FACILITIES PLAN FOR WATER SYSTEM IMPROVEMENTS

prepared for

CITY OF OCEAN SPRINGS

OCTOBER 2017

216-039.006

PREPARED BY:

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I. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study is to develop a comprehensive Facility Plan to meet the City of Ocean Springs water supply and distribution requirements for the Fiscal Year 2017 Drinking Water Systems Improvements Revolving Loan Fund (DWSIRLF) Program for both the short term as well as for the longer term through the year 2039. The proposed improvements in this Facilities Plan are based on a Hydraulic Study of the entire system prepared for the City of Ocean Springs by Compton Engineering, Inc. in 2014, and re-evaluated in June of 2017. This Facilities Plan generally meets the State of Mississippi's DWSIRLF Program Requirements.

The City of Ocean Springs is applying for Five Million Dollars ($5,000,000) in FY-2019 for the improvements to facilities throughout the City. The City of Ocean Springs will install with these improvements approximately 217,500 linear feet of water mains ranging in size from 4" to 12" to provide improved service to existing customers within the City's boundary. Additionally, the City will install a new tie-in to the West Jackson County Utility District's water distribution system to provide for an emergency connection. The detailed costs are outlined in Chapter VII.
The annual debt service associated with the FY-2017 DWSIRLF Program improvements is estimated to be $304,310.00 per year. The revenue from operations of the City of Ocean Springs system should be adequate to retire the debt. Additionally, a decrease in operation and maintenance costs is anticipated due to replacing old lines with new facilities. Growth in the area will also help offset the increased costs of the system.

We recommend the State of Mississippi grant the $5,000,000.00 loan for the first phase of the City's proposed system improvements. The complete project will specifically address the following:

- Installation of approximately 2,500 feet of 6” water line bore under Fort Bayou for an emergency connection to the West Jackson County Utility District’s water distribution system;
- Installation of approximately 24,300 feet of 4” water line and appurtenances;
- Installation of approximately 159,700 feet of 6” water line and appurtenances;
- Installation of approximately 28,250 feet of 8” water line and appurtenances;
- Installation of approximately 1,400 feet of 10” water line and appurtenances;
- Installation of approximately 3,700 feet of 12” water line and appurtenances.

A map of the proposed improvements is included in Appendix A.

FIGURE F-1

PLANNING AREA EXISTING SYSTEM

PROPRIETARY RIGHTS CLAUSE: INFORMATION AND DATA CONTAINED ON THIS DRAWING IS CONFIDENTIAL. IF GIVEN TO AN ENTITY NOT HAVING A CONTRACTUAL RELATIONSHIP WITH THE ENGINEER, THE INFORMATION SHALL NOT BE USED WITHOUT PRIOR WRITTEN PERMISSION. THIS LEGEND SHALL BE MARKED ON ANY REPRODUCTIONS HEREOF IN WHOLE OR IN PART. COMPTON ENGINEERING, P.A. © COPYRIGHT 1998.

S:\Pascagoula\0-Projects\2016\216-039 City of Ocean Springs\216-039.006 Water Facilities Plan\Dwg\Current Design\Concept-Design\OSMS-WTR APPENDIX A REV B.dwg, 6/19/2017 9:45:06 AM, josephl, 1:2

NORTH

PROPOSED IMPROVEMENT AREA "D":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

1,800 L.F. 4"Ø
34,600 L.F. 6"Ø

PROPOSED IMPROVEMENT AREA "E":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

1,700 L.F. 3"Ø & SMALLER
4,400 L.F. 4"Ø
11,200 L.F.6"Ø
4,350 L.F. 8"Ø
2,350 L.F. 12"Ø

W5 DEANA ROAD WELL (ACTIVE): FLOW = 400 GPM

HANDY AVENUE WELL (ACTIVE): FLOW = 1,000 GPM (W2)

T4 SUNPLEX TANK (ACTIVE): 400,000 GALLONS

W6 SUNPLEX WELL (ACTIVE): FLOW = 445 GPM

W1 CITY HALL WELL (ACTIVE): FLOW = 1,400 GPM

T1 PINE DRIVE TANK (ACTIVE): 500,000 GALLONS

T3 CIVIC CENTER TANK (ACTIVE): 500,000 GALLONS

PROPOSED IMPROVEMENT AREA "A":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

3,150 L.F. 3"Ø & SMALLER
3,250 L.F. 4"Ø
35,850 L.F.6"Ø
8,950 L.F. 8"Ø
1,400 L.F. 10"Ø

PROPOSED IMPROVEMENT AREA "B":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

7,750 L.F. 3"Ø & SMALLER
500 L.F. 4"Ø
58,950 L.F.6"Ø
9,500 L.F. 8"Ø
1,350 L.F. 12"Ø

T2 HALSTEAD ROAD TANK (ACTIVE): 500,000 GALLONS

W3 HALSTEAD ROAD WELL (ACTIVE): FLOW = 1,120 GPM

W4 PABST ROAD WELL (ACTIVE): FLOW = 1,044 GPM

PROPOSED IMPROVEMENT AREA "C":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

1,750 L.F. 3"Ø & SMALLER
19,100 L.F.6"Ø
5,450 L.F. 8"Ø

LEGEND:
- 12"
- 10"
- 8"
- 6"
- 4"
- LESS THAN 4"
- WATER VALVE
- FIRE HYDRANT
- PROPOSED IMPROVEMENT AREAS
- CITY LIMITS

	WELL LOCATION:
W1	CITY HALL WELL (ACTIVE): FLOW = 1,400 GPM
W2	HANDY AVENUE WELL (ACTIVE): FLOW = 1,000 GPM
W3	HALSTEAD ROAD WELL (ACTIVE): FLOW = 1,120 GPM
W4	PABST ROAD WELL (ACTIVE): FLOW = 1,400GPM

	WELL LOCATION:
W5	DENNA ROAD WELL (ACTIVE): FLOW = 400 GPM
W6	SUNPLEX WELL (ACTIVE): FLOW = 445 GPM

	TANK LOCATION:
T1	PINE DRIVE TANK (ACTIVE): 500,000 GALLONS
T2	HALSTEAD ROAD TANK (ACTIVE): 500,000 GALLONS
T3	CIVIC CENTER TANK (ACTIVE): 500,000 GALLONS
T4	SUNPLEX TANK (ACTIVE): 400,000 GALLONS

DATE	DESCRIPTION	BY	APVD
A 02/25/17	ISSUED FOR REVIEW	JDL	JMD
B 06/06/17	ISSUED FOR REVIEW	JDL	JMD

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CITY OF OCEAN SPRINGS
WATER SYSTEM MAP

WATER FACILITY MAP
EXISTING SYSTEM AND PROPOSED IMPROVEMENTS

SCALE: 1=2000
JOB NO.: 216-039.006
DATE:
DSGN.: JMD
DWG. BY: JDL
CHK.:
APVD.:

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET ADJUST SCALE ACCORDINGLY

APPENDIX A

SHEET OF

Rev. No. B

II. PURPOSE AND NEED

A. Compliance with National Primary Drinking Water Standards

The City of Ocean Springs currently meets National Primary Drinking Water Standards minimum recommended pressures and flows.

B. Only One Well and No MSDH Approved Emergency Tie-In to Another System

The City of Ocean Springs system has six (6) operational wells as included in the model, listed as follows:

Well Location:	Flow (gpm):
Handy Avenue Well	1000
Halstead Road Well	1120
Pabst Road Well	1044
City Hall Well	1400
Sunplex Well	445
Deana Road Well	400

The City of Ocean Springs system has four (4) tanks in the system as follows:

Tank Location:	Size (gallons):
Halstead Road Tank	500,000
Pine Drive Tank	500,000
Civic Center Tank	500,000
Sunplex Tank	400,000

In addition to the above facilities, the City of Ocean Springs has an agreement in place with the Jackson County Utility Authority (JCUA) that will allow the City to purchase up to 1,000 GPM

as a wholesale customer. Additionally, the City plans to install a new tie-in to the West Jackson County Utility District's water distribution system to provide for an emergency connection.

C. Minimum Pressure Maintenance

The City of Ocean Springs currently exceeds the 20 psi minimum pressure maintenance requirement.

D. Source Water Protection

The City of Ocean Springs has a Security Vulnerability Self-Assessment Guide. The Self-Assessment Guide was prepared in 2005 and updated in 2016. A copy of the vulnerability assessment is attached in Appendix B.

E. Expansion or New System for Unserved Areas

The City of Ocean Springs is not planning to expand the system.

F. Insufficient or Non-Existent Back-Up Supply

The City's system has adequate supply and back-up facilities as indicated in paragraph B above. Additionally, the City plans to install a new tie-in to the West Jackson County Utility District's water distribution system to provide for an emergency connection.

G. Facilities Rehabilitation/Replacement of Existing Facilities

The proposed project is primarily the replacement of distribution lines throughout the City that are either undersized, have reached their design life, or are asbestos cement lines. The facilities included in this plan are as follows:

Improvement Location	**Footage**	**Existing Size**	**Proposed Size**
Improvement Area A	3,150 LF	2” Asbestos Cement	4” PVC
	3,250 LF	4” Asbestos Cement	4” PVC
	35,850 LF	6” Asbestos Cement	6” PVC
	8,950 LF	8” Asbestos Cement	8” PVC
	1,400 LF	10” Asbestos Cement	10” PVC
Improvement Area B	7,750 LF	2” Asbestos Cement	4” PVC
	500 LF	4” Asbestos Cement	4” PVC
	58,950 LF	6” Asbestos Cement	6” PVC
	9,500 LF	8” Asbestos Cement	8” PVC
	1,350 LF	12” Asbestos Cement	12” PVC
Improvement Area C	1,750 LF	2” Asbestos Cement	4” PVC
	19,100 LF	6” Asbestos Cement	6” PVC
	5,450 LF	8” Asbestos Cement	8” PVC
Improvement Area D	1,800 LF	4” Asbestos Cement	4” PVC
	34,600 LF	6” Asbestos Cement	6” PVC
Improvement Area E	1,700 LF	2” Asbestos Cement	4” PVC
	4,400 LF	4” Asbestos Cement	4” PVC
	11,200 LF	6” Asbestos Cement	6” PVC
	4,350 LF	8” Asbestos Cement	8” PVC
	2,350 LF	12” Asbestos Cement	12” PVC

H. Compliance with National Secondary Drinking Water Standards

A recent Mississippi State Department of Health (MSDH) inspection report indicated the system meets National Secondary Drinking Water Standards (NSDWS). The system overall rating is a 5.0. We would anticipate that all new facilities proposed under this facilities plan will meet all minimum requirements of NSDWS.

The latest MSDH Inspection Report and Capacity Assessment Forms are included in Appendix C.

I. Consolidation

The water system is a public water supply owned and operated by the City of Ocean Springs. The City is tasked with providing potable water to all customers within their boundaries. Further consolidation may be an option for the City by taking over areas that are currently served by private systems located within their boundaries, if it is in their best interest to do so.

III. EXISTING SITUATION

A. General Environment

1. Planning Area

The planning area of this project is the city limits of the City of Ocean Springs, as indicated on the above referenced Figure F-1, and is generally bounded on the north by Fort Bayou, on the west by Biloxi Bay, on the south by the Mississippi Sound, and on the east by the City Boundary.

Appendix A shows the location of the proposed improvements addressed in this Facilities Plan.

2. Groundwater/Surface Water Resources

The major surface watersheds in the planning region include Fort Bayou, the Biloxi Bay, and the Mississippi Sound. There are also some additional minor watersheds that may empty into these basins. All surface water eventually reaches the Mississippi Sound. There should be no negative impacts to these receiving waters as a result of the construction project. To our knowledge, there are currently no surface water facilities for potable water supply in this area.

Ground water is currently utilized as the source of potable water supply. Three aquifers are used in this area for potable and/or industrial water supply. These aquifers include the Citronell formation; the Graham Ferry Formation; and the Terrace Formation. The Graham Ferry Formation is utilized for most of the potable water in the planning area. The Graham Ferry

Formation generally has sand regions about 500 to 600 feet below ground. This ground water resource is abundant and should be able to serve this area for years to come.

3. Organizational Context

The Owner and Applicant is the City of Ocean Springs. The City is governed by an elected mayor and an elected Board of Aldermen. The Board is comprised of seven Aldermen, one for each of the six city wards and one at-large who represents the entire city. Each elected official serves a four-year term.

4. Zip Codes of Service Area

The zip codes for the District are 39564 and 39566.

5. Current Population

The number of people served by the system is the entire population within the City of Ocean Springs service area. Based upon the 2010 census, the population was estimated at approximately 17,442 for the year 2010. Based on available census data and a geometric growth rate, it was assumed that 2017 population of the City of Ocean Springs is 17,686. The number of customers that are served by the system is currently approximately 8,214. The table below lists the current estimation of total customers, and the breakdown between residential and commercial customers:

TABLE 1 CURRENT CUSTOMER BASE	
Total Customers	8,214
Residential Customers	7,415
Commercial/Industrial Customers	799

B. Existing Drinking Water Facilities

1. Size, Location and Type of Facilities

A map of the existing system is shown in Figure F-1.

The City of Ocean Springs' system has six (6) drinking water wells. These wells and their capacities are as follows below:

Well Location	Capacity (gpm)
Handy Avenue Well	1000
Halstead Road Well	1120
Pabst Road Well	1044
City Hall Well	1400
Sunplex Well	445
Deana Road Well	400

The City also has an agreement with the Jackson County Utility Authority (JCUA) that will allow the City of Ocean Springs to purchase up to 1,000 gallons per minute. This agreement is included in appendix E.

2. Source Water Assessment Protection Report

The existing water supply wells use the Graham Ferry Aquifer Formation. The Susceptibility Assessment Report well sheets are attached in Appendix D. The Susceptibility Assessment Ranking was moderate.

3. Number of Connections Served

There are approximately 8,214 active customers currently connected to the system. Accounting for apartment usage rates, MSDH has estimated that there is the equivalent of 9,249 connections to the system. The Facilities that are being replaced are serving areas that are occupied by current customers.

4. Current Flow Demands

See attached Hydraulic Study of the City's System in Appendix F prepared by Compton Engineering, Inc. in June of 2017.

5. Current Pressures Maintained

See attached Hydraulic Study of the City's System in Appendix F prepared by Compton Engineering, Inc. in June of 2017.

6. Performance of Treatment Facilities in Meeting NPDWS

There is no treatment with the exception of disinfection with chlorine. The groundwater quality meets or exceeds appropriate drinking water standards.

7. Location and Description of Major Users

The City of Ocean Springs does not have any users that consume more than 5% of the system capacity.

8. Location of Served Versus Unserved Areas

There are no areas within the City's boundary where water service is not available.

9. Amount of Water Loss

Based on average well pump rates and metered water usage, the current calculated water loss is estimated to be 40%. In addition to the general age and condition of the distribution system, periodic hydrant flow tests conducted by the fire department and periodic flushing in areas of low flow to maintain fresh water contribute to this estimate of water loss.

IV. FUTURE ENVIRONMENT

The improvements are necessary to provide the public with proper water distribution. The "no-action" alternative is not acceptable since continuing to use the old lines may result in health risk to the population due to excessive breaks in the system.

V. DEVELOPMENT OF WATER DEMAND

Compton Engineering, Inc. prepared a Hydraulic Study of the City of Ocean Springs water distribution system. The study consisted of an analysis of current supply, storage, and distribution capabilities through the year 2039. The required improvements to the water system to meet the current and future demand were recommended.

A copy of the Hydraulic Study including computations is provided in Appendix F.

The purpose of the proposed improvements is to provide the public with a properly maintained public water supply by replacing aged and undersized distribution lines, as well as improving system capacity.

A. Residential

1. Current and Future Population

Per the 2010 Census, the population for the City of Ocean Springs was estimated to be 17,442 people for the year 2010. For the existing conditions analysis, 2017 was assumed as the Base Year and 2037 was assumed as the design year for future conditions. Based on available census data and a geometric growth rate, it was assumed that 2017 population of the City of Ocean Springs is 17,686. Using geometric growth rate, it was also assumed that the future population for the City of Ocean Springs will be 18,400 in 2037. This contributes to a population growth of 104% for the 20 year design period.

2. Demand

Per the MSHD/DWS Design Criteria, Table I, the 2010 Census Data, and the populations referenced above, the design flows based upon peak loads will result in a current peak demand of 9,250 GPM and a future peak demand of 9,625 GPM.

B Commercial/Industrial/Major Users

There are currently no users in the City of Ocean Springs that consume more than 5% of the system capacity.

C. Design Demand

The above considerations have resulted in an approximate current peak demand of 9,250 GPM and an approximate future peak demand of 9,625 GPM for the City.

VI. DEVELOPMENT OF ALTERNATIVES

A. Consolidation

The City is required by legislation to provide services to the public. The installation of adequate systems by the City of Ocean Springs may promote consolidation of other private systems in the area if this ever became a necessity for either party.

B. Supply

The ground water in the area has proven to be a dependable water supply. The existing wells are spaced to avoid impacts to the aquifer. We would not anticipate any need for another water supply in this area. This supply is further enhanced by an agreement with the JCUA to provide the City with water. This agreement is included in Appendix D.

C. Treatment

The existing wells meet all drinking water standards and are largely only in need of disinfection with chlorine. The City of Ocean Springs currently does not add fluoride to the drinking water.

D. Storage

The City currently has four (4) elevated tanks in operation with a total capacity of 1,900,000 gallons.

E. Distribution

The existing distribution network consists of various types of water pipe ranging in diameter from 1 ½" through 12". This project will replace undersized lines and other lines that are beyond their design life. The existing distribution system includes about 720,000 linear feet of lines. The Hydraulic Study prepared for the City by is included in Appendix F.

VII. SELECTED PLAN

The selected plan will include the following improvements to the facilities:

- Installation of approximately 2,500 feet of 6" water line bore under Fort Bayou for an emergency connection to the West Jackson County Utility District's water distribution system;
- Installation of approximately 24,300 feet of 4" water line and appurtenances;
- Installation of approximately 159,700 feet of 6" water line and appurtenances;
- Installation of approximately 28,250 feet of 8" water line and appurtenances;
- Installation of approximately 1,400 feet of 10" water line and appurtenances;
- Installation of approximately 3,700 feet of 12" water line and appurtenances.

A. General Information

1. Reason for Selection

The selected plan is the most cost effective approach to allow the City of Ocean Springs to provide adequate, updated, and upgraded facilities to their customers. The "no-action" alternative would not be acceptable in this case because of the health threats due to frequent breaking of lines in these areas.

2. Planning Area Map

The planning area for the proposed project is shown on the map in Figure F-1.

The project does not exclude any minority or low income individuals in the planning area.

3. Facilities

The proposed improvements will consist of approximately 217,500 linear feet of water mains ranging in size from 4" to 12". The various line sizes and lengths are as follows:

Line Size:	Length:
4"	24,300
6"	159,700
8"	28,250
10"	1,400
12"	3,700
Total	**217,500**

Additionally, the proposed future system improvements propose to install approximately 2,500 feet of 6" water line bore under Fort Bayou for an emergency connection to the West Jackson County Utility District's water distribution system.

4. Effect on Aquifers

The proposed improvements should not have any adverse effects on the Graham Ferry Aquifer Formation. By replacing these old lines, the net effect should reduce leaks, therefore, reducing the system losses.

5. Sludge Management

No sludge management system will be required for the proposed or future improvements, therefore, no solid waste permit or NPDES permit will be required.

6. Erosion Control

The proposed improvements to the system will require some trenching and site preparation for the new water mains. The contractor will be required to control erosion, and otherwise keep the site in a clean, useable condition while construction is in progress.

7. Eligible/Ineligible Costs

All costs for the planned improvements are eligible items under the DWSIRLF regulations.

B. Special Environmental Considerations

1. Archeological/Cultural

The facilities will be located on existing rights-of-way and/or easements. We have solicited comments from the agencies which will need to review this plan, including the Department of the Army/Corps of Engineers, Natural Heritage Program, Mississippi Department of Archives and History, U.S. Fisheries and Wildlife Service, and Mississippi Department of Marine Resources. Copies of the letters requesting comments are included in Appendices H, I, J, K, and L respectively. All comments from these agencies will be documented and addressed prior to the final submittal of this plan.

2. Farmlands

This project is on public right of ways and/or easements and will have no impact to farmlands.

3. Flood Plains

Portions of the distribution system are within the 100-year flood hazard boundary. There are no facilities included in this project that will be adversely impacted by being in the 100-year flood hazard boundary. The flood map of the area is attached as Appendix M.

VIII. FINANCIAL CAPABILITY SUMMARY

The Financial Capability Summary is included in Appendix N for your review. The cost of Phase 1 of the proposed water system improvements is $5,000,000 with a construction budget of $4,100,000; a total construction estimate for the scope of improvements in this plan totals approximately $10,600,000. Construction associated with this plan will be limited to the construction budget and based on actual bids received. A breakdown of the estimate is included in Table 1, Cost Estimate Phase 1.

A. There are no outside entities or inter-local agreements involved in this plan.

B. There are no items ineligible for DWSIRLF funding.

C. The City of Ocean Springs does not anticipate an increase in user fees to address OM&R for the system improvements.

D. The annual cost per household is not considered a high cost project.

Table T-1
Cost Estimate Phase 1

Construction Cost Distribution System	$4,100,000
Planning and Design	$275,000
Construction Engineering	$205,000
Construction Contingencies	$410,000
Testing	$10,000
DWSIRLF Admin Fee	$0
Total**	$5,000,000

A more detailed breakdown of construction cost is:

PHASE 1					
Emergency Connection with West Jackson County Utility District					
Item #	**Description:**	**Units:**	**Quantity:**	**Unit Price:**	**Amount:**
1	Mobilization/Demobilization	LS	1	$75,000.00	$75,000.00
2	6" Water Pipe (Directional Bore)	LF	2,400	$100.00	$240,000.00
3	6" Water Pipe	LF	525	$30.00	$15,750.00
4	6" Gate Valve	EA	3	$1,250.00	$3,750.00
5	Fire Hydrant Assembly	EA	1	$4,000.00	$4,000.00
6	Fittings	LBS	250	$5.00	$1,250.00
7	Tracer Wire Box	EA	4	$500.00	$2,000.00
			TOTAL:		**$341,750.00**
Replacement of Asbestos Cement Lines					
Item #	**Description:**	**Units:**	**Quantity:**	**Unit Price:**	**Amount:**
Improvement Area A					
1	Mobilization/Demobilization	LS	1	$100,000.00	$100,000.00
2	4" Water Pipe	LF	6,400	$25.00	$160,000.00
3	6" Water Pipe	LF	35,850	$30.00	$1,075,500.00
4	8" Water Pipe	LF	8,950	$40.00	$358,000.00
5	10" Water Pipe	LF	1,400	$50.00	$70,000.00
6	4" Gate Valve	EA	6	$1,000.00	$6,000.00
7	6" Gate Valve	EA	36	$1,250.00	$45,000.00
8	8" Gate Valve	EA	10	$1,500.00	$15,000.00
9	10" Gate Valve	EA	2	$2,500.00	$5,000.00
10	Fire Hydrant Assembly	EA	65	$4,000.00	$260,000.00
11	Fittings	LBS	50,000	$5.00	$250,000.00
12	Tracer Wire Box	EA	65	$500.00	$32,500.00
13	Asphalt Pavement Repair	SY	1,000	$20.00	$20,000.00
			TOTAL:		**$2,397,000.00**

Improvement Area C					
1	Mobilization/Demobilization	LS	1	$85,000.00	$85,000.00
2	4" Water Pipe	LF	1,750	$25.00	$43,750.00
3	6" Water Pipe	LF	19,100	$30.00	$573,000.00
4	8" Water Pipe	LF	5,450	$40.00	$218,000.00
5	4" Gate Valve	EA	2	$1,000.00	$2,000.00
6	6" Gate Valve	EA	20	$1,250.00	$25,000.00
7	8" Gate Valve	EA	6	$1,500.00	$9,000.00
8	Fire Hydrant Assembly	EA	35	$4,000.00	$140,000.00
9	Fittings	LBS	25,000	$5.00	$125,000.00
10	Tracer Wire Box	EA	35	$500.00	$17,500.00
11	Asphalt Pavement Repair	SY	1,000	$20.00	$20,000.00
				TOTAL:	**$1,258,250.00**
				SAY TOTAL PHASE 1:	**$4,100,000.00**

FUTURE PHASES					
Replacement of Asbestos Cement Lines					
Improvement Area B					
1	Mobilization/Demobilization	LS	1	$125,000.00	$125,000.00
2	4" Water Pipe	LF	8,250	$25.00	$206,250.00
3	6" Water Pipe	LF	58,950	$30.00	$1,768,500.00
4	8" Water Pipe	LF	9,500	$40.00	$380,000.00
5	12" Water Pipe	LF	1,350	$60.00	$81,000.00
6	4" Gate Valve	EA	8	$1,000.00	$8,000.00
7	6" Gate Valve	EA	60	$1,250.00	$75,000.00
8	8" Gate Valve	EA	10	$1,500.00	$15,000.00
9	12" Gate Valve	EA	14	$3,000.00	$42,000.00
10	Fire Hydrant Assembly	EA	100	$4,000.00	$400,000.00
11	Fittings	LBS	75,000	$5.00	$375,000.00
12	Tracer Wire Box	EA	100	$500.00	$50,000.00
13	Asphalt Pavement Repair	SY	1,000	$20.00	$20,000.00
				TOTAL:	**$3,545,750.00**

Improvement Area D					
1	Mobilization/Demobilization	LS	1	$85,000.00	$85,000.00
2	4" Water Pipe	LF	1,800	$25.00	$45,000.00
3	6" Water Pipe	LF	34,600	$30.00	$1,038,000.00
4	4" Gate Valve	EA	2	$1,000.00	$2,000.00
5	6" Gate Valve	EA	35	$1,250.00	$43,750.00
6	Fire Hydrant Assembly	EA	45	$4,000.00	$180,000.00
7	Fittings	LBS	35,000	$5.00	$175,000.00
8	Tracer Wire Box	EA	45	$500.00	$22,500.00
9	Asphalt Pavement Repair	SY	1,000	$20.00	$20,000.00
			TOTAL:		**$1,611,250.00**
Improvement Area E					
1	Mobilization/Demobilization	LS	1	$75,000.00	$75,000.00
2	4" Water Pipe	LF	6,100	$25.00	$152,500.00
3	6" Water Pipe	LF	11,200	$30.00	$336,000.00
4	8" Water Pipe	LF	4,350	$40.00	$174,000.00
5	12" Water Pipe	LF	2,350	$60.00	$141,000.00
6	4" Gate Valve	EA	6	$1,000.00	$6,000.00
7	6" Gate Valve	EA	12	$1,250.00	$15,000.00
8	8" Gate Valve	EA	5	$1,500.00	$7,500.00
9	12" Gate Valve	EA	3	$3,000.00	$9,000.00
10	Fire Hydrant Assembly	EA	30	$4,000.00	$120,000.00
11	Fittings	LBS	20,000	$5.00	$100,000.00
12	Tracer Wire Box	EA	30	$500.00	$15,000.00
13	Asphalt Pavement Repair	SY	1,000	$20.00	$20,000.00
			TOTAL:		**$1,171,000.00**
			SAY TOTAL FUTURE PHASES:		**$6,500,000.00**

IX. PUBLIC PARTICIPATION

The proposed project has scheduled a public hearing to allow for public participation. The public hearing notice will be published in the local newspaper 30 days prior to the hearing.

The notice and proof of publication are included in Appendix O.

The minutes and comments from the public hearing are included in Appendix P.

Any response to public comments and plan changes (if any were made) are included in Appendix Q.

APPENDICES

APPENDIX A

LOCATION OF PROPOSED PROJECTS

PROPRIETARY RIGHTS CLAUSE: INFORMATION AND DATA CONTAINED ON THIS DRAWING IS CONFIDENTIAL. IF GIVEN TO AN ENTITY NOT HAVING A CONTRACTUAL RELATIONSHIP WITH THE ENGINEER, THE INFORMATION SHALL NOT BE USED WITHOUT PRIOR WRITTEN PERMISSION. THIS LEGEND SHALL BE MARKED ON ANY REPRODUCTIONS HEREOF IN WHOLE OR IN PART. COMPTON ENGINEERING, P.A. © COPYRIGHT 1998.

NORTH

PROPOSED IMPROVEMENT AREA "D":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

1,800 L.F. 4"Ø
34,600 L.F. 6"Ø

PROPOSED IMPROVEMENT AREA "E":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

1,700 L.F. 3"Ø & SMALLER
4,400 L.F. 4"Ø
11,200 L.F.6"Ø
4,350 L.F. 8"Ø
2,350 L.F. 12"Ø

W5 DEANA ROAD WELL (ACTIVE): FLOW = 400 GPM

HANDY AVENUE WELL (ACTIVE): FLOW = 1,000 GPM (W2)

T4 SUNPLEX TANK (ACTIVE): 400,000 GALLONS

W6 SUNPLEX WELL (ACTIVE): FLOW = 445 GPM

W1 CITY HALL WELL (ACTIVE): FLOW = 1,400 GPM

T1 PINE DRIVE TANK (ACTIVE): 500,000 GALLONS

T3 CIVIC CENTER TANK (ACTIVE): 500,000 GALLONS

PROPOSED IMPROVEMENT AREA "A":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

3,150 L.F. 3"Ø & SMALLER
3,250 L.F. 4"Ø
35,850 L.F.6"Ø
8,950 L.F. 8"Ø
1,400 L.F. 10"Ø

PROPOSED IMPROVEMENT AREA "B":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

7,750 L.F. 3"Ø & SMALLER
500 L.F. 4"Ø
58,950 L.F.6"Ø
9,500 L.F. 8"Ø
1,350 L.F. 12"Ø

T2 HALSTEAD ROAD TANK (ACTIVE): 500,000 GALLONS

W3 HALSTEAD ROAD WELL (ACTIVE): FLOW = 1,120 GPM

PABST ROAD WELL (ACTIVE): FLOW = 1,044 GPM (W4)

PROPOSED IMPROVEMENT AREA "C":
- ***REPLACE UNDERSIZED/ OUTDATED LINES***

1,750 L.F. 3"Ø & SMALLER
19,100 L.F.6"Ø
5,450 L.F. 8"Ø

LEGEND:
- 12"
- 10"
- 8"
- 6"
- 4"
- LESS THAN 4"
- WATER VALVE
- FIRE HYDRANT
- PROPOSED IMPROVEMENT AREAS
- CITY LIMITS

	WELL LOCATION:
W1	CITY HALL WELL (ACTIVE): FLOW = 1,400 GPM
W2	HANDY AVENUE WELL (ACTIVE): FLOW = 1,000 GPM
W3	HALSTEAD ROAD WELL (ACTIVE): FLOW = 1,120 GPM
W4	PABST ROAD WELL (ACTIVE): FLOW = 1,400GPM

	WELL LOCATION:
W5	DENNA ROAD WELL (ACTIVE): FLOW = 400 GPM
W6	SUNPLEX WELL (ACTIVE): FLOW = 445 GPM

	TANK LOCATION:
T1	PINE DRIVE TANK (ACTIVE): 500,000 GALLONS
T2	HALSTEAD ROAD TANK (ACTIVE): 500,000 GALLONS
T3	CIVIC CENTER TANK (ACTIVE): 500,000 GALLONS
T4	SUNPLEX TANK (ACTIVE): 400,000 GALLONS

Rev. No.	DATE	DESCRIPTION	BY	APVD
A	02/25/17	ISSUED FOR REVIEW	JDL	JMD
B	06/06/17	ISSUED FOR REVIEW	JDL	JMD

COMPTON ENGINEERING, INC.
Engineering, Surveying, and Environmental Services
1706 Convent Avenue
Pascagoula, Mississippi 39567
Phone: (228) 762-3970 Fax: (228) 769-9079
E-mail: compton@comptonengineering.com

CITY OF OCEAN SPRINGS
WATER SYSTEM MAP

WATER FACILITY MAP
EXISTING SYSTEM AND PROPOSED IMPROVEMENTS

SCALE: 1=2000
JOB NO.: 216-039.006
DATE:
DSGN.: JMD
DWG. BY: JDL
CHK.:
APVD.:

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY
0 1"

APPENDIX A
SHEET OF

APPENDIX B

VULNERABILITY ASSESSMENT

Security Vulnerability Self-Assessment Guide for Mississippi's Public Water Systems

CITY OF OCEAN SPRINGS

NAME OF PUBLIC WATER SYSTEM

3000005 & 3000515

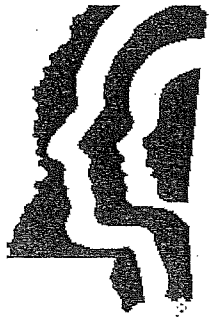
PWS ID NUMBER(S)

2/10/2005

Date Completed

10/14/2016

Date Last Updated
(should be updated annually)



MISSISSIPPI DEPARTMENT OF HEALTH

BUREAU OF PUBLIC WATER SUPPLY

INTRODUCTON:

This Vulnerability Assessment was conducted on behalf of The City of Ocean Springs by Compton Engineering, Inc. for the purpose of evaluating potential threats to the City water system and identifying corrective actions to reduce the risk of intentional damage, disruption, or destruction of the system.

Needed risk reduction measures have been prioritized and listed in *Attachment 1. Prioritization of Needed Actions*.

The City water system provides water services to approximately 8,150 residential and commercial customers. Approximately 17,450 people reside in the City.

The referenced system includes 6 source wells and one wholesale water connection:

1. Handy Street (Robinson Intersection) feeds Pine Street Tank
2. Senior Citizen's Building (next to City Hall) feeds Pine Street Tank
3. Halstead Road Well and Tank
4. Pabst Road Well feed Civic Center Tank
5. Sunplex Well and Tank
6. Deana Road Well feeds Civic Center Tank
7. JCUA Wholesale water connection

It also includes one 400,000-gallon holding tank (Sunplex Tank), and three 500,000-gallon holding tanks (Halstead, Pine and Civic Center).

Please see attached documents for further details.



Instructions to Assist Community Water Systems in Complying with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002

Office of Water
EPA 810-B-02-001
January 2003

www.epa.gov/safewater/security

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1. Introduction and purpose of these Instructions
2. Instructions At-A-Glance
3. What a CWS must do to comply with requirements of the Bioterrorism Act
4. Key dates for compliance with the requirements of the Bioterrorism Act
5. Determination of the size of the population the CWS serves
6. How to Submit VA Certifications, VAs, and ERP Certifications to EPA
7. Additional Information on Vulnerability Assessments (VAs)– components of a CWS the Bioterrorism Act requires a VA to cover; guidance on a VA's elements.
8. List of Acronyms

Appendices

1. Vulnerability Assessment Certification
2. Points to consider in Vulnerability Assessments
3. Mailing label to use for courier deliveries of items submitted to EPA; Recommended delivery address
4. Certification of Completion of an Emergency Response Plan

Instructions to Assist Community Water Systems in Complying With the Public Health Security and Bioterrorism Preparedness and Response Act of 2002

Long Title:

Instructions to community water systems: Guidance on how to comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 with respect to the certification and submission of Vulnerability Assessments to the US Environmental Protection Agency (EPA) and certification to EPA of completion of Emergency Response Plans.

1. **Introduction and Purpose of these Instructions**:

On June 12, 2002, President Bush signed the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act) into Law (PL 107-188). The Bioterrorism Act amends the Safe Drinking Water Act (SDWA) by adding section 1433. Section 1433(a) requires that certain community water systems (CWS) conduct Vulnerability Assessments (VAs), certify to EPA that the VAs were conducted, and submit a copy of the VA to EPA. Section 1433(b) requires that certain CWSs prepare or revise Emergency Response Plans (ERPs) and certify to EPA that an (ERP) has been completed.

We have prepared these *Instructions to Assist Community Water Systems in Complying With the Bioterrorism Act's* specific requirements and its deadlines for submission of VA and ERP documents.

Disclaimer: Please note that these Instructions are intended to provide information and recommendations to community water systems (CWSs) on how to comply with the Bioterrorism Act. The statutory provisions contained in the Bioterrorism Act are repeated in these Instructions and are legally binding requirements. The Instructions provided here do not substitute or expand upon these statutory requirements. Furthermore, adherence to these Instructions is not required where the discussed actions are not specifically required by the Bioterrorism Act; rather, following Instructions that are identified as suggestions are strictly voluntary for both EPA and affected CWSs. In addition, these Instructions may not apply to a particular situation based upon the circumstances. EPA decision-makers retain the discretion to adopt approaches on a case-by-case basis, which may differ from these Instructions where appropriate. Any decisions regarding a particular facility will be made based on the applicable statutory provisions. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of these Instructions to a particular situation and EPA will consider whether or not the recommendations or interpretations in the Instructions are appropriate in that situation based on the Bioterrorism Act or other relevant law. EPA may change these Instructions in the future as experience or other circumstances warrant.

2. Instructions At-A-Glance

What you, as the owner or operator of community water system should do, in brief, and where to look for additional information. (Throughout these Instructions, reference to "you" means the collective group of persons or those individuals involved in the work necessary to enable the community water system to comply with the Bioterroism Act. This includes but is not limited to, the community water system's owner(s), operator(s), authorized representative(s), and other employees.)

The following are the most frequently asked questions concerning compliance with the Bioterrorism Act. Following each answer are notes indicating the sections of the Instructions where you can find detailed information. (The complete Instructions that follow Instructions At-A-Glance explain the things you should do to comply, in detail.)

2.1 I represent a community water system. What must I do to comply?

Answer: If you represent a community water system serving more than 3,300 people, you must:

1. Conduct a vulnerability assessment (Section 7 and Appendix 2);
2. Send a written and signed certification to EPA that the system has conducted a vulnerability assessment (Sections 6.1.1 and 6.1.2; Appendix 1);
3. send a copy of the vulnerability assessment to EPA (Sections 6.1.2 and 6.2; Appendix 3);
4. send a written certification to EPA that your system has completed an emergency response plan (Section 6.3 and Appendix 4).

2.2 The information in my vulnerability assessment is very important and sensitive. How do I make sure my submission gets to EPA safely and securely?

Answer: Follow the mailing and packaging instructions in sections 6.1.2 and 6.2. In brief, you should USE A COURIER SERVICE, send the documents to the Recommended Delivery Address in section 6.1.2, and use double envelopes and the proper package labels as discussed in section 6.2. Appendix 3 contains a mailing label for your convenience.

2.3 My system serves more than 3,300 persons. When must these actions be completed?

Answer: Systems of different sizes must comply by different deadline dates, with the largest systems required to comply by the earliest date. For example, the largest water systems–those that serve populations of 100,000 or greater–must certify to EPA that they conducted a vulnerability assessment and submit a copy of the assessment to EPA prior to March 31, 2003. Systems must also certify to EPA that they completed an emergency

response plan not later than six months after certifying the vulnerability assessment or by the dates shown in Table 1, whichever is sooner.

Smaller systems (those serving fewer than 100,000 persons) should refer to Table 1 within Section 4 to determine their deadlines for conducting and certifying vulnerability assessments, sending vulnerability assessments to EPA, and certifying emergency response plans to EPA.

2.4 How will EPA determine the number of people that a community water system serves, which will in turn determine the deadline with which the system must comply?

Answer: As a general matter, EPA will use the Safe Drinking Water Information System (SDWIS) data that was submitted to EPA by the States on July 1, 2002, as the information that determines a system's population size. The information is publicly available, is maintained in EPA's Safe Drinking Water Information System, and is on file with state drinking water administrators (Section 5).

2.5 I am responsible for a water system owned or operated by the federal government. The system's vulnerability assessment will contain officially classified information. How should I submit the vulnerability assessment to EPA? Are there additional precautions to observe?

Answer: EPA most strongly recommends that all US Government-classified documents, of any security classification, be hand delivered to EPA either by a representative of the government water system or by courier service. Follow the instructions in Section 6.2.1 for details.

2.6 Who should I call if I need more information?

Answer: You should call the EPA Safe Drinking Water Hotline at 800-426-4791. The Hotline staff can provide additional information or refer you to the correct EPA contact person. Refer to the document number: EPA 810-B-02-001, dated January 2003.

3. **What a CWS must do to comply with requirements of the Bioterrorism Act**:

CWSs serving populations more than 3,300 persons must comply with the Bioterrorism Act. The Bioterrorism Act requires theses community water systems to:

1. Conduct a VA;
2. Certify to EPA that the CWS conducted a VA;
3. Submit a copy of the VA to EPA; and
4. Certify to EPA that the CWS has completed an ERP.

With respect to the VA submission, EPA encourages you to provide an Executive Summary of the VA, which summarizes the major system vulnerabilities and planned improvements to reduce the vulnerabilities. EPA also encourages you to provide a Table of Contents describing the VA by section and page number, including a page count to allow EPA to determine if the package, as received, is complete. Both of these items are optional and are not required by the Bioterrorism Act.

VA submissions need not include supporting documentation such as working papers, background or raw data, or other preparation or analytical materials. You may omit these items; however, if you omit these items, the VA itself should be complete and clear when reviewed on its own merits.

4. **Key dates for compliance with the requirements of the Bioterrorism Act:**

Table 1 provides the dates by which CWSs must comply with the above requirements. A discussion of how EPA will determine the size of the CWS follows Table 1.

