



2025 ANNUAL WATER QUALITY REPORT

BESSER QUINN SAND MANAGEMENT SITE

DNR ID #08-BUD-08-99

Site Location:
1159 216th Drive
Boone, IA 50036

APRIL 14, 2025

Prepared for:
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This report has been prepared by Klingner & Associate's, P.C. (Klingner) in coordination with Stone Environmental Engineering (Stone). All field data, site history, and permit history has been provided by Stone and incorporated into the report by Klingner. Tables 1 through 9 have been prepared by Klingner with data provided by Stone. Groundwater contour maps were prepared by Klingner.

SIGNATURES





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Acronyms & Abbreviations:

AL	Action Level
BUD	Beneficial Use Determination
CAMP	Corrective Action Monitoring Plan
CL	Control Limit - Mean plus Two Standard Deviations
GWPS	Groundwater Protection Standard
HAL	Health Advisory Level
MCL	EPA Maximum Contaminant Level
N	Normal
NC	No Change
NM	Not Measured
RL	Reporting Limit
SS	IDNR Statewide Standard for a protected groundwater source
SMCL	Secondary Drinking Water Standard
WL	Water Level
IDNR	Iowa Department of Natural Resources

1.0 EXECUTIVE SUMMARY

1.1 Period of Report Coverage

The site is under closure procedures and is operating under DNR ID #08-BUD-08-99 as prepared by the Iowa Department of Natural Resource. The BUD initially required groundwater monitoring for four quarters of a year in 2020 which has since been reduced to semi-annually. This report presents the findings of two sampling events, June 25, 2025 and November 4, 2025. Well QS did not have sufficient groundwater volume for sampling during the June 25 sampling event so it was sampled on July 13, 2025.

1.2 Site Status

The Quinn Quarry Reclamation site is located along Boone County Road E-41, which was formerly USA Highway 30. The street address of the site is 1159 216th Drive. Figure 1 notes the location of the Besser Quinn Sand Management Site. The site is under closure procedures and is operating under DNR ID #08-BUD-08-99 as prepared by the Iowa Department of Natural Resource.

2.0 SITE BACKGROUND

2.1 Site History

Besser Quinn owns a facility known as the Besser Quinn Sand Management Site. This site has received used foundry sand since 2000.

The historic development of the site was initially part of a sand and gravel pit south of the site. The ponds associated with that operation are currently deeded to the state as a fishing area. The sand management site was used for the scale house and some other storage buildings for the sand and gravel operations. Clay soils from the site were “mined” and used as fill for off site construction projects. The “mining” of the clay soils left a trench which was then used for acceptance of the foundry sand starting in 2000.

The Besser Quinn foundry has operated since the early 1900's. The foundry closed in 2019. From the initiation of the facility until around 2000, the foundry sand was disposed at several locations including the Boone County SLF and another permitted SLF around Fort Dodge. The foundry sand was also used as a construction material for projects in the area. A yearly metals analysis, starting in 1989, of the foundry sand was performed to confirm the sand was appropriate for secondary use.

In the mid to late 1990s the cost of transporting the sand to a SLF was increasing and an option for the sand disposal was investigated. The corporation that owned the foundry also owned the sand and gravel operation which included the current sand management site. The current site was determined to be in compliance with IAC 108.4 and 108.6 regarding a Foundry Sand Management Plan. The sand disposal was initiated in late 1990s.

The initial development of the site in 1995 required the determination of depth to groundwater and the collection of groundwater samples for chemical analysis. To accomplish these tasks, three groundwater wells were installed, QN, QE, and QW. Groundwater was found near 30' of depth and quality control samples did not note the presence of chemical at unacceptable concentrations. The initial wells were installed to determine groundwater flow direction and the groundwater was chemically analyzed for BETX. The BETX analysis did not note the presence of BETX and after several samplings, the BETX monitoring was discontinued.

In late 2018, the initial wells were checked and two of the wells were determined to be non-functional. Two replacements wells were installed adjacent to the two non-functional wells. Monitoring of the three functional wells did not present a defined groundwater flow direction and IDNR requested two additional wells to assist in defining the groundwater flow direction. After the completion of the fourth and fifth wells, IDNR geologic staff reviewed satellite images and suggested that the management site was sighted on a narrow peninsula of glacial till surrounded by alluvium. Based on this observation, this location of the site could potentially have groundwater flow in several directions which could change with time.

After the installation of the additional wells in 2019, the current sampling program was initiated.

2.2 Site Hydrology & Geology

The Besser Quinn Sand Management site is located in the Des Moines River Valley. Historically, the river has meandered around the site, eroding glacial till soils leaving the site basically as a peninsula or island of clay soils in the river alluvium. Figure 4 is a Lidar image of the site noting how the river has eroded around the site.

Boring logs of a water well on an adjacent property note a shale bedrock around 75-80' below the surface of the sand management site.

Groundwater in the alluvium around the site fluctuates with the river level. The fluctuation is demonstrated by the varying groundwater levels in monitoring well QN. However, the groundwater levels in the other monitoring wells does not appear to fluctuate with the river level. The tight clay soils in which the monitoring wells are bedded inhibits the flow of water.

2.3 Permit History

The site was initially addressed by IDNR with the development of a quarry reclamation plan. The site was reviewed with respect to Chapter 108 of the Iowa Administrative Code and found

to an acceptable site for a quarry reclamation project. Documents were submitted to IDNR noting the acceptability of the site, and activities initiated with the installation of monitoring wells in 1994. No formal permit was issued by IDNR at that time. IDNR did request yearly chemical analysis of the sand to be deposited at the site and a quantity of sand deposited.

The yearly report continued until 2019 when the BUD was issued. Since 2019, the site has been following the conditions of the BUD.

3.0 SAMPLING PROTOCOL

The groundwater sampling event initiates with the measurement of the depth to groundwater with a calibrated electronic measuring tape.

Because of the extremely slow recharge rate and limited water in the wells for sampling, the wells are not purged but rather directly sampled using a bailer. Each bailer is lowered slowly in an effort to reduce sediment at the bottom of the well. The collected groundwater is transferred to sample bottles and field measured for pH, conductivity, and temperature. The samples are placed on ice and transported to the SEE office, where the samples are stored in a refrigerator for pickup by MicroBac laboratories the following day.

3.1 June/July Sampling Event

The June sampling event occurred on June 25, 2025. Samples were collected at wells QNE, QNW, QN, QE, and QS. There was insufficient well volume at well QS to fill all of the samples bottles so a supplemental sample at QS was pulled on July 13, 2025.

3.2 November Sampling Event

The November sampling event occurred on November 4, 2025. Samples were collected at wells QNE, QNW, QN, QE, and QS. The groundwater measurements for the November sampling event were similar to those measured in June. Bailers were again used to collect samples.

4.0 DATA SUMMARY

4.1 Table 1: Monitoring Program Summary Table

Table 1 provides a summary of the wells in the hydrological monitoring system. There are currently six (6) monitoring wells that are sampled in the system, however one (1) monitoring well, QW, has been consistently dry.

The number of samples in each monitoring program begins with the 2020 samples collected.

4.2 Table 2: Monitoring Program Implementation Schedule

Table 2 tracks compliance with permitted sampling frequencies and required parameters to aid in scheduling. It is anticipated that sampling will continue in 2026 for permit required parameters. New wells are currently proposed for the site in 2026.

4.3 Table 3: Monitoring Well Maintenance & Performance Revaluation Schedule

Table 3 tracks compliance with applicable regulations. Annual sampling is required by the BUD.

4.4 Table 4: Monitoring Well Maintenance & Performance Summary

Table 4 provides a summary of the well depths, screen elevation, and most recent groundwater level measurements. QN had a submerged screen during the June 2025 sampling event. Additional groundwater level data is provided in Appendix C. Due to the site location, near the Des Moines River, a comparison of groundwater levels to river levels is provided.

4.5 Table 5: Background Summary Table

Table 5 summarizes the background levels detected for each constituent. Only QNE and QE were used in the determination of background. Background data was screened for normality using the Shapiro-Wilk test. For data which was normally distributed, equation 18.7 of EPA Unified Guidance was used to calculate prediction limits with 95% confidence. For data which was normally distributed after logarithmic transformation, equation 18.8 of EPA Unified Guidance was used to calculate prediction limits with 95% confidence. For data which was not normally distributed the background value was determined by screening the data using the 25th and 75th quartiles. The background value was determined by selecting the largest detect not excluded as an outlier.

4.6 Table 6: Summary of Well & Detected Constituent Pairs

Table 6 provides a summary of background levels compared to detections during the most recent sampling event for constituent pairs that had not been previously identified as having a control limit exceedance.

4.7 Table 7: Summary of Ongoing & Newly Identified CL Exceedances

Table 7 compares the most recent results to the control limit and the groundwater protection standard. Since the statistical method used for the determination of background levels was different for 2025 than previous years, the exceedances are the same as Table 6. This table will be used in subsequent years to track on-going control limit exceedances.

4.8 Table 8: Analytical Data Summary

Table 8 provides a summary of all of the analytical data for each well. Data going back to 2020 is backfilled into the table.

4.9 Table 9: Historic CL & AL Exceedances

Table 9 provides a summary of control limits and action levels for each well and constituent pair. Historic data is compared to the control limits calculated for the 2025 monitoring year.

5.0 RECOMMENDATIONS

5.1 Sampling Protocol

Since the monitoring wells QNW, QNE, QE, and QS currently have a limited amount of groundwater to sample and not enough water to pump the water from the wells, the method of slowly lowering the bailer into the well has been determined to be the most successful in obtaining a sample with limited sediment, TSS.

New, deeper, monitoring wells are proposed to be installed on the site to improve sample quality. Low flow sampling techniques are proposed for the new wells, assuming that a sufficient column of water will be present for purging and sampling. Previous documentation regarding new well installation was submitted with the 2024 AWQR and subsequent responses.

TABLES

Table 1
Monitoring Program Summary
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Monitoring Well	Boring Name	Formation	Current Monitoring Program	Change for next sampling event	Control Limit Exceedances	Total # of Samples since 2020
QN	QFS 1R	Glacial Till / Alluvium	---	(2)	(1) N/A	422
QW	QFS 2R	Glacial Till	Routine	(2)	None (3)	223
QE	QFS 3	Glacial Till	Background	(2)	N/A	420
QS	QFS 4	Alluvium	Routine	(2)	Aluminum	359
QNE	QFS 5	Glacial Till	Background	(2)	N/A	419
QNW	QFS 6	Glacial Till / Alluvium	Routine	(2)	Barium, total	422

Comments:

- (1) QN (upgradient) was considered not to be a valid background well by DNR following the submittal of the 2024 AWQR.
- (2) New monitoring wells are proposed to be installed. The current monitoring program will be re-evaluated following submittal of the 2025 AWQR and evaluation of the current monitoring wells.
- (3) QW has not been sampled since March 2023 due to low well volumes

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Table 2
Monitoring Program Implementation Schedule
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Monitoring Well	Recent Sampling Dates and Constituents						Upcoming Sampling Dates and Constituents*			
	12/1/2023	8/12/2024	12/16/2024	6/25/2025	7/13/2025	11/4/2025	August 2026	November 2026	August 2027	November 2027
QN	List B	List A	List A	List A	---	List A	List A	List A	List A	List A
QW	List B	List A	List A	List A	---	List A	List A	List A	List A	List A
QE	List B	List A	List A	List A	--	List A	List A	List A	List A	List A
QS	List B	List A	List A	List A	List A**	List A	List A	List A	List A	List A
QNE	List B	List A	List A	List A	---	List A	List A	List A	List A	List A
QNW	List B	List A	List A	List A	---	List A	List A	List A	List A	List A

List A - Appendix B parameters and field-measured temperature, specific conductivity, and pH

List B - lithium and Appendix B parameters except for iron, magnesium, formaldehyde, TSS, sulfate

*New monitoring wells are proposed to be installed. The current monitoring program will be re-evaluated following submittal of the 2025 AWQR and evaluation of the current monitoring wells.

**QS was resampled due to low volume during the initial sampling event

Table 3
Monitoring Well Maintenance and Performance Reevaluation Schedule
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Compliance with:	Monitoring Calendar Years					
	2022	2023	2024	2025	2026	2027
Special Condition #9b - GW sampling for App B Parameters	(1)	(1)	Completed	Completed	Scheduled	Scheduled
Special Condition #9b - GW sampling for Temperature, Specific Conductance, & pH	Completed	Completed	Completed	Completed	Scheduled	Scheduled

Comments:

(1) Not all Appendix B parameters sampled for, corrected in 2024

Table 4
Monitoring Well Maintenance and Performance Summary
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Well	Boring Name	Top of Casing	Ground Surface Elevation	Top of Screen	Total Well Depth		Date of Measurements		Maximum Depth Discrepancy (ft)	Baseline Permeability (cm/s/date)	Current Permeability	
							Jun-25	Nov-25			-	% Change
QN	QFS 1R	912.42	909.82	892	36	Groundwater Level, BGS (ft)	10.28	12.21	NM	NM	-	
						Groundwater Elevation (ft MSL)	899.54	897.61				
						Measured Well Depth (ft)	NM	NM				
						Submerged screen	Yes	Yes				
QW	QFS 2R	915.24	912.19	878.19	44	Groundwater Level, BGS (ft)	Dry	Dry	NM	NM	-	
						Groundwater Elevation (ft MSL)	---	---				
						Measured Well Depth (ft)	NM	NM				
						Submerged screen	---	---				
QE	QFS 3	918.48	915.76	891.76	34	Groundwater Level, BGS (ft)	35.12	34.64	NM	NM	-	
						Groundwater Elevation (ft MSL)	880.64	881.12				
						Measured Well Depth (ft)	NM	NM				
						Submerged screen	No	No				
QS	QFS 4	919.31	916.18	898.18	50	Groundwater Level, BGS (ft)	41.59	41.43	NM	NM	-	
						Groundwater Elevation (ft MSL)	874.59	874.75				
						Measured Well Depth (ft)	NM	NM				
						Submerged screen	No	No				
QNE	QFS 5	922.47	919.14	901.14	50	Groundwater Level, BGS (ft)	31.41	30.53	NM	NM	-	
						Groundwater Elevation (ft MSL)	887.73	888.61				
						Measured Well Depth (ft)	NM	NM				
						Submerged screen	No	No				
QNW	QFS 6	925.05	922.01	904.01	50	Groundwater Level, BGS (ft)	46.68	46.37	NM	NM	-	
						Groundwater Elevation (ft MSL)	875.33	875.64				
						Measured Well Depth (ft)	NM	NM				
						Submerged screen	No	No				

Comments:

Table 5
Background Summary
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Upgradient / Background (QNE & QE)							
Constituent	Units	Samples	Detections	Background Level (Control Limit)	Statistical Test	Action Level	Source
Aluminum	µg/l	14	11	310.00	(3)	200	SMCL
Antimony, total	µg/l	30	1	2.00	(3)	6	MCL
Arsenic, total	µg/l	30	13	9.90	(3)	10	MCL
Barium, total	µg/l	30	30	152.00	(3)	2000	MCL
Beryllium, total	µg/l	30	0	4.00	(3)	4	MCL
Boron, total	µg/l	30	26	752.00	(3)	6000	SS
Cadmium, total	µg/l	29	0	5.00	(3)	5	MCL
Chemical Oxygen Demand (COD)	µg/l	14	6	75000.00	(3)	---	---
Chloride	µg/l	14	14	22232.91	(1)	250000	SMCL
Chromium, total	µg/l	29	3	8.00	(3)	100	MCL
Cobalt, total	µg/l	30	29	1.30	(2)	2.8	SS
Copper, total	µg/l	30	4	17.00	(3)	1300	MCL
Fluoride	µg/l	30	25	300.00	(3)	---	---
Formaldehyde	µg/l	13	0	20.00	(3)	---	---
Iron	µg/l	14	11	4.65	(2)	300	SMCL
Lead, total	µg/l	30	1	10.00	(3)	15	MCL
Magnesium	µg/l	14	14	140149.15	(1)	---	---
Manganese, total	µg/l	30	28	2860.00	(3)	300	MCL
Mercury, total	µg/l	30	0	0.50	(3)	2	MCL
Molybdenum, total	µg/l	30	23	23.00	(3)	2	MCL
Nickel, total	µg/l	30	20	1.55	(2)	100	SS
Nitrogen, Ammonia	µg/l	14	13	2105.13	(1)	---	---
Phenols, total	µg/l	14	1	35.00	(3)	2000	SS
Selenium, total	µg/l	30	4	84.00	(3)	50	MCL
Silver, total	µg/l	29	0	5.00	(3)	100	SS
Sulfate	µg/l	14	14	1007315.16	(1)	250000	SMCL
Thallium, total	µg/l	30	0	2.00	(3)	2	MCL
Total Organic Halogens (TOX)	µg/l	13	5	32.00	(3)	---	---
Total Suspended Solids (TSS)	µg/l	14	14	6.94	(2)	---	---
Vanadium, total	µg/l	30	1	50.00	(3)	35	SS
Zinc, total	µg/l	30	8	20.00	(3)	5000	SMCL
Temperature	°F	30	30	61.00	(3)	---	---
pH	SU	30	30	7.01	(1)	---	---
Conductivity	umhos/cm	30	30	3.50	(2)	---	---

Comments:

RED indicates background exceeds Action Level

(1) CL calculated using equation 18.7 of EPA Unified Guidance

(2) CL calculated using equation 18.8 of EPA Unified Guidance, Log-transformed data for normal distribution

(3) CL & confidence level calculated using screened (25%-75%) data and using table 18-1 of EPA Unified Guidance

Table 6
Summary of Well/Detected Constituent Pairs With No Immediately Preceding Control Limit Exceedances
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Well	Constituent	Units	Result	Control Limit	Action Level/
QS	Aluminum	µg/l	2350	310.00	200
	Barium, total	µg/l	395	152.00	2000
	Total Organic Halogens (TOX)	µg/l	34	32.00	---
	Zinc, total	µg/l	29.3	20.00	5000
QNW	Barium, total	µg/l	196	152.00	2000

Table 7
Summary of Ongoing and Newly Identified Control Limit Exceedances
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Well	Constituent	Units	Result	Control Limit	Action Level/ Statewide Standard
QS	Aluminum	µg/l	2350	310.00	200
	Barium, total	µg/l	395	152.00	2000
	Total Organic Halogens (TOX)	µg/l	34	32.00	---
	Zinc, total	µg/l	29.3	20.00	5000
QNW	Barium, total	µg/l	196	152.00	2000

