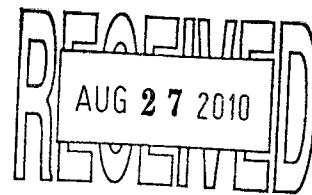


HAND DELIVERED



**City of Hot Springs
Utilities Department**

780 Adams
Post Office Box 700
Hot Springs National Park,
Arkansas 71902
(501) 321-6999
(501) 321-6967 Fax

August 27, 2010

Arkansas Department of Environmental Quality
Water Division
ATTN: Cindy Garner
5301 Northshore Drive
North Little Rock, AR 72118

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

Dear Cindy,

Pursuant to correspondence from your office dated August 6, 2010, the City of Hot Springs respectfully submits information as requested along with this correspondence. In the letter, your office is requesting an official Sewer Evaluation and Capacity Assurance Plan (SECAP) to be submitted to ADEQ by August 30, 2010. This submittal includes the SECAP, which is a bound report that basically includes the response to the CAO provided to ADEQ on November 18, 2008. As discussed in the letter and in other conversations with your office and ADEQ, this initial response included the components of a SECAP, however, they were not officially submitted as such. As this original document laid out the plan as it was in November of 2008, staff felt it necessary to provide a current update to the SECAP which would include supplemental information regarding the work performed to date including the number, type and location of defects found and repaired to date. This update was prepared by RJN and Associates and Garver Engineers and is presented as a separately bound report titled SECAP Update.

Also, included in this submittal is a requested copy of all Sanitary Sewer Overflows that have been reported to ADEQ since November 1, 2008. In addition to this information, staff has prepared graphs to illustrate the number and volume of these SSO's during that time frame. These graphs indicate a positive trend that we feel is partially attributable to the work that has been performed on our system to date. We do understand that this year has not been as wet as the previous two, however, similar events from year to year do indicate that the number and severity of the overflows related to comparable events show a positive improvement. There are three (3) graphs presented which include an overall comparison of overflow volume from 2008 to present as well as graphs of three (3) of our most chronic repeat offenders. The results are very promising as evidenced by drop in number and severity of overflows during this time period, most notably at the noted manholes.

In addition to the information presented above, a revised schedule of work is included with this letter. This schedule includes milestones met with completion dates as well as scheduled milestones looking forward. I have also included a more detailed schedule as provided by RJN with respect to collection system improvements. As this will be updated more frequently than the SECAP, it is and will continue to be provided separately.

We feel like this submittal includes the requested information along with supplemental information that indicates that we are already making an impact on our overflow problem. We trust that your office and the regional office of EPA in Dallas are satisfied with our efforts to date and appreciate your support. We are very satisfied and proud of our progress as compared to a year ago when we were operating at a zero budget as compared to today when we have secured over \$26 million in funding through a rate increase that was supported by the Board of Directors and our community. We have spent and/or encumbered approximately \$8 million to date which includes several large projects including manhole rehabilitation, pump station and force main construction as well as general line replacements. We feel that these efforts clearly indicate our commitment to meeting the requirements of the CAO as well as protecting the health, safety and welfare of our citizens, not simply because it is required, but because it is essential to the community we serve.

If any additional information is required, or if you have any questions or comments regarding the submittals, feel free to contact me at 501-321-6861.

Respectfully,

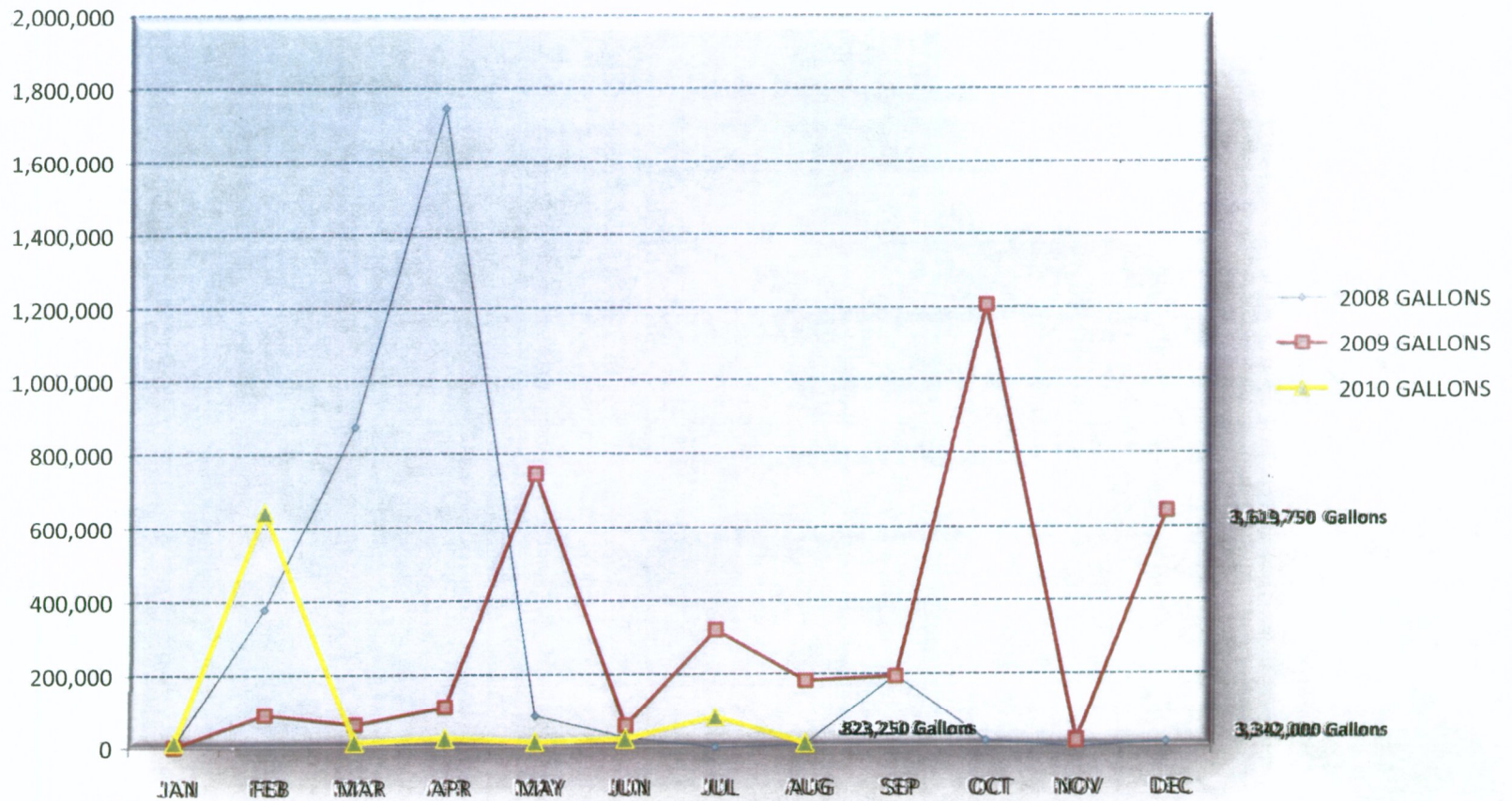


Steve Mallett, Jr., P.E.
City of Hot Springs Public Works Director

Cc: Lance Hudnell, City Manager
Larry Merriman, Project Manager
Ron Wacaster, Facilities Operations Manager

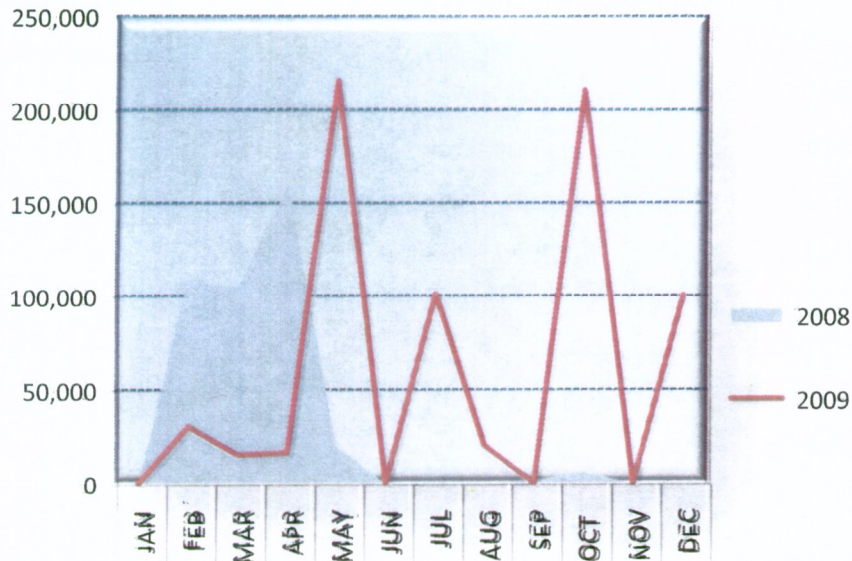


CITY OF HOT SPRINGS WASTEWATER COLLECTION SYSTEM
ANNUAL SYSTEM OVERFLOWS IN GALLONS FOR 2008 - 2009 - 2010

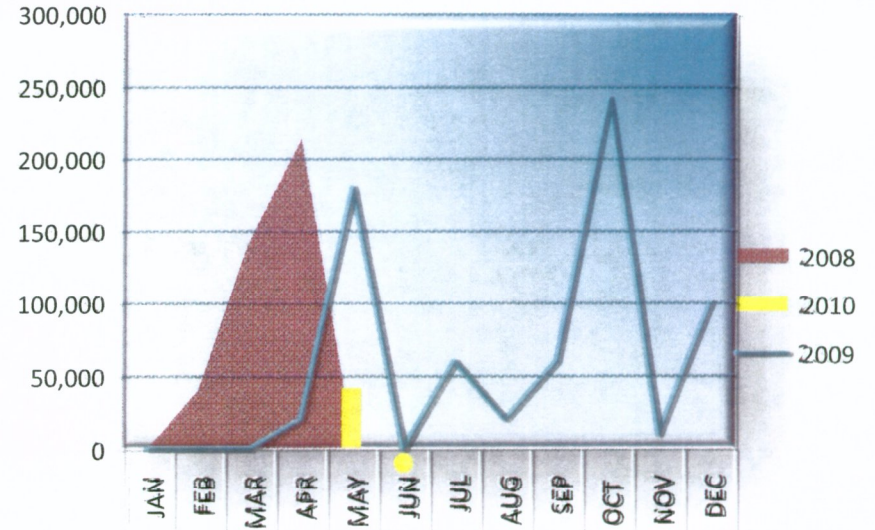




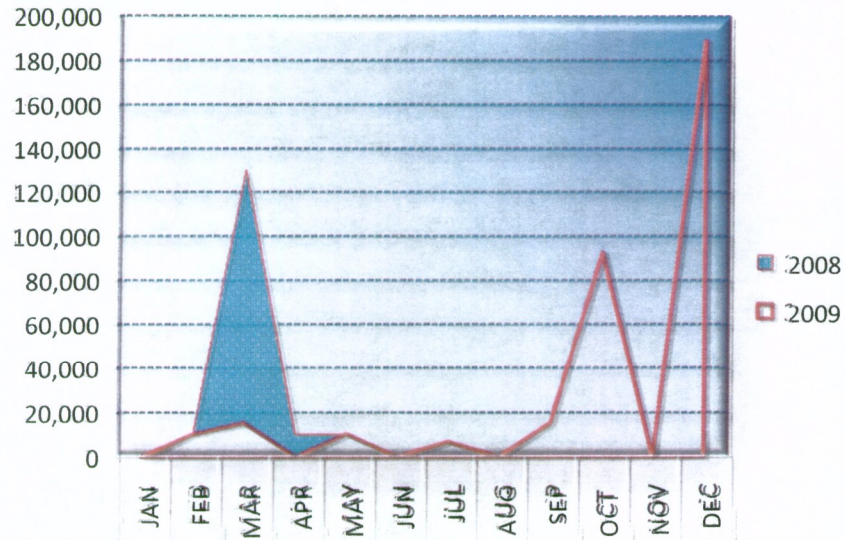
CITY OF HOT SPRINGS WASTEWATER COLLECTION SYSTEM
REPEAT OVERFLOW LOCATIONS 2008 – 2009 - 2010



FAIRWOOD RAINFALL EVENTS - 2008 - 2009 - 2010
FAIRWOOD 2010
NO OVERFLOWS IN 2010



GULPHA RAINFALL EVENTS - 2008 - 2009 - 2010
GULPHA 2010
2 OVERFLOWS IN 2010
1 IN MAY – 41,500
1 IN JUNE – UNKNOWN AMOUNT



McCLEOD 2008
2 OVERFLOWS
1 IN MARCH – 115,000 GALLONS
1 IN APRIL – 10,000 GALLONS

NO OVERFLOWS IN 2010

McCLEOD RAINFALL EVENTS - 2008 - 2009 - 2010

RAINFALL TOTALS IN INCHES

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2008	1.89	1.89	8.93	11.89	4.99	4.92	2.44	7.18	13.51	4.34	3.08	2.38
2009	1.76	4.63	5.42	5.88	15.21	2.79	9.43	2.63	7.38	13.98	1.55	9.33
2010	3.43	4.45	2.78	2.48	6.98	5.04	5.87					

WASTEWATER IMPROVEMENTS -- PROJECTED SCHEDULE

KEY DATES	ACTION ITEM	PURPOSE/COMMENTS
COMPLETE	Presentation of Draft Rate Plan and Wastewater Update to the Board	To update the Board with regards to status of wastewater system and Consent Administrative Order as well as the Draft Rate Plan
COMPLETE	Teleconference with Jana Harvill, EPA enforcement	To update EPA with current status related to progress of in-house and contractor efforts to address overflows and funding proposals
COMPLETE	Approve contract with underwriters for wastewater bond issue Board Meeting	Staff will select firms and present contract to Board of Directors
ATTENDED	Conference on Capacity Management, Operations and Maintenance (CMOM) in Austin, TX	To attend conference and obtain valuable training with regards to developing a SECAP in accordance with EPA guidelines - Merriman, Mallett, Davis, Davis
COMPLETE	Hold public meeting on proposed rates Agenda Meeting	To explain proposed rates and receive public input.
COMPLETE	Introduce Ordinance at a Board of Director's meeting. Board Meeting	Board will introduce the Ordinance with the proposed Rate Schedule.
COMPLETE April 1, 2008	Complete SCADA Master Plan	Provided by Brown Engineers
COMPLETE February, 2009	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
COMPLETE April 1, 2009	SCADA Master Plan Phase I Implementation	HMI Computer System Upgrade at Ouachita Plant for overall monitoring purposes.
COMPLETE September 15, 2009	Adopt new Rate Ordinance Board Meeting	Allows Board to put into effect new rate schedule.
COMPLETE November 3, 2009	Secure bond issue for first phase of wastewater improvements	Bond issue (est. \$25,000,000) to be used to fund purchasing of standby power generators, first phases of pump station improvements and SCADA installation - necessary to comply with dry weather deadline of January 1, 2011
COMPLETE November 4, 2009	Teleconference with Jana Harvill, EPA enforcement	To update EPA with current status related to progress of in-house and contractor efforts to address overflows and funding projections
COMPLETE December 15, 2009	Award remainder of Phase II to RJN and Associates to move forward with collection system survey	Phase II of \$3.3 million has been authorized for \$350,000 at this point - funding is needed to proceed with the remainder
COMPLETE February 27, 2010	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
COMPLETE April 6, 2010	Bid and award contract for Phase I of pump station improvements	To upgrade/repair the most critical pump stations as defined by Garver Engineers
COMPLETE April 6, 2010	Bid and award contract for standby generators	To equip critical pump stations with dependable backup power generation in accordance with ADEQ guidelines. <i>First Phase Included with Pump Station Project 10A.</i>
COMPLETE June 1, 2010	SCADA RTU Program Development	RTU Hardware and Software Selection
COMPLETE July 6, 2010	Bid and award contract for Fairwood Force Main	This project was bid in 2008 and suspended due to lack of funding - the project cost is estimated at \$2.3 million
COMPLETE August 27, 2010	Complete System Evaluation and Capacity Assurance Plan (SECAP)	Developed by RJN and associates based on survey - will describe condition of system and make recommendations to correct - basically a master plan of wastewater system
October, 2010 - January, 2012	Manhole Rehab Phase I	Begin multi-phase efforts regarding pipeline replacement based on results from RJN study.

KEY DATES	ACTION ITEM	PURPOSE/COMMENTS
October, 2010 - June, 2013	Pipeline Rehab Phase I	Begin multi-phase efforts regarding manhole rehabilitation based on results from RJN study.
October 1, 2010	Grinder Lift Station Radio Alarm Installation Project improvements	Preparation of contract documents for bidding and installation fo approximately 3,000 radio alarm meters on grinder stations. Work performed by Brown Engineers
December 1, 2010	SCADA Radio System	Installation of radio communications backbone. Work performed by Brown Engineers
January 11, 2011	Deadline for Dry Weather Overflow Compliance Meet with ADEQ/EPA to evaluate success of program	Failure to meet this deadline could result in monetary fines from EPA and/or ADEQ - Staff and consultants will review results of projects with ADEQ/EPA
February, 2011	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
March 1, 2011	SCADA RTU Installation of first 80 water/wastewater sites Phase I	SCADA RTU installaiton using new radio systme backbone as defined in SCADA Master Plan by Brown Engineers
April, 2011 - October, 2012	Manhole Rehab Phase II	Begin multi-phase efforts regarding pipeline replacement based on results from RJN study.
August, 2011 - April, 2013	Manhole Rehab Phase III	Begin multi-phase efforts regarding pipeline replacement based on results from RJN study.
October, 2011 - June, 2014	Pipeline Rehab Phase II	Begin multi-phase efforts regarding manhole rehabilitation based on results from RJN study.
February, 2012 - October, 2013	Manhole Rehab Phase IIII	Begin multi-phase efforts regarding pipeline replacement based on results from RJN study.
February, 2012	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
March, 2012	Bid and award contract for Phase II of pump station improvements	To upgrade/repair the next phase of critical pump stations as defined by Garver Engineers
March, 2012	Bid and award contract for Phase II SCADA improvements	To equip next phase of pump stations with dependable instrumentation to notify staff of mechanical or power failures
August, 2012 - June, 2015	Pipeline Rehab Phase III	Begin multi-phase efforts regarding manhole rehabilitation based on results from RJN study.
February, 2013	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
November, 2014	Secure bond issue for second phase of wastewater improvements (if required to meet CAO compliance)	Bond issue (est. \$15,000,000) to be used to fund second phases of pump station and SCADA installation as well as continued efforts involving manhole and pipeline repair - Likely necessary to comply with wet weather deadline of January 1, 2018
February, 2014	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
September, 2014 - June, 2017	Pipeline Rehab Phase IIII	Begin multi-phase efforts regarding manhole rehabilitation based on results from RJN study.
February, 2015	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
February, 2016	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order
February, 2017	Formal progress report due to ADEQ/EPA	Annual reporting requirement per the Consent Administrative Order

KEY DATES*	ACTION ITEM	PURPOSE/COMMENTS
January 11, 2018	Deadline for Wet Weather Overflow Compliance Meet with ADEQ/EPA to evaluate success of program	Failure to meet this deadline could result in monetary fines from EPA and/or ADEQ - Staff and consultants will review results of projects with ADEQ/EPA
January, 2018	Formally request release from CAO	Meet with ADEQ/EPA to discuss the success of the program with regards to meeting compliance with CAO and release from same - if not granted earlier

Note: Once initial funding is secured and Phase I projects are completed, all subsequent funding and projects will be evaluated based on the success of the program to date. The need to move forward with rate increases, bonds, etc. will be determined with respect to the revised needs as the program progresses.

*subject to change

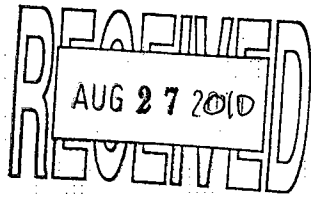
CITY OF HOT SPRINGS DESIGN SCHEDULE

ID	Task Name	Start	Finish	2009	2010	2011	2012	2013	2014	2015	2016	2017
				'09	'10	'11	'12	'13	'14	'15	'16	'17
1	Notice to Proceed	10/1/10	10/1/10			◆ 10/1						
2	Manhole Rehab Design Phase 1	10/1/10	12/31/10		■							
3	Manhole Rehab Design Phase 1 Bid Award	3/1/11	3/1/11			◆ 3/1						
4	Manhole Rehab Design Phase 1 Construction	3/1/11	1/31/12			■						
5												
6	Pipeline Rehab Design Phase 1	10/1/10	3/31/11		■							
7	Pipeline Rehab Design Phase 1 Bid Award	6/1/11	6/1/11			◆ 6/1						
8	Pipeline Rehab Design Phase 1 Construction	6/15/11	5/30/13			■						
9												
10	Manhole Rehab Design Phase 2	4/1/11	7/31/11			■						
11	Manhole Rehab Design Phase 2 Bid Award	10/1/11	10/1/11			◆ 10/1						
12	Manhole Rehab Design Phase 2 Construction	10/3/11	10/31/12			■						
13												
14	Pipeline Rehab Design Phase 2	10/3/11	3/30/12			■						
15	Pipeline Rehab Design Phase 2 Bid Award	6/1/12	6/1/12				◆ 6/1					
16	Pipeline Rehab Design Phase 2 Construction	7/2/12	6/1/14				■					
17												
18	Manhole Rehab Design Phase 3	8/1/11	1/30/12			■						
19	Manhole Rehab Design Phase 3 Bid Award	4/1/12	4/1/12				◆ 4/1					
20	Manhole Rehab Design Phase 3 Construction	4/30/12	4/1/13				■					
21												
22	Pipeline Rehab Design Phase 3	8/1/12	3/31/13				■					
23	Pipeline Rehab Design Phase 3 Bid Award	6/1/13	6/1/13					◆ 6/1				
24	Pipeline Rehab Design Phase 3 Construction	7/1/13	6/1/15					■				
25												
26	Manhole Rehab Design Phase 4	2/1/12	7/30/12				■					
27	Manhole Rehab Design Phase 4 Bid Award	10/1/12	10/1/12					◆ 10/1				
28	Manhole Rehab Design Phase 4 Construction	10/30/12	10/1/13					■				
29												
30	Pipeline Rehab Design Phase 4	9/1/14	4/1/15						■			
31	Pipeline Rehab Design Phase 4 Bid Award	6/1/15	6/1/15							◆ 6/1		
32	Pipeline Rehab Design Phase 4 Construction	6/30/15	6/1/17								■	

Project: Hot Springs Design Date: 8/25/10	Task	■	Milestone	◆	External Tasks	■
	Split	Summary	■	External Milestone	◆
	Progress	■	Project Summary	■	Deadline	◆

HAND DELIVERED

August 2010



City of Hot Springs



**Sewer Evaluation and
Capacity Assurance Plan**



**City of Hot Springs
Utilities Department**

780 Adams
Post Office Box 700
Hot Springs National Park,
Arkansas 71902
(501) 321-6999
(501) 321-6967 Fax

August 27, 2010

Arkansas Department of Environmental Quality
Water Division
ATTN: Cindy Garner
5301 Northshore Drive
North Little Rock, AR 72118

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

Dear Cindy,

As requested in correspondence from your office dated August 6, 2010, the City of Hot Springs formally submits a Sewer Evaluation and Capacity Assurance Plan (SECAP) to your office today, August 27, 2010. This document is a bound compilation of the documents that were presented in response to the CAO on November 14, 2008 as, according to your letter and other conversations with your office and the EPA Dallas office, the components that were submitted constituted a SECAP, but were not labeled as such.

In addition to the SECAP, a separately bound update to the plan is also submitted which provides supplemental, current information regarding our progress. Future updates to the plan will be provided on an annual basis unless more frequent updates are requested.

If any additional information is required, or if you have any questions or comments regarding the submittals, feel free to contact me at 501-321-6861.

Respectfully,

Steve Mallett, Jr., P.E.
City of Hot Springs Public Works Director

Cc: Lance Hudnell, City Manager
Larry Merriman, Project Manager
Ron Wacaster, Facilities Operations Manager

TABLE OF CONTENTS

1. Official Response to ADEQ
2. Attachment "A" – Summary of Collection System Management Program
3. Attachment "B" – Major Goals and Proposed Projects
4. Attachment "C" – Organizational Chart
5. Attachment "D" – Current Wastewater Standards and Specifications
6. Attachment "E" – Enforcement Document for Standards and Specifications
7. Attachment "F" – Sewer Use Ordinance including Pretreatment Program
8. Attachment "G" – Sanitary Sewer Overflow Response Plan
9. Attachment "H" – Recent In-house I&I Results



November 14, 2008

Arkansas Department of Environmental Quality
Water Division
5301 Northshore Drive
North Little Rock, Arkansas 72118

**City of Hot Springs
Utilities Department**

111 Opera Street
Post Office Box 700
Hot Springs National Park,
Arkansas 71902
(501) 321-6889
(501) 321-6967 FAX

RE: Consent Administration Order LIS. NO. 08-099
NPDES Permit No. AR0033880, AFIN 26-00145
Hot Springs, Arkansas

Dear Sirs:

Attached are documents as required in items 1-9 of Attachment A of the referenced Consent Administrative Order (CAO). City staff has provided data as requested with as much specific detail as is currently available. Obviously, a task of this size involves many different aspects of our wastewater system and will require extensive planning and development of detailed plans and specifications as well as hours of in-house and/or contracted field services. This submittal provides specific details where available regarding our current plans as well as a commitment to provide future details as they become available.

We, at the City of Hot Springs, are proud of our recent accomplishments with regard to addressing the overflow issues in Hot Springs. We have taken steps with regards to development and/or completion of needed improvements, reassignment of key personnel, equipment upgrades and hiring of consultants to assist with the development of a System Evaluation and Capacity Assurance Plan (SECAP).

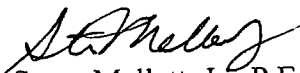
We currently have a proposal for a \$10,000,000 bond issue in the 2009 budget. Our ability to issue bonds will depend entirely on our ability to increase the wastewater rates early in 2009, which is currently being studied by a rate consultant. Currently, our Wastewater Fund Balance has been reduced to approximately \$500,000 due to our recent increased efforts with regards to I&I projects. Funding of the proposed projects will continue to be a major challenge as we address the requirements of the CAO in the coming years, but we are committed to make all necessary efforts to acquire the needed funding. These comments are not made as a precursor to any expected problems regarding funding, only as an informational statement regarding the current state of our wastewater fund and the challenges that face us in this arena.

Given the fact that funding is not yet in place, it is impossible for us to commit to any specific dates at this time, therefore, dates given in the response will be tentative dates that can be confirmed and/or modified at the time they are known. Also, the estimated costs for some projects will not be able to be confirmed until engineering firms can be contracted to provide design services for such projects, this too is pending funding. Many of the projects required to achieve compliance will not be defined with regard to scope and cost until the System Evaluation and Capacity Assurance Plan (SECAP) is completed.

We are fully committed to comply with the requirements of the order, however, the sheer size and cost of improvements necessary to do so will present a challenge to our staff with specific regards to funding and time constraints. That being said, we are committed to correct all of the items listed and in accordance with the schedule noted. We do so in the interest of public health and environmental stewardship. If we do see that we are unable to meet any deadlines that we have committed to, we will immediately contact ADEQ in accordance with the CAO.

If you have any questions or need to meet with myself and/or staff, please feel free to contact me at (501)321-6860.

Respectfully,



Steve Mallett, Jr., P.E.

City of Hot Springs Public Works Director

Cc: Larry Merriman, Project Manager
Ron Wacaster, Facilities Operations Manager
Craig Stevens, Wastewater Collections Superintendent
Kent Myers, City Manager
File

90 DAY RESPONSE TO ADEQ
PER ATTACHMENT A: SCHEDULE OF COMPLIANCE ACTIVITIES
11/14/2008

SPECIFIC REPOSSES REGARDING ITEMS IN "ATTACHMENT A"

1. ***Develop and submit a collection system management program as provided under Item 2 in the General Requirements*** - This program summary is presented as Attachment "A". This attachment will be made publicly available to anyone requesting information regarding our efforts to decrease inflow and infiltration in our commitment to comply with the Consent Administrative Order (CAO).

2. ***Submit Major Goals of the collection system management program as required under Item 1 of the Management/Administrative Requirements. The Major Goals shall include a schedule of implementation and achievement of goals.***
Currently, the City of Hot Springs is only able commit to projects included in our internal 2009 proposed budget. The city's ability to fund all other projects required to achieve compliance with the CAO depends entirely on our ability to secure funding through bonds, loans, etc. Currently, our wastewater rate is not sufficient to provide revenues capable of absorbing any additional payments that would be required to repay the bond, loan, etc. Our current cash balance in the Wastewater Fund is approximately \$500,000. This fund has consistently decreased over the past two years due to an increase in major projects, many of which were I&I related. In the 2009 budget, we are proposing a \$10,000,000 wastewater improvements package to be financed through revenue bonds. We are currently under a contract with Economists.com, a rate consultant, to evaluate our finances and offer recommendations regarding our water and wastewater rates. This study will enable us to achieve our goals and attain compliance in accordance with the CAO. Our ability to do so depends entirely on these events occurring early in 2009.

The Major Goals and proposed projects submitted in Attachment "B" are listed with respect to known or projected scope, cost and timeline. This listing will be confirmed and/or modified as funding is acquired and projects estimates are developed. Any modification to this list will be submitted as an addendum to this report. One of the Major Goals is the development of the SECAP. Obviously, until this report is completed the nature and cost of many projects will remain unknown. A revised report and implementation schedule will be provided to the appropriate parties upon completion of the SECAP.

3. ***Submit organization chart listing management personnel responsible for various elements of the collection system program and lines of authority.***
The organizational chart providing the requested information is presented as Attachment "C".

4. ***Submit copies of documents that provide the City of Hot Springs the legal authority to comply with Item 4 of the Management/Administrative Requirements.***

- A. Control private inflow sources – Regulated by the City’s pretreatment ordinance. See attachment “F”.
- B. Require that sewers and all connections be properly designed and constructed in accordance with the City of Hot Springs Standards and Specifications. This manual governs these facilities and the latest revision is provided as Attachment “D”. The ordinance by which the Board of Directors approved the latest revision which provides the city with legal authority to enforce these specifications is provided as Attachment “E”.
- C. Ensure proper installation, testing, and inspection of new and rehabilitated sewers (such collector sewers and service laterals) – The City of Hot Springs Standards and Specifications manual governs these facilities and the latest revision is provided as Attachment “D”. The ordinance by which the Board of Directors approved this latest revision which provides the city with legal authority to enforce these specifications is provided as Attachment “E”. In addition, state plumbing code provides general specifications regarding service lines. These too are referenced in our specifications manual.
- D. Address flows from satellite municipal collection systems – The City of Hot Springs currently does not treat any waste from satellite municipal systems.
- E. Implement the general and specific prohibitions of the national pretreatment program which the City of Hot Springs is subject to under 40 CFR § 403.5 – Regulated by the City’s pretreatment ordinance in Articles IV and V of attachment “F”. HS Code §9-3-41

5. ***Provide more detailed description of each element of the Collection System Management Program listed under Measures and Activities, and a list of specific individuals or positions responsible for each element.*** The City of Hot Springs offers the following list of responsible positions/personnel for all activities as request in “Measures and Activities”. The positions and/or comments listed in **bold** print are those that are directly involved with the activity listed. The overall organizational chart that will graphically display all of these positions as referenced in Item 3 of this document is provided as Attachment “C”.

- 1. Lift station operation and maintenance – Following is a hierarchal listing of those responsible for this item:
 - a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; develops budget; makes recommendations to Board of Directors.

- d. Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions; program implementation; project management; quality control.
 - e. **Wastewater Lift Stations Manager (Craig Stevens) – Responsible for management of all pressure wastewater facilities in the Hot Springs system; personnel evaluations; purchasing; project coordination.**
 - i. **Wastewater Lift Stations Supervisor (Tony Burkes) – Arranges work for field crews.**
 - 1. **Repair and Rehab Crew (16 members) – Repair and upgrade of existing pump stations.**
 - 2. **Maintenance Crew (3 members) – Maintain pumps and associated station elements.**
 - 3. **Motor Shop Crew (2 members) – Troubleshoot and repair pumps and *control* panels.**
2. Geographic Information System, a geo-based inventory of collection system assets and associated databases that supports system mapping and other utility operations – Following is a hierarchal listing of those responsible for this item:
- a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; develops budget; makes recommendations to Board of Directors.
 - d. Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions; program implementation; project management; quality control.
 - e. **Utilities GIS Technician (Brent Morrison) – Responsible for adding and/or modifying wastewater features in our existing GIS system as installed per as-built drawings. Brent will also be responsible for the maintenance and operations of our wastewater modeling software once developed and calibrated. Note: The overall maintenance of the city-wide GIS system with regards to data storage and layer development is the responsibility of our Information Services Department (Jeff Winter, IS Director).**
3. Maintenance procedures that ensure managers and supervisors are provided timely, relevant information from field personnel in order to establish and prioritize collections system activities (such as the immediate elimination of dry weather overflows or overflows into sensitive waters based upon consideration of factors, including: public drinking water supplies and their source waters, swimming beaches and waters where swimming occurs, shellfish beds, designated Outstanding National Resource Waters, National

Marine Sanctuaries, water within federal, state or local parks, and water containing threatened or endangered species or their habitat) – Following is a hierarchal listing of those responsible for this item:

- a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; develops budget; makes recommendations to Board of Directors with regards to annual budgets and funding options for projects with high priority.
 - d. **Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions; helps establish priority for all major projects that affect the City's efforts with regard to overflow reduction. Responsible for gathering overflow information from both wastewater managers and properly reporting to regulatory agencies and assigning priority to repair efforts in conjunction with both managers. Ensures that all crews are trained and follow the SSO Response Plan which clearly outlines the procedures regarding all overflows.**
 - i. **Wastewater Lift Stations Manager (Craig Stevens) – Responsible for the timely reporting of overflows from field personnel and the decisions regarding how and when immediate remediation activities are performed as they relate to overflows caused by pump station failures. Also instructs supervisor as to the nature and schedule for repairs to pump stations and/or force mains.**
 - ii. **Wastewater Collections Manager (Shawn Davis) – Responsible for the timely reporting of overflows from field personnel and the decisions regarding how and when immediate remediation activities are performed as they relate to overflows caused by gravity collection main issues. Also instructs supervisor as to the nature and schedule for repairs to the collection system.**
4. Computerized Maintenance Management System, an asset information and work order management software used to schedule and track all work performed on collection system, lift station, and wastewater treatment plant (WWTP) assets. – Currently, the Utilities Department utilizes the Cityworks software for work order generation for all work performed in the water and wastewater systems. However, the department does not, at this time, utilize the GIS system to attach these work orders or generate preventive maintenance work orders. The utilization of the GIS system is an item that has been given a high priority in 2009 in order to provide a graphical interface to our work order database. This additional effort will provide the wastewater managers with graphing and reporting

features which will prove to be critical as we implement our program and track our progress. The fact we do not have a preventive maintenance program has been identified as a major shortcoming that must be remedied. Currently, Garver Engineers is surveying the first phase of our wastewater lift stations. Once their survey has been completed they will provide us with information necessary to develop preventive maintenance work orders for these stations. We are currently proposing that Garver continue this effort in 2009 for the next phase. This pump station survey is an integral scope of work which is also dependent on funding that will have to be acquired. Following is a hierarchal listing of those responsible for seeing that these major items are implemented:

- a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; sets goals for division with respect to implementation of a preventive maintenance program and GIS enhancement through Cityworks.
 - i. Public Works Administrative Assistant (Paula Brown) – Oversees the general implementation of the Cityworks software within all Public Works divisions and assists in the coordination of integrating the GIS software.
 - d. Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions; oversees the development and implementation of the preventive maintenance work order system through Cityworks.
 - i. Utilities Administrative Secretary (Doris Elder) – Responsible for coordinating the gathering and entry of pertinent information which will be required to develop a complete preventive maintenance program.
5. Collection system preventive maintenance activities – With regards to the actual generation of work orders for preventive maintenance activities, refer to item 4 above. With regards to the personnel that will be responsible to perform such work once it has been scheduled, following is a hierarchal listing of those responsible for seeing that these tasks are completed:
- a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; sets goals for division with respect to implementation of a preventive maintenance program through Cityworks.

d. **Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions. Once the preventive maintenance program is developed, Larry will routinely generate and analyze open work order listings displaying any and all work that has not been performed. Based on this report, any outstanding work will be rescheduled or considered for assignment to an outside contractor. Should the work order list continue to increase beyond our current staff's ability to complete, additional maintenance staff will be requested.**

i. **Wastewater Collections Manager (Shawn Davis) – Responsible for directing the work plan in an effort to accomplish the work orders related to the gravity collection system in a timely manner. Shawn will ensure that the crews have the required materials and supplies necessary to properly complete these items.**

1. **Maintenance (4 members) – Maintain gravity mains and manholes as required via television and manual inspection.**

ii. **Wastewater Lift Stations Manager (Craig Stevens) – Responsible for directing the work plan in an effort to accomplish the work orders related to lift stations and pressure main system(s) in a timely manner. Craig will ensure the crews have the required materials and supplies necessary to properly complete these items.**

1. **Wastewater Lift Stations Supervisor (Tony Burkes) – Schedules work for field crews.**

a. **Repair and Rehab Crew (16 members) – Repair and upgrade of existing pump stations.**

b. **Maintenance Crew (3 members) – Maintain pumps and associated station elements.**

c. **Motor Shop Crew (2 members) – Troubleshoot and repair pumps and *control* panels.**

6. Assessment of the current capacity of the collection system and treatment facilities which the City of Hot Springs owns or has operational control of – This task is a monumental one and is in the initial stages of development. Currently, the City of Hot Springs is contracted with several engineering firms to provide different elements of the System Evaluation and Capacity Assurance Plan (SECAP). The need for the SECAP is directly related to our ability to address the wet weather overflows and, therefore, the development of this plan over the coming months will not inhibit our ability to move forward with the planned improvements to address the dry weather overflows. We expect this report to be finalized by end of year, 2009, and this will allow us to properly plan our future

improvements in order to comply with the January, 2018 deadline. With regards to the current contracts with engineering firms, following is a listing of those firms and a description of their scope of work:

- a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. **Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; oversees the administration of all engineering contracts with regards to selection of firm, negotiation of contract and progress meetings.**
 - d. **Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions. Coordinates with engineering firms with regard to meeting with staff, reporting of progress, and development and processing of pay estimates. Works closely with Wastewater Facilities Manager (Ron Wacaster), Wastewater Collections Manager (Shawn Davis) and Wastewater Lift Stations Manager (Craig Stevens) as appropriate.**
 - i. **Garver Engineers – Currently surveying large, major pump stations as assigned in phases in order to list deficiencies regarding condition of pumps, electrical components, backup power, SCADA, safety, etc. Funding is proposed in 2009 to begin resolving issues identified as deficient**
 - ii. **Garver Engineers – Currently assessing the existing wastewater plant with respect to our ability to comply with the newly issued NPDES permit as well as our local limits as they pertain to the current pretreatment program.**
 - iii. **Brown Engineers – Completed initial assessment and developed a SCADA Master Plan which provides the standard for future equipment as well as a plan to upgrade all existing utilities as deemed appropriate.**
 - iv. **RJN and Associates – Recently selected as firm to provide smoke testing and manhole inspection services. This work will be accomplished in a specified timeframe that will enable us to quickly attain crucial information regarding the physical condition of our system. All features will be surveyed and entered into our GIS system to facilitate development of the maintenance system for our facilities. The information provided will also assist us in developing the SECAP.**
7. Identification and prioritization of structural deficiencies and the short-term rehabilitation actions to address each deficiency – As noted in the item above, the City of Hot Springs is currently involved in contracts

regarding the analysis of all wastewater components that directly contribute to the overflow issues. Not noted above are the ongoing in-house efforts regarding surveying of the gravity system through televising, smoke testing and manual inspection. The deficient items are currently prioritized and scheduled for our in-house work group(s) or use of an outside contractor to accomplish required repair(s). Following is a list of in-house personnel dedicated to this item and, as mentioned, the outside firms are listed in the previous item:

- a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
- b. City Manager (Kent Myers) – Administrative oversight for all City departments.
- c. Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; reviews status reports from in-house I&I reduction efforts to insure progress.
- d. Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions. Oversees the in-house I&I reduction efforts through coordination with Wastewater Collections Manager (Shawn Davis) and Wastewater Lift Stations Manager (Craig Stevens) with regards to identification and repair of deficiencies.
 - i. Wastewater Collections Manager (Shawn Davis) – Responsible for directing the work plan to systematically inspect all gravity wastewater collection facilities in a timely manner. Shawn will ensure that the crews have the required materials and supplies necessary to accomplish timely completion of required repair items.
 1. Television and Inspection Crews (4 members) – Maintain gravity mains and manholes as required through television and manual inspection.
 - ii. Wastewater Lift Stations Manager (Craig Stevens) – Responsible for directing the work plan to inspect all pump stations on a routine basis and document/report deficiencies. Craig will ensure the crews have the required materials and supplies necessary to accomplish timely completion of these items.
 1. Wastewater Lift Stations Supervisor (Tony Burkes) – Schedules work for field crews.
 - a. Repair and Rehab Crew (16 members) – Repair and upgrade of existing pump stations.
 - b. Maintenance Crew (3 members) – Maintain pumps and associated station elements.
 - c. Motor Shop Crew (2 members) – Troubleshoot and repair pumps and *control* panels.

8. Collection system employee training – With all of the reassignment of personnel and changes in our procedures, it is imperative that we properly train all employees as necessary to ensure we maintain consistency in achieving compliance with our program. It will be the division's responsibility to arrange and/or conduct appropriate training as necessary. Following is a hierarchal listing of those responsible for this item:
 - a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. **Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; responsible for oversight of training plans for all of public works.**
 - d. **Utilities Operations Manager (New Position, Larry Merriman) – Responsible for the development and/or modification of divisional training programs with regards to the requirements of our compliance plan. Larry will monitor the implementation of the training plans to ensure all applicable personnel are properly trained in regard to their respective duties and responsibilities.**

9. Equipment and replacement parts inventories, including identification of critical replacement parts – Within the last 6 months, the utilities inventory manager has validated and entered all current repair parts for the water and wastewater system into the Cityworks Inventory Module that was purchased in 2007. With this accomplished, we can now initiate ordering based off of minimum thresholds rather than based on manual tracking as was done in the past. Staff will need to identify any and all critical repair components not currently in stock and insure that these parts are ordered for emergency situations. Following is a hierarchal listing of those responsible for this item:
 - a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
 - b. City Manager (Kent Myers) – Administrative oversight for all City departments.
 - c. **Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division; designated sole responsibility of ordering inventory to the current inventory manager with regards to maintaining a set minimum level.**
 - d. **Utilities Operations Manager (New Position, Larry Merriman) – Responsible for the oversight of the inventory division and development of critical inventory list with division managers.**
 - e. **Utilities Inventory Manager (Revised Position, Jim Merriott) – Responsible for the management of the inventory division and**

maintaining proper levels of critical inventory. Will generate inventory reports as required.

10. Trap Control Program to abate the impact of fats, oils and grease (FOG) on collection system – **Currently, our pretreatment program addresses this issue and is fully developed and implemented in Hot Springs. Our program is aggressive with respect to the installation and maintenance of grease traps at all places where food preparation takes place.** Following is a hierarchal listing of those responsible for this item:

- a. Board of Directors (6 directors plus 1 mayor) – Set policy; approve budgets.
- b. City Manager (Kent Myers) – Administrative oversight for all City departments.
- c. Public Works Director (Steve Mallett, Jr.) – Administrative oversight for Utilities Division;
- d. Utilities Operations Manager (New Position, Larry Merriman) – Operations and personnel management for all utilities divisions;
- e. **Wastewater Facilities Operations Manager (Revised Position, Ron Wacaster) – Responsible for the management of the wastewater treatment divisions including the pretreatment division.**
- f. **Pretreatment Coordinator (Dennis Brunson) – Responsible for the day to day operations of the pretreatment program with respect to compliance of area facilities.**

6. *Develop and submit standard specifications for the installation and testing of new sewers, pumps and other appurtenances.* The City of Hot Springs currently has standards and specifications for construction and testing of all sewer facilities. We modify these specifications on an as needed basis as changes in the industry dictate. The most recent revision being approved by our Board of Directors in August of this year. A copy of the most recent revision of our specifications with regard to our wastewater system is included with this report as Attachment "D".

7. *Develop and submit standard specifications outlining requirements for the rehabilitation and repair projects.* As mentioned in the response to Item 6, the City of Hot Springs currently has standards and specifications for construction and testing of general wastewater collection facilities. The city manual provides construction specifications for general wastewater pipeline and pump station construction, however, some specific rehabilitation and repair projects (i.e. pipe bursting, major pump station construction and/or rehab, manhole lining, etc.) are individually designed and specified in the bid documents on a case by case basis. We will be glad to provide copies of specifications for recent rehabilitation and repair projects upon request. Otherwise, we again present a copy of the most recent revision of our wastewater specifications as Attachment "D".

8. *Develop and submit a Sanitary Sewer Overflow Response Plan.* This plan is submitted as Attachment "G". Upon approval, this revised plan will be

immediately implemented as our standard operating procedure for all overflows. Specific responsibilities will be assigned and all staff will be trained accordingly.

9. ***Develop and submit a System Evaluation and Capacity Assurance Plan (SECAP). Any construction projects or improvements required by the SECAP shall include a schedule for construction and implementation of the improvements.*** The City of Hot Springs is currently under contract with several engineering firms to provide information that will be used in the development of a SECAP for the City of Hot Springs. We are estimating that the completion of our current surveys and contract inspection services will not be complete for at least 12 months due to the size and nature of our system. The projected time for completion of this document will not impair our ability to address the dry weather overflow compliance by the January, 2011 deadline and will be completed in ample time to make responsible and effective recommendations with regards to our compliance with wet weather issues by January, 2018. Once the SECAP is complete, the City of Hot Springs will be able to make commitments regarding the cost and completion date and submit an implementation schedule for the required projects. With that being said, we will move forward with one of the major issues we are facing regarding wet weather overflows, which is backup power for our pump stations. We will proceed with these improvements based on the surveys that are now being completed, without the need for the completion of the SECAP. A proposed schedule with regards to known recommendations as well as projected completion dates for pertinent projects and/or studies is presented as Attachment "B".

We are committed to follow through with all the requirements of the CAO, however, we want to be clear that, currently, we do not have funding available to perform most of what is listed herein. Our ability to achieve the requirements of the CAO depends totally on our ability to obtain funding through bonds, loans, etc. We will not be able to secure funding through these sources without a wastewater rate increase. Currently, a rate consultant is reviewing our situation and will likely have a recommendation regarding our rates in early 2009. We expect to take the recommendation to the Board of Directors by March, 2009.

SUMMARY OF PROPOSED COLLECTION SYSTEM MANAGEMENT PROGRAM
11/14/2008

GENERAL SUMMARY

With regards to City of Hot Springs' long term commitment to address the issue of sanitary sewer overflows, we are pleased to report that the city has already begun to make great strides towards an eventual system that minimizes overflows to the maximum extent possible. These improvements, along with future efforts, will allow us to meet the requirements listed in the Consent Administrative Order (CAO) which was issued by the Arkansas Department of Environmental Quality (ADEQ) on August 15, 2008. This summary will outline the recent improvements and/or engineering studies that have been completed as well as current and proposed plans. This document will also address our departmental efforts including a recent reallocation of equipment and personnel as well as the current state of our in-house inflow and infiltration program. Also discussed in this report are the current challenges with regards to funding these improvements over the next ten years. The report will provide tentative information regarding the nature, cost and schedule for various projects that will be necessary to comply with the CAO.

The basic requirements of the CAO are:

1. By January 1, 2011, the City of Hot Springs shall achieve compliance with the proper operation and maintenance of the wastewater collection system as it applies to dry weather overflows.
2. By January 1, 2018, the City of Hot Springs shall achieve full compliance with the operation and maintenance of the wastewater collection system as it applies to capacity related overflows.

Specific steps included in the CAO that will be taken in order to accomplish the above are:

1. Develop and Implement a Sanitary Sewer Overflow Response Plan to include proper notification to affected parties and regulatory agencies.
2. Develop a System Evaluation and Capacity Assurance Plan that establishes the cause of system deficiencies and identifies corrective measures for those deficiencies.
3. Develop a Computerized Maintenance Management System to address preventive and planned work orders for all wastewater components.
4. Improve GIS asset management system.
5. Revise standards and specifications manual as necessary to ensure quality construction.
6. Provide proper training to all personnel with regards to these procedures.
7. Provide annual audits and reports with regards to the progress of committed improvements.

EFFORTS TO DATE

The City of Hot Springs continues to dedicate substantial funding each year to begin the process of bringing the wastewater system into compliance. Over the past 10 years, the City of Hot Springs has spent in excess of \$13,000,000 to address the chronic inflow and infiltration problems. The annual budget, at a minimum, includes \$700,000 dedicated to a collection system project(s) to address reducing inflow and infiltration (I&I). In the past two years, we have also completed projects to rehabilitate a major wastewater lift station and have budgeted same for 2009. The city has also reassigned personnel to again provide dedicated staff responsible for the manual inspection of manholes, smoke testing and televising wastewater lines. The progress to date is presented as Attachment "H".

Prior to the summer of 2008 the collections and lift stations divisions were combined under one manager. Due to the size of these two divisions and the upcoming efforts in each, these divisions are now under separate management so each can concentrate on the improvements within the division. We have already realized the benefits of this change as we are able to better plan the work necessary to accomplish our goals. During our in-house investigation, we were also able to identify several residences that were connected to sewer but were not being billed. Obviously, this increases revenues, which in turn provides more funding for improvements.

Another important personnel modification was the creation of a Utilities Operations Manager Position to assist with the administration and management of all utilities divisions. This position will provide much needed leadership and support to the collections and lift station divisions as this major program develops and changes are implemented.

In addition to our in-house efforts, we have contracted with several engineering firms to begin the analysis of our system and provide information that will be used to develop our System Evaluation and Capacity Assurance Plan. In addition to these services, we have also contracted with engineering firms to provide plans and specification for improvements that have already been identified as necessary to achieve our goals. These will be discussed more specifically in subsequent sections of this document.

PROPOSED EFFORTS TO ACHIEVE COMPLIANCE WITH RESPECT TO DRY WEATHER OVERFLOWS BY JANUARY 1, 2011

The City of Hot Springs staff, in concert with various engineering consultants, agree that all dry weather overflows can effectively be minimized through dependable SCADA monitoring on the various pumping stations and scheduled flushing of collection mains with any history of clogging. Dry weather events occur primarily for two reasons within the City of Hot Springs – main blockage or pump station failure. Obviously, dry weather events are not capacity related and therefore, capacity issues are not being considered in this portion of the overall plan.

With regards to dry weather overflows due to main blockage, the City of Hot Springs will develop a "Trouble List" of any known wastewater mains that have a history of blockage due to grease build up, etc. The frequency of scheduled maintenance will be determined by the supervisor on a case by case basis. These work orders will be entered into our Computerized Maintenance Management System to ensure issuance and completion. The phone numbers given to the public to report such events will also be modified if necessary to minimize response time to overflows due to blocked mains as it is impossible to totally prevent all of these specific type overflows.

With regards to dry weather overflows due to pump station failure, which are the most common in Hot Springs, we will be required to upgrade and/or install a reliable SCADA system that will notify appropriate personnel of a pump failure. The pump failure may be of a mechanical or power outage nature. Timely notification will provide time for personnel to respond to the station and address the failure prior to creating an overflow. A dependable notification system will prevent the large majority of dry weather overflows in our system. On such an occasion that the pumps cannot be restored prior to overflow, the crew will be on site to properly document and notify parties as outlined in the SSO Response Plan while continuing efforts to restore operations. This will eliminate most overflows and drastically reduce the volume of any that do occur as we will not be depending on area residents or city staff to report the overflow. Historically we have seen the failure of timely reporting result in excess and sometimes unnecessary overflows.

The City of Hot Springs currently owns and operates approximately 75 major lift stations as well as approximately 300 duplex grinder stations. We are obviously placing priority on the 75 major stations due to the severity of overflow that would result. In 2008, we engaged the services of Brown Engineers to develop a SCADA master plan for both the water and wastewater systems including a plan to install SCADA at the first 75 stations. This year, we spent \$200,000 to develop the plan (\$50K) and implement Phase I (\$150K) which included software installation and screen development at the monitoring sites. Phase II is scheduled for 2009, pending funding, for \$3,500,000 which includes installing and/or upgrading SCADA and backup power generation at our 18 most critical stations. Phase III will address SCADA only at the remaining stations and will involve full SCADA Pak installations for our larger stations and simpler, less expensive units for the smaller stations. The ability to monitor all stations by January 1, 2011 is not feasible due to the sheer size and cost of this massive project. Those stations that are determined to be low flow stations that have the capacity to store more than one day's normal flow will be placed on a manual inspection schedule that will provide appropriate intervals between inspections that would not exceed the station's holding capacity if the station were to be rendered inoperable.

In addition to these larger pump stations, the City of Hot Springs also owns and operates over 4500 simplex grinder stations. These stations are equipped with visual alarms that are to be reported by the property owner. The City of Hot Springs is not proposing to change any of the alarm or reporting aspects of these individual stations and will continue to rely on the property owner to report any problems. We will, however, incorporate

these stations into our preventive maintenance program to ensure proper operation of the alarm system.

We feel that the combination of the planned improvements mentioned above will adequately address the requirements regarding dry weather overflows in the CAO.

PROPOSED EFFORTS TO ACHIEVE COMPLIANCE WITH RESPECT TO WET WEATHER OVERFLOWS BY JANUARY 1, 2018

The task of addressing the wet weather overflows is much more complicated and costly than that of dry weather overflows. In order to efficiently and responsibly spend money to address these problems, much analysis of the existing system is required. In order to properly design and construct necessary improvements, the capacity and condition of all pump stations, pipeline and plants must be determined. This process alone can take years of work to accomplish, especially in a system like that of Hot Springs which has an extremely high number of pump stations per capita. That fact, coupled with the deteriorating physical condition of most of our facilities and lack of adequate documentation make for an expensive and exhausting study. However, this is imperative in order to properly prepare a program to achieve our long term goals.

The development of a System Evaluation and Capacity Assurance Plan will be generated in accordance with the requirements contained in the CAO. Currently, we are in the process of negotiating a contract with RJN and Associates to provide inspection services with regards to manual manhole inspection and smoke testing. The information gathered will be presented to the City in digital form and incorporated into the GIS system so that it can be utilized in the Cityworks work order software program. This information will provide the basic information needed to develop in-house work orders as well as improvement projects to be bid. The data will also be used in the development of a preventive maintenance program.

To date, we have entered into a contract with Garver Engineers to perform an exhaustive survey of each of our larger pump stations with the goal of having recommendations for improvements regarding capacity, standby power, SCADA controls, safety etc. for all our major wastewater stations within the next two years, starting with our most critical stations first. Currently, Garver has completed nineteen (19) surveys of our largest stations and we are incorporating this information in a major pump station rehabilitation project in the proposed 2009 bond issue.

Also, the city has completed a contract with Brown Engineers through which we have received a comprehensive SCADA master plan for both our water and wastewater systems. Obviously, this item is crucial to the monitoring of our stations and will have a direct impact on our response time and ability to mitigate overflows. We have already issued a \$150,000 contract to Brown Engineers for implementation of Phase I of SCADA development that includes standardizing the software and hardware and begins screen development at the monitoring sites. Next year's proposed bond issue and future budgets will include funding for implementation of SCADA equipment at the wastewater stations.

Other positive efforts within the city include installation of a 30" trunk pipeline (Fairwood Force Main) that will improve capacity of our lift stations and eliminate the "piggy back" affect that we have an abundance of due to many years of extending our system without properly improving the existing facilities that are being connected to. Our in house efforts have been upgraded as we now have dedicated personnel and equipment related to inflow and infiltration inspection and repair. Our in-house program has been revised to include improved planning, reporting and benchmarking. Currently, we have several engineering firms providing services to develop a wastewater System Evaluation and Capacity Assurance Plan. Once this plan is generated, it will enable our staff to make informed recommendations regarding improvements that will directly attribute to the ability to comply with the requirements of the CAO with regards to wet weather overflows. Due to the fact that the wet weather overflow issue is the most complicated and expensive, we feel that completion of this document is imperative for the most efficient and responsible expense of funds. We expect this document to be complete in 2010. The completion of this document is not required for us to be able to address the dry weather issues as mentioned in previous section.

We feel that the current in-house efforts as well as the major evaluation projects already completed and/or underway show our commitment, urgency and dedication with respect to addressing sanitary sewer overflows. These projects will allow the city to define the system needs, determine capacity issues and improve the wastewater infrastructure to achieve compliance in accordance with the CAO. We are committed to address overflow issues and share ADEQ's dedication to protecting public health and our environment.

MAJOR GOALS AND PROPOSED PROJECT SCHEDULE

MAJOR GOALS

1. Achieve compliance with regards to dry weather overflows by January 1, 2011 through installation of SCADA equipment on our pumping stations, scheduled pump station maintenance and development of a flushing list to minimize blockages.
2. Achieve compliance with regards to wet weather overflows by January 1, 2018 through development of a System Evaluation and Capacity Assurance Plan, physical survey of all wastewater collection system elements, repair of identified deficiencies, and upgrades to various pump stations and treatment facilities.
3. Development of a comprehensive preventive maintenance program for all wastewater collection system elements and determine proper staffing levels to complete the work orders issued by system. Proper resource loading for staff will mitigate the potential to create a significant back log of work orders which would render the effort ineffective.
4. Obtain adequate funding required to complete projects required for compliance.
5. Implement an increase in wastewater rates in early 2009 to support payback of funding mechanism.
6. Implement the recommendations outlined in the recently developed SCADA Master Plan.
7. Develop a critical inventory list and ensure those parts are in stock.
8. Evaluate existing personnel with regards to efficiency, workload, job duties, etc. and implement necessary changes.
9. Properly train all personnel in accordance with existing and future policies in regard to applicable procedures in the wastewater system.
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.

