

Richard Healey (adpce.ad)

From: Charles McDowell <CMcDowell@lsbindustries.com>
Sent: Friday, December 15, 2023 10:27 AM
To: Richard Healey (adpce.ad); Water-Enforcement-Report
Cc: Keith Long; Derek Turner; Howard Stevens
Subject: EDCC, NPDES Permit AR0000752 Dec 15th Weekly Update
Attachments: 2023 Waste Water Data.xlsx; EDC Weekly Update 15 Dec 2023.docx

Mr Healey,
Attached is the weekly update with the effluent data.

If you have any questions, feel free to contact me.

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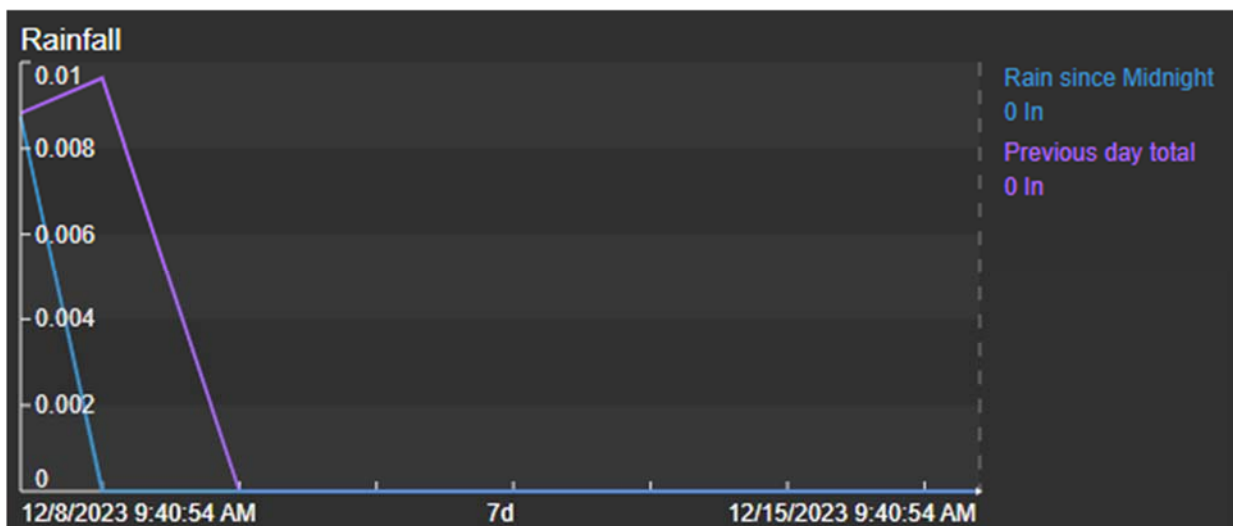
Weekly Report Required by Interim Measures Letter dated 8/4/2023

El Dorado Chemical Company, NPDES Permit Number: AR0000752, AFIN: 70-00040

Weekly Report Date: December 14, 2023 Updated portions are underlined.

Discharges and Implementation of Emergency Action Plan

EDC did not discharge any water through Outfall 001, Outfall 010, or the emergency spillway between when our interim measures plan was initiated on August 9th, 2023 and the 28th. Over the last week, the facility did not receive significant rain. Lake Kildeer levels are currently at 16.83 feet. EDC is attempting to keep the levels of Kildeer below 17.0 feet. The facility is discharging at 1.0 MGD to maintain levels in Kildeer. At this rate we are discharging at or near our permit limits. In the event of additional rain, EDC will manage the discharge from Kildeer as necessary to ensure water does not overtop the emergency spillway in accordance with the August 4, 2023 Interim Measures letter.



Conduct Daily Sampling of Lake Lee, Lake Killdeer, and Pond 004

EDC commenced this required sampling on August 5, 2023. Updated Information is in the attached 2023 spreadsheet.

Provide Copies of Sampling of Lake Lee, Lake Killdeer, and Pond 004 Since January 1, 2023

Please see the EDC Interim Measures response dated August 9, 2023.

Corrective Action Plan Activities [updates from the previous week are underlined]

During our August 17th conference call we discussed that these proposed activities may trigger a communication to the ADEQ and possible permit changes. We will continue to communicate plans and improvements to obtain ADEQ's guidance on proper permitting.

Minimize Wastewater Contaminant Loading

Water Reuse:

EDC has evaluated its processes to assess locations where water can be reutilized in processes. Currently we are reusing as much wastewater as possible, that would otherwise flow into Pond 004, and are reusing some water from Pond 004 when the opportunity arises.

Minimize Wastewater Inflow

EDC has diverted approximately 15% of the water flowing into Pond 004. Parts are now on order that will allow us to divert approximately an additional 15% of stormwater from Pond 004. Work has started to prepare to have the valves installed. All valves are expected to arrive in December. It is expected to have these installed and operation by the first quarter of 2023. EDC does not expect a permit will be required, however information related to this project was submitted to ADEQ to make a final determination. Additionally, we have started an engineering study to divert additional water away from the Ammonia Nitrate facility. This project will focus on paving in and around the Ammonia Nitrate area, and is upstream of any waste/process water connections and will not require a construction permit. EDC has utilized seven frac tanks to increase the storage capacity of Ammonia Nitrate water to reduce the overflow into Pond 004 from rain events.

Maximize Treatment Efficiency and Capacity

Lake Lee Ammonia Stripper

EDC continues to operate the ammonia stripper with an approximate 20% efficiency.

Short Term Treatment of Pond 004

EDC has met with Clean Harbors to develop a short-term treatment system (approximately one year) to provide treatment pending implementation of a permanent solution. EDC has collected samples for Clean Harbors to develop a short-term biological treatment system. Clean Harbors proposed a secondary solution utilizing membrane filtration. This may be a viable alternative; however, it will create a further concentrated wastewater stream that will have to be managed. After further investigation, this process is not viable.