Table 8
Analytical Data Summary
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Constituent (CAS #)	Sample Date	Units	QN ---	QNW DwnGrad	QNE UpGrad	QE UpGrad	QS DwnGrad	QW DwnGrad
Aluminum SMCL 200	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM
	9/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/10/2021	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2021	µg/l	NM	NM	NM	NM	NM	NM
	6/21/2022	µg/l	NM	NM	NM	NM	NM	NM
	12/6/2022	µg/l	NM	NM	NM	NM	NM	< 50
	3/22/2023	µg/l	< 50	< 50	51	< 50	NM	148
	6/19/2023	µg/l	1420	120	298	8980	NM	NM
	12/1/2023	µg/l	209	590000	310	127	304000	NM
	8/12/2024	µg/l	125	2460	92	78	NM	NM
	12/16/2024	µg/l	175	284	95	301	2380	NM
	6/25/2025	µg/l	292	1260	< 50	< 50	143	NM
7/13/2025	µg/l	NM	NM	NM	NM	140	NM	
11/4/2025	µg/l	1140	181	51	98	2350	NM	
Antimony (Total) (7440-36-0) MCL 6	3/1/2020	µg/l	< 2	< 2	< 2	< 2	3.3	< 2
	6/15/2020	µg/l	< 2	< 2	< 2	< 2	< 2	< 2
	9/1/2020	µg/l	< 2	< 2	< 2	< 2	< 2	< 2
	12/9/2020	µg/l	< 2	< 2	< 2	< 2	< 2	< 2
	6/10/2021	µg/l	< 2	< 2	< 2	< 2	< 2	< 2
	12/9/2021	µg/l	< 2	< 2	< 2	< 2	< 2	< 2
	6/21/2022	µg/l	< 2	< 2	< 2	< 2	3.8	2.6
	12/6/2022	µg/l	< 2	< 2	< 2	< 2	3.8	< 2
	3/22/2023	µg/l	< 2	< 2	< 2	< 2	NM	< 2
	6/19/2023	µg/l	< 2	< 2	< 2	< 2	NM	NM
	12/1/2023	µg/l	< 2	< 20	< 2	< 2	30.7	NM
	8/12/2024	µg/l	< 2	< 2	< 2	< 2	NM	NM
	12/16/2024	µg/l	< 2	< 2	< 2	< 2	< 2	NM
	6/25/2025	µg/l	1.3	< 1	< 1	< 1	< 1	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 1	NM	
11/4/2025	µg/l	1.4	1.1	1	< 1	1.4	NM	
Arsenic (Total) (7440-38-2) MCL 10	3/1/2020	µg/l	< 4	< 4	< 4	12.6	180	< 4
	6/15/2020	µg/l	< 4	5.4	< 4	7.1	8.8	< 4
	9/1/2020	µg/l	< 4	< 4	< 4	6.3	6	4
	12/9/2020	µg/l	5	< 4	< 4	4.8	7.1	< 4
	6/10/2021	µg/l	11.6	< 4	< 4	8.4	7.5	15.6
	12/9/2021	µg/l	< 4	7.4	< 4	< 4	< 4	< 4
	6/21/2022	µg/l	< 4	75	< 4	< 4	151	54.9
	12/6/2022	µg/l	4.5	65.3	4.6	41.1	137	5.6
	3/22/2023	µg/l	< 4	< 4	< 4	< 4	NM	10.8
	6/19/2023	µg/l	< 4	< 4	8.2	25.2	NM	NM
	12/1/2023	µg/l	< 4	765	< 4	4	1080	NM
	8/12/2024	µg/l	9.2	6.3	< 4	9.9	NM	NM
	12/16/2024	µg/l	6.9	< 4	< 4	4.4	8.9	NM
	6/25/2025	µg/l	< 2	< 2	< 2	< 2	< 2	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 2	NM	
11/4/2025	µg/l	5.9	< 2	< 2	4.1	9	NM	
Barium (Total) (7440-39-3) MCL 2000	3/1/2020	µg/l	121	226	149	120	2990	176
	6/15/2020	µg/l	89	170	104	114	256	151
	9/1/2020	µg/l	79	245	94	63	250	156
	12/9/2020	µg/l	104	287	97	52	384	170
	6/10/2021	µg/l	122	260	96	65	261	284
	12/9/2021	µg/l	126	309	97	77	202	189
	6/21/2022	µg/l	56	1820	100	69	3890	628
	12/6/2022	µg/l	43	1400	96	152	2680	44.5
	3/22/2023	µg/l	195	90.7	63.7	188	NM	88.1
	6/19/2023	µg/l	249	100	77.8	719	NM	NM
	12/1/2023	µg/l	59.4	9410	99.2	71.6	22500	NM
	8/12/2024	µg/l	48.6	314	109	65.9	NM	NM
	12/16/2024	µg/l	44.4	248	100	78.4	366	NM
	6/25/2025	µg/l	45.2	208	125	86.3	219	NM

Constituent (CAS #)	Sample Date	Units	QN	QNW	QNE	QE	QS	QW
	7/13/2025	µg/l	NM	NM	NM	NM	228	NM
	11/4/2025	µg/l	75	196	103	176	395	NM
Beryllium (Total) (7440-41-7) MCL 4	3/1/2020	µg/l	< 4	< 4	< 4	< 4	4.2	< 4
	6/15/2020	µg/l	< 4	< 4	< 4	< 4	< 4	< 4
	9/1/2020	µg/l	< 4	< 4	< 4	< 4	< 4	< 4
	12/9/2020	µg/l	< 4	< 4	< 4	< 4	< 4	< 4
	6/10/2021	µg/l	< 4	< 4	< 4	< 4	< 4	< 4
	12/9/2021	µg/l	< 4	< 4	< 4	< 4	< 4	< 4
	6/21/2022	µg/l	< 4	< 4	< 4	< 4	< 4	< 4
	12/6/2022	µg/l	< 4	< 4	< 4	< 4	< 4	< 4
	3/22/2023	µg/l	< 4	< 4	< 4	< 4	NM	< 4
	6/19/2023	µg/l	< 4	< 4	< 4	< 4	NM	NM
	12/1/2023	µg/l	< 4	< 40	< 4	< 4	< 40	NM
	8/12/2024	µg/l	< 4	< 4	< 4	< 4	NM	NM
	12/16/2024	µg/l	< 4	< 4	< 4	< 4	< 4	NM
	6/25/2025	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 0.5	NM	
11/4/2025	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NM	
Boron SS 6000 HAL 6000	3/1/2020	µg/l	544	174	1150	293	162	< 100
	6/15/2020	µg/l	479	< 100	476	185	< 100	< 100
	9/1/2020	µg/l	481	198	752	524	< 100	< 100
	12/9/2020	µg/l	520	247	739	523	< 100	< 100
	6/10/2021	µg/l	661	163	749	504	114	< 100
	12/9/2021	µg/l	634	277	730	489	< 100	< 100
	6/21/2022	µg/l	124	122	608	< 100	139	< 100
	12/6/2022	µg/l	523	296	632	645	135	654
	3/22/2023	µg/l	147	671	167	< 100	NM	603
	6/19/2023	µg/l	138	620	385	106	NM	NM
	12/1/2023	µg/l	488	1290	625	629	< 1000	NM
	8/12/2024	µg/l	374	211	660	577	NM	NM
	12/16/2024	µg/l	294	220	622	629	< 100	NM
	6/25/2025	µg/l	< 100	231	662	< 100	< 100	NM
7/13/2025	µg/l	NM	NM	NM	NM	109	NM	
11/4/2025	µg/l	128	187	594	< 100	112	NM	
Cadmium (Total) (7440-43-9) MCL 5 HAL 5	3/1/2020	µg/l	< 5	< 5	< 5	< 5	5	< 5
	6/15/2020	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	9/1/2020	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	12/9/2020	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	6/10/2021	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	12/9/2021	µg/l	< 5	< 5	< NM	< 5	< 5	< 5
	6/21/2022	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	12/6/2022	µg/l	< 5	< 5	< 5	< 5	< 5	< 0.8
	3/22/2023	µg/l	< 0.8	< 0.8	< 0.8	< 0.8	NM	0.8
	6/19/2023	µg/l	< 0.8	< 0.8	< 0.8	< 0.8	NM	NM
	12/1/2023	µg/l	1.4	43.1	< 0.8	< 0.8	29.6	NM
	8/12/2024	µg/l	< 0.8	< 0.8	< 0.8	< 0.8	NM	NM
	12/16/2024	µg/l	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	NM
	6/25/2025	µg/l	0.2	< 0.2	< 0.2	< 0.2	< 0.2	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 0.2	NM	
11/4/2025	µg/l	0.3	< 0.2	< 0.2	< 0.2	0.2	NM	
Chemical Oxygen Demand (COD)	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM
	9/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/10/2021	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2021	µg/l	NM	NM	NM	NM	NM	NM
	6/21/2022	µg/l	NM	NM	NM	NM	NM	NM
	12/6/2022	µg/l	NM	NM	NM	NM	NM	30000
	3/22/2023	µg/l	87000	< 20000	28000	1850000	NM	29000
	6/19/2023	µg/l	< 20000	< 20000	21000	< 20000	NM	NM
	12/1/2023	µg/l	< 54000	5000000	< 54000	110000	< 54000	NM
	8/12/2024	µg/l	< 20000	< 20000	< 20000	21000	NM	NM
	12/16/2024	µg/l	< 54000	69000	< 54000	75000	55000	NM
	6/25/2025	µg/l	58000	58000	< 54000	< 54000	< 54000	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 54000	NM	
11/4/2025	µg/l	< 54000	55000	< 54000	< 54000	< 54000	NM	
Chloride	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM

Constituent (CAS #) SMCL 250000	Sample Date	Units	QN	QNW	QNE	QE	QS	QW
	9/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/10/2021	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2021	µg/l	NM	NM	NM	NM	NM	NM
	6/21/2022	µg/l	NM	NM	NM	NM	NM	NM
	12/6/2022	µg/l	NM	NM	NM	NM	NM	38400
	3/22/2023	µg/l	398000	7400	15600	18800	NM	43200
	6/19/2023	µg/l	265000	8400	17400	18800	NM	NM
	12/1/2023	µg/l	19100	157000	8500	13300	21900	NM
	8/12/2024	µg/l	99300	241000	6500	15200	NM	NM
	12/16/2024	µg/l	49000	319000	7600	13200	15800	NM
	6/25/2025	µg/l	< 1000	323000	6000	17700	11100	NM
	7/13/2025	µg/l	NM	NM	NM	NM	12600	NM
	11/4/2025	µg/l	25500	303000	5400	18700	10000	NM
Chromium (Total) (7440-47-3) MCL 100	3/1/2020	µg/l	< 5	< 5	< 5	< 5	145	< 5
	6/15/2020	µg/l	< 5	< 5	< 5	< 5	8	< 5
	9/1/2020	µg/l	< 5	< 5	< 5	< 5	6	< 5
	12/9/2020	µg/l	< 5	< 5	< 5	< 5	13	< 5
	6/10/2021	µg/l	< 5	< 5	< 5	< 5	< 5	11
	12/9/2021	µg/l	< 5	< 5	< NM	< 5	< 5	< 5
	6/21/2022	µg/l	< 5	73	< 5	< 5	149	41
	12/6/2022	µg/l	< 5	83	< 5	< 5	110	< 8
	3/22/2023	µg/l	< 8	< 8	< 8	< 8	NM	< 8
	6/19/2023	µg/l	< 8	< 8	< 8	16.8	NM	NM
	12/1/2023	µg/l	< 8	788	< 8	< 8	666	NM
	8/12/2024	µg/l	< 8	< 8	< 8	< 8	NM	NM
	12/16/2024	µg/l	< 8	< 8	< 8	< 8	< 8	NM
	6/25/2025	µg/l	1.9	2.6	1.9	1.2	1.6	NM
	7/13/2025	µg/l	NM	NM	NM	NM	< 2	NM
	11/4/2025	µg/l	1.9	1	< 1	< 1	6.6	NM
Cobalt (Total) (7440-48-4) SS 2.8	3/1/2020	µg/l	3.9	3.3	3.8	4.8	227	1.2
	6/15/2020	µg/l	3.5	7.4	1.9	2	10.3	0.4
	9/1/2020	µg/l	2.9	0.4	1.1	0.4	6.4	0.4
	12/9/2020	µg/l	3.9	0.4	1.3	4.2	13.5	0.9
	6/10/2021	µg/l	3.4	3.3	0.6	1.7	7	8.2
	12/9/2021	µg/l	2.5	6.7	0.7	2.4	3.8	1.3
	6/21/2022	µg/l	0.8	80.4	0.5	2.3	226	30.8
	12/6/2022	µg/l	5.9	58.1	4.3	29.3	192	2.7
	3/22/2023	µg/l	0.7	1.1	6.6	< 0.4	NM	6.1
	6/19/2023	µg/l	3	6.2	7.6	35.7	NM	NM
	12/1/2023	µg/l	2.5	727	2.7	8.5	1620	NM
	8/12/2024	µg/l	4.1	8.7	0.9	5.8	NM	NM
	12/16/2024	µg/l	10	2.7	1.3	16.3	10.8	NM
	6/25/2025	µg/l	< 0.5	2.7	0.8	3.7	0.9	NM
	7/13/2025	µg/l	NM	NM	NM	NM	0.6	NM
	11/4/2025	µg/l	1.9	1.5	0.7	9.9	10.7	NM
Copper (Total) (7440-50-8) MCL 1300 SMCL 1000	3/1/2020	µg/l	< 10	< 10	17	< 10	283	< 10
	6/15/2020	µg/l	< 10	< 10	< 10	< 10	14	< 10
	9/1/2020	µg/l	< 10	< 10	< 10	< 10	10	< 10
	12/9/2020	µg/l	< 10	< 10	< 10	< 10	18	< 10
	6/10/2021	µg/l	< 10	< 10	< 10	< 10	10	16
	12/9/2021	µg/l	< 10	< 10	< 10	< 10	< 10	< 10
	6/21/2022	µg/l	< 10	118	< 10	< 10	316	57
	12/6/2022	µg/l	< 10	84	< 10	< 10	216	< 4
	3/22/2023	µg/l	< 4	< 4	< 4	< 4	NM	< 4
	6/19/2023	µg/l	< 4	< 4	< 4	35.9	NM	NM
	12/1/2023	µg/l	4.8	1100	4.6	< 4	1650	NM
	8/12/2024	µg/l	< 4	7.1	5.2	< 4	NM	NM
	12/16/2024	µg/l	< 4	< 4	< 4	< 4	10.7	NM
	6/25/2025	µg/l	5.8	< 5	< 5	< 5	< 5	NM
	7/13/2025	µg/l	NM	NM	NM	NM	< 5	NM
	11/4/2025	µg/l	< 5	< 5	< 5	< 5	13.1	NM
Fluoride	3/1/2020	µg/l	100	100	100	200	100	100
	6/15/2020	µg/l	100	< 100	< 100	100	< 100	< 100
	9/1/2020	µg/l	200	100	100	200	< 100	100
	12/9/2020	µg/l	200	200	200	200	100	200
	6/10/2021	µg/l	100	100	100	100	100	200
	12/9/2021	µg/l	100	100	200	200	< 100	200

Constituent (CAS #)	Sample Date	Units	QN	QNW	QNE	QE	QS	QW
	6/21/2022	µg/l	< 100	100	100	100	100	100
	12/6/2022	µg/l	200	100	100	200	< 100	200
	3/22/2023	µg/l	200	200	300	100	NM	200
	6/19/2023	µg/l	200	200	300	< 100	NM	NM
	12/1/2023	µg/l	200	< 100	100	200	< 100	NM
	8/12/2024	µg/l	100	100	100	< 100	NM	NM
	12/16/2024	µg/l	200	200	100	100	< 100	NM
	6/25/2025	µg/l	100	< 100	< 100	< 100	< 100	NM
	7/13/2025	µg/l	NM	NM	NM	NM	< 1000	NM
	11/4/2025	µg/l	100	100	100	100	< 100	NM
	Formaldehyde	3/1/2020	µg/l	NM	NM	NM	NM	NM
6/15/2020		µg/l	NM	NM	NM	NM	NM	NM
9/1/2020		µg/l	NM	NM	NM	NM	NM	NM
12/9/2020		µg/l	NM	NM	NM	NM	NM	NM
6/10/2021		µg/l	NM	NM	NM	NM	NM	NM
12/9/2021		µg/l	NM	NM	NM	NM	NM	NM
6/21/2022		µg/l	NM	NM	NM	NM	NM	NM
12/6/2022		µg/l	NM	NM	NM	NM	NM	< 20
3/22/2023		µg/l	< 10	< 10	< 20	< 10	NM	< 10
6/19/2023		µg/l	< 10	< 10	< 10	< 10	NM	NM
12/1/2023		µg/l	12.9	< 20	< 10	< 10	< 10	NM
8/12/2024		µg/l	< 20	< 10	< 10	< 20	NM	NM
12/16/2024		µg/l	< 20	< 20	< 10	NM	< 10	NM
6/25/2025		µg/l	< 20	< 20	< 20	< 20	NM	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 20000	NM	
11/4/2025	µg/l	< 20	< 20	< 20	< 20	< 20	NM	
Iron SMCL 300	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM
	9/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/10/2021	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2021	µg/l	NM	NM	NM	NM	NM	NM
	6/21/2022	µg/l	NM	NM	NM	NM	NM	NM
	12/6/2022	µg/l	NM	NM	NM	NM	NM	1930
	3/22/2023	µg/l	< 100	< 100	914	< 100	NM	2970
	6/19/2023	µg/l	3300	465	9090	51600	NM	NM
	12/1/2023	µg/l	613	2070000	917	2490	2280000	NM
	8/12/2024	µg/l	15700	13800	161	12300	NM	NM
	12/16/2024	µg/l	29000	2500	111	2120	13600	NM
	6/25/2025	µg/l	566	3770	< 100	2660	892	NM
7/13/2025	µg/l	NM	NM	NM	NM	550	NM	
11/4/2025	µg/l	9010	1630	< 100	5510	13700	NM	
Lead (Total) (7439-92-1) MCL 15	3/1/2020	µg/l	< 20	< 20	< 20	< 20	163	< 20
	6/15/2020	µg/l	< 10	< 10	< 10	< 10	13	< 10
	9/1/2020	µg/l	< 10	< 10	< 10	< 10	< 10	< 10
	12/9/2020	µg/l	58	< 10	< 10	< 10	13	< 10
	6/10/2021	µg/l	< 10	< 10	< 10	< 10	< 10	18
	12/9/2021	µg/l	< 10	< 10	< 10	< 10	< 10	< 10
	6/21/2022	µg/l	< 10	61	< 10	< 10	160	64
	12/6/2022	µg/l	< 10	55	< 10	< 10	106	< 4
	3/22/2023	µg/l	< 4	< 4	< 4	< 4	NM	< 4
	6/19/2023	µg/l	< 4	< 4	< 4	19.6	NM	NM
	12/1/2023	µg/l	< 4	859	< 4	< 4	1010	NM
	8/12/2024	µg/l	< 4	4.2	< 4	< 4	NM	NM
	12/16/2024	µg/l	< 4	< 4	< 4	< 4	6.3	NM
	6/25/2025	µg/l	< 1	1.3	< 1	< 1	< 1	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 1	NM	
11/4/2025	µg/l	1.8	< 1	< 1	< 1	6.7	NM	
Magnesium	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM
	9/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/10/2021	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2021	µg/l	NM	NM	NM	NM	NM	NM
	6/21/2022	µg/l	NM	NM	NM	NM	NM	NM
	12/6/2022	µg/l	NM	NM	NM	NM	NM	98900
	3/22/2023	µg/l	63400	61800	78700	48400	NM	90900
	6/19/2023	µg/l	51000	62000	117000	71100	NM	NM