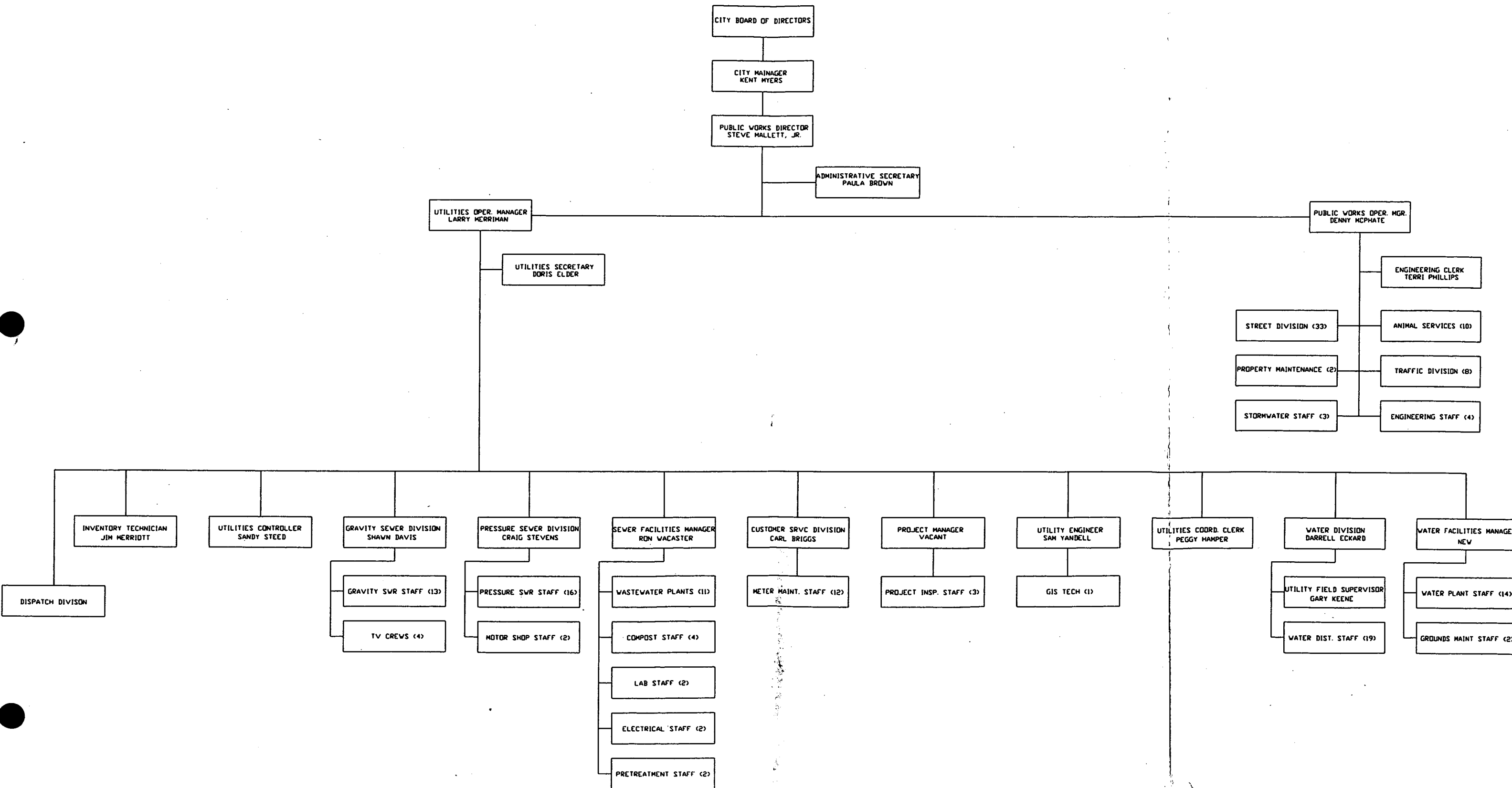
PROPOSED PROJECTS - All pending funding as identified

Description	Estimate	Estimated Completion	Funding
Collection System Survey Phase I – Flow Metering	\$500,000	Spring, 2009	Proposed 2009 Budget
Collection System Survey Phase II – MH Inspection	\$750,000	Spring, 2010	Proposed 2009 Budget
Collection System Survey Phase III – Smoke Testing	\$200,000	Fall, 2009	Proposed 2009 Budget
Treatment Plant Expansion Study	\$500,000	Fall, 2009	Proposed 2009 Budget
Fairwood Force Main	\$2,100,000	Summer,2009	Proposed 2009 Bond
Pump Station SCADA and Standby Power, Phase I	\$3,500,000	Spring, 2010	Proposed 2009 Bond
Pump Station Mechanical Upgrades, Phase I	Est. \$1,500,000	Summer,2010	Proposed 2009 Bond
Pump Station SCADA and Standby Power, Phase II	Est. \$3,000,000	January, 2011	Proposed 2009 Bond
Development of Wastewater System Model	Est. \$200,000	Winter, 2010	Future 2010 Budget
Collection System Manhole Repairs, Phase I	Est. \$2,000,000	January, 2013	Future 2010 Budget
Pump Station Mechanical Upgrades, Phase II	Est. \$5,000,000	January, 2014	Future Budget/Bond
Collection System Pipeline Repairs, Phase I	Est. \$5,000,000	January, 2013	Future Budget/Bond
Pump Station Mechanical Upgrades, Phase III	Est. \$5,000,000	January, 2018	Future Budget/Bond
Pump Station SCADA and Standby Power, Phase III	Est. \$1,000,000	January, 2018	Future Budget/Bond
Collection System Manhole Repairs, Phase II	Est. \$2,000,000	January, 2018	Future Budget/Bond
Collection System Pipeline Repairs, Phase II	Est. \$5,000,000	January, 2018	Future Budget/Bond

Estimated Program Totals

\$ 37,250,000.00

PUBLIC WORKS ORGANIZATION CHART PROPOSED IN 2009 BUDGET



Attachment "D"

 VAESA



**Wastewater Engineering and
Construction Standards
and Specifications Code**

SECTION THREE
SPECIFICATIONS AND DETAILS FOR WASTEWATER CONSTRUCTION
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ARTICLE I. WASTEWATER SYSTEM MATERIALS

1. General.

This section of the specification(s) shall govern all materials used in the construction of sanitary wastewater facilities under the jurisdiction of the City of Hot Springs Public Works/Utilities Department. Projects that would involve materials other than those included in this specification(s) shall be approved by the City of Hot Springs on a case by case basis. All request(s) for consideration of alternate material use shall be submitted on the request form as presented in the specification(s). The top of all Manholes, Grinder Stations and Pump Stations will maintain a minimum elevation 12" below finished slab of lowest building. In the event this is impractical, use of a back flow preventer may be approved by the Utility on a case by case basis.

2. Sanitary Wastewater Pipe.

(a) *General.* The different kinds of wastewater pipe materials outlined in this section shall be used in the construction of sanitary wastewater lines in accordance with methods specified in Article II - Construction Methods. The strength of pipe proposed shall be based upon standard engineering design procedures and manufacturer or trade association recommendations and approved by the City of Hot Springs. All pipe shall be circular unless otherwise approved. Only pipe materials listed in this section shall be used for main extensions or building wastewater unless specifically authorized in writing by the City of Hot Springs.

(b) *Reinforced Concrete Wastewater Pipe.* Not acceptable for sanitary wastewater construction or replacement.

(c) *Clay Wastewater Pipe.* Not acceptable for sanitary wastewater construction or replacement.

(d) *ABS Truss Pipe.* Not acceptable for sanitary wastewater construction or replacement.

(e) *Polyvinyl Chloride (PVC) Wastewater Pipe.* PVC pipe for sanitary wastewater gravity mains up to 21" in diameter shall conform to the current ASTM designation D-3034, for 4"-15", F-679 for 18"-21" PVC and shall be SDR-26 or SDR-35. Service laterals from the main to the property line shall not be assembled with glued joints. They shall be PVC gravity wastewater pipe SDR-35 or SDR-26 unless specified otherwise. Any proposed gravity wastewater main with a diameter larger than 21", shall be reviewed by the Utility on a case by case basis with regards to pipe material.

PVC Pipe for wastewater force mains up to 12" diameter shall conform to the current ASTM designation D-2241, PR 200 (SDR-21). Any proposed force main with a diameter

larger than 15" shall be reviewed by the Utility on a case by case basis with regard to pipe material.

Provisions must be made for contraction and expansion at each joint with an elastomeric gasket. The bell shall consist of an integral wall section with a solid cross section elastomeric gasket factory assembled, securely locked in place to prevent displacement. Standard lengths shall be 20' and 12.5' \pm 1".

All fittings and accessories shall be as manufactured and furnished by the pipe supplier or approved equal and have bell and/or spigot configurations identical to that of the pipe. Elastomeric gasket shall conform to ASTM Specification D1869. Minimum "pipe stiffness" at 5% deflection shall conform to ASTM D3034 and D3033 for all sizes when tested in accordance with ASTM Designation D2412 (External Loading Properties of Plastic Pipe by Parallel-Plate Loading). Pipe and fittings shall be tested in accordance with ASTM Designations D2412, D2152, and D2444.

(f) *Cast Iron Pipe.* Not acceptable for sanitary wastewater construction or replacement.

(g) *Ductile Iron Pipe.* For gravity pipelines, ductile iron pipe shall conform to ANSI/ASTM Standard A 746 (gravity wastewater pipe) or ANSI Standard C150/A21.5. It shall be lined with corrosive resistant lining in accordance with ANSI Standard A21.4 unless otherwise allowed by the Utility. Pipe shall be manufactured for use with the type joints specified. Approved linings: Protecto 401 (McWane), Polybond, PolybondPlus (American), Polythane (U.S. Pipe) or approved equal.

For Force Mains, ductile iron pipe shall conform to ANSI/AWWA C151/A21.51 thickness Class 50. It shall be lined with corrosive resistant lining in accordance with ANSI Standard A21.4 unless otherwise allowed by the Utility. Pipe shall be manufactured for use with the type joints specified.

Wall thickness of ductile iron wastewater pipe shall be calculated in accordance with ASTM A746 for laying condition 5, 350 psi maximum pressure and depth of cover as indicated on the plans. The minimum thickness shall be Class 51.

(h) *Encasement Pipe.* Steel encasement pipe shall be smooth wall, welded steel pipe of the size and wall thickness and approved by the City of Hot Springs. Steel pipe shall conform to the requirements of AASHTO Designation M-190 for Type C Coating.

Wall thickness or gauge shall be shown on the drawings and approved by the City of Hot Springs.

The annular space between the inside of the encasement pipe and the wastewater pipe shall be as shown on the plans. Casing spacers (Stainless or Plastic as applicable) shall

be used. State highway crossing(s) shall conform to requirements of current AHTD specification(s).

(i) *Pipe Joints.* Joints shall be the rubber gasket push-on type, conforming to the requirements of ASTM Designation D3139. All joints shall meet the requirements for ductile iron pipe as required by current manufacturers recommendations and shall be approved by the City of Hot Springs.

All joints for smooth wall steel encasement pipe shall be welded joints unless otherwise approved.

(j) *Service Lines.* All service lines shall meet with the requirements of the Arkansas State Plumbing Code and applicable City Plumbing Codes. Service lines under paved areas shall be bedded, as required for mains, from the main to the limits of the pavement.

Minimum size for any service line or building wastewater shall be 4" nominal diameter. Size of service line for multi-family or non-residential applications shall be as required in accordance with Arkansas State Plumbing Code, latest revision.

Service lines larger than 4" shall be constructed of material approved for main extensions by the City of Hot Springs.

A clean out is required on wastewater connections at nearest point to curb.

3. Pipe Fittings.

(a) *Gravity Wastewater.* For gravity wastewater, all bends, tees, plugs, adaptors, wyes, or other fittings shall meet the requirements of the type and kind of pipe used. All joints shall meet the requirements for the joints listed above.

(b) *Force Main Wastewater.* For Force Mains, all bends, tees, plugs, adaptors, reducers, wyes and other fittings shall be ductile iron mechanical joint conforming to ANSI/AWWA Standard C100/A21.10 and C111/A21.11. (For pipe sizes 3" and larger)

(c) *Special Fittings.* All special fittings shall be in accordance with the pipe manufacturers recommendations and as approved by The City of Hot Springs. Connections between different kinds of pipe and future connections shall be detailed on the plans. Connections shall be such as to provide watertight joints and shall be approved by The City of Hot Springs.

(d) *Couplings.* Connection between plain ends of the same type pipe or transitions from one type of pipe to another shall be made by Fernco couplings. If, in the opinion of the Utility, a rigid coupling is necessary to preserve the integrity of the

installation, one will be specified.

4. Manholes.

(a) *General.* Work to be performed under this item shall include all work necessary to ensure an acceptable manhole installation. Manholes may be constructed of precast concrete or concrete poured in place as detailed on the plans.

(b) *Concrete.* Concrete used in construction of this item shall be proportioned to produce a 28 day compressive strength of 4000 psi minimum and contain 6 bags of cement per cubic yard.

(1) Cement shall be an approved brand and type of Portland Cement conforming to ASTM Standard Specification C150 and may be either Type 1 or Type 3.

(2) Sand for concrete shall be sharp, clean and uniformly graded silica sand conforming to ASTM Standard Specification C33 and shall all pass a 1/4" screen.

(3) Gravel for concrete shall conform to ASTM Standard Specification C33 and shall grade uniformly from 1 1/2" to No. 4 size unless the conditions of placement require the use of small size coarse aggregate.

(4) Water used in making mortar or concrete shall be clean and free from oil, acid, alkali, sugar or other deleterious substances.

(c) *Mortar.* Mortar shall be composed of one part Portland Cement to three parts fine aggregate by volume to which shall be added seven pounds of hydrated lime with each sack of cement. Masonry cement shall be strictly prohibited for use in any part of manhole construction.

(d) *Brick or Block Manholes.* Brick or block manholes are not acceptable.

(e) *Precast Manholes.* Precast concrete manholes are allowed.

(f) *Poured In Place Manholes.* Poured in place manholes are allowed.

(g) *Drop Manholes.* Materials used in the construction of drop manholes shall conform to the requirements of the above paragraphs and other applicable parts of this specification(s). The fittings and pipe sections of the drop shall be as approved by Utility. All drops shall be constructed as inside drops.

(h) *Manhole Rings and Covers.* Metal used in manufacturing of municipal

castings shall conform to ASTM A-48, Class 35B Gray Iron. Castings shall meet requirements of AASHTO M-306.

Castings shall be manufactured true to pattern; component parts shall fit together in a satisfactory manner. They shall be of uniform quality, free from sand holes, shrinkage, cracks or other defects, and be smooth well cleaned by shot-blasting and furnished without paint for verification.

All circular manhole frames and covers shall be furnished with mechanical horizontal bearing surfaces unless a non-rocking feature is specified.

Manufacturers shop drawing shall be submitted to the Engineer for approval prior to the manufacturer or shipment of castings to the job site. The Engineer shall retain the right to reject castings not conforming to these specification(s).

Combined weights of manhole ring and cover shall not weigh less than 260 pounds. The size of opening shall be 24". The words "SANITARY SEWER" shall be cast into the lid. Manhole lids cast with the City of Hot Springs logo are required by Utility, provided supplier does not charge extra for the logo. Logo lids may be requested by the Utility if installed in a high traffic areas.

Acceptable foundries: Deeter and East Jordan Iron Works or approved equal.

(i) *Manhole Steps.* Manhole steps shall not be installed in new manholes unless otherwise specified by Utility.

(j) *Manhole Lining.* Mortar mix shall be a factory blended, one component, fiber reinforced, 100% Calcium Aluminate mortar, enhanced with Nepheline Synite Granite (NSG) aggregate. The mortar shall be designed to provide ultimate protection against Hydrogen Sulfide and other corrosive environmental elements induced corrosion, add structural strength and integrity, and stop the infiltration of groundwater in wastewater structures. The formulation shall allow for a monolithic one pass from ½ to 4" in thickness, without sag, by low pressure spraying. This material may be used for vertical repairs to concrete or masonry wastewater structures such as manholes, wetwells, pipelines and treatment plant structures where corrosion is a problem. Typical package weights shall not be less than 60 pounds with coverage yield of .50 cubic feet will cover 12.5 square feet at an average thickness of ½". Calcium Aluminate finish mix: Aluminaliner as manufactured by Quadex Corporation, (Little Rock, Arkansas), Strong Seal High Performance Mix, or approved equal.

(k) *Hydraulic Plug.* Fast setting cementitious waterstop may be used to plug hydrostatic leaks in the structure. All fast setting waterstop products must be manufactured by the same supplier of the finished Calcium Aluminate liner. Plugging materials shall be special cements and admixtures which are designed to instantly stop running water or seepage in all types of concrete and masonry structures. Fast setting

waterstop: Hydra-plug manufactured by Quadex Corporation, Strong-Plus manufactured by Strong Seal, or approved equal.

(l) *Patching Material.* Special rapid setting high strength patching material may be used to repair the invert and bench areas as well as other sections of the structure that will be under the normal water line. This rapid setting material must have a curing time of 15 minutes or less, a compressive strength of 4000 psi or greater within one hour of application. Material must have the ability to be applied in a thickness up to 8" with no adverse effect on the curing or the structural appearance (no cracks or voids). This material must cure to a compressive strength of no less than 1000 psi within 28 days of application. Special rapid setting patching material: Hyperform as manufactured by Quadex Corporation, QSR Patching material as manufactured by Strong Seal, or approved equal.

5. Pipe Bedding Material.

(a) *General.* All pipe shall be bedded in a foundation constructed as shown on the plans and standard details. Bedding material shall be gravel or crushed stone, maximum diameter 1 1/4". Foundation under pipe shall be bedding material 4" in thickness. Bedding material shall be used to backfill a height 12" above the top of the pipe. Excavated material shall not be used for bedding or pipe foundations.

Where the Contractor exceeds the maximum trench width to the extent that excessive backfill loads are imposed on the pipe, as determined by the Engineer, the Contractor will provide such additional pipe foundation as the Engineer may require without any additional compensation.

Bedding material shall be Class 1 as defined in ASTM Specification D2321. This Class includes graded stone, crushed stone and a number of fill materials which are found locally and have been used successfully for this purpose.

It is a requirement of these specification(s) that the bedding and initial backfill material to be used be approved by the Engineer prior to construction and that the supplier of such materials certify to the Engineer that each load supplied conforms to the Class 1 specification(s).

6. Low Pressure Wastewater System.

(a) *General.* Pressure Wastewater Systems for individual residences are not to be preferred or used in applications that can reasonably be served by Gravity Wastewater Systems. Each Pressure Wastewater System shall be approved by the Utility on a case by case basis.

Pressure Wastewater Systems shall be planned and designed to incorporate an approved

limited area with defined boundaries. The designing Engineer shall specify the limits of ultimate development with consideration given to the number and types of residential and commercial units projected for the area. Use of a Hot Tap process for wastewater line(s) will be approved following review of the request based on a case by case basis.

(b) *System Design.* Design shall include a plan and profile drawing to the main line pressure wastewater system clearly showing the size and elevation of all main line piping. The vicinity of the proposed pump locations on the lots, tap and stubout locations, valves, point and elevation of discharge, etc. shall all be clearly indicated on the plans. For ease of identification all pipe branches shall be separately numbered or otherwise identified.

Clean out and flushing stations shall be incorporated into the pipe layout. Cleanouts shall be installed at the terminal end of each main, at intervals of 1500' on straight runs and whenever two or more mains come together and feed into another main.

Mains shall be designed to achieve a minimum velocity of 2' per second, based on manufacturers' recommendations for general sizing guidelines:

Design parameters:

Residential	
1-2 Dwelling Units	Simplex 1hp
3-10 Dwelling Units	Duplex 1hp or 2hp
11-25 Dwelling Units	Duplex 3hp
26-100 Dwelling Units	Duplex 5hp
>100	Non Clog

Commercial
Duplex 1hp, 2hp, 3hp, 5hp or "Non Clog" dependent on flow rate and head conditions

The Low Pressure Wastewater System shall be designed for normal pressures of 40 psi or less. Mains shall be a minimum of 2" in diameter with design velocities between 2' per second and 5' per second. (Note: Individual Grinder pumps typically utilize 1 ¼" mains, in the event 3 or fewer Grinder Pumps utilize a single main the requirement to maintain clean out velocity may impose the need for a 1 ½" main.)

The system should be designed such that the maximum heads at the branch ends approximate 92'. This will provide optimum scouring velocity, minimum sewage holding capacity and the most economical pipe installation. (Note: Engineer may submit appropriate calculations to validate requested deviation from specifications as noted).

(c) *Pipe Material.*

- (1) Polyvinyl Chloride (PVC) Wastewater Pipe. PVC pipe for mains and service lines of the Low Pressure Wastewater System shall conform to current ASTM D-2241 PVC pipe SDR-21 PR 200, IPS - PVC gasket pipe.
- (2) Ductile Iron Pipe. For Force Mains, ductile iron pipe shall conform to ANSI/AWWA C151/A21.51 thickness Class 50. It shall be lined with corrosive resistant lining in accordance with ANSI Standard A21.4 unless otherwise allowed by Utility. Pipe shall be manufactured for use with the type joints specified. Approved Linings: Protecto 401 (McWane), Polybond, PolybondPlus (American), Polythane (U.S. Pipe) or approved equal.

Force Mains shall have a 30" minimum depth of cover over the top of pipe. A continuous #12 gauge copper coated wire shall be installed with all non-metallic pipe including service lines. The wire shall run continuously along the bottom of the pipe. The wire shall be looped around valves, saddles, curb stops and other appurtenances in such a manner that there is no interference with the operation of the appurtenances. Valve locate boxes shall have signage provided indicating Utility line(s) in place. In addition locate wire connection(s) shall be affixed to signage post.

(d) *Valve Material.* Isolation valves shall be bronze gate valves Class 125 Threaded Non-rising Stem, Screwed Bonnet, Solid Wedge Disc Crane No. 438 or equivalent.

Check valves shall be bronze swing type Class 125 Threaded, Bronze Disc, "Y" Pattern, Screwed Cap Crane No. 37 or equivalent.

Preassembled "Lateral Kits" containing both the ball and check valve are also acceptable.

(e) *Construction Methods and Policies.* Low Pressure Wastewater System(s) shall be constructed according to the standard methods as outlined in the general section of the specification(s) contained herein, except for the following special construction specification(s).

Service lines from individual residence(s) shall be PVC SDR-21 Class 200 pipe. Service lines shall be 1 ¼" diameter or a larger as specified by the Engineer and approved by the Utility. Service lines shall be buried a minimum of 18" below finish grade. Isolation valves and check valves shall be installed in a single valve box at the property line in a designated easement and a location approved by the Utility. The valve box may be plastic and shall be a type and size approved by the Utility. Ensure "wastewater connection box" is compliant with minimum distance requirements when placed near Water line(s).

Tracer wire for non-metallic pipe: locate wire shall be #12 gauge copper coated wire and shall run continuously along the "bottom of the pipe below pipe bedding material(s)" for all plastic (PVC) pipe(s).

Cost and installation of the grinder pump system shall be provided by the property owner or improvement district. All material and labor shall be warranted by the installer and/or supplier for a period of one (1) year after the system is placed in operation. The Utility will provide maintenance and service as required due to normal wear and tear for the pump and controls, check valve and isolation valve at the main after the one (1) year warranty period. Actual cost(s) to repair failures due to abuse by the owner shall be paid by the owner.

The property owner shall be responsible for proper maintenance, upkeep and replacement of the service line and power supply.

Property owners and developers shall furnish all easements and access required by the Utility to properly maintain and service the wastewater mains and associated pumping equipment. Roads utilized to access Utility maintained equipment will be constructed using "all weather service" material(s) and will require Utility approval.

The property owner shall not bury, build over or in any other way make inaccessible the lines and pumps for which the Utility is responsible.

When grinder pump systems are included in a wastewater extension, the developer/owner shall furnish the Utility, without cost, the number of complete pump/motor assemblies according to the following schedule:

<u>Grinder Pumps in District</u>	<u>Spares Furnished to Utility</u>
1 – 10	1
11 – 20	2
21 or more	10% (Add one for any fraction)

(f) *Service Line.* The 1 ¼" discharge line and service line shall be installed 24" below the top of the basin. A section of stainless steel pipe shall be connected to the basin and extend a minimum of 2' or to a longer length if required to reach the service line

trench having an undisturbed trench bottom. The service line shall be pressure tested from the basin connection to the force main prior to final installation of the pump assembly.

The pressure test shall be performed in accordance with the Force Main Leakage Test procedure as outlined in the general section of the specification(s) contained herein.

7. Simplex Grinder Pump System.

(a) *General.* Simplex (one pump) grinder pump systems mounted in a fiberglass sewage collection basin shall be provided as a minimum for up to two single family dwellings. In such cases where a single pump station can be shared by two residences, the station shall be located on the property line between the two homes and the discharge main shall be laid along the lot line when possible. A duplex dwelling will be considered as two homes and will require it's own unshared simplex grinder station. More than two dwelling units, including three separate houses, a triplex, fourplex, or apartment complex will require a duplex installation.

The installation of the pumping unit shall be performed by the Utility. Installation of all other components including the basin, piping, control panel, valving, etc. shall be performed by a licensed plumber who has successfully completed a training course and has been certified to install the equipment. A list of these certified licensed plumbers will be kept on file at the Utility Office and issued with each grinder pump permit.

(b) *Pump Design.* The pump shall be of a positive displacement design for submersible use and shall have a 1hp rating. The sewage cutter/grinder mechanism shall be of hardened and ground stainless steel capable of macerating solids into fine slurry. The grinder cutting impeller shall extend beyond the shredding ring to minimize the possibility of large solids clogging the suction inlet. Recessed grinder cutting impeller designs will not be acceptable.

The pump motor shall be air cooled and have a high temperature cut-off switch imbedded in motor windings. Pump(s) shall be an Environment One AMGP, Simplex Grinder Pump (Delta Environmental) or approved equal.

(c) *Fiberglass Basin.* The basin shall be fiberglass and be manufactured to be watertight through a filament wound or hand lay up system and shall be a type of construction strength and material approved by the Utility. A resin rich mixture shall be used. Stainless steel fasteners shall be encapsulated in the top lip to which a cover of fiberglass shall be bolted. Finished dimensions shall be 30" diameter by 60" or 72" deep as required by elevation of piping. The circumference of the basin bottom shall be equipped with anti-flotation hold downs which shall be embedded in concrete. Basin shall be Environment One grinder pump station package or equivalent. Basin shall be backfilled with select material containing no rocks or stones larger than 3".

The top of the basin shall be elevated a minimum of 4" above finish grade with positive run off grade on all sides. The basin and pump assembly shall be located a minimum of 10' from all buildings and water systems.

(d) *Control Panel.* Hercules brass lock shall be furnished with each control enclosure. All locks furnished for the system shall be keyed alike such that only one key will be required to open all panels. Keys and locks shall be furnished by the pump station vendor consistent with those previously installed.

All panels shall be in NEMA 4 enclosures of outdoor use and the box cover shall have a hasp for the lock, a flashing red high level alarm light with door. The alarm light shall have flashing red indication, shall be NEMA 4 rated, shall be oil and water tight, and shall be 1 1/2" diameter.

Panels shall be for 230 volt single phase unless otherwise approved by Utility depending upon voltage availability. Control circuit and alarm circuit shall be for 115 volts.

The control panel shall include a schematic wiring diagram permanently posted on the inside cover of the box. All terminals shall be clearly labeled with proper designation.

The power cable shall be of wire size, run in conduit in accordance with the National Electrical Code from the panel to the box a disconnect box shall be located at the building exterior wall.

(e) *Inlet Gasket.* The City of Hot Springs shall cut the inlet hole and install the inlet gasket at a level between the discharge level and 1' above the manufacturer(s) recommended alarm level.

(f) *Variable Requirements.* A check valve shall be installed in the discharge line of each pumping unit where the static discharge head of the pumping unit is less than 15' or in any pumping stations designated by the Engineer.

Where field conditions require, or in any pumping station designated by the Engineer, a siphon breaker shall be installed in the discharge line of each pumping unit. Siphon breakers shall be a minimum of 1 1/4" in size and be approved by the Engineer prior to installation. Manufacturer/Supplier shall furnish the Utility with a minimum of two operations and maintenance manuals along with the parts lists.

8. Duplex Grinder Pump System.

(a) *General.* Duplex (two pump) grinder pump systems mounted in a fiberglass sewage collection basin shall be provided as a minimum for each three-family or larger residential unit or commercial business.

Pump shall be a grinder pump of the centrifugal type or semi-positive displacement depending on volume requirement with recessed type impeller and integrally built-in grinder and submersible motor. Motor shall have seal failure detector and high temperature shut off. The pump shall be installed on a lift out rail type system in such a way that solids are fed in an up-flow direction to the grinder impeller, with no feet, rails, or other obstructions below the grinder inlet.

An isolation valve shall be added at the end of all pressure wastewater mains. A check valve and isolation valve shall be installed in a vault at all Duplex Pump Stations.

(b) *Operating Conditions.* The pump shall be capable of operating, without overloading, at any point on the pump performance curve.

(c) *Motor.* The motor shall be 1hp, 2hp, 3hp or 5hp as required and will operate at 1750 or 3450 rpm.

The motor shall be single phase 230 volt, unless otherwise approved by Utility depending on voltage availability and shall be of the capacitor start/capacitor run type.

To ensure optimum concentricity, the motor shall have a heat shrunk stator. The stator windings shall be of the open type with insulation rated for 150° C maximum operating temperature. The winding housing shall be filled with a clean high dielectric oil that will lubricate bearings and transfer heat from the windings to the outer shell.

Motor shall have three bearings; an upper ball bearing, an intermediate ball bearing, and a lower sleeve guide bearing to accommodate radial load from the grinder impeller. Ball bearings shall be designed for a B-10 life.

A heat sensor thermostat shall be attached to the windings and shall be connected in series with the motor starter coil to stop motor operation should the motor temperature exceeds 220°F. The high temperature shut off shall cause the pump to cease operation should a control failure cause the pump to run in a dry wetwell. The high temperature shut off shall automatically reset and restart the motor when the temperature drops to a safe limit.

The common motor pump and grinder shaft shall be of one piece and shall be 416 stainless steel. The pump impeller and grinder impeller shall thread onto the shaft.

(d) *Seal Chamber.* The motor shall be protected by two mechanical seals, mounted in tandem, with an oil filled chamber between the seals for lubricating seal faces. Seal faces shall be carbon and ceramic lapped to a flatness tolerance of one light band. Metal parts and spring for seals shall be stainless steel.

(e) *Seal Fail Detector.* A double electrode shall be mounted in the lower end of seal chamber to detect any water leakage into the chamber. Electrodes are connected to an amber seal failure light in the control panel. The seal failure warning system shall not stop the motor but indicate leakage so that the pump lower seal can be serviced prior to the motor being damaged.

(f) *Pump Impeller.* The impeller shall be of the recessed type to provide for an open unobstructed passage through the volute. The impeller shall be constructed of 85-5-5-5 bronze and shall have pump out vanes on the back side of the impeller to help keep trash away from seal and reduce pressure at the seal faces.

(g) *Grinder Construction.* Grinder assembly shall consist of a grinder impeller and a shredding ring mounted directly below the pump volute inlet. Grinder impeller shall thread onto shaft and will be locked with a screw and washer. The shredding ring shall be held in the housing by a snap ring and steel retaining ring. Both the shredding ring and impeller shall be removable from the outside without dismantling the pump.

Grinder assembly shall be of such construction that no clearance adjustments are required when reassembling. The grinder impeller and shredding ring shall be of 440 C stainless steel and shall be hardened to 58-60 Rockwell.

(h) *Pump and Motor Castings.* All castings shall be of high tensile cast iron, shall be treated with phosphate and chromic rinse and be painted inside and outside with baked on epoxy paint before machining. Likewise, the interior of the volute shall be coated with baked on epoxy paint.

(i) *Power Cords.* Motor power cords shall be #14 type ST, four conductor, and motor control cord to be #16 ST, four conductor. All cord lengths shall be such that no splices will be required between the pump and control panel. Both cords shall be potted into motor end cap with epoxy potting compound. In addition, a rubber grommet that seals both cords shall be clamped on the cords by the end holding cap. Cords shall withstand a pull of 150 pounds without loosening. The end cap shall have female thread tapping for 1 1/2" conduit.

(j) *Lift Out Rail System.* An upper guide plate shall be attached to liftout fitting and will guide pump on rails. A lifting eye shall be attached to plate and 1/4" stainless chain and clevis shall be furnished for lifting pump.

The lift out rail system must also employ swing type check valves with a bronze disconnect utilizing an o-ring sealing device. This system shall use a 3/16" stainless steel lifting chain.

Guide rails shall be 3/4 inch 304 stainless steel installed parallel to one another. Alternate guide rail systems utilizing other means of disconnect devices are not acceptable.

(k) *Level Controls.* These controls shall be a mercury tube sealed in polyurethane float and weighted to hold position in the sump. The cord connecting the control shall be SJO type. Four switches shall be provided; Pump On, Pump Off, High Level Alarm, and Lag On.

(l) *Electrical Control Panels General.* All panels shall be in NEMA 4 enclosures for outdoor use and box cover shall have hasp, lock and a flashing red high level alarm light and audible alarm.

Panels shall be for 230 volt single phase unless otherwise approved by the Utility depending on available voltage. Control circuit and alarm circuit shall be 115 volts

The following components will be provided for each pump; circuit breaker, magnetic contactor with 3 leg quick trip ambient compensated overload block, H-O-A switch, green run light, amber seal fail light, alarm switch for on-off and test and connection terminal strip.

Single phase panels shall also have start and run capacitors in addition to a start relay.

The control panel shall have the following options:

- (1) Elapsed Time Meter for each Pump
- (2) Lightning Arrestor
- (3) Phase Monitor in Three Phase Units
- (4) Remote Alarm Terminals and Circuitry
- (5) Audible Alarm Horn
- (6) Mounting Stand for Control Panel

The control panel shall include a schematic wiring diagram permanently posted on the inside cover of the box. All terminals will be clearly labeled with proper designation.

(m) *Startup.* Startup services shall be performed by the authorized factory representative with Utility personnel observing. Manufacturer shall furnish two operation and maintenance manuals and parts lists per system.

9. Air and Vacuum Release Valves.

(a) *Sewage.* All Force Mains and other pressure non-treated mains shall have air and vacuum release valves installed as they are indicated on the plans. Refer to detailed drawings section of this procedure for additional information. 36" Corrugated piping with appropriate manhole cover may be substituted when appropriate. The body of these valves shall be conical shaped to maintain maximum air gap with the spring loaded float and seal plug connection combining to ensure no contact between the sewage and

the seal. The valve shall have a double float design with the upper float being enclosed in the upper section of the valve and shall be made of polypropylene. The lower float shall be in the main body of the valve and shall be constructed of stainless steel. The body shall be constructed of steel, fusion coated inside and out with an epoxy coating and shall have a funnel shaped lower body to automatically drain sewage back into the system. All internal metal parts are to be made from corrosion resistant stainless steel with all operating parts in the upper section to be non-metallic plastic materials. The rolling resilient seal shall provide smooth positive opening, closing and leak free sealing over the fluctuation of pressure differentials. The working pressure shall be 230 psi and tested to 460 psi. All hardware shall be of stainless steel bolts and nuts with plastic washer(s) under the bolt and nut. The connection on all pipelines shall be the following sizing with an isolation valve of the same size:

8-inch and smaller	2-inch threaded
10-inch through 16-inch	3-inch flange
18-inch through 24-inch	4-inch flange
30-inch through 48-inch	6-inch flange
54-inch and larger	8-inch flange

All air and vacuum combination release valves shall be model ARI D-020 or approved equal, automatic air release valves shall be ARI model S-020 or approved equal. All valves shall be installed in accordance with manufacturer recommendations and shall have an isolation valve connection for control. All ARV shall have ISO 9002 certification in order to be supplied on this project.

(b) *Pump Station Air Valves.* Special application of the air release valves at the pump station piping shall allow for the ARI model D-040 combination valve. These valves are to be located as shown on the drawings just past the 90° bend on the header pipe detail. The body/base of these valves shall be made from high strength lightweight non-corroding fiberglass reinforced nylon and all operating parts are to be made of engineered corrosion resistance plastic materials. The rolling resilient seal shall provide smooth positive opening, closing and leak free sealing over the fluctuation of pressure differentials. The valve shall be designed to allow larger than normal automatic orifice providing efficient air release and minimize potential debris build-up and clogging. The working pressure shall be 200 psi and shall have a 2" threaded connection. All air and vacuum release valves shall be model ARI D-040 or approved equal. The connection to the system shall be a direct threaded connection on the top of the pipe with a saddle and an isolation valve.

ARTICLE II. WASTEWATER CONSTRUCTION METHODS

10. Construction Methods - General.

This section of the specification(s) shall govern the construction procedures used in

the installation of sanitary wastewater facilities under the jurisdiction of The City of Hot Springs. Construction procedures other than those outlined in this specification(s) shall meet with the approval of The City of Hot Springs. Complete specifications covering any unusual or special construction procedures shall be submitted for approval, said approval must be received prior to beginning any construction operations.

11. Excavation, Bedding, and Backfilling.

(a) *General.* Excavation shall include the removal, handling, rehandling, refill or backfilling and disposal of any and all materials encountered in the work. It shall also include all pumping, drainage and shoring. The excavation activities shall also include the responsibility of added expenses or other liability that may arise from obstacles or conditions, foreseen or unforeseen that may be encountered in the work.

All excavation shall be made in such manner and to such widths as will give ample room for properly laying and inspecting the pipes. All excavation necessary for laying pipe, constructing manholes, etc., shall be made to line and grade as indicated on the plans and as specified herein. Trenches shall be excavated to the alignment and depth required and shall not advance more than 100' in advance of the completed pipe unless otherwise permitted by the Engineer. The trench shall be braced and drained as may be required to ensure that workmen may work therein safely and efficiently in accordance with OSHA regulations. All excavation(s) shall be open cuts with vertical sides except in special cases where the Engineer may permit sloping sides above a point 2' above the top of the pipe or except where tunneling is required.

Since rock may vary from cobbles to hard rock and from easily ripped shale to sandstone (which requires blasting) the Contractor is encouraged to consult the standard details for trench design, bedding and backfill. The Contractor will also make his own determination of rock quantities and construction techniques.

The maximum width of trench for wastewater pipe installation at a point 2' above the top of the pipe shall be the external diameter of the barrel of the pipe plus sufficient space to ensure backfill material is placed in accordance with applicable standards and specification(s).

The Engineer shall, at any time, have the authority to require the Contractor to discontinue the use of any excavation machine or other equipment which, in his judgment, is not adapted to the purpose for which it is used.

All excavation(s) shall be dewatered before any construction begins. Concrete shall be placed only upon dry, firm foundation material and pipe shall be laid only in properly prepared trenches. All pipe ends shall be closed using devices or materials approved by the City of Hot Springs at the end of each day's operation. Dewatering shall be necessary

to avoid interfering with the progression of the work or endanger adjoining property and structures.

The Contractor shall maintain all excavation(s) in good order during the construction, so as not to hinder or impact the pipe laying, masonry or other work. The Contractor shall take all reasonable precautions to prevent movement of the sides of such excavation and shall remove at his own expense any material sliding into the excavation.

The Contractor shall furnish and put in place such shoring as may be required to support the sides of all trenches or other excavations. This shoring will not be considered as a separate pay item.

Wherever necessary for protection of workmen, for security of adjacent Utilities, structures, for stability of trench, for proper installation and operation of wastewater pipe the Engineer shall have the right to require that the excavation be braced and rendered secure to his satisfaction.

All material excavated shall be placed so as to not interfere with public travel to the extent possible. At street crossings and other points, as may be directed by the Engineer, the trenches shall be bridged in a proper and secure manner so as to prevent any serious interruption of travel upon the roadway or sidewalk. This will also provide access to particular public premises.

Surplus excavated material(s), other than those utilized to achieve final grade in accordance with the drawings shall be disposed of by the Contractor.

(b) *Excavation - Trench Sewage Force Mains.* Trenches for force mains shall be of the width and depth necessary to enable the proper installation of the pipe. All pipe lines shall be laid in trenches of such depth as to provide a minimum cover of 30" over the top of pipe barrel unless otherwise indicated on the plans.

Width of pipe trench for sewage Force Mains shall be adequate for the installation of the pipe and make-up of joints, however, in no case shall the width of the trench at the top of the pipe be wider than the outside diameter of the pipe plus two 2'.

The bottom of the trench shall be accurately graded so that the pipe will be in continuous and uniform contact with and have a longitudinal bearing on undisturbed soil for the full length of the barrel of the pipe. The trench bottom shall be excavated by hand below the bell ends so that the bell does not bear on the trench bottom.

If the soil at the bottom of the trench is mucky or if the subgrade is too soft to properly support the pipe, the Contractor shall excavate below the lower extremity of the pipe as directed by the Engineer, and place select material. Said select material shall be thoroughly tamped into place to receive the pipe.

(c) *Excavation - Trench for Gravity Wastewater Pipe.* All pipe lines shall be laid in trenches of such depth as to provide a minimum cover of 30" over the top of pipe barrel unless otherwise indicated on the Plans.

In order to avoid superimposed loading in excess of the designed and specified pipe strength and to provide sufficient room for proper installation and bedding of wastewater pipe, the trench widths for the pipe sizes used shall be kept within the limits specified as follows:

Inside Pipe Diameter	Maximum Width of Trench at Top of Pipe	Maximum Width of Trench 12" Above Outside Top of Pipe
6"	2' - 6"	2' - 10"
8"	2' - 6"	2' - 10"
10"	2' - 6"	3' - 0"
12"	3' - 0"	3' - 4"
14"	3' - 0"	3' - 6"
15"	3' - 0"	3' - 6"
16"	3' - 0"	3' - 6"
18"	3' - 6"	4' - 0"
21"	3' - 6"	4' - 4"
24"	4' - 0"	4' - 8"
27"	4' - 0"	5' - 0"
30"	4' - 6"	5' - 6"

If it becomes necessary to reduce the earth load on the trench banks to prevent sliding and cave-ins, it will be permissible to cut the trench banks on a slope above an elevation 2' above the outside top of the pipe. Under no circumstances, however, shall the specified maximum width 12" above the outside top of the pipe be exceeded, except at points where the combined superimposed earth and live loads on the pipe are sufficiently low to permit an increase in the specified maximum trench width, and then only where such an increase in trench width is authorized by the Engineer.

Shaping of the trench bottom and bedding procedures shall be as specified in this section. Under certain conditions, excavation below the planned invert of the pipe will be required before preparation of the bedding has begun, as listed in the following paragraphs:

If the soil at the bottom of the trench is mucky or in such condition that it cannot be properly shaped and graded, if the subgrade material is too soft to properly support the pipe the Contractor shall excavate below the normal subgrade elevation as directed by the Engineer. Whenever excavation is carried below the specified subgrade, at the direction

of the Engineer, the Contractor shall provide and install a fill of Class II bedding thoroughly tamped into place up to an elevation sufficient to prepare the subgrade as specified in this section for the particular classification of bedding that may be required.

Where water occurs in trenches they shall be excavated to a depth of approximately 6" below grade and backfilled with gravel to a point approximately 1/6 of the internal pipe diameter or 2", whichever is the greater, above grade. Pumps shall then be kept operating, taking suction out of a sump below the gravel so as to hold the water level well below the bottom of the pipe until the joints have been placed and firmly bedded in position.

Excavation(s) for manholes and other accessories shall be sufficient to leave at least 12" of clear space between their outer surfaces and the embankment or timber which may be used to protect them.

(d) *Disposal of Excavated Materials.* Excavated material(s) shall be stockpiled adjacent to the work, they will be used for backfilling as required. Excavated material(s) which is unsuitable for backfilling, excess material(s) and all excavated material(s) from a street cut shall be removed from the site and disposed of in a manner approved by the Engineer.

(e) *Use of Explosives.* In the event the use of explosives is necessary for the efficient prosecution of the work the Contractor shall notify the Engineer in advance of their use and shall exercise every precaution to prevent damage to adjoining improvements or property. Any damage to private property resulting from the use of explosives shall be the liability of the Contractor. In all cases where the explosives are necessary a permit from the local governmental agency shall be obtained by the Contractor prior to their use.

(f) *Bedding, Embedment, and Backfilling of Wastewater Lines.* No backfilling of trenches shall be performed until the pipework to be covered has been inspected by the Engineer. When any shoring is withdrawn, as backfilling progresses, all voids or spaces left thereby shall be carefully and thoroughly filled and then compacted with properly shaped tools.

The Engineer shall have the right to forbid the use of any compacting tools or machines that he considers dangerous to the pipe or incapable of properly compacting the backfill.

All backfill compacting operations shall be accomplished in the presence of the Engineer, these operations shall proceed in such sequence as he may direct. The Contractor shall be responsible for the stability of all backfill made under the contract until final acceptance of the work. The Contractor shall also bear the expense of replacing any portions which have become displaced due to carelessness or negligent work on the part of the Contractor, damages resulting from natural causes, such as a storm, and not attributable, in the opinion of the Engineer, to unavoidable movements of the ground upon which the backfill is made.

Backfilling of trenches for pipe wastewater shall start as soon as the Engineer considers the joints to be satisfactory. Backfill material(s), as called for on the plans and in these specification(s) shall be carefully placed in the trench so as not to move the pipe or dislodge any of the jointing material(s). Material(s) will be thoroughly but carefully placed under and around the pipe up to a point 12" above the top of the pipe. The utmost care shall be taken not to disturb the pipe or to shift a pipe from its proper position by careless or unskilled ramming around it or by unequal filling on the sides.

Where a trench is in highway or street pavement, backfill for the balance of the trench, above a point one foot above the top of the sewer shall be compacted by placing in layers of not more than 12" thickness. Material(s) will then be compacted with mechanical tampers or by satisfactory method(s) that will obtain the density hereinafter specified unless a specific method is provided by the special provisions. The density of compacted material in each layer of backfill shall not be less than 95% of the maximum density as measured by Method of Test for the Compaction and Density of Soils (Ref. AASHTO Standard Specification T-99).

Where a trench is in open ground and not in highway or street pavement, the trench from a point one foot above the top of the sewer to a point 1' below the original ground surface may be filled in layers approximately 12" thick. This will be accomplished using the best of the excavated material including only the smaller stones, cobbles, or broken rock pieces. This backfill will then be compacted by approved equipment or mechanical tampers to obtain at least 90% of maximum density as measured by Method of Test for the Compaction and Density of Soils (Ref. AASHTO Standard Specification T99). The remainder of the backfill may consist of the larger rocks and stones excavated from the trench and the surface mounded over the top to provide for some after settlement. The final surface shall be left in a condition equal to that originally found at the start of the work.

As soon as the backfilling of any excavation is complete the Contractor must begin the removal of all surplus dirt, pipe and other material(s) placed or left on the street by him except for material(s) needed for the replacement of the paving. The street shall be made passable for traffic. Following the above work the repairing and complete restoration of the street surfaces shall be accomplished as promptly as possible.

All gravity wastewater pipe shall be installed using Class I embedment materials as described in these specification(s) (Pipe Bedding Materials), except that cast or ductile iron pipe conforming to these specification(s) may be bedded as specified for "Type 1" laying conditions in ANSI A21.50. "Thickness Design of Ductile-Iron Pipe", latest revision, unless structural or foundation requirements indicate otherwise.

(g) *Bedding and Backfilling of Rigid Pipe.* The bedding of rigid pipe (ductile iron) shall be completed as described below and in accordance with the trench detail shown on the standard details sheet appended to these specification(s).

Excavation(s) shall be performed to a depth of 4" below the bottom of the pipe wherever the bottom of the trench is rock. Where excavation is done below the pipe for any reason the space shall be filled with select material as defined in these specification(s) and compacted as required to provide a firm non-settling foundation for the bottom of the pipe.

Said select material shall be brought to the required grade. The bottom of the trench shall be accurately graded so that the pipe will be in continuous and uniform contact with and have a longitudinal bearing on undisturbed soil for the full length of the barrel of the pipe. The trench bottom shall be excavated by hand below the bell ends so that the bell does not bear on the trench bottom. The pipe and joints shall be bedded with select material(s) to the spring line of the pipe and along the full width of the trench. The intent is to cradle the pipe so that the full length of each joint is uniformly supported on firm bedding and the weight of pipe and fill is borne uniformly by the lower half of the pipe barrel.

(h) *Bedding and Backfilling of Flexible (PVC) Pipe.* The bedding and backfilling of PVC pipe shall be accomplished as follows:

Excavation(s) shall be accomplished to a depth of 4" below the bottom of the pipe and wherever excavation is done below this depth for any reason the space shall be filled with Class I bedding material unless otherwise approved in writing by The City of Hot Springs. After the pipe is placed on the material(s) in the bottom of the trench, at least 6" of Class I material(s) shall be deposited on each side of the pipe and thoroughly tamped and rammed around the pipe using hand, mechanical, or pneumatic tampers. The pipe and joints shall be bedded in Class I bedding material(s) to a point 12" above the top of the pipe and along the full width of the trench at all depths.

The Class I bedding material(s) shall be compacted as required to provide a firm non-settling foundation for the bottom of the pipe. The purpose is to cradle the pipe so that the full length of each joint is uniformly supported on firm bedding and the weight of pipe and fill is borne uniformly by the pipe barrel.

(i) *Service Lines.* In areas to be paved, the bedding of service lines shall meet the requirements set forth above.

12. Dewatering of Trenches.

(a) *Well Pointing.* Well pointing, where required to keep the excavation dry and the subgrade stable, shall be installed when the excavation is within 2' of the water table, except as hereinafter provided, and shall be in continuous operation until backfill is completed to this level. When construction equipment is to be operated in an area that has been excavated and well pointing is required to keep trench excavation dry and the subgrade stable, the well pointing shall be installed when the excavation is within 5' of the water table. There shall be sufficient pumping equipment, in good working order, available at all times to remove any water that accumulates in excavations to the extent that a stable subgrade is obtained. Where the pipe line crosses natural drainage channels, the work

shall be conducted in such a manner that unnecessary damage or delays in the prosecution of the work shall be prevented. Provision shall be made for the satisfactory disposal of surface water pumped to prevent damage to public or private property.

(b) *Trench Dewatering.* Dewatering of trenches other than by well pointing shall be accomplished by whatever means elected by the Contractor, however, bedding material or pipe may not be placed in wet or unstable trenches. Soil that cannot be properly dewatered shall be excavated and dry material tamped in place to such a depth as may be required to provide a firm trench bottom.

(c) *Surface Runoff.* Surface runoff water shall be diverted away from the trenches. Such diversion shall be into existing drainage structures such as storm sewers, ditches or streams. Diversion of surface runoff shall be in such a manner to prevent flooding of streets or private property. All pipe ends shall be sealed watertight at the end of each day's operation as described in these specification(s). (Ensure dewatering activities comply with Storm water pollution prevention requirements).

(d) *Disposition of Water from Dewatering.* All water removed from the trenches by well pointing or any other means shall be pumped, piped or drained into existing drainage structures such as storm sewers, ditches or streams. The disposition of water from dewatering operations shall be accomplished in a manner that will prevent the flooding of public or private property. Discharge of trench water into a sanitary wastewater is a violation of City of Hot Springs Wastewater Ordinance and violators will be prosecuted as prescribed by law.

13. Sheeting and Shoring.

(a) *Cave-ins.* Where trench cave-ins are a possibility, adequate sheeting and/or shoring shall be provided so as to maintain the trench free from slides or cave-ins and safe for work group.

(b) *Existing Structures.* Where existing buildings, other utilities, streets or other structures are in close proximity to the trench, adequate protection shall be provided by the use of sheeting and shoring to protect the structure from possible damage. In the case of streets or utilities the Contractor may elect to alter the street or utility provided that the removal and subsequent replacement meets with the approval of the City of Hot Springs, the utility owner, or whomever has jurisdiction of the structure. In all cases, it shall be the responsibility of the Contractor to protect public and private property and any person or persons who might, as a result of the Contractor's work, be injured.

(c) *OSHA (Occupational Safety and Health Administration) Regulations.* All trench and structural excavation shall be conducted as required by OSHA Subpart P - Excavations, as found in CFR 1926.650, 29CFR 1926.651 and 29CFR 1926.652. The Contractor shall maintain a "NUCA Competent Person" on the job site at all times while

excavations are open or in progress.

14. Pipe Laying.

(a) *General.* Pipe shall be laid in the trench on bedding as called for on the plans or designated by the Engineer. A grade laser shall be used to maintain the desired pipe slope. Once the wastewater is completed, the interior surface on the bottom thereof shall conform accurately to the grade and alignment indicated on the plans or directed by the Engineer. Maximum deflection of PVC pipe shall not exceed 5% as recommended by manufacturer. Any pipe which is not true in alignment or which shows settlement or deflection after laying, exceeding manufacturer's recommendation, shall be taken up and relaid at the Contractor's expense.

Before being set in place, each section of pipe shall be thoroughly cleaned and freed of dirt. All bells shall be laid on the upstream end. Whenever pipe laying is stopped, either for the night or for any other cause, the end of the pipe shall be securely closed to prevent the entrance of water, mud, or other matter, and shall be secured in such manner as to prevent the pipe from being dislodged by movement of backfill.

Wye and tee branches shall be placed in the service lines at points indicated by the Engineer. Riser pipe and wastewater lines shall be laid at points and to grades indicated by the Engineer. Service lines will be laid in accordance with the requirements for wastewater pipe. The ends of all service lines and other points for future connections are to be capped with a suitable watertight stopper. Minimum slope of 4" service lines shall be 1/8 per foot. The end of each service connection shall be clearly marked with a 1/4" nylon rope to the surface and referenced with three landmarks.

(b) *Gravity Wastewater Lines.* If requested by the Utility, all lines shall be proven for alignment and grade. Care shall be taken to ensure that each spigot is centered properly in the bell of the proceeding pipe, properly seated, and that each pipe is solidly bedded. As the work progresses, pipes shall be cleaned of all dirt and other foreign matter. They shall be maintained clean until accepted or placed in service.

All gravity wastewater lines shall be laid in a straight alignment and on no less than the minimum grade for the engineered pipe size as outlined in the table below: (Unless approved by Utility minimum slope will be 0.40).

Nominal Wastewater Size	Minimum Slope in Feet (Per 100 Feet)
6 inch	0.60
8 inch	0.40
10 inch	0.28
12 inch	0.22
14 inch	0.17
15 inch	0.15
16 inch	0.14

18 inch	0.12
21 inch	0.10
24 inch	0.08
27 inch	0.067
30 inch	0.058
33 inch	0.052
36 inch	0.046
39 inch	0.041
42 inch	0.40

The cutting of pipe for any reason shall be done in a neat and craftsman type manner without damage to pipe or pipe lining.

Pipe shall be lowered carefully into the trench in such manner that spigot and bell will not become contaminated. Spigot and bell shall be checked for cleanliness immediately before lubricating and insertion of spigot into bell.

Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe be laid in water and no pipe shall be laid when trench conditions or weather are unsuitable for such work. Full responsibility for the diversion of drainage and for dewatering of trenches during construction shall be borne by the Contractor.

Spigot and bells shall be cleaned thoroughly before the application of lubricant. Application of lubricant shall be in strict accordance with manufacturer(s) recommendation(s).

Pipe shall not be placed in the trench without excavating for bells to ensure the entire barrel of the pipe is uniformly supported on the pipe bedding.

Pipe shall be supported to proper line and grade and secured against upheaval or floating during the placement of the specified bedding for the pipe material being used.

In areas of known perched water tables above levels of the wastewater mains and when instructed by Utility, the Contractor shall construct one clay dam between each manhole. The dam shall be a nominal 3' in width and extend the full width of the trench, from trench bottom to finish grade, except in paved areas.

(c) *Force Mains.* All pipe and fittings shall be installed to the line and grade as detailed on the plans. Subject to the approval of the Engineer, other fittings may be added to or substituted for those shown on the plans should the need therefore arise during construction. This permissive stipulation in no way shall relieve the Contractor of the responsibility for furnishing and installing all fittings required for a complete and proper installation of the main as detailed on the plans.

All dirt and other foreign matter shall be removed from the inside of pipe and fittings before they are lowered into the trench. They shall be kept clean during and after laying, care shall be taken to keep dirt out of the jointing space. At the end of each days work and when pipe laying is discontinued for an appreciable period, open ends of the pipe shall be closed with a cast plug or cap firmly secured in place by tamped jute or hemp or as described in these specification(s).

All pipe and fitting shall be lowered carefully into the trench in such a manner as to prevent damage to pipe, fittings or linings. Neither pipe nor fittings shall be dropped or dumped into the trench.

Cutting of pipe, where needed, shall be done in a neat and craftsman type manner without damage to pipe or pipe lining.

Unless otherwise directed by the Engineer, pipe shall be laid with bell ends facing in the direction of laying and shall be laid up grade. Whenever necessary to deflect pipe from a straight line in either the horizontal or vertical plane, to avoid obstructions, or for other allowable reasons, the degree of deflection at any joint shall not be greater than that which will provide adequate gasket space entirely around the spigot end of pipe.

Deflections shall not exceed the maximum recommended by the pipe manufacturer(s).

(d) *Steep Grades.* Type of Pipe - Ductile iron pipe, meeting the requirements as described in these specifications, shall be used on all wastewater lines when the grade is 15% or greater. Mechanical joints with joint restraints may be required by The City of Hot Springs.

(e) *Connections to existing Wastewater.* Connections to existing wastewater shall not be performed without approval of The City of Hot Springs.

All work shall be completed in a craftsman type manner using materials specified or as approved by The City of Hot Springs. Watertight connections shall meet with the requirements concerning tests of these specifications.

15. Pipe Joints.

(a) *Pipe Joint Installation.* All pipe joints other than those specified herein shall be made in strict accordance with the manufacturer(s) recommendation and as approved. All joints shall be made watertight in accordance with the latest ASTM Standards. Excavation for bells or other joint protrusions shall be made to ensure that the bottom of the pipe firmly rests against the bedding for the entire length of the pipe. All joints between pipes of different material shall not be backfilled until The City of Hot Springs has inspected same for proper materials and methods.

(b) *Installation of Push-On Joints.* Prior to jointing, the bell and spigot end of the

pipes shall be cleaned thoroughly by whatever means are necessary to remove all foreign matter and achieve the required cleanliness to prevent damage to the joint and gasket surfaces. A wire brush shall be used as necessary. Particular care shall be exercised to clean the gasket seat. Lubricated pipe end should be carefully pushed into the bell to the manufacturer(s) "stop reference mark."

Joints shall be made in strict accord with the recommendations of the pipe manufacturer(s). The rubber gasket shall be cleaned, lubricated and if required inserted in the gasket seat within the bell of the pipe to which connection is being made. It will then be forced to ensure firm contact with the shoulder of the bell. When this initial insertion is made, alignment of the added pipe shall be deflected from true alignment not more than 5° for 4" pipe, nor more than 3° for 12" pipe. Deflections for intermediate size pipes shall be in conformance with the stated maximum deflections of the manufacturer(s).

(c) *Installation of Mechanical Joints.* The spigot end of pipe, the bell of the fitting and the rubber gasket shall be cleaned thoroughly as specified for pipe joints in the paragraph above. The gland shall also be cleaned in like manner.

After the gland and gasket are lubricated and placed on the spigot end of the pipe, sufficient distance from the end to avoid fouling the bell, the spigot end shall be inserted in the fitting bell to firm contact with the bell shoulder. The rubber gasket shall then be advanced into the bell and seated in the gasket seat. Care shall be exercised to center the spigot end within the bell.

The gland shall be brought into contact with the gasket, all bolts entered and all nuts made hand tight. Continued care shall be exercised to keep the spigot centered in the bell. The joints shall be made tight by turning the nuts with a wrench, first partially tightening a nut and then partially tightening the opposing nut 180°. Continue working in like manner around the pipe with uniformly applied tension until the required torque is applied to all nuts. Required torque ranges and indicated wrench lengths for standard cast iron bolts are as follows:

Diameter Inches	Range of Torque		Length of Wrench
	Feet	Pounds	Inches
5/8	40	60	8
3/4	75	90	10
1	100	120	14
1 1/4	120	150	16

(d) *Jointing dissimilar pipe materials.* Joints shall be as shown on the standard details unless otherwise authorized by The City of Hot Springs.

16. Pipe Fittings.

(a) *Pipe Fittings Installation.* All pipe fittings shall be installed in strict accordance with the manufacturer(s) recommendation(s). Joints created by the installation of fittings shall meet the requirements described in these specifications (Ref. Pipe Joints). Pipe fittings shall meet the requirements described in these specification(s) (Ref. Sanitary Wastewater Pipe).

(b) *Wye or Tee Connections.* Wye or tee connections placed in sanitary wastewater lines for services shall be installed in accordance with the manufacturer(s) recommendation(s) and as approved by The City of Hot Springs. Installation of wye branches shall be as indicated on the standard construction details. PVC wye fittings shall be SDR-26 or SDR-35.

17. Manholes.

(a) *Excavation.* Excavation(s) for manholes shall be completed in a workmanlike manner. The area of excavation for the base shall be only that necessary to provide an adequate base with its sides poured against undisturbed earth. All excavation(s) shall be dewatered in accordance with and as described in these specification(s) (Ref. 12 Dewatering of Trenches) before any permanent construction is started. Sheet piling and shoring shall meet with the requirements as described in these specification(s) (Ref.- Sheet piling and Shoring).

Where excavation is carried below plan grade because of unsuitable soil or for any other reason, the space below plan grade shall be filled with Class I bedding material thoroughly tamped. Alternately the space may be filled with concrete poured monolithically with the base.