TABLE 1

Column A **Systems serving population* of:**	Column B **Submit VA and VA Certification** prior to:**	Column C **Certify ERP within 6 months of VA but no later than***:**
100,000 persons or greater	March 31, 2003	September 30, 2003
50,000 to 99,999 persons	December 31, 2003	June 30, 2004
3,301 to 49,999 persons	June 30, 2004	December 31, 2004
* See also Section 6, below, for discussion of determination of system population size.	** Compliance with these deadlines is determined by the date of the postmark or the date the courier places on the mailing label of the submission.	*** VA certifications submitted to EPA earlier than the dates shown in Column B means that the CWS must submit an ERP certification *earlier* than the dates shown in Column C.

5. **Determination of the size of the population the CWS serves:**

In order to determine whether the system is subject to the above requirements and the deadline that applies to the system, you must determine your CWS's size.

The Agency will use data from the Safe Drinking Water Information System (SDWIS) to determine system size. This data was filed by States, as of July 1, 2002, and made available to the public on October 1, 2002. EPA will presume that the size of the CWS indicated by SDWIS on that date is the size of the system that must comply with the due dates shown in Table 1 for certification and submission of VAs, and for certification of ERPs.

CWSs that operate as wholesalers, who sell water to other systems, should count the populations of those systems in determining the size of their total populations served. For example, if a wholesale CWS has no retail customers, but serves four water systems each having 30,000 retail customers, EPA will presume, for compliance purposes, that

the wholesale CWS serves 120,000 persons and must comply with the deadlines shown in Table 1 for systems serving 100,000 persons or greater.

General SDWIS data are available from:

http://www.epa.gov/safewater/data/getdata.html

Useful information on populations served by CWSs can also be obtained from State Drinking Water Administrators.

If you are unclear about whether the system is subject to the Act's requirements or which deadlines apply to the system, or if you have additional information relevant to determining the size of the system, we strongly recommend that you contact your State for a system-specific assessment. Systems that are operated on tribal lands, in the state of Wyoming, and in the District of Columbia should consult directly with EPA for final determinations of system sizes.

6. How to Submit VA Certifications, VAs, and ERP Certifications to EPA

6.1 Submission of VA Certifications

6.1.1. Content of a VA Certification:

If the CWS serves a population greater than 3,300, then the CWS is required to certify to EPA that it has conducted a VA. EPA recommends that you submit the certification to EPA along with the required copy of the VA itself. The certification may be sent prior to sending a copy of the VA, but EPA recommends sending both at the same time.

EPA suggests that you use the standardized certification form in Appendix 1 of these Instructions to certify to EPA that you have conducted a VA. The form is provided as a guide and is not required for this purpose. If you decide to use your own format for certifying that a VA was conducted, we recommend that the certification include the following language, printed on the CWS letterhead, above the signature of the authorized CWS representative:

> "I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has conducted a vulnerability assessment that complies with Section 1433(a)(1) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV— Drinking Water Security and Safety).
>
> I further certify that this document and all attachments were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C. 300f *et seq.*)).

The VA addresses the following components of the CWS: 'pipes and constructed conveyances, physical barriers, water collection, pretreatment, treatment, storage and distribution facilities, electronic, computer or other automated systems which are utilized by the public water system, the use, storage, or handling of various chemicals, the operation and maintenance of such system.'"

[For those parts of the system that are applicable to the CWS, indicate whether the VA addressed each part. For those parts that are not applicable, indicate so.]

The Certification should also include the following information:

A. name, address, telephone number, email address if available, and Federal Public Water System Identification Number (PWSID#) of the CWS;

B. Name(s), title(s), address(es), telephone number(s), and email address(es) of two persons designated by the Community Water System that EPA may contact with questions about the assessment (main contact person and alternate);

You should keep and securely file a copy of this form.

The owner, manager, Certified Operator, or other Authorized Representative of the water utility **must sign** the certification form. That person should have responsibility over the management and daily operation of the CWS, as well as knowledge of the development of the VA.

6.1.2 Mailing a VA Certification to EPA:

You must send a signed original certification form (Appendix 1 or another version of the Certification) to EPA on or before the dates shown in Column B of Table 1. You may also submit a copy of the VA in this package, along with the VA Certification. **If you choose to submit the Certification and VA together in one package (EPA recommends this), please be sure to read Section 6.2, entitled "Instructions specific to submitting the Vulnerability Assessment."**

Recommended Delivery Address:

We recommend that you submit the VA Certification using an express or courier service such as Federal Express, United Parcel Service, Airborne, etc., which provides tracking and certification of delivery. Using these services will ensure that the submission is delivered directly to the persons authorized to receive and process these items.

Use the following address for express or courier service deliveries to EPA. This location

is open for deliveries between 8:30am and 4:30pm Eastern Time. Call the number under the address below before attempting delivery outside of those hours. (For convenience, a mailing label with this address appears in Appendix 3, which the CWS can also use.)

U.S. Environmental Protection Agency
Water Resource Center (WSD-RAR)
Room 1119 EPA West Building
1301 Constitution Ave., NW
Washington DC 20004

Couriers are to use phone number 202-566-1729

Address to Use for US Postal Service Delivery (NOT RECOMMENDED):

If the CWS chooses to use US Postal Service delivery (any of their modes of delivery including certified mail, registered mail, express mail, and first class, etc.), use the following address. **EPA does not recommend using US Postal Service delivery because the shipment cannot always be tracked during transit. Also, there can be significant delays in the postal system's deliveries to EPA due to decontamination irradiation of the mail, which may also damage or destroy the submission.**

Use a double envelope and put this address on the **OUTER** envelope:

Attention: Janet Pawlukiewicz
Mail Code: 4601M
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington DC 20460

6.2 Instructions specific to submitting the Vulnerability Assessment:

The CWS should use these instructions when submitting a copy of the VA to EPA or if submitting the Certification of Conduct of a VA **AND** a copy of the VA together in one package.

You should use the "Recommended Delivery Address" shown in the above Section 6.1.2. **EPA strongly recommends that the CWS send the VAs to EPA sealed in two envelopes, one inside the other. No reference should be made on the outer envelope to its contents.** Avoid the use of markings on the outer envelope that may lead someone to know what it contains. Do NOT use words such as "vulnerability assessment," "confidential," "Water Protection Task Force," "Bioterrorism Act," etc.

The inside envelope should be sealed, and marked "**TO BE OPENED BY ADDRESSEE ONLY–Janet Pawlukiewicz**." The outside envelope should be

addressed to the Recommended Delivery Address shown above.

6.2.1 Special Instructions for Water Systems Owned or Operated by the Federal Government:

If the CWS classifies the VA under one of the federal government's denoted security classifications (Confidential, Secret, Top Secret, etc.), it is very important that you make advance arrangements with EPA to properly receive your submission.

Call the following numbers to request that you be placed in contact with the Water Security Information Security Manager. The Information Security Manager or her designee will help you arrange a time for hand delivery of your submission directly to an EPA employee who possesses the appropriate security clearance:

202-564-9932 or
202-564-6186

6.3 Submission of Certification of Completion of an Emergency Response Plan (ERP) to the Administrator of EPA

6.3.1 Content of an ERP Certification:

If the CWS is required to conduct a VA, then you must also certify to EPA that you have completed an ERP. **(Do not submit a copy of the ERP to EPA.)** EPA suggests that you use the standardized certification form in Appendix 4 of these Instructions to certify to EPA that the CWS has completed an ERP. The form is provided as a guide and is not required for this purpose. If you use your own format for certifying that you have completed an ERP, the certification should include the following language above the signature of the authorized CWS representative:

> "I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has completed an emergency response plan that complies with Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV— Drinking Water Security and Safety).
>
> I further certify that this document and all attachments were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C. 300f *et seq.*)).
>
> The emergency response plan that this community water system completed incorporates the results of the vulnerability assessment completed for the system and includes 'plans, procedures, and identification of equipment that can be

implemented or utilized in the event of a terrorist or other intentional attack' on this community water system. The emergency response plan also includes 'actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals.'

This CWS has coordinated, to the extent possible, with existing Local Emergency Planning Committees established under the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11001 et seq) when preparing this emergency response plan."

The Certification should also include the following information:

A. name, address, telephone number, email address if available, and Federal Public Water System Identification Number (PWSID#) of the CWS;

B. name(s), title(s), address(es), telephone number(s), and email address(es) of two persons designated by the CWS that EPA may contact with questions about the plan (main contact person and alternate);

The Bioterrorism Act requires that CWSs maintain a copy of the emergency response plan for five years after such plan is certified to EPA.

6.3.2 **Mailing an ERP Certification to EPA**

Follow the mailing instructions above under Section 6.1.2, "Recommended Delivery Address," discussing mailing VA certifications to EPA.

7. **Additional Information on Vulnerability Assessments (VAs)–components of a CWS the Bioterrorism Act requires a VA to cover; guidance on a VA's elements**

7.1 **Vulnerability Assessment– components of a CWS that a VA must address:**

Each CWS that serves a population greater than 3,300 persons must perform an assessment of the vulnerability of its system to a terrorist attack or other intentional acts that are intended to substantially disrupt the ability of the system to provide a safe and reliable supply of drinking water. This is a "vulnerability assessment" and is discussed further in the Bioterrorism Act as follows. **These components must be addressed in the VA, to the extent they are applicable to the CWS, in order to comply with the Bioterrorism Act**:

"The vulnerability assessment shall include, but not be limited to a review of:

[1.] pipes and constructed conveyances,
[2.] physical barriers,
[3.] water collection, pretreatment, treatment, storage and distribution facilities,
[4.] electronic, computer or other automated systems which are utilized by the public water system,
[5.] the use, storage, or handling of various chemicals, and
[6.] the operation and maintenance of such system."

7.2 Additional Information on the elements of a VA:

EPA has provided additional information about VAs and related security topics to CWSs in the document entitled *Baseline Threat Information for Vulnerability Assessments of Community Water Systems* (Baseline Threat Document). The Baseline Threat Document is not a blueprint for developing a VA, however, it does present an overview of threats, methodologies, and strategies for the CWS to consider as it develops a VA required under the Bioterrorism Act.

A VA generally should address six basic elements, as they were outlined in the Baseline Threat Document[1]. A VA is performance based, meaning that it evaluates the risk to the water system based on the effectiveness (performance) of existing and planned measures to counteract potential adversarial actions. The VA elements are:

1. Characterization of the water system, including its mission and objectives;
2. Identification and prioritization of adverse consequences to avoid;
3. Determination of critical assets that might be subject to malevolent acts that could result in undesired consequences;
4. Assessment of the likelihood (qualitative probability) of such malevolent acts from adversaries (e.g., terrorists, vandals);
5. Evaluation of existing countermeasures; and
6. Analysis of current risk and development of a prioritized plan for risk reduction.

---

[1]See also, Appendix 2 to these Instructions entitled "Points to Consider in Vulnerability Assessments." This Appendix provides additional discussion of these six elements.

8. List of Acronyms

CWS	Community Water System
EPA	US Environmental Protection Agency
ERP	Emergency Response Plan
SDWA	Safe Drinking Water Act, as amended
SDWIS	Safe Drinking Water Information System
VA	Vulnerability Assessment

A "FILL AND PRINT" VERSION OF THIS FORM IS AVAILABLE ONLINE AT
http://www.epa.gov/safewater/security/util-inst-app1.pdf

Appendix 1

VULNERABILITY ASSESSMENT CERTIFICATION

Public Water System ID number: _____

System Name: _____

City where system is located: _____

State : _____

Printed Name of Person Authorized to Sign this Certification on behalf of the System: _____

Title: _____

Address : _____

City: _____

State and ZIP Code: _____

Phone: _____ **Fax:** _____ **Email:** _____

I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has conducted a vulnerability assessment that complies with Section 1433(a)(1) of the Safe Drinking Water Act, as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV— Drinking Water Security and Safety).

I further certify that this document and all attachments were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C. 300f *et seq.*)).

The vulnerability assessment this community water system conducted addresses the following components of my system (Check YES if the CWS has the element in its system; check N/A if the element is not applicable to the system.):

YES	N/A	
☐	☐	pipes and constructed conveyances
☐	☐	physical barriers

☐	☐	water collection
☐	☐	pretreatment
☐	☐	treatment
☐	☐	storage
☐	☐	distribution facilities
☐	☐	electronic, computer or other automated systems which are utilized by the public water system
☐	☐	the use, storage, or handling of various chemicals
☐	☐	the operation and maintenance of such system

Other components in the CWS that were evaluated under this VA (list those applicable):

Signed: _____ **Date:** _____

Primary contact person that EPA can call if there are questions about this Certification and VA submission:
Name: _____
Address (if different than that of the Authorized Representative):_____

_____

Phone:_____
Email Address:_____

Alternate Contact Person:
Name: _____
Address (if different than that of the Authorized Representative):_____

_____

Phone:_____
Email Address:_____

Appendix 2

Points to Consider in Vulnerability Assessments

Points to consider related to the six basic elements of a vulnerability assessment are included below. The manner in which the vulnerability assessment is performed is determined by each individual water utility. It will be helpful to remember throughout the assessment process that the ultimate goal is twofold: to safeguard public health and safety, and to reduce the potential for disruption of a reliable supply of pressurized water.

1. **Characterization of the water system, including its mission and objectives.**

   Answers to the following system-specific questions may be helpful in characterizing the water system.

   What are the important missions of the system to be assessed? Define the highest priority services provided by the utility. Identify the utility's critical customers (e.g., public, government, military, industrial, critical care, retail operations, firefighters).

   What are the most important facilities, processes, and assets of the system for achieving the mission objectives and avoiding undesired consequences? Describe the utility facilities, operating procedures, and management practices that are necessary to achieve the mission objectives. Describe how the utility operates (e.g., water source, including ground and surface water, treatment process, storage methods and capacity, chemical use and storage, and distribution system). In assessing those assets that are critical, consider critical customers, dependence on other infrastructures (e.g., electricity, transportation, other water utilities), contractual obligations, single points of failure (e.g., critical aqueducts, transmission systems, aquifers, etc.), chemical hazards and other aspects of the utility's operations, or availability of other utility capabilities that may increase or decrease the criticality of specific facilities, processes, and assets.

2. **Identification and prioritization of adverse consequences to avoid.**

   When considering adverse consequences, the water system should take into account the impacts that could substantially disrupt the ability of the system to provide a safe and reliable supply of drinking water or otherwise present significant public health concerns to the surrounding community. In general, water systems should use the vulnerability assessment process to determine how to reduce risks associated with the consequences of significant concern.

   Ranges of consequences or impacts for each of these events should be identified and defined. Factors to be considered in assessing the consequences may include: magnitude

of service disruption; economic impact (such as replacement and installation costs for damaged critical assets or loss of revenue due to service outage); number of illnesses or deaths resulting from an event; impact on public confidence in the water supply; chronic problems arising from specific events; or other indicators of the impact of each event as determined by the water utility. Risk reduction recommendations at the conclusion of the vulnerability assessment should strive to prevent or reduce each of these consequences.

3. **Determination of critical assets that might be subject to malevolent acts that could result in undesired consequences.**

What are the malevolent acts that could reasonably cause undesired consequences? Consider the operation of critical facilities, assets, and/or processes, and assess what an adversary could do to disrupt these operations. Such acts may include physical damage to or destruction of critical assets, contamination of water, intentional release of stored chemicals, interruption of electricity or other infrastructure interdependencies.

Regarding water system vulnerabilities and determination of *critical assets*, the utility should review the potential for physical damage to the water system's infrastructure, including:

1. Pipes and constructed conveyances
2. Physical barriers
3. Water collection, pretreatment and treatment
4. Storage and distribution facilities
5. Electronic, computer or other automated systems that are utilized by the public water system (e.g., Supervisory Control and Data Acquisition (SCADA))
6. The use, storage, or handling of various chemicals
7. The operation and maintenance of such systems

The water system's vulnerabilities should also be reviewed for threats with the potential to significantly affect public health, such as chemical, biological, radiological, and other types of contamination.

4. **Assessment of the likelihood (qualitative probability) of such malevolent acts from adversaries (e.g., terrorists, vandals).**

Based on the critical *assets* of the water system, one can determine the possible modes of attack that might result in *consequences of significant concern*. However, the objective of this step of the assessment is to move beyond what is merely possible and determine the likelihood of a particular attack scenario. This is a very difficult task as there is often insufficient information to determine the likelihood of a particular event with any degree of certainty.

The threats (the kind of adversary and the mode of attack) selected for consideration during a vulnerability assessment will dictate, to a great extent, the risk reduction measures that should be designed to counter the threat(s). Some vulnerability assessment methodologies refer to this as a Design Basis Threat (DBT) where the threat serves as the basis for the design of countermeasures, as well as the benchmark against which vulnerabilities are assessed. It should be noted that there is no single DBT or threat profile for all water systems in the United States. Differences in geographic location, size of the utility, previous attacks in the local area, and many other factors will influence the threat(s) that water systems should consider in their assessments. From this perspective, water systems should consult with the local FBI and/or other law enforcement agencies, public officials, and others to determine the threats upon which their risk reduction measures should be based. Utilities may also want to review their incident reports to better understand past breaches of security.

5. Evaluation of existing countermeasures.

Having determined how various *critical assets, processes, and operations* are related to the system's mission and the potential for malevolent actions to cause adverse consequences, the effectiveness of existing security measures and operational practices should be considered. Depending on countermeasures already in place, some critical assets may already be sufficiently protected. This step will aid in identification of the areas of greatest concern, and help to focus priorities for risk reduction.

What capabilities does the system currently employ for detection, delay, and response? Identify and evaluate current detection capabilities such as intrusion detection systems, water quality monitoring, operational alarms, guard post orders, and employee security awareness programs. Identify current delay mechanisms such as locks and key control, fencing, structure integrity of critical assets and vehicle access checkpoints. Identify existing policies and procedures for evaluation and response to intrusion and system malfunction alarms, adverse water quality indicators, and cyber system intrusions. It is important to determine the performance characteristics. Poorly operated and maintained security technologies provide little or no protection.

What cyber protection system features does the utility have in place? Assess what protective measures are in-place for the Supervisory Control and Data Acquisition (SCADA) and business-related computer information systems such as fire walls, modem access, Internet, and other external connections, including wireless data and voice communications, and security policies and protocols. Identify whether vendors have access rights and/or "backdoors" to conduct system diagnostics remotely.

What security policies and procedures exist, and what is the compliance record for them? Identify existing policies and procedures concerning personnel security, physical security, key and access badge control, control of system configuration and operational data, chemical and other vendor deliveries, and security training and exercise records.

6. Analysis of current risk and development of a prioritized plan for risk reduction.

The information gathered on threat, critical assets, water utility operations, consequences, and existing countermeasures should be analyzed to determine the current level of risk. The utility should then determine whether current risks are acceptable or risk reduction measures should be pursued.

Recommended actions should measurably reduce risks by reducing vulnerabilities and/or consequences through improved deterrence, delay, detection, and or response capabilities or by improving operational policies or procedures. Selection of specific risk reduction actions should be completed prior to considering the cost of the recommended action(s). Utilities should carefully consider both short- and long-term solutions. An analysis of the cost of short- and long-term risk reduction actions may impact which actions the utility chooses to achieve its security goals. Utilities may also want to consider security improvements in light of other planned or needed improvements. Security and general infrastructure may provide significant multiple benefits. For example, improved treatment processes or system redundancies can both reduce vulnerabilities and enhance day-to-day operation.

Generally, strategies for reducing vulnerabilities fall into three broad categories: 1) sound business practices, 2) system upgrades, and 3) security upgrades. Sound business practices affect policies, procedures, and training to improve the overall security-related culture at the drinking water facility. For example, it is important to ensure rapid communication capabilities exist between public health authorities and local law enforcement and emergency responders. System upgrades include changes in operations, equipment, processes, or infrastructure itself that make the system fundamentally safer. Security upgrades improve capabilities for detection, delay, or response.

Appendix 3

Mailing Label to use for courier deliveries of items submitted to EPA; Recommended Delivery Address

Use this label ONLY if you are using an express direct-delivery courier such as Federal Express, UPS, Airborne, and so forth.

DO NOT USE THIS ADDRESS FOR ANY FORM OF US POSTAL SERVICE DELIVERY. See Instructions Section 6.1.2 for the address to use for postal delivery.

Be sure to give the courier service this phone number, so they can be authorized entrance to the building, if so requested by building guards: 202-566-1729.

U.S. Environmental Protection Agency
Water Resource Center (WSD-RAR)
Room 1119 EPA West Building
1301 Constitution Ave., NW
Washington, D.C. 20004

A "FILL AND PRINT" VERSION OF THIS FORM IS AVAILABLE ONLINE AT
http://www.epa.gov/safewater/security/util-inst-app4.pdf

Appendix 4

CERTIFICATION OF COMPLETION OF AN EMERGENCY RESPONSE PLAN

Public Water System ID number: _____

System Name: _____

City where system is located: _____

State : _____

Printed Name of Person Authorized to Sign this Certification on Behalf of the System: _____

Title: _____

Address : _____

City: _____

State and ZIP Code: _____

Phone: _____ **Fax:** _____ **Email:** _____

I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has completed an Emergency Response Plan that complies with Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV— Drinking Water Security and Safety).

I further certify that this document was prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C. 300f *et seq.*)).

The emergency response plan that this community water system completed incorporates the results of the vulnerability assessment completed for the system and includes "plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack" on this community water system. The emergency response plan also includes "actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals."

This CWS has coordinated, to the extent possible, with existing Local Emergency Planning Committees established under the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11001 et seq) when preparing this emergency response plan.

Signed: _____ **Date:** _____

Primary contact person that EPA can call if there are questions about this Certification:

Name: _____

Address (if different than that

of the Authorized Representative):_____

_____

Phone:_____

Email Address:_____

Alternate Contact Person:

Name: _____

Address (if different than that of the Authorized Representative):_____

_____

Phone:_____

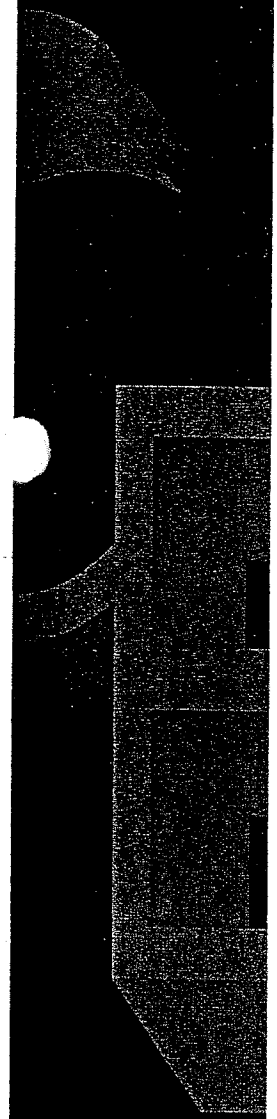
Email Address:_____

COMPTON ENGINEERING, P.A.

ENGINEERING, SURVEYING, & ENVIRONMENTAL SERVICES

156 Nixon Street
Biloxi, MS 39530
Phone: 228.432.2133
Fax: 228.432.8149

comptonengineering.com



PASCAGOULA

BILOXI

BAY ST. LOUIS

Memo

Date: February 10, 2005

To: Mr. Andre Kaufman, Public Works Director
Mr. Mark Hare, Civil Defense Director/Fire Chief

From: Ed Ott

Re: EPA Vulnerability Assessment Completed – Attached Copy for City Files

We have completed the above referenced assessment and request that each of your departments retain a copy. Due to the end of the month deadline, we have already submitted the certification of completion and the assessment. Any changes or suggestions that you may have can be incorporated in next years update.

If you have questions, please do not hesitate to call.

S:\Biloxi\Projects\2003\203-158 City of O.S. (A. Kaufman)\203-158.038 Water System Vulnerability Assessment\Docs\Memo - A Kaufman - 2-10-05 - VA Completed.doc

VULNERABILITY ASSESSMENT

PREPARED FOR

THE CITY OF OCEAN SPRINGS

PWS ID 300005 & 3000515 (Sunplex Park)

BY



COMPTON ENGINEERING, P. A.

Engineering, Surveying, and Environmental Services

156 Nixon Street
Biloxi, MS 39530
(228) 432-2133

FEBRUARY 10, 2005
Revised 10-14-2016

INTRODUCTON:

This Vulnerability Assessment was conducted on behalf of The City of Ocean Springs by Compton Engineering, Inc. for the purpose of evaluating potential threats to the City water system and identifying corrective actions to reduce the risk of intentional damage, disruption, or destruction of the system.

Needed risk reduction measures have been prioritized and listed in *Attachment 1. Prioritization of Needed Actions*.

The City water system provides water services to approximately 8,240 residential and commercial customers. Approximately 17,450 people reside in the City.

The referenced system includes 6 source wells and one wholesale water connection:

1. Handy Street (Robinson Intersection) feeds Pine Street Tank
2. Senior Citizen's Building (next to City Hall) feeds Pine Street Tank
3. Halstead Road Well and Tank
4. Pabst Road Well feed Civic Center Tank
5. Sunplex Well and Tank
6. Deana Road Well feeds Civic Center Tank
7. JCUA Wholesale water connection

It also includes one 400,000-gallon holding tank (Sunplex Tank), and three 500,000-gallon holding tanks (Halstead, Pine and Civic Center).

Please see attached documents for further details.

Security Vulnerability Self-Assessment Guide for Mississippi's Public Water Systems

CITY OF OCEAN SPRINGS

NAME OF PUBLIC WATER SYSTEM

3000005 & 3000515

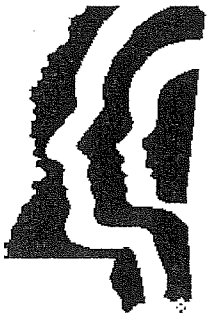
PWS ID NUMBER(S)

2/10/2005

Date Completed

10/14/2016

Date Last Updated
(should be updated annually)

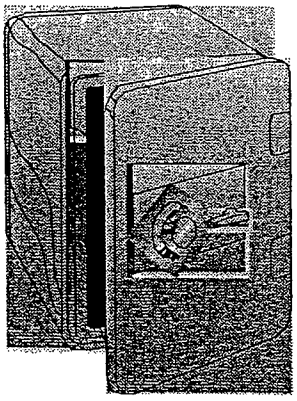


MISSISSIPPI DEPARTMENT OF HEALTH

BUREAU OF PUBLIC WATER SUPPLY

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A Note about Security for this Document



This document contains sensitive information about the security of your water system. Therefore, it should be treated as **Confidential Information** and should be stored in a secure place at your water system. A duplicate copy should also be stored in a secure off-site location.

Acknowledgments

This document is the result of collaboration among the Association of Drinking Water Administrators (ASDWA), the U.S. Environmental Protection Agency (U.S. EPA), the U.S. EPA Drinking Water Academy, and the National Rural Water Association (NRWA). We also thank NWRA for the template that was used as the foundation for this project.

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Security Vulnerability Self-Assessment Guide for Mississippi Public Water Systems

Introduction

Water systems are critical to every community. Protection of public drinking water systems must be a high priority for local officials and water system owners and operators to ensure an uninterrupted water supply, which is essential for the protection of public health (safe drinking water and sanitation) and safety (fire fighting).

Adequate security measures will help prevent loss of service through terrorist acts, vandalism, or pranks. If your system is prepared, such actions may even be prevented. The appropriate level of security is best determined by the water system at the local level.

This Security Vulnerability Self-Assessment Guide is designed to help public water systems determine possible vulnerable components and identify security measures that should be considered. A "vulnerability assessment" is the identification of weaknesses in water system security, focusing on defined threats that could compromise its ability to provide adequate potable water, and/or water for firefighting. This document is designed particularly for systems that serve populations of 3,300 or less. This document is meant to encourage smaller systems to review their system vulnerabilities, but it may not take the place of a comprehensive review by security experts.

The Self-Assessment Guide has a simple design. Answers to assessment questions are "yes" or "no," and there is space to identify needed actions and actions you have taken to improve security. For any "no" answer, refer to the "comment" column and/or contact your state drinking water primacy agency.

How to Use this Self-Assessment Guide

This document is designed for use by water system personnel. Physical facilities pose a high degree of exposure to any security threat. This self-assessment should be conducted on all components of your system (wellhead or surface water intake, treatment plant, storage tank(s), pumps, distribution system, and other important components of your system).

The Assessment includes an emergency contact list for your use. This list will help you identify who you need to contact in the event of an emergency or threat and will help you develop communication and outreach procedures. Filling out the Emergency Contact List is an important step toward developing an Emergency Response Plan, which provides detailed procedures on how to respond to an emergency.

You may be able to obtain sample Emergency Response Plans from your state drinking water primacy agency.

Security is everyone's responsibility. We hope this document helps you to increase the awareness of all your employees, governing officials, and customers about security issues.

Once you have completed this document, review the actions you need to take to improve your system's security. Make sure to prioritize your actions based on the most likely threats. Please complete the Certificate of Completion on page 37, make a copy of the completed certificate for your official records, and return only the certificate to the Division of Water Supply of the Mississippi State Department of Health. Do not include a full copy of your self-assessment.

Keep this Document

This is a working document. Its purpose is to start your process of security vulnerability assessment and security enhancements. Security is not an end point, but a goal that can be achieved only through continued efforts to assess and upgrade your system.

Don't forget that this is a sensitive document. It should be stored separately in a secure place at your water system. A duplicate copy should also be retained at a secure off-site location.

Access to this document should be limited to key water system personnel and local officials as well as the state drinking water primacy agency and others on a need-to-know basis.

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Security Vulnerability Self-Assessment

Record of Security Vulnerability Self-Assessment Completion

The following information should be completed by the individual conducting the self-assessment and/or any additional revisions.

Name: EDWIN S. OTT, P.E.
Title: CONSULTING ENGINEER, COMPTON ENGINEERING, INC.
Area of Responsibility: CITY ENGINEERING
Water System Name: CITY OF OCEAN SPRINGS
Water System PWSID: 3000005 & 3000515
Address: 156 NIXON STREET
City: BILOXI
County: JACKSON & HARRISON
State: MISSISSIPPI
Zip Code: 39530
Telephone: (228) 432-2133
Fax: (228) 432-8149
E-mail:
Date Completed: 2/10/05 - FEBRUARY 10, 2005

Date Revised:	10/14/13	**Signature:**
Date Revised:		**Signature:**
Date Revised:	10/14/14	**Signature:**
Date Revised:	10/14/2015	**Signature:**
Date Revised:	10/14/2016	**Signature:**

Page #___ of ___

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Inventory of Public Water System Critical Components

Component	Number & Location (if applicable)	Description
Source Water Type		
Ground Water	WELLS, SIX (6)	PUMPE TO TANKS
Surface Water		
Purchased	ONE(1) CLRA WHOLESALE CONNECTION AT SUNPLEX	
Treatment Plant		
Buildings		
Pumps		
Treatment Equipment (e.g., basin, clearwell, filter)		
Process Controls	CHLORINATORS, SIX (6)	TREATED @ EACH WELL
Treatment Chemicals and Storage	" "	"
Laboratory Chemicals and Storage		
Storage		
Storage Tanks	FOUR (4)	(3) 500,000 GALLON, (1) 400,000 GALLO
Pressure Tanks		
Power		
Primary Power	SIX (6) - ALL ELECTRIC	
Auxiliary Power	GENERATOR AT ALL SITES	
Distribution System		
Pumps	SIX*	(5) SIX STAGE 100HP (1) 50HP
Pipes	THROUGHOUT CITY	PVC, DUCTILE IRON
Valves	" "	
Appurtenances (e.g., flush hydrants, backflow preventers, meters)	" "	
Other Vulnerable Points		
Offices		
Buildings		
Computers		
Files		
Transportation/ Work Vehicles	FOUR (4) ASSIGNED TO OPERATORS	
Communications		
Telephone	OFFICE	
Cell Phone	(3) ASSIGNED TO OPERATORS	
Radio	EQUIPPED	
Computer Control Systems (SCADA)	ON ALL WELLS AND STORAGE TANKS	MONITOR AND CONTROL FUNCTIONS

NOTE: Use additional pages if necessary to fully document all equipment.

Revised 10-14-2016

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Security Vulnerability Self-Assessment for Public Water Systems

General Questions for the Entire Water System

The first 13 questions in this vulnerability self-assessment are general questions designed to apply to all components of your system (wellhead or surface water intake, treatment plant, storage tank(s), pumps, distribution system, and offices). These are followed by more specific questions that look at individual system components in greater detail.

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
1. Do you have a written emergency response plan (ERP)?	Yes ☒ No ☐	It is essential that you have an ERP. If you do not have an ERP, you can obtain a sample from your state drinking water primacy agency. As a first step in developing your ERP, you should develop your Emergency Contact List (see Attachment 2). A plan is vital in case there is an incident that requires immediate response. Your plan should be reviewed at least annually (or more frequently if necessary) to ensure it is up-to-date and addresses security emergencies. You should designate someone to be contacted in case of emergency regardless of the day of the week or time of day. This contact information should be kept up-to-date and made available to all water system personnel and local officials (if applicable). Share this ERP with police, emergency personnel, and your state primacy agency. Posting contact information is a good idea only if authorized personnel are the only ones seeing the information. These signs could pose a security risk if posted for public viewing since it gives people information that could be used against the system.	
2. Is access to the critical components of the water system (i.e., a part of the physical infrastructure of the system that is essential for water flow and/or water quality) restricted to authorized personnel only?	Yes ☒ No ☐	You should restrict or limit access to the critical components of your water system to authorized personnel only. This is the first step in security enhancement for your water system. Consider the following: • Issue water system photo identification cards for employees, and require them to be displayed within the restricted area at all times. • Post signs restricting entry to authorized personnel and ensure that assigned staff escort people without proper ID.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
3. Are facilities fenced, including wellhouses and pump pits, and are gates locked where appropriate?	Yes ☒ No ☐	Ideally, all facilities should have a security fence around the perimeter. The fence perimeter should be walked periodically to check for breaches and maintenance needs. All gates should be locked with chains and a tamper-proof padlock that at a minimum protects the shank. Other barriers such as concrete "jersey" barriers should be considered to guard certain critical components from accidental or intentional vehicle intrusion.	
4. Are your doors, windows, and other points of entry such as tank and roof hatches and vents kept closed and locked?	Yes ☒ No ☐	Lock all building doors and windows, hatches and vents, gates, and other points of entry to prevent access by unauthorized personnel. Check locks regularly. Dead bolt locks and lock guards provide a high level of security for the cost. A daily check of critical system components enhances security and ensures that an unauthorized entry has not taken place. Doors and hinges to critical facilities should be constructed of heavy-duty reinforced material. Hinges on all outside doors should be located on the inside. To limit access to water systems, all windows should be locked and reinforced with wire mesh or iron bars, and bolted on the inside. Systems should ensure that this type of security meets with the requirements of any fire codes. Alarms can also be installed on windows, doors, and other points of entry.	
5. Is there external lighting around the critical components of your water system?	Yes ☒ No ☐	Adequate lighting of the exterior of water systems' critical components is a good deterrent to unauthorized access and may result in the detection or deterrence of trespassers. Motion detectors that activate switches that turn lights on or trigger alarms also enhance security.	
6. Are warning signs (tampering, unauthorized access, etc.) posted on all critical components of your water system? (For example, well houses and storage tanks.)	Yes ☒ No ☐	Warning signs are an effective means to deter unauthorized access. "Warning - Tampering with this facility is a federal offense" should be posted on all water facilities. These are available from your state rural water association. "Authorized Personnel Only," "Unauthorized Access Prohibited," and "Employees Only" are examples of other signs that may be useful.	
7. Do you patrol and inspect your source intake, buildings, storage tanks, equipment, and other critical components?	Yes ☒ No ☐	Frequent and random patrolling of the water system by utility staff may discourage potential tampering. It may also help identify problems that may have arisen since the previous patrol. Consider asking your local law enforcement agencies to conduct patrols of your water system. Advise them of your critical components and explain why they are important.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
8. Is the area around the critical components of your water system free of objects that may be used for breaking and entering?	Yes ☒ No ☐	When assessing the area around your water system's critical components, look for objects that could be used to gain entry (e.g., large rocks, cement blocks, pieces of wood, ladders, valve keys, and other tools).	
9. Are the entry points to your water system easily seen?	Yes ☒ No ☐	You should clear fence lines of all vegetation. Overhanging or nearby trees may also provide easy access. Avoid landscaping that will permit trespassers to hide or conduct unnoticed suspicious activities. Trim trees and shrubs to enhance the visibility of your water system's critical components. If possible, park vehicles and equipment in places where they do not block the view of your water system's critical components.	
10. Do you have an alarm system that will detect unauthorized entry or attempted entry at critical components?	Yes ☐ No ☒	Consider installing an alarm system that notifies the proper authorities or your water system's designated contact for emergencies when there has been a breach of security. Inexpensive systems are available. An alarm system should be considered whenever possible for tanks, pump houses, and treatment facilities. You should also have an audible alarm at the site as a deterrent and to notify neighbors of a potential threat.	
11. Do you have a key control and accountability policy?	Yes ☒ No ☐	Keep a record of locks and associated keys, and to whom the keys have been assigned. This record will facilitate lock replacement and key management (e.g., after employee turnover or loss of keys). Vehicle and building keys should be kept in a lockbox when not in use. You should have all keys stamped (engraved) "DO NOT DUPLICATE."	
12. Are entry codes and keys limited to water system personnel only?	Yes ☒ No ☐	Suppliers and personnel from co-located organizations (e.g., organizations using your facility for telecommunications) should be denied access to codes and/or keys. Codes should be changed frequently if possible. Entry into any building should always be under the direct control of water system personnel.	
13. Do you have a neighborhood watch program for your water system?	Yes ☐ No ☒	Watchful neighbors can be very helpful to a security program. Make sure they know whom to call in the event of an emergency or suspicious activity.	

Water Sources

In addition to the above general checklist for your entire water system (questions 1-13), you should give special attention to the following issues, presented in separate tables, related to various water system components. Your water sources (surface water intakes or wells) should be secured. Surface water supplies present the greatest challenge. Typically they encompass large land areas. Where areas cannot be secured, steps should be taken to initiate or increase law enforcement patrols. Pay particular attention to surface water intakes. Ask the public to be vigilant and report suspicious activity.

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
14. Are your wellheads sealed properly?	Yes ☒ No ☐	A properly sealed wellhead decreases the opportunity for the introduction of contaminants. If you are not sure whether your wellhead is properly sealed, contact your well drilling/maintenance company, your state drinking water primacy agency, your state rural water association, or other technical assistance providers.	
15. Are well vents and caps screened and securely attached?	Yes ☒ No ☐	Properly installed vents and caps can help prevent the introduction of a contaminant into the water supply. Ensure that vents and caps serve their purpose, and cannot be easily breached or removed.	
16. Are observation/test and abandoned wells properly secured to prevent tampering?	Yes ☒ No ☐	All observation/test and abandoned wells should be properly capped or secured to prevent the introduction of contaminants into the aquifer or water supply. Abandoned wells should be either removed or filled with concrete.	
17. Is your surface water source secured with fences or gates? Do water system personnel visit the source?	Yes ☐ No ☐ N/A	Surface water supplies present the greatest challenge to secure. Often, they encompass large land areas. Where areas cannot be secured, steps should be taken to initiate or increase patrols by water utility personnel and law enforcement agents.	

Treatment Plant and Suppliers

Some Small system provide easy access to their water system for suppliers of equipment, chemicals, and other materials for the convenience of both parties this practice should be discontinued.

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
18. Are deliveries of chemicals and other supplies made in the presence of water system personnel?	Yes ☒ No ☐	Establish a policy that an authorized person, designated by the water system, must accompany all deliveries. Verify the credentials of all drivers. This prevents unauthorized personnel from having access to the water system.	
19. Have you discussed with your supplier(s) procedures to ensure the security of their products?	Yes ☒ No ☐	Verify that your suppliers take precautions to ensure that their products are not contaminated. Chain of custody procedures for delivery of chemicals should be reviewed. You should inspect chemicals and other supplies at the time of delivery to verify they are sealed and in unopened containers. Match all delivered goods with purchase orders to ensure that they were, in fact, ordered by your water system. You should keep a log or journal of deliveries. It should include the driver's name (taken from the driver's photo I.D.), date, time, material delivered, and the supplier's name.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
20. Are chemicals, particularly those that are potentially hazardous or flammable, properly stored in a secure area?	Yes ☒ No ☐	All chemicals should be stored in an area designated for their storage only, and the area should be secure and access to the area restricted. Access to chemical storage should be available only to authorized employees. You should have tools and equipment on site (such as a fire extinguisher, drysweep, etc.) to take immediate actions when responding to an emergency.	
21. Do you monitor raw and treated water so that you can detect changes in water quality?	Yes ☒ No ☒	Monitoring of raw and treated water can establish a baseline that may allow you to know if there has been a contamination incident. Some parameters for raw water include pH, turbidity, total and fecal coliform, total organic carbon, specific conductivity, ultraviolet adsorption, color, and odor. Routine parameters for finished water and distribution systems include free and total chlorine residual, heterotrophic plate count (HPC), total and fecal coliform, pH, specific conductivity, color, taste, odor, and system pressure. Chlorine demand patterns can help you identify potential problems with your water. A sudden change in demand may be a good indicator of contamination in your system. For those systems that use chlorine, absence of a chlorine residual may indicate possible contamination. Chlorine residuals provide protection against bacterial and viral contamination that may enter the water supply.	
22. Are tank ladders, access hatches, and entry points secured?	Yes ☒ No ☐	The use of tamper-proof padlocks at entry points (hatches, vents, and ladder enclosures) will reduce the potential for of unauthorized entry. If you have towers, consider putting physical barriers on the legs to prevent unauthorized climbing.	
23. Are vents and overflow pipes properly protected with screens and/or grates?	Yes ☒ No ☐	Air vents and overflow pipes are direct conduits to the finished water in storage facilities. Secure all vents and overflow pipes with heavy-duty screens and/or grates.	
24. Can you isolate the storage tank from the rest of the system?	Yes ☒ No ☐	A water system should be able to take its storage tank(s) out of operation or drain its storage tank(s) if there is a contamination problem or structural damage. Install shut-off or bypass valves to allow you to isolate the storage tank in the case of a contamination problem or structural damage. Consider installing a sampling tap on the storage tank outlet to test water in the tank for possible contamination.	

