

November 14, 2017

Arkansas Department of Environmental Quality  
Water Division  
ATTN: Leslie Allen-Daniel  
5301 Northshore Drive  
North Little Rock, AR 72118

Re: City of Hot Springs  
Request for CAO Termination  
CAO LIS No. 08-099

Ms. Leslie Allen-Daniel,

This document is intended to serve as a formal request for the release of CAO (8-099). The information offered in the remainder of this letter will provide data we believe substantiates our compliance with the original CAO mandate.

This final report is submitted to the Arkansas Department of Environmental Quality (ADEQ) to comply with CAO LIS No. 08-099, Attachment A: Schedule of Compliance Activities, Condition II. 1. The City of Hot Springs (CHS) continues the efforts presented in the document "City of Hot Springs – Response to Consent Administrative Order" dated November 14, 2008 (Response to CAO) with respect to the sanitary sewer collection system. This update follows the same format as the previous annual reports which specifically address the Major Goals presented in the aforementioned response from the city and is submitted to advise that the majority of those goals have been met.

The Consent Administrative Order, which was issued in August 2008, identifies specific issues with the sewer collection system and mandates that the City of Hot Springs address these issues in a defined time frame. The city takes pride in our accomplishments to date and feel that we have met our goals.

We are committed to continually make strides towards the ultimate goal of preventing further wastewater overflows and treatment bypasses through a systematic renewal and improvement effort that also insures long term compliance. Our current efforts remain centered on correcting remaining items that have a direct impact on reducing inflow and infiltration, the root cause of the system deficiencies that lead to wastewater overflows and treatment capacity issues. However, as we have noted in past reports, we are also focusing on the overall health of our system. This approach is intended to mitigate degradation and ensure neglect does not allow our system to experience this type issue in the future. We remain committed to sustaining the improved collection system and to instilling a value of stewardship among our staff.

The latest annual report, presented in February 2017, provided a summary of our efforts to date and our overall plans to achieve compliance with respect to overflows. This final report served to update our continuing efforts regarding preventing wastewater overflows by utilizing our innovative pump station monitoring system, ongoing pump station replacement and repairs, line rehab and replacement, manhole rehab/replacement, improved maintenance procedures and internal staff training in process improvement.

Since the issuance of the CAO in 2008, the city has spent and/or encumbered approximately \$70 million on projects related to achieving compliance. This project funding was made available by the 2009 and 2013 Bond funds. These funds were judiciously administered by carefully prioritizing the system issues noted in the August 2008 CAO and developing projects to resolve those issues.

The 2009 Bond issue yielded \$26.8 million in funds that were expended on specific projects by the end of 2013. That expenditure satisfied the Bond requirement but was not enough to complete all the projects needed to meet the CAO requirements. Additional projects were funded by a 2013 Bond issue yielding approximately \$40M.

This report included a list of projects funded by the 2013 bonds. It is attached to this report as Appendix A and includes a complete listing of all completed, current, and planned projects identified at this time, along with actual and estimated costs for each.

It is important to note that we continually analyzed and revised this list of projects with our staff and engineering partners to ensure we were staying on the course that best addressed the goal of achieving and sustaining compliance with our CAO mandates. As a result of the data obtained from the post rehab flow monitoring, we identified some priority changes to future projects. We remain committed to continually reviewing the best available data and updating the project list in order to ensure the most effective solution.

In the 2012 summary, we provided the final component (Chapter 6) of the Sewer Evaluation and Capacity Assurance Plan (SECAP) as well as an Executive Summary, which were included as Appendix B. Post Rehabilitation flow monitoring was conducted in 2013 in areas where extensive infrastructure repairs were made, and significant results were achieved. Post rehab flow monitoring was again performed in 2015 to validate work performed in 2014. The City's Wastewater hydraulic model was updated with the post rehabilitation flow monitoring data, and updates to the SECAP's capacity projects were made and efforts undertaken were graded.

It is important to note that the list of improvements is extensive and includes some substantial improvement projects that are not directly related to elimination of known overflows. City staff prioritized and phased these projects to first perform work that would

have a more immediate impact on the wet weather overflows and the CAO requirements. We are committed to a long-term schedule of capital improvements that will mitigate overflows and continue to improve the overall health of our wastewater system. Each annual budget has within it funding assigned from the operating budget to continue improvement projects in support of improving our overall system.

As stated in previous annual reports, we continue to realize benefits from our AMI water meter system completed in 2011. As you are aware, our wastewater rates are based on actual water consumption and not a flat rate charge. The accuracy in water consumption is directly affecting our revenues for the Wastewater fund. We have seen this provide an increase in wastewater revenues and expect that trend to continue in the coming years. Due to projects such as these and other budgetary and operational process improvements, the overall health of our Wastewater Fund continues to be stable. Annual rate increases approved in 2009 and 2014 continue to provide the funds necessary to meet our debt obligations, as well as fund our operating budget. The city's rate consultant will, as appropriate, continue to review our wastewater rates regarding the current and planned budgetary obligations to further ensure that we are in a good financial condition moving forward.

