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*"Award Winning Water"*

March 5, 2018

Mr. Alan Anderson  
Enforcement Analyst  
Water Division/Enforcement Branch  
Arkansas Department of Environmental Quality  
5301 Northshore Dr.  
North Little Rock, Arkansas 72118

Dear Mr. Anderson:

Pursuant to recent telephone conversations between you, me and members of Russellville City Corporation (RCC) staff whereby you requested a corrective action plan (CAP) for recent wastewater treatment plant (WWTP) violations, we present the following information in response to your request. We understand that the Arkansas Department of Environmental Quality (ADEQ) is currently considering a new or amended order to address these violations and we ask that you take the information presented herein into account when doing so.

Upon our request, you provided a listing of the violations that we anticipate will be addressed within the order. This listing includes a total of 201 violations occurring and reported between October, 2013 thru June, 2017. We acknowledge there has been violations in the months since June of 2017. While we are not specifically addressing these violations, we believe that these most recent violations are due to the same reasons listed herein for the violations prior to June, 2017 and addressing those will also address the most recent as well. Therefore, if those most recent violations are included in a final order/amendment, our response would not change with regard to addressing those violations as well.

We have taken the data that you provided and compiled a spreadsheet listing the pertinent information related to each violation and grouped them with respect to the stated cause. This information is included with this submission. This document is intended to provide information as to how we have and/or plan to address these violations. Some of the corrective actions listed are complete or in progress and may also be included in the CAP submitted and approved for Consent Administrative Order (CAO) LIS 09-146. It is unknown how the improvements cited herein which are also included in the current CAP for CAO LIS 09-146 will be referenced and/or included in a new or amended order, but for purposes of this report, we have assumed that the current approved CAP will remain unchanged with regard to content and timeframe, whether or not the current order is amended or incorporated into a new order.

We at City Corporation feel we are being proactive with respect to the violations presented within this report as we have already begun to address all of the items in some way. Some corrective action measures are defined and being implemented while others are more long term in nature and are in the preliminary stages. It is our

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plan to implement improvements over the next several years that will greatly reduce these violations and increase capacity at our plant to address growth in our system.

### Corrective Action Plan (CAP)

While the causes for the 201 violations vary, most fit within the following categories:

1. Plant construction activities.
2. Inability to process and dispose of proper amount of sludge.
3. Rainfall events creating hydraulic overloading.
4. Toxic slug received at the plant affecting biological treatment.
5. Operator error.
6. Equipment malfunctions.

The CAP presented herein will center around these six causes that address the cited violations.

- 1. Plant construction activities** – There is a total of 128 violations that we considered to be totally or partially due to construction activities at the WWTP. This construction was included in the CAP provided to address total residual chlorine (TRC), total suspended solids (TSS), ammonia (NH<sub>3</sub>) and Nitrates (NO<sub>3</sub>) as specified in CAO LIS 09-146. Compliance was addressed with two projects, the first being a project to construct new dechlorination facilities to address TRC and the second being a large project to address TSS, NH<sub>3</sub> and NO<sub>3</sub>.

The first project included construction of a new dechlorination building that housed a new sulfur dioxide system (SO<sub>2</sub>) and chlorine analyzer with automated chemical feed adjustment capabilities. This project was constructed from February to November of 2013 with a final construction cost of \$597,840. It should be noted that this project was designed, approved and built to meet the TRC limit at that point in time of 0.1 mg/l. Unfortunately, this limit was reduced to 0.011 mg/l during our permit renewal in September of 2016 rendering the entire largely ineffective with regards to monitoring and adjustment as we basically treat to non-detect levels. These improvements had a direct impact on the TRC removal process at certain times during construction and start-up. Alternate disinfection methods are currently being strongly considered in future plant improvements to permanently address this issue.

The second project included addition of aeration basins, anoxic zones, addition of secondary clarifiers, removal of trickling filters and other associated facilities to address the TSS, NH<sub>3</sub> and NO<sub>3</sub> limits. This project was constructed from July, 2013 to July, 2015 with a final construction cost of \$11,018,635. These improvements were plantwide and had a direct impact on the plants ability to perform at or near treatment and flow capacities for many months. These improvements were designed and constructed based on historical loadings at the wastewater plant. Since that time, our organic loading has increased substantially, which was not anticipated during the design. This increase has caused our plant to operate at the upper end of our design treatment capacity. While this may not be directly attributable to the

violations noted, we feel that it is prudent to address this increase in loading and flow through a plant expansion. We are also working with local industries to reduce their nutrient loadings where possible and practical.

**CORRECTIVE ACTION: The construction specifically referenced above related to TSS and Nitrates has been completed and, therefore, the plant is no longer compromised due to such activity. Consequently, the violations due to this issue have been addressed and no further action is required.**

- 2. Inability to process and dispose of the proper amount of sludge** – Historically, City Corporation has struggled to process and land apply sludge at the rate and volumes required for optimum treatment. Issues related to number and size of digestion basins, reliability and processing rate of sludge belt presses, and availability and accessibility of permitted lands have presented constant challenges which have affected wasting and recirculation rates. These limitations have compromised staff's ability at times to move sludge as needed to optimize plant performance. Because of this, we have experienced violations due to excess sludge volumes in our basins.