Distribution

Hydrants are highly visible and convenient entry points into the distribution system. Maintaining and monitoring positive pressure in your system is important to provide fire protection and prevent introduction of contaminants.

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
25. Do you control the use of hydrants and valves?	Yes ☒ No ☐	Your water system should have a policy that regulates the authorized use of hydrants for purposes other than fire protection. Require authorization and backflow devices if a hydrant is used for any purpose other than fire fighting. Consider designating specific hydrants for use as filling station(s) with proper backflow prevention (e.g., to meet the needs of construction firms). Then, notify local law enforcement officials and the public that these are the only sites designated for this use. Flush hydrants should be kept locked to prevent contaminants from being introduced into the distribution system, and to prevent improper use.	
26. Does your system monitor for, and maintain, positive pressure?	Yes ☒ No ☐	Positive pressure is essential for fire fighting and for preventing backsiphonage that may contaminate finished water in the distribution system. Refer to your state primacy agency for minimum drinking water pressure requirements.	
27. Has your system implemented a backflow prevention program?	Yes ☒ No ☐	In addition to maintaining positive pressure, backflow prevention programs provide an added margin of safety by helping to prevent the intentional introduction of contaminants. If you need information on backflow prevention programs, contact your state drinking water primacy agency.	

Personnel

You should add security procedures to your personnel policies.

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
28. When hiring personnel, do you request that local police perform a criminal background check, and do you verify employment eligibility (as required by the Immigration and Naturalization Service, Form I-9)?	Yes ☒ No ☐	It is good practice to have all job candidates fill out an employment application. You should verify professional references. Background checks conducted during the hiring process may prevent potential employee-related security issues. If you use contract personnel, check on the personnel practices of all providers to ensure that their hiring practices are consistent with good security practices.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
29. Are your personnel issued photo-identification cards?	Yes ☒ No ☐	For positive identification, all personnel should be issued water system photo-identification cards and be required to display them at all times. Photo identification will also facilitate identification of authorized water system personnel in the event of an emergency.	
30. When terminating employment, do you require employees to turn in photo IDs, keys, access codes, and other security-related items?	Yes ☒ No ☐	Former or disgruntled employees have knowledge about the operation of your water system, and could have both the intent and physical capability to harm your system. Requiring employees who will no longer be working at your water system to turn in their IDs, keys, and access codes helps limit these types of security breaches.	
31. Do you use uniforms and vehicles with your water system name prominently displayed?	Yes ☒ No ☐	Requiring personnel to wear uniforms, and requiring that all vehicles prominently display the water system name, helps inform the public when water system staff is working on the system. Any observed activity by personnel without uniforms should be regarded as suspicious. The public should be encouraged to report suspicious activity to law enforcement authorities.	
32. Have water system personnel been advised to report security vulnerability concerns and to report suspicious activity?	Yes ☒ No ☐	Your personnel should be trained and knowledgeable about security issues at your facility, what to look for, and how to report any suspicious events or activity. Periodic meetings of authorized personnel should be held to discuss security issues.	
33. Do your personnel have a checklist to use for threats or suspicious calls or to report suspicious activity?	Yes ☐ No ☒	To properly document suspicious or threatening phone calls or reports of suspicious activity, a simple checklist can be used to record and report all pertinent information. Calls should be reported immediately to appropriate law enforcement officials. Checklists should be available at every telephone. Sample checklists are included in Attachment 3. Also consider installing caller ID on your telephone system to keep a record of incoming calls.	PREPARE LIST FROM EMERGENCY RESPONSE CONTACT LIST

Information storage/computers/controls/maps

Security of the system, including computerized controls like a Supervisory Control and Data Acquisition (SCADA) system, goes beyond the physical aspects of operation. It also includes records and critical information that could be used by someone planning to disrupt or contaminate your water system.

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
34. Is computer access "password protected?" Is virus protection installed and software upgraded regularly and are your virus definitions updated at least daily? Do you have Internet firewall software installed on your computer? Do you have a plan to back up your computers?	Yes ☐ No ☐ N/A	All computer access should be password protected. Passwords should be changed every 90 days and (as needed) following employee turnover. When possible, each individual should have a unique password that they do not share with others. If you have Internet access, a firewall protection program should be installed on your computer. Also consider contacting a virus protection company and subscribing to a virus update program to protect your records. Backing up computers regularly will help prevent the loss of data in the event that your computer is damaged or breaks. Backup copies of computer data should be made routinely and stored at a secure off-site location.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
35. Is there information on the Web that can be used to disrupt your system or contaminate your water?	Yes ☐ No ☒	Posting detailed information about your water system on a Web site may make the system more vulnerable to attack. Web sites should be examined to determine whether they contain critical information that should be removed. You should do a Web search (using a search engine such as Google, Yahoo!, or Lycos) using key words related to your water supply to find any published data on the Web that is easily accessible by someone who may want to damage your water supply.	
36. Are maps, records, and other information stored in a secure location?	Yes ☒ No ☐	Records, maps, and other information should be stored in a secure location when not in use. Access should be limited to authorized personnel only. You should make back-up copies of all data and sensitive documents. These should be stored in a secure off-site location on a regular basis.	
37. Are copies of records, maps, and other sensitive information labeled confidential, and are all copies controlled and returned to the water system?	Yes ☒ No ☐	Sensitive documents (e.g., schematics, maps, and plans and specifications) distributed for construction projects or other uses should be recorded and recovered after use. You should discuss measures to safeguard your documents with bidders for new projects.	
38. Are vehicles locked and secured at all times?	Yes ☐ No ☐	Vehicles are essential to any water system. They typically contain maps and other information about the operation of the water system. Water system personnel should exercise caution to ensure that this information is secure. Water system vehicles should be locked when they are not in use or left unattended. Remove any critical information about the system before parking vehicles for the night. Vehicles also usually contain tools (e.g., valve wrenches) that could be used to access critical components of your water system. These tools should be secured and accounted for daily.	

Public Relations

You should educate your customers about your system. You should encourage them to be alert and to report any suspicious activity to law enforcement authorities

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
39. Do you have a program to educate and encourage the public to be vigilant and report suspicious activity to assist in the security protection of your water system?	Yes ☒ No ☐	Advise your customers and the public that your system has increased preventive security measures to protect the water supply from vandalism. Ask for their help. Provide customers with your telephone number and the telephone number of the local law enforcement authority so that they can report suspicious activities. The telephone number can be made available through direct mail, billing inserts, notices on community bulletin boards, flyers, and consumer confidence reports.	

QUESTION	ANSWER	COMMENT	ACTION NEEDED/TAKEN
40. Does your water system have a procedure to deal with public information requests, and to restrict distribution of sensitive information?	Yes ☒ No ☐	You should have a procedure for personnel to follow when you receive an inquiry about the water system or its operation from the press, customers, or the general public. Your personnel should be advised not to speak to the media on behalf of the water system. Only one person should be designated as the spokesperson for the water system. Only that person should respond to media inquiries. You should establish a process for responding to inquiries from your customers and the general public.	
41. Do you have a procedure in place to receive notification of a suspected outbreak of a disease immediately after discovery by local health agencies?	Yes ☒ No ☐	It is critical to be able to receive information about suspected problems with the water at any time and respond to them quickly. Procedures should be developed in advance with your state drinking water primacy agency, local health agencies, and your local emergency planning committee.	
42. Do you have a procedure in place to advise the community of contamination immediately after discovery?	Yes ☒ No ☐	As soon as possible after a disease outbreak, you should notify testing personnel and your laboratory of the incident. In outbreaks caused by microbial contaminants, it is critical to discover the type of contaminant and its method of transport (water, food, etc.). Active testing of your water supply will enable your laboratory, working in conjunction with public health officials, to determine if there are any unique (and possibly lethal) disease organisms in your water supply. It is critical to be able to get the word out to your customers as soon as possible after discovering a health hazard in your water supply. In addition to your responsibility to protect public health, you must also comply with the requirements of the Public Notification Rule. Some simple methods include announcements via radio or television, door-to-door notification, a phone tree, and posting notices in public places. The announcement should include accepted uses for the water and advice on where to obtain safe drinking water. Call large facilities that have large populations of people who might be particularly threatened by the outbreak: hospitals, nursing homes, the school district, jails, large public buildings, and large companies. Enlist the support of local emergency response personnel to assist in the effort.	
43. Do you have a procedure in place to respond immediately to a customer complaint about a new taste, odor, color, or other physical change (oily, filmy, burns on contact with skin)?	Yes ☒ No ☐	It is critical to be able to respond to and quickly identify potential water quality problems reported by customers. Procedures should be developed in advance to investigate and identify the cause of the problem, as well as to alert local health agencies, your state drinking water primacy agency, and your local emergency planning committee if you discover a problem.	

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IMPORTANT

Now that you have completed the "Security Vulnerability Self-Assessment Guide for Mississippi Public Water Systems," review your needed actions and then prioritize them based on the most likely threats. A table to assist you in prioritizing actions is povided in Attachment 1.

Attachment 1. Prioritization of Needed Actions

Once you have completed the "Security Vulnerability Self-Assessment Guide for Mississippi Public Water Systems," review the actions you need to take to improve your system's security. Note the questions to which you answered "no" on this worksheet. You can use it to summarize the areas where your system has vulnerability concerns. It can also help you prioritize the actions you should take to protect your system from vulnerabilities. Make sure to prioritize your actions based on the most likely threats to your water system.

Question Number	Needed Action	Scheduled Completion
10	RESEARCH POSSIBLE, LOW COST ALARM SYSTEMS FOR GATES & WELL SITES	2006
13	ADD DISCUSSION OF WATER SYSTEM TO "NEIGHBOR WATCH PROG."	2005
33	PREPARE LIST OR USE MS DEPT. OF HEALTH LIST	2005

Attachment 2. Emergency Contact List

We urge all public water systems to adopt an emergency response plan (ERP). Emergency plans are action steps to follow if a primary source of drinking water becomes contaminated or if the flow of water is disrupted. You can obtain sample ERPs from your state drinking water administrator, or from your state primacy agency.

This sample document is an "Emergency Contact List." It is an essential part of your ERP. It contains the names and telephone numbers of people you might need to call in the event of an emergency. This is a critical document to have at your disposal at all times. It gives you a quick reference to all names and telephone numbers that you need for support in the case of an emergency.

Filling out this Emergency Contact List reminds you to think about all of the people you might need to contact in an emergency. It also may encourage you to talk with these people about what you and they would do if an emergency were to occur.

Section 1. System Identification

Public Water System (PWS) ID Number	3000005	
System Name	CITY OF OCEAN SPRINGS	
Town/City	OCEAN SPRINGS	
Telephone Numbers	228-875-3955 System Telephone	228-217-5117 Evening/Weekend Telephone
Other Contact Information	228-875-4861 System Fax	Email
Population Served and Number of Service Connections	17,500 People Served	8500 Connections
System Owner (The owner must be listed as a person's name)	CONNIE MORAN. MAYOR CITY OF OCEAN SPRINGS	
Name, title, and telephone number of person responsible for maintaining this emergency contact list	NATE WILSON ASST. FIRE CHIEF CIVIL DEFENSE COORDINATOR Name and title	228-875-4063 Telephone

Revised 10-14-2015

Section 2. Notification/Contact Information

Local Notification List (Revised 10-14-2015)

ORGANIZATION	CONTACT NAME/TITLE	TELEPHONE (DAY)	TELEPHONE (NIGHT)	EMAIL
Fire Department	JEFF PONSON	228-875-4063	228-381-4047	jponson@oceanspringsms.gov
Police Department	MARK DUNSTON	228-875-2211	228-348-1189	mdunstone@oceanspringsms.gov
FBI Field Office				
County Health Department		228-762-1117		
Primacy Agency District Office				
Local Hospital	Ocean Springs Hospital	228-818-1111	228-818-1111	
Local Emergency Planning Committee				
EMS	Acadian Ambulance	911	911	
Local Pharmacy				
Local Nursing Homes				
Local Schools	SUPERINTENDT OF EDUCATION	228-875-7706		
Local Prisons				
Local Government Official	CONNIE MORAN	228-875-4236		cmoran@oceanspringsms.gov
Local Hazmat Team				
Water System Operator	GERALD GROVE	228-875-3955	228-217-5116	ggrove@oceanspringsms.gov
Neighboring Water System	Jackson County Utility Authority	228-762-0119		
Neighboring Water System	West Jackson County Utility District	228-872-5585		
Other	City of Gautier	228-497-8000		

Service/Repair Notification List

(Revised 10-14-2015)

ORGANIZATION	CONTACT NAME/TITLE	TELEPHONE (DAY)	TELEPHONE (NIGHT)	EMAIL
Electrician	LARRY GOSSETT	228-297-8915	228-297-8915	
Electric Utility Company	JOEL MOODY	228-497-4075		
Gas Utility Company	DARRYL PICKICH	228-896-7500		
Sewer Utility Company	MATT BARRELL	228-875-3955	228-219-5120	
Telephone Utility Company	RICK STEWART	228-868-5009		
Plumber				
Pump Specialist				
"Dig Safe" or local equivalent	"CALL BEFORE YOU DIG"	1-800-ONE-CALL		
Soil Excavator/Backhoe Operator				
Equipment Rental (Power Generators)				
Equipment Rental (Chlorinators)				
Equipment Rental (Portable Fencing)				
Equipment Repairman				
Radio/Telemetry Repair Service				
Bottled Water Source				
Bulk Water Hauler				
Pump Supplier				
Well Drillers				
Pipe Supplier				
Chemical Supplier				
Local/Regional Analytical Laboratory	MICRO METHODS	228-875-6420		

State Notification List (Revised 10-14-2016)

ORGANIZATION	CONTACT NAME/TITLE	TELEPHONE (DAY)	TELEPHONE (NIGHT)	EMAIL
MS Dept of Health/Bureau of Public Water Supply	William Moody P.E., Director	601.576.7518 (8 a.m.-5 p.m.; Monday-Friday)	601.576.7400	w.moody@msdh.state.ms.us
MS Department of Environmental Quality		601-961-5151		
Mississippi Emergency Management Agency	LARRY BOWMAN	601-965-6200		
County Emergency Management	JACKSON COUNTY CIVIL DEFENSE	228-769-3108	228-769-3063	
Hazmat Hotline				

Media Notification List

ORGANIZATION	CONTACT NAME/TITLE	TELEPHONE (DAY)	TELEPHONE (NIGHT)	EMAIL
Designated Water System Spokesperson	GERALD GROVE	228-875-3955	228-217-5116	
Newspaper - Local	O.S. RECORD	228-875-2791		
Newspaper – Regional/State	CLARION LEDGER	601-961-5131		
Radio				
Radio				
Radio				
Television	WLOX -	228-896-1313		
Television				
Television				

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Attachment 3: Threat Identification Checklists

Water System Telephone Threat Identification Checklist

In the event your water system receives a threatening phone call, remain calm and try to keep the caller on the line. Use the following checklist to collect as much detail as possible about the nature of the threat and the description of the caller.

1. Types of Tampering/Threat:

☐ Contamination ☐ Threat to tamper

☐ Biological ☐ Bombs, explosives, etc.

☐ Chemical ☐ Other (explain)

2. Water System Identification:

Name:
Address:

Telephone:

PWS Owner or Manager's Name:

3. Alternate Water Source Available: Yes/No **If yes, give name and location:**

4. Location of Tampering:

☐ Distribution Line ☐ Water Storage Facilities ☐Treatment Plant ☐ Raw Water Source ☐ Treatment Chemicals

☐ Other (explain):

5. Contaminant Source and Quantity:

7. Date and Time of Tampering/Threat:

8. Caller's Name/Alias, Address, and Telephone Number:

9. Is the Caller (check all that apply):

☐ Male ☐ Female ☐ Foul ☐ Illiterate ☐ Well Spoken ☐ Irrational ☐ Incoherent

10. Is the Caller's Voice (check all that apply):

☐ Soft	☐ Calm	☐ Angry	☐ Slow	☐ Rapid
☐ Slurred	☐ Loud	☐ Laughing	☐ Crying	☐ Normal
☐ Deep	☐ Nasal	☐ Clear	☐ Lisping	☐ Stuttering
☐ Old	☐ High	☐ Cracking	☐ Excited	☐ Young

☐ Familiar (who did it sound like?)

☐ Accented (which nationality or region?)

11. Is the Connection Clear? (Could it have been a wireless or cell phone?)

12. Are There Background Noises?

☐ Street noises (what kind?)	
☐ Machinery (what type?)	
☐ Voices (describe)	
☐ Children (describe)	
☐ Animals (what kind?)	
☐ Computer Keyboard, Office	
☐ Motors (describe)	
☐ Music (what kind?)	
☐ Other	

13. Call Received By (Name, Address, and Telephone Number):

Date Call Received:

Time of Call:

14. Call Reported to: **Date/Time**

15. Action(s) Taken Following Receipt of Call:

Water System Report of Suspicious Activity

In the event personnel from your water system (or neighbors of your water system) observe suspicious activity, use the following checklist to collect as much detail about the nature of the activity.

1. Types of Suspicious Activity:

- ❑ Breach of security systems (e.g., lock cut, door forced open)
- ❑ Changes in water quality noticed by customers (e.g., change in color, odor, taste) that were not planned or announced by the water system
- ❑ Unauthorized personnel on water system property.
- ❑ Other (explain)
- ❑ Presence of personnel at the water system at unusual hours

2. Water System Identification:

Name:
Address:

Telephone:

PWS Owner or Manager's Name:

3. Alternate Water Source Available: Yes/No **If yes, give name and location:**

4. Location of Suspicious Activity:

❑ Distribution Line ❑ Water Storage Facilities ❑Treatment Plant ❑ Raw Water Source ❑ Treatment Chemicals

❑ Other (explain):

5. If Breach of Security, What was the Nature of the Breach?

☐ Lock was cut or broken, permitting unauthorized entry.

Specify location

☐ Lock was tampered with, but not sufficiently to allow unauthorized entry.

Specify location

☐ Door, gate, window, or any other point of entry (vent, hatch, etc.) was open and unsecured

Specify location

☐ Other

Specify nature and location

6. Unauthorized personnel on site?

Where were these people?

Specify location

What made them suspicious?

☐ Not wearing water system uniforms

☐ Something else? (Specify)

What were they doing?

7. Please describe these personnel (height, weight, hair color, clothes, facial hair, any distinguishing marks):

8. Call Received By (Name, Address, and Telephone Number):

Date Call Received:

Time of Call:

9. Call Reported to: **Date/Time:**

10. Action(s) Taken Following Receipt of Call:

Disclaimer

This document contains information on how to plan for protection of the assets of your water system. The work necessarily addresses problems in a general nature. You should review local, state, and federal laws and regulations to see how they apply to your specific situation.

Knowledgeable professionals prepared this document using current information. The authors make no representation, expressed or implied, that this information is suitable for any specific situation. The authors have no obligation to update this work or to make notification of any changes in statutes, regulations, information, or programs described in this document. Publication of this document does not replace the duty of water systems to warn and properly train their employees and others concerning health and safety risks and necessary precautions at their water systems.

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Certification of Completion

A final step in completing the "Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems" is to notify the Mississippi State Department of Health that the assessment has been conducted. Please fill in the following information and send a copy of this page to the Mississippi State Department of Health. NOTE: You must maintain a copy of this page in your official records.

Public Water System (PWS) ID: 3000051 & 3000515

Svstem Name: CITY OF OCEAN SPRINGS

Address: 1018 PORTER AVE.

Town/City: OCEAN SPRINGS **State:** MS

ZIP Code: 39564

Phone: 228-875-4407 **Fax:** 228-875-4065

Email:

Person Name: MARK HARE

Title: FIRE CHIEF / CIVIL DEFENSE DIRECTOR

Address: P.O. BOX 1800

Town/City: OCEAN SPRINGS **State:** MS

ZIP Code: 39566-1800

Phone: 228-875-4407 **Fax:**

Email:

I certify that the information in this vulnerability assessment has been completed to the best of my knowledge and that the appropriate parties have been notified of the assessment and recommended steps to enhance the security of the water system have been identified. Furthermore, a copy of the completed assessment will be retained at the pubic water system, in a secure location, for review by the Mississippi State Department of Health when requested.

Signed Edwin S. Ott **Date** 2/10/05

EDWIN S. OTT, CONSULTING ENGINEER
COMPTON ENGINEERING, INC.

VERY IMPORTANT!!

Mail this completed page to:

Mississippi State Department of Health
Division of Water Supply
P. O. Box 1700
Jackson, MS 39215-1700

A "FILL AND PRINT" VERSION OF THIS FORM IS AVAILABLE ONLINE AT
http://www.epa.gov/safewater/security/util-inst-app1.pdf

Appendix 1

VULNERABILITY ASSESSMENT CERTIFICATION

Public Water System ID number: 3000051 & 3000515

System Name: City of Ocean Springs

City where system is located: (1018 Porter Ave.) Ocean Springs

State : Mississippi

Printed Name of Person Authorized to Sign this Certification on behalf of the System: Edwin S. Ott

Title: Engineer

Address : 156 Nixon Street

City: Biloxi

State and ZIP Code: MS 39530

Phone: (228) 432-2133 **Fax:** (228) 432-8149 **Email:**

I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has conducted a vulnerability assessment that complies with Section 1433(a)(1) of the Safe Drinking Water Act, as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV— Drinking Water Security and Safety).

I further certify that this document and all attachments were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C. 300f *et seq.*)).

The vulnerability assessment this community water system conducted addresses the following components of my system (Check YES if the CWS has the element in its system; check N/A if the element is not applicable to the system.):

YES	N/A	
☑	☐	pipes and constructed conveyances
☑	☐	physical barriers

☑	☐	water collection
☑	☐	pretreatment
☑	☐	treatment
☑	☐	storage
☑	☐	distribution facilities
☐	☑	electronic, computer or other automated systems which are utilized by the public water system
☑	☐	the use, storage, or handling of various chemicals
☑	☐	the operation and maintenance of such system

Other components in the CWS that were evaluated under this VA (list those applicable):

Signed: Edwin R. Ott **Date:** 2/15/05

Primary contact person that EPA can call if there are questions about this Certification and VA submission:
Name: MARK HANE
Address (if different than that of the Authorized Representative): 1801 PORTER AVE. (P.O. BOX 1800)
OCEAN SPRINGS, MS 39564
Phone: 228-875-4407
Email Address:

Alternate Contact Person:
Name: ANDRE KAUFMAN
Address (if different than that of the Authorized Representative): 1801 PORTER AVE.
OCEAN SPRINGS, MS 39564
Phone: 228-875-3955
Email Address:

OPERATIONS PLAN TEMPLATE

Disclaimer

This operations plan template is provided as guidance only. It contains recognized standards on the types of information that should be contained in an Operations Plan. Sections of the guidance may not be applicable to every water system and this guidance should be modified to reflect specific conditions at the water system. A copy of your Operations Plan in its entirety must be maintained at your facility and available for review upon request by a representative of the NJ Department of Environmental Protection.

OPERATIONS PLAN
WATER SECTOR

System Name: _____

PWSID No.: _____

Address: _____

_____

_____

Municipality/County: _____

Telephone No.: _____

System Type: ❑ Community ❑ Non-Community

Population Served: _____

Licensed Operator: _____

Licenses Held: _____

Plan prepared by: _____

Date Completed: _____

Purpose

This Operations Plan was developed, in part, to satisfy the Licensing of Water Supply and Wastewater Treatment System Operator Regulations, specifically N.J.A.C. 7:10A-1.12 *et seq*. This plan contains a detailed system description (source, treatment, storage, and distribution) and daily operation and maintenance procedures; this plan is intended to ensure that the system operates in a manner that satisfies all laws, rules, and regulations and that all employees are acquainted with their individual responsibilities.

Table of Contents

Section 1 – System Description.....4
source
treatment
distribution
storage

Section 2 – Routine Operation/Maintenance Procedures.....8
start-up & daily operations
emergency flags
equipment inventory
spare parts inventory
equipment repair/supply contact info

Section 3 – Emergency Response/Action Plan.....17

Section 4 – Water Quality Monitoring Plan.....18

Section 5 – Water Quality Violation Response Procedures.....19

Section 6 – Employee Training.....20

SECTION 1 – DESCRIPTION OF SOURCE, TREATMENT & DISTRIBUTION SYSTEM

This section provides a detailed description of our water source(s), treatment, storage, and distribution infrastructure.

Part 1 - Sources (complete for each well)

Source Name:
Source Location:
Well Record Attached: ❑Yes ❑ No

Latitude/Longitude: _____ Diameter: ____ in
Date Drilled: _____ Depth: ____ ft
Well Driller: _____

Type of Pump: _____
Pump Capacity: _____ gpm
Horsepower: _____
Method of Pump Control: manual or automatic

Specs Attached: ❑Yes ❑ No

Source Name:
Source Location:
Well Record Attached ❑Yes ❑ No

Latitude/Longitude: _____ Diameter: ____ in
Date Drilled: _____ Depth: ____ ft
Well Driller: _____
Type of Pump: _____
Pump Capacity: _____ gpm
Horsepower: _____

Metod of Pump Control: manual or automatic
Specs Attached: ❑Yes ❑ No

Part 2 - Treatment

Disinfection Process: ___ gas ___ hypochlorite

Chlorine Contact Time: _____ minutes at flow rate: _____ gpm
Design Chlorine Residual: _____
Chemical used: _____
Strength: _____
Container size: _____
Storage Location: _____
Supplier: _____
Phone No.: _____

Chemical Feeder Type: _____ (ie., diaphram, volumetric, gravimetric, etc.)
Make & Model No: _____

Control Process: manual or automatic (flow pacing, residual pacing, etc.)
Specs Attached: ❑Yes ❑ No

Other Treatment Process (complete for each treatment process)

Chemical used: _____
Purpose of Treatment: _____
Strength: _____
Container size: _____
Storage Location: _____
Supplier: _____
Phone No.: _____

Chemical Feeder Type: _____ (ie., diaphram, volumetric, gravimetric, etc.)
Make & Model No: _____
Pump Capacity (gpd): _____
Chemical Dosage: _____
Residual Concentration: _____

Control Process: manual or automatic (flow pacing, residual pacing, etc.)
Specs attached: ❑Yes ❑ No

Part 3 - Distribution

Service Area
Pipe Material: _____
Pipe Diameter: _____
Pipe Length: _____

No. of Fire Hydrants: _____

No. of Meters: _____

If an inventory of distribution materials (ie pipe, valves, etc.) is maintained, where is it located? _____

Are there any cross connections? ❑ Yes ❑ No
If yes, are the appropriate backflow prevention devices installed/permitted? ❑ Yes ❑ No

Are there any interconnections with other systems? ❑ Yes ❑ No
If yes, detail the location, the seller and the interconnection capacity: _____

Service Area (provide description & attach distribution map): _____

Finished Water Storage (complete for each storage tank/facility)

Type: _____
Location: _____
Size: _____

Year Constructed / Installed: _____
Manufacturer: _____
Maintenance Required: _____

Pressure range (pressure tank): _____

Specs attached: ❑Yes ❑ No

Finished Water Storage

Type: _____
Location: _____
Size: _____

Year Constructed / Installed: _____
Manufacturer: _____
Maintenance Required: _____

If pressure tank, pressure range (psi): _____

Specs attached: ❑Yes ❑ No

SECTION 2 - ROUTINE OPERATIONS/MAINTENANCE PROCEDURES

This section provides a description of the routine operation and maintenance (O&M) procedures designed to maximize operating techniques and preventative maintenance to ensure proper operation of the system.

Part 1 - Start-up and Daily Operations

Describe what controls the start-up of your water source (automatic or manual). If automatic, what activates the pump? (pressure switch, water level controls)

_____
_____
_____

Describe what controls the shut-down of your water source (automatic or manual). If pressure related, at what pressure does the pump shut off?

_____
_____
_____

Describe what controls water levels in the storage unit (altitude valve, float, pressure).

_____
_____
_____

Describe what controls the start-up of disinfection/other treatment processes.

_____
_____
_____

Describe what controls the shut-down of disinfection/other treatment processes.

_____
_____
_____

Emergency Flags - An emergency exists when:

- water pressure falls below _____ psi
- entry point chlorine residual is less than _____ ppm
- other (describe) _____
  _____

Routine record keeping is accomplished by utilizing the following reports:

- *Monthly Operating Report for Ground Water Treatment Plants (BSDW-40)*
- *Daily Start-up Checklist*
- *Weekly/Monthly Inspection Report*
- *Maintenance Activity Report*
- *Incident/Follow-up Action Report*

The Monthly Operating Report for Ground Water Treatment Plants (BSDW-40) is used to maintain daily records of water pumpage, chemical quantities, and routine test results. This report is submitted monthly by the 10th day of the month following the month for which the records contained in the report are compiled, in accordance with N.J.A.C. 7:10A-1.12(d).

A copy of the Daily Start-up Checklist should be kept at the well house and/or treatment plant. The form should be used to ensure that start-up activities are properly conducted, especially in the event of an emergency when the regular operator is not available. This report is not required to be submitted to the Bureau but should be kept on-site for review upon request.

The Weekly/Monthly Inspection Report can be used to document weekly and/or monthly inspections of mechanical equipment and appurtenances. Weekly/monthly inspections will ensure that the system is operating properly and in compliance with all applicable rules, regulations, and permit conditions. This report is not required to be submitted to the Bureau but should be kept on-site for review upon request.

The Maintenance Activity Report can be used to document preventative maintenance and testing activities, based on the manufacturer's recommendations and specifications for equipment. This report is not required to be submitted to the Bureau but should be kept on-site for review upon request.

The Incident/Follow-up Action Report can be used to record follow-up measures taken to correct any deficiencies noted during daily, weekly or monthly inspections. This report is not required to be submitted to the Bureau but should be kept on-site for review upon request.

Copies of the above reports are filed at _____.

Distribution maps are located at _____.

Technical Manuals are located at _____.

Daily Start-up Checklist

Inspected by: _____ Date: _____

- ❑ well pump operational (flow rate and pressure normal)
- ❑ disinfection process operational (adequate feed chemical available / design residual achieved)
- ❑ other treatment process operational (adequate feed chemical available / design residual achieved)
- ❑ performed physical inspection of pump, tubing, injection assembly
- ❑ performed mechanical inspection of piping, motors, sumps
- ❑ performed electrical inspection of wires, fuses
- ❑ other (describe)
- ❑ recorded water flows
- ❑ recorded water pressure
- ❑ recorded chlorine residual
- ❑ recorded other chemical feed residuals

Additional start-up step(s):

_____

_____

_____

_____

_____

_____

_____

_____

_____

Weekly / Monthly Inspection Report

Inspection of:	Observations/Initials	Date / Time

Maintenance Activity Report

Activity Performed:	Location	Initials / Date

Incident/Follow-up Action Report

This report documents all breaks, breakdowns, problems, bypasses, pump failures, occurrences, emergencies, complaints and/or intervening factors that result in or necessitate deviation from routine O&M procedures, and any situations that have the potential to affect public health, safety, welfare, or the environment or have the potential to violate any permits, regulations or laws relating to the water system. In addition, this report records the remedial or follow-up action taken to correct the circumstance.

Follow Up Action and/or Incident	Corrective Action Taken	Initials	Date/Time

Part 2 - Equipment Inventory

This section identifies our on-site inventory of equipment and spare parts including safety equipment such as eye washes, fire extinguishers, first aid kits, etc.

Equipment Description	Location	Quantity

Part 3 – Spare Parts Inventory

Auxiliary Power Sources

Type/Capacity	Location

Spare Pumps

Type/Manufacturer	Service Capabilities	Location

Spare Pump Parts

Part	Location

Spare Distribution Parts

Part	Location

Spare Treatment Parts

Part	Location

Reserve Chemicals

Chemical	Location

Part 4 - Equipment Repair/Supply Contact Information

Organization	Contact	Phone (day)	Phone (24/7)
Electrician			
Plumber			
Pump Specialist			
Soil Excavator/ Backhoe Operator			
Equipment Rentals			
Equipment Repairman			
SCADA Repair			
Pump Supplier			
Well Driller			
Pipe Supplier			
Analytical Lab			
Chemical Supplier			
Other			

SECTION 3 – EMERGENCY OPERATION PROCEDURES

This section addresses the protocols (actions and responses) to be followed in the event of an emergency situation or an intervening factor which mandates deviation from routine O&M procedures.

OPTIONAL INSERT (IF APPLICABLE) An Emergency Response Plan was developed for our system on **(insert date)** in accordance with the Public Health Security Bioterrorism Preparedness & Response Act of 2002, (Public Law 107-188) and the New Jersey Water Allocation Regulations, specifically N.J.A.C. 7:19-11.1 *et seq*. This plan details the actions, procedures, and identification of equipment that can be utilized to significantly lessen the impact of an emergency situation. Due to the confidential nature of our Emergency Response Plan, distribution has been limited to employees as indicated below:

Employee	Distributed by	Date

SECTION 4 - WATER QUALITY MONITORING PLAN

Monitoring Schedule Attached: ❑ Yes ❑ No

Samples collected by: _____

Samples analyzed by: _____

Laboratory Name: _____

Certification No.: _____

Address: _____

Phone No.: _____

Laboratory Contract Attached: ❑ Yes ❑ No

Does the lab prepare & send monitoring forms directly to the State? ❑ Yes ❑ No

Are copies of the Monitoring Report Forms kept on-site? ❑ Yes ❑ No

Location of Monitoring Report Forms: _____

Additional information:

_____

_____

_____

_____

_____

_____

SECTION 5 - WATER QUALITY VIOLATION RESPONSE PROCEDURE

Acute violations (such as the confirmed presence of fecal coliforms or an exceedance of the maximum contaminant level (MCL) for Nitrate) must be reported to the NJDEP within twenty-four hours (24) after becoming aware of the violation, in order to ensure appropriate public notification and/or any necessary corrective actions.

NJDEP, Bureau of Safe Drinking Water (609) 292-5550
NJDEP, Hotline (use after business hours) (877) 927-6337

Non-acute violations (such as the confirmed presence of total coliforms or an exceedance of the MCL for Inorganics, Volatile Organic Compounds, etc.) must be reported to the NJDEP, Bureau of Safe Drinking Water within forty-eight (48) hours after becoming aware of the violation.

In the case of a MCL, does the lab notify the State? ❑ Yes ❑ No

In the case of a single sample MCL violation, does the lab automatically collect check/confirmation samples? ❑ Yes ❑ No

Method of Public Notification: newspaper, posting, hand delivery, other _____

Additional information:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

SECTION 6 – EMPLOYEE TRAINING

Employees are trained in the applicable aspects of the Occupational Safety and Health Administration Standards, 29 CFR 1910 *et seq*. (including, but not limited to lockout/tagout procedures, confined space entry, heavy equipment operation, etc.). Safety protocols and workplace policies and procedures are also reviewed routinely. Content and frequency of employee training is recorded below:

Date	Course Title	Course Content

BSDW-ERP Template 10/04

EMERGENCY RESPONSE PLAN
WATER SECTOR

Public Water System Name:
City of Ocean Springs

PWSID No:
300005

Physical Address:
712 A Pine St.
City: Ocean Springs
State: MS
Zip Code: 39564
General Phone Number: 228-875-3955

Population Served: 17,225
Municipalities Served: 1

Prepared by (signature & title):

Reviewed by (signature & title):

Date Completed:

Date Revised:

Purpose

This Emergency Response Plan was developed in accordance with the Public Health Security Bioterrorism Preparedness & Response Act of 2002, (Public Law 107-188) and the New Jersey Water Allocation Regulations, specifically N.J.A.C. 7:19-11.1 *et seq.* This plan includes the actions, procedures, and identification of equipment that can be implemented or utilized to significantly lessen the impact of an emergency situation. Various scenarios are addressed, both naturally occurring and intentional actions (i.e. terrorist attacks).

Plan Distribution

Copies of the emergency plan have been distributed to all water supply personnel and other officials as indicated below. All employees will be trained on implementation of the plan.

Recipient	Distributed By	Date

Table of Contents

Section 1 - Emergency Response Team Page 4
Roles/Responsibilities/Contact Information
External Notifications

Section 2 - Emergency Communication Procedures Page 8
Communications Equipment Inventory
Communications Plan

Section 3 - Water System Priorities Page 9
Water Usage
Emergency Provisions for treatment, pumping, distribution, & emergency water stations

Section 4 - Resource Inventory Page 10
Personnel Protection - Evacuation/Assembly/Training
Plant Equipment
Property Protection

Section 5 - Alternate Water Supplies Page 17
Interconnections
Seasonal Sources/Backup Sources/Unapproved Sources
Alternate Sources

Section 6 - Interim Water Rationing Page 18
Water Use Restrictions

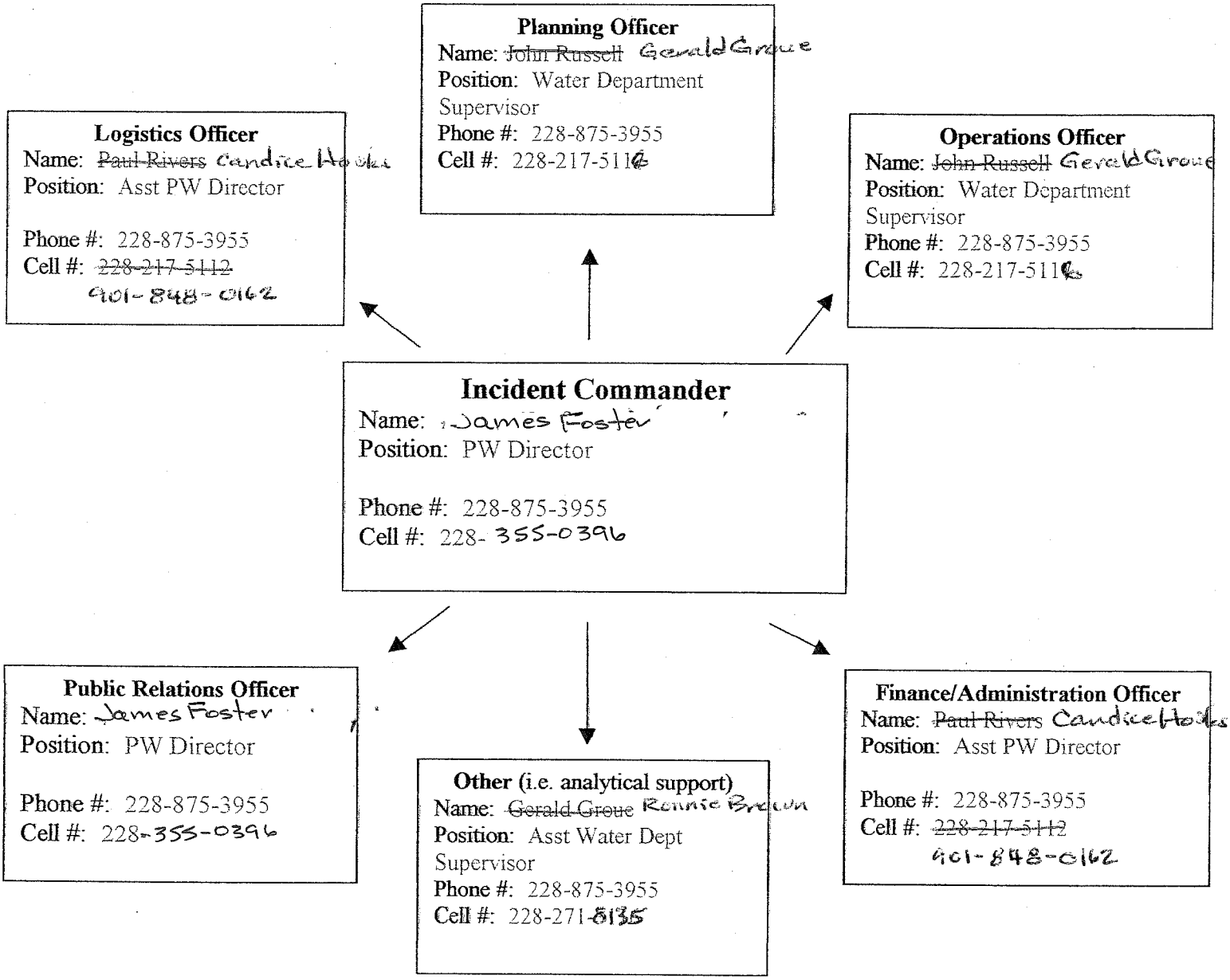
Section 7 – Emergency Situations Page 19
Incident Characterization
Analysis & Response to Emergency Scenarios
Continuity of Operations
Preliminary Damage Assessment

Section 8 – Emergency Response Evaluation Page 30
Emergency Response Evaluation Report

Section 1 – Emergency Response Team (Roles/Contact Information)

The following chart depicts our Emergency Response Team members and their contact information.

