in every month in WY 2021, so groundwater was maintained with augmentation and fluctuation was driven by rainfall (**Appendix A - Figure 27**).

Site 13B groundwater level fluctuated 2.34 feet with water elevation ranging from 69.76 feet NGVD in January 2021 to 72.10 feet NGVD in September 2021. In comparison with WY 2020, water elevation ranged from 70.24 feet NGVD to 71.67 feet NGVD. This site was augmented in every month in WY 2021, so groundwater was maintained with augmentation and fluctuation was driven by rainfall (**Appendix A - Figure 28**).

In summary, during WY 2021 surficial groundwater level fluctuations ranged from 2.34 feet at the Site 13B monitor well to 4.71 feet at Clear Lake. Depth to groundwater ranged from 1.45 feet at Site 13A to 9.36 feet at Goose Lake. Average composite groundwater elevation did not vary substantially from the composite average of WY 2020. Groundwater elevation ranged between a minimum of 66.58 feet NGVD at Clear Lake in May 2021 and maximum of 77.18 feet NGVD at Site 13A in August 2021. Composite average rainfall in WY 2021 was about two and one half inches higher than in WY 2020. Yearly rainfall amount was also above average; there were substantially higher amounts of rainfall during the wet season than the normal dry season, so the seasonal rainfall pattern (dry season, wet season), was typical for Florida.

In general, groundwater elevation changes were primarily influenced by rainfall in the sites served by Well 1 (Clear Lake, Goose Lake, Sites 7A, 7B, 7C, 7D, 8 and 10) in WY 2021. In wetlands served by Well 4 (Sites 13A and 13B), groundwater elevations were maintained with augmentation during the dry season, then rose in response to wet season rainfall. Groundwater levels from the previous water-year wet season started to recede before the beginning of the 2021 water year and continued to recede into the dry season throughout Cross Bar Ranch. Dry season groundwater levels receded to levels lower than were seen in the previous water year's dry season, but the normal dry season/wet season pattern was evident.

3.1.4 Surface Water Levels

Surface water levels are measured twice-monthly at eleven (11) staff gauge stations. All sites held water over the entire water year (**Appendix A - Figures 18 through 28** and **Tables 6 and 8** in **Appendix D**).

Clear Lake water depths at the staff gauge locations ranged from 1.59 feet in May 2021 to 5.19 feet in August 202. Goose Lake water depths at the staff gage ranged between 5.92 feet in October 2020 and receded to 1.92 feet in May.

Site 7A water depths ranged between 1.84 feet in May 2021 to 4.58 feet in September 2021. Site 7B held 0.14 feet of water in June 2021 and rose to a high of 2.82 feet in late September 2021.

Site 7C water depths ranged between 2.18 feet in late May 2021 to 3.96 feet in July 2021. Site 7D water depths ranged between 1.78 feet in late October 2020 to 0.40 feet in June 2021.

Site 8-1(NE) water depths ranged between 1.33 feet in late May 2021 to 3.18 feet in July 2021. Site 8-2(SW) water depths rose from 2.22 feet in late May 2021 to 5.80 feet in September 2021.

Water depth at Site 10 was just at land surface in late May 2021 and then rose to 2.37 feet in August 2021.

Site 13A water depths rose from 0.92 feet in late May 2021 to 4.30 feet in August 2021. Site 13B water depths rose from 0.76 feet in late May 2021 to 1.85 feet August 2021.

In summary, all sites held water over the entire water year. Maximum depth of water recorded at the staff gages was 5.92 feet at Goose Lake; surface water level fluctuation ranged between 1.09 feet at Site 13B to 4.00 feet at Goose Lake.

3.1.5 Rainfall

Tampa Bay Water maintains five (5) rainfall stations at Cross Bar Ranch. The average composite rainfall for the five stations was 58.92 inches during WY 2021 (**see Figures 4 and 5, Appendix A,** and **Table 1 in Appendix C**). Rainfall accumulation was highest during the month of July at 12.65 inches, followed by August and June, and September, respectively. The composite average rainfall for WY 2021 exceeded Cross Bar's period of record composite rainfall average of 55.54 inches (WY 2001 through 2020) by 3.38 inches. Rainfall during WY 2021 is the 6th highest amount in the range of recorded rainfall since augmentation commenced in 2001. WY 2003 composite average rainfall of 77.84 inches was the highest, followed by WY 2015 with 68.18 inches and WY 2004 with 68.02 inches. Rainfall at the nearby St. Leo rain gauge was 57.36 inches for WY 2021, approximately one and a half inches lower than rainfall recorded at the Cross Bar stations in WY 2021. Water years 2005 and 2006 are the two driest recorded at Cross Bar Ranch since Pinellas County initiated augmentation at Cross Bar Ranch in 2001.

3.1.6 Water Quality

For WY 2020 pH levels were 6.39 at Well 4 and 6.76 at Well 1. Hardness was 179 mg/L in both Well 1 and Well 4. Conductivity level was 368 micromhos per centimeter (µmhos/cm) at Well 1 and 369 µmhos/cm at Well 4. Both wells were successfully sampled for the annual sampling event in May 2021, as required (**Table 2 - Appendix C**).

3.2 Ecological Monitoring Results and Data Assessment

3.2.1 Qualitative Monitoring

This section discusses the current ecological condition of each of the nine (9) ecological monitoring stations. **Tables 9 and 10** in **Appendix E** provide a summary of the wetland conditions based on the Wetland Assessment Procedure (WAP) discussed in Section 2.2. The last two (2) columns of **Tables 9 and 10** in **Appendix E**

provide a total score for the fifteen (15) assessment categories and the percent of the maximum WAP scores. These scores are graphically depicted in **Appendix A - Figures 29 and 30**. The total maximum wetland score was not achieved at any of the ecological monitoring stations. As indicated in Section 2.2 the dry season monitoring was conducted during the month of April 2021 with the wet season monitoring conducted during the month of September 2021. Wetland Stations 7D, 8W, 13A, and 13B all received the highest score of 37 (out of 42) in April 2021, during the dry season monitoring event. Wetland Stations 7D, 13A, and 13B, received the highest score of 38 (out of 42) in September 2021, during the wet season monitoring events. Stations 7B and 8E received the second highest score of 34 (out of 42) during the April 2021 event, and stations 8E and 8W received the second highest score of 37 (out of 42) during the September 2021 event. Wetland Station 10 received the lowest score of 30 during the April 2021 monitoring event. Wetland station 10 also received the lowest score of 30 during the September 2021 event. This low score was due to a high cover of weedy species and a plant composition dominated by facultative and upland species in the transition zone in shrub and groundcover categories.

Due to inundation, soil subsidence could not be assessed at the sites during WY 2021. The average WAP score for each of the 14 assessed categories and nine (9) ecological monitoring stations was 34.33 for April 2021, and 35.11 for September 2021. The average for each category was 2.45 for April 2021 and 2.51 for September 2021; (i.e., 34.33 divided by the 14 categories = 2.45; 35.11 divided by the 14 categories = 2.51). The average percent of the maximum WAP score for April 2021 was 81.75% and for September 2021 it was 83.60% for the nine (9) sites. In comparison, the average percentage of maximum WAP score for April 2001 was 29.4% and May 2002 was 28.78%.

The average WAP scores, average category scores, and percent of maximum WAP scores in 2021 are higher for both dry and wet seasons than those recorded during initial monitoring in 2001. The consistently higher scores indicate an overall improvement in wetland conditions, including species composition, species zonation and improved hydrology. Sites 7D, 8E, 8W, 13A, and 13B received the highest scores indicating that these systems are the healthiest of the augmented wetlands.

These sites contain the largest percentage of appropriate plant species in both zones with only minor weedy components as outlined in **Table 11, Appendix E**.

3.2.1.1 General Conditions at Monitoring Stations

A summary of vegetation and general site conditions based on the WAP is provided in **Table 11, Appendix E**. In general, the overall site conditions are stable and trending toward improvement, as discussed above. In addition, efforts have been initiated in recent years to controlling nuisance vegetation around augmented sites.

Man-made Disturbances

During the WAP monitoring, man-made disturbances were identified within most of the ecological monitoring sites. Man-made disturbances included drainage ditches, culverting, fire lanes, roads, and clear cutting and re-planting of adjacent pine. Most of the man- made disturbances are a result of historical activities, silviculture, and mowing.

Eight (8) of the monitoring sites (7A, 7B, 7C, 7D, 8-1(NE), 8-2(SW), 10 and 13B) have culverts associated with historic drainage alterations. Sites 7D and 13B contain extensive historical agricultural ditching throughout the wetland interior, however, a ditch block is located downstream of each of these sites to retain water prior to discharging when the operation plan conditions are met. Due to the restrictive nature of the operation plan implementation opportunities are limited unless flood conditions are present. The agricultural ditches were submerged but evident during the April and September WY 2021 monitoring period. Historically soil fissures were present at these sites but they continue to dissipate and fill in. All nine (9) sites had water in the wetland interior during the April 2021 and September 2021 monitoring events.

With the exception of Site 13A, all of the monitoring sites historically exhibited significant evidence of historical subsidence. The primary indicator of subsidence was exposed roots of wetland trees; however, they were not observable during the monitoring events due to water depths.

Fire

None of the sites indicated significant evidence of recent or historic fire.

3.2.2 Wildlife

During the 2021 WAP monitoring events, direct and indirect incidental wildlife observations were documented at each of the monitoring stations. Indirect observations included vocalizations, tracks, scat, burrows, nests, etc. A list of all species observed and the locations documented is provided in **Table 12** in **Appendix E**. A total of eighteen (18) wildlife species were documented, including eleven (11) birds, four (4) amphibians, two (2) reptiles, and one (1) fish species. Many of the species observed rely on wetlands for at least a portion of their life cycle, including four (4) avian species, one (1) reptile species, two (2) species of frogs, and one (1) species of fish. Florida sandhill crane (*Grus canadensis pratensis*), a state-designated Threatened species – was observed at Wetland 13B during the April and September monitoring events. American Alligator (*Alligator mississippiensis*), a federally Threatened species – was observed at wetland 8W during the April monitoring event. All the monitored wetlands appear to provide suitable habitat for many more species of wetland-dependent wildlife that were not observed during the monitoring events.

4.0 CONCLUSIONS

This is the twenty-first (21st) annual report as required by Condition #10 of the previous permit and the eleventh (11th) under condition #2 of the renewed (current) permit. Only Clear and Goose Lakes were augmented in WY 2001 on a consistent basis. The remaining sites (7A, 7B, 7C, 7D, 8, and 10) have received periodic augmentation over this time period. This is the twentieth (20th) year (WY 2002-2021) of augmentation for sites 13A and 13B. The WAP assessment indicates an increase of wetland scores from initial monitoring in WY 2001 to WY 2021.

Augmentation water was sent to Goose Lake and sites 7B, 7C, 7D, 8 and 10 from Well 1. Relatively high water levels in the augmented sites served by this well kept necessary withdrawals to a minimum. Sites 13A and 13B received augmentation water from Well 4 during every month of WY 2021. Above-average rainfall in recent years and dry season rainfall helped to maintain and exceed permit target water in most sites served by augmentation Well 1; these augmented sites appeared to retain water fairly well, but there may be a recent onset of hydraulic influences other than precipitation and augmentation that account for this retention. Recorded surface water elevations ranged from 66.22 ft NGVD at Clear Lake to 77.22 ft. NGVD at Site 13A.

Average composite groundwater elevation in WY 2021 as insignificantly different from that of WY 2020. The range of fluctuation in groundwater elevations was marginally higher in 2021 than 2020. Augmentation from Well 1 was marginally higher in WY 2021 than in WY 2020, and augmentation from Well 4 was also higher. Periodic augmentation kept water levels relatively steady and seasonally adjusted. Surface water levels mainly fluctuated with the dry and wet season rainfall patterns. Additionally, average surface water levels were lowest in May 2021, started recovering in June with wet-season rainfall, and peaked in August and September 2021. Groundwater elevations followed the same pattern. Both surface water and groundwater elevations on average were substantially about the same in WY 2021 as in WY 2020. Annual groundwater quality results for both Well 1 and Well 4 in 2020 show pH was slightly higher compared to the previous May, while hardness was slightly lower and conductivity was the same.

The WAP scores obtained from the wetland assessments conducted during WY 2021 indicate the wetland vegetative community zonation has improved since the initial monitoring events and continues to be stable. The average WAP score for each nine (9) ecological monitoring stations was 34.33 for April 2021, and 35.11 for September 2021. The average percent of the maximum WAP score for April 2021 was 81.75% and for September 2021 it was 83.60% for the nine (9) sites; a significant increase compared to the average percentage of maximum WAP score of 29.40% April 2001 and 28.78% in May 2002. Wetland Stations 7D, 8W, 13A, and 13B all received the highest score of 37 (out of 42) in April 2021, during the dry season monitoring event. Wetland Stations 7D, 13A, and 13B, received the highest score of 38 (out of 42) in September 2021, during the wet season monitoring events. Stations 7B and 8E received the second highest score of 34 (out of 42) during the April 2021 event, and stations 8E and 8W received the second highest score of 37 (out of 42) during the September 2021 event.

5.0 REFERENCES

Florida Fish and Wildlife Conservation Commission, November 2010; *Florida's Endangered Species, Threatened Species and Species of Special Concern.*

Florida Fish and Wildlife Conservation Commission, January 2004; *Florida's Endangered Species, Threatened Species and Species of Special Concern.*

Reed, Porter B., Jr., May 1988; *National List of Plant Species That Occur in Wetlands: Florida,* U.S. Fish and Wildlife Service

Soil Conservation Service, June 1982; *Soil Survey of Pasco County, Florida*. U.S. Department of Agriculture.

NOAA National Climate Data Center, *St. Leo, Florida Daily Precipitation*, WY 2020, https://www.ncei.noaa.gov/orders/cdo/1127675.csv

Tampa Bay Water, March 2000; *Environmental Management Plan for the Tampa Bay Water Central System Wellfields.*

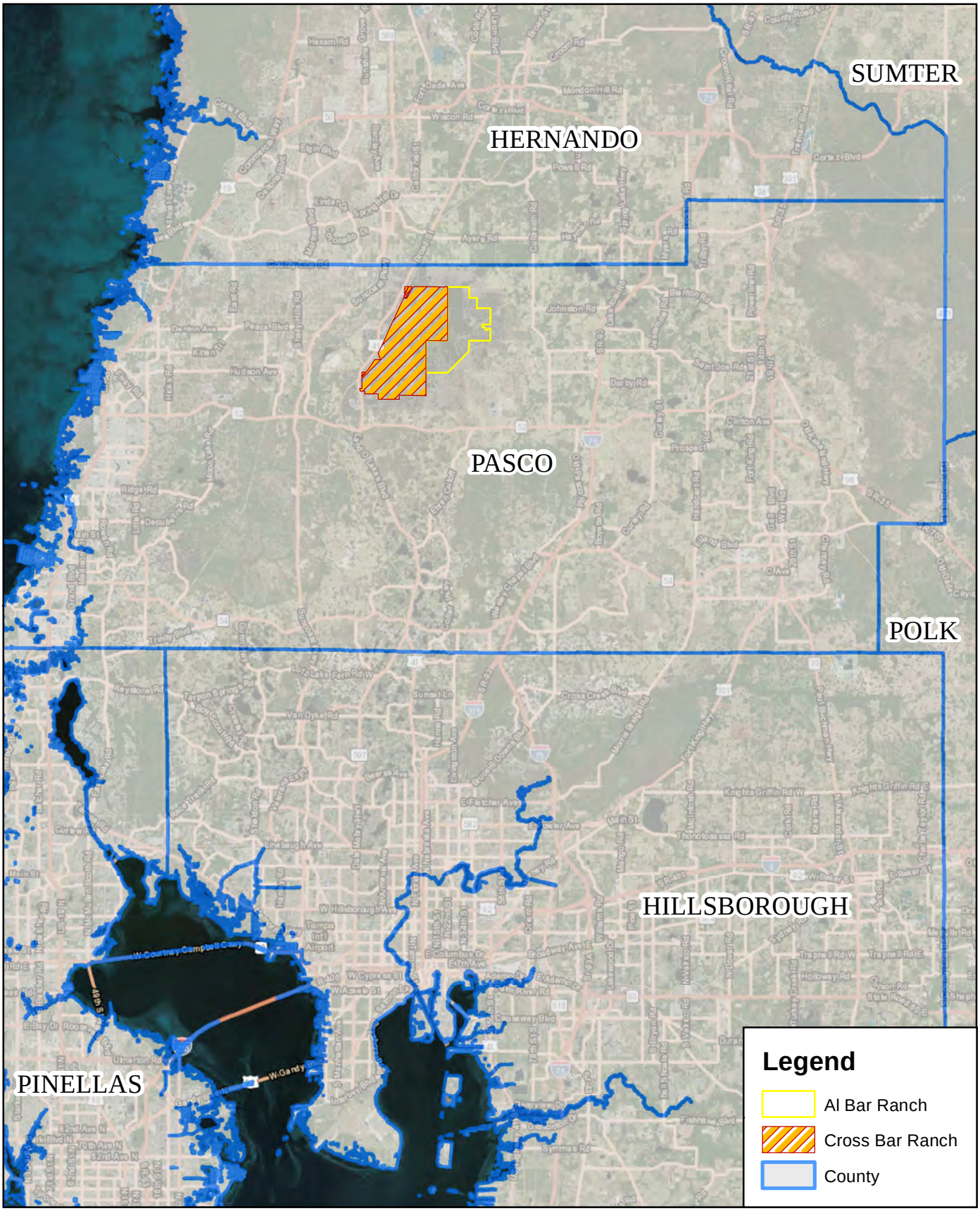
Tampa Bay Water; Rainfall Data for Cross Bar Ranch, WY 2021.

Wunderlin, Richard P., 1998 *Guide to the Vascular Plants of Central Florida.*

Wunderlin, R. P., B. F. Hansen, A. R. Franck, and F. B. Essig. 2019. Atlas of Florida Plants (http://florida.plantatlas.usf.edu/). [S. M. Landry and K. N. Campbell (application development), USF Water Institute.] Institute for Systematic Botany, University of South Florida, Tampa.

APPENDIX A

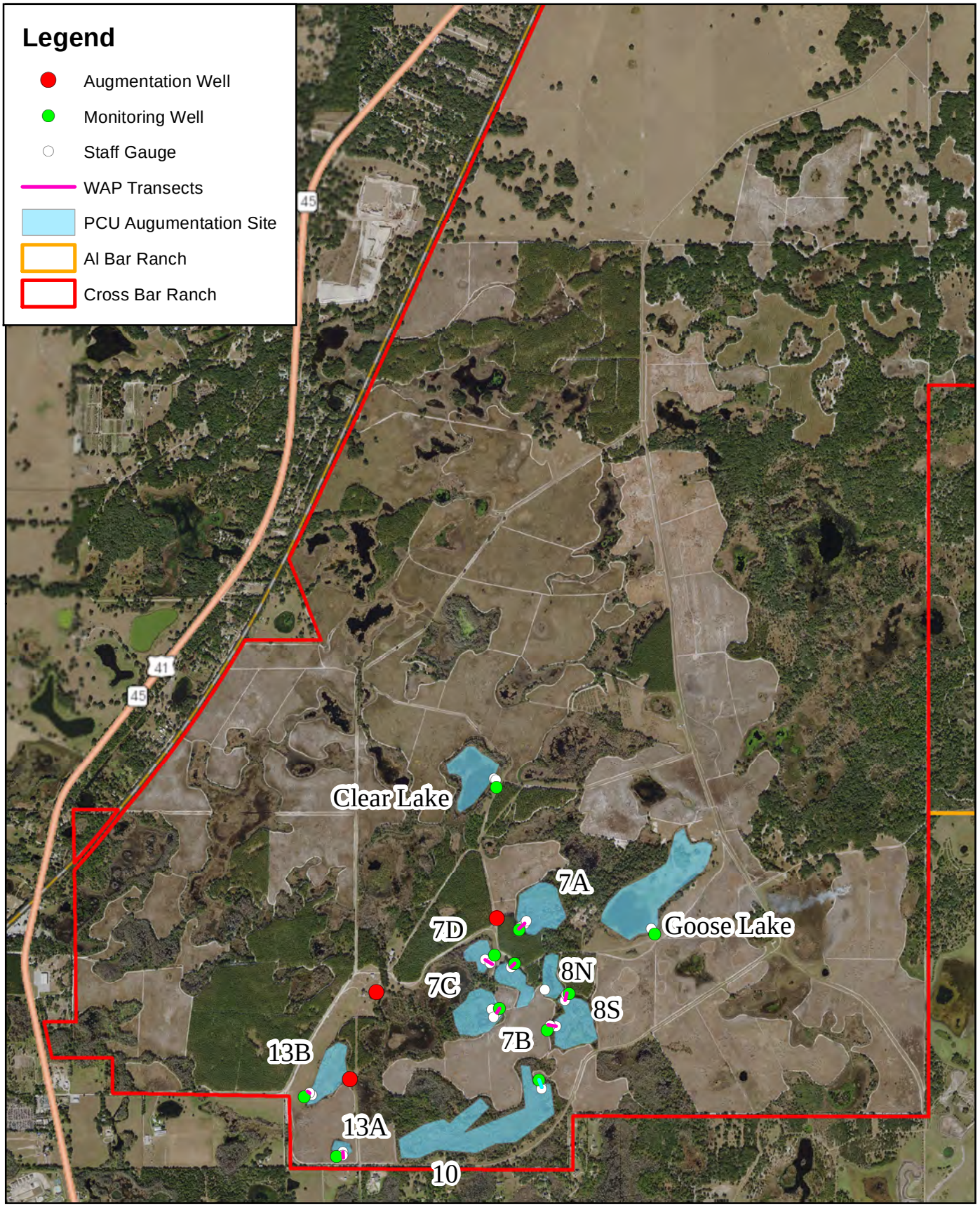
FIGURES AND HYDROGRAPHS



Path (E:\Mapping\Cross Bar - Al Bar Ranch\Maps\Cross Bar Location Map.mxd) By: AA Date: 2/19/2019

QUEST ecology

Figure 1
Location Map
Cross Bar Ranch
Pasco County, Florida



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QUEST ecology

Figure 2
Cross Bar Ranch
Pasco County, Florida

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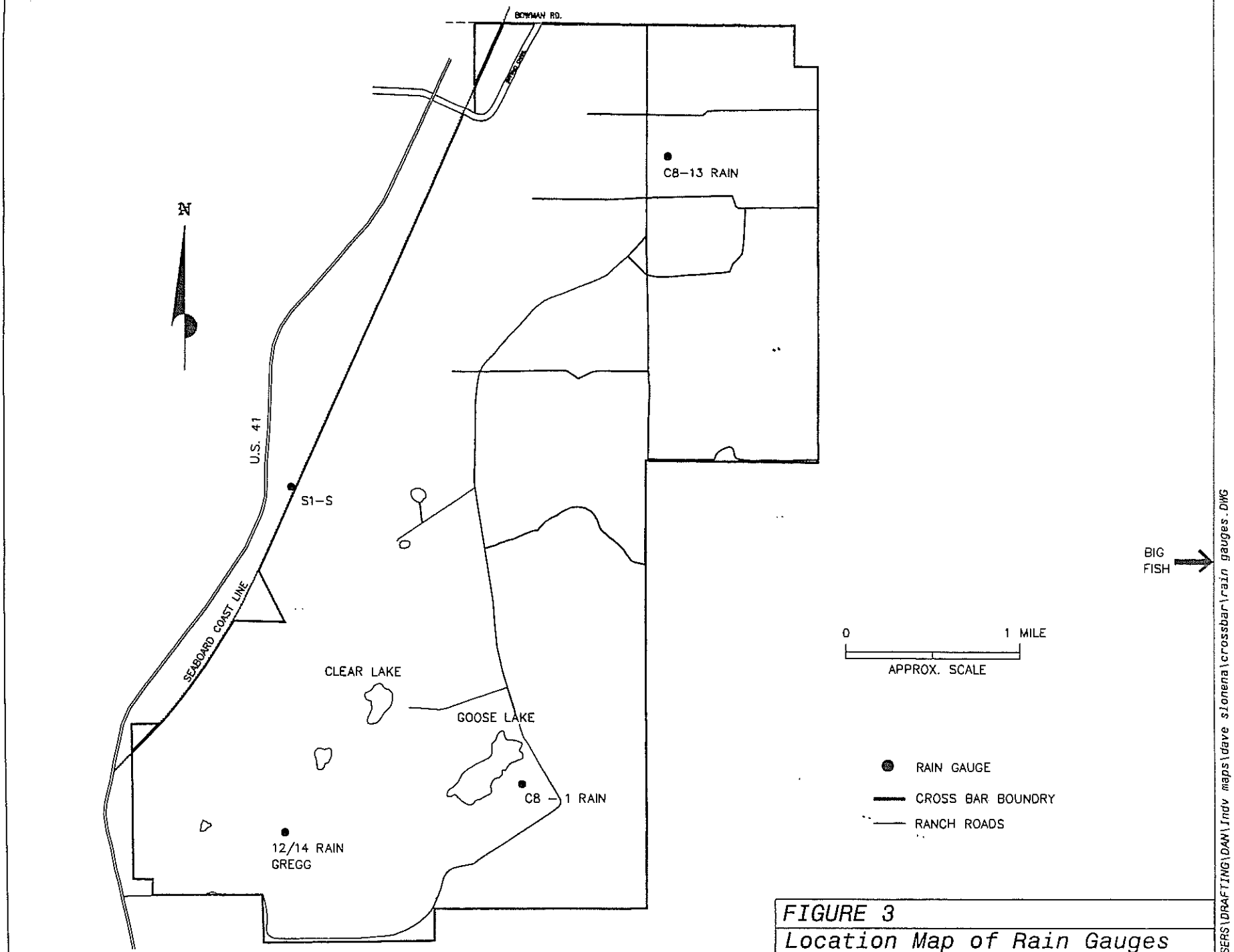

FIGURE 3

Location Map of Rain Gauges

CROSS BAR RANCH

06/12/2007

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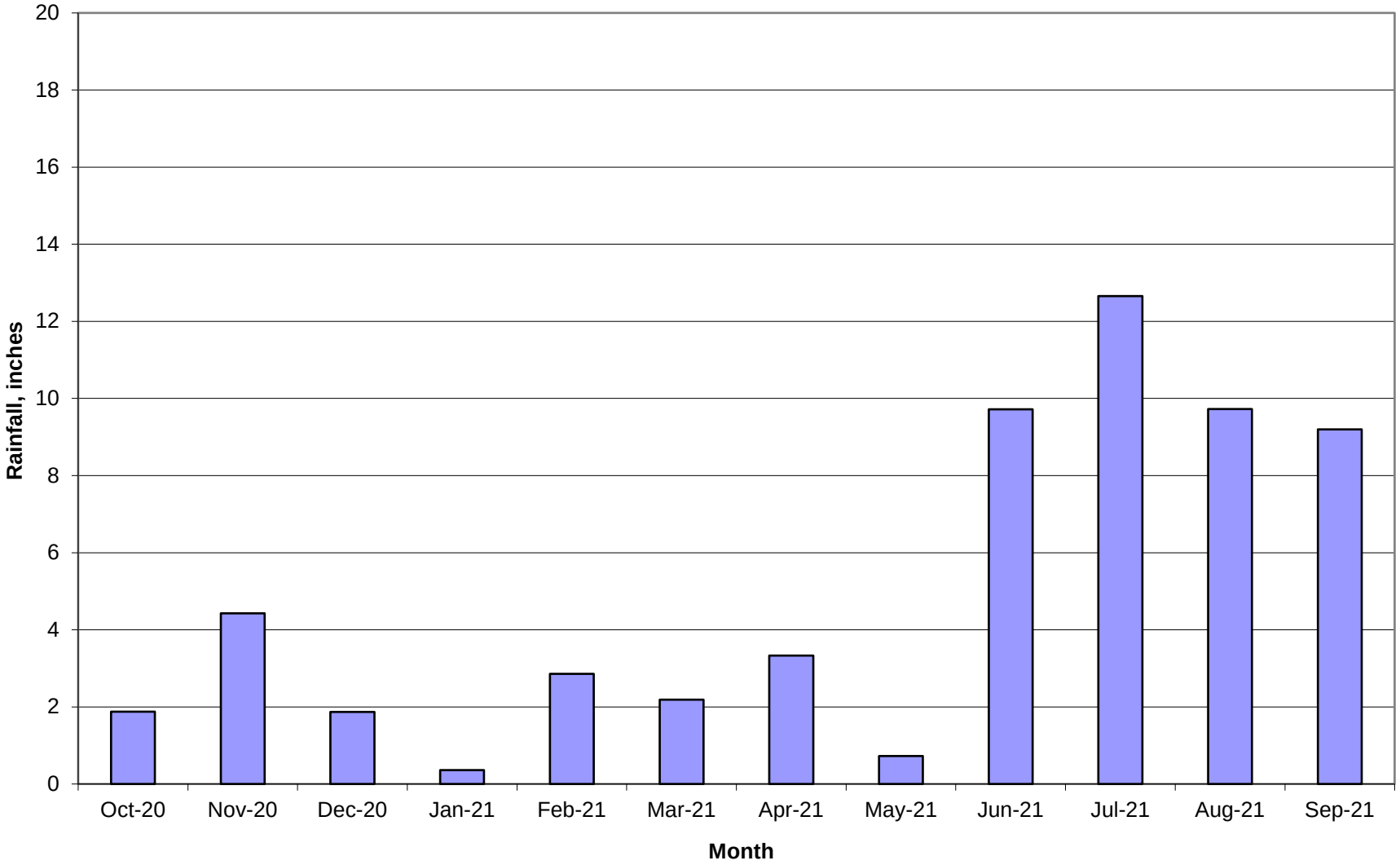
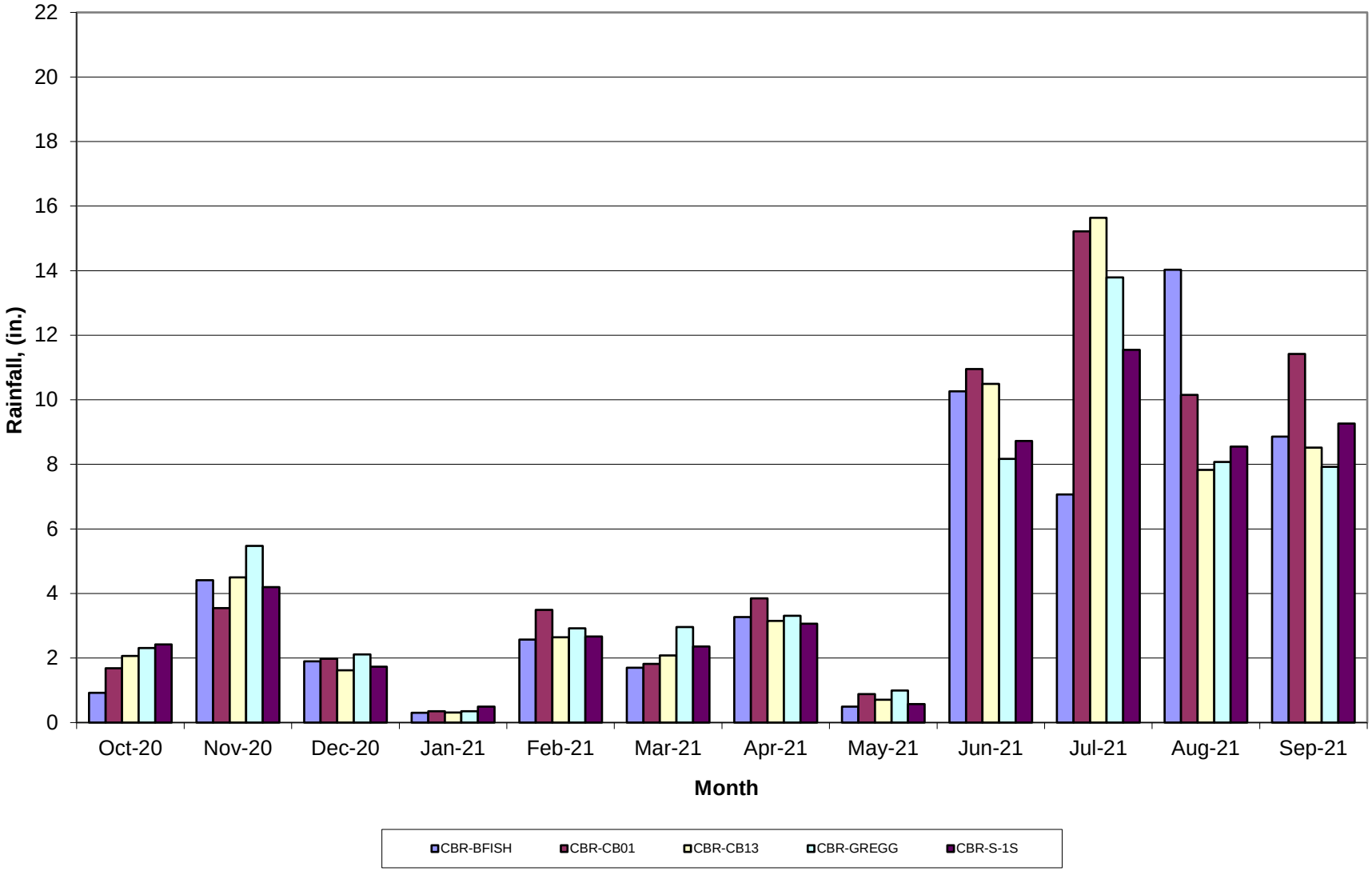
Figure 4 - Cross Bar Ranch Average Composite Monthly Rainfall, WY 2021



Source: Tampa Bay Water, 2020

Figure 5 - Total Monthly Rainfall by Station, Cross Bar Ranch, WY 2021



Source: Tampa Bay water, 2020

Figure 6 - Monthly Withdrawals Well 1 Cross Bar Ranch WY 2021

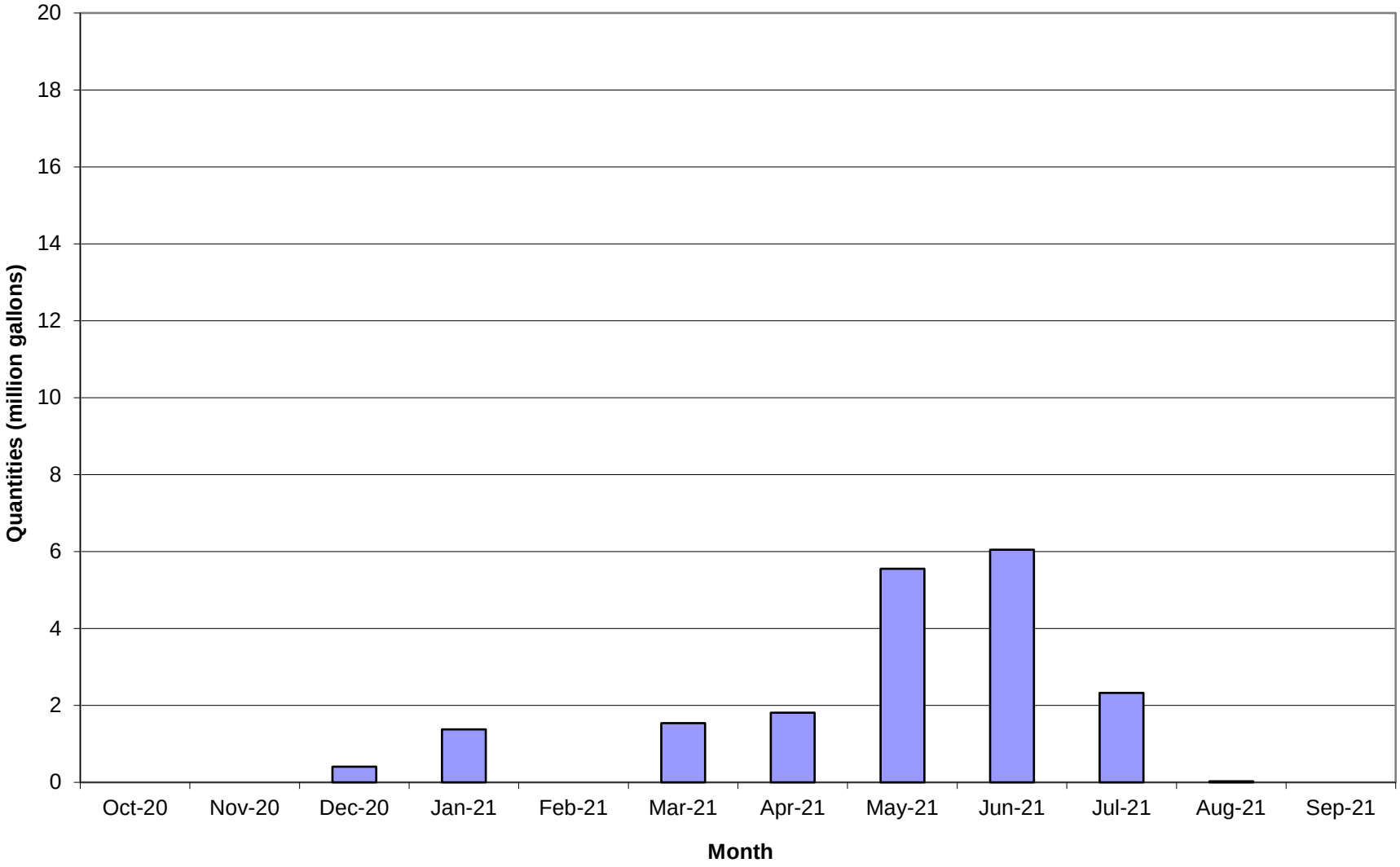


Figure 7 - Total Augmentation Quantities by Wetland Site, Cross Bar Ranch WY 2021

