

Electronic Report Transmittal Form

Attention:

Discharger: Wild Wings County Service Area
Name of Facility: Wild Wings Water Recycling Facility
WDRs Order Number: R5-2002-0077
CIWQS Place 1D: 272537
County: Yolo

I am hereby submitting to the Central Valley Water Board the following information:

Check all that apply:

Technical Report Title and Date _____

Monthly Monitoring Report for the month of _____

2nd / 3rd / 4th (circle one) Quarterly Monitoring Report for the year of _____

1st/ 2nd (circle one) Semi-annual Monitoring Report for the year _____

Annual Monitoring Report for the year N/A _____

Violation Notification:

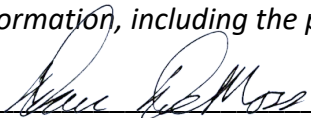
During the monitoring period, there were not (circle one) any violations of the WDRs

1. The violations were:

2. Have the violations been corrected? Yes / No. If no, what will be done to correct the violations:

Certification Statement:

"I certify under penalty of law that I have personally examined and am familiar with the Information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Signature:  Phone: 916.616.7761

Printed Name: Dan DeMoss Date: 5/31/2019

**Wild Wings Water Recycling Facility – First Quarter 2019
Groundwater Monitoring Report
WDR Order No. R5-2002-0077**

Prepared for:

Yolo County, California



May 2019

Prepared by:

California Rural Water Association



California
Rural Water Association



California

Rural Water Association

May 31, 2019

Ms. Beth Gabor
Yolo County
625 Court Street,
Room 202
Woodland, CA 95695

VIA Email.

**Re: Groundwater Monitoring Report First Quarter 2019
Wild Wings Water Recycling Facility, Yolo County, CA WDR No. R5-2002-0077**

Dear Ms. Gabor:

California Rural Water Association is pleased to present this report as a summary of the Groundwater Monitoring Data from the First Quarter of 2019.

If you have any questions regarding this report, please call our Senior Hydrogeologist, Thomas Ballard, CHG, at (916) 761-3700 or Dan DeMoss at (916) 553-4900.

Sincerely,
California Rural Water Association

Dan DeMoss
Executive Director

A handwritten signature in blue ink that reads "Thomas E. Ballard".

Thomas Ballard
Senior Hydrogeologist

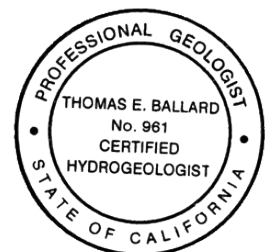


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1.0 INTRODUCTION

California Rural Water Association (CRWA) prepared this groundwater monitoring report on behalf of Yolo County for the Wild Wings Water Recycling Facility (WWRF) at the Wild Wings residential development, in Yolo County, California. This report represents and summarizes data collected and analyzed by CRWA, in conjunction with contract laboratory work, in February 2019; and also includes historical data and information from previous reports, consultants and laboratories.

Yolo County requested that CRWA provide groundwater monitoring and reporting for the WWRF to comply with Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (WDR) Order R5-2002-0077. The WDR requires quarterly monitoring and reporting of the groundwater levels and quality at the monitoring wells. National, under contract with Yolo County, began operating the WWRF on April 1, 2016. CRWA performed the field sampling and monitoring at the site on February 28, 2019.

1.1 LOCATION

The Wild Wings development is located north of Highway 16 and west of County Road 94B at 18530 Wildwings Drive, Woodland, CA 95695, and is surrounded by agricultural land to the west, Cache Creek and the Yolo Fliers Golf Club to the north, the Watts-Woodland Airport to the east, and several rural residences to the south. In early 2015, almond orchards were planted in the agricultural land to the west of the site and water wells were installed to provide water for the orchards. The WWRF encompasses 3.67 acres (400 by 400 feet) along the southwestern side of the Wild Wings development. Figure 1 shows the location of the WWRF along with general site information and locations of seven (7) monitoring wells.

1.2 SITE INFORMATION

The Wild Wings development consists of over 300 homes, a nine-hole golf course (including several ponds/lakes), and the WWRF, all built on 238 acres of previously undeveloped land. The WWRF has been operating since February 2005. Domestic wastewater from the Wild Wings development is treated to a tertiary level at the WWRF. The treated water is then blended with groundwater obtained from two deep on-site water supply wells and is used for irrigation of the golf course. The mixture of applied irrigation water typically consists of approximately one-fourth recycled water, but this ratio will vary by month. When irrigation demands are reduced, a lined storage pond on the WWRF site stores the recycled water. National does not operate or maintain the golf course irrigation system or ponds on the golf course.

1.3 MONITORING WELLS

Seven monitoring wells, MW-1 through MW-7, were constructed in May through June 2004. The monitoring wells were installed on the Wild Wings development in the vicinity of the WWRF. The locations of the monitoring wells are shown on Figure 1.

The WDR required that the monitoring wells be constructed to monitor the uppermost aquifer. While drilling, soil samples were collected to assess the subsurface lithology and to locate the uppermost aquifer. Review of the well logs shows that clays with various amounts of silt, sand, and gravel are predominant at the site. However, beds of coarse-grained materials, sands and gravels, with trace amounts of silt and clay were also logged at all monitoring well sites.

The monitoring wells were completed to depths ranging from 31 to 74 feet below ground surface (bgs). Each well is constructed with 2-inch schedule 40 PVC well casing and screen. The screen intervals are 10 feet in length at most wells, with the exception of MW-4 and MW-5R, which have 15-foot and 20-foot screen intervals, respectively. The top of each well casing is fitted with an expandable plug to prevent surface water from entering the wells. The top of each well is secured in a subsurface vault. Table 1 summarizes the well construction details. The well screens are not at the same depth in all of the monitoring wells. The depths varied based on when groundwater was first encountered. Thick clay beds were encountered at MW-4 and MW-5R and continued to relatively deep depths. MW-4 and MW-5R have deeper screen intervals than the other monitoring wells, ranging from an elevation of 51 to 71 feet mean sea level (msl). In contrast, MW-1, MW-2, MW-6, and MW-7 are screened at shallower depths, between 73 to 95 feet msl. MW-3 has the shallowest screen interval ranging from an elevation of 90 to 100 feet msl.

The lithologic sequences of strata encountered during well drilling show a heterogeneous appearance across the site making lateral geologic correlation difficult on a site scale (Luhdorff and Scalmanini, 2006). Furthermore, the uppermost water-bearing zone in which all monitoring wells are screened has weak to no lateral continuity across the site based on the lithologic logs. Based on evaluation of the lithology and well construction details, the consistent anomalously high groundwater elevations, and analytical results from previous monitoring reports, MW-3 appears to be screened in a perched water zone and not within the unconfined to semi-confined aquifers in which the other monitoring wells are screened. Therefore, groundwater in MW-3 does not appear to be in direct hydraulic communication with the other network wells.

1.4. SAMPLING PUMP DETAILS

Sampling and purging of the monitoring wells is accomplished with the use of a low flow electric submersible pump powered by portable battery system. Plastic tubing, which is disinfected prior to purging, between purging and sampling and after sampling, is used to conduct both the purging of the well and collection of groundwater samples. The pump is portable and is transported between wells.

1.5 HISTORIC MONITORING RESULTS

The WWRF has been active since February 2005. The WDR required that three monitoring events take place prior to the startup of the WWRF; however, only one monitoring event was performed. Quarterly monitoring commenced in March 2005. Historic monitoring results are summarized below:

- Groundwater levels have ranged from 19.7 to 56.7 feet below top of casing (btoc) or 64.0 to 101.7 feet mean sea level (msl). Groundwater has consistently been the shallowest at MW-3 and the deepest at MW-4. Since the fourth quarter 2008 MW-7 has been dry about 75 percent of the sampling events and has been dry from the third quarter 2013 until the first quarter of 2017 – corresponding to the California regional drought conditions. Table 2 summarizes the historic groundwater levels and Figure 2 displays a line graph of these historical groundwater levels.
- Groundwater flow direction has been consistently towards the northeast to east-northeast. Using MW-1, MW-4, and MW-5R to determine flow direction and gradient, the flow direction has varied from 53.3 to 75.0 degrees and the groundwater gradient has ranged from 0.005 to 0.009 ft./ft. The gradient has gradually steepened and the flow direction has changed to a more easterly direction since monitoring started in 2005. The most recent monitoring event in February 2018 indicates a 3-point gradient of 0.006 ft./ft. and a direction of 72 degrees. Table 3 summarizes historic groundwater flow directions and gradients.
- MW-1 has been consistently up-gradient of the recycled water effluent pond, whereas MW-4, MW-6, and MW-7 have consistently been down-gradient of the recycled water effluent pond. MW-2 is located adjacent to the recycled water effluent pond. MW-5R appears to be an up-gradient well that is recharged from Cache Creek, but is slightly down-gradient to the recycled water effluent pond.
- MW-3 has consistently had higher groundwater surface elevations than the other monitoring wells. Because of this, supplemented by the shallow screen interval, poor recharge, persistent presence of total coliform organisms as well as an overall different water quality than the other wells, and often gray to tan color of the water, MW-3 appears to be screened in a perched water zone. This perched or mounded water table appears prominently in the August 2017 data – but the November 2017 data did not look as pronounced.
- The WDR requires that monitoring wells be sampled and analyzed for the following constituents: pH, total dissolved solids (TDS), sodium, chloride, boron, iron, manganese, nitrate (as nitrogen), nitrite (as nitrogen), ammonia (as nitrogen), total nitrogen, total coliform organisms, and total trihalomethanes (TTHMs). In addition to the WDR requirements, samples collected up to February 2008 were analyzed for fecal coliform. Historical monitoring results are summarized in Table 4. Figures 3 through 9 show concentration trend graphs for the monitoring parameters.

- Metals analyses are required from the monitoring wells. Sampling protocol requires that the turbidity be below 5 Nephelometric Units (NTU) when collecting water samples for metal analyses, otherwise the sample must be filtered prior to being collected and reported as dissolved metals. Due to historical issues with turbidity and purging, the sampling protocol for Q4 2017 was adopted to field filter and continued for Q1 of 2018.
- Total coliform organisms have been sporadically detected at all wells since monitoring commenced. They have been most consistently detected at MW-3, which also has had positive results for fecal bacteria; however, since the second quarter 2013, total coliform organisms at MW-3 have only been detected four times. MW-3 has had past worm-like organisms and has been treated with disinfection products. Recently, no organisms have been visible and the Q3 sampling event had no detections for disinfection by-products, as analyzed for TTHM's.
- Groundwater quality samples were not obtained from MW-7 between November 2006 and November 2016, except for May and August 2011, due to either the well being dry or an insufficient amount of water in the well to collect samples. Since the wet weather in winter 2016 -2017, sufficient amounts of sample water from MW-7 have been retrieved for laboratory analyses – Until November 2017. In November 2017, there was not sufficient water to purge in MW-7 to collect samples and perform laboratory analyses. Again, in February 2018, there was insufficient water in MW-7 for sample collection.
- Groundwater quality analytical results were not available for the fourth quarter 2006 (except for total coliform results), first quarter 2007, and first quarter 2008.
- MW-2 has had historical security issues related to soils and foreign water entering the well vault. Previous reports contain details of this issue.

1.6 GROUNDWATER QUALITY LIMITATIONS

Interim Groundwater Limitations

Borings HB-2, HB-3, HB-7, and B-27 were drilled prior to the startup of the WWRF and within the vicinity of the WWRF. Water samples collected from these borings were used as the background water quality, using the average value for each constituent. Interim groundwater limitations for the WWRF were developed by comparing the basin plan Water Quality Objectives (WQOs) and background water quality data and using the highest value as the interim groundwater limitation. The interim groundwater limitations are listed at the top of Table 4.

The following summarizes how the WWRF monitoring wells have historically compared to the interim groundwater limitations:

- Boron has exceeded the interim groundwater limitations at all wells since quarterly monitoring commenced. Down-gradient monitoring wells MW-2 and MW-6 have had higher concentrations than up-gradient well MW-1.
- Up-gradient MW-1 is typically at or exceeding the interim groundwater limitations for TDS, chloride, nitrate (as nitrogen), and total nitrogen. Historically the TDS, chloride, nitrate (as nitrogen) and total nitrogen results are higher at MW-1 than at any other well in the monitoring well network. However, since 2013 chloride has been highest at down-gradient well MW-4. Nitrate concentrations have been variable and now (Q3 of 2018) several wells exceed the nitrate levels in MW-1.
- MW-2, the closest well to the WWRF, regularly exceeded the interim groundwater limitations for total nitrogen prior to 2008, from 2008 through 2016 total nitrogen has been less than the interim limitations. But since 2017, is again above the interim limit. For Q1 2018, MW-2 depicts higher nitrate and total nitrogen than the recent past. Prior to the fourth quarter 2013 the interim groundwater limitations were occasionally exceeded for sodium at MW-2, but since this time they have been below the interim groundwater limitations, until June 2017 when they again were slightly above the interim limit. Sodium in MW-2 has declined in recent sampling events but remains barely above the interim standard. Chloride levels at MW-2 exceeded the interim groundwater limitations from the fourth quarter 2010 through the first quarter 2012, but since this time the levels have been less than the interim limitations.
- Quarterly monitoring results at cross-gradient MW-5R and down-gradient MW-4, MW-6, and MW-7 have rarely exceeded the interim groundwater limitations for any constituent, with the exception of chloride and total nitrogen at MW-4 and sodium at MW-6 (with some exceptions).

Final Groundwater Limitations

On January 8, 2008, the RWQCB requested Yolo County prepare a Background Groundwater Quality Study/Groundwater Degradation Assessment Report to establish statistically derived water quality limitations. Central Valley Environmental, Incorporated (CVEI) prepared a Background Groundwater Quality Study/Groundwater Degradation Assessment Report dated April 1, 2009. Yolo County submitted the report to the RWQCB. CVEI used statistical methods to derive tolerance intervals representing the 95th quantile of all water quality sampling results from 2004 through February 2009. CVEI used these values in conjunction with the WQOs, using the greater of the two, to recommend Final Groundwater Limitations. Approval of the Final Groundwater Limitations by the RWQCB is still pending. However, since 2009 the sample population has more than doubled and therefore the analyses may be outdated.

2.0 GROUNDWATER MONITORING

Groundwater monitoring was performed on February 28, 2019 by CRWA personnel experienced with groundwater sampling. The following sections describe the monitoring protocol used to

measure the depth to water, purge the wells, and collect water quality samples from the monitoring wells.

2.1 GROUNDWATER LEVELS

CRWA personnel measured the depth to groundwater at the monitoring wells using an electric water level sounder accurate to 0.01 foot. The sounder was cleaned and decontaminated prior to the first monitoring well measurement and between each well site by thoroughly washing and scrubbing the sounding probe and line with a laboratory-grade detergent (Alconox) and distilled water, followed by a triple rinse with distilled water. The sounding probe and line was then sprayed with a 10 percent bleach solution to kill any bacteria. The sounding probe was allowed to air dry between wells.

2.2 PRE-SAMPLING ACTIVITIES

After the depth to groundwater was measured at a monitoring well, the well was purged. Each monitoring well was purged through the use of a portable low flow submersible pump. Prior to purging, the top 6 inches of the polyethylene tubing was decontaminated. The polyethylene tube was then connected to a vinyl tube via a double-barbed nipple and the vinyl tubing was routed to an empty 5-gallon bucket. The double-barbed nipple and vinyl tubing were cleaned and decontaminated prior to initial use and between each well (primary disinfection). The procedures for cleaning and decontaminating are the same as listed above (Groundwater Levels) except the vinyl tubing received six rinses with distilled water after cleaning.

Prior to collecting the groundwater samples, each monitoring well was micro purged (verbal approval, RWQCB 2008). Micro purging consisted of pumping each well until field parameters such as pH, temperature, and EC stabilized. Field parameters were measured by collecting purge water from the discharge line at select intervals and using a calibrated multi-parameter meter to record the readings. The volume purged and field parameters are documented on field data sheets, which are presented in Appendix A. The purge water was collected in 5-gallon buckets and then transported back to the WWRF and discharged to the wastewater holding tanks.

2.3 GROUNDWATER SAMPLING

Once each monitoring well was purged, CRWA personnel collected water samples in laboratory-prepared bottles. Prior to collecting the first sample, the vinyl tube connected to the 5-gallon bucket was disconnected from the bucket and the tip was sprayed with a 10 percent bleach solution to kill any bacteria that may have been present in the bucket and inadvertently transferred to the sampling tube (secondary disinfection). To eliminate any residual chlorine, pumping was then resumed for about 30 to 60 seconds (approximately 0.25 to 0.5 gallons) and the end of the vinyl tube was elevated and pinched so that the entire tubing surface was in contact with the purge water prior to sampling. The bacteriological (total coliform) sample was the first sample collected and was collected directly from the end of the vinyl tube, followed by

collection of samples for THMs. The samples for all other constituents analyzed were collected next. Water samples for metals were filtered in the field using a disposable 0.45 micron filter before being placed into acidified laboratory prepared sample bottles. Trip blanks are included by CLS for TTHM's analysis, when requested.

Nitrile gloves were worn while collecting samples. A new set of gloves was used at every monitoring well. The samples were placed in an ice chest and cooled to 4 degrees Celsius and delivered to California Laboratory Services (CLS) of Rancho Cordova, California, a California-certified laboratory, under standard chain-of-custody procedures. Samples collected from the monitoring wells were analyzed for TDS, sodium, boron, iron, manganese, nitrate (as N), nitrite (as N), ammonia (as N), total N, total coliform organisms, and total trihalomethanes per the WDR requirements. Table 4 presents the results for the monitoring wells and Table 5 presents the results for any trip blank and equipment blank samples. Appendix B contains the laboratory data sheets and chain-of-custody forms.

2.4 GROUNDWATER LEVELS AND FLOW DIRECTION

The measured groundwater levels in each well were subtracted from the surveyed ground surface elevation at each well. Table 2 lists the elevation of the top of the well casing (TOC) (reference point) at each well and presents the current and historic depths-to-water and groundwater surface elevations. The groundwater surface elevations were used to generate groundwater contours from which the groundwater gradient was calculated. Figure 10 shows the groundwater contours and flow direction for February 2019. Groundwater gradients and flow directions were estimated using wells MW-1, MW-4, and MW-5R. Table 3 summarizes these estimates.

3.0 FINDINGS

3.1 GROUNDWATER LEVELS

Groundwater levels in February 2019 (First Quarter 2019) ranged from 71.31.29 feet msl in MW-4 to 104.60 feet msl in MW-3, and were within historic ranges. Monitoring wells MW-3 and MW-6 showed the greatest changes in groundwater levels this quarter. This transition from late summer/fall seasonal low water level trend into a wetter winter trend continues and is fairly consistent within the monitoring well network. Table 2 lists the water level measurements. Chart 1 shows the current and historic groundwater levels.

Due to MW-3 being screened within a perched water zone it was left out of groundwater contouring, flow direction, and gradient calculations.

Between the Fourth Quarter of 2018 and First Quarter of 2019, groundwater levels rose an average of 4.56 feet. This matches what is commonly understood to be seasonal variations with moving from a relatively dry fall into a somewhat wetter winter season. Looking at the generalized pattern of rainfall and groundwater levels in the area since fall 2016 the trends in

those two parameters tend to correlate. There is generally a strong correlation between precipitation/recharge with water levels in the shallow groundwater zone.

3.2 GROUNDWATER FLOW DIRECTION AND GRADIENT

The groundwater flow direction and gradient for February 2019 were calculated using wells MW-1, MW-4, and MW-5R, which is consistent with past practice and historically reported data. Using these wells, the groundwater flow direction was to the east northeast (71.3 degrees) with a gradient of 0.005 feet/feet. The groundwater gradient and direction are consistent with historic results. Figure 2 displays the groundwater surface elevations at each well, the groundwater contours, and flow direction. In the northern portion of the site the groundwater flow direction appears to be influenced by Cache Creek. Table 3 lists the historic and current groundwater flow directions and gradients.

3.3 GROUNDWATER QUALITY

Tables 4 and 5 summarize the analytical results in table format and Charts 2 through 8 show the historical water quality parameter concentrations in graphical format.

Current (First Quarter 2019) water quality results were compared to historic water quality results to assess potential increasing trends. Overall, the water quality analytical testing results for the First Quarter of 2019 were within historical ranges and trends. While nitrates and total nitrogen showed a slight increase in concentrations MW-2 after the first quarter 2017, these concentrations have generally stabilized and are declining back towards historic levels. Concentrations for boron and TDS have remained consistent during the past 7 quarters, with TDS showing a general increase across most of the wells this quarter. pH levels this quarter are consistent with historical ranges, although samples for pH were received by the laboratory slightly out of hold time. Boron and sodium are generally consistent with past analytical data and they generally show a declining trend this quarter. Nitrogen and nitrate levels showed an overall slight decline. Overall TDS levels appear very close to historical levels and ranges at each well, but are generally showing a slight increasing trend this quarter. The spatial variation of TDS, nitrate and boron concentrations over the recent past are best explained by the recent rainfall/dryness patterns, recharge and pumping changes in the area groundwater. Total coliform was detected in all wells except MW-1 and, based on the levels detected in six of seven samples, is likely to be a cross-contamination issue. Chloride samples were not collected due to oversight by field personnel. No other significant trends in groundwater quality trends were observed from this quarter's monitoring results.

MW-3 has been an outlier in water quality with results that are significantly different from the remaining monitoring wells, and this quarter showed decreases in TDS, sodium, boron and nitrates.

Historically, up-gradient MW-1 has had the highest concentrations of TDS, chloride, nitrate (as N), and total nitrogen, and this generally holds true this quarter (First Quarter 2019).

Recently, increases in water quality parameters at MW-2 have caused it to tend to match or exceed the historic pattern of MW-1 (up gradient) being the location of the highest TDS, chloride and sodium concentrations in groundwater. For the First Quarter 2019, the sample from MW-2 shows the highest concentrations for sodium and boron and nitrate/TN. Refer to the water quality figures for additional trends.

The highest nitrate (as N) (14 mg/L) was detected in the sample from MW-2 and the highest total N (15 mg/L) was detected in the sample from MW-4. The sample from MW-2 again had the highest boron (5.7 mg/L) concentration detected, also consistent with historic results and mirroring the recent trend of all boron levels being elevated, although a general declining trend in boron concentrations was noted this quarter.

For First Quarter 2019 sampling, total coliform was detected in samples from samples from a;; wells with the exception of MW-1. Based on the concentrations detected in the samples and the fact that six of seven wells had detections indicates possible cross contamination. Monitoring for the Second Quarter 2019 will take extra precautions to avoid any Total Coliform cross contamination.

Ammonia (as N) was not detected at measurable concentrations in any of the wells sampled this quarter. Ammonia (as N) is not typically detected at any of the wells in the monitoring network, aside from MW-3.

Iron was reported in the sample from MW-1 for the First Quarter 2019, with no other samples detecting iron. MW-1 has had intermittent iron detections in the past. Manganese has been intermittently detected in samples from MW-3 in the past, but there were no detections this quarter.