The City of Hot Springs acknowledges that our efforts cannot stop once compliance is achieved. Our operating budget(s) will include provisions for additional equipment needed to continue and improve our preventive maintenance program. We have also increased our maintenance staff levels for the past (2ea) years to improve our program. Efforts such as pipeline cleaning and pre-treatment programs continue to be developed, implemented and/or improved. Addressing these components, as well as committing to hire, train and retrain qualified staff, is imperative to continually improve on and preserve the work now being performed.

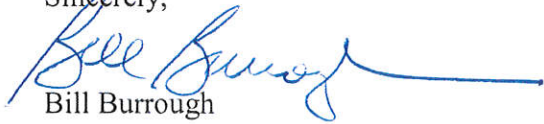
As noted in the 2012 report our reorganization and staffing changes in 2011 continue to add value to this effort. A maintenance planning process has been implemented and is yielding positive results in that pursuit. The City of Hot Springs also remains committed to keeping our customers informed of the progress in implementing the projects associated with the CAO effort. In 2012, we provided a Wastewater Bond Projects Update detailing our efforts to date. That brochure was included in the 2012 report as Appendix C. In 2013, we produced a video that was used to update our customers on the status and our commitment to continue the efforts related to improving our wastewater system. This video is available on several media venues for the public to view. We continue to utilize our web site and local public information television programs to inform our customers of the projects and progress to date of our CAO related efforts.

We trust that our efforts demonstrate the city's commitment in addressing all the issues outlined in the CAO and compliance thereto. The City respectfully requests closure of the CAO. We sincerely appreciate the continued cooperation from ADEQ and EPA in working

Arkansas Department of Environmental Quality  
October 27, 2017  
Page 4 of 19

with us as we progress in our efforts. Please feel free to contact me at (501) 321-6860 if you have any questions or need additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read "Bill Burrough", with a long horizontal flourish extending to the right.

Bill Burrough  
Deputy City Manager, City of Hot Springs

cc: City of Hot Springs Board of Directors  
David Frasher, City Manager  
CAO File

## **REQUEST FOR CAO TERMINATION**

### **1. ACHIEVE COMPLIANCE WITH REGARDS TO DRY WEATHER OVERFLOWS BY JANUARY 1, 2011.**

A previous annual report submitted on February 28, 2012 included a special section dedicated to achieving compliance with regards to dry weather overflows by January 1, 2011 as stated in the CAO. At that time, it was reported that efforts we had made in the twelve (12) month period since the time that funding was actually acquired in December 2009 were substantial, and we felt that we had complied with the mandate. However, it was stated that many of the capital projects and maintenance procedures that had a direct impact on dry weather overflows were ongoing. Since that time, we continue to make great strides in monitoring our large number of pump stations as well as the repair, rehabilitation and maintenance of those stations. The following section provides an update on those projects as related to eliminating dry weather overflows.

As stated in previous reports and conversations, city staff defined certain projects and/or practices that would directly impact issues related to dry weather overflows and allowed us to achieve compliance with the order. As these types of overflows in the Hot Springs Wastewater System are almost entirely related to pump station issues (power outage, lack of and/or failing SCADA units, mechanical pump failure, etc.), our efforts were primarily focused on addressing these shortcomings. The only non-pump station related item identified to address dry weather overflows is the development of an effective pipeline flushing/cleaning program. Therefore, the following is an update on those items that staff feels represents the major issues that lead to dry weather overflows.

1. Pump Station Rehabilitation and Backup Power
2. Major Pump Station SCADA System
3. Minor (Grinder Station) SCADA System
4. Preventive Maintenance Program
5. Pipeline Cleaning Program

### **PUMP STATION REHABILITATION AND BACKUP POWER GENERATORS:**

The City of Hot Springs has identified that the primary causes for dry weather overflows include equipment failure/malfunction and the loss of power at a pump station. The City retained Garver, LLC to begin evaluating pump stations that were considered to be critical to the collection system. An initial list of 76 pump stations for evaluation was developed by the City based on the condition of the station, frequency of overflows and station capacity. Garver conducted meetings with City personnel to gather any available information for the

pump stations on this list. Garver then began performing field investigations of the listed pump stations. Pump operating performance, influent flowrate, power usage, run hours, site measurements, equipment information, general site notes, and pictures were recorded at each station. Collection information in the field regarding pump characteristics and overall site layout was necessary to progress further with the collection system evaluation.

Once field investigations were completed, the data collected was compiled and developed into a report for each station. The reports included field information, wet well drawdown calculations, photographs, and recommendations for improvements. An example of those reports was included with the February 28, 2012 report.