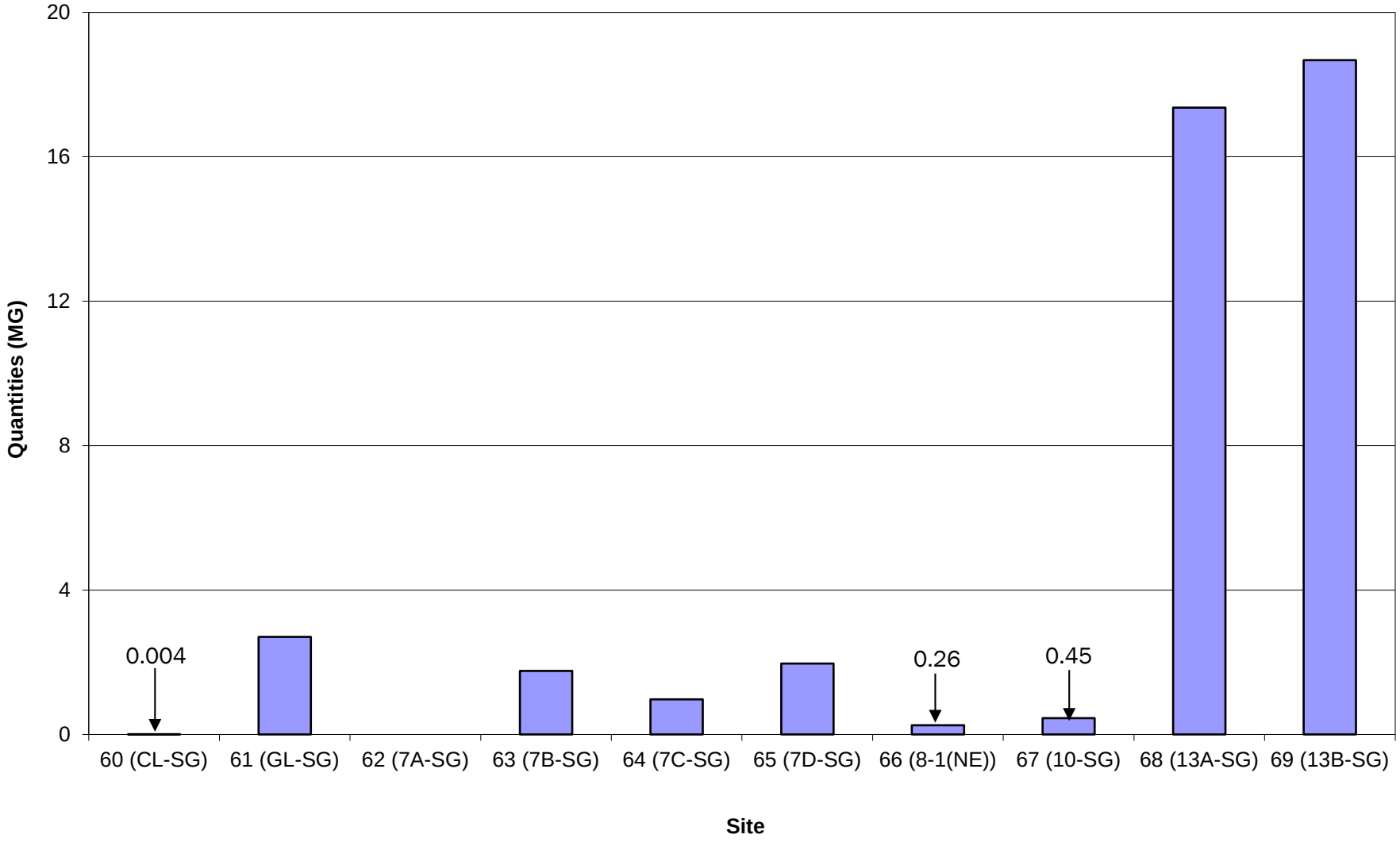


Figure 8 - Total Monthly Augmentation Well Withdrawals, Cross Bar Ranch WY 2021

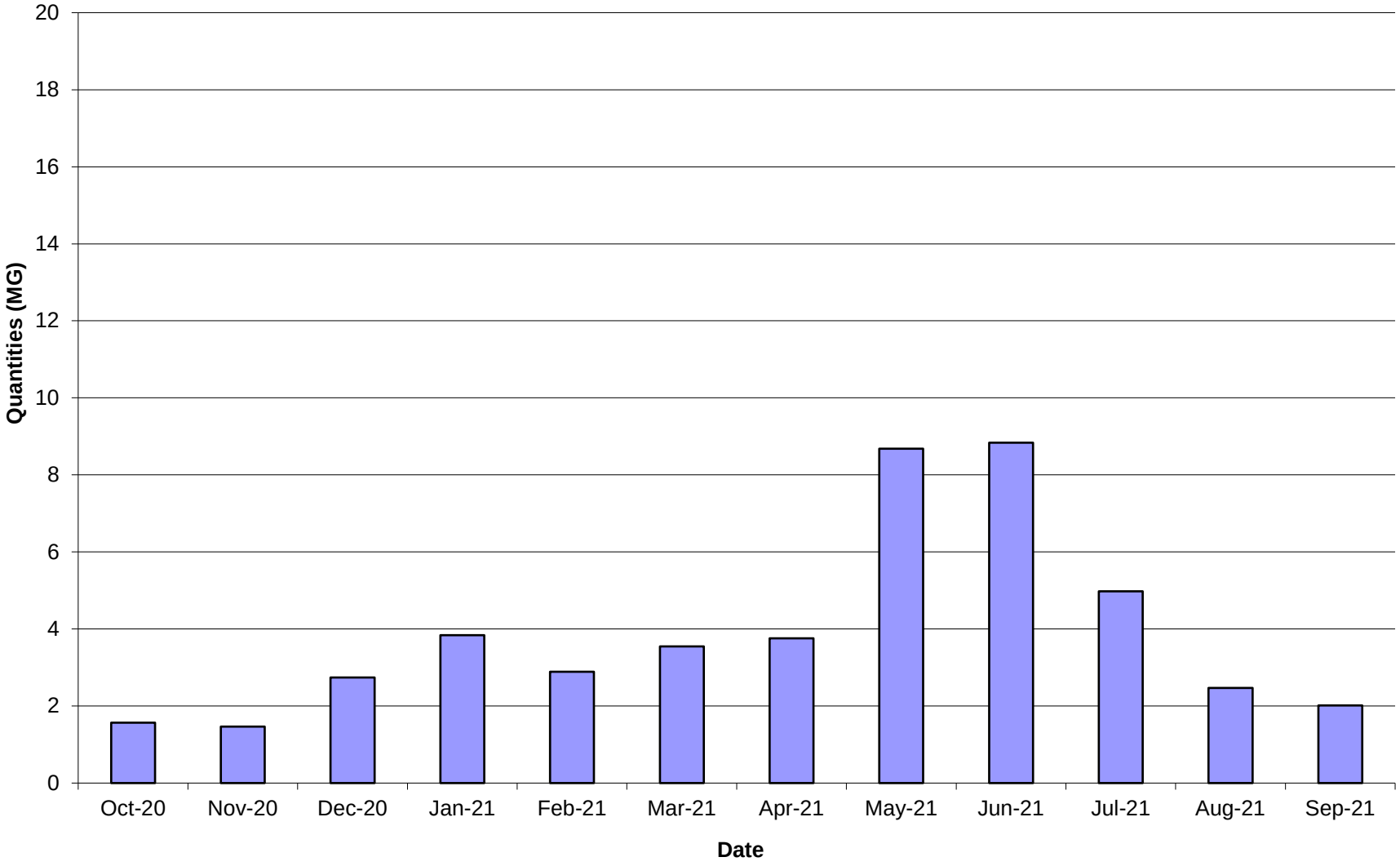


Figure 9 - Goose Lake Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

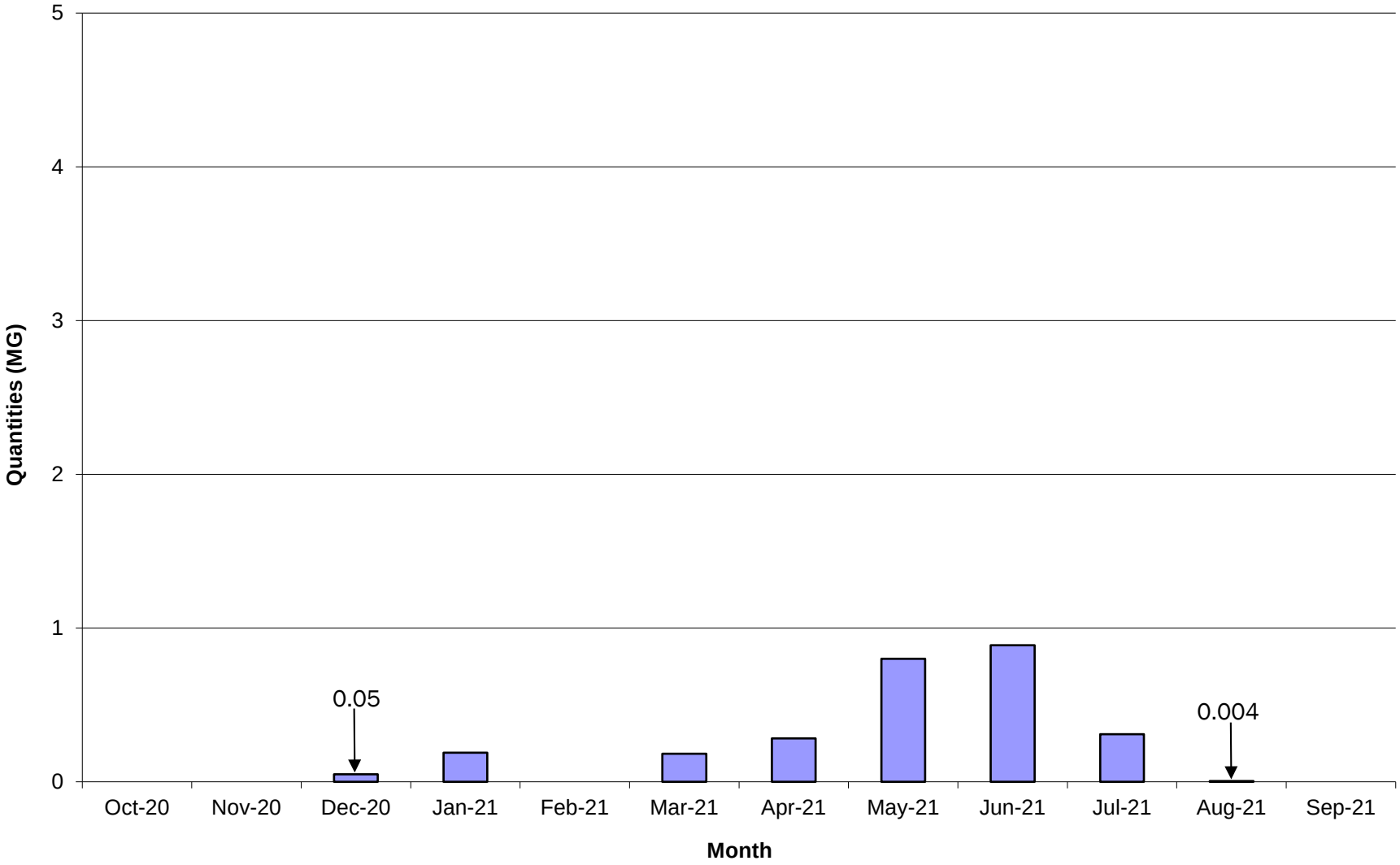


Figure 10 - Site 7B Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

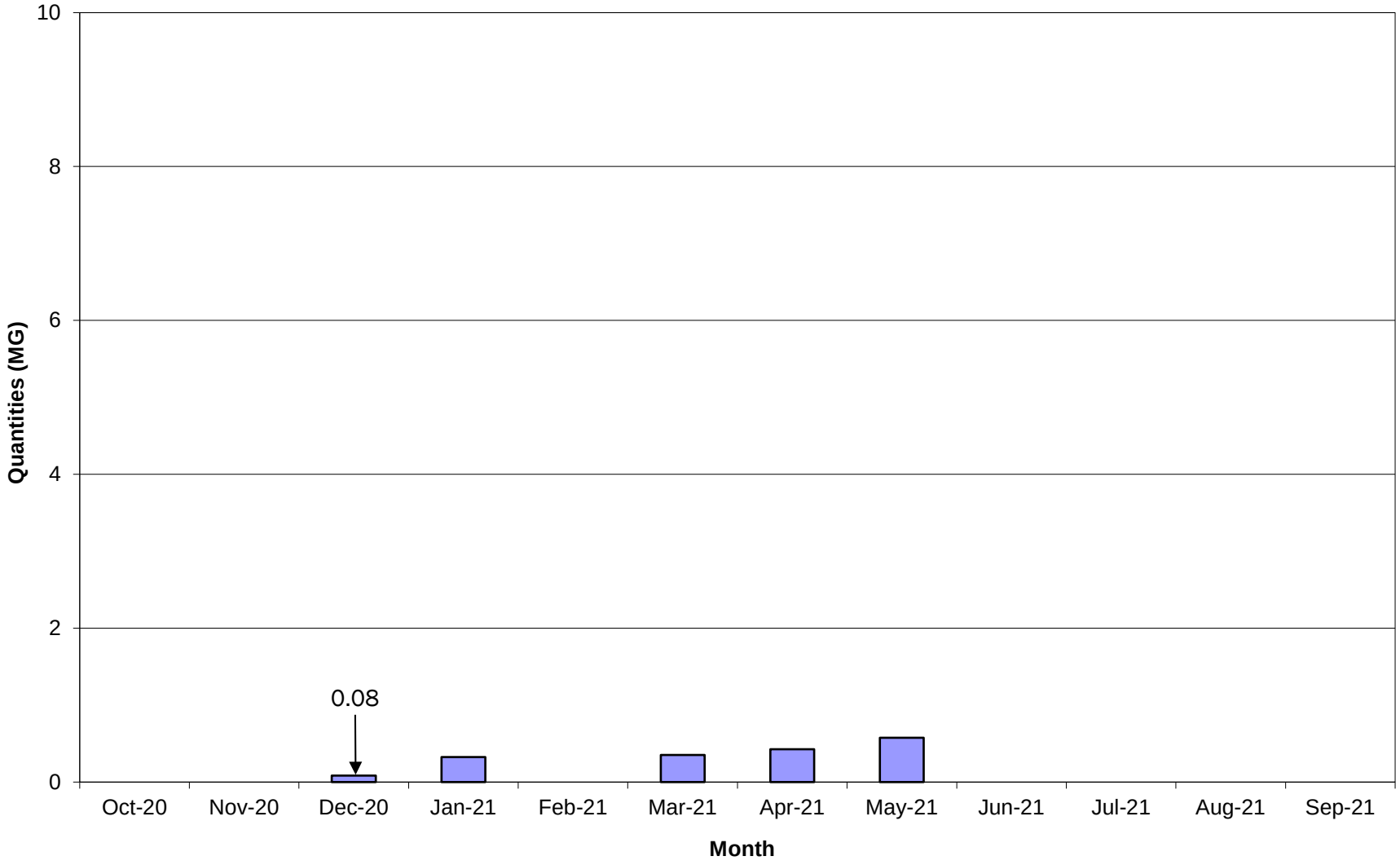


Figure 11 - Site 7C Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

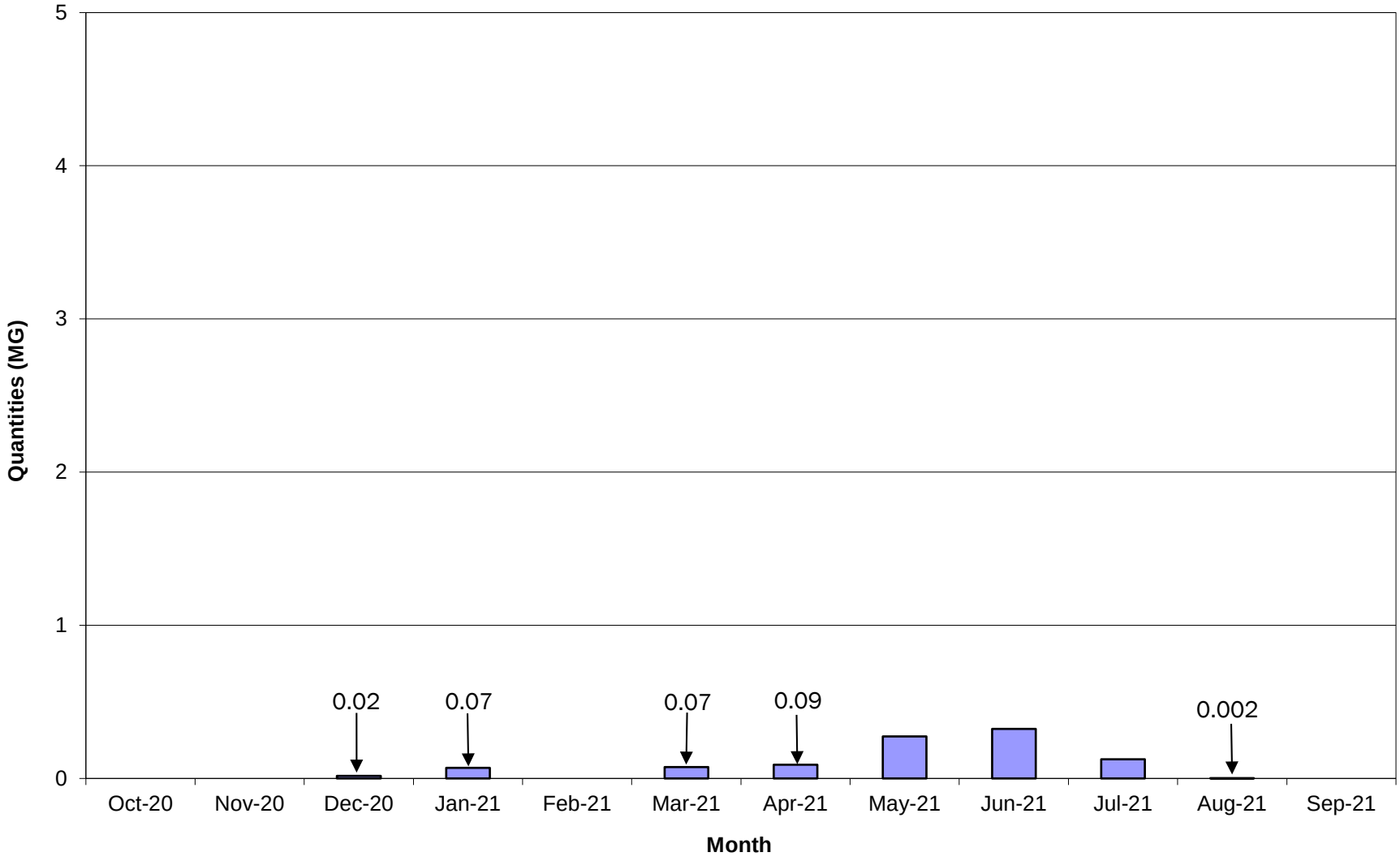


Figure 12 - Site 7D Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

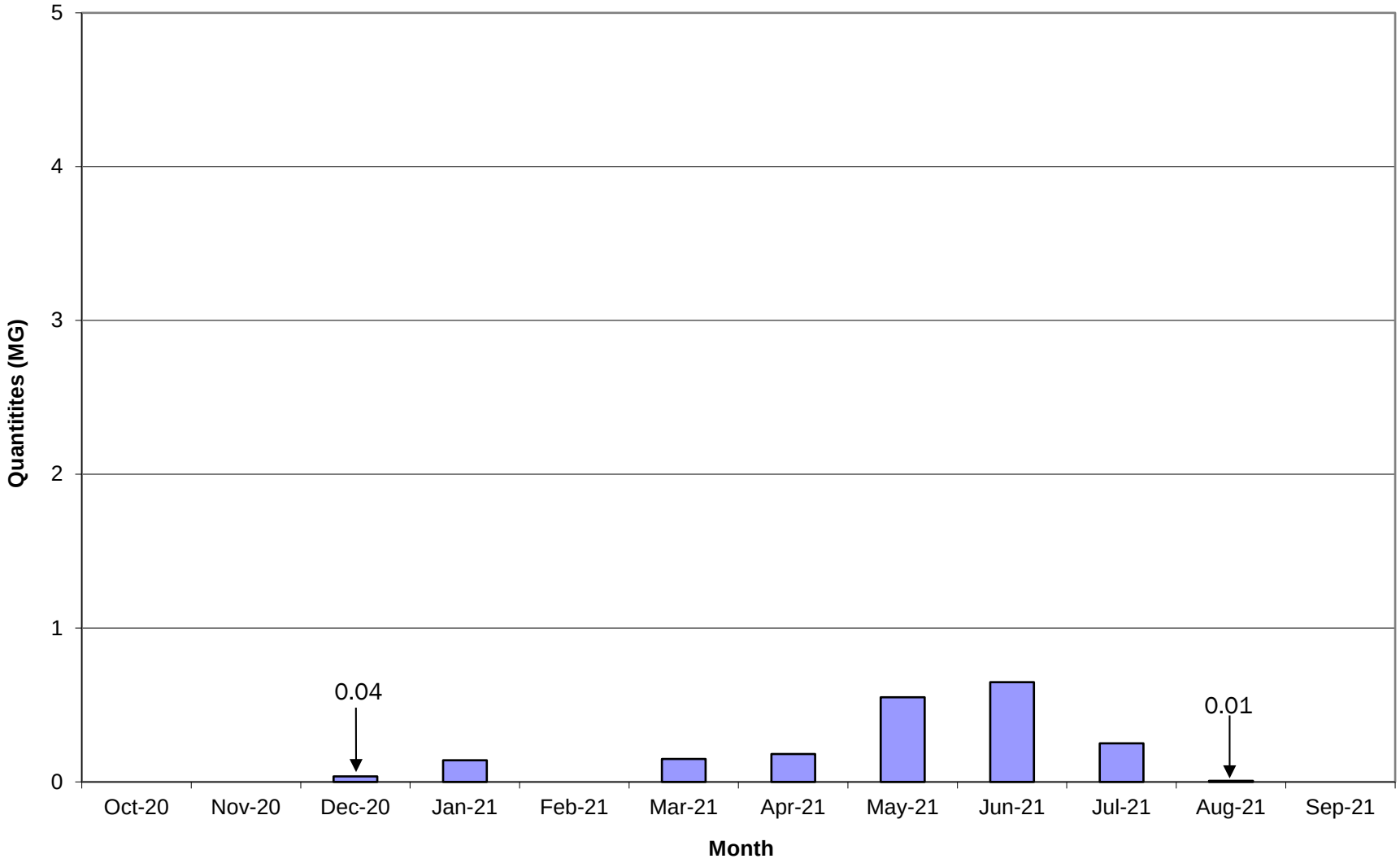


Figure 13 - Site 8-1(N) Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

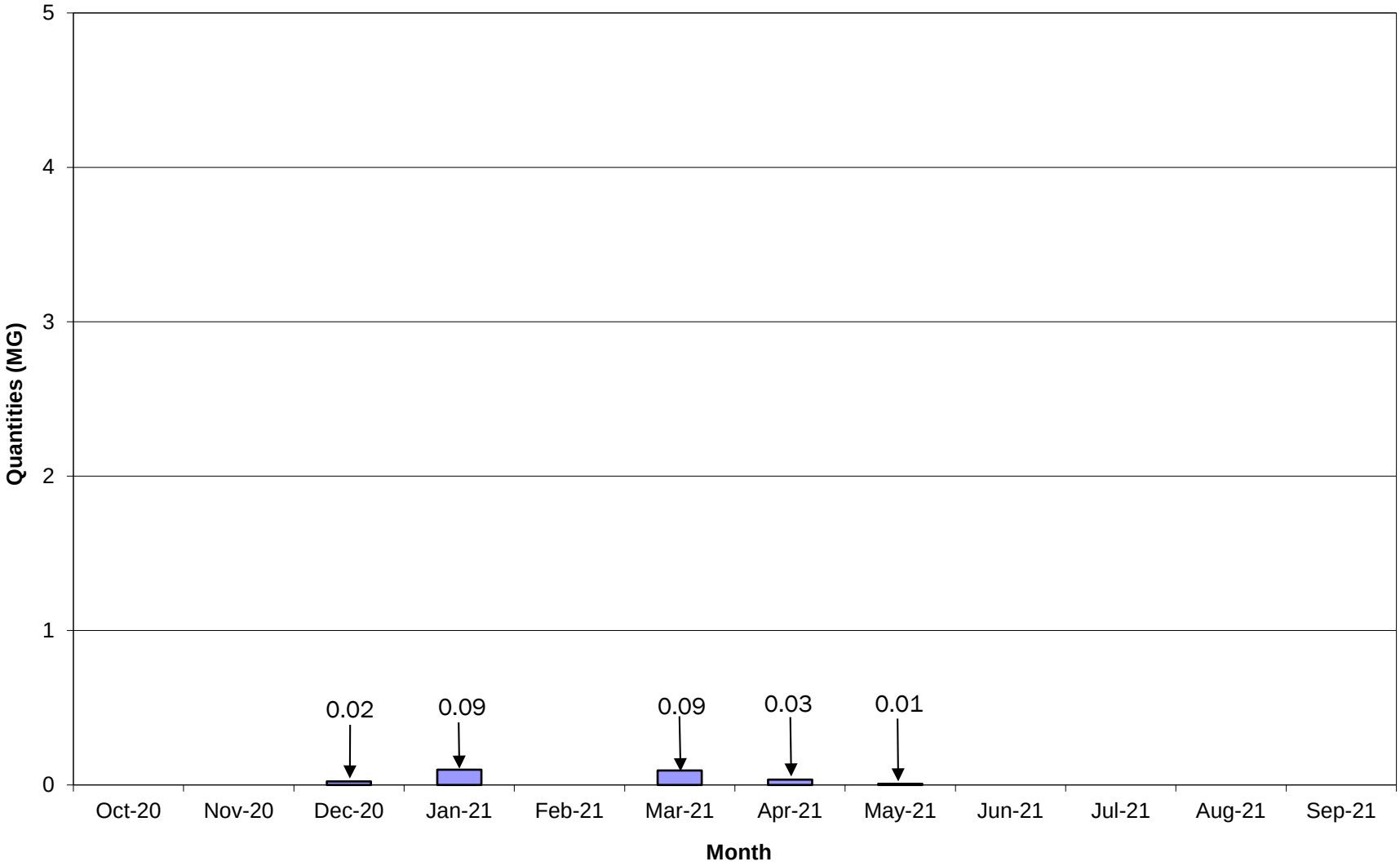


Figure 14 - Site 10 Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

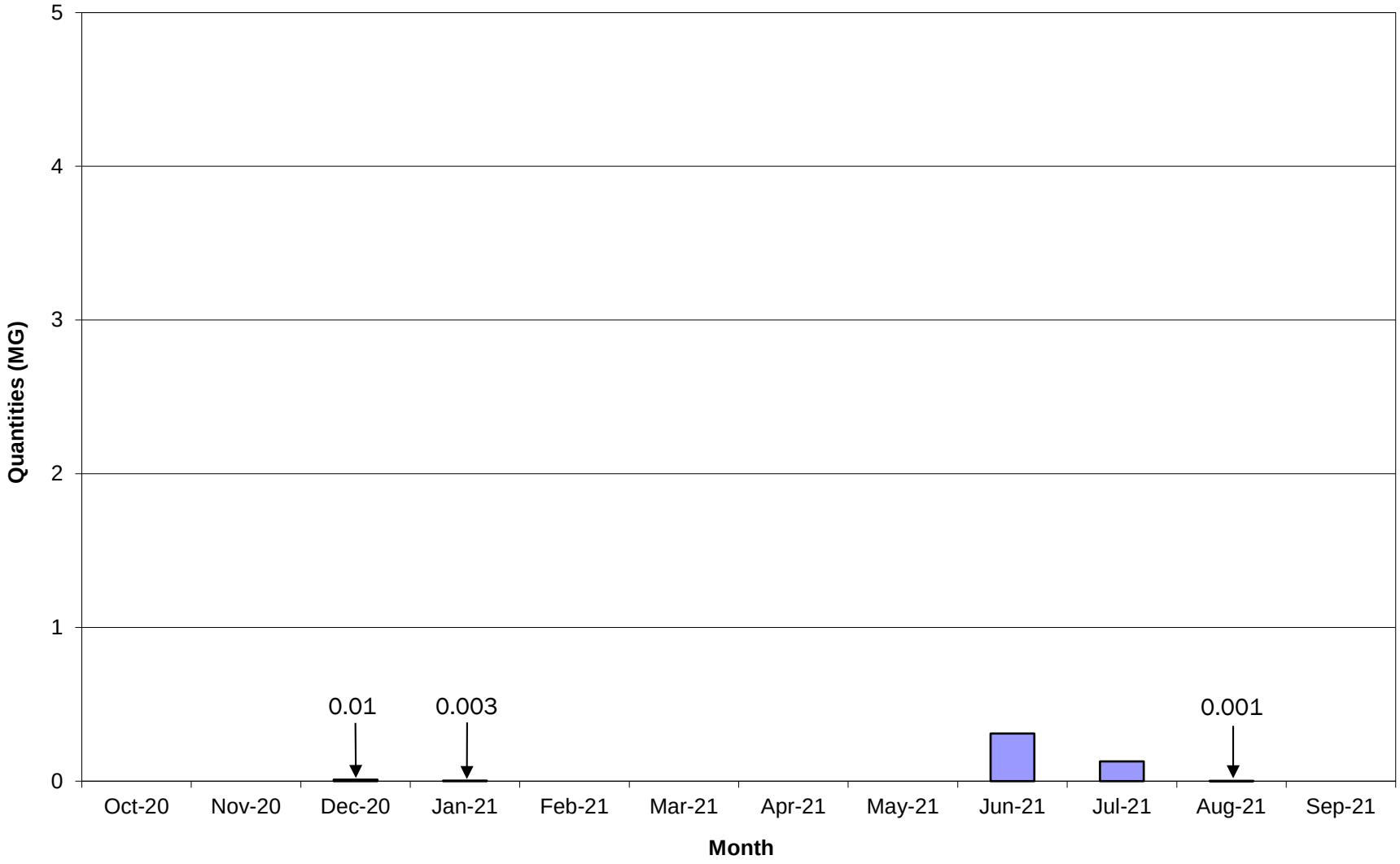


Figure 15 - Well 4 Monthly Withdrawals, Cross Bar Ranch WY 2021

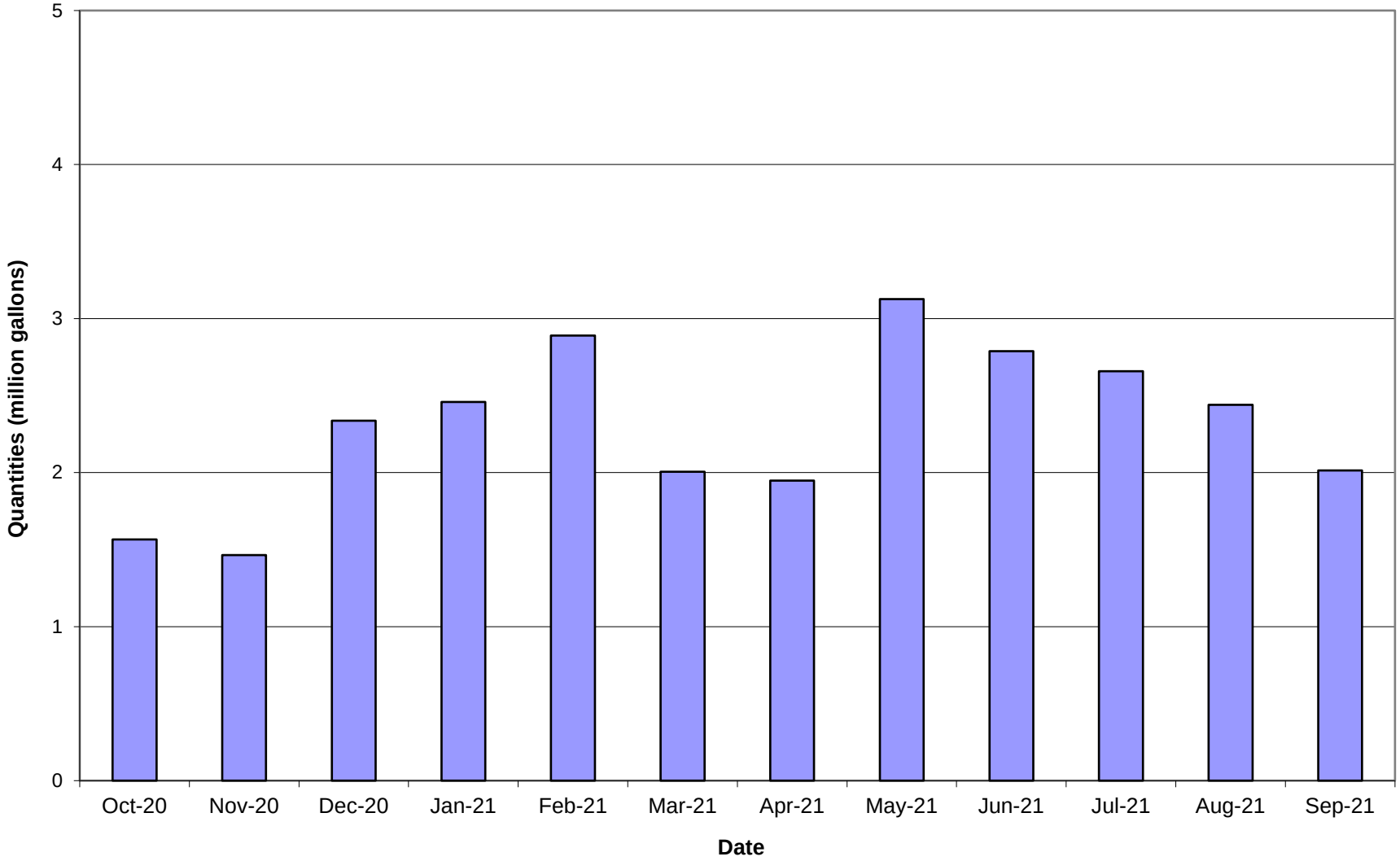


Figure 16 - Site 13A Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

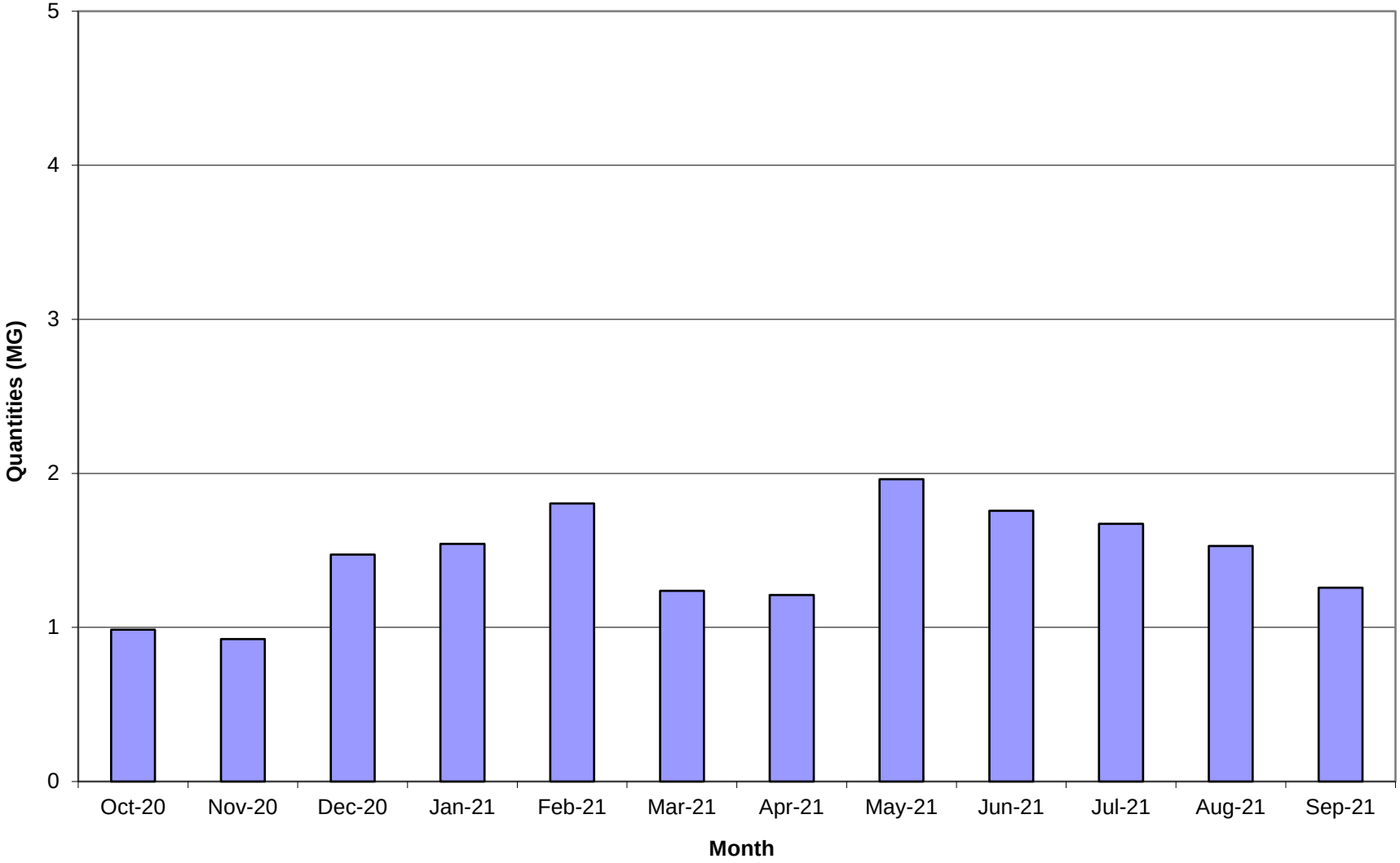


Figure 17 - Site 13B Monthly Augmentation Quantities, Cross Bar Ranch WY 2021

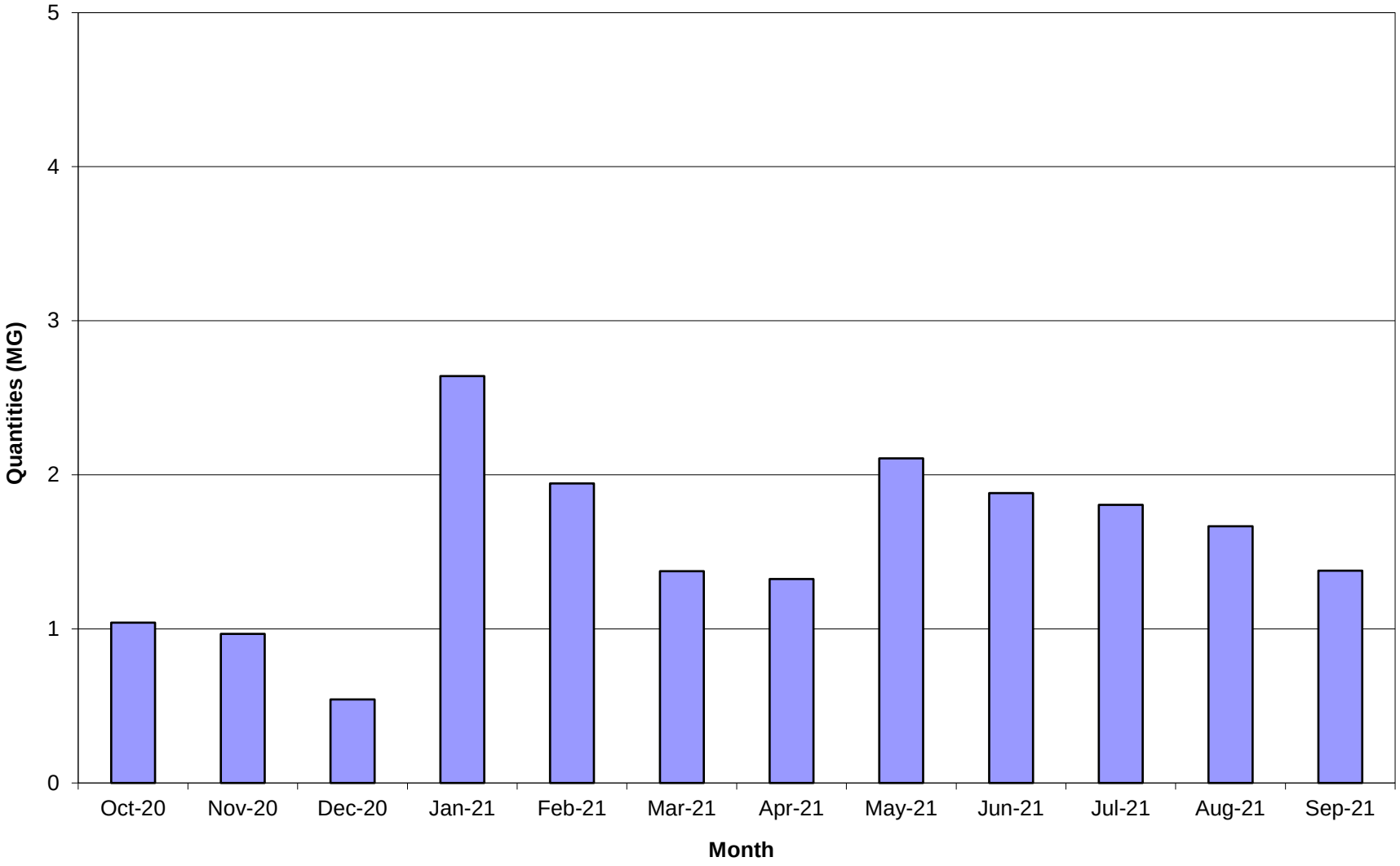


Figure 18 - Clear Lake Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

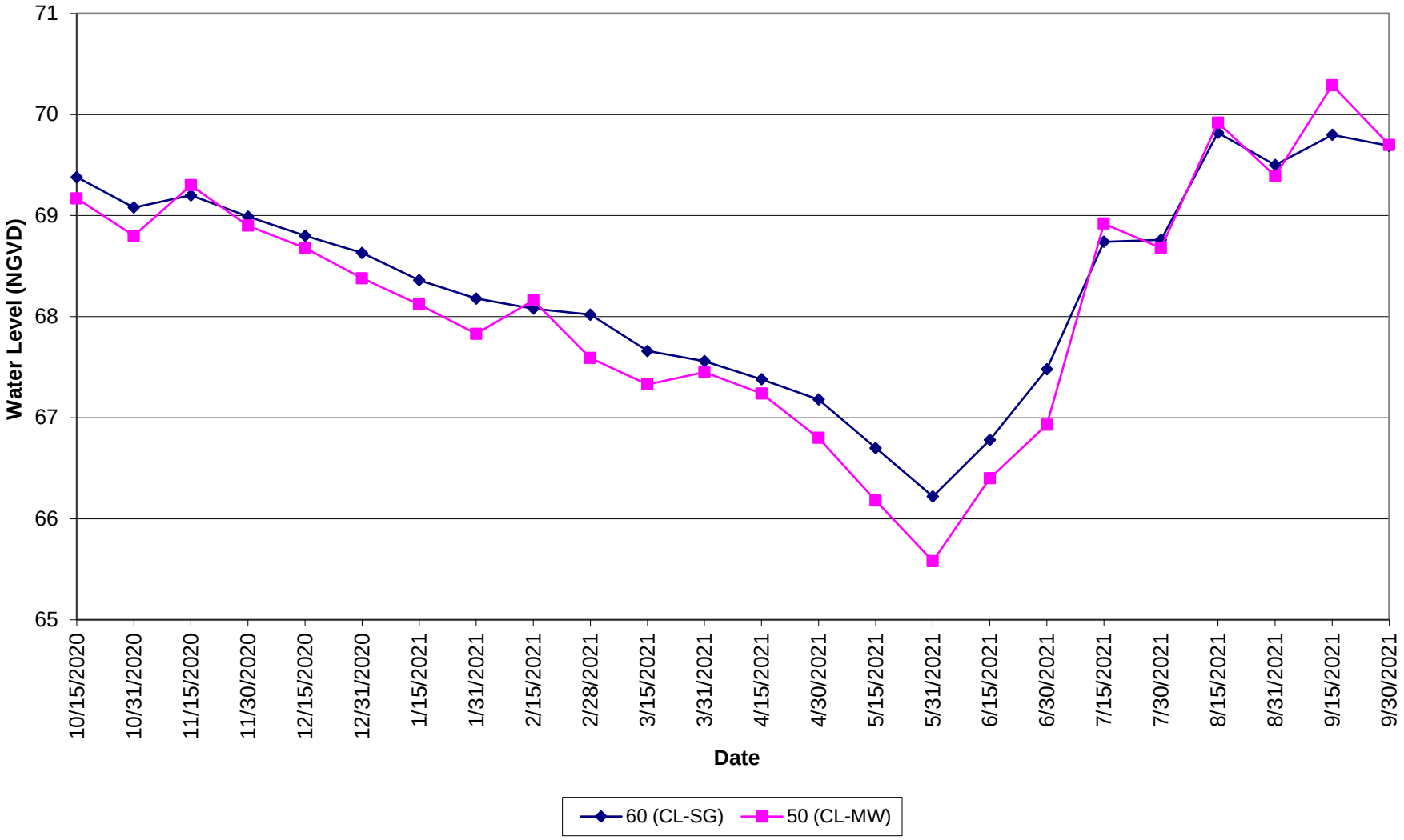


Figure 19 - Goose Lake Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

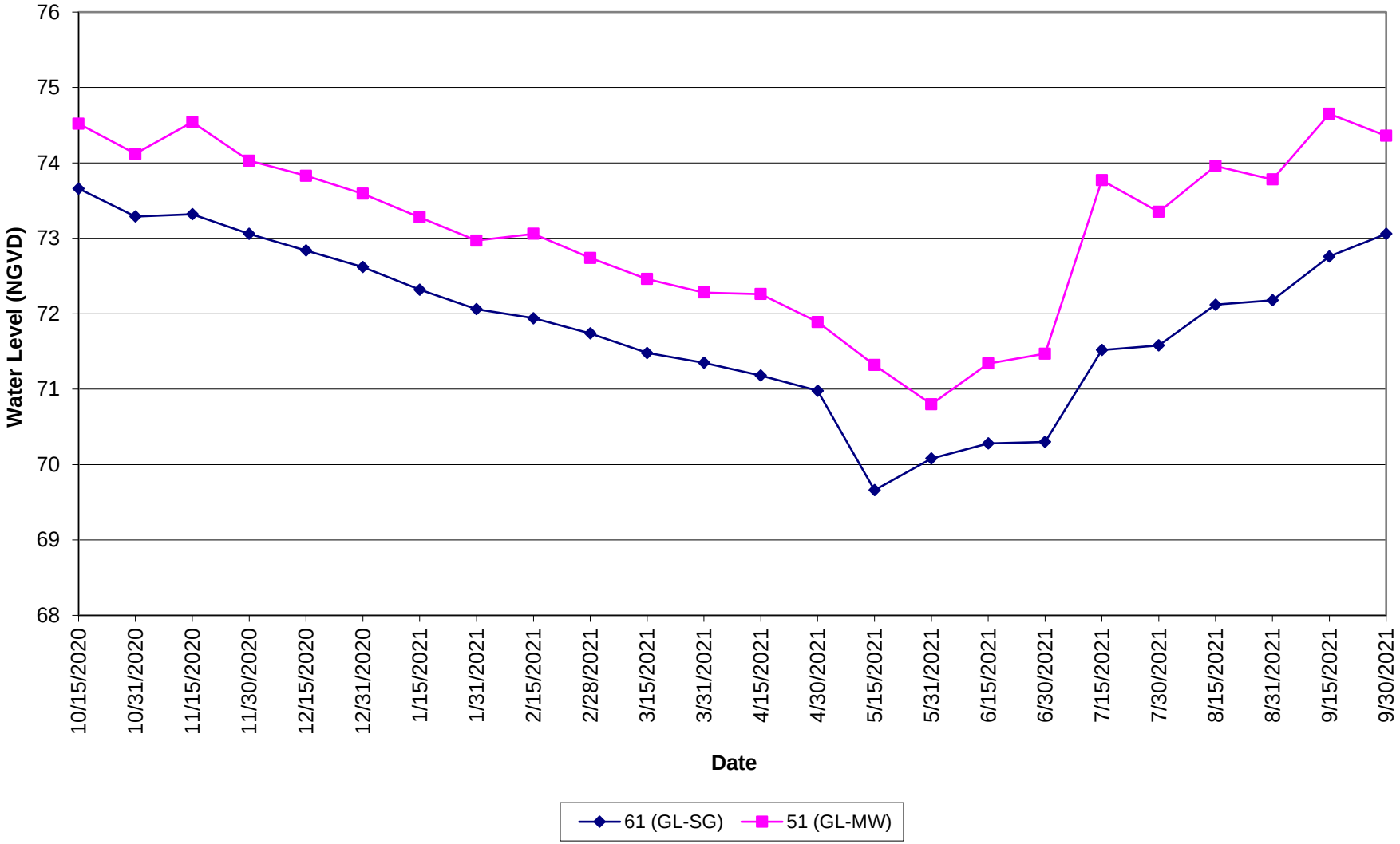


Figure 20 - Site 7A Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

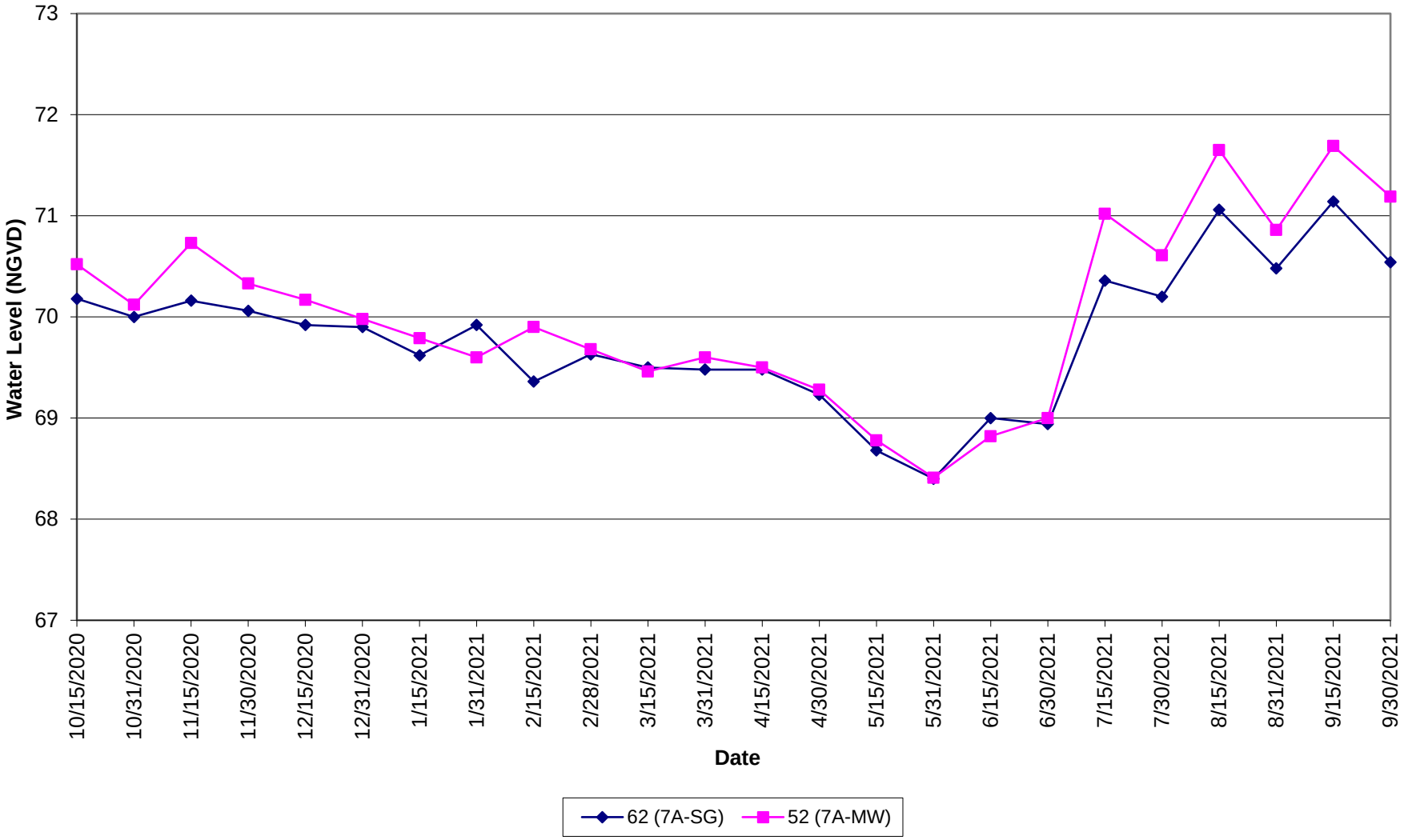


Figure 21 - Site 7B Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

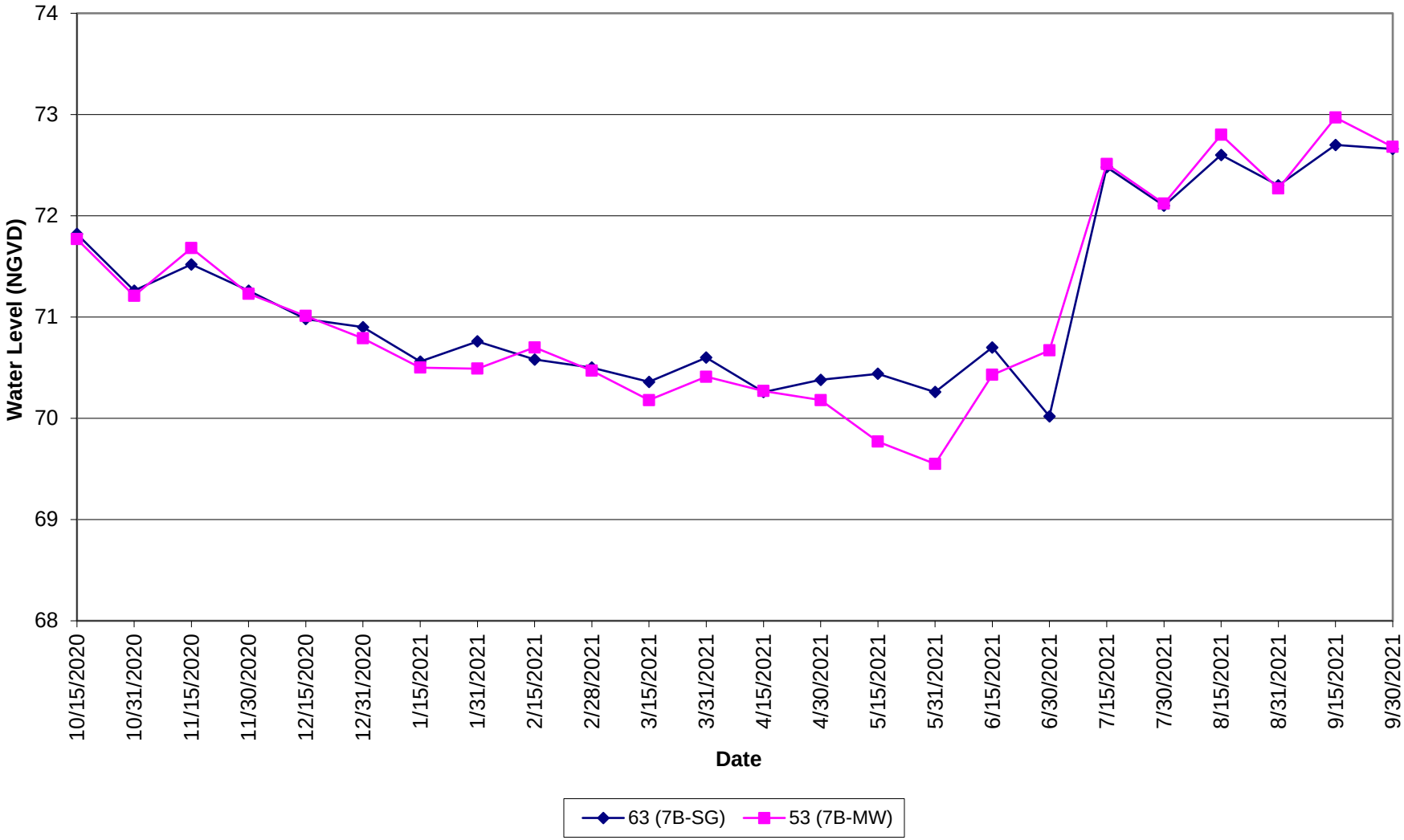


Figure 22 - Site 7C Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

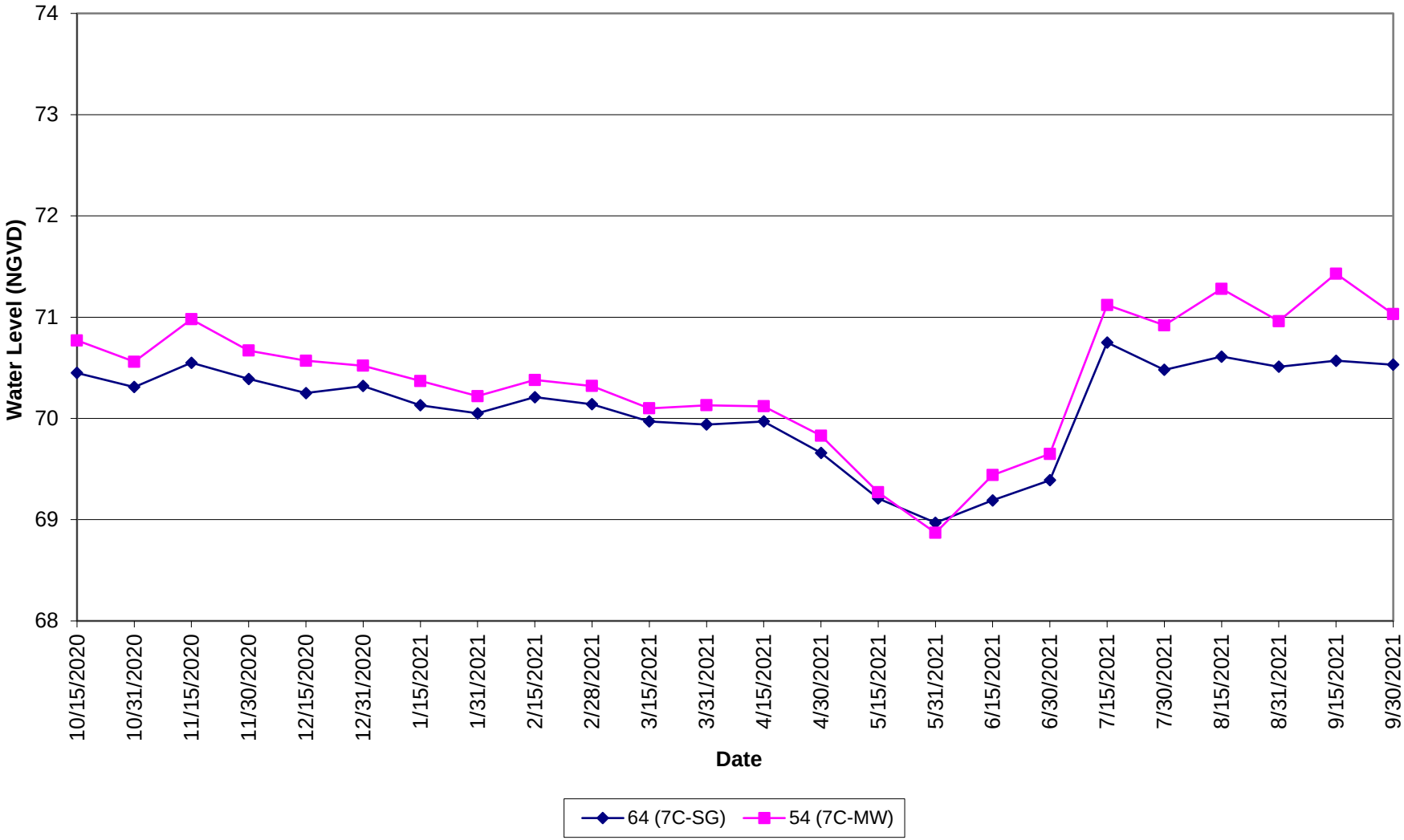


Figure 23 - Site 7D Bi-weekly Staff Gage and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

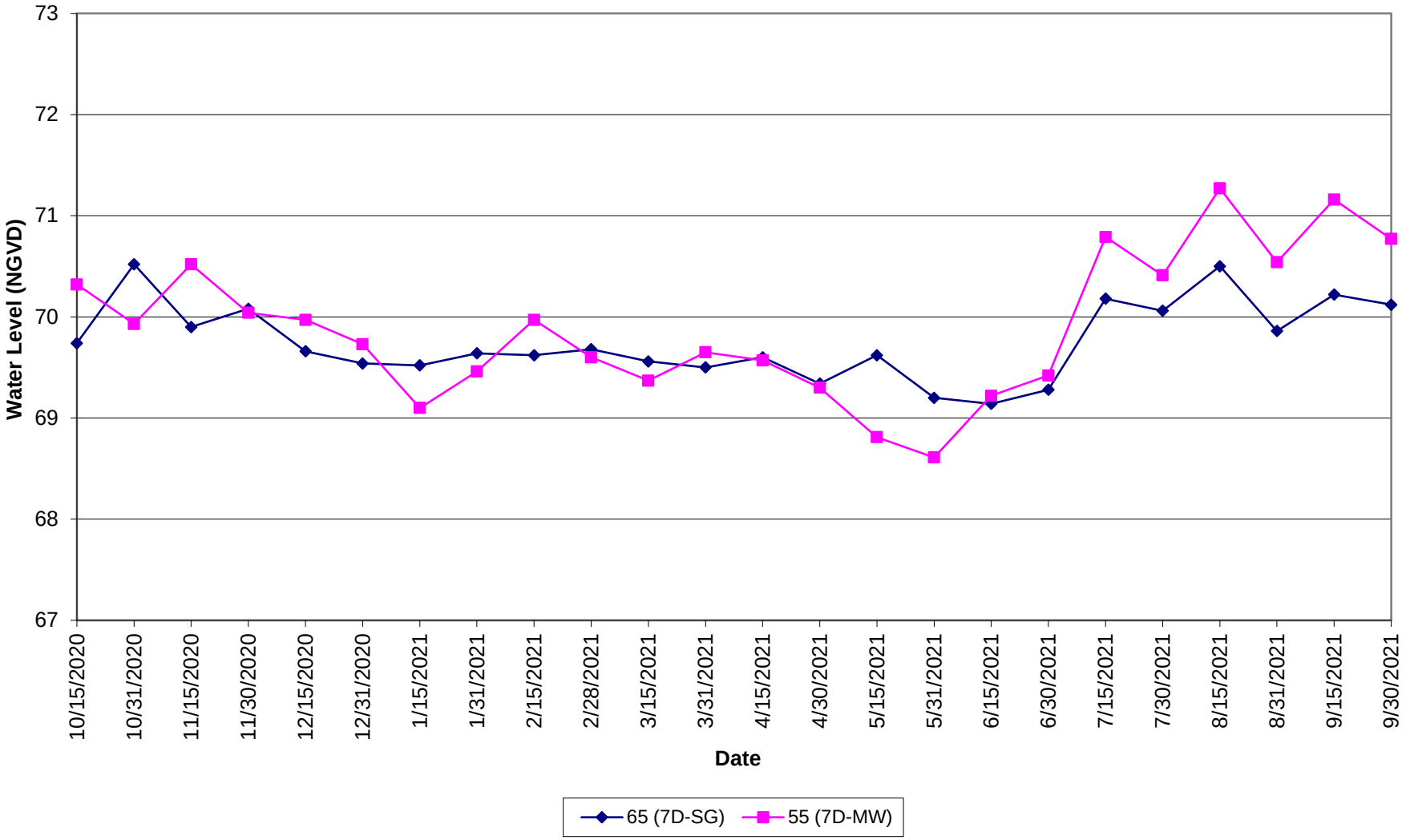


Figure 24 - Site 8-1(NE) Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

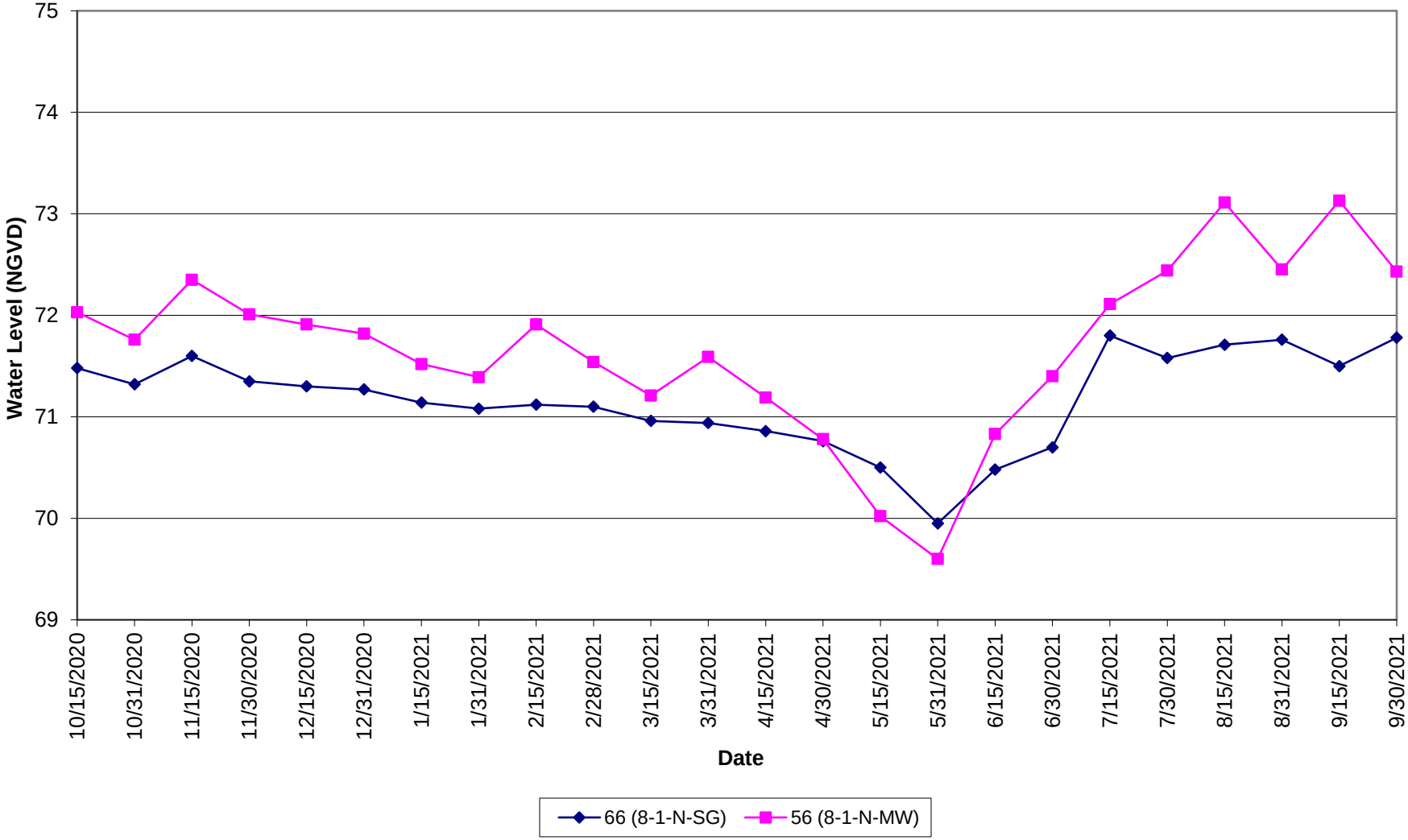


Figure 25 - Site 8-2(SW) Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

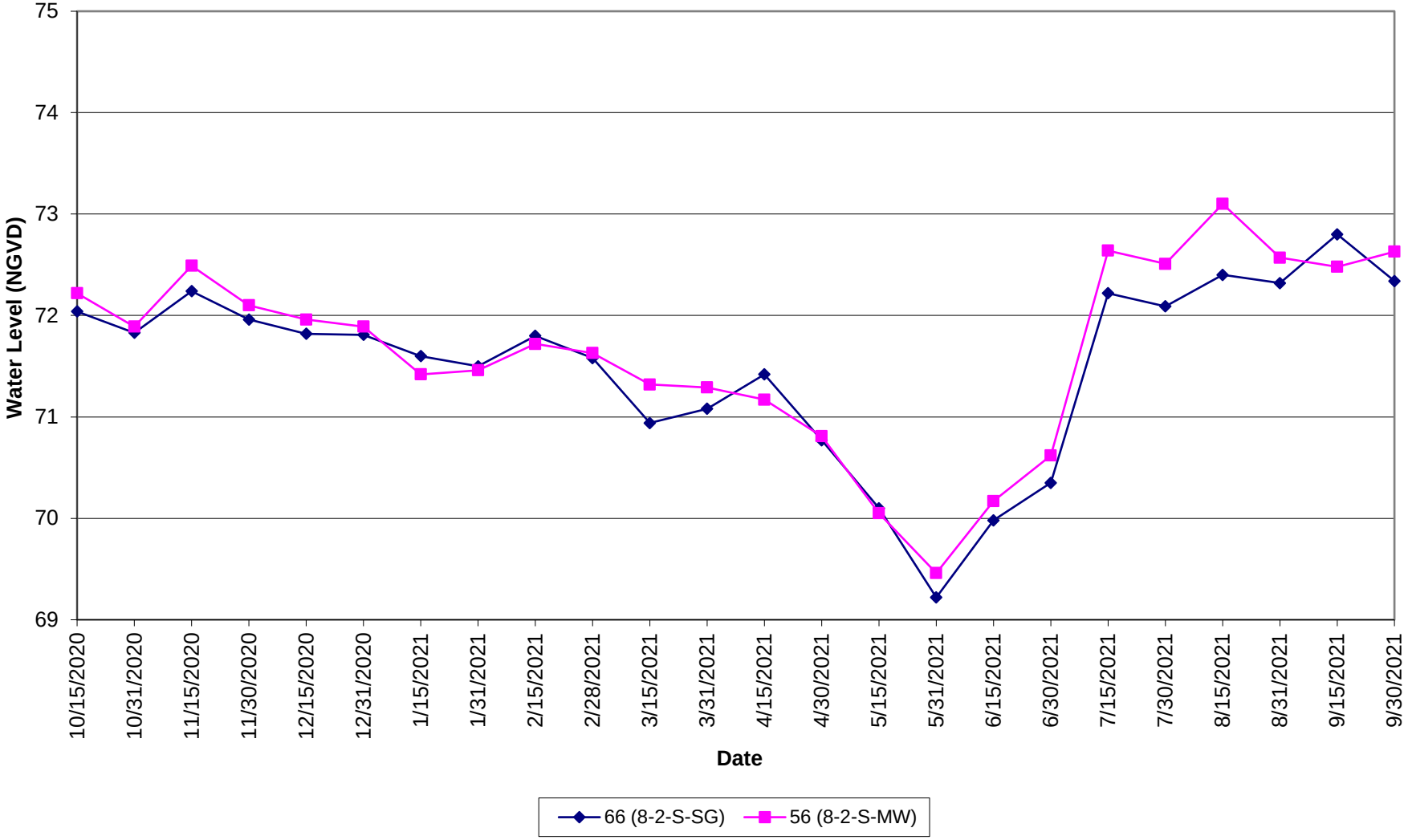


Figure 26 - Site 10 Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

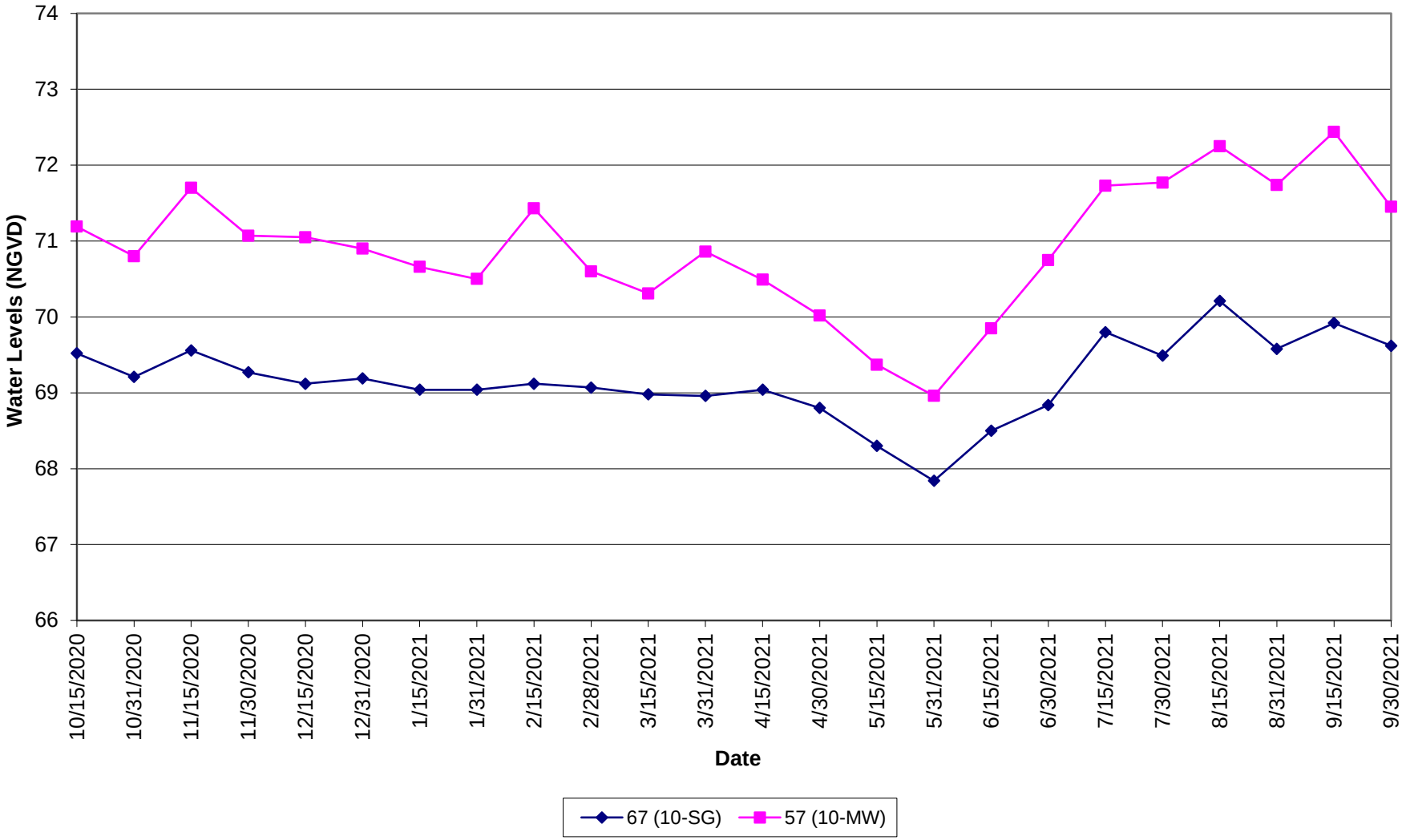


Figure 27 - Site 13A Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch, WY 2021

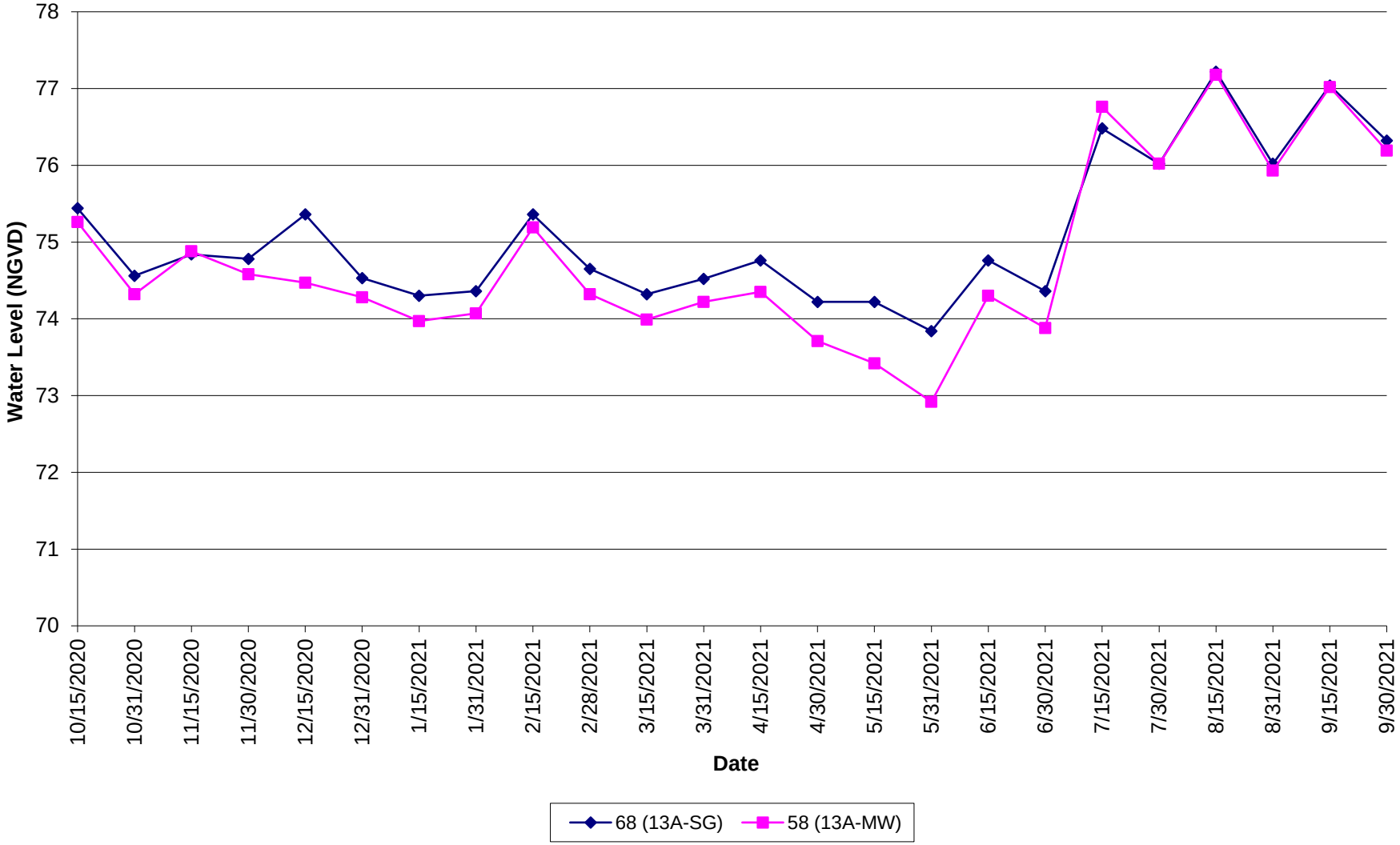


Figure 28 - Site 13B Bi-weekly Staff Gauge and Monitor Well Water Elevations, Cross Bar Ranch WY 2021

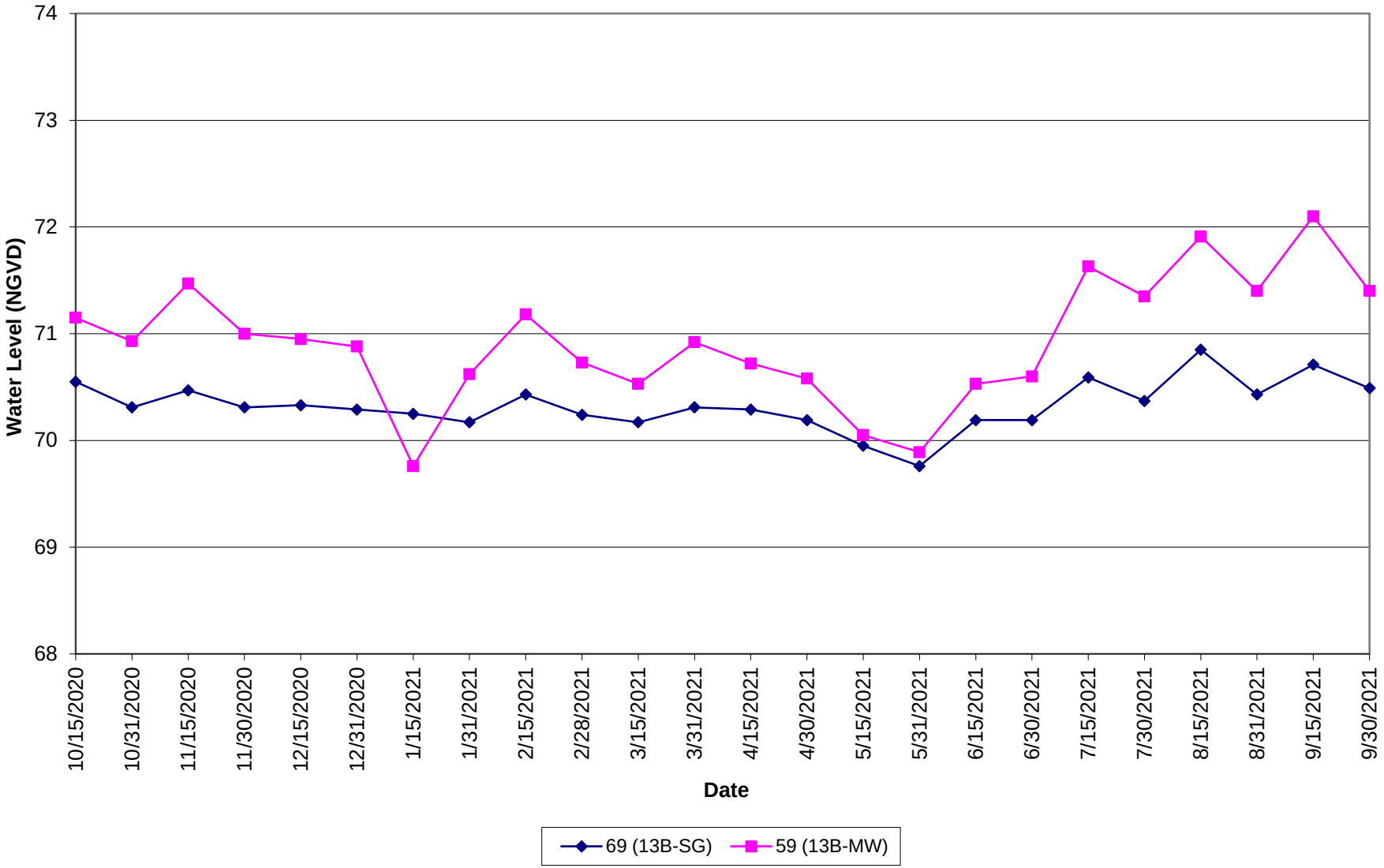
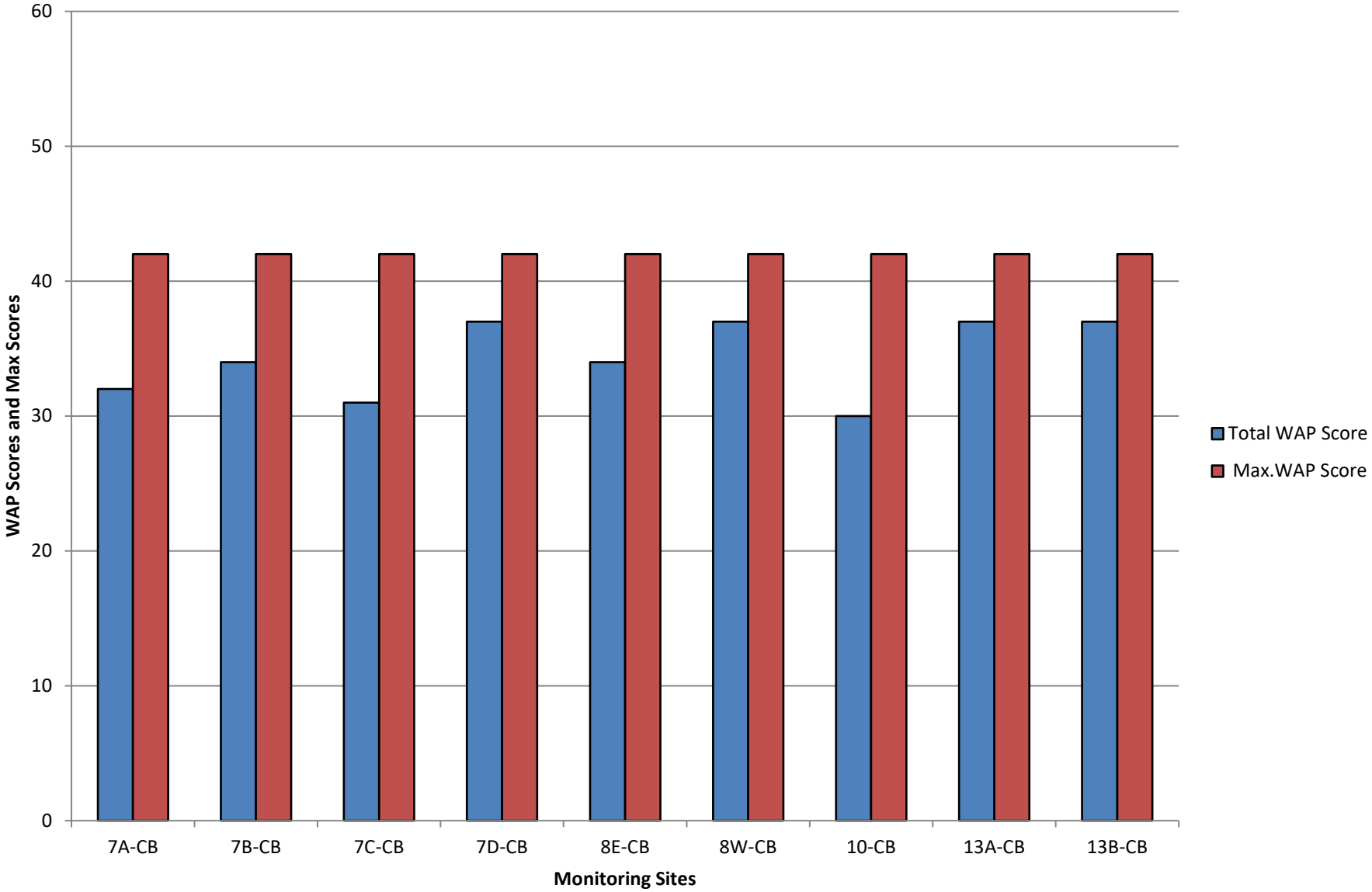
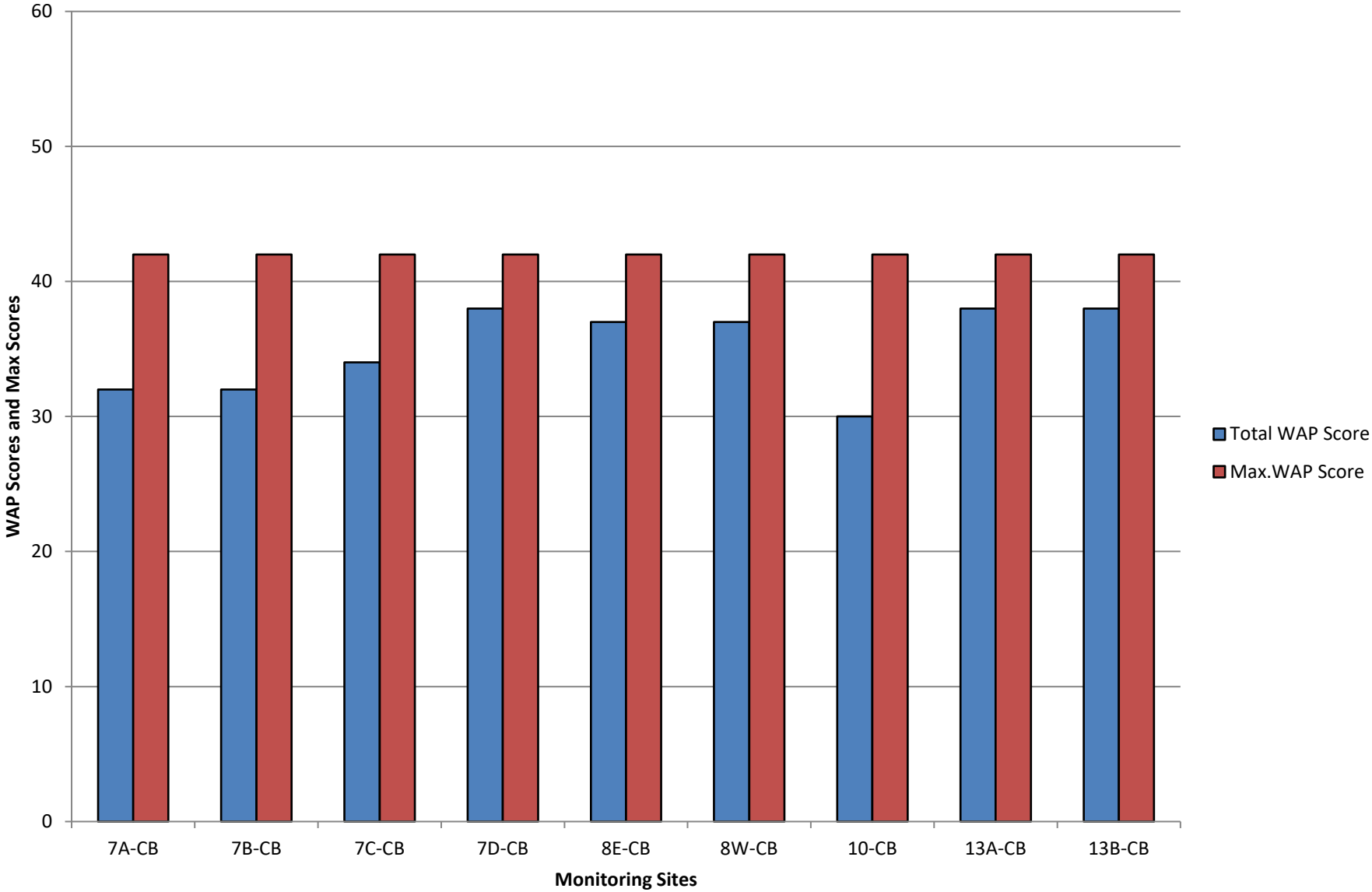


Figure 29
Wetland Assessment Scores at Cross Bar Ranch April 2021



Source: PEACOCK AND ASSOCIATES, LLC

Figure 30
Wetland Assessment Scores at Cross Bar Ranch September 2021



Source: PEACOCK AND ASSOCIATES, LLC

APPENDIX B

WATER USE PERMIT

DETAILS FOR AUGMENTATION AND MONITOR WELLS

Southwest Florida Water Management District
2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
TDD only: 1-800-231-6103 (FL only)
On the Internet at WaterMatters.org

An Equal Opportunity Employer

Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)

Sarasota Service Office
6750 Fruitville Road
Sarasota, Florida 34240-9711
(941) 377-3722 or
1-800-320-3503 (FL only)

Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

May 24, 2011

Pinellas County Utilities
14 South Fort Harrison Ave, 6th Floor
Clearwater, FL 33756

Subject: Final Agency Action Transmittal Letter
Individual Water Use Permit No. 20 004649.007

Dear Pinellas County Utilities:

This Water Use Permit was approved by the District Governing Board subject to all terms and conditions set forth in the Permit.

Please be advised that the Governing Board has formulated a water shortage plan as referenced in Condition 15 of the Standard Water Use Permit Conditions (Exhibit A), and will implement such a plan during periods of water shortage. You will be notified during a declared water shortage of any change in the conditions of your Permit or any suspension of your Permit, or of any restriction on your use of water for the duration of any declared water shortage. Please further note that water conservation is a condition of your Permit and should be practiced at all times.

The well tags for your withdrawals will be applied by a District representative. If you have any questions or concerns regarding your tags, please contact Frank Gargano at extension 4289, in the Brooksville Regulation Department. If you have any questions or concerns regarding your permit or any other information, please contact the Brooksville Regulation Department and ask to speak to someone in the Water Use Regulation Section

Sincerely,

Henry Robert Lue, P.E. Electronically Signed

Henry Robert Lue, P.E., Director
Brooksville Regulation Department

Enclosures: Approved Permit
cc: File of Record
David Slonena, Pinellas County Utilities

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
WATER USE
INDIVIDUAL
PERMIT NO. 20 004649.007

EXPIRATION DATE:	**May 24, 2021**	**PERMIT ISSUE DATE:**	**May 24, 2011**

The Permittee is responsible for submitting an application to renew this permit no sooner than one year prior to the expiration date, and no later than the end of the last business day before the expiration date, whether or not the Permittee receives prior notification by mail. Failure to submit a renewal application prior to the expiration date and continuing to withdraw water after the expiration date is a violation of Chapter 373, Florida Statutes, and Chapter 40D-2, Florida Administrative Code, and may result in a monetary penalty and/or loss of the right to use the water. Issuance of a renewal of this permit is contingent upon District approval.

TYPE OF APPLICATION: Renewal

GRANTED TO: Pinellas County Utilities
14 South Fort Harrison Ave, 6th Floor
Clearwater, FL 33756

PROJECT NAME: Cross Bar Ranch Ecosystem Management

WATER USE CAUTION AREA: NORTHERN TAMPA BAY

COUNTY: Pasco

TOTAL QUANTITIES AUTHORIZED UNDER THIS PERMIT (in gpd)

ANNUAL AVERAGE	800,000 gpd
PEAK MONTH [1]	1,500,000 gpd

1 Peak Month: Average daily use during the highest water use month.

ABSTRACT:

This is a renewal of an existing water use permit for environmental augmentation of wetlands located at a wellfield. The Annual Average quantity remains unchanged at 800,000 gallons per day (gpd) and the Peak Month quantity remains unchanged at 1,500,000 gpd. There are no changes in use type from the previous permit. Reclaimed water is not currently used as a source of water at the site.

Special Conditions include those that require the Permittee to do the following: record and report monthly meter readings from all withdrawal points and augmentation discharge points; sample water quality; monitor water levels in lakes, wetlands and the surficial aquifer; adhere to augmentation levels; investigate the feasibility of reuse; and coordinate with the Tampa Bay Water Phase I Mitigation Plan and Environmental Management Plan.

WATER USE TABLE (in gallons per day)

USE	ANNUAL AVERAGE	PEAK MONTH
RECREATION/AESTHETIC	800,000	1,500,000

USE TYPE

Augmentation For Environmental

Personal Sanitary Use

WITHDRAWAL POINT QUANTITY TABLE

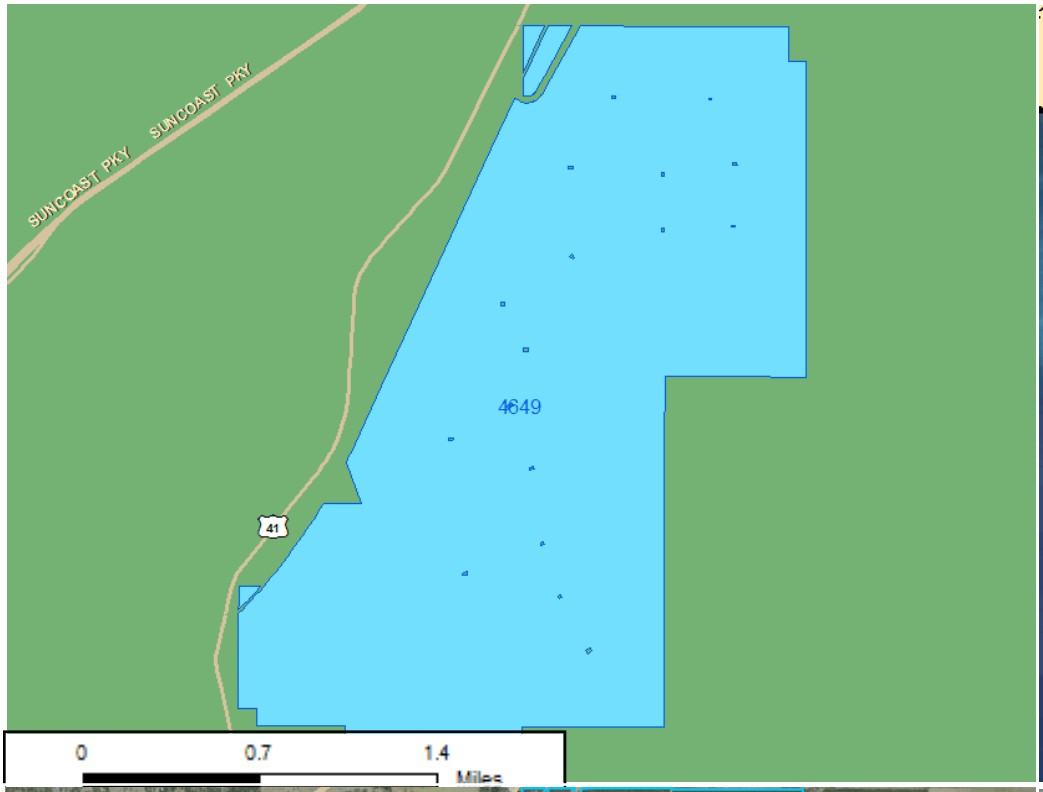
Water use from these withdrawal points are restricted to the quantities given below:

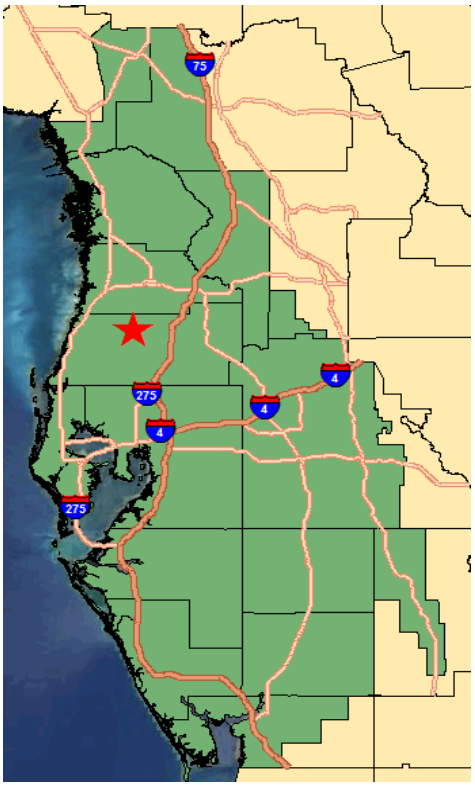
I.D. NO. PERMITTEE/ DISTRICT	DIAM (IN.)	DEPTH TTL./CSD.FT. (feet bls)	USE DESCRIPTION	AVERAGE (gpd)	PEAK MONTH (gpd)
G-1 / 1	12	619 / 105	Augmentation	650,000	1,260,000
G-4 / 4	8	400 / 200	Augmentation	149,000	237,000
6/Ed Cntr / 6	5	303 / 203	Personal Sanitary	1,000	3,000

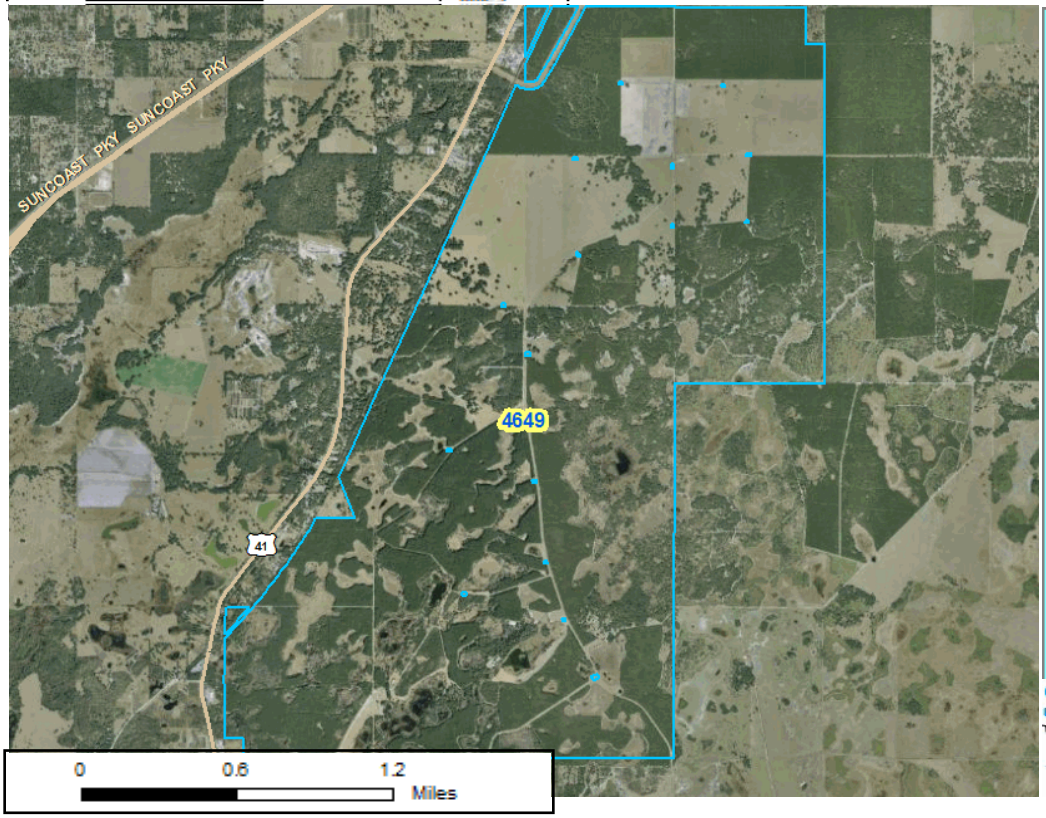
WITHDRAWAL POINT LOCATION TABLE

DISTRICT I.D. NO	LATITUDE/LONGITUDE
1	28° 21' 20.41"/82° 28' 38.83"
4	28° 20' 47.13"/82° 29' 09.01"
6	28° 21' 06.76"/82° 29' 06.36"

Location Map
Pinellas County Utilities
WUP No. 20 004649.007







Legend

- DIDs
- WUP Boundary
- 2010 Natural Color Imagery

PASCO COUNTY

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Southwest Florida Water Management District

STANDARD CONDITIONS:

The Permittee shall comply with the Standard Conditions attached hereto, incorporated herein by reference as Exhibit A and made a part hereof.

SPECIAL CONDITIONS:

1. All reports and data required by condition(s) of the permit shall be submitted to the District according to the due date(s) contained in the specific condition. If the condition specifies that a District-supplied form is to be used, the Permittee should use that form in order for their submission to be acknowledged in a timely manner. The only alternative to this requirement is to use the District Permit Information Center (www.swfwmd.state.fl.us/permits/epermitting/) to submit data, plans or reports online. There are instructions at the District website on how to register to set up an account to do so. If the report or data is received on or before the tenth day of the month following data collection, it shall be deemed as a timely submittal.

   All mailed reports and data are to be sent to:

   Southwest Florida Water Management District
   Brooksville Regulation Department, Water Use Regulation
   2379 Broad Street
   Brooksville, Florida 34604-6899

   Submission of plans and reports: Unless submitted online or otherwise indicated in the special condition, the original and two copies of each plan and report, such as conservation plans, environmental analyses, aquifer test results, per capita annual reports, etc. are required.

   Submission of data: Unless otherwise indicated in the special condition, an original (no copies) is required for data submittals such as crop report forms, meter readings and/or pumpage, rainfall, water level evapotranspiration, or water quality data.

   (499)

2. The Permittee shall provide a comprehensive and concise annual Environmental Assessment Report to the District regarding the information collected through the Special Conditions of this permit. The Environmental Assessment Report shall address the hydrological and ecological conditions of the augmented sites. Data collected through the water quantity, water quality, water level and environmental monitoring requirements of this permit shall be included in the report, summarized and analyzed by appropriate environmental professional(s). The annual report shall contain professional interpretations and conclusions of findings, and include raw data, essential graphs, tables, and text. Three copies of the annual report shall be submitted to the Brooksville Regulation Department by July 1 of each year; provided, only one set of original photographs and four color copies shall be submitted. The annual report shall cover the preceding water year period of October 1 to September 30.

   The frequency of monitoring may be modified by the Regulation Department Director, Resource Regulation, as necessary to ensure the protection of the resource and may be reduced in the future upon written request by the Permittee and written approval by the Regulation Department Director, Resource Regulation.
   (287)

3. The Permittee shall investigate the feasibility of using reclaimed water as a water source and submit a report describing the feasibility to the Brooksville Regulation Department by May 1, 2016. The report shall contain an analysis of reclaimed water sources for the area, including the relative location of these sources to the Permittee's property, the quantity of reclaimed water available, the projected date(s) of availability, costs associated with obtaining the reclaimed water, and an implementation schedule for reuse, if feasible. Infeasibility shall be supported with a detailed explanation. If the use of reclaimed water is determined to be feasible by the Permittee or by the District, then the Permittee shall submit an application to modify this water use permit to include reclaimed water as a source of water. The modification application shall include a date when the reclaimed water will be available and shall indicate a proposed reduction in permitted quantities. If the permit application is not submitted by the Permittee, the District may reduce, following notice to the Permittee, the quantities authorized with this permit to account for the availability of reclaimed water.
   (458)

4. Any wells not in use, and in which pumping equipment is not installed shall be capped or valved in a water tight manner in accordance with Chapter 62-532.500(3)(a)(4), F.A.C.(568)

5. Water quality samples from the withdrawal points listed below shall be collected after pumping the withdrawal point at its normal rate for a pumping time specified below, or to a constant temperature, pH, and conductivity. The frequency of sampling per water quality parameter is listed in the table according to the withdrawal point. The recording and reporting shall begin according to the first sample date for existing wells and shall begin within 90 days of completion of any proposed wells. Samples shall be collected whether or not the well is being used unless infeasible. If sampling is infeasible, the Permittee shall indicate the reason for not sampling on the water quality data form or in the space for comments in the WUP Portal for data submissions. For sampling, analysis and submittal requirements see Exhibit B, Water Quality Sampling Instructions, attached to and made part of this permit.

   Collect samples from existing District ID Nos. 1 and 4, Permittee ID Nos. G-1 and G-4 for pH, Hardness, and Specific Conductance after a minimum pumping time of 15 minutes, on an annual basis, with first sample due date of June 10, 2011.
   (752)

6. The following existing Environmental Augmentation discharge points shall continue to be metered: District ID Nos. 60, 61, 62, 63, 64, 65, 66, 67, 68, and 69, Permittee ID Nos. CL-SG, GL-SG, 7A-SG, 7B-SG, 7C-SG, 7D-SG, 8-SG, 10-SG, 13A-SG, and 13B-SG. Meter reading and reporting, excluding meter accuracy checks, shall be in accordance with instructions in Exhibit B, Metering Instructions, attached to and made part of this permit.(731)

7. Augmentation of each wetland or surface water site shall be allowed only when the water levels drop below the Target High Pool Elevation. The Permittee shall at no time augment above the Target High Pool Elevation. Once every five (5) years, the water level in each augmentation site, with the exception of District ID Nos. 60 and 61, Permittee ID Nos. CL-SG and GL-SG, shall be allowed to recede below the Target Low Pool Elevation and allowed to dry out so that no standing water exists. The Target High Pool Elevations and the Target Low Pool Elevations are referenced to the National Geodetic Vertical Datum (NGVD), and are as follows:

District ID No.	Permittee ID No.	Augmented Wetland	Target High Pool Elevation in Feet NGVD	Target Low Pool Elevation in Feet NGVD
60	CL-SG	Clear Lake	69.0	67.5
61	GL-SG	Goose Lake	71.0	70.5
62	7A-SG	Wetland 7A-CB	68.5	67.0
63	7B-SG	Wetland 7B-CB	71.0	70.0
64	7C-SG	Wetland 7C-CB	69.5	68.5
65	7D-SG	Wetland 7D-CB	69.5	68.5
66	8-SG	Wetland 8-CB	70.0	69.0
67	10-SG	Wetland 10-CB	69.5	68.5
68	13A-SG	Wetland 13A-CB	75.0	73.5
69	13B-SG	Wetland 13B-CB	71.0	70.0

   (991)

8. The Permittee shall adhere to the environmental augmentation program as represented by the information received on October 5, 1999, and February 17, 2000, and in accordance with the limits of this permit. Modifications to the program shall receive written approval from the Brooksville Regulation Director prior to implementation. In the event that environmental augmentation causes unforeseen adverse impacts to other existing legal withdrawals, environmental features, or off-site land uses, the Permittee may be required to adjust the environmental augmentation program in order to mitigate the impacts.
   (993)

9. The Permittee shall qualitatively monitor the augmented wetlands as specified in the table below. Reports of the data shall be submitted annually to the Permits Data Section, in a form acceptable to the District. All elevations shall be referenced to the National Geodetic Vertical Datum (NGVD). The frequency of qualitative monitoring may be modified by the Regulation Department Director, Resource Regulation, as necessary to insure the protection of the resource.

District ID No.	Permittee ID No.	Augmentation Site	Monitoring and Transect Location	Sampling Frequency
60	CL-SG	Clear Lake	Refer to Site Map received by the District Feb. 17, 2000	twice per year
61	GL-SG	Goose Lake	"	twice per year
62	7A-SG	Wetland 7A-CB	"	twice per year
63	7B-SG	Wetland 7B-CB	"	twice per year
64	7C-SG	Wetland 7C-CB	"	twice per year
65	7D-SG	Wetland 7D-CB	"	twice per year
66	8-SG	Wetland 8-CB	"	twice per year
67	10-SG	Wetland 10-CB	"	twice per year
68	13A-SG	Wetland 13A-CB	"	twice per year
69	13B-SG	Wetland 13B-CB	"	twice per year

Qualitative monitoring of the augmented wetlands shall be performed according to procedures outlined in the Environmental Monitoring Section of the Cross Bar Ranch Wetland Evaluation Report from Peacock and Associates, dated August 1999, and shall include photographic documentation.
(992)

10. The Permittee shall continue to maintain the monitor well(s) or piezometer(s) listed below, monitor water levels, and report them to the District at the frequency listed for the interval, aquifer system, or geologic formation listed. Water levels shall be recorded relative to National Geodetic Vertical Datum 1929 and to the maximum extent possible, recorded on a regular schedule: same time each day, same day each week, same week each month as appropriate to the frequency noted. The readings shall be reported online via the WUP Portal at the District website (http://www.watermatters.org/) or mailed in hardcopy on District-provided forms to the Permit Data Section, Performance Management Office on or before the tenth day of the following month. The frequency of recording may be modified by the Regulation Department Director, Resource Regulation, as necessary to ensure the protection of the resource.