TTHMs were detected at 1.8 ug/L in the sample from MW-5R this quarter. In the sample from MW-5R, the TTHM consisted of Chloroform. A trip blank was submitted this quarter, and reported TTHM at less than the detection limit. The detected concentration of TTHM in the sample from MW-5R is consistent with intermittent recent detections and do not appear to indicate a major concern.

3.4 COMPARISON TO INTERIM GROUNDWATER LIMITATIONS

The water quality results from the First Quarter 2019 monitoring event show that every monitoring well sampled exceeded the interim groundwater limitation for boron, consistent with historic results.

Based on the understanding that the interim groundwater quality limits remain the higher of the background level for the site and the basin wide WQO (water quality objective), the following is a summary of each wells exceedances for the current quarter (First Quarter 2019)

for other general mineral analytes (excluding boron). Comparing to the previous quarter, the number of parameters in exceedance is more, but the previous quarter did not include chloride.

MW-1: total nitrogen

MW-2: sodium, total nitrogen, Total Coliform

MW-3: Total Coliform

MW-4: total nitrogen, Total Coliform

MW-5R: Total Coliform

MW-6: total nitrogen, Total Coliform

MW-7: Total Coliform

4.0 CONCLUSIONS

The groundwater contours and flow directions show there are two potential sources of groundwater to the area. MW-5R monitors water entering the area that is recharged by Cache Creek, north of the WWRF area. Water also enters the area from the south near MW- 1 and MW-2 from regions used for agriculture. MW-4, MW-6, and MW-7 are in a mixing zone between these water sources and as such minor shifts in groundwater gradients may result in a change in water quality that reflects these two different water sources. In 2015, almond orchards were planted in the fields just west of the monitoring area and water wells were installed to provide water for the orchards. Deep percolation from irrigation or pumping for water supply could affect groundwater levels and flow directions, but to date they do not appear to be affecting groundwater beneath the WWRF area. In past monitoring events, it appeared groundwater pumping east of the monitoring well network was affecting MW-4 and could be affecting MW-7.

In general, the annual rainfall amounts, irrigation practices at farm lands and golf courses, and variations in groundwater pumping to meet local domestic water needs can impact the local groundwater contours, flow direction and gradients. However, for the First Quarter 2019 monitoring event, these parameters remained within historical ranges for groundwater levels. The most recent GW contours reflect an overall increase from the Third Quarter 2018 data corresponding to a wetter winter season. Generally, groundwater levels changes track each other across the various monitoring wells. GW flow gradients remain in the range of historical observations at 0.005 ft/ft for the quarter and the direction of flow remains to the east north east.

The analytical results from the First Quarter 2019 sampling event show several results above the interim groundwater limitations. All wells exceeded the interim groundwater limitations for boron, which is consistent with historic monitoring results. Additionally, several wells have total nitrogen levels slightly above the interim limits, one well had sodium levels above the interim limits and six wells had Total Coliform concentrations which exceeded the interim limits. However, overall, the First Quarter 2019 sample event indicated trends generally consistent with historical patterns in mineral concentrations in groundwater samples when compared to recent past quarters.

MW-3 is the only well to show a decrease in TDS this quarter, although all wells remain within historical ranges for TDS. It is likely that increasing water levels are responsible for increasing TDS level.

MW-3 and MW-5R showed substantial decreases in sodium compared to recent sample data. All other wells showed somewhat higher sodium concentrations, although still well within historical trends

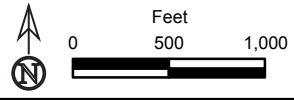
MW-1 showed a low-level detection for iron for the first time in 23 quarters of monitoring. Since the detected concentration is close to the laboratory detection limit and is only one data point at this time, no trends are apparent. No manganese was detected in any of the wells, which is consistent with historical trends.

The First Quarter 2019 analyses for TTHMs resulted in a detection in a single well (MW-6) consisting of chloroform only. This is an improvement from the Fourth Quarter 2018 where three wells had TTHM detections.

First Quarter 2019 analyses for Total Coliform indicate that six out of seven wells have Total Coliform detections, with MW-1 being the sole exception. This is likely that this a result of cross contamination of samples as there were no Total Coliform detections in the prior quarter. Special precautions will be taken during the Second Quarter 2019 sampling and sample handling to avoid any potential for cross contamination.

Review of the current quarter and historical data trends indicate the local groundwater quality appears to remain in historical ranges since before and after the operations of the WWRF.

FIGURES

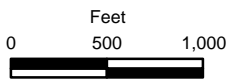


Notes:
 All locations are approximate.
 Aerial Source: USDA, National Agriculture Imagery Program, 8 July 2016



Figure 1
Site and Vicinity

Third Quarter 2018 Monitoring Report
 Wild Wings Water Recycling Facility
 18530 Wildwings Drive
 Woodland, Yolo County, California



Notes:
 All locations are approximate
 ft msl = feet above mean sea level
 *Groundwater monitoring well is screened at a shallower depth, therefore it is not included in groundwater elevation contouring
 Aerial Source: USDA, National Agriculture Imagery Program, 8 July 2016



California
 Rural Water Association

Figure 2
Groundwater Elevation Contours

First Quarter 2019 Monitoring Report
 Wild Wings Water Recycling Facility
 18530 Wildwings Drive
 Woodland, Yolo County, California

TABLES

Table 1
Monitoring Well Construction Details
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date Installed	Depth of Borehole (feet bgs)	Depth of Well Casing (feet bgs)	Screened Interval (feet bgs)	Slot Size (inches)	Grout (feet bgs)	Bentonite Seal (feet bgs)	Sand Pack (feet bgs)	Casing Material	TOC Elevation (feet msl)	Screen Elevations (feet msl)
MW-1	6/3/2004	46	41	31-41	0.010	0.5-25.5	25.5-28.5	28.5-45	2-inch Sch. 40 PVC, flush thread	126.22	95.22 - 85.22
MW-2	6/2/2004	51.5	47	37-47	0.010	0.5-31	31-34.5	34.5-47	2-inch Sch. 40 PVC, flush thread	124.93	87.93 - 77.93
MW-3	6/3/2004	31.5	31	21-31	0.010	0.5-14.5	14.5-19	19-32	2-inch Sch. 40 PVC, flush thread	121.37	100.37 - 90.37
MW-4	6/1/2004	71.5	70	55-70	0.010	0.5-48	48-52	52-70	2-inch Sch. 40 PVC, flush thread	120.71	65.71 - 50.71
MW-5R	6/10/2004	75	74	54-74	0.010	0.5-47	47-52	52-75	2-inch Sch. 40 PVC, flush thread	125.42	71.42 - 51.42
MW-6	5/27/2004	50	49	39-49	0.010	0.5-33	33-37	37-50	2-inch Sch. 40 PVC, flush thread	121.59	82.59 - 72.59
MW-7	5/28/2004	45	39	29-39	0.010	0.5-22	22-26.5	26.5-45	2-inch Sch. 40 PVC, flush thread	114.55	85.55 - 75.55

Notes:

Information for monitoring wells was extracted from Monitoring Well Installation Report (Geologic and Hydrogeologic Study) for the Wild Wings Residential Development, Jacobson Helgoth Consultants, Inc., August 2004.

All monitoring wells were drilled and constructed by PC Exploration of Rocklin, CA. An Ingersol Rand A-400 drill rig with an 8-inch diameter hollow stem auger was used. Oversight was provided by Jacobson Helgoth Consultants. Wellheads were constructed in subsurface vaults with flush mount covers and locking well caps. The top of the PVC casing is approximately 1.3 feet below ground surface (bgs).

TOC = top of casing; surveyed in reference to mean sea level by Morrow Surveying of West Sacramento, CA, on June 26, 2004

Table 2 (MW-1)
Static Water Level Measurement in Monitoring Wells
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date	TOC Elevation (feet msl)	DTW (feet btoc)	Water Surface Elevation (feet msl)
MW-1	6/15/04	126.22	32.81	93.41
	3/29/05		30.62	95.6
	6/16/05		29.62	96.6
	9/29/05		31.75	94.47
	12/6/05		31.4	94.82
	2/16/06		29.99	96.23
	5/16/06		27.25	98.97
	8/21/06		29.73	96.49
	11/20/06		30.27	95.95
	2/8/07		31.37	94.85
	5/7/07		30.79	95.43
	8/29/07		32.38	93.84
	2/21/08		29.96	96.26
	5/27/08		29.7	96.52
	8/27/08		30.49	95.73
	11/24/08		32.43	93.79
	2/18/09		30.72	95.5
	5/21/09		31.28	94.94
	8/7/09		32.96	93.26
	11/5/09		34.34	91.88
	2/8/10		32.05	94.17
	5/7/10		31.85	94.37
	8/18/10		31.22	95.0
	11/2/10		32	94.22
	12/28/10		30.76	95.46
	2/23/11		31.33	94.89
	5/5/11		29.44	96.78
	8/16/11		30.23	95.99
	11/8/11		31.95	94.27
	2/27/12		32.84	93.38
	5/21/12		32.8	93.42
	8/9/12		33.84	92.38
	11/19/12		34.39	91.83
	2/21/13		32.1	94.12
	5/15/13		31.73	94.49
	8/15/13		32.84	93.38
	11/7/13		33.69	92.53
	2/25/14		34.38	91.84
	5/22/14		35.22	91.0
	8/27/14		36.65	89.57
	11/12/14		36.93	89.29
	2/26/15		34.88	91.34
	5/13/15		35.6	90.62
	8/4/15		36.03	90.19
	11/5/15		36.9	89.32
	2/4/16		35.33	90.89
	6/30/16		34.37	91.85
	8/25/16		34.59	91.63
	11/17/16		34.9	91.32
	3/7/17		26.18	100.04
	6/27/17		28.14	98.08
	8/23/17		30.09	96.13
	11/14/17		31.07	95.15
	2/21/18		32.94	93.28
	5/24/18		33.03	93.19
	9/27/18		34.07	92.15
	12/28/18		31.34	94.88
	2/28/19		28.39	97.83

Table 2 (MW-2)
Static Water Level Measurement in Monitoring Wells
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date	TOC Elevation (feet msl)	DTW (feet btoc)	Water Surface Elevation (feet msl)
MW-2	6/15/04	124.93	34.75	90.18
	3/29/05		33.2	91.73
	6/16/05		31.71	93.22
	9/29/05		36.67	88.26
	12/6/05		36.29	88.64
	2/16/06		31.85	93.08
	5/16/06		28.12	96.81
	8/21/06		33.17	91.76
	11/20/06		34.75	90.18
	2/8/07		34.81	90.12
	5/7/07		35.53	89.4
	8/29/07		39.92	85.01
	2/21/08		33.15	91.78
	5/27/08		34.25	90.68
	8/27/08		37.59	87.34
	11/25/08		37.3	87.63
	2/19/09		36.01	88.92
	5/21/09		36.47	88.46
	8/7/09		40.14	84.79
	11/5/09		41.38	83.55
	2/8/10		38.48	86.45
	5/7/10		35.8	89.13
	8/18/10		36.66	88.27
	11/2/10		38.25	86.68
	12/28/10		37.08	87.85
	2/23/11		35.68	89.25
	5/5/11		30.87	94.06
	8/16/11		33.73	91.2
	11/8/11		35.93	89
	2/27/12		36.04	88.89
	5/21/12		35.89	89.04
	8/9/12		37.54	87.39
	11/19/12		37.9	87.03
	2/21/13		34.6	90.33
	5/15/13		36.4	88.53
	8/15/13		38.8	86.13
	11/7/13		38.74	86.19
	2/25/14		38.78	86.15
	5/22/14		41.17	83.76
	8/27/14		dry	
	11/12/14		45.07	79.86
	2/26/15		39.83	85.1
	5/13/15		39.72	85.21
	8/4/15		39.35	85.58
	11/5/15		41.79	83.14
	2/4/16		40.41	84.52
	6/30/16		37.44	87.49
	8/25/16		38.39	86.54
	11/17/16		37.67	87.26
	3/7/17		27.4	97.53
	6/27/17		30.42	94.51
	8/23/17		33.31	91.62
	11/14/17		35.97	88.96
	2/21/18		35.87	89.06
	5/24/18		35.5	89.43
	9/27/18		37.08	87.85
	12/28/18		34.06	90.87
	2/28/19		31.39	93.54

Table 2 (MW-3)
Static Water Level Measurement in Monitoring Wells
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date	TOC Elevation (feet msl)	DTW (feet btoc)	Water Surface Elevation (feet msl)
MW-3	6/15/04	121.37	20.42	100.95
	3/29/05		21.33	100.04
	6/16/05		20.14	101.23
	9/29/05		22.45	98.92
	12/6/05		21.54	99.83
	2/16/06		21.65	99.72
	5/16/06		26.51	94.86
	8/21/06		21.49	99.88
	11/20/06		21.14	100.23
	2/8/07		23.02	98.35
	5/7/07		20.63	100.74
	8/29/07		22.99	98.38
	2/21/08		21.24	100.13
	5/27/08		22.19	99.18
	8/28/08		23	98.37
	11/25/08		24.39	96.98
	2/19/09		19.67	101.7
	5/21/09		21.31	100.06
	8/7/09		22.49	98.88
	11/5/09		24.29	97.08
	2/8/10		20.2	101.17
	5/7/10		23.21	98.16
	8/18/10		23.55	97.82
	11/2/10		25.13	96.24
	12/28/10		19.95	101.42
	2/23/11		20.66	100.71
	5/5/11		21.64	99.73
	8/16/11		23.3	98.07
	11/8/11		25.03	96.34
	2/27/12		24.69	96.68
	5/21/12		24.44	96.93
	8/9/12		25.58	95.79
	11/19/12		25.96	95.41
	2/21/13		24.15	97.22
	5/15/13		25.45	95.92
	8/16/13		26.67	94.7
	11/7/13		25.97	95.4
	2/25/14		25.44	95.93
	5/22/14		26.5	94.87
	8/27/14		28.75	92.62
11/12/14		29.53	91.84	
2/26/15		21.33	100.04	
5/13/15		23.53	97.84	
8/4/15		25.7	95.67	
11/5/15		28.7	92.67	
2/4/16		24.81	96.56	
6/30/16		25.89	95.48	
8/25/16		27.74	93.63	
11/17/16		29.6	91.77	
3/7/17		19.13	102.24	
6/27/17		22.75	98.62	
8/23/17		23.33	98.04	
11/14/17		25.87	95.5	
2/21/18		26.98	94.39	
5/24/18		25.54	95.83	
9/27/18		27.37	94.0	
12/28/18		24.25	97.1	
2/28/19		16.75	104.6	

Table 2 (MW-4)
Static Water Level Measurement in Monitoring Wells
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date	TOC Elevation (feet msl)	DTW (feet btoc)	Water Surface Elevation (feet msl)
MW-4	6/15/04	120.71	44.59	76.12
	3/29/05		42.83	77.88
	6/16/05		41.93	78.78
	9/29/05		na	
	12/6/05		46.6	74.11
	2/16/06		42.31	78.4
	5/16/06		37.61	83.1
	8/21/06		42.25	78.46
	11/20/06		41.8	78.91
	2/8/07		40.85	79.86
	5/7/07		40.92	79.79
	8/29/07		46.13	74.58
	2/21/08		41.2	79.51
	5/27/08		42.34	78.37
	8/28/08		45.65	75.06
	11/25/08		46.07	74.64
	2/19/09		45.29	75.42
	5/21/09		44.44	76.27
	8/7/09		49.54	71.17
	11/5/09		51	69.71
	2/8/10		49.31	71.4
	5/7/10		45.94	74.77
	8/18/10		48.05	72.66
	11/2/10		49.05	71.66
	12/28/10		48.01	72.7
	2/23/11		46.31	74.4
	5/5/11		42.04	78.67
	8/16/11		45.02	75.69
	11/8/11		46.64	74.07
	2/27/12		44.72	75.99
	5/21/12		44.56	76.15
	8/9/12		48.08	72.63
	11/19/12		49.78	70.93
	2/21/13		45.9	74.81
	5/15/13		46.69	74.02
	8/16/13		50.67	70.04
11/7/13		51.99	68.72	
2/25/14		50.88	69.83	
5/22/14		51.08	69.63	
8/27/14		55.49	65.22	
11/12/14		56.36	64.35	
2/26/15		53.85	66.86	
5/13/15		53.9	66.81	
8/4/15		55.42	65.29	
11/5/15		56.74	63.97	
2/4/16		56.4	64.31	
6/30/16		54.22	66.49	
8/25/16		55.21	65.5	
11/17/16		55.54	65.17	
3/7/17		48.46	72.25	
6/27/17		47.06	73.65	
8/23/17		48.59	72.12	
11/14/17		49.98	70.73	
2/21/18		49.98	70.73	
5/24/18		49.69	71.02	
9/27/18		53.11	67.6	
12/28/18		53.42	67.29	
2/28/19		49.4	71.31	

Table 2 (MW-5R)
Static Water Level Measurement in Monitoring Wells
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date	TOC Elevation (feet msl)	DTW (feet btoc)	Water Surface Elevation (feet msl)
MW-5R	6/15/04	125.42	39.37	86.05
	3/29/05		37.65	87.77
	6/16/05		35.62	89.8
	9/29/05		40.73	84.69
	12/6/05		40.78	84.64
	2/16/06		36.02	89.4
	5/16/06		37.05	88.37
	8/21/06		36.12	89.3
	11/20/06		38.95	86.47
	2/8/07		38.97	86.45
	5/7/07		38.42	87
	8/29/07		42.97	82.45
	2/21/08		37.5	87.92
	5/27/08		38.06	87.36
	8/27/08		41.41	84.01
	11/24/08		41.84	83.58
	2/18/09		40.73	84.69
	5/21/09		40.54	84.88
	8/7/09		43.1	82.32
	11/5/09		45.2	80.22
	2/8/10		42.4	83.02
	5/7/10		39.77	85.65
	8/18/10		40.15	85.27
	11/2/10		42.53	82.89
	12/28/10		41.53	83.89
	2/23/11		40.1	85.32
	5/5/11		34.65	90.77
	8/16/11		36.78	88.64
	11/8/11		40.14	85.28
	2/27/12		40.31	85.11
	5/21/12		38.6	86.82
	8/9/12		40.68	84.74
	11/19/12		42.11	83.31
	2/21/13		39.03	86.39
	5/15/13		39.69	85.73
	8/15/13		41.55	83.87
	11/7/13		42.43	82.99
	2/25/14		42.28	83.14
	5/22/14		44.12	81.3
	8/27/14		49.26	76.16
	11/12/14		48.34	77.08
	2/26/15		43.39	82.03
	5/13/15		43.03	82.39
	8/4/15		42.8	82.62
	11/5/15		45.3	80.12
	2/4/16		43.76	81.66
	6/30/16		41.06	84.36
	8/25/16		42.23	83.19
	11/17/16		41.53	83.89
	3/7/17		32.08	93.34
	6/27/17		34.96	90.46
	8/23/17		38.11	87.31
	11/14/17		39.69	85.73
	2/21/18		40.39	85.03
	5/24/18		38.03	87.39
	9/27/18		41.65	83.77
	12/28/18		40.7	84.72
	2/28/19		35.59	89.83

Table 2 (MW-6)
Static Water Level Measurement in Monitoring Wells
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date	TOC Elevation (feet msl)	DTW (feet btoc)	Water Surface Elevation (feet msl)
MW-6	6/15/04	121.59	37.96	83.63
	3/29/05		37.26	84.33
	6/16/05		34.92	86.67
	9/29/05		40.59	81
	12/6/05		40.77	80.82
	2/16/06		35.32	86.27
	5/16/06		30.28	91.31
	8/21/06		35.59	86
	11/20/06		38.57	83.02
	2/8/07		38.46	83.13
	5/7/07		37.97	83.62
	8/29/07		42.96	78.63
	2/21/08		37.02	84.57
	5/27/08		37.56	84.03
	8/27/08		41.26	80.33
	11/24/08		41.98	79.61
	2/18/09		40.67	80.92
	5/21/09		39.94	81.65
	8/7/09		42.98	78.61
	11/5/09		45.37	76.22
	2/8/10		42.51	79.08
	5/7/10		39.51	82.08
	8/18/10		40.14	81.45
	11/2/10		42	75.57
	12/28/10		41.67	79.92
	2/23/11		40.1	81.49
	5/5/11		34.03	87.56
	8/16/11		36.23	85.36
	11/8/11		40.27	81.32
	2/27/12		40.2	81.39
	5/21/12		38.67	82.92
	8/9/12		41.03	80.56
	11/19/12		42.47	79.12
	2/21/13		38.91	82.68
	5/15/13		39.64	81.95
	8/15/13		41.84	79.75
	11/7/13		42.65	78.94
	2/25/14		42.34	79.25
	5/22/14		44.14	77.45
	8/27/14		dry	
	11/12/14		dry	
2/26/15		43.62	77.97	
5/13/15		43.65	77.94	
8/4/15		43.2	78.39	
11/5/15		45.58	76.01	
2/4/16		43.92	77.67	
6/30/16		41.31	80.28	
8/25/16		42.62	78.97	
11/17/16		41.8	79.79	
3/7/17		31.88	89.71	
6/27/17		34.37	87.22	
8/23/17		37.96	83.63	
11/14/17		39.71	81.88	
2/21/18		40.15	81.44	
5/24/18		39.25	82.34	
9/27/18		41.78	79.81	
12/28/18		40.71	80.88	
2/28/19		35.6	85.99	

Table 2 (MW-7)
Static Water Level Measurement in Monitoring Wells
Wild Wings Water Recycling Facility, Yolo County, CA

Well	Date	TOC Elevation (feet msl)	DTW (feet btoc)	Water Surface Elevation (feet msl)
MW-7	6/15/2004	114.55	36.22	78.33
	3/29/2005		35.8	78.75
	6/16/2005		33.77	80.78
	9/29/2005		38.09	76.46
	12/6/2005		dry	
	2/16/2006		34.08	80.47
	5/16/2006		28.69	85.86
	8/21/2006		34.29	80.26
	11/20/2006		36.96	77.59
	2/8/2007		36.85	77.7
	5/7/2007		36.22	78.33
	8/29/2007		dry	
	2/21/2008		35.55	79
	5/27/2008		35.92	78.63
	8/27/2008		38.16	76.39
	11/24/2008		dry	
	2/18/2009		dry	
	5/21/2009		dry	
	8/7/2009		dry	
	11/5/2009		dry	
	2/8/2010		dry	
	5/7/2010		37.4	77.15
	8/18/2010		dry	
	11/2/2010		dry	
	12/28/2010		dry	
	2/23/2011		37.95	76.6
	5/5/2011		33.15	81.4
	8/16/2011		34.92	79.63
	11/8/2011		dry	
	2/27/2012		38.04	76.51
	5/21/2012		36.95	77.6
	8/9/2012		dry	
	11/19/2012		dry	
	2/21/2013		37.21	77.34
	5/15/2013		37.55	77
	8/15/2013		dry	
	11/7/2013		dry	
	2/25/2014		dry	
	5/22/2014		dry	
	8/27/2014		dry	
	11/12/2014		dry	
	2/26/2015		dry	
	5/13/2015		dry	
8/4/2015		dry		
11/5/2015		dry		
2/4/2016		dry		
6/30/2016		dry		
8/25/2016		dry		
11/17/2016		dry		
3/7/2017		32.01	82.54	
6/27/2017		33.57	80.98	
8/23/2017		36.69	77.86	
11/14/2017		38.26	76.29	
2/21/18		38.42	76.13	
5/24/18		39.35	75.20	
9/27/18		dry		
12/28/18		dry		
2/28/19		34.9	79.65	