The approach for evaluating the pump stations has evolved over time and evaluations are now being performed based on drainage basins. This approach allows for measuring the capacity of a pump station and determining if the pumps and force mains are adequate. Field evaluations have been completed for over 100 pump stations and reports have been compiled for more than 60 pump stations.

Design phase estimates on household wastewater contributions, inflow and infiltration, and peaking factor are being used to calculate the total peak flow for each pump station rated above 5 HP in the Mazarn basin, starting with pump stations furthest “upstream” from the basin collection point and working “downstream”. Total peak flows have been calculated for 60 pump stations in the Mazarn basin. System curves and hydraulic grade lines have been developed for seven major pump stations. After completing system curves for all pump stations, analysis and design began on upgrading pump stations and force mains to eliminate wet weather overflows. RJN Group has been retained by Hot Springs and has presented Hot Springs with an accurate model of the collection system. The model serves as the essential tool in verifying pump station capacity calculations by allowing the comparison of predicted flows and calculated flows at a pump station. If these values agree, then a greater level of confidence can be placed in the design effort. If a discrepancy between the two is identified, then additional investigation is required to determine the cause of this disagreement. Other design approaches have been considered in this phase such as consolidating several smaller pump stations into one new pump station or into an upgraded existing station. This approach could reduce operational costs by having fewer pump stations and reducing staffing cost needed for maintenance and inspection. The model developed by RJN Group was recognized nationally at the annual WEFTEC conference in New Orleans, La. in October 2012. RJN Group presented a paper on this topic at the 2016 WEFTEC conference.

Currently, we are addressing issues at many our wastewater pumping stations related to backup power, mechanical dependability and SCADA monitoring. While the preceding information describes our current efforts, we do realize that it does not address all our pump stations. In addition to the pump stations detailed above, there are a number of duplex grinder stations used for small subdivisions and commercial businesses that were evaluated



with regards to mechanical dependability, back-up power and SCADA. These evaluations will be performed once all major stations and individual grinder stations are addressed.

Staff has identified four of our pump stations that will be equipped with a backup pump system (Godwin Pump) utilizing natural gas as the fuel. Staff chose to utilize a pump capable of maintaining flows during a utility power outage instead of a backup generator. This type of pump will also enable staff to work on the station equipment and take the station off line to perform maintenance or repairs. This backup pump system is being utilized at some of our larger stations and has proven to be very effective. This is scheduled for completion in December 2017.

#### **MAJOR PUMP STATION SCADA:**

As mentioned in previous reports, the City acknowledges that one of the most critical shortcomings within our wastewater collection system was the remote monitoring of our 3,400+ wastewater pump stations. Historically only a small portion of those stations had remote monitoring and of those that did, many of the units were obsolete and/or were no longer supported by the company that supplied them. This lack of remote monitoring was primarily responsible for the inability of staff to respond to a system fault until after an overflow occurred. For this reason, the City of Hot Springs entered into contract to develop a SCADA Master Plan to provide a comprehensive, standardized remote monitoring system utilizing equipment that incorporates an open architecture that is not proprietary. This would allow us to continue to build upon a stable, standardized system with compatible equipment that can be operated and programmed by anyone who understands basic PLC programming. This plan was completed in 2008 by Brown Engineers. Funds were budgeted in 2016 to once again update the current SCADA Master Plan.

With regards to implementation of the SCADA Master Plan, the City has installed major components related to the communications backbone and computer hardware and software at the Ouachita Water Treatment Plant. This includes a new Master Radio with connections to the new computer-based Ignition System Platform Human Machine Interface (HMI) system. A new radio repeater was installed at the West Mountain Tower which will provide coverage for the water distribution system and sewer collection system. The first radio-based Remote Telemetry Unit (RTU) has been installed at Music Mountain Pump Station. With the communications system complete and design of the first 80 RTU's complete, construction began in late 2012 to install the RTU's on major lift stations. The cost for this project was \$1,600,000.00 and was completed in December 2013. This SCADA RTU Installation Phase 2 was designed and implemented by Brown Engineers and provides SCADA system visibility and alarm/alert capability to truly monitor these major sites.

For those first 80 remote sites, the SCADA system remote equipment was split into three categories. The first category is the larger pump stations and tanks which require near real-time information regarding pump status, pressures, flows, and tank levels. There are approximately 20 of these sites. The second category is the wastewater duplex pump stations, and there are approximately 60 of these sites. The Sensus FlexNet metering system, allows these 60-small duplex pump station RTUs to deliver data to the SCADA system HMI computers through another database connection developed by Brown Engineers.

The third category is the Grinder Lift Stations of which there are over 3,400 sites. These are described later in this report under the heading Grinder Lift Station SCADA.