Team Members:
(Available 24/7)



Revised 10-14-2016 updated 3-10-2017

Section 1 – Emergency Response Team (Responsibilities)

A description of the responsibilities for the Emergency Response Team members is as follows.

Incident Commander: This individual is reachable 24 hours a day, 7 days a week and is responsible for decision-making during the event and for coordinating efforts with local emergency responders. All personnel involved in the incident will report to the Incident Commander. Should the incident escalate, the Incident Commander may delegate this position to an official from local, State or Federal government and assume a support role: in this situation a full briefing of the situation will be given to the incoming Incident Commander and all staff will be notified of the change.

Information Officer: This individual will be the primary spokesperson to the media or other organizations requesting information concerning the event. All Staff are advised to refer any requests for information directly to the Information Officer and not to talk directly to members of the press.

Planning Officer: This individual(s) will be responsible for developing an Action Plan for responding to the incident and will evaluate incoming information and revise the Action Plan as necessary.

Operations Officer: This individual(s) will be responsible for carrying out the Action Plan and directing resources.

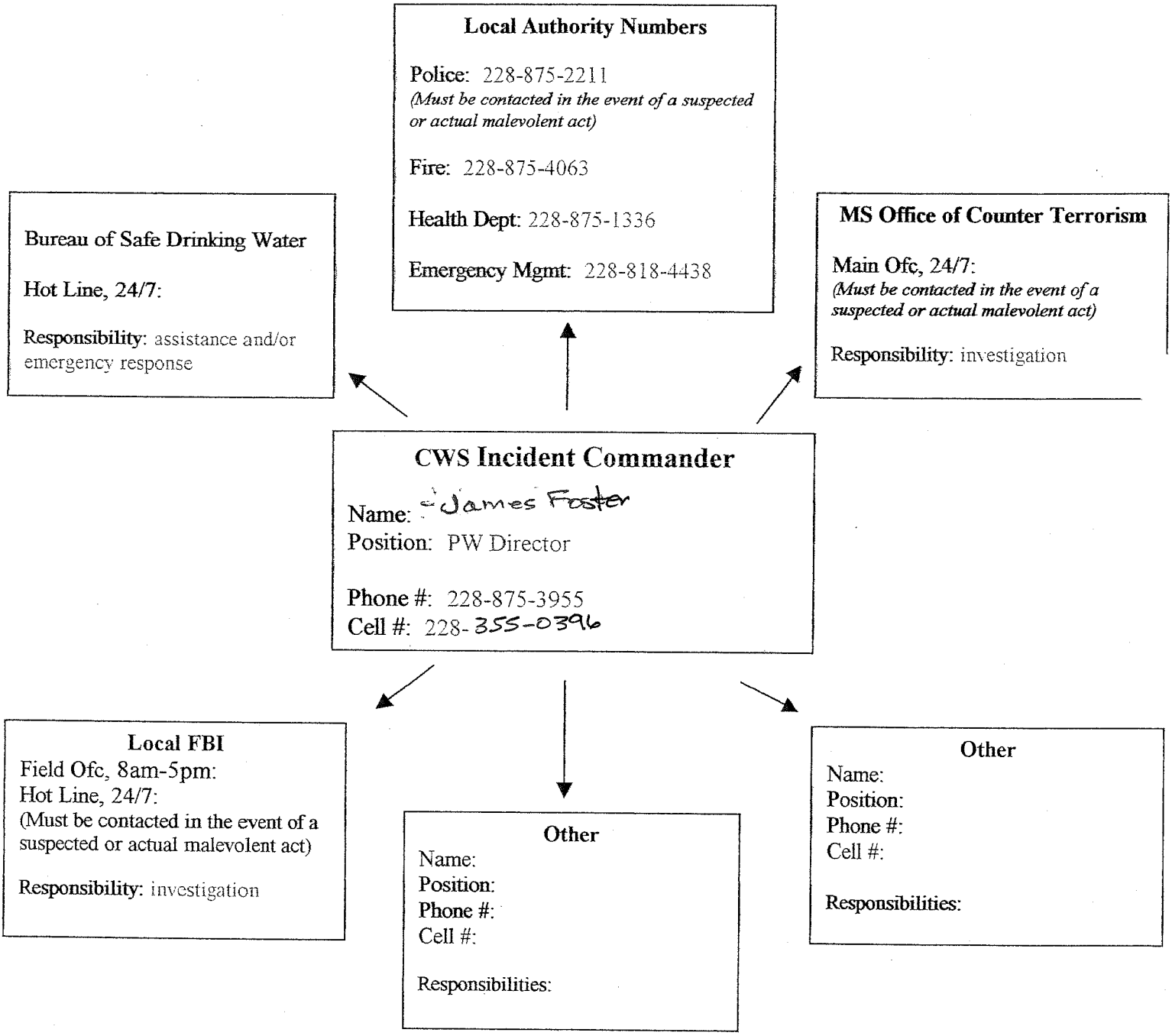
Logistics Officer: This individual (s) will be responsible for providing the necessary resources and any additional services required for responding to the incident.

> **Note**: The duties of Planning, Operations and Logistics may be carried out by one individual or by several, depending on the size and severity of the incident.

Finance/Administration Officer: This individual will be responsible for on-site financial management, especially the provision of funds to obtain the necessary equipment or supplies required to respond to the incident. This individual will activate contracts, deal with vendors and make cost estimates of alternative strategies. This individual can also monitor the costs associated with responding to the incident, although this is a secondary function.

Section 1 – Emergency Response Team (External Notifications)

The NJDEP will be notified, in accordance with N.J.A.C. 7:10-2.4(b), as soon as possible but no later than within six hours of any emergency that has the potential to lessen the quality or pressure of delivered water. The following charts establish other agencies to be contacted in the event of an emergency and identifies the contact person (where applicable) and phone number:



Other Emergency Contacts and Phone Numbers

The following *sensitive populations* (hospitals, nursing homes, childcare centers, schools, etc.) exist within our service area and will be contacted directly in the event of an emergency:

Facility Name	Contact	Population Type	Phone # (24/7)
OS Hospital			228-818-1111
OS School District			228-875-7706

Additional contact information for utilities and the media:

Organization	Contact	Phone (day)	Phone (24/7)
Electric Company			
Gas Company			
Sewer Company	Wastewater		
Telephone Company	Bellsouth		
One Call			
Other			

Organization	Contact	Phone (day)	Phone (24/7)
Newspaper – Local			
Newspaper – Regional			
Radio			
Television			

Section 2 – Emergency Communication Procedures (Communications Equipment)

An inventory of our communications equipment (cellular phones, two-way radios/Nextel phones, etc.) is as follows:

Type	Assigned to	Location	Number/Frequency/Channel
Motorola	~~John Russell~~ Ronnie Brown	Truck ~~49~~ 43	43 228-217-8135
Motorola	Gerald Groue	Truck ~~88~~ 46	~~40~~ 46 228-217-5116
Motorola	Danny Spica	Truck 48	~~46~~ 40 228-861-3384
Motorola	Joey Sonnier	Truck 2	42 228-861-7766

Section 2 – Emergency Communication Procedures (Communications Plan)

The following is a written description of our notification procedures and means of implementation that accounts for the loss of any mode of communication:

Primary plan: Use radios for communications. In the event of failure, use of cell phones and/or landlines will be implemented. In the event of failure, the use of the EOC communications will be implemented.

Section 3 - Water System Priorities (Water Usage)

This section establishes water usage priorities and assigns the best use of our water system resources during an emergency. Using *high*, *medium* or *low*, the chart to follow establishes the priority given to each use, our assessment of the water needed, and the method of sustaining the use. In some instances user groups were contacted directly to establish actual water needs.

Use Category	Priority	Water Needed	Method of Sustaining Use
Fire Protection	High	1.5 million gal	Generators
Sanitary	Medium	1.5 million gal	Generators
Industrial/Commercial	Medium	1.5 million gal	Generators
Potable (cooking, drinking, hygiene)	High	1.5 million gal	Generators
Sensitive Populations	High	1.5 million gal	Generators
Hospitals	High	1.5 million gal	Generators
Rehabilitation Centers	High	1.5 million gal	Generators
Emergency Shelters	High	1.5 million gal	Generators
Other	Medium	1.5 million gal	Generators

System Capacity: 1.5 million gallons per day (MGD)

Demand (MGD)	2004	2003	2002
Average Daily			
Maximum Daily			
Peak Daily			

Section 3 - Water System Priorities (Emergency Provisions)

This section details emergency procedures for treatment, pumping, distribution, and water stations:

Critical Process/Component	Emergency Procedures
Treatment 2	
Pumping 1	
Distribution 3	
Water Stations 1	

Section 4 – Resource Inventory
(Personnel Protection)

This section provides direction for water system personnel regarding the *safe* response to an emergency situation and covers Evacuation Procedures, Assembly Areas/Staff Accountability, Shelter Locations, and First Aid Equipment. Additionally, this section establishes the frequency of staff training (workshops, tabletop exercises, drills, refresher training, etc.) regarding the content of this plan and use of personal protective equipment and other safety protocols.

First Aid Equipment

Type	Location
Vests	PW and trucks
Glasses	PW and trucks
Masks	PW and trucks
Boots	PW and trucks
Rain suits	PW and trucks
Decon suits	PW and trucks

Evacuation Procedures

Upon orders of evacuation, skeleton crews of approximately 3 workers remain. The others return as needed upon recall.

Assembly Areas/Staff Accountability

Public Works Administration building. Head count and roll call is taken.

Shelter Locations

Civic Center
Police Station

Staff Training Frequency and Course Content

Date	Course Location	Course Description

Section 4 – Resource Inventory (Plant Equipment)

This section serves as a quick inventory of the available equipment, either maintained on-site or from a neighboring water system. Provisions for procuring appropriate equipment takes into consideration the Vulnerability Assessment process of identifying critical components. This section also provides contact information for supplies, equipment repair, and emergency services.

Inventory of Available Equipment/Parts

Auxiliary Power Sources

Type/Capacity	Location
Right angle drive backup motor	City Hall, Halstead Rd, Pabst Rd, Handy Dr

Spare Pumps

Type/Manufacturer	Service Capabilities	Location
4 stage		mobile

Spare Pump Parts

Part	Location

Spare Distribution Parts

Part	Location
	Water department shop

Spare Treatment Parts

Part	Location
	Water department shop

Reserve Chemicals

Chemical	Location
Chlorine cylinders	All wells, trucks, shop

Last Updated 10/05/ 2006 **Confidential**

Contact Information for Equipment Repair and Supplies

Organization	Contract Name/ Title	Phone (day)	Phone (24/7)
Electrician	Larry Gossett - Electrician Supervisor	1-228-875-3955	875-2211 Police Dept.
Plumber (Water)	~~John Russell~~ Gerald Grove - Water Supervisor	1-228-875-3955	875-2211 Police Dept.
Plumber (Sewer)	~~Jessie Wells~~ Matt Burrell - Sewer Supervisor	1-228-875-3955	875-2211 Police Dept.
Pump Specialist (WATER WELLS)	Mike Roden - Water Wells Layne - Central	1-601-922-4312	1-601-832-5631
Soil Excavator/Backhoe Operator	Public Works Department - Water, Sewer Street Department Operator's .	1-228-875-3955	875-2211 Police Dept.
Equipment Rental (Power Generators)	Joe Amoto - Rental Sales manager	1-228-872-6022	Cell 1-228-348-8034
Equipment Rentals (Chlorinators)	Coast Chlorinator and Pump. Co. Monthly/Daily/After Hours Service Contract	1-228-392-2085	1-228-392-2085
Equipment Repairman # 1	Steve Wittmann - Owner /Main Support	1-228-392-2085	860-0050
Equipment Repairman # 2	Tom Painter - After Hour Equipment Repair	1-228-392-2085	860-5454
SCADA Repair Service	N/A	N/A	N/A
Pump Supplier	Gibson Electric Motor Sales & Service Inc.	762-4923	762-4923
Well Driller # 1	Mike Roden - Water Wells Layne - Central	1-601-922-4312	1-601-832-5631
Well Driller # 2	Griner Drilling Service , Inc. Greg Weatherford	1-601-736-6347	1-601-441-4255
Pipe Supplier	Hughes Supply Inc.- Mobile Al. (Charlie Bower)	1-800-277-5533	1-251-478-6953
Pipe Supplier	Consolidated Pipe Supply Inc. (Larry Goodwin)	1-800-467-1921	1-228-990-8271
Local/Regional Analytical Laboratory	Micro-Methods Laboratory Inc.	1-228-875-6420	1-228-875-6420
Chemical Supplier(s)	Water & Waste Specialties - Theodore Al (Woody)	1-800-569-3354	1-251-402-0879
Other Well Driller # 3	Thompson Brothers Drilling - Perry Bridge	1-601-425-0970	1-601-319-8243

FROM : Public Works-Ocean Springs FAX NO. : 228 875 4861 Oct. 05 2006 11:06AM P1

Section 4 – Resource Inventory
(Property Protection)

This section details procedures for protecting and securing water system facilities, equipment, and vital records. Additionally, this section provides information for water system personnel regarding lock-out procedures, restricted access protocols, and in the event of a criminal act, perimeter security and evidence preservation.

Protection and Security of Facilities, Equipment, and Vital Records

Chain link, barbed wire topped fence
Security lights
Locks on all entrances

Lock Out Procedures

Key Holders:
~~John Russell~~, Gerald Groue, Maintenance crew, electrician, Danny Spicer, chlorine deliverers, maintenance contractors, power company

Restricted Access Protocols

Locks and log books at each well with regular histories being recorded of access.

Incident Perimeter Security and Evidence Preservation

Logbooks at each well. Logbooks are kept for decades in storage at Public Works Administrative building.

Section 5 - Alternate Water Supplies
(Interconnections, Seasonal/Backup/Unapproved Sources)

This section provides information on available alternate water sources to be utilized in an emergency. These water sources are derived from interconnections with adjacent public community water systems, seasonal/backup sources not normally in operation, unapproved water sources, and through written contracts with bottled water companies and/or certified bulk water haulers. This section also establishes any limitations for the derivation of water through these sources.

When determining the use of alternate water supplies, both short-term (i.e. a localized contamination event or an electrical power service disruption) and long-term (i.e. a major treatment failure or a major distribution system failure) water outages were considered. Ultimately, the cause and duration of the water outage will determine our response.

Available Interconnections

Provider Name	Location(s)	Main Size	Contract Limitations
OSPW	SunPlex	8 inch	
JCWA	Sunplex	12 inch	

Seasonal Sources/Backup Sources/Unapproved Sources

Source Type	Source Location	Available Yield	Treatment Requirements

Bottled Water Source/Bulk Water Haulers

Company Name	Phone Number	Contract Number	Available Quantity

Section 6 – Interim Water Rationing (Water Use Restrictions)

This section establishes the adopted water use restrictions to be implemented by our system during an emergency situation. Our phased water use restrictions model the Priority-Based Phase System of Water Restrictions outlined in the New Jersey Water Allocation regulations, specifically N.J.A.C. 7:19-13.3 through 13.6. Water use restrictions will be imposed on users (residential/non-residential) within the area served by our system depending on the severity of the water emergency situation.

PHASE I Restrictions (available water supply levels determined to be below normal)

PHASE II Restrictions (substantial threat to the public health and welfare)

PHASE III Restrictions (further rationing required)

PHASE IV Restrictions (disaster stage)

Section 7 – Emergency Situations (Incident Characterization)

This section establishes our field and/or crisis protocols for performing threat evaluation, site characterization, and response actions.

Optional Resource: Various worksheets and report forms, such as the *Threat Evaluation Worksheet*, *Security Incident Report Form*, *Phone Threat Report Form*, and *Public Health Response Action Worksheet* are located throughout our facility to ensure their use during an emergency situation. These worksheets/forms are derived from the United States Environmental Protection Agency's *Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents – Response Guidelines,* Interim Final (dated August 2004). Copies of the Response Guidelines worksheets and forms utilized by our system are included as Appendix I of this plan.

During an emergency situation, as part of incident characterization, sample collection and analyses are required to ascertain the extent of contamination and/or safety of the water supply. To ensure the timely analyses of samples, sample collection and analytical services will be provided by in-house staff and/or contract laboratory(s) as indicated below:

Water Sampling and Analytical Services

MicroMethods

Section 7 – Emergency Situations
(Analysis & Response to Emergency Situations)

This section identifies and evaluates anticipated emergency situations and establishes the appropriate actions and responses. The following emergency situations were analyzed:

A. Floods/Hurricanes
B. Power Outages
C. Pollution Episodes
D. Earthquakes
E. Major Distribution System Failure
F. Major Source Supply Failure
G. Major Treatment System Failure
H. Major SCADA or Other Automated Control Failure
I. Chemical Accidents
J. Explosion Affecting System Infrastructure
K. Job Actions (i.e., strikes, walkouts, etc.)
L. *Insider Threat (i.e., disgruntled employee, contractor, etc.)
M. *Terrorist Threat (i.e., terrorist activity involving intentional sabotage/contamination)

Note: Events caused by malevolent acts are a crime and therefore dictate crime scene preservation, evidence protection measures, and appropriate investigative techniques such as chain of custody for sampling activities and photographic documentation.

The potential effects of each emergency situation on the following system components was assessed:

A. Sources
B. Treatment System
C. Pumping System
D. Transmission/Distribution System
E. Personnel
F. Power Supply
G. Materials and Supplies
H. Communications

This process has enabled our system to identify critical and/or weaker components for each situation and to provide for a strengthening of these components to better respond to an emergency situation. No actual emergency situation will conform completely to a planned response and therefore the actual responses may be derived from several scenarios. The following general actions will be followed for all emergency situations:

- Take or direct any **immediate** response measures that are obviously needed to reduce risk to the public (see specific emergency response action below).
- Notify the water system administration and applicable government agencies.
- Determine and implement appropriate corrective actions to reduce and eliminate the effects of the emergency.
- Inform consumers of the emergency situation as soon as possible, and again as the status changes.

Each emergency situation (items A through M, previously listed) was evaluated and provided with a specific emergency action plan as outlined below:

Emergency situation: **Floods/Hurricanes**

Recovery Time Assessment: 24 hours

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells, Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power, fuel as needed, open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary, clear debris from around water wells, rotate chlorine cylinders as necessary, change over all wells to normal operation, relocate chlorine cylinders, repair broken water meters

Emergency situation: **Power Outages**

Recovery Time Assessment: less than 1 hour

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells, Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power, fuel as needed, open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary, clear debris from around water wells, rotate chlorine cylinders as necessary, change over all wells to normal operation, relocate chlorine cylinders, repair broken water meters

Emergency situation: **Pollution Episodes**

Recovery Time Assessment: _48 hours____

Action Plan:

- **Condition 1:** Test run wells, Assist with generators
- **Condition 2:** Secure Wells, Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power, fuel as needed, open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary, clear debris from around water wells, rotate chlorine cylinders as necessary, change over all wells to normal operation, relocate chlorine cylinders, repair broken water meters

Emergency situation: **Earthquakes**

Recovery Time Assessment: _____

Action Plan:

- **Condition 1:** Test run wells, Assist with generators
- **Condition 2:** Secure Wells, Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power, fuel as needed, open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary, clear debris from around water wells, rotate chlorine cylinders as necessary, change over all wells to normal operation, relocate chlorine cylinders, repair broken water meters.

Emergency situation: **Major Distribution System Failure**

Recovery Time Assessment: 4 hours

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells. Top off water tanks at wells. store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required. transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power. fuel as needed. open water valves as surge subsides. repair broken water lines (emergency)
- **Condition 5:** turn on water valves. rotate generators at water wells as necessary. clear debris from around water wells. rotate chlorine cylinders as necessary. change over all wells to normal operation. relocate chlorine cylinders. repair broken water meters

Emergency situation: **Major Source Supply Failure**

Recovery Time Assessment: 48 hours

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells. Top off water tanks at wells. store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required. transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power. fuel as needed. open water valves as surge subsides. repair broken water lines (emergency)
- **Condition 5:** turn on water valves. rotate generators at water wells as necessary. clear debris from around water wells. rotate chlorine cylinders as necessary. change over all wells to normal operation. relocate chlorine cylinders. repair broken water meters

Emergency situation: **Major Treatment System Failure**

Recovery Time Assessment: less than 1 hour

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells. Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power, fuel as needed, open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary, clear debris from around water wells, rotate chlorine cylinders as necessary, change over all wells to normal operation, relocate chlorine cylinders, repair broken water meters

Emergency situation: **Major SCADA or Other Automated Control Failure**

Recovery Time Assessment: 2 hours

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells, Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power, fuel as needed, open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary, clear debris from around water wells, rotate chlorine cylinders as necessary, change over all wells to normal operation, relocate chlorine cylinders, repair broken water meters

Emergency situation: **Chemical Accidents**

Recovery Time Assessment: _____

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells. Top off water tanks at wells. store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required. transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power. fuel as needed. open water valves as surge subsides. repair broken water lines (emergency)
- **Condition 5:** turn on water valves. rotate generators at water wells as necessary. clear debris from around water wells. rotate chlorine cylinders as necessary. change over all wells to normal operation. relocate chlorine cylinders. repair broken water meters

Emergency situation: **Explosion Affecting System Infrastructure**

Recovery Time Assessment: _____

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells. Top off water tanks at wells. store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required. transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power. fuel as needed. open water valves as surge subsides. repair broken water lines (emergency)
- **Condition 5:** turn on water valves. rotate generators at water wells as necessary. clear debris from around water wells. rotate chlorine cylinders as necessary. change over all wells to normal operation. relocate chlorine cylinders. repair broken water meters

Emergency situation: **Job Actions (i.e. strikes, walkouts, etc.)**

Recovery Time Assessment: _____

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells. Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power. fuel as needed. open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary. clear debris from around water wells. rotate chlorine cylinders as necessary. change over all wells to normal operation. relocate chlorine cylinders. repair broken water meters

Emergency situation: **Insider Threat** (i.e., disgruntled employee, contractor employee)

Recovery Time Assessment: _____

Action Plan:

- **Condition 1:** Test run wells. Assist with generators
- **Condition 2:** Secure Wells. Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power. fuel as needed. open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary. clear debris from around water wells. rotate chlorine cylinders as necessary. change over all wells to normal operation. relocate chlorine cylinders. repair broken water meters

Emergency situation: **Terrorist Threat** (intentional sabotage/contamination)

Recovery Time Assessment: _____

Action Plan:

- **Condition 1:** Test run wells, Assist with generators
- **Condition 2:** Secure Wells, Top off water tanks at wells, store exposed chlorine cylinders
- **Condition 3:** Turn off water valves as required, transfer wells over to generator as required
- **Condition 4:** Work water wells on generator power, fuel as needed, open water valves as surge subsides, repair broken water lines (emergency)
- **Condition 5:** turn on water valves, rotate generators at water wells as necessary, clear debris from around water wells, rotate chlorine cylinders as necessary, change over all wells to normal operation, relocate chlorine cylinders, repair broken water meters

Section 7 – Vulnerability Assessment (Continuity of Operations)

This section establishes our daily operational protocols. These written protocols establish a complete description of our source(s), treatment, & distribution system, routine operation & management procedures, and operational monitoring requirements and are detailed in our Operations Plan dated (September 29, 2006) (included as Appendix II to this plan). In the event of an emergency, any person so designated can implement the necessary procedures to ensure continuity of operations.

Additional system operational data can be found at the following locations:

Item	Location
Distribution Maps	Public Works, Fire Department, City Hall
Daily Operator Reports	Truck 49 and at all wells, records kept at Public Works Administration Building
Technical Manuals	Water Department Shop
Other	

Section 7 – Emergency Situations
(Preliminary Damage Assessment)

The preliminary damage assessment report will be utilized after an emergency situation to assess the extent of the damage caused by the emergency situation and the need for repair, replacement or abandoning of facilities.

Preliminary Damage Assessment Report

Well Stations	Yes	No	N/A
Physical damage	❑	❑	❑
Pump or motor failure	❑	❑	❑
Power source operating properly	❑	❑	❑
Test for water quality contamination	❑	❑	❑

Treatment Facilities	Yes	No	N/A
Physical damage	❑	❑	❑
Equipment operating properly	❑	❑	❑
Power source operating properly	❑	❑	❑
Chemical spills or release	❑	❑	❑

Water Storage Facilities	Yes	No	N/A
Physical damage	❑	❑	❑
Leaks	❑	❑	❑
Buckling	❑	❑	❑
Damage to inlet/outlet pipes	❑	❑	❑

Distribution System	Yes	No	N/A
Physical damage	❑	❑	❑
Leaks	❑	❑	❑
Main breaks	❑	❑	❑
Pressure loss	❑	❑	❑
Cross connection concerns	❑	❑	❑
Interconnections compromised	❑	❑	❑

Other system damage (i.e. reservoirs, vehicles, etc.) _____

_____

Description of Damage: _____

_____

Estimated Cost to Repair Damage: _____

_____

Section 8 – Emergency Response Evaluation (Emergency Response Evaluation Report)

At the conclusion of an emergency event, our Emergency Response Team will assemble and prepare an *Emergency Response Evaluation Report* to evaluate the timeliness and effectiveness of our Emergency Response Plan. Communication, critical decision-making, available resources, local emergency response coordination, and the integration of external resources will be evaluated. Based on our evaluation and subsequent recommendations, if any, the Emergency Response Plan will be revised as accordingly. The *Emergency Response Evaluation Report* will address the following:

Emergency Response Evaluation Report

Brief description of the emergency situation (causes, chronology of events, damages and impact):

Questions and Answers:

1. Was the Incident Commander notified and the emergency response team assembled in a timely manner?
2. Were the appropriate external notifications made in a timely manner?
3. Were there any difficulties in reaching the appropriate internal (team members)/external contacts?
4. Were the communication resources sufficient?
5. Do additional communication resources need to be acquired?
6. Does the communication plan need to be revised?
7. Was the chain-of-command clear to all individuals involved?
8. Was incoming information disseminated to the appropriate individuals in an efficient manner?
9. Were sufficient in-house resources available for use?
10. Would having additional resources on hand facilitate a quicker response time and/or lessen the impact of the emergency situation?
11. Were outside services (bulk water suppliers, laboratory services, etc.) deployed in an efficient manner and according to the timeframes specified within their respective contracts?
12. Did the Emergency Response Team and other responding staff act in a safe manner, following all safety protocols and procedures?
13. Should staff be provided with additional training to ensure their knowledge of the safety protocols?
14. Does the emergency response plan require revisions?

Description of recommendations (actions/procedures that could significantly lessen the impact of the emergency situation):

Appendix 4

CERTIFICATION OF COMPLETION OF AN EMERGENCY RESPONSE PLAN

Public Water System ID number: 300005

System Name: City of Ocean Springs

City where system is located: Ocean Springs

State : Mississippi

Printed Name of Person Authorized to Sign this Certification on Behalf of the System: Mark A. Hare

Title: Emergency Management Director

Address : PO Box 1800

City: Ocean Springs

State and ZIP Code: MS 39566-1800

Phone: (228) 872-4407 **Fax:** (228) 875-5442 **Email:** MHare@oceansprings-ms.gov

I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has completed an Emergency Response Plan that complies with Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV— Drinking Water Security and Safety).

I further certify that this document was prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C. 300f *et seq.*)).

The emergency response plan that this community water system completed incorporates the results of the vulnerability assessment completed for the system and includes "plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack" on this community water system. The emergency response plan also includes "actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals."

This CWS has coordinated, to the extent possible, with existing Local Emergency Planning Committees established under the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11001 et seq) when preparing this emergency response plan.

Signed: Mayor **Date:** 10-18-06

Primary contact person that EPA can call if there are questions about this Certification:

Name: Nathaniel Wilson

Address (if different than that of the Authorized Representative): Same

Phone: 228-875-4063

Email Address: nwilson@oceansprings-ms.gov

Alternate Contact Person:

Name: Candice Hooks

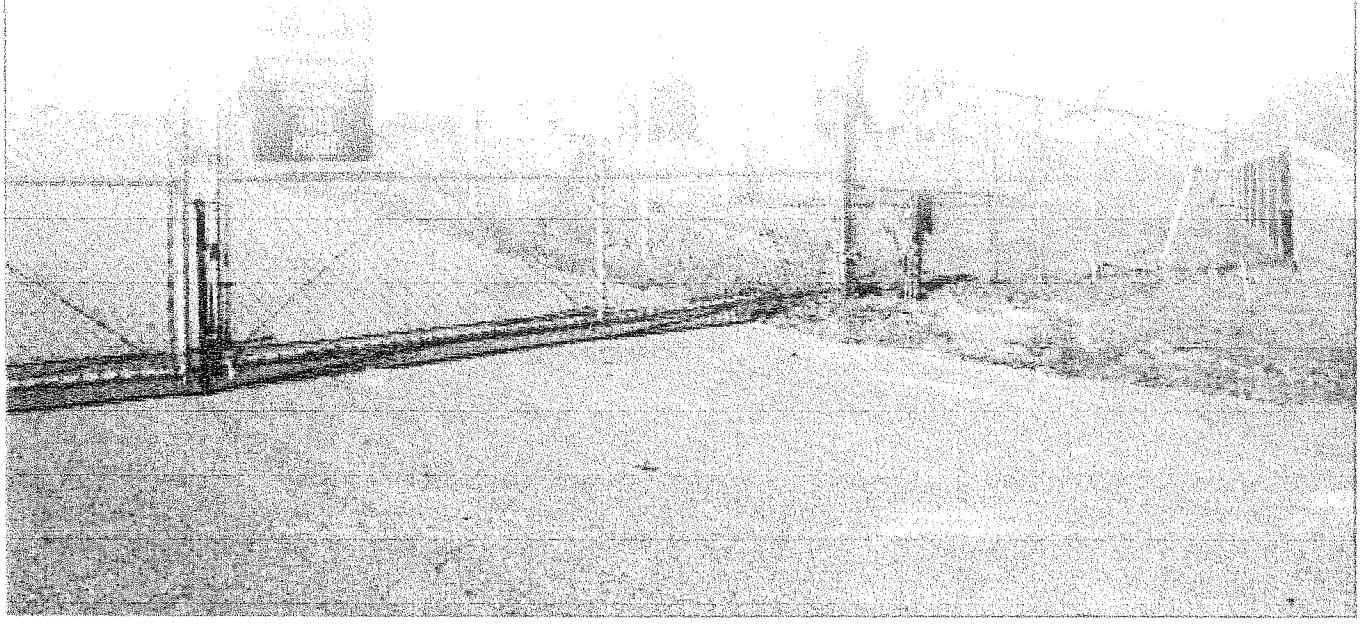
Address (if different than that of the Authorized Representative): Same

Phone: (228) 875-3955

Email Address: chooks@oceansprings-ms.gov

EPA
United States
Environmental Protection
Agency

Emergency Response Plan Guidance for Small and Medium Community Water Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002



Note to Readers: The U.S. Environmental Protection Agency (EPA) prepared this guide to help you enhance the security of your water system. This document does not impose legally binding requirements on EPA, states, tribes, or the regulated community, and it may or may not apply to a particular situation, depending on the circumstances. EPA and state decision-makers retain the discretion to adopt approaches on a case-by-case basis that may differ from this guide where appropriate. Any decisions regarding a particular community water system should be made based on the applicable statutes and regulations. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guide to a particular situation, and EPA will consider whether the recommendations or interpretations in this guide are appropriate in that situation based on the law and regulations. EPA may change this guide in the future. To determine whether EPA has revised this guide or to obtain additional copies, contact the Safe Drinking Water Hotline at 1-800-426-4791 or visit the EPA's Water Security website at www.epa.gov/watersecurity.

Office of Water (4601M)
EPA 816-R-04-002
www.epa.gov/safewater/security
April 2004

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Disclaimer: This document is provided as guidance only. It contains nationally recognized standards on the types of information that should be contained in an Emergency Response Plan (ERP). EPA recognizes that sections of this guidance may not be applicable to every Community Water System (CWS) and all potential situations may not be identified. It is each CWS's responsibility to evaluate the potential vulnerabilities related to their system and determine the appropriate responses. As site-specific needs dictate, this guidance can be modified.

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Introduction

What is the purpose of this document?

The purpose of this document is to provide guidance on developing or revising Emergency Response Plans (ERPs) for small- and medium-sized community drinking water systems. An ERP is a documented plan that describes the actions that a Community Water System (CWS) would take in response to various major events. A major event refers to:

- Credible threats, indications of terrorism, or acts of terrorism;
- Major disasters or emergencies such as hurricanes, tornadoes, storms, earthquakes, fires, flood, or explosion regardless of cause; and
- Catastrophic incidents that leave extraordinary levels of mass casualties, damage, and disruption severely affecting the population, infrastructure, environment, economy, and government functions.

On June 12, 2002, President Bush signed into law the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (PL 107-188, referred to as the Bioterrorism Act). In the Bioterrorism Act, Congress recognizes the need for drinking water systems to undertake a more comprehensive view of water safety and security. The Act amends the Safe Drinking Water Act and specifies actions CWSs and the U.S. Environmental Protection Agency (USEPA) must take to improve the security of the Nation's drinking water infrastructure.

CWS characteristics vary greatly, so CWSs should apply the information contained in this document to meet their particular needs and circumstances. This document should be used as a flexible template.

Why should a CWS develop or revise an ERP?

Protecting public health is the primary goal of community drinking water systems, and having an up-to-date and workable ERP helps achieve this goal in any crisis situation. The Bioterrorism Act amends the Safe Drinking Water Act (SDWA) by adding, among other requirements, section 1433. Section 1433(b) requires community water systems serving populations greater than 3,300 to either prepare or revise an ERP that incorporates the results of its Vulnerability Assessment (VA). The ERP must include "plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack" on the CWS. The ERP also must include "actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals."

Who should use this document?

In using the terms "small and medium-sized" within this document, USEPA is referring to CWS which serve populations from 3,301 to 99,999. A CWS serving a population from 3,301 to 99,999 should use this document to either develop or revise its ERP and address findings from its VA. A VA is also a requirement for a CWS serving a population greater than 3,300 under the Bioterrorism Act. Completing a VA is a necessary step before a comprehensive ERP can be developed or revised.

Note: Any reference to "CWS," "you," or "I" in this document is a reference to a CWS serving a population from 3,301 to 99,999 unless otherwise noted.

How do I use this document?

This document is divided into five sections that will assist you in developing or revising your ERP. The sections are:

I. **Before You Begin Developing or Revising Your ERP:** Describes steps and actions you would need to complete before you could successfully develop or revise your ERP.

II. **Emergency Response Plan—Eight Core Elements:** Describes core elements that are universal to any ERP. If you are beginning to develop your ERP, you should use this section as a general template. If you have an existing ERP, you can use this section to check if your existing ERP is comprehensive and complete. The core ERP elements are:

- System Specific Information;
- CWS Roles and Responsibilities;
- Communication Procedures: Who, What, and When;
- Personnel Safety;
- Identification of Alternate Water Sources;
- Replacement Equipment and Chemical Supplies;
- Property Protection; and
- Water Sampling and Monitoring.

III. **Putting Your ERP Together and ERP Activation:** Describes steps and issues you need to address once you have all your core ERP elements in place and how to put these elements together into a single comprehensive plan. Additionally, you will need to understand the types of events that will trigger use of the plan. An effective ERP now needs to address intentional acts of terrorism as well as other emergencies and natural disasters. Planning for these events makes developing, updating, and deciding to activate the ERP more challenging than in the past.

IV. **Action Plans:** Describes how Action Plans (AP) are developed and used to tailor emergency response actions to specific incidents or events. Under the Bioterrorism Act, you are required to address the findings of a VA in an ERP. An AP identifies the steps to take to address specific vulnerabilities and respond to a given incident.

V. **Next Steps:** Describes steps to take after completing an ERP, for example, submitting a certification to EPA, conducting training, and updating your plan.

Will my ERP contain sensitive information?

Your ERP may contain sensitive information, so you should consider steps you need to take to ensure the security of your ERP. Sensitive information should be placed in appendices, or in sections that are not readily available to unauthorized personnel. The ERP, however, should be easily accessible to authorized personnel and should be easily identifiable during a major event. Steps taken to limit access by unauthorized persons should consider local and state Freedom of Information Act (FOIA) laws. Alternatively, you can opt to make your ERP general in nature so that everyone can use it and not include specific information about system vulnerabilities.

A secure copy of your ERP should be maintained in an off-premises location in the event that your primary copy cannot be accessed.

I. Before You Begin Developing or Revising Your ERP

What steps do I need to take before I start to develop or revise my ERP?

Before you begin to develop or revise your ERP, there are two steps that you need to take. First, you need to have completed a VA as required under the Bioterrorism Act. The findings from your VA will be addressed in your ERP through specific Action Plans (AP), which are discussed in detail in Section IV, "Action Plans."

Second, you should identify and coordinate with first responders and ERP partners who will help and assist you during a major event. As required by Section 1433(b) of the Bioterrorism Act, partners should include, to the extent possible, Local Emergency Planning Committees (LEPCs) established under the Community Right-to-Know Act such as local law enforcement departments, fire departments, health departments, local environmental agencies, hospitals, broadcast and print media, community groups, and nearby utilities. Other partners could include State and Federal agencies, and laboratories. **Figure I-1** shows local entities (in the shaded area) as well as State and Federal entities (in the white area) that may assist you during a major event. EPA strongly recommends that you consult with local and State entities as you develop your ERP. The purpose of the consultation is to form partnerships and seek advice. Through these partnerships, each party knows and understands its role and responsibilities in emergency situations. These partnerships help everyone respond better to an emergency.

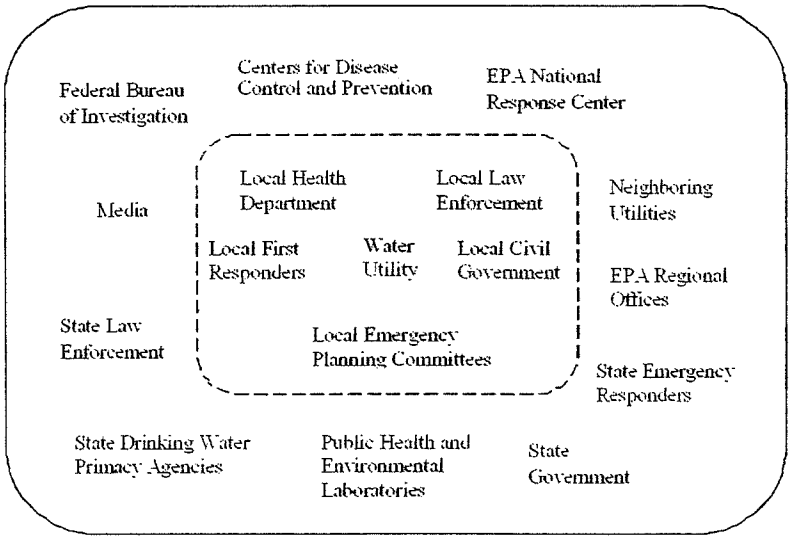


Figure I-1. Overview of ERP Partners

Are there any tools, training courses, or guides that can assist me in either developing or revising my ERP?

Emergency response has been around for quite some time, so many tools, training courses, and guides already exist on the topic of developing an ERP. Possible resources on how to develop or revise sections of your ERP include the following (see also the "References and Links" section of this document):

- ERP material from other Federal agencies [for example, Incident Command System information from the Federal Emergency Management Agency (FEMA) and the Department of Homeland Security (DHS)];

- State ERP guidance;
- Risk Management Plans as required by the Clean Air Act section 112(r) (if applicable to your CWS);
- Water association ERP guides and training courses; and
- USEPA's Response Protocol Tool Box (for water contamination incidents) http://www.epa.gov/safewater/security/index.html#emergency.

Many of the above resources address specific topics or subject areas in greater detail than this guidance document. Again, the purpose of this guidance document is to help produce a single comprehensive ERP that would meet the response needs of a variety of events. Use ERP resources available to you to help build a single and comprehensive ERP that includes response actions to terrorist or other intentional events.

II. Emergency Response Plan—Eight Core Elements

What does USEPA mean by "ERP core elements"?

Core elements form the basis, or foundation, for responding to any major event. USEPA has identified eight core elements common to an ERP that you should plan to utilize or bring to bear during water emergencies.

1. System Specific Information;
2. CWS Roles and Responsibilities;
3. Communication Procedures: Who, What, and When;
4. Personnel Safety;
5. Identification of Alternate Water Sources;
6. Replacement Equipment and Chemical Supplies;
7. Property Protection; and
8. Water Sampling and Monitoring.

If you already have an ERP in place and just need to revise it, use the following sections to check if you are missing any key information. If you are just beginning to develop your ERP, use the following sections as a general template for what should be included in your ERP. Use the following sections to develop or revise your ERP according to your needs.

A. System Specific Information (Element 1)

Why do I need to keep system-specific information on hand?

During a major event, you need to have basic technical information readily available for your personnel, first responders, repair contractors/vendors, the media, and others. The information needs to be clearly documented and readily accessible so your staff can find and distribute it quickly to those who may be involved in responding to the major event. The location of critical documents, such as distribution maps, detailed plan drawings, site plans, source water locations, and operations manuals, should be identified and readily available during a major event. You should have located and reviewed much of this information while conducting your VA, so the ERP should only need to identify it.

What basic information do I need to have?