Table 3
Groundwater Flow Direction and Gradient
Wild Wings Water Recycling Facility, Yolo County, CA

Sample Date	Water Surface Elevation ¹			Gradient (ft/ft)	Flow Direction (degrees) ²
	MW-1	MW-5R	MW-4		
6/15/2004	93.41	86.05	76.12	0.006	65
3/29/2005	95.6	87.77	77.88	0.006	64.2
6/16/2005	96.6	89.8	78.78	0.006	67.3
9/29/2005	94.47	84.69	n/a	n/a	n/a
12/6/2005	94.82	84.64	74.11	0.007	61.7
2/16/2006	96.23	89.4	78.4	0.006	67.2
5/16/2006	98.97	88.37	83.1	0.006	53.3
8/21/2006	96.49	89.3	78.46	0.006	66.4
11/20/2006	95.95	86.47	78.91	0.006	58.5
2/8/2007	94.85	86.45	79.86	0.005	58.3
5/7/2007	95.43	87	79.79	0.005	59.4
8/29/2007	93.84	82.45	74.58	0.007	56.9
2/21/2008	96.26	87.92	79.51	0.006	61.4
5/27/2008	96.52	87.36	78.37	0.006	61.1
8/27/2008	95.73	84.01	75.06	0.007	58
11/24/2008	93.79	83.58	74.64	0.007	59.7
2/18/2009	95.5	84.69	75.42	0.007	59.4
5/21/2009	94.9	84.88	76.27	0.006	59.4
8/4/2009	93.26	82.32	71.17	0.008	61.5
11/5/2009	91.88	80.22	69.71	0.008	60
2/8/2010	94.17	83.02	71.4	0.008	61.8
5/7/2010	94.37	85.65	74.77	0.007	64
8/18/2010	95	85.27	72.66	0.008	64.5
11/2/2010	94.22	82.89	71.66	0.008	61.2
12/28/2010	95.46	83.89	72.7	0.008	60.9
2/23/2011	94.89	85.32	74.4	0.007	62.9
5/5/2011	96.78	90.77	78.67	0.006	69.9
8/16/2011	95.99	88.64	75.69	0.007	68.3
11/8/2011	94.27	85.28	74.07	0.007	64
2/27/2012	93.38	85.11	75.99	0.006	62.5
5/21/2012	93.42	86.82	76.15	0.006	67.3
8/9/2012	92.38	84.74	72.63	0.007	67
11/19/2012	91.83	83.31	70.93	0.007	65.9
2/21/2013	94.12	86.39	74.81	0.007	66.3
5/15/2013	94.49	85.73	74.02	0.007	64.9
8/15/2013	93.38	83.87	70.04	0.008	66
11/7/2013	92.53	82.99	68.72	0.008	66.3
2/25/2014	91.84	83.14	69.83	0.007	66.6
5/22/2014	91	81.3	69.63	0.007	63.6
8/27/2014	89.57	76.16	65.22	0.009	58.8
11/12/2014	89.29	77.08	64.35	0.009	61.8
2/26/2015	91.34	82.03	66.86	0.008	67.4
5/13/2015	90.62	82.39	66.81	0.008	69.2
8/4/2015	90.19	82.62	65.29	0.008	71.3
11/5/2015	89.32	80.12	63.97	0.009	68.3
2/4/2016	90.89	81.66	64.31	0.009	69.1
6/30/2016	91.85	84.36	66.49	0.009	71.8
8/25/2016	91.63	83.19	65.5	0.009	70.3
11/17/2016	91.32	83.89	65.17	0.009	72.4
3/7/2017	100.04	93.34	72.25	0.009	74.7
6/27/2017	98.08	90.46	73.66	0.008	71.0
8/23/17	96.13	87.31	72.12	0.006	74.0
11/14/2017	95.15	85.73	70.73	0.006	75.0
2/21/2018	93.28	85.03	70.73	0.006	72.0
5/24/2018	93.19	87.39	71.02	0.006	79.0
9/27/2018	92.15	83.77	67.60	0.005	71.1
12/28/2018	94.88	84.72	67.29	0.007	69.0
2/28/2019	97.83	89.83	71.31	0.005	71.3

¹ Groundwater elevations from 6/15/04 to 2/21/08 were provided by DelTech; groundwater elevations from 5/27/08 to 3/7/2017 were provided by GEI; groundwater elevations from 6/27/2017 to 6/30/18 by SSAL; groundwater elevations from 9/27/2018 through present provided by CRWA.

² Measured clockwise with North as 0.0 degrees, Using graphical methods perpendicular to groundwater contours.

TOC = Top of Casing
msl = mean sea level
DTW = depth to water
btoc = below top of casing

Table 4
Groundwater Quality Monitoring Results
Wild Wings Water Recycling Facility, Yolo County, CA

Sampling Point	Sample Date	Lab	pH	TDS	Na (d)	Cl	B (d)	Fe (d)	Mn (d)	NO3-N	NO2-N	NH3-N	Total Nitrogen	Coliform Bacteria			TTHM (1)	Lab Notes
														(total)	(fecal)	(E. coli)		
	WO Objective		Std Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	(MPN/100 mL)	(MPN/100 mL)	(MPN/100 mL)	ug/L	
Recommended Interim Limitation ²	Background		6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100	
			7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-
MW-1	6/15/2004	STL	7.7	1410	112	391	2.1	<0.10	-	18.7	<0.05	<0.10	18.7	>23.0	<1.1	<1.1	<0.5	
MW-1	3/29/2005	BSK	7.9	1200	160	360	3.7	<0.05	<0.01	27	<0.15	<1	27	2.2	<1.1	-	<0.5	
MW-1	6/16/2005	BSK	7.7	1200	130	340	3.2	<0.05	<0.01	25	<0.20	<1	25	<1.1	<1.1	-	5.1	3
MW-1	9/29/2005	BSK	7.8	1200	130	310	3.2	<0.05	<0.01	27	<0.15	<1	27	<1.1	<1.1	-	<0.5	
MW-1	12/6/2005	BSK	8.1	1100	120	340	2.9	<0.05	<0.01	27	<0.15	<1	27	<1.1	<1.1	<1.1	6.12	3
MW-1	2/16/2006	BSK	8.0	1300	110	340	2.7	<0.05	<0.01	27	<0.10	<1	27	<1.1	<1.1	-	<0.5	
MW-1	5/16/2006	BSK	8.0	1100	130	300	3.4	<0.05	<0.01	27	<0.15	<1	27	<1.1	<1.1	-	<0.5	
MW-1	8/21/2006	BSK	8.0	1000	120	270	3.6	<0.05	<0.01	25	<0.05	<0.10	-	<1.1	<1.1	-	<0.5	
MW-1	11/20/2006	BSK	-	-	-	-	-	-	-	-	-	-	-	>23.0	<1.1	-	-	
MW-1	2/16/2007								No sample retrieved									
MW-1	5/7/2007	BSK	8.0	1100	140	250	4.2	<0.05	<0.01	27	<0.05	<1.0	27	2.2	<1.1	-	<0.5	
MW-1	8/29/2007	BSK	8.0	1100	110	240	3.6	<0.05	<0.01	24	*	<1.0	24	<1.1	<1.1	-	<0.5	
MW-1	11/28/2007	BSK	8.0	1100	130	220	4.0	<0.05	<0.01	24	*	<1.0	26	<1.1	<1.1	-	<0.5	
MW-1	2/21/2008	BSK	-	-	-	-	-	-	-	-	-	-	-	<1.1	<1.1	-	-	
MW-1	5/27/2008	CLS	7.3	1100	120	250	3.5	0.10	<0.02	23	<0.10	<0.10	23	13	-	-	<0.50	
MW-1	8/27/2008	CLS	7.4	1100	120	230	3.6	<0.10	<0.02	24	<0.10	<0.10	24	<1.8	-	-	<0.50	
MW-1	11/24/2008	CLS	7.4	1100	120	260	3.2	0.44	<0.02	25	<0.10	<0.10	25	<1.8	-	-	<0.50	
MW-1	2/18/2009	CLS		980 (5)	130	170	4	<0.10	<0.02	19	<0.10	<0.10	19	<1.8	-	-	<0.50	
MW-1	5/21/2009	CLS	7.3	1100	110	210	3.5	<0.10	<0.02	21	<0.10	<0.10	21	<1.8	-	-	<0.50	
MW-1	8/4/2009	CLS	7.3	1100	96	240	3.1	0.13	<0.02	23	<0.10	<0.10	23	2.0	-	-	<0.50	
MW-1	11/5/2009	CLS	7.16	1100 (5)	110	260	3.1	0.15	<0.02	24	<0.10	<0.10	24	<1.8	-	-	<0.50	
MW-1	2/8/2010	CLS	7.4	1200	120	290	3.5	<0.10	<0.02	25	<0.10	<0.10	25	<1.8	-	-	<0.50	
MW-1	5/7/2010	CLS	7.4	1100	120	280	3.0	<0.10	<0.02	25	<0.10	<0.10	25	<1.8	-	-	<0.50	
MW-1	8/18/2010	CLS	7.2	1100	140	250	3.6	<0.10	<0.02	24	<0.10	<0.10	24	2.0	-	-	<0.50	
MW-1	11/2/2010	CLS	7.4	1200	130	280	3.3	<0.10	<0.02	26	<0.10	<0.10	27	<1.8	-	-	<0.50	
MW-1	2/23/2011	CLS	7.4	1100	130	270	3.6	<0.10	<0.02	26	<0.10	<0.10	26	<1.8	-	-	<0.50	
MW-1	5/5/2011	CLS	7.4	1100	130	250	3.7	<0.10	<0.02	24	<0.10	<0.10	24	<1.8	-	-	<0.50	
MW-1	8/16/2011	CLS	7.4	1200	140	200	4.2	<0.10	<0.02	24	<0.10	<0.10	24	<1.8	-	-	<0.50	
MW-1	11/8/2011	CLS	7.3	1200	130	220	4.0	<0.10	<0.02	20	<0.10	<0.10	20	<1.8	-	-	<0.50	
MW-1	2/27/2012	CLS	7.3	1100	140	220	4.4	<0.10	<0.02	21	<0.10	<0.10	21	<1.8	-	-	<0.50	
MW-1	5/21/2012	CLS	7.5	1100	130	230	4.0	<0.10	<0.02	23	<0.10	0.13	23	<1.8	-	-	<0.50	
MW-1	8/9/2012	CLS	7.6	1100	130	210	3.9	<0.10	<0.02	20	<0.10	<0.10	20	<1.8	-	-	<0.50	
MW-1	11/19/2012	CLS	7.3	1200	120	220	3.5	<0.10	<0.02	20	<0.10	<0.10	20	<1.8	-	-	<0.50	
MW-1	2/21/2013	CLS	7.2	1100	140	200	4.1	<0.10	<0.02	19	<0.10	0.14	19	<1.8	-	-	<0.50	
MW-1	5/15/2013	CLS	7.2	1200	130	220	4.1	<0.10	<0.02	23	<0.10	<0.10	23	<1.8	-	-	<0.50	
MW-1	8/15/2013	CLS	7.3	1100	130	230	3.7	0.15	<0.02	22	<0.10	<0.10	22	<1.8	-	-	<0.50	
MW-1	11/7/2013	CLS	7.4	1100	150	240	3.4	<0.10	<0.02	22	<0.10	<0.10	22	<1.8	-	-	<0.50	
MW-1	2/25/2014	CLS	7.4	1100	100	260	3.5	<0.10	<0.02	22	<0.10	<0.10	22	<1.8	-	-	<0.50	
MW-1	5/22/2014	CLS	7.4	1100	110	220	3.3	<0.10	<0.02	20	<0.10	<0.10	20	<1.8	-	-	<0.50	
MW-1	8/27/2014	CLS	7.5	1200	110	230	3.5	<0.10	<0.02	20	<0.10	<0.10	20	<1.8	-	-	<0.50	
MW-1	11/12/2014	CLS	7.36	1000 (7)	93	240	2.8	<0.10	<0.02	20	<0.10	<0.10	20	<1	-	-	<0.50	
MW-1	2/26/2015	CLS	7.3	990	110	200	3.5	<0.10	<0.02	17	<0.10	<0.10	17	<1.8	-	-	<0.50	
MW-1	5/13/2015	CLS	7.4	1100	100	200	3.5	<0.10	<0.02	17	<0.10	<0.10	17	<1.8	-	-	<0.50	
MW-1	8/4/2015	CLS	7.3	1200	110	200	3.6	<0.10	<0.02	19	<0.10	<0.10	19	<1.8	-	-	<0.50	
MW-1	11/5/2015	CLS	7.3	1200	100	220	3.2	<0.10	<0.02	20	<0.10	<0.10	20	<1.8	-	-	<0.50	
MW-1	2/4/2016	CLS	7.3	1200	110	200	3.9	<0.10	<0.02	20	<0.40	<0.10	20	<1.8	-	-	<0.50	
MW-1	6/30/2016	CLS	7.2	1100	110	180	3.9	<0.10	<0.02	16	<0.40	<0.10	16	<1.8	-	-	<0.50	
MW-1	8/25/2016	CLS	7.3	990	100	170	3.3	<0.10	<0.02	16	<0.40	<0.10	16	2.0	-	-	8.5	
MW-1	11/17/2016	CLS	7.4	1100	110	180	3.7	<0.10	<0.02	17	<0.40	<0.10	17	<1.8	-	-	<0.50	
MW-1	3/7/2017	CLS	7.4	990	110	230	3.5	<0.10	<0.02	15	<0.40	0.18	15	<1.8	-	-	<0.50	
MW-1	6/27/2017	CLS	7.1	1100	150	140	4.6	<0.10	<0.02	16	<0.40	0.19	16	2.0	-	-	<0.50	
MW-1	8/23/2017	CLS	6.6	960	150	130	5.1	<0.10	<0.02	14	<0.40	<0.10	14	2.0	-	-	<0.50	
MW-1	11/14/2017	CLS	7.2	960	150	120	5.1	<0.10	<0.02	11	<0.40	<0.10	11	<1.8	-	-	<0.50	
MW-1	2/21/2018	CLS	7.4	960	140	120	5.4	<0.10	<0.02	12	<0.40	<0.10	12	<1.8	-	-	<0.50	
MW-1	5/24/2018	CLS	7.4	970	120	120	6.1	<0.10	<0.02	18	<0.40	<0.10	18	<1.8	-	-	<0.50	
MW-1	9/27/18	CLS	7.23	1,100	130	-	4.4	<0.10	<0.02	14	<0.40	<0.10	14	<1.8	-	-	<0.50	

Sampling Point	Sample Date	Lab	pH	TDS mg/L	Na (d) mg/L	Cl mg/L	B (d) mg/L	Fe (d) mg/L	Mn (d) mg/L	NO3-N mg/L	NO2-N mg/L	NH3-N mg/L	Total Nitrogen mg/L	Coliform Bacteria (total) (fecal) (<i>E. coli</i>) (MPN/100 mL)			TTHM (1) (EPA 601) ug/L	Lab Notes												
														6.5-8.5	450	69			106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100
														WO Objective																
Recommended Interim Limitation ²	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-												
MW-1	12/28/18	CLS	7.32	900	120	230	3.4	<0.10	<0.02	18	<0.40	<0.10	18	<1.8	-	-	<0.50													
MW-1	2/28/19	CLS	7.35	1,100	140	-	4.8	0.16	<0.02	10	<0.40	<0.10	10	<1.8	-	-	<0.50													
MW-2	6/15/2004	STL	7.6	884	147	78.4	5.9	<0.10	-	11.9	<0.05	<0.10	11.9	23	<1.1	<1.1	<0.5													
MW-2	3/29/2005	BSK	7.8	880	200	95	7.2	<0.05	<0.01	11	<0.15	<1	11	1.1	<1.1	-	<0.5													
MW-2	6/16/2005	BSK	7.6	920	150	100	5.5	<0.05	<0.01	11	<0.10	<1	11	>23.0	<1.1	-	4	3												
MW-2	9/29/2005	BSK	7.8	960	170	110	5.8	<0.05	<0.01	12	<0.15	<1	12	5.1	<1.1	-	<0.5													
MW-2	12/6/2005	BSK	8	970	180	130	6.1	<0.05	<0.01	12	<0.10	<1	12	1.1	<1.1	<1.1	1.8	3												
MW-2	2/16/2006	BSK	7.9	940	150	120	5.4	<0.05	<0.01	11	<0.10	<1	11	<1.1	<1.1	-	1.6	3												
MW-2	5/16/2006	BSK	8	1,000	170	120	5.9	<0.05	<0.01	13	<0.15	4	13	<1.1	<1.1	-	1.6	3												
MW-2	8/21/2006	BSK	7.9	1,000	150	140	5.2	<0.05	<0.01	14	<0.05	<0.10	-	<1.1	<1.1	-	<0.5													
MW-2	11/20/2006	BSK	-	-	-	-	-	-	-	-	-	-	-	>23.0	<1.1	-	-													
MW-2	2/16/2007									No sample retrieved																				
MW-2	5/7/2007	BSK	7.9	920	170	120	6	<0.05	<0.01	11	<0.05	<1.0	11	<1.1	<1.1	-	<0.5													
MW-2	8/29/2007	BSK	7.9	850	130	110	4.8	<0.05	<0.01	10	*	<1.0	10	<1.1	<1.1	-	1.14													
MW-2	11/28/2007	BSK	7.8	890	150	100	5.3	<0.05	<0.01	11	*	<1.0	11	<1.1	<1.1	-	<0.5													
MW-2	2/21/2008	BSK	-	-	-	-	-	-	-	-	-	-	-	1.1	<1.1	-	-													
MW-2	5/27/2008	CLS	7	910	170	97	5.7	<0.10	<0.01	9.1	<0.10	<0.10	9.2	<1.8	-	-	<0.50													
MW-2	8/27/2008	CLS	7	910	150	100	5	<0.10	<0.02	9.5	<0.10	0.11	9.6	<1.8	-	-	<0.50													
MW-2	11/24/2008	CLS	7.2	950	150	100	5	<0.10	<0.02	9.1	<0.10	<0.10	9.1	79	-	-	<0.50													
MW-2	2/18/2009	CLS	-	880 (5)	140	100	4.9	<0.10	<0.02	8.2	<0.10	<0.10	8.5	6.8	-	-	<0.50													
MW-2	5/21/2009	CLS	7.1	870	140	89	4.7	<0.10	<0.02	8.1	<0.10	<0.10	8.3	<1.8	-	-	<0.50													
MW-2	8/4/2009	CLS	7	860	120	91	4.2	<0.10	<0.02	8	<0.10	<0.10	8	<1.8	-	-	<0.50													
MW-2	11/5/2009	CLS	-	790 (5)	150	100	4.8	<0.10	<0.02	7.9	<0.10	<0.10	8	<1.8	-	-	<0.50													
MW-2	2/8/2010	CLS	7.2	960	170	110	5.6	0.1	<0.02	7.9	<0.10	<0.10	7.9	7.8	-	-	<0.50													
MW-2	5/7/2010	CLS	7.1	950	160	120	5.1	<0.10	<0.02	7.5	<0.10	<0.10	7.5	<1.8	-	-	<0.50													
MW-2	8/18/2010	CLS	7.1	1,000	180	130	5.7	0.22	<0.02	8.3	<0.10	0.11	8.5	<1.8	-	-	<0.50													
MW-2	11/2/2010	CLS	7.1	1,100	210	140	6.1	<0.10	<0.02	8.4	<0.10	<0.10	8.7	<1.8	-	-	<0.50													
MW-2	2/23/2011	CLS	7.1	1,200	160	160	5.7	<0.10	<0.02	8.5	<0.10	0.17	11	13	-	-	<0.50													
MW-2	5/5/2011	CLS	7.1	970	160	150	5.6	<0.10	<0.02	7.3	<0.10	<0.10	7.6	<1.8	-	-	<0.50													
MW-2	8/16/2011	CLS	7.1	1,100	190	170	6.6	0.17	<0.02	9.4	<0.10	<0.10	9.6	<1.8	-	-	<0.50													
MW-2	11/8/2011	CLS	7	1,200	180	170	6.3	<0.10	<0.02	8.8	<0.10	<0.10	8.8	<1.8	-	-	<0.50													
MW-2	2/27/2012	CLS	7	1,100	190	140	7	<0.10	<0.02	8	<0.10	<0.10	8.2	<1.8	-	-	<0.50													
MW-2	5/21/2012	CLS	7.1	990	180	130	7.3	<0.10	<0.02	8.2	<0.10	0.2	8.4	2	-	-	<0.50													
MW-2	8/9/2012	CLS	7.4	1,000	140	120	4.7	<0.10	<0.02	8.8	<0.10	0.11	9	<1.8	-	-	<0.50													
MW-2	11/19/2012	CLS	7	1000	170	110	6	<0.10	<0.02	8.6	<0.10	<0.10	8.9	2	-	-	<0.50													
MW-2	2/21/2013	CLS	7	930	170	100	6.2	0.14	<0.02	8.7	<0.10	0.12	8.9	14	-	-	<0.50													
MW-2	5/15/2013	CLS	7.1	940	170	120	6.2	<0.10	<0.02	8.6	<0.10	<0.10	8.7	<1.8	-	-	<0.50													
MW-2	8/15/2013	CLS	7	990	160	120	5.2	<0.10	<0.02	8.3	<0.10	<0.10	8.6	<1.8	-	-	<0.50													
MW-2	11/7/2013	CLS	7	900	150	110	5.7	<0.10	<0.02	8.1	<0.10	0.17	8.4	<1.8	-	-	<0.50													
MW-2	2/25/2014	CLS	7.1	830	140	86	5.9	<0.10	<0.02	8.4	<0.10	<0.10	8.6	<1.8	-	-	<0.50													
MW-2	5/22/2014	CLS	7	830	140	73	5.6	<0.10	<0.02	8.1	<0.10	<0.10	8.1	<1.8	-	-	<0.50													
MW-2	8/27/2014									No sample retrieved																				
MW-2	11/12/2014									No sample retrieved																				
MW-2	2/26/2015	CLS	7	800	130	87	5.3	<0.10	<0.02	8.3	<0.10	<0.10	8.4	<1.8	-	-	<0.50													
MW-2	5/13/2015	CLS	7.2	830	130	86	5.3	<0.10	<0.02	9.2	<0.10	<0.10	9.3	<1.8	-	-	<0.50													
MW-2	8/4/2015	CLS	7.2	830	150	88	5.4	<0.10	<0.02	8.3	<0.10	<0.10	8.5	<1.8	-	-	<0.50													
MW-2	11/5/2015	CLS	7.1	920	130	84	4.5	<0.10	<0.02	8.5	<0.10	<0.10	8.6	<1.8	-	-	<0.50													
MW-2	2/4/2016	CLS	7.1	840	140	83	5.4	<0.10	<0.02	9	<0.40	<0.10	9.2	<1.8	-	-	<0.50													
MW-2	6/30/2016	CLS	7	770	130	83	5.1	<0.10	<0.02	9.2	<0.40	<0.10	9.2	<1.8	-	-	0.68													
MW-2	8/25/2016	CLS	7.1	820	150	88	4.8	<0.10	<0.02	9.7	<0.40	0.17	9.7	<1.8	-	-	2.1													
MW-2	11/17/2016	CLS	7.3	820	140	94	4.9	<0.10	<0.02	10	<0.40	0.12	11	<1.8	-	-	<0.50													
MW-2	3/7/2017	CLS	7.2	840	140	120	5.4	<0.10	<0.02	8.8	<0.40	<0.10	9	<1.8	-	-	<0.50													
MW-2	6/27/2017	CLS	6.9	940	160	130	5.5	<0.10	<0.02	16	--	0.12	16	7.8	-	-	<0.50													
MW-2	8/23/2017	CLS	7.1	960	180	130	6.3	<0.10	<0.02	18	<0.40	<0.10	18	17	-	-	<0.50													
MW-2	11/14/2017	CLS	7.1	1000	170	140	6.2	<0.10	<0.02	21	<0.40	0.1	21	4.5	-	-	<0.50													
MW-2	2/21/2018	CLS	7.1	1000	160	130	6.3	<0.10	<0.02	19	<0.40	<0.10	19	7.8	-	-	<0.50													
MW-2	5/24/2018	CLS	7.1	970	150	130	6.1	<0.10	<0.02	18	<0.40	<0.10	18	<1.8	-	-	<0.50													
MW-2	9/27/18	CLS	7.03	990	170	-	6.0	<0.10	<0.02	16	<0.40	<0.10	16	<1.8	-	-	<0.50													
MW-2	12/28/18	CLS	7.13	890	150	120	5.5	<0.10	<0.02	14	<0.40	<0.10	14	<1.8	-	-	<0.50													