(b) *Backfill.* Backfill of manholes shall be compacted to the specified density when and as specified by the Engineer. Where manholes are within the limits of paved areas, backfill shall be in accordance with the backfill requirements of pipe laying for those areas.

Backfill around manholes shall not be completed until adequate strength has been obtained to support the backfill without damage to the manhole. In no case will backfill be allowed on poured in place manholes until the concrete has cured at least 48 hours except as approved by The City of Hot Springs.

(c) *Inverts.* All pipe lines shall extend entirely through the manhole to a joint approximately 6" outside the manhole except where change in direction or where sizes of pipes makes such construction unfeasible. Pipe in a manhole at the upper end of the line or discharging into an existing manhole shall not extend entirely through the manhole. In all cases the pipe or pipes shall extend entirely through the manhole wall so that a joint occurs approximately 6" outside the manhole wall. Depth and cross section of the invert of the manhole bottom flow line shall be approximately 1/2 the diameter of the outfall pipe. Curves in inverts shall have as long a radius as feasible to facilitate flow. Shape of the

invert shall be that approximating the bottom half of the pipe and inverts shall be brushed smooth.

The surface of the mortar fill used in forming the invert shall be sloped upward from the edge of the invert to the manhole wall. The upper half of any pipe extending inside the manhole wall shall be cut substantially flush with the wall. Any rough edge shall be smoothed with mortar.

Mortar for forming inverts shall be mixed in the proportions as described in these specifications and an approved bonding agent shall be used over the entire surface of the bond. The use of masonry cement shall be strictly prohibited. When approved by The City of Hot Springs, mortar may be mixed in a mortar box. Mortar shall have a workable consistency but shall be as dry as practical. Mortar thickness shall meet or exceed the bonding agent manufacturer(s) recommendation(s).

Inverts shall be formed in accordance with details shown on the standard manhole details.

(d) *Precast Manholes.* Precast concrete ring sections shall be equal in quality to reinforced concrete wastewater pipe ASTM C-76. Joints shall be rubber gasketed.

All joints either between separate precast sections or between the cone and manhole ring shall be gasketed with Ram-Nek or approved equal to ensure a watertight seal.

Inverts shall be formed in accordance with details shown on the standard manhole details.

(e) *Poured in Place Manholes.* Manhole base and barrel section shall be poured monolithically. The concrete shall be mechanically vibrated to ensure maximum concrete density.

Forms shall remain on the manhole until the concrete is set.

Manhole frames shall be installed into the monolithic pour when the final grade is known. Height adjustment shall be made within cast iron riser rings or with brick and mortar.

Poured in place manholes shall meet the requirements and details as shown on the standard details. The top section or cone shall be concentric.

Construction of poured in place manholes shall be in accordance with and as described in these specifications (Ref. Concrete and Reinforcing Steel and other applicable parts of these specifications).

(f) *Drop Manholes.* Drop manholes shall be constructed as outlined above and as shown on the standard details with inside drops only.

(g) *Watertight Manholes.* Construction of watertight manholes shall meet with the requirements outlined above for manholes and as shown on the standard details. Manholes shall be tested for infiltration and repaired in accordance with Utility requirements.

(h) *Manhole Details.* All manholes shall be constructed in accordance with the standard manhole details or as approved by The City of Hot Springs. Manholes 4' or less in height shall have a 24" minimum, 30" maximum high cone section and maximum 12" high throat section.

(i) *Connection to Existing Manholes.* No connection or alteration to any manhole shall be made without the approval of The City of Hot Springs. Connections requires cutting through the wall of the manhole shall be done in a craftsman type manner with a maximum hole size 2" larger than the outside diameter of the pipe. The hole shall be concentric with the pipe. No void space shall be allowed between the pipe and wall. The space shall be filled in accordance with and as described in these specifications.

Where an existing gravity outfall line requires the flow of sewage be diverted around the new construction, contractor shall intercept the sewage flow at the existing manhole upstream from the Construction and shall provide suitable pumping equipment and rerouting conduit to pump the sewage around the involved construction. Discharge shall be into an appropriate manhole downstream from the construction. The temporary by-pass line shall be approved by The City of Hot Springs.

(j) *Manhole Stub-outs.* Where it is anticipated a wastewater line is to be extended in future construction work or where required by The City of Hot Springs, one short joint of pipe shall be stubbed out from the manhole for each future connection. The size of the stub-out shall be of the size pipe required for the future construction or as required by the Utility and terminating in a standard bell with a removable watertight plug as approved by The City of Hot Springs.

(k) *Manhole Rings and Covers.* Manhole ring setting shall be set in Portland cement mortar using gasket material such as "Ramneck" or approved equal between the ring flange and the cone section, as shown on the standard details. Tops of the manhole rings and covers shall be set four 4" to 6" above planned finish grade and shall have positive back slope away from the top when finish grading is complete. In public right-of-way the top shall be set 1" to 2" above surrounding pavements, sidewalks or other surface areas and surfacing shall be sloped to match surrounding grade.

18. Concrete and Reinforcing Steel.

(a) *Ready-Mixed Concrete.* All concrete for poured in place manholes and other structural applications shall be ready-mixed concrete. Ready-mixed concrete shall conform to ASTM Standard D 94 and to applicable portions of these specifications for

on-site mixing. The concrete shall be delivered and placed within one hour after all materials, including mixing water have been placed in the mixing drum.

(b) *Reinforcing Steel.* Steel reinforcement shall be free from rust, scale, mortar, dirt or other objectionable coatings. It shall be placed accurately in accordance with details indicated on the plans and properly secured in position.

(c) *Vibration.* All structural concrete must be vibrated as it is placed. The use of form vibrators is not acceptable. Internal vibrators shall be capable of transmitting vibration to the concrete at frequencies not less than 4,500 impulses per minute. Duration of vibration shall be limited to the time required to provide satisfactory consolidation without causing segregation. The vibrator shall not be inserted into the lower courses previously vibrated. Vibrators shall be applied in a substantially vertical position and at uniformly spaced points not further apart than the visible effectiveness of the vibrator. Vibration shall be supplemented by such spading and spudding as the Engineer may require. All concrete shall be vibrated except that the concrete in manhole bases and pipe foundations need not be vibrated if other methods produce satisfactory results.

(d) *Application of Structural Concrete Other Than Manholes.* Utilization of reinforced or unreinforced concrete for structural uses other than poured in place manholes shall be subject to individual design and specification of the responsible Engineer to meet the specific needs of the project. Design and specification shall be in keeping with current engineering practice, applicable codes of practice, and subject to the review and approval of The City of Hot Springs.

19. Pavement Repairs.

(a) *Permanent Repairs.* Asphaltic Concrete Hot Mix Surface Course construction shall meet with the current requirements of the Arkansas State Highway Department Commission Specification(s) for the Construction of Asphaltic Concrete Hot Mix Surface Course or as otherwise approved.

Concrete pavement repairs shall meet with the current requirements of the Arkansas State Highway Department Commission Specification(s) for the Construction of Concrete Rigid Pavements.

Gravel surfacing shall meet with the current requirements of the Arkansas State Highway Department Commission Specification(s) for the Construction of Crushed Stone Base Courses.

Prime coats shall be applied in accordance with the current requirements of the Arkansas State Highway Department Commission Specification(s) for the Application of Prime Coat to Crushed Stone Based Courses.

All permanent repairs of streets, roads or other public right-of-way shall meet with the construction requirements of the governing agency or private owner and shall meet with the requirements of all local Ordinances, Regulations, Permits or Codes governing the repairs to roads, streets or other public right-of-way.

(b) *Temporary Surfacing.* Methods of temporary surfacing shall meet the requirements of this section or as otherwise approved to adequately maintain traffic and proper drainage.

20. Backfill Density Tests.

Backfill density requirements, when directed by The City of Hot Springs for a specific project as specified therein, shall be required.

21. Methods of Testing.

The moisture density relation of material shall be determined in a laboratory in accordance with AASHTO Designation T-180, modified to use material passing a 3/4" sieve.

Field density of backfill density shall be determined in accordance with AASHTO Designation T-147.

22. Wastewater Line Testing.

(a) *General.* Contractor shall provide the Utility with a minimum of four hours notice prior to any testing. All testing of wastewater facilities outside normal working hours will not be allowed unless previously arranged with and approved by the Utility.

The Contractor shall provide, at their own expense, all necessary equipment and materials required for the tests. Responsible Engineer(s) duties pertaining to testing activities will include providing (to contractor) test criteria, monitoring of all test(s) and providing results to Utility. Notification to Utility Inspection Group is required for all test(s). This will provide the Utility Inspection Group an opportunity to witness test(s) and acknowledge acceptance.

Contractor may elect to test wastewater facilities as installed prior to backfilling. This is highly recommended as problems can be detected and repaired without causing unnecessary excavation(s) at a later date.

(b) *Visual Inspection.* All new wastewater construction shall be visually inspected by designated Utility personnel periodically during construction and upon completion. This periodic inspection does not relieve the Contractor and Engineer of their

duty to inspect and provide quality craftsmanship in accordance with the standard specification(s). Utility personnel shall, at minimum, observe the bedding, alignment, grade of the pipe and services and ensure that all services are properly capped. All manholes will be visually inspected to guarantee proper invert construction and grouting of pipes, seams and ring and cover. The invert shall not hold water and shall allow for a smooth transition of flow through the manhole. All defects in the sewers shall be repaired to the satisfaction of the Engineer and Utility.

(c) T.V. Inspection of all new line(s) will be performed by Utility following the initial installation at no cost. Any subsequent inspection or flushing of line(s) required to enable inspection may result in cost(s) to the customer/contractor for equipment, manpower, etc.

(d) *Air Testing.* (Gravity Wastewater only) As each section wastewater is completed between manholes, each section shall be air tested. When practical, house connections in each section shall be completed. Air test shall be low-pressure air test based on the principal of air-pressure loss per time period. Contractor shall prepare a log of testing and submit this to the Engineer(s) as each section is completed and tested. The maximum allowable leakage shall be 50 gallons per day per inch-mile (not applicable to air testing method). All tests shall be accomplished in the presence of the Engineer(s). The test section of the wastewater line must be plugged at each end. One of the plugs used at the manhole must be tapped and equipped for air inlet connection to enable filling the line from the air compressor.

All service laterals, stubs and fittings into the wastewater test section should be properly capped or plugged and carefully braced to provide adequate resistance against the internal pressure and ultimately prevent air leakage by slippage and blowouts.

Connect air hose to the tapped plug selected for the air inlet. Connect the other end of the air hose to the portable air control equipment which consists of valves and pressure gauge used in order to control air entry rate into the wastewater test section and to monitor the air pressure in the pipe line.

More specifically, the air control equipment includes a shutoff valve, pressure regulating valve, pressure reduction valve and a monitoring pressure gauge having a pressure range from 0-5 psi. The gauge should have minimum divisions of .10 psi and an accuracy of .04 psi. Connect another air hose between the air compressor (or other source of compressed air) and the air control equipment. This completes the test equipment set-up. Test operations may then commence.

Supply air to the test section slowly, filling the pipe line until a constant pressure of 3.5 psig is maintained. The air pressure must be regulated to prevent the pressure inside the pipe from exceeding 5.0 psig.

When constant pressure of 5 psig is reached, throttle the air supply to maintain an internal

pressure above 3.0 psig for a period of at least 1 minute. This time permits the temperature of the air being introduced to equalize with the temperature of the pipe wall. During this stabilization period it is advisable to check all capped and plugged fittings with a soap solution to detect any leakage at these connections. If leakage is detected at any cap or plug, release the pressure in the line and tighten all leaky caps and plugs.

Resume the test operation by once again supplying air. When it is necessary to bleed off the air to tighten or repair a faulty plug, a new five-minute interval must be allowed after the pipeline has been refilled.

After the stabilization period, adjust the air pressure to 3.5 psig and shutoff or disconnect the air supply. Observe the gauge until the air pressure reaches 3.0 psig. At 3.0 psig commence timing with a stop watch which is allowed to run until the line pressure drops to 2.5 psig at which time the stop watch is stopped. The time required, as shown on the stop watch for a pressure loss of 0.5 psig, is used to compute the air loss.

If the time in minutes and seconds for the air pressure to drop from 3.0 to 2.5 psig is greater than that shown in the table for the designated pipe size, the section undergoing test shall have passed and shall be presumed to be free of defects. The test may be discontinued at that time.

**MINIMUM SPECIFIED TIME REQUIRED FOR A 0.5 PSIG PRESSURE DROP
FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015**

1 Pipe Dia. (in.)	2 Minimum Time (min:sec)	3 Length for Minimu m time (ft)	4 Time for Longer Length (sec)	Specification Time for Length (L) Shown (min:sec)								
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft	
4	1:53	597	.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12	
8	3:47	298	.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42	
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54	
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50	
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02	
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51	
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16	
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17	
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54	
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07	
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57	
36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23	
42	19:54	57	20.942 L	34:54	52:21	69:49	87:15	104:42	122:10	139:37	157:04	
48	22:47	50	27.352 L	45:35	68:23	91:11	113:58	136:46	159:33	182:21	205:09	
54	25:31	44	34.618 L	57:42	86:33	115:24	144:15	173:05	201:56	230:47	259:38	

Note: If there has been no leakage (zero psig drop) after one hour of testing, the test section shall be accepted and the test complete.

(Table Courtesy of Uni-Bell PVC Pipe Association)

If the time in minutes and seconds for the .5 psig drop is less than shown on the table for the designated pipe size, the section of pipe shall not have passed the test; therefore, appropriate repairs must be made and the line subsequently retested.

An air pressure correction is required when the prevailing ground water is above the wastewater line being tested. Under this condition, the air test pressure must be increased .433 psi for each foot the ground water level is above the invert of the pipe.

Height of ground water above wastewater pipe shall be determined via a method approved by the Engineer.

(e) *Manhole Testing.* All newly constructed manholes, whether pre-cast or poured in place shall pass a vacuum test prior to acceptance. A vacuum of 10" Hg shall be placed on the manhole, the time measured for the vacuum to drop to 9" Hg shall not be less than listed below. Visually inspecting manholes during rain events is recommended to assist Contractor in locating and repairing leaks, however, this is not considered to be a replacement for vacuum testing.

MANHOLE VACUUM TEST CRITERIA

NOTE: Establish 10" of vacuum on manhole.
Measure time in seconds for vacuum to drop.

MANHOLE DEPTH	ALLOWABLE LEAKAGE
6' Manhole & Under	Cannot lose more than 1" Vacuum in 15 seconds
6' to 8' Manhole	Cannot lose more than 1" Vacuum in 20 seconds
8' to 10' Manhole	Cannot lose more than 1" Vacuum in 25 seconds
10' to 12' Manhole	Cannot lose more than 1" Vacuum in 30 seconds
12' to 14' Manhole	Cannot lose more than 1" Vacuum in 35 seconds
14' to 16' Manhole	Cannot lose more than 1" Vacuum in 40 seconds
16' to 18' Manhole	Cannot lose more than 1" Vacuum in 45 seconds
18' to 20' Manhole	Cannot lose more than 1" Vacuum in 50 seconds

(f) *Safety Provisions for Air Testing.* Plug(s) used to close the wastewater pipe for the air test must be securely braced/restrained to prevent the unintentional release of the plug which can become a high velocity projectile. Gauges, air piping manifolds and valves shall be located at the top of the ground. No one shall be permitted to enter a

manhole once a plugged pipe is under pressure. Four pounds (gauge) air pressure develops a force against the plug in a 12" diameter pipe of approximately 450 pounds. Pipes larger than 24" in diameter shall not be air tested because of the difficulty involved in adequately blocking the plug(s). Other means of testing shall be approved by Engineer and Utility.

(g) *Force Main Leakage Tests:* Leakage tests for Force Mains shall be made in the same manner as water main testing, first by filling the force main with water and then increasing the pressure to a pressure of 150% of working pressure. (Responsible Engineer to provide calculations utilized in determining Test Criteria at the time drawings are submitted).

The duration of the leakage per hour for cast iron, ductile iron, PVC or concrete pipe shall be calculated utilizing the following formulas:

All rubber gasket or o-ring joints (cast iron and concrete):

$$L = \frac{ND \sqrt{P}}{7400}$$

L = Allowable Leakage (gallons per hour)
N = Number of Joints in Pipeline Tested
D = Nominal Diameter (inches)
P = Test Pressure (psi)

The Force Main will not be accepted until the actual leakage is equal to or less than the allowable rate. In addition, all obvious leaks shall be repaired.

(h) *Leaks Encountered in Final Inspection.* In addition to passing the above described leakage tests, all obvious running leaks which may be observed in the final inspection shall be satisfactorily repaired.

(i) *Pipe Deflection Testing.* Each section of the wastewater line between manholes is required to be straight and uniformly graded. The Utility requires that the Contractor utilize laser equipment to ensure proper alignment and grade. Pipeline laid without such equipment or by utilizing other methods not approved by Utility Administration will be considered unacceptable. The Contractor may be required to pull a mandrel sized to ~95% of the pipeline diameter to ensure alignment and form. Again, all testing equipment will be provided by the Contractor.

ARTICLE III. GREASE TRAPS, INTERCEPTORS, SEPARATORS AND GREASE RECOVERY DEVICES

23. General.

This section shall apply to those facilities whose waste discharge contains or may contain fats, oil and grease, sand and/or other harmful ingredients.

24. Grease Traps, Interceptors, Separators and Grease Recovery Devices Required.

(a) Grease traps, interceptors, separators, grease recovery devices or hold/haul tanks shall be provided for the proper handling of wastes containing grease, oil, sand, and other harmful ingredients.

(b) All restaurants, institutions, cafeterias or other establishments preparing or serving food, except those specifically exempted, shall be required to install and maintain a certified grease trap, interceptor, separator or grease recovery device for the efficient removal of oil and grease from the waste stream. The design and installation of such devices shall be subject to review by the Utility.

(c) All vehicle wash areas shall be equipped with interceptors and oil separators for the removal of oil and grease from the waste stream. The design and installation of such devices shall be subject to review by the Utility.

(d) Design criteria will be in accordance with detailed drawings as provided by Utility. Any deviation from approved design drawings will require approval from appropriate Utility. NOTE: See attached (3ea) drawings for reference. Please reference City of Hot Springs Ordinance Title 9 for additional details/requirements pertaining to this specification.

25 General Specifications.

(a) Specifications outlined in this section shall be considered minimum requirements only. It shall be the responsibility of each user to have a grease trap, interceptor, separator or grease recovery device designed and installed that will produce an effluent which is compliant with the requirements of this ordinance or other applicable provisions.

- (1) Grease traps, interceptors, separators and grease recovery devices shall meet or exceed the specifications and requirements set forth in this ordinance along with other applicable provisions of the wastewater use ordinance.
- (2) An existing grease trap, interceptor, separator or grease recovery device which is upgraded or replaced shall meet or exceed the specifications set forth in this ordinance and other applicable provisions in the wastewater use ordinance.

(3) Where a non-domestic user is required under this ordinance to have a grease trap, interceptor, or separator and who will occupy an existing building, the grease trap, interceptor, or separator shall meet or exceed the requirements of this ordinance and other applicable provisions of the wastewater use ordinance.

(b) Grease traps, interceptors, separators and grease recovery devices will be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature while also being capable of withstanding the traffic load where installed.

(c) Grease traps, interceptors, separators and grease recovery devices shall be installed outside the building wherever possible. Where it is impossible to locate a grease trap outside the building, the trap shall be located in a mechanical room or other area where no food is stored or processed.

(d) Grease traps, interceptors, separators and grease recovery devices shall be located so as to be readily and easily accessible for cleaning and inspection and shall be equipped with easily removable grates or covers.

(1) A manhole ring and cover not less than 24" in diameter shall be installed in the lid of each compartment to facilitate easy access for cleaning and inspection. The cover shall be at or near, but not below, the finishing grade.

(2) Where an interceptor, separator or grease recovery device is located inside a vehicle wash bay, the first chamber shall be preceded by a grated catch basin with holes not greater than 1/2" in diameter or shall be equipped with a grated cover with holes not greater than 1/2" in diameter. The cover on the secondary chamber shall be water tight.

(e) Grease traps, interceptors, separators and grease recovery device shall have a total capacity of not less than 500 gallons and shall be constructed within a minimum of two compartments.

(1) The first compartment shall have a detention time of not less than fifteen minutes.

(2) The second compartment shall have a detention time of not less than five minutes.

(f) Plans for new grease traps, interceptors, separators and grease recovery devices or modifications to existing grease traps, interceptors, separators and grease recovery device shall be submitted to the Utility for review. Calculations used to determine adequate sizing shall be included in the submittal.

(g) Grease traps, interceptors, separators and grease recovery devices shall be installed by a licensed plumber. Completed grease traps, interceptors, separators and grease recovery devices shall be subject to inspection by the Utility prior to connection to the collection system.

26. Grease Trap, Separator, Interceptor and Grease Recovery Device(s).

(a) All liquid waste lines in food preparation and dishwashing areas, except lines from rest room facilities and cooling unit condensate, ice maker(s), and soft drink dispenser drain lines, shall discharge through a grease trap. Garbage disposals shall have a filtering device installed that will prevent food solids from entering the grease trap.

(b) The minimum size of grease traps, separators, interceptors or grease recovery devices shall be sized according to the number of fixtures draining to the grease trap, separator, interceptor or grease recovery device.

- (1) The total number of fixture units multiplied by 100 gallons shall determine the minimum total capacity of the trap. The primary (first) chamber shall occupy 3/4 of the total capacity of the trap.
- (2) All fixtures shall be defined in accordance with applicable provisions outlined in code compliance regulations.

(c) Grease traps, separators, interceptors or grease recovery devices shall be equipped with double clean outs in both the influent and effluent pipes (i.e. before and after the trap). Sampling port shall be located on the effluent side of grease trap, separator, interceptor or grease recovery device.

(d) The flow into each chamber shall enter below the static water line.

- (1) The influent line shall be located between 12" and 18" from the bottom of the first chamber.
- (2) The discharge from the first chamber shall be between 12" and 18" from the bottom of the first chamber and shall terminate in the second chamber not less than 6" below the static water line.
- (3) The effluent line shall be located not more than 12" from the bottom of the second chamber.

27. Interceptor and Separator Specifications for Wash Bays.

(a) Automatic car or truck washes, hand wash bays and other areas where

vehicles are washed shall be equipped with a two-stage interceptor and a separator. The primary (first) chamber shall occupy 3/4 of the total capacity.

- (1) The interceptor and separator may be constructed as separate units or an integrated unit.
- (2) Interceptors/separators located inside the wash bay shall be equipped with a grated cover on the first chamber and a solid, water tight cover on the second chamber. The grated cover opening shall be no larger than 1/2" in diameter and shall be easily removable for cleaning and inspection.
- (3) Interceptors/separators located outside the wash bay shall be equipped with a grated cover on the first chamber and a solid, water tight cover on the second chamber. The grated cover opening shall be no larger than 1/2" in diameter and shall be easily removable for cleaning and inspection.

(b) Automatic wash bays (those having high pressure spray wands and brushes) shall be equipped with an interceptor and oil separator sized according to the following:

<u>Description</u>	<u>Minimum Size</u>
Single hand wash bay	500 gallons
2-4 hand wash bays	1000 gallons
>4 hand wash bays	1000 gallons + 200 gals per bay over 4
Drive through wash	500 gallons per bay

(c) Manual wash bays shall be equipped with a minimum 500 gallon interceptor and separator.

- (d) The flow into each chamber shall enter below the static water line.
- (1) The influent line shall be located between 24" and 30" from the bottom of the first chamber (except where the first chamber is a grated cover).
 - (2) The discharge from the first chamber shall be between 24" and 30" from the bottom of the first chamber and shall terminate in the second chamber not less than 6" below the static water line.
 - (3) The effluent line shall be located not more than 12" from the bottom of the second chamber.

28. Operation and Maintenance.

(a) Grease traps, interceptors, separators and grease recovery devices shall be maintained in continuously efficient operation by the owner or occupant at their own expense.

(b) Areas surrounding grease traps, interceptors, separators and grease recovery devices shall be maintained to facilitate easy access to the unit for inspection by the Utility at all times.

(c) A user shall not remove down-pipes or otherwise alter a grease trap, interceptor, separator or grease recovery device which may allow oil, grease, sand or other objectionable material(s) to pass through the device into the collection system.

(d) A user shall not increase the use of water or in any other way attempt to dilute the waste stream in lieu of adequate treatment.

(e) The use of hot water, emulsifiers, chemical, or other agents or devices that may cause oil, grease, or sand to pass through the collection system or the wastewater treatment facility is strictly prohibited.

(f) Materials shall not be splashed, allowed to overflow, or otherwise placed on the areas surrounding a grease trap, interceptor, or separators. In the event materials are spilled, splashed, overflowed, or otherwise placed on the surrounding area, the owner shall ensure the materials are cleaned from the area and properly disposed.

(g) Materials removed from grease traps, interceptors, separators or grease recovery devices shall either be utilized by the industry or disposed of in a suitable manner in accordance with all applicable federal, state, and local regulations.

(h) Where municipal utilities must clean associated public wastewater caused by inappropriate operation or maintenance of grease trap, interceptor, separator or grease recovery device cost of such cleaning shall be billed to the user. Other penalties outlined in the wastewater use ordinance may be imposed.

29. Grease Trap, Separator, Interceptor or Grease Recovery Device Treatment Procedures.

Use of grease trap treatment products, including bacteria designed to digest the grease, is specifically prohibited without prior written consent of the Utility.

(a) Acceptance of such products for use may be considered only where a valid screening test, showing the product's ability to treat the waste and to produce an effluent in compliance with this ordinance has been performed in accordance with methods that are acceptable to the Utility.

- (b) Screening test for grease trap treatment products shall be approved by the Utility.
- (c) The results of the screening test shall be subject to review by the Utility.
- (d) All screening tests shall be performed by a state approved laboratory utilizing EPA approved procedures.
- (e) All costs of screening tests shall be borne by the user.
- (f) If a product is accepted for use, user shall obtain written permission from the Utility to use the product.
- (g) The Utility may revoke permission to use such product where the effluent from the trap or basin in which the product is used fails to meet the requirements set forth in this ordinance and/or any other provision outlined on the wastewater use ordinance.
- (h) Use of such product shall not relieve the user of the minimum cleaning requirements set forth in this ordinance.

30. Inspection and Cleaning Schedules.

(a) Inspection, cleaning, and other necessary maintenance of such facilities shall be conducted as often as needed to assure the discharge is in compliance with the requirements set forth in this ordinance and/or other provisions of the wastewater use ordinance. Written documents shall consist of scheduled routine cleaning and maintenance by an approved pumper and/or plumbing service. These documents shall be presented to the Utility upon demand. The grease trap, interceptor, separator, or grease recovery device shall be cleaned as necessary to assure compliance with this ordinance and other applicable provisions outlined in the wastewater use ordinance.

(b) The physical conditions of the grease trap, interceptor, separator or grease recovery device (piping, sidewalls, etc.) shall be inspected by the user each time the facility is cleaned. Repairs, if needed, shall be made prior to further use. Documentation of repairs shall be submitted to the Utility within 15 days of repairs.

(c) Existing grease traps, interceptors, separators and grease recovery devices shall produce an effluent in compliance with national Plumbing & Drain Institute (PDIG) guidelines and other applicable provisions outlined in the wastewater use ordinance at the user's pumping schedule. Schedules inadequate to produce such effluent shall be upgraded to as often as necessary, up to and including daily, or the grease trap, separator, interceptor and grease recovery device shall be upgraded.

(d) A user shall have any grease trap, separator, interceptor or grease recovery device cleaned when ordered to do so by the Utility. Failure or refusal to comply within 48 hours after the request or demand shall be cause for the Utility to take further action which may include imposing a fine.

SPECIAL CONDITIONS

31. Written Release.

A written release by the Utility shall be given only after the user has met all required grease trap, interceptor and/or oil separator specifications outlined in this ordinance, general wastewater use ordinance and other applicable provisions of City of Hot Springs Code Compliance and the Arkansas Department of Health.

32. Certificate of Occupancy.

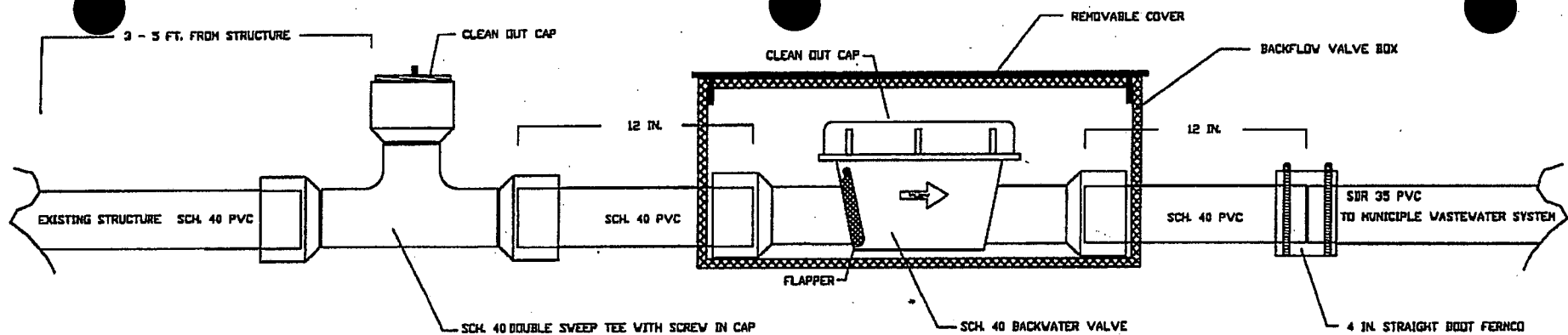
A new building shall not be occupied or a change made in the occupancy, nature or use of a building or part of a building until after City of Hot Springs Code Department has issued a Certificate of Occupancy. A certificate shall not be issued until all required grease trap, interceptor and/or oil separator have been inspected for compliance in accordance with specifications outlined in this ordinance, general wastewater use ordinance and other applicable provisions of City of Hot Springs Code Compliance and the Arkansas Department of Health.

33. Variances.

If the user seeks a variance from the required minimum size, a letter requesting a variance and reasons why must be submitted to the Utility for consideration.

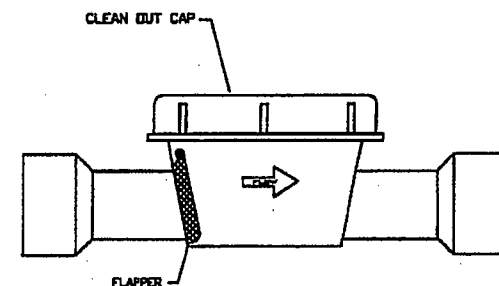
34. Best Available Technology.

If lack of space prevents the user from upgrading the grease trap, interceptor, grease recovery device and/or oil separator, the user must increase cleaning frequency or find the best available technology which is subject to Utility approval.

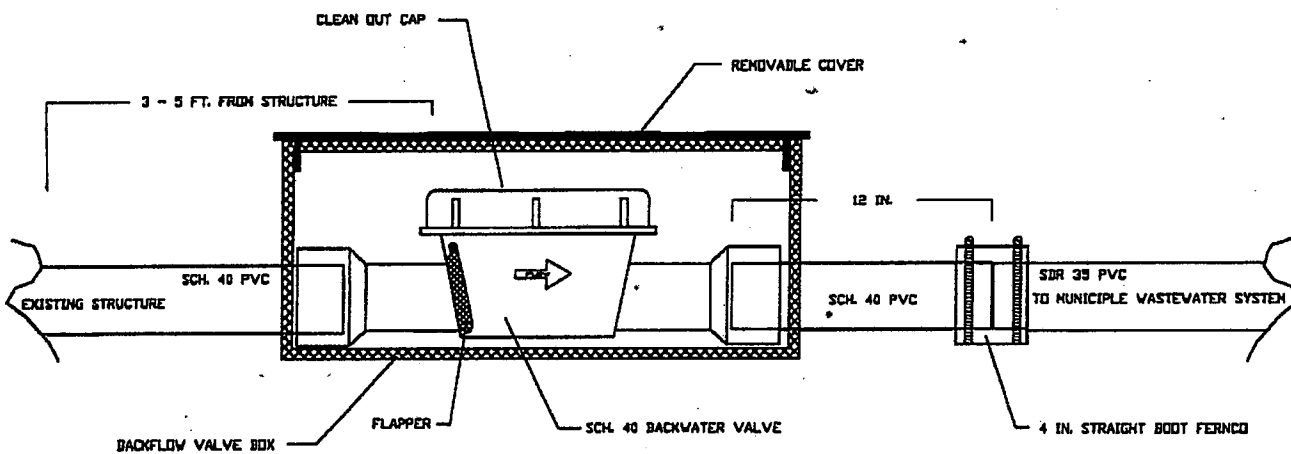


TYPICAL BACKWATER VALVE INSTALLATION

OPTION 1



TYPICAL SCH. 40 BACKWATER VALVE



TYPICAL BACKWATER VALVE INSTALLATION

OPTION 2

DATE	9/18/2005
SCALE	N.T.S.
DRAWN BY	S. VANDRELL
CHECKED BY	
DATE	

PROJECT NO.	
DATE	

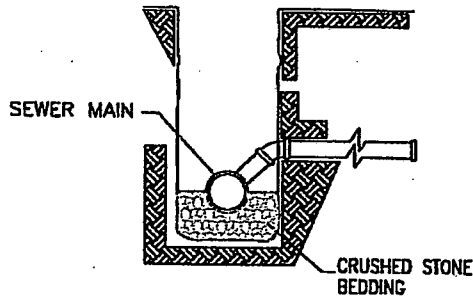
PROJECT TITLE	BACKFLOW PREVENTION
PROJECT DESCRIPTION	BACKFLOW PREVENTOR INSTALLATION

PROJECT NUMBER	
PROJECT LOCATION	

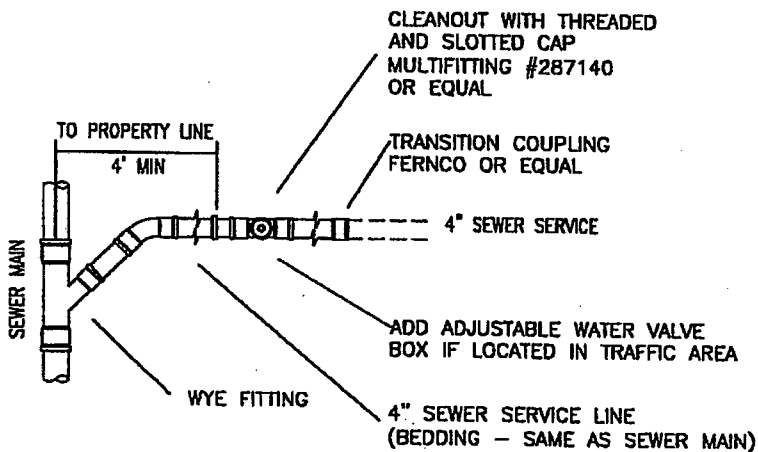
REVISIONS		
NUMBER	DATE	DESCRIPTION

CITY OF HOT SPRINGS
 P.O. BOX 700
 HOT SPRINGS
 ARKANSAS 71901
 Tel (501) 321-6800 Fax (501) 321-6997

UTILITY ENGINEERING DEPARTMENT
 Utility Engineer: (501) 321-6884
 Engineering Asst. (501) 321-6808



NOTE:
 END OF SERVICE LATERAL SHALL BE MARKED WITH EITHER A TREATED 2"x4" PLACED VERTICALLY, A BURIED METAL STAKE, OR A BRIGHTLY COLORED ROPE FROM THE END OF THE PIPE TO THE SURFACE OF THE GROUND.



NOTE:
 SDR 35 FITTINGS MAY BE USED IF APPROVED BY THE ENGINEER AND SDR 26 FITTINGS ARE NOT AVAILABLE.

SANITARY SEWER SERVICE DETAILS

CITY OF HOT SPRINGS
 P.O. BOX 720
 HOT SPRINGS, AR 71903
 (501) 321-6888 Fax: (501) 321-6887
 UTILITY ENGINEERING DEPARTMENT
 Utility Engineering Office (501) 321-6884



NUMBER	DATE	REVISIONS	
		DESCRIPTION	

STANDARD DETAIL DRAWING
 SANITARY SEWER SERVICE LINE CONNECTION
 GRAVITY SEWER

PROJECT TITLE

DATE

DATE: 02/01/2007

SCALE: N.T.S.

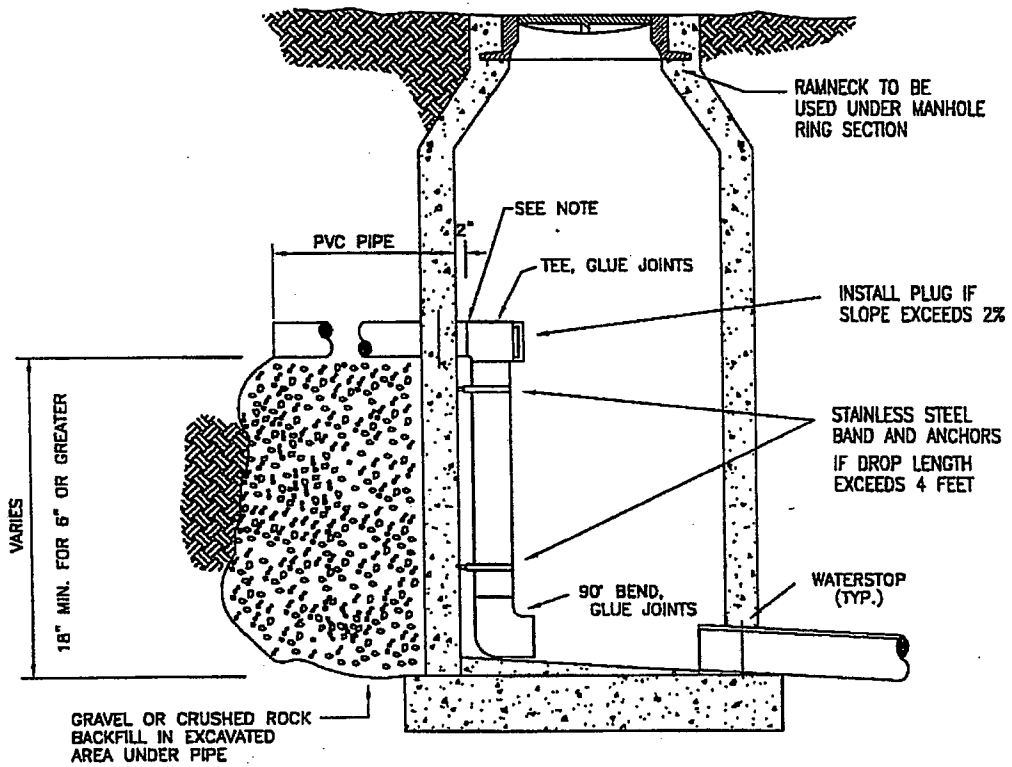
CAD FILE: SEWER SPEC

DRAWN BY: S.Y.

CHECKED BY:


DATE:

BY:



INSIDE MANHOLE DROP DETAIL

CITY OF HOT SPRINGS
 P.O. BOX 700
 HOT SPRINGS
 ARKANSAS 71901
 Tel (501) 321-6888 Fax (501) 321-6877
 UTILITY DESIGNING DEPARTMENT
 Utility Engineering Office, (501) 321-6884

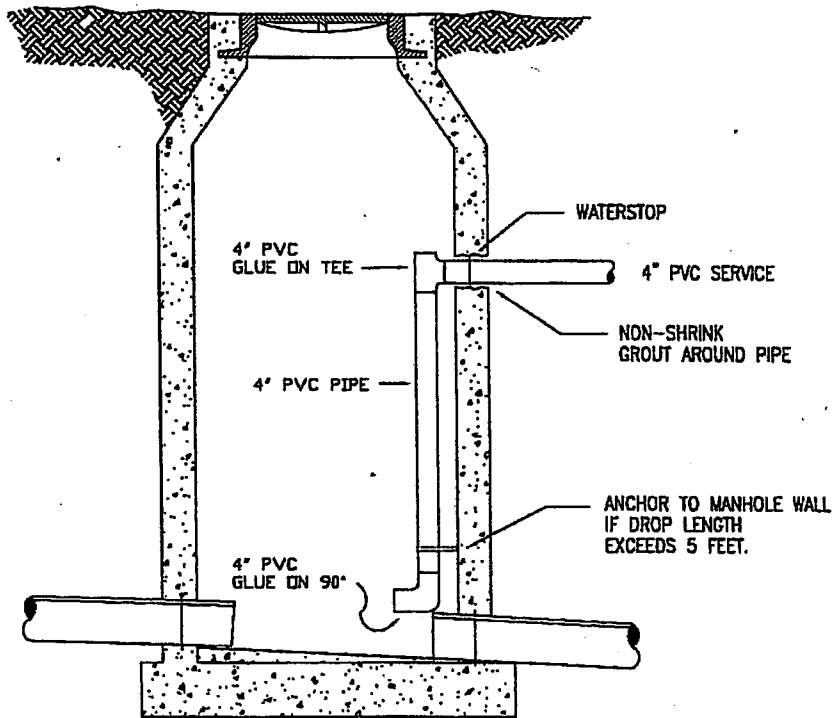


REVISIONS	
NUMBER	DESCRIPTION

STANDARD DETAIL DRAWINGS
 INSIDE MANHOLE SEWER DROP DETAIL
 GRAVITY SEWER

PROJECT FILED

DATE: 01/01/2007
 DESIGNED BY: M.T.S.
 CHECKED BY: BOWER SPICER
 DRAWN BY: S.T.
 DECORATED BY:
 CHECKED BY:
 SHEET:



INSIDE SERVICE DROP DETAIL

CITY OF HOT SPRINGS
 P.O. BOX 700
 HOT SPRINGS
 ARKANSAS 71901
 Tel (501) 321-4667 Fax (501) 321-6967
 UTILITY ENGINEERING DEPARTMENT
 Utility Engineering Office, (501) 321-4884

HOT SPRINGS
 UTILITY ENGINEERING DEPARTMENT

REVISION	NUMBER	DATE	DESCRIPTION

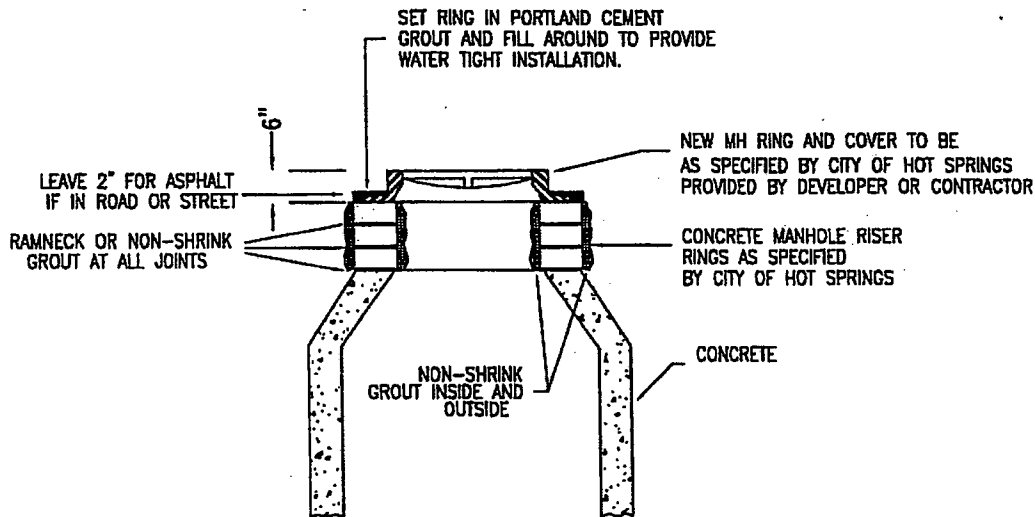
PROJECT TITLE

**STANDARD DETAIL DRAWING
 INSIDE MANHOLE SEWER SERVICE DROP DETAIL
 GRAVITY SEWER**

DATE: 01/01/2007

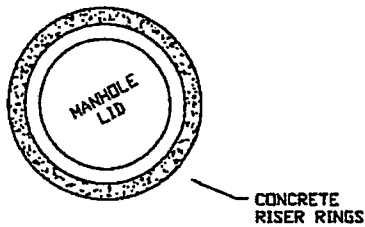
SCALE:

DATE:	01/01/2007
SCALE:	N.T.S.
CAD FILED BY:	BOBBER SPENCER
DRAWN BY:	S.T.
DESIGNED BY:	
CHECKED BY:	
SHEET:	



NOTES:

1. CLEAN BROKEN BRICK AND OTHER DEBRIS FROM INSIDE MANHOLE TO PREVENT STOPPAGES IN THE SEWER LINE.
2. CALL SEWER DEPARTMENT 321-6886 IF YOU NEED HELP OR FIND A PROBLEM.



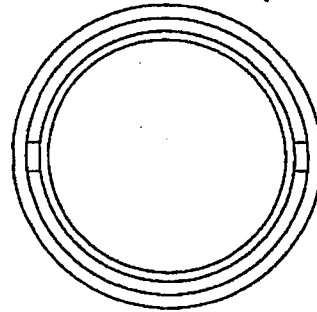
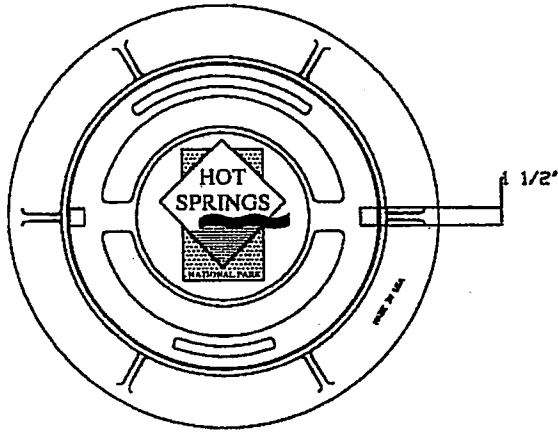
TYPICAL RAISING MANHOLE DETAILS

CITY OF HOT SPRINGS
 P.O. BOX 700
 HOT SPRINGS
 AR 71901
 501 321-6886 Fax: (501) 321-6887
 UTILITY ENGINEERING DEPARTMENT
 Liberty Engineering Office, (501) 321-6884

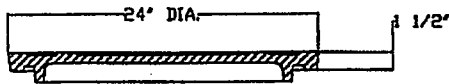
REVISIONS	DATE	DESCRIPTION

STANDARD DETAIL DRAWING
 TYPICAL MANHOLE RAISING DETAIL
 GRAVITY SEWER

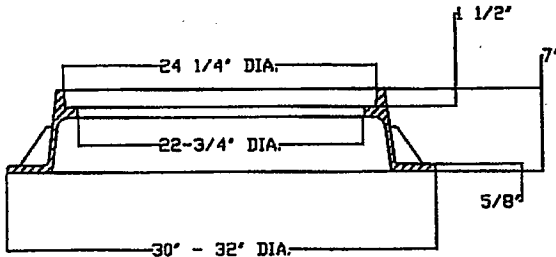
DATE	01/01/2007
SCALE	N.T.S.
DRAWN BY	SEWER SPEC
CHECKED BY	S.T.
DESIGNED BY	



BOTTOM VIEW OF COVER



COVER SECTION



FRAME SECTION

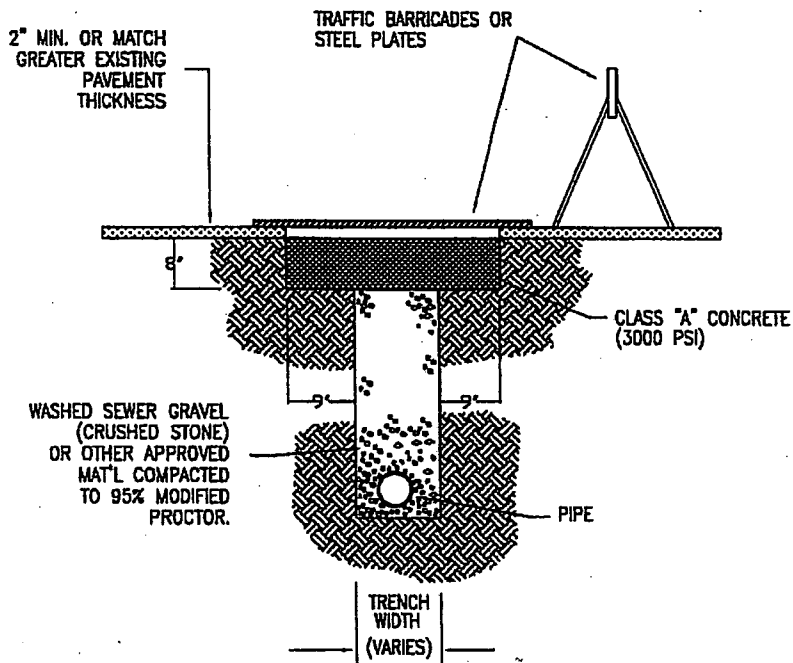
CITY OF HOT SPRINGS
 P.O. BOX 700
 HOT SPRINGS
 ARKANSAS 71901
 Tel (501) 321-4888 Fax (501) 321-4187
 UTILITY OPERATIONS DEPARTMENT
 Utility Engineering (501) 321-4884



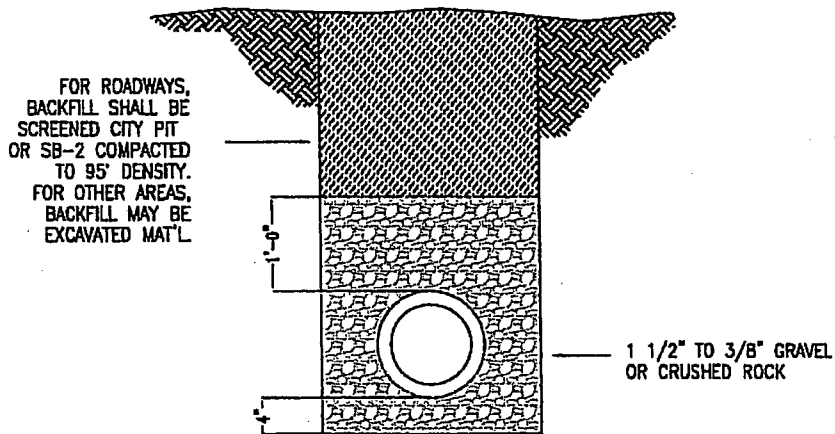
NUMBER	DATE	DESCRIPTION	REVISIONS

STANDARD DETAIL DRAWING
 SANITARY SEWER MANHOLE RING AND COVER DETAIL
 GRAVITY SEWER

PROJECT FILED:
 DATE: 01/21/2007
 SCALE: N.T.S.
 CAD FILE: SEWER SPEC
 DRAWN BY: S.Y.
 CHECKED BY:
 DATE:



TYPICAL UTILITY CUT



PIPE BEDDING DETAIL
FOR PVC GRAVITY SEWER PIPE

CITY OF HOT SPRINGS
P.O. BOX 700
HOT SPRINGS
ARKANSAS 71601
74 (501) 321-6887 Fax (501) 321-4447
UTILITY DEPARTMENT
Utility Engineering Office, (501) 321-6884

REVISIONS	NUMBER	DATE	DESCRIPTION

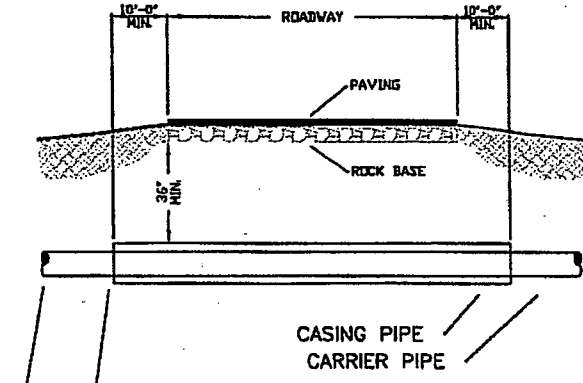
XXX
XXX
XXX

PROJECT TITLE

DATE SEAL

DATE	01/21/2007
SCALE	N.T.S.
CAD FILE	SEWER.SP23
DRAWN BY	ST
CHECKED BY	XXX
DESIGNED BY	XXX
SHEET	XXX

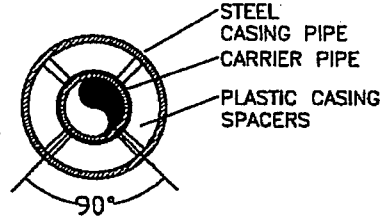
CITY OF HOT SPRINGS
 P. O. BOX 700
 HOT SPRINGS
 ARKANSAS 71901
 Tel (501) 321-6888 Fax (501) 321-6477
 UTILITY ENGINEERING DEPARTMENT
 Utility Engineering Office, (501) 321-6884



ENDS TO BE SEALED WITH "LINK SEAL" OR APPROVED EQUAL.

DUCTILE IRON RESTRAINED JOINT PIPE TO EXTEND ONE LENGTH MINIMUM BEYOND END OF CASING UNLESS OTHERWISE APPROVED BY UTILITY.

CARRIER PIPE SIZE	STEEL CASING	MIN. WALL THICKNESS
4"	12"	.188
6"	14"	.250
8"	16"	.250
10"	18"	.250
12"	20"	.250
14"	24"	.250
16"	24"	.250
18"	30"	.250
20"	30"	.250
24"	36"	.250
30"	42"	.500
36"	48"	.500
42"	60"	.500
48"	72"	.500



REVISIONS	
NUMBER	DESCRIPTION

STANDARD DETAIL DRAWING
 SANITARY SEWER MAIN CASING DETAIL
 GRAVITY SEWER

1. CASING PIPE SHALL BE IN ACCORDANCE WITH CURRENT ASTM SPECIFICATION A139.
2. WALL THICKNESS SHALL BE AS NOTED IN TABLE ABOVE, OR LATEST F.D.O.T. STANDARDS IF GREATER.
3. PIPE THROUGH CONFLICT STORM AND SANITARY STRUCTURES MUST USE THIS DETAIL. THE END OF THE CASING MUST EXTEND A MINIMUM OF 6" OUTSIDE THE STRUCTURE.

SANITARY SEWER CASING DETAILS

PROJECT TITLE

DATE

SCALE

DWG FILE

DRAWN BY

CHECKED BY

DATE

DATE: 11/01/2007

SCALE: N.T.S.

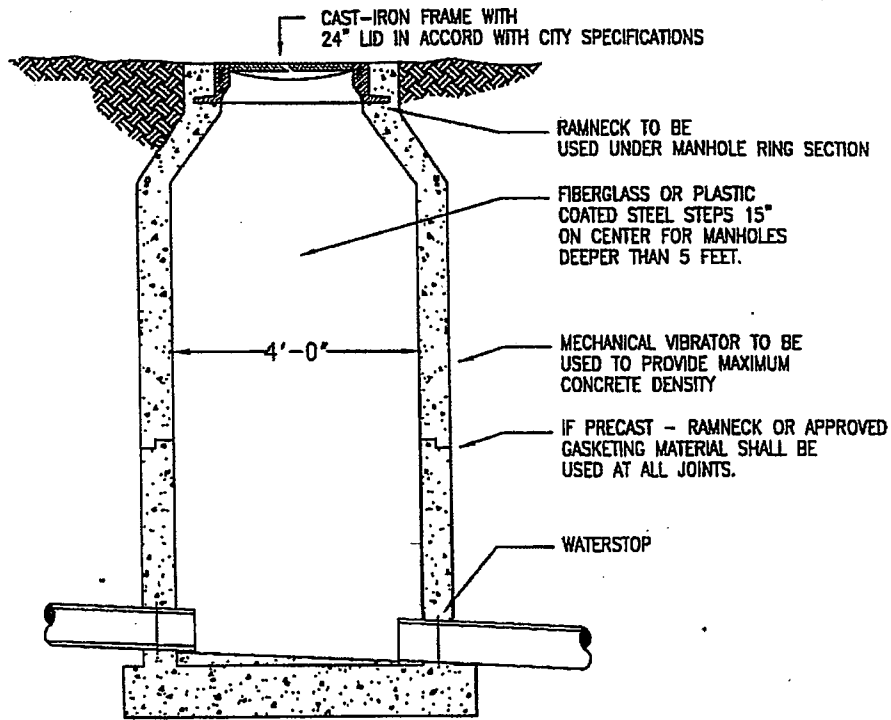
DWG FILE: SEWER SPDS

DRAWN BY: S.Y.

CHECKED BY:

DATE:

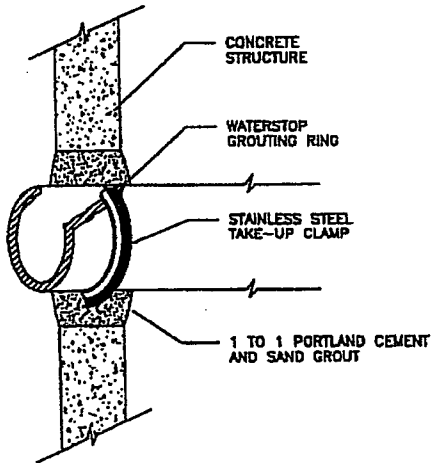
SHEET:



NOTE: PRECAST MANHOLES TO HAVE
RING BOLTED DOWN WITH 3/4"
ANCHOR BOLTS NUTS AND WASHERS.

STANDARD MANHOLE DETAIL

(CAST-IN-PLACE CONCRETE)
(OR PRECAST)



WATER STOP GROUTING RING

(MANHOLE OR CONCRETE WETWELL)

CITY OF HOT SPRINGS
P.O. BOX 700
HOT SPRINGS
ARKANSAS 71901
(501) 321-6888 Fax (501) 321-4977
UTILITY ENGINEERING DEPARTMENT
Utility Engineering Office (501) 321-6884

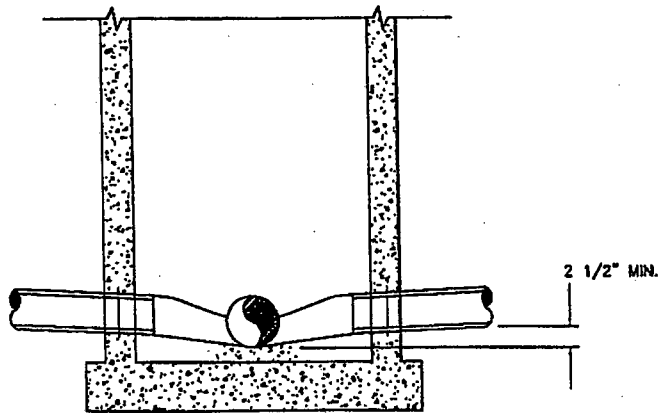
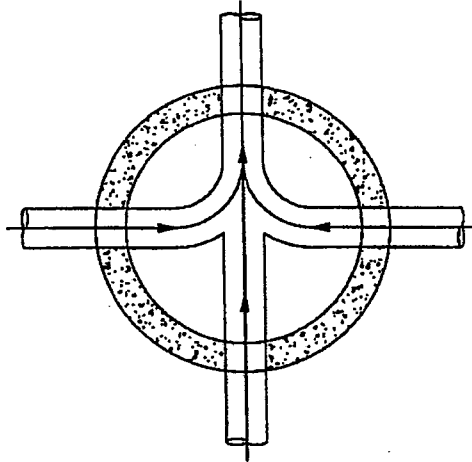
REVISIONS	
NUMBER	DESCRIPTION

STANDARD DETAIL DRAWINGS
STANDARD SANITARY SEWER MANHOLE
DETAIL DRAWINGS

PROJECT TITLE:

DRG. NO.:

DATE:	01/01/2007
SCALE:	N.T.S.
CAD FILE:	SEWER SPEC
DRAWN BY:	E.Y.
DESIGNED BY:	XXX
CHECKED BY:	XXX
SHEET:	XXX



1. ALL INVERT CHANNELS ARE TO BE CONSTRUCTED FOR SMOOTH FLOW WITHOUT OBSTRUCTION.
2. PROPERLY SHAPED FLOW CHANNELS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
3. SERVICE LATERALS ENTERING MANHOLES, AS APPROVED BY THE ENGINEER, MUST HAVE FLOW CHANNELS.
4. FLOW CHANNELS SHALL BE CONSTRUCTED WITH 6" BRICK RUBBLE, BEDDED AND COVERED WITH NON-SHRINK GROUT.
5. SIDEWALLS OF FLOW CHANNEL SHALL BEGIN AT SPRING LINE OF PIPE HEIGHT AT ALL POINTS.
6. PROVIDE 0.2 FEET (2-1/2") MINIMUM DROP THROUGH MANHOLE. BETWEEN HIGHEST INVERT AND LOWEST INVERT.
7. MINIMUM OF 6" BRICK RUBBLE BEDDED AND COVERED WITH NON-SHRINK GROUT.