EDC met with Black & Veatch, a wastewater consulting firm, to determine the best treatment possibilities for Pond 004. Based on these initial conversations a biological system seems to be the best path forward. The B&V report was attached in the 13 Oct 2023 report.

Based on review of the Black and Veatch data, EDC is proceeding with biological treatment of 004, but we are still assessing how to address treatment barriers such as predilution, carbon addition, and sludge generation. EDC has evaluated two existing package plants that would be moved to El Dorado to facilitate biological treatment. This will allow EDC to avoid long lead times on construction of new units and have a solution in place soon. This will probably require permit coverage from ADEQ.

Working with Borderland Construction who is developing a cost estimate for disassembling the package plants and shipping them from Arizona to ELD. EDC is attempting to get the units onsite by the end of the calendar year, however with the numerous entities involved this is ambitious and may not be achieved within that timeframe. It now appears the units will be on site in January. A construction permit will be submitted as soon as engineering is completed.

Working with Black and Veatch to develop a written plan to use these package plants in the setup they are proposing. Provide modifications and changes to adapt these package plants for the El Dorado wastewater contaminants. Once the plans are developed we can propose permit modification to facilitate this.

EDC internal engineering is evaluating siting and location for these package plants, ideally in a location near the Pond 004 outfall area.

EDC contacted a local Geotech engineer in Little Rock to provide estimate for sub-surface geo survey to determine how to design package plant foundations.

Additionally, we are evaluating possibilities of reuse of the process wastewater as an input into a product.

Increased Efficiency in Lake Killdeer Biological Activity

Based upon discussion with supplier of nitrification/denitrification bacteria, EDC will begin dosing Lake Killdeer with calcium carbonate or magnesium carbonate to increase the available of carbon and alkalinity in Lake Killdeer. Increasing available carbon should promote additional biological activity to reduce the amount of ammonia in Lake Killdeer and the effluent discharge. EDC has also ordered one ton of lime and will begin dosing Lake Lee with the lime in efforts to increase alkalinity in Lake Lee which flows into Lake Killdeer. Before any dosing begins a construction permit will be submitted.

Baffles in Lake Killdeer

EDC selected a vendor to install baffles in Lake Killdeer. As discussed in our August 17th conference call, this should promote longer residence time and further increase biological activity to reduce the amount of ammonia in Lake Killdeer and the effluent discharge. Baffles have arrived onsite. Construction drawings and design basis have been submitted to apply for the construction permit, however we cannot officially submit for the permit until we receive the proper forms. A teleconference has been scheduled with ADEQ to discuss this process on the 19th of December. The installation is expected to be completed in the first quarter of 2024.

Water Quality Sampling Results

Water quality sampling required by the Interim Measures letter is included in the attached 2023 spreadsheet.

Water Column Profile Measurements

EDC has contracted with Alliance Technology Group (formerly GBMc) to complete the profile and sampling of Pond 004, Lake Lee, and Lake Killdeer. The field work was completed on September 28th.

KT French Drain

KT French Drain is located south west of the KT plant on the west edge of the facility. Water is collected in a wet well then pumped back into the facility, much like a municipality utilized lift stations. During the previous inspection the pump was not operating and the wet well was overflowing. EDC has implemented daily inspections to ensure that the pump remains operational.

As requested, EDC collected samples from KT Wier. Samples collected on December 8th were collected based on the December 7, 2023 conversation with ADEQ and before we received the official request thus all requested in-situ parameters were not collected. EDC will pull twice weekly samples for the next two weeks in addition to the samples pulled on the 8th.

| Date | Temp | pH | D.O. | Cond. | Ammonia mg/l | Nitrate mg/l | Nitrite mg/l | Total – N mg/l | Nitrate + Nitrite |
|------------|------|------|------|--------|--------------|--------------|--------------|----------------|-------------------|
| 12-8-2023 | NA | 4.35 | NA | 79,150 | 6,600 | 10,351 | 0.43 | 16,951.4 | 10,351.4 |
| 12-12-2023 | 16 | 4.40 | 5.63 | 79,250 | 6,500 | 10,633 | 0.41 | 16,833.4 | 10,633.4 |
| 12-14-2023 | 18 | 4.37 | 5.16 | 77,440 | 6,350 | 10669 | 0.46 | 17019.46 | 10,669.46 |
| 12-19-2023 | | | | | | | | | |
| 12-21-2023 | | | | | | | | | |

Other Actions

In this call EDC was informed we need to obtain a wastewater operator's license as quickly as possible. Charles McDowell is planning on completing the advanced industrial wastewater class in March. EDC currently has a three certified operators. Second, ADEQ advised that EDC should coordinate with other Joint Pipeline members regarding discharges and volumes. We have initiated this communication.

EDC has contracted Alliance Technology to conduct a bathometric survey of 004. The results of the survey indicate that Pond 004 contains approximately 1.5 Million Gallons of water.