The remote site data consists of both water and wastewater systems. The SCADA system must send the appropriate data to our Ouachita Water Plant and Regional WWTP so the treatment and distribution operators have access to real-time data. Brown Engineers has configured the Human Machine Interface (HMI) computers at each plant for these graphical representations of the remote data as well as historical trending, alarming and reports for these remote facilities. A unified HMI software system is in place so that SCADA system data can be made available at any plant, as well as for management, supervisors, and engineers in other locations who need access to the system information. The Regional WWTP HMI was updated in early 2013; however, further control systems upgrades were required for SCADA operations. Phase 1 of the Regional HMI project was completed in 2015. Phase II development was completed in 2016. The HMI computer system upgrades were critical since they provided visibility into the process for all our staff. In addition, the HMI computer software was configured for alerting the staff of process conditions.

#### **GRINDER LIFT STATION SCADA:**

As mentioned in previous annual reports, our consultant, Brown Engineers worked with the SENSUS Company to utilize our existing automated water meter reading communications system through a modified electrical meter socket to provide a cost-effective alarm status for over 3400 individual wastewater grinder stations that we have in our system. Previously, none of these stations were equipped with remote monitoring devices other than visual and/or audible alarms. We were dependent on area residents to notify us of problems with these stations, hopefully, before an overflow event occurred. Many of these stations, however, are located at homes that are not occupied full-time and alarms may go unnoticed for some time if the property owners are not present. Also, the alarm system may be inoperable, and we would have had no way of recognizing a fault without individually checking each station.

This system, which utilizes our AMI (automated water meter reading system), includes a modified electrical metering device (Radio Alarm Meter) that will deliver a high level or power fail alarm to our central SCADA system via the new remote communications network



should a failure occur. The Alert Management System allows us to respond independently without relying on homeowner notification and thereby greatly enhances our ability to prevent overflows on grinder stations. Including the cost of engineering design, application development, programming and system integration, the cost for each installation was approximately \$458 per site. This cost was substantially lower than any traditional RTU and provided the critical data to our staff real-time. This project was awarded to All Service Electric and is complete. The devices that have been installed are working properly and provide alarm status of over 3,400 grinder stations. The cost for this work was \$869,504.60.

Again, we did not propose this work in the original scope presented in our response to the CAO as we were not aware of any practical way to effectively monitor these stations at a reasonable cost. We are grateful to our consulting engineer, Brown Engineers, and SENSUS metering company who worked together to craft a solution to this historical issue. This project was recognized in 2012 by the ACEC (American Council of Engineering Companies) and received the Grand Conceptor Award.

Another benefit realized from the SENSUS FlexNet metering system was the use of small duplex pump station RTUs that deliver data to the SCADA system HMI computers through use of another database connection developed by Brown Engineers. These enhancements continue to add value to the Sensus Advanced Metering Infrastructure.

Further power system improvements were put in place at the Purchasing/Finance Building in 2014. A new standby generator was bid in late 2013 and installation completed in 2014. This generator is integral to our overall SCADA collection of data related to our AMI and Grinder Alert systems.

Generator Monitoring Systems have been installed at 16 critical sites to allow for remote monitoring of the generator engine controller and the automatic transfer switches that control power from the electric utility or generator. This project was completed in late 2014.

#### **PREVENTIVE MAINTENANCE PROGRAM:**

The City of Hot Springs staff continues to place emphasis on a comprehensive and effective preventive maintenance program as we realize it is critical to ensure pump station(s) and pipeline reliability. Currently, the CHS staff has a crew dedicated solely to preventive maintenance. This has allowed for the other major station crews to focus on pump station planned maintenance and repair. We continue to improve and upgrade the process of our preventive maintenance program.

The Maintenance Control Center's ability to monitor SCADA from their desktops along with email alert notifications has proven to be an asset for the staff. This program has helped

reduce response time and thereby greatly reduced the potential for many SSO's. Maintenance Control has also developed preventive and planned maintenance programs and has improved daily operational processes. These improvements have had a direct impact on the group's efficiency. A recent upgrade to the Cityworks software has allowed for improved tracking and reporting. City staff continues to work towards improving our maintenance programs utilizing industry best practices, innovative techniques and Cityworks software.

We continue to gather information on our extensive inventory of pump station equipment. During the early years of implementing the preventive maintenance program we have confirmed what everyone already realized, each station is unique and the "one size fits all" approach does not apply to our vast system and facilities. With input from both our maintenance staff and the vendors who supply our pumps we continually upgrade our information data base and make the necessary changes to better service each station. We realize that this effort will be an ever growing and daunting task; but we know it is a necessity that the City of Hot Springs staff remains steadfast and unremittingly looks for improved ways to ensure the success of this effort.

#### **PIPELINE CLEANING PROGRAM:**

Staff continues to evaluate and revise our pipeline cleaning program as situations arise and update our list of known trouble areas. We continue these efforts both in response to reported issues and as part of the monthly schedule to flush mains that are habitually plugging for various reasons. We continually monitor our overflow reports that are a result of grease, etc. ensuring any of these that appear to be repeat offenders remain on the list to be periodically cleaned as a preventive measure.