Sampling Point	Sample Date	Lab	pH	TDS	Na (d)	Cl	B (d)	Fe (d)	Mn (d)	NO3-N	NO2-N	NH3-N	Total Nitrogen	Coliform Bacteria (total)	Coliform Bacteria (fecal)	TTHM (1) (E. coli)	Lab Notes		
			Std Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	(MPN/100 mL)	(MPN/100 mL)	ug/L		
Recommended Interim Limitation ²	WO Objective		6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100		
	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-	
MW-2	2/28/19	CLS	7.17	990	160	-	5.7	<0.10	<0.02	14	<0.40	<0.10	14	240	-	-	<0.50		
MW-3	6/15/2004	STL	7.7	435	90.6	34.8	1.7	<0.10	-	1.7	<0.05	<0.10	1.7	23	<1.1	<1.1	<0.5		
MW-3	3/29/2005	BSK	7.8	390	96	38	1.5	<0.05	<0.01	2.9	<0.05	<1	2.9	>23.0	1.1	-	<0.5		
MW-3	6/16/2005	BSK	7.6	380	81	26	1.2	<0.05	<0.01	0.7	<0.10	<1	0.7	5.1	<1.1	-	1.6	3	
MW-3	9/29/2005	BSK	7.8	620	120	57	2.0	<0.05	<0.01	1.8	<0.10	<1	1.8	>23.0	12	-	0.79	3	
MW-3	12/6/2005	BSK	8.1	610	140	62	2.1	<0.05	<0.01	1.6	<0.10	<1	1.6	>23.0	3.6	3.6	5.4	3	
MW-3	2/16/2006	BSK	7.9	380	74	31	1.1	0.1	<0.01	1.4	<0.05	<1	1.4	16.1	1.1	-	<0.5		
MW-3	5/16/2006	BSK	8.0	420	72	32	1.1	<0.05	<0.01	1.6	<0.05	<1	1.6	>23.0	5.1	-	2.6	3	
MW-3	8/21/2006	BSK	8.0	480	110	49	1.7	0.15	<0.01	0.9	<0.05	<0.10	-	<1.1	<1.1	-	<0.5		
MW-3	11/20/2006	BSK	-	-	-	-	-	-	-	-	-	-	-	>23.0	<1.1	-	-		
MW-3	2/16/2007									No sample retrieved									
MW-3	5/7/2007	BSK	7.9	550	160	65	2.0	<0.05	<0.01	0.54	<0.05	<1.0	-	2.2	<1.1	-	<0.5		
MW-3	8/29/2007	BSK	7.9	690	160	92	2.4	<0.05	<0.01	1.4	*	<1.0	1.4	>23.0	<1.1	-	<0.5		
MW-3	11/28/2007	BSK	7.8	770	170	94	2.4	0.27	0.45	2.3	*	<1.0	5.3	23	2.2	-	<0.5		
MW-3	2/21/2008	BSK	-	-	-	-	-	-	-	-	-	-	-	12	<1.1	-	-		
MW-3	5/28/2008	CLS	7.0	530	120	56	1.7	7.1	0.17	2.1	<0.10	<0.10	9.4	280	-	-	<0.5		
MW-3	8/27/2008	CLS	7.0	640	160	69	2.0	<0.10	<0.02	2.0	<0.10	0.12	2.7	540	-	-	<0.5		
MW-3	11/25/2008	CLS	7.1	680	170	67	2.1	0.34	0.19	0.58	<0.10	0.17	1.6	240	-	-	<0.5		
MW-3	2/19/2009	CLS	-	580(5)	130	75	1.8	0.69	0.14	1.3	<0.10	0.14	2.6	>1600	-	-	<0.5		
MW-3	5/21/2009	CLS	7.1	500	130	53	1.6	20	0.68	<0.5	<0.10	<0.10	1.2	79	-	-	<0.5		
MW-3	8/5/2009	CLS	7.0	690	130	73	1.8	0.31	0.04	0.55	<0.10	0.14	1.8	430	-	-	<0.5		
MW-3	11/5/2009	CLS	-	600(5)	160	77	2.1	0.33	0.25	1.0	<0.10	0.64	2.8	>1600	-	-	<0.5		
MW-3	2/8/2010	CLS	7.0	530	130	52	1.7	0.55	0.04	0.69	<0.10	0.15	1.5	1600	-	-	<0.5		
MW-3	5/7/2010	CLS	6.9	580	140	78	1.6	<0.10	0.06	1.1	<0.10	0.26	2.6	23	-	-	<0.5		
MW-3	8/18/2010	CLS	7.1	670	200	87	2.4	2.7	0.50	1.2	<0.10	0.93	3.4	350	-	-	5.2		
MW-3	11/2/2010	CLS	7.0	870	200	120	2.8	0.28	0.46	5.3	<0.10	0.36	7.2	280	-	-	1.5		
MW-3	2/24/2011	CLS	6.7	590	140	73	1.8	<0.10	<0.02	1.6	<0.10	0.17	2.5	1600	-	-	<0.5		
MW-3	5/5/2011	CLS	6.9	650	130	95	1.9	0.11	0.03	4.0	<0.10	0.3	4.6	33	-	-	<0.5		
MW-3	8/16/2011	CLS	7.4	910	170	120	3.2	<0.10	<0.02	5.0	<0.10	<0.10	5.4	94	-	-	<0.5		
MW-3	11/8/2011	CLS	7.0	920	180	130	2.7	2.0	0.35	3.7	<0.10	0.56	4.9	63	-	-	<0.5		
MW-3	2/27/2012	CLS	6.9	740	180	110	2.4	5.5	0.33	2	<0.10	0.43	3.2	49	-	-	<0.5		
MW-3	5/21/2012	CLS	7.0	760	160	98	2.3	<0.10	0.03	2.1	<0.10	0.13	3	13	-	-	<0.5		
MW-3	8/9/2012	CLS	7.3	850	180	110	2.3	0.22	0.03	2.9	<0.10	0.37	3.5	<1.8	-	-	1.7		
MW-3	11/19/2012	CLS	7.0	900	180	120	2.3	0.59	0.18	4.1	<0.10	0.31	5.4	130	-	-	<0.5		
MW-3	2/21/2013	CLS	6.9	670	170	110	2.0	0.18	0.04	2.4	<0.10	0.35	3.2	4	-	-	<0.5		
MW-3	5/15/2013	CLS	7.0	710	160	110	2.1	<0.10	0.07	1.8	<0.10	<0.10	2.1	<1.8	-	-	0.93		
MW-3	8/16/2013	CLS	7.4	630(5)	140	82	1.8	9.10	0.15	1.6	<0.10	0.16	3.7	<1.8	-	-	0.63		
MW-3	11/7/2013	CLS	6.9	620	150	81	1.4	<0.10	0.07	1.8	<0.10	0.12	2.5	<1.8	-	-	<0.5		
MW-3	2/25/2014	CLS	7.2	760	180	170	2.3	3.10	0.13	2.7	<0.10	0.32	3.3	>1600	-	-	<0.5		
MW-3	5/22/2014	CLS	7.0	860	170	170	2.3	0.96	0.03	1.9	<0.10	<0.10	2.3	<1.8	-	-	<0.5		
MW-3	8/27/2014	CLS	7.1	900	150	170	1.9	0.55	0.13	1.8	<0.10	0.2	2.4	<1.8	-	-	0.62		
MW-3	11/12/2014	CLS								No sample retrieved									
MW-3	2/25/2015	CLS	7.0	650	130	110	1.9	<0.10	<0.02	1.1	<0.10	<0.10	1.7	920	-	-	<0.5		
MW-3	5/13/2015	CLS	7.0	700	140	150	1.7	0.26	<0.02	2.4	<0.10	<0.10	2.6	<1.8	-	-	<0.5		
MW-3	8/4/2015	CLS	7.0	700	150	120	1.9	16.00	0.32	2.1	<0.10	0.3	2.7	<1.8	-	-	<0.5		
MW-3	11/5/2015	CLS								No sample retrieved									
MW-3	2/4/2016	CLS	7.1	980	210	230	2.1	<0.10	<0.02	1.7	<0.4	0.25	2.4	220	-	-	<0.5		
MW-3	6/30/2016	CLS	7.0	740	150	150	2.1	11.00	0.18	2.2	<0.4	0.16	3.1	9	-	-	3.1		
MW-3	8/25/2016	CLS								No sample retrieved									
MW-3	11/17/2016	CLS								No sample retrieved									
MW-3	3/7/2017	CLS	7.2	420	84	52	0.94	1.10	0.10	<0.4	<0.4	0.17	0.95	23	-	-	<0.5		
MW-3	6/27/2017	CLS	6.9	510	120	66	1.3	<0.10	<0.10	0.9	<0.4	0.44	4.6	540	-	-	<0.5		
MW-3	8/23/2017	CLS	7.3	610	170	55	2.1	0.12	<0.02	0.48	<0.4	0.33	1.7	>1600	-	-	<0.5		
MW-3	11/14/2017	CLS	7.1	580	130	78	1.7	<0.10	0.039	1.6	<0.4	0.13	4.2	13	-	-	<0.5		
MW-3	2/21/2018	CLS	7.1	690	180	110	2.3	<0.10	0.30	0.94	<0.4	0.26	2.2	220	-	-	<0.5		
MW-3	5/24/2018	CLS	7.3	620	140	81	2	<0.10	<0.20	1.7	<0.4	<0.1	2.0	13	-	-	<0.5		
MW-3	9/27/2018	CLS								No sample retrieved									
MW-3	12/28/2018	CLS	6.91	690	220	170	2.2	<0.10	<0.20	2.6	<0.4	<0.1	3.1	<1.8	-	-	33		
MW-3	2/28/2019	CLS	6.96	440	79	-	0.91	<0.10	<0.20	<0.4	<0.4	<0.1	0.53	>1600	-	-	<0.5		

Sampling Point	Sample Date	Lab	pH	TDS	Na (d)	Cl	B (d)	Fe (d)	Mn (d)	NO3-N	NO2-N	NH3-N	Total Nitrogen	Coliform Bacteria			TTHM (1)	Lab Notes
														(total)	(fecal)	(E. coli)		
Recommended	WO Objective		Std Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100 mL	MPN/100 mL	MPN/100 mL	ug/L	
Interim			6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100	
Limitation ²	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-
MW-4	6/15/2004	STL	8	647	53.3	138	1	0.87	--	8.4	<0.05	<0.10	8.4	9.2	<1.1	<1.0	<0.5	
MW-4	3/29/2005	BSK	8.1	570	69	170	1.2	<0.05	<0.01	9.7	<0.10	<1	9.7	23	<1.1	-	<0.5	
MW-4	6/16/2005	BSK	8	600	59	170	1	<0.05	<0.01	9.7	<0.10	<1	9.7	<1.1	<1.1	-	0.81	3
MW-4	9/29/2005	BSK							No sample retrieved									
MW-4	12/6/2005	BSK	8.2	570	55	180	1.1	<0.05	<0.01	9.9	<0.10	<1	9.9	<1.1	<1.1	<1.1	1.4	3
MW-4	2/16/2006	BSK	8.1	590	49	180	0.96	<0.05	<0.01	9.7	<0.10	<1	9.7	<1.1	<1.1	-	1.8	3
MW-4	5/16/2006	BSK	8.2	650	56	180	1.1	<0.05	<0.01	9.9	<0.10	<1	9.9	<1.1	<1.1	-	<0.99	3
MW-4	8/21/2006	BSK	8.2	590	49	170	1	<0.05	<0.01	9.7	<0.05	<0.10	-	>23.0	9.2	-	<0.5	
MW-4	11/20/2006	BSK	-	-	-	-	-	-	-	-	-	-	-	<1.1	<1.1	-	-	
MW-4	2/16/2007								No sample retrieved									
MW-4	5/7/2007	BSK	8.2	560	54	170	1.1	<0.05	<0.01	44 (4)	<0.05	<1.0	44 (4)	<1.1	<1.1	-	<0.5	
MW-4	8/29/2007	BSK	8.2	570	47	180	1.1	<0.05	<0.01	9.5	*	<1.0	9.5	6.9	<1.1	-	<0.5	
MW-4	11/28/2007	BSK	8.1	570	52	190	1	<0.05	<0.01	11	*	<1.0	11	<1.1	<1.1	-	<0.5	
MW-4	2/21/2008	BSK	-	-	-	-	-	-	-	-	-	-	-	<1.1	<1.1	-	-	
MW-4	5/27/2008	CLS	7.7	550	51	180	1	<0.10	<0.02	9.4	<0.10	<0.10	9.5	<1.8	-	-	<0.50	
MW-4	8/28/2008	CLS	7.5	560	52	170	0.94	<0.10	<0.02	9.5	<0.10	<0.10	9.7	<1.8	-	-	<0.50	
MW-4	11/25/2008	CLS	7.8	620	51	190	0.98	<0.10	<0.02	10	<0.10	<0.10	10	<1.8	-	-	<0.50	
MW-4	2/19/2009	CLS	-	650(5)	53	190	1.2	<0.10	<0.02	10	<0.10	<0.10	10	<1.8	-	-	<0.50	
MW-4	5/21/2009	CLS	7.9	620	50	170	0.98	<0.10	<0.02	9.3	<0.10	<0.10	9.3	<1.8	-	-	<0.50	
MW-4	8/5/2009	CLS	7.6	600	41	190	0.88	<0.10	<0.02	10	<0.10	<0.10	10	<1.8	-	-	<0.50	
MW-4	11/5/2009	CLS	7.8 (6)	710(5)	53	190	1	<0.10	<0.02	10	<0.10	<0.10	10	<1.8	-	-	<0.50	
MW-4	2/8/2010	CLS	7.8	630	59	210	1.2	0.15	<0.02	11	<0.10	<0.10	11	<1.8	-	-	<0.50	
MW-4	5/7/2010	CLS	7.6	710	54	220	0.96	0.12	<0.02	12	<0.10	<0.10	12	<1.8	-	-	<0.50	
MW-4	8/18/2010	CLS	7.6	560	59	200	1.1	<0.10	<0.02	11	<0.10	<0.10	11	<1.8	-	-	<0.50	
MW-4	11/2/2010	CLS	7.8	650	66	210	1.2	<0.10	<0.02	11	<0.10	<0.10	11	<1.8	-	-	<0.50	
MW-4	2/23/2011	CLS	7.7	680	57	220	1.1	<0.10	<0.02	12	<0.10	<0.10	12	<1.8	-	-	<0.50	
MW-4	5/5/2011	CLS	7.8	810	53	230	0.98	<0.10	<0.02	12	<0.10	<0.10	12	<1.8	-	-	<0.50	
MW-4	8/16/2011	CLS	8	690	58	210	1.1	<0.10	<0.02	12	<0.10	<0.10	12	<1.8	-	-	<0.50	
MW-4	11/8/2011	CLS	7.7	630	57	210	1	<0.10	<0.02	11	<0.10	<0.10	11	<1.8	-	-	<0.50	
MW-4	2/27/2012	CLS	7.7	610	62	210	1.2	<0.10	<0.02	11	<0.10	<0.10	11	<1.8	-	-	<0.50	
MW-4	5/21/2012	CLS	7.7	650	58	210	1.2	<0.10	<0.02	12	<0.10	0.26	12	<1.8	-	-	<0.50	
MW-4	8/9/2012	CLS	8	600	63	220	1.1	<0.10	<0.02	12	<0.10	0.19	12	<1.8	-	-	<0.50	
MW-4	11/19/2012	CLS	7.6	610	55	210	1	<0.10	<0.02	12	<0.10	<0.10	12	<1.8	-	-	<0.50	
MW-4	2/21/2013	CLS	7.6	670	66	230	1.1	<0.10	<0.02	15	<0.10	<0.10	15	<1.8	-	-	<0.50	
MW-4	5/15/2013	CLS	7.6	680	57	240	1.1	0.21	<0.02	15	<0.10	<0.10	15	<1.8	-	-	<0.50	
MW-4	8/16/2013	CLS	7.7	870(5)	58	250	1.1	<0.10	<0.02	14	<0.10	0.14	14	<1.8	-	-	<0.50	
MW-4	11/7/2013	CLS	7.6	670	56	250	1	<0.10	<0.02	14	<0.10	0.14	14	<1.8	-	-	<0.50	
MW-4	2/25/2014	CLS	7.7	830	70	250	1	<0.10	<0.02	14	<0.10	<0.10	14	<1.8	-	-	<0.50	
MW-4	5/22/2014	CLS	7.8	700	57	230	1.1	<0.10	<0.02	13	<0.10	<0.10	13	<1.8	-	-	<0.50	
MW-4	8/27/2014	CLS	7.8	840	58	250	1	<0.10	<0.02	14	<0.10	<0.10	14	<1.8	-	-	<0.50	
MW-4	11/12/2014	CLS	7.7 (6)	749(7)	54	260	1	<0.10	<0.02	15	<0.10	<0.10	15	<1	-	-	<0.50	
MW-4	2/26/2015	CLS	7.7	720	52	260	1	<0.10	<0.02	16	<0.10	<0.10	16	<1.8	-	-	<0.50	
MW-4	5/13/2015	CLS	7.8	770	53	250	1	<0.10	<0.02	15	<0.10	<0.10	15	<1.8	-	-	<0.50	
MW-4	8/4/2015	CLS	7.8	750	56	240	1	<0.10	<0.02	16	<0.10	<0.10	16	<1.8	-	-	<0.50	
MW-4	11/5/2015	CLS	7.8	970	60	240	1.1	<0.10	<0.02	17	<0.10	<0.10	17	<1.8	-	-	<0.50	
MW-4	2/4/2016	CLS	7.8	760	49	240	0.82	<0.10	<0.02	17	<0.40	0.17	17	<1.8	-	-	<0.50	
MW-4	6/30/2016	CLS	7.6	690	50	240	0.95	<0.10	<0.02	16	<0.40	<0.10	16	<1.8	-	-	<0.50	
MW-4	8/25/2016	CLS	7.7	560	56	220	0.88	<0.10	<0.02	16	<0.40	0.14	16	<1.8	-	-	12	
MW-4	11/17/2016	CLS	7.7	660	50	220	0.85	<0.10	<0.02	17	<0.40	<0.10	17	<1.8	-	-	<0.50	
MW-4	3/7/2017	CLS	7.7	670	49	250	0.95	<0.10	<0.02	14	<0.40	<0.10	14	<1.8	-	-	<0.50	
MW-4	6/27/2017	CLS	7.5	680	55	230	0.87	<0.10	<0.02	15	<0.40	<0.10	15	<1.8	-	-	<0.50	
MW-4	8/23/2017	CLS	7.5	630	57	220	1	<0.10	<0.02	14	<0.40	<0.10	14	79	-	-	<0.50	
MW-4	11/14/2017	CLS	7.5	660	58	240	0.97	<0.10	<0.02	15	<0.40	0.13	15	540	-	-	<0.50	
MW-4	2/21/2018	CLS	7.8	610	53	220	0.96	<0.10	<0.02	14	<0.40	<0.10	15	49	-	-	<0.50	
MW-4	5/24/2018	CLS	7.7	620	47	210	0.93	<0.10	<0.02	14	<0.40	<0.10	14	2	-	-	<0.50	
MW-4	9/27/18	CLS	7.76	610	54	-	0.97	<0.10	<0.02	15	<0.40	<0.10	3	<1.8	-	-	<0.50	
MW-4	12/28/18	CLS	7.8	530	52	220	0.88	<0.10	<0.02	15	<0.40	<0.10	15	<1.8	-	-	2	
MW-4	2/28/19	CLS	7.77	780	51	-	0.88	<0.10	<0.02	12	<0.40	<0.10	15	4.5	-	-	<0.50	