Existing District ID Nos. 50, 51, 52, 53, 54, 55, 56, 57, 58, and 59/Permittee ID Nos. CL-MW, GL-MW, 7A-MW, 7B-MW, 7C-MW, 7D-MW, 8-MW, 10-MW, 13A-MW, and 13B-MW, to monitor water level elevations in the surficial aquifer twice per month.
(756)

11. COORDINATION WITH THE TAMPA BAY WATER PHASE I MITIGATION PLAN AND ENVIRONMENTAL MANAGEMENT PLAN: The Environmental Management Plan and the Phase I Mitigation Requirements are set forth in Conditions 8 and 9, respectively, of Water Use Permit No. 20011771.001 (the Consolidated Permit).

A. The District may modify this Water Use Permit to delete any lake or wetland located on the Permittee's property that is not identified as a mitigation site in the District-approved Phase I Mitigation Plan for Water Use Permit No. 20011771.001.

B. The withdrawals authorized by this Water Use Permit are part of a recovery program to augment and sustain wetlands and lakes affected by ground-water withdrawals. It is anticipated that as ground-water withdrawal reductions occur, augmentation will decrease and possibly cease. The withdrawals authorized by this permit shall not be modified for any use other than environmental augmentation, unless the applicant demonstrates the new use meets the Conditions for Issuance of Water Use Permits.
(995)

12. The Permittee shall continue to maintain the District-approved staff gauge in the water bodies at the location(s) specified by latitude and longitude below and report measurements of water levels referenced to National Geodetic Vertical Datum 1929 at the frequency indicated.

District ID No.	Permittee ID No.	Augmented Wetland or Lake	Recording Frequency	Latitude	Longitude
60	CL-SG	Clear Lake	Twice Per Month	28°21'45.66513"	82°28'39.20945"
61	GL-SG	Goose Lake	Twice Per Month	28°21'18.49381"	82°28'06.80348"
62	7A-SG	Wetland 7A-CB	Twice Per Month	28°21'19.753"	82°28'32.750"
63	7B-SG	Wetland 7B-CB	Twice Per Month	28°21'11.30528"	82°28'35.84907"
64	7C-SG	Wetland 7C-CB	Twice Per Month	28°21'02.174"	82°28'39.478"
65	7D-SG	Wetland 7D-CB	Twice Per Month	28°21'12.61430"	82°28'41.27640

District ID No.	Permittee ID No.	Augmented Wetland or Lake	Recording Frequency	Latitude	Longitude
66	8-SG	Wetland 8-CB	Twice Per Month	28°21'05.27170"	82°28'24.61420"
67	10-SG	Wetland 10-CB	Twice Per Month	28°20'49.007"	82°28'29.404"
68	13A-SG	Wetland 13A-CB	Twice Per Month	28°20'37.21399"	82°29'10.65673"
69	13B-SG	Wetland 13BA-CB	Twice Per Month	28°20'47.68485"	82°29'17.12197"

To the maximum extent possible, water levels shall be recorded on the same day of each week and reported to the Brooksville Regulation Department, online via the WUP Portal on the District website, or in hardcopy on District-provided forms on or before the tenth day of the following month. The frequency of recording may be modified by the Regulation Department Director, Resource Regulation, as necessary to ensure the protection of the resource.
(762)

13. The following withdrawal facilities shall continue to be maintained and operated with existing, non-resettable, totalizing flow meter(s) or other measuring device(s) as approved by the Regulation Department Director: District ID No(s). 1 and 4, Permittee ID No(s). G-1 and G-4. Meter reading and reporting, as well as meter accuracy checks every five years shall be in accordance with instructions in Exhibit B, Metering Instructions, attached to and made part of this permit.(719)

40D-2
Exhibit A

WATER USE PERMIT STANDARD CONDITIONS

1. The Permittee shall provide access to an authorized District representative to enter the property at any reasonable time to inspect the facility and make environmental or hydrologic assessments. The Permittee shall either accompany District staff onto the property or make provision for access onto the property.

2. When necessary to analyze impacts to the water resource or existing users, the District shall require the Permittee to install flow metering or other measuring devices to record withdrawal quantities and submit the data to the District.

3. The District shall collect water samples from any withdrawal point listed in the permit or shall require the permittee to submit water samples when the District determines there is a potential for adverse impacts to water quality.

4. A District identification tag shall be prominently displayed at each withdrawal point that is required by the District to be metered or for which withdrawal quantities are required to be reported to the District, by permanently affixing the tag to the withdrawal facility.

5. The Permittee shall mitigate to the satisfaction of the District any adverse impact to environmental features or off-site land uses as a result of withdrawals. When adverse impacts occur or are imminent, the District shall require the Permittee to mitigate the impacts. Adverse impacts include the following:

   A. Significant reduction in levels or flows in water bodies such as lakes, impoundments, wetlands, springs, streams or other watercourses; or
   B. Sinkholes or subsidence caused by reduction in water levels;
   C. Damage to crops and other vegetation causing financial harm to the owner; and
   D. Damage to the habitat of endangered or threatened species.

6. The Permittee shall mitigate, to the satisfaction of the District, any adverse impact to existing legal uses caused by withdrawals. When adverse impacts occur or are imminent, the District shall require the Permittee to mitigate the impacts. Adverse impacts include the following:

   A. A reduction in water levels which impairs the ability of a well to produce water;
   B. Significant reduction in levels or flows in water bodies such as lakes, impoundments, wetlands, springs, streams or other watercourses; or
   C. Significant inducement of natural or manmade contaminants into a water supply or into a usable portion of an aquifer or water body.

7. Notwithstanding the provisions of Rule 40D-1.6105, F.A.C., persons who wish to continue the water use permitted herein and who have acquired ownership or legal control of permitted water withdrawal facilities or the land on which the facilities are located must apply to transfer the permit to themselves within 45 days of acquiring ownership or legal control of the water withdrawal facilities or the land.

8. If any of the statements in the application and in the supporting data are found to be untrue and inaccurate, or if the Permittee fails to comply with all of the provisions of Chapter 373, Florida Statutes (F.S.), Chapter 40D, Florida Administrative Code (F.A.C.), or the conditions set forth herein, the Governing Board shall revoke this permit in accordance with Rule 40D-2.341, F.A.C., following notice and hearing.

9. Issuance of this permit does not exempt the Permittee from any other District permitting requirements.

10. The Permittee shall cease or reduce surface water withdrawal as directed by the District if water levels in lakes fall below the applicable minimum water level established in Chapter 40D-8, F.A.C., or rates of flow in streams fall below the minimum levels established in Chapter 40D-8, F.A.C.

11. The Permittee shall cease or reduce withdrawal as directed by the District if water levels in aquifers fall below the minimum levels established by the Governing Board.

12. The Permittee shall not deviate from any of the terms or conditions of this permit without written approval by the District.

13. The Permittee shall practice water conservation to increase the efficiency of transport, application, and use, as well as to decrease waste and to minimize runoff from the property. At such time as the Governing Board adopts specific conservation requirements for the Permittee's water use classification, this permit shall be subject to those requirements upon notice and after a reasonable period for compliance.

14. The District may establish special regulations for Water-Use Caution Areas. At such time as the Governing Board adopts such provisions, this permit shall be subject to them upon notice and after a reasonable period for compliance.

15. In the event the District declares that a Water Shortage exists pursuant to Chapter 40D-21, F.A.C., the District shall alter, modify, or declare inactive all or parts of this permit as necessary to address the water shortage.

16. This permit is issued based on information provided by the Permittee demonstrating that the use of water is reasonable and beneficial, consistent with the public interest, and will not interfere with any existing legal use of water. If, during the term of the permit, it is determined by the District that the use is not reasonable and beneficial, in the public interest, or does impact an existing legal use of water, the Governing Board shall modify this permit or shall revoke this permit following notice and hearing.

17. All permits issued pursuant to these Rules are contingent upon continued ownership or legal control of all property on which pumps, wells, diversions or other water withdrawal facilities are located.

Exhibit B
Instructions

METERING INSTRUCTIONS

The Permittee shall meter withdrawals from surface waters and/or the ground water resources, and meter readings from each withdrawal facility shall be recorded on a monthly basis within the last week of the month. The meter reading(s) shall be reported to the Permit Data Section, Performance Management Office on or before the tenth day of the following month.The Permittee shall submit meter readings online using the Permit Information Center at www.swfwmd.state.fl.us/permits/epermitting/ or on District supplied scanning forms unless another arrangement for submission of this data has been approved by the District. Submission of such data by any other unauthorized form or mechanism may result in loss of data and subsequent delinquency notifications. Call the Performance Management Office in Brooksville (352-796-7211) if difficulty is encountered.

The meters shall adhere to the following descriptions and shall be installed or maintained as follows:

1. The meter(s) shall be non-resettable, totalizing flow meter(s) that have a totalizer of sufficient magnitude to retain total gallon data for a minimum of the three highest consecutive months permitted quantities. If other measuring device(s) are proposed, prior to installation, approval shall be obtained in writing from the Regulation Department Director.
2. The Permittee shall report non-use on all metered standby withdrawal facilities on the scanning form or approved alternative reporting method.
3. If a metered withdrawal facility is not used during any given month, the meter report shall be submitted to the District indicating the same meter reading as was submitted the previous month.
4. The flow meter(s) or other approved device(s) shall have and maintain an accuracy within five percent of the actual flow as installed.
5. Meter accuracy testing requirements:
    A. For newly metered withdrawal points, the flow meter installation shall be designed for inline field access for meter accuracy testing.
    B. The meter shall be tested for accuracy on-site, as installed according to the Flow Meter Accuracy Test Instructions in this Exhibit B, every five years in the assigned month for the county, beginning from the date of its installation for new meters or from the date of initial issuance of this permit containing the metering condition with an accuracy test requirement for existing meters.
    C. The testing frequency will be decreased if the Permittee demonstrates to the satisfaction of the District that a longer period of time for testing is warranted.
    D. The test will be accepted by the District only if performed by a person knowledgeable in the testing equipment used.
    E. If the actual flow is found to be greater than 5% different from the measured flow, within 30 days, the Permittee shall have the meter re-calibrated, repaired, or replaced, whichever is necessary. Documentation of the test and a certificate of re-calibration, if applicable, shall be submitted within 30 days of each test or re-calibration.
6. The meter shall be installed according to the manufacturer's instructions for achieving accurate flow to the specifications above, or it shall be installed in a straight length of pipe where there is at least an upstream length equal to ten (10) times the outside pipe diameter and a downstream length equal to two (2) times the outside pipe diameter. Where there is not at least a length of ten diameters upstream available, flow straightening vanes shall be used in the upstream line.
7. Broken or malfunctioning meter:
    A. If the meter or other flow measuring device malfunctions or breaks, the Permittee shall notify the District within 15 days of discovering the malfunction or breakage.
    B. The meter must be replaced with a repaired or new meter, subject to the same specifications given above, within 30 days of the discovery.
    C. If the meter is removed from the withdrawal point for any other reason, it shall be replaced with another meter having the same specifications given above, or the meter shall be reinstalled within 30 days of its removal from the withdrawal. In either event, a fully functioning meter shall not be off the withdrawal point for more than 60 consecutive days.

8. While the meter is not functioning correctly, the Permittee shall keep track of the total amount of time the withdrawal point was used for each month and multiply those minutes times the pump capacity (in gallons per minute) for total gallons. The estimate of the number of gallons used each month during that period shall be submitted on District scanning forms and noted as estimated per instructions on the form. If the data is submitted by another approved method, the fact that it is estimated must be indicated. The reason for the necessity to estimate pumpage shall be reported with the estimate.
9. In the event a new meter is installed to replace a broken meter, it and its installation shall meet the specifications of this condition. The permittee shall notify the District of the replacement with the first submittal of meter readings from the new meter.

FLOW METER ACCURACY TEST INSTRUCTIONS

1. **Accuracy Test Due Date** - The Permittee is to schedule their accuracy test according to the following schedule:

   A. For existing metered withdrawal points, add five years to the previous test year, and make the test in the month assigned to your county.
   B. For withdrawal points for which metering is added for the first time, the test is to be scheduled five years from the issue year in the month assigned to your county.
   C. For proposed withdrawal points, the test date is five years from the completion date of the withdrawal point in the month assigned to your county.
   D. For the Permittee's convenience, if there are multiple due-years for meter accuracy testing because of the timing of the installation and/or previous accuracy tests of meters, the Permittee can submit a request in writing to the Permitting Department Director for one specific year to be assigned as the due date year for meter testing. Permittees with many meters to test may also request the tests to be grouped into one year or spread out evenly over two to three years.
   E. The months for accuracy testing of meters are assigned by county. The Permittee is requested but not required to have their testing done in the month assigned to their county. This is to have sufficient District staff available for assistance.

January	Hillsborough
February	Manatee, Pasco
March	Polk (for odd numbered permits)*
April	Polk (for even numbered permits)*
May	Highlands
June	Hardee, Charlotte
July	None or Special Request
August	None or Special Request
September	Desoto, Sarasota
October	Citrus, Levy, Lake
November	Hernando, Sumter, Marion
December	Pinellas

   * The permittee may request their multiple permits be tested in the same month.

2. **Accuracy Test Requirements**: The Permittee shall test the accuracy of flow meters on permitted withdrawal points as follows:

   A. The equipment water temperature shall be set to 72 degrees Fahrenheit for ground water, and to the measured water temperature for other water sources.
   B. A minimum of two separate timed tests shall be performed for each meter. Each timed test shall consist of measuring flow using the test meter and the installed meter for a minimum of four minutes duration. If the two tests do not yield consistent results, additional tests shall be performed for a minimum of eight minutes or longer per test until consistent results are obtained.
   C. If the installed meter has a rate of flow, or large multiplier that does not allow for consistent results to be obtained with four- or eight-minute tests, the duration of the test shall be increased as necessary to obtain accurate and consistent results with respect to the type of flow meter installed.
   D. The results of two consistent tests shall be averaged, and the result will be considered the test result for the meter being tested. This result shall be expressed as a plus or minus percent (rounded to the nearest one-tenth percent) accuracy of the installed meter relative to the test meter. The percent accuracy indicates the deviation (if any), of the meter being tested from the test meter.

3. **Accuracy Test Report:** The Permittees shall demonstrate that the results of the meter test(s) are accurate by submitting the following information within 30 days of the test:

   A. A completed Flow Meter Accuracy Verification Form, Form LEG-R.014.00 (07/08) for each flow meter tested. This form can be obtained from the District's website (www.watermatters.org) under "Permits and Rules" for Water Use Permits.

   B. A printout of data that was input into the test equipment, if the test equipment is capable of creating such a printout;

   C. A statement attesting that the manufacturer of the test equipment, or an entity approved or authorized by the manufacturer, has trained the operator to use the specific model test equipment used for testing;

   D. The date of the test equipment's most recent calibration that demonstrates that it was calibrated within the previous twelve months, and the test lab's National Institute of Standards and Testing (N.I.S.T.) traceability reference number.

   E. A diagram showing the precise location on the pipe where the testing equipment was mounted shall be supplied with the form. This diagram shall also show the pump, installed meter, the configuration (with all valves, tees, elbows, and any other possible flow disturbing devices) that exists between the pump and the test location clearly noted with measurements. If flow straightening vanes are utilized, their location(s) shall also be included in the diagram.

   F. A picture of the test location, including the pump, installed flow meter, and the measuring device, or for sites where the picture does not include all of the items listed above, a picture of the test site with a notation of distances to these items. with a notation of distances to these items.

WATER QUALITY INSTRUCTIONS

The Permittee shall perform water quality sampling, analysis and reporting as follows:

1. The sampling method(s) from both monitor wells and surface water bodies shall be designed to collect water samples that are chemically representative of the zone of the aquifer or the depth or area of the water body.
2. Water quality samples from monitor wells shall be taken after pumping the well for the minimum time specified (if specified) or after the water reaches a constant temperature, pH, and conductivity.
3. The first submittal to the District shall include a copy of the laboratory's analytical and chain of custody procedures. If the laboratory used by the Permittee is changed, the first submittal of data analyzed at the new laboratory shall include a copy of the laboratory's analytical and chain of custody procedures.
4. Any variance in sampling and/or analytical methods shall have prior approval of the Regulation Department Director, Resource Regulation.
5. The Permittee's sampling procedure shall follow the handling and chain of custody procedures designated by the certified laboratory which will undertake the analysis.
6. Water quality samples shall be analyzed by a laboratory certified by the Florida Department of Health utilizing the standards and methods applicable to the parameters analyzed and to the water use pursuant to Chapter 64E-1, Florida Administrative Code, "Certification of Environmental Testing Laboratories."
7. Analyses shall be performed according to procedures outlined in the current edition of Standard Methods for the Examination of Water and Wastewater by the American Public Health Association-American Water Works Association-Water Pollution Control Federation (APHA-AWWA-WPCF) or Methods for Chemical Analyses of Water and Wastes by the U.S. Environmental Protection Agency (EPA).
8. Unless other reporting arrangements have been approved by the Regulation Department Director, Resource Regulation, reports of the analyses shall be submitted to the Permit Data Section, Strategic Programs Office Department, online at the District WUP Portal or mailed in hardcopy on or before the tenth day of the following month. The online submittal shall include a scanned upload of the original laboratory report. The hardcopy submittal shall be a copy of the laboratory's analysis form. If for some reason, a sample cannot be taken when required, the Permittee shall indicate so and give the reason in the space for comments at the WUP Portal or shall submit the reason in writing on the regular due date.
9. Water quality samples shall be collected based on the following timetable for the frequency listed in the special condition:
10. The parameters and frequency of sampling and analysis may be modified by the District as necessary to ensure the protection of the resource.

Frequency	Timetable
Weekly	Same day of each week
Quarterly	Same week of **February, May, August, November**
Semi-annually	Same week of **May, November**
Monthly	Same week of each month

Henry Robert Lue, P.E. Electronically Signed
Authorized Signature
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

This permit, issued under the provision of Chapter 373, Florida Statues and Florida Administrative Code 40D-2, authorizes the Permittee to withdraw the quantities outlined above, and may require various activities to be performed by the Permittee as described in the permit, including the Special Conditions. The permit does not convey to the Permittee any property rights or privileges other than those specified herein, nor relieve the Permittee from complying with any applicable local government, state, or federal law, rule, or ordinance.

MONITOR WELL DESIGNATIONS
CROSS BAR RANCH ECOSYSTEM MANAGEMENT

Pinellas County Designation		District Designation
(CL)	Clear Lake MW	50
(GL)	Goose Lake MW	51
	7A MW	52
	7B MW	53
	7C MW	54
	7D MW	55
	8-1 MW (Northeast)	56
	8-2 MW (Southwest)	56
	10 MW	57
	13A MW	58
	13B MW	59

STAFF GAUGE SITE DESIGNATIONS
CROSS BAR RANCH ECOSYSTEM MANAGEMENT

Pinellas County Designation		District Designation
(CL)	Clear Lake SG	60
(GL)	Goose Lake SG	61
	7A SG	62
	7B SG	63
	7C SG	64
	7D SG	65
	8-1 SG (Northeast)	66
	8-2 SG (Southwest)	66
	10 SG	67
	13A SG	68
	13B SG	69

APPENDIX C

HYDROLOGIC DATA TABLES

Table 1 - Monthly Average Rainfall Data, Cross Bar Ranch, WY 2021 (in.)

Month	CBR-BFISH	CBR-CB01	CBR-CB13	CBR-GREGG	CBR-S-1S	Composite Average	St. Leo
October-20	0.92	1.68	2.06	2.31	2.42	1.88	1.40
November-20	4.41	3.55	4.50	5.47	4.20	4.43	4.89
December-20	1.90	1.98	1.62	2.11	1.73	1.87	1.70
January-21	0.30	0.35	0.31	0.35	0.49	0.36	0.19
February-21	2.57	3.49	2.64	2.92	2.67	2.86	2.73
March-21	1.70	1.82	2.08	2.96	2.36	2.18	1.39
April-21	3.27	3.85	3.15	3.31	3.06	3.33	4.21
May-21	0.49	0.88	0.71	0.99	0.57	0.73	0.08
June-21	10.26	10.95	10.49	8.17	8.72	9.72	11.12
July-21	7.07	15.22	15.64	13.79	11.55	12.65	12.66
August-21	14.03	10.15	7.83	8.07	8.55	9.73	6.98
September-21	8.86	11.42	8.52	7.92	9.26	9.20	10.01
					Water Year Total	**58.92**	**57.36**

Source: Cross Bar - Tampa Bay Water, 2021
St. Leo - NOAA National Climate Data Center

Table 2
Cross Bar Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 20004649.007
Augmentation Wells Water Quality
WY 2020

Water Quality:
Condition # 5

Date	District ID Number	Permittee ID Number	pH	Hardness	Specific Conductance
11-May-21	1	G-1	6.76	179	368
11-May-21	4	G-3	6.39	179	369

TABLE 3
MONTHLY AUGMENTATION QUANTITIES
CROSS BAR RANCH AUGMENTATION WELLS
WY 2021

	Well 1		Well 4		TOTAL	
DATE	**MG**	**MGD**	**MG**	**MGD**	**MG**	**MGD**
10/31/2020	0.00	0.00	1.57	0.05	1.57	0.05
11/30/2020	0.00	0.00	1.46	0.05	1.46	0.05
12/31/2020	0.41	0.01	2.34	0.08	2.74	0.09
1/31/2021	1.38	0.04	2.46	0.08	3.84	0.12
2/28/2021	0.00	0.00	2.89	0.10	2.89	0.10
3/31/2021	1.54	0.05	2.01	0.06	3.55	0.11
4/30/2021	1.81	0.06	1.95	0.06	3.76	0.13
5/31/2021	5.55	0.18	3.13	0.10	8.68	0.28
6/30/2021	6.05	0.20	2.79	0.09	8.84	0.29
7/30/2021	2.32	0.07	2.66	0.09	4.98	0.16
8/31/2021	0.03	0.001	2.44	0.08	2.47	0.08
9/30/2021	0.00	0.00	2.01	0.07	2.01	0.07
WY 2021	19.09	0.05	27.70	0.08	46.78	0.13

TABLE 4
MONTHLY QUANTITIES
CROSS BAR RANCH WETLAND SITES
WATER YEAR 2021
(MILLIONS OF GALLONS)

	60 (CL-SG)	61 (GL-SG)	62 (7A-SG)	63 (7B-SG)	64 (7C-SG)	65 (7D-SG)	66 (8-1(NE))	67 (10-SG)	68 (13A-SG)	69 (13B-SG)		
	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	**TOTALS**	
DATE	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(Monthly MGD)
10/31/2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	1.04	2.03	0.07
11/30/2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.97	1.89	0.06
12/31/2020	0.001	0.05	0.00	0.08	0.02	0.04	0.02	0.01	1.47	0.54	2.24	0.07
1/31/2021	0.002	0.19	0.00	0.33	0.07	0.14	0.10	0.003	1.54	2.64	5.01	0.16
2/28/2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	1.94	3.75	0.13
3/31/2021	0.00	0.18	0.00	0.35	0.07	0.15	0.09	0.00	1.24	1.37	3.46	0.11
4/30/2021	0.001	0.28	0.00	0.43	0.09	0.18	0.03	0.00	1.21	1.32	3.55	0.12
5/31/2021	0.00	0.80	0.00	0.58	0.27	0.55	0.01	0.00	1.96	2.11	6.28	0.20
6/30/2021	0.00	0.89	0.00	0.00	0.32	0.65	0.00	0.31	1.76	1.88	5.81	0.19
7/30/2021	0.00	0.31	0.00	0.00	0.12	0.25	0.00	0.13	1.67	1.81	4.29	0.14
8/31/2021	0.00	0.004	0.00	0.00	0.002	0.01	0.00	0.001	1.53	1.67	3.21	0.10
9/30/2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	1.38	2.64	0.09

Table 5
Monitor Well Groundwater Elevations
Cross Bar Ranch
WY 2021

DATE	50 (CL-MW) NGVD	51 (GL-MW) NGVD	52 (7A-MW) NGVD	53 (7B-MW) NGVD	54 (7C-MW) NGVD	55 (7D-MW) NGVD	56 (8-1(NE)-MW) NGVD	56 (8-2(SW)-MW) NGVD	57 (10-MW) NGVD	58 (13A-MW) NGVD	59 (13B-MW) NGVD
10/15/2020	69.17	74.52	70.52	71.77	70.77	70.32	72.03	72.22	71.19	75.26	71.15
10/31/2020	68.80	74.12	70.12	71.21	70.56	69.93	71.76	71.89	70.80	74.32	70.93
11/15/2020	69.30	74.54	70.73	71.68	70.98	70.52	72.35	72.49	71.70	74.88	71.47
11/30/2020	68.90	74.03	70.33	71.23	70.67	70.04	72.01	72.10	71.07	74.58	71.00
12/15/2020	68.68	73.83	70.17	71.01	70.57	69.97	71.91	71.96	71.05	74.47	70.95
12/31/2020	68.38	73.59	69.98	70.79	70.52	69.73	71.82	71.89	70.90	74.28	70.88
1/15/2021	68.12	73.28	69.79	70.50	70.37	69.10	71.52	71.42	70.66	73.97	69.76
1/31/2021	67.83	72.97	69.60	70.49	70.22	69.46	71.39	71.46	70.50	74.07	70.62
2/15/2021	68.16	73.06	69.90	70.70	70.38	69.97	71.91	71.72	71.43	75.19	71.18
2/28/2021	67.59	72.74	69.68	70.47	70.32	69.60	71.54	71.63	70.60	74.32	70.73
3/15/2021	67.33	72.46	69.46	70.18	70.10	69.37	71.21	71.32	70.31	73.99	70.53
3/31/2021	67.45	72.28	69.60	70.41	70.13	69.65	71.59	71.29	70.86	74.22	70.92
4/15/2021	67.24	72.26	69.50	70.27	70.12	69.57	71.19	71.17	70.49	74.35	70.72
4/30/2021	66.80	71.89	69.28	70.18	69.83	69.30	70.78	70.81	70.02	73.71	70.58
5/15/2021	66.18	71.32	68.78	69.77	69.27	68.81	70.02	70.05	69.37	73.42	70.05
5/31/2021	65.58	70.80	68.41	69.55	68.87	68.61	69.60	69.46	68.96	72.92	69.89
6/15/2021	66.40	71.34	68.82	70.43	69.44	69.22	70.83	70.17	69.85	74.30	70.53
6/30/2021	66.93	71.47	69.00	70.67	69.65	69.42	71.40	70.62	70.75	73.88	70.60
7/15/2021	68.92	73.77	71.02	72.51	71.12	70.79	72.11	72.64	71.73	76.76	71.63
7/30/2021	68.68	73.35	70.61	72.12	70.92	70.41	72.44	72.51	71.77	76.02	71.35
8/15/2021	69.92	73.96	71.65	72.80	71.28	71.27	73.11	73.10	72.25	77.18	71.91
8/31/2021	69.39	73.78	70.86	72.27	70.96	70.54	72.45	72.57	71.74	75.93	71.40
9/15/2021	70.29	74.65	71.69	72.97	71.43	71.16	73.13	72.48	72.44	77.02	72.10
9/30/2021	69.70	74.36	71.19	72.68	71.03	70.77	72.43	72.63	71.45	76.19	71.40

Table 6
Cross Bar Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 20004649.007
Wetland Water Elevations and Water Depths
WY 2021

	60 (CL-SG)		61 (GL-SG)		62 (7A-SG)		63 (7B-SG)	
DATE	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION
10/15/2020	4.75	69.38	5.92	73.66	3.62	70.18	1.94	71.82
10/31/2020	4.45	69.08	5.55	73.29	3.44	70.00	1.38	71.26
11/15/2020	4.57	69.20	5.58	73.32	3.60	70.16	1.64	71.52
11/30/2020	4.36	68.99	5.32	73.06	3.50	70.06	1.38	71.26
12/15/2020	4.17	68.80	5.10	72.84	3.36	69.92	1.10	70.98
12/31/2020	4.00	68.63	4.88	72.62	3.34	69.90	1.02	70.90
1/15/2021	3.73	68.36	4.58	72.32	3.06	69.62	0.68	70.56
1/31/2021	3.55	68.18	4.32	72.06	3.36	69.92	0.88	70.76
2/15/2021	3.45	68.08	4.20	71.94	2.80	69.36	0.70	70.58
2/28/2021	3.39	68.02	4.00	71.74	3.07	69.63	0.62	70.50
3/15/2021	3.03	67.66	3.74	71.48	2.94	69.50	0.48	70.36
3/31/2021	2.93	67.56	3.61	71.35	2.92	69.48	0.72	70.60
4/15/2021	2.75	67.38	3.44	71.18	2.92	69.48	0.38	70.26
4/30/2021	2.55	67.18	3.24	70.98	2.67	69.23	0.50	70.38
5/15/2021	2.07	66.70	1.92	69.66	2.12	68.68	0.56	70.44
5/31/2021	1.59	66.22	2.34	70.08	1.84	68.40	0.38	70.26
6/15/2021	2.15	66.78	2.54	70.28	2.44	69.00	0.82	70.70
6/30/2021	2.85	67.48	2.56	70.30	2.38	68.94	0.14	70.02
7/15/2021	4.11	68.74	3.78	71.52	3.80	70.36	2.60	72.48
7/30/2021	4.13	68.76	3.84	71.58	3.64	70.20	2.22	72.10
8/15/2021	5.19	69.82	4.38	72.12	4.50	71.06	2.72	72.60
8/31/2021	4.87	69.50	4.44	72.18	3.92	70.48	2.42	72.30
9/15/2021	5.17	69.80	5.02	72.76	4.58	71.14	2.82	72.70
9/30/2021	5.06	69.69	5.32	73.06	3.98	70.54	2.78	72.66

Table 6
Cross Bar Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 20004649.007
Wetland Water Elevations and Water Depths
WY 2021

	64 (7C-SG)		65 (7D-SG)		66 (8-1(NE)-SG)		66 (8-2(SW)-SG)	
DATE	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION
10/15/2020	3.66	70.45	1.00	69.74	2.86	71.48	5.04	72.04
10/31/2020	3.52	70.31	1.78	70.52	2.70	71.32	4.83	71.83
11/15/2020	3.76	70.55	1.16	69.90	2.98	71.60	5.24	72.24
11/30/2020	3.60	70.39	1.34	70.08	2.73	71.35	4.96	71.96
12/15/2020	3.46	70.25	0.92	69.66	2.68	71.30	4.82	71.82
12/31/2020	3.53	70.32	0.80	69.54	2.65	71.27	4.81	71.81
1/15/2021	3.34	70.13	0.78	69.52	2.52	71.14	4.60	71.60
1/31/2021	3.26	70.05	0.90	69.64	2.46	71.08	4.50	71.50
2/15/2021	3.42	70.21	0.88	69.62	2.50	71.12	4.80	71.80
2/28/2021	3.35	70.14	0.94	69.68	2.48	71.10	4.58	71.58
3/15/2021	3.18	69.97	0.82	69.56	2.34	70.96	3.94	70.94
3/31/2021	3.15	69.94	0.76	69.50	2.32	70.94	4.08	71.08
4/15/2021	3.18	69.97	0.86	69.60	2.24	70.86	4.42	71.42
4/30/2021	2.87	69.66	0.60	69.34	2.14	70.76	3.77	70.77
5/15/2021	2.42	69.21	0.88	69.62	1.88	70.50	3.10	70.10
5/31/2021	2.18	68.97	0.46	69.20	1.33	69.95	2.22	69.22
6/15/2021	2.40	69.19	0.40	69.14	1.86	70.48	2.98	69.98
6/30/2021	2.60	69.39	0.54	69.28	2.08	70.70	3.35	70.35
7/15/2021	3.96	70.75	1.44	70.18	3.18	71.80	5.22	72.22
7/30/2021	3.69	70.48	1.32	70.06	2.96	71.58	5.09	72.09
8/15/2021	3.82	70.61	1.76	70.50	3.09	71.71	5.40	72.40
8/31/2021	3.72	70.51	1.12	69.86	3.14	71.76	5.32	72.32
9/15/2021	3.78	70.57	1.48	70.22	2.88	71.50	5.80	72.80
9/30/2021	3.74	70.53	1.38	70.12	3.16	71.78	5.34	72.34

Table 6
Cross Bar Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 20004649.007
Wetland Water Elevations and Water Depths
WY 2021

	67 (10-SG)		68 (13A-SG)		69 (13B-SG)	
DATE	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION
10/15/2020	1.68	69.52	2.52	75.44	1.55	70.55
10/31/2020	1.37	69.21	1.64	74.56	1.31	70.31
11/15/2020	1.72	69.56	1.92	74.84	1.47	70.47
11/30/2020	1.43	69.27	1.86	74.78	1.31	70.31
12/15/2020	1.28	69.12	2.44	75.36	1.33	70.33
12/31/2020	1.35	69.19	1.61	74.53	1.29	70.29
1/15/2021	1.20	69.04	1.38	74.30	1.25	70.25
1/31/2021	1.20	69.04	1.44	74.36	1.17	70.17
2/15/2021	1.28	69.12	2.44	75.36	1.43	70.43
2/28/2021	1.23	69.07	1.73	74.65	1.24	70.24
3/15/2021	1.14	68.98	1.40	74.32	1.17	70.17
3/31/2021	1.12	68.96	1.60	74.52	1.31	70.31
4/15/2021	1.20	69.04	1.84	74.76	1.29	70.29
4/30/2021	0.96	68.80	1.30	74.22	1.19	70.19
5/15/2021	0.46	68.30	1.30	74.22	0.95	69.95
5/31/2021	0.00	67.84	0.92	73.84	0.76	69.76
6/15/2021	0.66	68.50	1.84	74.76	1.19	70.19
6/30/2021	1.00	68.84	1.44	74.36	1.19	70.19
7/15/2021	1.96	69.80	3.56	76.48	1.59	70.59
7/30/2021	1.65	69.49	3.10	76.02	1.37	70.37
8/15/2021	2.37	70.21	4.30	77.22	1.85	70.85
8/31/2021	1.74	69.58	3.10	76.02	1.43	70.43
9/15/2021	2.08	69.92	4.12	77.04	1.71	70.71
9/30/2021	1.78	69.62	3.40	76.32	1.49	70.49

APPENDIX D

BI-WEEKLY HYDROLOGIC DATA TABLES

Table 7
Cross Bar Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 20004649.007
Bi-Weekly Monitor Well Water Level Measurement Data
WY 2021

DATE	50 (CL-MW)			51 (GL-MW)			52 (7A-MW)			53 (7B-MW)		
	MPE	DTW	NGVD	MPE	DTW	NGVD	MPE	DTW	NGVD	MPE	DTW	NGVD
10/15/2020	74.17	5.00	69.17	80.16	5.64	74.52	75.93	5.41	70.52	77.25	5.48	71.77
10/31/2020	74.17	5.37	68.80	80.16	6.04	74.12	75.93	5.81	70.12	77.25	6.04	71.21
11/15/2020	74.17	4.87	69.30	80.16	5.62	74.54	75.93	5.20	70.73	77.25	5.57	71.68
11/30/2020	74.17	5.27	68.90	80.16	6.13	74.03	75.93	5.60	70.33	77.25	6.02	71.23
12/15/2020	74.17	5.49	68.68	80.16	6.33	73.83	75.93	5.76	70.17	77.25	6.24	71.01
12/31/2020	74.17	5.79	68.38	80.16	6.57	73.59	75.93	5.95	69.98	77.25	6.46	70.79
1/15/2021	74.17	6.05	68.12	80.16	6.88	73.28	75.93	6.14	69.79	77.25	6.75	70.50
1/31/2021	74.17	6.34	67.83	80.16	7.19	72.97	75.93	6.33	69.60	77.25	6.76	70.49
2/15/2021	74.17	6.01	68.16	80.16	7.10	73.06	75.93	6.03	69.90	77.25	6.55	70.70
2/28/2021	74.17	6.58	67.59	80.16	7.42	72.74	75.93	6.25	69.68	77.25	6.78	70.47
3/15/2021	74.17	6.84	67.33	80.16	7.70	72.46	75.93	6.47	69.46	77.25	7.07	70.18
3/31/2021	74.17	6.72	67.45	80.16	7.88	72.28	75.93	6.33	69.60	77.25	6.84	70.41
4/15/2021	74.17	6.93	67.24	80.16	7.90	72.26	75.93	6.43	69.50	77.25	6.98	70.27
4/30/2021	74.17	7.37	66.80	80.16	8.27	71.89	75.93	6.65	69.28	77.25	7.07	70.18
5/15/2021	74.17	7.99	66.18	80.16	8.84	71.32	75.93	7.15	68.78	77.25	7.48	69.77
5/31/2021	74.17	8.59	65.58	80.16	9.36	70.80	75.93	7.52	68.41	77.25	7.70	69.55
6/15/2021	74.17	7.77	66.40	80.16	8.82	71.34	75.93	7.11	68.82	77.25	6.82	70.43
6/30/2021	74.17	7.24	66.93	80.16	8.69	71.47	75.93	6.93	69.00	77.25	6.58	70.67
7/15/2021	74.17	5.25	68.92	80.16	6.39	73.77	75.93	4.91	71.02	77.25	4.74	72.51
7/30/2021	74.17	5.49	68.68	80.16	6.81	73.35	75.93	5.32	70.61	77.25	5.13	72.12
8/15/2021	74.17	4.25	69.92	80.16	6.20	73.96	75.93	4.28	71.65	77.25	4.45	72.80
8/31/2021	74.17	4.78	69.39	80.16	6.38	73.78	75.93	5.07	70.86	77.25	4.98	72.27
9/15/2021	74.17	3.88	70.29	80.16	5.51	74.65	75.93	4.24	71.69	77.25	4.28	72.97
9/30/2021	74.17	4.47	69.70	80.16	5.80	74.36	75.93	4.74	71.19	77.25	4.57	72.68

Table 7
Cross Bar Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 20004649.007
Bi-Weekly Monitor Well Water Level Measurement Data
WY 2021

DATE	54 (7C-MW)			55 (7D-MW)			56 (8-1-N-MW)			56 (8-2-S-MW)		
	MPE	DTW	NGVD	MPE	DTW	NGVD	MPE	DTW	NGVD	MPE	DTW	NGVD
10/15/2020	76.73	5.96	70.77	74.81	4.49	70.32	77.19	5.16	72.03	77.38	5.16	72.22
10/31/2020	76.73	6.17	70.56	74.81	4.88	69.93	77.19	5.43	71.76	77.38	5.49	71.89
11/15/2020	76.73	5.75	70.98	74.81	4.29	70.52	77.19	4.84	72.35	77.38	4.89	72.49
11/30/2020	76.73	6.06	70.67	74.81	4.77	70.04	77.19	5.18	72.01	77.38	5.28	72.10
12/15/2020	76.73	6.16	70.57	74.81	4.84	69.97	77.19	5.28	71.91	77.38	5.42	71.96
12/31/2020	76.73	6.21	70.52	74.81	5.08	69.73	77.19	5.37	71.82	77.38	5.49	71.89
1/15/2021	76.73	6.36	70.37	74.81	5.71	69.10	77.19	5.67	71.52	77.38	5.96	71.42
1/31/2021	76.73	6.51	70.22	74.81	5.35	69.46	77.19	5.80	71.39	77.38	5.92	71.46
2/15/2021	76.73	6.35	70.38	74.81	4.84	69.97	77.19	5.28	71.91	77.38	5.66	71.72
2/28/2021	76.73	6.41	70.32	74.81	5.21	69.60	77.19	5.65	71.54	77.38	5.75	71.63
3/15/2021	76.73	6.63	70.10	74.81	5.44	69.37	77.19	5.98	71.21	77.38	6.06	71.32
3/31/2021	76.73	6.60	70.13	74.81	5.16	69.65	77.19	5.60	71.59	77.38	6.09	71.29
4/15/2021	76.73	6.61	70.12	74.81	5.24	69.57	77.19	6.00	71.19	77.38	6.21	71.17
4/30/2021	76.73	6.90	69.83	74.81	5.51	69.30	77.19	6.41	70.78	77.38	6.57	70.81
5/15/2021	76.73	7.46	69.27	74.81	6.00	68.81	77.19	7.17	70.02	77.38	7.33	70.05
5/31/2021	76.73	7.86	68.87	74.81	6.20	68.61	77.19	7.59	69.60	77.38	7.92	69.46
6/15/2021	76.73	7.29	69.44	74.81	5.59	69.22	77.19	6.36	70.83	77.38	7.21	70.17
6/30/2021	76.73	7.08	69.65	74.81	5.39	69.42	77.19	5.79	71.40	77.38	6.76	70.62
7/15/2021	76.73	5.61	71.12	74.81	4.02	70.79	77.19	5.08	72.11	77.38	4.74	72.64
7/30/2021	76.73	5.81	70.92	74.81	4.40	70.41	77.19	4.75	72.44	77.38	4.87	72.51
8/15/2021	76.73	5.45	71.28	74.81	3.54	71.27	77.19	4.08	73.11	77.38	4.28	73.10
8/31/2021	76.73	5.77	70.96	74.81	4.27	70.54	77.19	4.74	72.45	77.38	4.81	72.57
9/15/2021	76.73	5.30	71.43	74.81	3.65	71.16	77.19	4.06	73.13	77.38	4.90	72.48
9/30/2021	76.73	5.70	71.03	74.81	4.04	70.77	77.19	4.76	72.43	77.38	4.75	72.63

Table 7
Cross Bar Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 20004649.007
Bi-Weekly Monitor Well Water Level Measurement Data
WY 2021

DATE	57 (10-MW)			58 (13A-MW)			59 (13B-MW)		
	MPE	DTW	NGVD	MPE	DTW	NGVD	MPE	DTW	NGVD
10/15/2020	77.42	6.23	71.19	78.63	3.37	75.26	76.63	5.48	71.15
10/31/2020	77.42	6.62	70.80	78.63	4.31	74.32	76.63	5.70	70.93
11/15/2020	77.42	5.72	71.70	78.63	3.75	74.88	76.63	5.16	71.47
11/30/2020	77.42	6.35	71.07	78.63	4.05	74.58	76.63	5.63	71.00
12/15/2020	77.42	6.37	71.05	78.63	4.16	74.47	76.63	5.68	70.95
12/31/2020	77.42	6.52	70.90	78.63	4.35	74.28	76.63	5.75	70.88
1/15/2021	77.42	6.76	70.66	78.63	4.66	73.97	76.63	6.87	69.76
1/31/2021	77.42	6.92	70.50	78.63	4.56	74.07	76.63	6.01	70.62
2/15/2021	77.42	5.99	71.43	78.63	3.44	75.19	76.63	5.45	71.18
2/28/2021	77.42	6.82	70.60	78.63	4.31	74.32	76.63	5.90	70.73
3/15/2021	77.42	7.11	70.31	78.63	4.64	73.99	76.63	6.10	70.53
3/31/2021	77.42	6.56	70.86	78.63	4.41	74.22	76.63	5.71	70.92
4/15/2021	77.42	6.93	70.49	78.63	4.28	74.35	76.63	5.91	70.72
4/30/2021	77.42	7.40	70.02	78.63	4.92	73.71	76.63	6.05	70.58
5/15/2021	77.42	8.05	69.37	78.63	5.21	73.42	76.63	6.58	70.05
5/31/2021	77.42	8.46	68.96	78.63	5.71	72.92	76.63	6.74	69.89
6/15/2021	77.42	7.57	69.85	78.63	4.33	74.30	76.63	6.10	70.53
6/30/2021	77.42	6.67	70.75	78.63	4.75	73.88	76.63	6.03	70.60
7/15/2021	77.42	5.69	71.73	78.63	1.87	76.76	76.63	5.00	71.63
7/30/2021	77.42	5.65	71.77	78.63	2.61	76.02	76.63	5.28	71.35
8/15/2021	77.42	5.17	72.25	78.63	1.45	77.18	76.63	4.72	71.91
8/31/2021	77.42	5.68	71.74	78.63	2.70	75.93	76.63	5.23	71.40
9/15/2021	77.42	4.98	72.44	78.63	1.61	77.02	76.63	4.53	72.10
9/30/2021	77.42	5.97	71.45	78.63	2.44	76.19	76.63	5.23	71.40

Table 8
Cross Bar Ranch Augmentation
Pinellas County Utilitites
Water Use Permit No. 20004649.007
Bi-Weekly Wetland Staff Gauge Measurement Data
WY 2021

	60 (CL-SG)			61 (GL-SG)			62 (7A-SG)								
							INNER			INNER INNER			OUTER		
DATE	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD
10/15/2020	64.63	69.38	69.38	67.74	73.66	73.66	66.56	3.62	70.18						
10/31/2020	64.63	69.08	69.08	67.74	73.29	73.29	66.56	3.44	70.00						
11/15/2020	64.63	69.20	69.20	67.74	73.32	73.32	66.56	3.60	70.16						
11/30/2020	64.63	68.99	68.99	67.74	73.06	73.06	66.56	3.50	70.06						
12/15/2020	64.63	68.80	68.80	67.74	72.84	72.84	66.56	3.36	69.92						
12/31/2020	64.63	68.63	68.63	67.74	72.62	72.62	66.56	3.34	69.90						
1/15/2021	64.63	68.36	68.36	67.74	72.32	72.32	66.56	3.06	69.62						
1/31/2021	64.63	68.18	68.18	67.74	72.06	72.06	66.56	3.36	69.92						
2/15/2021	64.63	68.08	68.08	67.74	71.94	71.94	66.56	2.80	69.36						
2/28/2021	64.63	68.02	68.02	67.74	71.74	71.74	66.56	3.07	69.63						
3/15/2021	64.63	67.66	67.66	67.74	71.48	71.48	66.56	2.94	69.50						
3/31/2021	64.63	67.56	67.56	67.74	71.35	71.35	66.56	2.92	69.48						
4/15/2021	64.63	67.38	67.38	67.74	71.18	71.18	66.56	2.92	69.48						
4/30/2021	64.63	67.18	67.18	67.74	70.98	70.98	66.56	2.67	69.23						
5/15/2021	64.63	66.70	66.70	67.74	69.66	69.66	66.56	2.12	68.68						
5/31/2021	64.63	66.22	66.22	67.74	70.08	70.08	66.56	1.84	68.40						
6/15/2021	64.63	66.78	66.78	67.74	70.28	70.28	66.56	2.44	69.00						
6/30/2021	64.63	67.48	67.48	67.74	70.30	70.30	66.56	2.38	68.94						
7/15/2021	64.63	68.74	68.74	67.74	71.52	71.52	66.56	3.80	70.36						
7/30/2021	64.63	68.76	68.76	67.74	71.58	71.58	66.56	3.64	70.20						
8/15/2021	64.63	69.82	69.82	67.74	72.12	72.12							70.78	0.28	71.06
8/31/2021	64.63	69.50	69.50	67.74	72.18	72.18	66.56	3.92	70.48						
9/15/2021	64.63	69.80	69.80	67.74	72.76	72.76							70.78	0.36	71.14
9/30/2021	64.63	69.69	69.69	67.74	73.06	73.06	66.56	3.98	70.54						

MPE: Monitoring Point Elevation
NGVD: National Geodetic Vertical Datum

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Table 8
Cross Bar Ranch Augmentation
Pinellas County Utilitites
Water Use Permit No. 20004649.007
Bi-Weekly Wetland Staff Gauge Measurement Data
WY 2021

	63 (7B-SG)						64 (7C-SG)								
	INNER			OUTER			INNER			INNER INNER			OUTER		
DATE	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD
10/15/2020	69.88	71.82	71.82				68.97	1.48	70.45						
10/31/2020	69.88	71.26	71.26				68.97	1.34	70.31						
11/15/2020	69.88	71.52	71.52				68.97	1.58	70.55						
11/30/2020	69.88	71.26	71.26				68.97	1.42	70.39						
12/15/2020	69.88	70.98	70.98				68.97	1.28	70.25						
12/31/2020	69.88	70.90	70.90				68.97	1.35	70.32						
1/15/2021	69.88	70.56	70.56				68.97	1.16	70.13						
1/31/2021	69.88	70.76	70.76				68.97	1.08	70.05						
2/15/2021	69.88	70.58	70.58				68.97	1.24	70.21						
2/28/2021	69.88	70.50	70.50				68.97	1.17	70.14						
3/15/2021	69.88	70.36	70.36				68.97	1.00	69.97						
3/31/2021	69.88	70.60	70.60				68.97	0.97	69.94						
4/15/2021	69.88	70.26	70.26				68.97	1.00	69.97						
4/30/2021	69.88	70.38	70.38				68.97	0.69	69.66						
5/15/2021	69.88	70.44	70.44				68.97	0.24	69.21						
5/31/2021	69.88	70.26	70.26				68.97	0.00	68.97	66.79	2.18	68.97			
6/15/2021	69.88	70.70	70.70				68.97	0.22	69.19						
6/30/2021	69.88	70.02	70.02				68.97	0.42	69.39						
7/15/2021	69.88	72.48	72.48				68.97	1.78	70.75						
7/30/2021	69.88	72.10	72.10				68.97	1.51	70.48						
8/15/2021	69.88	72.60	72.60				68.97	1.64	70.61						
8/31/2021	69.88	72.30	72.30				68.97	1.54	70.51						
9/15/2021	69.88	72.70	72.70				68.97	1.60	70.57						
9/30/2021	69.88	72.66	72.66				68.97	1.56	70.53						

MPE: Monitoring Point Elevation
NGVD: National Geodetic Vertical Datum

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Table 8
Cross Bar Ranch Augmentation
Pinellas County Utilitites
Water Use Permit No. 20004649.007
Bi-Weekly Wetland Staff Gauge Measurement Data
WY 2021

	65 (7D-SG)						66 (8-1(NE)-SG)					
	INNER			OUTER			INNER			OUTER		
DATE	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD
10/15/2020				69.64	0.10	69.74				68.62	2.86	71.48
10/31/2020	68.74	1.78	70.52							68.62	2.70	71.32
11/15/2020				69.64	0.26	69.90				68.62	2.98	71.60
11/30/2020	68.74	1.34	70.08							68.62	2.73	71.35
12/15/2020	68.74	0.92	69.66							68.62	2.68	71.30
12/31/2020	68.74	0.80	69.54							68.62	2.65	71.27
1/15/2021	68.74	0.78	69.52							68.62	2.52	71.14
1/31/2021	68.74	0.90	69.64							68.62	2.46	71.08
2/15/2021	68.74	0.88	69.62							68.62	2.50	71.12
2/28/2021	68.74	0.94	69.68							68.62	2.48	71.10
3/15/2021	68.74	0.82	69.56							68.62	2.34	70.96
3/31/2021	68.74	0.76	69.50							68.62	2.32	70.94
4/15/2021	68.74	0.86	69.60							68.62	2.24	70.86
4/30/2021	68.74	0.60	69.34							68.62	2.14	70.76
5/15/2021	68.74	0.88	69.62							68.62	1.88	70.50
5/31/2021	68.74	0.46	69.20							68.62	1.33	69.95
6/15/2021	68.74	0.40	69.14							68.62	1.86	70.48
6/30/2021	68.74	0.54	69.28							68.62	2.08	70.70
7/15/2021				69.64	0.54	70.18				68.62	3.18	71.80
7/30/2021	68.74	1.32	70.06							68.62	2.96	71.58
8/15/2021				69.64	0.86	70.50	70.97	0.74	71.71			
8/31/2021				69.64	0.22	69.86				68.62	3.14	71.76
9/15/2021				69.64	0.58	70.22				68.62	2.88	71.50
9/30/2021				69.64	0.48	70.12				68.62	3.16	71.78

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Table 8
Cross Bar Ranch Augmentation
Pinellas County Utilitites
Water Use Permit No. 20004649.007
Bi-Weekly Wetland Staff Gauge Measurement Data
WY 2021

	66 (8-2(SW)-SG)						67 (10-SG)								
	INNER			OUTER			INNER			INNER INNER			OUTER		
DATE	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD
10/15/2020	67.00	5.04	72.04							67.84	1.68	69.52			
10/31/2020	67.00	4.83	71.83							67.84	1.37	69.21			
11/15/2020				72.14	0.10	72.24				67.84	1.72	69.56			
11/30/2020	67.00	4.96	71.96							67.84	1.43	69.27			
12/15/2020	67.00	4.82	71.82							67.84	1.28	69.12			
12/31/2020	67.00	4.81	71.81							67.84	1.35	69.19			
1/15/2021	67.00	4.60	71.60							67.84	1.20	69.04			
1/31/2021	67.00	4.50	71.50							67.84	1.20	69.04			
2/15/2021	67.00	4.80	71.80							67.84	1.28	69.12			
2/28/2021	67.00	4.58	71.58							67.84	1.23	69.07			
3/15/2021	67.00	3.94	70.94							67.84	1.14	68.98			
3/31/2021	67.00	4.08	71.08							67.84	1.12	68.96			
4/15/2021	67.00	4.42	71.42							67.84	1.20	69.04			
4/30/2021	67.00	3.77	70.77							67.84	0.96	68.80			
5/15/2021	67.00	3.10	70.10							67.84	0.46	68.30			
5/31/2021	67.00	2.22	69.22							67.84	0.00	67.84			
6/15/2021	67.00	2.98	69.98							67.84	0.66	68.50			
6/30/2021	67.00	3.35	70.35							67.84	1.00	68.84			
7/15/2021	67.00	5.22	72.22							67.84	1.96	69.80			
7/30/2021	67.00	5.09	72.09							67.84	1.65	69.49			
8/15/2021	67.00	5.40	72.40							67.84	2.37	70.21			
8/31/2021				72.14	0.18	72.32				67.84	1.74	69.58			
9/15/2021	67.00	5.80	72.80							67.84	2.08	69.92			
9/30/2021				72.14	0.20	72.34				67.84	1.78	69.62			

MPE: Monitoring Point Elevation
NGVD: National Geodetic Vertical Datum

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Table 8
Cross Bar Ranch Augmentation
Pinellas County Utilitites
Water Use Permit No. 20004649.007
Bi-Weekly Wetland Staff Gauge Measurement Data
WY 2021

	68 (13A-SG)						69 (13B-SG)					
	INNER			OUTER			INNER			OUTER		
DATE	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD
10/15/2020				74.10	1.34	75.44				68.91	1.64	70.55
10/31/2020				74.10	0.46	74.56				68.91	1.40	70.31
11/15/2020				74.10	0.74	74.84				68.91	1.56	70.47
11/30/2020				74.10	0.68	74.78				68.91	1.40	70.31
12/15/2020				74.10	1.26	75.36				68.91	1.42	70.33
12/31/2020				74.10	0.43	74.53				68.91	1.38	70.29
1/15/2021				74.10	0.20	74.30				68.91	1.34	70.25
1/31/2021				74.10	0.26	74.36				68.91	1.26	70.17
2/15/2021				74.10	1.26	75.36				68.91	1.52	70.43
2/28/2021				74.10	0.55	74.65				68.91	1.33	70.24
3/15/2021				74.10	0.22	74.32				68.91	1.26	70.17
3/31/2021				74.10	0.42	74.52				68.91	1.40	70.31
4/15/2021				74.10	0.66	74.76				68.91	1.38	70.29
4/30/2021	72.92	1.30	74.22							68.91	1.28	70.19
5/15/2021				74.10	0.12	74.22				68.91	1.04	69.95
5/31/2021	72.92	0.92	73.84							68.91	0.85	69.76
6/15/2021				74.10	0.66	74.76				68.91	1.28	70.19
6/30/2021				74.10	0.26	74.36				68.91	1.28	70.19
7/15/2021				74.10	2.38	76.48				68.91	1.68	70.59
7/30/2021				74.10	1.92	76.02				68.91	1.46	70.37
8/15/2021				74.10	3.12	77.22				68.91	1.94	70.85
8/31/2021				74.10	1.92	76.02				68.91	1.52	70.43
9/15/2021				74.10	2.94	77.04				68.91	1.80	70.71
9/30/2021				74.10	2.22	76.32				68.91	1.58	70.49

MPE: Monitoring Point Elevation
NGVD: National Geodetic Vertical Datum

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APPENDIX E

ECOLOGICAL MONITORING DATA TABLES

TABLE 9. WETLAND SCORES FOR EIGHT WETLAND SITES AT CROSS BAR RANCH (April 2021)

		Ground Cover				Shrub/Small Trees			Vines	Trees					Soils	Water Level			
SITE	FLUCFCS	Deep Zone comp.	Trans. Zone Comp.	Species Zonation	Weedy Comp.	Comp.	Species Zonation	Weedy Comp.	Vine Zonation	Tree Comp. App. For Wetland Type	Tree Zonation	% Tree Canopy Stress	%Tree Leaning	% Tree Dead	Subsidence	Current Indicators	Site	Total WAP Score	Max.WAP Score
7A-CB	621	**3**	**1**	**1**	**2**	**1**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**n/a**	**2**	7A-CB	**32**	**42**
7B-CB	621	**3**	**2**	**3**	**2**	**1**	**2**	**1**	**3**	**2**	**3**	**3**	**3**	**3**	**n/a**	**3**	7B-CB	**34**	**42**
7C-CB	621	**3**	**1**	**1**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**n/a**	**1**	7C-CB	**31**	**42**
7D-CB	641	**3**	**3**	**3**	**3**	**2**	**1**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**n/a**	**3**	7D-CB	**37**	**42**
8E-CB	621	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**n/a**	**2**	8E-CB	**34**	**42**
8W-CB	621	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**n/a**	**3**	8W-CB	**37**	**42**
10-CB	6411	**2**	**1**	**2**	**2**	**1**	**2**	**2**	**2**	**3**	**2**	**3**	**3**	**3**	**n/a**	**2**	10-CB	**30**	**42**
13A-CB	621	**3**	**3**	**3**	**3**	**1**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**n/a**	**2**	13A-CB	**37**	**42**
13B-CB	641	**3**	**1**	**3**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**n/a**	**2**	13B-CB	**37**	**42**

TABLE 10. WETLAND SCORES FOR EIGHT WETLAND SITES AT CROSS BAR RANCH (SEPTEMBER 2021)

		Ground Cover				Shrub/Small Trees			Vines	Trees					Soils	Water Level			
SITE	FLUCFCS	Deep Zone comp.	Trans. Zone Comp.	Species Zonation	Weedy Comp.	Comp.	Species Zonation	Weedy Comp.	Vine Zonation	Tree Comp. App. For Wetland Type	Tree Zonation	% Tree Canopy Stress	%Tree Leaning	% Tree Dead	Subsidence	Current Indicators	Site	Total WAP Score	Max.WAP Score
7A-CB	621	**3**	**1**	**2**	**2**	**1**	**2**	**1**	**3**	**3**	**3**	**3**	**3**	**3**	**n/a**	**2**	7A-CB	**32**	**42**
7B-CB	621	**2**	**1**	**3**	**2**	**1**	**2**	**1**	**3**	**2**	**3**	**3**	**3**	**3**	**n/a**	**3**	7B-CB	**32**	**42**
7C-CB	621	**3**	**1**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**n/a**	**1**	7C-CB	**34**	**42**
7D-CB	641	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**n/a**	**3**	7D-CB	**38**	**42**
8E-CB	621	**3**	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**n/a**	**2**	8E-CB	**37**	**42**
8W-CB	621	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**3**	**n/a**	**3**	8W-CB	**37**	**42**
10-CB	6411	**2**	**1**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**n/a**	**2**	10-CB	**30**	**42**
13A-CB	621	**3**	**2**	**3**	**3**	**1**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**n/a**	**3**	13A-CB	**38**	**42**
13B-CB	641	**3**	**2**	**3**	**3**	**1**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**n/a**	**2**	13B-CB	**38**	**42**

TABLE 11 - WETLAND ASSESSMENT VEGETATIVE SUMMARY FOR APRIL AND SEPTEMBER 2021

Station	CC	Groundcover Deep Zone	CC	Transitional Zone	CC	Weedy Cover	CC	Shrub Deep Zone	CC	Transition Zone	CC	Vines	CC	Tree
CB-7A April 2021	1	*Rubus spp. (FAC)*	1	*Pteridium aquilinum (UPL)*	2	*Rubus spp. (FAC)*	1	*Myrica cerifera (FAC)*	1	*Myrica cerifera (FAC)*		**Deep Zone:**		**Deep Zone:**
	2	*Woodwardia virginica (FACW)*	2	*Rubus spp. (FAC)*	2	*Eupatorium capillifolium (FAC)*	1	*Baccharis halimifolia (FAC)*	2	*Baccharis halimifolia (FAC)*	2	*Vitis rotundifolia*	4	*Taxodium ascendens (OBL)*
	1	*Erechtites hieraciifolius (FAC)*	1	*Condea verticillata (UPL)*	1	*Urena lobata (UPL)*	1	*Sabal palmetto (FAC)*	1	*Sambucus nigra (FAC)*	1	*Toxicodendron radicans*	2	*Nyssa sylvatica var. biflora (OBL)*
	1	*Paspalum urvelli (FAC)*	2	*Eupatorium capillifolium (FAC)*	1	*Vitis rotundifolia*	1	*Cephalanthus occidentalis (OBL)*	1	*Pinus elliotii (UPL)*	1	*Paederia foetida*	2	*Ilex cassine (OBL)*
	4	*Panicum hemitomon (OBL)*	1	*Erechtites hieraciifolius (FAC)*	1	*Pteridium aquilinum (UPL)*	1	*Taxodium ascendens (OBL)*						
	1	*Eupatorium capillifolium (FAC)*	1	*Thelypteris kunthii (FACW)*	1	*Toxicodendron radicans (-)*								
	1	*Galium tinctorium (FACW)*	3	*Paspalum urvillei (FAC)*	1	*Lygodium japonicum (-)*						**Transition Zone:**		**Transition Zone:**
	1	*Osmunda regalis (OBL*	1	*Urena lobata (UPL)*	1	*Erechtites hieraciifolius (FAC)*					1	*Parthenocissus quinquefolia*	2	*Taxodium ascendens (OBL)*
	2	*Cephalanthus occidentalis (OBL)*	1	*Scoparia dulcis (FAC)*							1	*Vitis rotundifolia*	1	*Persea palustris (OBL)*
	1	*Rhynchospora microcarpa (OBL)*	1	*Andropogon glomeratus (FACW)*							1	*Lygodium japonicum*		
	1	*Ludwigia repens (FACW)*	1	*Baccharis halimifolia (FAC)*										
	1	*Urena lobata (UPL)*	1	*Cirsium nuttallii (FACW)*										
	1	*Carex longii (FACW)*	2	*Andropogon virginicus (FAC)*										
	1	*Acer rubrum (FACW)*	1	*Carex longii (FACW)*										
	1	*Toxicodendron radicans*	1	*Panicum hemitomon (OBL)*										
	1	*Lycopus rubellus (OBL)*	1	*Lygodium japonicum (-)*										
	1	*Andropogon glomeratus (FACW)*												
	1	*Vitis rotundifolia*												
CB-7A September 2021	1	*Rubus spp. (FAC)*	2	*Rubus spp. (FAC)*	2	*Rubus spp. (FAC)*	1	*Myrica cerifera (FAC)*	1	*Myrica cerifera (FAC)*		**Deep Zone:**		**Deep Zone:**
	2	*Woodwardia virginica (FACW)*	2	*Condea verticillata (UPL)*	2	*Paspalum urvillei (FAC)*	1	*Baccharis halimifolia (FAC)*	2	*Baccharis halimifolia (FAC)*	2	*Vitis rotundifolia*	3	*Taxodium ascendens (OBL)*
	1	*Andropogon glomeratus (FACW)*	1	*Eupatorium capillifolium (FAC)*	3	*Urena lobata (UPL)*	1	*Persea palustris (OBL)*	1	*Sambucus nigra (FAC)*	1	*Toxicodendron radicans*	2	*Nyssa sylvatica var. biflora (OBL)*
	1	*Lycopus rubellus (OBL)*	2	*Thelypteris kunthii (FACW)*	1	*Vitis rotundifolia*	1	*Cephalanthus occidentalis (OBL)*	2	*Rubus spp. (FAC)*	1	*Paederia foetida*	2	*Ilex cassine (OBL)*
	3	*Panicum hemitomon (OBL)*	3	*Urena lobata (UPL)*	1	*Paederia foetida*	1	*Taxodium ascendens (OBL)*	1	*Callicarpa americana (UPL)*				
	1	*Eupatorium capillifolium (FAC)*	2	*Paspalum urvillei (FAC)*	1	*Eupatorium capillifolium (FAC)*	1	*Sabal palmetto (FAC)*	1	*Pinus elliotii (UPL)*				
	1	*Pluchea baccharis (FACW)*	1	*Bidens alba (FAC)*	1	*Toxicodendron radicans (-)*	1	*Nyssa sylvatica var. biflora*				**Transition Zone:**		**Transition Zone:**
	1	*Paederia foetida (-)*	1	*Scoparia dulcis (FAC)*	2	*Lygodium japonicum (-)*					2	*Parthenocissus quinquefolia*	2	*Taxodium ascendens (OBL)*
	1	*Cephalanthus occidentalis (OBL)*	1	*Woodwardia virginica (FACW)*	1	*Cuphea carthagenensis (FAC)*					2	*Vitis rotundifolia*	1	*Persea palustris (OBL)*
	1	*Rhynchospora microcarpa (OBL)*	1	*Baccharis halimifolia (FAC)*	2	*Scoparia dulcis (FAC)*					1	*Lygodium japonicum*		
	1	*Ludwigia repens (FACW)*	1	*Vitis rotundifolia (-)*	1	*Baccharis halimifolia (FAC)*								
	1	*Urena lobata (UPL)*	2	*Lygodium japonicum (-)*										
	1	*Persicaria punctata (OBL)*	1	*Senna obtusifolia (FACU)*										
	1	*Cuphea carthagenesis (FAC)*	2	*Sporobolus indicus (UPL)*										
	1	*Boehmeria cylindrica (OBL)*	1	*Bidens alba (FAC)*										
	1	*Baccharis halimifolia (FAC)*	1	*Setaria parviflora (UPL)*										
	1	*Cyperus odoratus (FACW)*	2	*Andropogon glomeratus (FACW)*										
	1	*Ludwigia octovalvus (OBL)*	2	*Phyllanthus urinaria (FAC)*										
	1	*Blechnum serrulatum (FACW)*												
	1	*Utricularia foliiosa (OBL)*												
	1	*Toxicodendron radicans*												
	1	*Myrica cerifera (FAC)*												
	2	*Thelypteris interrupta (FACW)*												
CB-7B April 2021	2	*Woodwardia virginica (FACW)*	1	*Cirsium nuttallii (FACW)*	1	*Eupatorium capillifolium (FAC)*	1	*Myrica cerifera (FAC)*	1	*Persea palustris (OBL)*		**Deep Zone:**		**Deep Zone:**
	1	*Lycopus rubellus (OBL)*	1	*Panicum hemitomon (OBL)*	1	*Ptilimnium capillaceum (FACW)*	1	*Baccharis halimifolia (FAC)*	2	*Baccharis halimifolia (FAC)*	1	*Toxicodendron radicans*	2	*Ilex cassine (OBL)*
	1	*Cirsium nuttallii (FACW)*	2	*Woodwardia virginica (FACW)*	1	*Pinus elliotii (UPL)*	1	*Persea palustris (OBL)*	2	*Myrica cerifera (FAC)*	1	*Campsis radicans*	4	*Taxodium ascendens (OBL)*
	1	*Solidago fistulosa (FACW)*	1	*Bidens alba (FAC)*	2	*Rubus spp. (FAC)*	1	*Cephalanthus occidentalis (OBL)*			1	*Vitis rotundifolia*	2	*Nyssa sylvatica var. biflora (OBL)*
	1	*Ptilimnium capillaceum (FACW)*	2	*Boehmeria cylindrica (OBL)*	1	*Vitis rotundifolia*	1	*Pinus elliottii (FAC)*					3	*Acer rubrum (FACW)*
	1	*Acer rubrum (FACW)*	1	*Eupatorium capillifolium (FAC)*	1	*Paederia foetida*							1	*Pinus elliotii (UPL)*
	1	*Panicum hemitomon (OBL)*	2	*Thelypteris kunthii (FACW)*	1	*Urena lobata (UPL)*						**Transition Zone:**		**Transition Zone:**
	1	*Urena lobata (UPL)*	1	*Paederia foetida (-)*	1	*Centella asiatica (FACW)*					2	*Vitis rotundifolia*	2	*Taxodium ascendens (OBL)*
	1	*Centella asiatica (FACW)*	1	*Pinus elliotii (UPL)*	1	*Toxicodendron radicans (-)*					1	*Paederia foetida*	2	*Pinus elliotii (UPL)*
	1	*Mikania scandens (-)*	2	*Boehmeria cylindrica (OBL)*	1	*Galium tinctorium (FACW)*					1	*Ampelopsis arborea*	2	*Acer rubrum (FACW)*
	1	*Phyla nodiflora (FAC)*	1	*Urena lobata (UPL)*							2	*Campsis radicans*	2	*Persea palustris (OBL)*
	1	*Galium tinctorium (FACW)*	1	*Toxicodendron radicans (-)*									1	*Sabal palmetto (FAC)*
	1	*Andropogon glomeratus (FACW)*	2	*Andropogon glomeratus (FACW)*										
	1	*Carex longii (FACW)*	1	*Vitis rotundifolia (-)*										
			1	*Carex longii (FACW)*										
			1	*Centella asiatica (FACW)*										
			1	*Dichondra carolinensis (FAC)*										
			1	*Campsis radicans (-)*										
			1	*Pinus elliotii (UPL)*										
			2	*Rubus spp. (FAC)*										
			1	*Acer rubrum (FACW)*										