Basic information that may be presented in an ERP includes:

1. Public Water System (PWS) ID, Owner, Administrative Contact Person, Alternate Administrative Contact Person;
2. Population Served and Service Connections;
3. Distribution Map;
4. Pressure Boundary Map;
5. Overall Process Flow Diagrams;
6. Site Plans and Facility "As-Built" Engineering Drawings
   a) Pumping and Storage Facilities
   b) Reservoirs and Retention Facilities
   c) Water Treatment Facilities
   d) Booster Pump Stations
   e) Pressure-Regulating Valve (PRV) Sites
   f) Distribution System Process and Instrumentation Diagrams (P&ID)
   g) Equipment and Operations Specifications
   h) Emergency Power and Light Generation
   i) Maintenance Supplies
7. Operating Procedures and System Descriptions including back-up systems and interconnections with other systems;
8. Supervisory Control and Data Acquisition (SCADA) System/Process Control Systems Operations;
9. Communications System Operation;
10. Site Staffing Rosters and Employees' Duties and Responsibilities; and
11. Chemical Handling and/or Storage Facilities and Release Impact Analyses (i.e., chemical releases into air or water).

It is important to note that not all of this technical information may be needed to document how you operate. The level of technical documentation should reflect the complexity of your CWS.

B. CWS Roles and Responsibilities (Element 2)

What roles and responsibilities do I need to define?

You should designate an Emergency Response Lead (ER Lead) and Alternate ER Lead. The ER Lead will be the main point of contact and decision-maker during a major event. This person will have responsibility for evaluating incoming information, managing resources and staff, and deciding on appropriate response actions. This person will also have the responsibility of coordinating emergency response efforts with first responders. The ER Lead should be heavily involved in forming the partnerships described in Section I, "Before You Begin Developing or Revising Your ERP."

You should also identify an Alternate ER Lead who would step in should the ER Lead be unavailable. The ER Lead and the Alternate ER Lead need to be reachable 24 hours a day, seven days a week. A clear chain of command, or command structure, should also be established so that personnel and staff know their individual roles and responsibilities. If you have the resources and staff, you may consider forming an ER team that uses a well-defined command structure. At a minimum, your ERP should include the following basic information:

Name of ER Lead		Name of Alternate ER Lead	
Work Telephone No.		Work Telephone No.	
Home Telephone No.		Home Telephone No.	
Cell Phone No.		Cell Phone No.	
Pager No.		Pager No.	
Radio Call No.		Radio Call No.	

I saw a reference to a Water Utility Emergency Response Manager (WUERM) in another USEPA document. What is a WUERM?

A WUERM is basically your ER Lead. An ER Lead can have a variety of titles but the basic role and responsibility of the ER Lead does not change. Do not get confused or bogged down with titles and terminology. The main contact person and decision-maker during a major event is the ER Lead, regardless of job title.

What is an Incident Command System (ICS)? Do I need to have ICS?

Briefly, ICS is the model tool for command, control, and coordination of an emergency response and provides a means to coordinate the efforts of first responders as they work toward the common goal of stabilizing a major event and protecting life, property, and the environment. ICS uses a well-defined command structure in order to specify roles and responsibilities in responding to a major event. In ICS, the main contact person and decision-maker is the Incident Commander. At the CWS level, the ER Lead has the role of Incident Commander, unless the incident is of such significance that local, State, or Federal officials take over the command. You could use ICS to help organize yourself and your ER team, whether the team consists of staff from your CWS or other emergency responders. You do not need to have a complex command structure in place, but one that reflects your capabilities and also works effectively.

First responders may use ICS when responding to a major event. Your State may also have adopted ICS to respond to major events, and you may be required to abide by this command structure. If you are not required to use ICS, you should be familiar with ICS terms and command structure at a minimum. Other first responders may take over the role and responsibilities of Incident Commander in the latter stages of a major event, and you should know how this affects your role and responsibilities. You (or more appropriately the ER Lead) should address roles, responsibilities, and the command structure when forming the partnerships described in Section I, "Before You Begin Developing or Revising Your ERP."

More information on ICS can be obtained from FEMA at http://training.fema.gov/EMIWeb/IS/is195.asp. Federal departments and agencies use an ICS under the National Incident Management System (NIMS)(http://www.dhs.gov/dhspublic/interweb/assetlibrary/NIMS-90-web.pdf).

C. Communication Procedures: Who, What, and When (Element 3)

What communication procedures do I need to have in place?

Appropriate and timely communication is essential during an emergency. The ERP should identify clear communication channels for CWS staff and personnel, external non-CWS entities, and the public/media. As part of your ERP, you should maintain internal and external notification lists that contain information on all appropriate entities to be contacted, including their names, titles, mailing addresses, e-mail addresses, all applicable land line and cellular phone numbers, and pager numbers. These lists should

be updated as necessary. In a major event (e.g., a terrorist attack), it may not be possible to use normal channels of communication. Provisions need to be made for an efficient and fail-safe form of communication to be available during conditions when the use of normal means may not be possible. Communication procedures with the public and media may already be part of your day-to-day operations, but these procedures need special attention during a major event in order to provide the public and media with timely, accurate, and complete information.

1. Internal Notification List

Who should be on my internal notification list?

The ER Lead and the Alternate ER Lead should be the first persons notified, because responding to a major event is their primary responsibility. If you have an ER team, then team members should be notified as well. Your ER team should consist of essential CWS personnel to be notified during an emergency. You should notify CWS management. Your internal notification list also should clearly identify all appropriate staff and personnel to be notified. Internal notification lists should include the name of the employee, work and home telephone numbers, and any other numbers at which the employee can be reached, such as cell phone, pager, or radio phone.

2. External Non-CWS Notification List

Who should be on my external non-CWS notification list?

Your external non-CWS notification list should ensure that all appropriate first responders and affected customers or critical users are notified. Procedures should also be established as to who should be notified, when they should be notified, and who is responsible to make the notifications from your CWS.

Below is a short list of possible first responders. These organizations are not listed in any particular order of preference.

- Local
  - Local 911
  - Police
  - Fire
  - Local Emergency Planning Committee (LEPC)
  - Elected Officials
  - Power Utility
  - Hazardous Materials (HAZMAT) personnel
- State
  - Drinking Water Primacy Agency
  - Department of Health
  - State 24-hr Emergency Communications Center Telephone
  - State Office of Homeland Security
  - HAZMAT
  - State Police
- Federal
  - FBI
  - EPA Headquarters and Regional Office
  - Department of Homeland Security (DHS)
  - Department of Health and Human Services (HHS)
  - National Response Center (800-424-8802, http://www.nrc.uscg.mil/)
- Other
  - Water Information Sharing & Analysis Center (http://www.waterisac.org/)

When you are identifying the list of groups to be notified during a major event, critical users (e.g., hospitals) and commercial and industrial customers such as those that incorporate water into their product (e.g., bottling and canning companies), should also be considered. You should maintain a list of critical users as part of your ERP. Some of these users should be given priority notification due to their public health mission and because they may serve customers considered "sensitive sub-populations" (e.g., senior residential housing, child care centers, medical facilities). Specific notification procedures should be developed for these groups.

3. Public/Media Notification: When and How to Communicate

What special items or issues do I need to consider when communicating with the public and media?

Effective public and media communications is a key element of your ERP. You should designate in advance who the CWS spokesperson will be during a major event. The spokesperson should be someone who is knowledgeable and credible, has good communication skills, and, if possible, is not a key person needed for implementing ERP response actions during the major event. In communicating with the media, the lead spokesperson may be someone external to the CWS if another organization has taken over the role of lead agency or Incident Commander (e.g., a representative from the health department or the State Drinking Water Primacy Agency). You should consider having both field and office staff respectfully defer questions to the designated spokesperson.

You can plan now for public and media notification needs by developing a communication plan or strategy for the spokesperson to follow. The communication plan or strategy should be a set of general guidelines for the spokesperson to follow in order to craft clear and concise messages for the public and to also deal with the media. The communication plan or strategy should be targeted to reach several audiences, such as your customers (both residential and business), local health professionals, and others. You can draft press releases and public water restriction notices in advance. The key to remember is that your message should be clear, accurate, and easily understood by your audience. Appendix A presents additional guidance on recommended communications plans or strategies.

D. Personnel Safety (Element 4)

Why do I need to address personnel safety in my ERP?

Protecting the health and safety of everyone in your CWS as well as the surrounding community is a key priority during an emergency. During an emergency, personnel may be at risk of harm, injury, or even death. This section of your ERP should provide direction personnel on how to safely implement a variety of response actions.

What procedures should the plan describe to provide for personnel safety?

When considering personnel safety the following factors should be taken into account:

- ***Evacuation Planning***: Develop a CWS evacuation policy and procedures.
- ***Evacuation Routes and Exits***: Designate primary and secondary evacuation routes and ensure that they are clearly marked, well lit, unobstructed at all times, and unlikely to expose evacuating personnel to additional hazards.

- ***Assembly Areas and Accountability***: Obtaining an accurate account of personnel requires planning and practice. Designate assembly areas where personnel should gather after an evacuation and specify procedures for taking a head count and identifying personnel.

- ***Shelter***: In some major events, the best means of protection is to take shelter (also known as shelter in place) either within the CWS or away from the CWS in another building.

- ***Training and Information***: Train staff and personnel in evacuation, shelter, and other safety procedures.

- ***Emergency Equipment***: Consider developing written procedures for using and maintaining your emergency response equipment. This should apply to any emergency equipment relevant to a response involving a toxic chemical, including all detection and monitoring equipment, alarms and communications systems, and Personal Protective Equipment (PPE) not used as part of normal operations.

- ***First Aid***: Discuss proper first aid and emergency medical treatment for employees and others who are onsite at the CWS. This should include standard safety precautions for victims as well as more detailed information for medical professionals. Indicate also who is likely to be responsible for providing the appropriate treatment (i.e., an employee with specialized training or a medical professional).

Are there other sources of information that can help me with developing personnel safety procedures?

You should focus on standard Occupational Safety and Health Administration (OSHA), Spill Prevention Control and Countermeasures (SPCC), Risk Management Program (RMP), and State procedures to define your own personnel safety procedures. Your staff should understand when to evacuate, when and how to use PPE, and how to rapidly locate additional safety information, such as chemical-specific Material Safety Data Sheets (MSDS). You also could consult with other utilities and water organizations.

E. Identification of Alternate Water Sources (Element 5)

What should I consider when identifying alternate water sources in my ERP?

You should consider the amount of water needed to address short-term (hours to days) and long-term (weeks to months) outages. As part of your ERP, you should identify the alternate water supplies available to you during both types of outages. To do this, you need to have a comprehensive understanding of your current water supply, your water distribution system, and your water system demand requirements. You should clearly understand the location and capabilities of other regional CWS, including available excess capacity and ease of connection to your distribution system. In addition, you should also understand the interconnection agreements your partners have in place and potential issues that could arise if multiple CWS are affected. These are important issues that should be addressed when you are forming the partnerships described in Section I, "Before You Begin Developing or Revising Your ERP."

What should I consider for short-term outages?

Short-term outages might be due to contamination or electrical power outages. If your CWS has been contaminated, a public health notification such as "boil water," "do not drink," or "do not use," may be issued by the drinking water primacy agency. If a "boil water" notice is issued, no alternative water source is needed. If a "do not drink" order is issued, then the suspect water can still be used for other

activities that do not involve ingestion of the water. In this situation, it will only be necessary to provide an alternate drinking water supply for consumption and related activities such as food preparation.

A "do not use" order is much more restrictive. You will need sufficient alternate water sources to supply water for consumption, hygiene, and emergency needs. A "do not use" notice may also have implications with respect to water used for firefighting. Although a prohibition on use of water for firefighting is likely to occur only if the water is contaminated with certain substances, an alternate source of firefighting water, such as a pond, river, or stream, may be necessary in this event.

As part of your ERP, you should consider the potential effects of a power outage. Your utility could be without power due to a major event, and it may take several days for power to be restored. Your plan should include contingencies for back up power generation and alternative power sources.

As part of your ERP, you also should identify agencies or private companies that could provide water supplies (bottled or bulk) in the event of a major event and establish mutual aid agreements with surrounding communities, industries, contractors and related utilities as appropriate. Your source list should be maintained to include accurate information on points of contacts for the alternate sources. Possible short-term alternate water supply options include (but are not limited to) the following:

- Bottled water provided by outside sources;
- Bottled water provided by local retailers;
- Bulk water provided by certified water haulers;
- Bulk water transported or provided by military assets (i.e., National Guard or U.S. Army Corps of Engineers (USACE));
- Bulk water provided by neighboring water utilities by truck or via pipeline;
- Bulk water from hospitals, universities, and local industry that maintain backup water supplies for consumption;
- Interconnections with nearby public water systems;
- Water treated by plant and hauled to distribution centers (i.e., in the case of water distribution system contamination);
- Water pumped from surface water sources, treated at the plant or nearby plants, and hauled to distribution centers;
- Water for firefighting from Federal agencies such as the USACE and FEMA; and
- Water from unaffected wells owned by local citizens and businesses.

Additional equipment may be available from:

- Local businesses such as dairies, well drillers, irrigation supply firms, or distributors that may have tank trucks that can be made suitable for carrying water, chlorinators or generators that can be used for emergency disinfection, and pipe that can be used to extend water supply lines.
- Other water utilities in the area that may have spare parts (such as valves, pumps, and pipe) available for use in an emergency.
- FEMA, USACE, and the U.S. Forest Service that may be able to provide firefighting equipment.

You may also want to plan for water conservation measures to be used if a major event causes a reduction in service or a "do not use" notice is issued. For example, if a major event causes a reduction in service, you could limit water use by advising customers not to do laundry, run the dishwater, or water the garden and to limit the duration of showers. To plan for a "do not use" notice, you could advise consumers to maintain an emergency supply of water, such as keeping a certain amount of bottled water in their homes.

What should I consider for long-term water outages?

If your CWS will need extensive cleaning, or if portions of the system have been destroyed, you will need a long-term alternate water supply. The following are examples of possible long-term water supply options:

- Connection of the water distribution system to an existing municipal or private water supply (assumes existing water treatment plant and distribution system is intact and useable);
- Connection of the water distribution system with a new uncontaminated groundwater or surface water source (assumes existing water treatment plant and distribution system is intact and useable);
- Development of new water distribution system (assumes existing water treatment plant and source water is uncontaminated and useable); and
- Development of oversized community storage facilities to compensate for loss of existing system capacity.

F. Replacement Equipment and Chemical Supplies (Element 6)

What pieces of equipment and chemical supplies do I need to identify in my ERP?

Your ERP should identify equipment that can significantly lessen the impact of a major event on public health and protect the safety and supply of drinking water. You should maintain an updated inventory of:

- Current equipment (e.g., pumps);
- Repair parts;
- Chemical supplies for normal maintenance and operations; and
- Information on mutual aid agreements.

Based on the findings of your VA, you should identify how and where to find the equipment, repair parts, and chemicals that you would need to respond adequately to a particular vulnerability. You should consider establishing mutual aid agreements with other CWS to address any deficiencies. These agreements should identify the equipment, parts, and chemicals available to you under the agreement.

G. Property Protection (Element 7)

Why do I need to address property protection in my ERP?

Protecting CWS facilities, equipment and vital records is essential to restoring operations once a major event has occurred. Your ERP should identify measures and procedures that are aimed at securing and protecting your CWS following a major event. Items that should be considered include:

- "Lock down" procedures;
- Access control procedures;
- Establishing a security perimeter following a major event;
- Evidence protection measures for law enforcement (should the major event also be declared a crime scene);
- Securing buildings against forced entry; and
- Other property protection procedures and measures.

H. Water Sampling and Monitoring (Element 8)

What water sampling and monitoring issues do I need to address in my ERP?

Water sampling and monitoring should be an integral part of your ERP and not an afterthought. How else can you determine whether the drinking water that you supply is safe for public consumption and use? During the stage of forming partnerships described in Section I, "Before You Begin Developing or Revising Your ERP," you should consult with your State Drinking Water Primacy Agency on the issues of water sampling and monitoring. In your ERP you will need to identify and address special water sampling and monitoring issues that may arise during and after a major event. Some water sampling and monitoring issues to consider include:

- Identifying proper sampling procedures for different types of contaminants;
- Obtaining sample containers;
- Determining the quantity of required samples;
- Identifying who is responsible for taking samples;
- Identifying who is responsible for transporting samples (in time sensitive situations);
- Confirming laboratory capabilities and certifications; and
- Interpreting monitoring or laboratory results.

For a more detailed discussion on water sampling and monitoring issues, please see USEPA's Response Protocol Tool Box Module 3, "Site Characterization and Sampling Guide" (EPA-817-D-03-003) at http://www.epa.gov/safewater/security/pdfs/guide_response_module3.pdf and Module 4, "Analytical Guide" (EPA-817-D-03-004) at http://www.epa.gov/safewater/security/pdfs/guide_response_module4.pdf

III. Putting Your ERP Together and ERP Activation

A. Putting All Your Core ERP Elements Into a Single Comprehensive Plan

I have addressed all my core ERP elements. What do I do next?

You now want to organize and document all the information that you gathered or produced while addressing your core ERP elements. Your goal is to produce a single comprehensive ERP document that is accessible to appropriate personnel, and that can be updated or modified as the need arises. Your ERP document may be organized into:

- Overall ERP polices;
- General ERP procedures;
- Any mutual aid agreements;
- Reference documents; and
- Action Plans (see Section IV, "Action Plans," for more details).

How you ultimately organize and document your ERP is up to you and can depend on whether you are developing an ERP from scratch, or are revising an existing ERP. Other Federal and State requirements may also influence how you organize and document your ERP. The Bioterrorism Act requires that you maintain a copy of your ERP for five years after you have sent your ERP certification to USEPA (see also Section V, "Next Steps"). A secure copy of your ERP should also be maintained in an off-premises location in the event that your copy cannot be accessed.

B. ERP Activation

What is "ERP Activation" and why is it important?

Knowing when to activate or set your ERP in motion is as important as having a prepared and documented ERP. In the past, emergency response mostly dealt with emergencies such as natural disasters and accidents. The definition of a "major event" in this guidance includes a major disaster or other emergency as well as a terrorist attack. Being prepared to respond to a terrorist attack requires special attention. This section discusses ways in which you may learn about a threat, the threat decision process, and activation of your ERP.

What things should I pay special attention to before activating my ERP?

You should pay attention to any "threat warning." The Homeland Security Advisory System shown in **Figure III-1** contains five threat condition levels. Low Condition (Green) is declared when there is a low risk of terrorist attacks. Guarded Condition (Blue) is declared when there is a general risk of terrorist attacks. Elevated Condition (Yellow) is declared when there is a significant risk of terrorist attacks. High Condition (Orange) is declared when there is a high risk of terrorist attacks. Finally, Severe Condition (Red) reflects a severe risk of terrorist attacks. EPA has issued supplemental guidance for water utilities to increase security based on threat conditions described by the five-tiered Homeland Security Advisory System (see Appendix B).

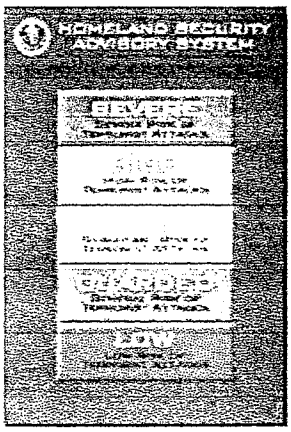


Figure III-1. Threat Condition Levels

A "threat warning" is an occurrence or discovery that indicates a threat of a malevolent act and triggers an evaluation of the threat. These warnings should be evaluated in the context of typical CWS activity and previous experience in order to avoid false alarms. The threat warnings presented in **Figure III-2** and described below are intended to be inclusive of those most likely to be encountered, but this listing is by no means comprehensive of all possibilities.



Figure III-2. Summary of Potential Threat Warnings

- ***Security Breach***. Physical security breaches caused by lax operations such as unsecured doors or criminal acts such as trespassing are probably the most common threat warnings.

- ***Witness Account***. You or your neighbors may see suspicious activity, such as trespassing, breaking and entering, and other types of tampering.

- ***Notification by Perpetrator***. A threat may be made directly to you, either verbally or in writing. Historical incidents indicate that verbal threats made over the phone are more common than written threats.

- ***Notification by Law Enforcement***. You may receive notification about a threat directly from law enforcement, whether it is county, local, State, or Federal. Such a threat could be a result of a report of suspicious activity or through information gathered by law enforcement.

- ***Notification by News Media***. A threat might be delivered to the news media, or the media may discover a threat. A conscientious reporter would immediately report such a threat to the law enforcement and either the reporter or law enforcement would immediately contact the CWS.

- ***Unusual Water Quality***. You should investigate possible causes of unusual water quality (i.e., changes from baseline). You want to rule out unusual results that can be explained or those that are due to known causes.

- ***Consumer Complaint***. An unexplained or unusually high incidence of consumer complaints about the aesthetic qualities of drinking water may indicate a potential threat. Many chemicals can impart a strong odor or taste to water, and some may discolor the water.

- ***Public Health Notification***. The first indication that a water-related incident has occurred may involve victims showing up in local emergency rooms and health clinics. An incident triggered by a public health notification is unique in that at least a segment of the population has been exposed to a harmful substance.

What do I do once I discover a threat warning?

Once a threat warning is received, the threat decision (or threat evaluation) process begins. The ER Lead or Alternate ER Lead should be notified immediately because they will be involved in this decision process and make decisions about who else (e.g., other emergency responders) should be involved. The threat decision process is considered in three successive stages: 'possible', 'credible', and 'confirmed'. As the situation escalates through these three stages, the actions that might be considered also change. The following describes the stages, actions that might be considered, and activation of your ERP.

- **Stage 1: "Is the threat 'possible'?"** If you are faced with a threat, you should evaluate the available information to determine whether or not the threat is possible (i.e., could something have actually happened?). If the threat is possible, immediate operational response actions might be implemented. Knowing the findings from your VA could help you determine whether a certain threat is possible or not.

- **Stage 2: "Is the threat 'credible'?"** There must be information to corroborate the threat in order for it to be considered credible. For example, your information source may be highly credible, hospitals may be reporting a potential incident, or your may have monitoring results that are unusual. At this stage, you may activate additional portions of your ERP, such as initiating internal and external notifications, conducting water sampling and analysis, or issuing public health advisories. At this stage, you're not sure whether a major event has occurred but are preparing to respond should the threat actually lead to a major event.

- **Stage 3: "Has the incident been 'confirmed'?"** Confirmation implies that definitive evidence and information has been collected to establish that an incident has occurred. Confirmation of an incident may be obvious, such as structural damage to a CWS; in such a case, Stages 1 and 2 would be omitted. Upon confirmation of the incident, you should fully implement your ERP. Your ERP should contain Action Plans (see Section IV) that address specific major events, and these Action Plans should be implemented immediately.

The application of this threat decision process will vary significantly with the circumstances. The ER Lead should work through the threat decision process and implement the ERP as needed. In summary, judgment must be exercised when determining how to appropriately manage a specific threat or incident.

IV. Action Plans

What are Action Plans?

Action Plans (APs), also known as Response Guidelines, are tailored ERPs that address specific major events. APs describe response actions to take for events that you think might occur at your facility based on the specific vulnerabilities identified in your VA.

An AP should provide a quick approach for responding to a specific major event and it complements actions already initiated under the ERP. You may only need one to two pages to cover specific response information since you have already addressed basic emergency response steps in the core elements of your ERP. An AP should be an accessible (i.e., "rip and run") document that can be detached and taken to the field by the ER Lead or Alternate ER Lead. An AP should include the following basic information:

- Any special notification requirements;
- Special response steps to be taken upon ERP activation; and
- Recovery actions to bring the CWS back into operation.

A. Response to Vulnerability Assessment Findings

How do I go about developing Action Plans for my VA findings?

The Bioterrorism Act requires that prepared or revised ERPs incorporate the results of completed VAs. During the VA process, you should have determined your high priority vulnerabilities. An Action Plan defines the specific actions you would take to respond to events where your high priority vulnerabilities have been compromised. In addition, we recommend that you develop APs for certain high consequence events regardless of whether these are among your high-priority vulnerabilities. Events and threats of events that should be considered in APs include the following:

- Contamination of the Drinking Water;
- Structural Damage/Physical Attack;
- SCADA, Computer, or Cyber Attack; and
- Intentional Hazardous Chemical Release (e.g., release of chlorine or ammonia from storage).

Even if your VA did not identify any vulnerabilities, you are encouraged to consider contingency planning for the possibility of these events.

Example Action Plans for the four intentional events listed above are included in Appendix C. Each AP goes through the threat decision process described in Section III.B, "ERP Activation." It should be noted

that these simplified examples are for discussion purposes only and that you should develop "Action Plans" specific to the needs of your water system and surrounding community. You also could consult EPA's Response Protocol Toolbox, http://www.epa.gov/safewater/security/index.html#emergency, as an aid in developing APs for contamination events.

So, what about all of the sensitive information in my Action Plans referring to my vulnerabilities?

APs should be easily accessible to authorized personnel and should be easily identifiable during a major event. However, you may want to limit access to APs containing sensitive information and specifics related to intentional events. Again, steps taken to limit such access should consider local and state Freedom of Information Act (FOIA) laws. Alternatively, you can opt to make your APs general in nature so that everyone can use them and place sensitive information in the ERP appendices, or in sections that are not readily available to unauthorized personnel.

B. Natural Disasters and Other Significant Events

How should my ERP deal with natural disasters and other emergencies?

If you already have an ERP in place to address other major events, you may want to tailor response actions in light of discussions in this section. You may wish to develop individual Action Plans for other major events that are not terrorist-related. A similar approach to that described above could be used to plan for natural disasters and other significant events. Natural disasters and other significant events include:

- Fire;
- Flood;
- Hurricane and/or Tornado;
- Severe Weather (snow, ice, temperature, lightning, drought);
- Earthquake;
- Electrical Power Outage;
- Mechanical Failure;
- Water Supply Interruption;
- Contaminated Water Treatment Chemicals;
- Accidental Hazardous Chemical Spill/Release;
- Construction Accidents;
- Personnel Problems (Loss of operator, medical emergencies);
- Vandalism; and
- Unintentional Contamination of the Water Supply (e.g., waterborne disease outbreak, accidental cross connections, etc.).

V. Next Steps

What do I do once my ERP is completed or revised?

Once you prepare or revise your ERP, you are required under the Bioterrorism Act to submit a written certification stating that the plan has been completed by a certain deadline date. (Do not submit a copy of the ERP to EPA.) USEPA has produced a separate document that addresses ERP certification submittal entitled *Instructions to Assist Community Water Systems in Complying with The Public Health Security and Bioterrorism Preparedness and Response Act, Title IV.* Please consult this document to answer your specific questions about submittal procedures and deadline dates. This document can be

found at http://www.epa.gov/safewater/security/community.html. A copy of the ERP certification is presented at the end of this section.

Additionally, as required under Section 1433(c) of the Bioterrorism Act you must maintain a copy of your ERP for five (5) years after you submit your ERP certification to USEPA.

Where do I send my signed ERP Certification?

We recommend that you submit the ERP certification using an express or courier service such as Federal Express, United Parcel Service, Airborne, etc., which provides tracking and certification of delivery. Using one of these services will ensure that the submission is delivered directly to the persons authorized to receive and process these items.

Use the following address for express or courier service deliveries to USEPA. This location is open for deliveries between 8:30am and 4:30pm Eastern Time. Call the number under the address below before attempting delivery outside of those hours.

U.S. Environmental Protection Agency
Water Resource Center (WSD-RAR)
Room 1119 EPA West Building
1301 Constitution Ave., NW
Washington DC 20004

Couriers are to use phone number 202-566-1729.

As stated above, more detailed guidance on preparing and submitting the ERP certification can be found at http://www.epa.gov/safewater/security/community.html.

What additional State requirements must I meet?

Depending on your State, you may be required to provide a copy of your ERP to State authorities or certify that you have completed or revised your ERP. You should coordinate with your State Drinking Water Primacy Agency to determine what requirements apply to your CWS.

When should I update my ERP?

It is important to note that an ERP is a "living" document that you should update periodically (i.e., at least annually or if there is a major change to your CWS configuration). The ER Lead and appropriate CWS management staff should approve the ERP and identify the time period for routinely updating the ERP (e.g., annually). Updates should occur if there are changes in CWS staff, internal and external contacts, roles and responsibilities of anyone involved in response, or there are changes made in infrastructure.

If you update your ERP, you are not required to resubmit a written ERP certification to the USEPA.

What type of training is appropriate?

You should make sure that your staff is trained on their ERP responsibilities. Training can include briefing sessions, classroom sessions, or mock exercises. You should also remember to do "refresher" training on a regular basis. Training should include testing of the ERP. Drills and exercises that challenge the information in the ERP should be conducted at least annually. There are many sources (State, Federal, and industry specific) that describe what should be included in emergency training. These typically include the following four types of training:

- **Orientation Sessions**: Orientation sessions work well for basic instruction and explaining ERP procedures. Written tests may be employed to ensure some level of comprehension by the attendees.

- **Table-Top Workshop**: Table-top workshops involve developing scenarios that describe potential problems and provides certain information necessary to address the problems. The idea is to present staff and emergency response officials with a fabricated event, have them verbally respond to a series of questions, and then evaluate whether the responses match what is written in the ERP.

- **Functional Exercises**: The Functional Exercise is considered the most effective training tool, next to a real emergency, because a team of simulators is trained to develop a realistic major event. By using a series of pre-scripted messages, the simulation team sends information in to personnel assigned to carry out the ERP procedures. Both the simulators and personnel responding to the simulation are focused on carrying out the procedures to test the validity of the ERP.

- **Full Scale Drills**: These are the most costly and time-consuming training programs but can be extremely effective. In a full-scale drill, emergency response personnel and equipment are mobilized to a scene, an emergency scenario is presented, and they respond as directed by the ERP.

The bottom line is that time, resources, and personnel need to be dedicated to accomplishing the training. Use the training to identify lessons learned, debrief staff of lessons learned to enhance future response and recovery efforts, and update plans to incorporate lessons learned.

Reproduction of ERP Certification

CERTIFICATION OF COMPLETION
OF AN EMERGENCY RESPONSE PLAN

Public Water System ID number:_____

System Name:_____

City where system is located:_____

State :_____

Printed Name of Person Authorized to Sign this Certification on Behalf of the System:_____

Title:_____

Address :_____

City:_____

State and ZIP Code:_____

Phone:_____ **Fax:**_____ **Email:**_____

I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has completed an Emergency Response Plan that complies with Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188,Title IV — Drinking Water Security and Safety).

I further certify that this document was prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C.300f *et seq.*)).

The emergency response plan that this community water system completed incorporates the results of the vulnerability assessment completed for the system and includes "plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack " on this community water system. The emergency response plan also includes "actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals."

This CWS has coordinated, to the extent possible, with existing Local Emergency Planning Committees established under the Emergency Planning and Community Right-to-Know Act (42 U.S.C.11001 et seq) when preparing this emergency response plan.

Signed:_____ **Date:**_____

Primary contact person that EPA can call if there are questions about this Certification:

Name:_____

Address (if different than that
of the Authorized Representative):_____
_____

Phone:_____

Email Address:_____

Alternate Contact Person:

Name:_____

Address (if different than that
of the Authorized Representative): _____
_____

Phone:_____

Email Address:_____

References and Links

The following is a list of references and Internet links that may be useful to you in preparing your Emergency Response Plan.

Department of Homeland Security (DHS): DHS is the overall lead agency for homeland security issues. DHS will become involved in incident response if needed. General information about DHS is available at http://www.dhs.gov/dhspublic. DHS administers the National Incident Management System (NIMS), which provides a nationwide template to enable Federal, State, local, and tribal governments and private-sector and nongovernmental organizations to work together to prepare for, prevent, respond to, and recover from domestic incidents, including terrorism. Information on the NIMS can be found at http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf.

Environmental Protection Agency: EPA has numerous resources available in addition to this guidance. The following are key sources:

- Water Infrastructure Security information, guidance, and training information can be found at http://www.epa.gov/safewater/security/index.html.
- More information on Local Emergency Planning Committees (LEPCs) can be found at http://www.epa.gov/ceppo/lepclist.htm.

The Center for Disease Control and Prevention (CDC): The CDC develops resources to assist hospital staff, clinics, and physicians in diagnosing diseases related to terrorism, reporting incidences of disease, and controlling the spread of infection. Information on emergency preparedness and response can be found at http://www.bt.cdc.gov.

- To assist in the development of a Public Health Response Plan, the CDC published a planning document entitled *The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials (July 2001)*, which can be found at http://www.bt.cdc.gov/Documents/Planning/PlanningGuidance.pdf.
- *Interim Recommended Notification Procedures for Local and State Public Health Department Leaders in the Event of a Bioterrorist Incident* can be found at http://www.bt.cdc.gov/LocalPlanning/Protocols.asp.

Federal Emergency Management Agency (FEMA): On March 1, 2003, FEMA became part of the U.S. Department of Homeland Security. FEMA's mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery. General information can be found at http://www.fema.gov. In addition, several online training courses relevant to emergency management are available on-line from FEMA at http://training.fema.gov/EMIWeb/IS/crslist.asp.

The American Water Works Association (AWWA): EPA training developed through partnership with AWWA covers security issues including assessing vulnerabilities, emergency response plans and risk communication. AWWA information can be accessed at their website, http://www.awwa.org. Specific AWWA resources can be found at http://www.awwa.org/communications/offer/secureresources.cfm.

The Association of State Drinking Water Administrators (ASDWA): ASDWA has information on water security planning, training, and links to State programs and other information sources. Go to the security link at http://www.asdwa.org.

National Rural Water Association (NRWA): NRWA developed the "Security and Emergency Management System" (SEMS) Software Program, which can be loaded on a personal computer. It is based on NRWA/ASDWA's *Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems Serving Populations Between 3,300 and 10,000*. You can find more information at http://www.nrwa.org.

Glossary

Definitions in this glossary are specific to the Emergency Response Plan Guidance but have been conformed to common usage as much as possible.

Action Plans: specific plans designed to be used during the response to a threat or incident. Action plans should be easy to use and contain forms, flow charts, and simple instructions to support staff in the field or decision officials during management of a crisis.

Bioterrorism Act: the Public Health Security and Bioterrorism Preparedness and Response Act of 2002.

Chain of Command: a clear and definitive structure of authority.

'Confirmed': a stage in the threat evaluation process in which there is definitive evidence and information to establish that an incident or major event has occurred.

'Credible': a stage in the threat evaluation process in which there is information to corroborate a threat.

Drinking Water Primacy Agency: the agency that has primary enforcement responsibility for national drinking water regulations, namely those promulgated under the Safe Drinking Water Act as amended. Drinking water primacy for a particular State may reside in one of a variety of agencies such as the State Health Agency, the State Environmental Agency, or the USEPA regional office.

Emergency Response (ER) Lead: the pre-designated main point of contact and decision-maker for a CWS during a major event.

Incident Command System: a standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.

Jurisdiction: the range or sphere of authority. Public agencies have jurisdiction at an incident related to their legal responsibilities and authority for incident mitigation. Jurisdictional authority at an incident can be political/geographic (e.g., city, county, State, or Federal boundary lines) or functional (e.g., police department, health department, etc.).

Local Emergency Planning Committee (LEPC): established by the Emergency Planning and Community Right-to-Know Act, LEPCs have the job of increasing community hazardous materials safety through public education, emergency planning, responder training, conducting exercises, and reviewing actual responses to releases.

Major Event: a domestic terrorist attack, major disaster, or other emergency (from Homeland Security Presidential Directive/HSPD-8) (http://www.whitehouse.gov/news/releases/2003/12/20031217-6.html)

Notification: the process of communicating information to interested parties.

Personal Protective Equipment (PPE): equipment and supplies designed to protect employees from serious injuries or illnesses resulting from contact with chemical, radiological, biological, or other hazards. PPE includes face shields, safety glasses, goggles, laboratory coats, gloves, and respirators.

'Possible': a stage in the threat evaluation process in which available information indicates there is an opportunity for an incident (i.e., the threat is possible).

Response Decisions: part of the threat management process in which decisions are made regarding appropriate response actions that consider 1) the conclusions of the threat evaluation, 2) the consequences of the suspected incident, and 3) the impacts of the response actions on drinking water customers and the utility.

Security Breach: an unauthorized intrusion into a secured facility that may be discovered through direct observation, an alarm trigger, or signs of intrusion (e.g., cut locks, open doors, cut fences). A security breach is a type of threat warning.

Spokesperson: the individual responsible for interfacing with the public and media or with other agencies requiring information directly from the incident. Under the ICS, there is only one spokesperson per incident.

Technical Assistance Provider: any organization or individual that provides assistance to drinking water utilities in meeting their mission to provide an adequate and safe supply of water to their customers.

Threat: an indication of possible violence, harm, or danger.

Threat Evaluation: part of the threat management process in which all available and relevant information about the threat is evaluated to determine if the threat is 'possible' or 'credible', or if an incident has been 'confirmed.' This is an iterative process in which the threat evaluation is revised as additional information becomes available. The conclusions from the threat evaluation are considered when making response decisions.

Threat Warning: an occurrence or discovery that indicates a threat of a malevolent act and triggers an evaluation of the threat.

Vulnerability Assessment (VA): a systematic process for evaluating the susceptibility of critical facilities to potential threats and identifying corrective actions that can reduce or mitigate the risk of serious consequences associated with these threats.

Appendix A: Public Communications Strategy

Developing a Public Communications Strategy

Developing a public communications strategy will prepare you to effectively communicate with the public and media at the time of an emergency or crisis. As a CWS, you should remember that any public notification or communication will have an immediate and direct impact on your customers and consumers. Consumers may be instructed to boil water, limit their water uses to activities that do not involve consumption, or not use the water at all. A good public communications strategy will help you get your message out effectively and outline who needs to do what and when. Items that should be considered in a public communication strategy include:

- Designating a spokesperson and any alternate spokespersons (should the main spokesperson be unavailable);
- Organizing basic facts about the CWS and the situation the CWS is facing;
- Having a method in place to develop key messages to use with the media that are clear, brief, and accurate;
- Making sure the messages are carefully planned and have been coordinated with other appropriate officials and organizations;
- Making sure the messages are targeted to reach different audiences such as residential and business customers, local health professionals, etc.; and
- Having methods in place for delivering messages;
- Determining how to reach the largest number of customers and key stakeholders by selecting delivery methods that are likely to produce the best results. The reach and impact of the message and information will increase if the same message is distributed via different delivery methods more than one time.

While it may seem that developing a public communications strategy may be a lot of work and effort, you should already have experience with public and media communication through your compliance with the public notification requirements of the 1996 Safe Drinking Water Act (SDWA) amendments. In fact, many of the suggestions found in this appendix on developing and implementing a public communication strategy are excerpts from the "Public Notification Handbook" (EPA 816-R-00-010, 2000) (http://www.epa.gov/safewater/pws/pn/handbook.pdf). For example, the sample public notices shown on the following pages are taken from the handbook. Additionally, other publications and tools are available that can assist you in developing and implementing a public communications strategy not only in response to major events, but also in improving your public and media communications in general.

Making Public and Media Communications Work

Making public and media communications work involves implementing your public communications strategy effectively. This takes practice and a lot of work BEFORE any notice or communication is issued. Below are some tips and suggestions that would help make your public communications strategy work. Please note that these tips and suggestion are not all inclusive. Many are taken directly from USEPA's "Public Notification Handbook" (EPA 816-R-00-010, 2000).

Communication Tips and Suggestions:

- Any decision to issue a public notification should be made in consultation with your Drinking Water Primacy Agency. You also should make arrangements with your local health department and/or other appropriate organizations prior to a major event in order to establish clear lines of communication and ensure access to decision officials on a 24/7 basis.
- Typical press releases and notices should be ready beforehand to save hours of time and possibly prevent serious health problems for water users. In your press release or notice you should explain to the media what information you are trying to communicate and why. The most important

information, including a description of the situation, populations at risk, instructions to consumers, and potential health effects, should be near the beginning of any press release or notice. Be sure to include a contact name and telephone number so that the media can call you for more information.

- ❑ Remember to avoid technical or confusing language in your press releases and notices.
- ❑ When you send a press release or notice to the media, write "PRESS RELEASE FOR PUBLIC SAFETY" at the top to emphasize its importance.
- ❑ Work with the media ahead of time and develop an ongoing relationship. Explain to them what constitutes a major event and what your needs will be during a crisis. Hold an annual media day where you can explain how your CWS operates, including any improvements you may be implementing. The more informed the members of the media are about your CWS then the more accurate and effective they are helping get your message out to the public. The box below provides some general tips when directly working with the media.
- ❑ Establish contacts with institutions and people who can translate press release and notices into other languages for you and who can help you target non-English speaking populations.
- ❑ If you are going to provide bottled water, you should confirm ahead of time and periodically reconfirm that available bottled water supplies meet the Food and Drug Administration or State safety standards.
- ❑ Consider beforehand which communication delivery methods would work best, particularly during a major event. Delivery methods during a major event could include:

    - Broadcast media (radio and television);
    - Government access channels;
    - Web site (local government and others);
    - Listserve e-mail;
    - Newspaper;
    - Phone banks;
    - Broadcast phone messages ("reverse 911" messaging);
    - Broadcast faxes;
    - Posting in conspicuous locations;
    - Mass distribution through partners (e.g., churches, retailers, restaurants);
    - Hand delivery;
    - Door-to-door canvassing; and
    - Direct notification to critical users (e.g., schools, hospitals, nursing homes, prisons, etc.).