TYPICAL INVERT FLOW CHANNELS

CITY OF HOT SPRINGS
 P.O. BOX 100
 HOT SPRINGS, ARKANSAS 71901
 Tel (501) 321-6828 Fax (501) 321-4847
 UTILITY ENGINEERING DEPARTMENT
 Utility Engineering Office, (501) 321-6844

NUMBER	DATE	REVISIONS	DESCRIPTION

STANDARD DETAIL DRAWING
 TYPICAL INVERT FLOW CHANNELS
 GRAVITY SEWER

DATE:	01/01/2007
SCALE:	N.T.S.
CAD FILE:	SDR04.SPLS
DRAWN BY:	E.T.
CHECKED BY:	
DESIGNED BY:	
DATE:	

AMENDED BY

Ord. 5479
Ord. 5512

ORDINANCE NO. 5200

AN ORDINANCE ADOPTING A WATER AND WASTEWATER ENGINEERING AND CONSTRUCTION STANDARDS AND SPECIFICATIONS CODE FOR THE CITY OF HOT SPRINGS, ARKANSAS; AND FOR OTHER PURPOSES.

WHEREAS, standards and specifications regulating the installation of water and wastewater lines should be adopted; and that

WHEREAS, three copies of said Code are on file in the Office of the City Clerk for inspection and view by the public; and notice thereof has been made by publication in a newspaper of general circulation within the City of Hot Springs, Arkansas.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of the City of Hot Springs, Arkansas, as follows:

SECTION 1. ADOPTION. That the City of Hot Springs, Water and Wastewater Engineering and Construction Standards and Specifications Code, attached hereto and hereby make a part hereof as if set out herein word for word is hereby adopted as the Water and Wastewater Engineering and Construction Standards and Specifications Code for the City of Hot Springs, Arkansas.

SECTION 2. SEVERABILITY. Should any part of these regulations be adjudged invalid by a court of law having jurisdiction, all other parts shall remain in full force and effect.

SECTION 3. CODIFICATION. This ordinance shall be codified in the Code of Ordinances, and the sections may be renumbered or relettered to accomplish such intention.

SECTION 4. PENALTY. The penalty for violation of this code shall, upon conviction in the Hot Springs Municipal Court, or any other court of competent jurisdiction, be such fines and penalties as established by the general penalty clause for the Hot Springs Code of Ordinances as may now or hereafter be enacted by the Hot Springs Board of Directors.

PASSED: July 21, 2003

APPROVED: Mike Bush
MIKE BUSH, MAYOR

ATTEST: Lance Hudnell
LANCE HUDNELL, CITY CLERK

ORDINANCE NO. 5665

AN ORDINANCE ADOPTING A WATER AND WASTEWATER ENGINEERING AND CONSTRUCTION STANDARDS AND SPECIFICATIONS CODE FOR THE CITY OF HOT SPRINGS, ARKANSAS MUNICIPAL UTILITY SYSTEM; AND FOR OTHER PURPOSES.

WHEREAS, Ordinance No. 5200, as amended, adopted a Water and Wastewater Engineering and Construction Standards and Specifications Code for the Hot Springs Municipal Utilities System; and that

WHEREAS, such standards and specifications have been revised; and that

WHEREAS, three copies of said Code are on file in the Office of the City Clerk for inspection and view by the public; and notice thereof has been made by publication in a newspaper of general circulation within the City of Hot Springs, Arkansas.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of the City of Hot Springs, Arkansas, as follows:

SECTION 1. ADOPTION. That the attached Water and Wastewater Engineering and Construction Standards and Specifications Code, is hereby adopted by reference as though set out herein word for word. Said Code shall be known and cited as the Hot Springs Water and Wastewater Engineering and Construction Standards and Specifications Code.

SECTION 2. PENALTY. The penalty for violation of this code shall, upon conviction in the Hot Springs Municipal Court, or any other court of competent jurisdiction, be such fines and penalties as established by the general penalty clause for the Hot Springs Code of Ordinances as may now or hereafter be enacted by the Hot Springs Board of Directors.

SECTION 3. SEVERABILITY. Should any part of these regulations be adjudged invalid by a court of law having jurisdiction, all other parts shall remain in full force and effect.

SECTION 4. REPEALER. Ordinance Nos. 5200, 5479 and 5512 are hereby repealed in their entirety.

SECTION 5. EFFECTIVE DATE. The effective date of this ordinance shall be from and after October 1, 2008.

SECTION 5. CODIFICATION. This ordinance shall be codified in the Code of Ordinances, and the sections may be renumbered or relettered to accomplish such intention.

PASSED: August 5, 2008

APPROVED: 
STEVE SMITH, ASSISTANT MAYOR

ATTEST: 
LANCE HUDNELL, CITY CLERK

August 5, 2008

SAWord BOD\Ordinances - 2008\Utility Construction Specifications.wpd

TITLE 9

MUNICIPAL UTILITIES

CHAPTER.

1. SOLID WASTE COLLECTION AND DISPOSAL.
2. SANITATION DEPARTMENT.
3. WASTEWATER SYSTEM.
 - Art. I. Rates and Charges
 - Art. II. Hot Springs Wastewater Impact Fee Ordinance
 - Art. III. Sewer Use Ordinance
 - Art. IV. Industrial Wastewater Pretreatment Code
 - Art. V. Grease Trap Regulations
4. WATER SYSTEM.
5. UTILITIES EXTENSION AND CONNECTION REGULATIONS.
6. UNIFORM MUNICIPAL UTILITY BILLING PROCEDURE.

CHAPTER 3 WASTEWATER SYSTEM

- Art. I. Rates and Charges, §§ 9-3-1
- Art. II. Hot Springs Wastewater Impact Fee Ordinance, §§ 9-3-2--9-3-29
- Art. III. Sewer Use Ordinance, §§ 9-3-30--9-3-40
- Art. IV. Industrial Wastewater Pretreatment Code, §§ 9-3-41--9-3-60
- Art. V. Grease Trap Regulations, §§ 9-3-61--9-3-93
 - Div. I. General Provisions, §§ 9-3-61--9-3-63
 - Div. II. General Requirements, §§ 9-3-64--9-3-69
 - Div. III. Grease Traps, Interceptors, Separators
and Grease Recovery Devices, §§ 9-3-70--9-3-77
 - Div. IV. Special Conditions, §§ 9-3-78--9-3-81
 - Div. V. Transport of Liquid Waste, §§ 9-3-82--9-3-84
 - Div. VI. Disposal of Transported Liquid Waste, §§ 9-3-85--9-3-93

ARTICLE I. RATES AND CHARGES

9-3-1. Rates and charges.

The following rates and charges are hereby established for the City of Hot Springs Wastewater (Sewer) System, hereinafter termed "system," and this ordinance shall be known as the Hot Springs Wastewater Rate Ordinance.

9-3-1.1. Rates established.

The city hereby establishes as rates to be charged for services furnished by the system, which the board of directors finds and declares to be fair, reasonable and necessary, to be charged to all users who contribute wastewater to the system. The proceeds of such charges so derived will be used for the purpose of operating and maintaining the system, including replacement ("OM&R") and debt service as specified hereinafter. (Replacement is defined as expenditures for obtaining and installing equipment, accessories or appurtenances during the useful life of the treatment works necessary to maintain the capacity and performance for which they were designed and constructed.) In order to provide for the cost of service differentials between system customers within the corporate limits of Hot Springs and those outside the corporate limits, a separate rate shall be established for "inside-city" and "outside-city" customers. All wastewater users shall be classified by the board of directors as residential, commercial or industrial. None of the facilities or services afforded by the system shall be furnished without a charge being made therefor.

9-3-1.2. User charge methodology.

The user charge methodology for operation, maintenance and replacement (OM&R) shall be as follows:

$$\text{Total annual OM\&R cost in } \$/1,000 \text{ gal.} = \frac{\text{Total annual OM\&R } \$}{\text{(No. of 1,000 gal. sold annually)}}$$

9-3-1.3. Minimum user OM&R volume charge.

The minimum monthly volume charge for operation and maintenance, including replacement, for the first 1,000 gallons or portion thereof of metered water consumption per user of the system shall be:

	<u>Inside City</u>	<u>Outside City</u>
Phase I	\$2.60	\$2.94
Phase II	\$2.67	\$3.38
Phase III	\$2.67	\$3.72

9-3-1.4. Additional OM&R volume charge.

All users of the system shall be charged an additional monthly volume charge for operation and maintenance, including replacement (OM&R), calculated as follows:

- (a) For all metered (either from a city-owned or private-owned water meter) water consumption in excess of 1,000 gallons (minimum), an additional charge (based on 100 gallon increments) calculated on the basis of wastewater discharged into the system as follows:

	<u>Inside City</u>	<u>Outside City</u>	
Phase I	\$2.60	\$2.94	per 1000 gallons or portion thereof
Phase II	\$2.67	\$3.38	per 1000 gallons or portion thereof
Phase III	\$2.67	\$3.72	per 1000 gallons or portion thereof

- (b) It shall be presumed that 88% of a customer's metered water consumption for the billing period is discharged into the system as wastewater. The volume charge shall be computed on that percentage of water consumption unless the customer establishes that a lower percentage reaches the system. Any customer may apply to the utilities director for determination that less than 88% of the customer's water consumption is discharged into the system. Upon a sufficient showing by the customer, the utilities director shall determine the actual percentage that reaches the system and the volume charge shall be computed on the lower percentage.

- (c) In cases of customers not on a metered basis, the utilities director shall establish water consumption based on a minimum of 2400 gallons per month (which shall include one occupant), plus 2400 gallons per person per month for each additional occupant. Commercial consumption shall be established by the utilities director based on a comparison with similarly sized commercial customers who are on metered service.

9.3.1.5. Debt service charge.

All users of the system shall be charged a flat monthly fee for debt service based on meter size as follows:

<u>Phase I</u>	<u>Meter Size</u>	<u>Inside City</u>	<u>Outside City</u>
	5/8"	\$ 8.55	\$9.66
	3/4"	\$ 8.55	\$9.66
	1"	\$13.00	\$14.71
	1-1/2"	\$17.40	\$19.76
	2"	\$29.40	\$33.56
	3"	\$119.40	\$136.06
	4"	\$152.40	\$173.06
	6"	\$232.40	\$262.06
	8"	\$322.40	\$362.06
<u>Phase II</u>	<u>Meter Size</u>	<u>Inside City</u>	<u>Outside City</u>
	5/8"	\$8.78	\$11.12
	3/4"	\$8.78	\$11.12
	1"	\$13.33	\$17.12
	1-1/2"	\$18.33	\$22.62
	2"	\$30.33	\$38.62
	3"	\$122.33	\$156.62
	4"	\$157.33	\$199.62
	6"	\$237.33	\$301.62
	8"	\$330.33	\$416.62
<u>Phase III</u>	<u>Meter Size</u>	<u>Inside City</u>	<u>Outside City</u>
	5/8"	\$8.78	\$12.23
	3/4"	\$8.78	\$12.23
	1"	\$13.33	\$18.78
	1-1/2"	\$18.33	\$25.28
	2"	\$30.33	\$42.28
	3"	\$122.33	\$171.28
	4"	\$157.33	\$221.28
	6"	\$237.33	\$331.28
	8"	\$330.33	\$461.28

9-3-1.6. Total user charge.

The total user monthly charge shall include the OM&R charges and debt service as follows:

Minimum bill per user = OM&R for 1,000 gal. + debt Service
Example: Phase I, 5/8@ meter, inside city: \$11.15 = \$2.60 + \$8.55

9-3-1.7. Phase effective dates.

Phase I rates shall apply to wastewater bills on or after July 1, 2004, and before January 1, 2005. Phase II rates shall apply to wastewater bills on or after January 1, 2005, and before January 1, 2006. Phase III rates shall apply to wastewater bills on or after January 1, 2006.

9-3-1.8. Excessive strength charges.

For any user, when the BOD exceeds *250 mg/l, the suspended solids exceed 250 mg/l, or when other pollutant concentrations exceed the range of concentrations of these pollutants in normal domestic sewage, a surcharge shall be added to the basic charge. This surcharge shall be calculated by the following formula:

$$C_s = (B_c(B) + S_c(S) + P_c(P)) V_u$$

Symbols and Definitions:

- C_s = A surcharge for wastewater of excessive strength
 - B_c = Operation and maintenance ("O&M") cost for treatment of a unit of biochemical oxygen demand ("BOD")
 - B = Concentration of BOD from a user above a base level
 - S_c = O&M cost for treatment of a unit of suspended solids ("SS")
 - S = Concentration of SS from a user above a base level
 - P_c = O&M cost for treatment of a unit of any pollutant
 - P = Concentration of any pollutant from a user above a base level
 - V_u = Volume contribution from a user per unit of time
- * Maximum limit for average domestic waste.

9-3-1.9. Charges for extraneous flows.

The costs of O&M for all flows not directly attributable to users (such as infiltration/inflow) shall be distributed among users on the same basis as operation and maintenance charges.

9-3-1.10. Toxic pollutants charges.

Each user that discharges any toxic pollutants which cause an increase in the cost of managing the effluent or the sludge of the system's treatment works shall pay for such increased costs.

9-3-1.11. Tapping fee.

Each customer who connects to the system shall pay a tapping fee and paving cut fee (if required) in an amount equal to the actual cost to the system for said connection as calculated by the Hot Springs Municipal Utilities Department, plus a service connection permit fee of \$75.

9-3-1.12. Septic tank haulers.

Persons, firms or corporations who haul and dump bulk sewage daily at the wastewater treatment plant shall be charged a dump fee of \$20 per load.

9-3-1.13. Compost fee.

The city manager and utilities director are hereby authorized to establish a policy and fee for distribution and loading of compost material to the general public. Said fee shall be based on the system's loading cost and demand for compost and loading services.

9-3-1.14. Pretreatment permit.

The direct cost of pretreatment program costs incurred by the system on behalf of industrial customers (e.g., lab fees, etc.) shall be paid by the industry requiring such services. Said pretreatment permit fee shall be equal to the direct system costs for providing such services.

9-3-1.15. Lift station surcharge.

Any new customer attaching to the system via grinder pump station or a gravity system serviced by a grinder pump station shall pay an additional tie-on charge of \$500.

9-3-1.16. Management system.

A financial management system shall be established and maintained by the city to document compliance with federal regulations pertaining to the Federal Water Pollution Control Act. Such system will account for all revenues generated and expenditures for OM&R and debt service.

9-3-1.17. Annual review and notification.

(a) The city will continuously monitor the revenues of the system, including specifically the adequacy of its rates and delinquent billings, and will take appropriate steps to remedy any delinquent billings or inadequacy of rates. The city will make a full review annually of the rates and charges of the system.

(b) The city shall at all times fix, charge and collect rates and charges for services furnished by the system, including increasing rates and charges as necessary, which shall provide revenues sufficient to at least: (1) pay the city's annual costs of OM&R; (2) pay annual debt service; and (3) provide the necessary bond coverage.

(c) Each user shall be notified at least annually, in conjunction with the regular bill, of the wastewater use rate and the portion of the user charges which are attributable to wastewater treatment. Costs shall be broken down to show the operation and maintenance costs attributable to that user.

9-3-1.18. Charge review.

(a) Any user who feels his user charge is unjust and inequitable may make written application to the utilities director requesting a review of his user charge. Said written request shall, where necessary, show the actual or estimated average flow and/or strength of his wastewater in comparison with the values upon which the charge is based, including how the measurements or estimates were made.

(b) Review of the request shall be made by the utilities director; and if substantiated, the user charges for that user shall be recalculated based on the revised flow and/or strength data and the new charges shall be applicable beginning with the next billing cycle/period.

9-3-1.19. Precedence.

The user charge system for the system shall take precedence over any terms or conditions of agreements or contracts between the city and any of the users which are inconsistent with applicable federal regulations regarding such user charge systems.

9-3-1.20. Appeals.

Any customer who is dissatisfied with a determination made by the utilities director under this ordinance may appeal to the city manager. A customer who is dissatisfied with a decision by the city manager, whether an initial decision or a decision on appeal from a determination by the utilities director, may appeal to the board of directors. Each appellate authority shall have authority to correct errors in the action appealed from.

9-3-1.21. Billing.

Users will be billed on a monthly basis in accordance with the city's uniform municipal utility billing procedure, the same being Ordinance No. 4549, as amended.

9-3-1.22. Severability.

That the provisions of this ordinance are separable; and if a section, phrase or provision shall be declared invalid, such declaration shall not affect the validity of the remainder of this ordinance.

(Ord. No. 5274, §§1, 2, 6-21-04)

ARTICLE II. HOT SPRINGS IMPACT FEE ORDINANCE**9-3-2. Impact fee ordinance.**

A wastewater impact fee is hereby established for the City of Hot Springs Wastewater (Sewer) System, hereinafter termed "System."

9-3-2.1. Short title, authority and applicability.

(a) *Short title.* This ordinance shall be known and may be cited as the "Hot Springs Wastewater Impact Fee Ordinance."

(b) *Authority.* This ordinance is enacted pursuant to the authority granted to the city by Ark. Code Ann. §§ 14-56-103 and the other relevant laws and judicial interpretations of the State of Arkansas.

(c) *Applicability.* The provisions of this ordinance shall apply to all of the territory within the service limits of the system including the corporate limits of Hot Springs, the unincorporated areas of Garland County served by the system, and all future additions to said areas.

9-3-2.2. Definitions.

For the purpose of this ordinance, the following terms shall have the following meanings:

- (a) *Board of directors.* The duly elected board of directors of the city of Hot Springs, Arkansas.
- (b) *Capital wastewater facilities.* The city's wastewater collection system, treatment facilities, lift lines, lift stations, interceptors, buildings, improvements to land, land and related equipment used to provide city wastewater services as defined in the study. The costs of capital wastewater facilities also include the costs of related planning and design for these facilities.

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- (c) *Certificate of occupancy.* A certificate issued by the city permitting the occupancy of a structure connected to the city's wastewater system. Said certificate may be limited to the structure's wastewater system for those structures located outside the corporate limits of Hot Springs.
- (d) *City.* The City of Hot Springs, Arkansas, including, but not limited to, its municipal utilities department.
- (e) *Developer.* Any person, firm or corporation commencing a development who is obligated to pay an Impact Fee in accordance with the terms of this ordinance, or who would be obligated to pay such a fee except for an exemption, refund, or credit provided for in this ordinance.
- (f) *Development.* Any residential, multifamily, commercial, or industrial improvement to lands within the system service area.
- (g) *Impact fee study (the study).* A study, that sets forth reasonable methodologies and analyses for determining the impacts of various types of development on the city's capital wastewater facilities, and that determines the cost of the facilities necessary to meet the demands created by new development.
- (h) *Impact fees.* The wastewater impact fees established by this ordinance pursuant to Ark. Code Ann. §§ 14-56-103.
- (i) *Impact fee trust fund.* The trust fund established by this ordinance. The impact fee trust fund is also called the trust fund.
- (j) *Improvements.* The results of planning, engineering design, construction inspection, on-site construction, off-site construction, land, the purchase of related equipment, and financing associated with new or expanded capital wastewater facilities, buildings, and equipment that expand the capacity of capital wastewater facilities, but not including maintenance, operations, or improvements that do not expand capacity.
- (k) *Independent fee calculation study.* A study prepared by *economists.com* and NRS Consulting Engineers, calculating the cost of expansions or improvements to the capital wastewater facilities required to serve the developer's proposed development, that is based on the established level of service standard, performed on an average cost (not marginal cost) methodology, that uses the service units and unit construction costs stated in the study, and is performed in compliance with any criteria for such studies established by this ordinance or by the city.

- (l) *Person.* Person means an individual, corporation, governmental agency, business trust, estate, trust, partnership, association, two or more persons having a joint or common interest, or any other entity.
- (m) *State.* The State of Arkansas.
- (n) *Successor in interest.* A person, as defined by this ordinance, who gains a fee simple interest in land for which a impact fee is paid or a credit is approved pursuant to the terms of this ordinance.
- (o) *System.* The city of Hot Springs municipal wastewater system including capital wastewater facilities.

9-3-2.3. Legislative findings.

The board of directors of Hot Springs, Arkansas, finds, determines and declares that:

(a) *System expansion required.* The protection of the health, safety, and general welfare of the citizens of the city requires that the city's capital sewer facilities be expanded and improved to accommodate growth and development within the city and the system service area.

(b) *System demand.* New residential and nonresidential development imposes increased and excessive demands upon the existing system facilities and often overburdens the existing system facilities. Provided, further, new development is expected to continue, and will place ever-increasing demands on the system to provide these facilities to serve new development.

(c) *System revenues.* System revenues generated from new development often does not generate sufficient funds to provide the necessary capital sewer facilities to accommodate new development; therefore, the creation of an equitable wastewater impact fee system would enable the city to impose a proportionate share of the costs of the needed improvements to system capital facilities to accommodate new development.

(d) *Study conducted.* In order to implement an equitable wastewater impact fee system, the city has caused to be prepared a "Wastewater Impact Fee Study," hereinafter termed "study." Said study is incorporated herein by reference, and sets forth reasonable methodologies and analyses for determining the impacts of various types of development on the city's system capital facilities, and for determining the cost of acquiring the improvements necessary to meet the demands for such services created by new development.

(e) *Standards established.* The city hereby establishes as city standards the assumptions and level of service (LOS) standards referenced in the study as part of its current plans for future expansions to the city's system capital facilities.

(f) *Impact fee use limited.* The impact fees described in this ordinance are based on the study, and do not exceed the costs of improvements to serve new development that will pay the impact fees nor shall such fees be used to correct existing deficiencies for these capital facilities, or to replace or rehabilitate existing improvements.

(g) *Benefit.* All of the capital wastewater facilities listed in the study will benefit all new development that depends on city services, and it is therefore appropriate to treat the entire system as a single service area for purposes of calculating, collecting, and spending the impact fees.

(h) *Impact fee relationship.* There is both a rational nexus and a rough proportionality between the development impacts created by each type of development covered by this ordinance and the impact fees that such development will be required to pay.

(i) *Impact fee purposes.* This ordinance creates a system by which wastewater impact fees paid by new development will be used to finance, defray, or reimburse all or a portion of the costs incurred by the city to construct improvements for system's capital wastewater facilities in ways that benefit the development that paid each fee within a reasonable period of time after the fee is paid.

9-3-2.4. Intent.

(a) *Capital improvement plan.* This ordinance is adopted to assist in the implementation of the city's capital improvement plan (CIP) for wastewater system projects. To that end, the intent of this ordinance is to ensure that new development bears a proportionate share of the cost of improvements to capital wastewater facilities; to ensure that such proportionate share does not exceed the cost of improvements for capital wastewater facilities required to accommodate new development; and to ensure that funds collected from new development are actually used for improvements for capital wastewater facilities that benefit such new development.

(b) *Impact fee purpose.* It is the further intent of this ordinance that new development pay for its fair share of the cost of improvements for capital wastewater facilities required to accommodate new development through the imposition of an impact fee that will be used to finance, defray, or reimburse all or a portion of the costs incurred by the city to construct improvements to the city capital wastewater facilities that serve or benefit such new development. It is not the intent of this ordinance to collect any money from any new development in excess of the actual amount necessary to offset new demands for capital wastewater facilities.

(c) *Funds restricted.* It is not the intent of this ordinance that any monies collected from any impact fee deposited in the wastewater impact fee trust fund ever be commingled with monies from any other city trust fund or account, or ever be used for a type of facility or equipment different from that for which the fees are paid, or are ever used to replace or rehabilitate existing improvements.

9-3-2.5. Impact fee imposed.

(a) *Impact fee obligation.* After the effective date of this ordinance, any person, firm or corporation who commences any development, except those exempted hereinafter, shall be obligated to pay impact fees upon commencement of such activity. The amount of the fees shall be determined in accordance with this ordinance, and shall be paid to the city as provided hereinafter. All monies paid by a developer pursuant to this ordinance shall be identified as impact fees and shall be promptly deposited into the wastewater trust fund described hereinafter.

(b) *Impact fee collection.* The impact fee imposed by this ordinance shall be collected in connection with and as a condition to the installation of a water meter serving the development. Should there not be water service to the development, the impact fee will be collected at the issuance of a certificate of occupancy. For those developments located outside the corporate limits of Hot Springs that are not served by water, the certificate of occupancy shall be limited to the development's wastewater system.

(c) *Impact fee calculation.* Impact fees shall be based on water meter size. Where no water meter is present, the utilities director shall determine and assign a water meter size equivalent based on a comparison with similarly-sized developments that are on metered service. The impact fees established hereinafter may be revised from time to time by the board of directors based on a new or revised impact fee study.

(d) *Impact fee schedule.*

Water Meter Size	Meter Ratio	Impact Fee
5/8"	1	\$ 500.00
3/4"	1	\$ 500.00
1"	1.4	\$ 700.00
1 1/2"	1.8	\$ 900.00
2"	2.9	\$ 1,450.00
3"	11	\$ 5,500.00
4"	14	\$ 7,000.00
6"	21	\$10,500.00
8"	29	\$14,500.00

(e) *Impact fee correction.* If an impact fee has been calculated and paid based on a mistake or misrepresentation, it shall be recalculated. Any amounts overpaid by a developer shall be refunded by the city within thirty (30) days after the city's acceptance of the recalculated amount, with accrued interest since the date of such overpayment. Any amounts underpaid by the developer shall be paid to the city within thirty (30) days after the city's acceptance of the recalculated amount, with accrued interest since the date of such underpayment. In the case of an underpayment to the city, the city shall not issue any additional permits or approvals for the project for which the impact fee was previously paid until such underpayment is corrected, and if amounts owed to the city are not paid within such thirty (30) day period, the city may also rescind any permits issued in reliance on the previous payment of such impact fee and refund such fee to the then current owner of the land.

(f) *Impact fee installments.* The board of directors may, on a case by cases basis, permit the payment of impact fees through monthly installments. Such installments shall not exceed twenty-four (24) months. Only those persons who demonstrate a documented hardship shall be eligible for installment payments as evidence by proof of household income at or below the then current low and moderate income guidelines as published by the United States Department of Housing and Urban Development (HUD). Persons desiring to pay impact fees by installment shall make application on such forms as may be prescribed by the city to the utilities director. The utilities director shall process such applications for consideration by the board of directors.

(g) *Impact fee waiver.* In order to promote the economic development and the provision of affordable housing in the city, the board of directors may agree, on a case by case basis to waive some or all of the impact fees imposed on a proposed development by this ordinance from other funds of the city that are not restricted to other uses. Any such decision to pay or waive impact fees on behalf of a developer shall be at the discretion of the board of directors and shall be made pursuant to goals and objectives of the board of directors to promote economic development and affordable housing. Affordable housing developments may include federally funded projects or projects funded by private non profit organizations for the benefit of low and moderate income persons. Developers seeking fee waiver, either in whole or part, shall make application on such forms as may be prescribed by the city to the utilities director. The utilities director shall process such applications for consideration by the board of directors.

9-3-2.6. Impact fee exceptions.

The following types of development shall be exempted from payment of the impact fees. Any claim for exemption shall be made no later than the time when the applicant applies for the first wastewater connection permit for the proposed development that creates the obligation to pay the impact fees. Any claim for exemption not made at or before that time shall have been waived. The utilities director or a designee shall determine the validity of any claim for exemption pursuant to the standards set forth below.

- (a) Reconstruction, expansion, or replacement of a previously existing residential unit that does not create any additional residential units or installation of a larger water meter.
- (b) The replacement of a destroyed or partially destroyed non-residential building or structure with a new non-residential building or structure of the same use as the original structure and with no more than a five (5%) percent increase in floor area from the original structure and no increase in the size or number of water meters.
- (c) Construction of unoccupied accessory structures related to a residential unit.
- (d) Projects for which an impact fee for each type of facility covered by this Ordinance has previously been paid in an amount that equals or exceeds the impact fee that would be required by this ordinance.
- (e) Projects built by the federal government and the state.
- (f) Public schools.
- (g) Construction within a duly established redevelopment district or improvement district for which the impact fees have specifically been waived by resolution of the board of directors prior to commencement of the improvements.

- (h) Such other economic or community development projects for which the impact fees have specifically been waived by resolution of the board of directors prior to commencement of the development.

9-3-2.7. Use of impact fee funds.

(a) *Trust fund.* A wastewater impact fee trust fund (hereinafter "trust fund") is hereby established for the purpose of ensuring that the impact fees collected pursuant to this ordinance are designated for the accommodation of impacts reasonably attributable to new development that paid the impact fees.

(b) *Trust fund management.* All impact fees collected by the city pursuant to this ordinance shall be promptly deposited into the trust fund. The impact fee trust fund shall be maintained in an interest bearing account. Monies in the trust fund shall be considered to be spent in the order collected, on a first-in/first-out basis.

(c) *Trust fund limitations.* The following limitations shall apply to the use and expenditure of impact fees collected and deposited in the trust fund:

- (1) The impact fee imposed pursuant to this ordinance may be assessed, collected and expended only for the planning, design and construction of new wastewater facilities or of capital improvements to existing wastewater facilities that expand the system's capacity or for the recoupment of prior capital improvements to wastewater facilities that created capacity available to serve new development.
- (2) The impact fee may be pledged to the payment of bonds issued by the city to finance wastewater capital improvements or wastewater facilities for which the impact fee may be imposed.
- (3) No impact fee shall be assessed for or expended upon the operation or maintenance of any wastewater facility or for the construction or improvement of wastewater facilities that do not create additional capacity.
- (4) No monies from the trust fund shall be spent for periodic or routine maintenance, rehabilitation, or replacement of any facility of any type or to cure deficiencies in capital wastewater facilities existing on the effective date of this ordinance.

9-3-2.8. Refunds of impact fees paid.

(a) *When refund due.* The city shall refund the portion of collected development impact fees, including the accrued interest, that has not been expended seven (7) years from the date the fees were paid. The refund shall be made on a pro rata basis and shall be paid in full not later than ninety (90) days after the date certain upon which the refund becomes due.

(b) *Refund notice.* When due, a refund shall be paid to the present owner of the property that was the subject of new development and against which the fee was assessed and collected. Notice of the right to a refund, including the amount of the refund and the procedure for applying for and receiving the refund, shall be sent or served in writing to the present owners of the property no later than thirty (30) days after the date on which the refund becomes due. The sending by regular mail of the notices to all present owners of record shall be sufficient to satisfy the requirement of notice.

(c) *Refund application.* In order to be eligible to receive a refund pursuant to this section, the developer or developer's successor in interest must submit a written refund application on such forms as shall be provided by the city. Said application must be received by the city within 180 calendar days of the date the notice of refund was mailed. If the refund application is being submitted by a developer's successor, the city may require written documentation of such succession. The utilities director or his/her designee may approve the refund application if it is determined the developer or developer's successor has paid an impact fee and that the city has not spent said fee within the required period of time as established by Ark. Code Ann. §§ 14-56-103.

(d) *Refund for expired project.* If a developer has paid an impact fee required by this ordinance and has obtained a wastewater connection permit, and the permit for which the fee was paid later expires without the possibility of further extension, then the developer or the developer's successor in interest shall be entitled to a refund of the fee paid, without interest. In order to be eligible to receive a refund of impact fees, the developer or the developer's successor in interest shall be required to submit an application for such refund to the utilities director or his/her designee within thirty (30) days after the expiration of the permit for which the fee was paid. If a successor in interest claims a refund of impact fees, the city may require written documentation that such rights have been conveyed to the claimant.

(e) *Refund for altered project.* After an impact fee has been paid pursuant to this ordinance, no refund of any part of such fee shall be made if the project for which the fee was paid is later demolished, destroyed, or is altered, reconstructed, or reconfigured so as to reduce the size of the project or the number of units in the project.

9-3-2.9. Fee review.

The impact fees described in this ordinance and the administrative procedures of this ordinance should be reviewed at least once every five (5) years to ensure that (1) the demand and cost assumptions underlying such fees are still valid, (2) the resulting fees do not exceed the actual cost of constructing capital wastewater facilities and that are required to serve new development, (3) the monies collected or to be collected in the trust fund have been and are expected to be spent for improvements of the type for which such fees were paid, and (4) that such improvements will benefit those developments for which the fees were paid.

9-3-2.10. Appeals.

Any determination made by any official of the city charged with the administration of any part of this ordinance may be appealed to the board of directors by filing with the city clerk within ten (10) days of the date of the determination being appealed: (1) a written notice of appeal on a form provided by the city, (2) a written explanation of why the appellant feels that a determination was in error, and (3) an appeal fee established by the city, if any. The board of directors shall promptly fix a time and place for hearing the appeal, and the city clerk shall mail notice of the hearing to the appellant at the address given in the notice of appeal. The hearing shall be conducted at the time and place stated in such notice given by the board of directors. The determination of the board of directors shall be final.

9-3-2.11. Capital plan and level of service standards.

(a) *Plan adoption.* The capital wastewater facilities to be financed by the wastewater impact fees shall be those facilities identified in the capital plan and level of service standards as presented in the study prepared by *economists.com* and NRS Consulting Engineers, entitled "Wastewater Impact Fee Study" dated May 2004. In this regard, the applicable sections of said study are hereby adopted as the official capital plan and level of service for the city of Hot Springs, Arkansas, wastewater system.

(b) *Plan revisions.* Provided, further, that said plan and standards may be revised from time to time by resolution of the board of directors. To this end, at least once during each fiscal year of the city, the city manager or his/her designee shall present to the board of directors a proposed capital improvements program for the city capital wastewater facilities, and such capital improvements program shall assign monies from the trust fund to specific projects and related expenses for capital wastewater facilities. Any monies, including any accrued interest not assigned to specific projects within such capital improvements program and not expended, shall be retained in the trust fund until the next fiscal year.

9-3-2.12. Penalty.

The penalty for violation of this ordinance shall, upon conviction in the Hot Springs District Court, or any other court of competent jurisdiction, be such fines and penalties as established by the general penalty clause for the Hot Springs Code of Ordinances as may now or hereafter be enacted by the Hot Springs Board of Directors.

9-3-2.13. Severability.

That the provisions of this ordinance are separable and if a section, phrase or provision shall be declared invalid, such declaration shall not affect the validity of the remainder of this ordinance.

(Ord. No. 5275, §§ 1-3, 6-21-04)

9-3-3. Reserved.**9-3-4. Sewer backwater damage claims - Policy.**

That from and after July 1, 1999, the city of Hot Springs will not consider any claims for damages caused by wastewater backwater conditions where the installation of a backwater protection device would have prevented such damage. Provided, further, that notice of this policy shall be given by mail to the address of all properties suspected of being subject to backwater damage. (Res. No. 4139, 3-1-99)

Editor's note- §9-3-4 was adopted by resolution but included in the Code of Ordinances due to its permanent nature.

9-3-5. Compost operations - Commercial disposal - Prohibited.

Disposal of brush, yard waste, leaves, tree trimmings and similar materials from all commercial haulers, landscapers, tree trimmers and similar commercial operations shall be prohibited from and after November 7, 2006. (Res. No. 6426, §1, 11-6-06)

Editor's note- §9-3-5 was adopted by resolution but included in the Code of Ordinances due to its permanent nature.

9-3-6--9-3-9. Reserved.**9-3-10. Water and sewer extension policy.**

Cross reference-See § 9-5-1 for sewer line extension policy.

9-3-11. Water/sewer extensions within Mid-America Park-Policy.

Cross reference-See § 9-5-2 for sewer line extension policy.

9-3-12--9-3-29. Reserved.

ARTICLE III. SEWER USE ORDINANCE

9-3-30. Definitions.

Unless the context specifically indicates otherwise, the meaning of terms used in this ordinance (article) shall be as follows:

BOD (denoting biochemical oxygen demand) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20° centigrade, expressed in milligrams per liter.

Building drain shall mean that part of the lowest horizontal piping of a drainage system which receives the discharge from soil, waste and other drainage pipes inside the walls of the building and conveys it to the building sewer, beginning five (5) feet (1.5 meters) outside the inner face of the building wall.

Building sewer shall mean the extension from the building drain to the public sewer or other place of disposal.

Combined sewer shall mean a sewer receiving both surface run-off and sewage.

Garbage shall mean solid wastes from the domestic and commercial preparation, cooking and dispensing of food, and from the handling, storage and sale of produce.

Industrial wastes shall mean the liquid wastes from industrial manufacturing processes, trade, or business as distinct from sanitary sewage.

Natural outlet shall mean any outlet into a watercourse, pond, ditch, lake, or other body of surface or groundwater.

Person shall mean any individual, firm, company, association, society, corporation or group.

pH shall mean the logarithm of the reciprocal of the weight of hydrogen ions in grams per liter of solution.

Properly shredded garbage shall mean the wastes from the preparation, cooking and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particles greater than one-half inch (1.27 centimeters) in any dimension.

Public sewer shall mean a sewer in which all owners of abutting properties have equal rights, and is controlled by public authority.

Sanitary sewer shall mean a sewer which carries sewage and to which storm, surface and ground waters are not intentionally admitted.

Sewage shall mean a combination of the water-carried wastes from residences, business buildings, institutions and industrial establishments, together with such ground surface and stormwaters as may be present, or from any other source.

Sewage treatment plant shall mean any arrangement of devices and structures used for treating sewage.

Sewage system shall mean all facilities for collecting, pumping, treating and disposing of sewage.

Sewer shall mean a pipe or conduit for carrying sewage.

Shall is mandatory; "may" is permissive.

Slug shall mean any discharge of water, sewage or industrial waste which in concentration of any given constituent or in quantity of flow exceeds for any period of duration longer than fifteen (15) minutes more than five (5) times the average twenty-four (24) hour concentration or flows during normal operation.

Storm drain (sometimes termed "storm sewer") shall mean a sewer which carries storm and surface waters and drainage, but excludes sewage and industrial wastes, other than unpolluted cooling water.

Superintendent shall mean the superintendent of sewage works of the city of Hot Springs, Arkansas, or his authorized deputy, agent or representative.

Suspended solids shall mean solids that float on the surface of, or are in suspension in water, sewage, or other liquids, and which are removable by laboratory filtering.

Watercourse shall mean a channel in which a flow of water occurs, either continuously or intermittently. (Ord. No. 3109, Art. I, §§ 1-22, 9-13-71)

9-3-31. Use of public sewers required.

(a) It shall be unlawful for any person to place, deposit, or permit to be deposited in any unsanitary manner on public or private property within the city of Hot Springs, Arkansas, or in any area under the jurisdiction of said city, any human or animal excrement, garbage or other objectionable waste.

(b) It shall be unlawful to discharge to any natural outlet within the city of Hot Springs, Arkansas, or in any area under the jurisdiction of said city, any sewage or other polluted waters, except where suitable treatment has been provided in accordance with subsequent provisions of this ordinance (article).

(c) Except as hereinafter provided, it shall be unlawful to construct or maintain any privy, privy vault, septic tank, cesspool or other facility intended or used for the disposal of sewage.

(d) The owner of all houses, buildings or properties used for human occupancy, employment, recreation or other purposes, situated within the city and abutting on any street, alley or right-of-way in which there is now located or may in the future be located a public sanitary or combined sewer of the city, is hereby required at his expense to install suitable toilet facilities therein, and to connect such facilities directly with the proper public sewer in accordance with the provisions of this ordinance, within sixty (60) days after date of official notice to do so, provided, that said public sewer is within three hundred (300) feet of the property line. (Ord. No. 3109, Art. II, §§ 1-4, 9-13-71)

9-3-32. Private sewage disposal.

(a) Where a public sanitary or combined sewer is not available under the provisions of Article II, Section 4 (section 9-3-31(d)), the building sewer shall be connected to a private sewage disposal system complying with the provisions of this article (section 9-3-32).

(b) Before commencement of construction of a private sewage disposal system, the owner shall first obtain a written permit signed by the superintendent. The application for such permit shall be made on a form furnished by the city, which the applicant shall supplement by any plans, specifications and other information as are deemed necessary by the superintendent. A permit and inspection fee as shall be established by the Hot Springs sewer committee shall be paid to the city at the time the application is filed.

(c) A permit for a private sewage disposal system shall not become effective until the installation is completed to the satisfaction of the superintendent. He shall be allowed to inspect the work at any stage of construction and, in any event, the applicant for the permit shall notify the superintendent when the work is ready for final inspection, and before any underground portions are covered. The inspection shall be made within two (2) working days of the receipt of notice by the superintendent.

(d) The type, capacities, location and layout of a private sewage disposal system shall comply with all recommendations of the department of public health of the State of Arkansas. No permit shall be issued for any private sewage disposal system employing subsurface soil absorption facilities where the area of the lot is less than 12,500 square feet on a lot serviced by city water and 20,000 square feet on a lot not serviced by city water. No septic tank or cesspool shall be permitted to discharge to any natural outlet.

(e) At such time as a public sewer becomes available to a property served by a private sewage disposal system, as provided in Article IV Section 4 (9-3-32 (d)), a direct connection shall be made to the public sewer in compliance with this ordinance (article), and any septic tanks, cesspools and similar private sewage disposal facilities shall be abandoned and filled with suitable material.

(f) The owner shall operate and maintain the private sewage disposal facilities in a sanitary manner at all times, at no expense to the city.

(g) No statement contained in this article shall be construed to interfere with any additional requirements that may be imposed by the health officer.

(h) When a public sewer becomes available, the building sewer shall be connected to said sewer within sixty (60) days and the private sewage disposal system shall be cleaned of sludge and filled with clean bankrun gravel or dirt. (Ord. No. 3109, Art. III, §§ 1-8, 9-13-71)

9-3-33. Building sewers and connection.

(a) No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the superintendent.

(b) There shall be two (2) classes of building sewer permits: (a) for residential and commercial service, and (b) for service to establishments producing industrial wastes. In either case, the owner or his agent shall make application on a special form furnished by the city. The permit application shall be supplemented by any plans, specifications or other information considered pertinent in the judgment of the superintendent. A permit and inspection fee as shall be established by the Hot Springs sewer committee for a residential or commercial building sewer permit or an industrial building sewer permit shall be paid to the city at the time the application is filed.

(c) All costs and expense incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the city for any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer.

(d) A separate and independent building sewer shall be provided for every building; except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one (1) building sewer.

(e) Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the superintendent, to meet all requirements of this ordinance (article).

(f) The size, slope, alignment, materials or construction of a building sewer, and the methods to be used in excavating, placing of the pipe jointing, testing, and backfilling the trench, shall all conform to the requirements of the building and plumbing code or other applicable rules and regulations of the City of Hot Springs and State of Arkansas.

(g) Whenever possible, the building sewer shall be brought to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved means and discharged to the building sewer.

(h) No person shall make connection of roof downspout, exterior foundation drains, areaway drains, or other sources of surface runoff or groundwater to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer.

(i) The connection of the building sewer into the public sewer shall conform to the requirements of the building and plumbing code or other applicable rules and regulations of the city, or the procedures set forth in appropriate specifications of the A.S.T.M. and the W.P.C.F. Manual of Practice No. 9. All such connections shall be made gastight and watertight. Any deviation from the prescribed procedures and materials must be approved by the superintendent before installation.

(j) The applicant for the building sewer permit shall notify the superintendent when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the superintendent or his representative.

(k) All excavations for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the city. (Ord. No. 3109, Art. IV, § 1-11, 9-13-71)

9-3-34. Use of public sewers.

(a) No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, uncontaminated cooling water, or unpolluted industrial process waters to any sanitary sewer. Provided, however, that the discharge of uncontaminated cooling water into the sanitary sewer from a historic building may be permitted by the Superintendent when the building owner can demonstrate that there is no other viable alternative for the disposal of such discharge. For purposes of this section, a "historic building" is a building listed on the National Register of Historic Places or a building that is a "contributing structure" in a historic district as established by ordinance of the City. (Ord. No. 5511, §1, 12-18-06)

(b) Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers, or to a natural outlet approved by the superintendent. Industrial cooling water or unpolluted process waters may be discharged, on approval of the superintendent, to a storm sewer, combined sewer or natural outlet.

(c) No person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewers:

- (1) Any gasoline, benzene, naphtha, fuel oil or other flammable or explosive liquid, solid, or gas.
- (2) Any waters or wastes containing toxic or poisonous solids, liquids, or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the sewage treatment plant, including but not limited to cyanides in excess of 0.05 ppm in the wastes as discharged in the public sewer.
- (3) Any waters or wastes having a pH lower than 5.5 or having any other corrosive property capable of causing damage or hazard to structures, equipment and personnel of the sewage works.
- (4) Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the sewage works such as, but not limited to, ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, unground garbage, whole blood, paunch manure, hair and fleshings, entrails and paper dishes, cups, milk containers, etc., either whole or ground by garbage grinders.

(d) No person shall discharge or cause to be discharged the following described substances, materials, waters or wastes, if it appears likely in the opinion of the superintendent that such wastes can harm either the sewers, sewage treatment process or equipment, have an adverse effect on the receiving stream, or can otherwise endanger life, limb, public property, or constitute a nuisance. In forming his opinion as to the acceptability of these wastes, the superintendent will give consideration to such factors as the quantities of subject wastes in relation to flows and velocities in the sewers, materials of construction of the sewers, nature of the sewage treatment process, capacity of the sewage treatment plant, degree of treatability of wastes in the sewage treatment plant and other pertinent factors. The substances prohibited are:

- (1) Any liquid or vapor having a temperature higher than 150 deg. F 65 deg C.

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- (2) Any water or waste containing fats, wax, grease or oils, whether emulsified or not, in excess of 100 mg/l or containing substances which may solidify or become viscous at temperatures between 32 and 150 deg. F (0 and 65 deg. C).
- (3) Any garbage that has not been properly shredded. The installation and operation of any garbage grinder equipped with a motor of three-fourths (3/4) horsepower (0.76 hp metric) or greater shall be subject to the review and approval of the superintendent.
- (4) Any waters or wastes containing strong acid iron pickling wastes, or concentrated plating solutions whether neutralized or not.
- (5) Any waters or waste containing iron, chromium, copper, zinc and similar objectionable or toxic substances, or wastes exerting an excessive chlorine requirement, to such degree that any such material received in the composite sewage at the sewage treatment works exceeds the limits established by the superintendent for such materials.
- (6) Any waters or wastes containing phenols or other taste or odor producing substances, in such concentration exceeding limits which may be established by the superintendent as necessary, after treatment of the composite sewage, to meet the requirements of the state, federal or other agencies of jurisdiction for such discharge to the receiving waters.
- (7) Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the superintendent in compliance with applicable state or federal regulations.
- (8) Any waters or wastes having a pH in excess of 9.0.
- (9) Materials which exert or cause:
 - a. Unusual concentrations of inert suspended solids (such as, but not limited to, Fullers earth, lime slurries and lime residues) or of dissolved solids (such as, but not limited to, sodium chloride and sodium sulfate) .
 - b. Excessive discoloration (such as, but not limited to dye wastes and vegetable tanning solution).
 - c. Unusual BOD, chemical oxygen demand, or chlorine requirements in such quantities as to constitute a significant load on the sewage treatment works.
 - d. Unusual volume of flow or concentration of wastes constituting "slugs" as defined herein.

- (10) Waters or wastes containing substances which are not amenable to treatment or reduction by the sewage treatment processes employed, or are amenable to treatment only to such degree that the sewage treatment plant effluent cannot meet the requirements of other agencies having jurisdiction over discharge to the receiving waters.

(e) If any waters or wastes are discharged, or are proposed to be discharged to the public sewers, which waters contain the substances or possess the characteristics enumerated in section 4 of this article (section 9-3-34(d)), and which in the judgment of the superintendent, may have deleterious effect upon the sewage works, processes, equipment or receiving waters, or which otherwise create a hazard to life or constitute a public nuisance, the superintendent may:

- (1) Reject the wastes.
- (2) Require pretreatment to an acceptable condition for discharge to the public sewers.
- (3) Require control over the quantities and rates of discharge, and/or;
- (4) Require payment to cover the added cost of handling and treating the wastes not covered by existing taxes or sewer charges under the provisions of section 10 of this article (section 9-3-34(j)).

If the superintendent permits the pretreatment or equalization of waste flows, the design and installation of the plants and equipment shall be subject to the review and approval of the superintendent, and subject to the requirements of all applicable codes, ordinances and laws.

(f) Grease, oil and sand interceptors shall be provided when, in the opinion of the superintendent they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand or other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the superintendent and shall be located as to be readily and easily accessible for cleaning and inspection.

(g) Where preliminary treatment or flow-equalizing facilities are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner at his expense.

(h) When required by the superintendent the owner of any property serviced by a building sewer carrying industrial wastes, shall install a suitable control manhole together with such necessary meters and other appurtenances in the building sewer to facilitate observation, sampling and measurement of the wastes. Such manhole, when required, shall be accessible and safely located, and shall be constructed in accordance with plans approved by the superintendent. The manhole shall be installed by the owner at his expense, and shall be maintained by him so as to be safe and accessible at all times.

(i) All measurements, tests and analyses of the characteristics of waters and wastes to which reference is made in this ordinance (article) shall be determined in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater", published by the American Public Health Association, and shall be determined at the control manhole provided, or upon suitable samples taken at said control manhole. In the event that no special manhole has been required, the control manhole shall be considered to be the nearest downstream manhole in the public sewer to the point at which the building sewer is connected. Sampling shall be carried out by customarily accepted methods to reflect the effect of constituents upon the sewage works and to determine the existence of hazards to life, limb and property.

(j) No statement contained in this article (section 9-3-34) shall be construed as preventing any special agreement or arrangement between the city and any industrial concern whereby an industrial waste of unusual strength or character may be accepted by the city for treatment, subject to payment therefor, by the industrial concern. (Ord. No. 3109, Art. V, § 1-10, 9-13-71)

9-3-35. Protection from damage.

No unauthorized person shall maliciously, willfully or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is a part of the sewage works. Any person violating this provision shall be subject to immediate arrest under charge of disorderly conduct. (Ord. No. 3109, Art. VI, § 1, 9-13-71)

9-3-36. Powers and authority of inspectors.

(a) The superintendent and other duly authorized employees of the city bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling and testing in accordance with the provisions of this ordinance (article). The superintendent or his representatives shall have no authority to inquire into any processes including metallurgical, chemical, oil, refining, ceramic, paper or other industries beyond that point having a direct bearing on the kind and source of discharge to the sewers or waterways or facilities for waste treatment.

(b) While performing the necessary work on private properties referred to in this section, paragraph (a) above, the superintendent or duly authorized employees of the city shall observe all safety rules applicable to the premises established by the company and the company shall be held harmless for injury or death to the city employees and the city shall indemnify the company against loss or damage to its property by city employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions as required in Section 9-3-34(h)).

(c) The superintendent and other duly authorized employees of the city bearing proper credentials and identification shall be permitted to enter all private properties through which the city holds a duly negotiated easement for the purpose of, but not limited to, inspection, observation, measurement, sampling, repair and maintenance of any portion of the sewage works lying within said easements. All entry and subsequent work, if any, on said easement, shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved. (Ord. No. 3109, Art. VII, §§ 1-3, 9-13-71)

9-3-37. Penalties.

(a) Any person found to be violating any provision of this ordinance (article) except Section 9-3-35, shall be served by the city with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall within the period of time stated in such notice, permanently cease all violations.

(b) The penalty for continuation of any violation of this ordinance, beyond the time limit provided for in (a) shall, upon conviction in the Hot Springs Municipal Court or any other court of competent jurisdiction, be such fines and penalties as established by the general penalty clause for the Hot Springs Code of Ordinances as may now or hereafter be enacted by the Hot Springs Board of Directors. (Ord. No. 4960, § 2, 3-5-01)

(c) Any person violating any of the provisions of this ordinance (article) shall become liable to the city for any expense, loss or damage occasioned the city by reason of such violation. (Ord. No. 3109, Art. VIII, §§ 1, 3, 9-13-71)

9-3-38--9-3-40. Reserved.

ARTICLE IV. INDUSTRIAL WASTEWATER PRETREATMENT CODE

9-3-41. Code adopted.

(a) The following City of Hot Springs Industrial Wastewater Pretreatment Code regulating discharges from industries served by the municipal sewer system and prescribing administration procedures and penalties for violation of said code is hereby adopted by reference as if set out herein word for word.

(b) Any person, firm or corporation violating any of the terms, provisions and regulations of the Hot Springs Industrial Wastewater Pretreatment Code as adopted herein shall be subject to the penalties as stated in said Hot Springs Code.

(c) If any provisions, paragraph, work, section or article of this ordinance or the reference codes are invalidated by any court of competent jurisdiction, the remaining provisions, paragraph, words, sections and chapters shall not be affected and shall continue in full force and effect. (Ord. No. 4577, §§ 1-3, 11-18-96)

Editor's note-Three copies of the Hot Springs Industrial Wastewater Pretreatment Code are on file in the office of the City Clerk for inspection and view by the public, and notice thereof was made by publication on November 21, 1996, in the Sentinel Record (a newspaper of general circulation within the City of Hot Springs, Arkansas)

9-3-42. General provisions.**9-3-42.1. Purpose and policy.**

This code sets forth uniform requirements for users of the publicly owned treatment works for the city of Hot Springs and enables the city to comply with all applicable state and federal laws, including the Clean Water Act (33 United States Code § 1251 et seq.) and the General Pretreatment Regulations (40 Code of Federal Regulations Part 403). The objectives of this code are:

- (a) To prevent the introduction of pollutants into the publicly owned treatment works that will interfere with its operation;
- (b) To prevent the introduction of pollutants into the publicly owned treatment works that will pass through the publicly owned treatment works, inadequately treated, into receiving waters, or otherwise be incompatible with the publicly owned treatment works;
- (c) To protect both publicly owned treatment works personnel who may be affected by wastewater and sludge in the course of their employment and the general public;
- (d) To promote reuse and recycling of industrial wastewater and sludge from the publicly owned treatment works;

- (e) To provide for fees for the equitable distribution of the cost of operation, maintenance, and improvement of the publicly owned treatment works; and
- (f) To enable the city to comply with its national pollutant discharge elimination system permit conditions, sludge use and disposal requirements, and any other federal or state laws to which the publicly owned treatment works is subject.

This code shall apply to all users of the publicly owned treatment works. The code authorizes the issuance of wastewater discharge permits; provides for monitoring, compliance, and enforcement activities; establishes administrative review procedures; requires user reporting; and provides for the setting of fees for the equitable distribution of costs resulting from the program established herein.

9-3-42.2. Administration.

Except as otherwise provided herein, the city manager or his designee shall administer, implement, and enforce the provisions of this code. Any powers granted to or duties imposed upon the city manager or his designee may be delegated by the city manager or his designee to other city personnel.

9-3-42.3. Abbreviations.

The following abbreviations, when used in this code, shall have the designated meanings:

* BOD	- Biochemical Oxygen Demand
* CFR	- Code of Federal Regulations
* COD	- Chemical Oxygen Demand
* EPA	- U.S. Environmental Protection Agency
* gpd	- gallons per day
* mg/l	- milligrams per liter
* NPDES	- National Pollutant Discharge Elimination System
* POTW	- Publicly Owned Treatment Works
* RCRA	- Resource Conservation and Recovery Act
* SIC	- Standard Industrial Classification
* TSS	- Total Suspended Solids
* U.S.C.	- United States Code

9-3-42.4. Definitions.

Unless a provision explicitly states otherwise, the following terms and phrases, as used in this code, shall have the meanings hereinafter designated.

Act or "the act." The federal water pollution control act, also known as the Clean Water Act, as amended, 33 U.S.C. § 1251 et seq.

Approval authority. The Arkansas Department of Pollution Control & Ecology is designated as the approval authority.

Authorized representative of the user.

- (a) If the user is a corporation:
 - (1) The president, secretary, treasurer, or a vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
 - (2) The city manager or his designee of one or more manufacturing, production, or operation facilities employing more than two hundred fifty (250) persons or having gross annual sales or expenditures exceeding twenty-five (25) million dollars (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the city manager or his designee in accordance with corporate procedures.
- (b) If the user is a partnership or sole proprietorship: a general partner or proprietor, respectively.
- (c) If the user is a federal, state, or local governmental facility: a director or highest official appointed or designated to oversee the operation and performance of the activities of the government facility, or their designee.
- (d) The individuals described in paragraphs (a) through (c) above may designate another authorized representative if the authorization is in writing, the authorization specifies the individual or position responsible for the overall operation of the facility from which the discharge originates or having overall responsibility for environmental matters for the company, and the written authorization is submitted to the city.

Biochemical oxygen demand (BOD). The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedures for five (5) days at 20° centigrade, usually expressed as a concentration (e.g., mg/l).

Categorical Pretreatment Standard or Categorical Standard. Any regulation containing pollutant discharge limits promulgated by EPA in accordance with Sections 307(b) and (c) of the Act (33 U.S.C. § 1317) which apply to a specific category of users and which appear in 40 CFR Chapter I, Subchapter N, Parts 405.471.

City. The City of Hot Springs, Arkansas.

Control authority. The city manager or the person(s) designated by the city manager to supervise the operation of the POTW, and who is charged with certain duties and responsibilities by this code, or a duly authorized representative. (Ord. no. 4725, § 2 (a), 4-20-98)

Environmental Protection Agency (EPA). The U.S. Environmental Protection Agency or, where appropriate, the regional water management division director, or other duly authorized official of said agency.

Existing source. Any source of discharge, the construction or operation of which commenced prior to the publication by EPA of proposed categorical pretreatment standards, which will be applicable to such source if the standard is thereafter promulgated in accordance with Section 307 of the Act.

Grab sample. A sample which is taken from a wastestream without regard to the flow in the wastestream and over a period of time not to exceed fifteen (15) minutes.

Indirect discharge (or discharge). The introduction of pollutants into the POTW from any nondomestic source regulated under Section 307(b), (c), or (d) of the Act.

Instantaneous maximum allowable discharge limit. The maximum concentration of a pollutant allowed to be discharged at any time, determined from the analysis of any discrete or composited sample collected, independent of the industrial flow rate and the duration of the sampling event.

Interference. A discharge, which alone or in conjunction with a discharge or discharges from other sources, inhibits or disrupts the POTW, its treatment processes or operations or its sludge processes, use or disposal; and therefore, is a cause of a violation of the city's NPDES permit or of the prevention of sewage sludge use or disposal in compliance with any of the following statutory/regulatory provisions or permits issued thereunder, or any more stringent state or local regulations: Section 405 of the Act; the Solid Waste Disposal Act, including Title II commonly referred to as the Resource Conservation and Recovery Act (RCRA); any state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the Solid Waste Disposal Act; the Clean Air Act; the Toxic Substances Control Act; and the Marine Protection, Research, and Sanctuaries Act.

Medical waste. Isolation wastes, infectious agents, human blood and blood products, pathological wastes, sharps, body parts, contaminated bedding, surgical wastes, potentially contaminated laboratory wastes, and dialysis wastes.

New source.