Constituent (CAS #)	Sample Date	Units	QN	QNW	QNE	QE	QS	QW
	12/1/2023	µg/l	73500	1370000	60600	132000	1120000	NM
	8/12/2024	µg/l	164000	68300	62200	140000	NM	NM
	12/16/2024	µg/l	99900	76300	57100	129000	49700	NM
	6/25/2025	µg/l	9440	69500	57300	63500	43500	NM
	7/13/2025	µg/l	NM	NM	NM	NM	48200	NM
	11/4/2025	µg/l	63300	49800	54000	86200	46500	NM
Manganese MCL 300	3/1/2020	µg/l	1150	1040	1460	1290	16600	82
	6/15/2020	µg/l	945	302	616	1020	658	24
	9/1/2020	µg/l	857	56	698	808	419	23
	12/9/2020	µg/l	1100	45	604	776	1080	49
	6/10/2021	µg/l	955	701	397	2070	429	504
	12/9/2021	µg/l	614	714	431	3010	78	59
	6/21/2022	µg/l	333	5240	313	719	20000	2020
	12/6/2022	µg/l	922	9880	399	1500	12000	782
	3/22/2023	µg/l	105	639	1390	< 4	NM	689
	6/19/2023	µg/l	512	347	4	< 4	NM	NM
	12/1/2023	µg/l	691	49900	555	1480	93100	NM
	8/12/2024	µg/l	5810	4420	402	2860	NM	NM
	12/16/2024	µg/l	5160	1490	421	1890	715	NM
	6/25/2025	µg/l	23.8	1530	308	871	69.4	NM
7/13/2025	µg/l	NM	NM	NM	NM	27.1	NM	
11/4/2025	µg/l	2440	216	279	1640	754	NM	
Mercury (7439-97-6) MCL 2	3/1/2020	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	0.73	< 0.5
	6/15/2020	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	9/1/2020	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	12/9/2020	µg/l	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	6/10/2021	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	12/9/2021	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	6/21/2022	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	12/6/2022	µg/l	< 0.5	1.1	< 0.5	< 0.5	1.11	< 0.5
	3/22/2023	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	NM	< 0.5
	6/19/2023	µg/l	0.5	< 0.5	< 0.5	< 0.5	NM	NM
	12/1/2023	µg/l	< 0.5	< 5	< 0.5	< 0.5	< 5	NM
	8/12/2024	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	NM	NM
	12/16/2024	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NM
	6/25/2025	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 0.5	NM	
11/4/2025	µg/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NM	
Molybdenum MCL 2	3/1/2020	µg/l	358	< 10	115	< 10	20	< 10
	6/15/2020	µg/l	265	< 10	21	< 10	< 10	< 10
	9/1/2020	µg/l	246	< 10	23	< 10	< 10	< 10
	12/9/2020	µg/l	250	< 10	23	10	< 10	< 10
	6/10/2021	µg/l	223	< 10	20	< 10	< 10	< 10
	12/9/2021	µg/l	184	< 10	20	< 10	< 10	< 10
	6/21/2022	µg/l	24	18	18	< 10	22	< 10
	12/6/2022	µg/l	134	20	14	19	14	124
	3/22/2023	µg/l	< 4	12.9	4.1	< 4	NM	115
	6/19/2023	µg/l	< 4	11.7	3030	2420	NM	NM
	12/1/2023	µg/l	90	155	12.7	7.6	67	NM
	8/12/2024	µg/l	14.7	7.7	12.1	7.1	NM	NM
	12/16/2024	µg/l	14.3	4.2	11.7	12.9	< 4	NM
	6/25/2025	µg/l	14.8	3.1	11.6	1.9	< 1	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 1	NM	
11/4/2025	µg/l	9	2.1	9.9	1.8	< 1	NM	
Nickel (Total) (7440-02-0) SS 100	3/1/2020	µg/l	19	< 10	16	11	338	< 10
	6/15/2020	µg/l	20	10	18	< 10	21	< 10
	9/1/2020	µg/l	17	< 10	15	< 10	15	< 10
	12/9/2020	µg/l	16	< 10	12	15	25	< 10
	6/10/2021	µg/l	13	< 10	< 10	< 10	12	16
	12/9/2021	µg/l	17	< 10	< 10	15	< 10	< 10
	6/21/2022	µg/l	20	100	< 10	< 10	336	53
	12/6/2022	µg/l	25	91	< 10	43	229	10.6
	3/22/2023	µg/l	4	5.3	15.7	< 4	NM	12.1
	6/19/2023	µg/l	5.6	4.4	11.6	45.6	NM	NM
	12/1/2023	µg/l	16.9	1370	6.6	24.8	1890	NM
	8/12/2024	µg/l	9.4	18.1	5.2	13	NM	NM
	12/16/2024	µg/l	8.9	5.1	4.4	44.7	13.9	NM
	6/25/2025	µg/l	< 5	6.3	5.1	15.5	< 5	NM

Constituent (CAS #)	Sample Date	Units	QN	QNW	QNE	QE	QS	QW
Nitrogen, Ammonia	7/13/2025	µg/l	NM	NM	NM	NM	< 5	NM
	11/4/2025	µg/l	5.9	< 5	< 5	15.9	15.1	NM
	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM
	9/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/10/2021	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2021	µg/l	NM	NM	NM	NM	NM	NM
	6/21/2022	µg/l	NM	NM	NM	NM	NM	NM
	12/6/2022	µg/l	NM	NM	NM	NM	NM	4420
	3/22/2023	µg/l	200	1490	500	< 100	NM	4640
	6/19/2023	µg/l	< 100	1270	1030	100	NM	NM
	12/1/2023	µg/l	1010	150	1390	1690	< 100	NM
	8/12/2024	µg/l	610	110	1520	1740	NM	NM
12/16/2024	µg/l	770	130	1680	110	< 100	NM	
6/25/2025	µg/l	< 100	< 100	680	280	< 100	NM	
7/13/2025	µg/l	NM	NM	NM	NM	< 100	NM	
11/4/2025	µg/l	130	< 100	1640	410	< 100	NM	
Phenols (Total) (108-95-2) SS 2000	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM
	9/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/10/2021	µg/l	NM	NM	NM	NM	NM	NM
	12/9/2021	µg/l	NM	NM	NM	NM	NM	NM
	6/21/2022	µg/l	NM	NM	NM	NM	NM	NM
	12/6/2022	µg/l	NM	NM	NM	NM	NM	< 35
	3/22/2023	µg/l	< 35	73	38	< 35	NM	44
	6/19/2023	µg/l	54	< 35	< 35	< 35	NM	NM
	12/1/2023	µg/l	< 35	< 35	< 35	< 35	< 35	NM
	8/12/2024	µg/l	< 35	53	< 35	< 35	NM	NM
	12/16/2024	µg/l	< 35	< 35	< 35	< 35	< 70	NM
	6/25/2025	µg/l	39	35	< 35	< 35	< 35	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 35	NM	
11/4/2025	µg/l	< 35	< 35	< 35	< 35	< 35	NM	
Selenium (Total) (7782-49-2) MCL 50	3/1/2020	µg/l	< 50	< 50	< 50	< 50	69	< 50
	6/15/2020	µg/l	< 50	< 50	< 50	< 50	< 50	< 50
	9/1/2020	µg/l	< 50	< 50	< 50	< 50	< 50	< 50
	12/9/2020	µg/l	< 50	< 50	< 50	< 50	< 50	< 50
	6/10/2021	µg/l	< 50	< 50	< 50	< 50	< 50	< 50
	12/9/2021	µg/l	< 50	< 50	< 50	54	< 50	< 50
	6/21/2022	µg/l	131	86	147	84	73	129
	12/6/2022	µg/l	< 50	< 50	< 50	< 50	< 50	< 4
	3/22/2023	µg/l	< 4	< 4	< 4	< 4	NM	< 4
	6/19/2023	µg/l	< 4	< 4	< 4	4.2	NM	NM
	12/1/2023	µg/l	< 4	112	< 4	< 4	92.5	NM
	8/12/2024	µg/l	< 4	< 4	< 4	< 4	NM	NM
	12/16/2024	µg/l	< 4	< 4	< 4	< 4	< 4	NM
	6/25/2025	µg/l	< 2	< 2	< 2	< 2	2	NM
7/13/2025	µg/l	NM	NM	NM	NM	2	NM	
11/4/2025	µg/l	< 2	< 2	< 2	< 2	2.3	NM	
Silver (Total) (7440-22-4) SS 100	3/1/2020	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	6/15/2020	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	9/1/2020	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	12/9/2020	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	6/10/2021	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	12/9/2021	µg/l	< 5	< 5	< NM	< 5	< 5	< 5
	6/21/2022	µg/l	< 5	< 5	< 5	< 5	< 5	< 5
	12/6/2022	µg/l	< 5	< 5	< 5	< 5	< 5	< 4
	3/22/2023	µg/l	< 4	< 4	< 4	< 4	NM	< 4
	6/19/2023	µg/l	< 4	< 4	< 4	< 4	NM	NM
	12/1/2023	µg/l	< 4	< 40	< 4	< 4	< 40	NM
	8/12/2024	µg/l	< 4	< 4	< 4	< 4	NM	NM
	12/16/2024	µg/l	< 4	< 4	< 4	< 4	< 4	NM
	6/25/2025	µg/l	< 5	< 5	< 5	< 5	< 5	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 5	NM	
11/4/2025	µg/l	< 5	< 5	< 5	< 5	< 5	NM	
Sulfate	3/1/2020	µg/l	NM	NM	NM	NM	NM	NM
	6/15/2020	µg/l	NM	NM	NM	NM	NM	NM

Constituent (CAS #)	Sample Date	Units	QN	QNW	QNE	QE	QS	QW
	6/21/2022	µg/l	< 50	147	< 50	< 50	310	110
	12/6/2022	µg/l	< 50	164	< 50	< 50	232	< 20
	3/22/2023	µg/l	< 20	< 20	< 20	< 20	NM	< 20
	6/19/2023	µg/l	< 20	< 20	< 20	36.5	NM	NM
	12/1/2023	µg/l	< 20	1440	< 20	< 20	1240	NM
	8/12/2024	µg/l	< 20	< 20	< 20	< 20	NM	NM
	12/16/2024	µg/l	< 20	< 20	< 20	< 20	< 20	NM
	6/25/2025	µg/l	< 2	2.2	< 2	< 2	< 2	NM
	7/13/2025	µg/l	NM	NM	NM	NM	< 2	NM
	11/4/2025	µg/l	< 2	< 2	< 2	< 2	13	NM
	Zinc (Total) (7440-66-6) SMCL 5000 HAL 2000	3/1/2020	µg/l	< 20	< 20	208	29	657
6/15/2020		µg/l	< 20	< 20	< 20	< 20	39	< 20
9/1/2020		µg/l	< 20	< 20	< 20	< 20	20	< 20
12/9/2020		µg/l	< 20	< 20	< 20	< 20	< 50	< 20
6/10/2021		µg/l	< 20	< 20	< 20	< 20	28	62
12/9/2021		µg/l	< 20	< 20	< 20	< 20	< 20	< 20
6/21/2022		µg/l	< 20	211	< 20	< 20	573	220
12/6/2022		µg/l	28	198	< 20	36	392	< 20
3/22/2023		µg/l	< 20	< 20	< 20	< 20	NM	< 20
6/19/2023		µg/l	< 20	< 20	< 20	73.1	NM	NM
12/1/2023		µg/l	< 20	3110	< 20	< 20	3610	NM
8/12/2024		µg/l	< 20	< 20	< 20	< 20	NM	NM
12/16/2024		µg/l	< 20	< 20	< 20	44.9	24.1	NM
6/25/2025		µg/l	6.3	9.6	5.1	6.4	< 5	NM
7/13/2025	µg/l	NM	NM	NM	NM	< 5	NM	
11/4/2025	µg/l	8.8	< 5	< 5	7.4	29.3	NM	
Temperature	3/1/2020	°F	59	60	59	59	60	60
	6/15/2020	°F	61	61	60	61	61	61
	9/1/2020	°F	61	60	60	60	61	61
	12/9/2020	°F	60	60	59	59	59	59
	6/10/2021	°F	61	61	61	60	60	60
	12/9/2021	°F	60	59	59	60	60	60
	6/21/2022	°F	61	60	61	61	60	61
	12/6/2022	°F	60	59	59	60	60	NM
	3/22/2023	°F	59	60	59	59	59	NM
	6/19/2023	°F	61	60	59	61	61	NM
	12/1/2023	°F	60	60	59	60	60	NM
	8/12/2024	°F	61	60	60	59	NM	NM
	12/16/2024	°F	60	59	60	60	59	NM
	6/25/2025	°F	60	61	61	61	60	NM
7/13/2025	°F	NM	NM	NM	NM	61	NM	
11/4/2025	°F	59	60	60	60	59	NM	
pH	3/1/2020	SU	6.5	6.8	6.7	6.6	6.6	7
	6/15/2020	SU	6.7	6.6	6.9	6.7	6.8	6.9
	9/1/2020	SU	6.6	6.7	6.6	6.6	6.8	6.9
	12/9/2020	SU	6.6	6.7	6.8	6.8	6.7	6.8
	6/10/2021	SU	6.7	6.8	6.8	6.6	6.9	6.9
	12/9/2021	SU	6.8	6.8	6.7	6.7	6.6	7.1
	6/21/2022	SU	6.5	6.8	6.7	6.8	6.8	7
	12/6/2022	SU	6.7	6.8	6.9	6.8	6.9	NM
	3/22/2023	SU	6.9	6.7	6.8	6.5	6.6	NM
	6/19/2023	SU	6.7	6.8	6.8	6.7	6.8	NM
	12/1/2023	SU	6.8	6.9	7.1	6.9	7	NM
	8/12/2024	SU	6.6	6.9	6.9	6.9	NM	NM
	12/16/2024	SU	6.5	6.6	6.8	6.5	6.7	NM
	6/25/2025	SU	6.8	7	6.8	6.7	7.1	NM
7/13/2025	SU	NM	NM	NM	NM	7.2	NM	
11/4/2025	SU	6.6	7	7.1	6.7	6.9	NM	
Conductivity	3/1/2020	umhos/cm	987	922	952	1820	822	790
	6/15/2020	umhos/cm	1056	1114	1103	2210	770	725
	9/1/2020	umhos/cm	1423	1015	1085	2314	1105	742
	12/9/2020	umhos/cm	1280	986	982	2278	1019	690
	6/10/2021	umhos/cm	1350	1057	1060	2196	890	622
	12/9/2021	umhos/cm	958	814	920	2730	793	508
	6/21/2022	umhos/cm	1780	883	976	763	688	640
	12/6/2022	umhos/cm	1990	1000	1020	2300	902	NM
	3/22/2023	umhos/cm	810	1020	620	810	610	NM
	6/19/2023	umhos/cm	1220	1421	1090	1245	1115	NM

Constituent (CAS #)	Sample Date	Units	QN	QNW	QNE	QE	QS	QW
		12/1/2023	umhos/cm	1640	1680	1210	2780	1400
	8/12/2024	umhos/cm	3190	1860	1200	3200	NM	NM
	12/16/2024	umhos/cm	2380	2170	1100	2580	1150	NM
	6/25/2025	umhos/cm	484	2060	1260	2250	1280	NM
	7/13/2025	umhos/cm	NM	NM	NM	NM	1090	NM
	11/4/2025	umhos/cm	1430	1920	1180	2670	1090	NM

Comments

1. MCL = USEPA Maximum Contaminant Level
2. HAL = Health Advisory Level
3. SMCL = USEPA Secondary MCL
4. SS = Iowa Statewide Standards

Table 9
Historic Control Limit & Action Level Exceedances
2025 Annual Water Quality Report
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99

Monitoring Well	Constituent	Control Limit	Action Level/ Statewide Standard	3/1/2020	6/15/2020	9/1/2020	12/9/2020	6/10/2021	12/9/2021	6/21/2022	12/6/2022	3/22/2023	6/19/2023	12/1/2023	8/12/2024	12/16/2024	6/25/2025	7/13/2025	11/4/2025
QS	Aluminum	310.00	200											304000		2380	143	140	2350
	Barium, total	152.00	2000	2990	256	250	384	261	202	3890	2680			22500		366	219	228	395
	Total Organic Halogens (TOX)	32.00	--											10		10	91	19	34
	Zinc, total	20.00	5000	657	39	20	50	28	20	573	392			3610		24.1	5	5	29.3
QNW	Barium, total	152.00	2000	226	170	245	287	260	309	1820	1400	90.7	100	9410	314	248	208		196

Comments:

1. Gray = Control Limit (CL)
2. Black = Action Level (AL)

FIGURES



Site Location
Bessser Quinn Sand Management Site
Boone, Iowa

Figure 1 - Site Location

July 2025

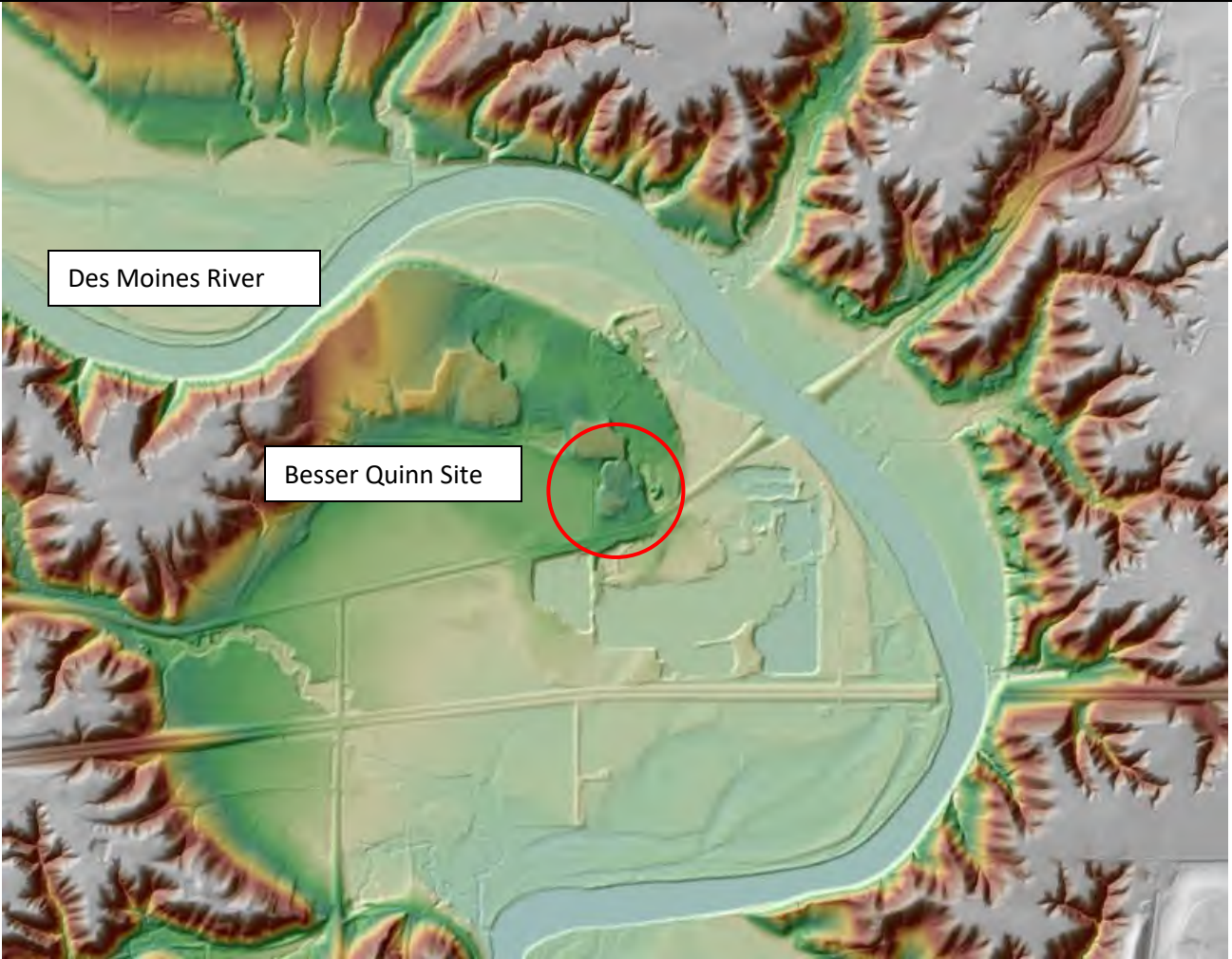


Monitoring Well Locations
 Besser-Quinn Sand Management Site
 Boone, Iowa

Figure 2
 November 2019

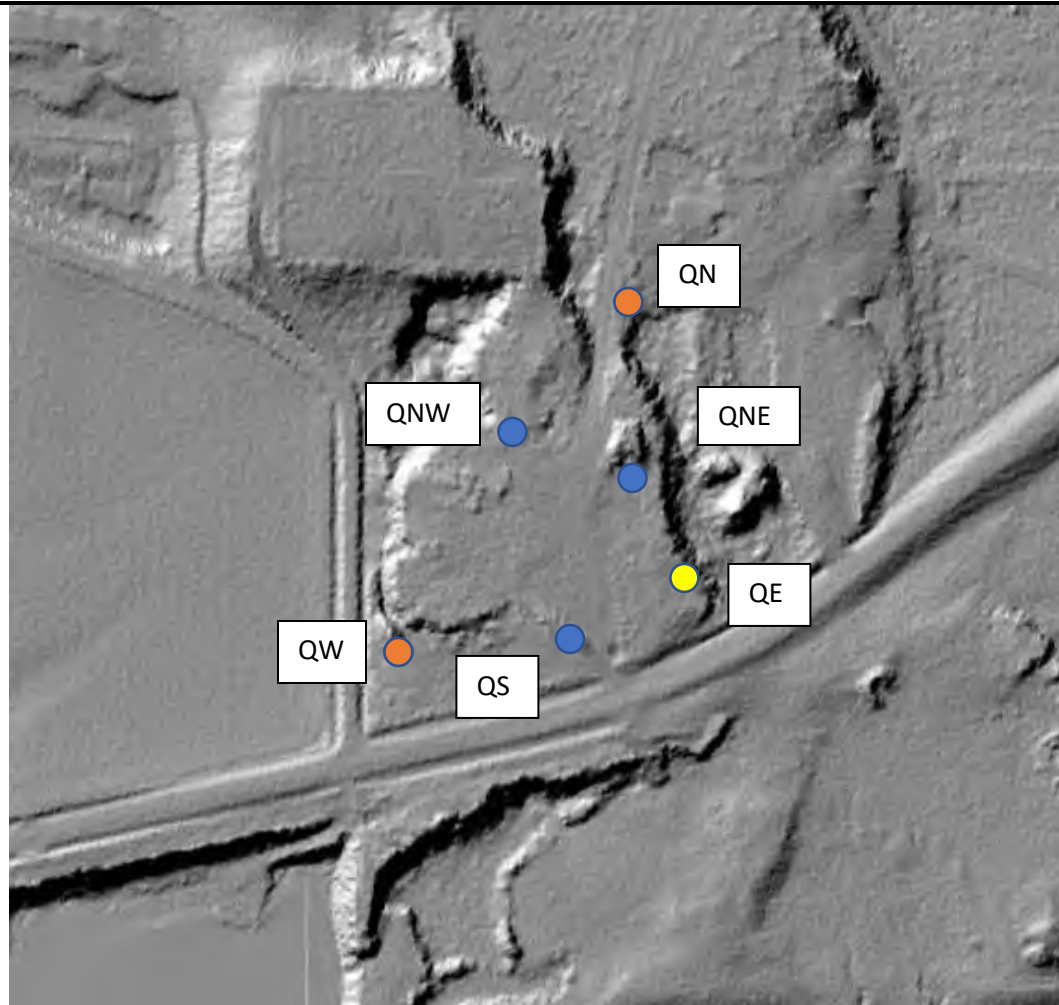
3409 NE Briarwood Drive, Ankeny, Iowa 50021 515-689-7701 dstone@stoneenviro.com