General Tips on Working with the Media

- Be truthful and up-front.
- Answer questions as well as you can, but don't be afraid to say that you need to check on something if there is a question you can't answer (once you find the information, quickly report back on what you've found).
- Keep in mind that reporters are not familiar with State or Federal requirements for safe drinking water – avoid technical jargon!
- Provide additional sources of information (for instance, referrals to State contacts).
- Be sensitive to the fact that reporters may be working on tight deadlines.
- Provide a list of the elements that should be addressed.
- Don't be upset if a newspaper article or news report isn't exactly as you would want it, but politely tell a reporter if a significant piece of information is wrong or missing.
- Don't be defensive when answering questions.

Example Boil Water Notice

WARNING

BOIL YOUR WATER BEFORE USING

[The Holly County Water System] water is contaminated with [fecal coliform/E. coli]

[Fecal coliform or E. coli] bacteria were found in the water supply on [November 5]. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

What should I do?

- DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for ten minutes, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and preparing food until further notice. Boiling kills bacteria and other organisms in the water.

- Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with organisms that can cause illness in humans. These organisms can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

- Organisms in drinking water are not the only cause of the symptoms above. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care providers.

What happened? What is being done?

The water distribution system was contaminated with fecal coliform. We are working with law enforcement and the public health department to investigate/resolve this issue. We are currently increasing the chlorination levels at the treatment plant as well as at the chlorine booster stations throughout the system. In addition, we are evaluating all available information and conducting tests to confirm the extent of the contamination of the system. We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within the next 48 hours.

For more information, please contact [Joseph Smith] at [555-555-6789]. General guidelines on ways to lessen the risk of infection by microbes are available from the EPA Safe Drinking Water Hotline at 1-800-426-4794 and [the Public Health Department Hotline at 1-800-123-4567].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

This notice is being sent to you by [Holly County Water System]. State Water System ID# [10001]. Date distributed: [November 6, 2003]

Example Do Not Drink Notice

WARNING

DO NOT DRINK THE WATER

[Cyanide] found in the [City of Rolling Brook] water supply on [October 10th]

Bottled water can be obtained at [Islington Station High School and Penn Road High School 24 hours per day].

What should I do?

- Do NOT drink the water.
- Symptoms associated with cyanide include dry mouth, itchy throat, headache, sweating, flushed skin, muscle rigidity, fever, confusion, lethargy, seizures, loss of consciousness, coma, and death.
- If you or someone you know exhibits any of these symptoms, immediately contact your health care provider. In addition, please notify the public health department at 1-800-123-4567.

What happened? What is being done?

On October 10th, the water distribution system was contaminated with cyanide. We are working with law enforcement and the public health department to investigate/resolve this issue. We have tested the water in various parts of the distribution system to verify the extent of the cyanide contamination. Based on these tests, we have isolated the portion of the system located north of Aspen Street and east of River Road. Everyone in this portion of the system **should not drink the water**. We have implemented additional security procedures to protect the system against further contamination. Additional information will be provided 24 hours/day on Channel 57- the local government television channel.

For more information, please contact [Joseph Smith] at [555-555-6789]. More information is also available from the EPA Safe Drinking Water Hotline at 1-800-426-4794 and [the Public Health Department Hotline at 1-800-123-4567].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

This notice is being sent to you by [City of Rolling Brook Water System]. State Water System ID#[50005]. Date distributed: [October 10, 2003]

Example Do Not Use Notice

WARNING

DO NOT USE THE WATER

[Lyonelle Water System] water is contaminated with [parathion]

Bottled water can be obtained at [Murray High School and Central High School 24 hours per day].

Parathion was found in the water supply on [November 14]. This chemical can make you sick and may result in death.

What should I do?

- DO NOT USE THE WATER. You should ***not*** use the water for drinking, making ice, brushing teeth, washing dishes, washing clothes, bathing, food preparation, or watering lawns. Bottled water should be used for all of the above necessities until further notice.

- Parathion is a chemical usually used to kill insects. It can cause constriction of the pupils, blurred vision, muscle and abdominal cramps, excessive salivation, sweating, nausea, vomiting, dizziness, headaches, convulsions, diarrhea, weakness, labored breathing, wheezing, and unconsciousness. Exposure can even lead to death.

- If you or someone you know exhibits any of these symptoms, immediately contact your health care provider. In addition, please notify the public health department at 1-800-123-4567.

What happened? What is being done?

The water distribution system was contaminated with parathion. We are working with law enforcement and the public health department to investigate/resolve this issue. We have tested the water in various parts of the distribution system to verify the extent of the parathion contamination. Based on these tests, we have isolated the portion of the system located north of Lincoln Avenue and east of Maple Road. Everyone in this portion of the system **should not use the water**. We have implemented additional security procedures to protect the system against further contamination. Additional information will be provided 24 hours/day on Channel 57- the local government television channel.

For more information, please contact [Joseph Smith] at [555-555-6789]. More information is also available from the EPA Safe Drinking Water Hotline at 1-800-426-4794 and [the Public Health Department Hotline at 1-800-321-4567].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

This notice is being sent to you by [Lyonelle Water System]. State Water System ID# [90008]. Date distributed: [November 14, 2003]

Appendix B: GUARDING AGAINST TERRORIST AND SECURITY THREATS

Suggested Measures for Drinking Water and Wastewater Utilities (Water Utilities)

EPA United States Environmental Protection Agency

Mid-Atlantic Region covering Delaware, Maryland, Pennsylvania, Virginia, West Virginia and the District of Columbia **April 2003**

GUARDING AGAINST TERRORIST AND SECURITY THREATS

Suggested Measures for Drinking Water and Wastewater Utilities (Water Utilities)

The Department of Homeland Security (DHS) established a five-tiered Homeland Security Advisory System to provide a national framework for notification about the nature and degree of terrorist threats. The system establishes a set of graduated levels that change in response to increases or decreases in terrorist threats. The threat levels are colored coded, beginning with green, and increasing in severity through blue, yellow, orange, and red. While the threat may not be specific to water utilities, the water sector, as one of the thirteen critical sectors identified by DHS, may consider themselves potential targets.

Why is EPA offering these suggestions?

Water utilities are in the forefront of ensuring that our nation's water systems are protected against terrorist threats. Many utilities have already developed safeguards. This document provides model guidelines for water utilities to increase security based on threat conditions described by the five-tiered Homeland Security Advisory System. Please note that the attached document is a guide; it is a not a requirement under any regulation or legislation.

This document provides suggested steps water utilities should consider implementing in the areas of detection, preparedness, prevention, and protection. The suggested measures are additive in that higher threat levels should also include those measures outlined in the document for lower threat levels. These suggestions are based on practices employed by various systems across the nation. The ability to implement them at the system level will vary. Note that these general recommendations should be adapted by the utility depending on the system size, status of emergency response planning at the utility, and identified system vulnerabilities. These suggestions should not be viewed as a complete source of information on protecting water utilities. Facility managers and utility security directors should consider the full range of resources available, as well as the specific nature of the threats, when responding to changes in threat condition levels.

Based on strong recommendations from the water sector, EPA is making this document available to water utilities and to the secure WaterISAC (www.waterisac.org). EPA is also providing this document to the state drinking water administrators. Some state homeland security and emergency response programs have issued suggestions to their critical infrastructures, including water. State drinking water administrators are encouraged to coordinate with state homeland security and emergency response programs and modify these suggested measures as appropriate to ensure consistency.

CONDITION	CONSIDER ADOPTING THESE MEASURES	
LOW (GREEN) Low Risk of Terrorist Attack Significant risk of terrorist attacks. Public should focus on ongoing facility assessments and the development, testing, and implementation of emergency plans. In addition to THREAT LEVEL GREEN, there are four higher threat levels: blue, yellow, orange, and red. (Please refer to the other fact sheets for information on suggested steps to be taken during other threat condition levels.)	Detection	▪ Monitor water quality at the source water, leaving the plant, and in distribution and storage systems. Establish baseline results. Review operational and analytical data to detect unusual variations. ▪ Follow-up on customer complaints concerning water quality and/or suspicious behavior on the facilities. ▪ Confirm communication protocol with public health officials concerning potential waterborne illnesses.
	Preparedness	▪ Post emergency evacuation plans in accessible, but secure, location near entrance for immediate access by law enforcement, fire response, and other first responders. ▪ Inventory spare parts and on-hand chemicals. Check if sufficient. ▪ Identify sensitive populations within the service area (e.g., hospitals, nursing homes, daycare centers, schools, etc.) for notification, as appropriate, in the event of a specific threat against the utility. ▪ Back-up critical files such as plans and drawings, as-builts, sampling results, billing, and other critical information. ▪ Conduct appropriate background investigations of staff, contractors, operators, and others with access to the facility. ▪ Prepare vulnerability assessments and revise to incorporate changes made (e.g., assets added/replaced or new countermeasures implemented). ▪ Ensure that employees understand appropriate emergency notification procedures.
	Prevention	▪ Train staff in safety procedures, such as handling hazardous materials and maintaining and using self-contained breathing apparatus. ▪ Secure equipment such as vehicles and spare parts. ▪ Monitor requests for potentially sensitive information.
	Protection	▪ Check all chemical deliveries for driver identification and verification of load. ▪ Maintain vigilance and be alert to suspicious activity. Inspect buildings in regular use for suspicious packages and evidence of unauthorized entry. Report any suspicious activity to appropriate authorities. ▪ Prosecute intruders, trespassers, and those detained for tampering to the fullest extent possible under applicable laws. ▪ Review request for tours and identify protocols for managing the tour. ▪ Implement controls for construction activities at critical sites. ▪ Maintain disinfectant residuals as required by regulations. ▪ Implement best management practices for optimizing drinking water treatment.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
GUARDED (BLUE) **General Risk of Terrorist Attacks** **Signifies a *guarded risk* of terrorist attacks. Protective measures should focus on activating employee and public information plans; exercising communication channels with response teams and local agencies; and reviewing and exercising emergency plans**	Detection	▪ Test security alarms and systems for reliability.
	Preparedness	▪ Reaffirm communication and coordination protocols (embedded in the utility's emergency response plan) with local authorities such as police and fire departments, HAZMAT teams, hospitals, and other first responders. ▪ Prepare and/or revise emergency response plans associated communication protocols. Include appropriate local officials concerned with law enforcement, emergency response and public health. ▪ On a regular basis post employee reminders about events that constitute security violations and ensure employees understand notification protocol in the event of a security breach. ▪ Prepare draft press releases, public notices and other communications for a variety of incidents. Route through appropriate channels of review to ensure pieces are clear and consistent.
	Prevention	▪ Secure buildings, rooms, and storage areas not in regular use. Maintain a list of secured areas or facilities and monitor activity in these areas.
	Protection	▪ Control access to mission critical facilities.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
ELEVATED (YELLOW) **Significant Risk of Terrorist Attack** Signifies an **elevated risk** of terrorist attacks. Protective measures should focus on increasing surveillance of critical facilities; coordinating response plans with allied utilities and response teams and local agencies; and implementing emergency plans, as appropriate.	Detection	▪ To the extent possible, increase the frequency and extent of monitoring activities and review results against baseline. ▪ Increase review of operational and analytical data (including customer complaints) with an eye toward detecting unusual variability (as an indicator of unexpected changes in the product). Variations due to natural or routine operational variability should be considered first. ▪ Increase surveillance activities in source and finished water areas.
	Preparedness	▪ Review and update emergency response procedures and communication protocols. ▪ Establish unannounced security spot checks (e.g., verification of personal identification and door security) at access control points for critical facilities. ▪ Increase frequency for posting employee reminders of the threat situation and about events that constitute security violations. ▪ Ensure employees understand notification protocol in the event of a security breach. ▪ Conduct security audit of physical security assets, such as fencing and lights, and repair or replace missing/broken assets. Remove debris from along fence-lines that could be stacked to facilitate scaling. ▪ Maximize physical control of all equipment and vehicles inoperable when not in-use, (e.g., lock steering wheels, secure keys, chain and padlock on front-end loaders, etc.). ▪ Review draft communications on potential incidents, brief media relations personnel of potential for press contact and/or issuance of release. ▪ Review and update list of sensitive populations within the service area, such as hospitals, nursing homes, daycare centers, schools, etc., for notification, as appropriate, in the event of a specific threat against the utility. ▪ Contact neighboring water utilities to review coordinated response plans and mutual aid during emergencies. ▪ Review whether critical replacement parts are available and accessible.
	Prevention	▪ Carefully review all facility tour requests before approving. If allowed, implement security measures to include list of names prior to tour, request identification of each attendee prior to tour, prohibit backpacks/duffle bags, cameras and identify parking restrictions. ▪ On a daily basis, inspect the interior and exterior of buildings in regular use for suspicious activity or packages, signs of tampering, or indications of unauthorized entry. ▪ Implement mailroom security procedures. Follow guidance provided by the United States Postal Service.
	Protection	▪ Verify the identity of all personnel entering the water utility. Mandate visible use of identification badges. Randomly check identification badges and cards of those on the premises. ▪ At the discretion of the facility manager or security director, remove all vehicles and objects (e.g., trash containers) located near mission critical facility security perimeters and other sensitive areas. ▪ Verify the security of critical information systems (e.g., Supervisory Control and Data Acquisition (SCADA), Internet, email, etc.) and review safe computer and internet access procedures with employees to prevent cyber intrusion. ▪ Consider steps needed to control access to all areas under the jurisdiction of the water utility.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
HIGH (ORANGE) **High Risk of Terrorist Attack** Signifies a **high risk** of terrorist attacks. Protective measures should focus on limiting facility access to essential staff and contractors, and coordinating security efforts with local law enforcement officials and the armed forces, as appropriate.	Detection	▪ Increase the frequency and extent of monitoring activities. Review results against baseline. ▪ Confirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses. ▪ If a neighborhood watch-type program is in place, notify the community and request increased awareness.
	Preparedness	▪ Confirm emergency response and laboratory analytical support network are ready for deployment 24 hours per day, 7 days a week. ▪ Reaffirm liaison with local police, intelligence, and security agencies to determine likelihood of an attack on the water utility personnel and facility and consider appropriate protective measures (e.g., road closing, extra surveillance, etc.). ▪ Practice communications protocol with local authorities and others cited in the facility's emergency response plan. ▪ Post frequent reminders for staff and contractors of the threat level, along with a reminder of what events constitute security violations. ▪ Ensure employees are fully aware of emergency response communication protocols and have access to contact information for relevant law enforcement, public health, environmental protection, and emergency response organizations. ▪ Inspect and practice activation of available emergency interconnections with neighboring water agencies. ▪ Have alternative water supply plan ready to implement (e.g., bottled water delivery).
	Prevention	▪ Discontinue tours and prohibit public access to all operational facilities. ▪ Consider requesting increased law enforcement surveillance, particularly of critical assets and otherwise unprotected areas.
	Protection	▪ Evaluate need to staff water treatment/production facility at all times. ▪ Consider the need to prohibit recreational use of surface water reservoirs. ▪ Increase security patrol activity to the maximum level sustainable and ensure tight security in the vicinity of mission critical facilities. Vary the timing of security patrols. ▪ Request employees change password on critical information management systems.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
SEVERE (RED) **Severe Risk of Terrorist Attack** **Signifies a *severe risk* of terrorist attacks. Protective measures should focus on the decision to close specific facilities and the redirection of staff resources to critical operations.**	Detection	▪ Ensure that list of sensitive populations (e.g., hospitals, nursing homes, daycare centers, schools, etc.) within the service area is accurate and shared with appropriate public health officials. ▪ Reconfirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses.
	Preparedness	▪ Post daily notices to staff regarding threat level and appropriate security practices ▪ Where appropriate, place back-up operational capacity on-line (water treatment plant filters, turbines, etc.). ▪ Ensure key utility personnel are on duty. ▪ Where appropriate, provide public notification for citizens to store emergency water supply or to implement other preparatory measures. ▪ Evaluate the need for opening an emergency operations center.
	Prevention	▪ As appropriate, request increased law enforcement and/or security agency surveillance, particularly of critical assets and otherwise unprotected areas (e.g., consider if National Guard assistance is needed and make appropriate request). ▪ Limit access to facilities and activities to essential personnel. ▪ Consider whether mail and packages should go to a central, secure location and be inspected before distribution. Remind mailroom personnel of the need for heightened awareness when sorting and distributing all incoming mail.
	Protection	▪ Ensure existing security policies, procedures, and equipment are effectively implemented. ▪ Recheck security of all on-site chemical storage and utilization areas. ▪ Implement frequent and staggered inspections of the exterior of buildings (to include roof areas) and parking areas. ▪ Re-check the security of critical information systems (e.g., SCADA, Internet, email, etc.) and have staff change computer passwords. ▪ Consider placing staff at remote (typically unmanned) facilities.

Appendix C: Example Action Plans

*Water System Contamination**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Evaluate whether the threat is credible in consultation with assisting agencies • Visually inspect physical evidence and determine whether there is a change in normal system operating parameters (i.e., chlorine residuals, turbidity, odor, color, pH, etc.) • Conduct actions and testing as recommended by monitoring and sampling experts

If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Isolate portion of system or backflush • Shut down system if obvious or confirmed contamination warrants • Issue public notice and issue follow-up media press releases • Continue sampling and water monitoring • Assess need to remediate storage tanks, filters, sediment basins, solids handling, etc.

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

*Structural Damage/Physical Attack to Water System or Facility(ies)**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Heighten security at critical facilities 3. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Physically secure water system facilities • Evaluate whether the threat is credible in consultation with assisting agencies

If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Deploy damage assessment team • Isolate damaged facility from rest of water system • Coordinate alternative water supply, as needed, or consider alternate (interim) treatment schemes • Issue public notice and issue follow-up media press releases • Repair damaged facilities • Assess need for additional protection/security measures

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

*Cyber Attack on SCADA or Operational Computer System**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Temporarily shut down SCADA system and go to manual operation using established protocol 3. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Continue manual operation using established protocol • Consider whether to isolate source water • Consider whether to shut down system and provide alternate water • Evaluate whether the threat is credible in consultation with assisting agencies • Conduct actions/testing recommended by monitoring and sampling experts

If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Continue manual operation, source water isolation, or system shut down and alternate water supply, as appropriate • Issue public notice and issue follow-up media press releases • Make image copy of all system logs to preserve evidence • With law enforcement assistance, check for implanted backdoors and other malicious code before restarting SCADA system • Install safeguards before restarting SCADA system • Bring SCADA system up and monitor system • Assess/implement additional precautions for SCADA system

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

*Hazardous Chemical Release from Water System Facility(ies)**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

▼

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Post full-time operations personnel at the chemical treatment areas of the facility 3. Verify that monitoring, leak detection, and personal protection equipment are fully operational 4. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

▼

If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Physically secure water system facilities and specifically the chemical treatment areas of the facility • Identify potentially hazardous chemical(s) to appropriate assisting agencies • Based on Risk Management program and ERP, evaluate potential extent of public evacuation or shelter in place order • Evaluate whether the threat is credible in consultation with assisting agencies

▼

If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat Been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Determine extent/concentration of chemical release and deploy damage assessment team • Turn off chemical treatment equipment and isolate chemical treatment areas from rest of water system • Depending on extent and concentration of release, issue evacuation or shelter in place order per Risk Management Program and ERP • Coordinate alternative water supply, as needed, or consider alternate (interim) treatment schemes • Issue public notice and issue follow-up media press releases • Repair damaged facilities • Assess need for additional protection/security measures

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

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List of Acronyms and Abbreviations

ATSDR	Agency for Toxic Substances and Disease Registry
CDC	Centers for Disease Control and Prevention
CWC	Chemical Weapons Convention
DHS	U.S. Department of Homeland Security
DOE	U.S. Department of Energy
EOC	Emergency Operations Center
EPA	U.S. Environmental Protection Agency
ERP	Emergency Response Plan
ETV	Environmental Technology Verification Program
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FOIA	Freedom of Information Act
FRMAC	Federal Radiological Monitoring and Assessment Center
Handbook	this *Water Security Handbook*
HazMat	Hazardous materials specialists, including specialists from government agencies and private contractors
HHS	U.S. Department of Health and Human Services
HSIN-CS	Homeland Security Information Network for Critical Sectors
ICS	Incident Command System
LEPC	Local Emergency Planning Committee
LRN	Laboratory Response Network
MOU	Memorandum of Understanding
NEMI	National Environmental Methods Index
NEMI-CBR	National Environmental Methods Index for Chemical, Biological and Radiological Contaminants
NHSRC	National Homeland Security Research Center
NIC	National Incident Management System (NIMS) Integration Center
NIH	National Institutes of Health
NIMS	National Incident Management System
NRC	National Response Center
NRP	National Response Plan
NRT	National Response Team
QA/QC	Quality Assurance and Quality Control
Toolbox	*Response Protocol Toolbox: Planning For and Responding to Drinking Water Contamination Threats and Incidents*
TSWG	Technical Support Working Group
TTEP	Technology Testing and Evaluation Program
USAMRIID	U.S. Army Medical Research Institute for Infectious Diseases
USCG	United States Coast Guard
WaterISAC	Water Information Sharing and Analysis Center
WaterSC	Water Security Channel
WCIT	Water Contaminant Information Tool
WMD	Weapons of Mass Destruction
WUERM	Water Utility Emergency Response Manager

Overview

What is the Water Security Handbook?

As a water utility manager, your role in water security planning and threat response is critically important. This *Water Security Handbook* was developed by the U.S. EPA to help you, the water utility official, protect your water system and respond effectively to threats and contamination incidents involving your water system.

EPA also wrote this Handbook in response to calls for a short, simplified document that summarizes the comprehensive document entitled *Response Protocol Toolbox: Planning For and Responding to Drinking Water Contamination Threats and Incidents* (also known as the *Response Protocol Toolbox*).

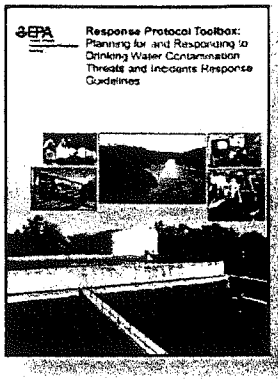
The Handbook is also intended to be a companion to EPA's *Response Protocol Toolbox: Planning For and Responding to Drinking Water Contamination Threats and Incidents: Response Guidelines.* The *Response Guidelines* provides many forms and checklists to help you organize and carry out your emergency response and planning efforts. This Handbook describes the basic concepts and procedures involved in water security planning and threat response. Together, the Handbook and *Response Guidelines* provide succinct recommendations concerning water security planning and response actions.

While the *Response Protocol Toolbox* is aimed at all utilities, agencies and other organizations that may be involved in responding to drinking water threats and incidents, this Handbook is aimed primarily at water utility managers and staff. This Handbook should help you to:

- Understand the "basics" of responding to contamination threats and incidents;
- Plan for responding to water contamination threats and contamination incidents;
- Learn about key concepts of water security covered in the *Response Protocol Toolbox;* and
- Learn how to use the *Response Protocol Toolbox,* the *Response Guidelines,* and other available tools to help you provide water security.

You can use this Handbook as a guide to the *Response Protocol Toolbox,* because chapters in this Handbook correspond to modules in the Toolbox:

Handbook Chapter	Toolbox Module
1	1. Water Utility Planning Guide
2	2. Contamination Threat Management Guide
3	3. Site Characterization and Sampling Guide
4	4. Analytical Guide
5	5. Public Health Response Guide
6	6. Remediation and Recovery Guide



Why Is This Handbook Important?

Contamination of a drinking water system can cause illness, disease, or even death. A water system can be contaminated, damaged or disrupted through intentional terrorist or criminal actions or by an accident. Intentional contamination poses one of the most serious threats to a water system because of the intent to harm human health or cause damage. **When a contamination threat is received or a contamination incident happens, it is critical that you act quickly and effectively to protect public health and the environment.**

This Handbook should help you to develop your own utility's plan for quickly and effectively responding to contamination threats or contamination incidents, even in situations where information may be limited.



How Can This Handbook Help Me?

This Handbook should help you in the following ways:

- Help you to plan for unforeseen emergencies involving your water system;
- Help you to review and improve your water utility's Emergency Response Plan (ERP) on an ongoing basis to address contamination threats and intentional incidents. Federal law required that drinking water systems serving more than 3,300 customers develop an ERP (see the "Public Health Security and Bioterrorism Preparedness and Response Act of 2002", also known as the Bioterrorism Act of 2002). Although the deadlines for certifying ERPs for approval have passed, all utilities should continue to review and improve their plans as their water system infrastructure, staff, technology and capabilities change.
- Provide pointers on how to respond to contamination threats and incidents; and
- Introduces and summarizes the more comprehensive *Response Protocol Toolbox.*

Please note that this Handbook provides general advice and general procedures for responding to a water system contamination threat or contamination incident. Because every water system and incident will be different, it would be impossible to develop a one-size-fits-all emergency response template. The steps described in this Handbook are recommendations, not rules.

Although this Handbook is not a regulatory document nor is it a template for an Emergency Response Plan, it can help you to review, update and implement your own ERP, because it describes the planning you would do to create such a plan. For example, in your ERP, you should provide answers to the following questions:

Emergency Response Plans (ERPs):

For more information on ERPs, see EPA's document entitled *Emergency Response Plan Guidance for Small and Medium Systems to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002,* the *Emergency Response Plan Outline,* and other emergency response planning documents. These documents can be downloaded from EPA's water security website at www.epa.gov/watersecurity. You may also obtain a copy by calling EPA's Safe Drinking Water Hotline at 1-800-426-4791 or by sending a request to the Hotline via e-mail at www.epa.gov/safewater/hotline.

- Who will respond?
- What level of personal protection do responders need in order to protect their health and safety?
- Who can I call for help and advice?
- When and where should samples be collected?
- Who will collect samples?
- Who will analyze water samples to identify the contaminant(s)?
- Who will make public health decisions?
- Who will manage remediation and recovery activities?

Addressing these kinds of questions should help you to update your own ERP for responding to a water contamination threat or incident. Utilities may also want to share their ERPs with local response partners in order to improve coordination when an incident or emergency actually occurs.

Who Should Read This Handbook?

This Handbook was written for water system owners and managers, water utility emergency response managers (WUERMs), and utility staff who maintain public and private drinking water systems, regardless of their size. In addition, anyone who may be involved in an emergency response concerning drinking water, such as public health officials, emergency responders, law enforcement officials, environmental protection officials and other government officials should read this Handbook. Utility managers in the wastewater sector may find this Handbook useful because it describes a general process for threat and incident response.

In the next chapter, water security planning is discussed.

Where To Get More Information:



For more information on a specific topic, please refer to the full *Response Protocol Toolbox.* You can download the entire Toolbox, this Handbook, the *Response Guidelines,* and other water security documents from the EPA Water Security website at www.epa.gov/watersecurity. This frequently updated website also contains other useful information on water security planning, requirements and training opportunities. You can also request a copy of these documents by calling EPA's Safe Drinking Water Hotline at 1-800-426-4791 or by sending a request to the Hotline via e-mail at www.epa.gov/safewater/hotline. Finally, the section on "Additional Resources" at the end of this Handbook describes many useful water security resources.

1

Introduction

This chapter discusses why you, as a water utility manager or officer, should know about water security planning for effective response to contamination threats and incidents. This chapter also defines water contamination threats and incidents and describes how water security planning is done. Chapter 1 corresponds to Module 1 of the *Response Protocol Toolbox*. See EPA's Water Security website at www.epa.gov/watersecurity for more information.

The first water security planning step is to designate an individual to be the lead emergency response manager for your utility, as well as an alternate. At a small utility, you may be this individual. The second step is to plan your utility's response to a contamination threat or contamination incident. In responding, you should decide if the threat or incident is **'possible'**, **'credible'**, or **'confirmed'**. If the threat is **'confirmed'**, then it becomes a contamination incident, requiring remediation (cleanup). Following successful remediation, the system is returned to normal safe operations (recovery).

Why is Water Security Planning Important?

Water security planning is critical because of the increased threat of terrorism and other intentional attacks since 9/11. There are many ways in which water systems can be threatened by contamination or be intentionally contaminated. Responding to contamination threats and contamination incidents requires careful planning and preparation.

What Are Contamination Threats and Contamination Incidents?

There are two kinds of water contamination problems that you may have to deal with: **contamination threats** and actual **contamination incidents.**

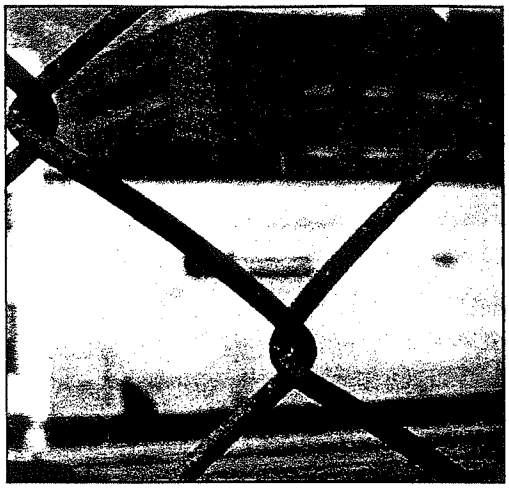
> A **contamination threat** is a suggestion or an indication that water has been or will be contaminated, but no conclusive proof has been collected yet to confirm that contamination has actually occurred. A threat may be written, verbal, or based on observations or other evidence.

Here are some examples of contamination threats:

1) A suspicious empty container with an unknown residue is left next to a reservoir. This is a contamination threat. In this case, there is physical evidence that suggests something has potentially been added to the water supply, but contamination has not yet been **'confirmed'** through testing or other conclusive evidence.

2) Someone phones to say that they observed someone adding something to the water reservoir. As before, you have become aware of a threat and there is not yet any proof that the contamination has actually occurred.

A contamination incident has occurred if you analyze water from the reservoir, distribution system or another part of your water system and find that the water contains levels of a harmful



contaminant above baseline or background levels. This is no longer a contamination threat, but an actual contamination incident. In short, a contamination threat has not yet been proven (or **'confirmed'**), while a contamination incident has already occurred. Be alert to the possibility that field or lab testing may not be comprehensive enough to detect the contaminant that may be present; for example, a Microtox® analysis should tell you whether or not there is a toxin present, but it does not measure radioactive materials or metals.

A drinking water **contamination incident** occurs when the presence of a harmful contaminant has been 'confirmed'; that is, verified.

To protect your water system, you should be ready to respond to both contamination threats and contamination incidents. You might not know whether a threat constitutes a contamination incident until you get more information. However, if you ignore a threat and it turns out to be a contamination incident, public health and/or the water system might be harmed. You should always investigate a threat and determine whether or not a contamination incident has occurred.

Should We Be Concerned About Contamination Threats and Contamination Incidents?

Contamination threats and contamination incidents could impact the public in the following ways:

- Cause harm to public health (illness, disease, or death);
- Cause fear or loss of public confidence;
- Disrupt the water system or cause long-term shortage of clean, safe water to customers or prevent use of the water supply for fire fighting;
- Disrupt businesses and services that depend on a safe water supply;
- Cause damage to the water system infrastructure (e.g., water plant, pumps, pipes, wells, treatment system, distribution system, electrical system or computer network) resulting in contamination or interference with treatment or delivery;
- Create a need to remediate and replace portions of the water system to make it safe, which could in turn create water shortages or outages;
- Result in significant costs for remediation or replacement; and
- Impact other critical infrastructures that rely on safe water, due to interdependencies (e.g., food processing and refineries, among others).

Since any one of these impacts could have serious consequences, you should be concerned about contamination threats and incidents.

Is Intentional Contamination Possible or Probable?

How likely is intentional contamination of the drinking water system? Could it happen again? How serious would it be? These are the kinds of questions you should consider when planning for water security.

It is possible to intentionally contaminate a water supply in many ways. However, "possible" and "probable" are two different cases. It is always possible that intentional contamination could be carried out, but the probability of this actually happening should be determined at each individual water system.

Question: Compared with other possible terrorist targets, how likely is an intentional contamination incident involving a water system?

Answer: The likelihood of an intentional contamination incident occurring may be low, but the likelihood that a contamination threat will occur is high. In fact, such threats have occurred often and are well documented.

Security experts have warned that terrorist organizations may be considering water systems as possible targets for weapons of mass destruction, known as WMD. WMD include some chemical, biological and radiological contaminants whose purpose is to cause harm. It has always been possible to intentionally contaminate a water system, but 9/11 and other recent events have suggested that the likelihood that an intentional contamination incident will happen has increased. This is why we all should plan and prepare to protect our drinking water.



How Serious Could Intentional Water Contamination Be?

There are many ways in which water can be intentionally contaminated, just as there are many different contaminants. Each contaminant has different effects on humans, animals and the environment, depending on its concentration (level) and toxicity (harmfulness).

Examples of Possible Contaminants:

Pathogens are harmful microorganisms that can impact human health, such as E. coli, Cryptosporidium, polio virus, Hanta virus, smallpox virus, and the microorganisms responsible for anthrax, bubonic plague, cholera and other illnesses;

Toxic metals such as arsenic, cadmium, mercury, osmium, and others;

Toxic organic compounds such as biotoxins (Ricin), pesticides, chlorinated compounds such as dioxin, or volatile organic compounds such as mustard gas; and

Radioactive materials such as radioactive isotopes used in hospitals, research labs, universities and nuclear reactor fuels.

A few contaminants are so dangerous that very small amounts could sicken or kill many humans or animals. These include certain pathogenic bacteria and viruses, some biotoxins, and some highly toxic chemicals that can persist in water for a long time before they break down into

less harmful chemicals. Other contaminants could cause death or illness in people who are especially at risk, such as children, the elderly, those who are already ill due to other causes or others who are particularly sensitive. There are hundreds of contaminants that could disrupt normal operations and cause the public to lose confidence in the water system, but which would not cause illness or death.



What is Due Diligence?

How will you know when you have done enough to evaluate and respond to a contamination threat or incident? This is where **due diligence** comes in. Due diligence involves a careful evaluation of any contamination threat and an appropriate response based on the evaluation. The response flow chart on the back cover of this Handbook shows what steps to take when a threat or incident occurs. Carrying out each of these steps in a responsible, careful, efficient and timely manner should help to ensure due diligence.

Due diligence should be determined locally, and local authorities should decide what level of risk is reasonable in a threat situation. If the threat is **'possible'**, appropriate responses to a threat could include immediate operational response actions and site characterization. If the threat is **'credible'**, more significant response actions may be needed, such as restrictions on water use. For a **'confirmed'** incident, authorities may be faced with a potential public health crisis, and response actions should include all steps necessary to protect public health, supply an alternate source of drinking water, and begin remediation of the system.

Due diligence means that you have done everything suitable, sensible and responsible to evaluate a contamination threat or incident and respond appropriately.

It is up to you and your response partners to decide when due diligence has been exercised, because response capabilities vary. As part of this decision, you should decide how much risk is acceptable. You may also want to ask for help in responding to a threat. Keep in mind, however, that over-responding to a threat may cause problems too, especially if it is a false alarm.

How Do I Prepare For A Contamination Threat or Incident?

You can prepare for contamination threats and incidents by taking these steps:

- ❑ Develop your own guidelines for dealing with intentional contamination at your utility. Make these guidelines easy to use. Emphasize action items. Know your roles and responsibilities. Include all necessary forms and checklists, as well as contact information for important people. Be sure to keep this information up-to-date. The *Response Guidelines* provide short summaries of specific responses that can be taken to specific threats.

- ❑ Set up your Incident Command structure ahead of time so everyone knows who will be in charge during an emergency and everyone knows what to do. Again, know your roles and responsibilities in advance. The structure should be based on the Incident Command System (ICS), which is

used throughout the nation for responding to natural disasters or emergencies. See Chapter 2 for further discussion of ICS.



- ❑ Establish partnerships and clarify roles with local emergency responders, such as your state drinking water primacy agency, law enforcement, public health agencies, HazMat, fire and your local emergency response network. Coordinate closely with your local first responders as a preparedness step.

- ❑ Develop a communication plan that includes a communication and notification system for threats and incidents and a plan for public communication and outreach. Keep contact information up-to-date.

- ❑ Develop contingency plans for alternate water supplies in advance, through such means as mutual aid agreements, Memoranda of Understanding (MOUs) and intermunicipal agreements, for example.

- ❑ Be familiar with your water system from top to bottom. Know its construction, operation, maintenance, hydraulics, chemicals used, distribution system, employees, customers, nearby roads, buildings, and other features.

- ❑ Maintain accurate, up-to-date information, plans and other records concerning your water system. This should help prepare you and your response partners to deal with a threat or incident.

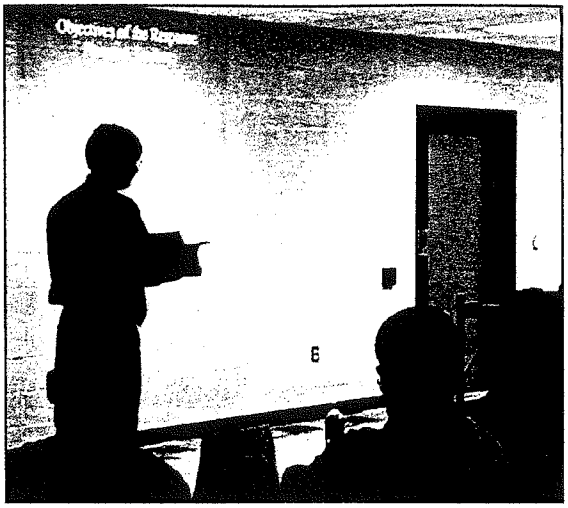
- ❑ Keep accurate records concerning any contamination threat or incident. See the *Response Guidelines* for an example of a "Security Incident Report Form", "Threat Evaluation Worksheet", and other forms and checklists that can help you to document a threat or incident and track evaluation, remediation, and recovery.

- ❑ Conduct baseline water quality monitoring during "normal", non-threat times to monitor the quality of water entering, passing through and leaving the system to customers. Baseline monitoring is done in order to establish "normal" water quality values.



- ❑ Prepare for contamination threats and intentional contamination incidents by including possible contamination scenarios in your Emergency Response Plan. Discuss these scenarios and possible responses with your staff.

- ❑ Practice emergency response by conducting training workshops, tabletop exercises, drills and field exercises.

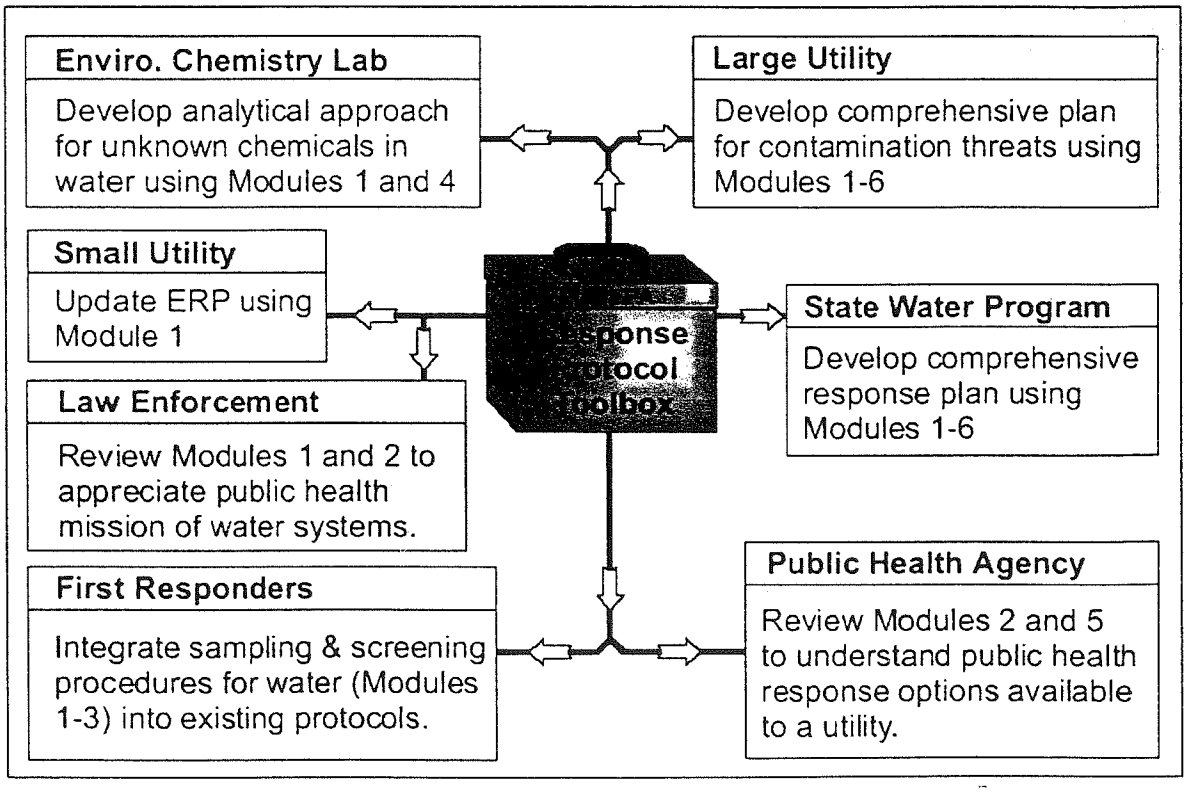


- ❑ Information on drinking water protection from services such as WaterISAC, WaterSC, InfraGard, and from other utilities and agencies can help you to prepare for a contamination threat or incident. See the section on "Additional Resources" at the end of this Handbook.