- (a) Any building, structure, facility, or installation from which there is (or may be) a discharge of pollutants, the construction of which commenced after the publication of proposed pretreatment standards under Section 307(c) of the Act which will be applicable to such source if such standards are thereafter promulgated in accordance with that section, provided that:

- (1) The building, structure, facility, or installation is constructed at a site at which no other source is located; or
 - (2) The building, structure, facility, or installation totally replaces the process or production equipment that causes the discharge of pollutants at an existing source; or
 - (3) The production or wastewater generating processes of the building, structure, facility, or installation are substantially independent of an existing source at the same site. In determining whether these are substantially independent, factors such as the extent to which the new facility is integrated with the existing plant, and the extent to which the new facility is engaged in the same general type of activity as the existing source, should be considered.
- (b) Construction on a site at which an existing source is located results in a modification rather than a new source if the construction does not create a new building, structure, facility, or installation meeting the criteria of Section (a)(2) or (3) above but otherwise alters, replaces, or adds to existing process or production equipment.
- (c) Construction of a new source as defined under this paragraph has commenced if the owner or operator has:
- (1) Begun, or caused to begin, as part of a continuous onsite construction program
 - a. any placement, assembly, or installation of facilities or equipment; or
 - b. significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for the placement, assembly, or installation of new source facilities or equipment; or
 - (2) Entered into a binding contractual obligation for the purchase of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under this paragraph.

Noncontact cooling water. Water used for cooling which does not come into direct contact with any raw material, intermediate product, waste product, or finished product.

Pass through. A discharge which exits the POTW into waters of the United States in quantities or concentrations which, along or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the city's NPDES permit, including an increase in the magnitude or duration of a violation.

Person. Any individual, partnership, copartnership, firm, company, corporation, association, joint stock company, trust, estate, governmental entity, or any other legal entity; or their legal representatives, agents, or assigns. This definition includes all federal, state, and local governmental entities.

pH. A measure of the acidity or alkalinity of a solution, expressed in standard units.

Pollutant. Dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, medical wastes, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, municipal agricultural and industrial wastes, and certain characteristics of wastewater (e.g., pH, temperature, TSS, turbidity, color, BOD, COD, toxicity, or odor).

Pretreatment. The reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to, or in lieu of, introducing such pollutants into the POTW. This reduction or alteration can be obtained by physical, chemical, or biological processes; by process changes; or by other means, except by diluting the concentration of the pollutants unless allowed by an applicable pretreatment standard.

Pretreatment requirements. Any substantive or procedural requirement related to pretreatment imposed on a user, other than a pretreatment standard.

Pretreatment standards or standards. Pretreatment standards shall mean prohibited discharge standards, categorical pretreatment standards, and local limits.

Prohibited discharge standards or prohibited discharges. Absolute prohibitions against the discharge of certain substances; these prohibitions appear in Section 9-3-43.1 of this code.

Publicly owned treatment works (POTW). A "treatment works," as defined by Section 212 of the Act (33 U.S.C. §1292) which is owned by the city. This definition includes any devices or systems used in the collection, storage, treatment, recycling, and reclamation of sewage or industrial wastes of a liquid nature and any conveyances which convey wastewater to a treatment plant.

Septic tank waste. Any sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.

Sewage. Human excrement and gray water (household showers, dishwashing operations, etc.).

Shall. As used in this Code shall is always mandatory. (Ord. No. 4725, § 1 (b), 4-20-98)

Significant industrial user.

- (a) A user subject to categorical pretreatment standards; or
- (b) A user that:
 - (1) discharges an average of twenty-five thousand (25,000) gpd or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater);
 - (2) contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or
 - (3) is designated as such by the city on the basis that it has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement.
- (c) Upon a finding that a user meeting the criteria in Subsection (b) has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the city may at any time, on its own initiative or in response to a petition received from a user, and in accordance with procedures in 40 CFR 403.8(f)(6), determine that such user should not be considered a significant industrial user.

Slug load or slug. Any discharge at a flow rate or concentration which could cause a violation of the prohibited discharge standards in Section 9-3-43.1 of this code.

Standard Industrial Classification (SIC) code. A classification pursuant to the *Standard Industrial Classification Manual* issued by the United States Office of Management and Budget.

Storm water. Any flow occurring during or following any form of natural precipitation, and resulting from such precipitation, including snowmelt.

Suspended solids. The total suspended matter that floats on the surface of, or is suspended in, water, wastewater, or other liquid, and which is removable by laboratory filtering.

User or industrial user. A source of indirect discharge.

Wastewater. Liquid and water-carried industrial wastes and sewage from residential dwellings, commercial buildings, industrial and manufacturing facilities, and institutions, whether treated or untreated, which are contributed to the POTW.

Wastewater treatment plant or treatment plant. That portion of the POTW which is designed to provide treatment of municipal sewage and industrial waste.

9-3-43. General sewer use requirements.

9-3-43.1. Prohibited discharge.

(a) General prohibitions. No user shall introduce or cause to be introduced into the POTW any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the POTW whether or not they are subject to categorical pretreatment standards or any other national, state, or local pretreatment standards or requirements.

(b) Specific prohibitions. No user shall introduce or cause to be introduced into the POTW the following pollutants, substances, or wastewater:

- (1) Pollutants which create a fire or explosive hazard in the POTW, including, but not limited to, wastestreams with a closed-cup flashpoint of less than 140°F (60°C) using the test methods specified in 40 CFR 261.21;
- (2) Wastewater having a pH less than 6.0 or more than 11.0, or otherwise causing corrosive structural damage to the POTW or equipment;
- (3) Solid or viscous substances in amounts which will cause obstruction of the flow in the POTW resulting in interference;
- (4) Pollutants, including oxygen-demanding pollutants (BOD, etc.), released in a discharge at a flow rate and/or pollutant concentration which, either singly or by interaction with other pollutants, will cause interference with the POTW;
- (5) Wastewater having a temperature greater than 110°F, or which will inhibit biological activity in the treatment plant resulting in interference, but in no case wastewater which causes the temperature at the introduction into the treatment plant to exceed 104°F (40°C);
- (6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin, in amounts that will cause interference or pass through;
- (7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems;

- (8) Trucked or hauled pollutants, except at discharge points designated by the control authority in accordance with Section 9-3-44.4 of this code;
- (9) Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;
- (10) Wastewater which imparts color which cannot be removed by the treatment process, such as, but not limited to, dye wastes and vegetable tanning solutions, which consequently imparts color to the treatment plant's effluent, thereby violating the city's NPDES permit;
- (11) Wastewater containing any radioactive wastes or isotopes except in compliance with applicable state or federal regulations;
- (12) Storm water, surface water, ground water, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, noncontact cooling water, and unpolluted wastewater, unless specifically authorized by the control authority;
- (13) Sludges, screenings, or other residues from the pretreatment of industrial wastes;
- (14) Medical wastes, except as specifically authorized by the control authority in a wastewater discharge permit;
- (15) Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to fail a toxicity test;
- (16) Detergents, surface-active agents, or other substances which may cause excessive foaming in the POTW;
- (17) Fats, oils, or greases of animal or vegetable origin in concentrations greater than 150mg/l;
- (18) Wastewater causing two readings on an explosion hazard meter at the point of discharge into the POTW, or at any point in the POTW, of more than twenty-five percent (25%) or any single reading over fifty percent (50%) of the Lower Explosive Limit of the meter.

Pollutants, substances, or wastewater prohibited by this section shall not be processed or stored in such a manner that they could be discharged to the POTW.

9-3-43.2. National categorical pretreatment standards.

The categorical pretreatment standards found at 40 CFR Chapter I, Subchapter N, Parts 405-471 are hereby incorporated.

- (a) Where a categorical pretreatment standard is expressed only in terms of either the mass or the concentration of a pollutant in wastewater, the control authority may impose equivalent concentration or mass limits in accordance with 40 CFR 403.6(c).
- (b) When wastewater subject to a categorical pretreatment standard is mixed with wastewater not regulated by the same standard, the control authority shall impose an alternate limit using the combined wastestream formula in 40 CFR 403.6(e).
- (c) A user may obtain a variance from a categorical pretreatment standard if the user can prove, pursuant to the procedural and substantive provisions in 40 CFR 403.13, that factors relating to its discharge are fundamentally different from the factors considered by EPA when developing the categorical pretreatment standard.
- (d) A user may obtain a net gross adjustment to a categorical standard in accordance with 40 CFR 403.15.

9-3-43.3. State pretreatment standards.

State pretreatment standards set by state statute or regulation are hereby incorporated.

9-3-43.4. Local limits.

The following pollutant limits are established to protect against pass through and interference. No person shall discharge wastewater containing in excess of the following average allowable monthly discharge limits:

1.11	mg/l	arsenic
0.59	mg/l	cadmium
17.43	mg/l	chromium
16.65	mg/l	copper
2.45	mg/l	cyanide
2.53	mg/l	lead
0.037	mg/l	mercury
10.07	mg/l	nickel
150	mg/l	oil and grease
0.47	mg/l	silver
34.08	mg/l	zinc

The above limits apply at the point where the wastewater is discharged to the POTW. All concentrations for metallic substances are for "total" metal unless indicated otherwise. The control authority may impose mass limitations in addition to, or in place of, the concentration-based limitations above.

9-3-43.5. City's right of revision.

The city reserves the right to establish, by ordinance or in wastewater discharge permits, more stringent standards or requirements on discharges to the POTW.

9-3-43.6. Dilution.

No user shall ever increase the use of process water, or in any way attempt to dilute a discharge, as a partial or complete substitute for adequate treatment to achieve compliance with a discharge limitation unless expressly authorized by an applicable pretreatment standard or requirement. The control authority may impose mass limitations on users who are using dilution to meet applicable pretreatment standards or requirements, or in other cases when the imposition of mass limitations is appropriate.

9-3-44. Pretreatment of wastewater.

9-3-44.1. Pretreatment facilities.

Users shall provide wastewater treatment as necessary to comply with this code and shall achieve compliance with all categorical pretreatment standards, local limits, and the prohibitions set out in Section 9-3-43.1 of this code within the time limitations specified by the EPA, the state, or the control authority for review, and shall be acceptable to the control authority before such facilities are constructed. The review of such plans and operating procedures shall in no way relieve the user from the responsibility of modifying such facilities as necessary to produce a discharge acceptable to the city under the provisions of this code.

9-3-44.2. Additional pretreatment measures.

(a) Whenever deemed necessary, the control authority may require users to restrict their discharge during peak flow periods, designate that certain wastewater be discharged only into specific sewers, relocate and/or consolidate points of discharge, separate sewage wastestreams from industrial wastestreams, and such other conditions as may be necessary to protect the POTW and determine the user's compliance with the requirements of this code.

(b) The control authority may require any person discharging into the POTW to install and maintain, on their property and at their expense, a suitable storage and flow-control facility to ensure equalization of flow. A wastewater discharge permit may be issued solely for flow equalization.

(c) Grease, oil, and sand interceptors shall be provided when, in the opinion of the superintendent, they are necessary for the proper handling of wastewater containing excessive amounts of grease and oil, or sand; except that such interceptors shall not be required for residential users. All interception units shall be of type and capacity approved by the control authority and shall be so located to be easily accessible for cleaning and inspection. Such interceptors shall be inspected, cleaned, and repaired regularly, as needed, by the user at their expense.

(d) Users with the potential to discharge flammable substances may be required to install and maintain an approved combustible gas detection meter.

9-3-44.3. Accidental discharge/slug control plans.

At least once every two (2) years, the control authority shall evaluate whether each significant industrial user needs an accidental discharge/slug control plan. The control authority may require any user to develop, submit for approval, and implement such a plan. Alternatively, the control authority may develop such a plan for any user. An accidental discharge/slug control plan shall address, at a minimum, the following:

- (a) Description of discharge practices, including nonroutine batch discharges;
- (b) Description of stored chemicals;
- (c) Procedures for immediately notifying the control authority of any accidental or slug discharge, as required by Section 9-3-47.6 of this code; and
- (d) Procedures to prevent adverse impact from any accidental or slug discharge. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants, including solvents, and/or measures and equipment for emergency response.

9-3-44.4. Hauled wastewater.

(a) Septic tank waste may be introduced into the POTW only at locations designated by the control authority, and at such times as are established by the control authority. Such waste shall not violate Section 9-3-43 of this code or any other requirements established by the city. The control authority may require septic tank waste haulers to obtain wastewater discharge permits.

(b) The control authority shall require haulers of industrial waste to obtain wastewater discharge permits. The control authority may require generators of hauled industrial waste to obtain wastewater discharge permits. The control authority also may prohibit the disposal of hauled industrial waste. The discharge of hauled industrial waste is subject to all other requirements of this code.

(c) Industrial waste haulers may discharge loads only at locations designated by the control authority. No load may be discharged without prior consent of the control authority. The control authority may collect samples of each hauled load to ensure compliance with applicable standards. The control authority may require the industrial waste hauler to provide a waste analysis of any load prior to discharge.

(d) Industrial waste haulers must provide a waste-tracking form for every load. This form shall include, at a minimum, the name and address of the industrial waste hauler, permit number, truck identification, names and addresses of sources of waste, and volume and characteristics of waste. The form shall identify the type of industry, known or suspected waste constituents, and whether any wastes are RCRA hazardous wastes.

9-3-45. Wastewater discharge permit application.

9-3-45.1. Wastewater analysis.

When requested by the control authority, a user must submit information on the nature and characteristics of its wastewater within thirty (30) days of the request. The control authority is authorized to prepare a form for this purpose and may periodically require users to update this information.

9-3-45.2. Wastewater discharge permit requirement.

(a) No significant industrial user shall discharge wastewater into the POTW without first obtaining a wastewater discharge permit from the control authority, except that a significant industrial user that has filed a timely application pursuant to Section 9-3-45.3 of this code may continue to discharge for the time period specified therein.

(b) The control authority may require other users to obtain wastewater discharge permits as necessary to carry out the purposes of this code.

(c) Any violation of the terms and conditions of a wastewater discharge permit shall be deemed a violation of this code and subjects the wastewater discharge permittee to the sanctions set out in Sections 9-3-51 through 9-3-53 of this code. Obtaining a wastewater discharge permit does not relieve a permittee of its obligation to comply with all federal and state pretreatment standards or requirements or with any other requirements of federal, state, and local law.

9-3-45.3. Wastewater discharge permitting: Existing connections.

Any user required to obtain a wastewater discharge permit who was discharging wastewater into the POTW prior to the effective date of this code and who wishes to continue such discharges in the future, shall, within thirty (30) days after said date, apply to the control authority for a wastewater discharge permit in accordance with Section 9-3-45.5 of this code, and shall not cause or allow discharges to the POTW to continue after thirty (30) days of the effective date of this code except in accordance with a wastewater discharge permit issued by the control authority.

9-3-45.4. Wastewater discharge permitting: New connections.

Any user required to obtain a wastewater discharge permit who proposes to begin or recommence discharging into the POTW must obtain such permit prior to the beginning or recommencing of such discharge. An application for this wastewater discharge permit, in accordance with Section 9-3-45.5 of this code, must be filed at least thirty (30) days prior to the date upon which any discharge will begin or recommence.

9-3-45.5. Wastewater discharge permit application contents.

All users required to obtain a wastewater discharge permit must submit a permit application. The control authority may require all users to submit as part of an application the following information:

- (a) All information required by Section 9-3-47.1(b) of this code;
- (b) Description of activities, facilities, and plant process on the premises, including a list of all raw materials and chemicals used or stored at the facility which are, or could accidentally or intentionally be, discharged to the POTW;
- (c) Number and type of employees, hours of operation, and proposed or actual hours of operation;
- (d) Each product produced by type, amount, process or processes, and rate of production;
- (e) Type and amount of raw materials processed (average and maximum per day);
- (f) Site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, floor drains, and appurtenances by size, location, and elevation, and all points of discharge;
- (g) Time and duration of discharges; and
- (h) Any other information as may be deemed necessary by the control authority to evaluate the wastewater discharge permit application.

Incomplete or inaccurate applications will not be processed and will be returned to the user for revision.

9-3-45.6. Application signatories and certification.

All wastewater discharge permit applications and user reports must be signed by an authorized representative of the user and contain the following certification statement:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

9-3-45.7. Wastewater discharge permit decisions.

The control authority will evaluate the data furnished by the user and may require additional information. Within thirty (30) days of receipt of a complete wastewater discharge permit application, the control authority will determine whether or not to issue a wastewater discharge permit. The control authority may deny any application for a wastewater discharge permit.

9-3-46. Wastewater discharge permit issuance process.**9-3-46.1. Wastewater discharge permit duration.**

A wastewater discharge permit shall be issued for a specified time period, not to exceed five (5) years from the effective date of the permit. A wastewater discharge permit may be issued for a period less than five (5) years, at the discretion of the control authority. Each wastewater discharge permit will indicate a specific date upon which it will expire.

9-3-46.2. Wastewater discharge permit contents.

A wastewater discharge permit shall include such conditions as are deemed reasonably necessary by the superintendent to prevent pass through or interference, protect the quality of the water body receiving the treatment plant's effluent, protect worker health and safety, facilitate sludge management and disposal, and protect against damage to the POTW.

- (a) Wastewater discharge permits shall contain:
 - (1) A statement that indicates wastewater discharge permit duration, which in no event shall exceed five (5) years;

- (2) A statement that the wastewater discharge permit is nontransferable without prior notification to the city in accordance with Section 9-3-46.5 of this code, and provisions for furnishing the new owner or operator with a copy of the existing wastewater discharge permit;
 - (3) Effluent limits based on applicable pretreatment standards;
 - (4) Self monitoring, sampling, reporting, notification, and record-keeping requirements. These requirements shall include an identification of pollutants to be monitored, sampling location, sampling frequency, and sample type based on federal, state, and local law; and
 - (5) A statement of applicable civil and criminal penalties for violation of pretreatment standards and requirements, and any applicable compliance schedule. Such schedule may not extend the time for compliance beyond that required by applicable federal, state, or local law.
- (b) Wastewater discharge permits may contain, but need not be limited to, the following conditions:
- (1) Limits on the average and/or maximum rate of discharge, time of discharge, and/or requirements for flow regulation and equalization;
 - (2) Requirements for the installation of pretreatment technology, pollution control, or construction of appropriate containment devices, designed to reduce, eliminate, or prevent the introduction of pollutants into the treatment works;
 - (3) Requirements for the development and implementation of spill control plans or other special conditions including management practices necessary to adequately prevent accidental, unanticipated, or nonroutine discharges;
 - (4) Development and implementation of waste minimization plans;
 - (5) The unit charge or schedule of user charges and fees;
 - (6) Requirements for installation and maintenance of inspection and sampling facilities and equipment;
 - (7) A statement that compliance with the wastewater discharge permit does not relieve the permittee of responsibility for compliance with all applicable federal and state pretreatment standards, including those which become effective during the term of the wastewater discharge permit; and

- (8) Other conditions as deemed appropriate by the control authority to ensure compliance with this code, and state and federal laws, rules, and regulations.

9-3-46.3. Wastewater discharge permit appeals.

The control authority shall provide public notice of the issuance of a wastewater discharge permit. Any person, including the user, may petition the control authority to reconsider the terms of a wastewater discharge permit within thirty (30) days of notice of its issuance.

- (a) Failure to submit a timely petition for review shall be deemed to be a waiver of the administrative appeal.
- (b) In its petition, the appealing party must indicate the wastewater discharge permit provisions objected to, the reasons for this objection, and the alternative condition, if any, it seeks to place in the wastewater discharge permit.
- (c) The effectiveness of the wastewater discharge permit shall not be stayed pending the appeal.
- (d) If the control authority fails to act within thirty days, a request for reconsideration shall be deemed to be denied. Decisions not to reconsider a wastewater discharge permit, not to issue a wastewater discharge permit, or not to modify a wastewater discharge permit shall be considered final administrative actions for purposes of judicial review.
- (e) Aggrieved parties seeking judicial review of the final administrative wastewater discharge permit decision must do so by filing a complaint with the proper court with the proper jurisdiction within the statute of limitations.

9-3-46.4. Wastewater discharge permit modification.

The control authority may modify a wastewater discharge permit for good cause, including, but not limited to, the following reasons:

- (a) To incorporate any new or revised federal, state, or local pretreatment standards or requirements;
- (b) To address significant alterations to the user's operation, processes, or wastewater volume or character since the time of wastewater discharge permit issuance;
- (c) A change in the POTW that requires either a temporary or permanent reduction or elimination of the authorized discharge;

- (d) Information indicating that the permitted discharge poses a threat to the city's POTW, city personnel, or the receiving waters;
- (e) Violation of any terms or conditions of the wastewater discharge permit;
- (f) Misrepresentations or failure to fully disclose all relevant facts in the wastewater discharge permit application or in any required reporting;
- (g) Revision of or a grant of variance from categorical pretreatment standards pursuant to 40 CFR 403.13;
- (h) To correct typographical or other errors in the wastewater discharge permit;
or
- (i) To reflect a transfer of the facility ownership or operation to a new owner or operator.

9-3-46.5. Wastewater discharge permit transfer.

Wastewater discharge permits may be transferred to a new owner or operator only if the permittee gives at least thirty (30) days advance notice to the control authority and the control authority approves the wastewater discharge permit transfer. The notice to the control authority shall include a written certification by the new owner or operator which:

- (a) States that the new owner and/or operator has no immediate intent to change the facility's operations and processes;
- (b) Identifies the specific date on which the transfer is to occur; and
- (c) Acknowledges full responsibility for complying with the existing wastewater discharge permit. Failure to provide advance notice of a transfer renders the wastewater discharge permit void as of the date of facility transfer.

9-3-46.6. Wastewater discharge permit revocation.

The control authority may revoke a wastewater discharge permit for good cause, including, but not limited to, the following reasons:

- (a) Failure to notify the control authority of significant changes to the wastewater prior to the changed discharge;
- (b) Failure to provide prior notification to the control authority of changed conditions pursuant to Section 9-3-47.5 of this code;
- (c) Misrepresentation or failure to fully disclose all relevant facts in the wastewater discharge permit application;

- (d) Falsifying self-monitoring reports;
- (e) Tampering with monitoring equipment;
- (f) Refusing to allow the control authority timely access to the facility premises and records.
- (g) Failure to meet effluent limitations;
- (h) Failure to pay fines;
- (i) Failure to pay sewer charges;
- (j) Failure to meet compliance schedules;
- (k) Failure to complete a wastewater survey or the wastewater discharge permit application;
- (l) Failure to provide advance notice of the transfer of business ownership of a permitted facility; or
- (m) Violation of any pretreatment standard or requirement, or any terms of the wastewater discharge permit or this code.

Wastewater discharge permits shall be voidable upon cessation of operations or transfer of business ownership. All wastewater discharge permits issued to a particular user are void upon the issuance of a new wastewater discharge permit to that user.

9-3-46.7. Wastewater discharge permit reissuance.

A user with an expiring wastewater discharge permit shall apply for wastewater discharge permit reissuance by submitting a complete permit application, in accordance with Section 9-3-45.5 of this code, a minimum of sixty (60) days prior to the expiration of the user's existing wastewater discharge permit.

9-3-46.8. Regulation of waste received from other jurisdictions.

- (a) If another municipality, or user located within another municipality, contributes wastewater to the POTW, the control authority shall enter into an intermunicipal agreement with the contributing municipality.
- (b) Prior to entering into an agreement required by paragraph (a) above, the control authority shall request the following information from the contributing municipality:
 - (1) A description of the quality; and volume of wastewater discharged to the POTW by the contributing municipality;

- (2) An inventory of all users located within the contributing municipality that are discharging to the POTW; and
 - (3) Such other information as the control authority may deem necessary.
- (c) An intermunicipal agreement, as required by paragraph (a) above, shall contain the following conditions:
- (1) A requirement for the contributing municipality to adopt a sewer use ordinance which is at least as stringent as this code and local limits which are at least as stringent as those set out in Section 9-3-43.4 of this code. The requirement shall specify that such ordinance and limits must be revised as necessary to reflect changes made to the city's ordinance or local limits;
 - (2) A requirement for the contributing municipality to submit a revised user inventory on at least an annual basis;
 - (3) A provision specifying which pretreatment implementation activities, including wastewater discharge permit issuance, inspection and sampling, and enforcement, will be conducted by the contributing municipality; which of these activities will be conducted by the control authority; and which of these activities will be conducted jointly by the contributing municipality and the control authority;
 - (4) A requirement for the contributing municipality to provide the control authority with access to all information that the contributing municipality obtains as part of its pretreatment activities;
 - (5) Limits on the nature, quality, and volume of the contributing municipality's wastewater at the point where it discharges to the POTW;
 - (6) Requirements for monitoring the contributing municipality's discharge;
 - (7) A provision ensuring the control authority access to the facilities of users located within the contributing municipality's jurisdictional boundaries for the purpose of inspection, sampling, and any other duties deemed necessary by the control authority; and
 - (8) A provision specifying remedies available for breach of the terms of the intermunicipal agreement.

9-3-47. Reporting requirements.**9-3-47.1. Baseline monitoring reports.**

(a) Within either one hundred eighty (180) days after the effective date of a categorical pretreatment standard, or the final administrative decision on a category determination under 40 CFR 403.6(a)(4), whichever is later, existing categorical users currently discharging to or scheduled to be discharged to the POTW shall submit to the control authority a report which contains the information listed in paragraph (b), below. At least ninety (90) days prior to commencement of their discharge, new sources, and sources that become categorical users subsequent to the promulgation of an applicable categorical standard, shall submit to the control authority a report which contains the information listed in paragraph (b), below. A new source shall report the method of pretreatment it intends to use to meet applicable categorical standards. A new source also shall give estimates of its anticipated flow and quantity of pollutants to be discharged.

- (b) Users described above shall submit the information set forth below.
- (1) Identifying Information. The name and address of the facility, including the name of the operator and owner.
 - (2) Environmental Permits. A list of any environmental control permits held by or for the facility.
 - (3) Description of Operations. A brief description of the nature, average rate of production, and standard industrial classifications of the operation(s) carried out by such user. This description should include a schematic process diagram which indicates points of discharge to the POTW from the regulated processes.
 - (4) Flow Measurement. Information showing the measured average daily and maximum daily flow, in gallons per day, to the POTW from regulated process streams and other streams, as necessary, to allow use of the combined wastestream formula set out in 40 CFR 403.6(e).
 - (5) Measurement of Pollutants.
 - a. The categorical pretreatment standards applicable to each regulated process.
 - b. The results of sampling and analysis identifying the nature and concentration, and/or mass, where required by the standard or by the control authority, of regulated pollutants in the discharge from each regulated process. Instantaneous, daily maximum, and long-term average concentrations, or mass, where required, shall be reported. The sample shall be representative of daily operations and shall be analyzed in accordance with procedures set out in Section 9-3-47.10 of this code.

- c. Sampling must be performed in accordance with procedures set out in Section 9-3-47.11 of this code.
- (6) Certification. A statement, reviewed by the user's authorized representative and certified by a qualified professional, indicating whether pretreatment standards are being met on a consistent basis, and, if not, whether additional operation and maintenance (O&M) and/or additional pretreatment is required to meet the pretreatment standards and requirements.
- (7) Compliance Schedule. If additional pretreatment and/or O&M will be required to meet the pretreatment standards, the shortest schedule by which the user will provide such additional pretreatment and/or O&M. The completion date in this schedule shall not be later than the compliance date established for the applicable pretreatment standard. A compliance schedule pursuant to this section must meet the requirements set out in Section 9-3-47.2 of this code.
- (8) Signature and Certification. All baseline monitoring reports must be signed and certified in accordance with Section 9-3-45.6 of this code.

9-3-47.2. Compliance schedule progress reports.

The following conditions shall apply to the compliance schedule required by Section 9-3-47.1(b)(7) of this code.

- (a) The schedule shall contain progress increments in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to meet the applicable pretreatment standards (such events include, but are not limited to, hiring an engineer, completing preliminary and final plans, executing contracts for major components, commencing and completing construction, and beginning and conducting routine operation);
- (b) No increment referral to above shall exceed nine (9) months;
- (c) The user shall submit a progress report to the superintendent no later than fourteen (14) days following each date in the schedule and the final date of compliance including, as a minimum, whether or not it complied with the increment of progress, the reason for any delay, and, if appropriate, the steps being taken by the user to return to the established schedule; and
- (d) In no event shall more than nine (9) months elapse between such progress reports to the control authority.

9-3-47.3. Reports on compliance with categorical pretreatment standard deadline.

Within ninety (90) days following the date for final compliance with applicable categorical pretreatment standards, or in the case of a new source following commencement of the introduction of wastewater into the POTW, any user subject to such pretreatment standards and requirements shall submit to the control authority a report containing the information described in Section 9-3-47.1(b)(4-6) of this code. For users subject to equivalent mass or concentration limits established in accordance with the procedures in 40 CFR 403.6(c), this report shall contain a reasonable measure of the user's long-term production rate. For all other users subject to categorical pretreatment standards expressed in terms of allowable pollutant discharge per unit of production (or other measure of operation), this report shall include the user's actual production during the appropriate sampling period. All compliance reports must be signed and certified in accordance with Section 9-3-45.6 of this code.

9-3-47.4. Periodic compliance reports.

(a) All significant industrial users shall, at a frequency determined by the control authority but in no case less than twice per year (in June and December), submit a report indicating the nature and concentration of pollutants in the discharge which are limited by pretreatment standards and the measured or estimated average and maximum daily flows for the reporting period. All periodic compliance reports must be signed and certified in accordance with Section 9-3-45.6 of this code.

(b) All wastewater samples must be representative of the user's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a user to keep its monitoring facility in good working order shall not be grounds for the user to claim that sample results are unrepresentative of its discharge.

(c) If a user subject to the reporting requirement in this section monitors any pollutant more frequently than required by the superintendent, using the procedures prescribed in Section 9-3-47.11 of this code, the results of this monitoring shall be included in the report.

9-3-47.5. Reports of changed conditions.

Each user must notify the control authority of any planned significant changes to the user's operations or system which might alter the nature, quality, or volume of its wastewater at least thirty (30) days before the change.

(a) The control authority may require the user to submit such information as may be deemed necessary to evaluate the changed condition, including the submission of a wastewater discharge permit application under Section 9-3-45.5 of this code.

- (b) The control authority may issue a wastewater discharge permit under Section 9-3-45.7 of this code or modify an existing wastewater discharge permit under Section 9-3-46.4 of this code in response to changed conditions or anticipated changed conditions.
- (c) For purposes of this requirement, significant changes include, but are not limited to; flow increases of twenty percent (20%) or greater, and the discharge of any previously unreported pollutants.

9-3-47.6. Reports of potential problems.

(a) In the case of any discharge, including, but not limited to, accidental discharges, discharges of a nonroutine, episodic nature, a noncustomary batch discharge, or a slug load, that may cause potential problems for the POTW, the user shall immediately telephone and notify the control authority of the incident. This notification shall include the location of the discharge, type of waste, concentration and volume, if known, and corrective actions taken by the user.

(b) Within five (5) days following such discharge, the user shall, unless waived by the control authority, submit a detailed written report describing the cause(s) of the discharge and the measures to be taken by the user to prevent similar future occurrences. Such notification shall not relieve the user of any expense, loss, damage, or other liability which may be incurred as a result of damage to the POTW, natural resources, or any other damage to person or property; nor shall such notification relieve the user of any fines, penalties, or other liability which may be imposed pursuant to this code.

(c) A notice shall be permanently posted on the user's bulletin board or other prominent place advising employees whom to call in the event of a discharge described in paragraph (a) above. Employers shall ensure that all employees, who may cause such a discharge to occur, are advised of the emergency notification procedure.

9-3-47.7. Reports from unpermitted users.

All users not required to obtain a wastewater discharge permit shall provide appropriate reports to the control authority as the control authority may require.

9-3-47.8. Notice of violation/repeat sampling and reporting.

If sampling performed by a user indicates a violation, the user must notify the control authority within twenty-four (24) hours of becoming aware of the violation. The user shall also repeat the sampling and analysis and submit the results of the repeat analysis to the control authority within thirty (30) days after becoming aware of the violation. The user is not required to resample if the control authority monitors at the user's facility at least once a month, or if the control authority samples between the user's initial sampling and when the user receives the results of this sampling.

9-3-47.9. Notification of the discharge of hazardous waste.

(a) Any user who commences the discharge of hazardous waste shall notify the POTW, the EPA Regional Waste Management Division Director, and state hazardous waste authorities, in writing, of any discharge into the POTW of a substance which, if otherwise disposed of, would be a hazardous waste under 40 CFR Part 261. Such notification must include the name of the hazardous waste as set forth in 40 CFR Part 261, the EPA hazardous waste number, and the type of discharge (continuous, batch, or other). If the user discharges more than one hundred (100) kilograms of such waste per calendar month to the POTW, the notification also shall contain the following information to the extent such information is known and readily available to the user: an identification of the hazardous constituents contained in the wastes, an estimation of the mass and concentration of such constituents in the wastestream discharged during that calendar month, and an estimation of the mass of constituents in the wastestream expected to be discharged during the following twelve (12) months. All notifications must take place no later than one hundred and eighty (180) days after the discharge commences. Any notification under this paragraph need be submitted only once for each hazardous waste discharged. However, notifications of changed conditions must be submitted under Section 9-3-47.5 of this code. The notification requirement in this section does not apply to pollutants already reported by users subject to categorical pretreatment standards under the self-monitoring requirements of Sections 9-3-47.1, 9-3-47.3, and 9-3-47.4 of this code.

(b) Dischargers are exempt from the requirements of paragraph (a) above, during a calendar month in which they discharge no more than fifteen (15) kilograms of hazardous wastes, unless the wastes are acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e). Discharge of more than fifteen (15) kilograms of nonacute hazardous wastes in a calendar month, or of any quantity of acute hazardous wastes as specified in 40 CFR 261.30(d) and 261.33(e), requires a one-time notification. Subsequent months during which the user discharges more than such quantities of any hazardous waste do not require additional notification.

(c) In the case of any new regulations under Section 3001 of RCRA identifying additional characteristics of hazardous waste or listing any additional substance as a hazardous waste, the user must notify the superintendent, the EPA Regional Waste Management Waste Division Director, and state hazardous waste authorities of the discharge of such substance within ninety (90) days of the effective date of such regulations.

(d) In the case of any notification made under this section, the user shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined to be economically practical.

(e) This provision does not create a right to discharge any substance not otherwise permitted to be discharged by this code, a permit issued thereunder, or any applicable federal or state law.

9-3-47.10. Analytical requirements.

All pollutant analyses, including sampling techniques, to be submitted as part of a wastewater discharge permit application or report shall be performed in accordance with the techniques prescribed in 40 CFR Part 136, unless otherwise specified in an applicable categorical pretreatment standard. If 40 CFR Part 136 does not contain sampling or analytical techniques for the pollutant in question, sampling and analyses must be performed in accordance with procedures approved by EPA.

9-3-47.11. Sample collection.

(a) Except as indicated in Section (b) below, the user must collect wastewater samples using flow proportional composite collection techniques. In the event flow proportional sampling is infeasible, the control authority may authorize the use of time proportional sampling or a minimum of four (4) grab samples where the user demonstrates that this will provide a representative sample of the effluent being discharged. In addition, grab samples may be required to show compliance with instantaneous discharge limits.

(b) Samples for oil and grease, temperature, pH, cyanide, phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.

9-3-47.12. Timing.

Written reports will be deemed to have been submitted on the date postmarked. For reports which are not mailed, postage prepaid, into a mail facility serviced by the United States Postal Service, the date of receipt of the report shall govern.

9-3-47.13. Record keeping.

Users subject to the reporting requirements of this code shall retain, and make available for inspection and copying, all records of information obtained pursuant to any monitoring activities required by this code and any additional records of information obtained pursuant to monitoring activities undertaken by the user independent of such requirements. Records shall include the date, exact place, method, and time of sampling, and the name of the person(s) taking the samples; the dates analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses. These records shall remain available for a period of at least three (3) years. This period shall be automatically extended for the duration of any litigation concerning the user or the city or where the user has been specifically notified of a longer retention period by the control authority.

9-3-48. Compliance monitoring.**9-3-48.1. Right of entry - Inspection and sampling.**

The control authority shall have the right to enter the premises of any user to determine whether the user is complying with all requirements of this code and any wastewater discharge permit or order issued hereunder. Users shall allow the control authority ready access to all parts of the premises for the purposes of inspection, sampling, records examination and copying, and the performance of any additional duties.

- (a) Where a user has security measures in force which require proper identification and clearance before entry into its premises, the user shall make necessary arrangements with its security guards so that, upon presentation of suitable identification, the control authority will be permitted to enter without delay for the purposes of performing specific responsibilities.
- (b) The control authority shall have the right to set up on the user's property, or require installation of, such devices as are necessary to conduct sampling and/or metering of the user's operations.
- (c) The control authority may require the user to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the user at its own expense. All devices used to measure wastewater flow and quality shall be calibrated annually to ensure their accuracy.
- (d) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the user at the written or verbal request of the control authority and shall not be replaced. The costs of clearing such access shall be born by the user.
- (e) Unreasonable delays in allowing the control authority access to the user's premises shall be a violation of this code.

9-3-48.2. Search warrants.

If the control authority has been refused access to a building, structure, or property, or any part thereof, and is able to demonstrate probable cause to believe that there may be a violation of this code, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program of the city designed to verify compliance with this code or any permit or order issued hereunder, or to protect the overall public health, safety and welfare of the community, then the control authority may seek issuance of a search warrant from the proper court of the city.

9-3-49. Confidential information.

Information and data on a user obtained from reports, surveys, wastewater discharge permit applications, wastewater discharge permits, and monitoring programs, and from the control authority's inspection and sampling activities, shall be available to the public without restriction, unless the user specifically requests, and is able to demonstrate to the satisfaction of the control authority, that the release of such information would divulge information, processes, or methods of production entitled to protection as trade secrets under applicable state law. Any such request must be asserted at the time of submission of the information or data. When requested and demonstrated by the user furnishing a report that such information should be held confidential, the portions of a report which might disclose trade secrets or secret processes shall not be made available for inspection by the public, but shall be made available immediately upon request to governmental agencies for uses related to the NPDES program or pretreatment program, and in enforcement proceedings involving the person furnishing the report. Wastewater constituents and characteristics and other "effluent data" as defined by 40 CFR 2.302 will not be recognized as confidential information and will be available to the public without restriction.

9-3-50. Publication of users in significant noncompliance.

The control authority shall publish annually, in the largest daily newspaper published in the municipality where the POTW is located, a list of the users which, during the previous twelve (12) months, were in significant noncompliance with applicable pretreatment standards and requirements. The term significant noncompliance shall mean:

- (a) Chronic violations of wastewater discharge limits, defined here as those in which sixty-six percent (66%) or more of wastewater measurements taken during a six (6)-month period exceed the daily maximum limit or average limit for the same pollutant parameter by any amount;
- (b) Technical Review Criteria (TRC) violations, defined here as those in which thirty-three percent (33%) or more of wastewater measurements taken for each pollutant parameter during a six-(6-)month period equals or exceeds the product of the daily maximum limit or the average limit multiplied by the applicable criteria (1.4 for BOD, TSS, fats, oils and grease, and 1.2 for all other pollutants except pH);
- (c) Any other discharge violation that the control authority believes has caused, alone or in combination with other discharges, interference or pass through, including endangering the health of POTW personnel or the general public;
- (d) Any discharge of pollutants that has caused imminent endangerment to the public or to the environment, or has resulted in the control authority's exercise of its emergency authority to halt or prevent such a discharge;

- (e) Failure to meet, within ninety (90) days of the scheduled date, a compliance schedule milestone contained in a wastewater discharge permit or enforcement order for starting construction, completing construction, or attaining final compliance;
- (f) Failure to provide within thirty (30) days after the due date, any required reports, including baseline monitoring reports, reports on compliance with categorical pretreatment standard deadlines, periodic self-monitoring reports, and reports on compliance with compliance schedules;
- (g) Failure to accurately report noncompliance; or
- (h) Any other violation(s) which the control authority determines will adversely affect the operation or implementation of the local pretreatment program.

9-3-51. Administrative enforcement remedies.

9-3-51.1. Notification of violation.

When the control authority finds that a user has violated, or continues to violate, any provision of this code, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the control authority may serve upon that user a written notice of violation. Within thirty (30) days of the receipt of this notice, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted by the user to the control authority. Submission of this plan in no way relieves the user of liability for any violations occurring before or after receipt of the notice of violation. Nothing in this section shall limit the authority of the control authority to take any action, including emergency actions or any other enforcement action, without first issuing a notice of violation.

9-3-51.2. Consent orders.

The control authority may enter into consent orders, assurances of voluntary compliance, or other similar documents establishing an agreement with any user responsible for noncompliance. Such documents will include specific action to be taken by the user to correct the noncompliance within a time period specified by the document. Such documents shall have the same force and effect as the administrative orders issued pursuant to Sections 9-3-51.4 and 9-3-51.5 of this code and shall be judicially enforceable.

9-3-51.3. Show cause hearing.

The control authority may order a user which has violated, or continues to violate, any provision of this code, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, to appear before the control authority and show

cause why the proposed enforcement action should not be taken. Notice shall be served on the user specifying the time and place for the meeting, the proposed enforcement action, the reasons for such action, and a request that the user show cause why the proposed enforcement action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least fifteen (15) days prior to the hearing. Such notice may be served on any authorized representative of the user. A show cause hearing shall not be a bar against, or prerequisite for, taking any other action against the user.

9-3-51.4. Compliance orders.

When the control authority finds that a user has violated, or continues to violate, any provision of this code, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the control authority may issue an order to the user responsible for the discharge directing that the user come into compliance within a specified time. If the user does not come into compliance within the time provided, sewer service may be discontinued unless adequate treatment facilities, devices, or other related appurtenances are installed and properly operated. Compliance orders also may contain other requirements to address the noncompliance, including additional self-monitoring and management practices designed to minimize the amount of pollutants discharged to the sewer. A compliance order may not extend the deadline for compliance established for a pretreatment standard or requirement, nor does a compliance order relieve the user of liability for any violation, including any continuing violation. Issuance of a compliance order shall not be a bar against, or a prerequisite for, taking any other action against the user.

9-3-51.5. Cease and desist orders.

When the control authority finds that a user has violated, or continues to violate, any provisions of this code, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, or that the user's past violations are likely to recur, the control authority may issue an order to the user directing it to cease and desist all such violations and directing the user to:

- (a) Immediately comply with all requirements; and
- (b) Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation, including halting operations and/or terminating the discharge.

Issuance of a cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the user.

9-3-51.6. Administrative fines.

(a) When the control authority finds that a user has violated, or continues to violate, any provision of this code, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the control authority may fine such user in an amount not to exceed \$1,000.00. Such fines shall be assessed on a per violation, per day basis. In the case of monthly or other long term average discharge limits, fines shall be assessed for each day during the period of violation.

(b) A lien against the user's property will be sought for unpaid charges, fines, and penalties.

(c) Users desiring to dispute such fines must file a written request for the control authority to reconsider the fine along with full payment of the fine amount within thirty (30) days of being notified of the fine. Where a request has merit, the control authority may convene a hearing on the matter. In the event the user's appeal is successful, the payment, together with any interest accruing thereto, shall be returned to the user. The control authority may add the costs of preparing administrative enforcement actions, such as notices and orders, to the fine.

(d) Issuance of an administrative fine shall not be a bar against, or a prerequisite for, taking any other action against the user.

9-3-51.7. Emergency suspensions.

The control authority may immediately suspend a user's discharge, after informal notice to the user, whenever such suspension is necessary to stop an actual or threatened discharge which reasonably appears to present or cause an imminent or substantial endangerment to the health or welfare of persons. The control authority may also immediately suspend a user's discharge, after notice and opportunity to respond, that threatens to interfere with the operation of the POTW, or which presents, or may present, an endangerment to the environment.

(a) Any user notified of a suspension of its discharge shall immediately stop or eliminate its contribution. In the event of a user's failure to immediately comply voluntarily with the suspension order, the control authority may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the POTW, its receiving stream, or endangerment to any individuals. The control authority may allow the user to recommence its discharge when the user has demonstrated to the satisfaction of the control authority that the period of endangerment has passed, unless the termination proceedings in Section 9-3-51.8 of this code are initiated against the user.

- (b) A user that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement, describing the causes of the harmful contribution and the measures taken to prevent any future occurrence, to the control authority prior to the date of any show cause or termination hearing under Sections 9-3-51.3 or 9-3-51.8 of this code.

Nothing in this section shall be interpreted as requiring a hearing prior to any emergency suspension under this section.

9-3-51.8. Termination of discharge.

In addition to the provisions in Section 9-3-46.6 of this code, any user who violates the following conditions is subject to discharge termination.

- (a) Violation of wastewater discharge permit conditions;
- (b) Failure to accurately report the wastewater constituents and characteristics of its discharge;
- (c) Failure to report significant changes in operations or wastewater volume, constituents, and characteristics prior to discharge;
- (d) Refusal of reasonable access to the user's premises for the purpose of inspection, monitoring, or sampling; or
- (e) Violation of the pretreatment standards in Section 9-3-43 of this code.

Such user will be notified of the proposed termination of its discharge and be offered an opportunity to show cause under Section 9-3-51.3 of this code why the proposed action should not be taken. Exercise of this option by the control authority shall not be a bar to, or a prerequisite for, taking any other action against the user.

9-3-52. Judicial enforcement remedies.

9-3-52.1. Injunctive relief.

When the control authority finds that a user has violated, or continues to violate, any provision of this code, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement, the control authority may petition the proper court through the city's attorney for the issuance of a temporary or permanent injunction, as appropriate, which restrains or compels the specific performance of the wastewater discharge permit, order, or other requirement imposed by this code on activities of the user. The control authority may also seek such other action as is appropriate for legal and/or equitable relief, including a requirement for the user to conduct environmental remediation. A petition for injunctive relief shall not be a bar against, or a prerequisite for, taking any other action against a user.

9-3-52.2. Civil penalties.

(a) A user who has violated, or continues to violate, any provision of this code, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement shall be liable to the city for a maximum civil penalty of \$1,000.00 per violation, per day. In the case of a monthly or other long-term average discharge limit, penalties shall accrue for each day during the period of the violation.

(b) The control authority may recover reasonable attorneys' fees, court costs, and other expenses associated with enforcement activities, including sampling and monitoring expenses, and the cost of any actual damages incurred by the city.

(c) In determining the amount of civil liability, the court shall take into account all relevant circumstances, including, but not limited to, the extent of harm caused by the violation, the magnitude and duration of the violation, any economic benefit gained through the user's violation, corrective actions by the user, the compliance history of the user, and any other factor as justice requires.

(d) Filing a suit for civil penalties shall not be a bar against, or a prerequisite for, taking any other action against a user.

9-3-52.3. Criminal prosecution.

(a) A user who willfully or negligently violates any provision of this code, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement shall, upon conviction, be guilty of a misdemeanor, punishable by a fine of not more than \$1,000.00 per violation, per day.

(b) A user who willfully or negligently introduces any substance into the POTW which causes personal injury or property damage shall, upon conviction, be guilty of a misdemeanor and be subject to a penalty of at least \$1,000.00. This penalty shall be in addition to any other cause of action for personal injury or property damage available under state law.

(c) A user who knowingly makes any false statements, representations, or certifications in any application, record, report, plan, or other documentation filed, or required to be maintained, pursuant to this code, wastewater discharge permit, or order issued hereunder, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this code shall, upon conviction, be punished by a fine of not more than \$1,000.00 per violation, per day.

(d) In the event of a second conviction, a user shall be punished by a fine of not more than \$1,000.00 per violation, per day.

9-3-52.4. Remedies nonexclusive.

The remedies provided for in this code are not exclusive. The control authority may take any, all, or any combination of these actions against a noncompliant user. Enforcement of pretreatment violations will generally be in accordance with the city's enforcement response plan. However, the control authority may take other action against any user when the circumstances warrant. Further, the control authority may take other action against any user when the circumstances warrant. Further, the control authority is empowered to take more than one enforcement action against any noncompliant user.

9-3-53. Affirmative defenses to discharge violators.**9-3-53.1. Upset.**

(a) For the purpose of this section, "upset" means an exceptional incident in which there is unintentional and temporary noncompliance with categorical pretreatment standards because of factors beyond the reasonable control of the user. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) An upset shall constitute an affirmative defense to an action brought for noncompliance with categorical pretreatment standards if the requirements of paragraph (c), below, are met.

(c) A user who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and the users can identify the cause(s) of the upset;
- (2) The facility was at the time being operated in a prudent and workman-like manner and in compliance with applicable operation and maintenance procedures; and
- (3) The user has submitted the following information to the control authority within twenty-four (24) hours of becoming aware of the upset if this information is provided orally, a written submission must be provided within five (5) days:
 - a. A description of the indirect discharge and cause of noncompliance;
 - b. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and

- c. Steps being taken and/or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- (d) In any enforcement proceeding, the user seeking to establish the occurrence of an upset shall have the burden of proof.
- (e) Users will have the opportunity for a judicial determination on any claim of upset only in an enforcement action brought for noncompliance with categorical pretreatment standards.
- (f) Users shall control production of all discharges to the extent necessary to maintain compliance with categorical pretreatment standards upon reduction, loss, or failure of its treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

9-3-53.2. Prohibited discharge standards.

A user shall have an affirmative defense to an enforcement action brought against it for noncompliance with the general prohibitions in Section 9-3-43.1(a) of this code or the specific prohibitions of this code if it can prove that it did not know, or have reason to know, that its discharge, alone or in conjunction with discharges from other sources, would cause pass through or interference and that either:

- (a) A local limit exists for each pollutant discharged and the user was in compliance with each limit directly prior to, and during, the pass through or interference; or
- (b) No local limit exists, but the discharge did not change substantially in nature or constituents from the user's prior discharge when the city was regularly in compliance with its NPDES permit, and in the case of interference, was in compliance with applicable sludge use or disposal requirements.

9-3-53.3. Bypass.

- (a) For the purposes of this section,
 - (1) "Bypass" means the intentional diversion of wastewater from any portion of a user's treatment facility.
 - (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonable be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

(b) A user may allow any bypass to occur which does not cause pretreatment standards or requirements to be violated, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of paragraphs (c) and (d) of this section.

(c)

- (1) If a user knows in advance of the need for a bypass, it shall submit prior notice to the control authority, at least ten (10) days before the date of the bypass, if possible.
- (2) A user shall submit oral notice to the control authority of an unanticipated bypass that exceeds applicable pretreatment standards within twenty-four (24) hours from the time it becomes aware of the bypass. A written submission shall also be provided within five (5) days of the time the user becomes aware of the bypass. The written submission shall contain a description of the bypass and its cause; the duration of the bypass, including exact dates and times, and, if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass. The control authority may waive the written report on a case-by-case basis if the oral report has been received within twenty-four (24) hours.

(d)

- (1) Bypass is prohibited, and the control authority may take an enforcement action against a user for a bypass, unless
 - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - c. The user submitted notices as required under paragraph (c) of this section.
- (2) The control authority may approve an anticipated bypass, after considering its adverse effects, if the control authority determines that it will meet the three conditions listed in paragraph (d)(1) of this section.

(Ord. No. 4577, §§ 1-3, 11-18-96; Ord. No. 4725, § 1, 4-20-98)

9-3-54-9-3-60. Reserved

ARTICLE V. HOT SPRINGS GREASE TRAP REGULATIONS

DIVISION 1. GENERAL PROVISIONS

9-3-61. Short title.

This ordinance shall be referred to as the "Hot Springs Grease Trap Ordinance."

9-3-62. Purpose and policy.

(a) This ordinance is established to prevent the discharge of fats, oil and grease (FOG), oil, flammable substances and other harmful wastes into the collection system and wastewater treatment facility of the City of Hot Springs Municipal Utilities by requiring the user to provide a device to intercept and treat these wastes, and to set forth uniform requirements for the installation and maintenance of oil and grease traps, interceptors and separators.

(b) The purpose of this ordinance is:

- (1) To prevent the introduction of wastewater containing fats, oil and grease in the amounts which may cause stoppages or obstruction of flow, or in any other way prevent or inhibit operation of the City of Hot Springs Municipal Utilities' collection system and wastewater treatment facility.
- (2) To prevent the introduction of pollutants into the collection system which may be incompatible with other waste streams.
- (3) To enable the City of Hot Springs to comply with National Pollutant Discharge Elimination System (NPDES) permit conditions, sludge disposal conditions, sludge use and disposal requirements, and any other federal or state laws which the Publicly Owned Treatment Works (POTW) is subject to.
- (4) To protect the environment and health, safety and welfare of the public by regulating the pretreatment, transport and disposal of liquid waste.

9-3-63. Specialized definitions.

For the purpose of this ordinance, the following words and terms shall have the following meanings:

ASME shall mean American Society of Mechanical Engineer.

ASTM shall mean American Standard Testing Materials.

Catch Basin shall mean a chamber or trench which admits drainage from a surface in a sewer drain.

Certified shall mean test to national standards.

Control Authority shall mean the City Manager or his/her designee charged with the responsibility for administration and enforcement of this ordinance.

Control Manhole shall mean a manhole installed in the building sewer specifically designed to facilitate sampling of the wastewater discharge.

Grease Recovery Device (GRD) shall mean a receptacle designed to collect and retain fats, oil and grease and similar waste normally found in the kitchen. A device installed in the drainage system between the kitchen or other point of production of the waste and building sewer.

Grease Trap or Trap shall mean a receptacle designed to collect and retain grease and fatty substances and similar waste normally found in the kitchen. A grease trap installed in the drainage system between the kitchen or other point of production of the waste and building sewer.

Hold-Haul Tank shall mean a receptacle designed to hold objectionable waste that is prohibited from being discharged into the collection system, the contents of which must be hauled to a disposal site. A hold-haul tank shall not be connected to the collection system.

Incompatible Waste shall mean waste which has different processing, storage or disposal requirements.

Interceptor shall mean a receptacle designed and constructed to intercept, separate and prevent passage of and/or other objectionable solids into the collection system to which it is connected. An interceptor may be integrated with a separator for vehicle wash bays or repair areas.

PDIG shall mean Plumbing & Drain Institute Guidelines.

POTW shall mean Publicly Owned Treatment Works operated and maintained by the City of Hot Springs Municipal Sewer System.

Separator shall mean a receptacle designed to remove oil and grease from wastewater by separation, usually by simple flotation or by chemical addition where the oils or greases are soluble or emulsified.

DIVISION II. GENERAL REQUIREMENTS

9-3-64. Applicability.

(a) This ordinance applies to all users of the City's Publicly Owned Treatment Works (POTW) whether the user discharges to the Publicly Owned Treatment Works (POTW's) collection system or transports the waste or has the waste transported to the Publicly Owned Treatment Works (POTW's) wastewater treatment facility for transfer or disposal or whether such user has been issued a permit.

(b) The following types of establishments may be exempt from the requirements of this ordinance:

- (1) Private living quarters;
- (2) Bars and clubs serving drinks where no food is prepared;
- (3) Snow cone and shaved ice stands, provided no other type of food is prepared;
- (4) Grocery stores without food preparation (grocery stores with delicatessens, bakeries, meat packing, butchering process, etc., are not exempt)
- (5) Day care centers that primarily serve microwaved dishes, using single service items;
- (6) Confectionery stores which exclusively sell unpackaged sweets, confection, nuts, ice cream, yogurt and variety food items;
- (7) Produce markets;
- (8) Mobile food establishments in a vehicle or trailer designed to be easily movable and not discharging to the collection system.

9-3-65. Prohibited discharges.

(a) The user shall not discharge, or cause to be discharged, plastics, paper, non-biodegradable oils or other non-biodegradable materials.

(b) The user shall not discharge, or cause to be discharged, fats, oil, and grease to any drains or traps. Such waste should be placed in a container specifically designed to hold such waste and either utilized by industry or disposed at suitable locations.

(c) No person shall discharge, or cause to be discharged, in the collection system or treatment facility, any transported waste having a pH less than 6.0 s.u. and greater than 11.0 s.u.

9-3-66. Pretreatment of waste.

(a) Grease traps, interceptors, oil separators, or hold-haul tanks shall be provided for the proper handling of wastes containing grease, flammable wastes, sand and other ingredients, which may be harmful to the building drainage system, the collection system or the wastewater treatment facility.

- (1) Any establishment not specifically exempt by this ordinance or other provisions outlined in the sewer use ordinance which prepares food for on-site or off-site consumption shall be equipped with adequately sized grease traps.
- (2) Vehicle wash facilities, wash bays, including hand wash bays, in service stations, or other facilities, and similar installations shall be equipped with oil separators and interceptors and shall discharge to the collection system. These facilities shall be protected from rainwater run on and run off. Drainage from areas exposed to rainwater run off shall not be discharged to the collection system.
- (3) Floor cleaning wash water from areas such as described above shall be excluded from the collection system except where pre-treated to within the specification of this ordinance or any other provision in the sewer use ordinance.
- (4) Disposal records shall be maintained for materials removed from hold haul tanks. Such records shall be made available to the control authority for inspection and copying upon request or demand.

(b) Grease traps, interceptors, separators, and hold haul tanks shall be constructed and maintained in accordance with this ordinance and other applicable provisions outlined in the sewer use ordinance. Grease traps, interceptors, separators, and grease recovery devices shall meet national Plumbing & Drain Institute Guidelines (PDIG-101) or American Society of Mechanical Engineering (ASME-14.3.00 or 14.4.01) standards.

(c) Steam cleaning and chemical cleaning facilities shall not discharge to the collection system unless the facility provides a process that will consistently produce an effluent that is in compliance with this ordinance and other applicable provisions outlined in the sewer use ordinance, particularly with regard to grease, oils, organics, and other chemicals.

(d) Where pretreatment or flow equalization facilities are provided for any water or waste, these facilities shall maintain a satisfactory and effective operation by the owner at his expense.

9-3-67. Control equipment.

(a) The control authority may require any non-domestic user to install monitoring equipment as necessary. Sampling and other monitoring equipment shall be maintained at all times in a safe and proper operating condition by the user at his own expense.

(b) The user shall install a suitable control manhole or sampling port in the building sewer to facilitate observation, sampling, and measurement of the waste and flow. Such manholes or sampling ports shall be readily accessible to the control authority at all times.

- (1) Control manholes or sampling ports shall be easily accessible, safely located and shall be constructed in accordance with plans approved by the control authority prior to use.
- (2) Appropriate control manholes or sampling ports shall be installed in the building sewer immediately downstream of the grease trap, interceptor, separator, or grease recovery device.
- (3) The sampling port shall have a top opening of not less than twenty-four (24) inches, with an open pipe not less than four (4) inches in diameter and twelve (12) inches in length.
- (4) Control manholes shall be installed by the owner at his expense and shall be maintained by him so as to be safe and accessible at all times.
- (5) Control manholes shall be constructed to exclude entry and exit of waters not discharged through the building sewer (to prevent infiltration/inflow and exfiltration exflow).

9-3-68. Monitoring requirements.

(a) Where required by any permit or otherwise ordered by the control authority, the non-domestic user shall obtain representative samples of the facility's wastewater discharge or proposed discharge for analysis. Specified analysis shall be conducted no less frequently than as outlined in the permit, order, or other documents issued by the control authority.

- (1) Representative sample shall mean a twenty-four (24) composite sample consisting of at least twelve parts where the discharge is continuous. That sample shall be representative of all discharges occurring in a twenty-four (24) hour period. Grab samples shall be collected for parameters determined by the control authority.
- (2) A state approved laboratory using 40 CFR 136 lab methods or EPA approved standard methods shall conduct analysis.
- (3) Analysis may be conducted by qualified personnel on-site utilizing 40 CFR 136 lab methods or EPA approved standard methods. In-house laboratories conducting monitoring for compliance shall be subject to the same requirements as commercial or contract laboratories.
- (4) All costs of self-monitoring shall be borne by the user.

(b) The control authority may randomly sample and analyze the discharge from any non-domestic user and conduct surveillance activities in order to identify, independent of information supplied by the user, occasional and continuing compliance or non-compliance with this ordinance and other provisions outlined in the sewer use ordinance.