Figure showing Des Moines River migration around the Besser Quinn Site noting how the site remains geologically different from adjacent land forms



Site Location Through Lidar
Besser-Quinn Sand Management Site
Boone, Iowa

Figure 3 - Area LiDAR
July 2025



- Current Wells
- 1994 Well
 - Aug. 2019 Wells
 - Nov. 2019 Wells



Monitoring Well Locations with Lidar
 Besser-Quinn Sand Management Site
 Boone, Iowa

Figure 4 - Site LiDAR
 July 2025



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REVISION HISTORY			
NO.	DESCRIPTION	DATE	APPR.
1			

BESSER QUINN SAND MNGMT
 DNR ID: 08-BUD-08-99
STONE ENV. ENGINEERING
 1631 NW 30TH COURT
 ANKENY, IA 50023

Non-Reduced Sheet Size: 11" x 17"	
DESIGNED	DRAWN
FIELD	JAC
STONE EE	FIELD BOOK
CHECKED	CHECK DATE

SHEET TITLE
GROUNDWATER CONTOURS
 JUNE 2025

PROJECT NO.
 8298-1/25-2174

DRAWING ISSUED DATE:
 04/13/2026

SHEET

JUN-25



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 04/13/2026

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NOV-25

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 319.792.9603
 www.klingner.com

APPENDIX A

LABORATORY REPORTS



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Stone Environmental Engineering

Project Name: SEE 001

Donn Stone
1631 NW 30th Court
Ankeny, IA 50023

Project / PO Number: N/A
Received: 06/26/2025
Reported: 07/16/2025

Analytical Testing Parameters

Table with 4 columns: Client Sample ID, Sample Matrix, Lab Sample ID, Collected By, Collection Date. Values include QNE, Aqueous, 11F2031-01, Stone, D, 06/25/2025 9:44.

Determination of Carbonyl Compounds

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 8315A Formaldehyde with result <20.0.

Determination of Conventional Chemistry Parameters

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 410.4, Rv. 2 (1993) COD, total with result <54.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 420.1 Phenols, total with result <0.035.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 9020B Total Organic Halogens (TOX) with result <0.020.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for TIMBERLINE Nitrogen, Ammonia with result 0.68.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for USGS I-3765-85 Total Suspended Solids (TSS) with result 3.

Determination of Inorganic Anions

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Rows for EPA 9056A Fluoride, Chloride, and Sulfate.

Determination of Total Metals

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Multiple rows for EPA 3005A/EPA 6020A listing various metals like Antimony, Arsenic, Barium, etc.



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID:	QNE	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	06/25/2025 9:44
Lab Sample ID:	11F2031-01		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Silver, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1825	RVV
Thallium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1825	RVV
Vanadium, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1825	RVV
Zinc, total	0.0051	0.0050	mg/L		06/30/25 1437	07/02/25 1825	RVV
EPA 3010A/EPA 6010B							
Aluminum, total	<0.050	0.050	mg/L		06/30/25 1529	07/02/25 2306	JAR
Boron, total	0.662	0.100	mg/L	M1	06/30/25 1529	07/02/25 2306	JAR
Iron, total	<0.100	0.100	mg/L		06/30/25 1529	07/02/25 2306	JAR
Magnesium, total	57.3	0.100	mg/L	M6	06/30/25 1529	07/02/25 2306	JAR
EPA 7470A							
Mercury, total	<0.00050	0.00050	mg/L		06/27/25 0747	06/27/25 1503	JAR



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID:	QNW	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	06/25/2025 10:38
Lab Sample ID:	11F2031-02		

Determination of Carbonyl Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 8315A							
Formaldehyde	<20.0	20.0	ug/L		06/26/25 1006	06/27/25 1348	PDS
Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 410.4, Rv. 2 (1993)							
COD, total	58	54	mg/L		07/01/25 1459	07/01/25 1459	CES
EPA 420.1							
Phenols, total	0.035	0.035	mg/L		06/26/25 1603	06/27/25 1530	CES
EPA 9020B							
Total Organic Halogens (TOX)	0.562	0.020	mg/L	TX1, TX2	07/14/25 0000	07/15/25 1615	BDF
TIMBERLINE							
Nitrogen, Ammonia	<0.10	0.10	mg/L		07/01/25 0950	07/01/25 1214	TEP
USGS I-3765-85							
Total Suspended Solids (TSS)	60	1	mg/L		06/27/25 0730	06/27/25 1343	LAW
Determination of Inorganic Anions	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9056A							
Fluoride	<0.1	0.1	mg/L		07/10/25 0000	07/11/25 0306	BMS
Chloride	323	10.0	mg/L			07/07/25 2101	BMS
Sulfate	169	10.0	mg/L			07/07/25 2101	BMS
Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		06/30/25 1437	07/02/25 1838	RVV
Arsenic, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1838	RVV
Barium, total	0.208	0.0010	mg/L		06/30/25 1437	07/02/25 1838	RVV
Beryllium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1838	RVV
Cadmium, total	<0.0002	0.0002	mg/L		06/30/25 1437	07/02/25 1838	RVV
Chromium, total	0.0026	0.0010	mg/L		06/30/25 1437	07/02/25 1838	RVV
Cobalt, total	0.0027	0.0005	mg/L		06/30/25 1437	07/02/25 1838	RVV
Copper, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1838	RVV
Lead, total	0.0013	0.0010	mg/L		06/30/25 1437	07/02/25 1838	RVV
Manganese, total	1.53	0.0050	mg/L		06/30/25 1437	07/02/25 1838	RVV
Molybdenum, total	0.0031	0.0010	mg/L		06/30/25 1437	07/02/25 1838	RVV
Nickel, total	0.0063	0.0050	mg/L		06/30/25 1437	07/02/25 1838	RVV
Selenium, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1838	RVV
Silver, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1838	RVV
Thallium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1838	RVV
Vanadium, total	0.0022	0.0020	mg/L		06/30/25 1437	07/02/25 1838	RVV
Zinc, total	0.0096	0.0050	mg/L		06/30/25 1437	07/02/25 1838	RVV
EPA 3010A/EPA 6010B							
Aluminum, total	1.26	0.050	mg/L		06/30/25 1529	07/02/25 2342	JAR

Microbac Laboratories, Inc., Newton

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID: QNW	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 06/25/2025 10:38
Lab Sample ID: 11F2031-02	

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Boron, total	0.231	0.100	mg/L		06/30/25 1529	07/02/25 2342	JAR
Iron, total	3.77	0.100	mg/L		06/30/25 1529	07/02/25 2342	JAR
Magnesium, total	69.5	0.100	mg/L		06/30/25 1529	07/02/25 2342	JAR
EPA 7470A							
Mercury, total	<0.00050	0.00050	mg/L		06/27/25 0747	06/27/25 1506	JAR



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID:	QN	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	06/25/2025 10:55
Lab Sample ID:	11F2031-03		

Determination of Carbonyl Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
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EPA 8315A							
Formaldehyde	<20.0	20.0	ug/L		06/26/25 1006	06/27/25 1408	PDS

Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
----------------------------------------------------	--------	----	-------	------	----------	----------	---------

EPA 410.4, Rv. 2 (1993)							
COD, total	58	54	mg/L		07/01/25 1459	07/01/25 1459	CES

EPA 420.1							
Phenols, total	0.039	0.035	mg/L		06/26/25 1603	06/27/25 1530	CES

EPA 9020B							
Total Organic Halogens (TOX)	0.094	0.020	mg/L	TX1, TX2	07/14/25 0000	07/15/25 1615	BDF

TIMBERLINE							
Nitrogen, Ammonia	<0.10	0.10	mg/L		07/01/25 0950	07/01/25 1215	TEP

USGS I-3765-85							
Total Suspended Solids (TSS)	56	1	mg/L		06/27/25 0730	06/27/25 1343	LAW

Determination of Inorganic Anions	Result	RL	Units	Note	Prepared	Analyzed	Analyst
-----------------------------------	--------	----	-------	------	----------	----------	---------

EPA 9056A							
Fluoride	0.1	0.1	mg/L		07/10/25 0000	07/11/25 0325	BMS
Chloride	<1.0	1.0	mg/L		07/10/25 0000	07/11/25 0325	BMS
Sulfate	53.4	10.0	mg/L			07/07/25 2120	BMS

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
-------------------------------	--------	----	-------	------	----------	----------	---------

EPA 3005A/EPA 6020A							
Antimony, total	0.0013	0.0010	mg/L		06/30/25 1437	07/02/25 1840	RVV
Arsenic, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1840	RVV
Barium, total	0.0452	0.0010	mg/L		06/30/25 1437	07/02/25 1840	RVV
Beryllium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1840	RVV
Cadmium, total	0.0002	0.0002	mg/L		06/30/25 1437	07/02/25 1840	RVV
Chromium, total	0.0019	0.0010	mg/L		06/30/25 1437	07/02/25 1840	RVV
Cobalt, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1840	RVV
Copper, total	0.0058	0.0050	mg/L		06/30/25 1437	07/02/25 1840	RVV
Lead, total	<0.0010	0.0010	mg/L		06/30/25 1437	07/02/25 1840	RVV
Manganese, total	0.0238	0.0050	mg/L		06/30/25 1437	07/02/25 1840	RVV
Molybdenum, total	0.0148	0.0010	mg/L		06/30/25 1437	07/02/25 1840	RVV
Nickel, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1840	RVV
Selenium, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1840	RVV
Silver, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1840	RVV
Thallium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1840	RVV
Vanadium, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1840	RVV
Zinc, total	0.0063	0.0050	mg/L		06/30/25 1437	07/02/25 1840	RVV

EPA 3010A/EPA 6010B							
Aluminum, total	0.292	0.050	mg/L		06/30/25 1529	07/02/25 2349	JAR



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID:	QN	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	06/25/2025 10:55
Lab Sample ID:	11F2031-03		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Boron, total	<0.100	0.100	mg/L		06/30/25 1529	07/02/25 2349	JAR
Iron, total	0.566	0.100	mg/L		06/30/25 1529	07/02/25 2349	JAR
Magnesium, total	9.44	0.100	mg/L		06/30/25 1529	07/02/25 2349	JAR
EPA 7470A							
Mercury, total	<0.00050	0.00050	mg/L		06/27/25 0747	06/27/25 1508	JAR



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID:	QE	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	06/25/2025 11:15
Lab Sample ID:	11F2031-04		

Determination of Carbonyl Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 8315A							
Formaldehyde	<20.0	20.0	ug/L		06/26/25 1006	06/27/25 1429	PDS
Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 410.4, Rv. 2 (1993)							
COD, total	<54	54	mg/L		07/01/25 1459	07/01/25 1459	CES
EPA 420.1							
Phenols, total	<0.035	0.035	mg/L		06/26/25 1603	06/27/25 1530	CES
EPA 9020B							
Total Organic Halogens (TOX)	0.109	0.020	mg/L	TX1, TX2	07/14/25 0000	07/15/25 1615	BDF
TIMBERLINE							
Nitrogen, Ammonia	0.28	0.10	mg/L		07/01/25 0950	07/01/25 1217	TEP
USGS I-3765-85							
Total Suspended Solids (TSS)	26	1	mg/L		06/27/25 0730	06/27/25 1343	LAW
Determination of Inorganic Anions	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9056A							
Fluoride	<0.1	0.1	mg/L		07/10/25 0000	07/11/25 0344	BMS
Chloride	17.7	10.0	mg/L			07/08/25 0015	BMS
Sulfate	630	10.0	mg/L			07/08/25 0015	BMS
Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		06/30/25 1437	07/02/25 1843	RVV
Arsenic, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1843	RVV
Barium, total	0.0863	0.0010	mg/L		06/30/25 1437	07/02/25 1843	RVV
Beryllium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1843	RVV
Cadmium, total	<0.0002	0.0002	mg/L		06/30/25 1437	07/02/25 1843	RVV
Chromium, total	0.0012	0.0010	mg/L		06/30/25 1437	07/02/25 1843	RVV
Cobalt, total	0.0037	0.0005	mg/L		06/30/25 1437	07/02/25 1843	RVV
Copper, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1843	RVV
Lead, total	<0.0010	0.0010	mg/L		06/30/25 1437	07/02/25 1843	RVV
Manganese, total	0.871	0.0050	mg/L		06/30/25 1437	07/02/25 1843	RVV
Molybdenum, total	0.0019	0.0010	mg/L		06/30/25 1437	07/02/25 1843	RVV
Nickel, total	0.0155	0.0050	mg/L		06/30/25 1437	07/02/25 1843	RVV
Selenium, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1843	RVV
Silver, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1843	RVV
Thallium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1843	RVV
Vanadium, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1843	RVV
Zinc, total	0.0064	0.0050	mg/L		06/30/25 1437	07/02/25 1843	RVV
EPA 3010A/EPA 6010B							
Aluminum, total	<0.050	0.050	mg/L		06/30/25 1529	07/02/25 2355	JAR



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID:	QE	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	06/25/2025 11:15
Lab Sample ID:	11F2031-04		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Boron, total	<0.100	0.100	mg/L		06/30/25 1529	07/02/25 2355	JAR
Iron, total	2.66	0.100	mg/L		06/30/25 1529	07/02/25 2355	JAR
Magnesium, total	63.5	0.100	mg/L		06/30/25 1529	07/02/25 2355	JAR
EPA 7470A							
Mercury, total	<0.00050	0.00050	mg/L		06/27/25 0747	06/27/25 1510	JAR



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID: QS	Collection Date: 06/25/2025 11:58
Sample Matrix: Aqueous	
Lab Sample ID: 11F2031-05	

Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 410.4, Rv. 2 (1993)							
COD, total	<54	54	mg/L		07/01/25 1459	07/01/25 1459	CES
EPA 420.1							
Phenols, total	<0.035	0.035	mg/L		06/26/25 1603	06/27/25 1530	CES
EPA 9020B							
Total Organic Halogens (TOX)	0.091	0.020	mg/L	TX1, TX2	07/14/25 0000	07/15/25 1615	BDF
TIMBERLINE							
Nitrogen, Ammonia	<0.10	0.10	mg/L		07/01/25 0950	07/01/25 1218	TEP
USGS I-3765-85							
Total Suspended Solids (TSS)	55	1	mg/L		06/27/25 0730	06/27/25 1343	LAW
Determination of Inorganic Anions	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9056A							
Fluoride	<0.1	0.1	mg/L		07/10/25 0000	07/11/25 0404	BMS
Chloride	11.1	10.0	mg/L			07/08/25 0034	BMS
Sulfate	115	10.0	mg/L			07/08/25 0034	BMS
Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony, total	<0.0010	0.0010	mg/L		06/30/25 1437	07/02/25 1845	RVV
Arsenic, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1845	RVV
Barium, total	0.219	0.0010	mg/L		06/30/25 1437	07/02/25 1845	RVV
Beryllium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1845	RVV
Cadmium, total	<0.0002	0.0002	mg/L		06/30/25 1437	07/02/25 1845	RVV
Chromium, total	0.0016	0.0010	mg/L		06/30/25 1437	07/02/25 1845	RVV
Cobalt, total	0.0009	0.0005	mg/L		06/30/25 1437	07/02/25 1845	RVV
Copper, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1845	RVV
Lead, total	<0.0010	0.0010	mg/L		06/30/25 1437	07/02/25 1845	RVV
Manganese, total	0.0694	0.0050	mg/L		06/30/25 1437	07/02/25 1845	RVV
Molybdenum, total	<0.0010	0.0010	mg/L		06/30/25 1437	07/02/25 1845	RVV
Nickel, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1845	RVV
Selenium, total	0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1845	RVV
Silver, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1845	RVV
Thallium, total	<0.0005	0.0005	mg/L		06/30/25 1437	07/02/25 1845	RVV
Vanadium, total	<0.0020	0.0020	mg/L		06/30/25 1437	07/02/25 1845	RVV
Zinc, total	<0.0050	0.0050	mg/L		06/30/25 1437	07/02/25 1845	RVV
EPA 3010A/EPA 6010B							
Aluminum, total	0.143	0.050	mg/L		06/30/25 1529	07/03/25 0001	JAR
Boron, total	<0.100	0.100	mg/L		06/30/25 1529	07/03/25 0001	JAR
Iron, total	0.892	0.100	mg/L		06/30/25 1529	07/03/25 0001	JAR
Magnesium, total	43.5	0.100	mg/L		06/30/25 1529	07/03/25 0001	JAR
EPA 7470A							



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11F2031

Client Sample ID:	QS								
Sample Matrix:	Aqueous								
Lab Sample ID:	11F2031-05								
					Collection Date:	06/25/2025 11:58			

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Mercury, total	<0.00050	0.00050	mg/L		06/27/25 0747	06/27/25 1512	JAR

Definitions

- M1:** Matrix spike recovery is above acceptance limits.
- M6:** Matrix spike recovery is outside of acceptance limits. The analyte concentration is greater than 4X the spiking level.
- RL:** Reporting Limit
- TX1:** Repeated analysis of this sample consistently exceeded greater than 10% breakthrough to the second column.
- TX2:** The RPD value for the sample duplicates are outside of acceptance limits due to matrix interference. The reported value is an average of all test measurements.