| 2023 | Lake Killdeer (KD) | | | | | | | | | Lake Lee | | | | | | | Pond 004 | | | | | | | | | | |
|------|--------------------|----------------|-----------------------|----------------|-----------------------|-----------------------|-------------------------|-------------------------|-----------------------|---------------------|-----------------|------------------------|-----------------|------------------------|-------------------------|-------------------------|------------------------|---------------------|------------|----------|----------|----------|--------------|-------------------------|-------------------------|---------------------|----|
| | KD Grab Sample | KD Grab Sample | KD Composite EDCC LAB | KD Grab Sample | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | LEE Grab Sample | LEE Grab Sample | Lee Composite EDCC LAB | LEE Grab Sample | Lee Composite EDCC LAB | Lee Composite EDCC LAB | Lee Composite EDCC LAB | Lee Composite EDCC LAB | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | | | |
| | Date | Time of Grab | Temp °C | pH | DO, ppm | Conductivity | NH _{3-N} , ppm | NO _{3-N} , ppm | P, ppm | SO ₄ ppm | Time of Grab | Temp °C | pH | DO, ppm | NH _{3-N} , ppm | NO _{3-N} , ppm | Phosphorous, ppm | SO ₄ ppm | DATE/ TIME | Temp °C | DO, ppm | pH | Conductivity | NH _{3-N} , ppm | NO _{3-N} , ppm | SO ₄ ppm | |
| 1/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1/2 | | | 6.69 | | | 1073 | 54 | 70 | 0.10 | 107 | | | | | 3.82 | 341 | 301 | 216 | | | | | | | | | |
| 1/3 | | | | | | | | | | | | | | | 4.00 | 296 | 298 | 232 | | | | | | | | | |
| 1/4 | | | 7.10 | | | 1095 | 62 | 71 | | 103 | | | | | 3.11 | 265 | 289 | 255 | | | | | | | | | |
| 1/5 | | | | | | | | | | | | | | | 6.95 | 268 | 272 | 105 | | | | | | | | | |
| 1/6 | | | 7.21 | | | 1114 | 63 | 75 | | 103 | | | | | 7.60 | 195 | 197 | 121 | | | | | | | | | |
| 1/7 | | | | | | | | | | | | | | | 7.71 | 178 | 180 | 108 | | | | | | | | | |
| 1/8 | | | | | | | | | | | | | | | 7.66 | 126 | 150 | 86 | | | | | | | | | |
| 1/9 | | | 7.10 | | | 1127 | 64 | 76 | 0.65 | 100 | | | | | 7.70 | 73 | 82 | 88 | | | | | | | | | |
| 1/10 | | | | | | | | | | | | | | | 7.42 | 65 | 69 | 73 | | | | | | | | | |
| 1/11 | | | 7.11 | | | 1154 | 71 | 81 | | 102 | | | | | 7.34 | 92 | 103 | 83 | 1/10/23 | | | 7.64 | 34410 | 4720 | 4741 | 13 | |
| 1/12 | | | | | | | | | | | | | | | 7.69 | 96 | 101 | 110 | | | | | | | | | |
| 1/13 | | | 7.18 | | | 1162 | 70 | 84 | | 100 | | | | | 7.85 | 83 | 89 | 91 | | | | | | | | | |
| 1/14 | | | | | | | | | | | | | | | 8.02 | 88 | 92 | 99 | | | | | | | | | |
| 1/15 | | | | | | | | | | | | | | | 8.04 | 83 | 83 | 72 | | | | | | | | | |
| 1/16 | | | 7.25 | | | 1185 | 60 | 89 | 0.04 | 97 | | | | | 7.73 | 65 | 72 | 73 | | | | | | | | | |
| 1/17 | | | | | | | | | | | | | | | 8.41 | 88 | 62 | 109 | | | | | | | | | |
| 1/18 | | | 7.15 | | | 1183 | 70 | 90 | | 98 | | | | | 8.21 | 87 | 53 | 96 | | | | | | | | | |
| 1/19 | | | | | | | | | | | | | | | 8.36 | 104 | 53 | 107 | | | | | | | | | |
| 1/20 | | | 7.27 | | | 1202 | 81 | 89 | | 94 | | | | | 7.94 | 125 | 93 | 87 | | | | | | | | | |
| 1/21 | | | | | | | | | | | | | | | 8.45 | 225 | 173 | 106 | | | | | | | | | |
| 1/22 | | | | | | | | | | | | | | | 8.51 | 234 | 197 | 122 | | | | | | | | | |
| 1/23 | | | 7.49 | | | 1245 | 89 | 90 | 2.28 | 92 | | | | | 8.95 | 232 | 153 | 98 | | | | | | | | | |
| 1/24 | | | | | | | | | | | | | | | 8.87 | 320 | 152 | 117 | | | | | | | | | |
| 1/25 | | | 7.81 | | | 1248 | 82 | 90 | | 82 | | | | | 8.81 | 342 | 128 | 112 | | | | | | | | | |
| 1/26 | | | | | | | | | | | | | | | 8.67 | 252 | 158 | 88 | | | | | | | | | |
| 1/27 | | | 7.83 | | | 1250 | 89 | 87 | | 80 | | | | | 8.34 | 312 | 182 | 100 | | | | | | | | | |
| 1/28 | | | | | | | | | | | | | | | 8.10 | 225 | 143 | 127 | | | | | | | | | |
| 1/29 | | | | | | | | | | | | | | | 7.94 | 161 | 143 | 100 | | | | | | | | | |
| 1/30 | | | 7.78 | | | 1286 | 77 | 97 | 2.59 | 81 | | | | | 7.78 | 142 | 134 | 82 | | | | | | | | | |
| 1/31 | | | | | | | | | | | | | | | 7.18 | 154 | 167 | 79 | | | | | | | | | |
| 2/1 | | | 7.60 | | | 1280 | 94 | 97 | | 76 | | | | | 7.45 | 158 | 171 | 79 | | | | | | | | | |
| 2/2 | | | | | | | | | | | | | | | 7.30 | 149 | 158 | 55 | | | | | | | | | |