Sampling Point	Sample Date	Lab	pH Std Unit	TDS mg/L	Na (d) mg/L	Cl mg/L	B (d) mg/L	Fe (d) mg/L	Mn (d) mg/L	NO3-N mg/L	NO2-N mg/L	NH3-N mg/L	Total Nitrogen mg/L	Coliform Bacteria (total) (fecal) (<i>E. coli</i>) (MPN/100 mL)			TTHM (1) (EPA 601) ug/L	Lab Notes
														ND	ND	ND		
Recommended Interim Limitation ²	WO Objective		6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100	
	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-
MW-5R	6/15/2004	STL	8.1	461	91.7	42.3	2.1	<0.10	-	1.6	<0.05	<0.10	1.6	>23.0	<1.1	<1.1	<0.5	
MW-5R	3/29/2005	BSK	8.2	490	120	48	2.6	<0.05	<0.01	2	<0.10	<1	2	5.1	<1.1	-	<0.5	
MW-5R	6/16/2005	BSK	8.2	450	95	49	2	<0.05	<0.01	1.4	<0.10	<1	1.4	1.1	<1.1	-	4	3
MW-5R	9/29/2005	BSK	8.2	430	92	48	2	<0.05	<0.01	1.1	<0.10	<1	1.1	1.1	<1.1	-	<0.5	
MW-5R	6/12/2005	BSK	8.4	430	92	51	2.1	<0.05	<0.01	1.6	<0.10	<1	1.6	<1.1	<1.1	<1.1	1.8	3
MW-5R	2/16/2006	BSK	8.3	450	91	48	2	<0.05	<0.01	1.7	<0.10	<1	1.7	<1.1	<1.1	-	1.6	3
MW-5R	5/16/2006	BSK	8.3	360	92	47	2.1	<0.05	<0.01	1.1	<0.10	<1	1.1	<1.1	<1.1	-	1.6	3
MW-5R	8/21/2006	BSK	8.3	420	78	47	1.8	<0.05	<0.01	1.1	<0.05	<0.10	-	<1.1	<1.1	-	<0.5	
MW-5R	11/20/2006	BSK	-	-	-	-	-	-	-	-	-	-	-	23	<1.1	-	-	
MW-5R	2/16/2007								No sample retrieved									
MW-5R	7/5/2007	BSK	8.3	420	89	49	2	<0.05	<0.01	1.1	<0.05	<1.0	1.1	<1.1	<1.1	-	<0.5	
MW-5R	8/29/2007	BSK	8.3	470	91	44	1.9	<0.05	<0.01	2	*	<1.0	2	<1.1	<1.1	-	1.14	
MW-5R	11/28/2007	BSK	8.2	460	95	45	2.1	<0.05	<0.01	2.1	*	<1.0	2.1	1.1	<1.1	-	<0.5	
MW-5R	2/21/2008	BSK	-	-	-	-	-	-	-	-	-	-	-	<1.1	<1.1	-	-	
MW-5R	5/28/2008	CLS	7.7	450	97	44	2.1	<0.05	<0.01	1.4	<0.10	<1.0	1.5	<1.8	-	-	<0.50	
MW-5R	8/27/2008	CLS	7.9	450	91	44	2	<0.10	<0.02	1.5	<0.10	<0.10	1.7	<1.8	-	-	<0.50	
MW-5R	11/24/2008	CLS	7.9	470	93	46	2	<0.10	<0.02	1.8	<0.10	<0.10	1.9	<1.8	-	-	<0.50	
MW-5R	2/18/2009	CLS	-	470(5)	92	48	2.1	<0.10	<0.02	1.8	<0.10	<0.10	2	<1.8	-	-	<0.50	
MW-5R	5/21/2009	CLS	7.9	470	86	44	1.9	<0.10	<0.02	1.6	<0.10	<0.10	1.6	<1.8	-	-	<0.50	
MW-5R	4/8/2009	CLS	7.9	480	78	44	1.9	<0.10	<0.02	1.7	<0.10	<0.10	1.7	<1.8	-	-	<0.50	
MW-5R	5/11/2009	CLS	7.7(6)	450(5)	98	44	2.1	<0.10	<0.02	1.7	<0.10	<0.10	1.8	<1.8	-	-	<0.50	
MW-5R	8/2/2010	CLS	7.9	490	110	45	2.4	0.12	<0.02	2	<0.10	<0.10	2	<1.8	-	-	<0.50	
MW-5R	7/5/2010	CLS	7.9	490	100	43	2.1	<0.10	<0.02	2.2	<0.10	<0.10	2.2	<1.8	-	-	<0.50	
MW-5R	8/18/2010	CLS	7.8	520	120	43	2.2	<0.10	<0.02	2.6	<0.10	<0.10	2.9	110	-	-	<0.50	
MW-5R	2/11/2010	CLS	8	560	120	42	2.2	<0.10	<0.02	2.8	<0.10	<0.10	2.8	<1.8	-	-	<0.50	
MW-5R	2/23/2011	CLS	7.9	520	100	42	2.2	<0.10	<0.02	3	<0.10	<0.10	3.4	<1.8	-	-	<0.50	
MW-5R	5/5/2011	CLS	7.9	380	92	45	1.9	<0.10	<0.02	2.9	<0.10	<0.10	2.9	2	-	-	<0.50	
MW-5R	8/16/2011	CLS	7.9	470	100	50	2.2	<0.10	<0.02	1.8	<0.10	<0.10	1.8	<1.8	-	-	<0.50	
MW-5R	8/11/2011	CLS	7.9	460	97	46	2.1	<0.10	<0.02	2.1	<0.10	<0.10	2.1	<1.8	-	-	<0.50	
MW-5R	2/27/2012	CLS	7.9	460	110	45	2.3	<0.10	<0.02	2.3	<0.10	<0.10	2.3	<1.8	-	-	<0.50	
MW-5R	5/21/2012	CLS	8	440	100	44	2.3	<0.10	<0.02	2.4	<0.10	<0.10	2.6	<1.8	-	-	<0.50	
MW-5R	9/8/2012	CLS	8.1	510	120	42	2.5	<0.10	<0.02	2.5	<0.10	<0.10	2.7	<1.8	-	-	<0.50	
MW-5R	11/19/2012	CLS	7.9	480	100	39	2.1	<0.10	<0.02	2.5	<0.10	<0.10	2.6	<1.8	-	-	<0.50	
MW-5R	2/21/2013	CLS	7.8	490	100	39	2.1	<0.10	<0.02	2.2	<0.10	<0.10	2.2	4.5	-	-	<0.50	
MW-5R	5/15/2013	CLS	7.7	460	100	48	2.2	<0.10	<0.02	2.5	<0.10	<0.10	2.6	<1.8	-	-	<0.50	
MW-5R	8/15/2013	CLS	7.9	480	110	45	2	<0.10	<0.02	2.7	<0.10	<0.10	3.1	<1.8	-	-	<0.50	
MW-5R	7/11/2013	CLS	7.8	480	110	45	2.1	<0.10	<0.02	2.7	<0.10	<0.10	3	<1.8	-	-	<0.50	
MW-5R	2/25/2014	CLS	8	520	110	41	2.3	<0.10	<0.02	2.7	<0.10	<0.10	2.8	<1.8	-	-	<0.50	
MW-5R	5/22/2014	CLS	8	490	96	38	2	<0.10	<0.02	2.5	<0.10	<0.10	2.5	<1.8	-	-	<0.50	
MW-5R	8/27/2014	CLS	8	530	98	40	2	<0.10	<0.02	2.7	<0.10	<0.10	2.7	<1.8	-	-	<0.50	
MW-5R	11/12/2014	CLS	7 (6)	534 (7)	99	35	2.1	<0.10	<0.02	3.2	<0.10	<0.10	3.2	<1	-	-	<0.50	
MW-5R	2/26/2015	CLS	7.9	520	100	39	2.2	<0.10	<0.02	3.4	<0.10	<0.10	3.5	<1.8	-	-	<0.50	
MW-5R	5/13/2015	CLS	8	520	98	43	2.1	<0.10	<0.02	3.3	<0.10	<0.10	3.3	<1.8	-	-	<0.50	
MW-5R	8/4/2015	CLS	7.9	530	110	40	2.1	<0.10	<0.02	3.3	<0.10	<0.10	3.6	<1.8	-	-	<0.50	
MW-5R	11/5/2015	CLS	7.9	560	95	38	1.9	<0.10	<0.02	3.1	<0.10	<0.10	3.2	<1.8	-	-	<0.50	
MW-5R	2/4/2016	CLS	8	550	99	38	2.1	0.18	<0.02	3.1	<0.40	<0.10	3.2	<1.8	-	-	<0.50	
MW-5R	6/30/2016	CLS	7.8	500	96	38	2.1	<0.10	<0.02	2.9	<0.40	<0.10	3.2	<1.8	-	-	0.68	
MW-5R	8/25/2016	CLS	7.9	490	110	40	2	<0.10	<0.02	2.9	<0.40	<0.10	2.9	<1.8	-	-	2.1	
MW-5R	11/17/2016	CLS	8	500	100	39	2	<0.10	<0.02	3	<0.40	<0.10	3.2	<1.8	-	-	<0.50	
MW-5R	3/7/2017	CLS	7.7	470	77	34	1.7	<0.10	0.058	2	<0.40	0.24	2.4	920	-	-	<0.50	
MW-5R	6/27/2017	CLS	7.1	290	21	4	0.3	<0.10	<0.02	<0.40	<0.40	0.12	0.81	170	<0.50	-	-	
MW-5R	8/23/2017	CLS	7.7	400	64	41	1.5	<0.10	<0.02	1.5	<0.40	0.31	1.9	33	-	-	<0.50	
MW-5R	11/14/2017	CLS	7.7	410	77	51	1.8	<0.10	<0.02	<0.40	<0.40	<0.10	<0.20	<1.8	-	-	<0.50	
MW-5R	2/21/2018	CLS	7.8	400	83	48	1.9	<0.10	<0.02	2.3	<0.40	<0.10	2.6	4.5	-	-	0.61	
MW-5R	5/24/2018	CLS	7.8	470	81	44	2.0	<0.10	<0.02	2.2	<0.40	<0.10	2.5	<1.8	-	-	0.68	
MW-5R	9/27/18	CLS	7.94	460	100	-	2.1	<0.10	<0.02	2.9	<0.40	<0.10	3	<1.8	-	-	<0.50	
MW-5R	12/28/18	CLS	7.97	400	92	44	2	<0.10	<0.02	2.6	<0.40	<0.10	2.7	<1.8	-	-	<0.50	
MW-5R	2/28/19	CLS	7.93	440	63	-	1.5	<0.10	<0.02	1.7	<0.40	<0.10	1.7	63	-	-	<0.50	
MW-6	6/15/2004	STL	7.6	865	143	87.7	5.6	<0.10	-	12.2	<0.05	<0.10	12.2	16.1	<1.1	<1.1	<0.5	

Sampling Point	Sample Date	Lab	pH	TDS	Na (d)	Cl	B (d)	Fe (d)	Mn (d)	NO3-N	NO2-N	NH3-N	Total Nitrogen	Coliform Bacteria			TTHM (1)	Lab Notes		
														(total)	(fecal)	(E. coli)				
Recommended	WO Objective		Std Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ND	ND	ND	100			
Interim	Background		6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	<2.0	<2.0	-	-	-		
Limitation ²			7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-		
MW-6	3/29/2005	BSK	7.8	870	180	110	6.6	<0.05	<0.01	11	<0.15	<1	11	5.1	<1.1	-	<0.5			
MW-6	6/16/2005	BSK	7.7	910	150	130	5.4	<0.05	<0.01	12	<0.15	<1	12	<1.1	<1.1	-	<0.5			
MW-6	9/29/2005	BSK	7.8	870	150	100	5.2	<0.05	<0.01	11	<0.15	<1	11	<1.1	<1.1	-	<0.5			
MW-6	12/6/2005	BSK	8.1	900	160	110	5.6	<0.05	<0.01	12	<0.05	<1	12	<1.1	<1.1	<1.1	<0.5			
MW-6	2/16/2006	BSK	7.9	900	140	130	4.9	<0.05	<0.01	12	<0.10	<1	12	<1.1	<1.1	-	<0.5			
MW-6	5/16/2006	BSK	8.0	1,000	160	150	5.5	<0.05	<0.01	13	<0.10	<1	13	<1.1	<1.1	-	<0.5			
MW-6	8/21/2006	BSK	7.9	860	140	160	4.7	<0.05	<0.01	13	<0.05	<0.10	-	<1.1	<1.1	-	<0.5			
MW-6	11/20/2006	BSK	-	-	-	-	-	-	-	-	-	-	-	>23.0	<1.1	-	-			
MW-6	2/16/2007									No sample retrieved										
MW-6	5/7/2007	BSK	7.9	900	160	120	5.5	<0.05	<0.01	11	<0.05	<1.0	11	16.1	<1.1	-	<0.5			
MW-6	8/29/2007	BSK	7.8	880	130	100	4.5	<0.05	<0.01	9.7	*	<1.0	9.7	<1.1	<1.1	-	<0.5			
MW-6	11/28/2007	BSK	7.8	850	150	96	5.1	<0.05	<0.01	8.7	*	<1.0	8.7	<1.1	<1.1	-	<0.5			
MW-6	2/21/2008	BSK	-	-	-	-	-	-	-	-	-	-	-	<1.1	<1.1	-	-			
MW-6	5/27/2008	CLS	7.1	900	150	130	4.8	<0.10	<0.02	9	<0.10	<0.10	9.1	<1.8	-	-	<0.50			
MW-6	8/27/2008	CLS	7.2	820	150	97	4.6	<0.10	<0.02	8.5	<0.10	0.12	8.6	<1.8	-	-	<0.50			
MW-6	11/24/2008	CLS	7.2	810	140	92	4.3	<0.10	<0.02	8	<0.10	<0.10	8.1	<1.8	-	-	<0.50			
MW-6	2/18/2009	CLS	-	820(5)	140	100	4.3	<0.10	<0.02	7.7	<0.10	<0.10	8.0	<1.8	-	-	<0.50			
MW-6	5/21/2009	CLS	7.2	880	140	97	4.3	<0.10	<0.02	7.9	<0.10	<0.10	7.9	<1.8	-	-	<0.50			
MW-6	8/4/2009	CLS	7.1	860	120	95	3.9	<0.10	<0.02	7.8	<0.10	<0.10	7.8	<1.8	-	-	<0.50			
MW-6	11/5/2009	CLS	-	750(5)	150	89	4.4	<0.10	<0.02	7	<0.10	<0.10	7.2	4.5	-	-	<0.50			
MW-6	2/8/2010	CLS	7.2	850	170	96	5.0	<0.10	<0.02	7.1	<0.10	<0.10	7.4	<1.8	-	-	<0.50			
MW-6	5/7/2010	CLS	7.1	910	160	120	4.6	<0.10	<0.02	7.5	<0.10	<0.10	7.7	<1.8	-	-	<0.50			
MW-6	8/18/2010	CLS	7.0	930	180	120	4.9	<0.10	<0.02	8	<0.10	<0.10	8.3	<1.8	-	-	<0.50			
MW-6	11/2/2010	CLS	7.2	930	180	110	4.8	<0.10	<0.02	7.7	<0.10	<0.10	7.9	1.8	-	-	<0.50			
MW-6	2/23/2011	CLS	7.2	920	160	120	4.8	<0.10	<0.02	7.5	<0.10	<0.10	8.0	2.0	-	-	<0.50			
MW-6	5/5/2011	CLS	7.1	990	150	200	4.1	<0.10	<0.02	4.3	<0.10	<0.10	4.5	<1.8	-	-	<0.50			
MW-6	8/16/2011	CLS	7.2	1100	160	200	4.5	<0.10	<0.02	9.9	<0.10	<0.10	9.9	<1.8	-	-	<0.50			
MW-6	11/8/2011	CLS	7.0	990	160	140	4.6	<0.10	<0.02	8	<0.10	<0.10	8.2	<1.8	-	-	<0.50			
MW-6	2/27/2012	CLS	7.1	880	180	120	5.4	<0.10	<0.02	8.5	<0.10	0.13	8.5	<1.8	-	-	<0.50			
MW-6	5/21/2012	CLS	7.2	870	160	120	5.8	0.11	<0.02	8.6	<0.10	0.18	8.8	<1.8	-	-	<0.50			
MW-6	8/9/2012	CLS	7.5	970	130	110	3.9	<0.10	<0.02	8.5	<0.10	0.11	8.8	<1.8	-	-	<0.50			
MW-6	11/19/2012	CLS	7.1	950	170	100	5.1	<0.10	<0.02	8.1	<0.10	<0.10	8.3	<1.8	-	-	<0.50			
MW-6	2/21/2013	CLS	6.9	900	160	110	5.3	<0.10	<0.02	7.9	<0.10	0.11	7.9	<1.8	-	-	<0.50			
MW-6	5/15/2013	CLS	7.0	890	160	120	5.1	<0.10	<0.02	8.9	<0.10	0.18	9.0	<1.8	-	-	<0.50			
MW-6	8/15/2013	CLS	7.1	890	150	110	5.0	<0.10	<0.02	8.9	<0.10	<0.10	9.3	<1.8	-	-	<0.50			
MW-6	11/7/2013	CLS	7.0	850	180	110	3.6	<0.10	<0.02	8.8	<0.10	0.18	9.0	<1.8	-	-	<0.50			
MW-6	2/25/2014	CLS	7.2	910	140	100	5.4	<0.10	<0.02	8.4	<0.10	<0.10	8.6	<1.8	-	-	<0.50			
MW-6	5/22/2014	CLS	7.1	880	150	93	5.3	<0.10	<0.02	8.5	<0.10	<0.10	8.8	<1.8	-	-	<0.50			
MW-6	8/27/2014	CLS								No sample retrieved										
MW-6	11/12/2014	CLS								No sample retrieved										
MW-6	2/26/2015	CLS	7.1	850	140	94	5.2	1.0	0.04	8.3	<0.10	<0.10	8.4	<1.8	-	-	<0.50			
MW-6	5/13/2015	CLS	7.2	860	130	87	4.8	<0.10	<0.02	8.5	<0.10	<0.10	8.6	<1.8	-	-	<0.50			
MW-6	8/4/2015	CLS	7.3	810	140	90	4.6	<0.10	<0.02	7.7	<0.10	<0.10	7.9	<1.8	-	-	<0.50			
MW-6	11/5/2015	CLS	7.2	830	160	81	5.0	<0.10	<0.02	8.5	<0.10	<0.10	8.6	<1.8	-	-	<0.50			
MW-6	2/4/2016	CLS	7.2	810	140	82	4.7	<0.10	<0.02	8.9	<0.40	<0.10	9.0	<1.8	-	-	<0.50			
MW-6	6/30/2016	CLS	7.1	780	120	87	4.3	<0.10	<0.02	8.5	<0.40	<0.10	8.5	<1.8	-	-	0.80			
MW-6	8/25/2016	CLS	7.1	730	150	86	4.3	<0.10	<0.02	8.5	<0.40	<0.10	8.5	<1.8	-	-	3.3			
MW-6	11/17/2016	CLS	7.3	760	140	86	4.2	<0.10	<0.02	9	<0.40	0.11	9.2	<1.8	-	-	<0.50			
MW-6	3/7/2017	CLS	7.1	1000	150	260	3.8	<0.10	<0.02	11	<0.40	0.11	11.0	<1.8	-	-	<0.50			
MW-6	6/27/2017	CLS	6.9	910	150	190	3.8	<0.10	<0.02	9.9	<0.40	0.18	10.0	14	-	-	<0.50			
MW-6	8/23/2017	CLS	7.2	920	150	160	4.2	<0.10	<0.02	11	<0.40	0.16	11.0	<1.8	-	-	<0.50			
MW-6	11/14/2017	CLS	7.0	880	150	130	4.3	<0.10	<0.02	12	<0.40	<0.10	12	<1.8	-	-	<0.50			
MW-6	2/21/2018	CLS	7.1	920	150	120	4.6	<0.10	<0.02	14	<0.40	<0.10	14	4.5	-	-	<0.50			
MW-6	5/24/2018	CLS	7.1	950	140	120	4.8	<0.10	<0.02	14	<0.40	<0.10	14	<1.8	-	-	0.8			
MW-6	9/27/18	CLS	7.09	930	160	-	5.0	<0.10	<0.02	14	<0.40	<0.10	14	2.0	-	-	1.4			
MW-6	12/28/18	CLS	7.11	860	150	120	4.7	<0.10	<0.02	12	<0.40	<0.10	12	<1.8	-	-	3			
MW-6	2/28/19	CLS	7.1	920	150	-	4.8	<0.10	<0.02	12	<0.40	<0.10	12	12	-	-	1.8			
MW-7	6/15/2004	STL	7.6	615	61.7	113	1.8	0.12	-	11.7	<0.05	<0.10	12.4				<0.5			
MW-7	3/29/2005	BSK	7.9	540	79	88	2.2	<0.05	<0.01	7.2	<0.10	<1	7.2				<0.5			

Sampling Point	Sample Date	Lab	pH	TDS mg/L	Na (d) mg/L	Cl mg/L	B (d) mg/L	Fe (d) mg/L	Mn (d) mg/L	NO3-N mg/L	NO2-N mg/L	NH3-N mg/L	Total Nitrogen mg/L	Coliform Bacteria (MPN/100 mL)			TTHM (1) (EPA 601) ug/L	Lab Notes
														(total)	(fecal)	(E. coli)		
Recommended	WO Objective		6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100	
Interim Limitation ²	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-
MW-7	6/16/2005	BSK	8.1	540	69	85	1.8	<0.05	<0.01	7.2	<0.10	<1	7.9				0.74	3
MW-7	9/29/2005	BSK								No sample retrieved								
MW-7	12/6/2005	BSK								No sample retrieved								
MW-7	2/16/2006	BSK	8.0	590	69	100	1.9	<0.05	<0.01	8.8	0.27	<1	9.1				1.7	3
MW-7	5/16/2006	BSK	8.0	610	74	92	2.0	<0.05	<0.01	8.6	<0.10	<1	8.6				<0.5	
MW-7	8/21/2006	BSK	8.0	530	60	81	1.6	<0.05	<0.01	6.8	<0.05	<0.10					<0.5	
MW-7	11/20/2006	BSK								No sample retrieved								
MW-7	2/16/2007									No sample retrieved								
MW-7	5/7/2007	BSK								No sample retrieved								
MW-7	8/29/2007	BSK								No sample retrieved								
MW-7	11/28/2007	BSK								No sample retrieved								
MW-7	2/21/2008	BSK	-	-	-	-	-	-	-	-	-	-	-				-	
MW-7	5/27/2008	CLS								No sample retrieved								
MW-7	8/27/2008	CLS								No sample retrieved								
MW-7	11/24/2008	CLS								No sample retrieved								
MW-7	2/18/2009	CLS								No sample retrieved								
MW-7	5/21/2009	CLS								No sample retrieved								
MW-7	8/4/2009	CLS								No sample retrieved								
MW-7	11/5/2009	CLS								No sample retrieved								
MW-7	2/8/2010	CLS								No sample retrieved								
MW-7	5/7/2010	CLS								No sample retrieved								
MW-7	8/18/2010	CLS								No sample retrieved								
MW-7	11/2/2010	CLS								No sample retrieved								
MW-7	2/23/2011	CLS								No sample retrieved								
MW-7	5/5/2011	CLS	7.1	660	87	100	1.8	<0.10	<0.02	7.2	<0.10	<0.10	7.4				<0.50	
MW-7	8/16/2011	CLS	7.4	680	95	100	1.9	<0.10	<0.02	6.6	<0.10	<0.10	6.9				<0.50	
MW-7	11/8/2011	CLS								No sample retrieved								
MW-7	2/27/2012	CLS								No sample retrieved								
MW-7	5/21/2012	CLS								No sample retrieved								
MW-7	8/9/2012	CLS								No sample retrieved								
MW-7	11/19/2012	CLS								No sample retrieved								
MW-7	2/21/2013	CLS								No sample retrieved								
MW-7	5/15/2013	CLS								No sample retrieved								
MW-7	8/15/2013	CLS								No sample retrieved								
MW-7	11/7/2013	CLS								No sample retrieved								
MW-7	2/25/2014	CLS								No sample retrieved								
MW-7	5/22/2014	CLS								No sample retrieved								
MW-7	8/27/2014	CLS								No sample retrieved								
MW-7	11/12/2014	CLS								No sample retrieved								
MW-7	2/26/2015	CLS								No sample retrieved								
MW-7	5/13/2015	CLS								No sample retrieved								
MW-7	8/4/2015	CLS								No sample retrieved								
MW-7	11/5/2015	CLS								No sample retrieved								
MW-7	2/4/2016	CLS								No sample retrieved								
MW-7	6/30/2016	CLS								No sample retrieved								
MW-7	8/25/2016	CLS								No sample retrieved								
MW-7	11/17/2016	CLS								No sample retrieved								
MW-7	3/7/2017	CLS	7.3	670	100	120	2	<0.10		7.5		0.16	7.8				1.2	
MW-7	6/27/2017	CLS	7.0	590	93	89	1.7	<0.10		4.6		0.19	4.9				<0.50	
MW-7	8/23/2017	CLS	7.3	620	99	56	2	<0.10		4.3		<0.10	4.4				<0.50	
MW-7	11/14/2017	CLS								No sample retrieved								
MW-7	2/21/2018	CLS								No sample retrieved								
MW-7	5/24/2018	CLS								No sample retrieved								
MW-7	9/27/18	CLS								No sample retrieved								
MW-7	12/28/18	CLS								No sample retrieved								
MW-7	2/28/19	CLS	7.22	660	63	-	1.5	<0.10	<0.02	4.8	<0.40	<0.10	4.8	2			<0.50	

Laboratory Notes:

Sampling Point	Sample Date	Lab	pH Std Unit	TDS mg/L	Na (d) mg/L	Cl mg/L	B (d) mg/L	Fe (d) mg/L	Mn (d) mg/L	NO3-N mg/L	NO2-N mg/L	NH3-N mg/L	Total Nitrogen mg/L	Coliform Bacteria (MPN/100 mL)			TTHM (1) (EPA 601) ug/L	Lab Notes
														(total)	(fecal)	(E. coli)		
Recommended	WO Objective		6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100	
Interim Limitation ²	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-

STL = Severn Trent Laboratory of West Sacramento, CA; BSK = BSK Laboratories of Fresno, CA; TDS = total dissolved solids; NO3-N = nitrate as nitrogen; NO2-N = nitrite as nitrogen;

NH3-N = ammonia as nitrogen; (d) = dissolved fraction; TTHM = total trihalomethanes; nd = nondetect

italic font style = Analysis for magnesium, total Kjeldahl nitrogen, fecal coliform and E. coli organisms is not required by RWQCB Order R5-2002-0077.