Report Comments

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. **The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <<https://www.microbac.com/standard-terms-conditions>>.**

Reviewed and Approved By:

Heather Tisdale
 Customer Relationship Specialist
 heather.tisdale@microbac.com
 07/16/25 15:42



600 East 17th Street South
 Newton, IA 50208
 641-792-8451



1 I F 2 0 3 1
 Stone Environmental Engineering
 PM: Heather Tisdale

Page 1 of
 Printed: 4/24/2025 1:06:32P
 www.keystonelabs.com

SITE INFORMATION

Sampler: B. Stone
Project: SEE 001

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

LAB USE ONLY

Work Order IFF2031
 Temperature 11/2.7
 Turn-Cooler: No

Custody Seal
 Containers Intact
 COC/Labels Agree
 Preservation Confirmed
 Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-001		Aqueous	GRAB	/ /		7	831.5629-hexamethylcyclo ag-t-6020 9020-100 as-t-6020 al-t-6010 bc-t-6020 ba-t-6020 cd-t-6020 b-t-6010 ee-t-410.4 gl-9056-w fo-t-6020 coind-2510 gp-t-6020 cr-t-6020 hq-t-7470 f-9056 ir-t-6020 mn-t-6020 ms-t-6020 ni3-fimbcrfine ni-t-6020 pb-t-6020 oh-t-420.1 phenol-t-420.1 qo-t-6020 so-t-6020 rs-t-3765-85 tl-t-6020 tt-t-6020 v-t-6020	01

Handwritten: PNF

Handwritten: 25 June

Handwritten: 0944

Relinquished By *[Signature]* Date/Time 26 June 07:05
 Received By _____ Date/Time _____

Relinquished By *[Signature]* Date/Time 16 June 15:00
 Received for Lab By *[Signature]* Date/Time _____

Remarks:



600 East 17th Street South
Newton, IA 50208
641-792-8451

Stone Environmental Engineering
PM: Heather Tisdale

Printed: 4/24/2025 1:06:32P
www.keystonelabs.com

CHAIN OF CUST



1 I F 2 0 3 1

SITE INFORMATION

Sampler: _____
Project: SEE 001

REPORT TO

Donn Stone
Stone Environmental Engineering
1631 NW 30th Court
Ankeny, IA 50023

INVOICE TO

Donn Stone
Stone Environmental Engineering
1631 NW 30th Court
Ankeny, IA 50023

SPECIAL INSTRUCTIONS

None
Turn Around Time
 Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order IEF2031
Temperature 111.8.7
Turn-Cooler: No

Custody Seal
 Containers Intact
 COC/Labels Agree
 Preservation Confirmed
 Received on Ice

Number _____ Sample Identification / Client ID _____

Matrix _____

Sample Type _____

Date _____

Time _____

Number of Containers _____

Analyses _____

Lab Sample Number _____

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-002		Aqueous	GRAB	/ /		7	831.5629+normalcycle ag-t-6020 al-t-6010 aa-t-6020 ba-t-6020 bc-t-6020 bd-t-6010 cd-t-6020 el-9056-w ee-t-410.4 cf-t-6020 fg-t-6020 gh-t-6010 hg-t-7470 ih-t-6020 ii-t-6020 jj-t-6020 kk-t-420.1 ll-t-6020 mm-t-6020 nn-t-6020 oo-t-6020 pp-t-6020 qq-t-6020 rr-t-6020 ss-t-3765-85 tt-t-6020 uu-t-6020	02

PNW

2 APR 22

10:30

7

Relinquished By [Signature] Date/Time 22 Apr 2022 09:00

Relinquished By [Signature] Date/Time 4-26-25 10:00

Remarks:

Received By _____ Date/Time _____

Received for Lab By [Signature] Date/Time _____

Original - Lab Copy Yellow - Sampler Copy



600 East 17th Street South
 Newton, IA 50208
 641-792-0451

CHAIN OF CUST



1 I F 2 0 3 1

Stone Environmental Engineering
 PM: Heather Tisdale

Page 3 of
 Printed: 4/24/2025 1:06:32P
 www.keystonelabs.com

SITE INFORMATION

Sampler: _____
 Project: SEE 001

REPORT TO

Dann Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Dann Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order IFF 2031
 Temperature 1172.7
 Turn-Cooler: No

Custody Seal
 Containers Intact
 COC/Labels Agree
 Preservation Confirmed
 Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-003		Aqueous	GRAB	1/1		7	831-5691-tert-butylate 90720-100 al-t-6010 ba-t-6020 b-t-6010 cl-9056-wr cond-2510 cr-t-6020 f-9056 hg-t-7470 mm-t-6020 ni3-timberline pb-t-6020 phenol-t-420.1 sc-t-6020 tl-t-6020 v-t-6020	03

25 June
 1055

DR

Relinquished By: [Signature]
 Date/Time: 26 June 2025

Relinquished By: [Signature]
 Date/Time: 6-26-25 10:00

Received for Lab By: [Signature]
 Date/Time: 6-26-25 10:00

Remarks:



600 East 17th Street South
 Newton, IA 50208
 641-792-8451

Stone Environmental Engineering
 PM: Heather Tisdale

Page 4 of
 Printed: 4/24/2025 1:06:32P
 www.kestonelabs.com

CHAIN OF CUSTODY



1 I F 2 0 3 1

SITE INFORMATION

Sampler: _____
 Project: SEE 001

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order IEF2031
 Temperature 11/2.7
 Turn-Cooler: No

Custody Seal
 Containers Intact
 COC/Labels Agree
 Preservation Confirmed
 Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-004		Aqueous	GRAB	/ /		7	8313/6/29/turntablehyde ag-t-6020 al-t-6010 as-t-6020 ba-t-6020 bc-t-6020 b-t-6010 cd-t-6020 cl-9056-w eod-t-410.4 eod-2510 co-t-6020 cr-t-6020 ca-t-6020 f-9056 cb-t-6010 hg-t-7470 mc-t-6010 mm-t-6020 mo-t-6020 ml3-kumbarline ni-t-6020 pb-t-6020 ph-4500 phenol-t-420.1 sb-t-6020 sc-t-6020 so-4-9056-w st-t-6020 ts-1-3765-85 v-t-6020 zn-t-6020	04

Handwritten notes: 11/5, 2/25, 2/25

Handwritten initials: GP

Received By _____ Date/Time _____
 Relinquished By TSB Date/Time 2/25/20

Received for Lab By _____ Date/Time _____
 Relinquished By ADW Date/Time 6-26-25 10:00

Remarks:



600 East 17th Street South
 Newton, IA 50208
 641-792-8451



Stone Environmental Engineering
 PM: Heather Tisdale

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 www.keystonelabs.com

SITE INFORMATION

Sampler:
Project: SEE 001

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

SPECIAL INSTRUCTIONS

None
Turn Around Time
 Standard RUSH, need by ___/___/___

LAB USE ONLY

Work Order: IF2031
Temperature: 1.1/2.7
Turn-Cooler: No
 Custody Seal
 Containers Intact
 COC/Labels Agree
 Preservation Confirmed
 Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number	
-005		Aqueous	GRAB	/ /		4	8315@hivmndelhyte age-t-6020 as-t-6020 bc-t-6020 cd-t-6020 coof-t-410.4 co-t-6020 cr-t-6020 cr-t-6020 fc-t-6010 mg-t-6010 mo-t-6020 ni-t-6020 ph-4500 sh-t-6020 so-t-9056-wr tbr-1-3765-55 zn-t-6020	91020-100 al-t-6010 ba-t-6020 b-t-6010 cl-3056-wr coand-2510 cr-t-6020 f-9056 hg-t-7470 mm-t-6020 mh3-fluoride pb-t-6020 phenol-t-420.1 se-t-6020 tl-t-6020 v-t-6020	05

Relinquished By: [Signature]
 Date/Time: 24 Jan

Relinquished By: [Signature]
 Date/Time: 4-26-25 10:00

Remarks:

Received By: _____
 Date/Time: _____

Received for Lab By: [Signature]
 Date/Time: _____

Original - Lab Copy Yellow - Sampler Copy



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1IG1571

Stone Environmental Engineering

Project Name: SEE 001

Donn Stone
1631 NW 30th Court
Ankeny, IA 50023

Project / PO Number: N/A
Received: 07/14/2025
Reported: 07/24/2025

Analytical Testing Parameters

Table with 4 columns: Client Sample ID, Sample Matrix, Lab Sample ID, Collected By, and Collection Date. Values include QS- Second Sample, Aqueous, 1IG1571-01, Unknown, and 07/13/2025 13:04.

Determination of Carbonyl Compounds

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 8315A Formaldehyde with result <20.0.

Determination of Conventional Chemistry Parameters

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 410.4, Rv. 2 (1993) COD, total with result <54.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 420.1 Phenols, total with result <0.035.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for EPA 9020B Total Organic Halogens (TOX) with result 0.019.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for TIMBERLINE Nitrogen, Ammonia with result <0.10.

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Row for USGS I-3765-85 Total Suspended Solids (TSS) with result 10.

Determination of Inorganic Anions

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Rows for EPA 9056A Fluoride, Chloride, and Sulfate.

Determination of Total Metals

Table with 8 columns: Result, RL, Units, Note, Prepared, Analyzed, Analyst. Multiple rows for EPA 3005A/EPA 6020A listing various metals like Antimony, Arsenic, Barium, etc.

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1IG1571

Client Sample ID:	QS- Second Sample	Collected By:	Unknown
Sample Matrix:	Aqueous	Collection Date:	07/13/2025 13:04
Lab Sample ID:	1IG1571-01		

Determination of Total Metals	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Silver, total	<0.0050	0.0050	mg/L		07/14/25 1602	07/16/25 1758	RVV
Thallium, total	<0.0005	0.0005	mg/L		07/14/25 1602	07/16/25 1758	RVV
Vanadium, total	<0.0020	0.0020	mg/L		07/14/25 1602	07/16/25 1758	RVV
Zinc, total	<0.0050	0.0050	mg/L		07/14/25 1602	07/16/25 1758	RVV
EPA 3010A/EPA 6010B							
Aluminum, total	0.140	0.050	mg/L		07/14/25 1506	07/17/25 0035	JAR
Boron, total	0.109	0.100	mg/L		07/14/25 1506	07/17/25 0035	JAR
Iron, total	0.550	0.100	mg/L		07/14/25 1506	07/17/25 0035	JAR
Magnesium, total	48.2	0.100	mg/L		07/14/25 1506	07/17/25 0035	JAR
EPA 7470A							
Mercury, total	<0.00050	0.00050	mg/L		07/21/25 0721	07/21/25 1251	JAR

Definitions

- RL:** Reporting Limit
- TX1:** Repeated analysis of this sample consistently exceeded greater than 10% breakthrough to the second column.

Report Comments

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. **The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <<https://www.microbac.com/standard-terms-conditions>>.**

Reviewed and Approved By:

Heather Tisdale
 Customer Relationship Specialist
 heather.tisdale@microbac.com
 07/24/25 08:26



600 East 17th Street South
 Newton, IA 50208
 641-792-8451



1 I G 1 5 7 1

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 Printed: 4/24/2025 1:06:32P

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CHAIN OF CUSTODY

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

LAB USE ONLY

Work Order 1161571
 Temperature 1.0
 Turn-Cooler: No

Custody Seal
 Containers Intact
 COC/Labels Agree
 Preservation Confirmed
 Received on Ice

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-005	Q5- Second Samples	Aqueous	GRAB	1 / 1	1304	3	8315620-Formaldehyde ag-t-6020 as-t-6020 bc-t-6020 cd-t-6020 eod-t-410.4 co-t-6020 cu-t-6020 fe-t-6010 mg-t-6010 mo-t-6020 ni-t-6020 ph-t-500 sb-t-6020 so4-9056-ww tse-t-3765-85 zn-t-6020	01
							9020-100 al-t-6010 ba-t-6020 b-t-6010 cl-9056-ww eond-2510 cr-t-6020 f-9056 hg-t-7470 mn-t-6020 ni3-hmbcflne pb-t-6020 phenol-t-420.1 se-t-6020 tl-t-6020 v-t-6020	FORMALDEHYDE METALS

Relinquished By: [Signature] Date/Time: 14 Jul 2005 0700
 Received By: _____ Date/Time: _____
 Relinquished By: Saber Date/Time: 7/14/25 11:18
 Received for Lab By: _____ Date/Time: _____

Remarks:



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Stone Environmental Engineering

Project Name: SEE 001

Donn Stone
1631 NW 30th Court
Ankeny, IA 50023

Project / PO Number: N/A
Received: 11/05/2025
Reported: 11/25/2025

Analytical Testing Parameters

Table with client sample details: Client Sample ID: MW QN, Sample Matrix: Aqueous, Lab Sample ID: 11K0383-01, Collected By: Stone, D, Collection Date: 11/04/2025 11:10

Main analytical results table with columns: Inorganics Total, Metals Total by AA, Determination of Carbonyl Compounds, Metals Total by ICP, Metals Total by ICPMS. Rows include EPA 410.4, EPA 420.1, USGS I-3765-85, EPA 7470A, EPA 8315A, EPA 3010A/EPA 6010B, and EPA 3005A/EPA 6020A.



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID:	MW QN	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	11/04/2025 11:10
Lab Sample ID:	11K0383-01		

Metals Total by ICPMS	Result	RL	Units	Note	Prepared	Analyzed	Analyst
Silver	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2031	RVV
Thallium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2031	RVV
Vanadium	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2031	RVV
Zinc	0.0088	0.0050	mg/L		11/12/25 1512	11/13/25 1824	RVV

Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
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EPA 9020B

Total Organic Halogens (TOX)	<0.010	0.010	mg/L		11/18/25 0000	11/24/25 1646	CSM
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TIMBERLINE

Nitrogen, Ammonia	0.13	0.10	mg/L		11/06/25 1033	11/06/25 1147	BHF
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Anions by IC	Result	RL	Units	Note	Prepared	Analyzed	Analyst
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EPA 9056A

Fluoride	0.1	0.1	mg/L			11/07/25 0544	BMS
Chloride	25.5	1.0	mg/L			11/07/25 0544	BMS
Sulfate	360	20.0	mg/L			11/06/25 2240	BMS



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID: MW QNW	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 11/04/2025 11:41
Lab Sample ID: 11K0383-02	

Inorganics Total	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 410.4, Rv. 2 (1993)							
COD, total	55	54	mg/L		11/14/25 0820	11/17/25 0842	KAC
EPA 420.1							
Phenols, total	<0.035	0.035	mg/L		11/06/25 0719	11/07/25 1358	RDH
USGS I-3765-85							
Total Suspended Solids (TSS)	118	1	mg/L		11/05/25 1530	11/07/25 1201	CJF
Metals Total by AA	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 7470A							
Mercury	<0.00050	0.00050	mg/L		11/05/25 1541	11/06/25 1601	JAR
Determination of Carbonyl Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 8315A							
Formaldehyde	<20.0	20.0	ug/L		11/06/25 1526	11/07/25 1720	PDS
Metals Total by ICP	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3010A/EPA 6010B							
Aluminum	0.181	0.050	mg/L		11/05/25 1533	11/06/25 2145	JAR
Boron	0.187	0.100	mg/L		11/05/25 1533	11/06/25 2145	JAR
Iron	1.63	0.100	mg/L		11/05/25 1533	11/06/25 2145	JAR
Magnesium	49.8	0.100	mg/L		11/05/25 1533	11/06/25 2145	JAR
Metals Total by ICPMS	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	0.0011	0.0010	mg/L		11/06/25 1541	11/07/25 2046	RVV
Arsenic	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2046	RVV
Barium	0.196	0.0010	mg/L		11/06/25 1541	11/07/25 2046	RVV
Beryllium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2046	RVV
Cadmium	<0.0002	0.0002	mg/L		11/06/25 1541	11/07/25 2046	RVV
Chromium	0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2046	RVV
Cobalt	0.0015	0.0005	mg/L		11/06/25 1541	11/07/25 2046	RVV
Copper	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2046	RVV
Lead	<0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2046	RVV
Manganese	0.216	0.0050	mg/L		11/06/25 1541	11/07/25 2046	RVV
Molybdenum	0.0021	0.0010	mg/L		11/06/25 1541	11/07/25 2046	RVV
Nickel	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2046	RVV
Selenium	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2046	RVV
Silver	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2046	RVV
Thallium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2046	RVV
Vanadium	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2046	RVV
Zinc	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2046	RVV
Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst

Microbac Laboratories, Inc., Newton

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID: MW QNW	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 11/04/2025 11:41
Lab Sample ID: 11K0383-02	

Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9020B							
Total Organic Halogens (TOX)	0.020	0.010	mg/L		11/18/25 0000	11/24/25 1646	CSM
TIMBERLINE							
Nitrogen, Ammonia	<0.10	0.10	mg/L		11/06/25 1033	11/06/25 1149	BHF
Anions by IC							
EPA 9056A							
Fluoride	0.1	0.1	mg/L			11/07/25 0607	BMS
Chloride	303	10.0	mg/L			11/06/25 2302	BMS
Sulfate	117	10.0	mg/L			11/06/25 2302	BMS



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID: MW OZ	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 11/04/2025 12:42
Lab Sample ID: 11K0383-03	

Inorganics Total	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 410.4, Rv. 2 (1993)							
COD, total	<54	54	mg/L		11/14/25 0820	11/17/25 0842	KAC
EPA 420.1							
Phenols, total	<0.035	0.035	mg/L		11/10/25 0941	11/12/25 1226	RDH
USGS I-3765-85							
Total Suspended Solids (TSS)	48	1	mg/L		11/05/25 1530	11/07/25 1201	CJF
Metals Total by AA	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 7470A							
Mercury	<0.00050	0.00050	mg/L		11/05/25 1541	11/06/25 1604	JAR
Determination of Carbonyl Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 8315A							
Formaldehyde	<20.0	20.0	ug/L		11/06/25 1526	11/07/25 1741	PDS
Metals Total by ICP	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3010A/EPA 6010B							
Aluminum	0.098	0.050	mg/L		11/05/25 1533	11/06/25 2151	JAR
Boron	<0.100	0.100	mg/L		11/05/25 1533	11/06/25 2151	JAR
Iron	5.51	0.100	mg/L		11/05/25 1533	11/06/25 2151	JAR
Magnesium	86.2	0.100	mg/L		11/05/25 1533	11/06/25 2151	JAR
Metals Total by ICPMS	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	<0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2049	RVV
Arsenic	0.0041	0.0020	mg/L		11/06/25 1541	11/07/25 2049	RVV
Barium	0.176	0.0010	mg/L		11/06/25 1541	11/07/25 2049	RVV
Beryllium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2049	RVV
Cadmium	<0.0002	0.0002	mg/L		11/06/25 1541	11/07/25 2049	RVV
Chromium	<0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2049	RVV
Cobalt	0.0099	0.0005	mg/L		11/06/25 1541	11/07/25 2049	RVV
Copper	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2049	RVV
Lead	<0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2049	RVV
Manganese	1.64	0.0050	mg/L		11/06/25 1541	11/07/25 2049	RVV
Molybdenum	0.0018	0.0010	mg/L		11/06/25 1541	11/07/25 2049	RVV
Nickel	0.0159	0.0050	mg/L		11/06/25 1541	11/07/25 2049	RVV
Selenium	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2049	RVV
Silver	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2049	RVV
Thallium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2049	RVV
Vanadium	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2049	RVV
Zinc	0.0074	0.0050	mg/L		11/12/25 1512	11/13/25 1839	RVV
Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst

Microbac Laboratories, Inc., Newton

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID: MW OZ	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 11/04/2025 12:42
Lab Sample ID: 11K0383-03	

Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9020B							
Total Organic Halogens (TOX)	<0.010	0.010	mg/L		11/18/25 0000	11/24/25 1646	CSM
TIMBERLINE							
Nitrogen, Ammonia	0.41	0.10	mg/L		11/06/25 1033	11/06/25 1153	BHF
Anions by IC	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9056A							
Fluoride	0.1	0.1	mg/L			11/07/25 0629	BMS
Chloride	18.7	1.0	mg/L			11/07/25 0629	BMS
Sulfate	637	10.0	mg/L			11/06/25 2325	BMS