The City of Hot Springs Wastewater Pretreatment Department remains diligent in their inspection efforts as they continue to inspect commercial establishments that have food service capable of producing grease waste. All to ensure that these businesses are compliant with the Pretreatment Ordinance requirements related to trapping and disposing of waste grease. Based on these focused efforts since the passage of an amendment to the Pretreatment Ordinance in 2002, which included strict regulations related to fats, oils and grease, we continue to see improvement in this area. We have experienced a reduction in the occurrences of SSO's and sewer line blockages because of regulating the design, installation, cleaning schedule and maintenance of the grease interceptors, oil separators and grease recovery device (GRD) units. Educating the public about the hazards associated with the disposal of cooking grease has also had an impact in reducing SSO's. Our Pretreatment Division has taken enforcement action with several businesses in recent years to emphasize that our ordinance will be strictly enforced.

As we complete projects related to reducing inflow and infiltration, we must be aware that these efforts may lower the flow and velocity in the lines which may increase the potential for blockages/build up due to grease. With this said, we continue to keep our fats, oils and grease program a top priority for our Pretreatment Division.

## **SUMMARY OF SECTION 1 – DRY WEATHER OVERFLOWS**

Given the listing of work mentioned in this report, the City of Hot Springs continues to be proud of our efforts to date targeted at addressing the dry weather overflows. Post rehab monitoring data provided in 2013 indicated a reduction in I/I of ~21% in the tributary to the Southwest Wastewater Treatment Plant. Additionally, post rehab monitoring for the tributary area for the Davidson Dr. WWTP occurred in 2015 and indicated an ~11% reduction in I/I. Hot Springs undertook a city-wide manhole rehabilitation project, which addressed approximately 40% of the Utilities 12,000 manholes, along with targeted sewer line rehab for high contributors of I&I into the sewer system. We fully recognize this was no small achievement. With the additional scope of work currently in progress we remain hopeful the next phase of flow monitoring will continue that trend. Our current plan is to perform the next phase of post rehab flow monitoring at the appropriate time to validate the efforts which are currently in progress. Now that we have raised the bar, we accept the fact our challenge will be to sustain our overall efforts. Everyone involved is committed to accomplish the remainder of the work required as we endeavor to achieve the goal of eliminating overflows. We believe that the work completed to date, in addition to future work (detailed in Appendix A) has shown our commitment to our community to provide a safe and reliable wastewater collection and treatment system(s). We continue to be encouraged by the trends we are seeing related to plant flows, overflow volumes, etc. We are extremely excited about our ability to develop and utilize new technology that allows us to monitor large components of our system. Those items once thought to be impractical due to both the logistics and cost. The city owes our gratitude to all the firms who have worked on the vast array of projects to date. By partnering with these groups, we have found innovative and dependable ways to develop cost effective solutions to the problems we face.

The City of Hot Springs has effectively implemented the following major items to address dry weather overflows:

1. Pump Station Rehabilitation and Backup Power
2. Major Pump Station SCADA System
3. Minor (Grinder Station) SCADA System
4. Preventive Maintenance Program
5. Pipeline Cleaning Program

## **2. ACHIEVE COMPLIANCE WITH REGARDS TO WET WEATHER OVERFLOWS BY JANUARY 1, 2018.**

On August 27, 2010 the City of Hot Springs submitted the original System Evaluation and Capacity Assurance Plan (SECAP), along with an update that was current at the time of that correspondence. An updated SECAP, which includes the results and the wastewater collection system assessment and hydraulic capacity analysis dated September 29, 2011 was included with the February 28, 2012 update. That report outlined all the inflow and infiltration sources found in the field, as well as the capacity and structural deficiencies within our system that need to be addressed based on priority.

With respect to our efforts related to wet weather overflows, all items mentioned in the special report related to dry weather overflows contained herein obviously contributed to satisfying the wet weather overflow issues as well. In addition to those efforts, CHS retained RJN Group, Inc. to perform a Sanitary Sewer Condition Assessment and Capacity Evaluation Study to evaluate the collection system and identify potential deficiencies that may require attention. This study included a system wide flow monitoring program which has been completed. The results, which have been presented to ADEQ and EPA, provided information that allowed us to prioritize our efforts related to the physical inspection of the collection system.

Notably, of the manholes inspected during the collection system study, 4,500 required some type of corrective action, ranging from sealing of the ring to total replacement. The first two of a total of four phases of manhole rehabilitation contracts have been completed totaling \$3,410,523. This effort removed approximately 2.98 million gallons of inflow/infiltration for a one-year storm event. This project included 1,849 manholes that were rehabilitated and 139 manholes that were completely replaced. Post Rehabilitation flow monitoring occurred in twelve basins in 2013, which manhole rehab concluded within the first project and a 22% reduction in overall inflow was observed to the Southwest WWTP. A 10.4% reduction in overall inflow was observed to the Davidson WWTP from post rehab construction flow monitoring which occurred in 2015. Construction began on the remaining two phases of manhole rehabilitation in May 2014 and construction was completed in early 2015. This project included 1,704 manholes that were rehabilitated and 60 manholes which were completely replaced. This project totaled \$2,181,111 and will remove an approximate 2.16 million gallons of inflow/infiltration for a one-year storm event.