TABLE 11 - WETLAND ASSESSMENT VEGETATIVE SUMMARY FOR APRIL AND SEPTEMBER 2021

Station	CC	Groundcover Deep Zone	CC	Transitional Zone	CC	Weedy Cover	CC	Shrub Deep Zone	CC	Transition Zone	CC	Vines	CC	Tree
CB-7B September 2021	2	*Woodwardia virginica (FACW)*	2	*Panicum hemitomon (OBL)*	1	*Baccharis halimifolia (FAC)*	1	*Myrica cerifera (FAC)*	2	*Baccharis halimifolia (FAC)*		**Deep Zone:**		**Deep Zone:**
	2	*Lycopus rubellus (OBL)*	2	*Woodwardia virginica (FACW)*	1	*Eupatorium capillifolium (FAC)*	1	*Ilex cassine (OBL)*	2	*Myrica cerifera (FAC)*	1	*Campsis radicans*	3	*Taxodium ascendens (OBL)*
	1	*Panicum hemitomon (OBL)*	2	*Bidens alba (FAC)*	2	*Rubus spp. (FAC)*	1	*Persea borbonia (OBL)*	1	*Persea palustris (OBL)*	1	*Vitis rotundifolia*	3	*Acer rubrum (FACW)*
	1	*Urena lobata (UPL)*	2	*Thelypteris kunthii (FACW)*	2	*Urena lobata (UPL)*	1	*Baccharis halimifolia (FAC)*	1	*Serenoa repens (FAC)*	1	*Toxicodendron radicans*	2	*Ilex cassine (OBL)*
	1	*Centella asiatica (FACW)*	1	*Boehmeria cylindrica (OBL)*	1	*Ampelopsis arborea (-)*	1	*Pinus elliottii (FAC)*	1	*Pinus elliotii (UPL)*	1	*Smilax laurifolia*	2	*Nyssa sylvatica var. biflora (OBL)*
	2	*Andropogon glomeratus (FACW)*	2	*Urena lobata (UPL)*	1	*Centella asiatica (FACW)*			1	*Callicarpa americana (UPL)*	1	*Mikania scandens*	1	*Pinus elliotii (UPL)*
	1	*Acer rubrum (FACW)*	1	*Toxicodendron radicans (-)*	1	*Toxicodendron radicans (-)*					1	Ampelopsis arborea		**Transition Zone:**
	1	*Campsis radicans (-)*	2	*Rubus spp. (FAC)*	1	*Paederia foetida (-)*							2	*Taxodium ascendens (OBL)*
	1	*Mikania scandens (-)*	2	*Baccharis halimifolia (FAC)*	1	*Pinus elliotii (UPL)*						**Transition Zone:**	2	*Pinus elliotii (UPL)*
	1	*Osmunda regalus (OBL)*	1	*Eupatorium capillifolium (FAC)*							2	*Vitis rotundifolia*	2	*Acer rubrum (FACW)*
	1	*Persicaria punctata (OBL)*	2	*Senna obtusifolia (FACU)*							2	*Campsis radicans*	1	*Sabal palmetto (FAC)*
	1	*Hypericum fasciculatum (OBL)*	1	*Ampelopsis arborea (-)*							1	*Toxicodendron radicans*	1	*Persea palustris (OBL)*
	1	*Rubus spp. (FAC)*	2	*Condea verticillata (UPL)*							1	*Paederia foetida*		
	1	*Setaria parviflora*	1	*Pinus elliotii (UPL)*							1	*Mikania scandens*		
	1	*Baccharis halimifolia (FAC)*	1	*Mikania scandens (-)*										
	1	*Boehmeria cylindrica (OBL)*	1	*Campsis radicans (-)*										
	1	*Phyla nodiflora (FAC)*	1	*Paederia foetida (-)*										
			1	*Phyllanthus urinaria (FAC)*										
			1	*Centella asiatica (FACW)*										
			1	*Setaria parviflora (UPL)*										
			1	*Persicaria punctata (OBL)*										
			1	*Hydrocotyle umbellata (FACW)*										
			2	*Andropogon glomeratus (FACW)*										
			1	*Acer rubrum (FACW)*										
CB-7C April 2021	4	*Woodwardia virginica (FACW)*	1	*Panicum hemitomon (OBL)*	2	*Eupatorium capillifolium (FAC)*	2	*Myrica cerifera (FAC)*	2	*Myrica cerifera (FAC)*		**Deep Zone:**		**Deep Zone:**
	1	*Urena lobata (UPL)*	1	*Bidens alba (FAC)*	1	*Paederia foetida (-)*	1	*Taxodium ascendens (OBL)*	1	*Callicarpa americana (UPL)*	1	*Vitis rotundifolia*	3	*Taxodium ascendens (OBL)*
	1	*Cephalanthus occidentalis (OBL)*	2	*Urena lobata (UPL)*	2	*Urena lobata (UPL)*	1	*Persea palustris (OBL)*	2	*Rubus spp. (FAC)*	1	*Paederia foetida*	2	*Ilex cassine (OBL)*
	1	*Panicum hemitomon (OBL)*	1	*Woodwardia virginica (FACW)*	2	*Toxicodendron radicans (-)*	2	*Cephalanthus occidentalis (OBL)*	1	*Sambucus nigra (FAC)*	1	*Toxicodendron radicans*	2	*Acer rubrum (FACW)*
	1	*Vitis rotundifolia*	1	*Thelypteris kunthii (FACW)*	1	*Juncus effusus (OBL)*	1	*Ilex cassine (OBL)*	1	*Citrus spp. (UPL)*	1	*Smilax bona-nox*		
	1	*Acer rubrum (FACW)*	1	*Paederia foetida (-)*	1	*Vitis rotundifolia (-)*								
	1	*Nuphar advena (OBL)*	3	*Erechtites hieraciifolius (FAC)*	3	*Erechtites hieraciifolius (FAC)*						**Transition Zone:**		**Transition Zone:**
	1	*Ludwigia repens (FACW)*	2	*Eupatorium capillifolium (FAC)*	1	*Ampelopsis arborea (-)*					2	*Vitis rotundifolia*	2	*Taxodium ascendens (OBL)*
	1	*Woodwardia areolata (OBL)*	2	*Condea verticillata (UPL)*	1	*Oxalis spp. (FAC)*					2	*Ampelopsis arborea*	1	*Ilex cassine (OBL)*
	1	*Lycopus rubellus (OBL)*	1	*Toxicodendron radicans (-)*	1	*Galium tinctorium (FACW)*					2	*Paederia foetida*	1	*Acer rubrum (FACW)*
			1	*Vitis rotundifolia (-)*	1	*Lygodium japonicum (-)*					2	*Toxicodendron radicans*	1	*Cinnamomum camphora (UPL)*
			1	*Lygodium japonicum (-)*	1	*Sambucus nigra (FAC)*					1	*Parthenocissus quiquefolia*		
			1	*Oxalis spp (FAC)*										
			1	*Ampelopsis arborea (-)*										
			1	*Galium tinctorium (FACW)*										
			2	*Carex longii (FACW)*										
			1	*Ragweed (FAC)*										
			1	*Sambucus nigra (FAC)*										
			1	*Cirsium nuttallii (FACW)*										
			1	*Acer rubrum (FACW)*										
			1	*Juncus effusus (OBL)*										
CB-7C September 2021	2	*Lycopus rubellus (OBL)*	2	*Bidens alba (FAC)*	2	*Rubus spp. (FAC)*	1	*Myrica cerifera (FAC)*	2	*Myrica cerifera (FAC)*		**Deep Zone:**		**Deep Zone:**
	2	*Woodwardia virginica (FACW)*	2	*Rubus spp. (FAC)*	2	*Urena lobata (UPL)*	1	*Ilex cassine (OBL)*	2	*Baccharis halimifolia (FAC)*	1	*Campsis radicans*	3	*Taxodium ascendens (OBL)*
	1	*Panicum hemitomon (OBL)*	2	*Woodwardia virginica (FACW)*	1	*Eupatorium capillifolium (FAC)*	1	*Persea borbonia (OBL)*	1	*Persea borbonia (OBL)*	1	*Toxicodendron radicans*	2	*Ilex cassine (OBL)*
	1	*Osmunda regalis (OBL*	2	*Panicum hemitomon (OBL)*	1	*Ampelopsis arborea (-)*	1	*Baccharis halimifolia (FAC)*	1	*Lantana strigocamera (UPL)*	1	*Vitis rotundifolia*	3	*Acer rubrum (FACW)*
											1	*Mikania scandens*	2	*Nyssa sylvatica var. biflora (OBL)*
											1	*Ampelopsis arborea*	1	*Pinus elliottii (UPL)*
	1	*Urena lobata (UPL)*	2	*Thelypteris kunthii (FACW)*	1	*Centella asiatica (FACW)*	1	*Pinus elliottii (FAC)*	1	*Serenoa repens (FAC)*	1	*Smilaz laurifolia*		
	1	*Acer rubrum (FACW)*	1	*Eupatorium capillifolium (FAC)*	1	*Toxicodendron radicans (-)*			1	*Pinus elliotii (UPL)*		**Transition Zone:**		
	1	*Centella asiatica (FACW)*	2	*Condea verticillata (UPL)*	1	*Paederia foetida (-)*			1	*Callicarpa americana (UPL)*	2	*Campsis radicans*		**Transition Zone:**
	2	*Andropogon glomeratus (FACW)*	1	*Boehmeria cylindrica (OBL)*	1	*Pinus elliotii (UPL)*					1	*Paederia foetida*		
	1	*Campsis radicans (-)*	2	*Urena lobata (UPL)*	2	*Baccharis halimifolia (FAC)*					1	*Mikania scandens*	2	*Taxodium ascendens (OBL)*
	1	*Setaria parviflora (UPL)*	1	*Acer rubrum (FACW)*							2	*Vitis rotundifolia*	2	*Acer rubrum (FACW)*
	1	*Mikania scandens (-)*	1	*Toxicodendron radicans (-)*							1	*Toxicodendron radicans*	2	*Pinus elliottii (UPL)*
	1	*Persicaria punctata (OBL)*	1	*Ampelopsis arborea (-)*									1	*Sabal palmetto (FAC)*
	1	*Hypericum fasciculatum (OBL)*	2	*Andropogon glomeratus (FACW)*									2	*Persea palustris (OBL)*
	1	*Rubus spp. (FAC)*	1	*Centella asiatica (FACW)*										
	1	*Baccharis halimifolia (FAC)*	1	*Mikania scandens (-)*										
	1	*Phyla nodiflora (FAC)*	1	*Campsis radicans (-)*										
	1	Boehmeria cylindrica (OBL)	1	*Phyllanthus urinaria (FAC)*										
			2	*Baccharis halimifolia (FAC)*										
			1	*Hydrocotyle umbellata (FACW)*										
			2	*Senna spp. (UPL)*										
			1	*Pinus elliotii (UPL)*										
			2	*Setaria parviflora (UPL)*										
			1	*Persicaria punctata (OBL)*										
			1	*Paederia foetida (-)*										

TABLE 11 - WETLAND ASSESSMENT VEGETATIVE SUMMARY FOR APRIL AND SEPTEMBER 2021

Station	CC	Groundcover Deep Zone	CC	Transitional Zone	CC	Weedy Cover	CC	Shrub Deep Zone	CC	Transition Zone	CC	Vines	CC	Tree
	2	*Amphicarpum muhlenbergianum (FACW)*	3	*Andropogon glom. var. glauc.(FACW)*	1	*Pinus elliotii (UPL)*	1	*Hypericum fasciculatum (OBL)*	2	*Persea palustris (OBL)*		**Deep Zone:**		**Deep Zone:**
	3	*Panicum hemitomon (OBL)*	2	*Woodwardia virginica (FACW)*	1	*Centella asiatica (FACW)*	1	*Taxodium ascendens (OBL)*	1	*Pinus elliotii (UPL)*	1	*Smilax laurifolia*	2	*Taxodium ascendens (OBL)*
	3	*Sagittaria lancifolia (OBL)*	3	*Amphicarpum muehlenbergianum (FACW)*	2	*Rubus spp. (FAC)*	1	*Cephalanthus occidentalis (OBL)*	2	*Myrica cerifera (FAC)*			1	*Pinus elliotii (UPL)*
	1	*Saccharum giganteum (OBL)*	2	*Lachnanthes caroliana (FAC)*	2	*Vitis rotundifolia (-)*	1	*Acer rubrum (FACW)*						**Transition Zone:**
	1	*Andropogon glom. var. glauc.(FACW)*	1	*Rhynchospora microcephala (OBL)*			2	*Myrica cerifera (FAC)*					2	*Pinus elliotii (UPL)*
	2	*Leersia hexandra (OBL)*	2	*Panicum hemitomon (OBL)*			1	*Salix caroliniana (OBL)*					1	*Taxodium ascendens (OBL)*
	1	*Nymphaea odorata (OBL)*	1	*Acer rubrum (FACW)*			1	*Pinus elliottii (FAC)*				**Transition Zone:**	1	*Ilex cassine (OBL)*
CB-7D April 2021	2	*Eleocharis spp. (OBL)*	1	*Centella asiatica (FACW)*							1	*Smilax laurifolia*	2	*Acer rubrum (FACW)*
	2	*Acer rubrum (FACW)*	1	*Pinus elliotii (UPL)*							2	*Vitis rotundifolia*	2	*Persea palustris (OBL)*
	1	*Rhychospora microcarpa (FACW)*	2	*Vitis rotundifolia (-)*										
	1	*Xyris elliottii (OBL)*	1	*Hypericum crux-andreae (FACW)*										
	1	*Hypericum fasciculatum (OBL)*	2	*Rubus spp. (FAC)*										
	1	*Cephalanthus occidentalis (OBL)*	1	*Nuphar spp. (OBL)*										
			1	*Cephalanthus occidentalis (OBL)*										
			1	*Smilax laurifolia (-)*										
			1	*Xyris spp. (OBL)*										
	3	*Sagittaria lancifolia (OBL)*	2	*Andropogon glom. var. glauc.(FACW)*	1	*Centella asiatica (FACW)*	1	*Hypericum fasciculatum (OBL)*	2	*Persea palustris (OBL)*		**Deep Zone:**		**Deep Zone:**
	2	*Leersia hexandra (OBL)*	2	*Woodwardia virginica (FACW)*	1	*Pinus elliotii (UPL)*	1	*Taxodium ascendens (OBL)*	1	*Pinus elliotii (UPL)*			2	*Taxodium ascendens (OBL)*
	1	*Eleocharis vivipara (OBL)*	1	*Lachnanthes caroliana (FAC)*	2	*Rubus spp. (FAC)*	1	*Cephalanthus occidentalis (OBL)*	2	*Myrica cerifera (FAC)*			1	*Pinus elliotti (FACW)*
	3	*Panicum hemitomon (OBL)*	1	*Vitis rotundifolia (-)*	1	*Vitis rotundifolia (-)*	1	*Acer rubrum (FACW)*	1	*Ilex cassine (OBL)*				
	1	*Amphicarpum muhlenbergianum (FACW)*	3	*Amphicarpum muehlenbergianum (FACW)*	1	*Axonopus spp. (FAC)*	2	*Myrica cerifera (FAC)*	1	*Rubus spp. (FAC)*				**Transition Zone:**
	1	*Hypericum fasciculatum (OBL)*	1	*Hypericum fasciculatum (OBL)*	1	*Salvinia minima (OBL)*	1	*Pinus elliottii (FAC)*					2	*Pinus elliotii (UPL)*
	1	*Rhynchospora microcephala (OBL)*	1	*Pinus elliotii (UPL)*			1	*Salix caroliniana (OBL)*				**Transition Zone:**	1	*Taxodium ascendens (OBL)*
	1	*Salvinia minima (OBL)*	1	*Rhynchospora microcephala (OBL)*							1	*Smilax laurifolia*	1	*Ilex cassine (OBL)*
CB-7D September 2021	1	*Acer rubrum (FACW)*	2	*Xyris elliotii (OBL)*							2	*Vitis rotundifolia*	2	*Acer rubrum (FACW)*
	1	*Saccharum giganteum (OBL)*	1	*Acer rubrum (FACW)*									2	*Persea palustris (OBL)*
	2	*Nymphaea odorata (OBL)*	2	*Panicum hemitomon (OBL)*										
	1	*Utricularia gibba (OBL)*	1	*Centella asiatica (FACW)*										
	1	*Pluchea baccharis (FACW)*	1	*Axonopus spp. (FAC)*										
	1	*Xyris elliottii (OBL)*	1	*Pluchea baccharis (FACW)*										
			1	*Rhexia martiana (FACW)*										
			1	*Leersia hexandra (OBL)*										
			1	*Nuphar advena (OBL)*										
			1	*Salvinia minima (OBL)*										
			1	*Thelypteris kunthii (FACW)*										
			2	*Rubus spp. (FAC)*										
	3	*Woodwardia virginica (FACW)*	2	*Woodwardia virginica (FACW)*	2	*Rubus spp. (FAC)*	2	*Myrica cerifera (FAC)*	2	*Persea palustris (OBL)*		**Deep Zone:**		**Deep Zone:**
	2	*Ludwigia repens (FACW)*	1	*Woodwardia areolata (OBL)*	1	*Eupatorium capillifolium (FAC)*	1	*Taxodium ascendens (OBL)*	2	*Myrica cerifera (FAC)*	2	*Vitis rotundifolia*	3	*Taxodium ascendens (OBL)*
	3	*Blechnum serrulatum (FACW)*	1	*Galium tinctorium (FACW)*	1	*Erechtites hieraciifolius (FAC)*	2	*Cephalanthus occidentalis (OBL)*	1	*Quercus laurifolia (FACW)*	1	*Mikania scandens*	1	*Sabal palmetto (FAC)*
	1	*Rhynchospora inundata. (OBL)*	1	*Eupatorium capillifolium (FAC)*	1	*Pinus elliotii (UPL)*	1	*Acer rubrum (FACW)*	1	*Baccharis halimifolia (FAC)*	1	*Smilax bona-nox*	2	*Ilex cassine (OBL)*
	1	*Erechtites hieraciifolius (FAC)*	2	*Rubus spp. (FAC)*	1	*Urena lobata (UPL)*	1	*Baccharis halimifolia (FAC)*	1	*Triadica sebifera (FAC)*			2	*Acer rubrum (FACW)*
	1	*Persicaria punctata (OBL)*	1	*Dichanthelium portoricense (UPL)*	2	*Vitis rotundifolia (-)*	1	*Ilex cassine (OBL)*	1	*Pinus elliotii (UPL)*			1	*Pinus elliotti (FACW)*
	1	*Galium tinctorium (FACW)*	1	*Panicum hemitomon (OBL)*	1	*Ptilimnium capillaceum (FACW)*	1	*Persea palustris (OBL)*	1	*Serenoa repens (FAC)*		**Transition Zone:**	1	Nyssa sylvatica var. biflora (OBL)
	1	*Rhynchospora spp. (OBL)*	1	*Ptilimnium capillaceum (FACW)*	1	*Juncus effusus (OBL)*	1	*Salix caroliniana (OBL)*	1	*Sabal palmetto (FAC)*	2	*Vitis rotundifolia*		
	2	*Paspalum conjugatum (FAC)*	1	*Ludwigia repens (FACW)*	1	*Dichanthelium portoricense (UPL)*			1	*Acer rubrum (FACW)*	1	*Smilax bona-nox*		
	1	*Cephalanthus occidentalis (OBL)*	1	*Boehmeria cylindrica (OBL)*	1	*Paspalum setaceum (FAC)*			1	*Cephalanthus occidentalis (OBL)*	1	*Mikania scandens*		**Transition Zone:**
	1	*Acer rubrum (FACW)*	1	*Paspalum setaceum (FAC)*	1	Scoparia dulcis (FAC)			1	*Cinnamomum camphora (UPL)*			1	*Pinus elliotii (UPL)*
	1	*Smilax bona-nox (-)*	1	*Thelypteris interrupta (FACW)*	1	Centella asiatica (FACW)			1	*Melia azedarach (UPL)*			2	*Taxodium ascendens (OBL)*
	1	*Nymphaea odorata (OBL)*	1	*Osmunda regalis (OBL)*	2	Paspalum conjugatum (FAC)							1	*Cinnamomum camphora (UPL)*
	1	*Ludwigia octovalvus (OBL)*	2	*Vitis rotundifolia (-)*	1	Galium tinctorium (FACW)							1	*Acer rubrum (FACW)*
	1	*Eupatorium capillifolium (FACU)*	1	*Urena lobata (UPL)*	1	Baccharis halimifolia (FAC)							1	*Persea palustris (OBL)*
	1	*Cyperus haspans (OBL)*	1	*Smilax bona-nox (-)*										
CB-8E April 2021	1	*Pluchea baccharis (FACW)*	1	*Quercus virginiana (UPL)*										
	1	*Mikania scandens (-)*	1	*Acer rubrum (FACW)*										
	1	*Pinus elliottii (FAC)*	1	*Pluchea baccharis (FACW)*										
	1	*Carex longii (FACW)*	1	*Mikania scandens (-)*										
	1	*Andropogon glomeratus var glaucopsis (FAC)*	1	*Juncus effusus (OBL)*										
	1	*Lycopus rubellus (OBL)*	1	*Baccharis halimifolia (FAC)*										
	1	*Pontederia cordata (OBL)*	1	*Rhynchospora spp. (OBL)*										
			1	*Hypericum myrtifolium (FACW)*										
			1	*Callicarpa americana (UPL)*										
			1	*Scoparia dulcis (FAC)*										
			1	*Centella asiatica (FACW)*										
			1	*Sagittaria lancifolia (OBL)*										
			1	*Lachnanthes caroliana (FAC)*										
			1	*Xyris spp. (OBL)*										
			1	*Blechnum serrulatum (FACW)*										
			1	*Andropogon virginicus var glaucus (FAC)*										
			2	*Lycopus rubbellus (OBL)*										
			1	*Persicaria hydropiperoides (OBL)*										

TABLE 11 - WETLAND ASSESSMENT VEGETATIVE SUMMARY FOR APRIL AND SEPTEMBER 2021

Station	CC	Groundcover Deep Zone	CC	Transitional Zone	CC	Weedy Cover	CC	Shrub Deep Zone	CC	Transition Zone	CC	Vines	CC	Tree
	2	*Woodwardia virginica (FACW)*	2	*Woodwardia virginica (FACW)*	1	*Eupatorium capillifolium (FACU)*						**Deep Zone:**		**Deep Zone:**
	3	*Blechnum serrulatum (FACW)*	2	*Woodwardia areolata (OBL)*	1	*Rubus spp. (FAC)*	2	*Myrica cerifera (FAC)*	1	*Cinnamomum camphora (UPL)*	2	*Vitis rotundifolia*	3	*Taxodium ascendens (OBL)*
	2	*Boehmeria cylindrica (OBL)*	1	*Eupatorium capillifolium (FACU)*	1	*Paederia foetida (-)*	2	*Cephalanthus occidentalis (OBL)*	2	*Persea palustris (OBL)*	2	*Smilax bona-nox*	2	*Ilex cassine (OBL)*
	2	*Rhynchospora inundata. (OBL)*	1	*Rubus spp. (FAC)*	1	*Pinus elliotii (UPL)*	1	*Acer rubrum (FACW)*	2	*Myrica cerifera (FAC)*	1	*Paederia foetida*	2	*Acer rubrum (FACW)*
	1	*Cephalanthus occidentalis (OBL)*	2	*Panicum hemitomon (OBL)*	1	*Urena lobata (UPL)*	2	*Ilex cassine (OBL)*	1	*Quercus laurifolia (FACW)*	1	*Mikania scandens*	1	*Pinus elliotti (FACW)*
	2	*Pontederia cordata (OBL)*	1	*Ludwigia repens (FACW)*	1	*Vitis rotundifolia (-)*	1	*Taxodium ascendens (OBL)*	1	*Triadica sebifera (FAC)*			1	*Sabal palmetto (FAC)*
	1	*Urena lobata (UPL)*	1	*Boehmeria cylindrica (OBL)*	1	*Juncus effusus (OBL)*	1	*Persea palustris (OBL)*	2	*Pinus elliotii (UPL)*		**Transition Zone:**	2	Nyssa sylvatica var. biflora (OBL)
	1	*Woodwardia areolata (OBL)*	1	*Paederia foetida (-)*	1	*Centella asiatica (FACW)*	1	*Salix caroliniana (OBL)*	1	*Melia azedarach (UPL)*	1	*Mikania scandens*	1	*Triadica sebifera (FAC)*
	1	*Ludwigia repens (FACW)*	1	*Juncus effusus (OBL)*	1	*Paspalum conjugatum (FAC)*	1	*Baccharis halimifolia (FAC)*	1	*Serenoa repens (FAC)*	2	*Vitis rotundifolia*		
	1	*Lycopus rubellus (OBL)*	1	*Thelypteris interrupta (FACW)*	1	*Galium tinctorium (FACW)*	1	*Triadica sebifera (FAC)*	1	*Acer rubrum (FACW)*	1	*Smilax bona-nox*		**Transition Zone:**
	1	*Quercus nigra (FACW)*	1	*Osmunda regalus (OBL)*					1	*Cephalanthus occidentalis (OBL)*	1	*Paederia foetida*	1	*Pinus elliotii (UPL)*
	1	*Pluchea baccharis (FACW)*	1	*Vitis rotundifolia (-)*									2	*Taxodium ascendens (OBL)*
	1	*Mikania scandens (-)*	1	*Urena lobata (UPL)*									1	*Acer rubrum (FACW)*
	1	*Persea palustris (OBL)*	1	*Smilax bona-nox (-)*									1	*Cinnamomum camphora (UPL)*
CB-8E September 2021	2	*Thelypteris interrupta (FACW)*	1	*Sagittaria lancifolia (OBL)*									1	*Persea palustris (OBL)*
	1	*Proserpinaca palustris (OBL)*	1	*Callicarpa americana (UPL)*										
	1	*Juncus marginatus (FACW)*	1	*Galium tinctorium (FACW)*										
	1	*Vitis rotundifolia*	1	*Quercus virginiana (UPL)*										
	1	*Pinus elliottii (FAC)*	1	*Pluchea baccharis (FACW)*										
	1	*Nymphaea odorata (OBL)*	2	*Lycopus rubbellus (OBL)*										
	1	*Paspalum conjugatum (FAC)*	2	*Andgropogon virginicus var glaucus*										
	1	*Persicaria punctata (OBL)*	1	*Juncus scirpoides (OBL)*										
	1	*Angropogon glomerauts var glaucopsis (FAC)*	1	*Edrastima uniflora (FACU)*										
	1	*Juncus effusus (OBL)*	1	*Acer rubrum (FACW)*										
	2	*Persicaria hydropiperoides (OBL)*	1	*Hypericum mutilum (FACW)*										
	1	*Ludwigia spp. (OBL)*	2	*Xyris elliottii (OBL)*										
			1	*Centella asiatica (FACW)*										
			1	*Solidago fistulosa (FACW)*										
			1	*Mikania scandens (-)*										
			2	*Rhynchospora inundata. (OBL)*										
			2	*Blechnum serrulatum (FACW)*										
	2	*Woodwardia virginica (FACW)*	2	*Thelypteris interrupta (FACW)*	2	*Erechtites hieraciifolius (FAC)*	2	*Taxodium ascendens (OBL)*	1	*Baccharis halimifolia (FAC)*		**Deep Zone:**		**Deep Zone:**
	1	*Panicum hemitomon (OBL)*	1	*Andropogon virginicus var glaucus (FAC)*	1	*Urena lobata (UPL)*	1	*Myrica cerifera (FAC)*	1	*Rubus spp. (FAC)*	2	*Vitis rotundifolia*	4	*Taxodium ascendens (OBL)*
	1	*Acer rubrum (FACW)*	1	*Woodwardia areolata (OBL)*	2	*Vitis rotundifolia (-)*	1	*Persea borbonia (OBL)*	2	*Persea palustris (OBL)*	1	*Smilax laurifolia*	2	*Acer rubrum (FACW)*
	1	*Utricularia spp. (OBL)*	1	*Panicum hemitomon (OBL)*	1	*Eupatorium capillifolium (FAC)*					1	*Mikania scandens*	1	*Ilex cassine (OBL)*
	1	*Pluchea baccharis (FACW)*	1	*Urena lobata (UPL)*	1	*Toxicodendron radicans (-)*					1	*Toxicodendron radicans*		
	1	*Andropogon glomeratus (FACW)*	2	*Amphicarpum muehlenbergianum (FACW)*	1	*Dichanthelium portoricense (UPL)*								**Transition Zone:**
	1	*Lycopus rubellus (OBL)*	2	*Erechtites hieraciifolius (FAC)*								**Transition Zone:**	2	*Pinus elliotii (UPL)*
	1	*Vitis rotundifolia*	1	*Persea palustris (OBL)*							2	*Vitis rotundifolia*	2	*Acer rubrum (FACW)*
CB-8SW April 2021	1	*Toxicodendron radicans*	1	*Paspalum laeve (FACW)*							1	*Parthenocissus quinquefolia*	1	*Quercus laurifolia (FACW)*
	1	*Mikania scandens (-)*	1	*Eupatorium caplillifolium (FAC)*							1	*Mikania scandens*	2	*Persea palustris (OBL)*
	1	*Andropogon glomeratus var glaucopsis (FAC)*	1	*Mikania scandens (-)*										
	1	*Leersia hexandra (OBL)*	1	*Vitis rotundifolia (-)*										
	1	*Woodwardia areolata (OBL)*	1	*Lycopus rubbellus (OBL)*										
	1	*Persea palustris (OBL)*	1	*Quercus virginiana (UPL)*										
	1	*Myrica cerifera (FAC)*	1	*Dichanthelium portoricense (UPL)*										
			1	*Parthenocissus quinquefolia (-)*										
	1	*Panicum hemitomon (OBL)*	2	*Amphicarpum muehlenbergianum (FACW)*	1	*Urena lobata (UPL)*	1	*Myrica cerifera (FAC)*	1	*Baccharis halimifolia (FAC)*		**Deep Zone:**		**Deep Zone:**
	1	*Acer rubrum (FACW)*	2	*Urena lobata (UPL)*	1	*Vitis rotundifolia (-)*	1	*Acer rubrum (FACW)*	2	*Persea palustris (OBL)*	2	*Vitis rotundifolia*	4	*Taxodium distichum (OBL)*
	2	*Woodwardia virginica (FACW)*	1	*Persea palustris (OBL)*	1	*Eupatorium capillifolium (FACU)*	1	*Persea palustris (OBL)*	1	*Rubus spp. (FAC)*	1	*Smilax laurifolia*	2	*Acer rubrum (FACW)*
	1	*Pluchea baccharis (FACW)*	1	*Woodwardia areolata (OBL)*	1	*Toxicodendron radicans (-)*	1	*Taxodium ascendens (OBL)*	1	*Myrica cerifera (FAC)*	1	*Toxicodendron radicans*	1	*Ilex cassine (OBL)*
	1	*Andropogon glomeratus (FACW)*	2	*Andropogon glomeratus (FACW)*	1	*Pinus elliotii (UPL)*								
	1	*Lycopus rubellus (OBL)*	1	*Eupatorium capillifolium (FAC)*	1	*Axonopus furcatus (FAC)*								**Transition Zone:**
	1	*Proserpinaca palustris (OBL)*	1	*Vitis rotundifolia (-)*								**Transition Zone:**	2	*Pinus elliotii (UPL)*
	1	*Toxicodendron radicans*	2	*Andropogon glomeratus var glaucopsis (FACW)*							2	*Vitis rotundifolia*	2	*Acer rubrum (FACW)*
	1	*Andropogon glomeratus var glaucopsis (FACW)*	1	*Thelypteris interrupta (FACW)*							1	*Mikania scandens*	2	*Persea palustris (OBL)*
CB-8SW September 2021	1	*Leersia hexandra (OBL)*	1	*Axonopus furcatus (FAC)*							1	*Parthenocissus quinquefolia*	1	*Quercus laurifolia (FACW)*
	1	*Mikania scandens (-)*	1	*Mikania scandens (-)*										
	1	*Rhynchospora microcarpa (FACW)*	2	*Woodwardia virginica (FACW)*										
	1	*Persea palustris (OBL)*	1	*Eleocharis baldwinii (OBL)*										
	1	*Woodwardia areolata (OBL)*	1	*Panicum hemitomon (OBL)*										
	1	*Utricularia gibba (OBL)*	1	*Pinus elliotii (UPL)*										
	1	*Pinus elliottii (FAC)*	1	*Cirsium nuttallii (FACW)*										
	1	*Myrica cerifera (FAC)*	1	*Pluchea baccharis (FACW)*										
	1	*Hypericum myrtifolia (FACW)*												
	1	*Amphicarpum muhlenbergianum (FACW)*												
	1	*Eupatorium capillifolium (FACU)*												
	1	*Taxodium ascendens (OBL)*												

TABLE 11 - WETLAND ASSESSMENT VEGETATIVE SUMMARY FOR APRIL AND SEPTEMBER 2021

Station	CC	Groundcover Deep Zone	CC	Transitional Zone	CC	Weedy Cover	CC	Shrub Deep Zone	CC	Transition Zone	CC	Vines	CC	Tree
CB-10 April 2021	1	*Pluchea baccharis (FACW)*	1	*Callicarpa americana (UPL)*	3	*Rubus spp. (FAC)*	2	*Myrica cerifera (FAC)*	1	*Callicarpa americana (UPL)*		**Deep Zone:**		**Deep Zone:**
	2	*Cladium jamaicense (OBL)*	3	*Rubus spp. (FAC)*	1	*Centella asiatica (FACW)*	2	*Persea borbonia (OBL)*	2	*Persea borbonia (OBL)*	1	*Ampelopsis arborea*	3	*Taxodium ascendens (OBL)*
	2	*Rubus spp. (FAC)*	1	*Panicum hemitomon (OBL)*	1	*Paspalum conjugatum (FAC)*	1	*Rubus spp. (FAC)*	1	*Quercus nigra (FACW)*	1	*Vitis rotundifolia*	2	*Ilex cassine (OBL)*
	1	*Sagittaria lancifolia (OBL)*	1	*Amphicarpum muehlenbergianum (FACW)*	1	*Eupatorium capillifolium (FACU)*	2	*Salix caroliniana (OBL)*	2	*Rubus spp. (FAC)*	1	*Toxicodendron radicans*	2	*Acer rubrum (FACW)*
	1	*Pontederia cordata (OBL)*	1	*Vitis rotundifolia (-)*	1	*Vitis rotundifolia (-)*	1	*Baccharis halimifolia (FAC)*	1	*Juniperus virginiana (UPL)*			2	*Persea palustris (OBL)*
	2	*Woodwardia virginica (FACW)*	1	*Andropogon virginicus (FAC)*	1	*Typha spp. (OBL)*	2	*Cinnamomum camphora (UPL)*	1	*Cinnamomum camphora (UPL)*			2	*Cinnamomum camphora (UPL)*
	1	*Acer rubrum (FACW)*	1	*Acer rubrum (FACW)*	1	*Juncus effusus (OBL)*	2	*Taxodium ascendens (OBL)*					1	*Nyssa sylvatica var. biflora (OBL)*
	1	*Osmunda regalis (OBL)*	1	*Carex longii (FACW)*	1	*Andropogon virginicus (FAC)*	1	*Acer rubrum (FACW)*						
	1	*Callicarpa americana (UPL)*	1	*Thelypteris kunthii (FACW)*	1	*Cinnamomum camphora (UPL)*								
	1	*Juncus effusus (OBL)*	1	*Erechtites hieraciifolius (FAC)*	1	*Erechtites hieraciifolius (FAC)*						**Transition Zone:**		**Transition Zone:**
	1	*Vitis rotundifolia*	1	*Centella asiatica (FACW)*	1	*Ptilimnium capillaceum (FACW)*					2	*Vitis rotundifolia*	2	*Taxodium ascendens (OBL)*
	1	*Hypericum mutilum (FACW)*	1	*Dichanthelium portoricense (UPL)*									2	*Acer rubrum (FACW)*
	1	*Blechnum serrulatum (FACW)*	1	*Paspalum conjugatum (FAC)*									1	*Cinnamomum camphora (UPL)*
	2	*Thelypteris kunthii (FACW)*	1	*Juniperus virginiana (UPL)*									2	*Persea palustris (OBL)*
	1	*Cinnamomum camphora (UPL)*	1	*Smilax spp.*									1	*Pinus elliottii (UPL)*
	1	*Rhynchospora spp. (OBL)*	1	*Lacnocaulon minus (OBL)*										
	1	*Lycopus rubellus (OBL)*	1	*Edrastima uniflora (FACU)*										
	1	*Ludwigia repens (FACW)*	1	*Eupatorium capillifolium (FAC)*										
	1	*Ptilimnium capillaceum (FACW)*	1	*Axonopus furcatus (FAC)*										
	1	*Cyperus haspans (OBL)*												
	1	*Cirsium nuttallii (FACW)*												
	1	*Cephalanthus occidentalis (OBL)*												
	1	*Mikania scandens (-)*												
	1	*Centella asiatica (FACW)*												
	1	*Persicaria punctata (OBL)*												
	1	*Carex longii (FACW)*												
	1	*Typha spp. (OBL)*												
	1	*Utricularia gibba (OBL)*												
	1	*Paspalum conjugatum (FAC)*												
	1	*Eupatorium capillifolium (FACU)*												
	1	*Andropogon virginicus (FAC)*												
	1	*Erechtites hieraciifolius (FAC)*												
	1	*Dichanthelium spp. (UPL)*												
	1	*Persea palustris (OBL)*												
	1	*Eleocharis vivipara (OBL)*												
CB-10 September 2021	1	*Pluchea baccharis (FACW)*	2	*Callicarpa americana (UPL)*	1	*Centella asiatica (FACW)*	1	*Magnolia virginiana (OBL)*	2	*Callicarpa americana (UPL)*		**Deep Zone:**		**Deep Zone:**
	2	*Cladium jamaicense (OBL)*	2	*Rubus spp. (FAC)*	2	*Rubus spp. (FAC)*	2	*Myrica cerifera (FAC)*	2	*Persea borbonia (OBL)*	1	*Paederia foetida*	3	*Taxodium ascendens (OBL)*
	2	*Rubus spp. (FAC)*	2	*Panicum hemitomon (OBL)*	2	*Paspalum conjugatum (FAC)*	2	*Persea borbonia (OBL)*	1	*Quercus nigra (FACW)*	2	*Mikania scandens*	2	*Ilex cassine (OBL)*
	2	*Sagittaria lancifolia (OBL)*	2	*Amphicarpum muehlenbergianum (FACW)*	2	*Vitis rotundifolia (-)*	1	*Callicarpa americana (UPL)*	2	*Rubus spp. (FAC)*	1	*Vitis rotundifolia*	1	*Nyssa sylvatica var. biflora (OBL)*
	2	*Pontederia cordata (OBL)*	2	*Vitis rotundifolia (-)*	2	*Typha spp. (OBL)*	1	*Acer rubrum (FACW)*	1	*Juniperus virginiana (UPL)*	1	*Toxicodendron radicans*	2	*Acer rubrum (FACW)*
	1	*Woodwardia virginica (FACW)*	2	*Andropogon virginicus var glaucus (FAC)*	2	*Andropogon virginicus (FAC)*	2	*Cinnamomum camphora (UPL)*	2	*Cinnamomum camphora (UPL)*			2	*Cinnamomum camphora (UPL)*
	1	*Acer rubrum (FACW)*	1	*Acer rubrum (FACW)*	1	*Drymaria cordata (FAC)*	2	*Rubus spp. (FAC)*					2	*Persea borbonia (OBL)*
	1	*Osmunda regalis (OBL)*	1	*Toxicodendron radicans (-)*	1	*Paederia foetida (-)*	2	*Taxodium ascendens (OBL)*					1	*Juniperus virginiana (UPL)*
	1	*Callicarpa americana (UPL)*	1	*Centella asiatica (FACW)*	1	*Eupatorium capillifolium (FAC)*	2	*Salix caroliniana (OBL)*				**Transition Zone:**		**Transition Zone:**
	2	*Phyllanthus urinaria (FAC)*	1	*Dichanthelium portoricense (UPL)*	1	*Urena lobata (UPL)*					2	*Vitis rotundifolia*	2	*Taxodium ascendens (OBL)*
	1	*Vitis rotundifolia*	1	*Urena lobata (UPL)*	1	*Scoparia dulcis (FAC)*					1	*Paederia foetida*	2	*Acer rubrum (FACW)*
	1	*Hypericum mutilum (FACW)*	1	*Smilax spp.*	1	*Dichanthelium portoricense (UPL)*					1	*Toxicodendron radicans*	1	*Persea palustris (OBL)*
	1	*Paederia foetida (-)*	1	*Ludwigia suffruticosa (FACW)*	2	*Paspalum setaceum (FAC)*					1	*Smilax spp.*	1	*Pinus elliottii (UPL)*
	1	*Thelypteris kunthii (FACW)*	1	*Ophioglossum petiolatum (FAC)*	1	*Toxicodendron radicans (-)*								
	1	*Ophioglossum petiolatum (FAC)*	1	*Scoparia dulcis (FAC)*										
	2	*Drymaria cordata (FAC)*	2	*Andropogon virginicus (FAC)*										
	2	*Ludwigia repens (FACW)*	1	*Phyllanthus urinaria (FAC)*										
	2	*Lycopus rubellus (OBL)*	1	*Eupatorium capillifolium (FAC)*										
	1	*Amphicarpum muhlenbergianum (FACW)*	1	*Solidago sempervirens (FACW)*										
	1	*Ludwigia suffruticosa (FACW)*	1	*Edrastima uniflora (FACU)*										
	1	*Mikania scandens (-)*	1	*Rhexia martiana (FACW)*										
	1	*Centella asiatica (FACW)*	2	*Paspalum setaceum (FAC)*										
	1	*Persicaria punctata (OBL)*												
	2	*Typha spp. (OBL)*												
	2	*Paspalum conjugatum (FAC)*												
	1	*Galium tinctorium (FACW)*												
	2	*Andropogon virginicus (FAC)*												
	1	*Taxodium distichum (OBL)*												
	1	*Utricularia gibba (OBL)*												
	1	*Xyris elliottii (OBL)*												
	2	*Blechnum serrulatum (FACW)*												
	1	*Panicum hemitomon (OBL)*												
	1	*Eleocharis vivipara (OBL)*												

TABLE 11 - WETLAND ASSESSMENT VEGETATIVE SUMMARY FOR APRIL AND SEPTEMBER 2021

Station	CC	Groundcover Deep Zone	CC	Transitional Zone	CC	Weedy Cover	CC	Shrub Deep Zone	CC	Transition Zone	CC	Vines	CC	Tree
	2	*Woodwardia virginica (FACW)*	1	*Cirsium nuttallii (FACW)*	2	*Centella asiatica (FACW)*	1	*Cephalanthus occidentalis (OBL)*	2	*Myrica cerifera (FAC)*		**Deep Zone:**		**Deep Zone:**
	1	*Persicaria punctata (OBL)*	2	*Woodwardia virginica (FACW)*	1	*Galium tinctorium (FACW)*	2	*Triadica sebifera (FAC)*	2	*Quercus virginiana (FACU)*	2	*Toxicodendron radicans*	4	*Taxodium ascendens (OBL)*
	4	*Rhynchospora inundata. (OBL)*	2	*Rhynchospora inundata. (OBL)*	1	*Ampelopsis arborea (-)*	2	*Myrica cerifera (FAC)*	1	*Salix caroliniana (OBL)*			2	*Triadica sebifera (FAC)*
	2	*Sagittaria lancifolia (OBL)*	1	*Salix caroliniana (OBL)*	1	*Juncus effusus (OBL)*	1	*Salix caroliniana (OBL)*					2	*Acer rubrum (FACW)*
	1	*Mikania scandens (-)*	2	*Andropogon glomeratus (FACW)*										
			1	*Eleocharis baldwinii (OBL)*								**Transition Zone:**		**Transition Zone:**
			1	*Hydrocotyle umbellata (FACW)*							1	*Mikania scandens*	3	*Taxodium ascendens (OBL)*
CB-13A			2	*Phyla nodiflora (FAC)*							1	*Vitis rotundifolia*	1	*Ilex cassine (OBL)*
April 2021			3	*Thelypteris interrupta (FACW)*							1	*Toxicodendron radicans*	1	*Triadica sebifera (FAC)*
			1	*Carex longii (FACW)*							1	*Ampelopsis arborea*		
			2	*Centella asiatica (FACW)*										
			1	*Galium tinctorium (FACW)*										
			1	*Cephalanthus occidentalis (OBL)*										
			1	*Persicaria punctata (OBL)*										
			1	*Juncus scirpoides (OBL)*										
			1	*Juncus effusus (OBL)*										
			1	*Ampelopsis arborea (-)*										
	2	*Rhynchospora inundata. (OBL)*	2	*Woodwardia virginica (FACW)*	1	*Centella asiatica (FACW)*	1	*Cephalanthus occidentalis (OBL)*	1	*Quercus virginiana (FACU)*		**Deep Zone:**		**Deep Zone:**
	1	*Woodwardia areolata (OBL)*	2	*Rhynchospora inundata. (OBL)*	2	*Andropogon virginicus (FAC)*	2	*Triadica sebifera (FAC)*	2	*Myrica cerifera (FAC)*	1	*Toxicodendron radicans*	4	*Taxodium ascendens (OBL)*
	1	*Woodwardia virginica (FACW)*	2	*Panicum hemitomon (OBL)*			1	*Myrica cerifera (FAC)*	1	*Triadica sebifera (FAC)*			2	Triadica sebifera (FAC)
	1	*Ilex cassine (FACW)*	1	*Andropogon glomeratus (FACW)*			1	*Ilex cassine (OBL)*					1	Acer rubrum (FACW)
	2	*Sagittaria lancifolia (OBL)*	2	*Andropogon virginicus (FAC)*										
			1	*Hydrocotyle umbellata (FACW)*										
			2	*Phyla nodiflora (FAC)*										
			2	*Thelypteris interrupta (FACW)*										
CB-13A			1	*Centella asiatica (FACW)*										
September			1	*Andropogon virginicus var glaucus (FAC)*										
2021			1	*Amphicarpum muehlenbergianum (FACW)*								**Transition Zone:**		**Transition Zone:**
			1	*Ludwigia repens (FACW)*							1	*Ampelopsis arborea*	3	*Taxodium ascendens (OBL)*
			1	*Ampelopsis arborea (-)*							1	*Vitis rotundifolia*	2	*Ilex cassine (OBL)*
			1	*Symphiotrichum subulatum (OBL)*									1	*Triadica sebifera (FAC)*
			1	*Acer rubrum (FACW)*									1	*Magnolia virginiana (OBL)*
	2	*Sagittaria lancifolia (OBL)*	2	*Rhynchospora microcephala (OBL)*	1	*Juncus effusus (OBL)*	2	*Acer rubrum (FACW)*	2	*Myrica cerifera (FAC)*		**Deep Zone:**		**Deep Zone:**
	2	*Leersia hexandra (OBL)*	3	*Amphicarpum muehlenbergianum (FACW)*	1	*Centella asiatica (FACW)*	2	*Myrica cerifera (FAC)*	1	*Acer rubrum (FACW)*	1	*Vitis rotundifolia*	2	*Taxodium ascendens (OBL)*
	1	*Hydrocotyle umbellata (OBL)*	2	*Andropogon golmeratus var glaucopsis (FAC)*	2	*Rubus spp. (FAC)*	1	*Cephalanthus occidentalis (OBL)*	1	*Baccharis halimifolia (FAC)*			1	Acer rubrum (FACW)
	1	*Juncus effusus (OBL)*	2	*Rubus spp. (FAC)*	1	*Vitis rotundifolia (-)*	1	*Salix caroliniana (OBL)*						
	2	*Woodwardia virginica (FACW)*	1	*Eupatorium mohrii (FAC)*	1	*Eupatorium capillifolium (FACU)*								
	2	*Pontederia cordata (OBL)*	1	*Woodwardia virginica (FACW)*	3	*Axonopus furcatus (FAC)*						**Transition Zone:**		**Transition Zone:**
	2	*Andropogon glomeratus var glaucopsis (FAC)*	3	*Axonopus furcatus (FAC)*	1	*Eupatorium mohrii (FAC)*							2	*Taxodium ascendens (OBL)*
	1	*Proserpinaca palustris (OBL)*	2	*Solidago fistulosa (FACW)*	2	*Andropogon virginicus (FAC)*					2	*Vitis rotundifolia*	1	*Quercus nigra (FACW)*
CB-13B	2	*Saccharum giganteum (OBL)*	1	*Osmunda regalus (OBL)*	2	*Dichanthelium portoricense (UPL)*							1	*Acer rubrum (FACW)*
April 2021	1	*Xyris elliottii (OBL)*	2	*Acer rubrum (FACW)*									1	*Magnolia virginiana (OBL)*
	2	*Amphicarpum muhlenbergianum (FACW)*	2	*Dichanthelium portoricense (UPL)*										
	2	*Centella asiatica (FACW)*	1	*Centella asiatica (FACW)*										
	3	*Rhynchospora microcephala (OBL)*	2	*Andropogon virginicus (FAC)*										
	1	*Juncus scirpoides (OBL)*	1	*Eupatorium capillifolium (FACU)*										
	2	*Eleocharis spp. (OBL)*	1	*Xyris elliottii (OBL)*										
	2	*Nuphar advena (OBL)*												
	1	*Vitis rotundifolia*												
	2	*Acer rubrum (FACW)*												
	1	*Rhexia martiana (FACW)*												
	2	*Sagittaria lancifolia (OBL)*	2	*Rhynchospora microcephala (OBL)*	1	*Centella asiatica (FACW)*	1	*Salix caroliniana (OBL)*	2	*Myrica cerifera (FAC)*		**Deep Zone:**		**Deep Zone:**
	2	*Leersia hexandra (OBL)*	2	*Amphicarpum muehlenbergianum (FACW)*	2	*Rubus spp. (FAC)*	1	*Acer rubrum (FACW)*	1	*Acer rubrum (FACW)*	1	*Mikania scandens*	2	*Taxodium ascendens (OBL)*
	1	*Hydrocotyle umbellata (OBL)*	1	*Andropogon glomeratus var glaucopsis (FACW)*	1	*Eupatorium capillifolium (FAC)*	2	*Myrica cerifera (FAC)*	1	*Baccharis halimifolia (FAC)*	1	*Vitis rotundifolia*	1	*Acer rubrum (FACW)*
	1	*Woodwardia virginica (FACW)*	2	*Rubus spp. (FAC)*	1	*Axonopus spp. (FAC)*								
	2	*Pontederia cordata (OBL)*	1	*Woodwardia virginica (FACW)*	1	*Galium tinctorium (FACW)*								
	1	*Proserpinaca palustris (OBL)*	1	*Axonopus spp. (FAC)*	1	*Euthamia caroliniana (FAC)*								
	2	*Andropogon glom. var. glauc.(FACW)*	1	*Solidago fistulosa (FACW)*										
	1	*Mikania scandens (-)*	1	*Euthamia caroliniana (FAC)*										
	2	*Amphicarpum muhlenbergianum (FACW)*	1	*Acer rubrum (FACW)*										
	1	*Centella asiatica (FACW)*	2	*Xyris elliottii (OBL)*										
	1	*Rhynchospora microcephala (OBL)*	1	*Centella asiatica (FACW)*								**Transition Zone:**		**Transition Zone:**
CB-13B	1	*Pluchea baccharis (FACW)*	2	*Rhexia martiana (FACW)*							2	*Vitis rotundifolia*	2	*Taxodium ascendens (OBL)*
September	2	*Panicum hemitomon (OBL)*	2	*Eleocharis baldwinii (OBL)*							1	*Mikania scandens*	1	*Quercus nigra (FAC)*
2021	1	*Habenaria repens (FACW)*	1	*Sacciolepis indica (FAC)*									1	*Magnolia virginiana (OBL)*
	2	*Nuphar advena (OBL)*	1	*Pluchea baccharis (FACW)*									2	*Acer rubrum (FACW)*
	1	*Utricularia gibba (OBL)*	2	*Scleria reticularis (FACW)*										
	2	*Eleocharis baldwinii (OBL)*	2	*Panicum hemitomon (OBL)*										
	1	*Acer rubrum (FACW)*												
	1	*Xyris elliottii (OBL)*												
	1	*Eupatorium capillifolium (FACU)*												
	1	*Solidago fistulosa (FACW)*												
	1	*Sacciolepis indica (FAC)*												
	1	*Diodia virginiana (FACW)*												
	1	*Galium tinctorium (FACW)*												
	1	*Fuirena pumila (OBL)*												

TABLE 12 - WILDLIFE OBSERVATIONS FOR WATER YEAR 2021 AT NINE MONITORING LOCATIONS ON CROSS BAR RANCH

Species	April 2021	September 2021
	Monitoring Sites	**Monitoring Sites**
Birds		
American Crow	-	**13A, 13B**
Black-bellied Whistling Duck	-	**8W**
Belted Kingfisher	-	**13A**
Carolina Wren	-	**8E, 8W, 10, 13A**
Great Egret	**7C**	-
Northern Cardinal	-	**13A**
Pileated Woodpecker	-	**7A, 13A**
Red-bellied Woodpecker	-	**13A**
Red-shouldered Hawk	-	**13A**
Sandhill Crane	**13B**	**13B**
Tufted Titmouse	-	**13A**
Reptiles		
American Alligator	**8W**	**8W**
Cuban Anole	**7A, 10**	-
Amphibians		
Pig Frog	**7A, 7B, 7D, 8W**	-
Florida Cricket Frog	**13B**	-
Southern Leopard Frog	-	**13A**
Squirrel Treefrog	-	**8E**
Fish		
Mosquitofish	-	**13A**

ANNUAL ENVIRONMENTAL ASSESSMENT REPORT

AL BAR RANCH ECOSYSTEM MANAGEMENT

WY 2021

WUP PERMIT No. 2011558.003

PROJECT No. 617-259917-0834

PREPARED BY:

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June 2022

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EXECUTIVE SUMMARY

This Annual Environmental Assessment Report summarizes the hydrological and ecological conditions for thirteen (13) wetland sites augmented by Pinellas County at AL BAR Ranch, Pasco County, during Water Year (WY) 2021 (October 1, 2020 to September 30, 2021). Augmentation is permitted by Southwest Florida Water Management District (SWFWMD) (District) Water Use Permit (WUP) No. 20011558.003. This permit had previously been renewed on May 24, 2011 and remained in effect until 2021. This is the twenty-first (21st) annual report as required by condition #11 of the previous permit and the eleventh (11th), and final report, under condition #2 of the subsequent (renewed) permit (WUP No. 20011558.003 has been renewed for five (5) years as permit WUP No. 20011558.004 as of December 10, 2021; this annual report covers the final water year-term of WUP No. 20011558.003). Seven (7) augmentation wells, Pinellas County I.D. Wells No. 1, 4, 5, 6, 7, 8 and 9, are permitted for withdrawals under Pinellas County Utilities' WUP as addressed by this report. Augmentation wells were constructed during WY 2001 and augmentation pumps were installed in November 2001. Full time augmentation was initiated in December 2001 from Wells 1, 6, 7, and 8. Augmentation from Well 5 was initiated in January 2002, from Well 4 in August 2002, and from Well 9 in June 2002. All augmentation wells were utilized for augmentation during WY 2021 and augmentation water was distributed to wetland sites 1, 4A, 4B, 5, 6, 7A, 7B, 9A, 9B, 9E and 10. Sites 9C, 7B and 9A received substantially smaller amounts of augmentation water than the rest of the sites.

The average daily withdrawal allowed under the WUP is 1.343 million gallons per day (mgd) with a peak month of 2.339 mgd. The average annual daily withdrawal during WY 2020 was 0.56 mgd with a peak monthly quantity of 0.81 mgd. Well 4 overwhelmingly accounted for the largest volume of withdrawals, followed by Wells 9, 5 and 8.

Groundwater levels in the surficial aquifer are measured in monitor wells and surface water level is measured at staff gauges twice per month at thirteen (13) surface water locations within AL BAR Ranch. Water elevations were referenced to the National Geodetic Vertical Datum (NGVD 1929). Range of fluctuation of groundwater elevations, as measured in the monitor wells, was between 5.04 and 9.13 feet (ft.) during WY 2021. Surface water depths ranged from 0.10 ft. to 8.39 ft.; surface water elevations ranged from

69.79 ft. NGVD at Site 1 to 76.33 ft. NGVD at Site 9D. All augmented wetland sites held water over the entire water year.

A composite average of 58.92 inches of rainfall was recorded from five (5) rainfall stations on Cross Bar Ranch: CBR-CB-1, CBR-CB-13, CBR-S1-S, CBR GREGG, and CBR FISH, for WY 2021. Rainfall accumulation was highest during the months June through September 2021. The composite average rainfall for WY 2021 is higher than Cross Bar's period of record composite rainfall average of 55.70 inches (WY 2001 through 2021). Rainfall during WY 2021 is the sixth (6^{th}) highest amount in the range of recorded rainfall since augmentation commenced in 2002. WY 2003 composite average rainfall of 77.84 inches was the highest, followed by WY 2015 with 68.18 inches. Rainfall at the nearby St. Leo rain gauge was 57.36 inches for WY 2021, approximately one and a half inches lower than the amount of rainfall as recorded at the Cross Bar stations in WY 2021. Water years 2005 and 2006 (41.1 and 39.37 inches) have been the two driest recorded at Cross Bar Ranch since Pinellas County initiated augmentation at Al Bar Ranch in WY 2002.

Annual sampling commenced in accordance with permit condition #10, which was issued with the renewal of Permit No. 20011558.003 on May 24, 2011; annual sampling of all augmentation wells occurs in May. Well 7 was out of service during the WY 2021 sampling event. Water samples are analyzed for hardness and field readings are taken for specific conductance and pH. Field pH data depicted a minimum of 6.51 and a maximum of 6.90, and an average of 6.70 in WY 2021, a slight decrease from May 2020. The range between minimum and maximum conductivity was 140 micromhos per centimeter (µmhos/cm), the lowest in Well 1 at 291 µmhos/cm and the highest in Well 6 at 431 µmhos/cm; average conductivity was the same as the average from WY 2020. The range between minimum and maximum hardness was 73 milligrams per liter (mg/L), with the highest in Well 6 (214 mg/L) and lowest in Well 1 (141 mg/L). Average hardness values were slightly lower than values detected in May of the previous water year.

Staff gages and monitor wells' survey elevation values had been updated in the previous water year, WY 2020, either by re-survey or from Tampa Bay Water data sets. In addition, staff gages at Site 10 were replaced and surveyed.

The Wetland Assessment Procedure (WAP) (Southwest Florida Water Management District & Tampa Bay Water, 2000) was utilized for qualitative ecological monitoring in April and September 2021. Thirteen (13) ecological monitoring stations were established to document wetland conditions. The total maximum wetland score was achieved for four (4) of the sites in April 2021 and one (1) of the sites during the September 2021 monitoring. The remaining sites were below the maximum wetland score due primarily to inappropriate vegetation zonation and transition zone composition.

In addition to qualitative monitoring, sites 4B, 5, 9C and 10 were also quantitatively monitored. Quantitative monitoring implemented the line intercept methodology to document coverage of wetland plant species. The wetland scores were analyzed for both transitional and deep zones and the overall transect. The overall wetland scores range from 1.09 in September for Site 10 to 2.54 in September for Site 4B.

ANNUAL ENVIRONMENTAL ASSESSMENT REPORT
AL BAR RANCH ECOSYSTEM MANAGEMENT

1.0 INTRODUCTION

The AL BAR Ranch consists of approximately 4,092-acres located in north-central Pasco County (**Appendix A - Figure 1**). This property was previously managed primarily for cattle production. Prior to conversion for cattle production, AL BAR Ranch consisted mainly of longleaf pine (*Pinus palustris*), turkey oak (*Quercus laevis*), sand live oak (*Quercus geminata*), sand hills, hardwood hammocks, pine (*Pinus spp.*) and palmetto (*Serenoa repens*) flatwoods, natural freshwater marshes and wet prairies. Historically, many of the upland areas were converted to native range and improved pasture. Pinellas County Utilities purchased AL BAR Ranch to establish a major buffer and wellhead protection zone to the Cross Bar wellfield.

Pinellas County Utilities has established a set of objectives for the land management of the AL BAR property compatible with the adjacent Cross Bar wellfield. These objectives are based upon a long-term perspective of management towards enhancing the area including improving habitat for selected wildlife species. Pinellas County Utilities has also implemented ecosystem management of the AL BAR Ranch which includes wetland

enhancement by augmentation. The environmental augmentation for thirteen (13) wetlands was authorized under the District WUP 20011558.000 issued on June 27, 2000. This authorization continued with the issuance of the renewed permit.

On March 8, 2002 the District provided approval for permit modification. The specific modifications to this permit included minor changes to water quality specifications; deleting references to lake management levels and replacing with target pool elevations; locating monitor wells and staff gauges with a GPS unit; and modified language related to the coordination with Tampa Bay Water (TBW). The WUP was renewed through SWFWMD effective May 24, 2011 (WUP No. 20011558.003) as the previous permit expired December 2010 (**Appendix B**). This annual report closes out the term of this renewal.

This report addresses the hydrological and ecological monitoring requirements for the AL BAR Ranch Ecosystem Management permit. The hydrologic section of this report summarizes (1) augmentation well withdrawals; (2) surficial aquifer and wetland water levels; (3) rainfall; and (4) Floridan aquifer augmentation water quality.

Hydrologic data provided in this report (**Appendix A – Figures and Hydrographs** and **Appendices C and D – Data Tables**) was collected by Pinellas County Utilities representatives; and rainfall data was collected by Tampa Bay Water. Ecological monitoring data was collected, and wetland assessments were performed, by Quest Ecology, Inc.

The Ecological Monitoring section summarizes the results of qualitative and quantitative monitoring using the approved Wetlands Assessment Procedure (WAP) and line intercept methodology, respectively. The ecological monitoring is a requirement of the WUP to document the results of augmentation by vegetation analyses and general hydrological assessments, with wildlife observations and photographic documentation. Data from the ecological monitoring is provided in **Appendix E** and photographs are in **Appendix F**.

2.0 METHODS

2.1 Hydrologic Monitoring

2.1.1 Wetland Augmentation

There are seven (7) Floridan aquifer augmentation wells that provide groundwater for the thirteen (13) wetland areas (**Figure 2**). There are two (2) 10-inch wells, one (1) 8-inch well and four (4) 6-inch wells with open boreholes constructed into the Floridan aquifer. These include Pinellas County I.D. Wells No. 1, 4, 5, 6, 7, 8 and 9. Thirteen wetland areas include sites 1, 4A, 4B, 5, 6, 7A, 7B, 9A, 9B, 9C, 9D, 9E, and 10.

The permitted annual average quantity is 1.343 mgd with a peak monthly of 2.339 mgd. Augmentation quantities required per permit conditions No. 2 and 3 are measured and recorded with flow meters. The total withdrawal is calculated from meter readings that are recorded on a monthly basis. The augmentation discharge from wells are provided in graph form for WY 2021 in **Appendix A – Figures 6 through 15**; augmentation quantities in tabular form for augmentation wells are provided in **Appendix C – Data Tables**. Pinellas County site designations and District designations are provided for clarification on a summary sheet in **Appendix B**. **Figures 16 through 28** in **Appendix A** graphically display monthly augmentation discharges to the individual wetland sites.

There were no flow meter failures at any of the wells. The flow meters for the District IDs 7, 8, 9, 10, and 11 (Permitee IDs 4, 5, 6, 7 and 8) passed accuracy tests on August 11, 2021 in accordance with WUP Special Condition #13 and Exhibit B, Metering Instructions, 5.B. Power to well DID 6 (Permitee ID 1) malfunctioned on the day of testing in 2021 but passed its calibration test in January 2022.

When discharge values at the well meter appear to be incorrect and meter malfunction is suspected and/or confirmed, the SWFWMD is notified. Discharges are calculated for the period the meter is malfunctioning or out of service from the sum of registered amounts on the augmented wetland site meter(s), as available. For wells with no downstream wetland meter(s), discharges are estimated from normal discharge rates multiplied by the amount of time the pump was running.

2.1.2 Surficial Aquifer Groundwater Levels

Groundwater levels are measured in monitor wells constructed into the surficial aquifer at thirteen (13) locations and are referenced to NGVD 1929. Groundwater levels are

recorded at twice monthly intervals. Water Year 2021 groundwater monitoring data provided in **Appendix A – Figures 29 through 41** are hydrographs depicting groundwater and surface water elevations at each wetland site; and **Appendices C and D – Hydrologic Data Tables** depict this data in tabular form.

2.1.3 Surface Water Levels

Surface water levels are measured at twice monthly intervals at the thirteen (13) stations and referenced to NGVD. Staff gauges have been installed at each station and surveyed for location and reference elevation. The WY 2021 water elevations from each staff gauge are provided in **Appendix A – Figures 29 through 41** and **Appendix C – Hydrologic Data** depict this data in tabular form.

2.1.4 Rainfall

Rainfall data is provided from Tampa Bay Water at five (5) rainfall stations on adjacent Cross Bar Ranch: CB-1, CB-13, S1-S, CBR GREGG, and CBR FISH, west of AL BAR Ranch, as depicted on **Figure 3 – Appendix A**. Rainfall data for WY 2021 is provided in **Appendix C – Table 1** and depicted in **Figures 4 and 5, Appendix A**.

2.1.5 Water Quality

Water samples are collected from each well on an annual basis (May). Samples are analyzed for hardness and field readings for pH and specific conductance are taken. Wells were successfully sampled for the required event in WY 2021 with the exception of Well 7 (DID 10) which was out of service. The results of water quality monitoring are provided in **Appendix C – Table 2**.

2.2 Ecological Monitoring

Ecological monitoring is required under the County's Water Use Permit (WUP) for thirteen (13) augmentation wetlands. All of the sites are discussed using Pinellas County I.D. numbers in this report. Both qualitative and quantitative ecological monitoring are required under this permit; however, only four (4) sites are designated for quantitative monitoring. All thirteen (13) monitored wetlands on AL BAR Ranch are classified as herbaceous.

Following is a list of wetland types in accordance with the Florida Land Use Cover, and Forms Classification System (FLUCFCS) (FDOT 1999) and the appropriate site classifications:

SITES	**WETLAND FLUCFCS* TYPE**
4A, 9D, 9E	523 Shallow prairie lake
4B, 5, 7A, 7B, 10	641 Freshwater Marsh
1, 6, 9A, 9B, 9C	643 Wet prairie/seasonal pond
*FLUCFCS classification (FDOT 1999)	

2.2.1 Qualitative Vegetation Monitoring

The locations of the thirteen (13) augmented wetlands and the thirteen (13) ecological monitoring stations are depicted on **Figure 2, Appendix A**. Qualitative monitoring of the augmented wetlands is performed twice per year, in April and September, based on the Wetland Assessment Procedure (WAP) developed by Tampa Bay Water in 2000 and described in the Environmental Management Plan (EMP). The WAP is a semi-quantitative vegetative, soil and hydrological analysis of wetland conditions. The WAP includes the collection of pertinent information on vegetation, hydrology, and soils to characterize vegetative zonation, biological condition, and health of the wetland. This data provides a basis for evaluating wetland recovery through augmentation. Vegetative monitoring was based on the initial transects established in April 1996 for each site identified on **Figure 2, Appendix A**.

2.2.2 Ecological Data Analysis

As described in Section 2.2.1 Qualitative Vegetative Monitoring, data is collected as part of WAP to assess the health and general condition of a particular wetland (e.g., species composition, zonation and levels of disturbance). The fifteen (15) categories used to assess the health or condition of each wetland system are listed in **Appendix E - Tables 9 and 10**. As part of the evaluation process, each of the applicable categories is ranked one (1), two (2), or three (3) depending upon the evaluation criteria and the condition of the wetland system. A rank of three (3) represents normal wetland conditions with minimal disturbances. A rank of one (1) represents atypical wetland conditions.

To facilitate comparisons of wetland conditions over time, a total WAP score was calculated for each of the monitored wetland systems. The total WAP score represents the sum of the ranking of the WAP categories. If a wetland system can be ranked on all fifteen (15) major categories of the WAP, the maximum score would be 45 (15 times 3). However, individual categories are eliminated if the specific parameter is not applicable to a particular wetland system. Under these scenarios, the maximum score would be less than 45. For example, if a wetland system does not have a forested, shrub or vine component, these categories would not be ranked. The thirteen (13) monitoring sites are considered herbaceous wetlands, dominated by grasses, sedges, and forbs; however, tree and shrub data is still collected when applicable. Wetland monitoring stations with no tree, shrub, or vine components have a potential maximum score of 15. Site 9E is the only site without any of these components. A minor tree, shrub, and/or vine component was present at all other sites, resulting in higher potential scores. Shrub and vine presence can increase or decrease from year to year and occasionally, from one season to the next. Due to this variability in the maximum WAP score, comparisons of total WAP scores between other wetland systems are not considered appropriate.

Due to the variability in the maximum WAP scores, the percent of maximum WAP score was calculated to facilitate comparisons between wetlands of similar community types. The percent of maximum WAP score is considered to represent the overall wetland health and is calculated by dividing the total WAP score by the maximum possible WAP score. Wetlands with normal vegetation zonation and hydrology are expected to have the highest percent of maximum WAP score. To assist in the evaluation of total WAP scores for individual wetlands, factors contributing to a particular score have also been noted.

The WAP scores were compiled and summarized in tables for individual wetlands. Descriptive graphs were used to analyze the change in wetland health between April and September 2021 monitoring.

2.2.3 Quantitative Vegetation Monitoring

The quantitative vegetation monitoring replicates monitoring collected in the baseline data (Peacock and Associates, Inc., 1996). In addition to the qualitative monitoring (WAP), four (4) reference sites were also monitored quantitatively by the line intercept methodology twice per year: April to represent dry season conditions and September to represent wet

season conditions. The four (4) sites are 4B, 5, 9C and 10. Tampa Bay Water is currently monitoring sites 4A, 7A and 9E under the TBW Consolidated WUP.

2.2.4 Quantitative Ecological Data Analyses

Quantitative vegetative monitoring of the four (4) reference sites employed the line intercept methodology. Fixed length transects were established in each wetland, perpendicular to the wetland edge, and through the previously established, fixed-length vegetative zones within each system. The transect locations are depicted on **Figure 2** in **Appendix A**. The presence of all plant species within 2-foot by 2-foot quadrats placed every meter, from the point-of-beginning extending to the transect endpoint in the center of the wetland, was recorded. The presence of open water or bare ground within each quadrat was also documented.

All quantitative transects are monumented (i.e., PVC pipe, monitor well or staff gauge) to allow continuous replication of data. Specific field data sheets were utilized to collect data along each transect. All species present within each quadrat were recorded every meter along the entire transect within both the transition zone and deep zones. Nomenclature follows Wunderlin et al (2019). The total number of recorded occurrences of each species was used to calculate its relative percent cover both along the entire transect and within each zone. This methodology establishes a way to evaluate changes in species zonation over time. During the monitoring events, the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) (Reed, 1988) indicator status was recorded for each plant species documented. These indicator classifications are based on individual species likelihood to occur within wetlands, and each species was assigned a Plant Hydroperiod Index (PHI) score from 1.00 (Obligate wetland) to 5.0 (Upland). All species with a score below 3.0 (Facultative) are assumed to represent wetland conditions.

The wetland scores are obtained by multiplying the number of occurrences of each species within a site by its wetland indicator status (Reed, 1988). The sum of all species' wetland scores is then divided by the total number of occurrences, excluding species with no assigned wetland indicator to obtain a weighted average wetland score with values from 1 to 5 for each site. The closer the calculated score is to 1.0 indicates that the site contains higher numbers of obligate (OBL) wetland plant species (which are nearly always found in wetlands). A score near 5.0 indicates a predominance of upland plant species.

Therefore, the lower the calculated score is, the greater the proportion of wetland species. Based on the vegetative indicator list used for the quantitative monitoring, a wetland score lower than 3.0 for an individual site indicates that the area within the site can be considered a wetland. The following is a list of wetland categories with respective PHI scores:

Category	Symbol	Wetland Scores
Obligate	OBL	1.0
Facultative Wetland +	FACW +	1.67
Facultative Wetland	FACW	2.0
Facultative Wetland -	FACW -	2.33
Facultative +	FAC +	2.67
Facultative	FAC	3.0
Facultative -	FAC -	3.33
Facultative Upland +	FACU +	3.67
Facultative Upland	FACU	4.0
Facultative Upland -	FACU -	4.33
Upland	UPL	5.0

Quantitative wetland scores are listed in **Appendix A, Tables 11 and 12**.

2.3 Ground Photography

Photographs for each augmentation site are rendered on a semi-annual basis during each ecological monitoring event. Photographs are taken from fixed points along the ecological monitoring transects. Photographs for each site are provided in **Appendix F**.

2.4 Wildlife Observations

Incidental wildlife observations are noted during each semi-annual monitoring event for each ecological monitoring site based on visual observations or indications of their presence by sound, burrows, tracks, scat, etc. Wildlife observations are documented on the WAP forms and summarized for each site on **Table 17**.

3.0 RESULTS AND DATA ASSESSMENT

3.1 Hydrology

3.1.1 Augmentation Wells Withdrawals

All augmentation wells were utilized for augmentation during WY 2021. All wells are normally pumped water for least de-minimis amounts during the month of May for annual water quality sampling.

Wells 1, 4, and 5 were operated every month of the water year and well 4 pumped the most volume; Wells 6, 8 and 9 were operated in every month of the year except for September. Well 7 was pumped a total of five months in WY 2021, and a de-minimis amount in August. Other than these circumstances, groundwater withdrawals occurred throughout WY 2021. When not operated for augmentation, wells may have pumped de-minimis amounts for maintenance or sampling purposes, as described above.

Overall volume of augmentation was distributed fairly evenly throughout the year, except for September and July when the least amounts of volume were withdrawn, respectively.

Augmentation quantities totaled 204 million gallons (MG) for the year (**Appendix A - Figures 6, 7 and 8,** and **Appendix C - Table 3**). The average annual daily withdrawal recorded at seven augmentation well meters during WY 2021 was 0.56 mgd for AL BAR Ranch with a peak monthly quantity of 0.81 mgd; therefore, the annual average permitted quantities of 1.31 mgd and peak monthly quantities of 2.339 mgd were not exceeded during WY 2021 (**Appendix A** – **Figure 7**).

3.1.2 Wetland Augmentation

Augmentation flows were highest in January, October and May, respectively, averaging more than 20 MG during these months. Augmentation was distributed fairly evenly throughout the rest of the remaining months, averaging around 16 MG, with the exception of September, which was the lowest discharge quantity at 2.35 MG, and July at about 8 MG.

Site 4A was the recipient of the largest total volume of augmentation water in WY 2021, followed by sites 4B, 7A and 9B, respectively (**Appendix A - Figure 8 and Appendix C – Table 4**). Sites 9C, 7B, 9A, 9D and 1 received the lowest amounts of water, respectively.

Sites 1, 4A, 4B and 5 received augmentation water in every month of the year; Sites 6, 9B, and 9E received augmentation water in every month of the year except for September. Site 9A was not augmented in August or September; Sites 7B and 10 were not augmented in March, April and September, nor was 7B Augmented in October, January and July through August, except for a de minims amount in August for testing purposes. Site 9C was lightly augmented in January through May with de minimis amounts in October, November, and June and July. Site 9D received no augmentation in January through March and September, and Site 10 received a de minimis amount in February.

Augmentation meters for sites 5, 9D and 9E were replaced in WY 2021. All other augmentation wetland flow meters appeared to function properly in WY 2021. All wetland augmentation quantities were reported during the water year. Augmentation quantities for individual wetland sites are depicted graphically in **Figures 16 through 28** in **Appendix A** and in tabular form on **Table 4, Appendix C**.

3.1.3 Surficial Aquifer Groundwater Levels

The results of groundwater level data are discussed below using Pinellas County I.D. for site designations. District I.D. numbers for each of these sites are provided in **Appendix B** and on the referenced **Figures**. Groundwater levels are measured twice-monthly at thirteen (13) ecological monitoring stations. **Appendix A – Figures 29 through 41** graphically depict surficial aquifer elevation data, and **Table 5** in **Appendix C** lists the data in tabular form.

Surficial aquifer water levels for MW-1 ranged from a low of 61.98 ft. NGVD in late May 2021 to a high of 68.45 ft. NGVD in September 2021, a difference of 6.47 feet. Groundwater levels fluctuated with rainfall and augmentation (**Appendix C - Figure 29**).

MW-4A surficial aquifer water levels fluctuated 8.94 feet during WY 2021. Water levels ranged from a from a low of 63.74 ft. NGVD in late May 2021 to a high of 72.68 ft. NGVD in September 2021. Groundwater levels fluctuated with rainfall and were maintained with augmentation (**Appendix C - Figure 30**).

MW-4B surficial aquifer water levels fluctuated 6.67 feet during WY 2021. Water levels ranged from a low of 66.67 ft. NGVD in late May 2020 to 73.34 ft. NGVD in late September

2021. Groundwater levels fluctuated with rainfall and were maintained with augmentation (**Appendix C - Figure 31**).

MW-5 surficial aquifer water levels fluctuated 5.04 feet with elevations ranging from 71.82 ft. NGVD in September 2021 to 66.78 ft. NGVD in late May 2020. Groundwater levels fluctuated primarily with rainfall (**Appendix C - Figure 32**).

MW-6 surficial aquifer water levels fluctuated 8.80 feet with elevations ranging from 66.07 ft. NGVD in late May 2021 to a high of 74.87 ft. NGVD in September 2021. Groundwater levels fluctuated primarily with rainfall and were maintained with augmentation (**Appendix C** - **Figure 33**).

MW-7A surficial aquifer water levels fluctuated 7.93 feet with elevations ranging from a low of 63.02 ft. NGVD in late May 2021 to a high of 70.95 ft. NGVD in September 2021. Groundwater levels fluctuated primarily with rainfall and were maintained with augmentation (**Appendix C - Figure 34**).

MW-7B surficial aquifer water levels fluctuated 8.56 feet with elevations ranging from a low of 64.68 ft. NGVD in late May 20121 to a high of 73.24 ft. NGVD in September 2021. This site received small amounts of augmentation water in November, December, February, May and June; hence, water levels primarily fluctuated with rainfall (**Appendix C - Figure 35**).

MW-9A surficial aquifer water levels fluctuated 6.90 feet with elevations ranging from 69.06 ft. NGVD in late May 2021 to 75.96 ft. NGVD in late September 2021. Water levels fluctuated primarily with rainfall as this wetland received minimal amounts of augmentation water (**Appendix C - Figure 36**).

MW-9B surficial aquifer water levels fluctuated 7.04 feet with elevations ranging from a low of 68.50 ft. NGVD in late May 2021 to a high of 75.54 ft. NGVD in late September 2021. Groundwater levels fluctuated primarily with rainfall and were maintained with augmentation in the dry season (**Appendix C - Figure 37**).