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID: MW QNE	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 11/04/2025 12:11
Lab Sample ID: 11K0383-04	

Inorganics Total	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 410.4, Rv. 2 (1993)							
COD, total	<54	54	mg/L		11/13/25 0815	11/13/25 1246	KAC
EPA 420.1							
Phenols, total	<0.035	0.035	mg/L		11/10/25 0941	11/12/25 1226	RDH
USGS I-3765-85							
Total Suspended Solids (TSS)	2	1	mg/L		11/05/25 1530	11/07/25 1201	CJF
Metals Total by AA	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 7470A							
Mercury	<0.00050	0.00050	mg/L		11/05/25 1541	11/06/25 1606	JAR
Determination of Carbonyl Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 8315A							
Formaldehyde	<20.0	20.0	ug/L		11/06/25 1526	11/07/25 1801	PDS
Metals Total by ICP	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3010A/EPA 6010B							
Aluminum	0.051	0.050	mg/L		11/05/25 1533	11/06/25 2200	JAR
Boron	0.594	0.100	mg/L		11/05/25 1533	11/06/25 2200	JAR
Iron	<0.100	0.100	mg/L		11/05/25 1533	11/06/25 2200	JAR
Magnesium	54.0	0.100	mg/L		11/05/25 1533	11/06/25 2200	JAR
Metals Total by ICPMS	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2051	RVV
Arsenic	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2051	RVV
Barium	0.103	0.0010	mg/L		11/06/25 1541	11/07/25 2051	RVV
Beryllium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2051	RVV
Cadmium	<0.0002	0.0002	mg/L		11/06/25 1541	11/07/25 2051	RVV
Chromium	<0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2051	RVV
Cobalt	0.0007	0.0005	mg/L		11/06/25 1541	11/07/25 2051	RVV
Copper	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2051	RVV
Lead	<0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2051	RVV
Manganese	0.279	0.0050	mg/L		11/06/25 1541	11/07/25 2051	RVV
Molybdenum	0.0099	0.0010	mg/L		11/06/25 1541	11/07/25 2051	RVV
Nickel	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2051	RVV
Selenium	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2051	RVV
Silver	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2051	RVV
Thallium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2051	RVV
Vanadium	<0.0020	0.0020	mg/L		11/06/25 1541	11/07/25 2051	RVV
Zinc	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2051	RVV
Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst

Microbac Laboratories, Inc., Newton

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID: MW QNE	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 11/04/2025 12:11
Lab Sample ID: 11K0383-04	

Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9020B							
Total Organic Halogens (TOX)	<0.010	0.010	mg/L		11/18/25 0000	11/24/25 1646	CSM
TIMBERLINE							
Nitrogen, Ammonia	1.64	0.10	mg/L		11/06/25 1033	11/06/25 1155	BHF
Anions by IC	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9056A							
Fluoride	0.1	0.1	mg/L			11/07/25 0652	BMS
Chloride	5.4	1.0	mg/L			11/07/25 0652	BMS
Sulfate	222	10.0	mg/L			11/06/25 2347	BMS



Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID: MW QS	Collected By: Stone, D
Sample Matrix: Aqueous	Collection Date: 11/04/2025 13:01
Lab Sample ID: 11K0383-05	

Inorganics Total	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 410.4, Rv. 2 (1993)							
COD, total	<54	54	mg/L		11/13/25 0815	11/13/25 1246	KAC
EPA 420.1							
Phenols, total	<0.035	0.035	mg/L		11/10/25 0941	11/12/25 1226	RDH
USGS I-3765-85							
Total Suspended Solids (TSS)	190	1	mg/L		11/05/25 1530	11/07/25 1201	CJF
Metals Total by AA	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 7470A							
Mercury	<0.00050	0.00050	mg/L		11/05/25 1541	11/06/25 1608	JAR
Determination of Carbonyl Compounds	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 8315A							
Formaldehyde	<20.0	20.0	ug/L		11/06/25 1526	11/07/25 1822	PDS
Metals Total by ICP	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3010A/EPA 6010B							
Aluminum	2.35	0.050	mg/L		11/05/25 1533	11/06/25 2220	JAR
Boron	0.112	0.100	mg/L		11/05/25 1533	11/06/25 2220	JAR
Iron	13.7	0.100	mg/L		11/05/25 1533	11/06/25 2220	JAR
Magnesium	46.5	0.100	mg/L		11/05/25 1533	11/06/25 2220	JAR
Metals Total by ICPMS	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A							
Antimony	0.0014	0.0010	mg/L		11/06/25 1541	11/07/25 2054	RVV
Arsenic	0.0090	0.0020	mg/L		11/06/25 1541	11/07/25 2054	RVV
Barium	0.395	0.0010	mg/L		11/06/25 1541	11/07/25 2054	RVV
Beryllium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2054	RVV
Cadmium	0.0002	0.0002	mg/L		11/06/25 1541	11/07/25 2054	RVV
Chromium	0.0066	0.0010	mg/L		11/06/25 1541	11/07/25 2054	RVV
Cobalt	0.0107	0.0005	mg/L		11/06/25 1541	11/07/25 2054	RVV
Copper	0.0131	0.0050	mg/L		11/06/25 1541	11/07/25 2054	RVV
Lead	0.0067	0.0010	mg/L		11/06/25 1541	11/07/25 2054	RVV
Manganese	0.754	0.0050	mg/L		11/06/25 1541	11/07/25 2054	RVV
Molybdenum	<0.0010	0.0010	mg/L		11/06/25 1541	11/07/25 2054	RVV
Nickel	0.0151	0.0050	mg/L		11/06/25 1541	11/07/25 2054	RVV
Selenium	0.0023	0.0020	mg/L		11/06/25 1541	11/07/25 2054	RVV
Silver	<0.0050	0.0050	mg/L		11/06/25 1541	11/07/25 2054	RVV
Thallium	<0.0005	0.0005	mg/L		11/06/25 1541	11/07/25 2054	RVV
Vanadium	0.0130	0.0020	mg/L		11/06/25 1541	11/07/25 2054	RVV
Zinc	0.0293	0.0050	mg/L		11/12/25 1512	11/13/25 1841	RVV
Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst

Microbac Laboratories, Inc., Newton

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

11K0383

Client Sample ID:	MW QS	Collected By:	Stone, D
Sample Matrix:	Aqueous	Collection Date:	11/04/2025 13:01
Lab Sample ID:	11K0383-05		

Determination of Conventional Chemistry Parameters	Result	RL	Units	Note	Prepared	Analyzed	Analyst
EPA 9020B							
Total Organic Halogens (TOX)	0.034	0.010	mg/L		11/18/25 0000	11/24/25 1646	CSM
TIMBERLINE							
Nitrogen, Ammonia	<0.10	0.10	mg/L		11/06/25 1033	11/06/25 1156	BHF
Anions by IC							
EPA 9056A							
Fluoride	<0.1	0.1	mg/L			11/07/25 0714	BMS
Chloride	10.0	1.0	mg/L			11/07/25 0714	BMS
Sulfate	96.9	20.0	mg/L			11/07/25 0009	BMS

Definitions

RL: Reporting Limit

Report Comments

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <<https://www.microbac.com/standard-terms-conditions>>.

Reviewed and Approved By:

Heather Tisdale
Customer Relationship Specialist
heather.tisdale@microbac.com
11/25/25 12:10

CHAIN OF CUSTODY RECORD



600 East 17th Street South
 Newton, IA 50208
 Phone: 641-792-8451

Page 1 of 7
 Printed: 6/6/2025 12:24:46PM

SITE INFORMATION

Sampler: D. Stone
Project: SEE 001

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

LAB USE ONLY
 1 I K 0 3 8 3
 Stone Environmental Engineering
 PM: Heather Tisdale

Temperature: 60.5 / 8.3 °C

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	# Containers	Analyses	Lab Sample Number
01-001	MW QN	Aqueous	GRAB	4 NOV 25	11:10	7	f-9056 cond-2510 b-t-6010 hg-t-7470 cod-t-410.4 ph-4500 as-t-6020 be-t-6020 co-t-6020 cu-t-6020 pb-t-6020 se-t-6020 v-t-6020 mn-t-6020 so4-9056-w 9020-100 mg-t-6010 cl-9056-w phenol-t-420.1 fe-t-6010 nh3-timberline 8315@Formaldehyde ag-t-6020 ba-t-6020 cd-t-6020 cr-t-6020 ni-t-6020 sb-t-6020 tl-t-6020 zn-t-6020 mo-t-6020 al-t-6010 tss-i-3765-85	01

Relinquished By: [Signature]
 Date/Time: 5 Nov 0700

Relinquished By: [Signature]
 Date/Time: 11-5-25 11:00

Received By: _____ Date/Time: _____
 Received for Lab By: _____ Date/Time: _____
 Remarks: _____



600 East 17th Street South
Newton, IA 50208
Phone: 641-792-8451

Page 2 of 7
Printed: 6/6/2025 12:24:46PM

CHAIN OF CUSTODY RECORD

SITE INFORMATION

Sampler: D. STORKE
Project: SEE 001

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

REPORT TO

Donn Stone
Stone Environmental Engineering
1631 NW 30th Court
Ankeny, IA 50023

INVOICE TO

Donn Stone
Stone Environmental Engineering
1631 NW 30th Court
Ankeny, IA 50023

LAB USE ONLY



1 I K 0 3 8 3

Stone Environmental Engineering
PM: Heather Tisdale

Temperature: 6.5 / 8.3 °C

Number 01-002 Sample Identification / Client ID MW QNW

Matrix Aqueous

Sample Type GRAB

Date 4 NOV 25

Time 11:41

Containers 7

F-9056
cond-2510
b-t-6010
hg-t-7470
cod-t-410.4
ph-4500
as-t-6020
be-t-6020
co-t-6020
cu-t-6020
pb-t-6020
se-t-6020
v-t-6020
mn-t-6020
so4-9056-w
9020-100
mg-t-6010

Analyses
cl-9056-w
phenol-t-420.1
fe-t-6010
nh3-timberline
8315@Formaldehyde
ag-t-6020
ba-t-6020
cd-t-6020
cr-t-6020
ni-t-6020
sb-t-6020
tl-t-6020
zn-t-6020
mo-t-6020
al-t-6010
tss-i-3765-85

Lab Sample Number 02

Relinquished By D. Storke

Date/Time 5 NOV 25 0700

Relinquished By Heather Tisdale

Date/Time 11-5-25 11:00

Remarks:

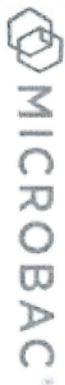
Received By

Date/Time

Received for Lab By

Date/Time

CHAIN OF CUSTODY RECORD



600 East 17th Street South
 Newton, IA 50208
 Phone: 641-792-8451

Page 3 of 7
 Printed: 6/6/2025 12:24:46PM

SITE INFORMATION

Sampler: Down Stone
 Project: SEE 001

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

LAB USE ONLY

Barcode: 1 I K 0 3 8 3
 Stone Environmental Engineering
 PM: Heather Tisdale

Temperature: 6.5 / 8.3 °C

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	# Containers	Analyses	Lab Sample Number	
01-003	<u>NW Q5</u>	Aqueous	GRAB	<u>4 Nov 25</u>	<u>12:42</u>	<u>7</u>	F-9056 cond-2510 b-t-6010 hg-t-7470 cod-t-410.4 ph-4500 as-t-6020 hc-t-6020 co-t-6020 cu-t-6020 pb-t-6020 se-t-6020 v-t-6020 mn-t-6020 so4-9056-w 9020-100 mg-t-6010	cl-9056-w phenol-t-420.1 fe-t-6010 nh3-timberline 8315@Formaldehyde ag-t-6020 ha-t-6020 cd-t-6020 cr-t-6020 ni-t-6020 sb-t-6020 tl-t-6020 zn-t-6020 mo-t-6020 al-t-6010 tss-i-3765-85	<u>03</u>
Relinquished By: <u>[Signature]</u> Date/Time: <u>07:50</u> Relinquished By: <u>[Signature]</u> Date/Time: <u>11-5-25 11:00</u>									
Received By: _____ Date/Time: _____ Received for Lab By: _____ Date/Time: _____									
Remarks: _____									

CHAIN OF CUSTODY RECORD



600 East 17th Street South
 Newton, IA 50208
 Phone: 641-792-8451

Page 4 of 7
 Printed: 6/6/2025 12:24:46PM

SITE INFORMATION

Sampler: D. Stone
 Project: SEE 001

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

LAB USE ONLY

Barcode: 1 I K 0 3 8 3
 Stone Environmental Engineering
 PM: Heather Tisdale

Temperature: 6.5 / 8.3 °C

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	# Containers	Analyses	Lab Sample Number	
01-004	<u>NW 015</u>	Aqueous	GRAB	<u>4 Nov 25</u>	<u>12:11</u>	<u>7</u>	f-9056 cond-2510 b-t-6010 hg-t-7470 cod-t-410.4 ph-4500 as-t-6020 be-t-6020 co-t-6020 cu-t-6020 pb-t-6020 se-t-6020 v-t-6020 mn-t-6020 so4-9056-w 9020-100 mg-t-6010	cl-9056-w phenol-t-420.1 fe-t-6010 nh3-timberline 8315@Formaldehyde ag-t-6020 ba-t-6020 cd-t-6020 cr-t-6020 ni-t-6020 sb-t-6020 tl-t-6020 zn-t-6020 mo-t-6020 al-t-6010 tss-i-3765-85	<u>04</u>

Relinquished By _____ Date/Time _____

Relinquished By Heather Tisdale Date/Time 11-25-25 11:00

Remarks:

Received By _____ Date/Time _____

Received for Lab By _____ Date/Time _____

CHAIN OF CUSTODY RECORD



600 East 17th Street South
 Newton, IA 50208
 Phone: 641-792-8451

Page 5 of 7
 Printed: 6/6/2025 12:24:46PM

SITE INFORMATION

Sampler: D. Stone
 Project: SEE 001

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

SPECIAL INSTRUCTIONS

None
 Turn Around Time
 Standard RUSH, need by ___/___/___

LAB USE ONLY

Barcode: 1 I K 0 3 8 3
 Stone Environmental Engineering
 PM: Heather Tisdale

Temperature: 65/8.3 °C

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	# Containers	Analyses	Lab Sample Number	
01-005	<u>NW 05</u>	Aqueous	GRAB	<u>4 Nov 25</u>	<u>1301</u>	<u>7</u>	f-9056 cond-2510 b-t-6010 hg-t-7470 cod-t-410.4 ph-4500 as-t-6020 be-t-6020 co-t-6020 cu-t-6020 pb-t-6020 se-t-6020 v-t-6020 mn-t-6020 so4-9056-w 9020-100 mg-t-6010	cl-9056-w phenol-t-420.1 fe-t-6010 nh3-timberline 8315@Formaldehyde ag-t-6020 ba-t-6020 cd-t-6020 cr-t-6020 ni-t-6020 sb-t-6020 tl-t-6020 zn-t-6020 mo-t-6020 al-t-6010 tss-i-3765-85	<u>05</u>

Received By _____ Date/Time _____
 Relinquished By [Signature] Date/Time 5 Nov 0760

Received for Lab By [Signature] Date/Time 11-5-25 11:00

Remarks: _____



600 East 17th Street South
Newton, IA 50208
Phone: 641-792-8451

CHAIN OF CUSTODY RECORD

SITE INFORMATION

Sampler:
Project: SEE 001

SPECIAL INSTRUCTIONS

None
Turn Around Time
 Standard RUSH, need by ___/___/___

REPORT TO

Donn Stone
Stone Environmental Engineering
1631 NW 30th Court
Ankeny, IA 50023

INVOICE TO

Donn Stone
Stone Environmental Engineering
1631 NW 30th Court
Ankeny, IA 50023

LAB USE ONLY



1 I K 0 3 8 3
Stone Environmental Engineering
PM: Heather Tisdale

Temperature: 6.5/8.3
OC

Number 01-006 Sample Identification / Client ID MW QW

Matrix Aqueous Sample Type GRAB

Date

Time

Containers

Analyses

ci-9056-w
phenol-t-420.1
fe-t-6010
nh3-timberline
8315@Formaldehyde
ag-t-6020
ba-t-6020
cd-t-6020
cr-t-6020
ni-t-6020
sb-t-6020
tl-t-6020
zn-t-6020
mo-t-6020
al-t-6010
tss-i-3765-85

Lab Sample Number

DRY - NO SAMPLES

EE:BF
DTG

Relinquished By _____ Date/Time _____

Relinquished By _____ Date/Time _____

Relinquished By _____ Date/Time _____

Remarks:

Received By _____ Date/Time _____

Received for Lab By Definable Date/Time _____

Received for Lab By _____ Date/Time _____

Remarks:

CHAIN OF CUSTODY RECORD



600 East 17th Street South
 Newton, IA 50208
 Phone: 641-792-8451

Page 7 of 7
 Printed: 6/6/2025 12:24:46PM

SITE INFORMATION

Sampler:
 Project: SEE 001

SPECIAL INSTRUCTIONS
 None
 Turn Around Time
 Standard RUSH, need by ___/___/___

REPORT TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

INVOICE TO

Donn Stone
 Stone Environmental Engineering
 1631 NW 30th Court
 Ankeny, IA 50023

LAB USE ONLY

1 I K 0 3 8 3
 Stone Environmental Engineering
 PM: Heather Tisdale

Temperature: 6.5 / 8.3 °C

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	# Containers	Analyses	Lab Sample Number

Relinquished By _____ Date/Time _____

Relinquished By Patricia Date/Time 11-5-25 11:00

Received By _____ Date/Time _____

Received for Lab By _____ Date/Time _____

Remarks:

APPENDIX B

FIELD SAMPLING FORMS



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QNE Weather: overcast, misty 68

Date: 25 June 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 922.47 Ground Surface Elevation (ft. MSL): 919.14

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			31.41
Water Elevation (ft. MSL):			887.73

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

							Final Reading
Date/Time	25 June						
Depth to Water (ft)	31.41						
Volume Purged ()							
Temp (°C)	66						
Sp. Cond (umhos/cm)	1200						
pH	6.8						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QNW Weather: overcast, misty 68

Date: 25 June 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 925.05 Ground Surface Elevation (ft. MSL): 922.01

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			46.68
Water Elevation (ft. MSL):			875.33

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time	25 June						
Depth to Water (ft)	46.68						
Volume Purged ()							
Temp (°C)	65						
Sp. Cond (umhos/cm)	2060						
pH	7.0						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99
 Well/Piezometer: MW QN Weather: overcast , misty 68
 Date: 25 June 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 26'
 Casing Diameter (in): 2 Casing Material: 2' PVC
 Top of Casing Elevation (ft. MSL): 912.42 Ground Surface Elevation (ft. MSL): 909.82

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			10.28
Water Elevation (ft. MSL):			899.54

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time	25 June						
Depth to Water (ft)	10.28						
Volume Purged ()							
Temp (°C)	67						
Sp. Cond (umhos/cm)	484						
pH	6.8						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QS Weather: overcast, misty 68

Date: 25 June 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 919.31 Ground Surface Elevation (ft. MSL): 916.18

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			41.73
Water Elevation (ft. MSL):			874.45

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time	25 June						
Depth to Water (ft)	41.73						
Volume Purged ()							
Temp (°C)	65						
Sp. Cond (umhos/cm)	1280						
pH	7.1						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QE Weather: overcast , misty 68

Date: 25 June 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 24'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 918.48 Ground Surface Elevation (ft. MSL): 915.76

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			35.12
Water Elevation (ft. MSL):			880.64

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time	25 June						
Depth to Water (ft)	35.12						
Volume Purged ()							
Temp (°C)	64						
Sp. Cond (umhos/cm)	2250						
pH	6.7						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QW Weather: overcast, misty 68