(c) The control authority may conduct sampling analysis of the discharge of any non-domestic user where deemed necessary to assure compliance with this ordinance or any other provisions in the sewer use ordinance.

9-3-69. Record-keeping requirements.

(a) Any user subject to reporting requirements established in this ordinance shall retain records of all wastewater-related data for a period of three (3) years.

(1) The user shall, upon request or demand, make available for inspection and copying by the control authority, all records of information obtained pursuant to any monitoring activities required by this ordinance and any records of information obtained pursuant to monitoring activities undertaken by the user.

(2) Periods of retention shall be automatically extended for the duration of any litigation concerning the user or the city or where the user has been specifically notified of a longer retention time by the control authority.

(b) The non-domestic user shall maintain records of inspection, pumping and cleaning, other maintenance activities of grease traps, interceptors, separators or grease recovery device for a minimum of three (3) years. These records shall be made available to the control authority upon request or demand for inspection and copying.

(1) Inspection records shall contain, at a minimum, the date the facility was inspected, who inspected the facility, the specific conditions of the piping and other structures of the facility, and a description of any repairs recommended and made to the facility.

(2) Pumping and cleaning records shall include at a minimum, the date the facility was cleaned, who cleaned the facility, what type and amount of material were removed, who disposed the removed materials, the disposal site for the removed materials, and any other information required by federal, state, or local regulations governing such operations.

(3) Repair and maintenance records shall include a description of the maintenance or repair, the date of the maintenance or repair, and who performed the maintenance or repair. All repairs shall be made by a licensed plumber.

(c) The user shall document cleaning of building sewer lines made necessary by excessive grease buildup. These records shall contain, at a minimum, the date and by whom the lines were cleaned, known suspected cause of the buildup, and action taken to prevent recurrence.

DIVISION III. GREASE TRAPS, INTERCEPTORS, SEPARATORS
AND GREASE RECOVERY DEVICES**9-3-70. Applicability.**

This section shall apply to facilities whose waste discharge contain or may contain fats, oil and grease, sand and/or other harmful ingredients.

9-3-71. Grease traps, interceptors, separators and grease recovery devices required.

(a) Grease traps, interceptors, separators, grease recovery devices or hold haul tanks shall be provided for the proper handling of wastes containing grease, oil, sand, and other harmful ingredients.

(b) All restaurants, institutions, cafeterias or other establishments preparing or serving food, except those specifically exempted, shall be required to install and maintain a certified grease trap, interceptor, separator or grease recovery device for the efficient removal of oil and grease from the waste stream. The design and installation of such devices shall be subject to review by the control authority.

(c) All vehicle wash areas shall be equipped with interceptors and oil separators for the removal of oil and grease from the waste stream. The design and installation of such devices shall be subject to review by the control authority.

9-3-72. General specifications.

(a) Specifications outlined in this section shall be considered minimum requirements only. It shall be the responsibility of each user to have a grease trap, interceptor, separator or grease recovery device designed and installed that will produce an effluent in compliance with the requirements of this ordinance or other applicable provisions.

- (1) Grease traps, interceptors, separators and grease recovery devices shall meet or exceed the specifications and requirements set forth in this ordinance and other applicable provisions of the sewer use ordinance.
- (2) An existing grease trap, interceptor, separator or grease recovery device which is upgraded or replaced shall meet or exceed the specifications set forth in this ordinance and other applicable provisions in the sewer use ordinance.
- (3) Where a non-domestic user is required under this ordinance to have a grease trap, interceptor, or separator, and who will occupy an existing building, the grease trap, interceptor, or separator shall meet or exceed the requirements of this ordinance and other applicable provisions of the sewer use ordinance.

(b) Grease traps, interceptors, separators and grease recovery devices will be constructed of imperious materials capable of withstanding abrupt and extreme changes in temperature and capable of withstanding the traffic load where installed.

(c) Grease traps, interceptors, separators and grease recovery devices shall be installed outside the building wherever possible. Where it is impossible to locate a grease trap outside the building, the trap shall be located in a mechanical room or other area where no food is stored or processed.

(d) Grease traps, interceptors, separators and grease recovery devices shall be located so as to be readily and easily accessible for cleaning and inspection and shall be equipped with easily removable grates or covers.

(1) A manhole ring and cover not less than twenty-four (24) inches in diameter shall be installed in the lid of each compartment to facilitate easy access for cleaning and inspection. The cover shall be at or near, but not below, the finishing grade.

(2) Where an interceptor, separator or grease recovery device is located inside a vehicle wash bay, the first chamber shall be preceded by a grated catch basin with holes not greater than one-half ($\frac{1}{2}$) inch in diameter or shall be equipped with a grated cover with holes not greater than one-half ($\frac{1}{2}$) inch in diameter. The cover on the secondary chamber shall be water tight.

(e) Grease traps, interceptors, separators and grease recovery device shall have a total capacity of not less than five hundred (500) gallons and shall be constructed within a minimum of two (2) compartments.

(1) The first compartment shall have a detention time not less than fifteen (15) minutes.

(2) The second compartment shall have a detention time not less than five (5) minutes.

(f) Plans for new grease traps, interceptors, separators and grease recovery devices or modifications to existing grease traps, interceptors, separators and grease recovery device shall be submitted to the control authority for review. Calculations used to determine adequate size shall be included in the submittal.

(g) Grease traps, interceptors, separators and grease recovery devices shall be installed by a licensed plumber. Completed grease traps, interceptors, separators and grease recovery devices shall be subject to inspection by the control authority prior to connection to the collection system.

9-3-73. Grease trap, separator, interceptor and grease recovery device specifications.

(a) All liquid waste lines in food preparation and dishwashing areas, except lines from rest room facilities and cooling unit condensate, ice maker, and soft drink dispenser drain lines, shall discharge through a grease trap. Garbage disposals shall have a filtering device installed that will prevent food solids from entering the grease trap.

(b) The minimum size of grease traps, separators, interceptors or grease recovery devices shall be sized according to the number of fixtures draining to the grease trap, separator, interceptor or grease recovery device.

- (1) The total number of fixture units multiplied by 100 gallons shall determine the minimum total capacity of the trap. The primary (first) chamber shall occupy three-quarters ($3/4$) of the total capacity of the trap.
- (2) All fixtures shall be defined in accordance with applicable provisions outlined in code compliance regulations.

(c) Grease traps, separators, interceptors or grease recovery devices shall be equipped with double clean outs in both in fluent and effluent pipes (before and after the trap). Sampling port shall be located on the effluent side of grease trap, separator, interceptor or grease recovery device.

- (d) The flow into each chamber shall enter below the static water line.
 - (1) The in fluent line shall be located between twelve (12) and eighteen (18) inches from the bottom of the first chamber.
 - (2) The discharge from the first chamber shall be between twelve (12) and eighteen (18) inches from the bottom of the first chamber and shall terminate in the second chamber not less than six (6) inches below the static water line.
 - (3) The effluent line shall be located not more than twelve (12) inches from the bottom of the second chamber.

9-3-74. Interceptor and separator specifications for wash bays.

(a) Automatic car or truck washes, hand wash bays and other areas where vehicles are washed shall be equipped with a two-stage interceptor and a separator. The primary (first) chamber shall occupy three-quarters ($3/4$) of the total capacity.

- (1) The interceptor and separator may be as separate units or integrated.
- (2) Interceptors/separators located inside the wash bay shall be equipped with a grated cover on the first chamber and a solid, water tight cover on the second chamber. The grated cover opening shall be no larger than one-half ($1/2$) inch in diameter and shall be easily removable for cleaning and inspection.
- (3) Interceptors/separators located outside the wash bay shall be equipped with a grated cover on the first chamber and a solid, water tight cover on the second chamber. The grated cover opening shall be no larger than one-half ($1/2$) inch in diameter and shall be easily removable for cleaning and inspection.

(b) Automatic wash bays (those having high pressure spray wands and brushes) shall be equipped with an interceptor and oil separator sized according to the following:

<u>Description</u>	<u>Minimum Size</u>
Single hand wash bay	500 gallons
2-4 hand wash bays	1000 gallons
>4 hand wash bays	1000 gallons + 200 gals per bay over 4
Drive through wash	500 gallons per bay

(c) Manual wash bays shall be equipped with a minimum five hundred (500) gallon interceptor and separator.

(d) The flow into each chamber shall enter below the static water line.

(1) The influent line shall be located between twenty-four (24) and thirty (30) inches from the bottom of the first chamber (except where the first chamber is a grated cover).

(2) The discharge from the first chamber shall be between twenty-four (24) and (30) inches from the bottom of the first chamber and shall terminate in the second chamber not less than six inches below the static water line.

(3) The effluent line shall be located not more than twelve (12) inches from the bottom of the second chamber.

9-3-75. Operation and maintenance.

(a) Grease traps, interceptors, separators and grease recovery devices shall be maintained in continuously efficient operation by the owner or occupant at his own expense.

(b) Areas surrounding grease traps, interceptors, separators and grease recovery devices shall be maintained to facilitate ready access to the unit for inspection by the control authority at all times.

(c) A user shall not remove down-pipes or otherwise alter a grease trap, interceptor, separator or grease recovery device which may allow oil, grease, sand or other objectionable materials to pass through the device onto the collection system.

(d) A user shall not increase the use of water or in any other way attempt to dilute the waste stream in lieu of adequate treatment.

(e) The use of hot water, emulsifiers, chemical, or other agents or devices that may cause oil, grease, or sand to pass through the collection system or the wastewater treatment facility is prohibited.

(f) Materials shall not be splashed, allowed to overflow, or otherwise placed on the areas surrounding a grease trap, interceptor, or separators. In the event materials are spilled, splashed, overflowed, or otherwise placed on the surrounding area, the owner shall assure the materials are cleaned from the area and properly disposed.

(g) Materials removed from grease traps, interceptors, separators or grease recovery devices shall either be utilized by the industry or disposed of in a suitable manner in accordance with all applicable federal, state, and local regulations.

(h) Where municipal utilities must clean associated public sewers caused by inappropriate operation or maintenance of grease trap, interceptor, separator or grease recovery device cost of such cleaning shall be billed to the user. Other penalties outlined in the sewer use ordinance may be imposed.

9-3-76. Grease trap, separator, interceptor or grease recovery device treatment procedures.

Use of grease trap treatment products, including bacteria designed to digest the grease, is specifically prohibited without prior written consent of the control authority.

- (a) Acceptance of such products for use may be considered only where a valid screening test, showing the product's ability to treat the waste and to produce an effluent in compliance with this ordinance, has been performed in accordance with methods that are acceptable to the control authority.
- (b) Screening test for grease trap treatment products shall be approved by the control authority.
- (c) The results of the screening test shall be subject to review by the control authority.
- (d) All screening tests shall be performed by a state approved laboratory utilizing EPA approved procedures.
- (e) All costs of screening tests shall be borne by the user.
- (f) If a product is accepted for use, the user shall obtain written permission from the control authority to use the product.
- (g) The control authority may revoke permission to use such product where the effluent from the trap or basin in which the product is used fails to meet the requirements set forth in this ordinance and any other provision outlined on the sewer use ordinance.
- (h) Use of such product shall not relieve the user of the minimum cleaning requirements set forth in this ordinance.

9-3-77. Inspection and cleaning schedules.

(a) Inspection, cleaning, and other necessary maintenance of such facilities shall be conducted as often as needed to assure the discharge is in compliance with the requirements set forth in this ordinance and other provisions of the sewer use ordinance. Written documents shall consist of scheduled routine cleaning and maintenance by an approved pumper and/or plumbing service. These documents shall be presented to the control authority upon demand. The grease trap, interceptor, separator, or grease recovery device shall be cleaned as necessary to assure compliance with this ordinance and other applicable provisions outlined in the sewer use ordinance.

(b) The physical conditions of the grease trap, interceptor, separator or grease recovery device (piping, sidewalls, etc.) shall be inspected by the user each time the facility is cleaned. Repairs, if needed, shall be made prior to further use. Documentation of repairs shall be submitted to the control authority within fifteen (15) days of repairs.

(c) Existing grease traps, interceptors, separators and grease recovery devices shall produce an effluent in compliance with national Plumbing & Drain Institute (PDIG) guidelines and other applicable provisions outlined in the sewer use ordinance at the user's pumping schedule. Schedules inadequate to produce such effluent shall be upgraded to as often as necessary, up to and including daily, or the grease trap, separator, interceptor and grease recovery device shall be upgraded.

(d) A user shall have any grease trap, separator, interceptor or grease recovery device cleaned when ordered to do so by the control authority. Failure or refusal to comply within forty-eight (48) hours after the request or demand shall be cause for the control authority to take further action which may include imposing a fine.

DIVISION IV. SPECIAL CONDITIONS**9-3-78. Written release.**

A written release by the control authority shall be given only after the user has met all required grease trap, interceptor and/or oil separator specifications outlined in this ordinance, general sewer use ordinance and other applicable provisions of city code compliance and the health department.

9-3-79. Certificate of occupancy.

A new building shall not be occupied or a change made in the occupancy, nature or use of a building or part of a building until after city code has issued a certificate of occupancy. A certificate shall not be issued until all required grease trap, interceptor and/or oil separator have been inspected for compliance in accordance with specifications outlined in this ordinance, general sewer use ordinance and other applicable provisions of city code compliance and the health department.

9-3-80. Variances.

If the user seeks a variance from the required minimum size, a letter requesting a variance and reasons why must be submitted to the control authority for consideration.

9-3-81. Best available technology.

If lack of space prevents the user from upgrading the grease trap, interceptor, grease recovery device and/or oil separator, the user must increase cleaning frequency or find the best available technology which is subject to control authority approval.

DIVISION V. TRANSPORT OF LIQUID WASTE

9-3-82. Applicability.

(a) This section shall apply to waste haulers that have obtained a wastewater discharge permit from the City of Hot Springs Municipal Utilities.

(b) This section shall apply to the waste haulers that transport waste to the wastewater treatment facility for transfer or disposal.

(c) This section shall apply to separator trucks or other vehicles designed to separate grease from grease waste removed from the grease trap and return liquid to the grease trap.

- (1) Separator trucks may operate and shall be subject to this ordinance and other applicable provisions outlined in the sewer use ordinance where the operator provides written documentation from the state which demonstrates the technology sufficiently separates the grease without increasing the organic loading or potential for oil and grease to pass into the collection system.
- (2) The liquid waste tank shall be an integral part of the vehicle used to transport the waste. Portable or temporarily-installed containers must meet state criteria.
- (3) The tank shall be equipped with a site gauge which is maintained in such a manner so it can be determined whether the vehicle is loaded and the volume in the tank. The gauge or other approved measuring device shall accurately measure the contents of the tank at varying depths of material in the tank. The gauge shall meet all Arkansas Department of Health criteria.
- (4) Each tank shall be equipped with a leakproof gate valve, minimum of two and one half (2 ½) inches in diameter and, if needed, a compatible hose of sufficient length and design to facilitate discharge into the designated point without splashing, spraying, or spilling onto the surrounding area.
- (5) The discharge valve shall be prominently marked and shall be readily visible and accessible.

(b) The liquid waste transport vehicle shall be prominently marked, in letters not less than two (2) inches in height given unless otherwise stated, with information as follows:

- (1) The capacity, in gallons on each side of the tank (four (4) inches minimum height).
- (2) The name and telephone number of the firm or owner under which the business is conducted.
- (3) The Arkansas Establishment Number, where operated in the State of Arkansas.
- (4) Waste hauler permit number issued by the control authority.

(c) Where a state issues a decal or authorization sticker to the registrant, the decal or sticker shall be displayed on the vehicle at all times.

(d) The waste hauler permit number shall be removed from the vehicle when the company is no longer authorized to contribute haul waste to the Publicly Owned Treatment Works (POTW).

9-3-83. Inspection of liquid waste transport vehicles.

(a) Where the liquid waste transport vehicle must pass a state inspection for liquid waste, the control authority may require the submission of a copy of the inspection report.

(b) The control authority reserves the right to inspect any liquid waste transport vehicle at any time as deemed necessary.

(c) The control authority may revoke the permit of any liquid waste transport vehicle not meeting the requirements set forth in this ordinance or any applicable condition. Upon proof the vehicle meets the requirements, the control authority may reinstate the permit or require the industry to submit a new application.

9-3-84. Cleanup of leak and spills.

(a) In the event a discharge or spill of waste during collection or transport, the waste hauler shall take appropriate action to protect human health and the environment. Appropriate action may include notifying local law enforcement and health officials, build an embankment around the discharge area, cleaning up the spill or discharge materials or other action as may be required or approved by federal, state, and local officials having jurisdiction so that the waste no longer presents a public health or environmental problem.

- (1) Spills shall be prevented from entering any water supply or water way, including storm sewers.
- (2) Spills that enter a water way or otherwise contaminate water way or water supply shall be reported to the appropriate state and local officials.

(b) If a spill, splash, spray, or leak occurs during collection, transport or discharge, the waste hauler shall clean and properly dispose the spilled, splashed, sprayed, or leaked waste at his expense.

(c) Where a spill, splash, spray, or leak occurred during transport or discharge, the owner shall make necessary repairs or modifications to the vehicle prior to subsequent operation of the vehicle.

DIVISION VI. DISPOSAL OF TRANSPORTED LIQUID WASTE

9-3-85. Applicability.

This section shall apply to the transport to and disposal of transported liquid wastes into the collection system and wastewater treatment facility of the City of Hot Springs Municipal Utilities.

9-3-86. Permitting process.

All businesses or industries that desires to discharge transported liquid waste into the collection system or wastewater treatment facility shall be required to go through the permitting process before a discharge permit is granted.

9-3-87. Approval requirements.

Any business or industry, prior to discharging transported liquid waste into the collection system or wastewater treatment facility, shall comply with the requirements of this section before such approval may be granted. Approval shall be granted to those industries or businesses that have met all federal, state, and local requirements for transport of liquid wastes.

- (a) All liquid waste hauler vehicles shall possess a valid establishment number issued by the appropriate state authority.
- (b) All liquid waste haulers delivering waste to the City of Hot Springs Municipal Utilities wastewater treatment facility or designated discharge point shall possess a valid transporter registration number issued by the appropriate state authority.

9-3-88. Disposal of transported waste.

- (a) Transported liquid waste may be discharged to the City of Hot Springs Municipal Utilities wastewater treatment facility or designated point established by the control authority.
- (1) All non-domestic waste shall be subject to general and specific requirements established in the pretreatment program and other applicable provisions outlined in the sewer use ordinance.

- (2) The control authority may collect samples of each transported waste load to ensure compliance with all applicable standards.
 - (3) The control authority may require lab analysis to be performed on any and/or every waste load prior to discharge.
 - (4) Required analysis will be specified in the waste hauler's discharge permit.
 - (5) The liquid waste may be subject to 'on the spot' pH, temperature, visual and odor testing prior to discharge.
 - (6) The control authority may sample the liquid waste for other pollutants of concern.
- (b) Liquid waste shall not be accepted by the control authority except from waste haulers that are permitted by the control authority.
- (c) A completed 'legible' waste hauler manifest form and required documentation shall be presented to and reviewed by the Publicly Owned Treatment Works (POTW) operator designated by the control authority prior to waste discharge. (See Article V)

9-3-89. Rejection of liquid waste.

- (a) Transported waste will not be accepted if it has a solvent-like, petroleum-like or other odor that is not characteristic of normal domestic septic tank waste.
- (b) Transported waste will not be accepted if it has an excessively oily appearance.
- (c) Delivery of any liquid waste found to contain toxic or other non-compatible or prohibited pollutants may result in enforcement action taken by the control authority.

9-3-90. Incompatible waste.

- (a) Mixing of incompatible waste within the same container is prohibited. Waste haulers shall not use the same container or pumping equipment to collect or transport incompatible waste without first emptying and cleaning the container and equipment of all previously handled waste.
- (b) The waste hauler shall not mix chemical toilet waste and septic tank waste or other types of waste in the same load.
- (c) The waste hauler shall not attempt to deliver, for discharge into the POTW, mixed liquid waste which is incompatible with the treatment facility processes.

9-3-91. Transported waste disposal records requirements.

(a) Records shall be maintained for each individual collection and disposal. Such records shall be in the form of a waste hauler manifest issued by the control authority. The waste hauler manifest shall include:

- (1) Name, establishment number, and discharge permit number.
- (2) Name, address, telephone number, and signature of person who generated the waste.
- (3) Type of facility from which the waste was collected.
- (4) Known or suspected constituents and whether any wastes are RCRA hazardous waste.
- (5) Date the waste was collected.
- (6) Volume of waste collected.
- (7) Name and signature of responsible person (s) collecting and transporting the waste.
- (8) Date and time the waste was disposed.
- (9) Name and signature of control authority representative acknowledging receipt of the waste.

(b) The waste manifest forms shall be obtained from the control authority upon written request. The form shall consist of four copies which shall be used to document the generation, transportation, and disposal of applicable waste.

(c) The first section of the manifest shall be completed at the time of collection and before the vehicle is moved from the generator's property. The remainder of the manifest shall be completed at the time of transfer or disposal as appropriate.

- (1) The manifest form shall be signed by the generator at the time of waste collection.
- (2) The manifest form shall be signed by the waste hauler at the time of waste collection.
- (3) The manifest form shall be signed by the control authority representative at the time of waste disposal.
- (d) The copies of the manifest forms shall be distributed as follows:

- (1) The fourth copy with the generator information and transporter information and signatures completed shall be given to the generator at the time of waste collection.
- (2) The third copy with all information and signatures completed shall be retained by the waste hauler at the time of disposal.
- (3) The second and original copies with all information and signatures completed shall be given to the control authority representative.

(e) All copies of the manifest form shall be retained by the respective recipients for a minimum of three (3) years and shall be made available to the control authority, state, and EPA upon request or demand for inspection and /or copying. This period shall be automatically extended for duration of any litigation concerning the generator, waste hauler, or control authority, or where any involved party has been specifically notified by the control authority of a longer retention period.

(f) An acceptable log of operation shall be maintained by the waste hauler and made available for inspection and copying by the control authority at any reasonable time.

9-3-92. Violations.

The penalty for violation of this ordinance shall, upon conviction in the Hot Springs Municipal Court, or any other court of competent jurisdiction, be such fines and penalties as established by the general penalty clause for the Hot Springs Code of Ordinances as may now or hereafter be enacted by the Hot Springs Board of Directors.

9-3-93. Severability.

Should any part of these regulations be adjudged invalid by a court of law having jurisdiction, all other parts shall remain in full force and effect.

(Ord. No. 5111, §1, 6-15-02)

SSO Response Plan

In response to Section #6 (Sanitary Sewer Overflow Response Plan) listed in the CAO issued August, 2008, we offer the following procedure as an appropriate response to the concerns listed. If approved by ADEQ, this process will be immediately implemented as our Standard Operating Procedure for all sanitary sewer overflows.

Steps Taken by City Personnel

1. Once notification of overflow is received by City staff, the pertinent information regarding location will be communicated to the appropriate personnel. During normal work hours (8:00 AM - 4:30 PM, M-F), the call will be routed via the Service Center and dispatched to the responsible supervisor and crew. After normal work hours, the notification will be received via the after hours emergency phone number listed in the phone book and dispatched by the Lakeside Water Treatment Plant to the on call personnel.
2. Upon arrival at the affected site, staff personnel will document quantities and record in required format as per NPDES permit requirements for reporting to ADEQ. In the event the overflow is considered outside the normal operating guidelines, the department supervisor will be contacted and will provide on site instruction to resolve all issues.
3. Notification to the affected individuals, agencies and any other entities will be accomplished in a timely and concise manner.
4. Staff will inform the City of Hot Springs Stormwater Division of the locations and severity of the overflows.
5. Staff will make timely return visits to the overflow location making note of any change in estimated volume until the overflow has stopped.
6. Once the overflow has stopped, staff will treat the affected area with a disinfectant, most likely lime, and remove any and all visible waste materials from the area, within reason.
7. The reporting paperwork shall be completed by field staff on provided report that is in accordance with state and federal requirements regarding wastewater overflows and submitted to the supervisor.
8. The supervisor will properly report the overflows to ADEQ in accordance with state and federal regulatory requirements.
9. The supervisor will develop a monthly overflow report in accordance with state and federal regulatory requirements.

SUMMARY- Staff will respond in a timely manner once notification of the overflow has been received. Upon arrival at the affected site staff will assess the incident to establish overflow quantities, required equipment to commence clean up effort and will provide notification to affected individuals or agencies. Clean up of affected surfaces will be accomplished in the appropriate manner (i.e. use of vacuum trucks, backhoe, etc.) to ensure removal of any potentially contaminated area. Chemical treatment will be applied as required; only approved products (i.e. lime) will be used to mitigate the potential for bacterial concerns. In the event loss of electrical power is the cause of the overflow,

personnel will utilize appropriate equipment (i.e. pump truck) to reduce pump station level. In addition, staff will provide temporary back up power as applicable to restore pumping capacity. Inspection of the facility to ensure operability is maintained will be performed at a frequency deemed appropriate by staff and supervision.

Staff personnel will be trained in and cognizant of standard operating procedures to effectively mitigate the potential for additional overflow and related unplanned events. Personnel will be trained in method(s) of resolving overflow issues, completing required documentation, notification to surrounding/affected parties and ensuring all applicable items of concern are adequately reviewed. Personnel will be equipped with appropriate tools, trained in repair methods and will maintain communication with group supervisor as deemed necessary.

The assessment to establish root cause of the overflow will be conducted by staff, reviewed and subsequently approved by the group supervisor and reported in accordance with standard operating procedures. In the event the root cause is undetermined, staff will monitor the affected site at a frequency deemed appropriate to mitigate the potential for additional issues pertaining to overflow(s). If the event was caused due to mechanical failure of a component, the site will be re-inspected at the appropriate frequency to ensure replacement items are performing as expected to mitigate potential for additional overflow(s).

All items related to the incident will be documented in accordance with department requirements and addressed via the existing work order system. This documentation will enable staff to trend overflows and provide required data to ensure appropriate level of oversight in the assessment of eliminating overflow(s).

Attachment "H"

AMERY

I&I Project
Weekly Status Report

Date (Week Ending)	Manholes Inspected	Manholes Requiring Repair	Smoke Tested	T.V. Inspected	Work Orders Created	CHS Work Orders Created	Work Orders Completed To Date	Letters to Owners
06/20/08	44	14	0	0	14	4		
06/27/08	0	0	15,766	2,562	0	0		2
07/03/08	0	0	0	3,000	0	0		1
07/11/08	65	26	0	2,445	26	5		0
07/18/08	0	0	17,506	0	0	0		4
07/25/08	1	0	8,903	6,591	3	3		2
08/01/08	72	20	0	7,953	20	19		1
08/08/08	52	10	14,579	772	10	7		3
08/15/08	51	10	7,753	0	10	4		0
08/22/08	0	3	13,214	5,370	3	1		3
08/29/08	0	2	16,498	5,522	2	1		6
09/05/08	* See Note	0	0	0	0	0		0
09/12/08	0	0	0	5,679	0	0		0
09/19/08	0	0	0	12,073	0	0		0
09/26/08	90	26	0	357	26	20		0
10/03/08	70	12	0	0	12	8		0
10/10/08	123	31	0	0	31	23		0
10/24/08	159	35	0	0	35	22		1
10/31/08	116		0	0	28	21	45	0
11/18/08	182	12	0	0	3	31	45	3
TOTAL	1025	201	94,219	52,324	223	169	45	26

* No results this week - Rain Event and Equipment Issues

Work orders completed to date includes performed by Contractor



Minutes

CONFERENCE CALL UPDATE ON CONSENT ADMINISTRATIVE ORDER STATUS

July 15, 2009 – 9:30 AM

City of Hot Springs Participants

Lance Hudnell, City Manager

Steve Mallett, Deputy City Manager for Public Works and Utilities

Larry Merriman, Utilities Operations Director

Environmental Protection Agency Participants

Jana Harvill, Environmental Engineer, Region 6

Ellen Chang-Vaughan

Nancy Williams

Racquel Douglas

RJN and Associates Participants

Daniel Jackson, Collection System Rehab Project Manager

Garver Engineers

Aaron Stallman, Pump Station Rehab Project Manager

Note: Invitation was extended to Cindy Garner of Arkansas Department of Environmental Quality (ADEQ), but was unable to participate. No others from ADEQ participated.

Welcome and Introductions

Steve Mallett introduced participants from Hot Springs, RJN and Associates, and Garver Engineers whom were all present in Hot Springs. Jana Harvill introduced participants from EPA. It was noted that Cindy Garner was expected to participate on behalf of ADEQ but had not yet joined the conference call. As it was past 9:30 it was decided to begin the meeting.

Consent Administrative Order Status Update

Steve Mallett began the meeting by updating the group as to the current status of all ongoing efforts related to the Consent Administrative Order (CAO).

With regards to the work being performed by RJN and Associates, the city has recently approved a contract with RJN to begin Phase II of the system assessment based on the results of the recent flow monitoring efforts. As the current wastewater fund balance would not allow the city to engage in the full \$3 million+ contract for Phase II, RJN agreed to move forward with a \$350,000 contract and begin the large manhole/pipeline inspection phase with a scaled back approach. It was agreed that RJN would begin their assessment in the basin that is served by the new Southwest Wastewater Treatment Plant

(SWWTP), located southwest of Hot Springs, due to the plant's recent inability to handle peak hourly flows. It is our desire to make repairs to this basin to allow the plant to handle all flows and eliminate the need to pump excess flows to the large plant on Davidson Drive. In addition to this basin, the crews have begun to work in other basins that were listed in the flow monitoring report. Mallett referenced findings in the report with respect to the ranking of the 65 basins with regards to inflow and infiltration. Mallett asked Harvill if she had seen a copy of the draft report and she stated that she had not, therefore, Mallett stated that Harvill would receive a copy of the final report as soon as it was complete. Daniel Jackson reported that his (RJN) crews had inspected 400 manholes to date within the SWWTP basin and an additional 100 in the other high priority basins with 4 two-man crews. Jackson stated that the manholes were located by GPS and an assessment of the condition was performed and recorded in a database that will be integrated with the city's existing software. Jackson also stated that the crews were also beginning the smoke testing efforts in the same basins to locate leaks on mains and service lines.

Mallett reported that in addition to the work being performed on the collection system served by the Southwest Wastewater Treatment Plant, the city had recently entered into a contract with CDM, an engineering consultant, who provided an assessment of the newly constructed SWWTP. Our staff had been experiencing operational issues that were not being addressed by the design engineer and questions were raised about the true capacity of the plant, stated at 0.85 MGD. During the assessment, operational changes were made regarding raising the level within the basins, as it is a batch plant, which increased the capacity. Other recommendations were made regarding the sludge handling capabilities which were poorly addressed in the design as well as other operational improvements for near and long term. A copy of this report will also be provided to EPA once finalized. Any improvements made to this plant to increase capacity will further reduce the need to pump to the Davidson Drive Plant and help to reduce volume and overflows.

Mallett reported on the progress that Garver has been making with regards to the assessment of our major wastewater pump stations. To date, Garver staff have provided final recommendations on 29 of our most critical and for the most part, largest, pump stations that include improvements ranging from electrical safety to total station replacement. Mallett stated that city staff met with Garver to discuss the difficulty properly assessing capacity and sizing the pump stations as in most cases, not all the pump stations within the basin were analyzed, leaving flow components unknown. Much of Hot Springs wastewater collection system is a series of "piggy-backed" pump stations, which makes it impossible to size receiving stations without all of the information from the providing stations. It was decided that the only way to properly assess the stations is to do it in basins, much the same way the collection system was done. In doing so, all flow components are known and it can be assured that the small system serving the basin will work together as a unit, rather than make improvements to one and wait to see how it will affect the others. All feel that this is the most effective and productive way to survey our pump stations and stations have now been prioritized with respect to basins. There were several basins that only lacked data from a few smaller stations, so we expect to have recommendations from which to design projects by later this fall. Aaron Stallman

noted that any safety items that were identified would be addressed immediately by staff and/or contractor.

Mallett reported that the 2008/09 SCADA improvements were complete which included providing a consistent software platform and communications hardware that allow us to monitor the collection system at the water and wastewater plants. Screens were developed and computers installed to provide the backbone for the collection system SCADA that will be implemented over the coming years. Currently, our larger pump stations have monitoring equipment, but the reliability is very poor as we continually deal with false readings and communication issues. The SCADA Master Plan, as developed by Brown Engineers two years ago, outlines a standard installation that will allow us to have reliable and consistent hardware and software throughout our system. Obviously, this is a key component to meeting the deadline regarding the dry weather overflows. (It was not mentioned in the meeting, but a copy of the SCADA Master Plan will be provided to EPA as well.)

Lance Hudnell provided an update with regards to the progress and upcoming schedule for items related to funding. Hudnell referred primarily to a schedule that was provided to Harvill by email on the preceding day. The schedule was a spreadsheet that included items and dates that were critical to acquiring funding for the improvements in a timely manner. Items and dates of note were:

- | | |
|--------------------|---|
| July 21, 2009 | Board to approve contract with underwriters in preparation for Bond Issue (This item was accomplished) |
| August 11, 2009 | City to hold public meeting on proposed rate increase for water and wastewater (On schedule – notice published) |
| August 18, 2009 | City Board to introduce rate ordinance at normal board meeting (On schedule) |
| September 1, 2009 | City to hold public hearing during normal board meeting (On schedule – pending 8/18 introduction) |
| September 15, 2009 | Adopt new rate ordinance at normal board meeting (On schedule – pending previous meetings) |
| Fall, 2009 | Issue bonds for first phase of wastewater improvements |
| November, 2009 | Teleconference with Jana Harvill and EPA staff |

Hudnell explained that the city was committed to these dates and the main item of concern that could disrupt this proposed schedule would be the possibility of a group of citizens circulating petitions to take the proposed rate increase to a public vote, which is within the rights of the citizens to do so. In fact, it has recently been done with several other items that the board approved, so there is precedent. With that in mind, city staff

continues to inform the public of the issues facing the wastewater system and is organizing a campaign effort in case the situation presents itself. Hudnell stated that, currently, there is no sign of opposition with the Board of Directors as they understand the need and have resigned themselves to the fact that an increase is needed. The main issues facing the board are duration of financing terms, etc. and how those items will affect the incremental increases.

Mallett then continued moving down the schedule as the remaining items and dates dealt primarily with construction and reporting timelines.

Mallett also mentioned the continued efforts by city staff with regards to in-house investigation and repair. Recently, city crews have dedicated their time to locating and uncovering manholes for the RJN crews in order to expedite their work and improve productivity.

When complete with the schedule, Harvill had questions for city staff. Harvill asked a question pertaining to the recent overflow reports for months January through June of 2009. A general question was asked regarding the large number of overflows that were reported in the time frame and special concern was given to those caused by equipment failure. Harvill asked if we had a system in place to allow the homeowner to notify us of an alarm condition before an overflow occurred. Mallett stated that all of the small grinder pumps in the yards of the homeowner have red lights and alarms and the residents are usually quick to respond, however, the larger stations are not normally that close to the homes and may be in remote locations. Mallett stated that staff has recently installed some signage on some trouble stations and informed the area residents to contact the number on the sign if they saw and/or heard the alarm. Larry Merriman reported that city staff has made recent improvements in this area, including providing door hangers to residents near pump stations asking for their assistance in reporting alarms. Harvill suggested initiating a public information campaign utilizing newspaper ads, radio spots, etc. to provide information regarding the reporting of pump station alarms. Merriman agreed and also suggested posting an ad on the local public television station which was well received (This item has already been initiated by Merriman). All agreed that city staff would pursue making improvements in this area.

Harvill stated that any changes in the proposed schedule would need to be provided to her office. Mallett stated that any changes to the schedule would be circulated to her office and ADEQ office as well. Any major items of change would also be provided by phone and/or email contact.

Prior to ending the call, all participants agreed that the meeting had been beneficial and agreed to participate in another conference call as scheduled in November.

ACTION ITEMS FOR CITY STAFF:

Provide copy of RJN final flow monitoring report
Provide copy of final report on SWWTP from CDM

Provide copy of SCADA Master Plan
Develop and implement public campaign for alarm reporting (provide copy of ad to EPA)
Provide any and all changes to schedule to EPA in timely manner
Schedule time and date for next conference call in November

Adjournment

There being no further business, the meeting conference call was adjourned.

Approved this 10th day of August, 2009



Steve Mallett

Stewe

February 27, 2010



Arkansas Dept. of Environmental Quality
Water Division
ATTN: Cindy Garner
5301 Northshore Drive
North Little Rock, AR 72118

**City of Hot Springs
Utilities Department**

780 Adams
Post Office Box 700
Hot Springs National Park,
Arkansas 71902
(501) 321-6999
(501) 321-6967 Fax

Re: City of Hot Springs
CAO LIS No. 08-099
Annual Report

Dear Cindy,

This letter 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) has continued 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 report is submitted in the same format as the February, 2009 update for sake of consistency. If the department desires a modified format from the one presented herein, we would be glad to make changes as requested. We feel that this report not only addresses the items required by the CAO but provides much more specific information related to our efforts.

As mentioned in correspondence to date, as well as in discussion between involved parties, the critical issue facing the City of Hot Springs up to this point has been funding. As of the date of last report, the city's wastewater fund was hovering near zero and our contractors were moving forward on a pay as we go basis and even worked at risk by cash-flowing the current operations to keep from falling behind. We are extremely happy to report that the City of Hot Springs was successful in the issuance of over \$26 million worth of wastewater improvement bonds that will be dedicated to addressing the issues identified in the Consent Administrative Order (CAO). Since the issuance of these bonds in late 2009, staff has been able to work with the engineers, contractors, etc. and move forward with the existing contracts and those that were awaiting funding. The time frame to spend the majority of this funding is three years, which means that we must move quickly and earnestly to carry out the plans that have been presented to you in previous correspondence, which will be updated herein.

On another positive note, the City of Hot Springs made application for and was awarded \$5.5 million in ARRA stimulus funding towards the installation of a fixed based automated water meter reading system. Implementation of this system will inherently include replacement of all of our existing 33,000+ water meters. This is significant to the wastewater system in that our wastewater billing is based off actual water consumption and not a flat rate as some systems. As the majority of our water meter are at, past or towards the end of their useful life, it is projected that replacement of these meters should yield an increase in both water and wastewater revenues through more accurate readings. This will help further boost the wastewater fund balance and help facilitate our efforts. In addition to the increase in revenues, the communications system utilized by the water metering system can be used to monitor our 4000+ grinder stations. The equipment manufacturer has modified and tested one of the automated units for electrical meters and has proven it to be able to provide a power fail and high level alarm for a grinder station. The cost of this is very feasible and will likely

allow us to equip all of our grinder pump stations with monitoring systems, a task which was previously thought not to be achievable within the scope of this overall project.

In keeping with the format utilized with the previous annual report, the list below updates the Major Goals associated with the collection system that CHS has identified:

1. **Achieve compliance with regards to dry weather overflows by January 1, 2011.** As mentioned in the narrative above, lack of funding has provided a challenge in meeting this deadline. However, our project team, consisting of staff and consulting engineers, were busy developing a plan to address this item once money became available. As mentioned in earlier correspondence, the City plans to address this directive through installation of SCADA equipment on our pumping stations, scheduled pump station maintenance, and development of a flushing list to minimize blockages. Brown Engineering has previously developed a Master plan and has presented plans to install SCADA equipment on 76 of our most critical pumping stations. Also, as mentioned above, the team is working on installation of SCADA equipment on all of the city's grinder pump stations. We expect to have the SCADA for the larger stations complete by January, 2011 and are hopeful that we will be able to develop a project related to the grinder stations in time for this deadline as well. Staff feels that these improvements, in conjunction with backup power systems on the major stations, routine preventive maintenance and continued manual inspection of the smaller stations, will address the dry weather overflow requirements. We have continued with the systematic evaluation of our major pump stations to develop a prioritized schedule to perform routine maintenance/inspections for these stations. To date, 30 pump stations have been evaluated and 29 reports have been prepared. Currently a project is out for bid (Project 10A) which will include the installation of 5 permanent standby generators, 5 generator receptacles and manual transfer switches to facilitate the use of portable generators, and general site improvements at 20 other pump stations. Plans and specifications for improvements for approximately 20 additional pump stations are at the 95% completion stage. The city continues to formalize and revise the main line flushing list as necessary to minimize overflows due to stoppages.
2. **Achieve compliance with regards to wet weather overflows by January 1, 2018.** This directive will be accomplished through development of a System Evaluation and Capacity Plan, physical survey of all wastewater collection system elements, repair of identified deficiencies, and upgrades to various pump stations and treatment facilities. The efforts mentioned in item one as they relate to dry weather overflows will obviously contribute to satisfying the wet weather overflow issues as well. In addition to those efforts, CHS has retained RJN Group, Inc. to perform a Sanitary Sewer Evaluation Study to evaluate the collection system and identify potential deficiencies that may require attention. This study includes a system wide flow monitoring program which has been completed. The results, which have been presented to ADEQ and EPA, have provided information that has allowed us to prioritize our efforts related to the physical inspection of the collection system. To date, 5,657 manholes have been inspected, 301,010 linear feet of sanitary sewer lines have been smoked tested, 18 dye tests have been performed, and 13,500 linear feet of sewer has been televised and reviewed. In-house city efforts include providing assistance to RJN with respect to locating manholes as well as continuing our efforts to televise all lines within our

system as workload allows. CHS has authorized Garver to proceed with the development of plans and specification to address the issues discovered during the pump station evaluations. This will allow for the upgrade of pump stations throughout the collection system and provide provisions for standby power in the event of a power outage.

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.** As pump station data is collected and new equipment is installed, maintenance paperwork will be the basis for development of a routine preventive maintenance program utilizing the city's existing Cityworks software. This effort remains in it's initial stages. Once the required workload is determined, staffing levels will be adjusted. We fully expect this system to be in working state well before the January 2018 deadline for wet weather overflows and staff will continue to report on the progress of this program through annual reports and/or teleconferences.
4. **Obtain adequate funding required to complete projects required for compliance.** As mentioned in the introduction, the city is pleased to report that funding has been secured to fund the first \$26 million of wastewater improvements over the next three years. Results from this initial phase of projects will be evaluated in order to determine the scope of the next phase of work. Of course, staff hopes that the impact from the first phase of work will satisfy the requirements of the CAO, however, we realistically expect to have more work to do. Regardless of our success with regards to satisfying the CAO requirements, the city fully understands the need to continue investing in the long term upkeep, repair and rehabilitation of our system to insure that we do not return to this situation.
5. **Implement an increase in wastewater rates in early 2009 to support payback of funding mechanism.** As mentioned in the introduction, the city was successful in increasing wastewater rates to a level that will support up to \$50 million of improvements over the next 10 years. Increases in revenues from the replacement of all existing water meters will also add to the city's ability to increase the annual operations and maintenance budget as well as fund additional improvements over and above the \$50 million if necessary. We feel that the financial position of the city's wastewater system is now sufficient to facilitate the needed improvements that will satisfy the CAO requirements within the timeframe set.
6. **Implement the recommendations outlined in the recently developed SCADA Master Plan.** The city continues to include funding in the annual wastewater capital budget to implement general system wide SCADA improvements that will accommodate the large SCADA projects that are specifically mentioned in item one. The schedule for the two major phases of the SCADA system is included later in this report. The expected completion date for the first phase of this work has been moved from Spring of 2010 to January, 2011 due to the fact that funding for the project did not become available until December, 2009, which dictates this schedule.
7. **Develop critical inventory list and ensure those parts are in stock.** The city has revised our current inventory levels in accordance with the needs that have been identified to this point in our system evaluation. Our inventory and work order software has been fully

implemented in conjunction with our Finance Department as the two are tied together. We have set minimum thresholds for critical items and have assigned all inventory responsibilities to one individual as compared to the previous system where each division manager was responsible for his or her inventory levels, which was not efficient.

8. **Evaluate existing personnel with regards to efficiency, workload, job duties, etc. and implement necessary changes.** The city has reassigned staff to effectively manage personnel involved in the collections department. In order to more effectively manage our wastewater system, the collection system now consists of two separate maintenance divisions under two separate managers, one for gravity system and the other for pump stations. The manager for the lift stations division has recently retired, and we are currently beginning the process to fill that position. This will be a challenge as the previous manager had very strong technical skills and knew our system very well. However, we consider this an opportunity to strengthen this position through hiring a person with strong management skills that will assist the city with the large task ahead. We will keep ADEQ and EPA posted with regards to this process and will provide information on the new manager once placed as this individual will be a key member of the team. As an update to our previous report, the relocation of the Utilities Operations Manager to the utility complex located at 798 Adams Street has proven to be an excellent decision with regards to the overall operational aspects of all our divisions, not just wastewater. The operational improvements related to the wastewater collection and pump station divisions include creation of operational procedures (SOP's), improved documentation, more efficient workforces and better time management. We are very pleased with the direction that our in-house staff is headed, which is a large component of our overall plan.
9. **Properly train all personnel in accordance with existing and future policies in regard to applicable procedures in the wastewater system.** Appropriate personnel with the city has attended a CMOM conference in Austin, Texas during the reporting period and has begun implementing the knowledge gained at this conference to improve the efficiency of our efforts. We have passed along some of the major points covered at this seminar with our staff as well as our consulting engineers, one of which also in attendance at the conference. We have trained our staff internally with respect to the proper procedures and reporting requirements related to our SSO's in accordance with what was presented in our initial response to the CAO. The city continues to evaluate available training which is applicable tour effort as we must ensure personnel are adequately equipped and trained to perform required duties. Training will be ongoing and personnel will be required to accomplish and prove a level of proficiency in applicable areas. The city's wastewater collection division continues to be involved in the efforts with RJN and are receiving valuable on the job training as it relates to our investigative efforts.
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 continues to compile information gathered as part of the RJN efforts related to the development of the collection system SSES. This process will continue to run parallel to the survey efforts. Personnel are also involved in developing work order processes that will better enable a more efficient issuance and closure of work order items.

The following table lists the proposed projects intended to address the goals described above

Description	Estimated Percentage Complete	Current Estimated Completion Date
Collection System Survey Phase I – Flow Metering	100%	Spring 2009
Collection System Survey Phase II – MH Inspection	47%	Summer 2010
Collection System Survey Phase III – Smoke Testing	17%	Fall 2010
Treatment Plant Expansion Study	100%	Fall 2009
Fairwood Force Main	0%	Spring 2011
Pump Station SCADA, Phase I		Spring 2010
Pump Station Mechanical Upgrades and Standby Power, Phase I	50%	Summer 2010
Pump Station SCADA, Phase II	0%	Summer 2013
Development of Wastewater System Model	2%	Winter 2010
Collection System Manhole Repairs, Phase I	0%	January 2013
Pump Station Mechanical Upgrades and Standby Power, Phase II	0%	January 2014
Collection System Pipeline Repairs, Phase I	0%	January 2013
Pump Station Mechanical Upgrades and Standby Power, Phase III	0%	January 2018
Collection System Manhole Repairs, Phase II	0%	January 2018
Collection System Pipeline Repairs, Phase II	0%	January 2018

Additional information is provided below regarding the scope and progress of projects that are currently underway or have recently been completed.

Pump Station Evaluations

CHS has contracted Garver to conduct evaluations and prepare reports for CHS's major pump stations. The purpose of this project is to determine the condition of and provide recommendations to improve these stations. Currently, Garver has completed the reports for 29 pump stations. Garver has also prepared and are currently soliciting bids for a project (Project 10A) which will include the installation of 5 permanent standby generators, 5 generator receptacles and manual transfer switches to facilitate the use of portable generators, and general site improvements at 20 other pump stations. Garver has also prepared plans and specification for approximately 20 additional pump stations that are at 95% completion. As Garver continues the evaluations and report preparation, plans and specifications will also be developed to implement the recommended improvements at each station.

Sanitary Sewer Evaluation Study

CHS has retained RJN Group, Inc. to perform a Sanitary Sewer Evaluation Study. This project will be completed in phases. Phase I is complete and included monitoring flow at 65 locations for a duration of 60 days and measuring rainfall at 15 locations for the same duration. The monitoring project identified the areas of the City where inflow and infiltration (I/I) were highest and thus prioritized where improvements in the collection system will be most beneficial.

Phase II is currently underway and consists of inspecting approximately 12,000 manhole inspections, GPS of all 12,000 manholes, 1,800,000 linear feet of smoke testing, subsequent dye testing and CCTV inspection. This information will lead to accurately defining the areas of the collection system that are in need of the most attention and where future construction money will be best utilized. Phase III will use the physical survey of the manholes and sewer lines and generate a hydraulic model using InfoWorks that will simulate current and future operating conditions.

SCADA Master Plan and Upgrade

The city continues to work closely with Brown Engineering to insure that our efforts are consistent with the SCADA Master Plan. As mentioned in the introduction, we are currently moving forward with Phase I of the SCADA improvements which involves installation of SCADA equipment on 76 of our most critical pump stations. Also as mentioned, we are moving forward with the development of a project to monitor all of the systems 4000+ grinder stations with a modified version of an electrical automated meter reading device. This device is compatible with the automated meter reading system that is to be installed on our water meters over the next 9-12 months. The feasibility of such a project was unknown less than a month ago, but a brain storming effort between city staff, Brown Engineering and SENSUS metering equipment resulted in the successful testing of one of the electrical metering units as a monitor for one of our grinder stations. This will likely allow the city to equip all of our grinder stations with these units and provide remote monitoring versus the visual monitors that we currently have now. This will be a major component of our efforts to reduce dry weather overflows. The final details of this project are being ironed out now by Brown Engineering and SENSUS metering. We hope to have this project underway within 60 days.

Fairwood Force Main

This project was bid in the past, but funding was not available to fund the entire project. The city is moving forward in re-bidding this project with the expectation of beginning this project in early summer. This project consists of upgrading the Fairwood pump station, one of our largest and installing a new large diameter force main that will provide additional capacity within our collection system and help prevent capacity related overflows.

Molly Creek Pump Station

This project which involved upgrading and rehabilitation of the Molly Creek Pump station, one of the systems largest, has been completed and is in service.

Hot Springs Creek Pump Installation

CHS is in the process of revamping this pump station. Garver has completed their study and CHS is reviewing data provided to determine path forward for this effort.

Provide explanation of newly reorganized personnel structure – List new positions and responsibilities. The previous annual report outlined the various personnel changes in early 2009 in efforts to improve operations and better facilitate the efforts related to the CAO. The city has also hired a new City Engineer which provides additional in-house technical expertise. This has enhanced the city's involvement with project development and management, while providing the Utilities Operations Manager with more time to concentrate on operational and administrative processes and procedures related to wastewater overflows. As mentioned earlier, the city has lost our Lift Stations Manager of 28 years to retirement and we are in the process of filling the position. While these are big shoes to fill, we are viewing this as an opportunity to promote or hire an individual with good technical and management skills who will become a vital member of our in-house team.

In closing, the City of Hot Springs wastewater division is in a much different position than one year ago when the last status report was provided. A year ago, we were operating on a month to month basis as our budget hovered near zero. We now have a growing fund balance and \$26 million from the issuance of revenue bonds. The issuance of the bonds as well as the rate increase necessary to repay these bonds was a major obstacle for the city and staff credits the Board of Directors for understanding the critical nature of these issues and unanimously supporting these measures. The City of Hot Springs Board of Directors is dedicated to insuring that staff is fully equipped with the means to meet the requirements of the CAO, and we hope that this is evidenced by the major accomplishments over the past 12 months.

We trust that these efforts outlined above illustrate the city's commitment to addressing all of the issues mentioned in the CAO. As mentioned before, our efforts began before the CAO was issued in conjunction with changes in management resulting in a renewed focus on eliminating these environmental issues. We appreciate the cooperation from ADEQ and EPA in working with us as we move forward.

Please feel free to contact me at (501) 321-6860 or Aaron Stallmann with Garver at (501) 376-3633 if you have any questions or need additional information.

Sincerely,

CITY OF HOT SPRINGS, ARKANSAS



Steve Mallett, Jr., P.E.
Deputy City Manager for Public Works and Utilities

cc: Aaron Stallman, Garver
Lance Hudnell, City Manager
Larry Merriman, Utilities Operations Director

February 27, 2009



AR Department of Environmental Quality
Water Division
5301 Northshore Drive
North Little Rock, AR 72118

Re: City of Hot Springs
CAO LIS No. 08-099
Annual Report

**City of Hot Springs
Utilities Department**

111 Opera Street
Post Office Box 700
Hot Springs National Park,
Arkansas 71902
(501) 321-6889
(501) 321-6967 FAX

Dear Sir or Madam:

This letter 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) has continued the efforts documented 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. The following sections should provide an outline of proposed projects, status of projects currently underway, and a revised organizational structure for CHS personnel.

The list below documents the Major Goals associated with the collection system that CHS has identified at this time.

1. **Achieve compliance with regards to dry weather overflows by January 1, 2011.** This directive will be accomplished through installation of SCADA equipment on our pumping stations, scheduled pump station maintenance, and development of a flushing list to minimize blockages. SCADA program development is in process. Brown Engineering has developed a Master plan and is in the process of prioritizing placement of related to equipment to enable mitigation of the overflow issues. We have continued with the systematic evaluation of our major pump stations to develop a prioritized schedule to perform routine maintenance and inspections for these stations. To date, 24 pump station evaluations and reports have been completed. CHS has recently authorized Garver Engineers to proceed with the development of plans and specification to address the issues discovered during the pump station evaluations. This will allow for the upgrade of pump stations throughout the collection system and provide provisions for standby power in the event of a power outage. The city's in-house efforts include making minor repairs as identified in the pump station evaluation. All major repairs will be packaged and bid once funding is obtained. Funding options, including bonds and RLF funding are currently being pursued.
2. **Achieve compliance with regards to wet weather overflows by January 1, 2018.** This directive will be accomplished through development of a System Evaluation and Capacity Plan, physical survey of all wastewater collection system elements, repair of identified deficiencies, and upgrades to various pump stations and treatment facilities. The efforts mentioned in item one as they relate to dry weather overflows will obviously contribute to satisfying the wet weather overflow issues as well. In addition to those efforts, CHS has retained RJN Group, Inc. to perform a Sanitary Sewer Evaluation Study to evaluate the collection system and identify potential deficiencies that may require attention. This study includes a system wide flow monitoring program including installation and monitoring of 65

in-line flowmeters, which is currently underway, and a systematic inspection of all manholes in our system. In-house city efforts include providing assistance to RJN with respect to locating manholes as well as continuing our efforts to televise all lines within our system so as to obtain current records. The 2009 budget includes a new television truck to replace an older, less sophisticated unit.

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.** As data is collected, CHS staff will begin to develop the backbone of a preventive maintenance program for the wastewater facilities. CHS management will evaluate the resources required to effectively administer the program and complete the work orders in order to reduce the potential to create a significant back log of work orders, which would render the effort ineffective. CHS will continue the process of evaluation staffing levels to achieve the desired result of adequate personnel to effectively maintain the collection system in an effort to mitigate overflows.
4. **Obtain adequate funding required to complete projects required for compliance.** CHS is currently under contract with a rate consultant who will provide proposed rate plans to address the immediate and future funding needed to accomplish the work required by the CAO. City staff has already began pursuing funding options through bonds and/or RLF funds. It does not seem likely that any stimulus money will be available for any of our projects, much to our disappointment. However, we will continue to apply for these funds until the time we are denied.
5. **Implement an increase in wastewater rates in early 2009 to support payback of funding mechanism.** As mentioned in item four, CHS has hired a consultant who is in the process of developing a rate study to confirm ability to repay any funding required for collection system improvements. We expect to have this final report by end of March, 2009.
6. **Implement the recommendations outlined in the recently developed SCADA Master Plan.** CHS has appropriated funding for the current year and will continue to do so to accomplish the implementation of the SCADA system. Phase I of this overall Master Plan was completed in 2008 and included upgrade and standardization of software platform and addition of crucial monitoring locations at the various plants.
7. **Develop critical inventory list and ensure those parts are in stock.** CHS will revise current inventory as pump study progresses and identifies required material inventory to ensure material is procured and available. Our inventory program has recently been converted to an asset management program through Cityworks Inventory module which will allow us to better track our items and establish thresholds for all crucial items.
8. **Evaluate existing personnel with regards to efficiency, workload, job duties, etc. and implement necessary changes.** CHS is currently reassigning staff to effectively manage personnel involved in the collections department. In order to more effectively manage our wastewater system, the collection system now consists of two separate maintenance divisions under two separate managers, one for gravity system and the other for pump stations. We

feel this is imperative in our ability to focus on both areas equally and allocate proper resources as we strive to meet the requirements of the CAO. A new department manager has been put in charge of the gravity system and has been tasked with identifying process improvements which will enable staff to perform at optimum levels. In addition to these staff changes, the position of Utilities Operations Director has been created and this position was relocated from City Hall to 798 Adams Street where all of the maintenance divisions are housed. This change has already produced results as the on-site presence of an administrative position provides support, consistency and motivation.

9. **Properly train all personnel in accordance with existing and future policies in regard to applicable procedures in the wastewater system.** CHS is evaluating available training which is applicable to ensure personnel are adequately equipped and trained to perform required duties. Training will be ongoing and personnel will be required to accomplish and prove a level of proficiency in applicable areas. CHS maintenance staff is involved in the efforts with RJN and are receiving valuable on the job training as it relates to our investigative efforts.

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.** CHS is continuing to upgrade current data with information provided as part of the RJN efforts related to the development of the collection system SSES. Personnel are also involved in developing work order processes that will better enable a more efficient issuance and closure of work order items.

The following table lists the proposed projects intended to address the goals described above

Description	Estimated Percentage Complete	Current Estimated Completion Date
Collection System Survey Phase I – Flow Metering	40%	Spring 2009
Collection System Survey Phase II – MH Inspection	0%	Spring 2010
Collection System Survey Phase III – Smoke Testing	0%	Fall 2009
Treatment Plant Expansion Study		Fall 2009
Fairwood Force Main		Summer 2009
Pump Station SCADA, Phase I		Spring 2010
Pump Station Mechanical Upgrades and Standby Power, Phase I		Summer 2010
Pump Station SCADA, Phase II		January 2011
Development of Wastewater System Model		Winter 2010
Collection System Manhole Repairs, Phase I		January 2013
Pump Station Mechanical Upgrades and		January 2014

Standby Power, Phase II		
Collection System Pipeline Repairs, Phase I		January 2013
Pump Station Mechanical Upgrades and Standby Power, Phase III		January 2018
Collection System Manhole Repairs, Phase II		January 2018
Collection System Pipeline Repairs, Phase II		January 2018

Additional information is provided below regarding the scope and progress of projects that are currently underway or have recently been completed.

Pump Station Evaluations

CHS has contracted Garver Engineers to conduct evaluations and prepare reports for 76 of CHS's major pump stations. The purpose of this project is to determine the condition of and provide recommendations to improve these stations. Currently, Garver has completed the reports for 24 pump stations. Garver has also recently been authorized to begin preparation of plans and specifications to implement the recommended improvements at each pump station.

Sanitary Sewer Evaluation Study

CHS has retained RJN Group, Inc. to perform a Sanitary Sewer Evaluation Study. This project will be completed in phases. Phase I is currently underway and includes monitoring flow at 65 locations for a duration of 60 days and measuring rainfall at 15 locations for the same duration. Once the data is gathered, it will be analyzed to provide a comprehensive evaluation of the quantity and location of potential inflow/infiltration sources. At this time, all 65 flow meters and 15 rain gauges are installed and recording data.

Phase II will consist of field investigations such as, manhole inspections, field surveying, smoke testing, dye water flooding, and CCTV inspection. Phase II is scheduled to begin in the spring of 2009 pending funding. Due to the conditions required to complete some of these tasks, Phase II is scheduled for approximately 18 months.

SCADA Master Plan and Upgrade

CHS is working closely with Dee Brown (Brown Eng) to ensure SCADA effort is accomplished in a timely manner. Prioritization of desired locations is being reviewed with appropriate staff to maximize the impact of the overall effort.