| 2/3 | | | 7.52 | | | 1308 | 99 | 100 | | 76 | | | | | 7.55 | 194 | 150 | 78 | | | | | | | | | |
| 2/4 | | | | | | | | | | | | | | | 7.38 | 167 | 158 | 63 | | | | | | | | | |
| 2/5 | | | | | | | | | | | | | | | 7.36 | 169 | 176 | 71 | | | | | | | | | |
| 2/6 | | | 7.35 | | | 1416 | 67 | 112 | 0.04 | 73 | | | | | 7.67 | 154 | 179 | 72 | | | | | | | | | |
| 2/7 | | | | | | | | | | | | | | | 7.13 | 82 | 122 | 71 | | | | | | | | | |
| 2/8 | | | 7.43 | | | 1294 | 98 | 100 | | 75 | | | | | 7.50 | 129 | 121 | 103 | | | | | | | | | |
| 2/9 | | | | | | | | | | | | | | | 7.52 | 152 | 120 | 130 | | | 02/08/23 | | 8.05 | 47270 | 6440 | 6041 | <1 |
| 2/10 | | | 7.46 | | | 1315 | 94 | 99 | | 76 | | | | | 6.93 | 135 | 120 | 292 | | | | | | | | | |
| 2/11 | | | | | | | | | | | | | | | 7.67 | 150 | 134 | 194 | | | | | | | | | |
| 2/12 | | | | | | | | | | | | | | | 7.72 | 192 | 191 | 154 | | | | | | | | | |
| 2/13 | | | 7.30 | | | 1311 | 100 | 102 | 0.02 | 78 | | | | | 7.64 | 208 | 211 | 101 | | | | | | | | | |
| 2/14 | | | | | | | | | | | | | | | 7.80 | 198 | 158 | 109 | | | | | | | | | |
| 2/15 | | | 7.26 | | | 1340 | 110 | 106 | | 82 | | | | | 7.75 | 207 | 159 | 82 | | | | | | | | | |
| 2/16 | | | | | | | | | | | | | | | 7.60 | 255 | 161 | 84 | | | | | | | | | |
| 2/17 | | | 7.39 | | | 1342 | 106 | 107 | | 82 | | | | | 7.68 | 181 | 160 | 141 | | | | | | | | | |
| 2/18 | | | | | | | | | | | | | | | 7.99 | 213 | 222 | 112 | | | | | | | | | |
| 2/19 | | | | | | | | | | | | | | | 8.53 | 147 | 100 | 109 | | | | | | | | | |
| 2/20 | | | 7.50 | | | 1446 | 117 | 119 | 0.03 | 85 | | | | | 8.00 | 152 | 97 | 101 | | | | | | | | | |
| 2/21 | | | | | | | | | | | | | | | 7.96 | 128 | 122 | 81 | | | | | | | | | |
| 2/22 | | | 7.48 | | | 1438 | 135 | 115 | | 82 | | | | | 7.70 | 115 | 113 | 93 | | | | | | | | | |
| 2/23 | | | | | | | | | | | | | | | 7.36 | 105 | 98 | 125 | | | | | | | | | |
| 2/24 | | | 7.47 | | | 1440 | 118 | 116 | | 82 | | | | | 7.21 | 114 | 104 | 128 | | | | | | | | | |
| 2/25 | | | | | | | | | | | | | | | 7.23 | 131 | 126 | 121 | | | | | | | | | |
| 2/26 | | | | | | | | | | | | | | | 7.36 | 117 | 152 | 114 | | | | | | | | | |
| 2/27 | | | 7.33 | | | 1464 | 123 | 119 | 0.02 | 83 | | | | | 7.16 | 122 | 153 | 112 | | | | | | | | | |
| 2/28 | | | | | | | | | | | | | | | 7.15 | 108 | 144 | 98 | | | | | | | | | |
| 3/1 | | | 7.35 | | | 1460 | 130 | 116 | | 82 | | | | | 6.95 | 105 | 135 | 145 | | | | | | | | | |
| 3/2 | | | | | | | | | | | | | | | 6.68 | 80 | 107 | 151 | | | | | | | | | |
| 3/3 | | | 7.26 | | | 1463 | 101 | 94 | | 81 | | | | | 7.17 | 63 | 76 | 125 | | | | | | | | | |
| 3/4 | | | | | | | | | | | | | | | 6.67 | 105 | 111 | 127 | | | | | | | | | |
| 3/5 | | | | | | | | | | | | | | | 6.27 | 238 | 167 | 93 | | | | | | | | | |
| 3/6 | | | 7.33 | | | 1846 | 131 | 131 | 1.67 | 81 | | | | | 6.55 | 186 | 156 | 103 | | | | | | | | | |
| 3/7 | | | | | | | | | | | | | | | 6.59 | 187 | 158 | 100 | | | | | | | | | |
| 3/8 | | | 8.23 | | | 1874 | 152 | 146 | | 75 | | | | | 7.24 | 173 | 151 | 100 | | | | | | | | | |
| 3/9 | | | | | | | | | | | | | | | 6.96 | 109 | 107 | 101 | | | | | | | | | |
| 3/10 | | | 7.21 | | | 1672 | 124 | 137 | | 78 | | | | | 7.06 | 139 | 123 | 117 | | | | | | | | | |
| 3/11 | | | | | | | | | | | | | | | 7.08 | 136 | 148 | 131 | | | 03/09/23 | | 8.22 | 54800 | 11000 | 7275 | 26 |
| 3/12 | | | | | | | | | | | | | | | 6.84 | 122 | 149 | 129 | | | | | | | | | |
| 3/13 | | | 7.36 | | | 1534 | 130 | 125 | 1.79 | 76 | | | | | 6.92 | 118 | 144 | 98 | | | | | | | | | |
| 3/14 | | | | | | | | | | | | | | | 6.57 | 225 | 196 | 67 | | | | | | | | | |
| 3/15 | | | 7.56 | | | 1595 | 127 | 133 | | 76 | | | | | 7.00 | 238 | 212 | 77 | | | | | | | | | |
| 3/16 | | | | | | | | | | | | | | | 7.35 | 225 | 195 | 100 | | | | | | | | | |
| 3/17 | | | 7.38 | | | 1599 | 168 | 135 | | 79 | | | | | 7.62 | 144 | 160 | 111 | | | | | | | | | |
| 3/18 | | | | | | | | | | | | | | | 7.31 | 154 | 137 | 108 | | | | | | | | | |
| 3/19 | | | | | | | | | | | | | | | 6.96 | 132 | 149 | 129 | | | | | | | | | |
| 3/20 | | | 7.56 | | | 1608 | 135 | 136 | 3.07 | 80 | | | | | 7.17 | 123 | 154 | 113 | | | | | | | | | |
| 3/21 | | | | | | | | | | | | | | | 7.33 | 139 | 144 | 104 | | | | | | | | | |
| 3/22 | | | 7.24 | | | 1598 | 131 | 136 | | 80 | | | | | 7.27 | 118 | 116 | 100 | | | | | | | | | |