Date: 25 June 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 915.24 Ground Surface Elevation (ft. MSL): 912.19

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			Dry
Water Elevation (ft. MSL):			Dry

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

							Final Reading
Date/Time	25 June						
Depth to Water (ft)	Dry						
Volume Purged ()							
Temp (°C)							
Sp. Cond (umhos/cm)							
pH							
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QS Weather: Clear 25

Date: 13 July 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 919.13 Ground Surface Elevation (ft. MSL): 916.18

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			41.59
Water Elevation (ft. MSL):			874.59

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

								Final Reading
Date/Time	13 July							
Depth to Water (ft)	41.59							
Volume Purged ()								
Temp (°C)	64							
Sp. Cond (umhos/cm)	1090							
pH	7.2							
DO (mg/l)								
ORP (mV)								
Turbidity (NTU)								

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QN Weather: overcast 36

Date: 4 nov 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 26'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 912.42 Ground Surface Elevation (ft. MSL): 909.83

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			12.21
Water Elevation (ft. MSL):			897.61

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

							Final Reading
Date/Time	4 nov						
Depth to Water (ft)	12.21						
Volume Purged ()							
Temp (°C)	60						
Sp. Cond (umhos/cm)	1430						
pH	6.6						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QNW Weather: overcast - 36

Date: 4 November 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 925.05 Ground Surface Elevation (ft. MSL): 922.01

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			46.37
Water Elevation (ft. MSL):			875.64

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

							Final Reading
Date/Time	4 nov						
Depth to Water (ft)	46.37						
Volume Purged ()							
Temp (°C)	62						
Sp. Cond (umhos/cm)	1920						
pH	6.7						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QNE Weather: overcast - 36

Date: 4 November 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 922.47 Ground Surface Elevation (ft. MSL): 919.14

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			30.53
Water Elevation (ft. MSL):			888.61

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

							Final Reading
Date/Time	4 nov						
Depth to Water (ft)	30.53						
Volume Purged ()							
Temp (°C)	64						
Sp. Cond (umhos/cm)	1180						
pH	7.1						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QE Weather: overcast - 36

Date: 4 November 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 24'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 918.48 Ground Surface Elevation (ft. MSL): 915.76

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			34.64
Water Elevation (ft. MSL):			881.12

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

							Final Reading
Date/Time	4 nov						
Depth to Water (ft)	34.64						
Volume Purged ()							
Temp (°C)	60						
Sp. Cond (umhos/cm)	2670						
pH	6.7						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QS Weather: overcast 36

Date: 4 nov 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 919.13 Ground Surface Elevation (ft. MSL): 916.18

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			41.43
Water Elevation (ft. MSL):			874.75

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time	4 nov						
Depth to Water (ft)	41.43						
Volume Purged ()							
Temp (°C)	60						
Sp. Cond (umhos/cm)	1090						
pH	6.9						
DO (mg/l)							
ORP (mV)							
Turbidity (NTU)							

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____



Groundwater Sampling Field Sheet

Disposal Site Name: Besser Quinn Permit No.: #08-BUD-08-99

Well/Piezometer: MW QW Weather: overcast - 36

Date: 4 November 2025 Sampler Name: Donn Stone

Monitoring Well Details

Construction Data

Borehole Diameter (in): 6 Depth to Top of Screen (ft): 18'

Casing Diameter (in): 2 Casing Material: 2' PVC

Top of Casing Elevation (ft. MSL): 915.24 Ground Surface Elevation (ft. MSL): 912.19

Field Observations

Locked: Yes No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):			Dry
Water Elevation (ft. MSL):			Dry

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) Yes No

	Start	End
Purge Date/Time		

Well Conditions Commentary: _____

Sampling Equipment (check one)

Pump Interval Sampler
 Bailer Other (specify): _____

Equipment Name & Description: _____

Pump Types (check one)

Submersible Peristaltic Bladder Inertial Lift Pump Other (specify): _____

Method (check one)

Low Flow No Purge Purge

Options (check one)

Dedicated Disposable Portable

Decontamination Method: _____

Field Analysis

Final Reading

Date/Time	4 nov							
Depth to Water (ft)	Dry							
Volume Purged ()								
Temp (°C)								
Sp. Cond (umhos/cm)								
pH								
DO (mg/l)								
ORP (mV)								
Turbidity (NTU)								

Equipment Depth: _____ Flow Rate: _____ Volume Removed: _____ Volume Sampled: _____

Odor? Yes No Color? Yes No

Comments: _____

APPENDIX C

WATER LEVEL DATA

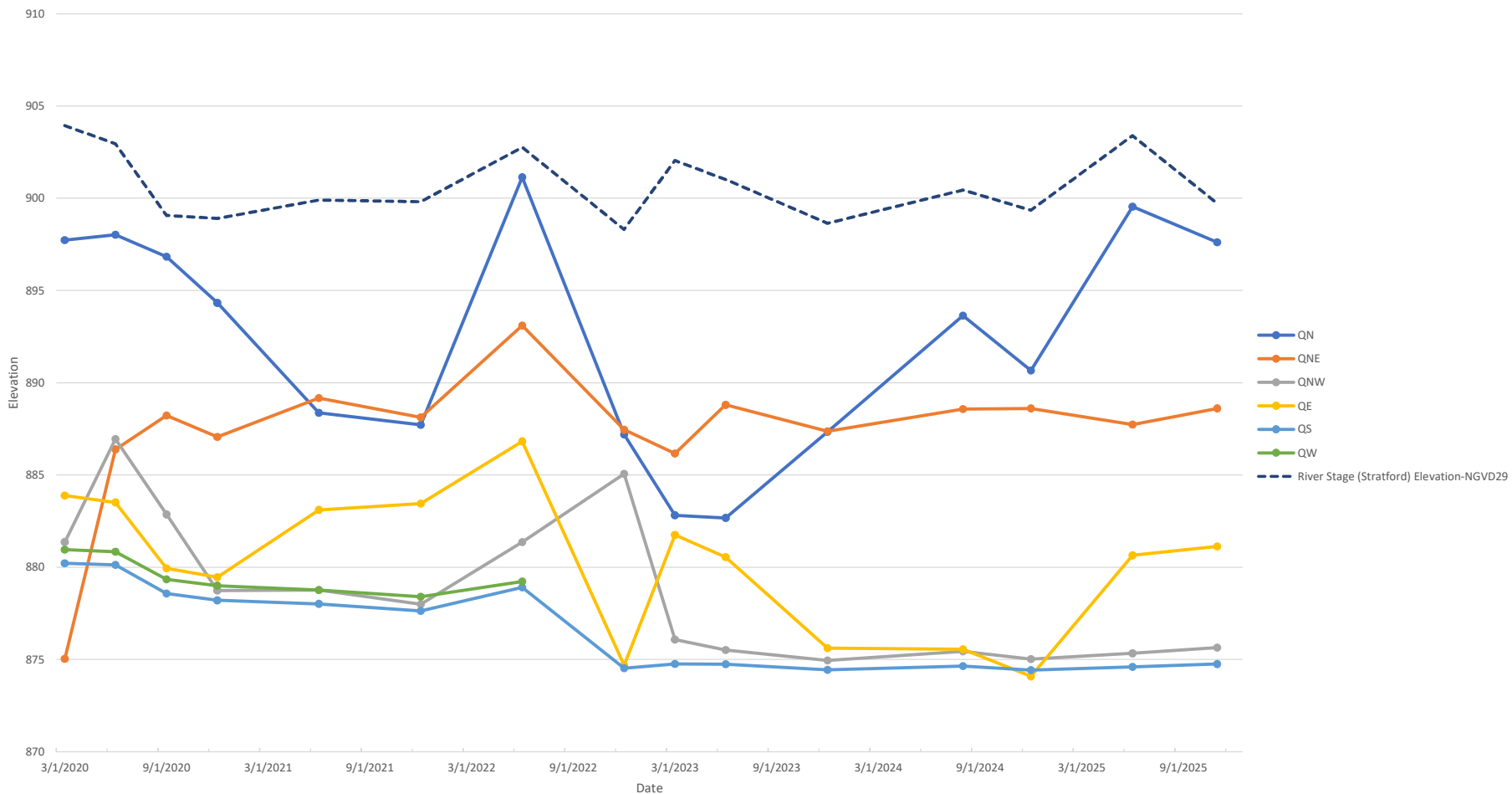
**Historic Groundwater Levels
Besser Quinn Sand Management Site
DNR ID #08-BUD-08-99**

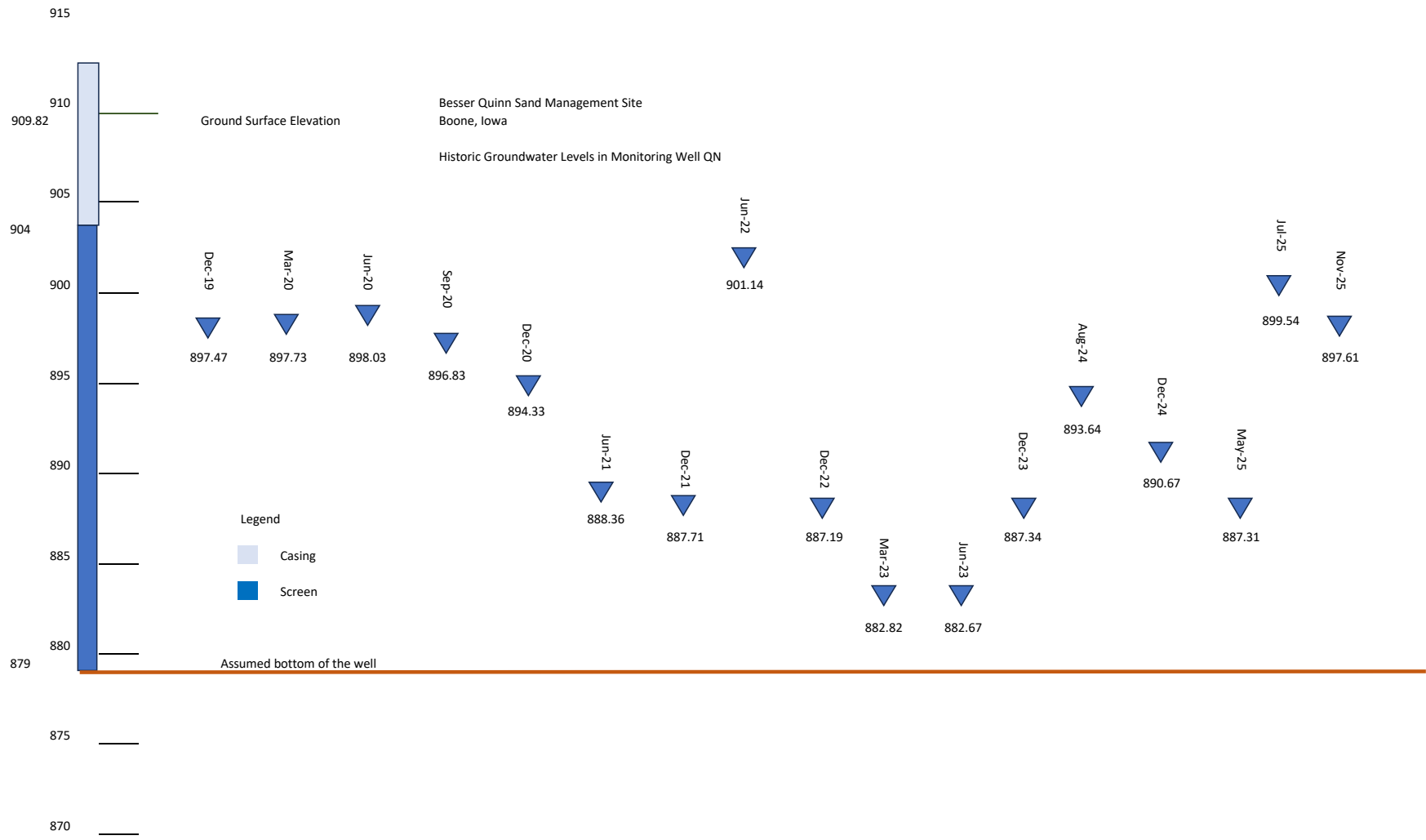
Monitoring Well							River Stage (Stratford) Elevation- NGVD29	Annual Precipitation (inches)
Date	QN	QNE	QNW	QE	QS	QW		
3/1/2020	897.73	875.03	881.37	883.89	880.21	880.95	903.94	24.16
6/15/2020	898.03	886.39	886.95	883.51	880.12	880.84	902.95	
9/1/2020	896.83	888.23	882.86	879.93	878.57	879.34	899.07	
12/9/2020	894.33	887.06	878.74	879.45	878.2	879	898.91	
6/10/2021	888.36	889.17	878.76	883.11	878.01	878.76	899.9	27.71
12/9/2021	887.71	888.13	877.99	883.45	877.63	878.4	899.81	
6/21/2022	901.14	893.1	881.36	886.82	878.91	879.23	902.76	31.81
12/6/2022	887.19	887.45	885.06	874.68	874.52	(1)	898.31	
3/22/2023	882.82	886.16	876.07	881.76	874.76	(1)	902.04	29.32
6/19/2023	882.67	888.8	875.51	880.54	874.74	(1)	901.02	
12/1/2023	887.34	887.37	874.95	875.61	874.43	(1)	898.64	
8/12/2024	893.64	888.57	875.44	875.55	874.64	(1)	900.45	34.45
12/16/2024	890.67	888.61	875.02	874.08	874.42	(1)	899.35	
6/25/2025	899.54	887.73	875.33	880.64	874.59	(1)	903.39	47.84
11/4/2025	897.61	888.61	875.64	881.12	874.75	(1)	899.72	