**CORRECTIVE ACTION: As part of the recent plant improvements to address TSS, NH<sub>3</sub> and NO<sub>3</sub>, sludge handling improvements were added totaling approximately \$5 million. This included construction of a new, separate sludge handling facility that included purchase and installation of a closed vessel lime stabilization system and new high speed belt filter press. This system is capable of producing Class A Biosolids at a rate that does not inhibit plant operation and does not require permitted land application. We now store the final product and allow the public to take and use for soil amendment. This project has been overwhelmingly successful and has addressed all of the issues mentioned above related to sludge handling. Consequently, the violations due to this issue have been addressed and no further action is required.**

- 3. Rainfall Events creating hydraulic overloading** – Historically, City Corporation has experienced high flows in the collection system and at the wastewater treatment plant during rain events. City Corporation has also been placed under administrative order on more than one occasion, including CAO LIS 09-146, for wastewater overflows in our collection system. Currently, we are addressing the overflows in our collection system through a multi-year, \$50 million capital improvement plan and are also attempting to treat the flows that reach the plant. The addition of storm water basins over the years has helped but was basically a short term band-aid as we can fill the storm water basins in a matter of hours during a heavy rain event. It was decided rather than storing and/or treating the excess flows, we would invest in our collection system and stop the inflow at the source, not only reducing flows that cause overflows and plant wash-outs, but also save pumping and treatment costs.

This plan of improvements was submitted to and approved by ADEQ in response to CAO LIS 09-146. We have been given a deadline of 2022 to complete this list of projects and are on track to do so. The

design engineer is predicting a reduction of approximately 30% based on their experience and projections, which should bring the flows to a level that can be accommodated at the treatment facility.

**CORRECTIVE ACTION:** We would offer this existing slate of projects as mentioned above as our plan to achieve compliance through the reduction of flows at the wastewater plant to within the hydraulic capacity of the plant. Future expansion of the plant will also aid in the plants ability to process higher flows through the proposed increase in design flow and optimization of the flows to and from the storm water basin. This expansion is currently in the conceptual planning stage and will deal with not only increasing the design flow of the plant, but repairing structural issues, increasing operational flexibility and addressing flooding issues around the headworks and chlorine contact basins. We do not feel this project is required to achieve compliance with the violations listed given the slate of collection system projects already committed to, but wanted to mention it as staff is moving forward with the development of such a project to help address some of the issues described herein as well as prepare us for growth in the community.

- 4. Toxic slug received at the plant affecting biological treatment** – From time to time, our plant experiences issues related to the health of our biomass, primarily the nitrifying bacteria. We have not been able to explain the timing nor the immediate impact on the biomass other than being the cause of a toxic substance entering the plant. The compromised biomass is rendered incapable of fully treating the wastewater, resulting in several  $\text{NH}_3$  violations as noted. Of the six causes listed and addressed herein, we consider this item to be one of the two, along with hydraulic overloading, that is having the largest impact on our ability to meet permit. We have hired different professional engineers to study this anomaly and provide their opinion of what could be causing this to happen. They have all pointed to a toxic slug. We thought at one point that the increased loading may be affecting the different types of bacteria during the colder months due to the food to microorganism (F/M) ratio. However, while this is an issue that will be addressed in the future through a plant expansion, studies by Garver show that the plant should be capable of meeting permit limits during cold weather with the increased loading. This has been confirmed during these recent months when the plant has operated well as compared to last winter when it did not. Until this month, where the recent rains have created several violations, we have seen the plant perform well during the coldest winter we have experienced in some time. Therefore, as a result of these findings, our focus has been on identifying the source of the toxin and eliminating it.

We have gathered Material Safety Data Sheet (MSDS) information and made site visits to a number of industries that we feel have the ability to release an amount of toxin that could inhibit our plant. We are assuming it is a quaternary ammonium compound as these are common for sanitizing and cleaning and are used at several of our industries. At this point, we have narrowed the list to a handful of industries and will continue our efforts to locate and eliminate this occurrence. Since we have no way yet of knowing exactly what is entering our system, we cannot prepare for such an occurrence and short of bypassing the influent, there is no practical way to detect and/or deal with it at the plant. So the only solution is to prevent it from entering our collection system at its source. We have also been in contact

with EnviTreat laboratories out of Northwest Arkansas and will engage their assistance as needed to address this issue.