| 3/23 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| 2023 | Lake Killdeer (KD) | | | | | | | | | Lake Lee | | | | | | | Pond 004 | | | | | | | | | |
|------|--------------------|----------------|-----------------------|----------------|-----------------------|-------------------------|-------------------------|-----------------------|-----------------------|-----------------|-----------------|------------------------|-----------------|-------------------------|-------------------------|------------------------|------------------------|------------|----------|----------|----------|--------------|-------------------------|-------------------------|---------------------|----|
| | KD Grab Sample | KD Grab Sample | KD Composite EDCC LAB | KD Grab Sample | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | LEE Grab Sample | LEE Grab Sample | Lee Composite EDCC LAB | LEE Grab Sample | Lee Composite EDCC LAB | Lee Composite EDCC LAB | Lee Composite EDCC LAB | Lee Composite EDCC LAB | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | |
| Date | Time of Grab | Temp °C | pH | DO, ppm | Conductivity | NH _{3-N} , ppm | NO _{3-N} , ppm | P, ppm | SO ₄ ppm | Time of Grab | Temp °C | pH | DO, ppm | NH _{3-N} , ppm | NO _{3-N} , ppm | Phosphorous, ppm | SO ₄ ppm | DATE/ TIME | Temp °C | DO, ppm | pH | Conductivity | NH _{3-N} , ppm | NO _{3-N} , ppm | SO ₄ ppm | |
| 3/28 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3/29 | | | 7.12 | | 1620 | 130 | 134 | | 83 | | | 7.13 | | 132 | 143 | | 178 | | | | | | | | | |
| 3/30 | | | | | | | | | | | | 7.16 | | 140 | 141 | | 140 | | | | | | | | | |
| 3/31 | | | 6.98 | | 1622 | 119 | 136 | | 85 | | | 7.18 | | 126 | 129 | | 123 | | | | | | | | | |
| 4/1 | | | | | | | | | | | | 7.01 | | 87 | 103 | | 107 | | | | | | | | | |
| 4/2 | | | | | | | | | | | | 7.30 | | 68 | 76 | | 93 | | | | | | | | | |
| 4/3 | | | 7.16 | | 1588 | 122 | 134 | 0.04 | 83 | | | 7.92 | | 53 | 70 | | 127 | | | | | | | | | |
| 4/4 | | | | | | | | | | | | 7.10 | | 67 | 77 | 1.01 | 115 | | | | | | | | | |
| 4/5 | | | 7.04 | | 1867 | 164 | 167 | | 83 | | | 7.56 | | 141 | 134 | | 103 | | 04/04/23 | | | 8.33 | 70340 | 10060 | 9506 | 28 |
| 4/6 | | | | | | | | | | | | 7.54 | | 139 | 148 | | 99 | | | | | | | | | |
| 4/7 | | | 6.87 | | 1806 | 159 | 166 | | 72 | | | 6.95 | | 168 | 170 | | 122 | | | | | | | | | |
| 4/8 | | | | | | | | | | | | 6.78 | | 272 | 294 | | 97 | | | | | | | | | |
| 4/9 | | | | | | | | | | | | 6.94 | | 330 | 343 | | 112 | | | | | | | | | |
| 4/10 | | | 7.04 | | 2042 | 169 | 188 | 0.00 | 72 | | | 9.95 | | 164 | 248 | | 97 | | | | | | | | | |
| 4/11 | | | | | | | | | | | | 7.36 | | 175 | 190 | 0.24 | 99 | | | | | | | | | |
| 4/12 | | | 7.00 | | 1814 | 140 | 162 | | 74 | | | 7.02 | | 136 | 141 | | 154 | | | | | | | | | |
| 4/13 | | | | | | | | | | | | 6.58 | | 87 | 122 | | 149 | | 04/12/23 | | | 8.61 | 39320 | 4400 | 5032 | 20 |
| 4/14 | | | 6.90 | | 1675 | 132 | 146 | | 75 | | | 6.47 | | 78 | 109 | | 138 | | | | | | | | | |
| 4/15 | | | | | | | | | | | | 5.86 | | 63 | 81 | | 231 | | | | | | | | | |
| 4/16 | | | | | | | | | | | | 6.24 | | 47 | 56 | | 182 | | | | | | | | | |
| 4/17 | | | 7.18 | | 1598 | 131 | 140 | 1.42 | 81 | | | 6.56 | | 30 | 44 | | 171 | | | | | | | | | |
| 4/18 | | | | | | | | | | | | 5.56 | | 72 | 82 | 1.28 | 205 | | | | | | | | | |
| 4/19 | | | 6.75 | | 1615 | 131 | 141 | | 83 | | | 7.03 | | 64 | 61 | | 272 | | 04/18/23 | | | 7.68 | 57620 | 8240 | 3691 | 16 |
| 4/20 | | | | | | | | | | | | 6.94 | | 35 | 36 | | 233 | | | | | | | | | |
| 4/21 | | | 6.82 | | 1580 | 124 | 137 | | 84 | | | 6.89 | | 19 | 21 | | 198 | | | | | | | | | |
| 4/22 | | | | | | | | | | | | 6.37 | | 18 | 20 | | 178 | | | | | | | | | |
| 4/23 | | | | | | | | | | | | 5.21 | | 75 | 87 | | 202 | | | | | | | | | |
| 4/24 | | | 7.03 | | 1565 | 130 | 133 | 1.41 | 86 | | | 5.42 | | 181 | 199 | | 187 | | | | | | | | | |
| 4/25 | | | | | | | | | | | | 6.26 | | 210 | 212 | 2.70 | 179 | | | | | | | | | |
| 4/26 | | | 7.02 | | 1582 | 121 | 137 | | 88 | | | 6.89 | | 175 | 177 | | 191 | | | | | | | | | |
| 4/27 | | | | | | | | | | | | 6.95 | | 109 | 117 | | 219 | | | | | | | | | |
| 4/28 | | | 6.93 | | 1570 | 112 | 135 | | 89 | | | 6.65 | | 93 | 95 | | 184 | | | | | | | | | |