- ❑ Seek out support and training by contacting your state drinking water primacy agency and technical assistance providers (e.g., state rural water association).

The next chapter describes a general game plan for managing the response to a contamination threat or intentional incident.

The diagram below shows the intended audience for each module of the Toolbox.



2



Introduction

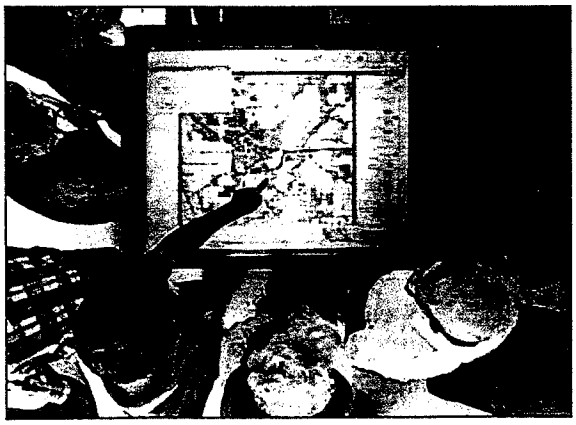
If a contamination threat or incident occurs, you should act quickly to protect public health and limit the spread of the contaminant, based on the best information you have at the time. You should also avoid over-reaction or false alarms that might inconvenience your customers and harm your credibility. You may not have all the information needed to determine whether the water has been contaminated or not, because this may require water testing, which takes time. As new information becomes available, however, you might change the way in which you are dealing with the threat or incident.

In this chapter, you will learn about a general, yet systematic approach for evaluating contamination threats and managing the overall response to a contamination threat or incident. You will learn how to manage a threat response in a timely manner to protect public health, using due diligence. For effective contamination threat management, this systematic approach or general game plan for threat response is perhaps the most important planning tool covered in this Handbook.

Chapter 2 covers the following topics:

- Roles and responsibilities;
- A general plan for responding to contamination threats and incidents;
- How to evaluate a water contamination threat;
- How to make the right decisions and when;
- Types of information needed to evaluate threats;
- Response actions to protect public health; and
- Exercising care in response actions.

Chapter 2 summarizes Module 2 of the Toolbox, which can be obtained at EPA's Water Security website at www.epa.gov/watersecurity.



Roles and Responsibilities

The vast majority of threats and incidents will likely be handled by individual utilities working together with their local responder network. Some incidents may be elevated to the federal level, especially incidents involving terrorism or an incident of national significance, such as a severe hurricane. This section of Chapter 2 briefly outlines roles and responsibilities from the federal level down to the utility level.



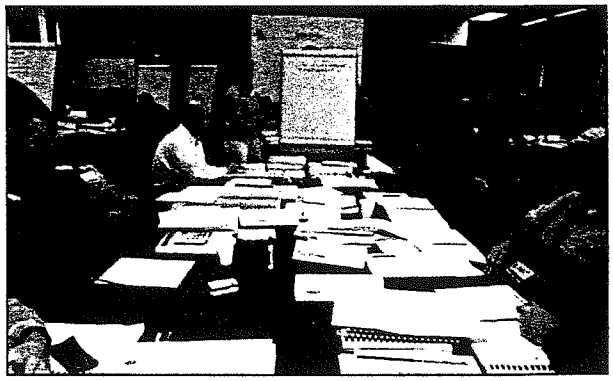
Federal Roles:

The National Response Plan (NRP)

The **National Response Plan**, or **NRP**, establishes a comprehensive all-hazards approach to manage domestic incidents. The NRP brings together individual federal agency response plans, the Concept of Operations Plan, the Federal Response Plan and the Federal Radiological Emergency Response Plan into a single, comprehensive approach.

The NRP includes the best practices and procedures from several incident management disciplines (e.g., homeland security, emergency management, law enforcement, fire fighting, public works, public health, responder and recovery worker health and safety, emergency medical services, and the private sector) and combines them into one. The NRP outlines how federal departments and agencies should work together and how the federal government should coordinate with state, local, and tribal governments and the private sector during incidents.

As an example, the NRP designates the U.S. Department of Health and Human Services (HHS) as the lead federal agency in response to a disease outbreak (which could be the result of intentional water contamination) requiring federal assistance. The NRP recognizes, however, that state, local, and tribal governments are primarily responsible for detecting and responding to disease outbreaks and implementing measures to minimize the health, social and economic consequences of such an outbreak. Coordination between HHS and local authorities would occur as necessary to determine current medical and public health assistance requirements.



EPA supports HHS by providing technical and policy assistance in matters involving drinking water supplies. To learn more about the NRP, visit the Department of Homeland Security website at www.dhs.gov.

Federal, State and Local Roles:

The National Incident Management System (NIMS)

During an incident, the **National Incident Management System,** or **NIMS,** further defines roles and responsibilities. NIMS has established standardized incident management processes, protocols, and procedures that all responders (federal, state, tribal, and local) should use to coordinate and conduct response actions. The use of standardized procedures should enable you and other responders to focus on incident management when a water security incident occurs. These standardized procedures apply whether the incident is related to terrorism, an accident or a natural disaster.



NIMS is maintained by the NIMS Integration Center (NIC) that, under the direction of DHS, provides strategic direction and oversight for NIMS. One function of the NIC is to help establish general training requirements and to develop national-level training standards and course materials associated with NIMS.

The overwhelming majority of emergency incidents will be handled on a daily basis by a single jurisdiction at the local level. However, there will be some instances, such as terrorist attacks, accidents or nationally significant natural disasters, in which successful incident management requires the involvement of emergency responders from multiple jurisdictions, as well as personnel and equipment from other states and the federal government. These instances require effective and efficient coordination across many organizations and activities. The Incident Command System (ICS), as described below, provides the management framework to achieve this coordination.

To ensure further coordination during incidents involving multiple jurisdictions or agencies, the principle of Unified Command (defined below) has also been incorporated into NIMS via the ICS.

To learn more about NIMS and training opportunities, visit the FEMA website at www.fema.gov/nims/.

Federal, State and Local Roles:

The Incident Command System (ICS)

Under NIMS, the **Incident Command System (ICS)** is the national standard for the **command, control,** and **coordination** of a response. The flexible nature of the ICS structure allows for the numbers and types of people on the response team to change over time as the need for resources and skills changes.

The ICS organization can expand or contract to address a particular incident, **but all incidents, regardless of their size or complexity, will initially have a single Incident Commander. The Incident Commander is the individual responsible for managing the overall response to the crisis.** The Incident Commander frequently oversees a group of people, often from his or her own organization as well as other agencies or organizations, who are responsible for responding with due diligence to the contamination threat or incident.

To learn more about NIMS and ICS training opportunities, visit the FEMA website at www.fema.gov/nims/.

Local Role:

Incident Command at the Water Utility

If a threat or incident is discovered first by water utility personnel, you or an appropriate designated person should be the Incident Commander, at least initially. As additional responders arrive in response to your notifications, command may transfer to an agency that has primary authority for overall control of the threat or incident or to a more senior or better qualified first responder. At the transfer of command, you should give the incoming Incident Commander a full briefing and notify all staff of the change in command.

Organizations that may provide an Incident Commander include:

Water Utility: Every water system should designate a lead emergency response coordinator and an alternate. This point person can be known as the **Water Utility Emergency Response Manager (WUERM)** or by some other title as defined by the utility. **This individual (which may be you) is responsible for managing the water utility's internal emergency response procedures and may initially be responsible for Incident Command.**

Drinking Water Primacy Agency: If the utility does not have all the resources needed to manage the threat, the drinking water primacy agency may take the lead after being notified by the water utility. The roles of the utility and the drinking water primacy agency should be defined during the planning stage.

Public Health Agency (state or local): This agency may take the lead in Incident Command if there is a public health crisis and no criminal act is involved or at least not initially suspected.

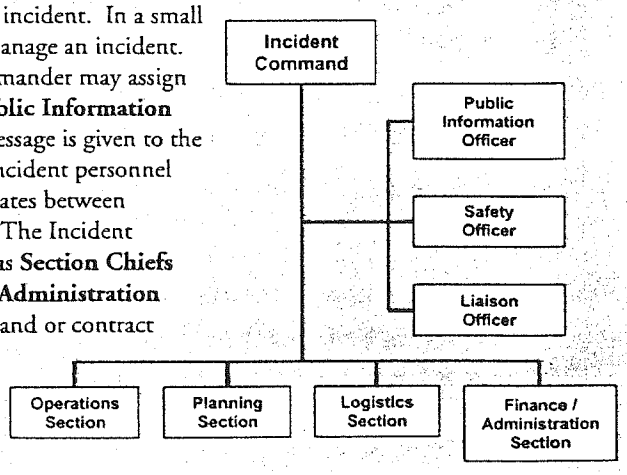
Local Law Enforcement: May take on Incident Command if the site of an incident is a crime scene.

HazMat/Fire Department: If the incident involves a hazardous material or spill, an individual from one of these organizations may assume Incident Command.

FBI: The FBI may assume Incident Command if the FBI determines that a federal crime (e.g., terrorism or an incident crossing state lines) has been committed.

How does the ICS organization grow or shrink to fit the incident?

The **Incident Commander** has overall control over the incident. In a small incident, he or she may be the only person needed to manage an incident. In larger or more complex incidents, the Incident Commander may assign other members of the **Command Staff,** including a **Public Information Officer** (vital in assuring that an accurate, consistent message is given to the public), a **Safety Officer** (responsible for the safety of incident personnel and operations) and/or a **Liaison Officer** (who coordinates between incident command and the various response agencies). The Incident Commander also may assign **General Staff,** who serve as **Section Chiefs** for the **Operations, Planning, Logistics** and **Finance/Administration Sections**. The Section Chiefs have the authority to expand or contract their sections as the resource (people and equipment) demands of the incident increase or decrease.



Federal, State and Local Roles:

Unified Command

In most cases, more than one organization or agency has jurisdiction or statutory authority in managing a response, and a **Unified Command** may be established. Unified Command is a team effort that allows all agencies with responsibility for the incident, either geographic or functional, to manage an incident together by establishing a common set of incident goals and strategies. Unified Command not only coordinates the efforts of many jurisdictions, but provides for and ensures joint decisions on plans, priorities and public communications. Unified Command does not have a single Incident Commander; instead, representatives from several responding agencies contribute to the command process. Unified Command does not mean losing or giving up any of your individual agency's authority, responsibility, or accountability.



Free Online Training in NIMS, NRP and ICS:

FEMA offers free online training courses to help you become familiar with NIMS, the NRP, ICS, and the duties of being an Incident Commander. Examples of courses include:

National Incident Management System: NIMS is now the nationwide standard for incident management, and NIMS certification (by September 30, 2006) is required in order to be eligible for federal preparedness grants. FEMA's online courses include IS-700 National Incident Management System and others.

National Response Plan: The NRP is based on NIMS; together, they provide a template for effective threat prevention and response. FEMA's online courses include IS-800 National Response Plan and others.

Incident Command System: Use of ICS is recommended under NIMS. FEMA's online courses on ICS include IS-100 (Introduction to the Incident Command System), and IS-200 (Basic Incident Command System). There is also IS-100.PW (Introduction to the Incident Command System for Public Works).

To enroll in these courses, visit FEMA's website at http://training.fema.gov/EMIWeb/IS.

Your Role and Responsibilities

As the utility emergency response manager or utility manager, you should make decisions and carry out your utility's pre-existing plans for responding to an incident. Depending on the situation, you may also assume the role of Incident Commander. As each incident is unique, your role in the ICS may change. In one incident, you may provide information to the Incident Commander from another agency to carry out a response. In another incident, your input may be included as part of the Unified Command decision-making process.

Figure 1 shows how your role may change at various stages during an incident. At the **'possible'** threat stage, you will most likely be the Incident Commander. At the **'credible'** threat stage, the figure shows that Incident Command will be dictated by the situation and that command may shift as more becomes known about the situation. It is highly likely that any **'confirmed'** contamination threat (especially if terrorism related) will be managed by a Unified Command, and you may be in Unified Command or in a supporting role.

The textbox on the following two pages provides an example that shows how your role may change throughout the process of threat evaluation and response.

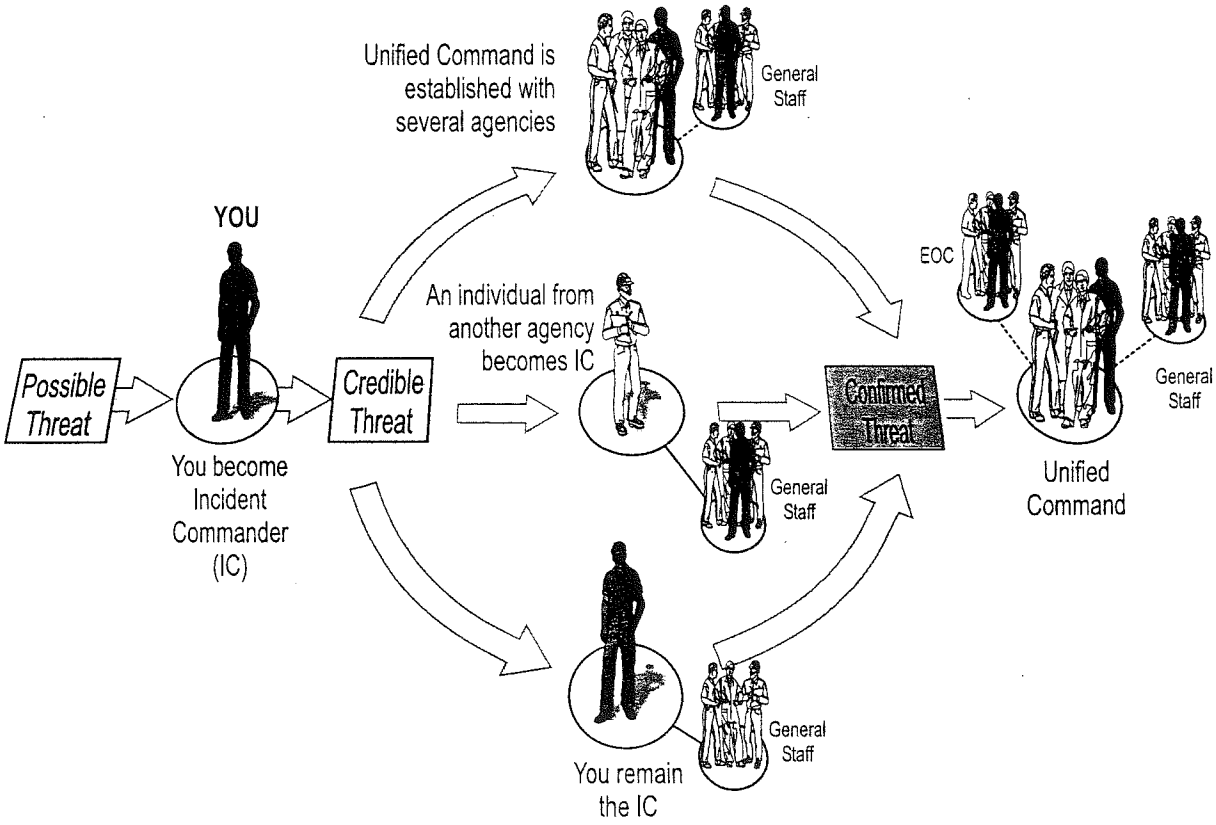


Figure 1. How Your Role May Change

Example of How Your Role May Change During Threat Evaluation and Response:
You have just received a phone call from an unknown individual claiming to have contaminated one of your water tanks. Once you decide that this threat is **'possible'** based on the details of the threat warning and your knowledge of the water tank in question, you should next determine if the threat is **'credible'**. You may also consider initiating **operational response actions,** such as isolating the suspect water tank, if feasible. You may wish to consult with outside resources, such as your state primacy agency or police, to help you determine if the threat is **'credible'**.

Next, you or one of your staff and another employee may drive to the water tank to begin an initial **site characterization** to see if there is anything unusual (see Figure 2 on page 18 describing threat evaluation and response). Other employees may be sent to collect water samples from the distribution system. On arrival at the water tank, you discover that the fence is cut, ripped-open bags with a white powdery residue are scattered about, protective suits and latex gloves are piled in a heap, and the tank hatch is open.

Recognizing that this is potentially a crime scene and not knowing how dangerous the powder is, you may decide to call the police to the scene of what now appears to be a **'credible'** threat. Once the police arrive, you may decide to relinquish incident command to the responding law enforcement officer, who is probably better qualified to address the potential criminal and HazMat issues. However, you should assist law enforcement officials in the ensuing response and investigation. You should also continue to direct your own staff within your utility's internal ICS structure.

As the situation unfolds, you might receive a call from the local public health agency, which informs you that people in the area of the water tank are reporting to the local hospital complaining of similar illness symptoms. You should instruct the public health agency to notify the Incident Commander via the Liaison Officer.

Meanwhile, the Incident Commander has already called the National Response Center, a single point of contact for all pollution incident reporting, and a regional HazMat team to do a more intensive site characterization that includes rapid field screening of the white powder. Preliminary indications are that the powder is some form of poison. Although you or Incident Command do not yet have any lab results from water samples to **'confirm'** that this potential poison is in the water, the Incident Commander decides that a preponderance of evidence now exists to determine that the threat is **'credible'**.

At this point, having determined that the threat is **'credible'**, the Incident Commander notifies the public, through the Public Information Officer, that they should not drink the water. The Incident Commander also informs the public of what is being done to provide an alternate supply of safe drinking water. He or she may also notify the FBI and activate the **Emergency Operations Center (EOC)** to support the response.

What is an Emergency Operations Center?

The **Emergency Operations Center**, or **EOC**, is a pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response to an emergency. It is not a part of on-scene incident management, but rather supports the on-scene Incident Commander or Unified Command by arranging for needed resources.

By now, many more agencies have been notified by the Incident Commander or the EOC, and a Unified Command may be formed to lead the response. In this situation, Unified Command may have members from the police, FBI, HazMat, state, EPA and other agencies having jurisdiction over the incident. At this point, you may report to the EOC to assist in their response efforts. However, someone should be designated as the utility's internal Incident Commander, who will undertake operational responses at your utility in support of Unified Command.

In this example, Unified Command will continue to work with appropriate laboratories, including laboratories only accessible by federal agencies such as the FBI, to **'confirm'** the contamination incident. Once the white powder has been positively identified and detected in the water system and the threat or incident has been **'confirmed'**, Unified Command will update or revise their public notifications. Unified Command will most likely direct you to undertake appropriate operational and **remediation and recovery** activities at your utility.

Even if the contaminant is never positively identified in the water, Unified Command, in consultation with public health, may still determine that the contaminant was introduced into the water system, based on a preponderance of evidence.

Tip: Your local emergency plans may differ from the example presented here. This is why it is very important for you to talk with other first responders in your area so that you will understand where you "fit in" in various emergency scenarios.

Keep in mind that ICS is a flexible system and will be uniquely established by the Incident Commander (which may be you or someone from another agency) or Unified Command for each incident. The example given above is only one of the many ways in which ICS may be used to effectively manage a water supply incident. Your local and state policies and procedures may require different actions than those described in the example given above. This is why it is important for you to include your local first responders, local emergency planning committee (LEPC), public health and state primacy agencies in your emergency response planning efforts.

Remember: Regardless of the organization responsible for incident command, the utility has an ongoing responsibility to serve as a technical advisor to the Incident Commander or Unified Command for issues related to the operation of the water system and ensuring water quality.



A General Plan for Threat Response and Threat Management

The goals of threat response and threat management are to: 1) evaluate the threat, 2) take necessary steps to protect public health while the threat is being evaluated, 3) 'confirm' the threat, 4) remediate the water system if necessary, and 5) return the system to safe, normal operation as soon as possible.

To achieve these goals, the response to a contamination threat or incident should be efficiently managed. Threat response and management involves a number of steps, actions and decision points. The most important lesson of this chapter is to understand these key elements and how to proceed from one decision point to the next to achieve these goals. The key elements of threat response are summarized below and in Figure 2, with key terms in bold:

Step 1. Decide if a threat is **'possible'**, take appropriate preliminary response actions to protect public health, and proceed to Step 2.

Step 2. Determine if a **'possible'** threat is **'credible'** through consultation with other utilities, the drinking water primacy agency, public health and other agencies. If it is **'credible'**, notify the necessary agencies and the public, take appropriate response actions to further protect public health, and proceed to Step 3.

Step 3. 'Confirm' a **'credible'** threat (which results in a **'confirmed'** contamination incident), take appropriate public health and other response actions, and proceed to Step 4.

Step 4. Remediate the water system; and

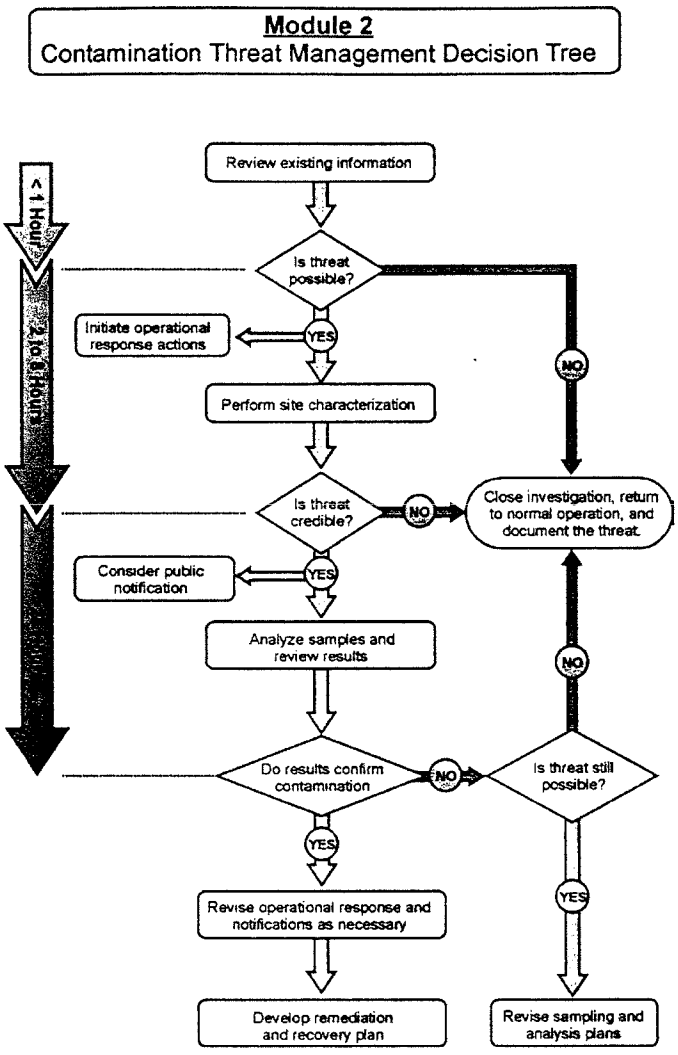


Figure 2. Process of Threat Evaluation and Response

Step 5. Return the water system to normal, safe operation (recovery).

Each of these steps is described in more detail below and in Module 2 of the Toolbox.

Please note that your responsibility, as the water utility manager (or emergency response manager), is to operate and maintain a safe water system, ensure a safe water supply

and provide public notification regarding impaired drinking water quality. In a threat situation or contamination incident, a different Incident Commander or Unified Command structure may be in charge of Steps 2 through 5, as explained previously. You can serve an important role by providing technical advice on your water system to the Incident Commander or Unified Command.

A detailed **Decision Tree** for responding to a contamination threat or incident is available in Module 2 of the *Response Protocol Toolbox.*

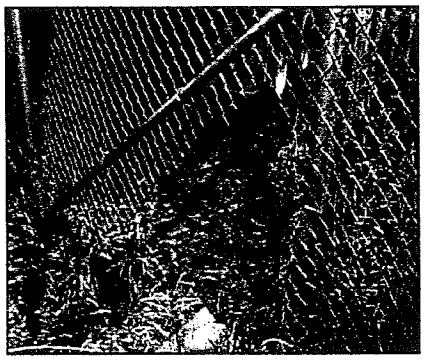
Step 1: Decide if the Threat is 'Possible'

After receiving a threat, the first step is to decide if the threat is **'possible'**. This is the first decision-point and the lowest threat level.

A water contamination threat is **'possible'** if the circumstances suggest that contamination could have occurred. If the threat is found to be impossible, then the investigation is closed, the incident is documented, and operations are returned to normal. However, if the contamination threat is **'possible'**, then further investigation is needed. It is likely that most contamination threats will be classified as **'possible'**.

To decide whether a threat is **'possible'** or not, you need reliable information in the one hour you have to make a decision. Often, the threat warning itself can provide much information.

If the threat warning is **'possible'**, then go on to Step 2 (see below). However, if the threat warning is not believable because it comes from an unreliable source or the situation does not lend itself to such contamination, you may decide that contamination is not **'possible'**. If the threat warning is not **'possible'**, then your response actions are to note the incident and the reasons for the decision to return to normal operations.



How much time do I have to decide if a threat is 'possible' or not?

Speed is critical for protecting public health. Once a threat warning is received, you should act with due diligence to manage the threat. You should decide quickly if a contamination threat is **'possible'** within one (1) hour from the time you receive the threat warning. You may have to make a decision based on the limited information available at the time.

A threat warning is an indication that something may be wrong. Examples of different threat warnings that may be classified as **'possible'** are:

- **Security breach** – evidence of an unauthorized entry into a secured facility, such as an alarm, cut fence, etc.
- **Witness account** – someone directly witnesses suspicious activity and notifies the utility.
- **Direct notification by perpetrator** – the perpetrator sends a verbal or written threat to the utility.
- **Notification by news media** – a threat is sent to the media, or the media may learn of a threat and pass it on to the utility.
- **Notification by law enforcement** – a law enforcement agency may pass along information about a threat to a utility.
- **Unusual water quality** – on-line monitoring, grab sampling or an early warning system indicate unusual water quality results.
- **Consumer complaints** – an unusual or unexplained increase in consumer complaints may indicate contamination.
- **Notification by public health agencies** – health agencies or health care providers observe increased illness, disease or death rates, which may indicate a contaminated water supply.

Who Do I Notify Once A Threat is 'Possible'?

Once you decide that a threat is **'possible'**, you should notify other utility staff. You may also want to consult with or notify your local law enforcement agency and drinking water primacy agency, depending on the nature of the threat. Be aware of your state's reporting requirements.

Remember:

- Use due diligence at all times.
- Encourage staff to immediately report any and all threat warnings to you, 24 hours a day, 7 days a week, 365 days a year.
- Within one (1) hour of receiving the threat warning, you should decide whether the incident is **'possible'** or not.
- Practice notification and reporting procedures ahead of time to be prepared for a real emergency.
- Most threats will end up being **'possible'**, unless you are able to absolutely rule out the possibility of contamination.



Step 2: Determine if the Threat is 'Credible' and Protect Public Health

Once you have decided that the threat is **'possible'**, you should immediately do two things:

- Determine if the threat is **'credible'** or not; and if it is **'credible'**, then
- Protect public health through operational responses.

These two actions should be carried out together, because your first and highest priority is to protect public health, so you should move quickly to determine if the threat is **'credible'** or not.

The word **'credible'** means believable, plausible or reliable. A contamination threat is **'credible'** if the threat is both **'possible'** and other reliable information shows that there is reason to believe that the threat warning is real and that contamination is likely. **A 'credible' threat is a much higher threat level than a 'possible' threat.**

> **How much time do I have to decide if a threat is 'credible' or not?**
>
> As a general rule, once you have decided that the threat is **'possible'**, you should determine within 2 to 8 hours whether the threat is also **'credible'**, based on site information, the nature of the threat, the circumstances and other reliable information.

It is crucial to make this assessment quickly, because if the threat does turn out to be **'credible'**, public health and safety are at stake. Here are some actions you can take to determine if a threat is **'credible'** or not:



1) Conduct a **site characterization** by collecting more information about the site of the **'possible'** contamination to help decide if the **'possible'** threat is also a **'credible'** threat. This step should probably involve sample collection to find out if contaminants are present and to help **'confirm'** the threat. Proper sample collection should help to ensure that lab analyses provide useable data. Law enforcement agencies may be investigating the site as well, and you should assist them in protecting a crime scene. See Chapter 3 of this Handbook to learn more about site characterization.

2) Check to see if there have been previous security incidents similar to the current **'possible'** threat, including previous incidents at your utility and/or elsewhere.

3) Consult early with other agencies and organizations to get information to help you evaluate the threat. Some useful sources of information are listed below (Note that not all of these may be relevant, depending on your locality and the threat or incident under investigation):

- Your state drinking water primacy agency;
- EPA Regional Office;
- The National Response Center;
- Law enforcement agencies and your regional FBI Joint Terrorism Task Force;
- Neighboring utilities;
- Public health agencies (local, state, and federal – the latter includes the CDC, ATSDR, and NIH);
- 911 call centers;
- Homeland Security Warnings and Alerts (see the DHS website at www.dhs.gov);
- Water Information Sharing and Analysis Center, or WaterISAC, which can assist in threat evaluation (see the WaterISAC website at www.waterisac.org);
- Contaminant information from EPA's Water Contaminant Information Tool (WCIT) at www.epa.gov/wcit;
- Use the Contamination Threat Management Matrices (see Module 2, p.54 of the Toolbox) and the *Response Guidelines* to help you collect and organize information and evaluate the threat; and
- Other resources listed in the "Additional Resources" section of this Handbook.

You should now decide if the threat warning is **'credible'** or not. However, because of the types of information needed, the determination of credibility of the threat will most likely involve more parties than your utility alone.

If the threat warning is not **'credible'**, then the investigation is closed, the incident is documented and water system operations are returned to normal.

If you determine that the threat warning is **'credible'**, then you should notify appropriate agencies and the public, undertake suitable response actions to protect public health and **'confirm'** the threat (see below).

To protect public health, provide **immediate operational responses** to prevent or limit public exposure to the (potentially) contaminated water. See Chapter 5 for examples of operational responses that may include isolating suspect water or increasing levels of disinfection. For a **'credible'** threat warning, the public health goal is to minimize public exposure to the suspected contaminated water. If it is not possible to provide an operational response that effectively reduces the possibility that the public will be exposed to the suspected contaminant, then you should speed up your assessment of the credibility of the threat.

Collecting and Organizing Information For Threat Evaluation:

"Contamination Threat Management Matrices"

To help you collect and organize the information to help determine if a threat is **'possible', 'credible'**, or **'confirmed'**, see Module 2 of the Toolbox for the "Contamination Threat Management Matrices". Each matrix covers:

- Information and factors considered in assessing a threat;
- Possible notifications; and
- Possible response actions.

These generalized matrices can be customized to your utility or to specific incidents. Customized matrices can be used in your utility's Emergency Response Plan.

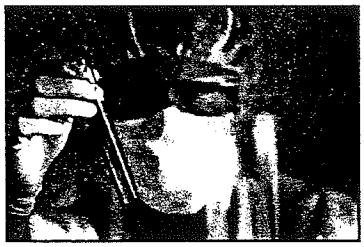
Response Guidelines

The *Response Guidelines* is a companion to this Handbook and contains emergency response planning checklists, standard report forms and other forms to help you manage and organize your emergency response. Visit www.epa.gov/watersecurity to download this document.

Who Do I Notify Once the Threat is 'Credible'?

Once you decide that the threat is **'credible,'** you should report the threat to your drinking water primacy agency, public health agencies, law enforcement agencies and others, if you have not done so already. They will need some basic information, such as your name, contact information, a description of the threat, incident or event, and its location. You may also need to notify the public. Be aware of your state's reporting requirements.

Step 3. 'Confirm' the Threat



Once you decide that a threat warning is **'credible'**, you should work with your drinking water primacy agency, public health agencies and law enforcement agencies to **'confirm'** the threat. Here are some steps in confirming the threat:

1) **Send water samples collected during site characterization to a laboratory for analysis and identification of unknown or suspected contaminants in the water.** The best way to **'confirm'** contamination is to provide factual evidence of contamination by measuring contaminants through laboratory analyses of water samples. Laboratory analysis can potentially identify and/or **'confirm'** contaminants(s), although it is important to keep in mind that not all contaminants can be identified and/or **'confirmed'** by every laboratory (see Chapter 4 of this Handbook). Lab data can also be useful in planning and implementing remediation activities (see Chapter 6). However, if laboratory analysis of samples is not possible for some reason, the standard for **'confirming'** a **'credible'** threat is that a "preponderance of evidence exists" to confirm an incident. **A preponderance of evidence means that most of the evidence available points in this direction.**

2) **Conduct additional site characterization and sampling if needed to 'confirm' a contamination incident.** You may need more information after your initial site characterization to **'confirm'** the incident. For example, your initial site characterization and sampling may indicate that the contaminant was introduced somewhere outside the area where you first sampled. (Note: If the **'credible'** contamination threat cannot be **'confirmed'**, then the additional site characterization and water sampling is done to make sure the water is safe and to support the decision to return to normal operations).

3) **Notify law enforcement agencies in the event that criminal activity is involved, if you have not done so already.** Law enforcement agencies may need to collect evidence and samples to determine whether or not criminal activity occurred. You should continue to help ensure a safe water supply and work together with law enforcement agencies to obtain evidence that could help to **'confirm'** whether contamination occurred or not.



Once you have lab results and other information, you should decide whether the threat can be **'confirmed'** or not. When a threat is **'confirmed'**, you should immediately notify appropriate public health agencies (if you have not done so already). This sets the stage for public health agencies to make public health recommendations. Review the public health protection measures that may already have been provided (when the threat was found to be **'credible'**), and provide additional protection measures if needed. You may also be required to notify the public. See Chapter 5 of this Handbook for more information on public health.

Public notification may be required at any stage of the threat evaluation process under the National Primary Drinking Water Regulations: Public Notification Rule, which says that the public should be notified when there is a *"situation with significant potential to have serious side effects on human health as a result of short term exposure."* (see www.epa.gov/safewater/pn.html).

Public health advisories may be issued, such as:

- "Boil water";
- "Do not drink the water";
- "Do not use water" (including no flushing of toilets and no use of water for fire fighting).

Remember, **'confirming'** a **'credible'** threat represents an important and necessary decision-making step. Once a threat is **'confirmed'** and it becomes a contamination incident, decisions should be made concerning public health responses, and remediation and recovery. Keep in mind that it may take several rounds of information collection and evaluation to **'confirm'** a threat.

If the threat cannot be **'confirmed'** because there is not enough information, the process of collecting information should be continued until a preponderance of evidence indicates that the threat either can be **'confirmed'** or, alternatively, the threat cannot be **'confirmed'** because it is an empty threat.

Why should I 'confirm' a 'credible' threat?

You should **'confirm'** a **'credible'** threat because responding to a **'credible'** threat is an important decision that could affect public health, affect your water system, involve different agencies and require resources. To **'confirm'** a **'credible'** threat, you should be certain, based on definitive lab results or a "preponderance of evidence" that the threat is plausible and believable. **Once a threat is 'confirmed', it becomes a contamination incident.**

Step 4. Remediate the Affected Water System

In this step, the goal is to remediate the contaminated water system to remove or inactivate the contaminant and test the water to make sure that the remediation has worked. Remediation is discussed in more detail in Chapter 6.

By this time, if the threat has been **'confirmed'** to be a contamination incident, a Unified Command structure will probably be established and other agencies and organizations will be responsible for overseeing the response and remediation. During remediation, your role as water utility manager will most likely be to work with the remediation team and Unified Command to help ensure recovery of the water system.

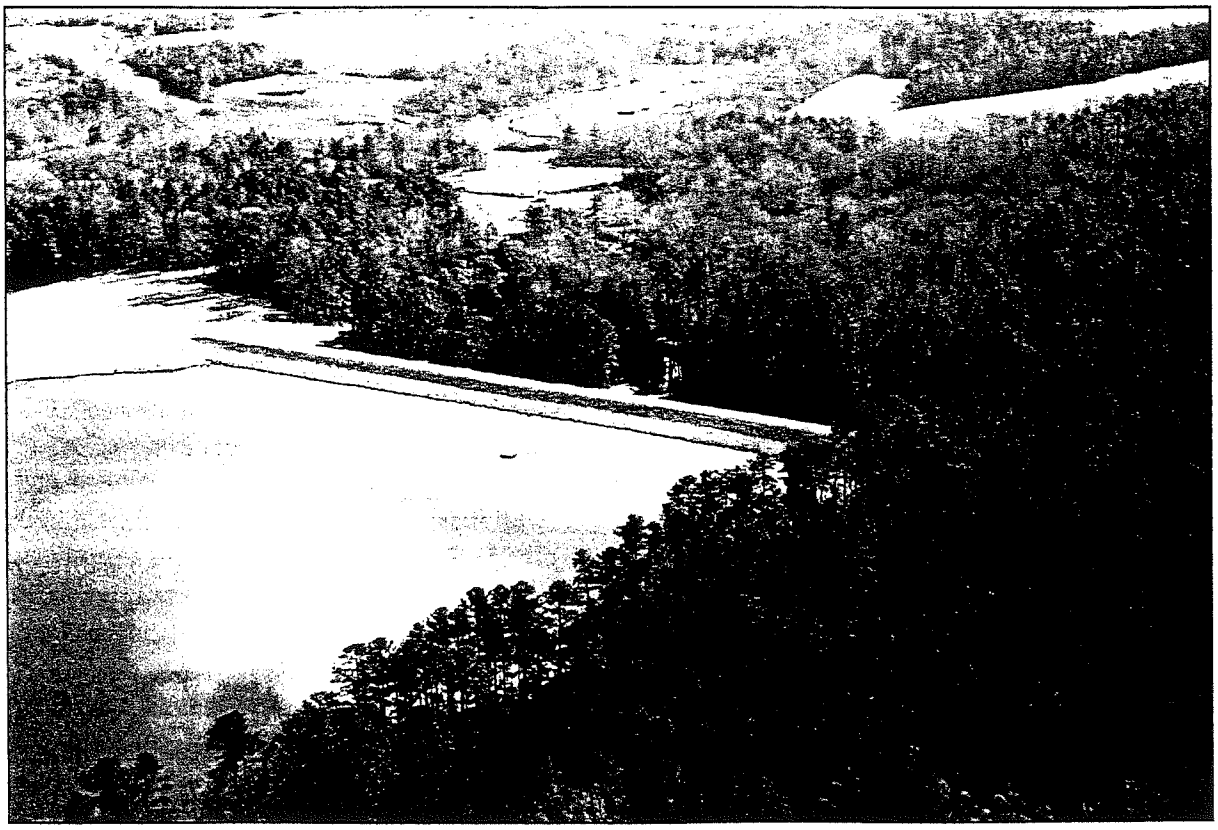
Step 5. Recovery of the System

In this step, the goal is to return your water system to safe, normal operation, which is also called recovery. Recovery of your water system can begin as soon as remediation is complete. If a portion of your water system is remediated, you may be able to resume normal operation of that portion provided that it does not affect remediation of other affected parts of the system. Keep in mind that your customers may still be experiencing residual contamination from within their home or business plumbing. As the water system is remediated and returned to normal, it is important to keep your water utility customers informed. Recovery is discussed in more detail in Chapter 6.

Now that the general process of threat response has been described, the following chapters will describe site characterization, sample analysis, the public health response, and remediation and recovery in more detail.

Remember, successful response involves:

- Planning before an incident occurs;
- Responding in a timely manner and using due diligence;
- Protecting public health;
- Investigating and documenting the incident;
- Identifying the contaminant;
- Basing your decisions on a "preponderance of evidence" if sample analyses are not conclusive;
- Choosing the right remediation in collaboration with others; and
- Returning the system to normal, safe operation (recovery).

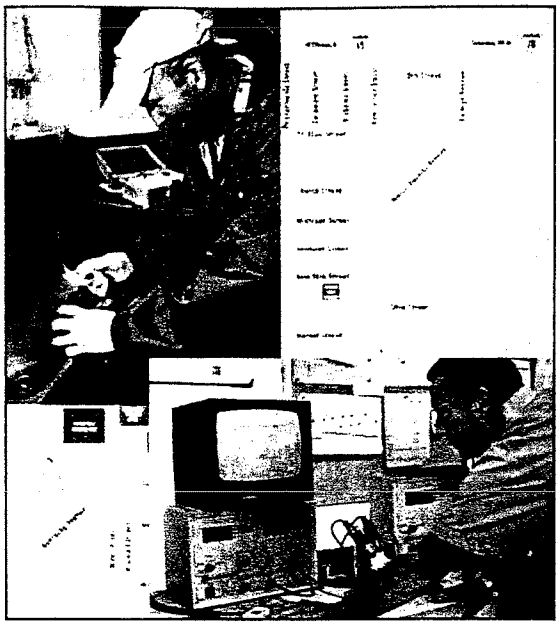


Site Characterization And Sampling Guide

Introduction

In this chapter, you will learn about site characterization and sampling to obtain the information needed to decide whether a threat is **'credible'** and/or **'confirmed'**. Site characterization involves investigating the site to find out the **what, where, when, who, why** and **how** of the contamination threat. A site could be your entire water system or a component of it, such as the distribution system, source water, treatment facility, storage tanks or some other area that may have been contaminated. Site characterization activities include site investigation, field safety screening, rapid field testing of the water and sampling.

Chapter 3 summarizes Module 3 of the Toolbox, which can be obtained at EPA's Water Security website at www.epa.gov/watersecurity.