In addition, 662 manholes were identified as good candidates for Uretek, utilizing their patented polymer and \$650,000 was awarded to rehabilitate those manholes and this project concluded in early 2014. This project addressed infiltration more than inflow and will have addressed approximately 0.806 million gallons of infiltration. The City of Hot Springs, through its aggressive campaign of repairing all defective manholes across the entire service area, will have spent over \$6.20 million dollars and removed over 5.94 million gallons of inflow/infiltration for a one-year storm event. The results to date serve to further validate that our plan is effective and well thought out.

More than 10,500 linear feet of new gravity pipe feeding the Stokes Pump Station was designed and construction completed in 2016. Leaving the Stokes Pump Station, a new 24-inch parallel force main was designed, and construction is nearing completion. These two projects will eliminate the choke point of a significant capacity restraint entering and leaving Stokes Pump Station. Along with upgrades to Stokes Pump Station these projects will remove 18 historical overflows the City has along McLeod St.

In addition to the manhole repairs, RJN Group, Inc. has completed smoke testing of all the system's gravity pipelines and completed CCTV on the lines that indicated the possibility of problems during the smoke testing and visual pipe efforts. The first phase of pipeline replacement has been completed by The Heller Company totaling \$1,748,007. This project addressed 15,227 linear feet of sewer replacement and removed approximately 2.424 million gallons of I/I and improved the overall efficiency of the collection system. An additional 10,100 linear feet of sewer replacement was designed. This project removed approximately 0.290 million gallons of I/I, as well as addressing specific structural deficiencies found during the study phase.

**The remaining major projects that have a direct impact on our efforts to address wet weather overflows are updated below:**

**Fairwood Force Main/Pump Station Improvements** - This project, with a total cost of approximately \$3.5 million, was completed in early 2014. This project consisted of upgrading the Fairwood pump station, one of our largest pump stations, and installing a new large diameter force main that will provide additional capacity within our collection system and help prevent capacity related overflows. The force main scope of work for this project, in its entirety, included over seven miles of new piping. Most of the piping is 24" diameter. The scope of work has been broken down into (4ea) phases due to the significant size of the effort. The Phase I Force Main project was originally bid in 2009, but due to lack of sufficient funding was placed on hold. It was re-bid in 2010 and was completed in 2012. Phase II, completed in 2013 is in service now. Phase III of this project was completed in 2015 and placed in service. Throughout the design of the final phases, our wastewater model has been utilized for various scenarios to determine the effect(s) of our planned design projects. All intended to validate the engineering plans and ensure pipe sizing and conveyance plans will result in the most effective design. The final phase has been validated by the model and design of the final phase (Phase IV) has been completed. The project to construct the final phase of the force main is in progress and will be completed in 2017.

**Stokes Creek Gravity Main/ Force Main** – Projects to upsize the existing gravity main feeding the Stokes Lift Station and constructing a parallel force main from the Stokes Lift Station are in progress. The gravity main project was awarded in 2015 and completed in 2016



at a cost of \$5.9MM. The Stokes Force Main project was awarded first quarter of 2016, construction will be completed in 2017. The gravity main project consisted of upsizing approximately 10,700 linear feet of sewer. The Stokes Force Main project consists of installing a new parallel force main of approximately 20,000 linear feet. This force main will be routed from the Stokes Lift Station and manifold into the existing 30" force main leaving Hot Springs Creek Lift Station. The flow arriving from Hot Springs Creek Lift Station will manifold into the new Fairwood Force Main. The construction cost for this project is approximately \$5.5 million. The completion of this project will further assist in eliminating 18 wet-weather overflows on the gravity main entering the Stokes Lift Station.

The projects listed above, as well as the large number of projects completed, are included in Appendix A. This information represents all the work to date as well as future projects that may change in size and/or scope based on further evaluation of the system components.

**3. DEVELOPMENT OF A COMPREHENSIVE MAINTENANCE PROGRAM FOR ALL WASTEWATER COLLECTION SYSTEM ELEMENTS AND DETERMINE PROPER STAFFING LEVELS TO COMPLETE THE WORK ORDERS ISSUED BY THE SYSTEM.**

This item was addressed within item No. 1 in the section titled "Preventive Maintenance Program". Please refer to this section for information regarding the development and staffing of a comprehensive maintenance program. Our preventative maintenance staff was increased by two additional employees in 2017 with an additional two employees to be added in 2018.