1 = Total trihalomethanes consist of the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane.

2 = See WDRs Item E. 1. Ground Water Limitations; WQ Objective = a variety of applicable regional water quality goals compiled by RWQCB staff; Background = Tolerance Limit (calculated from August 2001 borings and monitoring wells MW-1 and MW-5R)

3 (in Lab Notes column) = Chloroform detection; this compound was also detected in the laboratory method blank; this compound is a common laboratory contaminant.

4 = Nitrate (as nitrogen) laboratory result for 5/7/2007 at MW-4 is reported as shown on the laboratory report although the concentration is about four times higher than historic results. It is probable that the concentration was reported for nitrate (as nitrate). Due to the age of the sample, laboratory validation of the result could not be performed.

5 = Sample was extracted/analyzed outside the EPA recommended holding time

6 = Measured in the field

7 = Calculated using field Electrical Conductivity measurement

* = Nitrate as nitrogen and Nitrite as Nitrogen results were combined as one

- = Sample not collected or not measured for this constituent

Notes on Laboratory Data depicted on Figures.

1. MW-7 – Data for NO3, and TN for 5/7/2007 is not graphed due to concerns with data.
2. MW-5R – Data for Chloride for 6/27/2017 is suspect (dilution factor?) but is shown on graph.
3. Data reported as less than the laboratory reporting limit is shown on figures as "zero"

Table 5
Quality Assurance/Quality Control Samples
Wild Wings Water Recycling Facility, Yolo County, CA

Sampling Point	Sample Date	Lab	TTHM ¹ (ug/L)	Lab Notes
EB-1	11/17/2017	CLS	1.1	-
	3/7/2017	CLS	2.0	-
Trip Blanks	11/17/2017	CLS	<0.50	-
	3/7/2017	CLS	<0.50	-
	6/28/2017	CLS	<0.50	-
	8/23/2017	CLS	<0.50	-
	2/21/2018	CLS	<0.50	-
	5/24/2018	CLS	<0.50	Mislabeled 3
	9/27/2018	CLS	<0.50	-
	2/28/2019	CLS	<0.50	-

TTHM = total trihalomethanes; nd = nondetect

1 = Total trihalomethanes consists of the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane

CHARTS

Chart 1
Water Levels 2004-19

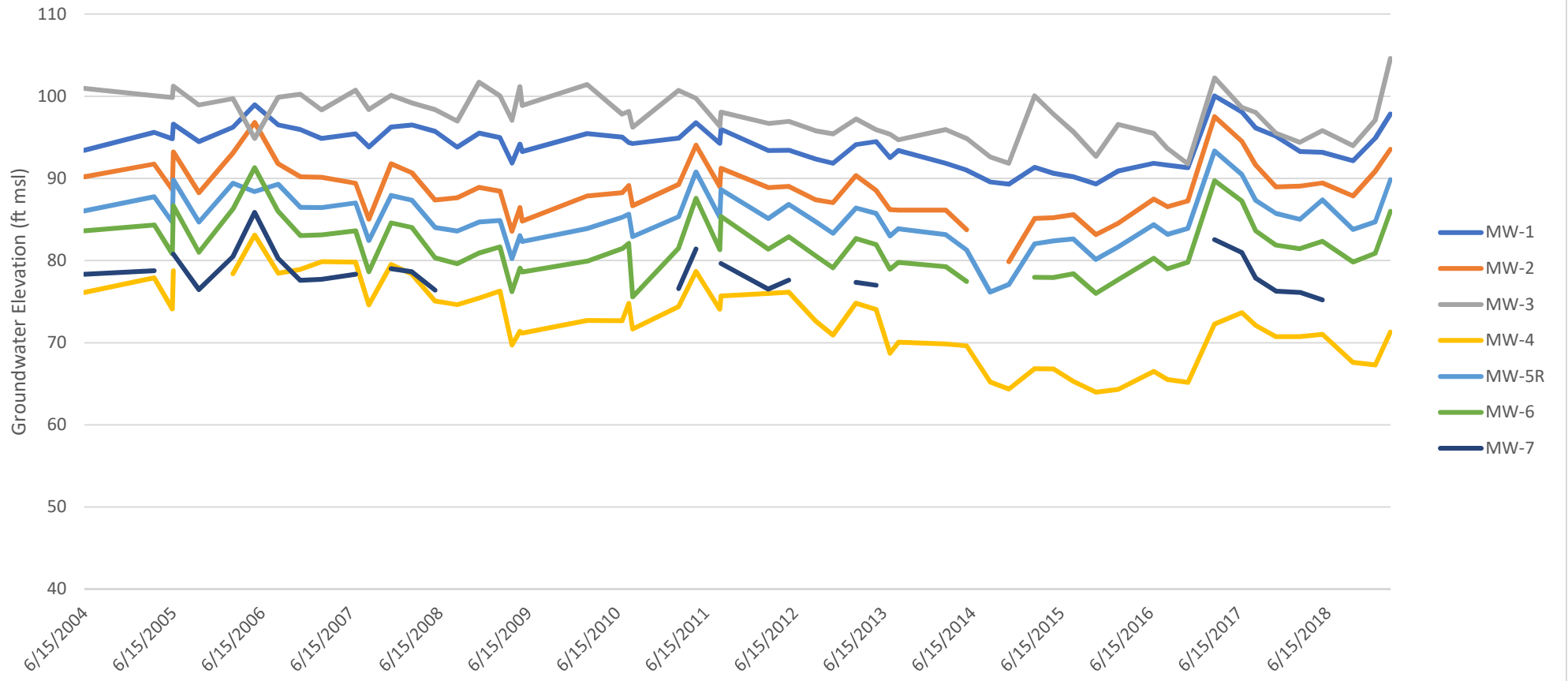


Chart 2
pH Trends 2004-19

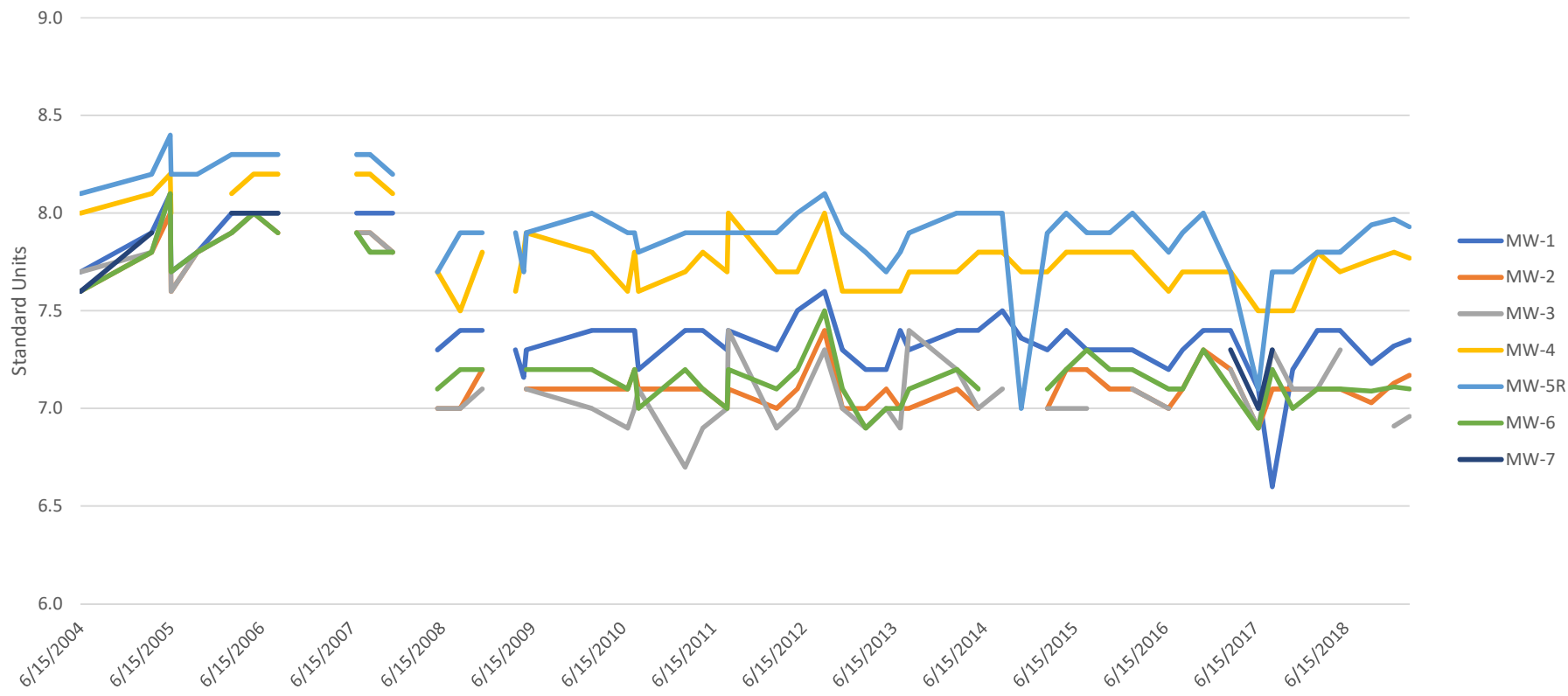


Chart 3
TDS Trends 2004-19

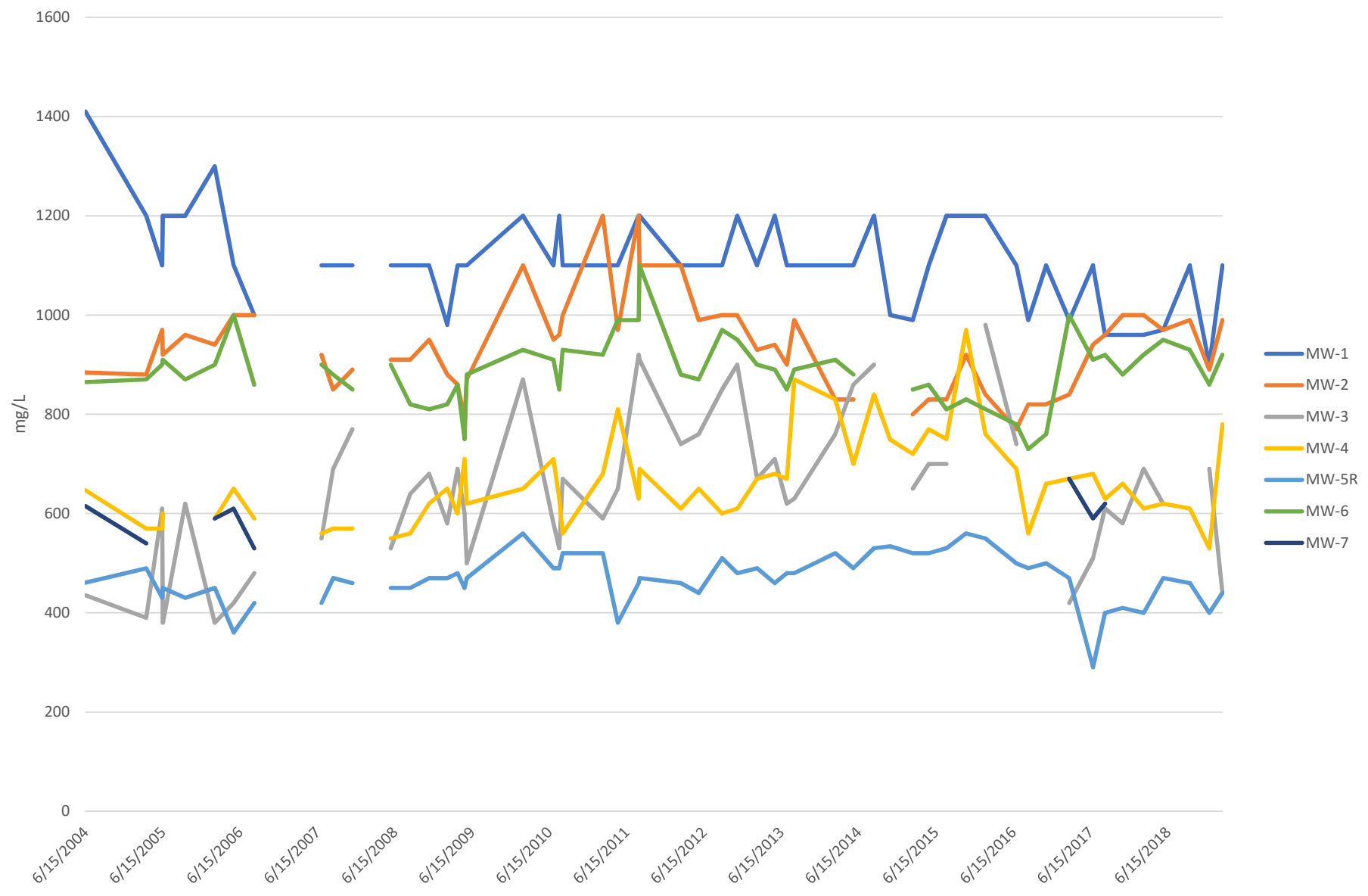


Chart 4
Na Trends 2004-19

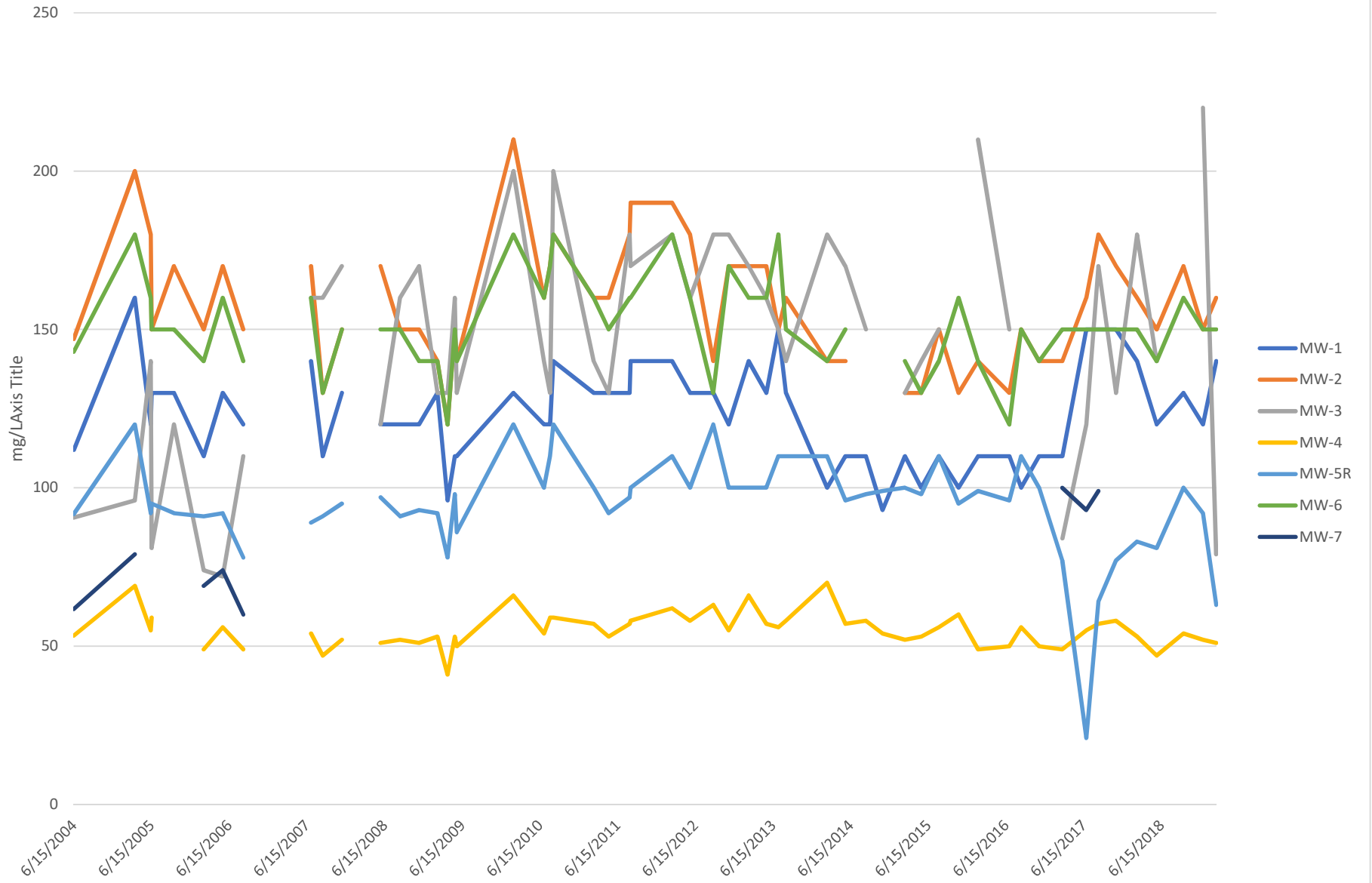


Chart 5
CI Trends 2004-19

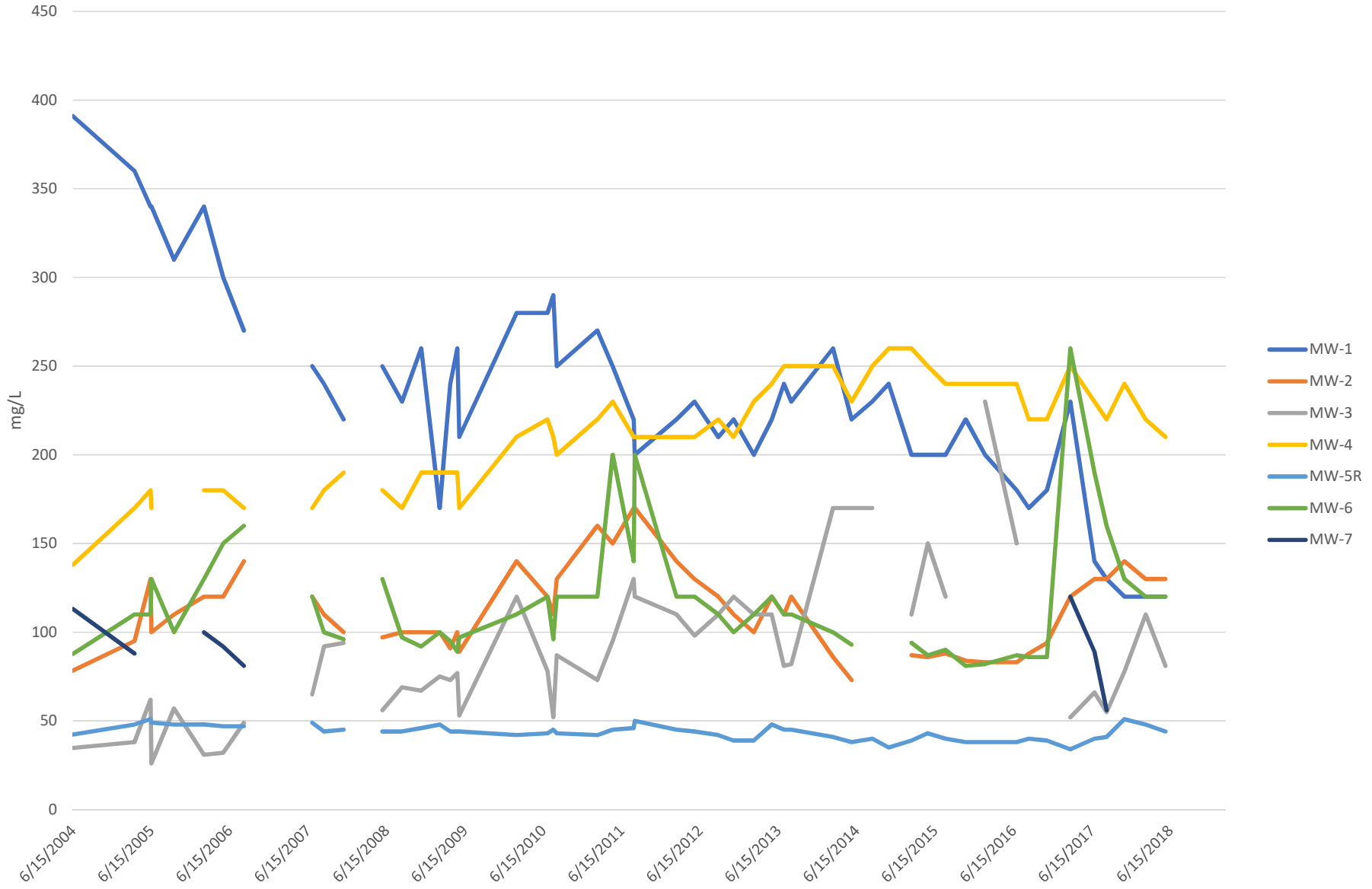


Chart 6
B Trends 2004-19

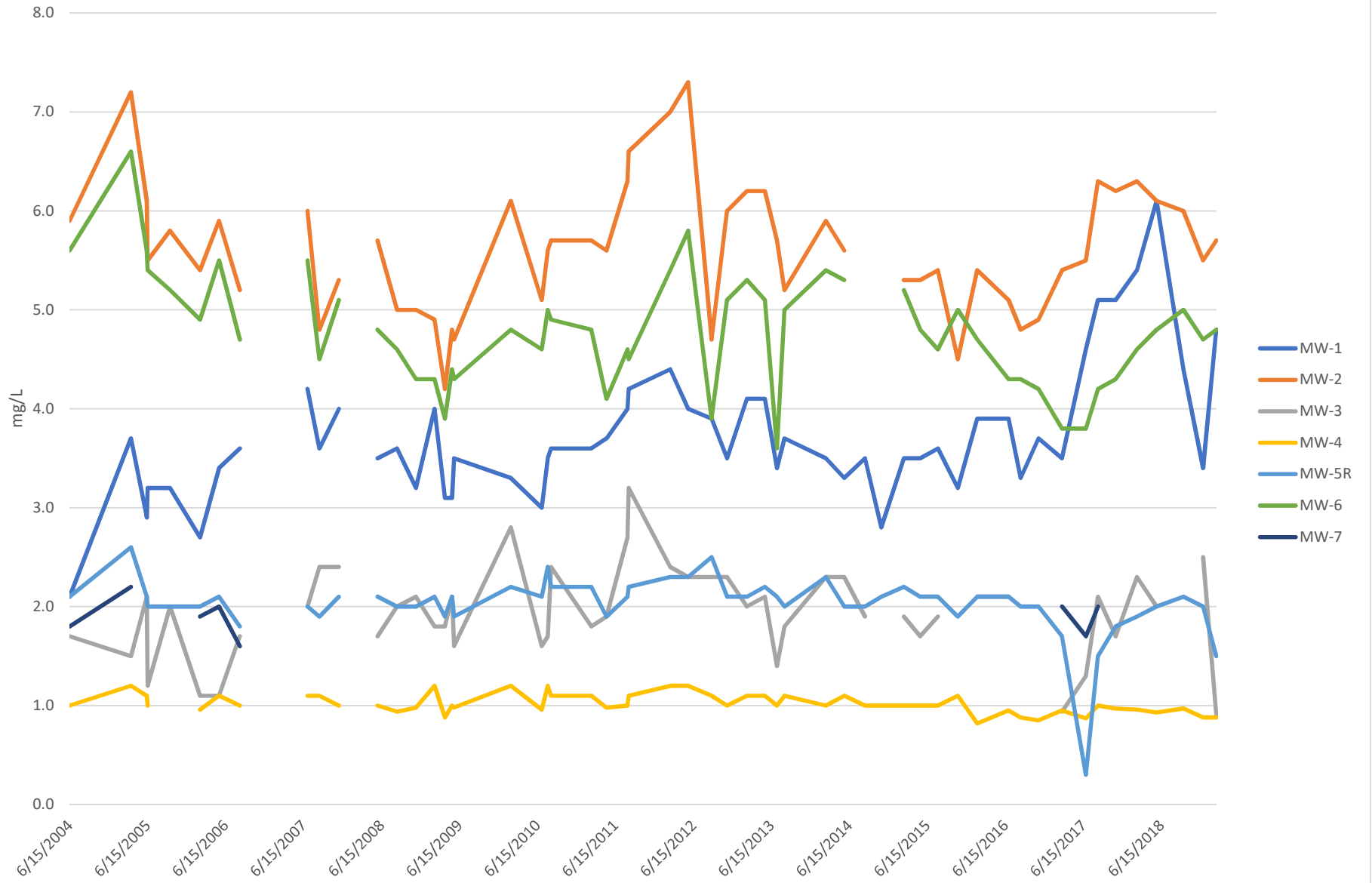


Chart 7
Nitrate, as N Trends 2004-19

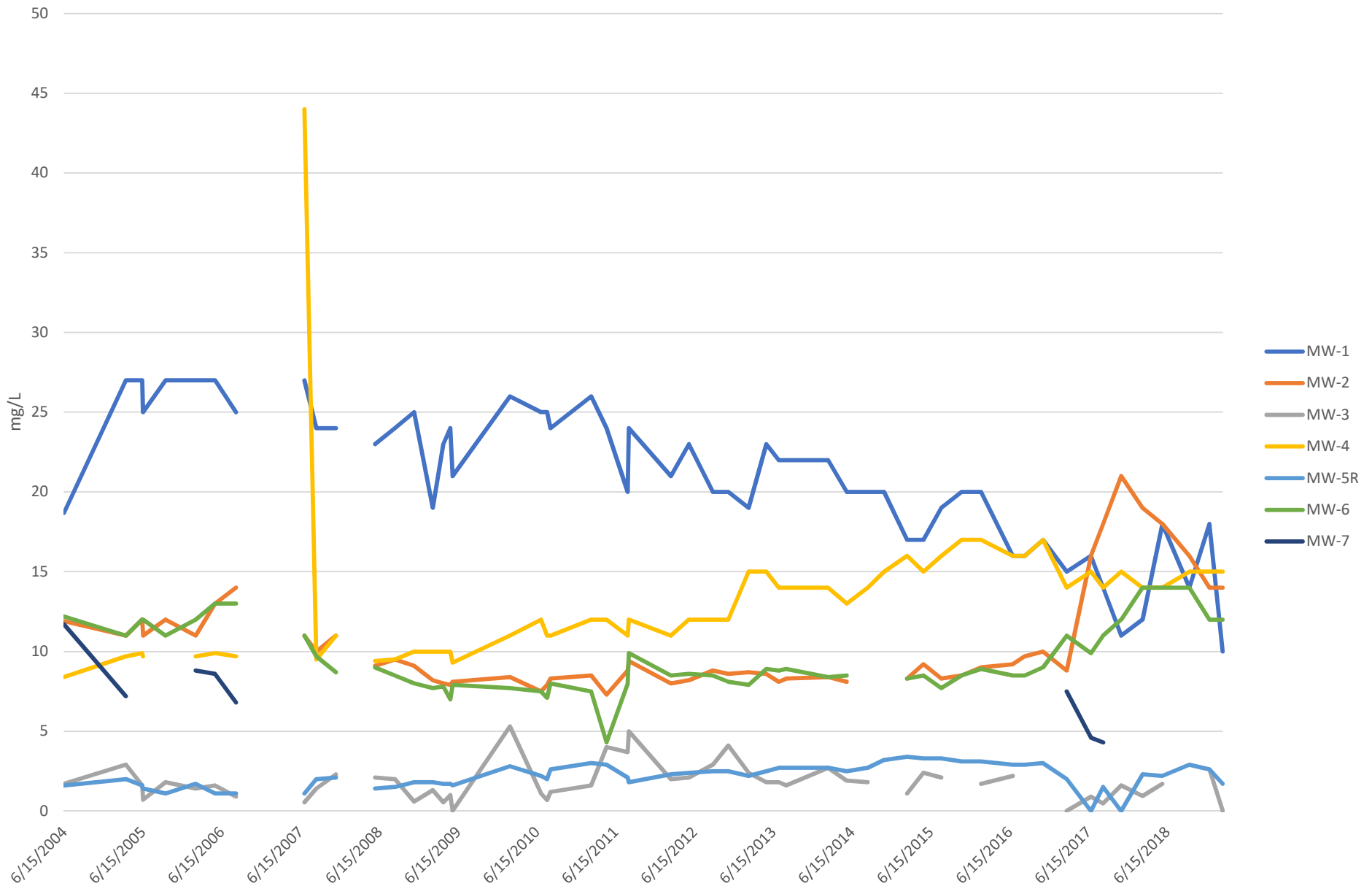
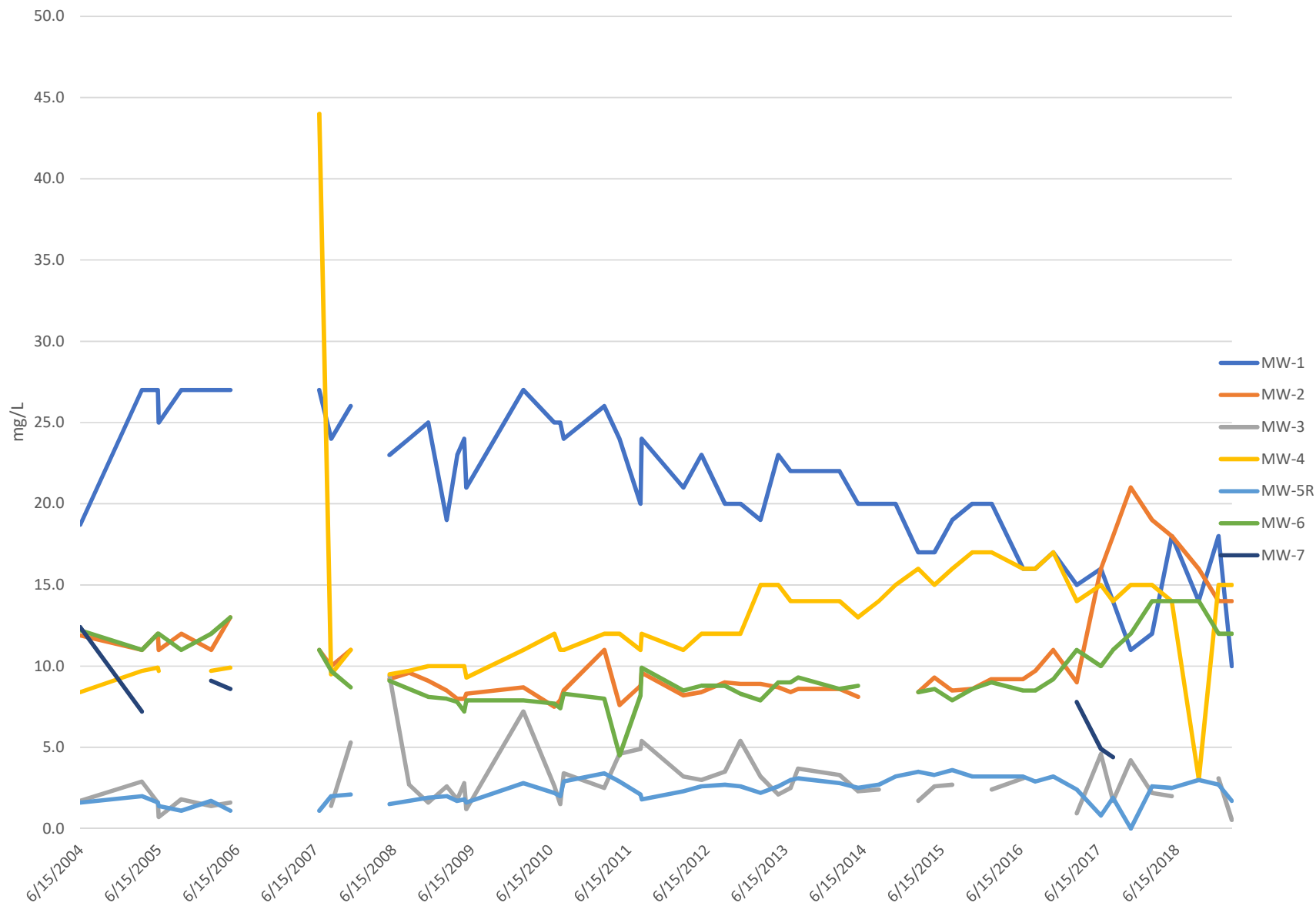


Chart 8
Total Nitrogen Trends 2004-19



APPENDIX A
FIELD DATA FORMS

GROUNDWATER SAMPLING LOG

Well Number: MW-1 Samplers Name: D. Busch Total well depth (ft): 41.40'
 Date: 2/28/19 Site: WILD Wings Well Diameter (in): 2"
 Project Number: 1st OTR G.W Borehole Diameter (in):

Gauging Date: 2/28/19 Static water level (ft): 28.39 Development method:
 Bailer ID: DISPOSABLE Previous static water level (ft): 31.34' Purging method: Pump
 Sample Date: 3/1/19 Standing water column (ft): 13.01 Sampling method: Bailer

All Measurements Taken From:

Top of Casing X Protective Casing Ground Level

TIME	AMOUNT PURGED (gal)	EC (µ S/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1115	2	1809	7.45	18.3	SLIGHT TURBID, NO ODOOR	28.39
1119	4	1802	7.46	19.3		
1123	6	1912	7.52	19.3		
1127	8	1940	7.39	19.4		
1131	10	1932	7.42	19.6	PUMPED DOWN	
					1 VOL = 2.12 GAL X 3 = 6.36 GAL	40.29
0925	sampled	1810	7.47	18.2	CLEAR	28.07

Sampled By: D. Busch

GROUNDWATER SAMPLING LOG

Well Number: MW-2
 Date: 2/28

Samplers Name: D. Busch
 Site: Wild Wings
 Project Number: 1st OTR G.W. Well

Total well depth (ft): 46.61'
 Well Diameter (in): 2"
 Borehole Diameter (in):

Gauging Date: 2/28/19
 Bailer ID:
 Sample Date: 3/1/19

Static water level (ft): 31.09
 Previous static water level (ft): 34.06"
 Standing water column (ft): 15.22

Development method:
 Purging method: Pump
 Sampling method: Bailer

All Measurements Taken From:

Top of Casing X Protective Casing Ground Level

TIME	AMOUNT PURGED (gal)	EC (µS/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1045	2	1679	7.34	18.2	ht. BAN, no odor	
1049	4	1694	7.26	18.6	less turbid	
1053	6	1693	7.34	18.6	Clear, no odor	
1057	8	1695	7.30	18.7	Clear, no odor	
1101	10	1699	7.31	18.7	Clear, no odor	
1105	12	1698	7.32	18.7	pumped down	45.2
					1 Vol. 2.48 Gal x 3 = 7.44 Gal	
0945	Sampled by	D. Busch				
0945	sample	1677	7.31	18.2	Clear	31.42

GROUNDWATER SAMPLING LOG

Well Number: MW-3
 Date: 2/28/19

Samplers Name: D. Busch
 Site: WLD Wings
 Project Number: 1st QTR G.W

Total well depth (ft): 30.80'
 Well Diameter (in): 2"
 Borehole Diameter (in):

Gauging Date: 2/28/19
 Bailer ID: DISPOSABLE
 Sample Date: 3/1/19

Static water level (ft): 16.75
 Previous static water level (ft): 24.25'
 Standing water column (ft): 14.05

Development method:
 Purging method: Pump
 Sampling method: Bailer

All Measurements Taken From:

Top of Casing X

Protective Casing

Ground Level

TIME	AMOUNT PURGED (gal)	EC (µS/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1010	2	640.4	7.80	16.5	Cloudy, no odor	
1014	4	602.5	7.65	16.1	Clearish, no odor	
1018	6	553.7	7.63	16.3	Clearing, no odor	
1022	8	555.9	7.55	16.3	Clear, no odor	
1026	10	555.4	7.55	16.3	Clear, no odor	29.81
					Purge Volume = 2.29 Gal/Pur	
					3 Vol. = 6.87 Gal.	
					Sampled:	
					DTW	
1045					Time 1045	
					Date 3/1/19	
					DTW 17.21	
1045	sample	645.1	7.76	16.4	Clear L.T. Brown no odor	17.21

GROUNDWATER SAMPLING LOG

Well Number: MW-4 Samplers Name: D. Busch Total well depth (ft): 70.30
 Date: 2/28/19 Site: WLDwinbs Well Diameter (in): 2
 Project Number: 1st QTR G.W. Borehole Diameter (in): -

Gauging Date: 2/28/19 Static water level (ft): 49.40 Development method: -
 Bailer ID: D1270340HR Previous static water level (ft): 53.42 Purging method: BAIL
 Sample Date: 3/1/19 Standing water column (ft): 20.90 Sampling method: Bailer

* All measurements taken from: Top of casing, Protective casing, Ground level

TIME	AMOUNT PURGED (gal)	EC (µS/cm)	pH	TEMP (°C)	COMMENTS	WATER LEVEL (ft bgs)
1450	2	1287	8.01	18.4		
1455	4	1286	7.89	18.3		
1500	6	1293	7.99	18.3		
1505	8	1294	7.98	18.3		
1510	10	1293	7.91	18.5		
1515	12	1290	7.89	18.6		
					1 Vol = 3.40 GAL x 3 = 10.2 GAL	
3/1/19						
1105	Sampler	1294	7.98	17.9	Clear, no odor	49.90

Volume per Foot for 2" Well = 0.1632 gal/foot
 Casing Volume = Standing Water Column * 0.1632 gal/foot (multiply by 3 to get purge volume)

GROUNDWATER SAMPLING LOG

Well Number: MW-50R
 Date: 2/28/19

Samplers Name: D Bosch
 Site: W110
 Project Number: _____

Total well depth (ft): 73.20'
 Well Diameter (in): 2"
 Borehole Diameter (in): _____

Gauging Date: 2/28/19
 Bailer ID: DISPOSABLE
 Sample Date: 3/1/19

Static water level (ft): 41.65 35.59
 Previous static water level (ft): 41.65'
 Standing water column (ft): 37.61

Development method: _____
 Purging method: PUMP
 Sampling method: Bailer

All Measurements Taken From:

Top of Casing X

Protective Casing _____

Ground Level _____

TIME	AMOUNT PURGED (gal)	EC (µS/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
11:50	4	916.5	8.21	18.3	Cloudy, no odor	4
11:58	8	916.5	8.18	18.3	CLEAR	8
12:06	12	919.4	8.18	17.7	CLEAR, no odor	12
12:14	16	918.4	8.19	17.7	CLEAR, no odor	16
12:22	20	921.8	8.19	17.7	CLEAR, no odor, no color	20 72.02
					1 Vol = 37.61 Gal	
					1 Vol = 6.13 Gal x 3 = 18.39 Gal	
10:10	sampled	917	8.22	19.0	CLEAR	36.11

Sampled by: D. Bosch

GROUNDWATER SAMPLING LOG

Well Number: mw-6
 Date: 2/28/19

Samplers Name: D. Busch
 Site: Wild Wings
 Project Number: 1st QTAG.W

Total well depth (ft): 48.80'
 Well Diameter (in): 2"
 Borehole Diameter (in):

Gauging Date: 2/28/19
 Bailer ID: DISPOSABLE
 Sample Date: 3/1/19

Static water level (ft): 35.60
 Previous static water level (ft):
 Standing water column (ft): 13.2

Development method:
 Purging method: Pump
 Sampling method: Bailer

All Measurements Taken From:

Top of Casing X

Protective Casing

Ground Level

TIME	AMOUNT PURGED (gal)	EC (S/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1415	2	1570	7.57	17.3	Cloudy, no odor	
1423	4	1620	7.57	18.5	Cloudy, no odor	39.70
1430	6	1618	7.53	18.7	Clearing, no odor	
1440	8	1638	7.50	18.2	CLEAR	
					Vol = 2.15 x 3 = 6.45 Gal	
	Sampled By: <u>D. Busch</u>					
1125	Sampled	1591	7.59	17.1	CLEAR No odor	35.91

GROUNDWATER SAMPLING LOG

Well Number: MW-7
 Date: 2/28/19

Samplers Name: D. Busch
 Site: WLDWinds
 Project Number: 1st QTR GW

Total well depth (ft): 38.65
 Well Diameter (in): 2
 Borehole Diameter (in): —

Gauging Date: 2/28/19
 Bailer ID: DISPOSABLE
 Sample Date: 3/1/19

Static water level (ft): 38.90 34.9
 Previous static water level (ft): 38.01
 Standing water column (ft): 3.75

Development method: —
 Purging method: Bailer
 Sampling method: —

All Measurements Taken From:

Top of Casing X

Protective Casing —

Ground Level —

TIME	AMOUNT PURGED (gal)	EC (S/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1355	1 LITER	1194.97	7.69	19.9	CLOUDY -	
1400	2 LITERS	1193	7.47	19.7	CLOUDY LT. BROWN	
1405	4.5 LITERS	1195	7.44	19.3	Bailed Dry.	
					1 Vol = 0.61 GAL X 3 = 1.83 GAL	
1145	SAMPLED	1192	7.68	18.4	BROWN (LT) TURBID, NO ODOOR	35.5

APPENDIX B
LABORATORY ANALYTICAL RESULTS
&
CHAIN OF CUSTODY



CALIFORNIA LABORATORY SERVICES

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March 08, 2019

CLS Work Order #: 19C0024

COC #: 195513

Dan Demoss
California Rural Water Association
1234 N. Market Blvd.
Sacramento, CA 95834

Project Name: Wild Wings

Enclosed are the results of analyses for samples received by the laboratory on 03/01/19 14:25. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233



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1 QTR 19'

CHAIN OF CUSTODY

CLS ID No.:

LOG No 195513

REPORT TO:		CLIENT JOB NUMBER		ANALYSIS REQUESTED						GEOTRACKER:				
NAME AND ADDRESS		DESTINATION LABORATORY		PRESERVATIVES	Total Coliform	Ammonia as N	THMS.	PH, TDS, TOTAL NITROGEN	NITRATE, NITRITE AS N	B, Fe, Mn, Na Dissolved	EDF REPORT GLOBAL ID: <input type="checkbox"/> YES <input type="checkbox"/> NO			
PROJECT MANAGER		PHONE									CDPH WRITE ON EDT TRANSMISSION? <input type="checkbox"/> YES <input type="checkbox"/> NO			
PROJECT NAME		STATE SYSTEM NUMBER									IF "YES" PLEASE ENTER THE SOURCE NUMBER(S).			
SAMPLED BY		COMPOSITE: <u>CONDITIONS INSTRUCTIONS</u>									LAB TOO FILTER METALS			
JOB DESCRIPTION		TURN AROUND TIME									SPECIAL INSTRUCTIONS			
SITE LOCATION		OR									ALT. ID:			
DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO.	TYPE	1 DAY	2 DAY	3 DAY	5 DAY	OR				
3/1/19	1045	MW-3	GW	7	VOY/PLT	X	X	X	X	X	X	LAP FILTER METALS		
3/1/19	1105	MW-4		7										
3/1/19	1125	MW-6		7										
3/1/19	1145	MW-7		7										
3/1/19	1010	MW-5R		7										
3/1/19	945	MW-2		7										
3/1/19	925	MW-1	GW	7	VOY/PLT	X	X	X	X	X	X			
3/1/19	0845	TRIP BANK	O.I.	3	HCL						X	INVOICE TO:		
SUSPECTED CONSTITUENTS				PRESERVATIVES:		(1) HCL	(3) = COLD	(5) = H ₂ SO ₄	(7) =					
RELINQUISHED BY (SIGN)		PRINT NAME / COMPANY		DATE / TIME		RECEIVED BY (SIGN)		PRINT NAME / COMPANY						
<i>Dayton Busch</i>		DAYTON BUSCH		3/1/19 1425										
RECD AT LAB BY:		DATE / TIME:		CONDITIONS / COMMENTS:										
<i>[Signature]</i>		3/1/19 1425		4.0										
SHIPPED BY:		<input type="checkbox"/> FED X		<input type="checkbox"/> UPS		<input type="checkbox"/> OTHER		AIR BILL #						

Yellow - Lab Use only (Forms and Conditions) Print - Chain Forms and Conditions Field - Printed Mr. Field Submit/Theme and conditions

CLS LABS
SAMPLE RECEIVING EXCEPTION REPORTS

CLS Labs Job # 19C0024

Problem discovered by: OK

Date: 3 / 1 / 19

Nature of problem

Sulfite

Chlorine, Total

Chlorine, Residual

Ph

Dissolved O2

(Circle analysis above) Received out of HOLD time.