Fairwood Force Main

CHS has this project designed, bid and awaits funding to release contract for implementation. CHS is hoping that this project would qualify for stimulus as it is "shovel-ready", but we were told it would have to go through the normal project review time which could take a year, thus rendering us unable to capitalize on the funding.

Molly Creek Pump Station

CHS confirmed this project is ~85% complete. The project is expected to enable more efficient operation of the collection system and provide much needed assistance in reducing/eliminating overflows.

Hot Springs Creek Pump Installation

CHS is in the process of revamping this pump station. Graver has completed their study and CHS is reviewing data provided to determine path forward for this effort.

Provide explanation of newly reorganized personnel structure – List new positions and responsibilities. CHS has recently made several management changes that directly affect the wastewater division. The most significant change is the splitting of the wastewater maintenance division into two separate divisions – one dedicated to the maintenance of the collection system including piping, manholes and services and the other dedicated to our pump stations which number in the 4500 range including individual grinders. This will allow both divisions to receive individual dedicated management and resources to insure our compliance with the CAO. The Collections Manager has over 18 years of experience and is assigned to oversee the efforts of his division with respect to televising, inspecting and repairing known defects as well as facilitating the efforts of RJN. The Lift Stations Manager has over 28 years of experience and will continue with his previous duties of troubleshooting, maintaining and repairing all of the wastewater pump stations. CHS is evaluating other staff and will reassign personnel to best utilize available skill sets for employees as a part of the overall staff assessment. Personnel are also being cross trained in an effort to better equip the department to address all issues in a more effective manner. Review of existing work processes and methods is under review and employees are being challenged to self assess for areas that will enhance the groups ability to better maintain the collections system.

We trust that these efforts outlined above illustrate the city's commitment to addressing all of the issues mentioned in the CAO. As mentioned before, our efforts began before the CAO was issued in conjunction with changes in management resulting in a renewed focus on eliminating these environmental issues. We appreciate the cooperation from ADEQ in working with us as we move forward.

Please feel free to contact me at (501) 321-6860 or Aaron Stallmann with Garver Engineers at (501) 376-3633 if you have any questions or need additional information.

Sincerely,

CITY OF HOT SPRINGS, ARKANSAS



Steve Mallett, Jr., P.E.
Deputy City Manager for Public Works and Utilities

cc: Aaron Stallman, Garver Engineers
Lance Hudnell, City Manager
Larry Merriman, Utilities Operations Director

C.A.O.

AMERICA

ADEQ

ARKANSAS
Department of Environmental Quality

August 18, 2008

CERTIFIED MAIL 7002 0860 0007 6829 0980

Steve Mallet, Utilities Director
City of Hot Springs
P.O. Box 638
Hot Springs, AR 72104

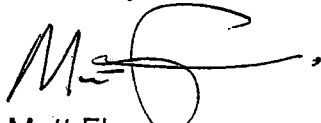
RE: NPDES Permit AR0033880, CAO LIS No. 08-099

Dear Mr. Mallet:

Enclosed is your signed copy of the Consent Administrative Order (Order) that representatives of the City of Hot Springs and ADEQ agreed to at the meeting of June 10, 2008. The Director signed the Order on August 15, 2008. The Order must now be sent for Public Notice. The next scheduled date for ADEQ to send items to Public Notice will be September 10, 2008. The effective date of the Order will be thirty days after Public Notice is formally given. This means that the effective date of the Order will most likely be October 10, 2008. For all document submittals required by this Order, refer to Attachment A: Schedule of Compliance Activities and Attachment B: Schedule of SECAP Projects.

Please refer to NPDES Permit AR0033880 in any written correspondence to this Department. Thank you for your attention to this matter. Should you have any questions, feel free to contact me at 501-682-0635 or you may e-mail me at flowers@adeq.state.ar.us.

Sincerely,



Matt Flowers
Enforcement Administrator
NPDES Enforcement Section

Enclosure

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

IN THE MATTER OF:

CITY OF HOT SPRINGS
GARLAND COUNTY

LIS. NO. 08-099
AFIN 26-00145

CONSENT ADMINISTRATIVE ORDER

This Consent Administrative Order (hereinafter "Order") is issued pursuant to the authority of the Arkansas Water and Air Pollution Control Act (Act 472 of 1949, as amended; Ark. Code Ann. §8-4-101 et seq.) and the regulations issued thereunder (hereinafter collectively referred to as "the Act").

Pursuant to the authority of Ark. Code Ann. §8-4-207(1)(B), the Director for the Arkansas Department of Environmental Quality (hereinafter ADEQ) is authorized to set schedules of compliance for facilities permitted under the Act necessary to assure compliance with both applicable state and federal effluent limitations, including, but not limited to, those mandated by the National Pollutant Discharge Elimination System Program (hereinafter "NPDES") under section 402 of the Federal Water Pollution Control Act, 33 U.S.C. §1342 as well as under sections 301, 318, and 405 of the Federal Water Pollution Control Act, 33 U.S.C. §1311, 33 U.S.C. §1328 and 33 U.S.C. §1345; and Arkansas Pollution Control and Ecology Commission Regulations 2, 6, 7 & 8.

The issues herein having been settled by the agreement of the City of Hot Springs (hereinafter the "Permittee") and ADEQ, it is hereby agreed and stipulated that the following **FINDINGS OF FACT** and **ORDER AND AGREEMENT** be entered herein.

FINDINGS OF FACT

1. The City of Hot Springs operates a municipal wastewater utility in Garland County, Arkansas.
2. The City of Hot Springs operates and maintains a sanitary sewer system that includes two wastewater treatment plants, a collection system, 4150 pump stations, and related appurtenances pursuant to Arkansas NPDES Permit Numbers AR0033880 and AR0050148, issued by ADEQ.
3. The City of Hot Springs has been actively improving its collection system management and operation and maintenance practices. The City of Hot Springs has constructed collection system rehabilitation projects totaling over \$13,442,587.
4. Despite these efforts, the City of Hot Springs continues to experience wet weather sanitary sewer overflows (SSOs) during heavy rains. There were 359 SSOs beginning in January 2004 through May 2008. The City of Hot Springs is in the initial phases of developing a Sewer Evaluation and Capacity Assurance Plan.
5. Violations of the effluent characteristic limits in Part I, Section A of permit AR0033880 for outfall number 001, as found in Discharge Monitoring Reports ("DMRs") submitted by the Permittee to ADEQ since January 2007, are as follows:

Outfall	Date	Parameter	Reported	Permitted
001	Jan 2007	TSS (Mo.Avg.)	2681 lbs/dy	1500 lbs/dy
001	Jan 2007	TSS (Mo.Avg.)	17.58 mg/l	15 mg/l
001	Jan 2007	TSS (7-Dy.Avg.)	31.20 mg/l	23 mg/l
001	May 2007	pH (Min.)	5.90 s.u.	6 s.u.
001	Feb 2008	DO (Mo.Avg.Min.)	Overdue	2.0 mg/l
001	Feb 2008	Phosphorus (Mo.Avg.)	Overdue	150.0 lbs/dy

Outfall	Date	Parameter	Reported	Permitted
001	Feb 2008	Phosphorus (Mo.Avg.)	Overdue	Report mg/l
001	Feb 2008	Phosphorus (Mo.Avg.)	Overdue	Report mg/l
001	Mar 2008	DO (Mo.Avg.Min.)	Overdue	2.0 mg/l
001	Mar 2008	Phosphorus (Mo.Avg.)	Overdue	150.0 lbs/dy
001	Mar 2008	Phosphorus (Mo.Avg.)	Overdue	Report mg/l
001	Mar 2008	Phosphorus (Mo.Avg.)	Overdue	Report mg/l
001	Apr 2008	TSS (Mo.Avg.)	2019 lbs/dy	1500.0 lbs/dy
001	Apr 2008	CBOD5 (Mo.Avg.)	1090 lbs/dy	1000.0 lbs/dy

ORDER AND AGREEMENT

In order to further document the actions the City of Hot Springs is taking to comply with its NPDES Permits, and to ensure that the City of Hot Springs actions are fully consistent with the "proper operation and maintenance" clause of the NPDES permits, ADEQ and the City of Hot Springs agree to the following:

I. General Requirements

1. The City of Hot Springs shall develop a collection system management program capable of allowing the City of Hot Springs to comply with and maintain the following general standards:

- a. Properly manage, operate and maintain, at all times, all parts of the collection system that the City of Hot Springs owns or retains operational control of;
- b. Provide adequate capacity to convey base flows and peak flows in accordance with the System Evaluation and Capacity Assurance Plan

(SECAP), to be submitted and approved by the Department, for all parts of the collection system over which the City of Hot Springs retains operational control or owns, and take all feasible steps to stop and mitigate the impact of non-wet weather related sanitary sewer overflows in portions of the collection system over which the City of Hot Springs retains operational control or owns;

- c. Provide notification to parties with a reasonable potential for exposure to pollutants associated with an overflow event.

The overall goal of these requirements is the elimination of capacity and noncapacity related sanitary sewer overflows and to ensure the City of Hot Springs shall at all times properly operate and maintain all facilities and systems of treatment and control, which are installed or used by the City of Hot Springs to achieve compliance with Part II, Section B, Paragraph 1 of the NPDES Permit.

2. Develop and submit a written summary of the collection system management program in accordance with the Schedule of Compliance Activities (Attachment A). This summary will be made available to any member of the public upon request.

3. Within ninety (90) days of the date of a request by ADEQ, the City of Hot Springs shall provide documentation to ADEQ personnel confirming compliance with specific program requirements, and if not in compliance, a written explanation of why compliance cannot be achieved.

II. Management/Administrative Requirements

1. Identify with specificity the major goals of the collection system management program, consistent with the general standards identified above.

2. Identify the management/administrative personnel responsible for implementing the collection system management program, including lines of authority by organizational chart or similar document.
3. Identify the chain of communication for reporting SSOs, beginning with receipt of a complaint or other information, and concluding with the person responsible for reporting to the NPDES authority.
4. Submit documentation identifying the City of Hot Springs authority to:
 - A. Control private inflow sources;
 - B. Require that sewers and connections be properly designed and constructed;
 - C. Ensure proper installation, testing, and inspection of new and rehabilitated sewers (such collector sewers and service laterals);
 - D. Address flows from satellite municipal collection systems; and
 - E. Implement the general and specific prohibitions of the national pretreatment program which the City of Hot Springs is subject to under 40 CFR § 403.5.

III. Measures and Activities

In accordance with the Schedule of Compliance Activities (Attachment A):

The City of Hot Springs collection system management program shall provide ADEQ with a list which identifies the individuals, or positions within its organization, responsible for the elements listed below:

1. Lift station operation and maintenance;

2. Geographic Information System, a geo-based inventory of collection system assets and associated databases that supports system mapping and other utility operations;
3. Maintenance procedures that insure managers and supervisors are provided timely, relevant information from field personnel in order to establish and prioritize collections system activities (such as the immediate elimination of dry weather overflows or overflows into sensitive waters based upon consideration of factors, including: public drinking water supplies and their source waters, swimming beaches and waters where swimming occurs, shellfish beds, designated Outstanding National Resource Waters, National Marine Sanctuaries, waters within federal, state or local parks, and water containing threatened or endangered species or their habitat);
4. Computerized Maintenance Management System, an asset information and work management software used to schedule and track all work performed on collection system, lift station, and wastewater treatment plant (WWTP) assets.
5. Collection system preventive maintenance activities;
6. Assessment of the current capacity of the collection system and treatment facilities which the City of Hot Springs owns or has operational control of;
7. Identification and prioritization of structural deficiencies and the short-term rehabilitation actions to address each deficiency;
8. Collection system employee training;
9. Equipment and replacement parts inventories, including identification of critical replacements parts; and

10. Trap Control Program to abate impact of fats, oil, and grease (FOG) on collection system.

IV. Design and Performance Provisions

The City of Hot Springs shall establish requirements and standards for the installation of new sewers, pumps, and other appurtenances and rehabilitation and repair projects in accordance with the Schedule of Compliance Activities (Attachment A). The requirements must include the specifications and procedures for testing the installation of new sewers, pumps, other appurtenances, and for rehabilitation and repair projects.

V. Monitoring, Measurement, and Program Modifications

The City of Hot Springs shall:

1. Submit annual reports on the implementation and measurement of the effectiveness of each element of its collection system management program.
2. Update program elements based on monitoring or performance evaluations.
3. Modify the summary of its collection system management program, as appropriate, to keep it updated and accurate.

VI. Sanitary Sewer Overflow Response Plan

In accordance with the Schedule of Compliance Activities (Attachment A), the City of Hot Springs shall develop and implement a Sanitary Sewer Overflow Response Plan that identifies measures to protect public health and the environment by including, but not limited to, mechanisms to:

1. Ensure that overflows are appropriately responded to and are immediately dispatched to appropriate personnel for investigation and appropriate response;

2. Ensure appropriate reporting of overflows in accordance with its NPDES Permits requirements;

3. Ensure appropriate notification of overflows to the public, health agencies, and other impacted entities. The City of Hot Springs must identify the public health and other officials who will receive immediate notification of overflows;

4. Ensure that appropriate personnel are aware of, trained on, and follow the plan, including implementing the necessary operational changes to provide emergency operational capacity.

VII. System Evaluation and Capacity Assurance Plan

The City of Hot Springs shall prepare a SECAP in accordance with the Schedule of Compliance Activities (Attachment A), if peak flow conditions are contributing to SSO discharges caused by hydraulic deficiency. The SECAP shall provide:

1. Estimates of peak flows, including flows from SSOs that escape from the system associated with conditions similar to those causing overflow events;

2. Identify hydraulic deficiencies, including components of the system with limiting capacity;

3. Identify the major sources that contribute to the peak flows associated with overflow events;

4. Establish short and long term capacity enhancements to address each hydraulic deficiency including prioritization, alternative analysis, a schedule; and

5. Systematic updates to describe any significant change in proposed actions or the implementation schedule. The plan must also be updated to reflect available information

on the performance of measures that have been implemented. Plan updates should be submitted in accordance with the Schedule to Compliance Activities (Attachment A).

VIII. Construction Activities and Required Compliance Deadlines

1. In order to eliminate dry weather overflows and ensure proper operation and maintenance of all facilities and systems of treatment and control which are installed or used by the City of Hot Springs, efforts have been underway to increase collection system maintenance staff. It is the responsibility of the new staff members to investigate and take corrective action on surcharging collection systems prior to reaching overflow condition. By **January 1, 2011**, the City of Hot Springs shall achieve compliance with the proper operation and maintenance of the wastewater collection system as it applies to dry weather overflows.
2. To eliminate wet weather overflows as referred to in Section I. 1.b and to ensure proper operation and maintenance of all facilities and systems of treatment and control which are installed or used by the City of Hot Springs, the City shall accomplish tasks identified in the SECAP, subject to the plan update provisions of Section VII, item 4. The schedule of activities necessary to obtain compliance with the most recent SECAP updates are provided in the Schedule of SECAP Projects (Attachment B). Notwithstanding periodic updates to the SECAP, the City of Hot Springs shall achieve full compliance with the operation and maintenance of the wastewater collection system, as it applies to capacity related overflows, by **January 1, 2018**.

IX. Program Audits

On an annual basis, the City of Hot Springs shall conduct an audit, appropriate to the size of the system and the number of overflows, and submit a report of such audit in

accordance with the schedule contained in Attachment A of this CAO. The audit shall include, but not be limited to, an evaluation of the collection system management program and its effectiveness in preventing SSOs and achieving compliance with the "proper operation and maintenance" clause of the NPDES permits.

X. Communications

The City of Hot Springs shall communicate at least on an annual basis with ADEQ on the implementation and performance of its collection system management program. The communication system will allow interested parties to provide input to the City of Hot Springs as the collection system management program is developed and implemented.

XI. Administration and Penalties

1. All submittals required by this Order, including compliance schedules, are subject to approval by ADEQ. In the event of any deficiency, the City of Hot Springs shall, within thirty (30) days of notification by ADEQ, submit any additional information requested. Failure to adequately respond to the notice of deficiency within thirty (30) days constitutes a failure to meet a deadline and is subject to the civil penalties established in paragraph 2 below.

2. Failure to meet the requirements, deadlines, or the approved schedules of this Order or failure to meet the goals of the SECAP provided for herein constitutes a violation of said Order. If the City of Hot Springs should fail to meet any such requirement or deadline, the City of Hot Springs consents and agrees to pay to ADEQ civil penalties according to the following schedule:

- | | | |
|----|---|------------------|
| A. | First day through the tenth day: | \$100.00 per day |
| B. | Eleventh day through the twentieth day: | \$200.00 per day |

- | | | |
|----|---|------------------|
| C. | Twenty-first day through thirtieth day: | \$300.00 per day |
| D. | Each day beyond the thirtieth day: | \$500.00 per day |

These stipulated penalties may be imposed for delay in performance and shall be in addition to any other remedies or sanctions which may be available to ADEQ by reason of the City of Hot Springs's failure to comply with the requirements of this CAO. ADEQ reserves the right to collect other penalties and fines pursuant to its enforcement authority in lieu of the stipulated penalties set forth above.

3. If any event occurs which causes or may cause delay in the achievement of compliance by the City of Hot Springs with the requirements or deadlines of this Order, the City of Hot Springs shall so notify ADEQ in writing, as soon as reasonably possible after it is apparent that delay will result, but in no case after the due dates specified in the schedules above. The notification shall describe in detail the anticipated length of the delay, the precise cause of the delay, the measures being taken and to be taken to minimize the delay, and the timetable by which those measures will be implemented.

4. ADEQ may grant an extension of any provision of this Order, provided that the City of Hot Springs requests such an extension in writing and provided that the delay is caused by circumstances beyond the control of the City of Hot Springs, or otherwise reasonably justified. The time for performance may be extended for a reasonable period but in no event longer than the period of delay resulting from such circumstances. The burden of proving that the delay is caused by circumstances beyond the control of the City of Hot Springs and the length of the delay attributable to such circumstances shall rest with the

City of Hot Springs. Failure to notify ADEQ promptly, as provided in paragraph 3, shall be grounds for denial of an extension.

5. This CAO is subject to public review and comment in accordance with A.C.A. 8-4-103(d), however this CAO is effective immediately upon signature of the Director. ADEQ retains the right and discretion to rescind this CAO based upon comments received during the thirty (30) day comment period.

6. As provided by Arkansas Pollution Control and Ecology Commission Regulation 8, this matter is subject to being reopened upon Commission initiative or in the event a petition to set aside this Order is granted by the Commission.

7. Nothing contained herein shall relieve the City of Hot Springs of any obligation imposed by any other applicable local, state, or federal laws, nor, except as specifically provided herein, shall this CAO be deemed in anyway to relieve the City of Hot Springs of responsibilities contained in its permit.

8. Nothing in the CAO shall be construed as a waiver by ADEQ of its enforcement authority over alleged violations not specifically addressed herein. Also this CAO does not exonerate the City of Hot Springs from any past, present, or future conduct which is not expressly addressed herein, nor does it relieve the City of Hot Springs of the responsibilities for obtaining any necessary permits.

9. Mailing Guidelines: Documentation and reports required to be submitted by this CAO shall be sent by certified mail, to the following addressee:

Arkansas Department of Environmental Quality
Water Division
5301 Northshore Drive
North Little Rock, AR 72118

The City of Hot Springs
Attn: Steve Mallett, Jr., P.E., Public Works Director
P.O. Box 700
Hot Springs National Park, AR 71902

10. Termination: At such time as the City of Hot Springs believes that it has complied with all terms and conditions of this CAO, it may request that ADEQ concur whether the requirements of this CAO have been satisfied. Such request shall be in writing and shall provide the necessary documentation to establish whether there has been full compliance with the terms and conditions of this CAO. ADEQ will respond to said request in writing within 90 days of receipt of the request. This CAO shall terminate when all actions required to be taken by this CAO have been completed, and the City of Hot Springs has been notified by ADEQ in writing that this CAO has been satisfied and terminated.

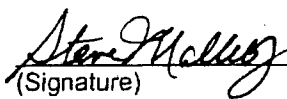
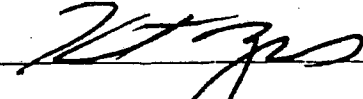
SO ORDERED THE 15th DAY OF August, 2008



Teresa Marks, Director

APPROVED AS TO FORM AND CONTENT:

BY:

STEPHEN MALLET, JR.
(Typed or printed name)

KENT MYERS

TITLE: PUBLIC WORKS DIRECTOR
(Typed or printed title)

CITY MANAGER

DATE: 8/7/08

Attachment A: Schedule of Compliance Activities

All submittals required by this attachment to the Order are subject to review and approval as provided for in Part XI, paragraph 1 of this Order. Within 90 days of the execution of the CAO by the Directors of ADEQ, the City of Hot Springs shall:

- I. 1. Develop and submit a collection system management program as provided under item 2 in the *General Requirements*.
2. Submit Major Goals of the collection system management program as required under Item 1 of the *Management/Administrative Requirements*. The Major Goals shall include a schedule for the implementation and achievement of the goals.
3. Submit organization chart listing management personnel responsible for various elements of the collection system program and lines of authority.
4. Submit copies of documents that provide the City of Hot Springs the legal authority to comply with Item 4 of the *Management/Administrative Requirements*.
5. Provide more detailed description of each element of the Collection System Management Program listed under *Measures and Activities*, and a list of specific individuals or positions responsible for each element.
6. Develop and submit standard specifications for the installation and testing of new sewers, pumps, and other appurtenances.
7. Develop and submit standard specifications outlining requirements for the rehabilitation and repair projects.
8. Develop and submit a Sanitary Sewer Overflow Response Plan.

9. Develop and submit a System Evaluation and Capacity Assurance Plan (SECAP). Any construction projects or improvements required by the SECAP shall include a schedule for construction and implementation of the improvements.

On or before February 28th every calendar year the City of Hot Springs shall:

II. 1. Submit to ADEQ an annual report on the implementation and effectiveness of each element of its collection system management program as required by Item 1 of Monitoring, Measurement, and Program Modifications;

2. Submit to ADEQ the most recent update of the City of Hot Spring's SECAP, a status report on specific improvements identified in the plan, and a summary of any proposed changes to the content of the SECAP; and

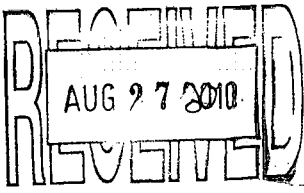
3. Submit an audit report to ADEQ evaluating the effectiveness of the City of Hot Springs collection system management program in achieving compliance and preventing SSOs.

Attachment B: Schedule of SECAP Projects

The dates contained in this schedule are subject to SECAP updates, and generally represent initiation of engineering planning and design work through construction completion.

HAND DELIVERED

August 2010



City of Hot Springs



**Sewer Evaluation and
Capacity Assurance Plan
Update**

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Visual Pipe Inspection Report
Smoke Testing Report
Dyed Water Flooding Report
I/I Status Reports
Wet-Weather Hydrographs
Pump Station Inspection Reports

INTRODUCTION

This SECAP update presents the results thus far of the ongoing condition assessment of the Hot Springs sanitary sewer system and the outline for the Sewer Evaluation and Capacity Assurance Plan (SECAP).

OBJECTIVE

The overall objectives of the SECAP study include, but are not limited to:

- Evaluate all components of the sanitary sewer system and document the condition of each. This includes condition assessment for manholes, gravity sewer mains, and lift stations.
- Develop a hydraulic model of the trunk system and pertinent collection lines
- Utilize the model to identify existing capacity deficiencies and capacity requirements.
- Provide recommendations for potential inflow/infiltration reduction measures.
- Provide recommendations for upgrading of existing lift stations to handle capacity requirements or condition repairs.

CONDITION ASSESSMENT

The City of Hot Springs completed the first phase of the condition assessment in the spring of 2009. This initial phase involved temporary flow monitoring conducted by RJN Group. RJN installed 65 gravity flow meters and 15 rain gauges throughout the sanitary sewer collection system. The objective of this phase was to provide the City of Hot Springs with dry and wet weather sewer flows for model calibration and to isolate the City into 65 basins in order to identify which areas of the system were contributing the highest amounts of inflow and infiltration (I/I).

The second phase which is currently underway encompassed two main components. The first was a complete sanitary sewer evaluation study (SSES) of the system conducted by RJN Group. This involved physically inspecting all of the roughly 12,000 manholes throughout the City, smoke testing 1.8 million of 2.1 million feet of sewer, resultant dye testing to quantify the amount of I/I, closed circuit television inspection (CCTV) of sewer lines identified to be susceptible to both I/I and structural defects, global positioning of all 12,000 manholes, and the development and calibration of a dynamic hydraulic model of the sanitary sewer system. The second component, conducted by Garver Engineers, is a full evaluation of all major lift stations within the City with accompanying reports outlining the condition and hydraulic components of those stations.

CAPACITY ASSURANCE

A fully dynamic hydraulic model is currently being constructed to simulate operation for the sanitary sewer collection system of Hot Springs. The model will be calibrated to both dry and wet weather flow conditions using the flow monitoring data that was recorded in 2009. The model will be used to identify hydraulic capacity restraints and deficiencies during the design wet weather storm.

The hydraulic models will include the major pump stations and associated force mains and gravity lines 10 inches in diameter and larger as well as critical 8 and 6 lines that lead to reported overflows or are acting as an interceptor. All pump station wet wells, controls, and pump curves will be included in analyzing the lift stations in the model. As-builts of existing lift stations will be verified as well as the lift station reports generated by Garver Engineers for inclusion to the model.

After the model is calibrated using the 65 temporary flow meters model results will be compared to meter data, and model parameters such as per capita flows, diurnal patterns, groundwater infiltration, runoff routing, and pump curves to assist with the accuracy of the model. The calibration will be verified by comparing model predicted overflows to reported historical overflows.

The objective of the calibrated model will be to predict flow conditions during the design storm and provide Hot Springs with a tool to identify capacity improvements that would eliminate hydraulic choke points. Alternative solutions will be analyzed and input into the model to address the system deficiencies. These alternative solutions, such as paralleling existing sewers, upsizing undersized sewers, upgrading capacity for existing pumping and possible storage for wet weather flows will be input into the model and analyzed to verify the solution integrity.

FLOW ANALYSIS

RJN Group, Inc. was retained by the City of Hot Springs, AR to perform a city-wide flow monitoring program during the spring of 2009. A total of sixty-five meters were used to monitor wastewater flow in the City of Hot Springs. Of the sixty-five meters, fifty-five (55) meters were Sigma meters and ten (10) were ADS Flowshark meters. The flow monitoring locations are given in Table 2-A. Wastewater flows were monitored from February 6, 2009 to April 14, 2009 for a period of 67 days. During the flow monitoring period, it was determined that the meters should stay in the system for an additional week in order to gather sufficient rainfall data required to do analysis. During this extra week several good rain events occurred that aided in the process. Data analysis was performed on all data collected through April 14, 2009. Fifteen rain gauges were also installed to determine the amount of rainfall that occurred during these periods. Rain gauge locations, recorded totals, and intensities are listed in Table 2-B.

Engineering review and input of additional calibration data were performed in order to finalize the flow data collected in the field. Manual depth and velocity readings (velocity profiles) were taken on a weekly basis to verify the metered data. Average flow rates for one hour intervals were determined for each monitoring location. The hourly, average flow rates were used to determine daily dry-weather and wet-weather flow rates. Flow data collected during rainfall events was evaluated to determine peak instantaneous inflow rates.

DETERMINATION OF AVERAGE DAILY DRY-WEATHER FLOW

Flow data collected during dry-weather/low-groundwater periods was analyzed to determine the average daily dry-weather flow for each of the sixty-five (65) basins. The dry-weather period for this analysis was from March 3, 2009 through March 9, 2009 and was selected because it is the only week no measurable rainfall was recorded. The analysis determined that the average daily dry-weather flow during the monitoring period was approximately 9.462 mgd.

A summary of average daily dry-weather flow by basin is given in Table 2-C on page 12 and is shown graphically on page 14. Hydrographs of the dry-weather flow overlaid with wet-weather periods for each basin and are included in the CD labeled Sanitary Sewer Inspection.

Table 2-A

**FLOW METER LOCATIONS
CITY OF HOT SPRINGS, ARKANSAS**

Meter/Basin Number	Location	Manhole ID	Pipe Diameter (in)
01	2136 Airport Road	11927	8
02	3035 Marion Anderson	9300	8
03	1760 Marion Anderson	9271	10
04	Mid American Blvd and Mountain Pine Road	1604	12
05	NW of where Chuck Lane ends	9544	10
06	3060 Albert Pike	9524	15
08	Thornton Ferry and Albert Pike	9456	12
09	148 Lonbeach Drive	10299	10
10	133 Echo Valley Road	10273	10
11	Behind pump station on Aberina Street	8171	24
12	247 Scroggins	8698	10
13	196 Streetar	8569	18
14	Gorge Road and Gulpha Gorge Campground	3309	12
15	Central Avenue and Whittington Avenue	2553	15
16	745 Park Avenue	3514	10
17	Central Avenue and Fountain Street	651	12
18	Spring Street and Vernel Street	4013	10
19	314 Cottrell Avenue	3097	12
20	675 Vernel	4106	21
21	2200 Spring Street	4283	21
22	2214 Spring Street	4141	12
23	723 Bellaire Street	4561	12
24	Millbranch Court	1769	12
25	920 Ridgeway Street	1753	15
26	Guy Street & Ridgeway Street	1713	22
27	N of 494 Whispering Hills Street	1719	21
28	SE of 198 Ravenwood Place	1726	24
29	2708 Malvern Avenue	5086	15
30	2820 Malvern Avenue	4872	15
31	100 Chase Place	939	24
32	106 W Grand Avenue	2497	24
33	300 Valley Street	300	24
34	167 Shady Grove Road	1302	27
35	167 Shady Grove Road	1135	18
36	310 Pond Street	2307	10
37	106 Flag Street	11529	12
38	207 Patriot	971	15
39	101 Leeper	963	12
40	205 Lexington	1789	10
41	SE of 180 Talmadge Place	983	15

Table 2-A (Cont.)

**FLOW METER LOCATIONS
CITY OF HOT SPRINGS, ARKANSAS**

Meter/Basin Number	Location	Manhole ID	Pipe Diameter (in)
42	Shady Grove Road and Services Lane	163	27
43	Adams Street & Chelsea Street	1004	30
44	775 Adams Street	1898	27
45	798 Adams	1899	12
46	McLeod & Leonard	6535	12
47	221 Foxwood	8001	24
48	198 Sonora Street	7969	12
49A	E of 124 Forest View Court	1863	36
49B	124 Forest View Court	3729	8
50	S of 646 Golf Links Road	1912	24
51	E of Approx 3672 Central Avenue	2756	12
53	846 Carpenter Dam Road	5260	10
54	618 Davidson	1673	48
56A	317 Oak Shores Circle	11653	8
56B	S of Intersection of Carpenter Dam Road & Peninsula Drive	9049	10
57	318 Davidson	962	30
58	1340 Higdon Ferry	1872	24
59A	221 Paradise Point	12768	8
59B	426 Springwood Road	11968	8
60	Lake Shore Drive & Airport Road	7035	12
61	135 John Owens	7006	18
62	178 Pond Street	1254	24
63	320 Highline	7133	12
64	594 Streetover Street	7123	15
65	139 Donnie Court	7178	8

Table 2-B

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 1 Double B Stables 188 Lemay Place		Rain Gauge No. 2 Pump Station 107 Dodson Terrace		Rain Gauge No. 3 Shell Gas Station 2070 Airport Road		Rain Gauge No. 4 Walker's Marine Service 478 Amity Road	
	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)
February 09	0.52	0.16	0.56	0.16	<u>1/</u>	<u>1/</u>	0.57	0.11
10	0.72	0.24	0.68	0.21	<u>1/</u>	<u>1/</u>	1.43	0.61
11	1.04	0.99	0.60	0.56	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
17	0.10	0.04	0.11	0.03	0.11	0.03	0.10	0.03
18	<u>1/</u>	<u>1/</u>	0.10	0.10	0.01	0.01	0.01	0.01
21	0.22	0.16	0.16	0.12	0.12	0.09	0.15	0.10
26	0.23	0.23	0.03	0.03	0.03	0.03	0.04	0.04
27	1.04	0.08	0.58	0.29	0.35	0.22	0.32	0.18
28	0.01	0.01	0.01	0.01	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
March 8	<u>1/</u>	<u>1/</u>	0.01	0.01	0.01	0.01	0.01	0.01
10	0.02	0.02	<u>1/</u>	<u>1/</u>	0.02	0.02	<u>1/</u>	<u>1/</u>
11	1.40	0.35	<u>1/</u>	0.23	0.69	0.16	0.69	0.27
12	0.75	0.11	0.88	0.10	0.81	0.11	0.76	0.09
13	0.31	0.09	0.30	0.09	0.28	0.09	0.29	0.09
14	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
17	0.01	0.01	<u>1/</u>	<u>1/</u>	0.01	0.01	<u>1/</u>	<u>1/</u>
19	0.05	0.04	0.05	0.04	0.04	0.04	0.05	0.05
24	1.03	0.87	0.91	0.38	1.05	0.73	0.96	0.75

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-B (Cont.)

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 1 Double B Stables 188 Lemay Place		Rain Gauge No. 2 Pump Station 107 Dodson Terrace		Rain Gauge No. 3 Shell Gas Station 2070 Airport Road		Rain Gauge No. 4 Walker's Marine Service 478 Amity Road	
	Total	Peak 60-Minute	Total	Peak 60-Minute	Total	Peak 60-Minute	Total	Peak 60-Minute
	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)
March 25	0.61	0.29	0.69	0.23	0.59	0.29	0.57	0.26
26	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.01	0.01	0.01	0.01
27	1.10	0.91	1.25	0.37	1.62	1.12	1.22	0.71
28	0.56	0.48	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
31	0.42	0.21	0.20	0.10	0.49	0.29	0.46	0.26
April 2	0.82	0.41	1.00	0.25	0.77	0.22	0.91	0.41
05	0.02	0.02	0.01	0.01	0.02	0.02	<u>1/</u>	<u>1/</u>
09	0.22	0.22	0.20	0.19	0.20	0.20	0.33	0.33
12	2.06	0.74	1.91	0.45	1.98	0.76	2.08	0.85
13	<u>0.08</u>	0.05	<u>0.07</u>	0.03	<u>0.10</u>	0.09	<u>0.13</u>	0.09
Total	13.34		11.22		9.31		11.09	

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-B (Cont.)

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 5 Golden's Paint and Body 109 Airway Road		Rain Gauge No. 6 Terminix International Co. 215 Twin Points Road		Rain Gauge No. 7 Lift Station Beachview Cir & Fish Hatchery Road		Rain Gauge No. 8 ABI Building 911 West Grand	
	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)
	February 09	0.60	0.14	0.60	0.14	0.36	0.16	0.71
10	0.29	0.13	0.26	0.18	0.23	0.10	1.88	0.70
11	1.26	0.51	1.42	0.76	0.42	0.24	<u>1/</u>	<u>1/</u>
17	0.15	0.04	0.13	0.03	0.13	0.03	0.15	0.04
18	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.01	0.01	<u>1/</u>	<u>1/</u>
21	0.15	0.11	0.12	0.07	0.14	0.10	0.16	0.12
26	0.02	0.02	0.02	0.02	<u>1/</u>	<u>1/</u>	0.03	0.02
27	0.49	0.25	0.31	0.17	0.24	0.09	0.51	0.20
28	0.01	0.01	0.01	0.01	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
March 8	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.04	0.03	0.01	0.01
10	0.02	0.02	<u>1/</u>	<u>1/</u>	0.02	0.02	<u>1/</u>	<u>1/</u>
11	0.91	0.26	0.78	0.27	0.71	0.21	0.97	0.27
12	0.84	0.11	0.85	0.11	0.76	0.10	0.87	0.11
13	0.30	0.10	0.30	0.10	0.30	0.09	<u>1/</u>	<u>1/</u>
14	0.01	0.01	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
17	0.01	0.01	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
19	0.05	0.04	0.04	0.04	0.05	0.05	<u>1/</u>	<u>1/</u>
24	1.09	0.79	1.15	0.93	1.18	0.83	1.18	0.88

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-B (Cont.)

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 5 Golden's Paint and Body 109 Airway Road		Rain Gauge No. 6 Terminix International Co. 215 Twin Points Road		Rain Gauge No. 7 Lift Station Beachview Cir & Fish Hatchery Road		Rain Gauge No. 8 ABI Building 911 West Grand	
	Total	Peak 60-Minute	Total	Peak 60-Minute	Total	Peak 60-Minute	Total	Peak 60-Minute
	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)
March 25	0.63	0.27	0.62	0.29	0.61	0.29	0.66	0.35
26	<u>1/</u>	<u>1/</u>	0.01	0.01	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
27	1.81	1.07	1.45	0.77	1.29	0.64	1.80	0.20
28	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
31	0.46	0.23	0.54	0.33	0.47	0.24	0.45	0.20
April 2	1.34	0.42	1.08	0.49	1.01	0.39	1.44	0.51
05	0.02	0.01	0.01	0.01	<u>1/</u>	<u>1/</u>	0.02	0.02
09	0.20	0.20	0.21	0.21	0.20	0.20	0.11	0.11
12	2.19	0.97	2.08	0.86	1.84	0.88	2.14	0.88
13	<u>0.10</u>	0.08	<u>0.13</u>	0.08	<u>0.17</u>	0.14	<u>0.08</u>	0.07
Total	12.95		12.13		10.18		13.20	

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-B (Cont.)

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 9 AA Storage World 415 Golf Links Road		Rain Gauge No. 10 Entergy 1398 Carpenter Dam Road		Rain Gauge No. 11 Belvedere Country Club 257 Belvedere Drive		Rain Gauge No. 12 Morning Star Fire Dept Station 1 232 Westinghouse Drive	
	Total Daily Rainfall	Peak 60-Minute Rainfall Intensity	Total Daily Rainfall	Peak 60-Minute Rainfall Intensity	Total Daily Rainfall	Peak 60-Minute Rainfall Intensity	Total Daily Rainfall	Peak 60-Minute Rainfall Intensity
	(in)	(in/hr)	(in)	(in/hr)	(in)	(in/hr)	(in)	(in/hr)
February 09	0.60	0.17	<u>2/</u>	<u>2/</u>	0.60	0.13	0.67	0.19
10	1.30	0.80	<u>2/</u>	<u>2/</u>	0.80	0.18	0.28	0.09
11	<u>1/</u>	<u>1/</u>	<u>2/</u>	<u>2/</u>	0.88	0.72	0.69	0.41
17	0.12	0.02	0.14	0.03	0.14	0.05	0.10	0.02
18	<u>1/</u>	<u>1/</u>	0.01	0.01	<u>1/</u>	<u>1/</u>	0.01	0.01
21	0.11	0.08	0.10	0.07	0.20	0.14	0.12	0.09
26	0.02	0.02	0.01	0.01	0.32	0.32	0.03	0.03
27	0.45	0.16	0.45	0.30	1.10	0.86	0.50	0.20
28	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.01	0.01	0.02	0.01
March 8	<u>1/</u>	<u>1/</u>	0.01	0.01	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
10	<u>1/</u>	<u>1/</u>	0.02	0.01	0.07	0.07	<u>1/</u>	<u>1/</u>
11	0.64	0.24	0.64	0.25	0.94	0.34	0.56	0.21
12	0.76	0.10	0.71	0.10	0.84	0.11	0.66	0.10
13	0.28	0.08	0.29	0.09	0.29	0.09	0.26	0.08
14	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
17	0.01	0.01	<u>1/</u>	<u>1/</u>	0.01	0.01	0.01	0.01
19	0.04	0.03	0.05	0.03	0.07	0.07	0.03	0.03
24	0.95	0.73	1.01	0.74	1.28	0.94	0.98	0.79

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-B (Cont.)

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 9 AA Storage World 415 Golf Links Road		Rain Gauge No. 10 Entergy 1398 Carpenter Dam Road		Rain Gauge No. 11 Belvedere Country Club 257 Belvedere Drive		Rain Gauge No. 12 Morning Star Fire Dept Station 1 232 Westinghouse Drive	
	Total	Peak 60-Minute	Total	Peak 60-Minute	Total	Peak 60-Minute	Total	Peak 60-Minute
	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)	Daily Rainfall (in)	Rainfall Intensity (in/hr)
March 25	0.57	0.30	0.55	0.24	0.59	0.29	0.56	0.26
26	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
27	1.11	0.56	1.24	0.69	0.94	0.69	0.74	0.50
28	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.32	0.14	0.27	0.11
31	0.44	0.22	0.45	0.22	0.49	0.26	0.42	0.24
April 2	1.19	0.52	0.79	0.32	1.15	0.36	1.22	0.60
05	0.01	0.01	<u>1/</u>	<u>1/</u>	0.02	0.02	0.02	0.02
09	0.15	0.15	0.34	0.34	0.09	0.09	0.10	0.10
12	1.78	0.77	1.85	0.84	1.96	0.70	1.76	0.77
13	<u>0.13</u>	0.08	<u>0.13</u>	0.10	<u>0.04</u>	0.04	<u>0.11</u>	0.07
Total	10.67		8.80		13.16		10.13	

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-B (Cont.)

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 13 Affiliated Engineers 800 Ridgeway Street		Rain Gauge No. 14 Morning Star Fire Dept Station 4 1764 Shady Grove Road		Rain Gauge No. 15 Buddy Bean Lumber Co. 3900 Malvern Avenue	
	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)
February 09	0.67	0.19	0.72	0.19	0.62	0.19
10	0.26	0.05	0.26	0.07	1.01	0.28
11	0.69	0.43	0.68	0.10	<u>1/</u>	<u>1/</u>
17	0.12	0.02	0.16	0.04	0.11	0.02
18	0.01	0.01	0.02	0.01	<u>1/</u>	<u>1/</u>
21	0.15	0.10	0.12	0.06	0.10	0.07
26	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
27	0.34	0.16	0.18	0.04	0.50	0.19
28	0.18	0.17	0.10	0.01	0.01	<u>1/</u>
March 8	<u>1/</u>	<u>1/</u>	0.02	0.02	0.01	0.01
10	<u>1/</u>	<u>1/</u>	0.02	0.02	0.01	0.01
11	0.65	0.23	0.68	0.10	0.62	0.18
12	0.77	0.10	0.37	0.02	0.62	0.09
13	0.29	0.08	0.16	0.01	0.29	0.08
14	<u>1/</u>	<u>1/</u>	0.15	0.01	<u>1/</u>	<u>1/</u>
17	0.01	0.01	0.02	0.01	<u>1/</u>	<u>1/</u>
19	0.04	0.04	0.01	0.01	0.04	0.03
24	0.93	0.74	<u>2/</u>	<u>2/</u>	1.11	0.78

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-B (Cont.)

**RAIN GAUGE LOCATIONS AND RAINFALL SUMMARY
HOT SPRINGS, ARKANSAS**

Date (2009)	Rain Gauge No. 13 Affiliated Engineers 800 Ridgeway Street		Rain Gauge No. 14 Morning Star Fire Dept Station 4 1764 Shady Grove Road		Rain Gauge No. 15 Buddy Bean Lumber Co. 3900 Malvern Avenue	
	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)	Total Daily Rainfall (in)	Peak 60-Minute Rainfall Intensity (in/hr)
March 25	0.57	0.24	<u>2/</u>	<u>2/</u>	0.57	0.24
26	0.01	0.01	<u>2/</u>	<u>2/</u>	0.01	0.01
27	0.85	0.59	<u>2/</u>	<u>2/</u>	0.87	0.58
28	0.27	0.14	<u>2/</u>	<u>2/</u>	0.31	0.01
31	0.46	0.24	0.02	0.01	0.42	0.19
April 2	1.18	0.65	0.02	0.01	0.62	0.29
05	0.03	0.03	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
09	0.12	0.12	0.31	0.31	0.40	0.40
12	1.77	0.91	2.21	0.76	2.00	0.75
13	<u>0.12</u>	0.04	<u>0.13</u>	0.03	<u>0.12</u>	0.09
Total	10.49		6.36		10.37	

1/ No rainfall recorded.

2/ Rain gauge malfunctioned.

Table 2-C

**AVERAGE DAILY DRY-WEATHER FLOW
CITY OF HOT SPRINGS, ARKANSAS**

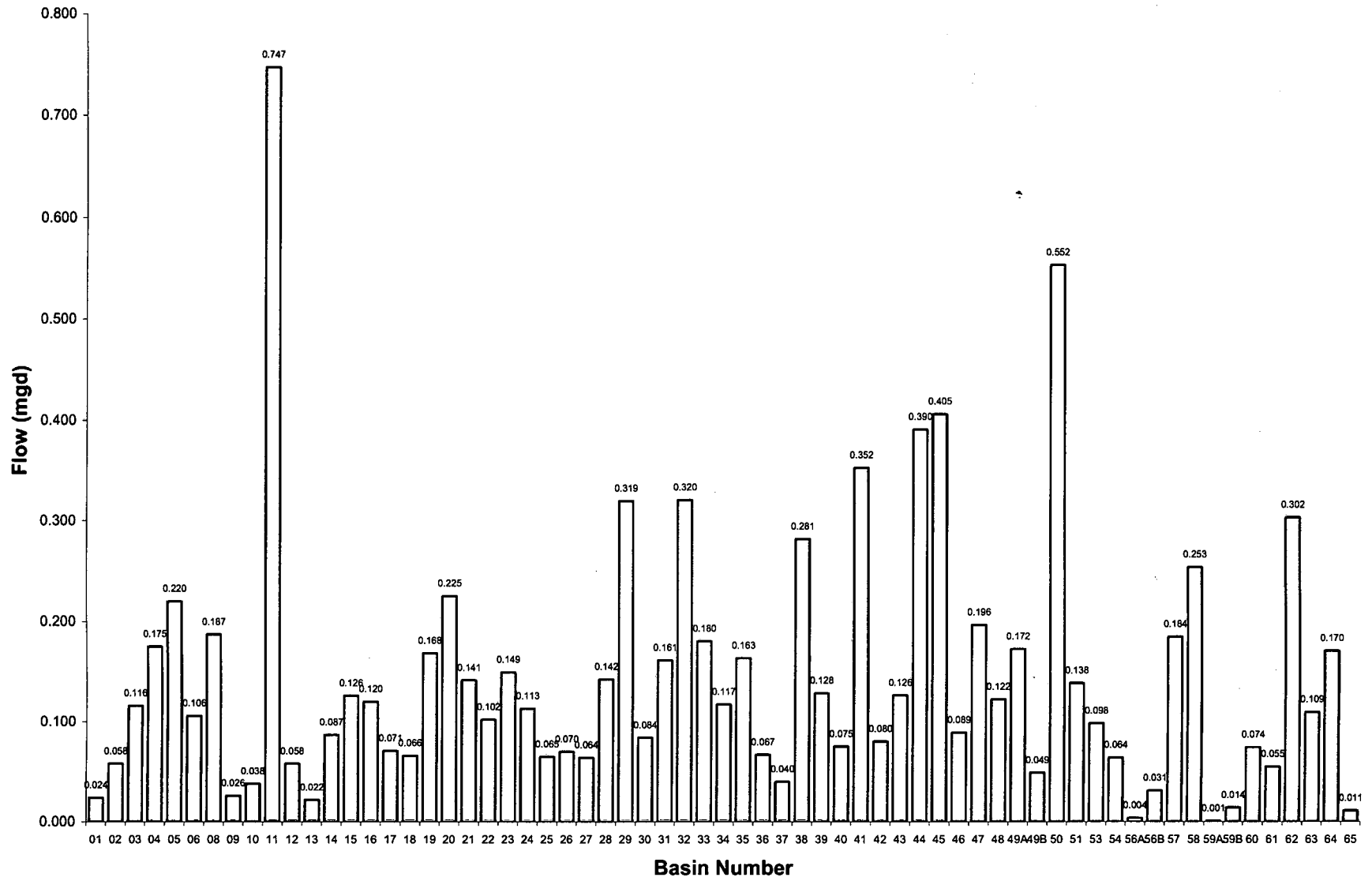
Meter Basin	Cumulative Average Daily Dry-Weather Flow (mgd)	Basin Average Daily Dry-Weather Flow (mgd)
<u>Southwest WWTP</u>		
01	0.039	0.024
02	0.058	0.058
03	0.174	0.116
59A	0.001	0.001
59B	0.014	<u>0.014</u>
Subtotal		0.213
<u>Davidson WWTP</u>		
04	0.175	0.175
05	0.220	0.220
06	0.501	0.106
08	0.187	0.187
09	0.026	0.026
10	0.038	0.038
11	0.811	0.747
12	0.058	0.058
13	0.080	0.022
14	0.087	0.087
15	0.126	0.126
16	0.120	0.120
17	0.191	0.071
18	0.153	0.066
19	0.168	0.168
20	0.546	0.225
21	0.687	0.141
22	0.102	0.102
23	0.149	0.149
24	0.262	0.113
25	0.327	0.065
26	0.859	0.070
27	1.250	0.064
28	1.392	0.142
29	0.319	0.319
30	0.403	0.084
31	2.036	0.161
32	0.637	0.320

Table 2-C (Cont.)

**AVERAGE DAILY DRY-WEATHER FLOW
CITY OF HOT SPRINGS, ARKANSAS**

Meter Basin	Cumulative Average Daily Dry-Weather Flow (mgd)	Basin Average Daily Dry-Weather Flow (mgd)
33	0.817	0.180
34	0.934	0.117
35	1.260	0.163
36	0.067	0.067
37	0.040	0.040
38	0.484	0.281
39	0.203	0.128
40	0.075	0.075
41	0.642	0.352
42	2.274	0.080
43	2.400	0.126
44	2.790	0.390
45	0.405	0.405
46	0.089	0.089
47	0.318	0.196
48	0.122	0.122
49A	5.972	0.172
49B	0.049	0.049
50	2.605	0.552
51	0.138	0.138
53	0.098	0.098
54	9.214	0.064
56A	0.004	0.004
56B	0.031	0.031
57	2.220	0.184
58	1.915	0.253
60	0.074	0.074
61	0.055	0.055
62	1.097	0.302
63	0.109	0.109
64	0.279	0.170
65	0.011	<u>0.011</u>
Subtotal		<u>9.249</u>
Total		9.462

Basin Average Daily Dry-Weather Flow City of Hot Springs, Arkansas



AVERAGE DAILY DRY-WEATHER FLOW PEAKING FACTOR

Wastewater flow during dry-weather periods will vary during the day in response to water consumption. By examining the diurnal curves for each monitored drainage basin, a peaking factor was determined. The peaking factor is the ratio of the peak hourly flow rate and the average daily flow. Peaking factors for the City of Hot Springs varied from 1.19 to 2.99 and are given for each basin in Table 2-D on page 16 and shown graphically on page 18. Basins 56A, 56B, 59A, and 59B should not be considered for the variance in peaking factors due to the rates being greatly impacted by lift stations.

INFILTRATION CONDITIONS

Infiltration may enter the system through pipe joints, sewer line defects (including main sewer lines and building sewer lines), and defective manhole walls, benches, and pipe seals. There are two types of infiltration that can be determined during a study, permanent infiltration and peak infiltration. Permanent infiltration is defined as extraneous flow that enters the sewer system through the ground during periods of dry-weather and low-groundwater. Peak infiltration is defined as the maximum extraneous flow that enters the sanitary sewer system during high-groundwater conditions after the inflow effects of a rain event have ended. Peak infiltration was used to evaluate the effects of infiltration on the sewer system.

DETERMINATION OF PEAK INFILTRATION

Determining peak infiltration requires analysis of the flow data obtained during dry-weather/high-groundwater conditions. Care must be exercised in the analysis to exclude days that are too close to rainfall events. This is necessary to avoid including residual inflow (rainfall induced infiltration) that may lead to an over-estimation of peak infiltration. Generally, periods following significant rainfall, excluding the day immediately following a rain event, are used for determining peak infiltration.

Average dry-weather/high-groundwater flow was determined using hourly flows during high-groundwater periods. Average peak monitored infiltration was determined by subtracting the average dry-weather/low-groundwater flow from the average dry-weather/high-groundwater flow. Peak infiltration during the study period was determined to be 8.323 mgd.

A summary of peak infiltration for each monitored basin is given in Table 2-E on page 19 and shown graphically on page 21. The peak basin unit infiltration rate expressed in gallons per day per inch-diameter-mile (gpd/idm), also given in Table 2-E, is a method of expressing the magnitude of peak infiltration relative to other basins.

Several basins experienced a loss of flow during dry-weather/high-groundwater flow. These basins have been notated in Table 2-E.

Eight basins are above the threshold of 5,000 gpd/idm set by the Environmental Protection Agency (EPA).

Table 2-D

**DRY-WEATHER FLOW PEAKING FACTOR
CITY OF HOT SPRINGS, ARKANSAS**

Meter Basin	Cumulative Average Daily Dry-Weather Flow (mgd)	Peak Hourly Flow Rate (mgd)	Dry-Weather Flow Peaking Factor
Southwest WWTP			
01	0.039	0.079	2.03
02	0.058	0.141	2.43
03	0.174	0.347	1.99
59A	0.001	0.011	11.00
59B	0.014	0.034	2.43
Subtotal			2.15 ^{1/}
			(average)
Davidson WWTP			
04	0.175	0.244	1.39
05	0.220	0.378	1.72
06	0.501	0.771	1.54
08	0.187	0.357	1.91
09	0.026	0.051	1.96
10	0.038	0.098	2.58
11	0.811	1.438	1.77
12	0.058	0.165	2.84
13	0.080	0.153	1.91
14	0.087	0.229	2.63
15	0.126	0.194	1.54
16	0.120	0.164	1.37
17	0.191	0.331	1.73
18	0.153	0.269	1.76
19	0.168	0.250	1.49
20	0.546	0.728	1.33
21	0.687	0.836	1.22
22	0.102	0.184	1.80
23	0.149	0.276	1.85
24	0.262	0.394	1.50
25	0.327	0.479	1.46
26	0.859	1.164	1.36
27	1.250	1.603	1.28
28	1.392	1.715	1.23
29	0.319	0.532	1.67
30	0.403	0.516	1.28
31	2.036	2.901	1.42
32	0.637	1.009	1.58

^{1/} Average excludes Meter Basins 56A, 56B, 59A, and 59B.

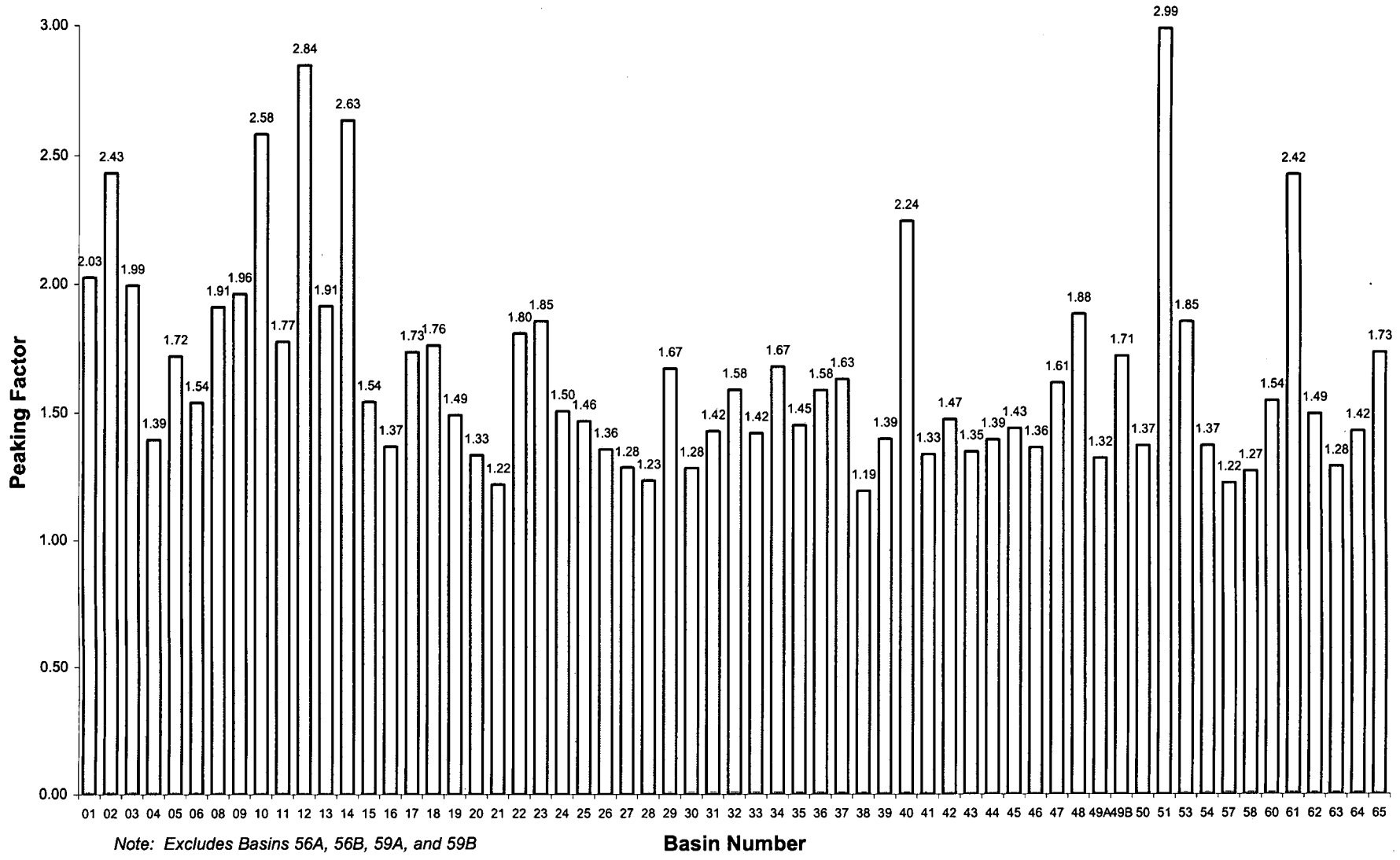
Table 2-D (Cont.)

**DRY-WEATHER FLOW PEAKING FACTOR
CITY OF HOT SPRINGS, ARKANSAS**

Meter Basin	Cumulative Average Daily Dry-Weather Flow (mgd)	Peak Hourly Flow Rate (mgd)	Dry-Weather Flow Peaking Factor
33	0.817	1.157	1.42
34	0.934	1.564	1.67
35	1.260	1.824	1.45
36	0.067	0.106	1.58
37	0.040	0.065	1.63
38	0.484	0.576	1.19
39	0.203	0.283	1.39
40	0.075	0.168	2.24
41	0.642	0.857	1.33
42	2.274	3.342	1.47
43	2.400	3.228	1.35
44	2.790	3.879	1.39
45	0.405	0.581	1.43
46	0.089	0.121	1.36
47	0.318	0.512	1.61
48	0.122	0.229	1.88
49A	5.972	7.867	1.32
49B	0.049	0.084	1.71
50	2.605	3.560	1.37
51	0.138	0.412	2.99
53	0.098	0.181	1.85
54	9.214	12.595	1.37
56A	0.004	0.012	3.00
56B	0.031	0.084	2.71
57	2.220	2.707	1.22
58	1.915	2.425	1.27
60	0.074	0.114	1.54
61	0.055	0.133	2.42
62	1.097	1.634	1.49
63	0.109	0.140	1.28
64	0.279	0.397	1.42
65	0.011	0.019	1.73
Subtotal			<u>1.63</u> ^{1/}
Total			1.66 ^{1/}
			(Average)

^{1/} Average excludes Meter Basins 56A, 56B, 59A, and 59B.