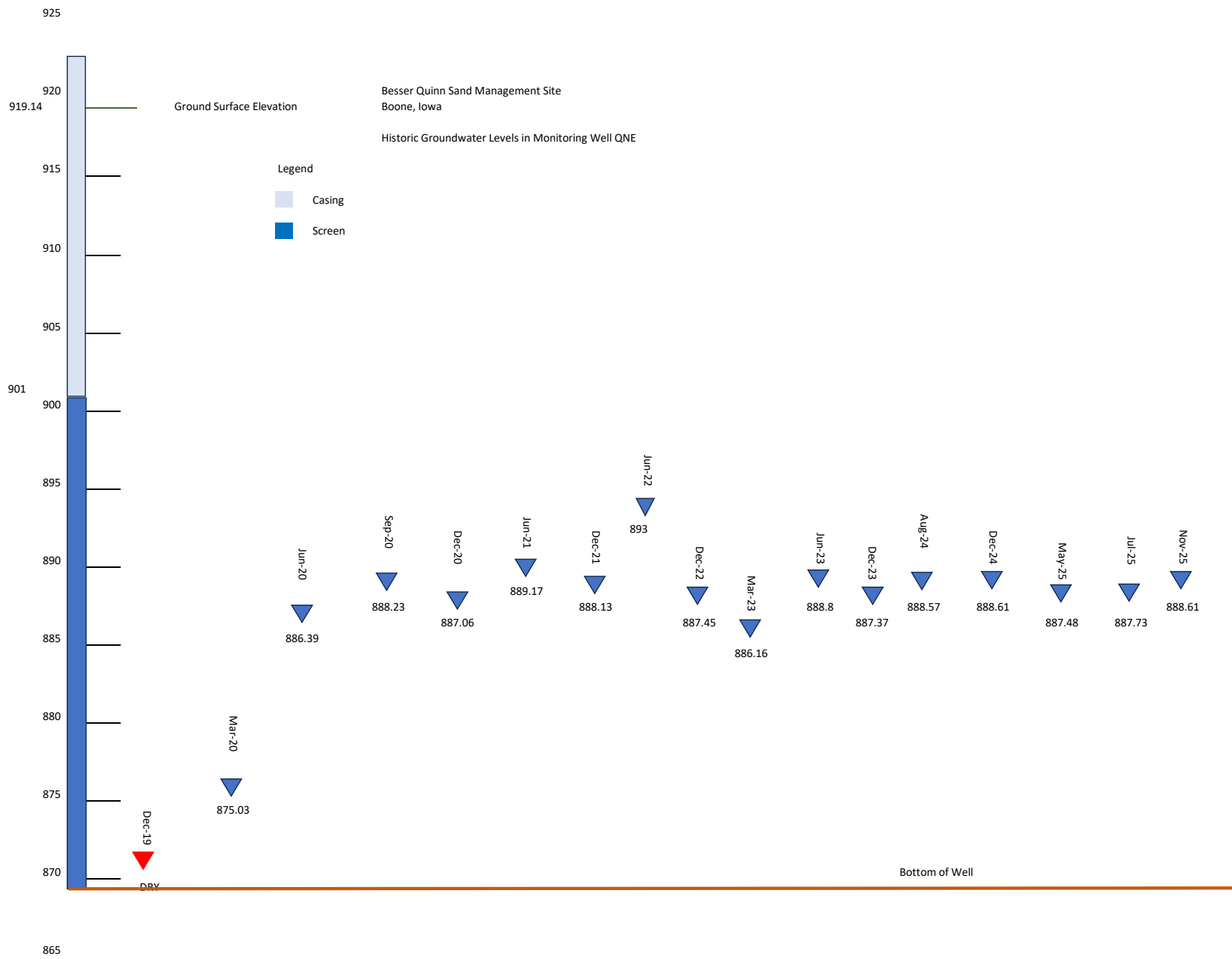
Notes

(1) - Monitoring well was measured to be dry

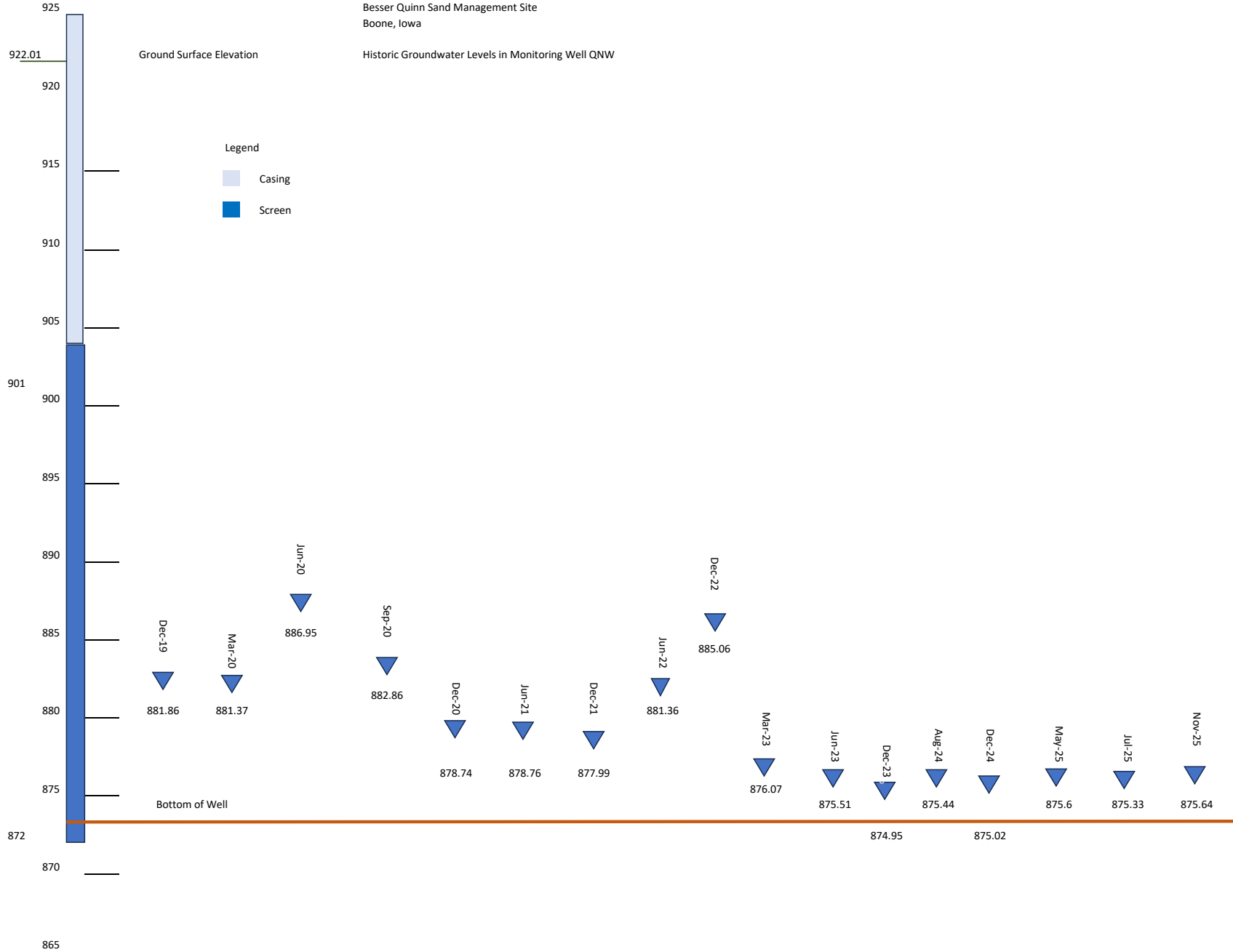
Groundwater Levels with River Levels

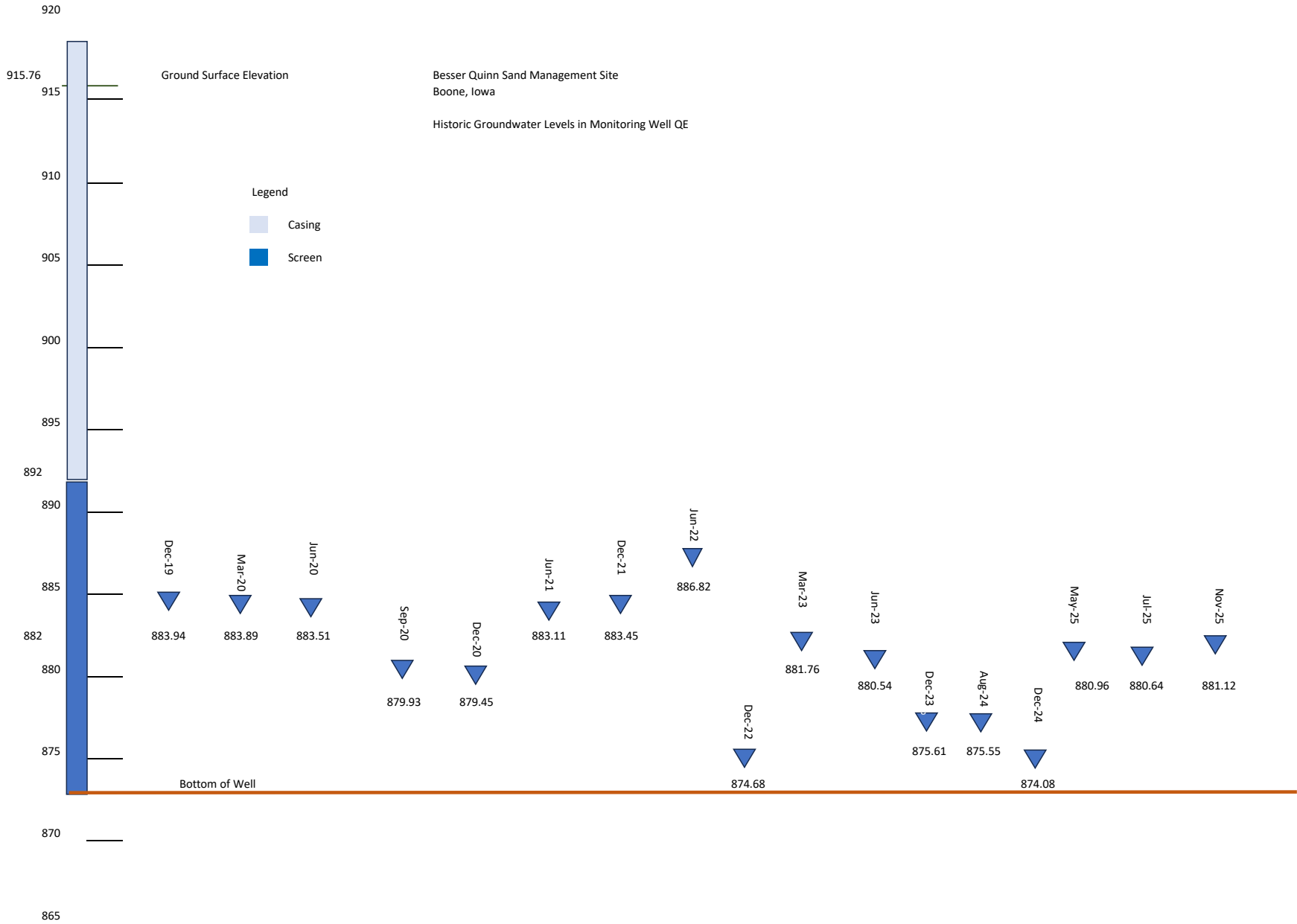


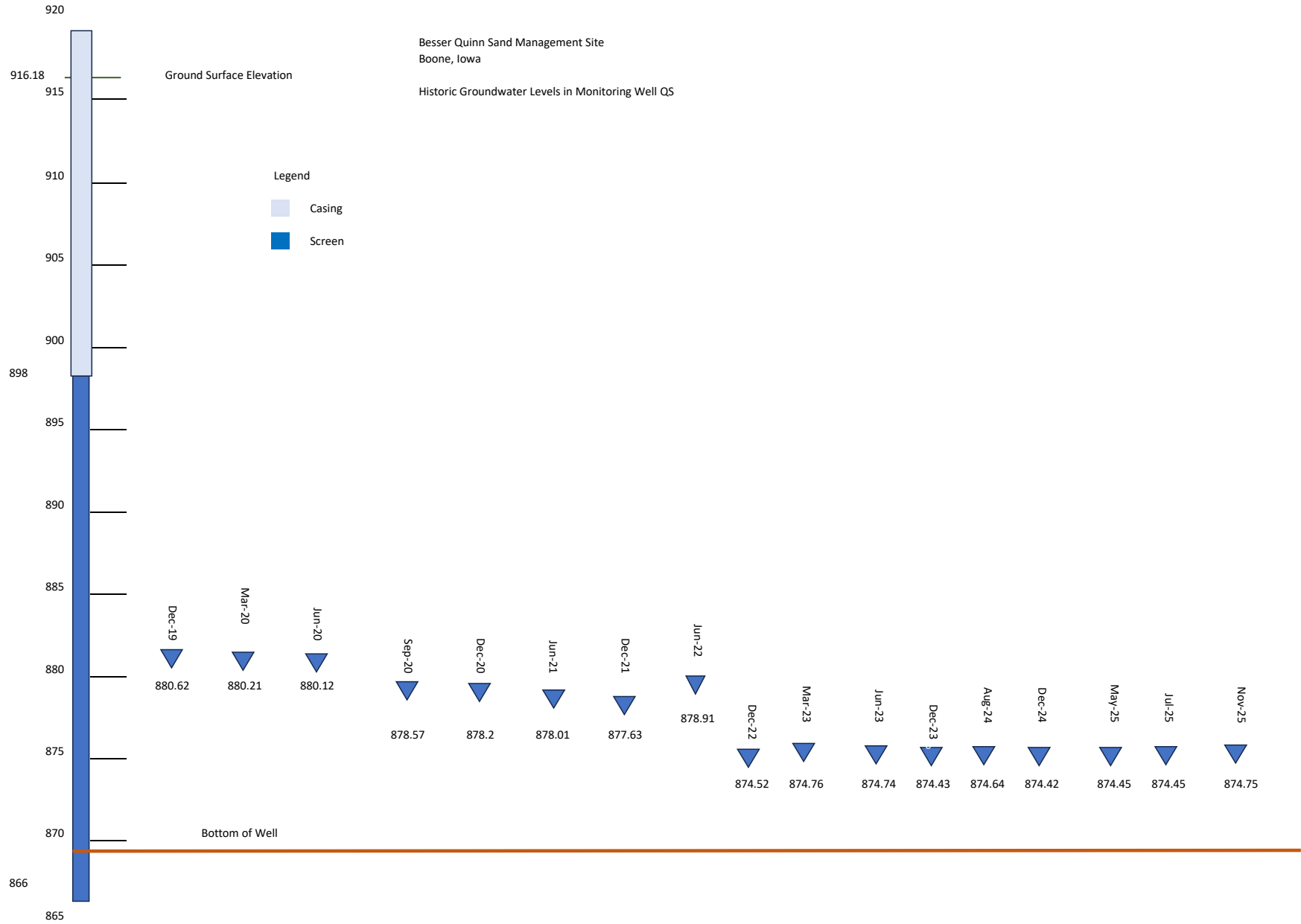


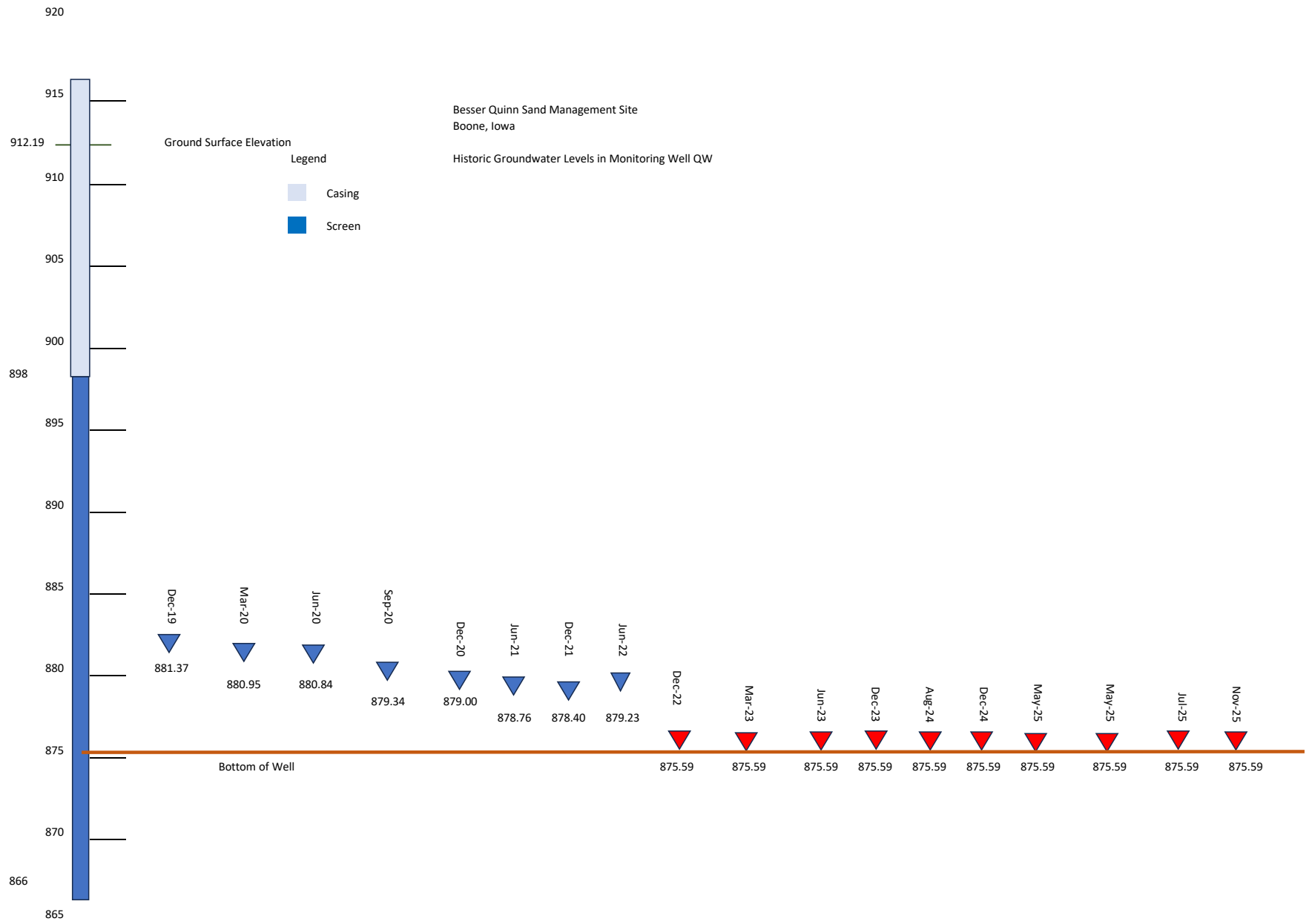


Besser Quinn Sand Management Site
Boone, Iowa
Historic Groundwater Levels in Monitoring Well QNW





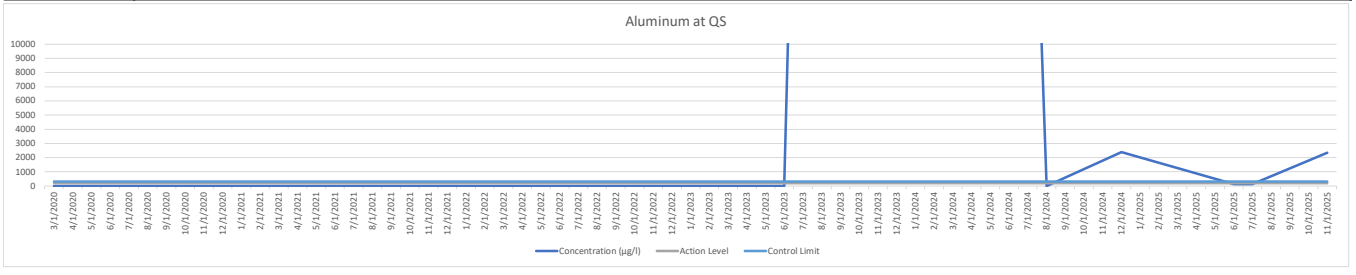




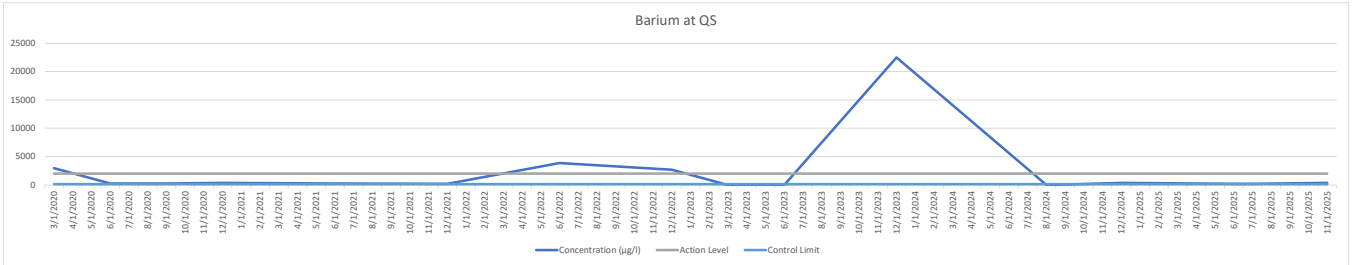
APPENDIX D

GRAPHS

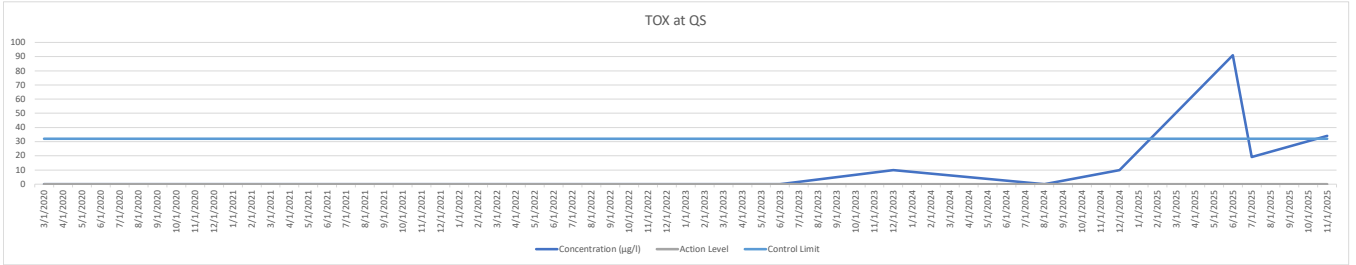
Aluminum at QS																
Date	3/1/2020	6/15/2020	9/1/2020	12/9/2020	6/10/2021	12/9/2021	6/21/2022	12/6/2022	3/22/2023	6/19/2023	12/1/2023	8/12/2024	12/16/2024	6/25/2025	7/13/2025	11/4/2025
Concentration (µg/l)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	304000	143	140	2350
Action Level	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Control Limit	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310	310



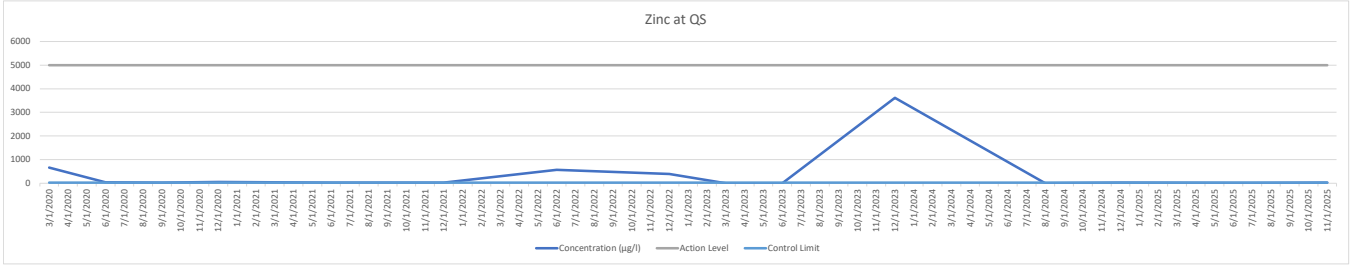
Barium at QS																
Date	3/1/2020	6/15/2020	9/1/2020	12/9/2020	6/10/2021	12/9/2021	6/21/2022	12/6/2022	3/22/2023	6/19/2023	12/1/2023	8/12/2024	12/16/2024	6/25/2025	7/13/2025	11/4/2025
Concentration (µg/l)	2990	256	250	384	261	202	3890	2680	NM	NM	22500	366	219	219	228	395
Action Level	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Control Limit	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152



TOX at QS																
Date	3/1/2020	6/15/2020	9/1/2020	12/9/2020	6/10/2021	12/9/2021	6/21/2022	12/6/2022	3/22/2023	6/19/2023	12/1/2023	8/12/2024	12/16/2024	6/25/2025	7/13/2025	11/4/2025
Concentration (µg/l)	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	10	NM	10	91	19	34
Action Level	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Control Limit	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32



Zinc at QS																
Date	3/1/2020	6/15/2020	9/1/2020	12/9/2020	6/10/2021	12/9/2021	6/21/2022	12/6/2022	3/22/2023	6/19/2023	12/1/2023	8/12/2024	12/16/2024	6/25/2025	7/13/2025	11/4/2025
Concentration (µg/l)	657	39	20	50	28	20	573	392	NM	NM	3610	NM	24.1	5	5	29.3
Action Level	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
Control Limit	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20



Barium at QNW																
Date	3/1/2020	6/15/2020	9/1/2020	12/9/2020	6/10/2021	12/9/2021	6/21/2022	12/6/2022	3/22/2023	6/19/2023	12/1/2023	8/12/2024	12/16/2024	6/25/2025	7/13/2025	11/4/2025
Concentration (µg/l)	226	170	245	287	260	309	1820	1400	90.7	100	9410	314	248	208	NM	196
Action Level	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Control Limit	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152	152