**4. OBTAIN ADEQUATE FUNDING REQUIRED TO COMPLETE PROJECTS REQUIRED FOR COMPLIANCE.**

As mentioned in this and previous reports, the City of Hot Springs Wastewater Fund was basically at a zero-fund balance at the time the CAO was issued (2008) and struggled to include substantial capital improvements in the annual budgets. It was obvious that to correct the issues included in the CAO, the City would need to obtain funding that was initially estimated in excess of \$37 million over the next ten years. In 2009 the City was successful at securing funding exceeding \$26 million to address the first round of capital improvements. We have encumbered or spent this allocation on the initial phase of associated projects.

Based on the results of the collection system survey performed by RJN Group, Inc. and the pump station surveys to date performed by Garver Engineers, it was evident the original estimate of \$37 million was insufficient to resolve the entire issue. Staff continues to refine

our prioritized schedule of improvements and funding plans for projects planned for the January 2018 deadline and beyond.

A current review of the rates by our rate consultant indicated that the schedule of rate increases which were approved in 2009 remain sufficient to fund our existing expenses and debt payments. Our annual rate increase enabled us to issue new debt in late 2013 in an amount of approximately \$40 million, which has funded the set of projects in progress now, all of which are associated with achieving compliance with the CAO mandate. This report includes a list of projects through the deadline of January 2018 that is based on the balance of the current bond issue, as well as additional funding through future debt issuance. This planned list of projects is summarized in Appendix A.

**5. IMPLEMENT AN INCREASE IN WASTEWATER RATES IN EARLY 2009 TO SUPPORT PAYBACK OF FUNDING MECHANISM.**

As mentioned in previous reports, the City was successful in increasing wastewater rates to a level that supported a \$26 million bond issue in 2009, as well as future debt issues of approximately \$40 million in late 2013. We are optimistic that as we continue to complete major projects to reduce inflow and infiltration, we will see substantial decreases in collection and treatment costs such as pumping power, emergency callout personnel, and pump station repair costs. These reductions would enable the City to issue additional debt if required. As mentioned in item No. 4, we have maintained a contract with Economists.com, our rate consultant based in Dallas, Texas, to perform annual rate reviews of our current water and wastewater rates to ensure that we are progressing as projected. The current review indicates that we are in sound financial condition and the existing rate structure has been adjusted to fund our current needs, as well as the additional debt added in 2013. The City fully understands that circumstances could change that may require future rate adjustments to ensure that we remain compliant with the requirements of the CAO.

**6. IMPLEMENT THE RECOMMENDATIONS OUTLINED IN THE RECENTLY DEVELOPED SCADA MASTER PLAN.**

These items were addressed in item No. 1 under the “Pump Station SCADA” and “Grinder Lift Station SCADA” items as they are key elements in addressing the dry weather overflow issues. Please refer to this section for information regarding the implementation of the SCADA Master Plan. All the projects described within these two sections are listed in Attachment A. City staff acknowledges that these improvements were vital in addressing both dry and wet weather overflows as reporting problems is imperative, regardless of the conditions that create them.

**7. DEVELOP CRITICAL INVENTORY LIST AND ENSURE THOSE PARTS ARE IN STOCK.**

As stated in previous annual reports, this item has been completed. We continue to monitor the inventory and parts warehouse operations to further insure that our records are accurate, and all materials are properly stocked and tracked.

We continue to gain proficiency in the application and use of the Cityworks software program. This enables us to trend repair parts both overall and, for any pump. This tool is essential in identifying locations that may have more frequent pump issues unique to that specific area. We can identify and stock frequently used repair parts and replacement pumps to immediately replace faulty pumps. This is yet another process improvement for our Lift Station group.

**8. EVALUATE EXISTING PERSONNEL WITH REGARDS TO EFFICIENCY, WORKLOAD, JOB DUTIES, ETC. AND IMPLEMENT NECESSARY CHANGES**

During 2012, the city began utilizing the Engineering Department staff to improve our Wastewater Utilities and Engineering staff communications. The position of utilities director was suddenly vacated in September 2015; the selection process to fill that vital role was completed in December 2015. Monty Ledbetter was selected to fill the position of utilities director. Mr. Ledbetter came to us with a significant work history and background in the municipal utilities arena. Bobby Harris remains in the position of field operations manager and continues to provide the stability our Wastewater Group needs as well as now working among the other groups within the organization. The position of city engineer, filled in 2011 by Gary Carnahan, whose time is split 50/50 between Utilities and Public Works continues to add value in the overall process. Our staff Project Manager, Larry Merriman, who is responsible for administering funding and construction management on large utilities projects, primarily those associated with the CAO projects, remains committed to effectively overseeing the assigned projects. These key staff positions have proven to be a good resource in supporting the overall effort of the team to administer the large number of contracts and projects related to addressing the CAO as evidenced by the listing of projects included as Attachment A.