Dry-Weather Flow Peaking Factor Hot Springs, Arkansas



Note: Excludes Basins 56A, 56B, 59A, and 59B

Basin Number

Table 2-E

**SUMMARY OF PEAK INFILTRATION
CITY OF HOT SPRINGS, ARKANSAS**

Basin	Basin Peak Monitored Infiltration (mgd)	Total Inch-Diameter-Mile (idm)	Basin Peak Infiltration (gpd/idm)	Rank
<u>Southwest WWTP</u>				
01	0.007	41.36	161	52
02	0.116	38.81	2,978	22
03	0.059	28.31	2,092	35
59A	0.000	3.92	36	54
59B	<u>0.007</u>	<u>5.45</u>	<u>1,272</u>	44
Subtotal	0.189	117.85	1,308 (average)	
<u>Davidson WWTP</u>				
04	0.087	53.51	1,624	39
05	0.107	51.55	2,073	36
06	0.191	57.28	3,340	18
08	0.150	99.22	1,510	41
09	0.027	57.15	466	50
10	0.011	41.14	257	51
11	0.104	96.99	1,067	46
12	0.046	44.27	1,034	47
13	0.056	64.53	869	49
14	0.228	54.25	4,211	13
15	0.096	55.34	1,735	37
16	0.097	33.46	2,901	24
17	0.121	46.99	2,572	30
18	0.232	43.33	5,359	8
19	0.102	38.58	2,640	27
20	<u>1/</u>	52.79	<u>1/</u>	<u>1/</u>
21	0.694	67.54	10,273	3
22	0.094	62.75	1,497	43
23	0.151	58.71	2,577	29
24	0.062	40.36	1,543	40
25	0.149	52.44	2,841	25
26	0.291	43.55	6,674	6
27	<u>1/</u>	39.04	<u>1/</u>	<u>1/</u>
28	<u>1/</u>	57.40	<u>1/</u>	<u>1/</u>
29	0.087	57.92	1,504	42
30	0.152	50.67	3,006	21
31	<u>1/</u>	109.85	<u>1/</u>	<u>1/</u>
32	<u>1/</u>	71.58	<u>1/</u>	<u>1/</u>

1/ Unable to calculate due to surcharging and/or overflows.

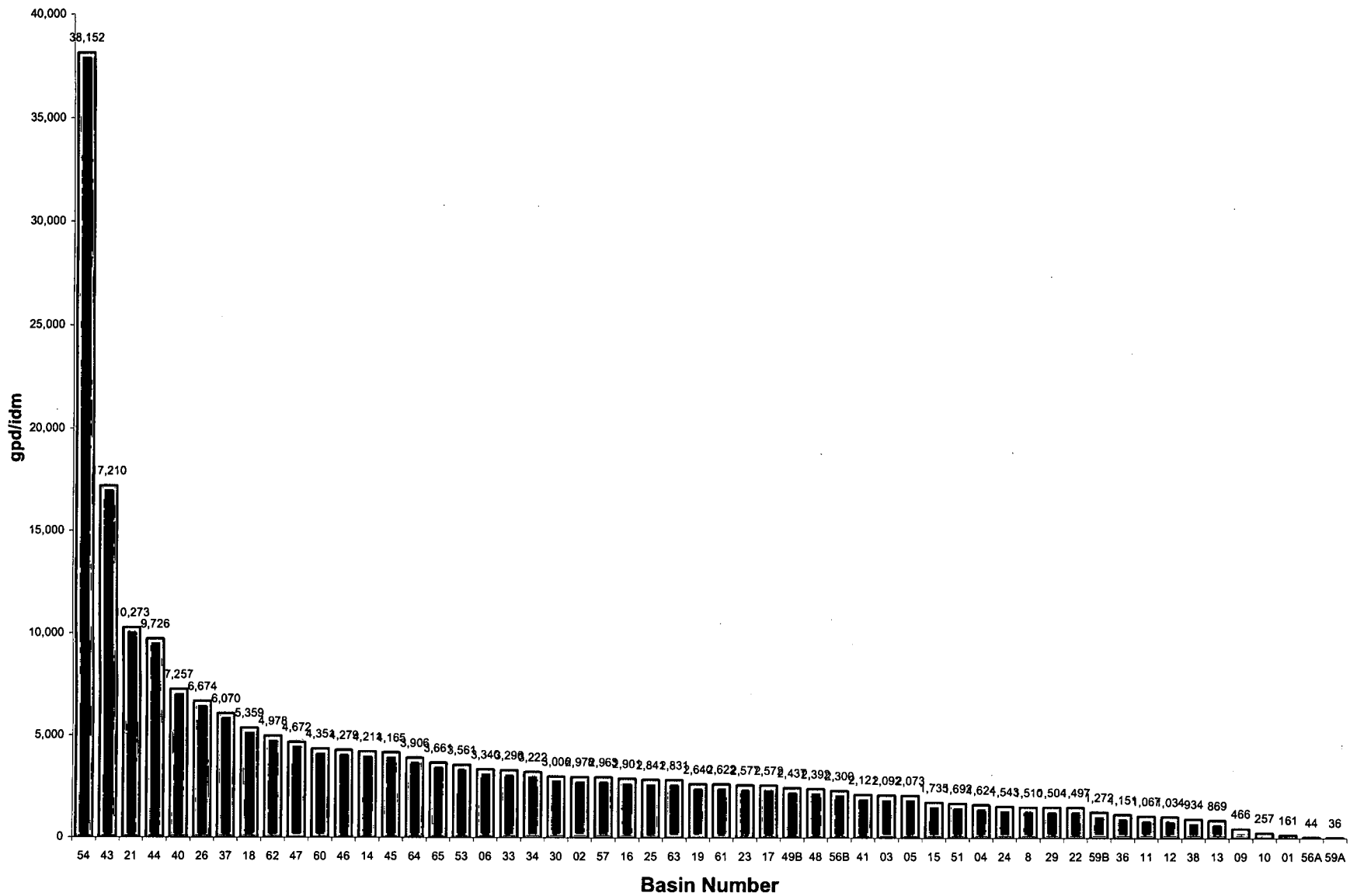
Table 2-E (Cont.)

**SUMMARY OF PEAK INFILTRATION
CITY OF HOT SPRINGS, ARKANSAS**

Basin	Basin Peak Monitored Infiltration (mgd)	Total Inch-Diameter-Mile (idm)	Basin Peak Infiltration (gpd/idm)	Rank
33	0.140	42.32	3,296	19
34	0.144	44.69	3,222	20
35	<u>1/</u>	39.08	<u>1/</u>	<u>1/</u>
36	0.024	20.91	1,151	45
37	0.064	10.60	6,070	7
38	0.066	70.94	934	48
39	<u>1/</u>	36.78	<u>1/</u>	<u>1/</u>
40	0.189	25.97	7,257	5
41	0.218	102.52	2,121	34
42	<u>1/</u>	58.93	<u>1/</u>	<u>1/</u>
43	0.980	56.95	17,210	2
44	0.415	42.67	9,726	4
45	0.230	55.32	4,165	14
46	0.214	50.09	4,279	12
47	0.261	55.93	4,672	10
48	0.171	71.38	2,392	32
49A	<u>1/</u>	61.53	<u>1/</u>	<u>1/</u>
49B	0.049	19.99	2,437	31
50	<u>1/</u>	59.29	<u>1/</u>	<u>1/</u>
51	0.075	44.58	1,692	38
53	0.219	61.39	3,561	17
54	3.811	99.88	38,152	1
56A	0.001	16.21	44	53
56B	0.031	13.32	2,300	33
57	0.235	79.28	2,963	23
58	<u>1/</u>	148.25	<u>1/</u>	<u>1/</u>
60	0.122	28.04	4,351	11
61	0.105	40.07	2,622	28
62	0.394	79.15	4,978	9
63	0.124	43.90	2,831	26
64	0.170	43.52	3,906	15
65	<u>0.032</u>	<u>8.62</u>	<u>3,661</u>	16
Subtotal	<u>11.817</u>	<u>3,234.58</u>	<u>4,114</u>	
Total	12.006	3,352.13	3,854	
			(average)	

1/ Unable to calculate due to surcharging and/or overflows.

Infiltration by Ranking City of Hot Springs, Arkansas

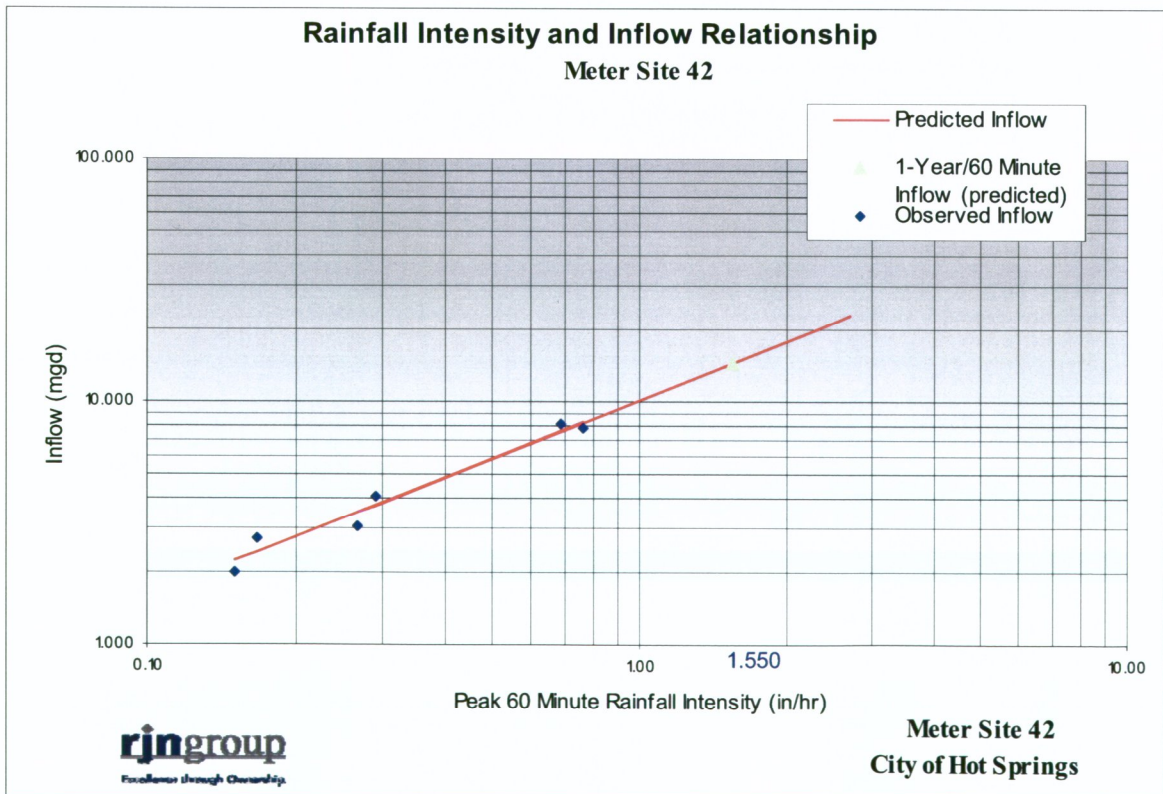


INFLOW CONDITIONS

Inflow in a sanitary sewer system is defined as extraneous flow that is a direct result of stormwater runoff. Inflow may enter the sanitary sewer system through directly connected downspouts, area drains, cleanouts, and building sewers. Stormwater may also enter the system through direct or indirect connections between the sanitary sewers and storm drains or ditches and sewer line defects, and through defective manhole covers, frame seals, corbels, and manhole walls.

DETERMINATION OF INFLOW

Flow data collected during wet-weather periods is analyzed to determine peak inflow originating in each basin. To determine the peak inflow rate, the sum of base flow and infiltration is subtracted from the peak instantaneous flow observed immediately following a rain event. Base flow and infiltration is generally determined from flow data 24 hours prior to the time that the maximum flow rate occurred following the rainfall event. The peak inflow rate is plotted against the 60-minute rainfall intensity for the corresponding rain event. Regression analysis is then used to determine the “best fit” relationship between the various sets of data points, as shown below. Generally, several storm events of various intensities are required to establish the rainfall intensity/inflow relationship. It is also important to use rain events that do not surcharge the sewer system. Using data from rain events that surcharge the sewer system may greatly underestimate the inflow potential in each basin.



The analysis projected the peak 1-year/60-minute storm (1.55 inches/hour) inflow rate to be 42.053 mgd and the 5-year storm (2.32 inches/hour) to be 62.944 mgd. These peak inflow rates are most likely dampened due to capacity restrictions upstream of the outfall meters to the two treatment plants. Specifically, this occurred in the basins on the east side of the City and began between Basins 27 and 28. Capacity restrictions were also observed through the analysis between Basins 49A and 54. In addition, five basins experience a loss of flow during a projected one-year storm event. Therefore, an inflow rate was not possible to calculate for those basins.

A summary of the projected peak wet-weather flow rates during a 1-year/60-minute and a 5-year/60-minute storm event is given in Table 2-F on page 24 and shown graphically on page 26. The basin unit inflow rate expresses the magnitude of peak inflow relative to other basins.

During the flow monitoring period, 11 rain events were recorded with a peak 60-minute rainfall intensity greater than 0.15 inches/hour. These intensities ranged from 0.15 inches/hour to 1.12 inches/hour.

Most of the rain events were fairly homogenous throughout the study period. The number of events plus the evenly distributed totals and intensities allowed good data to provide the "best fit" relationship as described above. However, larger intensity storms would typically surcharge a good portion of the system and some of these events could not be used.

Typically, a more detailed comprehensive study is recommended for areas that exhibit excessive inflow greater than 10,000 gpd/1,000 ft for a one-year rainfall event. Analysis of the flow data indicated that 48 of the 65 basins had a basin unit inflow rate exceeding 10,000 gpd/1,000 ft. In addition, nine basins either had a loss of flow or capacity restrictions that inhibited calculating an inflow rate. It is recommended that the City move forward with a more comprehensive program in these basins to further isolate and identify the excessive inflow identified during the flow monitoring period. The comprehensive inspection program would generally begin in the basins with the highest unit inflow ratio and then proceed to basins with lower ratios.

VOLUMETRIC ANALYSIS

DETERMINATION OF VOLUME

Analysis of recorded volume was also performed for each basin. To determine the volumetric rate experienced at each meter location, analysis was performed on four rainfall events. Two events were of high intensity and short duration rainfall and the other two were low intensity and long duration. The base flow that occurred during the same day of the dry week was then subtracted from the 24-hour total during the rain event. Each of the four events was then normalized for a one-inch rain and calculated to a gallon per day per 1,000 feet of pipe for a one-inch rain event.

Several basins experienced a loss of flow during these rain events and therefore an accurate rate was not possible to calculate. A summary of the projected volumetric rates for a one-inch rain event is given in Table 2-G on page 27 and shown graphically on page 29. A basin flow diagram depicting the volumetric analysis is shown on Exhibit 6.

Table 2-F

**SUMMARY OF INFLOW RATES
CITY OF HOT SPRINGS, ARKANSAS**

Meter Basin	Basin Size (lf)	Cumulative Peak	Basin Peak	Basin Unit Inflow Rate (gpd/1,000lf)	Basin Peak	Basin Unit Inflow Rate (gpd/1,000lf)	Basin Unit
		1-Year/60 Minute inflow (mgd)	1-Year/60-Minute inflow (mgd)		5-Year/60-Minute inflow (mgd)		Inflow Rate 1-Year Ranking
Southwest WWTP							
01	27,844	0.601	0.496	17,814	0.743	26,667	32
02	32,862	0.787	0.787	23,949	1.178	35,851	27
03	20,597	1.113	0.326	15,828	0.488	23,694	39
59A	2,592	0.042	0.042	16,204	0.063	24,257	37
59B	4,434	0.063	0.063	14,208	0.094	21,270	42
Subtotal	88,329		1.714	17,600 (average)	2.566	26,348 (average)	
Davidson WWTP							
04	37,763	0.621	0.621	16,445	0.930	24,618	36
05	40,498	0.482	0.482	11,902	0.722	17,817	45
06	38,150	1.760	0.657	17,221	0.984	25,781	33
08	73,447	1.257	1.257	17,114	1.882	25,620	34
09	41,229	0.242	0.242	5,870	0.362	8,787	54
10	28,709	0.262	0.262	9,126	0.392	13,662	50
11	60,852	3.951	3.447	56,646	5.160	84,799	8
12	29,743	0.552	0.552	18,559	0.826	27,783	30
13	41,158	1.538	0.986	23,956	1.476	35,863	26
14	38,258	1.370	1.370	35,810	2.051	53,607	16
15	44,111	0.710	0.710	16,096	1.063	24,095	38
16	29,182	1.129	1.129	38,688	1.690	57,916	14
17	35,605	2.139	1.010	28,367	1.512	42,465	23
18	29,246	1.798	0.428	14,634	0.641	21,908	41
19	30,554	0.911	0.911	29,816	1.364	44,635	21
20	36,867	2.941	0.232	6,293	0.347	9,420	52
21	40,730	5.439	2.498	61,331	3.740	91,812	6
22	42,254	1.234	1.234	29,204	1.847	43,719	22
23	40,627	1.139	1.139	28,036	1.705	41,969	24
24	26,330	1.511	0.372	14,128	0.557	21,150	43
25	31,212	1.700	0.189	6,055	0.283	9,065	53
26	24,277	8.200	1.527	62,899	2.286	94,160	5
27	23,975	1/	1/	1/	1/	1/	61
28	36,990	2/	2/	2/	2/	2/	57
29	36,886	0.610	0.610	16,537	0.913	24,757	35
30	30,592	0.715	0.105	3,432	0.157	5,138	55
31	50,525	2/	2/	2/	2/	2/	57

1/ Unable to calculate due to surcharging and/or overflows.

2/ Capacity restrictions upstream dampen peak flow.

Table 2-F (Cont.)

**SUMMARY OF INFLOW RATES
CITY OF HOT SPRINGS, ARKANSAS**

Meter Basin	Basin Size (lf)	Cumulative Peak	Basin Peak	Basin Unit Inflow Rate (gpd/1,000lf)	Basin Peak	Basin Unit Inflow Rate (gpd/1,000lf)	Basin Unit
		1-Year/60 Minute inflow (mgd)	1-Year/60-Minute inflow (mgd)		5-Year/60-Minute inflow (mgd)		Inflow Rate 1-Year Ranking
32	42,007	4.501	1.652	39,327	2.473	58,872	12
33	33,966	5.704	1.203	35,418	1.801	53,020	18
34	30,878	6.809	1.105	35,786	1.654	53,572	17
35	21,047	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	61
36	17,364	0.223	0.223	12,843	0.334	19,225	44
37	8,089	0.464	0.464	57,362	0.695	85,871	7
38	49,164	2.320	0.148	3,010	0.222	4,506	56
39	30,207	2.172	1.299	43,003	1.945	64,376	10
40	21,777	0.873	0.873	40,088	1.307	60,012	11
41	64,107	1.628	0.650	10,139	0.973	15,179	48
42	39,034	14.425	2.595	66,481	3.885	99,521	4
43	34,887	15.541	1.116	31,989	1.671	47,888	20
44	26,873	15.737	0.196	7,294	0.293	10,918	51
45	40,009	4.026	4.026	100,627	6.027	150,639	1
46	34,344	1.339	1.339	38,988	2.004	58,365	13
47	37,081	1.859	1.401	37,782	2.097	56,560	15
48	48,136	0.458	0.458	9,515	0.686	14,244	49
49A	32,019	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	61
49B	15,996	1.107	1.107	69,205	1.657	103,600	2
50	26,243	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	61
51	32,458	1.560	1.560	48,062	2.335	71,949	9
53	41,238	0.757	0.757	18,357	1.133	27,480	31
54	68,956	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	57
56A	10,713	0.284	0.284	26,510	0.425	39,685	25
56B	9,182	0.199	0.199	21,673	0.298	32,444	29
57	36,707	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>2/</u>	57
58	89,406	10.230	1.385	15,491	2.073	23,190	40
60	21,306	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	61
61	21,102	0.699	0.699	33,125	1.046	49,588	19
62	58,662	7.665	3.961	67,522	5.930	101,081	3
63	28,069	0.627	0.627	22,338	0.939	33,440	28
64	27,022	0.918	0.291	10,769	0.436	16,121	46
65	<u>5,698</u>	0.060	<u>0.060</u>	<u>10,530</u>	<u>0.090</u>	<u>15,763</u>	47
Subtotal	<u>2,123,517</u>		<u>51.648</u>	<u>29,047</u>	<u>77.317</u>	<u>43,483</u>	
Total	2,211,846		53.362	28,025	79.883	41,953	
				(average)		(average)	

1/ Unable to calculate due to surcharging and/or overflows.

2/ Capacity restrictions upstream dampen peak flow.

Summary of Basin Inflow Rates 1-Year/60-Minute Storm Event City of Hot Springs

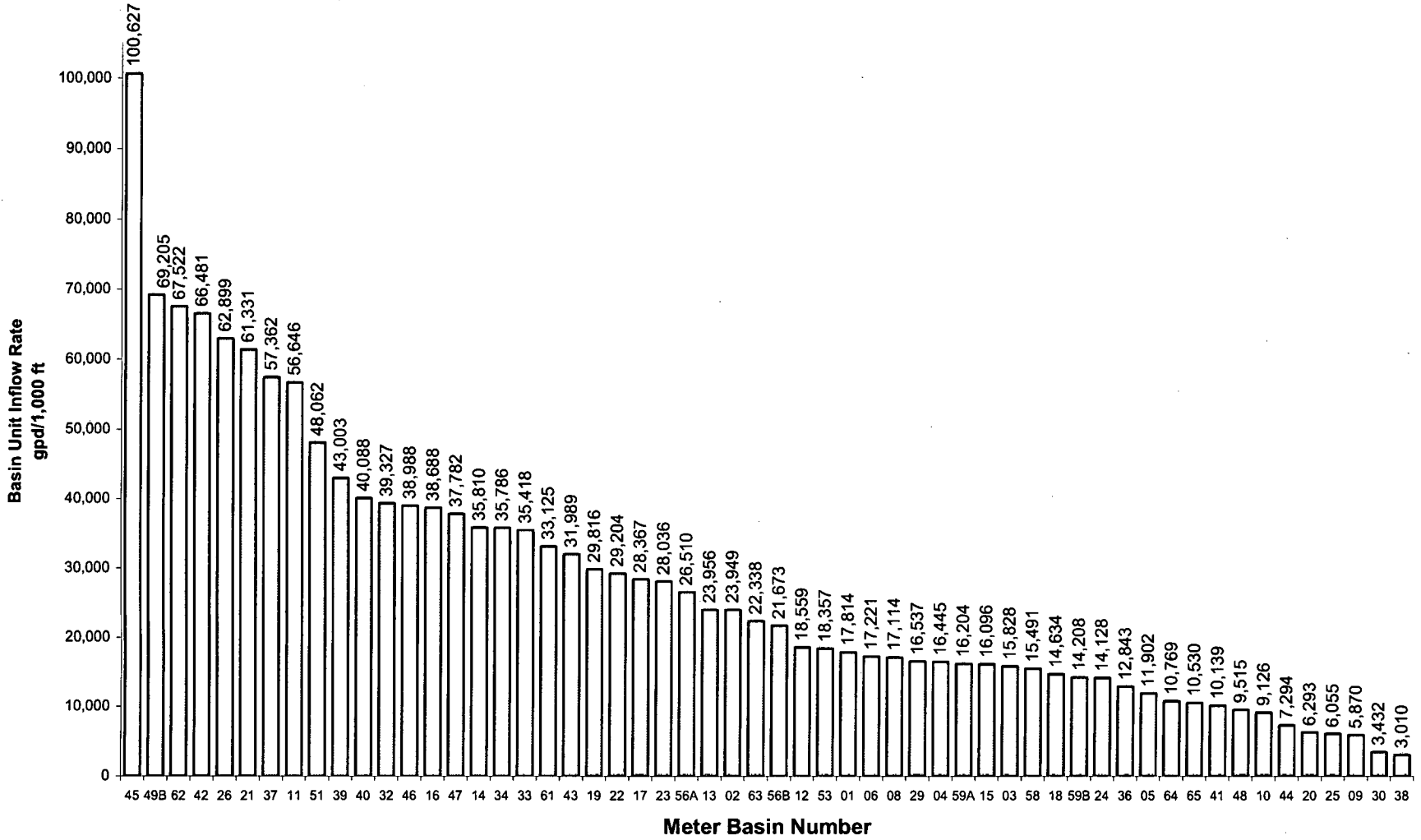


Table 2-G

PROJECTED VOLUMETRIC RATES

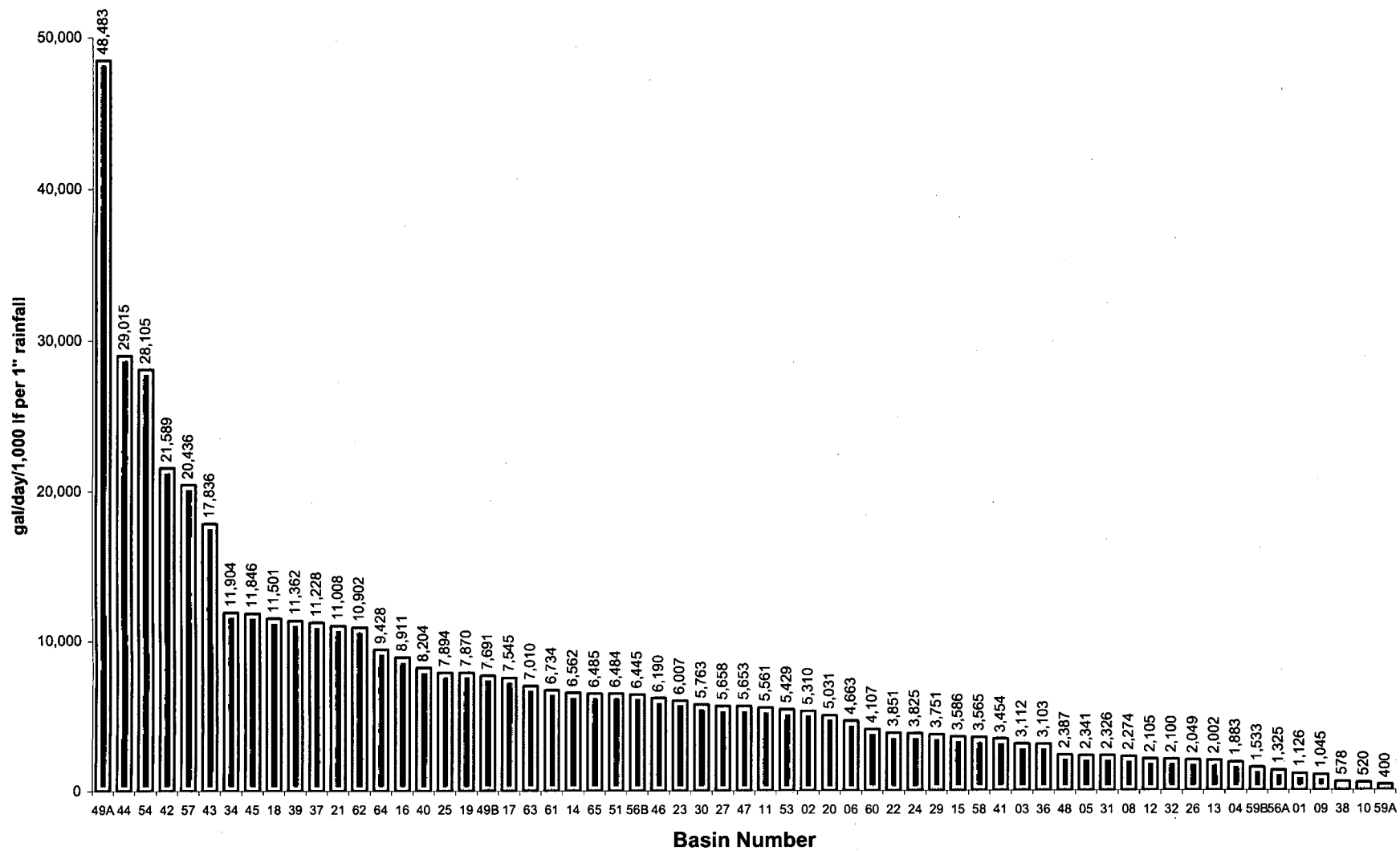
Meter Basin	Basin Length (lf)	Rain Gauge(s) Association	Normalized I/I mgd per 1" rainfall	I/I (gal/day/1,000 lf) per 1" rainfall	Ranking
Southwest WWTP					
01	27,844	2,3	0.031	1,126	57
02	32,862	3	0.175	5,310	34
03	20,597	3	0.064	3,112	44
59A	2,592	2,3	0.001	400	61
59B	4,434	2,3	0.007	1,533	55
Subtotal	88,329				
Davidson WWTP					
04	37,763	1	0.071	1,883	54
05	40,498	1	0.095	2,341	47
06	38,150	1,2	0.178	4,663	36
08	73,447	2	0.167	2,274	49
09	41,229	4,7	0.043	1,045	58
10	28,709	4,7	0.015	520	60
11	60,852	4,6,7	0.338	5,561	32
12	29,743	15	0.063	2,105	50
13	41,158	15	0.082	2,002	53
14	38,258	11	0.251	6,562	23
15	44,111	8	0.158	3,586	41
16	29,182	11	0.260	8,911	15
17	35,605	8,11	0.269	7,545	20
18	29,246	11	0.336	11,501	9
19	30,554	8	0.240	7,870	18
20	36,867	8,11	0.185	5,031	35
21	40,730	8,11,13	0.448	11,008	12
22	42,254	12	0.163	3,851	38
23	40,627	13	0.244	6,007	28
24	26,330	13	0.101	3,825	39
25	31,212	13	0.246	7,894	17
26	24,277	8,11,12,13	0.050	2,049	52
27	23,975	8,11,12,13	0.136	5,658	30
28	36,990	8,11,12,13	N/A	N/A	63
29	36,886	13	0.138	3,751	40
30	30,592	13	0.176	5,763	29
31	50,525	8,11,12,13,15	0.117	2,326	48
32	42,007	8,11	0.088	2,100	51
33	33,966	8,11	N/A	N/A	62
34	30,878	8,11	0.368	11,904	7

Table 2-G (Cont.)

PROJECTED VOLUMETRIC RATES

Meter Basin	Basin Length (lf)	Rain Gauge(s) Association	Normalized I/I mgd per 1" rainfall	I/I (gal/day/1,000 lf) per 1" rainfall	Ranking
35	21,047	1,2,8	N/A	N/A	64
36	17,364	8	0.054	3,103	45
37	8,089	8	0.091	11,228	11
38	49,164	8	0.028	578	59
39	30,207	8	0.343	11,362	10
40	21,777	8	0.179	8,204	16
41	64,107	5,8	0.221	3,454	43
42	39,034	1,2,8,11	0.843	21,589	4
43	34,887	1,2,8,9,11	0.622	17,836	6
44	26,873	1,2,8,9,11	0.780	29,015	2
45	40,009	9	0.474	11,846	8
46	34,344	6,9	0.213	6,190	27
47	37,081	6	0.210	5,653	31
48	48,136	6	0.115	2,387	46
49A	32,019	1,2,5,6,8,9,11	1.552	48,483	1
49B	15,996	9	0.123	7,691	19
50	26,243	5,6,8,9	N/A	N/A	65
51	32,458	6	0.210	6,484	25
53	41,238	9	0.224	5,429	33
54	68,956	1,2,4,5,6,7,8,9,11,12,13,15	1.938	28,105	3
56A	10,713	10	0.014	1,325	56
56B	9,182	10	0.059	6,445	26
57	36,707	8,11,12,13,15	0.750	20,436	5
58	89,406	5,6,8,9	0.319	3,565	42
60	21,306	5	0.088	4,107	37
61	21,102	5	0.142	6,734	22
62	58,662	1,2,8	0.640	10,902	13
63	28,069	5	0.197	7,010	21
64	27,022	5	0.255	9,428	14
65	5,698	5	0.037	6,485	24
Subtotal	<u>2,123,517</u>				
Total	2,211,846				

Summary of Projected Volumetric Rates Hot Springs, Arkansas



RECOMMENDATIONS

During a typical SSES study, the field investigations can generally identify 50 to 70 percent of the monitored inflow. Data analysis performed on these field investigations identifies the areas in the sewer systems that are in need of rehabilitation.

Typically, if the recommended rehabilitation is completed that was identified during the field investigations, a 30 to 50 percent reduction in the monitored inflow can be seen during post flow monitoring activities.

Table 2-H shows the basins that are recommended for additional field investigations based on the 2009 citywide flow monitoring. Basins that experienced a loss of flow are also recommended for field investigations due to the loss most likely occurring in these areas.

A total of 1,945,937 linear feet in 58 separate basins indicated an average of 31,145 gpd/1,000 lf. Fifty (50) of these basins are recommended due to high amounts of inflow, seven basins are for both inflow and infiltration, and one (1) basin for infiltration alone.

Table 2-H

RECOMMENDED PLAN

Basin	Basin Size (lf)	Cumulative Peak 1-Year/60-Minute inflow (mgd)	Basin Peak 1-Year/60-Minute inflow (mgd)	Basin Unit Inflow Rate (gpd/1,000lf)	Basin Peak Monitored Infiltration (mgd)	Basin Peak Unit Infiltration (gpd/idm)
<u>Inflow Only</u>						
45	40,009	4.026	4.026	100,627	0.230	4,165
49B	15,996	1.107	1.107	69,205	0.049	2,437
62	58,662	7.665	3.961	67,522	0.394	4,978
42	39,034	14.425	2.595	66,481	1.000	1
11	60,852	3.951	3.447	56,646	0.104	1,067
51	32,458	1.560	1.560	48,062	0.075	1,692
39	30,207	2.172	1.299	43,003	1.000	1/
32	42,007	4.501	1.652	39,327	1.000	1/
46	34,344	1.339	1.339	38,988	0.214	4,279
16	29,182	1.129	1.129	38,688	0.097	2,901
47	37,081	1.859	1.401	37,782	0.261	4,672
14	38,258	1.370	1.370	35,810	0.228	4,211
34	30,878	6.809	1.105	35,786	0.144	3,222
33	33,966	5.704	1.203	35,418	0.140	3,296
61	21,102	0.699	0.699	33,125	0.105	2,622
19	30,554	0.911	0.911	29,816	0.102	2,640
22	42,254	1.234	1.234	29,204	0.094	1,497
17	35,605	2.139	1.010	28,367	0.121	2,572
23	40,627	1.139	1.139	28,036	0.151	2,577
56A	10,713	0.284	0.284	26,510	0.001	44
13	41,158	1.538	0.986	23,956	0.056	869
02	32,862	0.787	0.787	23,949	0.116	2,978
63	28,069	0.627	0.627	22,338	0.124	2,831
56B	9,182	0.199	0.199	21,673	0.031	2,300
12	29,743	0.552	0.552	18,559	0.046	1,034
53	41,238	0.757	0.757	18,357	0.219	3,561
01	27,844	0.601	0.496	17,814	0.007	161
06	38,150	1.760	0.657	17,221	0.191	3,340
08	73,447	1.257	1.257	17,114	0.150	1,510
29	36,886	0.610	0.610	16,537	0.087	1,504
04	37,763	0.621	0.621	16,445	0.087	1,624
59A	2,592	0.042	0.042	16,204	0.000	36

1/ Unable to calculate due to surcharging and/or overflows.

2/ Capacity restrictions upstream dampen peak flow.

Table 2-H (Cont.)

RECOMMENDED PLAN

Basin	Basin Size (lf)	Cumulative Peak 1-Year/60-Minute inflow (mgd)	Basin Peak 1-Year/60-Minute inflow (mgd)	Basin Unit Inflow Rate (gpd/1,000lf)	Basin Peak Monitored Infiltration (mgd)	Basin Peak Unit Infiltration (gpd/idm)
15	44,111	0.710	0.710	16,096	0.096	1,735
03	20,597	1.113	0.326	15,828	0.059	2,092
58	89,406	10.230	1.385	15,491	1.000	<u>1/</u>
59B	4,434	0.063	0.063	14,208	0.007	1,272
24	26,330	1.511	0.372	14,128	0.062	1,543
36	17,364	0.223	0.223	12,843	0.024	1,151
5	40,498	0.482	0.482	11,902	0.107	2,073
64	27,022	0.918	0.291	10,769	0.170	3,906
65	5,698	0.060	0.060	10,530	0.032	3,661
41	64,107	1.628	0.650	10,139	0.218	2,121
60	21,306	<u>1/</u>	<u>1/</u>	<u>1/</u>	0.122	4,351
57	36,707	<u>2/</u>	<u>2/</u>	<u>2/</u>	0.235	2,963
28	36,990	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>1/</u>	<u>1/</u>
31	50,525	<u>2/</u>	<u>2/</u>	<u>2/</u>	<u>1/</u>	<u>1/</u>
27	23,975	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
35	21,047	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
49A	32,019	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
50	<u>26,243</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>	<u>1/</u>
Subtotal	1,691,102					
<u>Inflow and Infiltration</u>						
26	24,277	8.200	1.527	62,899	0.291	6,674
21	40,730	5.439	2.498	61,331	0.694	10,273
37	8,089	0.464	0.464	57,362	0.064	6,070
40	21,777	0.873	0.873	40,088	0.189	7,257
43	34,887	15.541	1.116	31,989	0.980	17,210
18	29,246	1.798	0.428	14,634	0.232	5,359
54	<u>68,956</u>	2.000	2.000	<u>2/</u>	3.811	38,152
Subtotal	227,962					
<u>Infiltration Only</u>						
44	<u>26,873</u>	15.737	0.196	7,294	0.415	9,726
Subtotal	<u>26,873</u>					
Total	1,975,937					

*1/ Unable to calculate due to surcharging and/or overflows.**2/ Capacity restrictions upstream dampen peak flow.*

METHODOLOGY

RJN and Garver Engineers have been conducting complete sanitary sewer investigation activities throughout the city of Hot Springs, Arkansas. The objective is to identify and quantify sources of infiltration and inflow (I/I), identify sewer maintenance problems, develop reports and upgrades at existing pump stations, and recommend a rehabilitation plan to reduce I/I and improve the overall efficiency of the collection system in these five areas. Field investigation activities included the following:

1. Manhole and Visual Pipe Inspections
2. Rainfall Simulation
 - a. Smoke Testing
 - i. Identification of Public Defects
 - ii. Identification of Private Defects
 - b. Dye Testing
 - i. Potential Mainline/Storm Sewer Connections
 - ii. Manhole Defects
3. Television Inspection (Defects identified from dye testing and visual pipe)
4. Pump Station Evaluations

MAPPING

City of Hot Springs staff provided map data of the wastewater collection system for the study areas at the initiation of the study that included existing access structures. Any manholes or other access structures found during the field investigations that were not shown on existing maps were assigned new numbers.

FIELD INVESTIGATIONS

MANHOLE AND VISUAL PIPE INSPECTIONS

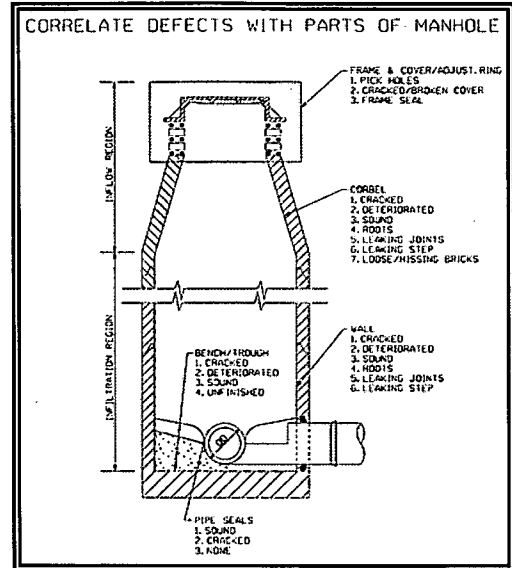
Manhole and visual pipe inspection is that part of the survey where the physical condition of the sewer system is visually evaluated.

These inspections verify manhole location, pipe size, line segment continuity, and evaluate manhole and adjacent pipe condition. A sectional elevation of a typical manhole is shown on the right.

Manhole Inspections

The manhole/cleanout inspection procedure included recording the following observations:

1. Location and identification number
2. Potential for ponding or sheeting on manhole cover
3. Cover type, fit, description, distance above or below grade, evidence of inflow
4. Frame adjustment, seal, evidence of inflow
5. Corbel construction, condition, evidence of inflow
6. Wall construction, condition, evidence of infiltration
7. Bench/trough construction, condition, deposition, evidence of infiltration
8. Pipe seal condition, evidence of infiltration
9. Step condition
10. Manhole inside diameter
11. Surcharging or evidence of surcharging
12. Indication of groundwater infiltration



Inspections have been performed on 10,097 of the 11,971 manholes visited (84.3 percent). Access structures not inspected included buried, not found, and inaccessible structures. Partial inspections were performed on any surcharged manholes. Manholes that were not inspected are indicated on the manhole information report included in Appendix A.

Visual Pipe Inspections

Visual pipe inspection is also being performed as part of the manhole inspection program with the following observations recorded:

1. Manhole identification numbers for connecting sewer lines
2. Flow direction in pipes
3. Pipe diameter and construction material
4. Amount of root growth
5. Amount and type of deposition
6. Structural condition and line/grade of pipe
7. Visible infiltration in pipe and/or from pipe seals
8. Depth from manhole rim to each pipe invert
9. Recommended method of cleaning
10. Depth and velocity of flow

Visual pipe inspection verifies pipe diameter, continuity, and aids in identifying pipe defects near the collection system access structure. Sewer lines in the study area are primarily constructed of vitrified clay (VCP), concrete and PVC. A computer output report listing the findings of the visual pipe inspections is given in Appendix B.

RAINFALL SIMULATION

A major field task in sewer system evaluation studies is locating infiltration and inflow sources by rainfall simulation. Types of infiltration and inflow sources identified by rainfall simulation include the following:

1. Roof downspouts, yard, and area drains
2. Defective building sewers, faulty connections, and defective cleanouts
3. Cross connections between sanitary sewers and storm sewers (indirect or direct)
4. Storm sewer sections, stream sections, ditch sections, and ponding areas which may cause infiltration and inflow
5. Structurally damaged sewers and manholes

Rainfall simulation can also be utilized with flow measurements to quantify infiltration and inflow from identified sources. Rainfall simulation techniques include smoke testing and dyed water flooding.

SMOKE TESTING

Smoke testing is a quick method for detecting infiltration and inflow sources in a sanitary sewer system. This method is very effective in detecting sources such as roof downspouts, yard and area drains, defective building sewers, faulty connections, defective cleanouts, and storm sewer cross connections. It can also be utilized during dry weather periods to detect inflow sources in the sewer main. During testing, observations are recorded by line segment as follows:

1. Location of line segment
2. Location of observed smoke leaks recorded at the:
 - a. Curb
 - b. Sidewalk
 - c. Cleanout
 - d. Building lateral; front, side or rear yard
 - e. Driveway or area drain
 - f. Downspout
 - g. Building interior (resident must inform inspector)
3. Location of smoke observed from stormwater conveyance systems
4. Location of smoke along a main sewer line

DYED WATER TESTING

Public sector dyed water flooding is performed on segments identified as possible main line defects, cross connections or manhole defects during smoke testing. This testing is used to more accurately identify and quantify public sector inflow sources.

TELEVISION INSPECTION

RJN is reviewing the data collected during field investigations and identifying segments of sewer line for television inspection and video review. Selections were based on known problem areas as well as defects identified during visual pipe inspection and smoke testing.

PUMP STATION EVALUATION

The City of Hot Springs has identified that potential 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.

The 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 flow rate, 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 the field investigations were completed, the data collected was compiled and developed into a report for each station. The reports included the field information, wet well drawdown calculations, photographs, and recommendations for improvements.

Based on the recommendations in the reports, Garver began developing plans and specifications to solicit bids from contractors for the improvements. Currently, a project is in the construction phase (Project 10A) which includes lighting upgrades, replacement of power supplies and control panels, general site improvements, installation of 4 100KW natural gas generators, installation of 1 200KW diesel generator, and installation of 5 manual transfer switches with receptacles to facilitate the use of portable generators. Project 10A was awarded to H&H Electrical for the contract amount of approximately \$923,000 and is scheduled to be completed on October 4, 2010.

Another issue identified by Hot Springs personnel included replacing discharge piping and valve vault components in 6 large pump stations. During inspection of these 6 stations it was noted that discharge piping was in poor condition and valves were malfunctioning due to severe corrosion. To address these issues the City of Hot Springs asked Garver to provide plan and specifications to replace all existing ductile iron discharge piping and guide rails with stainless steel, and to either rehabilitate or replace all valves in the affected pump stations. Plans and specifications are currently being prepared for this task. This portion of the project should be completed before the end of the year.

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 particular pump station and determining if the pumps and force mains are adequate. The City of Hot Springs and Garver have delineated the city into major drainage basins. Evaluation and design are currently being completed on the Mazarn and Fairwood drainage basins. Field evaluations have been completed for 83 pump stations and reports have been compiled for 49 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 station furthest "upstream" from the basin collection point and working "downstream". Total peak flow has been calculated for

59 pump stations in the Mazarn basin. System curves and hydraulic grade lines have been developed for 7 major pump stations. After completing system curves for every pump station, analysis and design can begin on upgrading pump stations and force mains to eliminate wet weather SSO. Other design approaches are being 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.

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)

A Supervisory Control and Data Acquisition (SCADA) Master Plan was completed so that SCADA equipment improvements and additions could be effectively installed within the City Wastewater Collection System. The Master Plan provides an overview of how the SCADA system can add control and notification features to the collection system's operation.

The first phase of SCADA improvements was to equip the critical pump stations within the sewer collection system with dependable instrumentation to notify staff of mechanical or power failures. This work included selection of Remote Telemetry Unit (RTU) hardware and software selection as well as the initial programming and radio configuration. The first of the RTU pieces are due to be installed on 80 of the lift stations within the collection system by March, 2011.

As of August 2010, work is underway to prepare for the configuration and installation of approximately 3,000 radio alarm meters for grinder pump stations within the sewer collection system. These alarms will advise the utility staff if the grinder pumps are not functioning. These are expected to be installed starting early in 2011 and the work to be completed within 9 months.

RESULTS

RJN is currently conducting sanitary sewer investigation activities as described in Chapter 3. Defects that have been identified are included in this chapter and in the appendices on the accompanying DVD. All data included in this report was collected before July 2010. Investigation activities are currently ongoing. It should be noted that eighty-five (85) manholes that feed the Southwest Treatment Plant have undergone rehabilitation and a reduction of flow during wet-weather events has been seen.

FIELD INVESTIGATIONS

MANHOLE AND VISUAL PIPE INSPECTIONS

Manhole and visual pipe inspection is that part of the survey where the physical condition of the sewer system is visually evaluated.

Inspections were performed on 10,097 of the 12,040 manholes (83.9 percent). An access structure inspection summary is given in Table 4-A, while a summary of manhole defects is given in Table 4-B.

A total of 751 manholes located throughout the study area indicated evidence of surcharging. A detailed manhole inspection report is included in Inspection Reports on the included DVD.

Sewer lines in the study area are primarily constructed of vitrified clay (VCP) and PVC. The visual pipe inspections revealed segments with root intrusion, 539 broken or cracked segments, and 19 collapsed segments. A computer output report listing the findings of the visual pipe inspections is given in Inspection Reports on the included DVD.

Table 4-A

ACCESS STRUCTURE INSPECTION SUMMARY

Basin No.	Total Structures	Inspected Structures	Not Inspected		
			Not Found Structures	Buried Structures	Inaccessible Structures
HS01	133	130	0	2	1
HS02	197	195	1	0	1
HS03	113	113	0	0	0
HS04	181	158	21	0	2
HS05	234	228	4	1	1
HS06	211	172	35	2	2
HS08	418	372	33	7	6
HS09	200	181	12	1	6
HS10	131	86	21	11	13
HS11	386	353	25	2	6
HS12	178	133	20	15	10
HS13	233	157	20	32	24
HS14	167	139	24	0	4
HS15	213	208	3	2	0
HS16	153	145	3	4	1
HS17	175	172	0	3	0
HS18	164	125	18	9	12
HS19	165	144	15	3	3
HS20	184	151	21	9	3
HS21	198	166	18	9	5
HS22	213	201	9	3	0
HS23	244	198	27	7	12
HS24	149	114	21	5	9
HS25	154	127	24	2	1
HS26	120	78	31	1	10
HS27	117	95	9	6	7
HS28	177	120	16	23	18
HS29	205	169	22	7	7
HS30	149	103	39	3	4
HS31	257	185	42	7	23
HS32	234	220	8	4	2
HS33	167	149	13	3	2
HS34	180	160	13	3	4
HS35	124	106	6	4	8
HS36	82	73	9	0	0
HS37	35	34	1	0	0
HS38	269	244	17	8	0
HS39	133	123	4	5	1

Table 4-A (Cont.)

ACCESS STRUCTURE INSPECTION SUMMARY

Basin No.	Total Structures	Inspected Structures	Not Inspected		
			Not Found Structures	Buried Structures	Inaccessible Structures
HS40	93	85	0	6	2
HS41	360	270	29	12	49
HS42	207	190	12	2	3
HS43	169	136	20	8	5
HS44	118	103	10	3	2
HS45	211	200	10	0	1
HS46	181	139	22	10	10
HS47	221	177	26	7	11
HS48	284	228	53	1	2
HS49A	152	129	14	9	0
HS49B	96	84	7	1	4
HS50	148	124	18	3	3
HS51	143	122	20	1	0
HS53	198	161	29	8	0
HS54	388	300	39	32	17
HS56A	61	56	2	3	0
HS56B	59	37	2	5	15
HS57	161	120	13	11	17
HS58	567	453	50	26	38
HS59A	15	13	0	0	2
HS59B	25	24	0	0	1
HS60	126	97	13	9	7
HS61	120	98	14	5	3
HS62	361	323	22	11	5
HS63	154	124	26	3	1
HS64	173	162	4	7	0
HS65	33	30	2	1	0
Unmonitored	104	85	3	6	10
Total	11,971	10,097	1,065	393	416

Table 4-B

SUMMARY OF MANHOLE DEFECTS

Type of Defect	Number of Defects
<u>Inflow</u>	
Cover Missing Bolts	23
Cover with Pick Holes	1,659
Defective Frame Seal	1,998
Broken Frame	243
Defective Corbel	1,189
<u>Infiltration</u>	
Defective Manhole Walls	1,516
Defective Pipe Seal	631
Defective Bench & Trough	90
Total	7,349

SMOKE TESTING

A total of 975 potential sources of I/I has been identified to date from the 519,424 liner feet of sewer lines that were smoke tested. A total of 815 sources identified are from the private sector, while 160 sources are from the public sector. Smoke testing investigations identified sixty-eight (68) possible main line leaks, fifty-three (53) possible catch basins, 26 defective cleanouts, and 13 building laterals as public I/I sources. Public building laterals and cleanouts are defined as potential building lateral leaks identified within the public ROW's. Private I/I sources included 450 defective cleanouts and 296 building laterals. These sources are represented in the pie chart below and given in Table 4-C. The Inspection Reports on the included DVD contains a detailed report of all identified smoke defects.

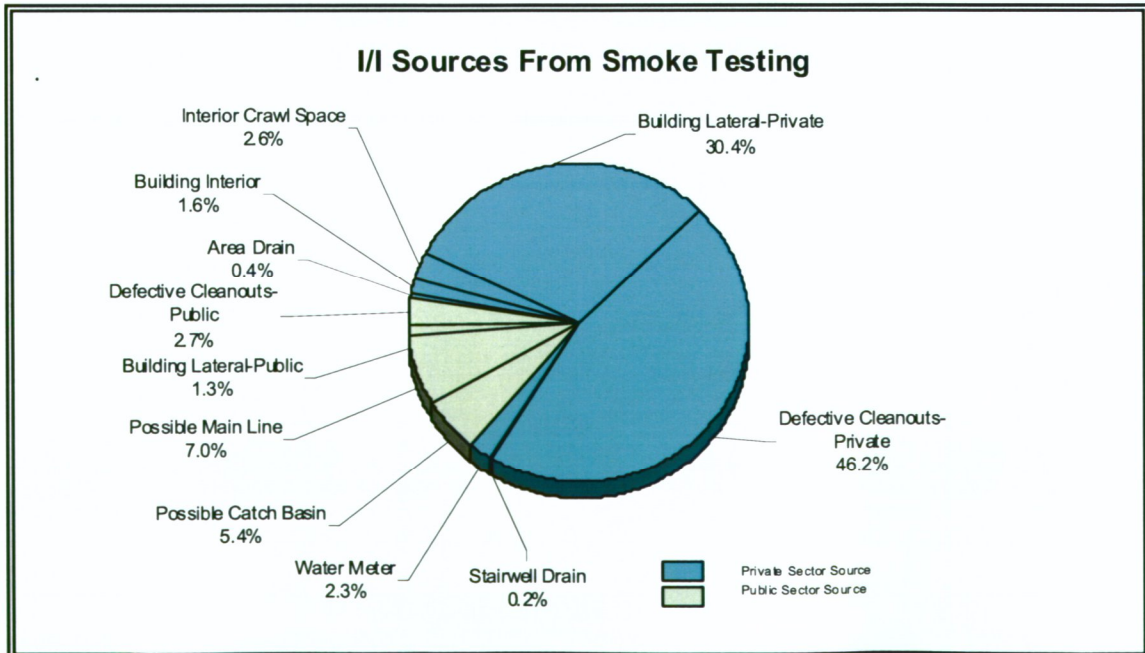


Table 4-C

SMOKE TEST DATA

Type of Source	Number of Defects
<u>Public Sector</u>	
Possible Catch Basin Cross Connection	53
Possible Main Line	68
Building Lateral	13
Defective Cleanouts	<u>26</u>
Subtotal	160
<u>Private Sector</u>	
Area Drain	4
Building Interior	16
Interior Crawl Space	25
Building Lateral	296
Defective Cleanouts	450
Stairwell Drain	2
Water Meter	<u>22</u>
Subtotal	<u>815</u>
Total	975

DYED WATER TESTING

Public sector dyed water flooding has been performed on 14 segments identified as possible main line, catch basin, or manhole defects during smoke testing. Eleven tests produced positive results.

A summary of the dye water testing is included in Table 4-D. A detailed report can be found in Inspection Reports on the included DVD.

Table 4-D

PUBLIC SECTOR DYED WATER FLOODING

Line Segment	Defect Type	Result
<u>Basin HS01</u>		
11852 - PUMP	Manhole	Positive
<u>Basin HS02</u>		
9302 - 9301	Manhole	Positive
9336 - 9335	Manhole	Positive
9427 - 9428	Manhole	Positive
11437 - 11436	Manhole	Positive
12744 - 12743	Manhole	Negative
<u>Basin HS03</u>		
9292 - 9293	Manhole	Positive
9296 - PUMP	Manhole	Negative
9309 - 9310	Manhole	Negative
11388 - 11386	Manhole	Positive
11589 - 10803	Manhole	Positive
12611 - 12612	Manhole	Positive
12613 - 12614	Manhole	Positive
<u>Basin HS59A</u>		
12778 - PUMP	Manhole	Positive
<u>Basin HS32</u>		
625 - 624	Cross Connection	Positive

TELEVISION INSPECTION

RJN has currently identified approximately 34,700 linear feet of sewer line for television inspection and video review. Selections were based on known problem areas as well as defects identified during visual pipe inspection. A total of 17,510 linear feet of video has been reviewed. A detailed report can be found in Inspection Reports on the included DVD.

WORK REMAINING

There are approximately 150 manholes that are located in State Highway right-of-way yet to be visited. In addition to these manholes, the City of Hot Springs is working to locate, uncover, and gain access to all manholes that have not yet been inspected.

Approximately one (1) million linear feet of sanitary sewer is left to smoke test. From this remaining footage an additional 200 dyed water tests will be identified and performed.

The additional amount of linear feet of sewer that will need to be televised and reviewed will be determined from smoke testing.

All remaining field work should be completed in 2010.

MODEL DEVELOPMENT

This section describes the development of the hydraulic model and the processes that will be utilized to identify any capacity deficiencies in the City of Hot Springs sanitary sewer collection system.

HYDRAULIC MODEL CONSTRUCTION

The hydraulic model for the sanitary sewer system utilizes the Infoworks CS software from MWH Soft. The sewer system consists of a series of nodes and conduits representing manholes, mains and other structures. Data for this network is sourced from GPS survey, GIS files and as-built plans.

LIFT STATIONS

Prior to hydraulic modeling, field investigations of the city lift stations are performed. During these inspections, the crews record the physical information about the lift stations and perform tasks to determine pump performance. This data is input into the model to properly reflect existing conditions.

SUBCATCHMENT DELINEATION

Subcatchments are geometric sub-areas within each drainage basin. These areas contain all the parameters using the loading flow into the pipe geometry such as population, flow rates and inflow/infiltration coefficients. Subcatchments are delineated manually by comparing current aerial photography with the sewer network. Each subcatchment covers areas that contribute flow into the sewer system. Areas such as parks, golf courses, cemeteries, etc. do not have a subcatchment assigned to them as they do not contribute any wastewater flow or inflow/infiltration.

POPULATION PROCESSING

Population for the model is typically sourced from the US Census Bureau and adjusted to reflect current city estimates. The population data is geo-processed to assign people into houses. Then, the houses are overlaid on the model and the population is transferred to the subcatchments.

FLOW MONITORING SURVEY

Flow and rainfall data for model use in calibration is collected from flow monitors rain gauges installed in the manhole locations throughout the city. These meters record level, velocity, flow and rainfall at five minute intervals for approximately 90 days. This data is used during the calibration of the model and to extract flow patterns.

DRY-WEATHER PERIOD

Dry-weather calibration ideally requires at least a 7-day period unaffected by rainfall induced flows. This period must also include at least one weekend. The recorded flow data is assessed in conjunction with the rainfall data and from this comparison; a typical dry-weather week for the area is selected.

RESIDENTIAL DRY-WEATHER ANALYSIS

Using the flow data collected from each meter during the dry period, weekday and weekend average hydrographs are calculated and graphed for each flow monitor with a primarily residential catchment. Weekday and weekend dimensionless diurnal profiles are developed through a process of ground water subtraction and normalization. These profiles are input into the model and used to modulate dry-weather flows in the model.

COMMERCIAL / INDUSTRIAL FLOWS

Commercial/Industrial flows can be assigned into the model by two methods. The first is by obtaining data from the city about their largest water customers or from pre-treatment flow records. The second is to isolate the commercial/industrial flow from the normal residential flow by subtracting the residential flow from the total flow recorded at the meter. This can then be averaged and profiled for weekday and weekend periods. The flow data from either method is input into sub-catchments that are identified from aerial imagery as containing a commercial / industrial presence or from address records.

CALIBRATION

Although the wet-weather flows are many times greater than the dry-weather flows, it is good modeling practice to have a reasonably accurate representation of these flows in a model. Calibrating the model for dry-weather flow is achieved by modifying:

- Permanent ground water infiltration rates
- Per capita flow rates
- Commercial / industrial flow rates.

WET-WEATHER CALIBRATION

Wet-weather flows are generated in the model using both fixed response surfaces as well as infiltration flows:

- Up to three "fixed" response surface areas are calibrated for each subcatchment. These surface types are fundamentally independent of the catchment condition prior to the rainfall event and represent fast responses from areas such as illegally connected roof drainage and storm water cross connections.
- Infiltration is modeled using hydrology in the Ground Infiltration module within Infoworks. This hydrological module has soil and ground water storage zones and the inflow into the model is dependent upon the wetness of the catchment prior to the rainfall

event. These flows represent the delayed ingress of storm water from the ground into the sewerage system through cracks and leaks in sewers and private drains.

DESIGN STORM

In order to analyze the required system capacity improvements a design storm is simulated on the calibrated model. This storm is selected based upon the level service the city wishes to achieve in the sewer system. The model is then used to assess sewer capacity and to determine overflow locations. With this data, recommendations are made to increase capacity and eliminate overflows.

CURRENT STATUS

The development of the hydraulic model is currently underway and is expected to be completed by the end of 2010.

CAPACITY ASSURANCE

Results will be provided after model calibration is complete.



ARKANSAS
Department of Environmental Quality

Hand Delivered Mail Receipt

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