MW-9C surficial aquifer water levels fluctuated 7.07 feet with elevations ranging from 75.72 ft. NGVD in late September 2021 to 68.65 ft. NGVD in late May 2021. Water levels fluctuated primarily with rainfall as this site was not substantially augmented in WY 2021 (**Appendix C - Figure 38**).

MW-9D surficial aquifer water levels fluctuated 6.03 feet with elevations ranging from 70.17 ft. NGVD in late May 2021 to 76.20 ft. NGVD in late September 2021. Water levels fluctuated primarily with rainfall and were maintained with augmentation during the dry season (**Appendix C - Figure 39**).

MW-9E surficial aquifer water levels fluctuated 9.13 feet with elevations ranging from a low of 66.95 ft. NGVD in late May 2021 to 76.08 ft. NGVD in September 2021. Water levels fluctuated primarily with rainfall and were maintained with augmentation during the dry season (**Appendix C - Figure 40**).

MW-10 surficial aquifer water levels fluctuated 6.54 feet with elevations ranging from 69.45 ft. NGVD in late May 2021 to 75.99 ft. NGVD in late September 2021. Water levels fluctuated with rainfall and augmentation (**Appendix C - Figure 41**).

In summary, during WY 2020 surficial aquifer water levels range of fluctuation was from 5.04 feet as recorded at Site MW-5 to 9.13 feet at Site MW-9E. In general, groundwater elevations were influenced by augmentation and rainfall. Groundwater levels started dropping at the beginning of the water year and steadily trended lower with the normal dry season. Groundwater levels started rising with the effects of wet season rainfall in June. Average measured groundwater elevations for the entire water year were about the same as in the previous water year (2020).

Average range of surficial aquifer water level fluctuation in WY 2021 among all monitor wells was three feet higher than the fluctuation in WY 2020 and the difference between the minimum (Site 5-MW) and maximum (Site 9E-MW) fluctuation was approximately one and a half foot more. Groundwater levels steadily dropped through the dry season, except for a small spike in elevation in December 2020. Compared with the previous water year, lower water levels in the 2021 dry season resulted from lower dry-season rainfall in 2021 than in 2020. The dry to wet season re-bound of water for the 2021 wet season was typical

but water levels re-bounded to a higher elevation compared with 2020. Composite average groundwater elevations in the wet seasons of WYs 2014, 2015 and 2018 have been the highest observed since augmentation began in 2002. Groundwater elevations appear to have approached these highs in 2021 but were also the lowest seen since the 2017 dry season, hence the very large range of fluctuation. Composite average of 69.82 ft. NGVD is higher than the composite average of 67.19 since 2002 and higher than the 68.61 composite average since 2010.

3.1.4 Surface Water Levels

Surface water levels are measured twice-monthly at thirteen (13) ecological monitoring stations (wetland sites) (**Appendix A - Figures 29 through 41** and **Tables 6 and 8** in **Appendix C**). Water was recorded at all sites over the water year.

Results of staff gauge data for WY 2021 indicate water depths at Site 1 ranged from a low of 1.48 feet in November 2020 to a high of 3.28 feet in August 2021. Water levels at this site were fairly steady and fluctuated primarily with augmentation. This site is relatively small and has high leakage (**Figure 29**).

Site 4A surface water depths at the staff gauge locations ranged between 5.14 feet in late October 2020 to 2.65 feet in late May 2021 to (**Figure 30**). Water levels at this site were fairly steady but fluctuated primarily with seasonal rainfall.

Site 4B surface water depths at the staff gauge locations ranged between 3.04 feet in late May 2021 to 4.91 feet in September 2021 (**Figure 31**). Water levels at this site were fairly steady but fluctuated primarily with seasonal rainfall.

Surface water depths at Site 5 ranged from 3.47 feet in late May 2021 to 5.11 feet in September 2021. Water levels were maintained with augmentation during the dry season and increased with wet-season rainfall (**Figure 32**).

Water depths at Site 6 fluctuated from 1.29 feet in late April 2021 to 3.37 feet in August 2021. Water levels were maintained with augmentation during the dry season and increased with wet-season rainfall (**Figure 33**).

Site 7A surface water depths ranged from 2.21 feet in May 2021 to 3.53 feet in September 2021. Water was below the staff gage in late May 2019. Water levels remained steady with augmentation during the dry season and increased slightly with wet-season rainfall (**Figure 34**).

Site 7B water depths fluctuated from 0.10 feet in May 2021 to 2.74 feet in September 2021. Water levels fluctuated primarily with wet-season rainfall as this site was substantially augmented only in November, May and June. This site naturally retains water and demands very little augmentation (**Figure 35**).

Recorded surface water at Site 9A ranged from at least 0.34 feet in late May 2021 to 4.90 feet in late September 2021. Water levels were maintained with low volume augmentation during the dry season and then increased with wet-season rainfall (**Figure 36**).

Recorded surface water at Site 9B ranged from 1.92 feet in May 2021 to 4.76 feet in September 2021. Water levels were maintained with augmentation during the dry season and increased with wet-season rainfall. This site has the highest leakage rate of the Al Bar augmented sites and is normally dependent on augmentation to maintain water levels (**Figure 37**).

Recorded surface water at Site 9C ranged from 0.53 feet in May 2021 to 4.24 feet in September 2021. Water levels were maintained with minimal augmentation during the dry season and then increased with wet-season rainfall, but this site was not substantially augmented in WY 2021 (**Figure 38**).

Recorded surface water depths at Site 9D ranged from 2.88 feet in May 2021 to 7.60 feet in late September 2021. Water levels were maintained with augmentation late in the dry season and then increased from wet-season rainfall (**Figure 39**).

Site 9E surface water depths ranged from at least 3.83 feet in late May 2021 to 8.39 feet in late September 2021. Water levels were maintained with augmentation during the dry season and increased with wet-season rainfall (**Figure 40**).

Water depths Site 10 ranged from 1.05 feet in May 2021 to 4.95 feet in late September

2021. Water levels were maintained with augmentation during the dry season and increased with both wet-season rainfall and augmentation (**Figure 41**).

In summary, the maximum water depth recorded at the augmented wetlands on AL BAR Ranch was 8.39 feet at Site 9E and the shallowest depth recorded was at Site 7B. Measured water level fluctuations at the augmented sites ranged between 1.32 feet at Site 7A to 4.72 feet at Site 9D. The lowest surface water elevation was 69.79 feet NGVD at Site 1 and highest water elevation was 76.33 feet NGVD at Site 9D.

3.1.5 Rainfall

Tampa Bay Water maintains five (5) rainfall stations at Cross Bar Ranch. The average composite rainfall for the five stations was 58.92 inches during WY 2021 (**see Figures 4 and 5, Appendix A,** and **Table 1 in Appendix C**). Rainfall accumulation was highest during the months of June through September. The composite average rainfall for WY 2021 is slightly higher than Cross Bar's period of record composite rainfall average of 55.570 inches (WY 2001 through 2021) by 3.22 inches. Rainfall during WY 2021 is the sixth highest amount in the range of recorded rainfall since augmentation commenced in 2002. WY 2003 composite average rainfall of 77.84 inches was the highest, followed by WY 2015 with 68.18 inches. Rainfall at the nearby St. Leo rain gauge was 57.36 inches for WY 2021, approximately one and one-half inches lower than rainfall recorded at the Cross Bar stations in WY 2021. Water years 2005 and 2006 are the two driest recorded at Cross Bar Ranch since Pinellas County initiated augmentation at AL BAR Ranch in 2002.

3.1.6 Water Quality

For WY 2021 pH levels ranged from 6.51 at Pinellas County I.D. Well 9 to 6.90 at Well 1; pH averaged 6.70 throughout the site. Hardness levels ranged from 141 mg/L at Well 1 to 214 mg/L at Well 6. Conductivity levels ranged from 291 µmhos/cm at Well 1 to 431 µmhos/cm at Well 6. All wells were successfully sampled for the annual sampling event as required by permit with the exception of Well 7, which was out of service at the time. The results of water quality monitoring are provided in **Appendix C – Table 2**.

3.2 Ecological Monitoring Results and Data Assessment

3.2.1 Qualitative Monitoring

This section discusses the current ecological condition of each of the thirteen (13) ecological monitoring stations. **Tables 9 and 10** (**Appendix E**) provide a summary of the wetland conditions based on the Wetland Assessment Procedure (WAP) discussed in Section 2.2. **Tables 9 and 10, Appendix E** provide the WAP scores for each assessed category, the total WAP score, and the percent of the maximum WAP scores for each of the thirteen (13) sites. These scores are graphically depicted in **Figures 42 and 43** in **Appendix A**. The average percent of maximum WAP score for all assessed wetlands in April 2021 was 85.5% compared with 68.6% in April of WY 2001. In April 2021 the average category score, i.e., the total WAP score divided by the total number of categories, was 2.56. The WAP scores for each category have shown an increase since initial monitoring when the average was 2.05 in 2001. While some slight variation has been observed over the period of record (POR), the scores have been relatively stable. During the April 2021 monitoring, four (4) of the monitored wetlands (9A, 9D, 9E, and 10) achieved the maximum WAP score. The other sites did not achieve the maximum WAP score primarily due to abnormal species zonation and transition zone composition in both groundcover and shrub categories. During the April monitoring event, wetland 4A received the lowest percent of maximum WAP score of 66.7%. This lower score was primarily due to improper zonation and composition of shrub and canopy species in the transition zone.

The average percent of maximum WAP score for all assessed wetlands in September 2021 was 83.3% compared with an average percent of maximum WAP score of 69.8% in September 2001. The average category score for all sites was 2.50 in September 2021 compared with 2.10 for WY 2001. In September 2021, one (1) of the monitored wetlands (Site 10) achieved the maximum WAP score. The other sites did not achieve a maximum WAP score primarily due to abnormal species zonation in both groundcover and shrub categories and transitional zone composition in these categories. During the September monitoring event, wetland 4A received the lowest percent of maximum WAP score of 69.2%. This lower score was primarily due to improper zonation and composition in the transition zone and shrub layer, as well as a high cover by weedy shrub and groundcover species.

The wetland scores from the qualitative monitoring (WAP) indicate relatively stable improved conditions and generally higher current scores than those obtained during initial monitoring. An analysis of the data depicts an increase in WAP scores from WY 2001 to WY 2021 indicating that vegetative zonation has improved since initial monitoring.

3.2.1.1 General Conditions at Monitoring Stations

Man-made Disturbances

During the WAP monitoring, man-made disturbances were identified within the ecological monitoring sites. Man-made disturbances included drainage ditches, culverting, fire lanes, roads, and clear cutting and re-planting of adjacent pine. Most of the disturbances are caused by mowing and fire line maintenance.

Fire lanes that are periodically disked surround or traverse eight (8) of the wetland sites, sites 4A, 4B, 5, 6, 7A, 9B, 9C, and 10 respectively. Fencing, primarily at property boundaries, was noted at sites 5, 9C, and 10. Dirt roads are located at all of the sites; however they are generally located at the upland edge of the wetlands. At sites 1, 4A, 4B, 7A, 7B, 9A, 9C, 9D, and 9E roads are minor with some vegetation in the roadway. Mowing has been conducted around the perimeter of sites 4A, 4B, 7B, 9A, 9C, 9D, and 9E.

3.2.2 Quantitative Monitoring

An analysis of the quantitative monitoring data for four (4) sites; 4B, 5, 9C, and 10 is provided with the compilation of the Plant Hydroperiod Index (PHI) wetland scores. The PHI wetland scores for both the transitional and deep zones within each site is provided in **Table 11, Appendix E**. The total PHI wetland score for each of the four (4) sites is provided in **Table 12** of **Appendix E**. These tables are depicted graphically on **Figures 44, 45, and 46**. For comparison, the WY 2001 scores are also shown on each of these figures. As indicated in Section 2.2.4, a value of 1.0 indicates the site is dominated by OBL wetland plant species. The higher PHI wetland score (i.e., 5.0) indicates a site is dominated by upland plant species. Therefore, unlike the qualitative WAP monitoring wetland scores, the lower PHI wetland scores indicate the presence of plant species that occur more frequently in wetlands. All of the sites resulted in scores below 3.0 and, therefore, all sites are dominated by wetland vegetation. Below is a summary of the results of ecological analysis for each site. A summary of plant species occurrences within each zone is provided in **Tables 13, 14, 15 and 16**.

The PHI wetland scores within the deep zones of all four (4) quantitative monitoring sites indicated a dominance of OBL wetland plants for each site in April 2021 with a score of 1.88 for Site 4B, 1.06 for Site 5, 1.18 for Site 9C, and 1.07 Site 10. In September 2021, the deep zones had scores of 2.16 for Site 4B, 1.17 for Site 5, 1.06 for Site 9C, and 1.04 for Site 10. These scores indicate a dominance of OBL wetland plant species within the deep zones for sites 5, 9C, and 10, and a dominance of FACW species in the deep zone of site 4B during the September monitoring event.

The transitional zone PHI wetland score of all four (4) quantitative wetland monitoring sites ranged from a low of 1.19 for Site 10 to a high of 2.52 for Site 4B during the April 2021 monitoring period. The scores for transitional zone PHI wetland scores for September 2021 ranged from 1.14 for Site 10 to 2.52 for Site 4B. The site 10 score remained low during both monitoring events due to high coverage of obligate species. The higher transitional zone score of Site 4B is attributed largely to a significant number of facultative or drier species including *Croton michauxii, Dichanthelium portoricense,* and *Andropogon virginicus*. The deep zone of site 4B contains mostly appropriate vegetation.

Total wetland scores (**Table 12**) ranged from 1.14 at Site 10 to 2.40 at Site 4B during the April 2021 monitoring period. This score at Site 10 indicates a dominance of OBL plant species, which were primarily *Leersia hexandra, Panicum hemitomon, Pontederia cordata, Sagittaria lancifolia* and *Bacopa caroliniana.* Site 9C had a total wetland score of 1.80 and was dominated by FACW and OBL plant species *Amphicarpum muehlenbergianum, Phyla nodiflora, Leersia hexandra, Hydrocotyle umbellata, Panicum hemitomon,* and *Bacopa caroliniana.* Site 5 was dominated by FACW and OBL plant species including, *Amphicarpum muehlenbergianum, Axonopus furcatus, panicum hemitomon, Pontederia cordata,* and *Typha sp.* with a total wetland score of 1.29. Site 4B had a score of 2.40 and was dominated by FACW plant species including, *Amphicarpum muehlenbergianum, panicum hemitomon,* and *Panicum repens.* Significant numbers of FAC and drier species including *Croton michauxii*, *Dichanthelium portoricense, and Andropogon virginicus* were also present. As previously indicated, **Tables 13, 14, 15 and 16** provide a summary of plant species occurrences for the April 2021 monitoring period.

During the September 2021 monitoring period total wetland scores (**Table 12**) ranged from 1.09 at Site 10 to 2.54 at Site 4B. Site 10 contained mostly FACW and OBL species and was dominated by *Leersia hexandra, Panicum hemitomon, Sagittaria lancifolia* and *Pontederia cordata*. Site 9C received a score of 1.67 and Site 5 received a score of 1.88. Site 9C also contained mostly FACW and OBL species and was dominated by *Leersia hexandra, Amphicarpum muehlenbergianum,* and *Panicum hemitomon*. Site 5 was dominated by *Amphicarpum muehlenbergianum* in the transitional zone (FACW) and *Pontederia cordata* (OBL) in the deep zone. Site 4B had a score of 2.54 and was dominated by *Amphicarpum muehlenbergianum, Dichanthelium portoricense,* and *Panicum repens.* Significant numbers of FAC and drier species including *Croton michauxii* and others were also present. As previously indicated **Tables 13, 14, 15 and 16** provide a summary of plant species and coverage for the September monitoring period.

The total wetland scores of sites 5, 9C, and 10 received scores between 1 and 2 during both the April and September 2021 monitoring events. These scores indicate a dominance of hydrophytic vegetation. Site 4B scores for both April and September are greater than 2, but lower than the wetland threshold of 3.

Scores in all sites remained relatively consistent from April to September 2021. The results of quantitative monitoring indicate that total PHI wetland scores for sites 5, 9C, and 10 have significantly improved and stabilized since initial monitoring in 2001. Site 4B received a higher PHI score than the initial monitoring event in 2001.

3.2.3 Wildlife

During the 2020 monitoring events, direct and indirect incidental wildlife observations were documented at each of the monitoring stations. Indirect observations included vocalizations, tracks, scat, burrows, nests, etc. A list of all species observed and the locations documented is provided in **Table 17** in **Appendix E**. A total of 24 wildlife species were documented, including 19 birds, three (3) amphibians, one (1) mammal, and one (1) fish species. Nineteen (19) of the species observed rely on wetlands for at least a portion of their life cycle, including fifteen (15) species of birds, three (3) species of frogs, and one (1) species of fish. Three (3) listed species were observed during this year's monitoring, including Florida sandhill crane (*Grus canadensis*), observed in Wetlands 4A, 4B, 7B, 9A, 9C, 9E, and 10; Bald Eagle (*Haliaeetus leucocephalus*),

observed in Wetland 9A and 9C; and Florida scrub-jay (*Aphelocoma coerulescens*), observed at Wetlands 9A and 9C. All the monitored wetlands appear to provide suitable habitat for many more species of wetland-dependent wildlife that were not observed during the monitoring events.

4.0 CONCLUSIONS

Augmentation occurred in every month of the water year and all wells were pumped at some point. Well 4 pumped the largest volume during the water year, followed by Wells 9 and 5, respectively. Well 7 pumped the least amount of augmentation water in WY 2021. Site 4A was the recipient of the largest total volume of augmentation water in WY 2021, followed by sites 4B, 7A, and 9B.

Augmentation production was below permitted quantities (1.343 mgd) with annual average daily withdrawal at 0.56 mgd. The peak monthly quantity of 0.81 mgd was 1.53 mgd below the permitted peak quantity of 2.339 mgd. These quantities were distributed to all wetland sites (1, 4A, 4B, 5, 6, 7A, 7B, 9A, 9B, 9C, 9D, 9E and 10. Sites 9C, 7B and 9A received the least amounts of augmentation water.

Range of fluctuation in surficial aquifer water levels, as measured in the monitor wells in WY 2021, was between 5.04 and 9.13 feet. Groundwater elevations ranged from 61.98 ft. NGVD at Site 1 to 76.20 ft. NGVD at Site 9D. Surface water depths ranged from 0.10 feet to 8.39 feet in depth. Surface water elevations ranged from 69.79 ft. NGVD at Site 1 to 76.33 ft. NGVD at Site 10.

Total augmentation quantities were less than the amount that was pumped in the previous water year. Recorded composite average surface water elevations for all sites was slightly higher, by a tenth of a foot, than those in WY 2020, but average fluctuation was almost one foot higher. Average composite groundwater elevations were slightly lower in WY 2021 than in WY 2020 by about a tenth of a foot; groundwater levels responded to a mix of augmentation, predominately during the dry season months, and rainfall during the wet season.

Water samples from all augmentation wells were analyzed for hardness and field readings were taken for specific conductance and pH. Field pH data depicts a range between 6.51 and 6.90 with an average of 6.70 in WY 2021. Conductivity ranged between 291 and 431 µmhos/cm. pH values averaged slightly lower than the previous May in WY 2021, but average conductivity was the same; average hardness values were slightly lower than the average of samples taken in May 2020 of the previous water year.

Ecological monitoring was analyzed qualitatively for all thirteen (13) monitoring stations and quantitatively for four (4) wetlands. The results of the qualitative monitoring for WY 2021 indicate that WAP scores continue be consistent for each site, becoming wetter and more stable since initial monitoring. This indicates that wetland conditions have improved and are stable. The total maximum wetland score was achieved for four (4) of the sites during the April 2021 monitoring event and one (1) of the sites in September 2021 monitoring event.

The results from the quantitative monitoring sites (4B, 5, 9C, and 10) show the total PHI wetland scores were lowest for Site 10 (1.09) in September 2021 and the highest at Site 4B (2.54) in September 2021. The results of quantitative monitoring indicate that total PHI wetland scores for sites 5, 9C, and 10, have been improving since initial monitoring in 2001 with an increase of plant species tolerant of hydric conditions (**Table 12**). PHI scores at site 4B are higher than those obtained during initial monitoring event in 2001.

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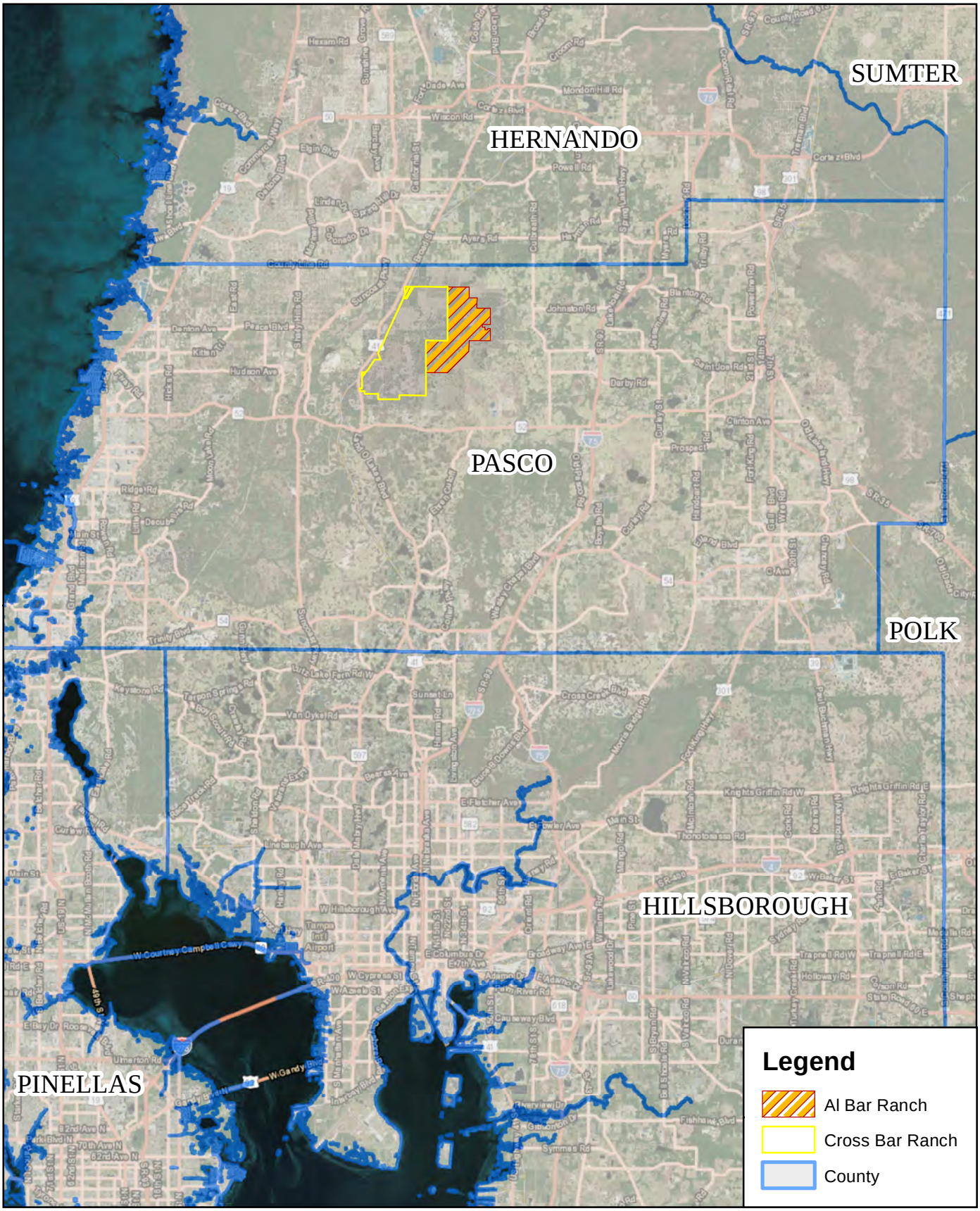
APPENDIX A

FIGURES AND HYDROGRAPHS



Path (E:\Mapping\Cross Bar - Al Bar Ranch\Maps\Al Bar Location Map.mxd) By: AA Date: 2/19/2019

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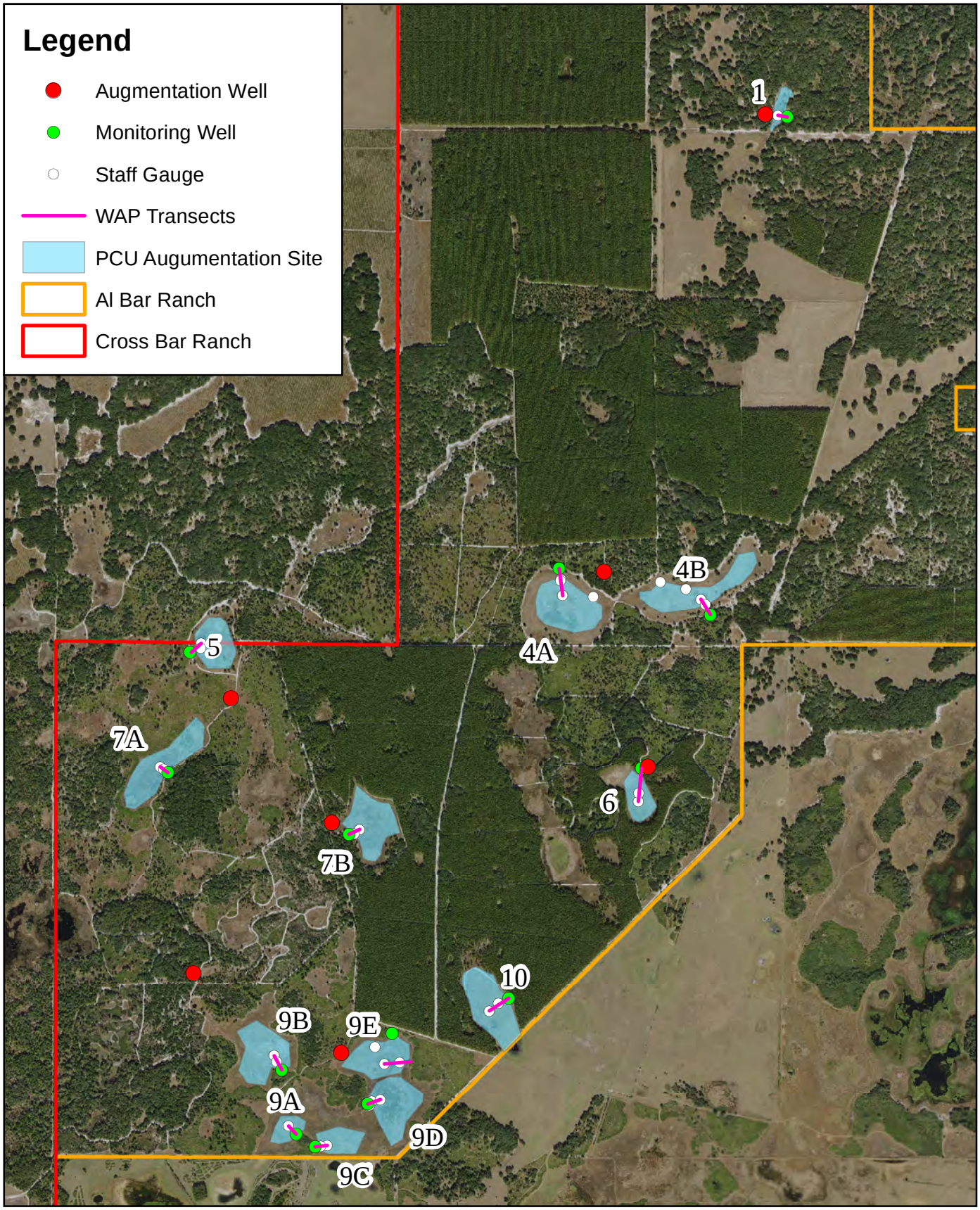
Figure 1
Location Map
Al Bar Ranch
Pasco County, Florida



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QUEST ecology

Figure 2
Al Bar Ranch
Pasco County, Florida

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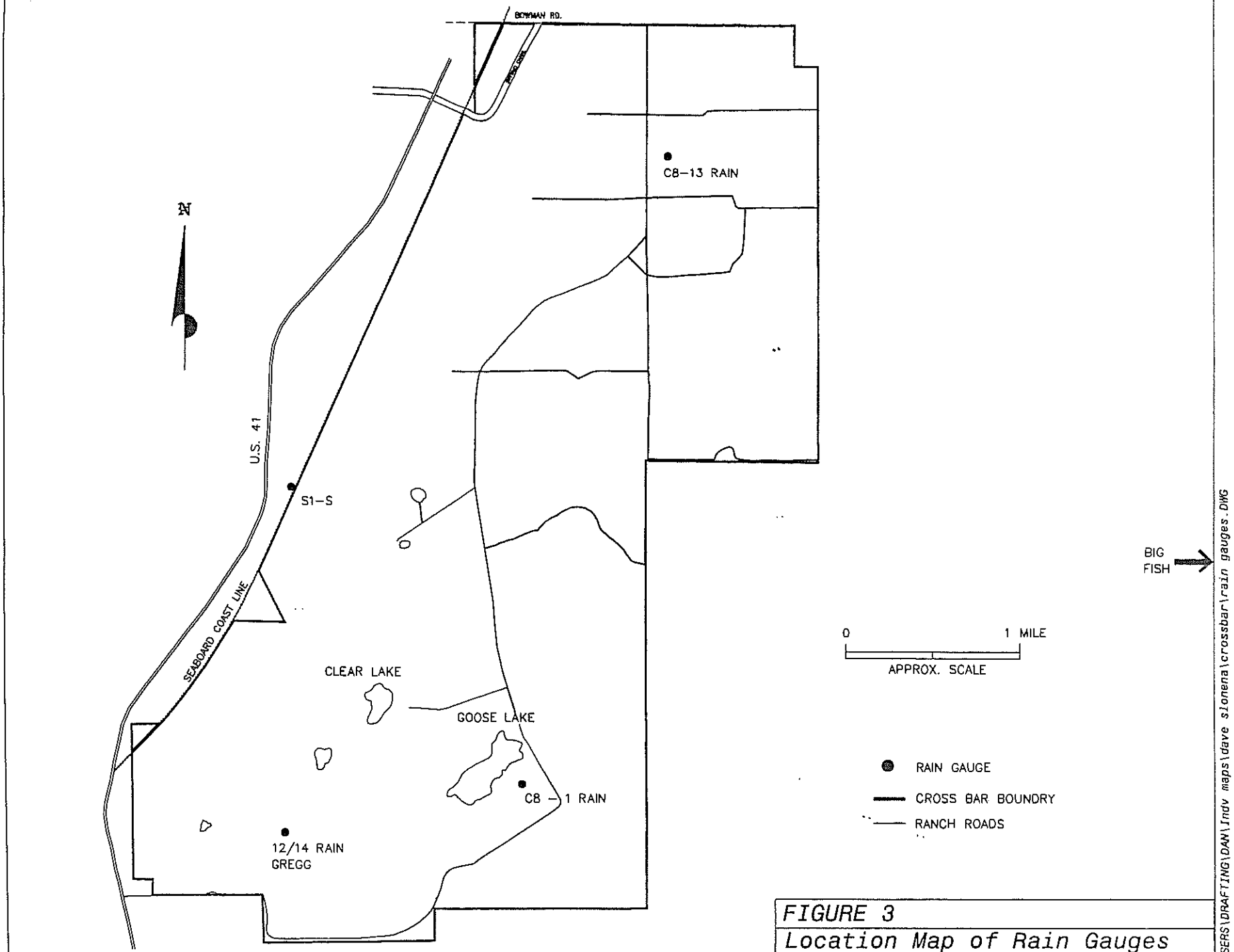

FIGURE 3

Location Map of Rain Gauges

CROSS BAR RANCH

06/12/2007

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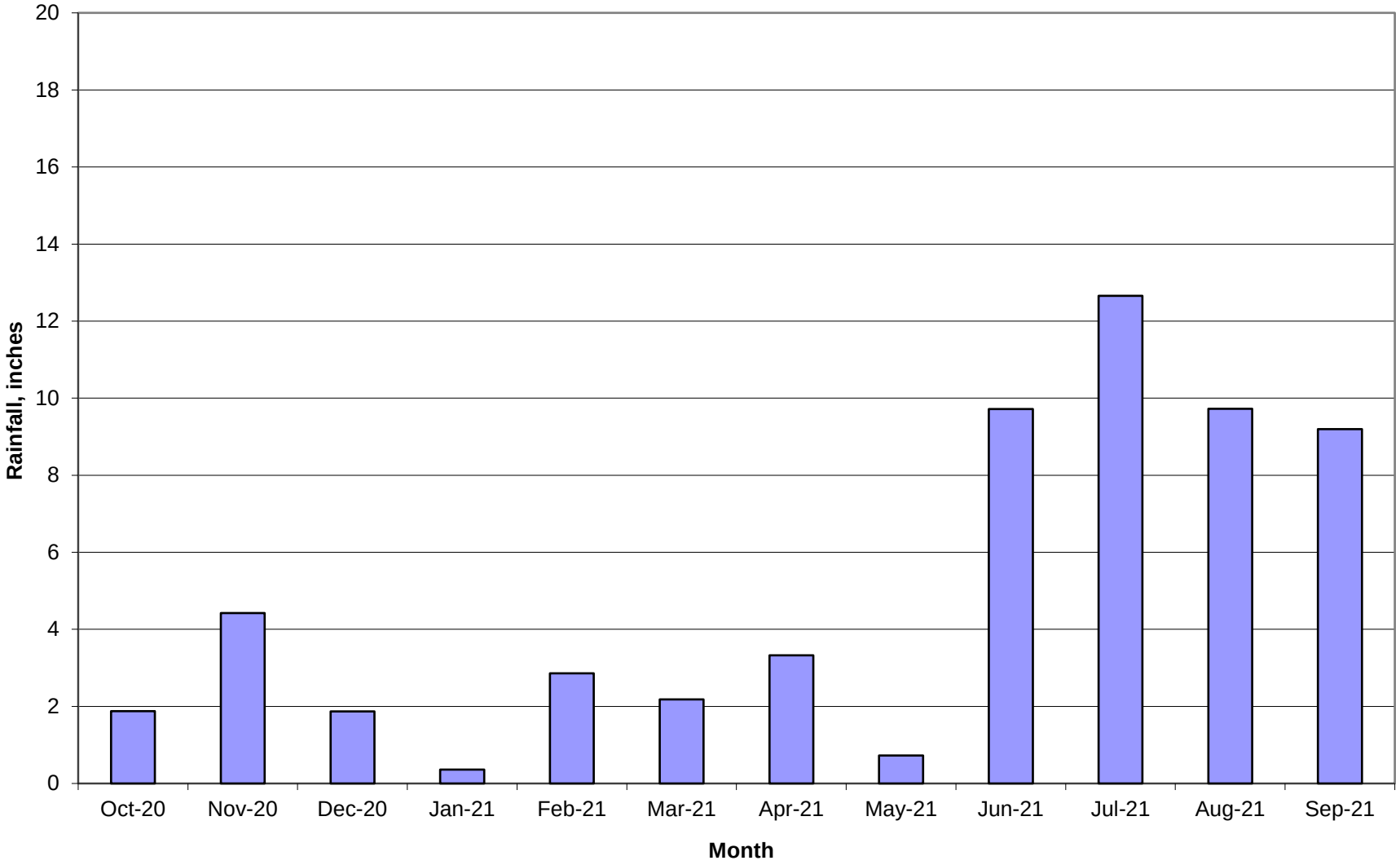
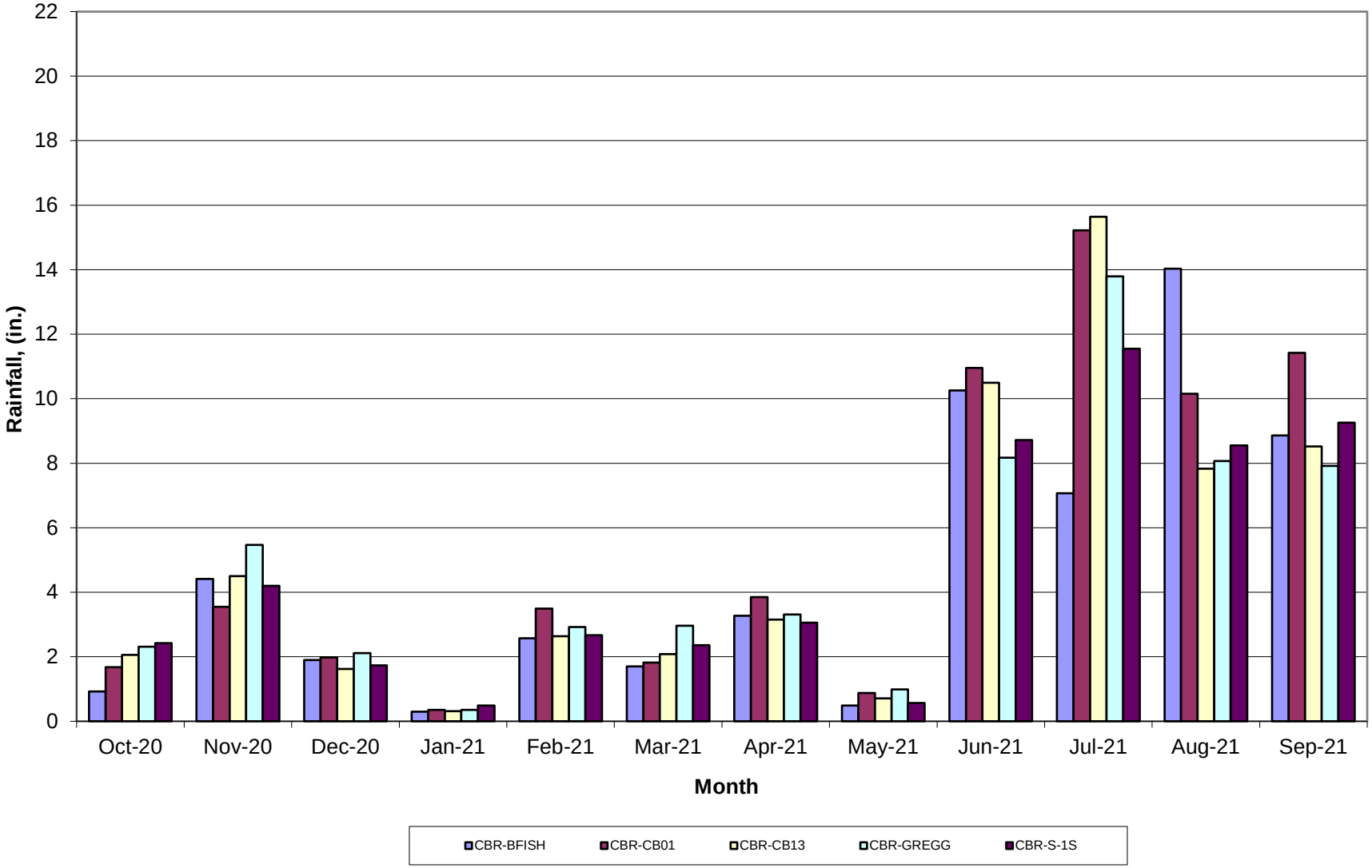
Figure 4 - AL BAR Ranch Average Composite Monthly Rainfall, WY 2021