| 4/29 | | | | | | | | | | | | 5.71 | | 140 | 154 | | 162 | | | | | | | | | |
| 4/30 | | | | | | | | | | | | 7.63 | | 142 | 180 | | 174 | | | | | | | | | |
| 5/1 | | | 6.87 | | 1611 | 112 | 139 | 1.46 | 92 | | | 6.82 | | 169 | 204 | | 176 | | | | | | | | | |
| 5/2 | | | | | | | | | | | | 5.50 | | 122 | 169 | 2.02 | 189 | | | | | | | | | |
| 5/3 | | | 6.82 | | 1633 | 122 | 140 | | 93 | | | 7.18 | | 133 | 150 | | 246 | | | | | | | | | |
| 5/4 | | | | | | | | | | | | 7.03 | | 95 | 108 | | 191 | | | | | | | | | |
| 5/5 | | | 6.85 | | 1628 | 120 | 138 | | 94 | | | 6.73 | | 57 | 68 | | 168 | | | | | | | | | |
| 5/6 | | | | | | | | | | | | 4.68 | | 44 | 51 | | 209 | | | | | | | | | |
| 5/7 | | | | | | | | | | | | 6.94 | | 73 | 89 | | 210 | | | | | | | | | |
| 5/8 | | | 6.88 | | 1613 | 123 | 139 | 1.24 | 95 | | | 8.07 | | 95 | 108 | | 152 | | | | | | | | | |
| 5/9 | | | | | | | | | | | | 8.19 | | 81 | 97 | 1.50 | 122 | | | | | | | | | |
| 5/10 | | | 6.65 | | 1588 | 120 | 132 | | 92 | | | 7.58 | | 163 | 157 | | 75 | | | | | | | | | |
| 5/11 | | | | | | | | | | | | 7.55 | | 335 | 361 | | 82 | | 05/10/23 | | | 8.71 | 34840 | 5080 | 4463 | 26 |
| 5/12 | | | 6.81 | | 1841 | 138 | 161 | | 89 | | | 7.60 | | 323 | 332 | | 139 | | | | | | | | | |
| 5/13 | | | | | | | | | | | | 7.02 | | 208 | 243 | | 90 | | | | | | | | | |
| 5/14 | | | | | | | | | | | | 7.19 | | 213 | 235 | | 171 | | | | | | | | | |
| 5/15 | | | 6.80 | | 1805 | 142 | 156 | 1.61 | 86 | | | 7.15 | | 164 | 187 | | 169 | | | | | | | | | |
| 5/16 | | | | | | | | | | | | 7.71 | | 138 | 156 | 2.96 | 192 | | | | | | | | | |
| 5/17 | | | 6.86 | | 1812 | 138 | 158 | | 86 | | | 7.63 | | 103 | 119 | | 176 | | | | | | | | | |
| 5/18 | | | | | | | | | | | | 7.36 | | 81 | 105 | | 171 | | | | | | | | | |
| 5/19 | | | 7.03 | | 1825 | 145 | 160 | | 85 | | | 7.35 | | 81 | 95 | | 175 | | | | | | | | | |
| 5/20 | | | | | | | | | | | | 7.21 | | 64 | 75 | | 176 | | | | | | | | | |
| 5/21 | | | | | | | | | | | | 6.68 | | 52 | 65 | | 170 | | | | | | | | | |
| 5/22 | | | 6.97 | | 1786 | 143 | 155 | 1.79 | 86 | | | 6.27 | | 111 | 133 | | 171 | | | | | | | | | |
| 5/23 | | | | | | | | | | | | 6.51 | | 182 | 199 | 2.72 | 194 | | | | | | | | | |
| 5/24 | | | 7.10 | | 1758 | 117 | 153 | | 87 | | | 6.78 | | 142 | 158 | | 221 | | | | | | | | | |
| 5/25 | | | | | | | | | | | | 6.72 | | 75 | 103 | | 206 | | | | | | | | | |
| 5/26 | | | 6.73 | | 1760 | 135 | 149 | | 111 | | | 6.55 | | 68 | 83 | | 405 | | | | | | | | | |
| 5/27 | | | | | | | | | | | | 3.80 | | 63 | 65 | | 672 | | | | | | | | | |
| 5/28 | | | | | | | | | | | | 3.32 | | 46 | 49 | | 511 | | | | | | | | | |
| 5/29 | | | 6.18 | | 1740 | 122 | 146 | 0.32 | 114 | | | 3.17 | | 30 | 48 | | 432 | | | | | | | | | |
| 5/30 | | | | | | | | | | | | 3.14 | | 20 | 53 | 1.12 | 332 | | | | | | | | | |
| 5/31 | | | 6.59 | | 1734 | 119 | 146 | | 121 | | | 3.67 | | 16 | 32 | | 298 | | | | | | | | | |
| 6/1 | | | | | | | | | | | | 4.88 | | 14 | 20 | | 283 | | | | | | | | | |
| 6/2 | | | 6.73 | | 1721 | 120 | 147 | | 126 | | | 6.67 | | 11 | 13 | | 275 | | | | | | | | | |
| 6/3 | | | | | | | | | | | | 7.24 | | 7 | 10 | | 234 | | | | | | | | | |
| 6/4 | | | | | | | | | | | | 7.25 | | 4 | 9 | | 199 | | | | | | | | | |
| 6/5 | | | 6.68 | | 1680 | 122 | 137 | 1.64 | 135 | | | 7.36 | | 6 | 9 | | 227 | | | | | | | | | |
| 6/6 | | | | | | | | | | | | 7.38 | | 7 | 10 | 0.65 | 205 | | | | | | | | | |
| 6/7 | | | 6.06 | | 1674 | 116 | 135 | | 139 | | | 7.25 | | 7 | 10 | | 192 | | | | | | | | | |
| 6/8 | | | | | | | | | | | | 7.27 | | 8 | 10 | | 205 | | 06/07/23 | | | 7.42 | 79560 | 10600 | 10832 | 42 |
| 6/9 | | | 6.22 | | 1655 | 114 | 132 | | 141 | | | 7.49 | | 6 | 18 | | 259 | | | | | | | | | |
| 6/10 | | | | | | | | | | | | 7.60 | | 5 | 23 | | 202 | | | | | | | | | |
| 6/11 | | | | | | | | | | | | 7.46 | | 3 | 15 | | 146 | | | | | | | | | |
| 6/12 | | | 6.44 | | 1624 | 116 | 126 | 1.31 | 142 | | | 6.35 | | 12 | 26 | | 190 | | | | | | | | | |
| 6/13 | | | | | | | | | | | | 6.70 | | 30 | 42 | 0.22 | 197 | | | | | | | | | |
| 6/14 | | | 6.55 | | 1590 | 111 | 125 | | 145 | | | 6.53 | | 27 | 42 | | 140 | | | | | | | | | |
| 6/15 | | | | | | | | | | | | 6.38 | | 103 | 120 | | 148 | | | | | | | | | |
| 6/16 | | | 6.65 | | 1695 | 123 | 139 | | 139 | | | | | | | | | | | | | | | | | |