We continue to experience positive results as the field operations manager (Bobby Harris) implements innovative approaches within the entire department to improve the overall process. As previously noted, Mr. Harris' past experience as a manager with an extensive background in maintenance and preventative maintenance has proven to be very effective within our organization. Mr. Harris continues to make an impact in this effort since his hire in early 2011. His staff has embraced the changes and continues to improve in all areas. Having the new accurate mapping system along with an exceptional work order software in

Cityworks has given them the tools they need to establish a fully operational “service department” which responds quickly to alarms, is properly equipped and trained to address the problems in the field and has a work order software that allows them to build a history on the elements within our system. We expect Mr. Harris to continue to evaluate and benchmark our Utilities Division’s efforts and strive to improve in areas of critical importance. In addition, he continues to review our current standards and specifications to ensure our requirements are a best practices approach.

**9. PROPERLY TRAIN ALL PERSONNEL IN ACCORDANCE WITH EXISTING AND FUTURE POLICIES REGARDING APPLICABLE PROCEDURES IN THE WASTEWATER SYSTEM.**

The City of Hot Springs continues to invest time and money to train staff about being informed of and understanding current wastewater regulations, proper operations and maintenance of the system, as well as encouraging them to seek out new technology and utilize best practices as a management approach. The City continues to send key personnel to the annual CMOM conference in Austin, Texas. We believe this training continues to yield benefits for our staff and overall system.

We continue to meet with ADEQ and EPA officials and ensure we are current in understanding the rules and regulations that affect our system. We met with EPA Region 6 staff in September 2016 to discuss our annual report and our overall progress. Our relationship with our state and federal officials remains both open and positive and the City of Hot Springs very much appreciates the assistance we have received from both ADEQ and EPA. It is imperative that we, as a team, share a common vision and path forward, especially given the large financial and staffing investment that has been dedicated to this effort.

The City continues to evaluate and attend appropriate training which is applicable to our effort. To be successful we must ensure personnel are adequately equipped and trained to perform required duties. Several Lift Station Division staff members have taken the initiative to educate themselves on the Cityworks software program through formal and on the job training. This allows us to better utilize this resource and, coupled with the greatly improved pump station monitoring and implementation of the dispatch center, strongly improves our ability to respond to and track trouble calls. The City is very appreciative of the initiative taken by our Utilities staff as they continue to offer process improvement in establishing an efficient and reliable in-house process to receive, respond to, and record trouble calls in our system. We recognize this is a critical step in achieving the task before us.

**10. UTILIZE THE EXISTING GIS DATABASE TO INTEGRATE THE WORK ORDER SYSTEM WITH THE MAP FEATURE TO IMPROVE MANAGER'S ABILITY TO ANALYZE WORKLOAD AND IDENTIFY TROUBLE AREAS.**

The City has received mapping data from RJN Group, Inc. that was developed during the collection system survey. This information includes accurate horizontal and vertical coordinates of the manholes and inlets and outlets, which was used to develop the hydraulic model. We have incorporated this information into our GIS system and now have accurate maps of our gravity collection system.

The City has also received coordinates of all our grinder pump stations, which were gathered during the project that equipped all of our 3,400+ grinder stations with remote alarm telemetry as discussed in previous sections of this report. Prior to this project, our mapping data for these stations was essentially nonexistent.

We have also received new aerial base maps flown to 6" pixel resolution of our wastewater service area. These improvements have greatly improved the accuracy and dependability of our wastewater mapping system. We continue to work on our ability to graphically tie our work order system to these system features for reporting and ease of historical referencing.

**ADDITIONAL INFORMATION:**

Remaining Projects

The following table lists active projects intended to address the goals described above. Completion dates for the three (3) remaining projects are scheduled no later than December 31, 2017. A comprehensive detailed listing of all projects is included in this report as Appendix A.



Description	Estimated Percentage Complete	Current Estimated Completion Date
Fairwood Force Main Phase IV	90%	2017
Stokes Pump Station Revamp	90%	2017
Stokes Force Main	95%	2017

### Closing Remarks

43 recurring overflows were documented when the CAO was issued. 40 locations have been mitigated with efforts to date. The remaining three (3) locations will be mitigated by the end of 2017 with the completion of the Fairwood Force Main Phase IV, Stokes Pump Station, and Stokes Force Main projects. The City has recorded three (3) overflows year to date over 416 miles of pipe. This equates to less than one (1) overflow per 100 miles of sewer line.

In closing, the City of Hot Springs Utilities Division remains committed to process improvements that enable us to achieve the overall goal as mandated in our CAO. We continue to review and refine our planned projects based on data provided from our post rehab flow monitoring, hydraulic model and other available technology. All this intended to validate our plan is in fact the best path forward. Long term decision making is paramount to our success. The City of Hot Springs Board of Directors is dedicated to ensuring that staff is fully equipped with the means to meet the requirements of the CAO and beyond, as evidenced by the completed and proposed efforts included in this report. Upon completion of the remaining projects currently under construction and in conjunction with each of the annual status reports provided to ADEQ, the information provides necessary documentation that the City of Hot Springs has complied with the terms and conditions of the CAO.