Source: Tampa Bay Water, 2020

Figure 5 - Total Monthly Rainfall by Station, AL BAR Ranch, WY 2021



Source: Tampa Bay Water, 2020

Figure 6 - Total Monthly Augmentation Quantities, AL BAR Ranch WY 2021

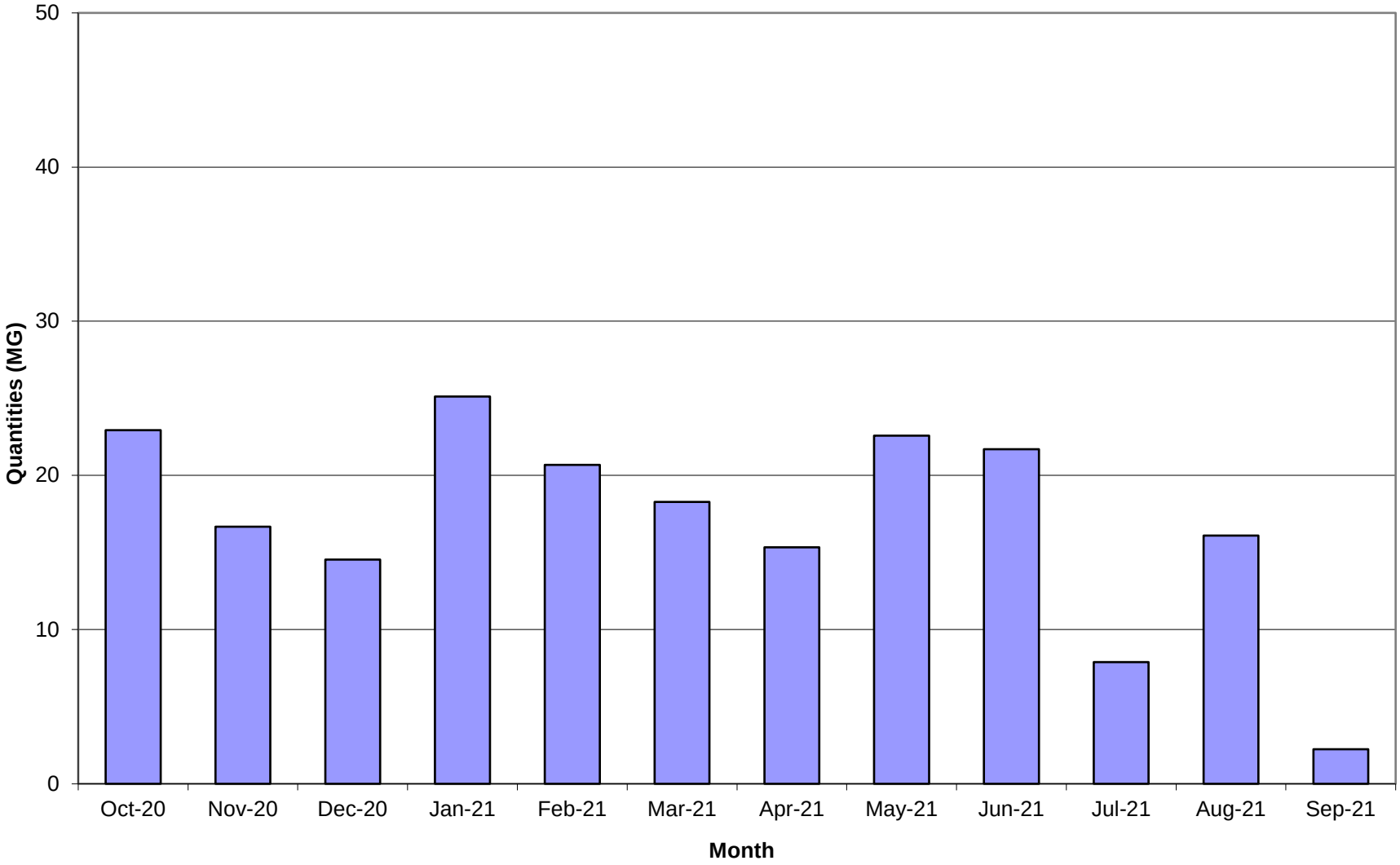


Figure 7 - Total Augmentation Withdrawals by Well, AL BAR Ranch WY 2021

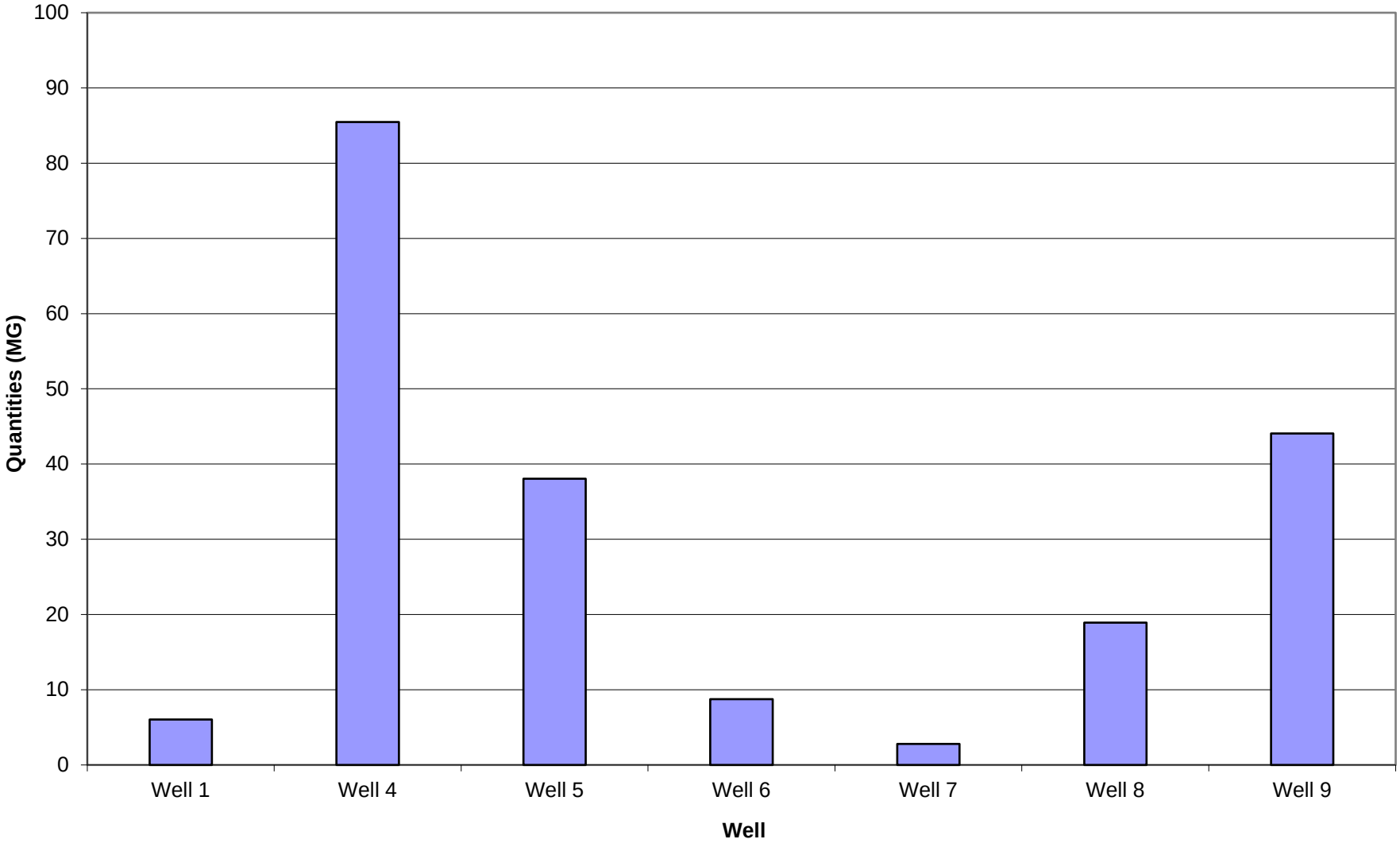


Figure 8 - Total Augmentation Quantities by Wetland Site, AL BAR Ranch WY 2021

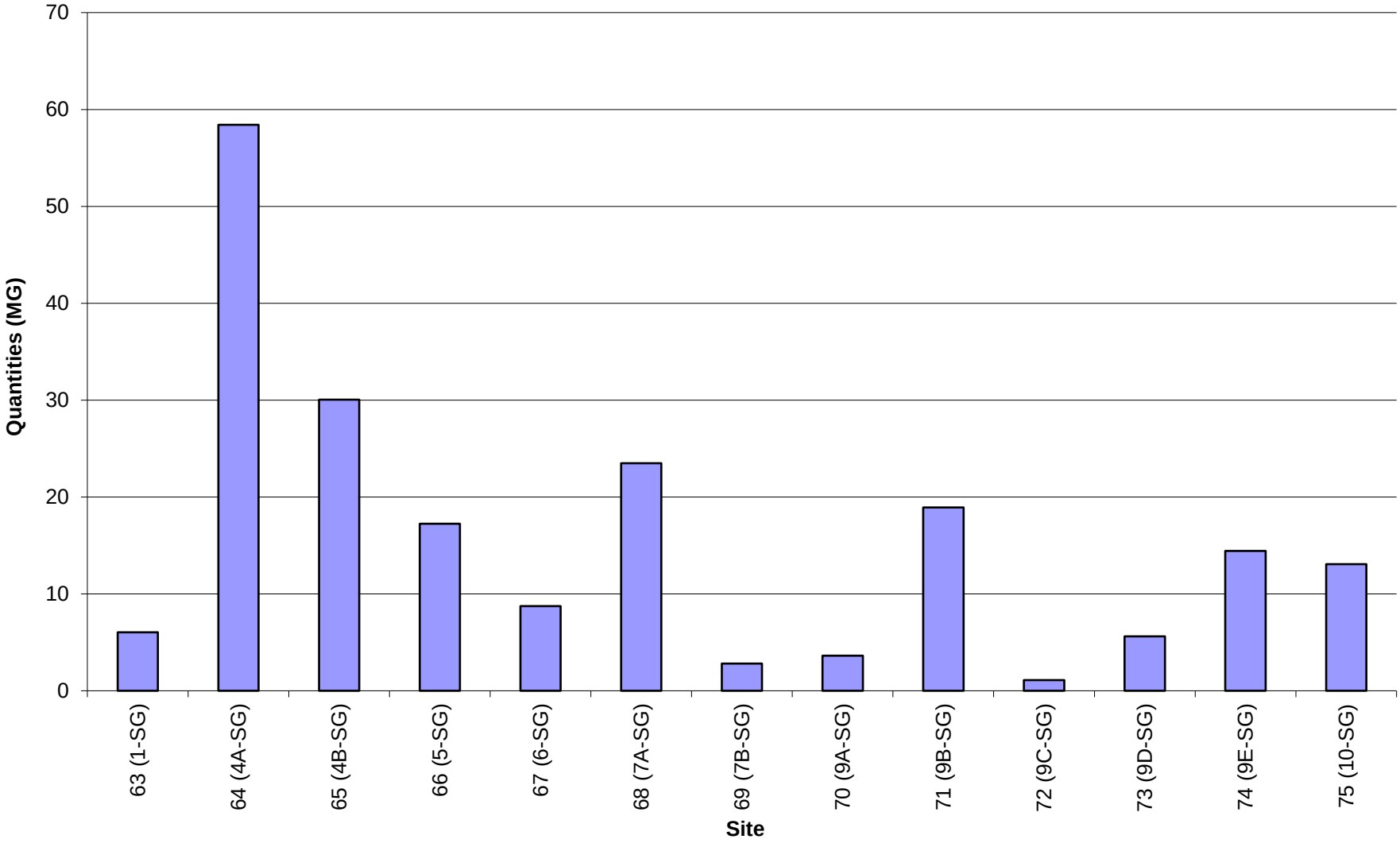


Figure 9 - Monthly Withdrawals Well 1, AL BAR Ranch WY 2021

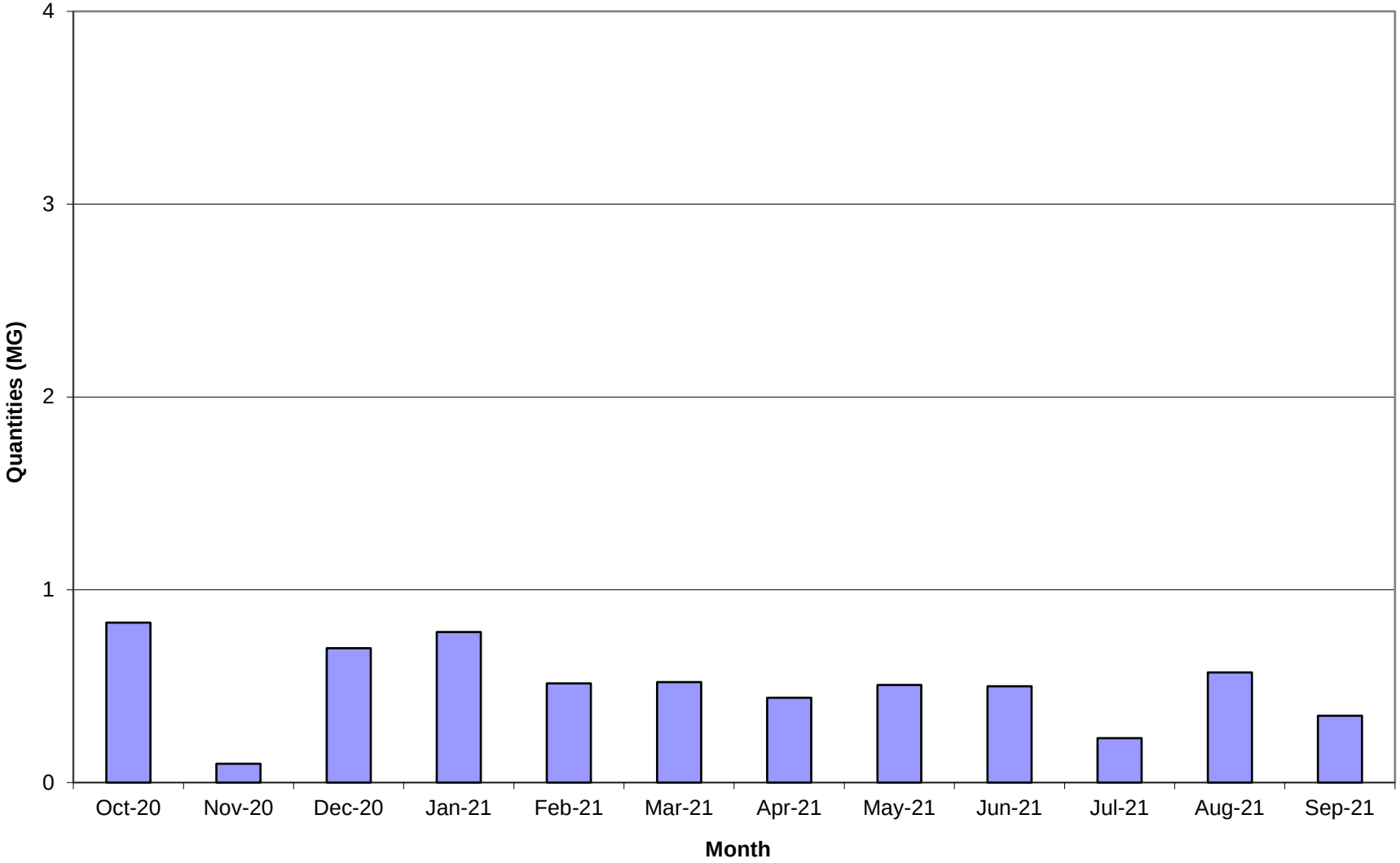


Figure 10 - Monthly Withdrawals Well 4, AL BAR Ranch WY 2021

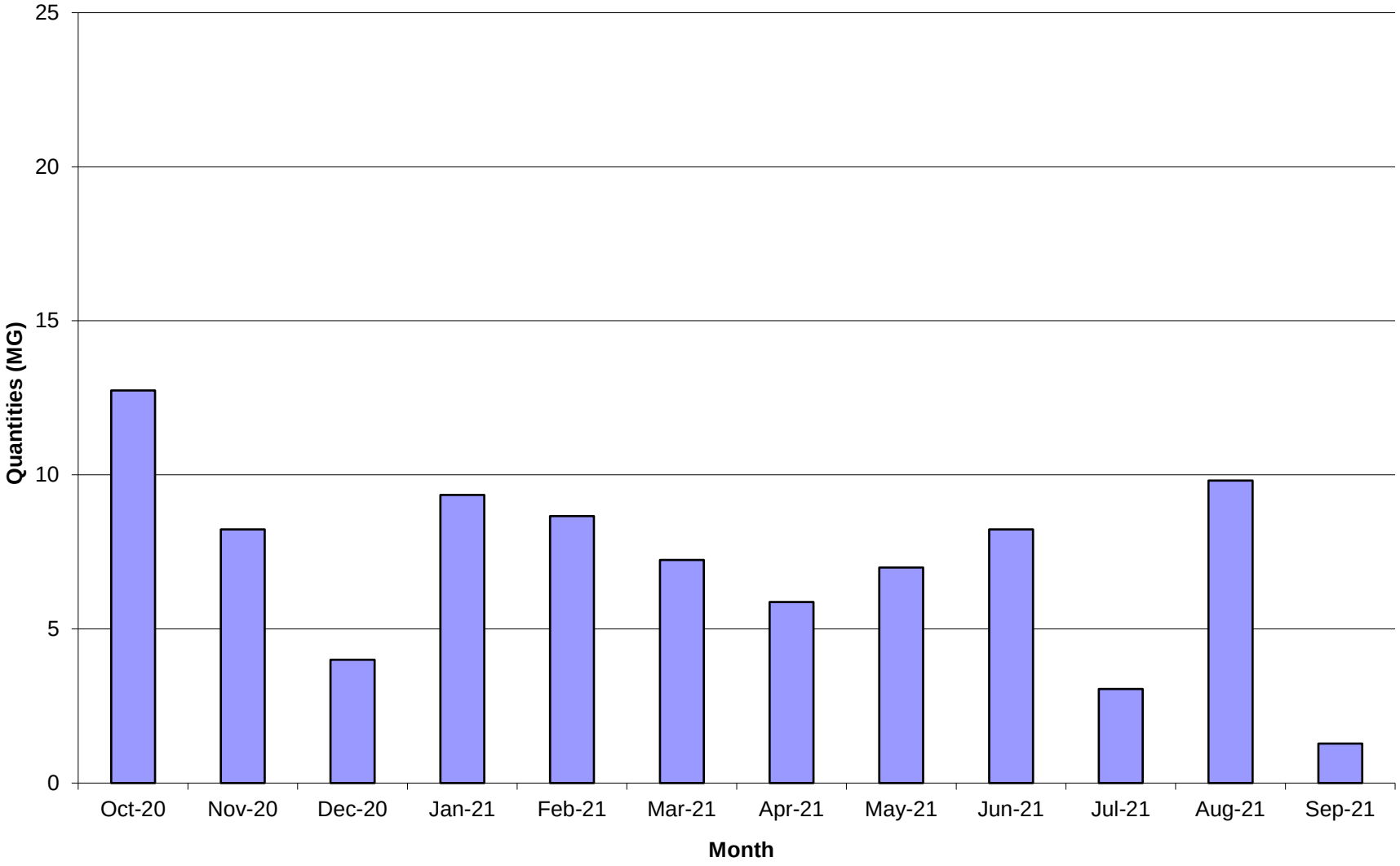


Figure 11 - Well 5 Monthly Withdrawals, AL BAR Ranch WY 2021

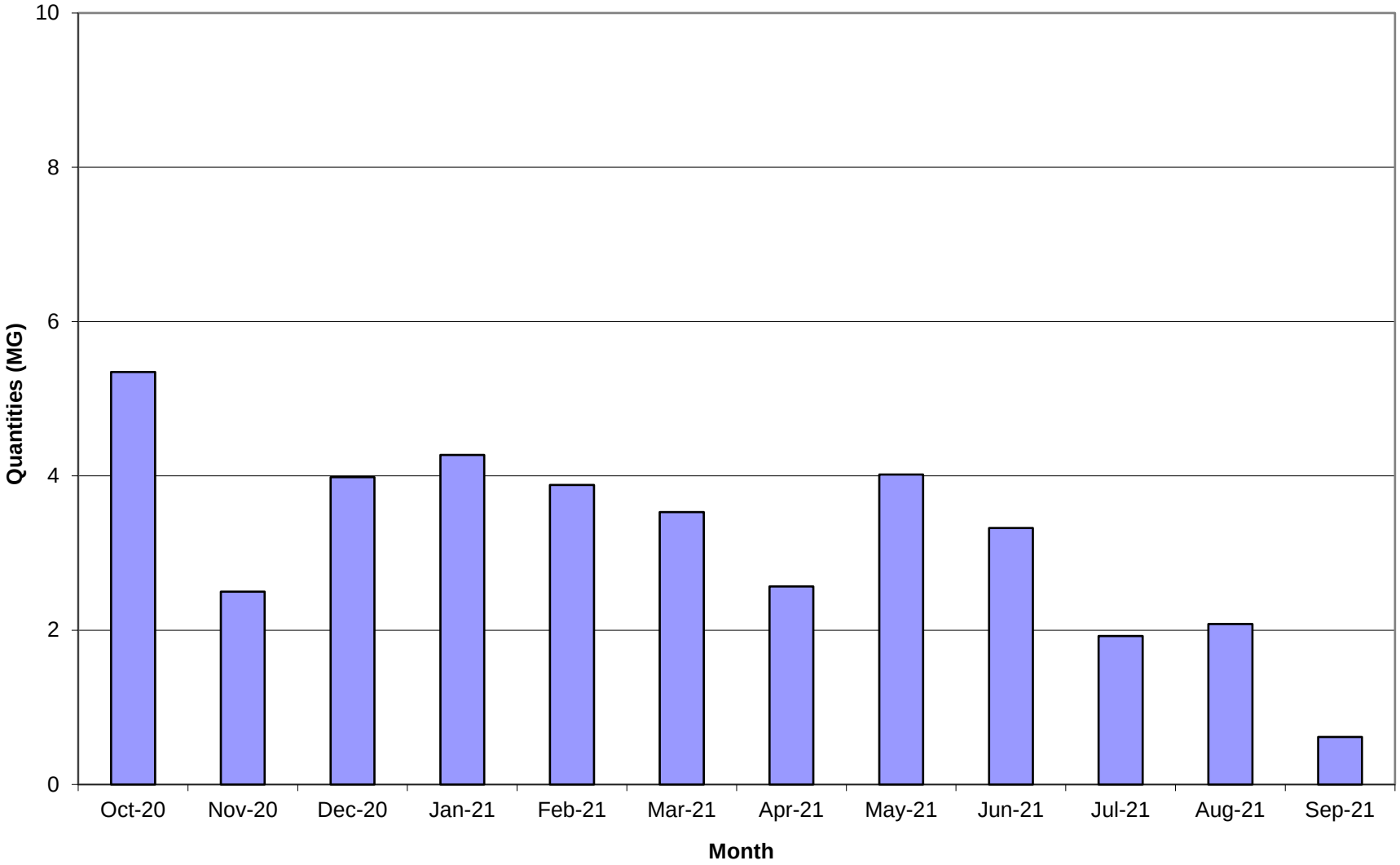


Figure 12 - Well 6 Monthly Withdrawals, AL BAR Ranch WY 2021

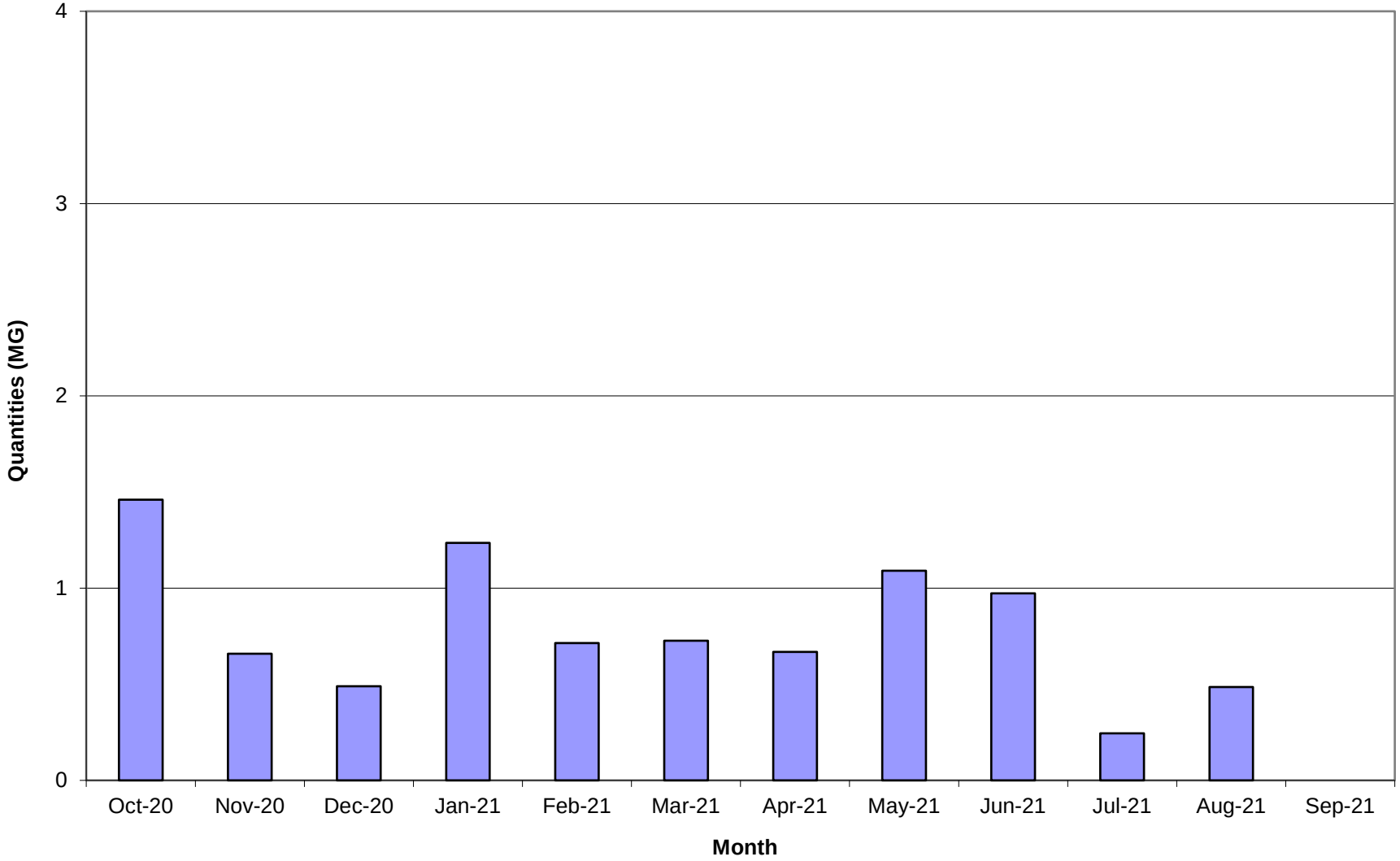


Figure 13 - Well 7 Monthly Withdrawals, AL BAR Ranch WY 2021

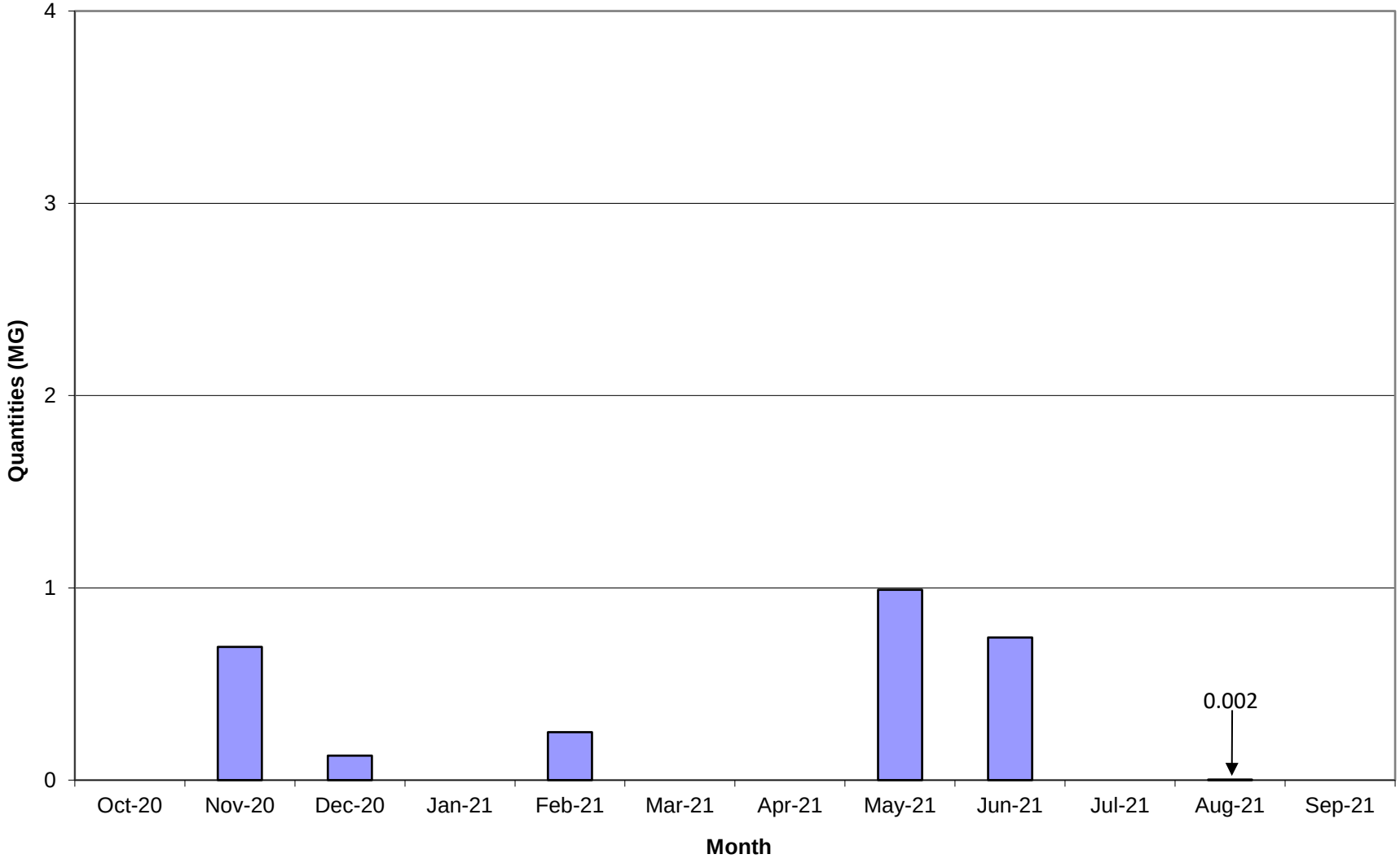


Figure 14 - Well 8 Monthly Withdrawals, AL BAR Ranch WY 2021

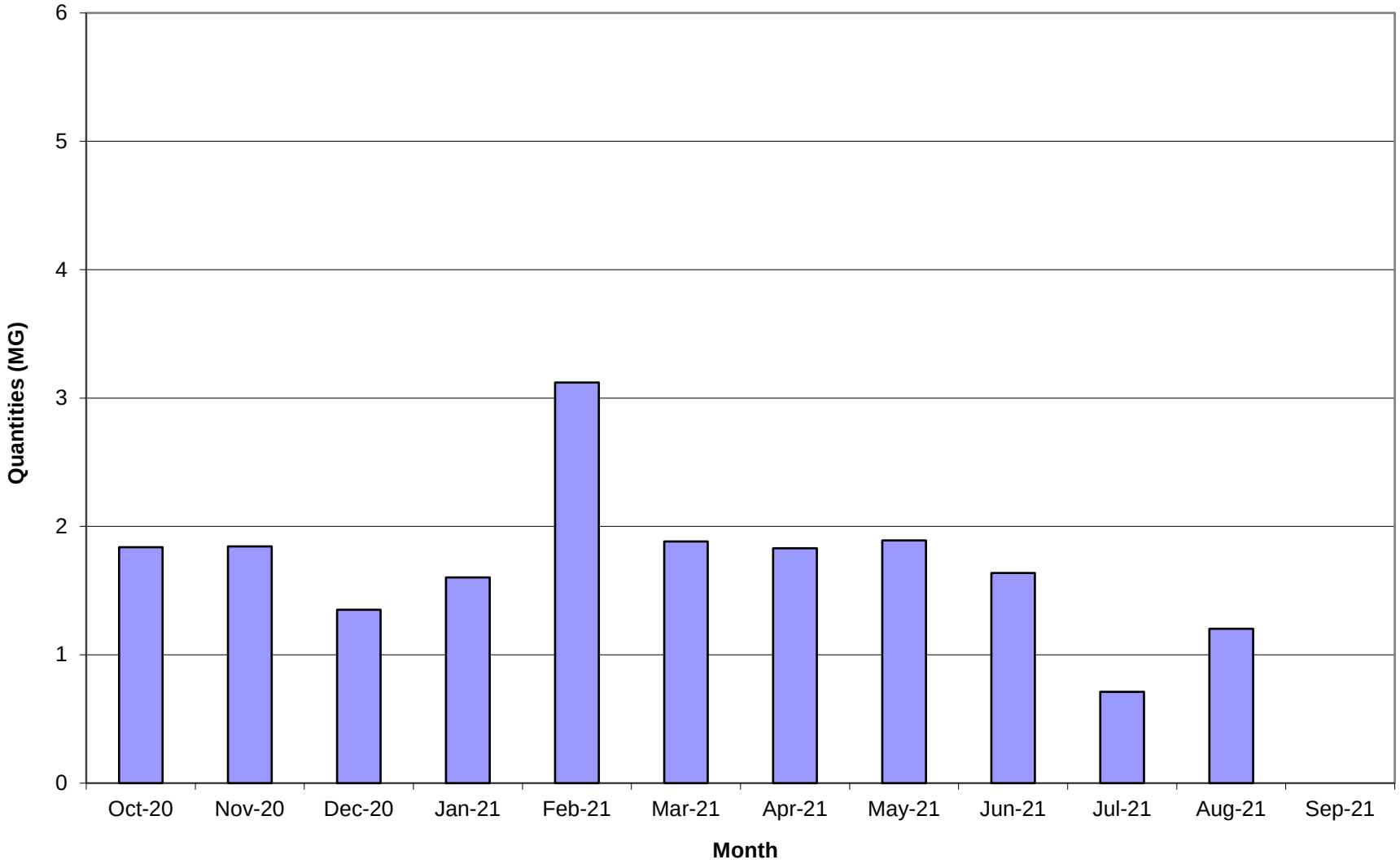


Figure 15 - Well 9 Monthly Withdrawals, ALBAR Ranch WY 2021

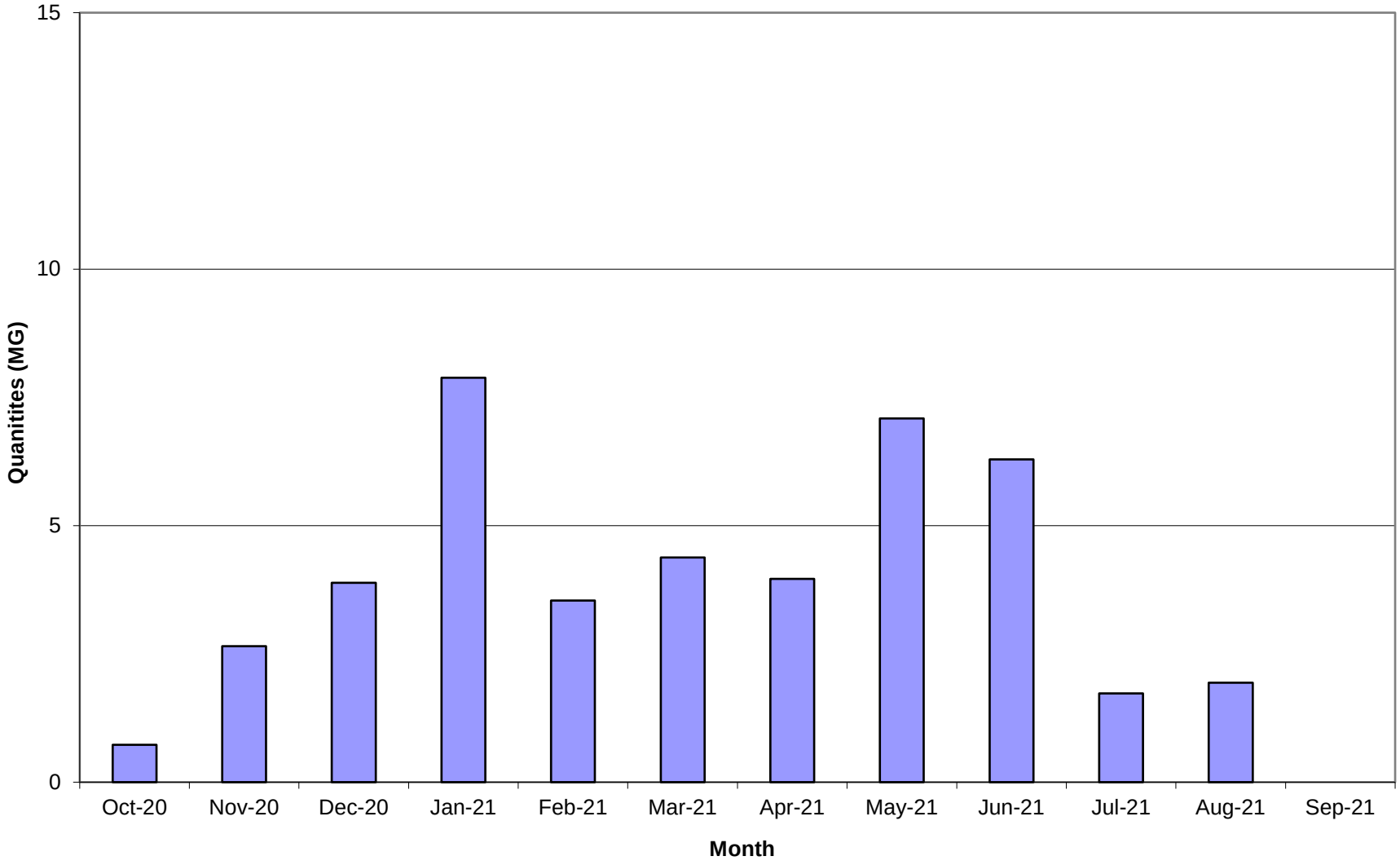


Figure 16 - Site 1 Monthly Augmentation Quantities, AL BAR Ranch WY 2021

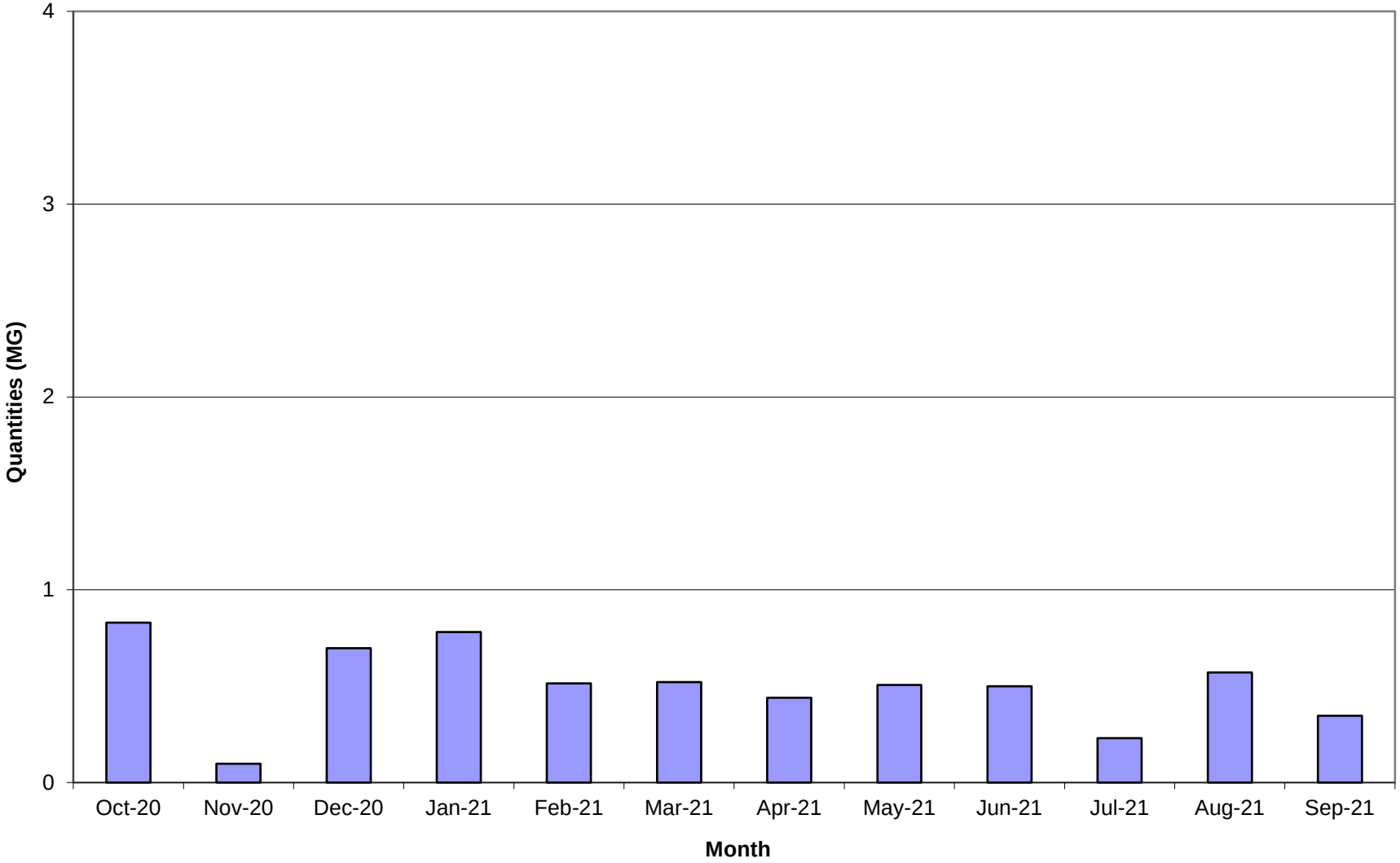


Figure 17 - Site 4A Monthly Augmentation Quantities, AL BAR Ranch WY 2021

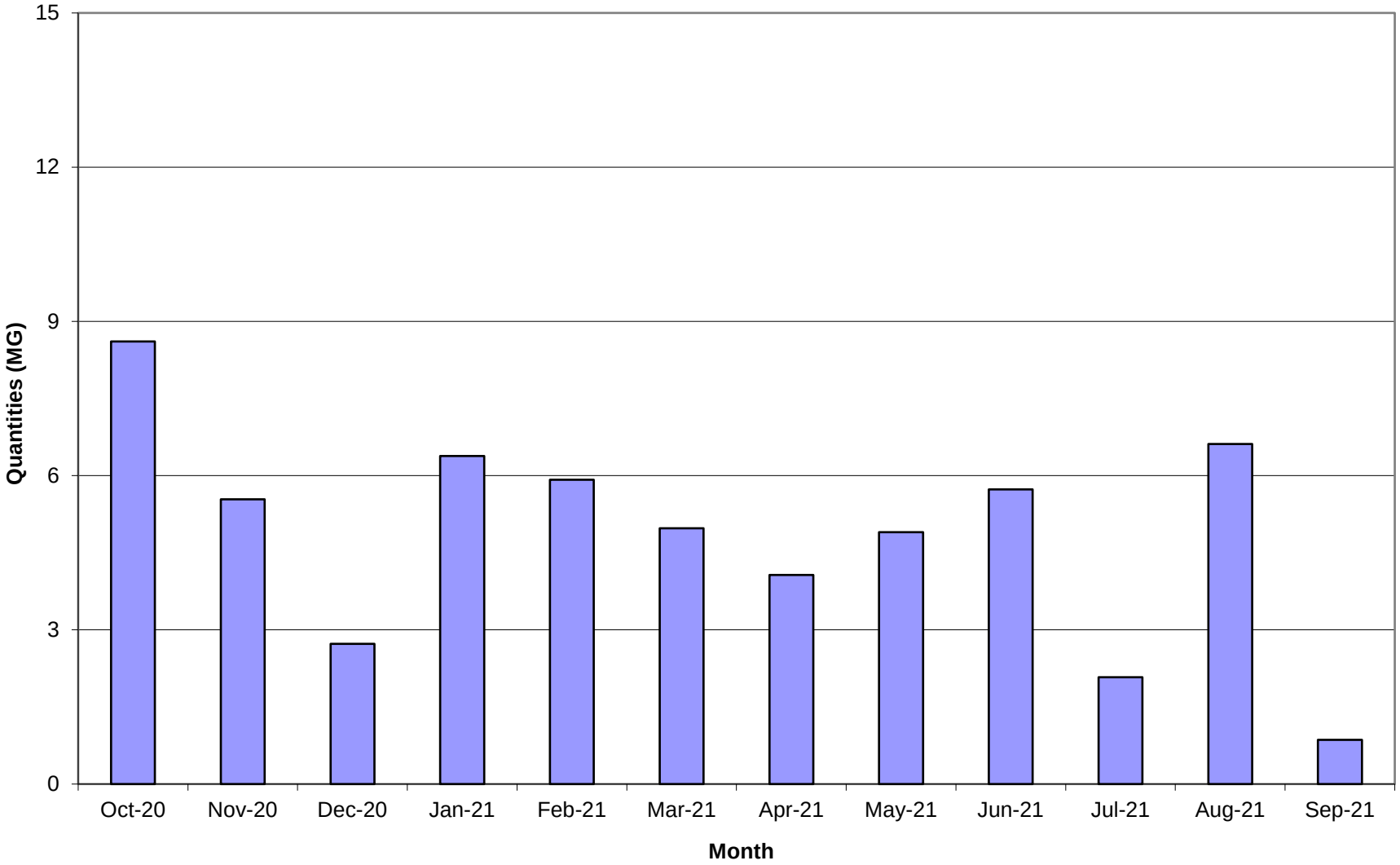


Figure 18 - Site 4B Monthly Augmentation Quantities, AL BAR Ranch WY 2021

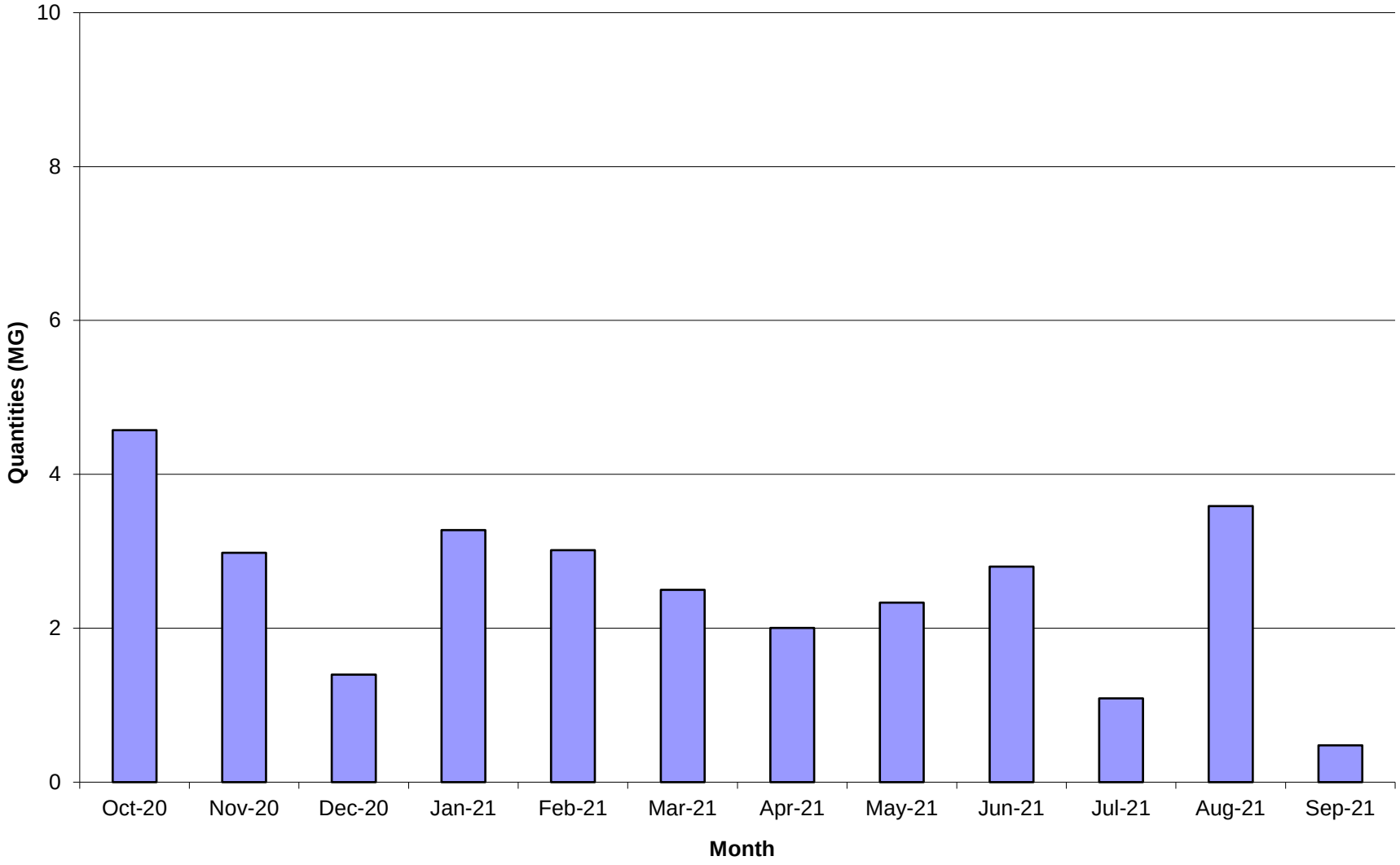


Figure 19 - Site 5 Monthly Augmentation Quantities, AL BAR Ranch WY 2021

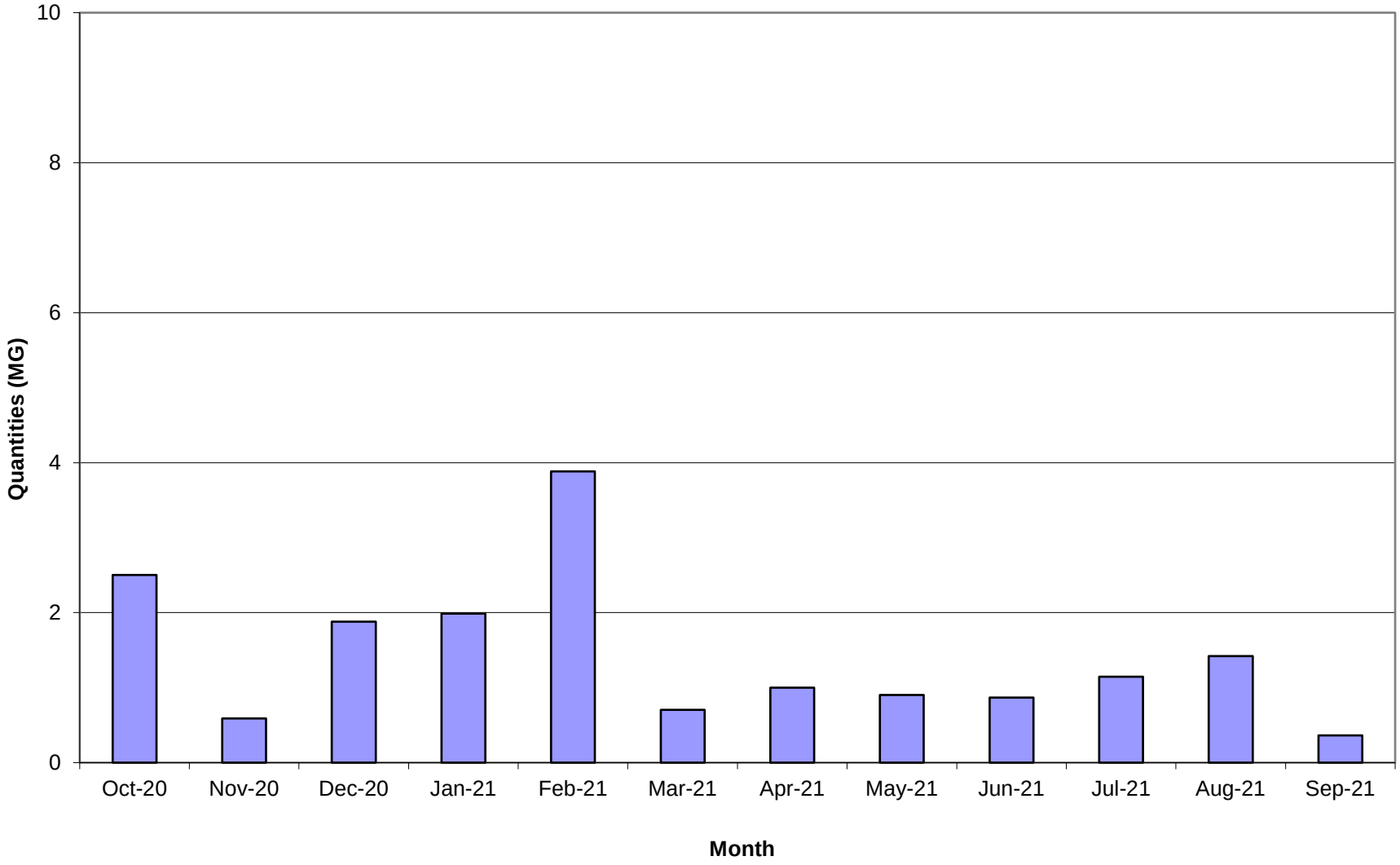


Figure 20 - Site 6 Monthly Augmentation Quanitities, AL BAR Ranch WY 2021

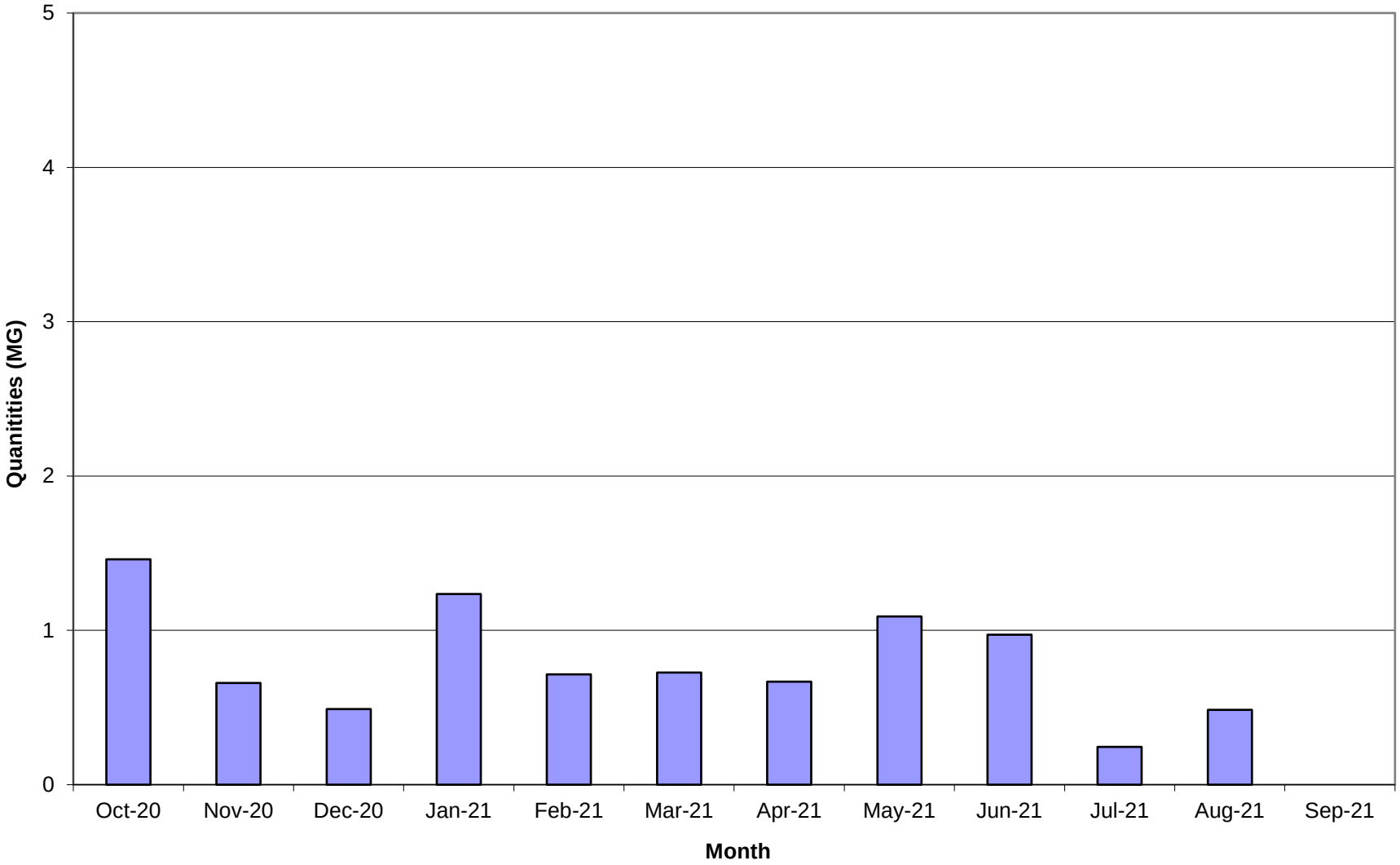


Figure 21 - Site 7A Monthly Augmentation Quantities, AL BAR Ranch WY 2021

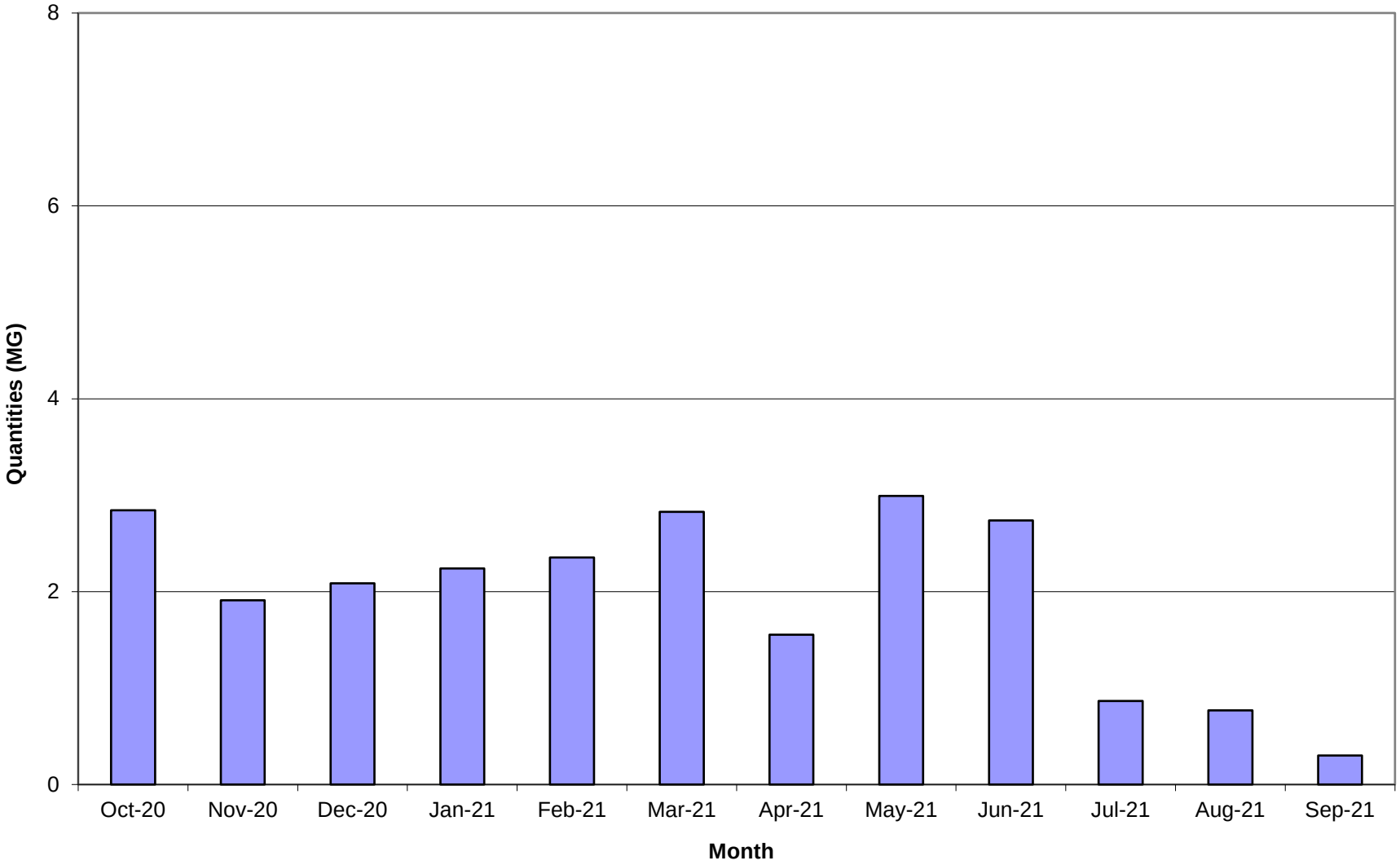


Figure 22 - Site 7B Monthly Augmentation Quantities, AL BAR Ranch WY 2021

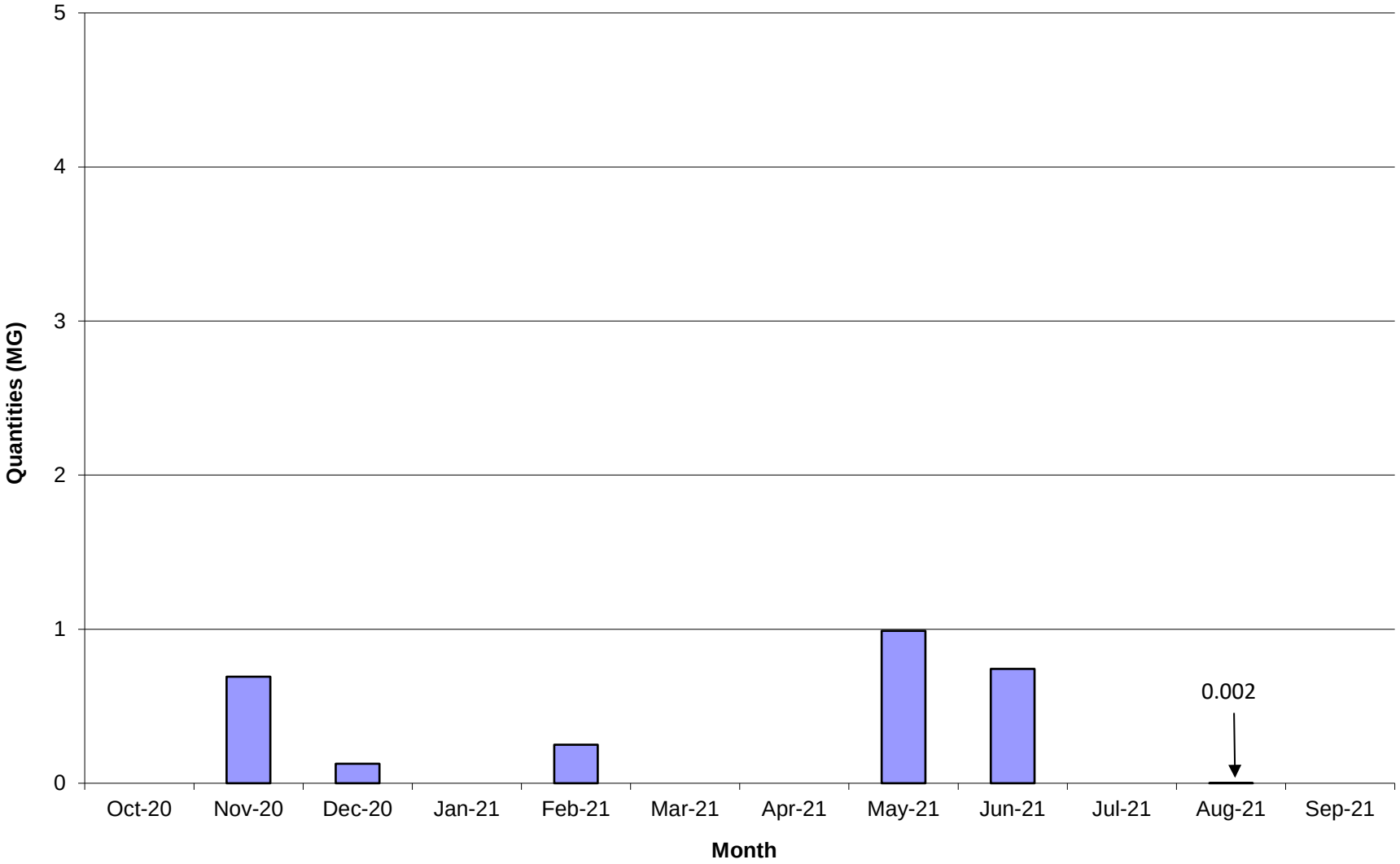


Figure 23 - Site 9A Monthly Augmentation Quantities, AL BAR Ranch WY 2021

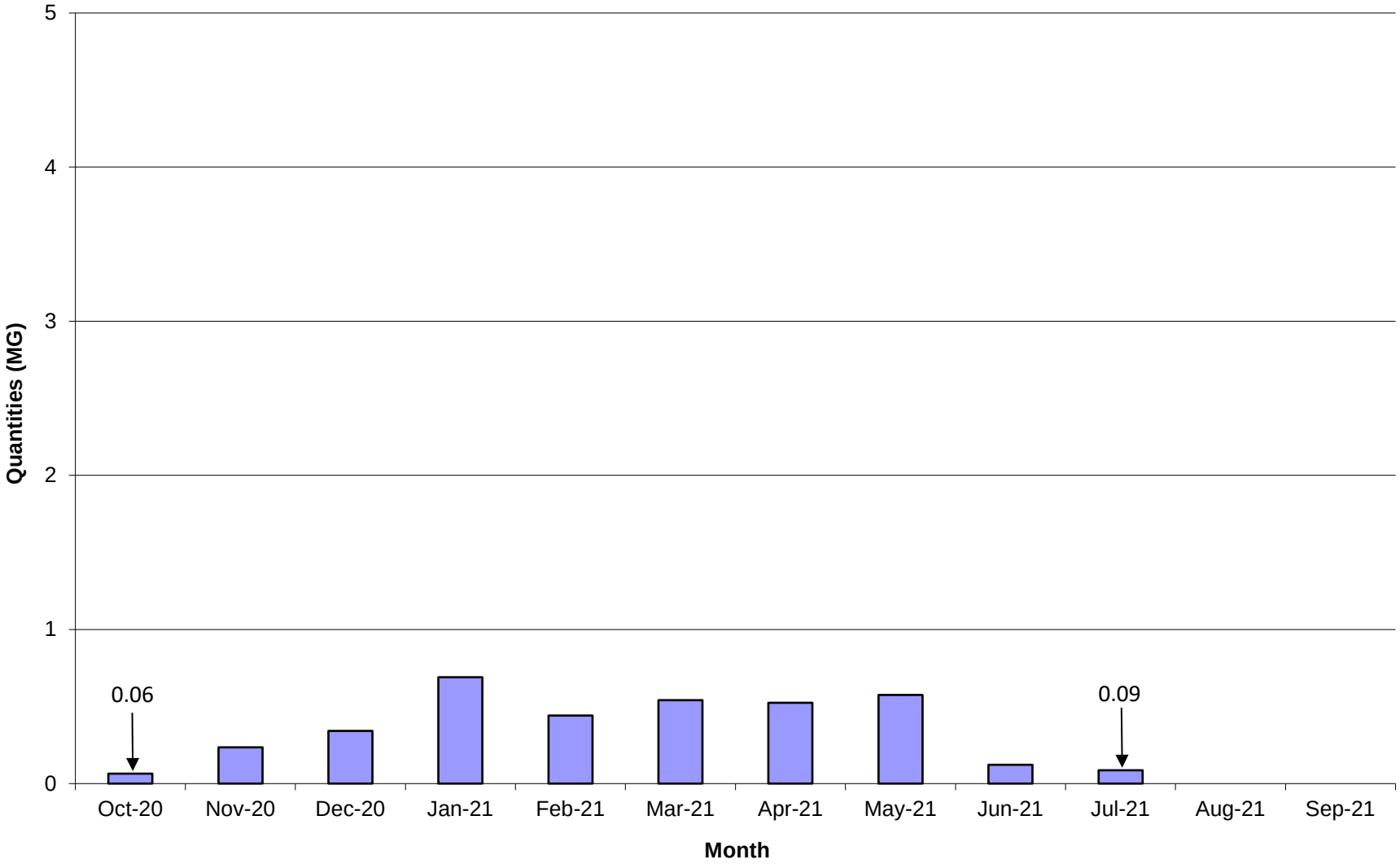


Figure 24 - Site 9B Monthly Augmentation Quantities, AL BAR Ranch WY 2021

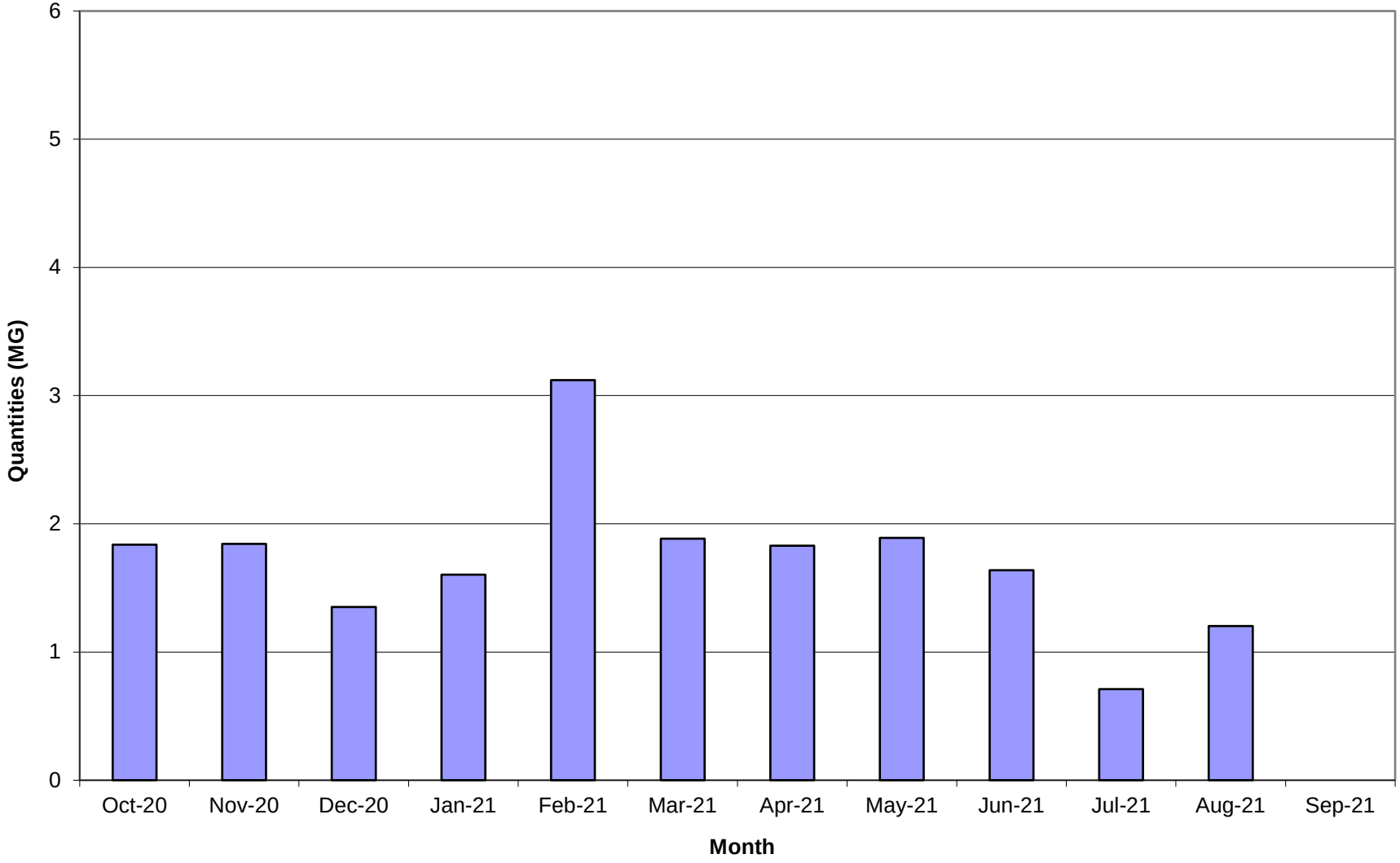


Figure 25 - Site 9C Monthly Augmentation Quantities, AL BAR Ranch WY 2021

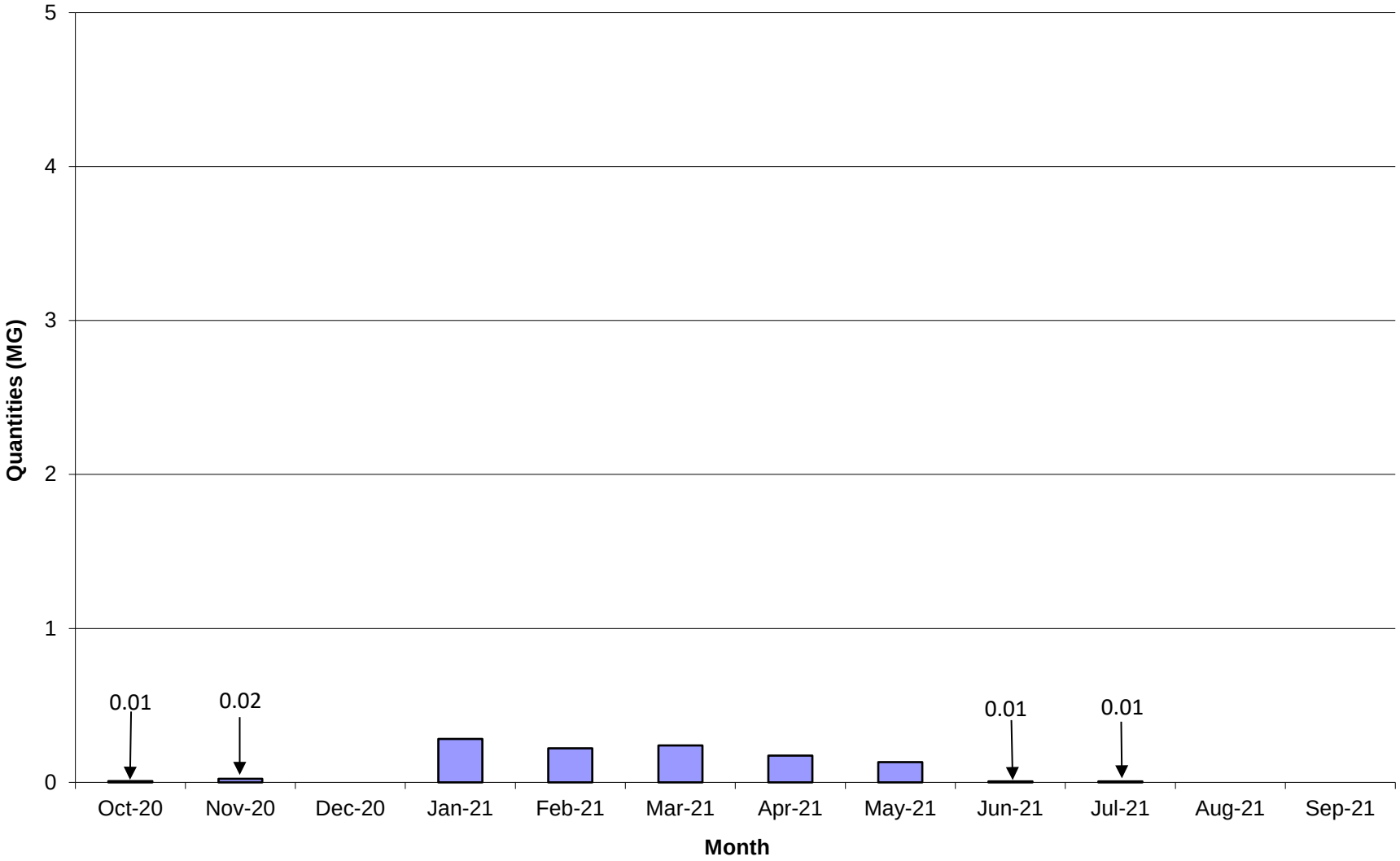


Figure 26 - Site 9D Monthly Augmentation Quantities, AL BAR Ranch WY 2021

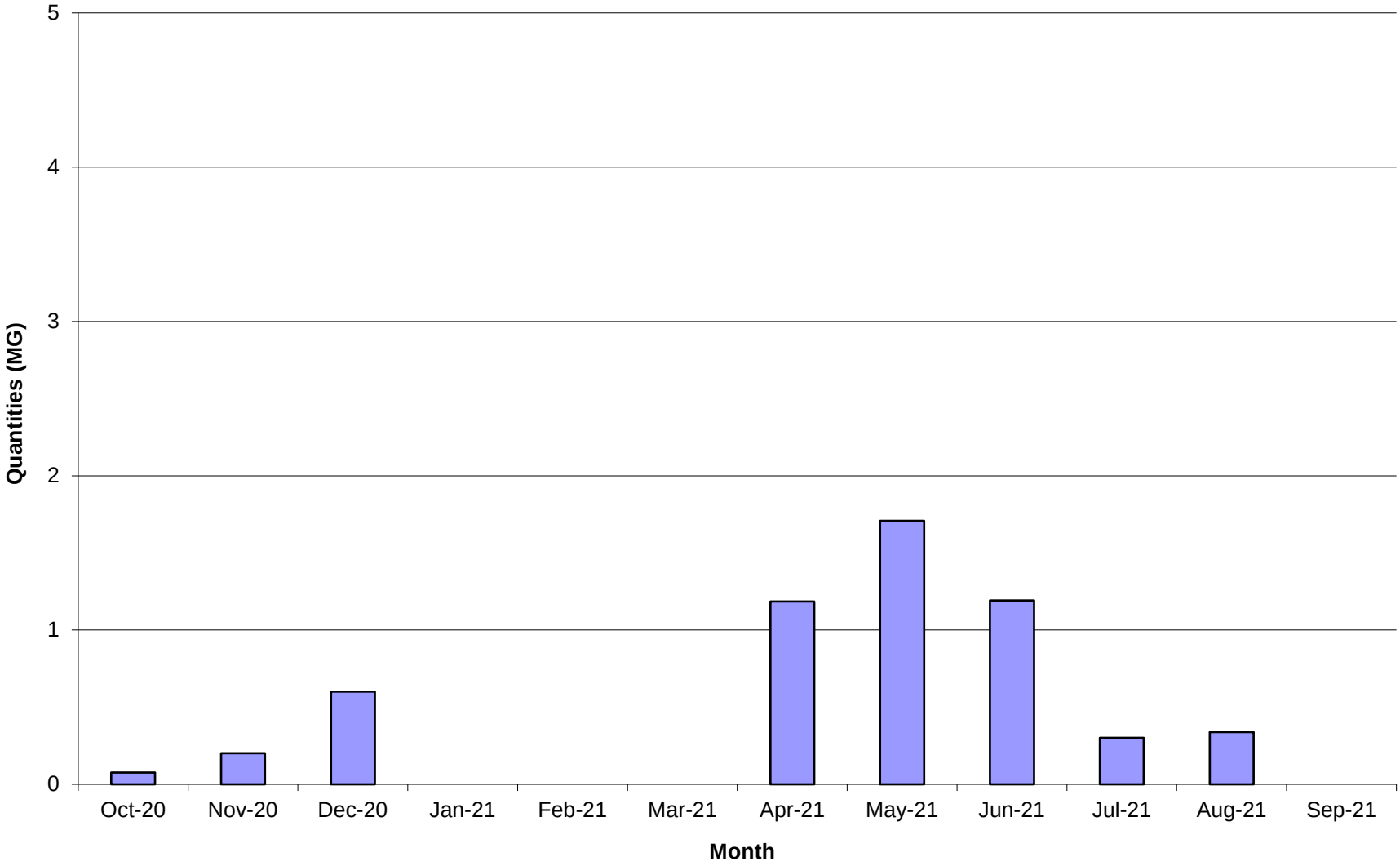


Figure 27 - Site 9E Monthly Augmentation Quantities, AL BAR Ranch WY 2021

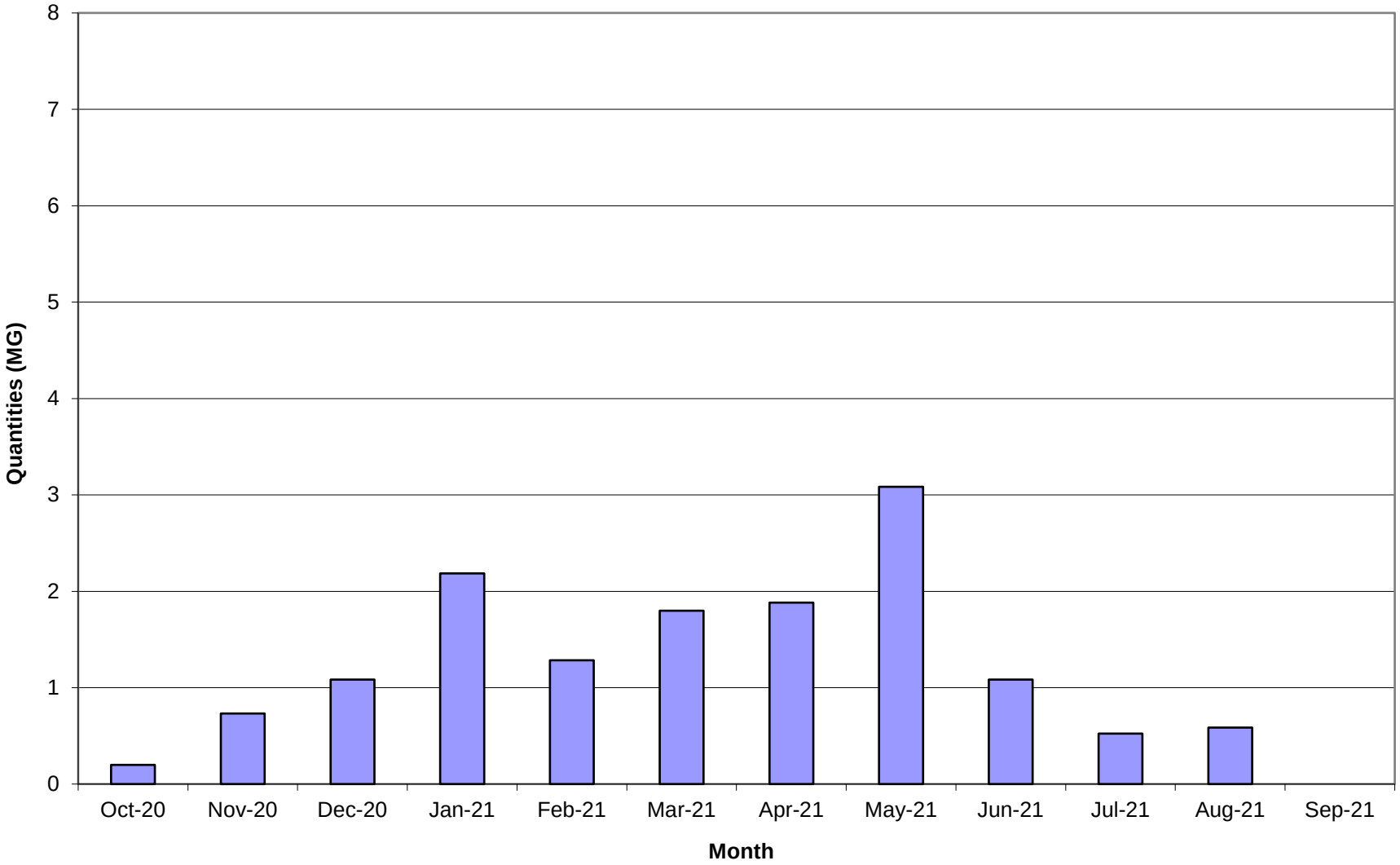


Figure 28 - Site 10 Monthly Augmentation Quantities, AL BAR Ranch WY 2021

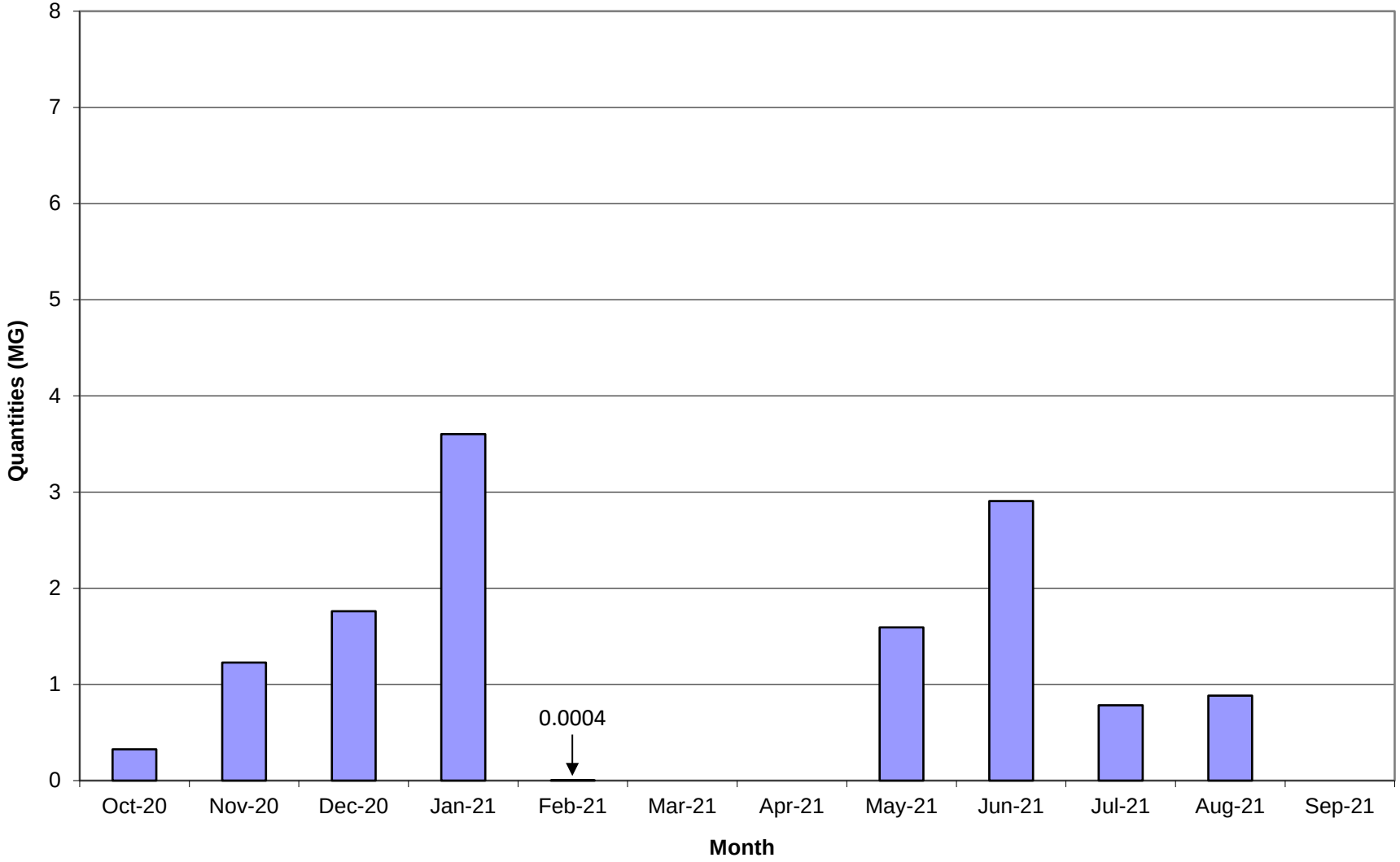


Figure 29 - Site 1 Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

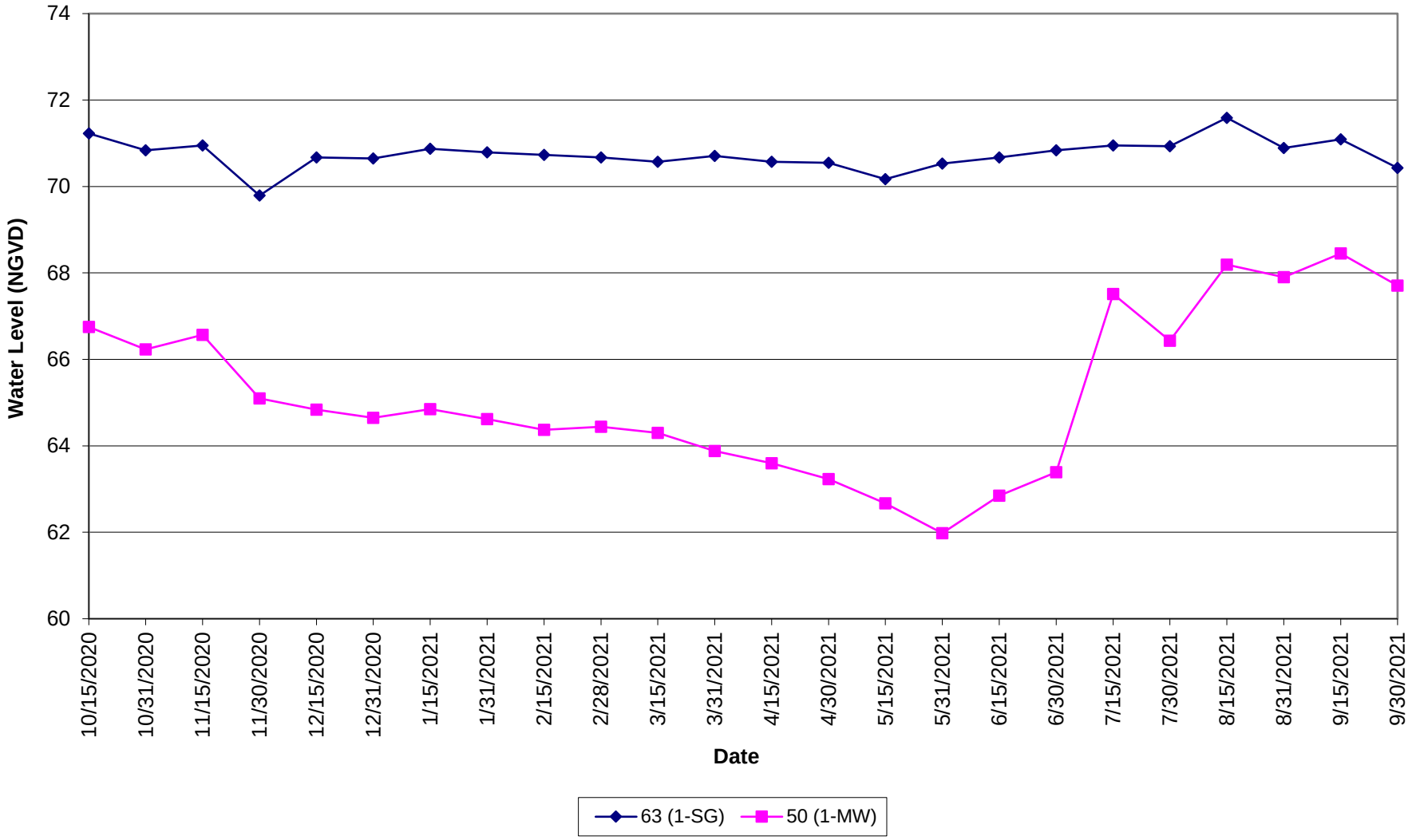


Figure 30 - Site 4A Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

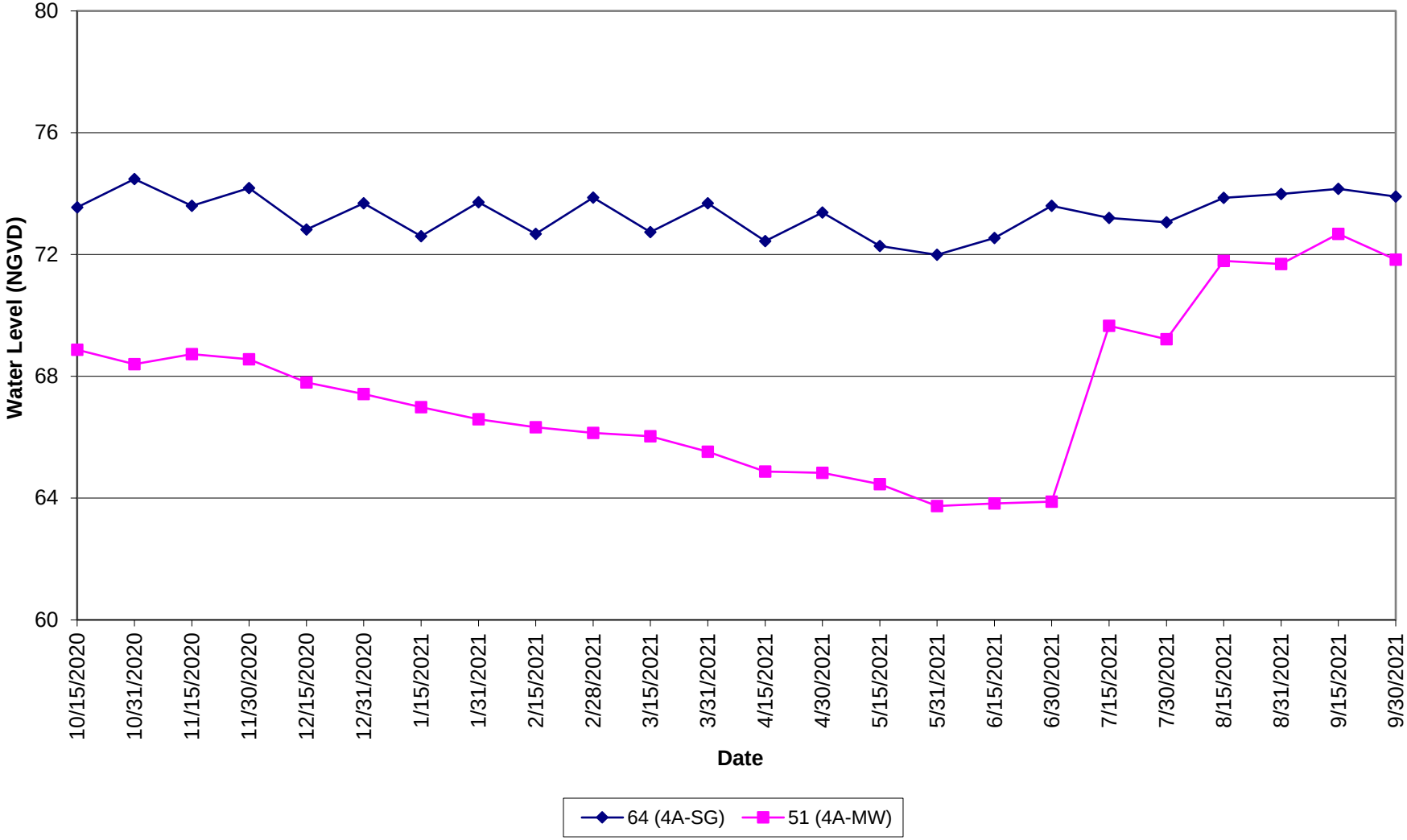


Figure 31 - Site 4B Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

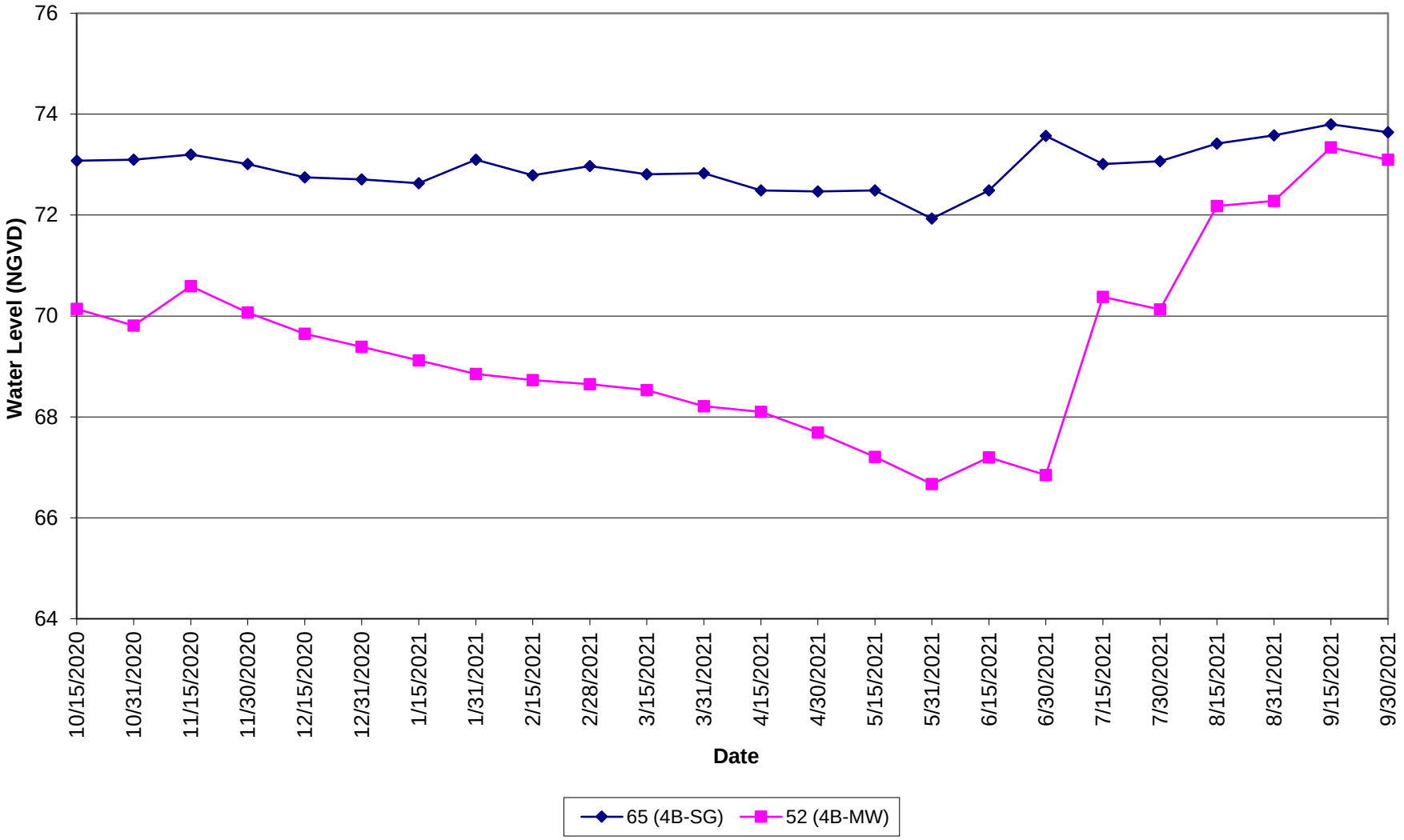


Figure 32 - Site 5 Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

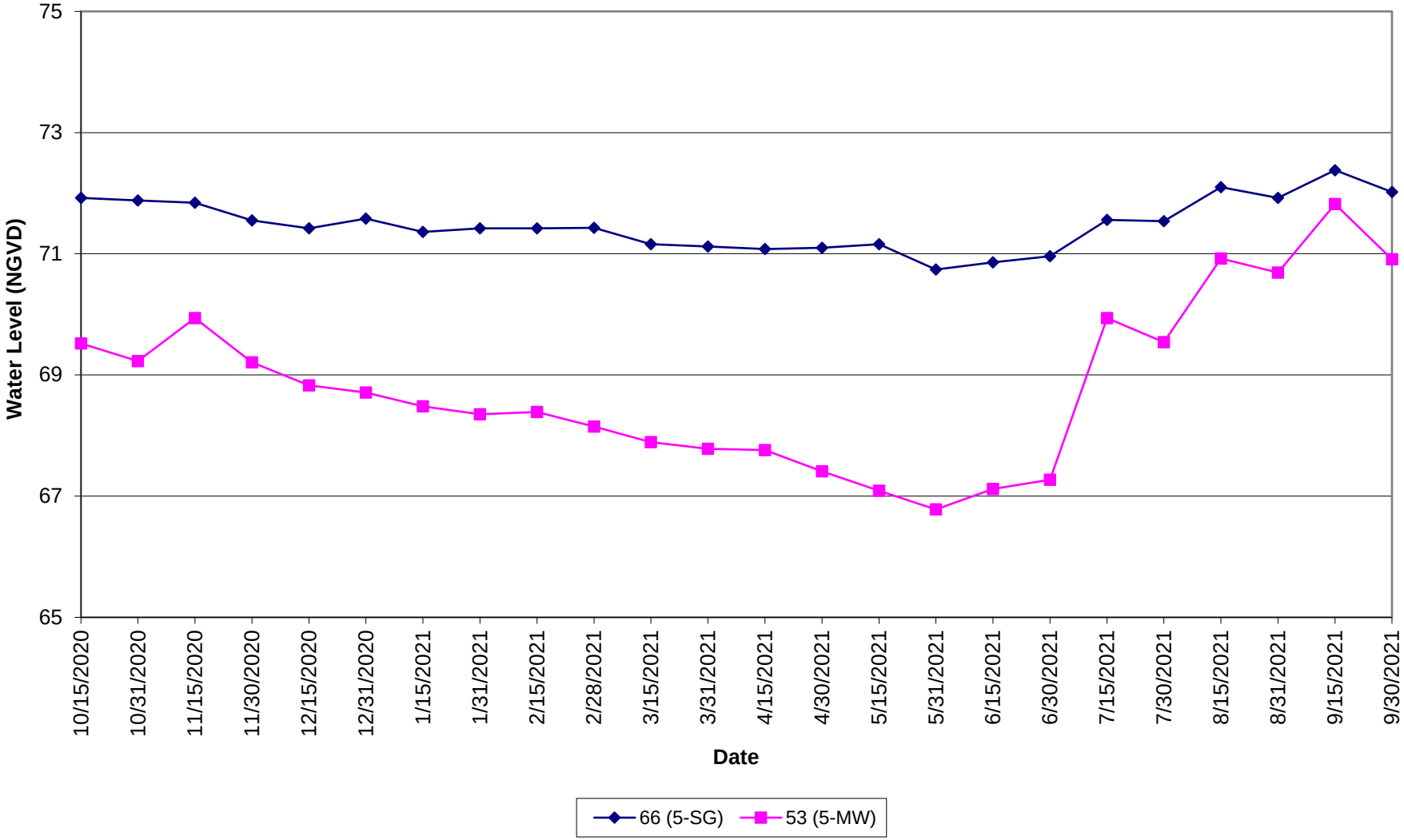


Figure 33 - Site 6 Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

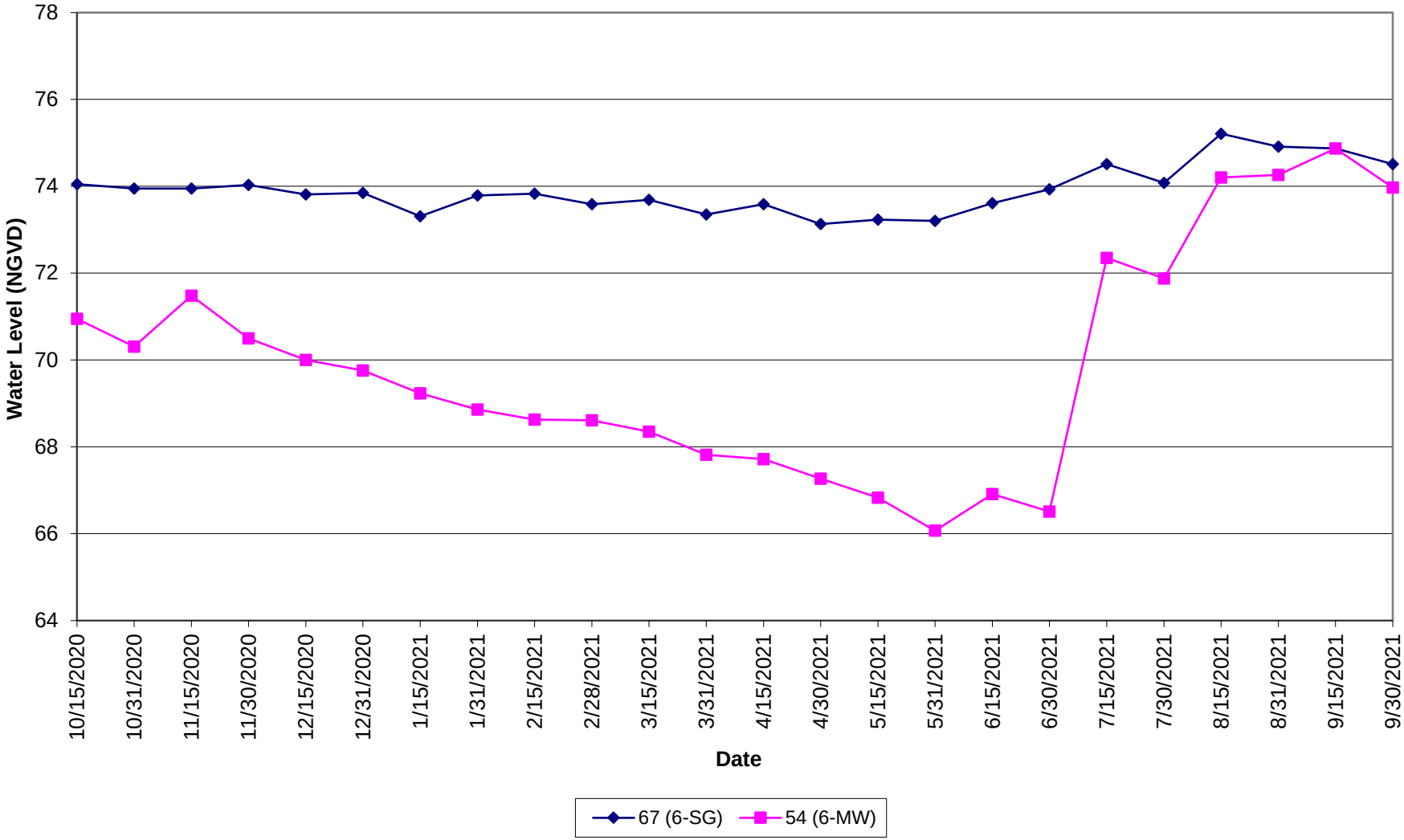


Figure 34 - Site 7A Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

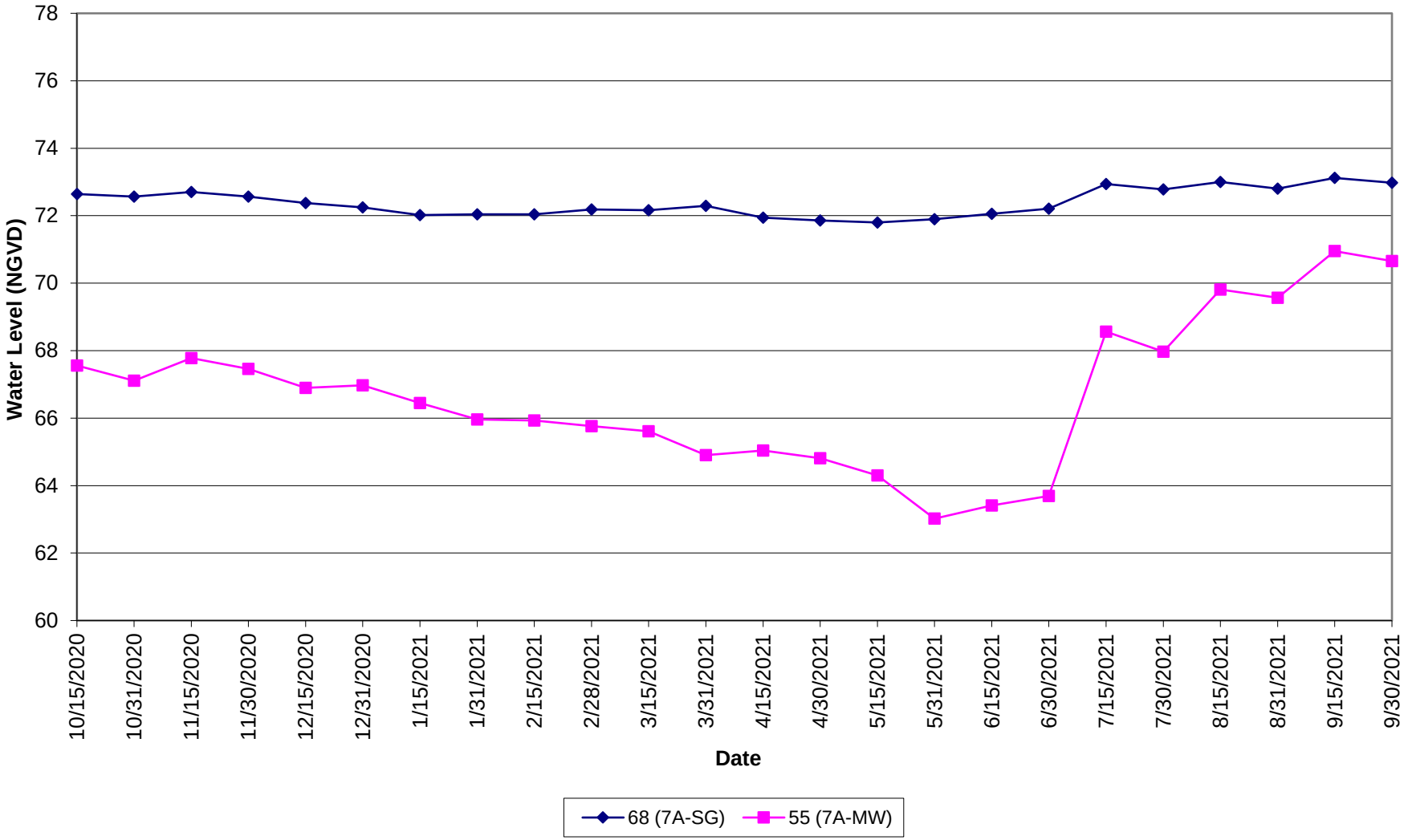


Figure 35 - Site 7B Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

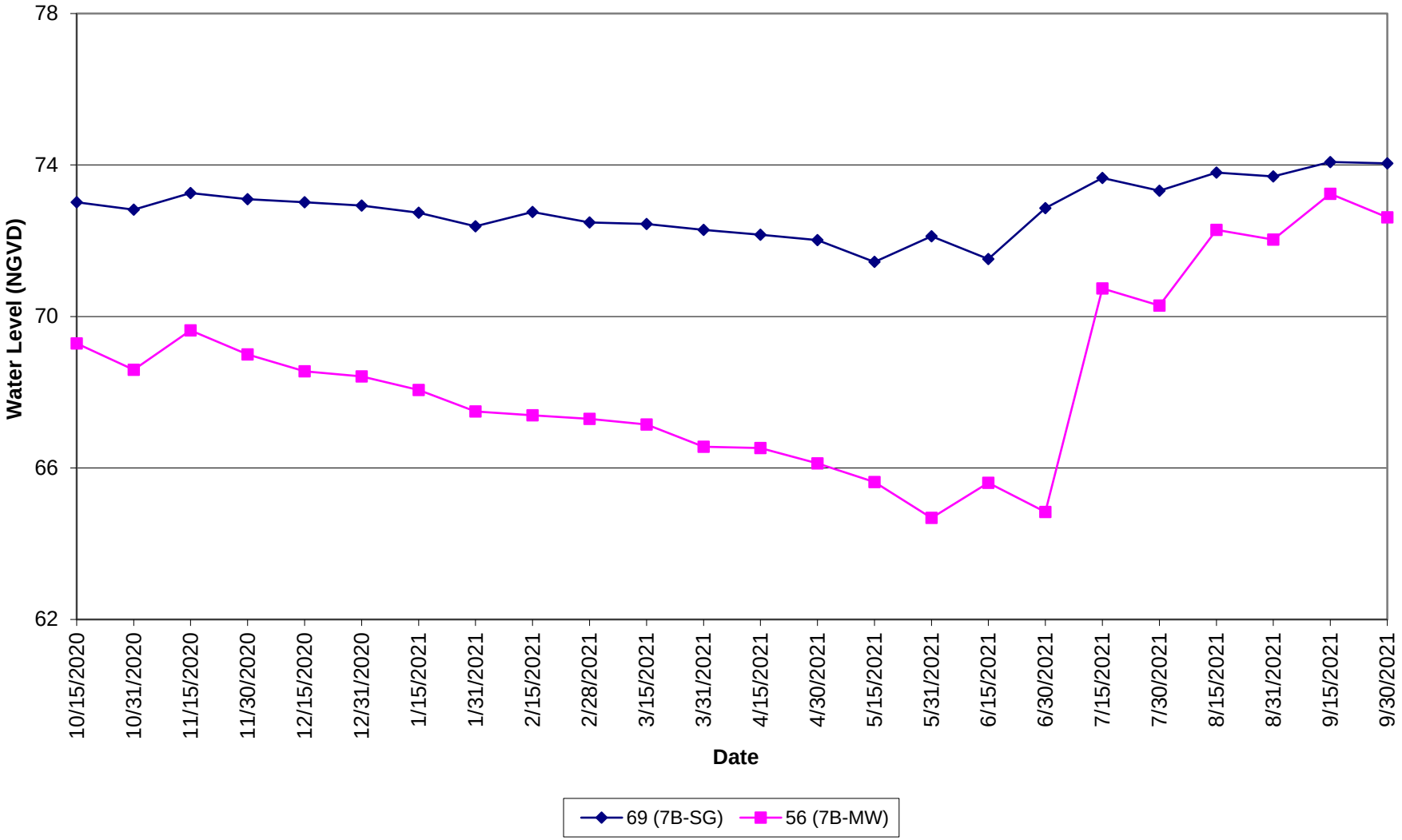


Figure 36 - Site 9A Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

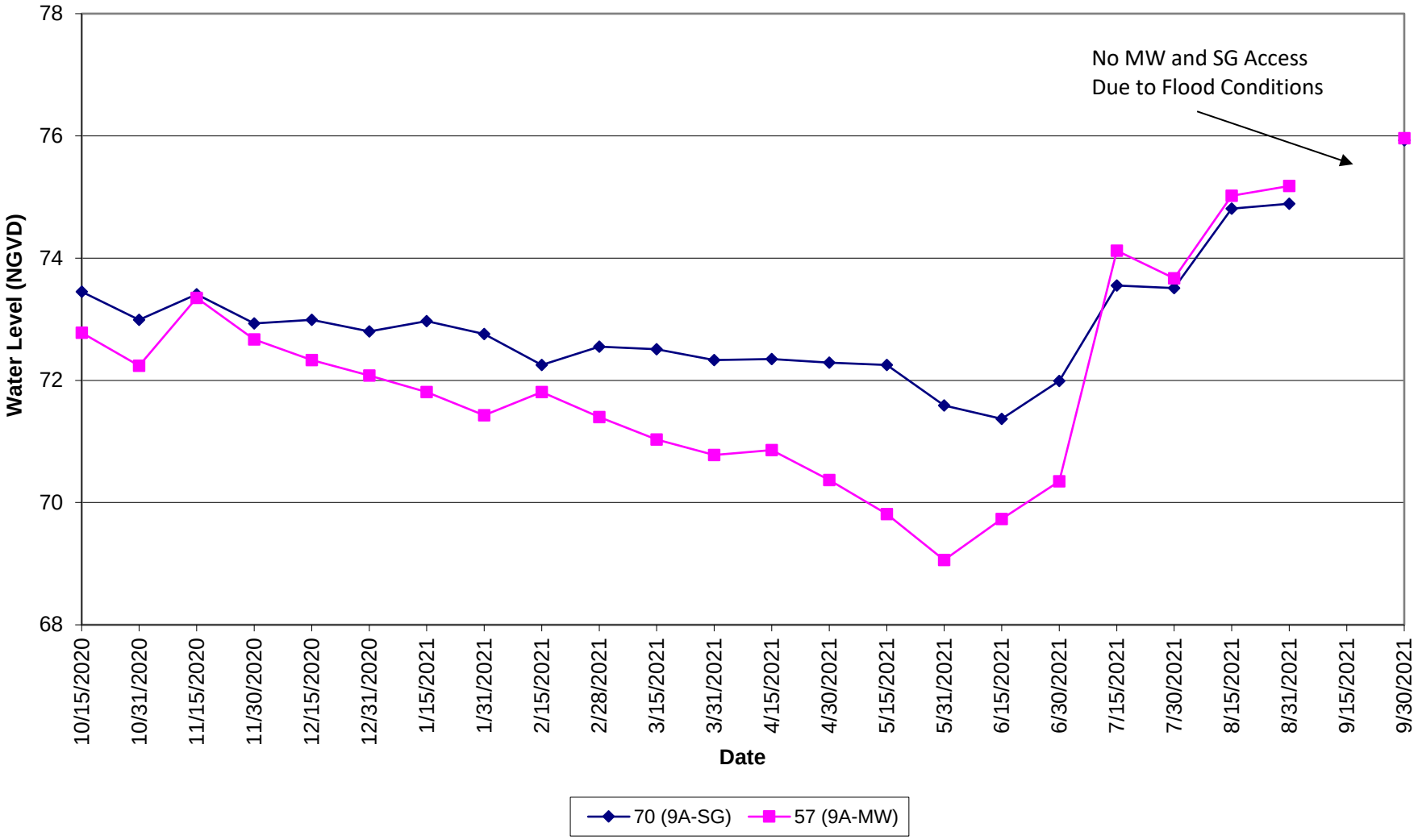


Figure 37 - Site 9B Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

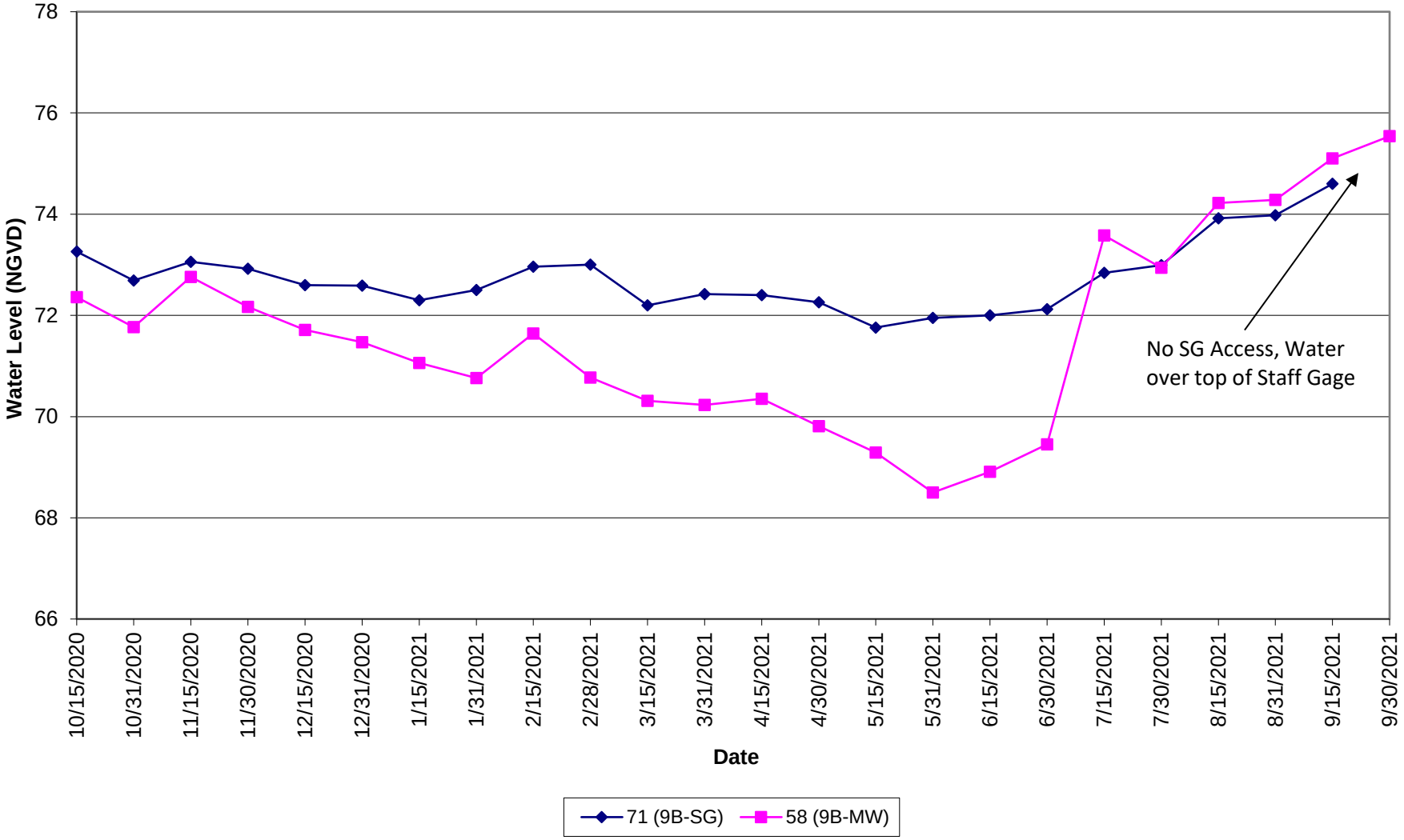


Figure 38 - Site 9C Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

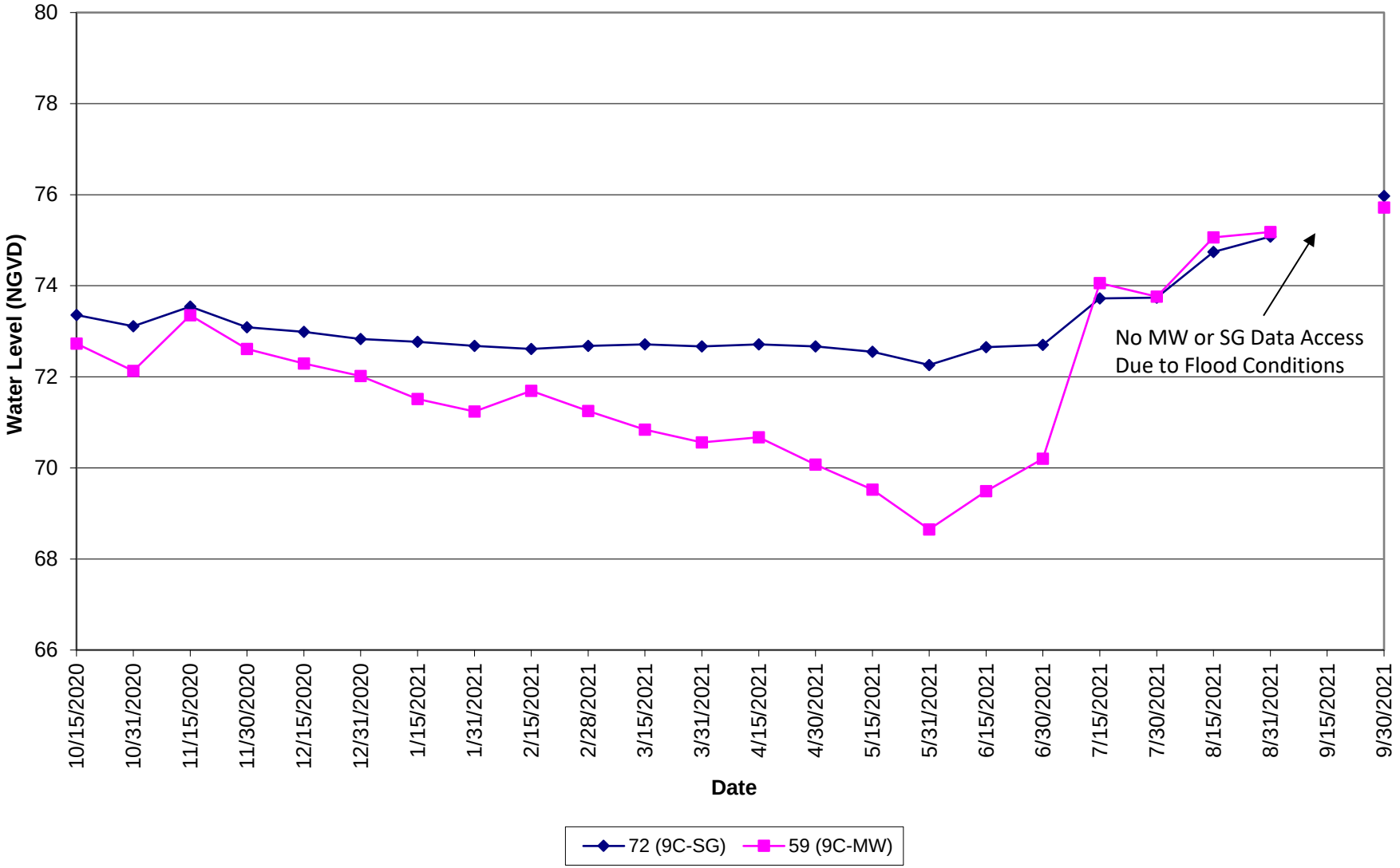


Figure 39 - Site 9D Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

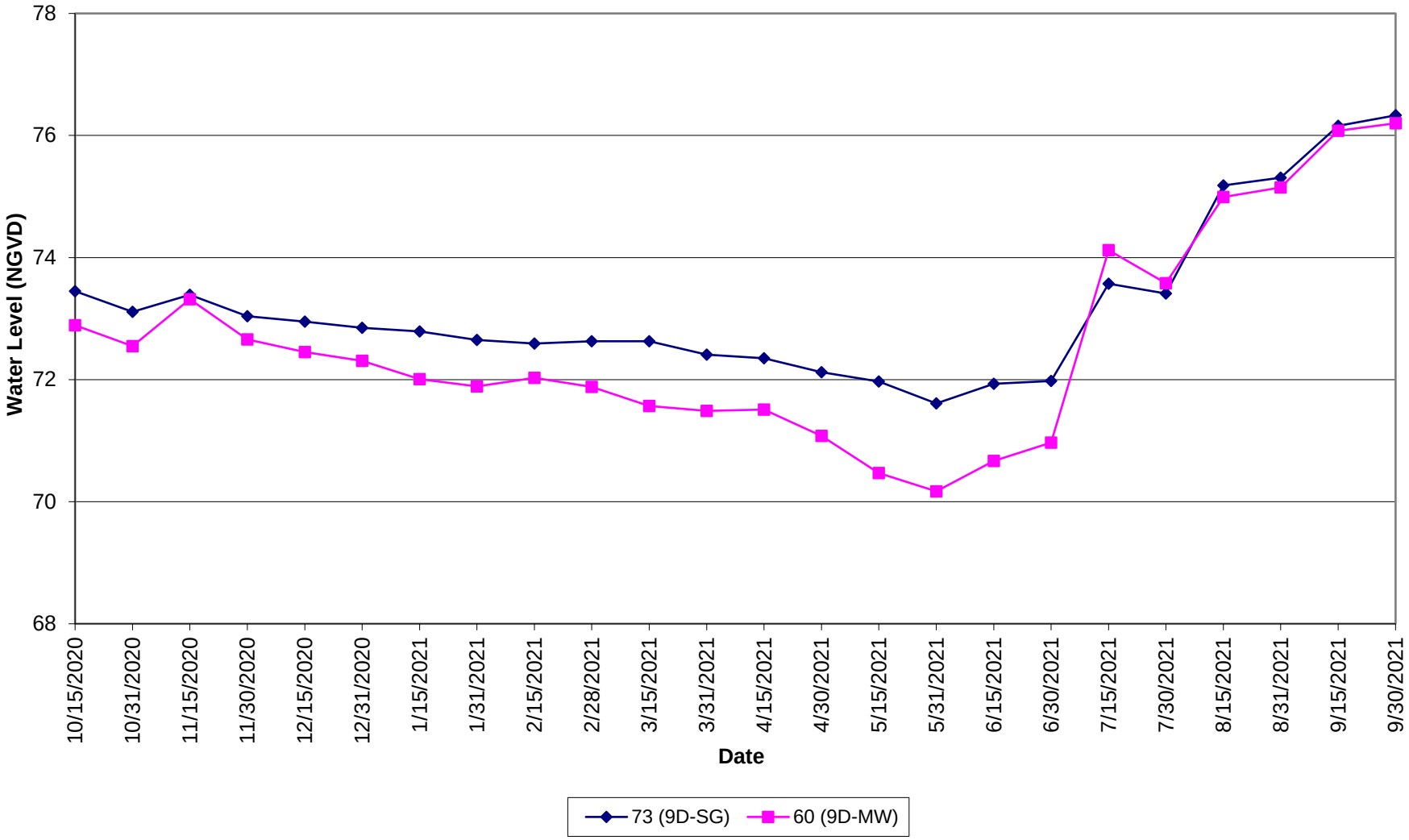


Figure 40 - Site 9E Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

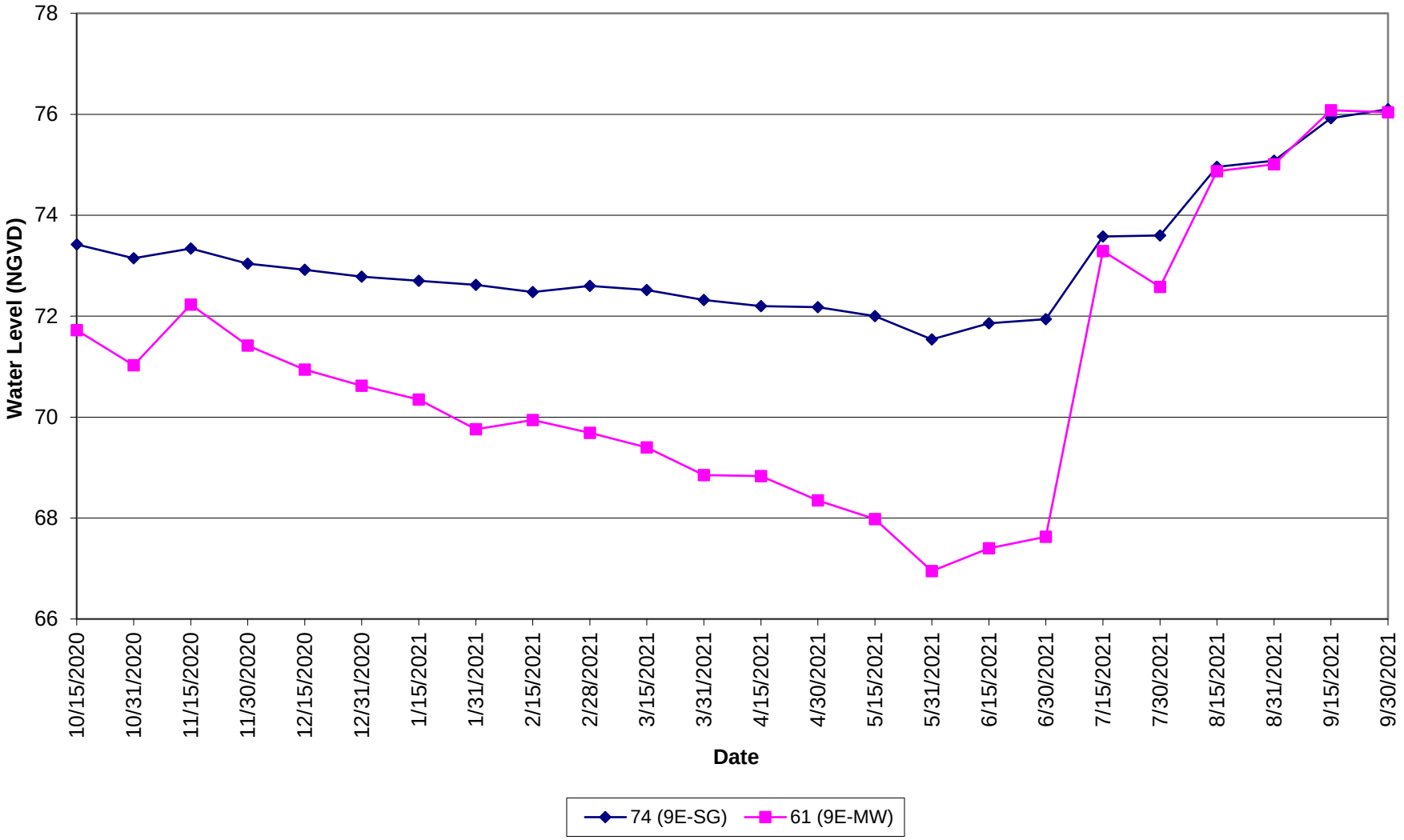


Figure 41 - Site 10 Bi-weekly Staff Gage and Monitor Well Water Elevations, AL BAR Ranch WY 2021

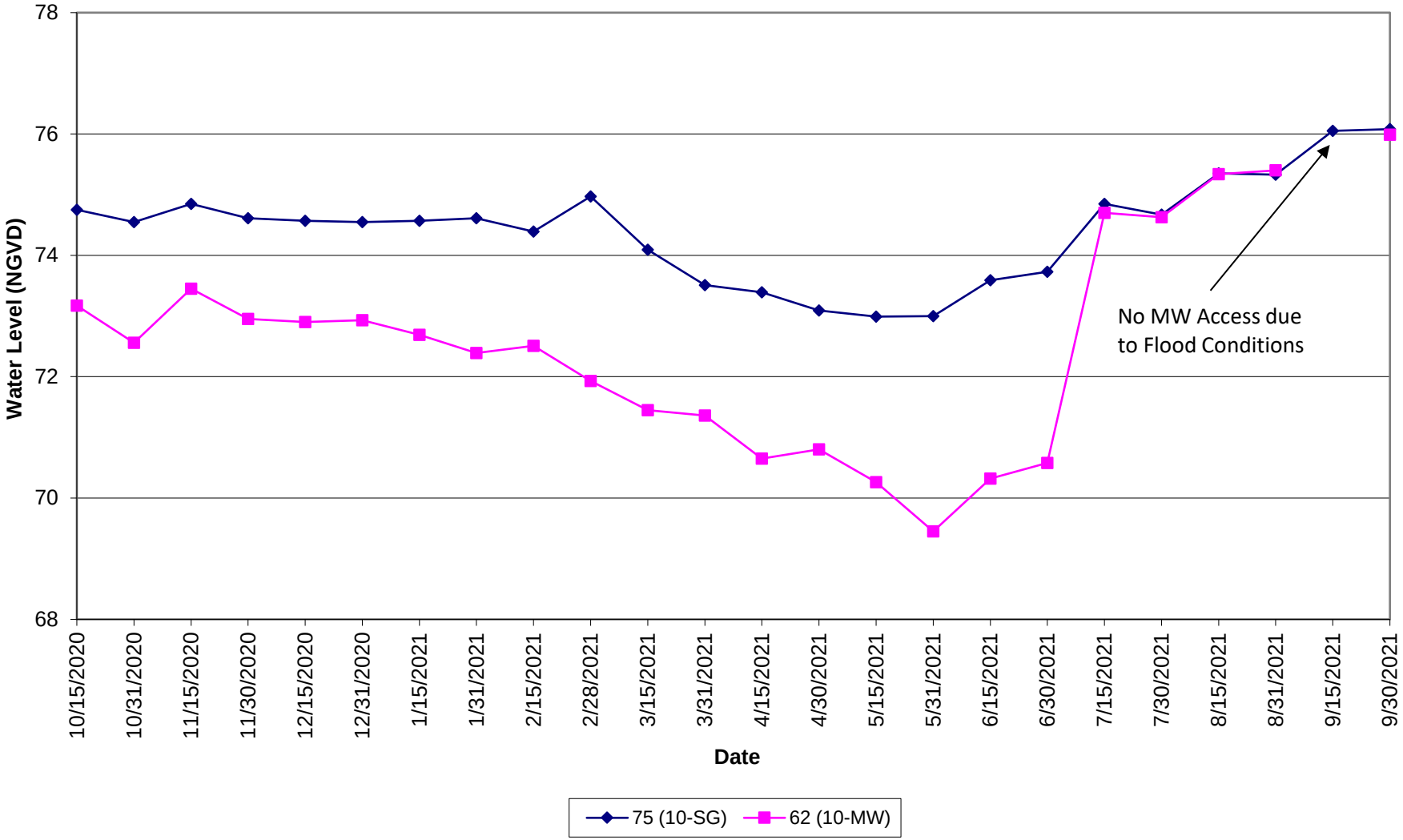


Figure 42
Wetland Assessment Scores at Al Bar Ranch April 2021

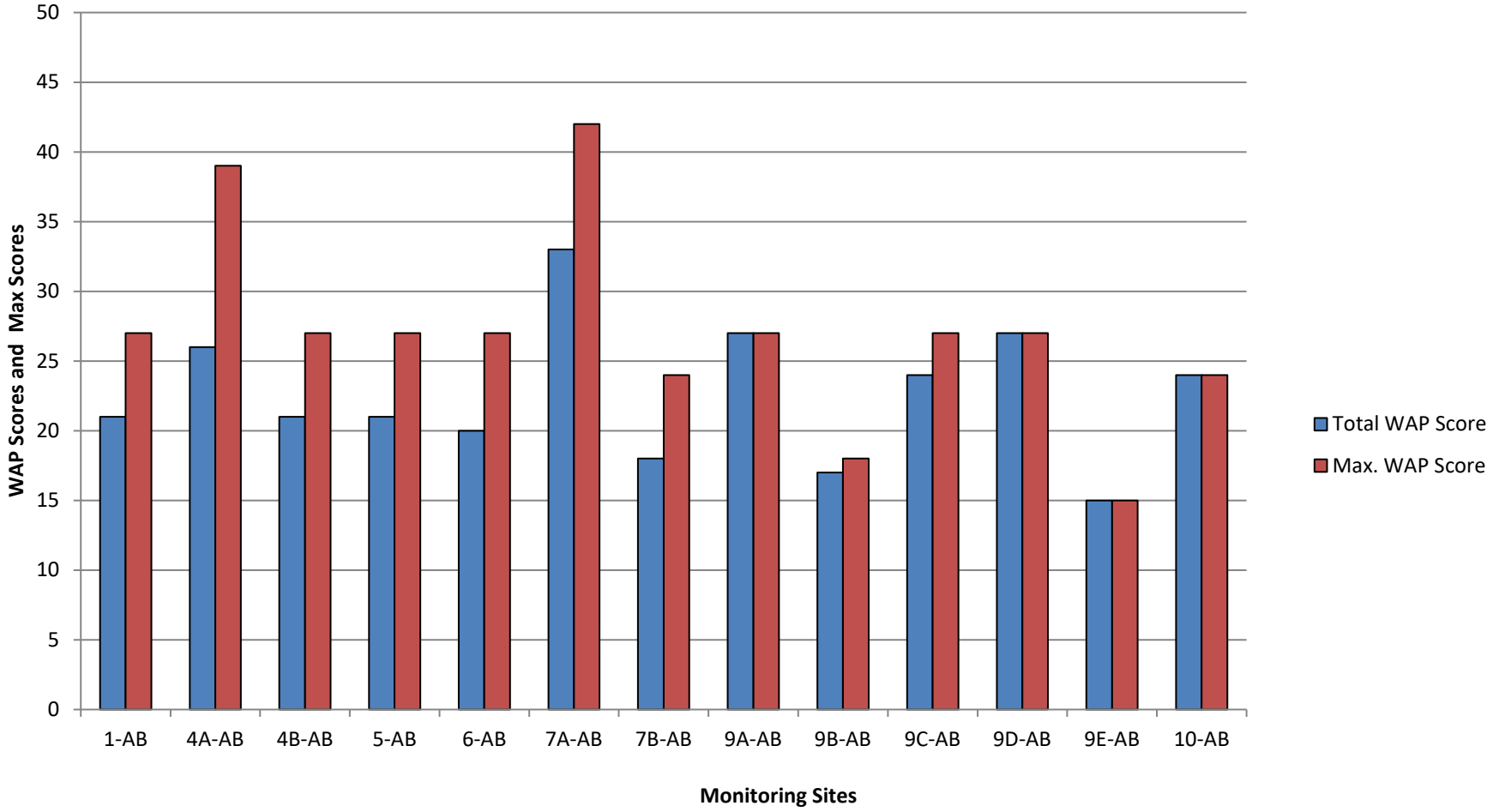
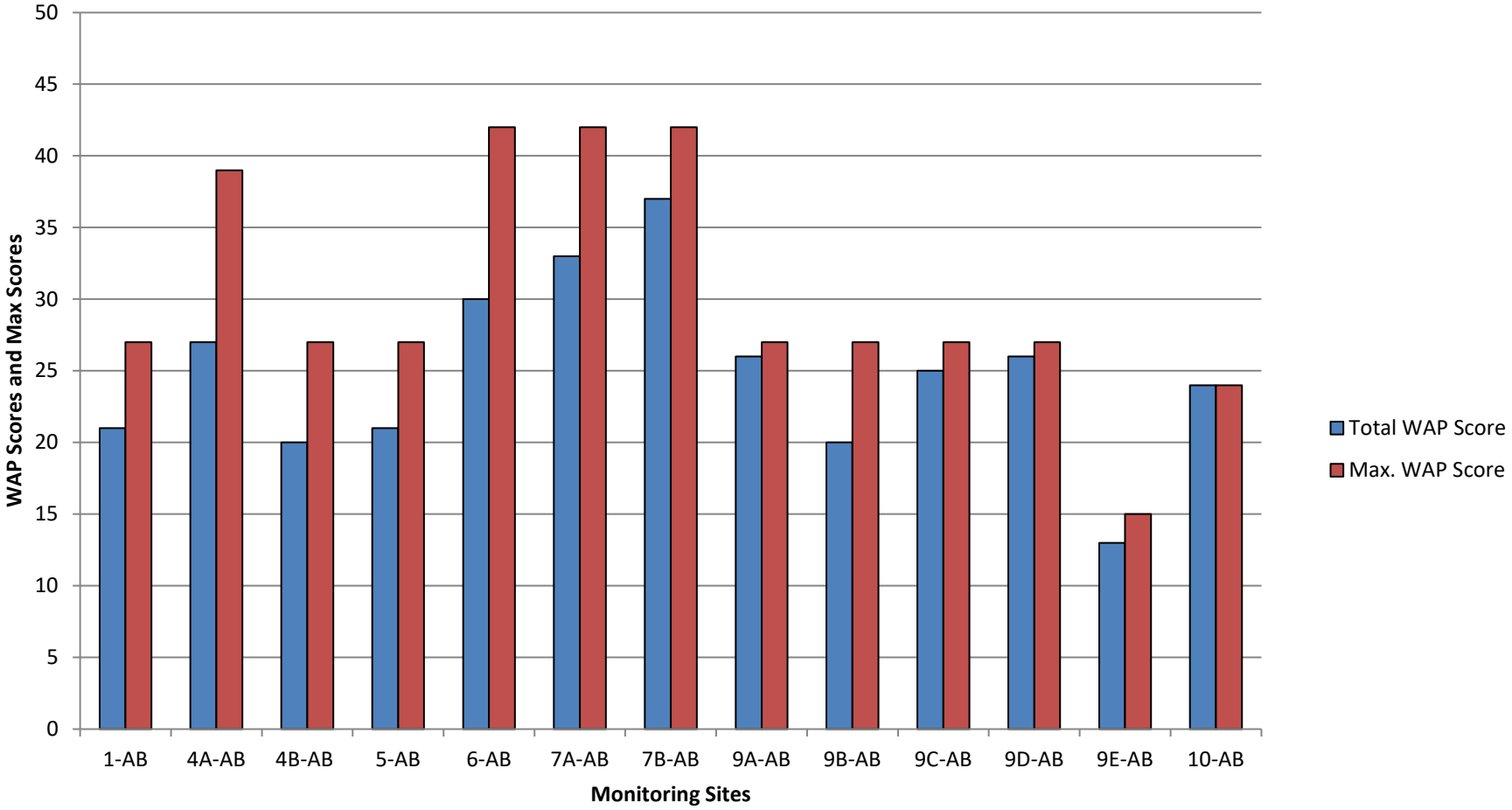


Figure 43
Wetland Assessment Scores at Al Bar Ranch September 2021



APPENDIX B

WATER USE PERMIT

DETAILS FOR AUGMENTATION AND MONITOR WELLS

Southwest Florida Water Management District
2379 Broad Street, Brooksville, Florida 34604-6899
(352) 796-7211 or 1-800-423-1476 (FL only)
TDD only: 1-800-231-6103 (FL only)
On the Internet at WaterMatters.org

An Equal Opportunity Employer

Bartow Service Office
170 Century Boulevard
Bartow, Florida 33830-7700
(863) 534-1448 or
1-800-492-7862 (FL only)

Sarasota Service Office
6750 Fruitville Road
Sarasota, Florida 34240-9711
(941) 377-3722 or
1-800-320-3503 (FL only)

Tampa Service Office
7601 Highway 301 North
Tampa, Florida 33637-6759
(813) 985-7481 or
1-800-836-0797 (FL only)

May 24, 2011

Pinellas County Utilities
14 South Fort Harrison Ave, 6th Floor
Clearwater, FL 33756

Subject: Final Agency Action Transmittal Letter
Individual Water Use Permit No. 20 011558.003

Dear Pinellas County Utilities:

This Water Use Permit was approved by the District Governing Board subject to all terms and conditions set forth in the Permit.

Please be advised that the Governing Board has formulated a water shortage plan as referenced in Condition 15 of the Standard Water Use Permit Conditions (Exhibit A), and will implement such a plan during periods of water shortage. You will be notified during a declared water shortage of any change in the conditions of your Permit or any suspension of your Permit, or of any restriction on your use of water for the duration of any declared water shortage. Please further note that water conservation is a condition of your Permit and should be practiced at all times.

The well tags for your withdrawals will be applied by a District representative. If you have any questions or concerns regarding your tags, please contact Frank Gargano at extension 4289, in the Brooksville Regulation Department. If you have any questions or concerns regarding your permit or any other information, please contact the Brooksville Regulation Department and ask to speak to someone in the Water Use Regulation Section

Sincerely,

Henry Robert Lue, P.E. Electronically Signed

Henry Robert Lue, P.E., Director Br
Brooksville Regulation Department

Enclosures: Approved Permit
cc: File of Record
David Slonena, Pinellas County Utilities

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
WATER USE
INDIVIDUAL
PERMIT NO. 20 011558.003

EXPIRATION DATE:	**May 24, 2021**	**PERMIT ISSUE DATE:**	**May 24, 2011**

The Permittee is responsible for submitting an application to renew this permit no sooner than one year prior to the expiration date, and no later than the end of the last business day before the expiration date, whether or not the Permittee receives prior notification by mail. Failure to submit a renewal application prior to the expiration date and continuing to withdraw water after the expiration date is a violation of Chapter 373, Florida Statutes, and Chapter 40D-2, Florida Administrative Code, and may result in a monetary penalty and/or loss of the right to use the water. Issuance of a renewal of this permit is contingent upon District approval.

TYPE OF APPLICATION: Renewal

GRANTED TO: Pinellas County Utilities
14 South Fort Harrison Ave, 6th Floor
Clearwater, FL 33756

PROJECT NAME: Al-Bar Ranch Ecosystem Management

WATER USE CAUTION AREA: NORTHERN TAMPA BAY

COUNTY: Pasco

TOTAL QUANTITIES AUTHORIZED UNDER THIS PERMIT (in gpd)

ANNUAL AVERAGE	1,343,000 gpd
PEAK MONTH [1]	2,339,000 gpd

1 Peak Month: Average daily use during the highest water use month.

ABSTRACT:

This is a renewal of an existing water use permit for environmental augmentation of wetlands located at a wellfield. The Annual Average quantity remains unchanged at 1,343,000 gallons per day (gpd) and the Peak Month quantity remains unchanged at 2,339,000 gpd. There are no changes in use type from the previous permit. Reclaimed water is not currently used as a source of water at the site.

Special Conditions include those that require the Permittee to do the following: record and report monthly meter readings from all withdrawal points and augmentation discharge points; sample water quality; monitor water levels in lakes, wetlands and the surficial aquifer; adhere to augmentation levels; investigate the feasibility of reuse; and coordinate with the Tampa Bay Water Phase I Mitigation Plan and Environmental Management Plan.

WATER USE TABLE (in gallons per day)

USE	ANNUAL AVERAGE	PEAK MONTH
RECREATION/AESTHETIC	1,343,000	2,339,000

USE TYPE

Augmentation For
Environmental

WITHDRAWAL POINT QUANTITY TABLE

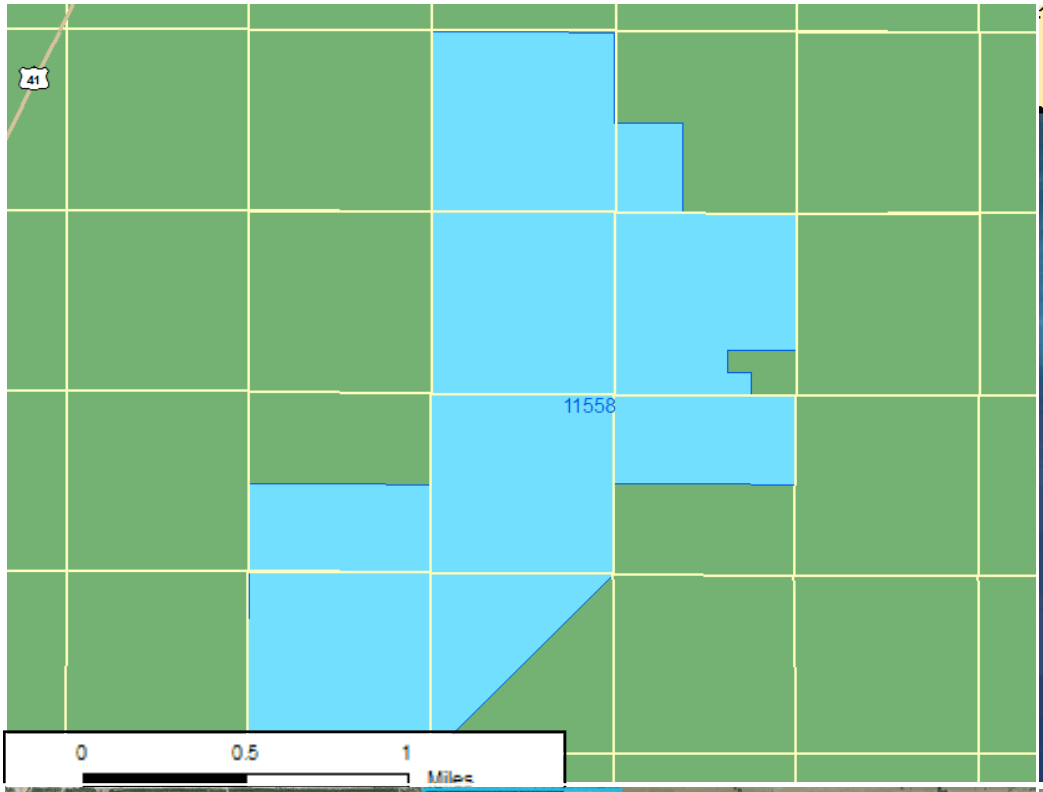
Water use from these withdrawal points are restricted to the quantities given below:

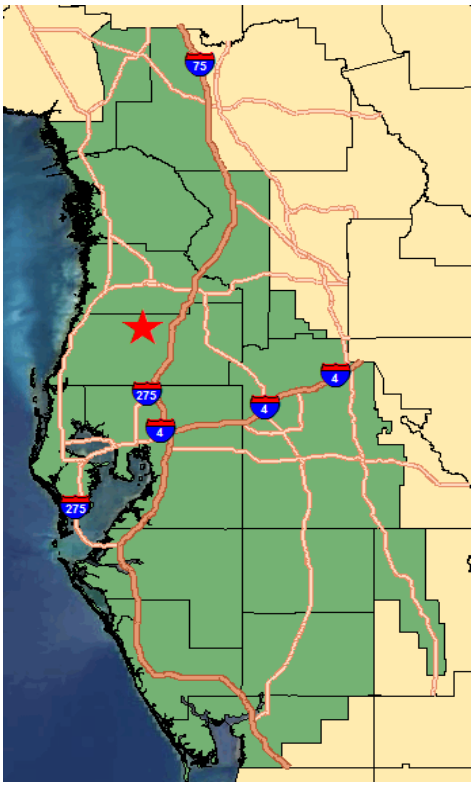
I.D. NO. PERMITTEE/ DISTRICT	DIAM (IN.)	DEPTH TTL./CSD.FT. (feet bls)	USE DESCRIPTION	AVERAGE (gpd)	PEAK MONTH (gpd)
1 / 6	6	400 / 200	Augmentation	35,000	49,000
4 / 7	10	700 / 201	Augmentation	453,000	830,000
5 / 8	8	400 / 200	Augmentation	197,000	331,000
6 / 9	6	400 / 200	Augmentation	55,000	96,000
7 / 10	6	400 / 200	Augmentation	127,000	199,000
8 / 11	6	390 / 200	Augmentation	68,000	111,000
9 / 12	10	640 / 218	Augmentation	408,000	723,000

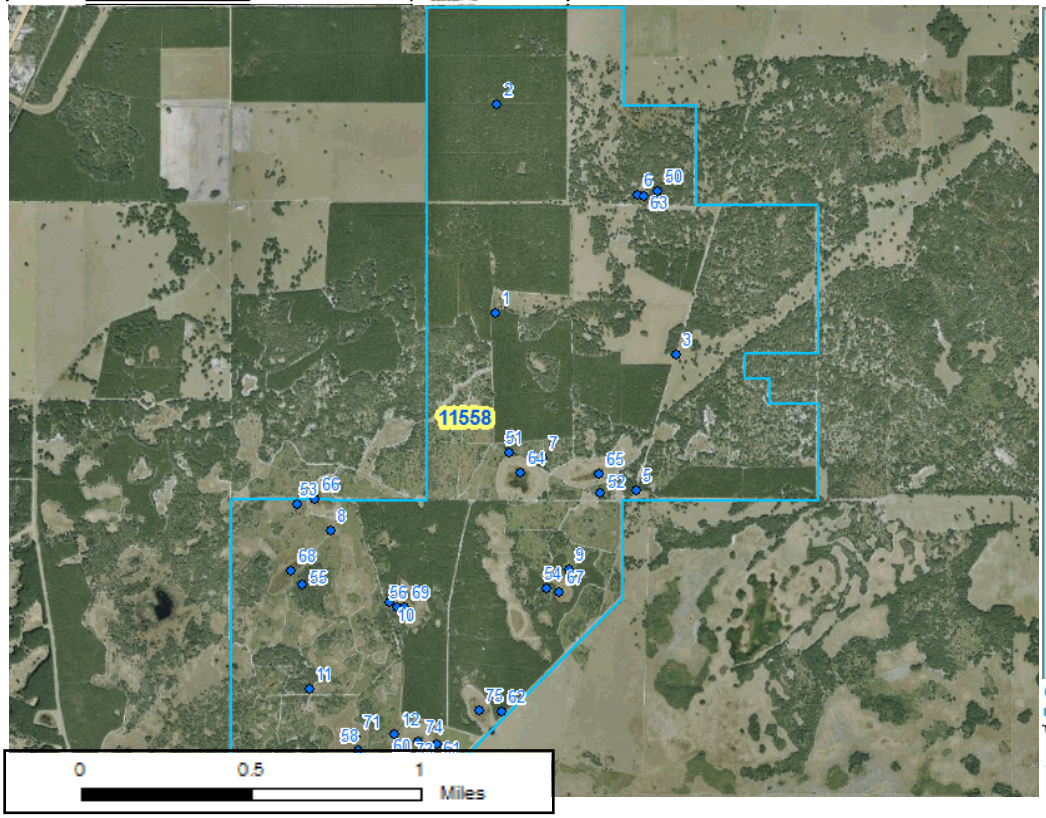
WITHDRAWAL POINT LOCATION TABLE

DISTRICT I.D. NO	LATITUDE/LONGITUDE
6	28° 24' 19.40"/82° 25' 06.90"
7	28° 23' 09.50"/82° 25' 35.50"
8	28° 22' 49.90"/82° 26' 39.70"
9	28° 22' 39.80"/82° 25' 27.30"
10	28° 22' 31.20"/82° 26' 21.60"
11	28° 22' 08.00"/82° 26' 45.80"
12	28° 21' 56.10"/82° 26' 20.10"

Location Map
Pinellas County Utilities
WUP No. 20 011558.003







Legend

- DIDs
- WUP Boundary
- 2010 Natural Color Imagery

PASCO COUNTY

N
W E
S

Southwest Florida Water Management District

STANDARD CONDITIONS:

The Permittee shall comply with the Standard Conditions attached hereto, incorporated herein by reference as Exhibit A and made a part hereof.

SPECIAL CONDITIONS:

1. All reports and data required by condition(s) of the permit shall be submitted to the District according to the due date(s) contained in the specific condition. If the condition specifies that a District-supplied form is to be used, the Permittee should use that form in order for their submission to be acknowledged in a timely manner. The only alternative to this requirement is to use the District Permit Information Center (www.swfwmd.state.fl.us/permits/epermitting/) to submit data, plans or reports online. There are instructions at the District website on how to register to set up an account to do so. If the report or data is received on or before the tenth day of the month following data collection, it shall be deemed as a timely submittal.

   All mailed reports and data are to be sent to:

   Southwest Florida Water Management District
   Brooksville Regulation Department, Water Use Regulation
   2379 Broad Street
   Brooksville, Florida 34604-6899

   Submission of plans and reports: Unless submitted online or otherwise indicated in the special condition, the original and two copies of each plan and report, such as conservation plans, environmental analyses, aquifer test results, per capita annual reports, etc. are required.

   Submission of data: Unless otherwise indicated in the special condition, an original (no copies) is required for data submittals such as crop report forms, meter readings and/or pumpage, rainfall, water level evapotranspiration, or water quality data.
   (499)

2. The Permittee shall provide a comprehensive and concise annual Environmental Assessment Report to the District regarding the information collected through the Special Conditions of this permit. The Environmental Assessment Report shall address the hydrological and ecological conditions of the augmented sites. Data collected through the water quantity, water quality, water level and environmental monitoring requirements of this permit shall be included in the report, summarized and analyzed by appropriate environmental professional(s). The annual report shall contain professional interpretations and conclusions of findings, and include raw data, essential graphs, tables, and text. Three copies of the annual report shall be submitted to the Brooksville Regulation Department by July 1 of each year; provided, only one set of original photographs and four color copies shall be submitted. The annual report shall cover the preceding water year period of October 1 to September 30.

   The frequency of monitoring may be modified by the Regulation Department Director, Resource Regulation, as necessary to ensure the protection of the resource and may be reduced in the future upon written request by the Permittee and written approval by the Regulation Department Director, Resource Regulation.
   (287)

3. The Permittee shall investigate the feasibility of using reclaimed water as a water source and submit a report describing the feasibility to the Brooksville Regulation Department by May 1, 2016. The report shall contain an analysis of reclaimed water sources for the area, including the relative location of these sources to the Permittee's property, the quantity of reclaimed water available, the projected date(s) of availability, costs associated with obtaining the reclaimed water, and an implementation schedule for reuse, if feasible. Infeasibility shall be supported with a detailed explanation. If the use of reclaimed water is determined to be feasible by the Permittee or by the District, then the Permittee shall submit an application to modify this water use permit to include reclaimed water as a source of water. The modification application shall include a date when the reclaimed water will be available and shall indicate a proposed reduction in permitted quantities. If the permit application is not submitted by the Permittee, the District may reduce, following notice to the Permittee, the quantities authorized with this permit to account for the availability of reclaimed water.

   (458)

4. Any wells not in use, and in which pumping equipment is not installed shall be capped or valved in a water tight manner in accordance with Chapter 62-532.500(3)(a)(4), F.A.C.(568)

5. The Permittee shall continue to maintain the monitor well(s) or piezometer(s) listed below, monitor water levels, and report them to the District at the frequency listed for the interval, aquifer system, or geologic formation listed. Water levels shall be recorded relative to National Geodetic Vertical Datum 1929 and to the maximum extent possible, recorded on a regular schedule: same time each day, same day each week, same week each month as appropriate to the frequency noted. The readings shall be reported online via the WUP Portal at the District website (www.watermatters.org) or mailed in hardcopy on District-provided forms to the Brooksville Regulation Department on or before the tenth day of the following month. The frequency of recording may be modified by the Brooksville Regulation Department Director as necessary to ensure the protection of the resource.

   Existing District ID No. 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, and 62/Permittee ID No. 1-MW, 4A-MW, 4B-MW, 5-MW, 6-MW, 7A-MW, 7B-MW, 9A-MW, 9B-MW, 9C-MW, 9D-MW, 9E-MW, and 10-MW, to monitor the surficial aquifer twice per month.
   (756)

6. COORDINATION WITH THE TAMPA BAY WATER PHASE I MITIGATION PLAN AND ENVIRONMENTAL MANAGEMENT PLAN: The Environmental Management Plan and the Phase I Mitigation Requirements are set forth in Conditions 8 and 9, respectively, of Water Use Permit No. 2011771.001 (the Consolidated Permit).

   A. The District may modify this Water Use Permit to delete any lake or wetland located on the Permittee's property that is not identified as a mitigation site in the District-approved Phase I Mitigation Plan for Water Use Permit No. 2011771.001.

   B. The withdrawals authorized by this Water Use Permit are part of a recovery program to augment and sustain wetlands and lakes affected by ground-water withdrawals. It is anticipated that as ground-water withdrawal reductions occur, augmentation will decrease and possibly cease. The withdrawals authorized by this permit shall not be modified for any use other than environmental augmentation, unless the applicant demonstrates the new use meets the Conditions for Issuance of Water Use Permits.
   (995)

7. The Permittee shall continue to maintain the District-approved staff gauge in the water bodies at the location(s) specified by latitude and longitude below and report measurements of water levels referenced to National Geodetic Vertical Datum 1929 at the frequency indicated.

District ID No.	Permittee ID No.	Recording Frequency	Latitude	Longitude
63	1-SG	Twice Per Month	28°24'19.28464	82°25'05.26377
64	4A-SG	Twice Per Month	28°23'05.71264	82°25'42.20195
65	4B-SG	Twice Per Month	28°23'05.24069	82°25'18.27751
66	5-SG	Twice Per Month	28°22'58.23604	82°26'44.53464
67	6-SG	Twice Per Month	28°22'33.87734	82°25'30.40765
68	7A-SG	Twice Per Month	28°22'39.37919	82°26'51.61280
69	7B-SG	Twice Per Month	28°22'29.89514	82°26'17.14550
70	9A-SG	Twice Per Month	28°21'44.58323	82°26'29.20658
71	9B-SG	Twice Per Month	28°21'55.28183	82°26'31.71718
72	9C-SG	Twice Per Month	28°21'41.64423	82°26'22.47520
73	9D-SG	Twice Per Month	28°21'47.99806	82°26'15.80353
74	9E-SG	Twice Per Month	28°21'54.09286	82°26'12.70934
75	10-SG	Twice Per Month	28°22'02.28734	82°25'54.58113

   To the maximum extent possible, water levels shall be recorded on the same day of each week and reported to the Brooksville Regulation Department, online via the WUP Portal on the District website, or in hardcopy on District-provided forms on or before the tenth day of the following month. The frequency of recording may be modified by the Brooksville Regulation Department Director as necessary to ensure the protection of the resource.

   (762)

8. The Permittee shall adhere to the environmental augmentation program as represented by the information received on October 5, 1999 and February 17, 2000 in accordance with the limits of this permit. Modifications to the program shall receive written approval from the Brooksville Regulation Department Director prior to implementation. In the event that environmental augmentation causes unforeseen adverse impacts to other existing legal withdrawals, environmental features, or off-site land uses, the Permittee may be required to adjust the environmental augmentation program in order to mitigate the impacts.(993)

9. The Permittee shall qualitatively monitor the augmented wetlands as specified in the table below. Reports of the data shall be submitted annually to the Brooksville Regulation Department, in a form acceptable to the District. All elevations shall be referenced to the National Geodetic Vertical Datum (NGVD). The frequency of qualitative monitoring may be modified by the Brooksville Regulation Department Director as necessary to insure the protection of the resource.

District ID No.	Permittee ID No.	Augmentation Site	Monitoring and Transect Location	Sampling Frequency
63	1-SG	Wetland 1-AB	refer to Site Map received by the District 02/17/2000	twice per year
64	4A-SG	Wetland 4A-AB	" " " "	twice per year
65	4B-SG	Wetland 4B-AB	" " " "	twice per year
66	5-SG	Wetland 5-AB	" " " "	twice per year
67	6-SG	Wetland 6-AB	" " " "	twice per year
68	7A-SG	Wetland 7A-AB	" " " "	twice per year
69	7B-SG	Wetland 7B-AB	" " " "	twice per year
70	9A-SG	Wetland 9A-AB	" " " "	twice per year
71	9B-SG	Wetland 9B-AB	" " " "	twice per year
72	9C-SG	Wetland 9C-AB	" " " "	twice per year
73	9D-SG	Wetland 9D-AB	" " " "	twice per year
74	9E-SG	Wetland 9E-AB	" " " "	twice per year
75	10-SG	Wetland 10-AB	" " " "	twice per year

Qualitative monitoring of the augmented wetlands shall be performed according to procedures outlined in the Environmental Monitoring section of the Al Bar Ranch Wetland Evaluation Report from Peacock & Associates, dated August 1999, and shall include photographic documentation.
(992)

10. Water quality samples from the withdrawal points listed below shall be collected after pumping the withdrawal point at its normal rate for a pumping time specified below, or to a constant temperature, pH, and conductivity. The frequency of sampling per water quality parameter is listed in the table according to the withdrawal point. The recording and reporting shall begin according to the first sample date for existing wells and shall begin within 90 days of completion of any proposed wells. Samples shall be collected whether or not the well is being used unless infeasible. If sampling is infeasible, the Permittee shall indicate the reason for not sampling on the water quality data form or in the space for comments in the WUP Portal for data submissions. For sampling, analysis and submittal requirements see Exhibit B, Water Quality Sampling Instructions, attached to and made part of this permit.

Existing District ID Nos. 6, 7, 8, 9, 10, 11 and 12 /Permittee ID Nos. 1, 4, 5, 6, 7, 8 and 9 for pH, Hardness, and Specific Conductance after a minimum pumping time of 15 minutes, on an annual basis, with first sample due date of 06/10/2011.
(752)