Client contacted? Yes No Spoke With: _____

By whom: _____ Date: ___ / ___ / ___ Time: _____ HRS

Client instructions:

Resolution of problem:

Logged in regardless and will be ran for analysis requested.



CALIFORNIA LABORATORY SERVICES

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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (19C0024-01) GW Sampled: 03/01/19 10:45 Received: 03/01/19 14:25									
Ammonia as N	ND	0.10	mg/L	1	1901849	03/06/19	03/06/19	SM4500-NH3F-1997	
Nitrate as N	ND	0.40	"	"	1901712	03/01/19	03/01/19	EPA 300.0	
Nitrite as N	ND	0.40	"	"	"	"	"	"	
pH	6.96	0.01	pH Units	"	1901694	03/01/19	03/01/19	SM4500-H B	HT-F
Total Dissolved Solids	440	10	mg/L	"	1901806	03/05/19	03/06/19	SM2540C	
Total Kjeldahl Nitrogen	0.53	0.20	"	"	1901881	03/07/19	03/07/19	SM4500-NH3F-1997	
Total Nitrogen	0.53	0.40	"	"	1901887	03/07/19	03/07/19	EPA 351.3/300	
MW-4 (19C0024-02) GW Sampled: 03/01/19 11:05 Received: 03/01/19 14:25									
Ammonia as N	ND	0.10	mg/L	1	1901849	03/06/19	03/06/19	SM4500-NH3F-1997	
Nitrate as N	15	2.0	"	5	1901712	03/01/19	03/04/19	EPA 300.0	HT-4
Nitrite as N	ND	0.40	"	1	"	"	03/01/19	"	
pH	7.77	0.01	pH Units	"	1901694	03/01/19	03/01/19	SM4500-H B	HT-F
Total Dissolved Solids	780	10	mg/L	"	1901806	03/05/19	03/06/19	SM2540C	
Total Kjeldahl Nitrogen	0.24	0.20	"	"	1901881	03/07/19	03/07/19	SM4500-NH3F-1997	
Total Nitrogen	15	0.40	"	"	1901887	03/07/19	03/07/19	EPA 351.3/300	
MW-6 (19C0024-03) GW Sampled: 03/01/19 11:25 Received: 03/01/19 14:25									
Ammonia as N	ND	0.10	mg/L	1	1901849	03/06/19	03/06/19	SM4500-NH3F-1997	
Nitrate as N	12	2.0	"	5	1901712	03/01/19	03/04/19	EPA 300.0	HT-4
Nitrite as N	ND	0.40	"	1	"	"	03/01/19	"	
pH	7.10	0.01	pH Units	"	1901694	03/01/19	03/01/19	SM4500-H B	HT-F
Total Dissolved Solids	920	10	mg/L	"	1901806	03/05/19	03/06/19	SM2540C	
Total Kjeldahl Nitrogen	0.23	0.20	"	"	1901881	03/07/19	03/07/19	SM4500-NH3F-1997	
Total Nitrogen	12	0.40	"	"	1901887	03/07/19	03/07/19	EPA 351.3/300	



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-7 (19C0024-04) GW Sampled: 03/01/19 11:45 Received: 03/01/19 14:25									
Ammonia as N	ND	0.10	mg/L	1	1901849	03/06/19	03/06/19	SM4500-NH3F-1997	
Nitrate as N	4.8	0.40	"	"	1901712	03/01/19	03/01/19	EPA 300.0	
Nitrite as N	ND	0.40	"	"	"	"	"	"	
pH	7.22	0.01	pH Units	"	1901694	03/01/19	03/01/19	SM4500-H B	HT-F
Total Dissolved Solids	660	10	mg/L	"	1901806	03/05/19	03/06/19	SM2540C	
Total Kjeldahl Nitrogen	ND	0.20	"	"	1901881	03/07/19	03/07/19	SM4500-NH3F-1997	
Total Nitrogen	4.8	0.40	"	"	1901887	03/07/19	03/07/19	EPA 351.3/300	
MW-5R (19C0024-05) GW Sampled: 03/01/19 10:10 Received: 03/01/19 14:25									
Ammonia as N	ND	0.10	mg/L	1	1901849	03/06/19	03/06/19	SM4500-NH3F-1997	
Nitrate as N	1.7	0.40	"	"	1901712	03/01/19	03/01/19	EPA 300.0	
Nitrite as N	ND	0.40	"	"	"	"	"	"	
pH	7.93	0.01	pH Units	"	1901694	03/01/19	03/01/19	SM4500-H B	HT-F
Total Dissolved Solids	440	10	mg/L	"	1901806	03/05/19	03/06/19	SM2540C	
Total Kjeldahl Nitrogen	ND	0.20	"	"	1901881	03/07/19	03/07/19	SM4500-NH3F-1997	
Total Nitrogen	1.7	0.40	"	"	1901887	03/07/19	03/07/19	EPA 351.3/300	
MW-2 (19C0024-06) GW Sampled: 03/01/19 09:45 Received: 03/01/19 14:25									
Ammonia as N	ND	0.10	mg/L	1	1901849	03/06/19	03/06/19	SM4500-NH3F-1997	
Nitrate as N	14	2.0	"	5	1901712	03/01/19	03/04/19	EPA 300.0	HT-4
Nitrite as N	ND	0.40	"	1	"	"	03/01/19	"	
pH	7.17	0.01	pH Units	"	1901694	03/01/19	03/01/19	SM4500-H B	HT-F
Total Dissolved Solids	990	10	mg/L	"	1901806	03/05/19	03/06/19	SM2540C	
Total Kjeldahl Nitrogen	ND	0.20	"	"	1901881	03/07/19	03/07/19	SM4500-NH3F-1997	
Total Nitrogen	14	0.40	"	"	1901887	03/07/19	03/07/19	EPA 351.3/300	



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Conventional Chemistry Parameters by APHA/EPA Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (19C0024-07) GW Sampled: 03/01/19 09:25 Received: 03/01/19 14:25									
Ammonia as N	ND	0.10	mg/L	1	1901849	03/06/19	03/06/19	SM4500-NH3F-1997	
Nitrate as N	10	2.0	"	5	1901712	03/01/19	03/04/19	EPA 300.0	HT-4
Nitrite as N	ND	0.40	"	1	"	"	03/01/19	"	
pH	7.35	0.01	pH Units	"	1901694	03/01/19	03/01/19	SM4500-H B	HT-F
Total Dissolved Solids	1100	10	mg/L	"	1901806	03/05/19	03/06/19	SM2540C	
Total Kjeldahl Nitrogen	ND	0.20	"	"	1901881	03/07/19	03/07/19	SM4500-NH3F-1997	
Total Nitrogen	10	0.40	"	"	1901887	03/07/19	03/07/19	EPA 351.3/300	



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Metals (Dissolved) by EPA 200 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (19C0024-01) GW Sampled: 03/01/19 10:45 Received: 03/01/19 14:25									
Boron	910	50	µg/L	1	1901650	03/04/19	03/04/19	EPA 200.7	
Iron	ND	100	"	"	"	"	"	"	
Manganese	ND	20	"	"	"	"	"	"	
Sodium	79000	1000	"	"	"	"	"	"	
MW-4 (19C0024-02) GW Sampled: 03/01/19 11:05 Received: 03/01/19 14:25									
Boron	880	50	µg/L	1	1901650	03/04/19	03/04/19	EPA 200.7	
Iron	ND	100	"	"	"	"	"	"	
Manganese	ND	20	"	"	"	"	"	"	
Sodium	51000	1000	"	"	"	"	"	"	
MW-6 (19C0024-03) GW Sampled: 03/01/19 11:25 Received: 03/01/19 14:25									
Boron	4800	50	µg/L	1	1901650	03/04/19	03/04/19	EPA 200.7	
Iron	ND	100	"	"	"	"	"	"	
Manganese	ND	20	"	"	"	"	"	"	
Sodium	150000	1000	"	"	"	"	"	"	
MW-7 (19C0024-04) GW Sampled: 03/01/19 11:45 Received: 03/01/19 14:25									
Boron	1900	50	µg/L	1	1901650	03/04/19	03/04/19	EPA 200.7	
Iron	ND	100	"	"	"	"	"	"	
Manganese	ND	20	"	"	"	"	"	"	
Sodium	88000	1000	"	"	"	"	"	"	
MW-5R (19C0024-05) GW Sampled: 03/01/19 10:10 Received: 03/01/19 14:25									
Boron	1500	50	µg/L	1	1901650	03/04/19	03/04/19	EPA 200.7	
Iron	ND	100	"	"	"	"	"	"	
Manganese	ND	20	"	"	"	"	"	"	
Sodium	63000	1000	"	"	"	"	"	"	



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Metals (Dissolved) by EPA 200 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (19C0024-06) GW Sampled: 03/01/19 09:45 Received: 03/01/19 14:25									
Boron	5700	50	µg/L	1	1901650	03/04/19	03/04/19	EPA 200.7	
Iron	ND	100	"	"	"	"	"	"	
Manganese	ND	20	"	"	"	"	"	"	
Sodium	160000	1000	"	"	"	"	"	"	
MW-1 (19C0024-07) GW Sampled: 03/01/19 09:25 Received: 03/01/19 14:25									
Boron	4800	50	µg/L	1	1901650	03/04/19	03/04/19	EPA 200.7	
Iron	160	100	"	"	"	"	"	"	
Manganese	ND	20	"	"	"	"	"	"	
Sodium	140000	1000	"	"	"	"	"	"	



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (19C0024-01) GW Sampled: 03/01/19 10:45 Received: 03/01/19 14:25									
Total Coliforms	>1600	1.8	MPN/100 mL	1	1901734	03/01/19	03/04/19	SM 9221	
MW-4 (19C0024-02) GW Sampled: 03/01/19 11:05 Received: 03/01/19 14:25									
Total Coliforms	4.5	1.8	MPN/100 mL	1	1901734	03/01/19	03/05/19	SM 9221	
MW-6 (19C0024-03) GW Sampled: 03/01/19 11:25 Received: 03/01/19 14:25									
Total Coliforms	12	1.8	MPN/100 mL	1	1901734	03/01/19	03/05/19	SM 9221	
MW-7 (19C0024-04) GW Sampled: 03/01/19 11:45 Received: 03/01/19 14:25									
Total Coliforms	2.0	1.8	MPN/100 mL	1	1901734	03/01/19	03/05/19	SM 9221	
MW-5R (19C0024-05) GW Sampled: 03/01/19 10:10 Received: 03/01/19 14:25									
Total Coliforms	63	1.8	MPN/100 mL	1	1901734	03/01/19	03/05/19	SM 9221	
MW-2 (19C0024-06) GW Sampled: 03/01/19 09:45 Received: 03/01/19 14:25									
Total Coliforms	240	1.8	MPN/100 mL	1	1901734	03/01/19	03/04/19	SM 9221	
MW-1 (19C0024-07) GW Sampled: 03/01/19 09:25 Received: 03/01/19 14:25									
Total Coliforms	<1.8	1.8	MPN/100 mL	1	1901734	03/01/19	03/03/19	SM 9221	



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Trihalomethanes by EPA Method 524.2

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (19C0024-01) GW Sampled: 03/01/19 10:45 Received: 03/01/19 14:25									
Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	ND	0.50	"	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	86 %	70-130	"	"	"	"	"
<i>Surrogate: Toluene-d8</i>	89 %	70-130	"	"	"	"	"

MW-4 (19C0024-02) GW Sampled: 03/01/19 11:05 Received: 03/01/19 14:25									
Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	ND	0.50	"	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	86 %	70-130	"	"	"	"	"
<i>Surrogate: Toluene-d8</i>	90 %	70-130	"	"	"	"	"

MW-6 (19C0024-03) GW Sampled: 03/01/19 11:25 Received: 03/01/19 14:25									
Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	1.8	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	1.8	0.50	"	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	87 %	70-130	"	"	"	"	"
<i>Surrogate: Toluene-d8</i>	89 %	70-130	"	"	"	"	"



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Trihalomethanes by EPA Method 524.2

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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MW-7 (19C0024-04) GW Sampled: 03/01/19 11:45 Received: 03/01/19 14:25

Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

90 % 70-130 " " "

Surrogate: Toluene-d8

90 % 70-130 " " "

MW-5R (19C0024-05) GW Sampled: 03/01/19 10:10 Received: 03/01/19 14:25

Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

89 % 70-130 " " "

Surrogate: Toluene-d8

91 % 70-130 " " "

MW-2 (19C0024-06) GW Sampled: 03/01/19 09:45 Received: 03/01/19 14:25

Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	ND	0.50	"	"	"	"	"	"	

Surrogate: 1,2-Dichloroethane-d4

91 % 70-130 " " "

Surrogate: Toluene-d8

90 % 70-130 " " "



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Trihalomethanes by EPA Method 524.2

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (19C0024-07) GW Sampled: 03/01/19 09:25 Received: 03/01/19 14:25									
Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	ND	0.50	"	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	93 %	70-130	"	"	"	"	"	"
<i>Surrogate: Toluene-d8</i>	91 %	70-130	"	"	"	"	"	"

Trip Blank (19C0024-08) Water Sampled: 03/01/19 08:45 Received: 03/01/19 14:25									
Bromodichloromethane	ND	0.50	µg/L	1	1901766	03/04/19	03/04/19	EPA 524.2	
Bromoform	ND	0.50	"	"	"	"	"	"	
Chloroform	ND	0.50	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
Total Trihalomethanes (THM)	ND	0.50	"	"	"	"	"	"	

<i>Surrogate: 1,2-Dichloroethane-d4</i>	93 %	70-130	"	"	"	"	"	"
<i>Surrogate: Toluene-d8</i>	91 %	70-130	"	"	"	"	"	"



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Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1901694 - General Preparation

Duplicate (1901694-DUP1)		Source: 19B1538-01			Prepared & Analyzed: 03/01/19					
pH	7.74	0.01	pH Units		7.73			0.129	20	

Batch 1901712 - General Prep

Blank (1901712-BLK1)		Prepared & Analyzed: 03/01/19								
Nitrite as N	ND	0.40	mg/L							
Nitrate as N	ND	0.40	"							

LCS (1901712-BS1)		Prepared & Analyzed: 03/01/19								
Nitrite as N	1.95	0.40	mg/L	2.00		97	80-120			
Nitrate as N	1.97	0.40	"	2.00		99	80-120			

LCS Dup (1901712-BSD1)		Prepared & Analyzed: 03/01/19								
Nitrite as N	1.95	0.40	mg/L	2.00		97	80-120	0.02	20	
Nitrate as N	1.96	0.40	"	2.00		98	80-120	0.4	20	

Matrix Spike (1901712-MS1)		Source: 19C0008-06			Prepared & Analyzed: 03/01/19					
Nitrate as N	3.11	0.40	mg/L	2.00	1.08	101	80-120			
Nitrite as N	1.98	0.40	"	2.00	0.0187	98	80-120			

Matrix Spike Dup (1901712-MSD1)		Source: 19C0008-06			Prepared & Analyzed: 03/01/19					
Nitrate as N	3.10	0.40	mg/L	2.00	1.08	101	80-120	0.09	20	
Nitrite as N	2.00	0.40	"	2.00	0.0187	99	80-120	0.9	20	

Batch 1901806 - General Preparation

Blank (1901806-BLK1)		Prepared: 03/05/19 Analyzed: 03/06/19								
Total Dissolved Solids	ND	10	mg/L							



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Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1901806 - General Preparation

Duplicate (1901806-DUP1)		Source: 19C0024-01		Prepared: 03/05/19 Analyzed: 03/06/19						
Total Dissolved Solids	481	10	mg/L		444			8	20	

Batch 1901849 - General Preparation

Blank (1901849-BLK1)				Prepared & Analyzed: 03/06/19						
Ammonia as N	ND	0.10	mg/L							

LCS (1901849-BS1)				Prepared & Analyzed: 03/06/19						
Ammonia as N	0.467	0.10	mg/L	0.500		93	80-120			

LCS Dup (1901849-BSD1)				Prepared & Analyzed: 03/06/19						
Ammonia as N	0.431	0.10	mg/L	0.500		86	80-120	8	25	

Matrix Spike (1901849-MS1)		Source: 19C0024-07		Prepared & Analyzed: 03/06/19						
Ammonia as N	0.499	0.10	mg/L	0.500	ND	100	75-125			

Matrix Spike Dup (1901849-MSD1)		Source: 19C0024-07		Prepared & Analyzed: 03/06/19						
Ammonia as N	0.497	0.10	mg/L	0.500	ND	99	75-125	0.4	25	

Batch 1901881 - General Preparation

Blank (1901881-BLK1)				Prepared & Analyzed: 03/07/19						
Total Kjeldahl Nitrogen	ND	0.20	mg/L							

LCS (1901881-BS1)				Prepared & Analyzed: 03/07/19						
Total Kjeldahl Nitrogen	0.498	0.20	mg/L	0.500		100	80-120			



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 19C0024 COC #: 195513
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Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1901881 - General Preparation										
LCS Dup (1901881-BSD1)				Prepared & Analyzed: 03/07/19						
Total Kjeldahl Nitrogen	0.497	0.20	mg/L	0.500		99	80-120	0.2	20	
Matrix Spike (1901881-MS1)				Source: 19C0024-02 Prepared & Analyzed: 03/07/19						
Total Kjeldahl Nitrogen	0.359	0.20	mg/L	0.500	0.241	24	75-125			QM-7
Matrix Spike Dup (1901881-MSD1)				Source: 19C0024-02 Prepared & Analyzed: 03/07/19						
Total Kjeldahl Nitrogen	0.364	0.20	mg/L	0.500	0.241	25	75-125	1	25	QM-7



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Metals (Dissolved) by EPA 200 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1901650 - 6010A/No Digestion

Blank (1901650-BLK1)

Prepared & Analyzed: 03/04/19

Aluminum	ND	50	µg/L							
Boron	ND	50	"							
Iron	ND	100	"							
Manganese	ND	20	"							
Sodium	ND	1000	"							

LCS (1901650-BS1)

Prepared & Analyzed: 03/04/19

Aluminum	5410	50	µg/L	5000		108	85-115			
Boron	1040	50	"	1000		104	85-115			
Iron	1070	100	"	1000		107	85-115			
Manganese	1110	20	"	1000		111	85-115			
Sodium	5090	1000	"	5000		102	85-115			

Matrix Spike (1901650-MS1)

Source: 19B1288-01

Prepared & Analyzed: 03/04/19

Aluminum	ND	50	µg/L	5000	ND		70-130			QM-7
Boron	35.8	50	"	1000	36.1	NR	70-130			QM-7
Iron	13.0	100	"	1000	16.2	NR	70-130			QM-7
Manganese	13.7	20	"	1000	13.7	NR	70-130			QM-7
Sodium	9730	1000	"	5000	9460	5	70-130			QM-7

Matrix Spike (1901650-MS2)

Source: 19C0024-01

Prepared & Analyzed: 03/04/19

Aluminum	5140	50	µg/L	5000	30.2	102	70-130			
Boron	2030	50	"	1000	913	111	70-130			
Iron	1490	100	"	1000	52.8	143	70-130			QM-7
Manganese	1160	20	"	1000	5.57	116	70-130			
Sodium	80600	1000	"	5000	78500	42	70-130			QM-4X



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Trihalomethanes by EPA Method 524.2 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1901766 - EPA 5030 Water MS

Blank (1901766-BLK1)

Prepared & Analyzed: 03/04/19

Bromodichloromethane	ND	0.50	µg/L							
Bromoform	ND	0.50	"							
Chloroform	ND	0.50	"							
Dibromochloromethane	ND	0.50	"							
Total Trihalomethanes (THM)	ND	0.50	"							
Surrogate: 1,2-Dichloroethane-d4	8.25		"	10.0		83	70-130			
Surrogate: Toluene-d8	8.97		"	10.0		90	70-130			

LCS (1901766-BS1)

Prepared & Analyzed: 03/04/19

Bromodichloromethane	15.8	0.50	µg/L	20.0		79	70-130			
Bromoform	17.3	0.50	"	20.0		86	70-130			
Chloroform	17.6	0.50	"	20.0		88	70-130			
Dibromochloromethane	16.7	0.50	"	20.0		84	70-130			
Surrogate: 1,2-Dichloroethane-d4	7.95		"	10.0		80	70-130			
Surrogate: Toluene-d8	9.63		"	10.0		96	70-130			

LCS Dup (1901766-BSD1)

Prepared & Analyzed: 03/04/19

Bromodichloromethane	18.5	0.50	µg/L	20.0		92	70-130	16	30	
Bromoform	20.9	0.50	"	20.0		104	70-130	19	30	
Chloroform	16.7	0.50	"	20.0		84	70-130	5	30	
Dibromochloromethane	19.6	0.50	"	20.0		98	70-130	16	30	
Surrogate: 1,2-Dichloroethane-d4	8.02		"	10.0		80	70-130			
Surrogate: Toluene-d8	9.62		"	10.0		96	70-130			



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California Rural Water Association
1234 N. Market Blvd.
Sacramento, CA 95834

Project: Wild Wings
Project Number: [none]
Project Manager: Dan Demoss

CLS Work Order #: 19C0024
COC #: 195513

Notes and Definitions

QM-7	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery.
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
HT-F	This is a field test method and it is performed in the lab outside holding time.
HT-4	Sample was originally analyzed within holding time. Due to high concentration of the analyte, the sample was reanalyzed with a dilution outside of the EPA recommended holding time.
BT-5	>1600
BT-4	<1.8
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference