

Richard Healey (adpce.ad)

Subject: FW: 10/26/2023 Weekly Update
Attachments: EDC Weekly Update 26 Oct 2023.docx; 2023 Waste Water Data.xlsx

From: Charles McDowell <CMcDowell@lsbindustries.com>
Sent: Thursday, October 26, 2023 3:33 PM
To: Richard Healey (adpce.ad) <Richard.Healey@adeq.state.ar.us>; Water-Enforcement-Report <Water-Enforcement-Report@adeq.state.ar.us>
Cc: Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>
Subject: RE: 10/6/2023 Weekly Update

Mr Healey,

Attached is the weekly update with the effluent data. There are two data points for Nitrate in Lake Kildeer that appear to be laboratory errors, this is noted in the report, but not in the spreadsheet. If you have any questions, feel free to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

 O: 870-863-1403 |  M: 870-310-6696 |  E: email cmcdowell@lsbindustries.com

From: Charles McDowell
Sent: Friday, October 20, 2023 10:34 AM
To: 'Richard Healey (adpce.ad)' <Richard.Healey@adeq.state.ar.us>; 'Water-Enforcement-Report' <water-enforcement-report@adeq.state.ar.us>
Cc: Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>
Subject: RE: 10/6/2023 Weekly Update

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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 O: 870-863-1403 |  M: 870-310-6696 |  E: email cmcdowell@lsbindustries.com

From: Charles McDowell <CMcDowell@lsbindustries.com>
Sent: Friday, October 13, 2023 1:56 PM
To: Richard Healey (adpce.ad) <Richard.Healey@adeq.state.ar.us>; Water-Enforcement-Report <water-enforcement-report@adeq.state.ar.us>
Cc: Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>
Subject: RE: 10/6/2023 Weekly Update

Mr Healey,

Attached is the weekly update with the effluent data and as requested the Black and Veatch report. If you have any questions, feel free to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

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From: Richard Healey (adpce.ad) <Richard.Healey@adeq.state.ar.us>

Sent: Friday, October 13, 2023 1:22 PM

To: Charles McDowell <CMcDowell@lsbindustries.com>

Cc: Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>

Subject: RE: 10/6/2023 Weekly Update

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Charles

EDCC weekly report references a corrective action report by Black & Veatch. DEQ is requesting a copy of the this report. If you have any questions, please do not hesitate to ask.

Thanks

Richard C. Healey | Enforcement Branch Manager

Division of Environmental Quality | Office of Water Quality

5301 Northshore Drive | North Little Rock, AR 72118

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ARKANSAS
ENERGY & ENVIRONMENT

From: Charles McDowell <CMcDowell@lsbindustries.com>

Sent: Friday, October 6, 2023 11:42 AM

To: Water-Enforcement-Report <Water-Enforcement-Report@adeq.state.ar.us>

Cc: Richard Healey (adpce.ad) <Richard.Healey@adeq.state.ar.us>; Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>

Subject: RE: 10/6/2023 Weekly Update

Please find attached the weekly update, stratification memo, and updated 2023 water parameters for El Dorado Chemical Company.

If you have any questions or concerns, please do not hesitate to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

📞 O: 870-863-1403 | 📱 M: 870-310-6696 | ✉️ E: email cmcdowell@lsbindustries.com

From: Charles McDowell

Sent: Friday, September 29, 2023 10:05 AM

To: 'water-enforcement-report@adeq.state.ar.us' <water-enforcement-report@adeq.state.ar.us>

Cc: 'Richard Healey (adpce.ad)' <Richard.Healey@adeq.state.ar.us>; Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>

Subject: RE: 9/29/2023 Weekly Update

Please find attached the weekly update, and updated 2023 water parameters for El Dorado Chemical Company.

If you have any questions or concerns, please do not hesitate to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

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From: Charles McDowell

Sent: Tuesday, September 19, 2023 2:25 PM

To: 'water-enforcement-report@adeq.state.ar.us' <water-enforcement-report@adeq.state.ar.us>

Cc: 'Richard Healey (adpce.ad)' <Richard.Healey@adeq.state.ar.us>; Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>

Subject: RE: 9/5/2023 Weekly Update

Please find attached the weekly update, and updated 2023 water parameters for El Dorado Chemical Company.

If you have any questions or concerns, please do not hesitate to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

 O: 870-863-1403 |  M: 870-310-6696 |  E: email cmcdowell@lsbindustries.com

From: Charles McDowell

Sent: Tuesday, September 12, 2023 4:23 PM

To: water-enforcement-report@adeq.state.ar.us

Cc: Richard Healey (adpce.ad) <Richard.Healey@adeq.state.ar.us>; Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>

Subject: RE: 9/5/2023 Weekly Update

Please find attached the weekly update, and updated 2023 water parameters for El Dorado Chemical Company.

If you have any questions or concerns, please do not hesitate to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

 O: 870-863-1403 |  M: 870-310-6696 |  E: email cmcdowell@lsbindustries.com

From: Charles McDowell

Sent: Tuesday, September 5, 2023 2:22 PM

To: 'water-enforcement-report@adeq.state.ar.us' <water-enforcement-report@adeq.state.ar.us>

Cc: 'Richard Healey (adpce.ad)' <Richard.Healey@adeq.state.ar.us>; Keith Long <klong@lsbindustries.com>; Derek Turner <DTurner@lsbindustries.com>

Subject: 9/5/2023 Weekly Update

Please find attached the weekly update and updated 2023 water parameters for El Dorado Chemical Company.

If you have any questions or concerns, please do not hesitate to contact me.

Charles McDowell | Environmental Leader | LSB INDUSTRIES, Inc. (NYSE: LXU) | El Dorado Chemical Plant | 4500 North West Avenue, El Dorado, Arkansas 71731

 O: 870-863-1403 |  M: 870-310-6696 |  E: email cmcdowell@lsbindustries.com

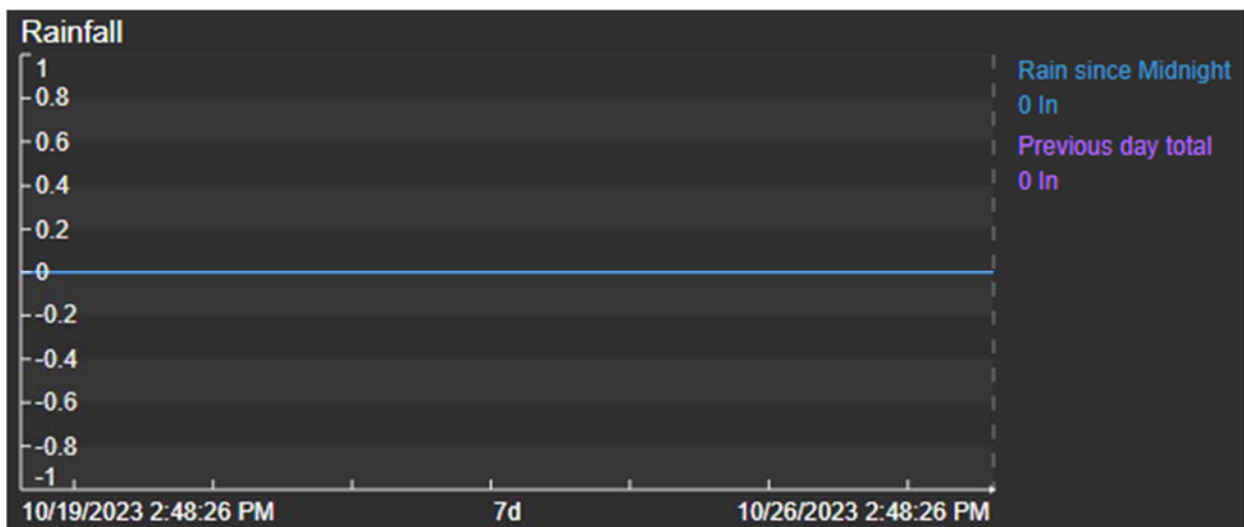
Weekly Report Required by Interim Measures Letter dated 8/4/2023

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

Weekly Report Date: October 26, 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 receive a trace of rainfall. Lake Killdeer levels are currently at 16.76 feet. EDC is attempting to keep the levels of Kildeer below 17.0 feet. During the week we have been able to maintain Kildeer levels by discharging 1.0 MGD. 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. It is expected to have these installed and operation by the first quarter of 2023. 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. EDC has utilized frac tanks to increase the storage capacity of Ammonia Nitrate water to reduce the overflow into Pond 004 from rain events. During the previous rain event it did not appear that any process water overflowed into 004.

Maximize Treatment Efficiency and Capacity

Lake Lee Ammonia Stripper

EDC continues to operate the ammonia stripper with an approximate 20% efficiency. However, during the last week, we have not operated on the stripper. The ammonia concentrations in Lake Lee is low enough to not warrant it.

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.

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.

Evaluating siting and location where to put these package plants with internal engineering in a location near the Pond 004 outfall area.

Contacted 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

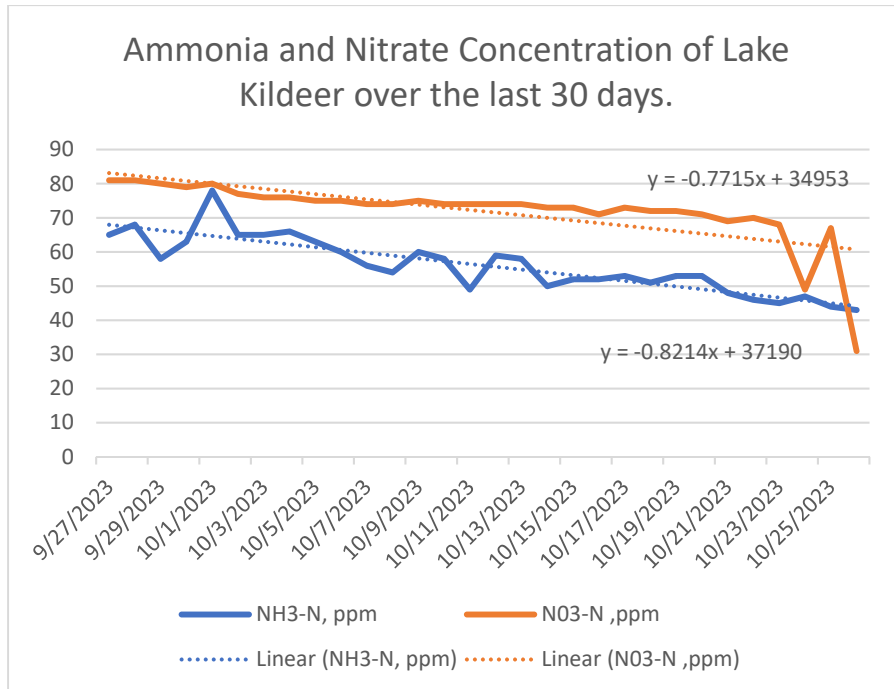
Based upon discussion with supplier of nitrification/denitrification bacteria, EDC will begin dosing Lake Killdeer with calcium carbonate or magnesium carbonate to increase the available of carbon and alkalinity in Lake Killdeer. Increasing available carbon should promote additional biological activity 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.

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. This 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. For the ammonia data for 004, on the 6th through the 10th, the sample testing did not result in complete release of ammonia, resulting in lower levels of ammonia being reported. The sample results for Nitrate on the 24th and 26th of October appear to be artificially low.



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 Kildeer. The field work was completed on September 28th.

Other Actions

In this call EDC was informed we need to obtain a wastewater operator’s license as quickly as possible. Charles McDowell has completed the wastewater operator course work has successfully passed the testing for industrial wastewater operator on the 27th of this month. Additionally, we have had a second operator receive the industrial wastewater license. 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 study 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	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	