11. The Permittee shall quantitatively monitor the augmented wetlands as specified in the table below. Reports of the data shall be submitted annually to the Brooksville Regulation Department, in a form acceptable to the District. All elevations shall be referenced to the National Geodetic Vertical Datum (NGVD). The frequency of quantitative monitoring may be modified by the Brooksville Regulation Department Director as necessary to insure the protection of the resource.

District ID No.	Permittee ID No.	Augmentation Site	Monitoring and Transect Location	Sampling Frequency
65	4B-SG	Wetland 4B-AB	refer to Site Map received by the District 02/17/2000	twice per year
66	5-SG	Wetland 5-AB	" " " "	twice per year
72	9C-SG	Wetland 9C-AB	" " " "	twice per year
75	10-SG	Wetland 10-AB	" " " "	twice per year

Quantitative monitoring of the augmented wetlands shall be performed according to procedures outlined in the Environmental Monitoring section of the Al Bar Ranch Wetland Evaluation Report from Peacock & Associates, dated August 1999, and shall include photographic documentation.

(994)

12. Augmentation of each wetland or surface water site shall be allowed only when the water levels drop below the Target High Pool Elevation. The Permittee shall follow the water elevations defined on the hydrograph for each site, received by the District the District on February 17, 2000. Once every five years, each augmentation site shall be allowed to recede below the Target Low Pool Elevation and allowed to dry out so that no standing water exists. The Target High Pool Elevations and the Target Low Pool Elevations are referenced to the National Geodetic Vertical Datum, 1929 (NGVD), and are as follows:

District ID No.	Permittee ID No.	Augmented Wetland	Target High Pool Elevation in Feet NGVD	Target Low Pool Elevation in Feet NGVD
63	1-SG	1-AB	71.50	69.50
64	4A-SG	4A-AB	74.50	72.00
65	4B-SG	4B-AB	74.50	72.00
66	5-SG	5-AB	72.00	70.00
67	6-SG	6-AB	74.50	73.00
68	7A-SG	7A-AB	73.00	72.00
69	7B-SG	7B-AB	73.00	72.00
70	9A-SG	9A-AB	74.00	72.00
71	9B-SG	9B-AB	74.00	72.50
72	9C-SG	9C-AB	73.50	72.00
73	9D-SG	9D-AB	73.50	71.25
74	9E-SG	9E-AB	73.50	71.00
75	10-SG	10-AB	74.00	73.00

(991)

13. The following withdrawal facilities shall continue to be maintained and operated with existing, non-resettable, totalizing flow meter(s) or other measuring device(s) as approved by the Regulation Department Director: District ID Nos. 6, 7, 8, 9, 10, 11 and 12, Permittee ID Nos. 1, 4, 5, 6, 7, 8 and 9. Meter reading and reporting, as well as meter accuracy checks every five years shall be in accordance with instructions in Exhibit B, Metering Instructions, attached to and made part of this permit.(719)

14. The following existing Environmental Augmentation discharge points shall continue to be metered: District ID Nos. 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74 and 75, Permittee ID Nos. 1-SG, 4A-SG, 4B-SG, 5-SG, 6-SG, 7A-SG, 7B-SG, 9A-SG, 9B-SG, 9C-SG, 9D-SG, 9E-SG and 10-SG. Meter reading and reporting, excluding meter accuracy calibration, shall be in accordance with instructions in Exhibit B, Metering Instructions, attached to and made part of this permit.(731)

40D-2
Exhibit A

WATER USE PERMIT STANDARD CONDITIONS

1. The Permittee shall provide access to an authorized District representative to enter the property at any reasonable time to inspect the facility and make environmental or hydrologic assessments. The Permittee shall either accompany District staff onto the property or make provision for access onto the property.

2. When necessary to analyze impacts to the water resource or existing users, the District shall require the Permittee to install flow metering or other measuring devices to record withdrawal quantities and submit the data to the District.

3. The District shall collect water samples from any withdrawal point listed in the permit or shall require the permittee to submit water samples when the District determines there is a potential for adverse impacts to water quality.

4. A District identification tag shall be prominently displayed at each withdrawal point that is required by the District to be metered or for which withdrawal quantities are required to be reported to the District, by permanently affixing the tag to the withdrawal facility.

5. The Permittee shall mitigate to the satisfaction of the District any adverse impact to environmental features or off-site land uses as a result of withdrawals. When adverse impacts occur or are imminent, the District shall require the Permittee to mitigate the impacts. Adverse impacts include the following:

   A. Significant reduction in levels or flows in water bodies such as lakes, impoundments, wetlands, springs, streams or other watercourses; or
   B. Sinkholes or subsidence caused by reduction in water levels;
   C. Damage to crops and other vegetation causing financial harm to the owner; and
   D. Damage to the habitat of endangered or threatened species.

6. The Permittee shall mitigate, to the satisfaction of the District, any adverse impact to existing legal uses caused by withdrawals. When adverse impacts occur or are imminent, the District shall require the Permittee to mitigate the impacts. Adverse impacts include the following:

   A. A reduction in water levels which impairs the ability of a well to produce water;
   B. Significant reduction in levels or flows in water bodies such as lakes, impoundments, wetlands, springs, streams or other watercourses; or
   C. Significant inducement of natural or manmade contaminants into a water supply or into a usable portion of an aquifer or water body.

7. Notwithstanding the provisions of Rule 40D-1.6105, F.A.C., persons who wish to continue the water use permitted herein and who have acquired ownership or legal control of permitted water withdrawal facilities or the land on which the facilities are located must apply to transfer the permit to themselves within 45 days of acquiring ownership or legal control of the water withdrawal facilities or the land.

8. If any of the statements in the application and in the supporting data are found to be untrue and inaccurate, or if the Permittee fails to comply with all of the provisions of Chapter 373, Florida Statutes (F.S.), Chapter 40D, Florida Administrative Code (F.A.C.), or the conditions set forth herein, the Governing Board shall revoke this permit in accordance with Rule 40D-2.341, F.A.C., following notice and hearing.

9. Issuance of this permit does not exempt the Permittee from any other District permitting requirements.

10. The Permittee shall cease or reduce surface water withdrawal as directed by the District if water levels in lakes fall below the applicable minimum water level established in Chapter 40D-8, F.A.C., or rates of flow in streams fall below the minimum levels established in Chapter 40D-8, F.A.C.

11. The Permittee shall cease or reduce withdrawal as directed by the District if water levels in aquifers fall below the minimum levels established by the Governing Board.

12. The Permittee shall not deviate from any of the terms or conditions of this permit without written approval by the District.

13. The Permittee shall practice water conservation to increase the efficiency of transport, application, and use, as well as to decrease waste and to minimize runoff from the property. At such time as the Governing Board adopts specific conservation requirements for the Permittee's water use classification, this permit shall be subject to those requirements upon notice and after a reasonable period for compliance.

14. The District may establish special regulations for Water-Use Caution Areas. At such time as the Governing Board adopts such provisions, this permit shall be subject to them upon notice and after a reasonable period for compliance.

15. In the event the District declares that a Water Shortage exists pursuant to Chapter 40D-21, F.A.C., the District shall alter, modify, or declare inactive all or parts of this permit as necessary to address the water shortage.

16. This permit is issued based on information provided by the Permittee demonstrating that the use of water is reasonable and beneficial, consistent with the public interest, and will not interfere with any existing legal use of water. If, during the term of the permit, it is determined by the District that the use is not reasonable and beneficial, in the public interest, or does impact an existing legal use of water, the Governing Board shall modify this permit or shall revoke this permit following notice and hearing.

17. All permits issued pursuant to these Rules are contingent upon continued ownership or legal control of all property on which pumps, wells, diversions or other water withdrawal facilities are located.

Exhibit B
Instructions

METERING INSTRUCTIONS

The Permittee shall meter withdrawals from surface waters and/or the ground water resources, and meter readings from each withdrawal facility shall be recorded on a monthly basis within the last week of the month. The meter reading(s) shall be reported to the Permit Data Section, Performance Management Office on or before the tenth day of the following month.The Permittee shall submit meter readings online using the Permit Information Center at www.swfwmd.state.fl.us/permits/epermitting/ or on District supplied scanning forms unless another arrangement for submission of this data has been approved by the District. Submission of such data by any other unauthorized form or mechanism may result in loss of data and subsequent delinquency notifications. Call the Performance Management Office in Brooksville (352-796-7211) if difficulty is encountered.

The meters shall adhere to the following descriptions and shall be installed or maintained as follows:

1. The meter(s) shall be non-resettable, totalizing flow meter(s) that have a totalizer of sufficient magnitude to retain total gallon data for a minimum of the three highest consecutive months permitted quantities. If other measuring device(s) are proposed, prior to installation, approval shall be obtained in writing from the Regulation Department Director.
2. The Permittee shall report non-use on all metered standby withdrawal facilities on the scanning form or approved alternative reporting method.
3. If a metered withdrawal facility is not used during any given month, the meter report shall be submitted to the District indicating the same meter reading as was submitted the previous month.
4. The flow meter(s) or other approved device(s) shall have and maintain an accuracy within five percent of the actual flow as installed.
5. Meter accuracy testing requirements:
    A. For newly metered withdrawal points, the flow meter installation shall be designed for inline field access for meter accuracy testing.
    B. The meter shall be tested for accuracy on-site, as installed according to the Flow Meter Accuracy Test Instructions in this Exhibit B, every five years in the assigned month for the county, beginning from the date of its installation for new meters or from the date of initial issuance of this permit containing the metering condition with an accuracy test requirement for existing meters.
    C. The testing frequency will be decreased if the Permittee demonstrates to the satisfaction of the District that a longer period of time for testing is warranted.
    D. The test will be accepted by the District only if performed by a person knowledgeable in the testing equipment used.
    E. If the actual flow is found to be greater than 5% different from the measured flow, within 30 days, the Permittee shall have the meter re-calibrated, repaired, or replaced, whichever is necessary. Documentation of the test and a certificate of re-calibration, if applicable, shall be submitted within 30 days of each test or re-calibration.
6. The meter shall be installed according to the manufacturer's instructions for achieving accurate flow to the specifications above, or it shall be installed in a straight length of pipe where there is at least an upstream length equal to ten (10) times the outside pipe diameter and a downstream length equal to two (2) times the outside pipe diameter. Where there is not at least a length of ten diameters upstream available, flow straightening vanes shall be used in the upstream line.
7. Broken or malfunctioning meter:
    A. If the meter or other flow measuring device malfunctions or breaks, the Permittee shall notify the District within 15 days of discovering the malfunction or breakage.
    B. The meter must be replaced with a repaired or new meter, subject to the same specifications given above, within 30 days of the discovery.
    C. If the meter is removed from the withdrawal point for any other reason, it shall be replaced with another meter having the same specifications given above, or the meter shall be reinstalled within 30 days of its removal from the withdrawal. In either event, a fully functioning meter shall not be off the withdrawal point for more than 60 consecutive days.

8. While the meter is not functioning correctly, the Permittee shall keep track of the total amount of time the withdrawal point was used for each month and multiply those minutes times the pump capacity (in gallons per minute) for total gallons. The estimate of the number of gallons used each month during that period shall be submitted on District scanning forms and noted as estimated per instructions on the form. If the data is submitted by another approved method, the fact that it is estimated must be indicated. The reason for the necessity to estimate pumpage shall be reported with the estimate.
9. In the event a new meter is installed to replace a broken meter, it and its installation shall meet the specifications of this condition. The permittee shall notify the District of the replacement with the first submittal of meter readings from the new meter.

FLOW METER ACCURACY TEST INSTRUCTIONS

1. **Accuracy Test Due Date** - The Permittee is to schedule their accuracy test according to the following schedule:

   A. For existing metered withdrawal points, add five years to the previous test year, and make the test in the month assigned to your county.
   B. For withdrawal points for which metering is added for the first time, the test is to be scheduled five years from the issue year in the month assigned to your county.
   C. For proposed withdrawal points, the test date is five years from the completion date of the withdrawal point in the month assigned to your county.
   D. For the Permittee's convenience, if there are multiple due-years for meter accuracy testing because of the timing of the installation and/or previous accuracy tests of meters, the Permittee can submit a request in writing to the Permitting Department Director for one specific year to be assigned as the due date year for meter testing. Permittees with many meters to test may also request the tests to be grouped into one year or spread out evenly over two to three years.
   E. The months for accuracy testing of meters are assigned by county. The Permittee is requested but not required to have their testing done in the month assigned to their county. This is to have sufficient District staff available for assistance.

January	Hillsborough
February	Manatee, Pasco
March	Polk (for odd numbered permits)*
April	Polk (for even numbered permits)*
May	Highlands
June	Hardee, Charlotte
July	None or Special Request
August	None or Special Request
September	Desoto, Sarasota
October	Citrus, Levy, Lake
November	Hernando, Sumter, Marion
December	Pinellas

   * The permittee may request their multiple permits be tested in the same month.

2. **Accuracy Test Requirements**: The Permittee shall test the accuracy of flow meters on permitted withdrawal points as follows:

   A. The equipment water temperature shall be set to 72 degrees Fahrenheit for ground water, and to the measured water temperature for other water sources.
   B. A minimum of two separate timed tests shall be performed for each meter. Each timed test shall consist of measuring flow using the test meter and the installed meter for a minimum of four minutes duration. If the two tests do not yield consistent results, additional tests shall be performed for a minimum of eight minutes or longer per test until consistent results are obtained.
   C. If the installed meter has a rate of flow, or large multiplier that does not allow for consistent results to be obtained with four- or eight-minute tests, the duration of the test shall be increased as necessary to obtain accurate and consistent results with respect to the type of flow meter installed.
   D. The results of two consistent tests shall be averaged, and the result will be considered the test result for the meter being tested. This result shall be expressed as a plus or minus percent (rounded to the nearest one-tenth percent) accuracy of the installed meter relative to the test meter. The percent accuracy indicates the deviation (if any), of the meter being tested from the test meter.

3. **Accuracy Test Report:** The Permittees shall demonstrate that the results of the meter test(s) are accurate by submitting the following information within 30 days of the test:

   A. A completed Flow Meter Accuracy Verification Form, Form LEG-R.014.00 (07/08) for each flow meter tested. This form can be obtained from the District's website (www.watermatters.org) under "Permits and Rules" for Water Use Permits.

   B. A printout of data that was input into the test equipment, if the test equipment is capable of creating such a printout;

   C. A statement attesting that the manufacturer of the test equipment, or an entity approved or authorized by the manufacturer, has trained the operator to use the specific model test equipment used for testing;

   D. The date of the test equipment's most recent calibration that demonstrates that it was calibrated within the previous twelve months, and the test lab's National Institute of Standards and Testing (N.I.S.T.) traceability reference number.

   E. A diagram showing the precise location on the pipe where the testing equipment was mounted shall be supplied with the form. This diagram shall also show the pump, installed meter, the configuration (with all valves, tees, elbows, and any other possible flow disturbing devices) that exists between the pump and the test location clearly noted with measurements. If flow straightening vanes are utilized, their location(s) shall also be included in the diagram.

   F. A picture of the test location, including the pump, installed flow meter, and the measuring device, or for sites where the picture does not include all of the items listed above, a picture of the test site with a notation of distances to these items. with a notation of distances to these items.

WATER QUALITY INSTRUCTIONS

The Permittee shall perform water quality sampling, analysis and reporting as follows:

1. The sampling method(s) from both monitor wells and surface water bodies shall be designed to collect water samples that are chemically representative of the zone of the aquifer or the depth or area of the water body.
2. Water quality samples from monitor wells shall be taken after pumping the well for the minimum time specified (if specified) or after the water reaches a constant temperature, pH, and conductivity.
3. The first submittal to the District shall include a copy of the laboratory's analytical and chain of custody procedures. If the laboratory used by the Permittee is changed, the first submittal of data analyzed at the new laboratory shall include a copy of the laboratory's analytical and chain of custody procedures.
4. Any variance in sampling and/or analytical methods shall have prior approval of the Regulation Department Director, Resource Regulation.
5. The Permittee's sampling procedure shall follow the handling and chain of custody procedures designated by the certified laboratory which will undertake the analysis.
6. Water quality samples shall be analyzed by a laboratory certified by the Florida Department of Health utilizing the standards and methods applicable to the parameters analyzed and to the water use pursuant to Chapter 64E-1, Florida Administrative Code, "Certification of Environmental Testing Laboratories."
7. Analyses shall be performed according to procedures outlined in the current edition of Standard Methods for the Examination of Water and Wastewater by the American Public Health Association-American Water Works Association-Water Pollution Control Federation (APHA-AWWA-WPCF) or Methods for Chemical Analyses of Water and Wastes by the U.S. Environmental Protection Agency (EPA).
8. Unless other reporting arrangements have been approved by the Regulation Department Director, Resource Regulation, reports of the analyses shall be submitted to the Permit Data Section, Strategic Programs Office Department, online at the District WUP Portal or mailed in hardcopy on or before the tenth day of the following month. The online submittal shall include a scanned upload of the original laboratory report. The hardcopy submittal shall be a copy of the laboratory's analysis form. If for some reason, a sample cannot be taken when required, the Permittee shall indicate so and give the reason in the space for comments at the WUP Portal or shall submit the reason in writing on the regular due date.
9. Water quality samples shall be collected based on the following timetable for the frequency listed in the special condition:
10. The parameters and frequency of sampling and analysis may be modified by the District as necessary to ensure the protection of the resource.