**CORRECTIVE ACTION: Continue to investigate industries to determine the source(s) of toxin entering our wastewater system. We will also engage the services of professional engineers and/or independent laboratory services as needed to evaluate this situation. Until this can be accomplished, future occurrences will undoubtedly continue. As there is no practical way to detect and/or treat at our plant, the source of the toxin must be identified and measures put in place to prevent toxins from being released into our system.**

- 5. Operator error** – Inherent to any operation where employees are involved, there is an opportunity for errors from time to time that affect plant performance. Most of the violations involving operator error involved the dechlorination equipment when we were attempting to use the control loop utilizing the chlorine analyzer. This process did not lend itself to monitoring and control due to the amount of cleaning required to keep the analyzer probe clean which could lead to a false reading of no chlorine indicated and the SO<sub>2</sub> system would adjust accordingly based on the faulty reading. This became increasingly difficult once the permit limit was lowered. We began running the SO<sub>2</sub> feed system in manual mode to achieve proper dechlorination and continue to do so. Other violations due to operator error were random in nature and are expected to be isolated incidents.

**CORRECTIVE ACTION: Regarding the violations related to the chlorine feed system, those issues have been addressed by running the system in manual mode. This was done because the permit limit was lowered and the troublesome chlorine analyzer was removed from the process. In all cases of operator error, the employee was counseled and/or reprimanded as appropriate and training was performed if needed to confirm that all employees were properly instructed so as to prevent similar occurrences in the future. We also continue with a much needed effort to upgrade job descriptions and salaries to attract higher quality applicants for new hires. We feel that we have taken all reasonable steps to minimize operator error. Consequently, the violations due to this issue have been addressed and no further action is required.**

- 6. Equipment malfunctions** – Unfortunately, equipment malfunctions can, at times, lead to violations. As mentioned in the previous item, we experienced this at the new dechlorination facility and decided to operate it in manual mode to remove the malfunctioning part, which has resolved the problem. Other malfunctions happen from time to time and every effort is made to correct as quickly as possible to avoid disruption of the treatment process. We have made purchases of back-up equipment as deemed necessary to minimize these occurrences.

**CORRECTIVE ACTION: Regarding the violations related to equipment malfunction, the chlorine feed system issues have been addressed by running the system in manual mode. This was done because the permit limit was lowered and the troublesome chlorine analyzer was removed**



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**from the process. For all other cases, staff made necessary precautions up to and including purchase of spare equipment as necessary. Consequently, the violations due to this issue have been addressed and no further action is required.**

### Summary

To summarize the information presented above, City Corporation staff feels that based on the information acquired and studies performed over the last couple years, there are three primary reasons for the large number of violations noted since October, 2013. The majority of the violations listed from Oct, 2013 through May, 2015 are largely related to the plant construction activity going on at that time that was approved by ADEQ to address CAO LIS 09-146 and these violations should not be considered in a new/amended order or at least listed and exempted since the cause for those violations no longer exists.

The two other main reasons for the majority of the remaining violation are exceeding hydraulic capacity of the plant and/or the introduction of a toxin that impacts the health of our biomass. We feel that addressing these two issues as proposed above will allow us to achieve compliance with existing permit limits.

It should also be noted that we have engaged Garver engineers to revise our wastewater master plan that will include recommendations for a wastewater plant expansion. Such an expansion will increase the design capacity to meet long term growth, which will also help address some of the items mentioned herein related primarily to hydraulic loading, equipment and operator error, and to a degree, the ability to address toxins. It is our plan to move forward with an expansion that not only increases our design flow but also addresses some structural issues and improve operator flexibility. As we currently are in the very preliminary stages of the study phase, the scope and cost of such a project is unknown as is the source of funding for such a project, but we are dedicated to moving this project along as quickly as is feasible.

We do not want to be in a situation where we are given a very short timeframe to achieve such a large project for fear of rushing to meet a deadline and not fully incorporating all the improvements needed. We feel this happened with the last expansion as mandated in CAO LIS 09-146 and do not want to be in this same situation again. As stated above, we do not feel that this project is required to achieve compliance as of today, but we want to make sure that this plant expansion addresses current issues as well as future growth so that we are not in this position again. We hope that our commitment to do so is seen as putting an end to the band-aid approach given ample time to do so.

As with most wastewater master plans, RCC is looking at a 30-year planning horizon for the PCW. All NPDES permits expire every 5-years and the current RCC permit is scheduled to expire on August 31, 2021 and the limits can be revisited each time the permit expires. Therefore, during the 30-year planning period, the RCC PCW NPDES permit will be renewed five times. RCC would like to ask ADEQ to provide any future changes to the permit so we can include those changes in the PCW Master Plan. We realize this may be difficult to forecast permit limit changes beyond one permit cycle but any information you can provide us would be



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appreciated. If possible, we would like to receive the future permit information within 30 calendar days from the date of this Corrective Action Plan

We hope that this correspondence provides you with the information requested. If you need more information and/or clarification on the information presented, feel free to contact me at 479-968-2105. We would also welcome the opportunity to meet and discuss this information at your convenience if you feel it would be beneficial.

Sincerely,

Steve Mallett  
Chief Executive Officer

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