| 2023 | Lake Killdeer (KD) | | | | | | | | | Lake Lee | | | | | | | Pond 004 | | | | | | | | | |
|------|--------------------|----------------|-----------------------|----------------|-----------------------|-------------------------|-------------------------|-----------------------|-----------------------|-----------------|-----------------|------------------------|-----------------|-------------------------|-------------------------|------------------------|------------------------|------------|----------|----------|----------|--------------|-------------------------|-------------------------|---------------------|--|
| | KD Grab Sample | KD Grab Sample | KD Composite EDCC LAB | KD Grab Sample | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | KD Composite EDCC LAB | LEE Grab Sample | LEE Grab Sample | Lee Composite EDCC LAB | LEE Grab Sample | Lee Composite EDCC LAB | Lee Composite EDCC LAB | Lee Composite EDCC LAB | Lee Composite EDCC LAB | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | 004 Grab | |
| Date | Time of Grab | Temp °C | pH | DO, ppm | Conductivity | NH _{3-N} , ppm | NO _{3-N} , ppm | P, ppm | SO ₄ ppm | Time of Grab | Temp °C | pH | DO, ppm | NH _{3-N} , ppm | NO _{3-N} , ppm | Phosphorous, ppm | SO ₄ ppm | DATE/ TIME | Temp °C | DO, ppm | pH | Conductivity | NH _{3-N} , ppm | NO _{3-N} , ppm | SO ₄ ppm | |
| 6/21 | | | 6.60 | | 1688 | 115 | 131 | | 138 | | | 7.31 | | 141 | 153 | | 201 | | | | | | | | | |
| 6/22 | | | | | | | | | | | | 6.86 | | 123 | 130 | | 322 | | | | | | | | | |
| 6/23 | | | 6.68 | | 1705 | 115 | 133 | | 141 | | | 7.17 | | 101 | 116 | | 287 | | | | | | | | | |
| 6/24 | | | | | | | | | | | | 6.84 | | 78 | 94 | | 200 | | | | | | | | | |
| 6/25 | | | | | | | | | | | | 7.14 | | 55 | 69 | | 199 | | | | | | | | | |
| 6/26 | | | 6.69 | | 1690 | 119 | 130 | 1.32 | 143 | | | 6.72 | | 49 | 54 | 1.27 | 184 | | | | | | | | | |
| 6/27 | | | | | | | | | | | | 7.02 | | 125 | 136 | | 180 | | | | | | | | | |
| 6/28 | | | 6.75 | | 1672 | 122 | 127 | | 142 | | | 7.61 | | 195 | 201 | | 143 | | | | | | | | | |
| 6/29 | | | | | | | | | | | | 7.82 | | 192 | 194 | | 146 | | | | | | | | | |
| 6/30 | | | 6.64 | | 1720 | 119 | 133 | | 141 | | | 7.97 | | 132 | 164 | | 167 | | | | | | | | | |
| 7/1 | | | | | | | | | | | | 7.59 | | 108 | 126 | | 167 | | | | | | | | | |
| 7/2 | | | | | | | | | | | | 7.23 | | 75 | 100 | | 167 | | | | | | | | | |
| 7/3 | | | 6.69 | | 1730 | 120 | 137 | 1.38 | 144 | | | 7.09 | | 72 | 86 | 2.21 | 149 | | | | | | | | | |
| 7/4 | | | | | | | | | | | | 7.06 | | 51 | 67 | | 158 | | | | | | | | | |
| 7/5 | | | 6.77 | | 1724 | 125 | 133 | | 142 | | | 6.82 | | 102 | 116 | | 152 | | | | | | | | | |
| 7/6 | | | | | | | | | | | | 6.96 | | 188 | 209 | | 172 | | | | | | | | | |
| 7/7 | | | 6.74 | | 1720 | 116 | 132 | | 140 | | | 7.62 | | 186 | 223 | | 161 | | | | | | | | | |
| 7/8 | | | | | | | | | | | | 7.66 | | 134 | 130 | | 186 | | | | | | | | | |
| 7/9 | | | | | | | | | | | | 8.21 | | 132 | 126 | | 195 | | | | | | | | | |
| 7/10 | | | 6.75 | | 1780 | 130 | 136 | 5.24 | 140 | | | 8.16 | | 209 | 231 | 3.83 | 155 | | | | | | | | | |
| 7/11 | | | | | | | | | | | | 7.88 | | 157 | 196 | | 125 | | | | | | | | | |
| 7/12 | | | 6.64 | | 1782 | 102 | 113 | | 139 | | | 5.74 | | 52 | 66 | | 73 | | | | | | | | | |
| 7/13 | | | | | | | | | | | | 8.49 | | 136 | 215 | | 75 | | | | | | | | | |
| 7/14 | | | 7.50 | | 2240 | 179 | 69 | | 34 | | | 8.22 | | 281 | 119 | | 36 | 07/14/23 | | | 9.02 | 24910 | 4320 | 2989 | 2 | |
| 7/15 | | | | | | | | | | | | 8.29 | | 278 | 323 | | 109 | | | | | | | | | |
| 7/16 | | | | | | | | | | | | 8.50 | | 231 | 270 | | 110 | | | | | | | | | |
| 7/17 | | | 6.98 | | 1890 | 151 | 153 | 6.08 | 112 | | | 8.35 | | 222 | 229 | 4.11 | 124 | | | | | | | | | |
| 7/18 | | | | | | | | | | | | 8.03 | | 167 | 189 | | 122 | | | | | | | | | |
| 7/19 | | | 6.95 | | 1820 | 143 | 143 | | 104 | | | 7.92 | | 133 | 143 | | 110 | | | | | | | | | |
| 7/20 | | | | | | | | | | | | 8.17 | | 128 | 137 | | 170 | | | | | | | | | |
| 7/21 | | | 6.91 | | 1804 | 140 | 141 | | 108 | | | 8.05 | | 120 | 129 | | 123 | | | | | | | | | |
| 7/22 | | | | | | | | | | | | 7.49 | | 95 | 93 | | 113 | | | | | | | | | |
| 7/23 | | | | | | | | | | | | 6.86 | | 86 | 82 | | 121 | | | | | | | | | |
| 7/24 | | | 6.90 | | 1763 | 125 | 136 | 2.03 | 110 | | | 7.69 | | 86 | 90 | 2.89 | 133 | | | | | | | | | |
| 7/25 | | | | | | | | | | | | 7.38 | | 72 | 79 | | 146 | | | | | | | | | |
| 7/26 | | | 6.85 | | 1764 | 126 | 134 | | 110 | | | 7.22 | | 58 | 72 | | 125 | | | | | | | | | |
| 7/27 | | | | | | | | | | | | 7.43 | | 53 | 57 | | 101 | | | | | | | | | |
| 7/28 | | | 6.84 | | 1753 | 120 | 132 | | 110 | | | 8.14 | | 36 | 42 | | 121 | | | | | | | | | |
| 7/29 | | | | | | | | | | | | 8.27 | | 16 | 30 | | 107 | | | | | | | | | |
| 7/30 | | | | | | | | | | | | 6.99 | | 10 | 24 | | 121 | | | | | | | | | |
| 7/31 | | | 6.83 | | 1745 | 128 | 129 | 1.96 | 110 | | | 7.19 | | 13 | 20 | 1.34 | 119 | | | | | | | | | |
| 8/1 | | | | | | | | | | | | 6.92 | | 64 | 75 | | 126 | | | | | | | | | |
| 8/2 | | | 6.77 | | 1726 | 114 | 128 | | 111 | | | 7.09 | | 38 | 51 | | 122 | | | | | | | | | |
| 8/3 | | | | | | | | | | | | 8.10 | | 16 | 32 | | 113 | | | | | | | | | |
| 8/4 | | | 6.79 | | 1710 | 119 | 126 | | 111 | | | 7.44 | | 9 | 22 | | 143 | | | | | | | | | |
| 8/5 | 8:53AM | 28 | 6.79 | 7.65 | 1703 | 114 | 125 | | | 6:00AM | 26 | 6.60 | 6.03 | 6 | 17 | 1.22 | 147 | 11:20am | 34 | 10.63 | 7.14 | 48920 | 5280 | 6293 | 25 | |
| 8/6 | 9:57AM | 29 | 6.77 | 8.27 | 1676 | 105 | 123 | | | 6:00AM | 25 | 6.45 | 6.12 | 6 | 15 | | 125 | 9:50AM | 28 | 5.61 | 7.07 | 49230 | 6200 | 6191 | 34 | |
| 8/7 | 8:25AM | 26 | 6.80 | 6.45 | 1683 | 115 | 124 | 1.75 | 113 | 7:00AM | 27 | 6.48 | 7.69 | 7 | 14 | | 115 | 10:09AM | 27 | 6.02 | 6.95 | 49870 | 6200 | 6657 | 20 | |
| 8/8 | 8:45AM | 26 | 6.84 | 6.13 | 1678 | 114 | 124 | | | 7:00AM | 26 | 6.81 | 6.08 | 10 | 18 | | 111 | 8:40AM | 30 | 6.5 | 6.84 | 49750 | 6240 | 6216 | 33 | |
| 8/9 | 8:13AM | 27 | 7.11 | 7.34 | 1584 | 114 | 120 | | | 7:00AM | 24 | 7.26 | 7.86 | 102 | 102 | | 80 | 8:53AM | 25 | 5.62 | 6.81 | 34560 | 4260 | 4281 | 22 | |
| | | | | | | | | | | | | | | | | | | 8:39AM | 25 | 6.63 | 6.63 | 29930 | 3660 | 3553 | 18 | |