Frequency	Timetable
Weekly	Same day of each week
Quarterly	Same week of **February, May, August, November**
Semi-annually	Same week of **May, November**
Monthly	Same week of each month

Henry Robert Lue, P.E. Electronically Signed
Authorized Signature
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

This permit, issued under the provision of Chapter 373, Florida Statues and Florida Administrative Code 40D-2, authorizes the Permittee to withdraw the quantities outlined above, and may require various activities to be performed by the Permittee as described in the permit, including the Special Conditions. The permit does not convey to the Permittee any property rights or privileges other than those specified herein, nor relieve the Permittee from complying with any applicable local government, state, or federal law, rule, or ordinance.

MONITOR WELL DESIGNATIONS
ALBAR RANCH ECOSYSTEM MANAGEMENT

District I.D.	Pinellas County I.D.
50	1 MW
51	4A MW
52	4B MW
53	5 MW
54	6 MW
55	7A MW
56	7B MW
57	9A MW
58	9B MW
59	9C MW
60	9D MW
61	9E MW
62	10 MW

STAFF GAUGE DESIGNATIONS
ALBAR RANCH ECOSYSTEM MANAGEMENT

District I.D.	Pinellas County I.D.
63	1 SG
64	4A SG
65	4B SG
66	5 SG
67	6 SG
68	7A SG
69	7B SG
70	9A SG
71	9B SG
72	9C SG
73	9D SG
74	9E SG
75	10 SG

APPENDIX C

HYDROLOGIC DATA TABLES

Table 1: Monthly Average Rainfall Data, AL BAR Ranch, WY 2021 (in.)

Month	CBR-BFISH	CBR-CB01	CBR-CB13	CBR-GREGG	CBR-S-1S	Composite Average	St. Leo
October-20	0.92	1.68	2.06	2.31	2.42	1.88	1.40
November-20	4.41	3.55	4.50	5.47	4.20	4.43	4.89
December-20	1.90	1.98	1.62	2.11	1.73	1.87	1.70
January-21	0.30	0.35	0.31	0.35	0.49	0.36	0.19
February-21	2.57	3.49	2.64	2.92	2.67	2.86	2.73
March-21	1.70	1.82	2.08	2.96	2.36	2.18	1.39
April-21	3.27	3.85	3.15	3.31	3.06	3.33	4.21
May-21	0.49	0.88	0.71	0.99	0.57	0.73	0.08
June-21	10.26	10.95	10.49	8.17	8.72	9.72	11.12
July-21	7.07	15.22	15.64	13.79	11.55	12.65	12.66
August-21	14.03	10.15	7.83	8.07	8.55	9.73	6.98
September-21	8.86	11.42	8.52	7.92	9.26	9.20	10.01
					Water Year Total	**58.92**	**57.36**

Source: AL BAR - Tampa Bay Water, 2021
St. Leo - NOAA National Climate Data Center

Table 2
AL BAR Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 2011558.003
Augmentation Wells Water Quality
WY 2021

Date	District ID Number	Permittee ID Number	pH	Hardness (mg/L)	Specific Conductance umhos/cm
11-May-21	6	1	6.90	141	291
11-May-21	7	4	6.83	200	405
11-May-21	8	5	6.65	182	368
11-May-21	9	6	6.76	214	431
11-May-21	10	7	OOS	OOS	OOS
11-May-21	11	8	6.52	189	386
11-May-21	12	9	6.51	182	367

OOS - Well 7 Out of Service at time of sampling event

Table 3
Monthly Discharge Quantities
AL BAR Ranch Augmentation Wells
Water Year 2021

	Well 1	Well 4	Well 5	Well 6	Well 7	Well 8	Well 9		
	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	Totals	
DATE	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MGD)
10/31/2020	0.83	12.74	5.35	1.46	0.00	1.84	0.73	22.94	0.74
11/30/2020	0.10	8.23	2.50	0.66	0.69	1.844	2.65	16.67	0.56
12/31/2020	0.70	4.00	3.98	0.49	0.13	1.35	3.89	14.54	0.47
1/31/2021	0.78	9.35	4.27	1.24	0.00	1.60	7.89	25.13	0.81
2/28/2021	0.51	8.66	3.88	0.71	0.25	3.12	3.54	20.69	0.74
3/31/2021	0.52	7.24	3.53	0.73	0.00	1.88	4.38	18.28	0.59
4/30/2021	0.44	5.88	2.57	0.67	0.00	1.83	3.96	15.34	0.51
5/31/2021	0.51	6.99	4.02	1.09	0.99	1.89	7.09	22.58	0.73
6/30/2021	0.50	8.23	3.32	0.97	0.74	1.64	6.29	21.70	0.72
7/30/2021	0.23	3.05	1.93	0.24	0.00	0.71	1.73	7.89	0.25
8/31/2021	0.57	9.81	2.08	0.48	0.002	1.20	1.94	16.10	0.52
9/30/2021	0.35	1.28	0.62	0.00	0.00	0.00	0.00	2.25	0.07

Table 4
Monthly Augmentation Quantities
AL BAR Ranch Wetland Sites WY 2021
(millions of gallons)

	63 (1-SG)	64 (4A-SG)	65 (4B-SG)	66 (5-SG)	67 (6-SG)	68 (7A-SG)	69 (7B-SG)	70 (9A-SG)	71 (9B-SG)	72 (9C-SG)	73 (9D-SG)	74 (9E-SG)	75 (10-SG)		
	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	**TOTALS**	
DATE	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MG)	(MGD)
10/31/2020	0.83	8.61	4.58	2.50	1.46	2.84	0.00	0.06	1.84	0.01	0.08	0.20	0.32	23.33	0.75
11/30/2020	0.10	5.54	2.98	0.59	0.66	1.91	0.69	0.23	1.84	0.02	0.20	0.73	1.23	16.73	0.56
12/31/2020	0.70	2.73	1.40	1.88	0.49	2.09	0.13	0.34	1.35	0.00	0.60	1.08	1.76	14.54	0.47
1/31/2021	0.78	6.38	3.28	1.99	1.24	2.24	0.00	0.69	1.60	0.28	0.00	2.19	3.60	24.264	0.78
2/28/2021	0.51	5.92	3.02	3.88	0.71	2.35	0.25	0.44	3.12	0.22	0.00	1.29	0.0004	21.72	0.75
3/31/2021	0.52	4.97	2.50	0.70	0.73	2.83	0.00	0.54	1.88	0.24	0.00	1.80	0.00	16.71	0.54
4/30/2021	0.44	4.07	2.00	1.00	0.67	1.55	0.00	0.52	1.83	0.17	1.18	1.88	0.00	15.33	0.51
5/31/2021	0.51	4.90	2.33	0.90	1.09	2.99	0.99	0.57	1.89	0.13	1.71	3.08	1.59	22.70	0.73
6/30/2021	0.50	5.73	2.80	0.87	0.97	2.74	0.74	0.12	1.64	0.01	1.19	1.08	2.91	21.30	0.71
7/30/2021	0.23	2.08	1.09	1.15	0.24	0.87	0.00	0.09	0.71	0.01	0.30	0.52	0.78	8.07	0.26
8/31/2021	0.57	6.61	3.59	1.42	0.48	0.77	0.002	0.00	1.20	0.00	0.34	0.59	0.88	16.46	0.53
9/30/2021	0.35	0.86	0.48	0.36	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.35	0.08

Table 5
Monitor Well Groundwater Elevations
AL BAR Ranch
WY 2021

DATE	50 (1-MW)	51 (4A-MW)	52 (4B-MW)	53 (5-MW)	54 (6-MW)	55 (7A-MW)	56 (7B-MW)	57 (9A-MW)	58 (9B-MW)	59 (9C-MW)	60 (9D-MW)	61 (9E-MW)	62 (10-MW)
10/15/2020	66.75	68.87	70.14	69.52	70.95	67.56	69.29	72.78	72.36	72.73	72.89	71.72	73.17
10/31/2020	66.23	68.40	69.81	69.23	70.31	67.11	68.59	72.24	71.77	72.13	72.55	71.03	72.56
11/15/2020	66.57	68.73	70.59	69.94	71.48	67.78	69.63	73.35	72.76	73.35	73.32	72.23	73.45
11/30/2020	65.10	68.56	70.07	69.21	70.50	67.46	69.00	72.67	72.17	72.61	72.66	71.42	72.95
12/15/2020	64.84	67.80	69.65	68.83	70.00	66.90	68.55	72.33	71.71	72.29	72.45	70.94	72.90
12/31/2020	64.65	67.42	69.39	68.71	69.76	66.97	68.42	72.08	71.47	72.02	72.31	70.62	72.93
1/15/2021	64.85	66.99	69.12	68.48	69.23	66.45	68.06	71.81	71.06	71.51	72.01	70.35	72.69
1/31/2021	64.62	66.59	68.85	68.35	68.86	65.96	67.49	71.43	70.76	71.24	71.89	69.76	72.39
2/15/2021	64.37	66.33	68.73	68.39	68.63	65.93	67.39	71.81	71.64	71.69	72.03	69.94	72.51
2/28/2021	64.44	66.14	68.65	68.15	68.61	65.76	67.30	71.40	70.77	71.25	71.88	69.69	71.93
3/15/2021	64.30	66.03	68.53	67.89	68.35	65.61	67.15	71.03	70.31	70.84	71.57	69.40	71.45
3/31/2021	63.88	65.52	68.21	67.78	67.82	64.90	66.56	70.78	70.23	70.56	71.49	68.85	71.36
4/15/2021	63.60	64.87	68.10	67.76	67.72	65.04	66.53	70.86	70.35	70.67	71.51	68.83	70.65
4/30/2021	63.23	64.83	67.69	67.41	67.27	64.81	66.12	70.37	69.81	70.07	71.08	68.35	70.80
5/15/2021	62.67	64.46	67.21	67.09	66.83	64.30	65.63	69.81	69.29	69.52	70.47	67.98	70.26
5/31/2021	61.98	63.74	66.67	66.78	66.07	63.02	64.68	69.06	68.50	68.65	70.17	66.95	69.45
6/15/2021	62.85	63.82	67.20	67.12	66.91	63.41	65.61	69.73	68.91	69.49	70.67	67.40	70.32
6/30/2021	63.39	63.88	66.85	67.27	66.51	63.69	64.84	70.35	69.45	70.20	70.97	67.63	70.58
7/15/2021	67.51	69.66	70.38	69.94	72.35	68.56	70.74	74.12	73.58	74.06	74.12	73.29	74.70
7/30/2021	66.43	69.22	70.13	69.54	71.88	67.97	70.29	73.67	72.94	73.76	73.58	72.58	74.63
8/15/2021	68.19	71.79	72.18	70.92	74.20	69.81	72.29	75.02	74.22	75.06	74.99	74.87	75.34
8/31/2021	67.90	71.69	72.28	70.69	74.26	69.57	72.03	75.18	74.28	75.18	75.15	75.01	75.40
9/15/2021	68.45	72.68	73.34	71.82	74.87	70.95	73.24	ND	75.10	ND	76.08	76.08	ND
9/30/2021	67.71	71.83	73.10	70.91	73.97	70.66	72.62	75.96	75.54	75.72	76.20	76.04	75.99

ND - No data collected due to equipment failure

Table 6
Wetland Water Elevations and Water Depths
AL BAR Ranch
WY 2021

	63 (1-SG)		64 (4A-SG)		65 (4B-SG)		66 (5-SG)	
DATE	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION
10/15/2020	2.92	71.23	4.21	73.55	4.19	73.08	4.65	71.92
10/31/2020	2.53	70.84	5.14	74.48	4.21	73.10	4.61	71.88
11/15/2020	2.64	70.95	4.26	73.60	4.31	73.20	4.57	71.84
11/30/2020	1.48	69.79	4.84	74.18	4.12	73.01	4.28	71.55
12/15/2020	2.36	70.67	3.48	72.82	3.86	72.75	4.15	71.42
12/31/2020	2.34	70.65	4.34	73.68	3.82	72.71	4.31	71.58
1/15/2021	2.56	70.87	3.26	72.60	3.74	72.63	4.09	71.36
1/31/2021	2.48	70.79	4.38	73.72	4.21	73.10	4.15	71.42
2/15/2021	2.42	70.73	3.34	72.68	3.90	72.79	4.15	71.42
2/28/2021	2.36	70.67	4.53	73.87	4.08	72.97	4.16	71.43
3/15/2021	2.26	70.57	3.40	72.74	3.92	72.81	3.89	71.16
3/31/2021	2.40	70.71	4.34	73.68	3.94	72.83	3.85	71.12
4/15/2021	2.26	70.57	3.10	72.44	3.60	72.49	3.81	71.08
4/30/2021	2.24	70.55	4.04	73.38	3.58	72.47	3.83	71.10
5/15/2021	1.86	70.17	2.94	72.28	3.60	72.49	3.89	71.16
5/31/2021	2.22	70.53	2.65	71.99	3.04	71.93	3.47	70.74
6/15/2021	2.36	70.67	3.20	72.54	3.60	72.49	3.59	70.86
6/30/2021	2.53	70.84	4.26	73.60	4.68	73.57	3.69	70.96
7/15/2021	2.64	70.95	3.86	73.20	4.12	73.01	4.29	71.56
7/30/2021	2.62	70.93	3.72	73.06	4.18	73.07	4.27	71.54
8/15/2021	3.28	71.59	4.52	73.86	4.53	73.42	4.83	72.10
8/31/2021	2.58	70.89	4.65	73.99	4.69	73.58	4.65	71.92
9/15/2021	2.78	71.09	4.82	74.16	4.91	73.80	5.11	72.38
9/30/2021	2.12	70.43	4.56	73.90	4.75	73.64	4.75	72.02

Table 6
Wetland Water Elevations and Water Depths
AL BAR Ranch
WY 2021

	67 (6-SG)		68 (7A-SG)		69 (7B-SG)		70 (9A-SG)		71 (9B-SG)	
DATE	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION
10/15/2020	2.21	74.05	3.05	72.64	1.68	73.02	2.42	73.45	3.42	73.26
10/31/2020	2.11	73.95	2.98	72.57	1.48	72.82	1.96	72.99	2.85	72.69
11/15/2020	2.11	73.95	3.11	72.70	1.92	73.26	2.38	73.41	3.22	73.06
11/30/2020	2.19	74.03	2.98	72.57	1.76	73.10	1.90	72.93	3.08	72.92
12/15/2020	1.97	73.81	2.79	72.38	1.68	73.02	1.96	72.99	2.76	72.60
12/31/2020	2.01	73.85	2.66	72.25	1.59	72.93	1.77	72.80	2.75	72.59
1/15/2021	1.47	73.31	2.43	72.02	1.40	72.74	1.94	72.97	2.46	72.30
1/31/2021	1.95	73.79	2.45	72.04	1.04	72.38	1.73	72.76	2.66	72.50
2/15/2021	1.99	73.83	2.45	72.04	1.42	72.76	1.22	72.25	3.12	72.96
2/28/2021	1.75	73.59	2.60	72.19	1.14	72.48	1.52	72.55	3.16	73.00
3/15/2021	1.85	73.69	2.57	72.16	1.10	72.44	1.48	72.51	2.36	72.20
3/31/2021	1.51	73.35	2.70	72.29	0.95	72.29	1.30	72.33	2.58	72.42
4/15/2021	1.75	73.59	2.35	71.94	0.82	72.16	1.32	72.35	2.56	72.40
4/30/2021	1.29	73.13	2.27	71.86	0.68	72.02	1.26	72.29	2.42	72.26
5/15/2021	1.39	73.23	2.21	71.80	0.10	71.44	1.22	72.25	1.92	71.76
5/31/2021	1.36	73.20	2.31	71.90	0.78	72.12	0.56	71.59	2.11	71.95
6/15/2021	1.77	73.61	2.47	72.06	0.18	71.52	0.34	71.37	2.16	72.00
6/30/2021	2.09	73.93	2.62	72.21	1.52	72.86	0.96	71.99	2.28	72.12
7/15/2021	2.67	74.51	3.35	72.94	2.32	73.66	2.52	73.55	3.00	72.84
7/30/2021	2.24	74.08	3.19	72.78	1.98	73.32	2.48	73.51	3.15	72.99
8/15/2021	3.37	75.21	3.41	73.00	2.46	73.80	3.78	74.81	4.08	73.92
8/31/2021	3.07	74.91	3.21	72.80	2.36	73.70	3.86	74.89	4.14	73.98
9/15/2021	3.03	74.87	3.53	73.12	2.74	74.08	UG	UG	4.76	74.60
9/30/2021	2.67	74.51	3.39	72.98	2.70	74.04	4.90	75.93	UG	UG

UG - Unable to read SG due to flooding

Table 6
Wetland Water Elevations and Water Depths
AL BAR Ranch
WY 2021

	72 (9C-SG)		73 (9D-SG)		74 (9E-SG)		75 (10-SG)	
DATE	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION	WATER DEPTHS	WATER ELEVATION
10/15/2020	1.63	73.36	4.72	73.45	5.71	73.42	3.62	74.75
10/31/2020	1.38	73.11	4.38	73.11	5.44	73.15	3.42	74.55
11/15/2020	1.81	73.54	4.66	73.39	5.63	73.34	3.72	74.85
11/30/2020	1.36	73.09	4.31	73.04	5.33	73.04	3.48	74.61
12/15/2020	1.26	72.99	4.22	72.95	5.21	72.92	3.44	74.57
12/31/2020	1.10	72.83	4.12	72.85	5.07	72.78	3.42	74.55
1/15/2021	1.04	72.77	4.06	72.79	4.99	72.70	3.44	74.57
1/31/2021	0.95	72.68	3.92	72.65	4.91	72.62	3.48	74.61
2/15/2021	0.88	72.61	3.86	72.59	4.77	72.48	3.26	74.39
2/28/2021	0.95	72.68	3.90	72.63	4.89	72.60	3.84	74.97
3/15/2021	0.98	72.71	3.90	72.63	4.81	72.52	2.96	74.09
3/31/2021	0.94	72.67	3.68	72.41	4.61	72.32	2.38	73.51
4/15/2021	0.98	72.71	3.62	72.35	4.49	72.20	1.45	73.39
4/30/2021	0.94	72.67	3.39	72.12	4.47	72.18	1.15	73.09
5/15/2021	0.82	72.55	3.24	71.97	4.29	72.00	1.05	72.99
5/31/2021	0.53	72.26	2.88	71.61	3.83	71.54	1.06	73.00
6/15/2021	0.92	72.65	3.20	71.93	4.15	71.86	1.65	73.59
6/30/2021	0.97	72.70	3.25	71.98	4.23	71.94	1.79	73.73
7/15/2021	1.99	73.72	4.84	73.57	5.87	73.58	2.91	74.85
7/30/2021	2.01	73.74	4.68	73.41	5.89	73.60	2.73	74.67
8/15/2021	3.01	74.74	3.92	72.65	7.25	74.96	3.41	75.35
8/31/2021	3.35	75.08	6.58	75.31	7.37	75.08	4.20	75.33
9/15/2021	UG	UG	7.43	76.16	8.21	75.92	4.92	76.05
9/30/2021	4.24	75.97	7.60	76.33	8.39	76.10	4.95	76.08

UG - Unable to read SG due to flooding

APPENDIX D

BI-WEEKLY HYDROLOGIC DATA TABLES

Table 7
AL BAR Ranch
Bi-Weekly Monitor Well Water Level Measurement Data
WY 2021

	50 (1-MW)			51 (4A-MW)			52 (4B-MW)			53 (5-MW)		
DATE	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**
10/15/2020	76.01	9.26	66.75	78.44	9.57	68.87	79.28	9.14	70.14	77.03	7.51	69.52
10/31/2020	76.01	9.78	66.23	78.44	10.04	68.40	79.28	9.47	69.81	77.03	7.80	69.23
11/15/2020	76.01	9.44	66.57	78.44	9.71	68.73	79.28	8.69	70.59	77.03	7.09	69.94
11/30/2020	76.01	10.91	65.10	78.44	9.88	68.56	79.28	9.21	70.07	77.03	7.82	69.21
12/15/2020	76.01	11.17	64.84	78.44	10.64	67.80	79.28	9.63	69.65	77.03	8.20	68.83
12/31/2020	76.01	11.36	64.65	78.44	11.02	67.42	79.28	9.89	69.39	77.03	8.32	68.71
1/15/2021	76.01	11.16	64.85	78.44	11.45	66.99	79.28	10.16	69.12	77.03	8.55	68.48
1/31/2021	76.01	11.39	64.62	78.44	11.85	66.59	79.28	10.43	68.85	77.03	8.68	68.35
2/15/2021	76.01	11.64	64.37	78.44	12.11	66.33	79.28	10.55	68.73	77.03	8.64	68.39
2/28/2021	76.01	11.57	64.44	78.44	12.30	66.14	79.28	10.63	68.65	77.03	8.88	68.15
3/15/2021	76.01	11.71	64.30	78.44	12.41	66.03	79.28	10.75	68.53	77.03	9.14	67.89
3/31/2021	76.01	12.13	63.88	78.44	12.92	65.52	79.28	11.07	68.21	77.03	9.25	67.78
4/15/2021	76.01	12.41	63.60	78.44	13.57	64.87	79.28	11.18	68.10	77.03	9.27	67.76
4/30/2021	76.01	12.78	63.23	78.44	13.61	64.83	79.28	11.59	67.69	77.03	9.62	67.41
5/15/2021	76.01	13.34	62.67	78.44	13.98	64.46	79.28	12.07	67.21	77.03	9.94	67.09
5/31/2021	76.01	14.03	61.98	78.44	14.70	63.74	79.28	12.61	66.67	77.03	10.25	66.78
6/15/2021	76.01	13.16	62.85	78.44	14.62	63.82	79.28	12.08	67.20	77.03	9.91	67.12
6/30/2021	76.01	12.62	63.39	78.44	14.56	63.88	79.28	12.43	66.85	77.03	9.76	67.27
7/15/2021	76.01	8.50	67.51	78.44	8.78	69.66	79.28	8.90	70.38	77.03	7.09	69.94
7/30/2021	76.01	9.58	66.43	78.44	9.22	69.22	79.28	9.15	70.13	77.03	7.49	69.54
8/15/2021	76.01	7.82	68.19	78.44	6.65	71.79	79.28	7.10	72.18	77.03	6.11	70.92
8/31/2021	76.01	8.11	67.90	78.44	6.75	71.69	79.28	7.00	72.28	77.03	6.34	70.69
9/15/2021	76.01	7.56	68.45	78.44	5.76	72.68	79.28	5.94	73.34	77.03	5.21	71.82
9/30/2021	76.01	8.30	67.71	78.44	6.61	71.83	79.28	6.18	73.10	77.03	6.12	70.91

ND - No data collected due to flood conditions

MPE: Measuring Point Elevation
NGVD: National Geodetic Vertical Datum
DTW: Depth to Water

S:\Shared\Engineering\Hydrogeology\CROSS BAR_AL BAR\EXCEL\AL_BAR_WUP\2021 annual\2021_annual_DATA_AlBar

Table 7
AL BAR Ranch
Bi-Weekly Monitor Well Water Level Measurement Data
WY 2021

	54 (6-MW)			55 (7A-MW)			56 (7B-MW)			57 (9A-MW)		
DATE	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**
10/15/2020	78.12	7.17	70.95	77.18	9.62	67.56	76.94	7.65	69.29	78.83	6.05	72.78
10/31/2020	78.12	7.81	70.31	77.18	10.07	67.11	76.94	8.35	68.59	78.83	6.59	72.24
11/15/2020	78.12	6.64	71.48	77.18	9.40	67.78	76.94	7.31	69.63	78.83	5.48	73.35
11/30/2020	78.12	7.62	70.50	77.18	9.72	67.46	76.94	7.94	69.00	78.83	6.16	72.67
12/15/2020	78.12	8.12	70.00	77.18	10.28	66.90	76.94	8.39	68.55	78.83	6.50	72.33
12/31/2020	78.12	8.36	69.76	77.18	10.21	66.97	76.94	8.52	68.42	78.83	6.75	72.08
1/15/2021	78.12	8.89	69.23	77.18	10.73	66.45	76.94	8.88	68.06	78.83	7.02	71.81
1/31/2021	78.12	9.26	68.86	77.18	11.22	65.96	76.94	9.45	67.49	78.83	7.40	71.43
2/15/2021	78.12	9.49	68.63	77.18	11.25	65.93	76.94	9.55	67.39	78.83	7.02	71.81
2/28/2021	78.12	9.51	68.61	77.18	11.42	65.76	76.94	9.64	67.30	78.83	7.43	71.40
3/15/2021	78.12	9.77	68.35	77.18	11.57	65.61	76.94	9.79	67.15	78.83	7.80	71.03
3/31/2021	78.12	10.30	67.82	77.18	12.28	64.90	76.94	10.38	66.56	78.83	8.05	70.78
4/15/2021	78.12	10.40	67.72	77.18	12.14	65.04	76.94	10.41	66.53	78.83	7.97	70.86
4/30/2021	78.12	10.85	67.27	77.18	12.37	64.81	76.94	10.82	66.12	78.83	8.46	70.37
5/15/2021	78.12	11.29	66.83	77.18	12.88	64.30	76.94	11.31	65.63	78.83	9.02	69.81
5/31/2021	78.12	12.05	66.07	77.18	14.16	63.02	76.94	12.26	64.68	78.83	9.77	69.06
6/15/2021	78.12	11.21	66.91	77.18	13.77	63.41	76.94	11.33	65.61	78.83	9.10	69.73
6/30/2021	78.12	11.61	66.51	77.18	13.49	63.69	76.94	12.10	64.84	78.83	8.48	70.35
7/15/2021	78.12	5.77	72.35	77.18	8.62	68.56	76.94	6.20	70.74	78.83	4.71	74.12
7/30/2021	78.12	6.24	71.88	77.18	9.21	67.97	76.94	6.65	70.29	78.83	5.16	73.67
8/15/2021	78.12	3.92	74.20	77.18	7.37	69.81	76.94	4.65	72.29	78.83	3.81	75.02
8/31/2021	78.12	3.86	74.26	77.18	7.61	69.57	76.94	4.91	72.03	78.83	3.65	75.18
9/15/2021	78.12	3.25	74.87	77.18	6.23	70.95	76.94	3.70	73.24	78.83	ND	ND
9/30/2021	78.12	4.15	73.97	77.18	6.52	70.66	76.94	4.32	72.62	78.83	2.87	75.96

ND - No data collected due to flood conditions

MPE: Measuring Point Elevation
NGVD: National Geodetic Vertical Datum
DTW: Depth to Water

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Table 7
AL BAR Ranch
Bi-Weekly Monitor Well Water Level Measurement Data
WY 2021

DATE	58 (9B-MW)			59 (9C-MW)			60 (9D-MW)		
	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**
10/15/2020	78.66	6.30	72.36	78.75	6.02	72.73	78.96	6.07	72.89
10/31/2020	78.66	6.89	71.77	78.75	6.62	72.13	78.96	6.41	72.55
11/15/2020	78.66	5.90	72.76	78.75	5.40	73.35	78.96	5.64	73.32
11/30/2020	78.66	6.49	72.17	78.75	6.14	72.61	78.96	6.30	72.66
12/15/2020	78.66	6.95	71.71	78.75	6.46	72.29	78.96	6.51	72.45
12/31/2020	78.66	7.19	71.47	78.75	6.73	72.02	78.96	6.65	72.31
1/15/2021	78.66	7.60	71.06	78.75	7.24	71.51	78.96	6.95	72.01
1/31/2021	78.66	7.90	70.76	78.75	7.51	71.24	78.96	7.07	71.89
2/15/2021	78.66	7.02	71.64	78.75	7.06	71.69	78.96	6.93	72.03
2/28/2021	78.66	7.89	70.77	78.75	7.50	71.25	78.96	7.08	71.88
3/15/2021	78.66	8.35	70.31	78.75	7.91	70.84	78.96	7.39	71.57
3/31/2021	78.66	8.43	70.23	78.75	8.19	70.56	78.96	7.47	71.49
4/15/2021	78.66	8.31	70.35	78.75	8.08	70.67	78.96	7.45	71.51
4/30/2021	78.66	8.85	69.81	78.75	8.68	70.07	78.96	7.88	71.08
5/15/2021	78.66	9.37	69.29	78.75	9.23	69.52	78.96	8.49	70.47
5/31/2021	78.66	10.16	68.50	78.75	10.10	68.65	78.96	8.79	70.17
6/15/2021	78.66	9.75	68.91	78.75	9.26	69.49	78.96	8.29	70.67
6/30/2021	78.66	9.21	69.45	78.75	8.55	70.2	78.96	7.99	70.97
7/15/2021	78.66	5.08	73.58	78.75	4.69	74.06	78.96	4.84	74.12
7/30/2021	78.66	5.72	72.94	78.75	4.99	73.76	78.96	5.38	73.58
8/15/2021	78.66	4.44	74.22	78.75	3.69	75.06	78.96	3.97	74.99
8/31/2021	78.66	4.38	74.28	78.75	3.57	75.18	78.96	3.81	75.15
9/15/2021	78.66	3.56	75.10	78.75	ND	ND	78.96	2.88	76.08
9/30/2021	78.66	3.12	75.54	78.75	3.03	75.72	78.96	2.76	76.20

ND - No data collected due to flood conditions

MPE: Measuring Point Elevation
NGVD: National Geodetic Vertical Datum
DTW: Depth to Water

S:\Shared\Engineering\Hydrogeology\CROSS BAR_AL BAR\EXCEL\AL_BAR_WUP\2021 annual\2021_annual_DATA_AlBar

Table 7
AL BAR Ranch
Bi-Weekly Monitor Well Water Level Measurement Data
WY 2021

DATE	61 (9E-MW)			62 (10-MW)		
	MPE	DTW	**NGVD**	MPE	DTW	**NGVD**
10/15/2020	79.16	7.44	71.72	77.51	4.34	73.17
10/31/2020	79.16	8.13	71.03	77.51	4.95	72.56
11/15/2020	79.16	6.93	72.23	77.51	4.06	73.45
11/30/2020	79.16	7.74	71.42	77.51	4.56	72.95
12/15/2020	79.16	8.22	70.94	77.51	4.61	72.90
12/31/2020	79.16	8.54	70.62	77.51	4.58	72.93
1/15/2021	79.16	8.81	70.35	77.51	4.82	72.69
1/31/2021	79.16	9.40	69.76	77.51	5.12	72.39
2/15/2021	79.16	9.22	69.94	77.51	5.00	72.51
2/28/2021	79.16	9.47	69.69	77.51	5.58	71.93
3/15/2021	79.16	9.76	69.40	77.51	6.06	71.45
3/31/2021	79.16	10.31	68.85	77.51	6.15	71.36
4/15/2021	79.16	10.33	68.83	77.51	6.86	70.65
4/30/2021	79.16	10.81	68.35	77.51	6.71	70.80
5/15/2021	79.16	11.18	67.98	77.51	7.25	70.26
5/31/2021	79.16	12.21	66.95	77.51	8.06	69.45
6/15/2021	79.16	11.76	67.40	77.51	7.19	70.32
6/30/2021	79.16	11.53	67.63	77.51	6.93	70.58
7/15/2021	79.16	5.87	73.29	77.51	2.81	74.70
7/30/2021	79.16	6.58	72.58	77.51	2.88	74.63
8/15/2021	79.16	4.29	74.87	77.51	2.17	75.34
8/31/2021	79.16	4.15	75.01	77.51	2.11	75.40
9/15/2021	79.16	3.08	76.08	77.51	ND	ND
9/30/2021	79.16	3.12	76.04	77.51	1.52	75.99

ND - No data collected due to flood conditi

MPE: Measuring Point Elevation
NGVD: National Geodetic Vertical Datum
DTW: Depth to Water

Table 8
AL BAR Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 2011558.003
Bi-Weekly Wetland Staff Gauge Data

	63 (1-SG)			64 (4A-SG)									65 (4B-SG)					
		INNER			INNER TBW			INNER TBW E				OUTER			INNER			OUTER	
DATE	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD	MPE	READING	NGVD
10/15/2020	68.31	70.08	71.23							72.59	0.96	73.55				73.00	72.28	73.08
10/31/2020	68.31	69.69	70.84	69.34	73.68	74.48										73.00	72.30	73.10
11/15/2020	68.31	69.80	70.95	69.34	72.80	73.60										73.00	72.40	73.20
11/30/2020	68.31	68.64	69.79	69.34	73.38	74.18							68.89	4.12	73.01			
12/15/2020	68.31	69.52	70.67	69.34	72.02	72.82							68.89	3.86	72.75			
12/31/2020	68.31	69.50	70.65	69.34	72.88	73.68							68.89	3.82	72.71			
1/15/2021	68.31	69.72	70.87	69.34	71.80	72.60							68.89	3.74	72.63			
1/31/2021	68.31	69.64	70.79	69.34	72.92	73.72							68.89	4.21	73.10			
2/15/2021	68.31	69.58	70.73	69.34	71.88	72.68							68.89	3.90	72.79			
2/28/2021	68.31	69.52	70.67	69.34	73.07	73.87							68.89	4.08	72.97			
3/15/2021	68.31	69.42	70.57	69.34	71.94	72.74							68.89	3.92	72.81			
3/31/2021	68.31	69.56	70.71	69.34	72.88	73.68							68.89	3.94	72.83			
4/15/2021	68.31	69.42	70.57	69.34	71.64	72.44							68.89	3.60	72.49			
4/30/2021	68.31	69.40	70.55	69.34	72.58	73.38							68.89	3.58	72.47			
5/15/2021	68.31	69.02	70.17	69.34	71.48	72.28							68.89	3.60	72.49			
5/31/2021	68.31	69.38	70.53	69.34	71.19	71.99							68.89	3.04	71.93			
6/15/2021	68.31	69.52	70.67	69.34	71.74	72.54							68.89	3.60	72.49			
6/30/2021	68.31	69.69	70.84	69.34	72.80	73.60							68.89	4.68	73.57			
7/15/2021	68.31	69.80	70.95	69.34	72.40	73.20							68.89	4.12	73.01			
7/30/2021	68.31	69.78	70.93				69.34	73.24	73.06				68.89	4.18	73.07			
8/15/2021	68.31	70.44	71.59	69.34	73.06	73.86										73.00	72.62	73.42
8/31/2021	68.31	69.74	70.89	69.34	73.19	73.99				72.59	1.42	74.01				73.00	72.78	73.58
9/15/2021	68.31	69.94	71.09	69.34	73.36	74.16										73.00	73.00	73.80
9/30/2021	68.31	69.28	70.43	69.34	73.10	73.90										73.00	72.84	73.64

MPE: Monitor Point Elevation
NGVD: National Geodetic Vertical Datum

Table 8
AL BAR Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 2011558.003
Bi-Weekly Wetland Staff Gauge Data

	66 (5-SG)						67 (6-SG)						68 (7A-SG)					
DATE	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD
10/15/2020				70.94	0.98	71.92	71.84	73.04	74.05							71.60	1.04	72.64
10/31/2020				70.94	0.94	71.88	71.84	72.94	73.95							71.60	0.97	72.57
11/15/2020				70.94	0.90	71.84	71.84	72.94	73.95							71.60	1.10	72.70
11/30/2020	67.27	70.57	71.55				71.84	73.02	74.03							71.60	0.97	72.57
12/15/2020				70.94	0.48	71.42	71.84	72.80	73.81							71.60	0.78	72.38
12/31/2020	67.27	70.60	71.58				71.84	72.84	73.85							71.60	0.65	72.25
1/15/2021				70.94	0.42	71.36	71.84	72.30	73.31							71.60	0.42	72.02
1/31/2021				70.94	0.48	71.42	71.84	72.78	73.79							71.60	0.44	72.04
2/15/2021				70.94	0.48	71.42	71.84	72.82	73.83							71.60	0.44	72.04
2/28/2021	67.27	70.45	71.43				71.84	72.58	73.59							71.60	0.59	72.19
3/15/2021	67.27	70.18	71.16				71.84	72.68	73.69							71.60	0.56	72.16
3/31/2021	67.27	70.14	71.12				71.84	72.34	73.35							71.60	0.69	72.29
4/15/2021	67.27	70.10	71.08				71.84	72.58	73.59							71.60	0.34	71.94
4/30/2021	67.27	70.12	71.10				71.84	72.12	73.13							71.60	0.26	71.86
5/15/2021	67.27	70.18	71.16				71.84	72.22	73.23							71.60	0.20	71.80
5/31/2021	67.27	69.76	70.74				71.84	72.19	73.20							71.60	0.30	71.90
6/15/2021	67.27	69.88	70.86				71.84	72.60	73.61							71.60	0.46	72.06
6/30/2021	67.27	69.98	70.96				71.84	72.92	73.93							71.60	0.61	72.21
7/15/2021	67.27	70.58	71.56				71.84	73.50	74.51							71.60	1.34	72.94
7/30/2021				70.94	0.60	71.54	71.84	73.07	74.08							71.60	1.18	72.78
8/15/2021	67.27	71.12	72.10				71.84	74.20	75.21							71.60	1.40	73.00
8/31/2021				70.94	0.98	71.92	71.84	73.90	74.91							71.60	1.20	72.80
9/15/2021	67.27	71.40	72.38				71.84	73.86	74.87							71.60	1.52	73.12
9/30/2021				70.94	1.08	72.02	71.84	73.50	74.51							71.60	1.38	72.98

MPE: Monitor Point Elevation
NGVD: National Geodetic Vertical Datum

Table 8
AL BAR Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 2011558.003
Bi-Weekly Wetland Staff Gauge Data

	69 (7B-SG)						70 (9A-SG)			71 (9B-SG)					
DATE	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD	MPE	INNER READING	NGVD	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD
10/15/2020				72.54	0.48	73.02	71.03	2.42	73.45				71.94	1.32	73.26
10/31/2020				72.54	0.28	72.82	71.03	1.96	72.99				71.94	0.75	72.69
11/15/2020				72.54	0.72	73.26	71.03	2.38	73.41				71.94	1.12	73.06
11/30/2020				72.54	0.56	73.10	71.03	1.90	72.93				71.94	0.98	72.92
12/15/2020				72.54	0.48	73.02	71.03	1.96	72.99				71.94	0.66	72.60
12/31/2020				72.54	0.39	72.93	71.03	1.77	72.80				71.94	0.65	72.59
1/15/2021				72.54	0.20	72.74	71.03	1.94	72.97				71.94	0.36	72.30
1/31/2021	71.34	1.04	72.38				71.03	1.73	72.76				71.94	0.56	72.50
2/15/2021				72.54	0.22	72.76	71.03	1.22	72.25				71.94	1.02	72.96
2/28/2021	71.34	1.14	72.48				71.03	1.52	72.55				71.94	1.06	73.00
3/15/2021	71.34	1.10	72.44				71.03	1.48	72.51				71.94	0.26	72.20
3/31/2021	71.34	0.95	72.29				71.03	1.30	72.33				71.94	0.48	72.42
4/15/2021	71.34	0.82	72.16				71.03	1.32	72.35				71.94	0.46	72.40
4/30/2021	71.34	0.68	72.02				71.03	1.26	72.29				71.94	0.32	72.26
5/15/2021	71.34	0.10	71.44				71.03	1.22	72.25	69.84	1.92	71.76			
5/31/2021	71.34	0.78	72.12				71.03	0.56	71.59	69.84	2.11	71.95			
6/15/2021	71.34	0.18	71.52				71.03	0.34	71.37	69.84	2.16	72.00			
6/30/2021				72.54	0.32	72.86	71.03	0.96	71.99	69.84	2.28	72.12			
7/15/2021				72.54	1.12	73.66	71.03	2.52	73.55				71.94	0.90	72.84
7/30/2021				72.54	0.78	73.32	71.03	2.48	73.51				71.94	1.05	72.99
8/15/2021				72.54	1.26	73.80	71.03	3.78	74.81				71.94	1.98	73.92
8/31/2021				72.54	1.16	73.70	71.03	3.86	74.89				71.94	2.04	73.98
9/15/2021				72.54	1.54	74.08	71.03	N/A	N/A				71.94	2.66	74.60
9/30/2021				72.54	1.50	74.04	71.03	4.90	75.93				71.94	N/A	N/A

N/A - SG unreadable due to high water

MPE: Monitor Point Elevation
NGVD: National Geodetic Vertical Datum

Table 8
AL BAR Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 2011558.003
Bi-Weekly Wetland Staff Gauge Data

	72 (9C-SG)						73 (9D-SG)						74 (9E-SG)					
DATE	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD
10/15/2020				73.10	0.26	73.36	68.73	4.72	73.45							69.83	73.42	73.42
10/31/2020	71.73	1.38	73.11				68.73	4.38	73.11							69.83	73.15	73.15
11/15/2020				73.10	0.44	73.54	68.73	4.66	73.39							69.83	73.34	73.34
11/30/2020	71.73	1.36	73.09				68.73	4.31	73.04							69.83	73.04	73.04
12/15/2020	71.73	1.26	72.99				68.73	4.22	72.95							69.83	72.92	72.92
12/31/2020	71.73	1.10	72.83				68.73	4.12	72.85							69.83	72.78	72.78
1/15/2021	71.73	1.04	72.77				68.73	4.06	72.79							69.83	72.70	72.70
1/31/2021	71.73	0.95	72.68				68.73	3.92	72.65							69.83	72.62	72.62
2/15/2021	71.73	0.88	72.61				68.73	3.86	72.59							69.83	72.48	72.48
2/28/2021	71.73	0.95	72.68				68.73	3.90	72.63							69.83	72.60	72.60
3/15/2021	71.73	0.98	72.71				68.73	3.90	72.63							69.83	72.52	72.52
3/31/2021	71.73	0.94	72.67				68.73	3.68	72.41							69.83	72.32	72.32
4/15/2021	71.73	0.98	72.71				68.73	3.62	72.35							69.83	72.20	72.20
4/30/2021	71.73	0.94	72.67							71.23	0.89	72.12				69.83	72.18	72.18
5/15/2021	71.73	0.82	72.55				68.73	3.24	71.97							69.83	72.00	72.00
5/31/2021	71.73	0.53	72.26				68.73	2.88	71.61							69.83	71.54	71.54
6/15/2021	71.73	0.92	72.65				68.73	3.20	71.93							69.83	71.86	71.86
6/30/2021	71.73	0.97	72.70							71.23	0.75	71.98				69.83	71.94	71.94
7/15/2021				73.10	0.62	73.72				71.23	2.34	73.57				69.83	73.58	73.58
7/30/2021				73.10	0.64	73.74				71.23	2.18	73.41				69.83	73.60	73.60
8/15/2021				73.10	1.64	74.74				73.76	1.42	75.18				69.83	74.96	74.96
8/31/2021				73.10	1.98	75.08				73.76	1.55	75.31				69.83	75.08	75.08
9/15/2021				73.10	N/A	N/A				73.76	2.40	76.16				69.83	75.92	75.92
9/30/2021	71.73	4.24	75.97							73.76	2.57	76.33				69.83	76.10	76.10

N/A - SG unreadable due to high water

MPE: Monitor Point Elevation
NGVD: National Geodetic Vertical Datum

Table 8
AL BAR Ranch Augmentation
Pinellas County Utilities
Water Use Permit No. 2011558.003
Bi-Weekly Wetland Staff Gauge Data

	75 (10-SG)					
DATE	MPE	INNER READING	NGVD	MPE	OUTER READING	NGVD
10/15/2020				73.19*	1.56	74.75
10/31/2020				73.19*	1.36	74.55
11/15/2020				73.19*	1.66	74.85
11/30/2020				73.19*	1.42	74.61
12/15/2020				73.19*	1.38	74.57
12/31/2020				73.19*	1.36	74.55
1/15/2021				73.19*	1.38	74.57
1/31/2021				73.19*	1.42	74.61
2/15/2021				73.19*	1.20	74.39
2/28/2021				73.19*	1.78	74.97
3/15/2021				72.23	1.86	74.09
3/31/2021				72.23	1.28	73.51
4/15/2021	71.13	72.58	73.39			
4/30/2021	71.13	72.28	73.09			
5/15/2021	71.13	72.18	72.99			
5/31/2021	71.13	72.19	73.00			
6/15/2021	71.13	72.78	73.59			
6/30/2021	71.13	72.92	73.73			
7/15/2021	71.13	74.04	74.85			
7/30/2021	71.13	73.86	74.67			
8/15/2021	71.13	74.54	75.35			
8/31/2021				73.19*	2.14	75.33
9/15/2021				73.19*	2.86	76.05
9/30/2021				73.19*	2.89	76.08

*FG - Flood Gage

MPE: Monitor Point Elevation
NGVD: National Geodetic Vertical Datum

APPENDIX E

ECOLOGICAL MONITORING DATA TABLES

Table 9 (April 2021) Wetland Assessment Procedure (WAP) Scores for thirteen augmented wetlands at ALBAR Ranch

		Ground Cover				Shrub/ Small Trees			Vines	Trees					Water Level		
		Deep Zone	Transitional Zone	Species	Weedy	Composition	Species	Weedy	Vine	Composition	Zonation	% Canopy	% Leaning	% Dead	Current	Total WAP	Max.
Site	FLUCFCS	Composition	Composition	Zonation	Composition		Zonation	Composition	Zonation			Stress			Indicators	Score	WAP Score
1-AB	643	3	2	2	3	2	2	3	3	N/A	N/A	N/A	N/A	N/A	1	21	27
4A-AB	523	3	2	3	2	1	2	1	N/A	1	1	3	3	3	1	26	39
4B-AB	641	3	1	2	2	2	3	2	3	N/A	N/A	N/A	N/A	N/A	3	21	27
5-AB	641	3	2	3	2	1	2	2	3	N/A	N/A	N/A	N/A	N/A	3	21	27
6-AB	643	3	3	3	2	1	3	1	3	N/A	N/A	N/A	N/A	N/A	1	20	27
7A-AB	641	3	3	3	2	1	1	2	3	1	2	3	3	3	3	33	42
7B-AB	641	3	2	2	2	1	2	3	N/A	N/A	N/A	N/A	N/A	N/A	3	18	24
9A-AB	643	3	3	3	3	3	3	3	3	N/A	N/A	N/A	N/A	N/A	3	27	27
9B-AB	643	3	2	3	3	N/A	N/A	N/A	3	N/A	N/A	N/A	N/A	N/A	3	17	18
9C-AB	643	3	3	3	2	3	3	3	3	N/A	N/A	N/A	N/A	N/A	1	24	27
9D-AB	523	3	3	3	3	3	3	3	3	N/A	N/A	N/A	N/A	N/A	3	27	27
9E-AB	523	3	3	3	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	15	15
10-AB	641	3	3	3	3	3	3	3	N/A	N/A	N/A	N/A	N/A	N/A	3	24	24

TABLE 10 (September 2021) Wetland Assessment Procedure (WAP) Scores for thirteen augmented wetlands at ALBAR Ranch

		Ground Cover				Shrub/ Small Trees			Vines	Trees					Water Level		
		Deep Zone	Transitional Zone	Species	Weedy	Composition	Species	Weedy	Vine	Composition	Zonation	% Canopy	% Leaning	% Dead	Current	Total WAP	Max.
Site	FLUCFCS	Composition	Composition	Zonation	Composition		Zonation	Composition	Zonation			Stress			Indicators	Score	WAP Score
1-AB	643	3	2	2	3	2	2	3	3	N/A	N/A	N/A	N/A	N/A	1	21	27
4A-AB	523	3	2	2	3	1	2	1	N/A	1	2	3	3	3	1	27	39
4B-AB	641	3	2	2	2	1	2	2	3	N/A	N/A	N/A	N/A	N/A	3	20	27
5-AB	641	3	2	3	2	1	2	2	3	N/A	N/A	N/A	N/A	N/A	3	21	27
6-AB	643	3	2	3	1	1	3	1	3	1	2	3	3	3	1	30	42
7A-AB	641	3	2	3	3	1	2	2	3	1	1	3	3	3	3	33	42
7B-AB	641	3	2	3	3	2	3	3	3	1	2	3	3	3	3	37	42
9A-AB	643	3	2	3	3	3	3	3	3	N/A	N/A	N/A	N/A	N/A	3	26	27
9B-AB	643	3	2	2	2	1	2	2	3	N/A	N/A	N/A	N/A	N/A	3	20	27
9C-AB	643	3	2	3	2	3	3	3	3	N/A	N/A	N/A	N/A	N/A	3	25	27
9D-AB	523	3	2	3	3	3	3	3	3	N/A	N/A	N/A	N/A	N/A	3	26	27
9E-AB	523	3	2	3	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	13	15
10-AB	641	3	3	3	3	3	3	3	N/A	N/A	N/A	N/A	N/A	N/A	3	24	24

TABLE 11. Quantitative Monitoring Wetland Scores By Zone for 4 Wetland Sites WY2001 & WY2021

SITE 4B 2001 MAY		**SITE 4B 2001** AUG		**SITE 4B 2021** APRIL		**SITE 4B 2021** SEPT		**SITE 5 2001** MAY		**SITE 5 2001** AUG		**SITE 5 2021** APRIL		**SITE 5 2021** SEPT	
Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep
1.73	1.00	1.89	1.00	2.52	1.88	2.60	2.16	2.07	1.53	2.07	1.00	1.92	1.06	2.21	1.17
SITE 9C 2001 APRIL		**SITE 9C 2001** AUG		**SITE 9C 2021** APRIL		**SITE 9C 2021** SEPT		**SITE 10 2001** APRIL		**SITE 10 2001** AUG		**SITE 10 2021** APRIL		**SITE 10 2021** SEPT	
Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep	Trans	Deep
2.16	2.13	2.13	1.76	2.16	1.18	2.05	1.06	1.58	1.20	2.26	1.20	1.19	1.07	1.14	1.04

TABLE 12. Quantitative Monitoring Wetland Scores for 4 Wetland Sites WY2001 & WY2021

SITE 4B 2001		**SITE 4B 2021**		**SITE 5 2001**		**SITE 5 2021**		**SITE 9C 2001**		**SITE 9C 2021**		**SITE 10 2001**		**SITE 10 2021**	
MAY	AUG.	APR	SEPT	MAY	AUG.	APR	SEPT	MAY	AUG	APR	SEPT	MAY	AUG.	APR	SEPT
1.46	1.43	2.40	2.54	2.66	2.24	1.29	1.88	3.43	2.65	1.80	1.67	1.24	1.54	1.14	1.09

Table 13

Wetland 4B Vegetation Summary April 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Amphicarpum muehlenbergianum	FACW	2	23	10.95%	46.00	-	-	-
Euthamia caroliniana	FACW	2	6	2.86%	12.00	-	-	-
Axonopus furcatus	OBL	1	14	6.67%	14.00	-	-	-
Euphorbia bombensis	FACU	4	5	2.38%	20.00	-	-	-
Andropogon virginicus	FAC	3	10	4.76%	30.00	-	-	-
Croton michauxii	UPL	5	8	3.81%	40.00	-	-	-
Dichanthelium portoricense	FAC	3	16	7.62%	48.00	-	-	-
Panicum hemitomon	OBL	1	1	0.48%	1.00	7	10.61%	7.00
Hypericum mutilum	FACW	2	2	0.95%	4.00	-	-	-
Crocanthemum nashii	FACU+	3.67	1	0.48%	3.67	-	-	-
Andropogon virginicus var. glaucus	FACU	4	15	7.14%	60.00	-	-	-
Quercus virginiana	FACU+	3.67	2	0.95%	7.34	-	-	-
Panicum repens	FACW-	2.33	11	5.24%	25.63	25	37.88%	58.25
Paspalum notatum	FACU+	3.67	3	1.43%	11.01	-	-	-
Syngonanthus flavidulus	FACW+	1.67	9	4.29%	15.03	-	-	-
Water	NI	-	37	17.62%	-	26	39.39%	-
Bare ground	NI	-	-	-	-	-	-	-
Fuirena scirpoidea	OBL	1	4	1.90%	4.00	-	-	-
Eragrostis elliottii	NI	-	4	1.90%	-	-	-	-
Bulbostylis ciliatifolia	FACU	4	10	4.76%	40.00	-	-	-
Rhynchospora sp.	FACW	2	1	0.48%	2.00	-	-	-
Hypericum tetrapetalum	FACW	2	1	0.48%	2.00	-	-	-
Eupatorium leptophyllum	FACW+	1.67	4	1.90%	6.68	-	-	-
Hypericum myrtifolium	FACW	2	1	0.48%	2.00	-	-	-
Erechtites hieraciifolius	FAC-	3.33	1	0.48%	3.33	-	-	-
Juncus marginatus	FACW	2	4	1.90%	8.00	-	-	-
Mikania scandens	FACW+	1.67	8	3.81%	13.36	2	3.03%	3.34
Andropogon glomeratus	FACW+	1.67	7	3.33%	11.69	1	1.52%	1.67
Pontederia cordata	OBL	1	-	-	-	5	7.58%	5.00
Pluchea camphorata	FACW-	2.33	2	0.95%	4.66	-	-	-

Table 13

Wetland 4B Vegetation Summary September 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Amphicarpum muehlenbergianum	FACW	2	31	10.51%	62.00	-	-	-
Euthamia caroliniana	FACW	2	3	1.02%	6.00	-	-	-
Axonopus furcatus	OBL	1	27	9.15%	27.00	-	-	-
Richardia spp.	NI	-	5	1.69%	-	-	-	-
Andropogon virginicus	FAC	3	19	6.44%	57.00	-	-	-
Croton michauxii	UPL	5	26	8.81%	130.00	-	-	-
Dichanthelium portoricense	FAC	3	31	10.51%	93.00	-	-	-
Panicum hemitomon	OBL	1	5	1.69%	5.00	1	2.50%	1.00
Rhynchospora microcarpa	FACW+	1.67	3	1.02%	5.01	-	-	-
Eupatorium capillifolium	FACU+	3.67	3	1.02%	11.01	-	-	-
Andropogon virginicus var. glaucus	FACU	4	12	4.07%	48.00	-	-	-
Eriocaulon spp.	OBL	1	6	2.03%	6.00	-	-	-
Panicum repens	FACW-	2.33	4	1.36%	9.32	33	82.50%	76.89
Bare ground	NI	-	10	13.56%	-	-	-	-
Eragrostis elliottii	FAC	3	9	3.05%	27.00	-	-	-
Bulbostylis ciliatifolia	FACU	4	24	8.14%	96.00	-	-	-
Mikania scandens	FACW+	1.67	5	1.69%	8.35	3	7.50%	5.01
Andropogon glomeratus	FACW+	1.67	3	1.02%	5.01	1	2.50%	1.67
Pontederia cordata	OBL	1	-	-	-	1	2.50%	1.00
Hypericum myrtifolium	FACW	2	6	2.03%	12.00	-	-	-
Serenoa repens	FACU	4	2	0.68%	8.00	-	-	-
Ludwigia suffruticosa	OBL	1	11	3.73%	11.00	-	-	-
Quercus virginiana	FACU+	3.67	2	0.68%	7.34	-	-	-
Paspalum setaceum	FAC	3	4	1.36%	12.00	-	-	-
Scleria reticularis	FACW	2	1	0.34%	2.00	-	-	-
Salix caroliniana	OBL	1	-	-	-	1	2.50%	1.00

Table 14

Wetland 5 Vegetation Summary April 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Amphicarpum muehlenbergianum	FACW	2	15	9.62%	30.00	-	-	-
Dichanthelium portoricense	FAC	3	7	4.49%	21.00	-	-	-
Axonopus furcatus	OBL	1	16	10.26%	16.00	-	-	-
Euthamia caroliniana	FACW	2	1	0.64%	2.00	-	-	-
Croton michauxii	UPL	5	5	3.21%	25.00	-	-	-
Andropogon virginicus	FAC	3	12	7.69%	36.00	-	-	-
Andropogon virginicus var. glaucus	FACU	4	3	1.92%	12.00	-	-	-
Paspalum spp.	FAC	3	2	1.28%	6.00	-	-	-
Hydrocotyle umbellata	OBL	1	10	6.41%	10.00	6	5.17%	6.00
Mikania scandens	FACW+	1.67	8	5.13%	13.36	2	1.72%	3.34
Pinus elliottii	FACW	2	2	1.28%	4.00	-	-	-
Eragrostis spp.	NI		3	1.92%	0.00	-	-	-
Phyla nodiflora	FACW	2	8	5.13%	16.00	2	1.72%	4.00
Panicum hemitomon	OBL	1	3	1.92%	3.00	13	11.21%	13.00
Fuirena scirpoidea	OBL	1	8	5.13%	8.00	-	-	-
Leersia hexandra	OBL	1	2	1.28%	2.00	9	7.76%	9.00
Eupatorium mohrii	FACW-	2.33	3	1.92%	6.99	-	-	-
Ophioglossum petiolatum	FAC	3	1	0.64%	3.00		-	-
Persicaria punctata	FACW+	1.67	-	-	-	3	2.59%	5.01
Pontederia cordata	OBL	1	2	1.28%	2.00	21	18.10%	21.00
Water	NI		-	-	-	32	27.59%	-
Centella asiatica	FACW	2	3	1.92%	6.00	-	-	-
Syngonanthus flavidulus	FACW+	1.67	5	3.21%	8.35	-	-	-
Bare ground	NI		18	11.54%	1.00	1	0.86%	-
Eupatorium leptophyllum	FACW+	1.67	1	0.64%	1.67	-	-	-
Paspalum setaceum	FAC	3	2	1.28%	6.00	-	-	-
Serenoa repens	FACU	4	1	0.64%	4.00	-	-	-
Rhexia mariana	FACW+	1.67	1	0.64%	1.67	-	-	-
Ludwigia repens	OBL	1	1	0.64%	1.00	2	1.72%	2.00
Typha spp.	OBL	1	2	1.28%	2.00	25	21.55%	25.00
Ludwigia microcarpa	OBL	1	4	2.56%	4.00	-	-	-
Andropogon glomeratus	FACW+	1.67	4	2.56%	6.68	-	-	-
Edrastima uniflora	FACW-	2.33	2	1.28%	4.66	-	-	-
Cirsium nuttallii	FAC	3	1	0.64%	3.00	-	-	-

Table 14

Wetland 5 Vegetation Summary September 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Amphicarpum muehlenbergianum	FACW	2	22	10.73%	44.00	2	1.65%	4.00
Dichanthelium portoricense	FAC	3	15	7.32%	45.00	-	-	-
Axonopus furcatus	OBL	1	14	6.83%	14.00	-	-	-
Euthamia caroliniana	FACW	2	7	3.41%	14.00	-	-	-
Croton michauxii	UPL	5	14	6.83%	70.00	-	-	-
Andropogon virginicus	FAC	3	20	9.76%	60.00	-	-	-
Andropogon virginicus var. glaucus	FACU	4	2	0.98%	8.00	-	-	-
Hydrocotyle umbellata	OBL	1	4	1.95%	4.00	7	5.79%	7.00
Mikania scandens	FACW+	1.67	8	3.90%	13.36	4	3.31%	6.68
Eragrostis sp.	NI	-	8	3.90%	0.00	-	-	-
Phyla nodiflora	FACW	2	3	1.46%	6.00	8	6.61%	16.00
Panicum hemitomon	OBL	1	4	1.95%	4.00	11	9.09%	11.00
Fuirena scirpoidea	OBL	1	4	1.95%	4.00	-	-	-
Leersia hexandra	OBL	1	1	0.49%	1.00	6	4.96%	6.00
Persicaria punctata	FACW+	1.67	-	-	-	3	2.48%	5.01
Pontederia cordata	OBL	1	1	0.49%	1.00	23	19.01%	23.00
Water	NI	-	3	1.46%	-	33	27.27%	-
Centella asiatica	FACW	2	2	0.98%	4.00	-	-	-
Bare ground	NI	-	17	8.29%	-	-	-	-
Rhynchospora microcarpa	FACW+	1.67	3	1.46%	5.01	-	-	-
Paspalum setaceum	FAC	3	10	4.88%	30.00	-	-	-
Eupatorium mohrii	FACW-	2.33	6	2.93%	13.98	-	-	-
Typha sp.	OBL	1	1	0.49%	1.00	22	18.18%	22.00
Andropogon glomeratus	FACW+	1.67	4	1.95%	6.68	-	-	-
Hypericum myrtifolium	FACW	2	2	0.98%	4.00	-	-	-
Bulbostylis ciliatifolia	FACU	4	2	0.98%	8.00	-	-	-
Richardia sp.	NI	-	7	3.41%	-	-	-	-
Eupatorium capillifolium	FACU+	3.67	4	1.95%	14.68	-	-	-
Ludwigia microcarpa	OBL	1	2	0.98%	2.00	-	-	-
Serenoa repens	FACU	4	1	0.49%	4.00	-	-	-
Erigeron vernus	OBL	1	7	3.41%	7.00	-	-	-
Pinus elliottii	UPL	5	3	1.46%	15.00	-	-	-
Cirsium nuttallii	FAC	3	1	0.49%	3.00	-	-	-
Ludwigia repens	OBL	1	3	1.46%	3.00	1	0.83%	1.00
Salix caroliniana	OBL	1	-	-	-	1	0.83%	1.00

* Zone Scores are the product of "number of occurances" and "Classification Score"

* (-) Represents a value of 0.00

Table 15

Wetland 9C Vegetation Summary April 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Axonopus furcatus	OBL	1	8	3.90%	8.00	-	-	-
Andropogon virginicus	FAC	3	13	6.34%	39.00	-	-	-
Amphicarpum muehlenbergianum	FACW	2	22	10.73%	44.00	1	0.83%	4.00
Andropogon virginicus var. glaucus	FACU	4	-	-	-	1	0.83%	1.00
Salix caroliniana	OBL	1	-	-	-	5	4.17%	5.00
Ludwigia microcarpa	OBL	1	6	2.93%	6.00	-	-	-
Eustachys petraea	FACU-	4.33	1	0.49%	4.33	-	-	-
Eupatorium mohrii	FACW-	2.33	1	0.49%	2.33	4	3.33%	12.00
Cirsium nuttallii	FAC	3	10	4.88%	30.00	18	15.00%	18.00
Leersia hexandra	OBL	1	6	2.93%	6.00	4	3.33%	8.00
Phyla nodiflora	FACW	2	21	10.24%	42.00	-	-	-
Eleocharis baldwinii	FACW+	1.67	2	0.98%	3.34	-	-	-
Rhexia mariana	FACW+	1.67	12	5.85%	20.04	17	14.17%	17.00
Hydrocotyle umbellata	OBL	1	13	6.34%	13.00	-	-	-
Xyris elliottii	OBL	1	2	0.98%	2.00	-	-	-
Oxalis corniculata	FACU	4	10	4.88%	40.00	9	7.50%	9.00
Ludwigia repens	OBL	1	1	0.49%	1.00	22	18.33%	22.00
Bacopa caroliniana	OBL	1	-	-	-	16	13.33%	16.00
Panicum hemitomon	OBL	1	9	4.39%	9.00	-	-	-
Polypremum procumbens	FACU-	4.33	8	3.90%	34.64	9	7.50%	-
Water	NI	-	0	0.00%	0.00	1	0.83%	-
Bare ground	NI	-	23	11.22%	0.00	-	-	-
Gamochaeta pensylvanica	FACU-	4.33	6	2.93%	25.98	-	-	-
Euthamia caroliniana	FACW	2	1	0.49%	2.00	4	3.33%	4.00
Nymphaea odorata	OBL	1	-	-	-	-	-	-
Eupatorium capillifolium	FACU+	3.67	1	0.49%	3.67	-	-	-
Buchnera americana	FAC	3	1	0.49%	3.00	-	-	-
Edrastima uniflora	FACW-	2.33	5	2.44%	11.65	-	-	-
Drosera capillaris	OBL	1	4	1.95%	4.00	-	-	-
Scoparia dulcis	FAC	3	3	1.46%	9.00	-	-	-
Cyperus sp.	FACW	2	4	1.95%	8.00	-	-	-
Mikania scandens	FACW+	1.67	5	2.44%	8.35	3	2.50%	5.01
Erigeron quercifolius	FAC+	2.67	1	0.49%	2.67	-	-	-
Eupatorium leptophyllum	FACW+	1.67	6	2.93%	10.02	4	3.33%	6.68
Cyperus haspan	OBL	1	-	-	-	1	0.83%	1.00
Fuirena scirpoidea	OBL	1	-	-	-	1	0.83%	1.00

Table 15

Wetland 9C Vegetation Summary September 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Axonopus furcatus	OBL	1	8	6.20%	8.00	-	-	-
Andropogon virginicus	FAC	3	10	7.75%	30.00	-	-	-
Amphicarpum muehlenbergianum	FACW	2	22	17.05%	44.00	-	-	-
Croton michauxii	UPL	5	5	3.88%	25.00	-	-	-
Leersia hexandra	OBL	1	18	13.95%	18.00	23	24.47%	23.00
Phyla nodiflora	FACW	2	2	1.55%	4.00	-	-	-
Persicaria punctata	FACW+	1.67	-	-	-	2	2.13%	3.34
Hydrocotyle umbellata	OBL	1	2	1.55%	2.00	-	-	-
Xyris elliottii	OBL	1	2	1.55%	2.00	-	-	-
Bacopa caroliniana	OBL	1	-	-	-	5	5.32%	5.00
Panicum hemitomon	OBL	1	2	1.55%	2.00	17	18.09%	17.00
Water	NI	-	30	23.26%	-	31	32.98%	-
Eragrostis elliottii	FAC	3	12	9.30%	36.00	-	-	-
Nymphaea odorata	OBL	1	-	-	-	6	6.38%	6.00
Scleria reticularis	FACW+	1.67	4	3.10%	6.68	-	-	-
Mikania scandens	FACW+	1.67	5	3.88%	8.35	1	1.06%	1.67
Sacciolepis striata	OBL	1	1	0.78%	1.00	7	7.45%	7.00
Euthamia caroliniana	FACW	2	1	0.78%	2.00	-	-	-
Eupatorium mohrii	FACW	2	1	0.78%	2.00	-	-	-
Hypericum myrtifolium	FACW	2	1	0.78%	2.00	-	-	-
Rhynchospora microcarpa	FCAW	2	1	0.78%	2.00	1	1.06%	2.00
Eupatorium capillifolium	FACU	4	2	1.55%	8.00	-	-	-
Rhynchospora inundata	FACW	2	-	-	-	1	1.06%	2.00

* Zone Scores are the product of "number of Occurrences" and "Classification Score"

* (-) Represents a value of 0.00

Table 16

Wetland 10 Vegetation Summary April 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Amphicarpum muehlenbergianum	FACW	2	11	5.16%	22.00	-	-	-
Centella asiatica	FACW	2	5	2.35%	10.00	-	-	-
Eleocharis vivipara	OBL	1	8	3.76%	8.00	-	-	-
Leersia hexandra	OBL	1	25	11.74%	25.00	3	1.71%	3.00
Xyris elliottii	OBL	1	2	0.94%	2.00	-	-	-
Eleocharis baldwinii	FACW+	1.67	-	-	-	4	2.29%	6.68
Pluchea baccharis	FACW	2	2	0.94%	4.00	-	-	-
Hydrocotyle umbellata	OBL	1	2	0.94%	2.00	7	4.00%	7.00
Panicum hemitomon	OBL	1	24	11.27%	24.00	33	18.86%	33.00
Ludwigia suffruticosa	OBL	1	7	3.29%	7.00	-	-	-
Pontederia cordata	OBL	1	18	8.45%	18.00	41	23.43%	41.00
Sagittaria lancifolia	OBL	1	3	1.41%	3.00	22	12.57%	22.00
Eleocharis interstincta	OBL	1	3	1.41%	3.00	15	8.57%	15.00
Oldenlandia uniflora	NI	1	30	14.08%	-	28	16.00%	-
Lactuca graminifolia	OBL	1	1	0.47%	1.00	-	-	-
Bacopa caroliniana	OBL	1	23	10.80%	23.00	-	-	-
Water	NI	-	3	1.41%	3.00	11	6.29%	11.00
Eriocaulon sp.	OBL	1	11	5.16%	11.00	-	-	-
Ludwigia repens	OBL	1	1	0.47%	1.00	-	-	-
Proserpinaca palustris	OBL	1	3	1.41%	3.00	-	-	-
Nymphaea odorata	OBL	1	1	0.47%	1.00	-	-	-
Andropogon virginicus var. glaucus	FAC	3	5	2.35%	15.00	-	-	-
Bare ground	NI	-	16	7.51%	-	-	-	-
Fuirena scirpoidea	OBL	1	3	1.41%	3.00	-	-	-
Hypericum fasciculatum	OBL	1	2	0.94%	2.00	1	57.00%	1.00
Rhynchospora sp.	FACW	2	4	1.88%	8.00	-	-	-
Solidago fistulosa	FACW	2	-	-	-	8	4.57%	16.00
Utricularia gibba	OBL	1	-	-	-	2	1.14%	2.00

Wetland 10 Vegetation Summary September 2021								
Species	**Plant Hydroperiod Index (P.H.I.) Classification**	**P.H.I. Value**	**Occurrences in Transition Zone**	**Transition Zone % Cover**	**Transition Zone Score**	**Occurrences in Deep Zone**	**Deep Zone % Cover**	**Deep Zone Score**
Amphicarpum muehlenbergianum	FACW	2	10	4.20%	20.00	1	0.41%	2.00
Eleocharis vivipara	OBL	1	-	-	-	10	4.07%	10.00
Leersia hexandra	OBL	1	42	17.65%	42.00	5	2.03%	5.00
Xyris elliottii	OBL	1	2	0.84%	2.00	1	0.41%	1.00
Rhynchospora tracyi	OBL	1	13	5.46%	13.00	-	-	-
Hydrocotyle umbellata	OBL	1	-	-	-	11	4.47%	11.00
Rhynchospora microcarpa	FACW+	1.67	1	0.42%	1.67	-	-	-
Panicum hemitomon	OBL	1	30	12.61%	30.00	36	14.63%	36.00
Ludwigia suffruticosa	OBL	1	4	1.68%	4.00	2	0.81%	2.00
Pontederia cordata	OBL	1	31	13.03%	31.00	51	20.73%	51.00
Sagittaria lancifolia	OBL	1	7	2.94%	7.00	34	13.82%	34.00
Eleocharis interstincta	OBL	1	7	2.94%	7.00	17	6.91%	17.00
Water	NI	-	57	23.95%	-	39	15.85%	0.00
Ludwigia leptocarpa	OBL	1	-	-	-	10	4.07%	10.00
Bacopa caroliniana	OBL	1	18	7.56%	18.00	1	0.41%	1.00
Nymphaea odorata	OBL	1	4	1.68%	4.00	17	6.91%	17.00
Eragrostis elliottii	FAC	3	4	1.68%	12.00	-	-	-
Salix caroliniana	OBL	1	-	-	-	1	0.41%	1.00
Utricularia gibba	OBL	1	-	-	-	2	0.81%	2.00
Rhynchospora inundata	FACW	2	2	0.84%	4.00	-	-	-
Fuirena scirpoidea	OBL	1	2	0.84%	2.00	1	0.41%	1.00
Pluchea baccharis	FACW	2	1	0.42%	2.00	-	-	-
Diodia virginiana	OBL	3	2	0.84%	6.00	-	-	-
Ludwigia repens	FACW	1	1	0.42%	1.00	-	-	-
Cyperus odoratus	FACW	2	-	-	-	3	1.22%	6.00
Eupatorium capillifolium	FACU	4	-	-	-	1	0.41%	4.00
Solidago sempervirens	FACW	2	-	-	-	1	0.41%	2.00
Habenaria repens	FACW	2	-	-	-	1	0.41%	2.00
Ludwigia octovalvis	OBL	1	-	-	-	1	0.41%	1.00

* Zone Scores are the product of "number of Occurrences" and "Classification Score"

* (-) Represents a value of 0.00

TABLE 17 - WILDLIFE OBSERVATIONS FOR WATER YEAR 2021 AT THIRTEEN MONITORING LOCATIONS ON AL BAR RANCH

Species	April 2021	September 2021
	Monitoring Sites	**Monitoring Sites**
Birds		
American Bittern	**9A**	**10**
American Coot	**4A, 4B**	**-**
Bald Eagle	**-**	**9A, 9C**
Black-bellied Whistling Duck	**-**	**9C**
Belted Kingfisher	**-**	**9C**
Boat-Tailed Grackle	**10**	**-**
Common Gallinule	**4A, 5, 7A**	**4A, 4B, 5, 7A, 7B, 9A, 10**
Common Yellowthroat	**-**	**4B**
Florida Scrub-Jay	**9A**	**9A, 9C**
Great Blue Heron	**10**	**10**
Great Egret	**9B, 9C, 10**	**4B, 6, 9A, 9C, 10**
Greater Yellowlegs	**9E**	**-**
Little Blue Heron	**5**	**9A, 9B, 10**
Mottled Duck	**4B**	**4B, 9C**
Pied-billed Grebe	**-**	**9D**
Red-Winged Blackbird	**10**	**-**
Sandhill Crane	**4A, 4B, 7B, 9C**	**7B, 9A, 9C, 9E, 10**
White Ibis	**5**	**10**
Wilson's Snipe	**9A**	**-**
Amphibians		
Pig Frog	**4B, 7A, 10**	**4A, 10**
Florida Cricket Frog	**4A, 4B, 7A, 9C, 10**	**-**
Squirrel Treefrog	**-**	**1, 6, 10**
Mammals		
Wild Hog	**7A**	**-**
Fish		
Mosquitofish	**5, 9D, 9E, 10**	**4A, 6, 7B, 9A, 9B, 9C, 9D, 9E, 10**