Investigating the Site

To determine if a threat is **'credible'** and to **'confirm'** a **'credible'** threat, you will need factual evidence concerning the nature of the threat, what the contaminant is, and how serious the contaminant may be in terms of public health. Site characterization and sampling are done to help you get this factual information.

Site characterization results are important to get, but it is just as important to make sure that the site is safe to enter. You should decide if it is safe to proceed with site characterization, whether other equipment or specially trained personnel are needed, whether another approach is needed and many other issues.

Because a utility probably will not have staff trained to deal with all hazards, you should decide ahead of time what you can and cannot do and whether you may need help from other organizations or agencies. For example, you may be able to do visual inspections and test basic water quality at low hazard sites, but you may not have the equipment and/or training to test for more hazardous substances. You may need to call a HazMat team which has the equipment and training to safely deal with hazardous materials.

Good planning calls for your utility to make prior arrangements with a laboratory to provide sample kits with appropriate, clean sample containers, before any threat or incident occurs. Utilities should keep pre-staged sample kits on hand. Refer to Chapter 4 for more information. You should then be better prepared if a threat warning is received or an emergency occurs. **Arrangements with other organizations should be made ahead of time to respond effectively to a threat. The best way to prepare is to communicate, plan, and practice.**

Who Does the Site Characterization and Sampling?

The answer to this question depends on what stage of site characterization and sampling you are in. You or another designated utility emergency response lead may carry out the first steps of site characterization and sampling. Or, an Incident Commander from another agency may oversee the threat response, beginning with site characterization and sampling.

The **Site Characterization Team** is the group that actually performs site characterization and sampling activities. This team may include people from the water utility, police and fire, HazMat specialists, environmental response teams from government agencies, public health officials, FBI and EPA criminal investigators, civil support teams and other agencies.

> The **Incident Commander** or the WUERM manages the site characterization and sampling. The site characterization team carries out the investigation. The utility remains involved at all times, but its role may change as a particular investigation progresses.

Ensuring Safety and Protection for Personnel

Protecting the safety of the Site Characterization Team during site characterization is critical. Team members must have the proper training, protective gear, clothing and other equipment needed to safely inspect and sample the site. If there is a threat to safety, then the team should stop until the proper gear, personnel, or equipment can be obtained.



What Does Site Characterization Involve?

First, the Site Characterization Team develops and uses a customized site characterization plan as a set of guidelines for investigating the threat. Each threat or incident will be different, so every site characterization plan will be different. However, all plans will share certain features in common. You may already have a generic site characterization plan which should contain the following five elements:

1) Hazard evaluation (including an initial hazard assessment before entering the site and ongoing reassessment of the hazard as you collect more information);
2) Approaching the site and doing a field safety screening;
3) Characterizing (investigating) the site;
4) Collecting samples; and
5) Leaving the site.

Each of these elements is described below.

Initial Hazard Assessment Before Entering the Site



The first step in developing a specific site characterization plan is to decide if the site is safe to enter and investigate further. This is done by making an **initial hazard assessment** before the team is sent to the site. You or the Incident Commander (which may be you) should make this initial hazard assessment, based on the available data and initial threat evaluation. A decision is made regarding the potential need for special hazardous material handling techniques or equipment. This is a very important step that protects the safety of anyone who enters the site. People should not be sent into a dangerous area without protection. Response plans should document who would be called to respond to contamination threats under different hazard conditions.

Some possible hazard categories are described in the textbox. Although these hazard categories are based upon tentative identification of the particular type of contaminant at the site, there may be enough information in a threat warning to allow you to judge that a particular hazard category may apply to the situation, thus helping you to make an initial hazard assessment. As you get more information from the site characterization and sampling, you may want to revise your initial hazard assessment (and take appropriate precautions). Hazard evaluation is an ongoing and iterative process.

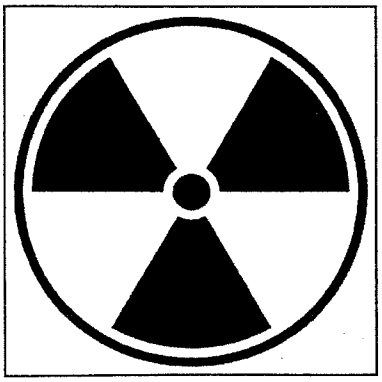
Possible hazard categories:

Low Hazard – there are no obvious signs of radiological, chemical, or biological contaminants at the site, in the air, or on surfaces. Contaminants that may be present in the water are assumed to be dilute and confined to the water.

Radiological Hazard – radiological isotopes or emitters are identified at the site or in the water (i.e., through the use of a field radiation detector).

Chemical Hazard – presence of highly toxic chemicals (e.g., chemical weapons or biotoxins) or volatile toxic industrial chemicals is potentially identified at the site or in the water, with a possible risk of exposure through dermal or inhalation routes.

Biological Hazard – presence of pathogens is potentially identified at the site, with a possible risk of exposure through dermal or inhalation routes.



The initial hazard assessment is also important for deciding who should be on the Site Characterization Team, because the team should have the skills, experience and equipment needed to deal with the hazards that may exist on the site. Some suggestions for possible staff are given below:

- If the site appears to be a "Low Hazard" site, the water utility staff may do the site characterization.
- If there are clear signs of greater hazard (radiological, chemical, or biological hazard), then HazMat professionals trained in hazardous materials safety and handling techniques may need to do the initial hazard assessment and the entire site characterization as well.
- The HazMat team may do the initial hazard assessment, find that the site is safe enough for others to enter, and allow the utility staff or other agency staff to enter the site to continue the site characterization.

The threat warning itself may suggest what the hazard is. Be alert to the possibility of "red herrings", where the threat warning suggests one type of hazard, yet the site actually contains a different hazard. Another example would be misleading clues designed to confuse the investigation. If this occurs, the contamination threat or incident is most likely intentional.





Approaching the Site and Doing a Field Safety Screening

In this step following the initial hazard assessment, the Site Characterization Team approaches the site and conducts a **field safety screening**. Field safety screening is done to observe site conditions and, in particular, to detect any immediate threats to the response team from contaminants in the atmosphere or on surfaces. Field safety screening might include field testing for radioactivity, chemical and biological agents. The site characterization team should already have been trained in the use of safety screening equipment. Because such equipment can be expensive, you may have to call in a HazMat specialist with the proper equipment and training to conduct such screening. Consider due diligence in all of your decisions and actions.

The first step in a field safety screening is to define the perimeter of the site before approaching it. The site perimeter should include the immediate area of the incident as well as a buffer zone for safety. Beginning at some distance outside the site perimeter, the Site Characterization Team carefully proceeds towards the site perimeter with appropriate personal protective equipment and field monitoring equipment and notes anything out of the ordinary. Signs of contamination could include dead or sick animals, discarded chemical containers, or other indicators.

Minimize risks by following common-sense safety practices, such as:

- Approach the site from upwind;
- Do not eat, drink or smoke at the site;
- Do not drink, smell, touch or taste the suspect water;
- Use appropriate personal protective gear (e.g., splash-proof goggles, respirator, disposable gloves, disposable shoe covers, and a disposable lab coat);
- Avoid skin contact with suspect water;
- Fill sample containers slowly to avoid splashing or creating spray or droplets of water that could spread the contamination; and
- Do not spend any more time than needed to characterize the site and get samples.

If there are signs of hazards, the team should stop their investigation and immediately contact the Incident Commander (who may be you). You should then decide how to proceed. It is recommended that the site be evacuated immediately and that a properly trained and equipped HazMat team be brought in to investigate.

If there are no obvious signs of hazards, the team should still contact the Incident Commander (who may be you) before crossing the site perimeter and entering the site. In most cases, you should be able to tell the team to enter the site and proceed with site characterization and collection of water samples to determine the nature of the threat or incident.

Characterizing the Site

After the field safety screening has been completed and if it appears safe to proceed, the team may continue the site characterization. The team should also do a **detailed visual inspection** of the site. They should perform **rapid field testing** of the water suspected of being contaminated. Recommended **core field testing** consists of monitoring for radiation, cyanide, chlorine residual, conductivity and pH of the suspect water.

Rapid Field Testing and EPA's Technology Testing and Evaluation Program (TTEP)

Rapid field testing of water suspected of being contaminated is done to try to identify the type of contaminant, so that the right laboratory analyses can be done. Equipment and instruments for rapid field testing are described on pages 27-30 of Module 3 of the Toolbox.

Information on field testing technologies is also available from the EPA's National Homeland Security Research Center (NHSRC), through its Technology Testing and Evaluation Program (TTEP). The TTEP is an outgrowth of EPA's successful and internationally recognized Environmental Technology Verification (ETV) Program. TTEP rigorously tests technologies for detection, monitoring, treatment, decontamination, computer modeling, and other tools for protecting water infrastructure and decontaminating structures and the environment.

For more information on TTEP, visit the NHSRC website at www.epa.gov/nhsrc/tte.htm.

There is no single field testing kit that tests for all possible radiological, chemical or biological contaminants. Because there is no way to test for everything, field testing should be used only as a guide, not as the final answer. A negative result during field testing may mean that there is no contaminant, or it may mean that your field screening kit is not sensitive enough to detect the contaminant or was not designed to measure the particular contaminant that is present.

Remember: To conclusively prove (or 'confirm') that water is either safe or contaminated, you must have water samples analyzed by a laboratory that is qualified to do such testing. Water samples should always be collected if there is any question that the water might be contaminated. These samples can be analyzed later by a laboratory.

Collecting Samples

After rapid field testing of the water, samples of the suspect water may be collected in case they are needed for later laboratory analysis. (Note that if a serious hazard is apparent, a HazMat responder may be needed to collect samples). Depending on the outcome of the threat evaluation, the Incident Commander (who may be you) may decide to send the samples to a laboratory or not. If the threat is **'credible'**, then the samples should be sent immediately to a laboratory for analysis. But if the threat is not 'credible', then the samples should be stored in a safe place for a specific period of time in case it later becomes necessary to analyze them. Keep in mind that sample holding times for radiological, biological and chemical contaminants can vary widely.

More information on sample collection, packaging and transporting can be found on pages 20-27 of Module 3 of the Toolbox.

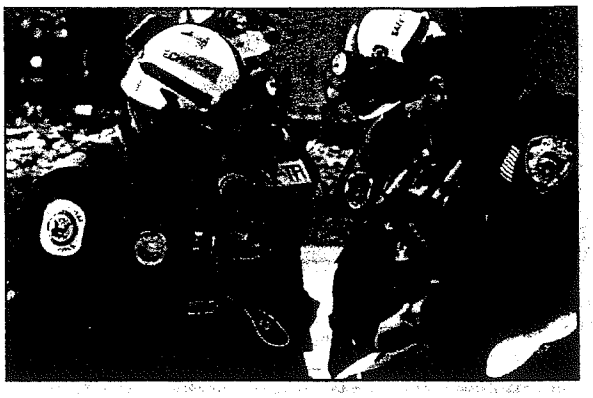
Exiting the Site

After finishing the site characterization, the team should prepare to leave the site. Before leaving, the team should make sure that they have:

- Documented their findings;
- Collected all samples needed;
- Collected all equipment; and
- Re-secured the site (lock doors, hatches, gates, etc.).

There may be other actions to take before leaving the site. If the site is a possible crime scene, follow guidelines from law enforcement agencies to restrict or block access to the site and to protect any evidence from disturbance. If the site contains hazardous materials, it may be necessary to decontaminate the entire team and their equipment.

In the next chapter, you will learn about analyzing samples for contaminants, types of contaminants, and types of analytical laboratories.



4

Introduction

Chapter 4 is aimed at water utility staff who will plan, order and interpret laboratory analyses of water samples collected from the site of a suspected incident. In this chapter, you will learn how to plan for sample analyses before a contamination threat or incident happens, what to ask the lab to analyze for, how to set data quality goals and what precautions to take when handling or shipping samples. The following topics are covered:

1) What you should know about laboratory analyses and testing;
2) Safety considerations for handling suspected contaminated water samples;
3) Types of laboratories, the analyses they perform and how to access labs;
4) Making sure that analyses are conducted in a manner that ensures high-quality, useable results;
5) Screening approaches to determine if contaminants are present in a sample; and
6) Threat response planning for analytical laboratories.

Chapter 4 summarizes Module 4 of the Toolbox, which can be obtained at EPA's Water Security website at www.epa.gov/watersecurity.



What Do I Need to Know About Laboratory Analyses?

To plan effectively for threat response, you need to be familiar with the general types of contaminants, how samples are analyzed, what laboratories can perform such analyses, what to look for in the data and how to use the results in decision-making. It is not enough for you to simply "leave it up to the lab to decide what to analyze" because:

- The threat warning, the circumstances surrounding the threat, or information collected during site characterization or field safety screening may provide clues to the nature of the contaminant or compound. You should pass on such information to the laboratory so the right analyses can be performed.

- Different contaminants may need different sampling, preservation, handling or shipping methods, otherwise the samples may be compromised, resulting in poor quality data or useless data. You should be familiar with these differences so that your samples arrive at the laboratory in useable condition. Refer to Module 4 of the *Response Protocol Toolbox* for more information on sampling, preserving samples and shipping.

- In response planning and decision-making, you should take into account the time needed by a laboratory to analyze the sample for contaminants. This time will vary depending on the analyses and the nature of the contaminant and other factors.

- You should work with the laboratory to choose the analyses to be done, determine if the lab can do the analyses and specify the data quality goals (e.g., accuracy, precision, range).

Most importantly, you should work together with the laboratory to understand what the analytical results mean and the limitations of the data.

Safety Considerations for Water Utilities and Others

Contact with contaminated water, soil or other materials may pose serious threats to your health or safety and that of other water utility staff, emergency responders, Site Characterization Team members, transport staff, laboratory staff or others. Anyone who may be collecting, handling or analyzing samples that may contain unknown contaminants should plan ahead of time to ensure their own safety and that of their staff.



Utilities and laboratories should develop and routinely use Health and Safety plans ahead of time. You, the Site Characterization Team and the laboratory should discuss and clearly identify any potential risks associated with the suspect water to allow all parties to take appropriate safety measures. The laboratory should also have an internal hazard communication plan to ensure that everyone handling suspect samples is aware of the potential danger and takes adequate precautions.

Types of Labs and Analyses Performed

There are several ways to classify analytical testing laboratories in the U.S. Labs can be classified by sector, such as:

- **Utility labs**, such as your water utility's own lab, which may be the first to respond to most contamination threats;
- **Non-utility labs**, such as **commercial labs** that can analyze many kinds of contaminants in water, tissue, soil or air; **specialized labs** such as commercial, government or university labs that do highly specialized analyses; and **government labs** run by cities, counties, states, the EPA, FBI, Centers for Disease Control and Prevention (CDC) and other public agencies.

If your utility has a lab for testing water quality, then your lab will probably be the first lab to analyze samples suspected of being contaminated. Other non-utility labs can provide support by confirming your lab's analysis or by performing analyses that your lab may not be able to perform.

Sometimes your utility lab may not be able to analyze the samples, especially if site characterization suggests that the samples do not fall in the "Low Hazard" category described in Chapter 3. You may therefore decide that the samples should not be analyzed by your utility lab but should instead be analyzed by a non-utility lab that is certified to handle and analyze hazardous samples.

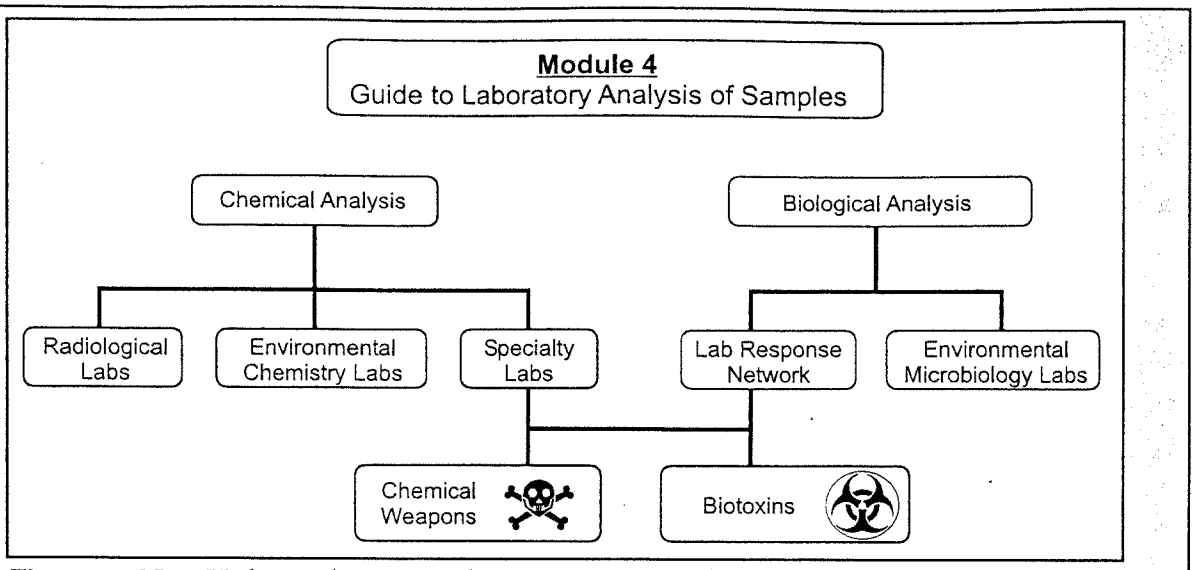


Figure 3. Non-Utility Laboratories by Contaminant Class. From Module 4, *Response Protocol Toolbox.*

You should also keep in mind that certain contaminants may potentially contaminate lab equipment, which could cause contamination of future tests. For this reason, it is important to get as much information concerning the possible contaminant as is feasible from the threat warning, the field safety screening and site characterization. This information should be shared with the laboratory staff in order to plan for analyses and to ensure both safety and good results.

Non-utility analytical laboratories can be classified according to the kinds of analyses they perform (Figure 3). Different analytical capabilities are briefly described below.



Non-Utility Laboratories That Perform Chemical Analyses

Radiological Labs: Radiological labs analyze and identify radioactive substances and contaminants such as radioactive isotopes (also known as radioisotopes), radionuclides, radiochemical compounds and radiological weapons. The EPA, Department of Energy (DOE), states and some commercial firms have labs that can analyze radioactive materials. The Federal Radiological Monitoring and Assessment Center (FRMAC), maintained by DOE, can provide information on analyzing radioactive materials.

Environmental Chemistry Labs: This group includes many EPA, state and commercial labs that test water samples to see if they meet federal and state drinking water standards under the Safe Drinking Water Act, Clean Water Act or other relevant environmental laws. Under these regulations, government-certified labs should use certain analytical methods that have been standardized and approved for use.

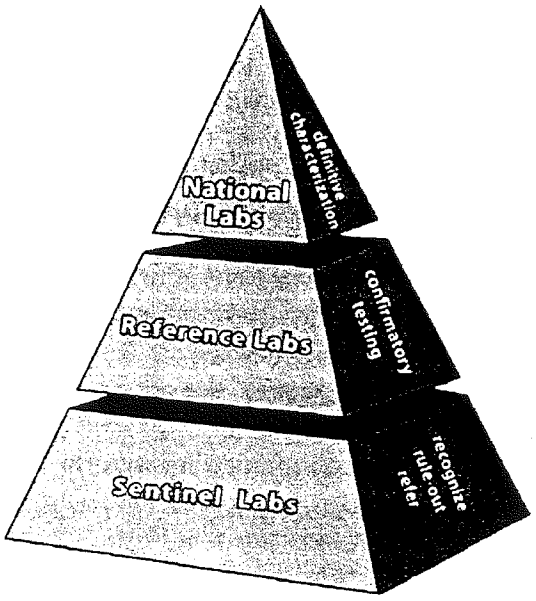
Specialty Labs: Specialty labs include both chemical weapons labs and biotoxin labs. Chemical weapons, defined by the Chemical Weapons Convention (CWC), can only be analyzed by labs that have the appropriate capability and legal authority. Nationwide, there are only a few of these labs, and analyses should usually be arranged by the proper authorities, such as the FBI or certain other federal agencies. Few laboratories currently exist which can perform chemical weapons analyses. Biotoxins, produced by animals or plants, can be analyzed by certain government or university labs. Some commercial environmental chemistry labs may also be able to perform certain biotoxin analyses.

Non-Utility Laboratories That Perform Biological Analyses

Laboratory Response Network (LRN) Labs: The Laboratory Response Network (LRN) was specifically developed to address bioterrorism threats. The LRN was set up by the CDC, the Association of Public Health Laboratories and the FBI. LRN labs include certain city, county, state and federal public health labs. Some labs that are part of the LRN can perform analyses of pathogens, some biotoxins and a "Select List" of particularly dangerous pathogens. During the planning stage, a utility should partner with such labs in order to jointly plan for threat or incident response; this should make it easier to quickly access lab services during an actual incident.

Environmental Microbiology Labs: These labs test for microbiological pathogens such as disease-causing bacteria, certain protozoans, viruses, fungi and other microorganisms. An environmental microbiology lab, state water quality lab, hospital lab, medical lab, public health lab or a lab that belongs to the LRN will probably be able to analyze pathogens in water samples. However, not all of these labs may be able to analyze contaminants resulting from bioterrorism, depending on what the contaminant is.

Diagrammatic Representation of the Laboratory Response Network



The LRN membership is organized into "Sentinel Labs" which recognize a contaminant, rule it out and/or refer the sample to the next level for confirmatory testing by "Reference Labs". At the top of the pyramid are "National Labs" (such as the CDC and the U.S. Army Medical Research Institute for Infectious Diseases, or USAMRIID), which are capable of definitive characterization of even the most hazardous biological agents. See Module 4, *Response Protocol Toolbox.*

Obtaining High-Quality Lab Results

Laboratory analyses of samples are performed to get accurate factual information on whether samples are contaminated or not. This factual information is needed to make important decisions which can affect many people. It is crucial that the analyses be performed in a manner that is credible, accurate and repeatable and that the results are of sufficient quality to be useful for decision-making.

(If the data will be used for a criminal investigation, refer to Section 3.5 of Module 4 of the Toolbox for further information).

Some steps to obtain high-quality analytical results include the following:

- Plan for analyses before a threat or incident occurs. Some labs may be able to run certain analyses with little or no advance notice. However, many labs should be contacted well before the analysis is done so they can prepare for the analysis;
- Choose a reputable, experienced and certified laboratory;
- Maintain communication with the Incident Commander, public health officials and the laboratory to ensure that the right analyses are performed;
- Use standard protocols for sample collection, storage, transport and processing;
- Use analytical methods which have been standardized to the greatest extent possible (e.g., EPA methods and other standardized methods);
- Work with the lab and drinking water primacy agency to define both data quality goals to ensure good, accurate results and suitable detection limits that can measure both background and harmful, elevated concentrations of the compound;
- Collect enough samples from appropriate locations to obtain meaningful, representative results; and
- Maintain good records, such as the chain-of-custody, sample locations, date and time of sampling, who sampled, shipping information, lab contact information, types of analyses requested and any observations.

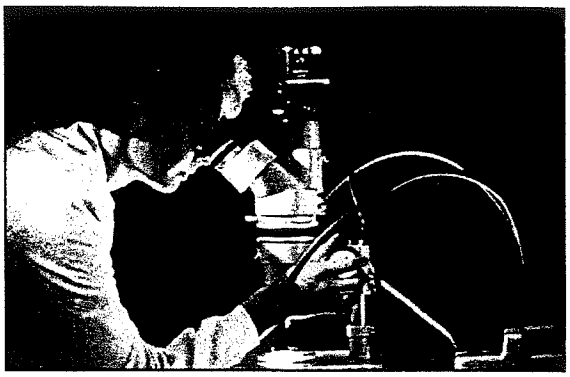
EPA's Compendium of Environmental Testing Laboratories

This database of laboratories describes lab analytical capacities and capabilities. The database is designed to assist EPA and other users to identify qualified and appropriate laboratories that analyze chemical, biological, and radiological agents. Users must be registered to access the database. To log on, visit the website at www.epa.gov/compendium or contact your regional EPA laboratory.



Approaches to Analytical Screening For Unknown Contaminants

What should you ask the lab to analyze for when the contaminant is not known? **Screening is a systematic scientific approach to try to identify unknown contaminants that may be present in a sample.** Screening involves progressively analyzing a sample to try to identify an unknown contaminant(s) through skilled, systematic laboratory analysis. This can be very difficult when there may be thousands of possible contaminants. Contaminant identification may be even more difficult if there is no information from the threat warning, site characterization or field safety screening to indicate the nature of the contaminant, if any.



Unfortunately, there is no one screening process that can detect all known contaminants or compounds. In addition, different laboratories may have slightly different approaches to screening. Thus, the judgment and experience of an individual emergency response planner, Incident Commander or public health official can be extremely important in helping the lab to plan and/or implement the right screening approach that will result in identifying the contaminant(s) present, if any. This is another reason why everyone involved in emergency planning and response should understand at least the basics of laboratory analyses of samples.

Screening a sample that may contain contaminants involves sifting through evidence to narrow the list of unknowns down to a few suspected contaminants. Screening is done in two steps. The first step is the **Basic Screen** and the second step is the **Expanded Screen.**

The **Basic Screen** is a broad-spectrum screen for common chemical contaminants ("the usual suspects"). The Basic Screen uses widely-used methods to analyze the sample for a variety of contaminants of concern. However, these methods do not cover all contaminants that may potentially be used to contaminate water; for example, there are no standard tests for all biotoxins in water. Make sure that the laboratory has all the information from field screening before it undertakes a basic screen.

Basic screening for radiological contaminants is done by measuring radioactivity; for example, by using a Geiger counter. A Geiger counter can be used as a field screening tool, or it can be used in the lab. If radioactivity is detected, the chemical identity of the radionuclide should be determined through further analysis.

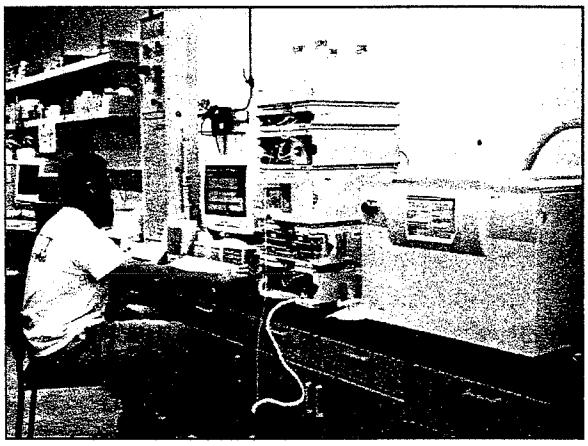
To cover the shortfalls of the Basic Screen, the **Expanded Screen** tests for more unusual chemical or biological contaminants. The Expanded Screen "explores" to find out what might be in the water sample and looks for contaminants that the Basic Screen may have missed.

Microbiological screening is similar to screening for chemical contaminants or biotoxins, except that it targets pathogenic microorganisms. It involves four steps:

1) Rapid field testing. The sample is tested in the field to see if the pathogen is present. Keep in mind that rapid field testing equipment for pathogens may be limited.
2) Sample concentration and recovery in the field. Large volumes of suspect water are collected and the sample is concentrated down to a smaller volume to improve the chances of finding a pathogen;
3) Testing at a "Sentinel Laboratory", which is a laboratory certified for analysis of certain pathogens; and
4) Testing at a "Reference Laboratory", if necessary, to compare the pathogen to known pathogens kept in "reference collections" (much as reference books are kept in a library).

Although laboratory analyses may seem complex, it is crucial for threat response managers to be aware of analytical capabilities and limitations so that you can use the information to make important decisions. If laboratory testing **'confirms'** the presence of a contaminant in the water system, public health response actions should be initiated. These are discussed in the next chapter.





Why Analytical Laboratories Should Plan for Threat Response

Laboratories are a key part of our nation's response to water contamination threats and incidents. Like water utilities and public agencies, laboratories should be ready to respond to an emergency by quickly and accurately analyzing samples suspected of being contaminated and producing reliable results. These results should be used by you, the Incident Commander, Unified Command, public health agencies and others to make important decisions that could have far-ranging effects.

Labs that may someday be involved in analyzing samples during a water contamination threat emergency should develop their own Laboratory Response Plans. A Laboratory Response Plan is a plan prepared by a laboratory detailing their approach and capabilities for the 24/7 processing of emergency water samples. Such a plan should always be tailored to local needs, facilities and skills, and it should be reviewed and accepted before use. Module 4 of the Toolbox describes laboratory response planning in detail. The "model screening procedure", for example, can help labs plan for screening samples.

In the next chapter, public health response activities are described.

Public Health Response Guide

Introduction

A primary goal of threat response planning is to protect public health and safety to the greatest extent possible. This chapter describes public health response planning and public notification in the event of a contamination threat or incident. This chapter discusses:

- Who is responsible for undertaking public health response actions;
- The role of the water utility; and
- The need for cooperation and interaction between public health officials, utilities, drinking water primacy agencies and others to protect public health and deliver good information to the public.

As a water utility manager or emergency response manager, you should read this chapter to ensure that you understand how to help protect public health and safety in the event of a contamination threat or incident.

Chapter 5 summarizes Module 5 of the Toolbox, which can be obtained at EPA's Water Security website at www.epa.gov/watersecurity.



Response Planning for Protection of Public Health

Water utilities, public health agencies and other threat response managers should plan together for protection of public health. Such mutual planning is crucial.

There are five steps to consider in planning for effective public health response:

1) Plan the public health response to a contamination threat or incident before a threat or incident occurs;
2) When a threat or incident occurs, determine the public health consequences;
3) Carry out operational response actions to contain the contaminant and protect public health;
4) Communicate effectively with other agencies, utilities and the public through a communication and notification plan; and
5) Provide an alternate short-term water supply (your utility's ERP should provide options for an alternate water supply).

Each of these steps is summarized below.

Step 1. Plan the Public Health Response Before A Threat Occurs

Long before a threat is received, your utility, together with local public health agencies, should plan and coordinate the public health response. State and local public health agencies typically develop Public Health Response Plans that cover responses to all kinds of public health emergencies, including water emergencies. Examples of response planning are provided below, modified for water utilities.

Use public health planning in your own utility's Emergency Response Plan (ERP): Each utility should examine how public health response plans of local and state health agencies address water contamination. Utilities should use relevant parts of the public health response plans in their own ERPs.

Know which agencies will be involved in the public health response: Water utility emergency response planners should know which agencies will be involved in the public health response and what these agencies will be doing. The appropriate responsible agencies can vary significantly by locality. You should coordinate your emergency response planning with appropriate agencies and take advantage of training offered by others.

Agencies that may be involved in the public health response to a water contamination incident include:

- Water and wastewater utilities;
- Drinking water primacy agency;
- Local, state and federal public health and environmental agencies;
- Hospitals, clinics, doctors and poison control centers;
- Local, state and federal emergency services;
- U.S. Environmental Protection Agency;
- Centers for Disease Control and Prevention;
- Agency for Toxic Substances and Disease Registry;
- Federal Emergency Management Agency; and
- U.S. Army Corps of Engineers, National Guard and/or other military organizations.

Develop a communication and notification plan for your utility: Fast, reliable communication is the key to success in coordinating the public health response. Before an incident occurs, water utilities should develop a communication and notification plan. Communication and notification plans should include other agencies, utility staff, utility customers and the public. For example, you should report a contamination threat to the appropriate drinking water primacy agency and public health agencies. Public health agencies may in turn alert doctors, clinics and hospitals to be on the lookout for public health symptoms and to report these to the public health agency. Public health agencies should report symptoms of contaminated drinking water to utilities.

Your utility's communication and notification plan should specify:

- Agencies, organizations and individuals to contact or notify;
- Who will send and receive information;
- Contact information;
- The kinds of information to be communicated;
- When and how to notify your staff, drinking water primacy agency and other agencies and organizations;
- When and how to notify the public; and
- A backup communication and notification system.

Identify possible operational response actions during the planning process: During the planning process, your utility should identify possible operational response actions to respond to possible public health threats. During an actual contamination threat or incident, you should act quickly to protect public health and prevent the contaminant from spreading.

Operational response actions are described below in Step 3.

Step 2. When a Threat or Incident Occurs, Determine the Public Health Consequences

Once a contamination incident has been **'confirmed'**, you should find out more about the contaminant and its health effects in order to choose the right course of action to keep the contaminant from spreading and to protect public health. EPA's Water Contaminant Information Tool (WCIT) can provide useful information to help you make these decisions.

Water Contaminant Information Tool (WCIT)

The **Water Contaminant Information Tool** is a secure, on-line database developed by the U.S. EPA that provides information on contaminants of concern for water security. WCIT contains the most up-to-date, reliable information on water contaminants, such as contaminant names, fate and transport, health effects and toxicity, medical information, drinking water treatment effectiveness, potential water quality and environmental indicators, sampling and analysis, helpful response activities for utilities and other useful information.

To learn more about WCIT, download the WCIT Fact Sheet from EPA's water security publications website at cfpub.epa.gov/safewater/watersecurity/tools.cfm , or connect to the WCIT website at www.epa.gov/wcit. Access to the WCIT database is controlled.

What You Need To Know To Make The Right Public Health Decision:

- Potential acute (severe short-term) health effects of the contaminant;
- Potential chronic (less severe but longer-lasting) health effects of the contaminant;
- Contaminant concentrations that can cause these effects;
- Exposure pathways (ingestion, inhalation or skin contact); and
- How long the contaminant will remain in water, what causes the contaminant to break down, what the breakdown product is and how toxic this breakdown product is compared to the original substance.

As the utility manager, you should work with public health agencies to determine how fast the contaminant can spread throughout the water system, whether there are points at which the spread of contaminants can be stopped and what public health response actions to take. For example, you should have up-to-date information on your water distribution system, such as water flow volumes and flow rates, locations of shutoff valves and access points and so on, so that you can determine where and how fast contaminated water might spread in the event of a contamination incident. Getting this information and keeping it up to date may be challenging, but the benefit should be an improved ability to protect public health.

If it is possible, the public health agency should also try to estimate how much contaminant remains after a given period of time has passed, how dangerous this amount is, what health precautions to take, and when and where these precautions apply.

Estimating Terrorist Impacts on Water Systems:

EPA and others have developed tools, such as hydraulic models, to help utilities estimate the effects of a terrorist incident on drinking water systems. If your utility decides to use such tools, you should be aware that such models may involve costs and require training and time to apply them. Practice using such tools before an incident occurs so that you can act quickly and with due diligence when a real incident occurs.

Step 3. Carry Out Operational Response Actions

Operational response actions are actions that protect public health by reducing exposure to the suspect water. Operational response actions are often carried out while more information is being collected to determine whether or not the threat is **'credible'**. It is critical to work with local agencies and elected officials when initiating operational response actions.

Example: The Mayor receives a call that a water tank has been contaminated. The Mayor then phones you at the water utility and you decide, as the water utility manager, that contamination of a particular water tank is **'possible'** because that tank is on-line and the fence around the tank is old and decrepit. Your immediate operational response is to shut the valves on pipes leading into and out of the water tank to isolate the water tank from the rest of the water system (if feasible), thus preventing any contaminant from spreading to the rest of the system. You may need to notify your state drinking water primacy agency immediately. Also, in addition to the federal Public Notification Rule, local notification rules can vary by locality and all other appropriate parties should be notified (e.g., public health agency, law enforcement, and others).

Containment of suspect water should be done as soon as possible, ideally during the first stage of threat evaluation when you are determining if the threat is **'possible'** or not. If you cannot contain the suspect water quickly, then you should accelerate the determination of whether or not the contamination threat is **'credible'**.

Deciding on operational responses can be tricky, because there could be unforeseen consequences of the action taken. For example, restricting water use or water delivery could result in portions of the service area, including hospitals and schools, being deprived of water. This could lead to poor sanitation or a host of other effects. To deal with these other effects, you should plan well in advance of a contamination threat or incident.

For Water Utilities: Possible Operational Response Actions to Protect Public Health

- ❑ Isolate and contain the suspect water so it doesn't spread and contaminate other parts of the water system;
- ❑ Increase levels of disinfection; for example, by using a mobile disinfection unit to treat a part of the water system or by adding more chlorine to the system;
- ❑ Notify the public to take precautions, such as "Boil water", "Do not drink", or "Do not use" in coordination with your state primacy agency, public health officials and other officials, as appropriate.
- ❑ Distribute bottled water or water from neighboring utilities as a safe alternative to the contaminated or suspect water.

Step 4. Notify the Public

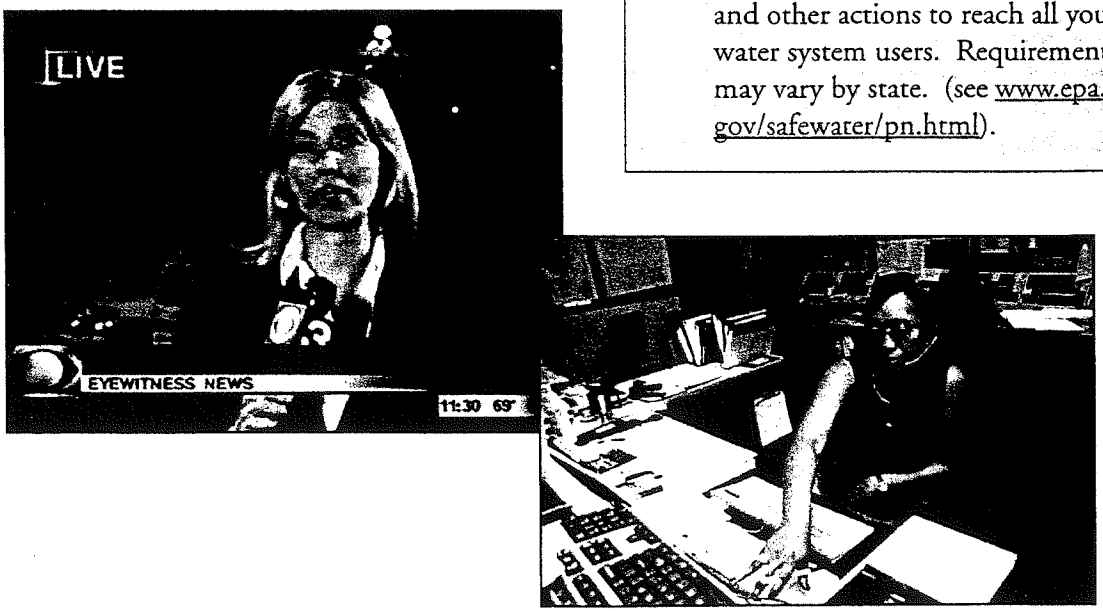
If the contamination threat is **'credible'**, then you should coordinate with your drinking water primacy agency and public health agencies to decide whether to issue a public notice or not. It is critical to work with local agencies and elected officials when planning public notification.

One way to help the public minimize their exposure to contaminated water is to issue a public notice to avoid drinking or using the water. The Federal Public Notification Rule under the National Primary Drinking Water Regulations requires public notification when there is a *"situation with significant potential to have serious adverse effects on human health as a result of short term exposure"* (40 CFR § 141.202).

Once you have decided to notify the public to reduce their exposure, you should decide what type of notification to issue, based on the threat or incident and the contaminant potentially involved. Examples of public notices are described in the table on page 44.

Public Notification Procedure under the National Primary Drinking Water Regulations, Federal Public Notification Rule (Tier 1, 40 CFR 141.202):

- ❑ Notify the public as soon as practical, but no later than 24 hours after you learn of the water quality violation or credible contamination threat;
- ❑ Discuss the threat with your drinking water primacy agency as soon as practical, but no later than 24 hours after you learn of the situation, in order to find out if any additional public notification is required; and
- ❑ Provide any additional public notification as required by your drinking water primacy agency. Examples might be repeat notices, providing direction on how long the notices are in effect, how often the notices are to be issued, the form and timing of public notices, and other actions to reach all your water system users. Requirements may vary by state. (see www.epa.gov/safewater/pn.html).



Examples of Public Notices About Drinking Water

Type of Notice	When To Use This Notice	Relative Burden on Public
Boil Water Before Use	Use if boiling will make the water safe to drink and boiling does not create other health problems, particularly through routes of exposure other than drinking (e.g., inhalation or skin contact with water vapor).	Least burden. Facilities which use large amounts of water for drinking or food preparation will be most affected.
Do Not Drink	Use if boiling is not an option and if water vapor and skin contact do not pose risks.	More burden – an alternate water supply for drinking and food preparation will be needed.
Do Not Use	Use if the contaminant is unknown, if treatment is not possible at the moment or if the contaminant poses a health risk through inhalation of water vapor or through skin contact with affected water.	Greatest burden – an alternate water supply for all uses, including fire fighting and flushing toilets, will be needed.

Because water use restrictions can have unintended health consequences, you should weigh the potential public health consequences of restricting water use against the public health threat posed by the contaminant.

Step 5. Provide an Alternate Water Supply for the Short Term

If the decision is made to issue a "Do Not Drink" or "Do Not Use" order, utilities should be prepared to provide alternate safe sources of water such as bottled water, potable water trucked to distribution points, or water provided by an interconnection. You may need assistance from federal, state and/or local emergency responders to distribute water. Keep in mind that providing an alternate water supply can pose a significant logistical challenge and should be planned in advance. Consider the use of mutual aid agreements to provide backup water from other municipalities or sources, a memorandum of understanding (MOU) with other water suppliers, and/or contracted services to provide alternate water.

In the next chapter, you will learn about the key issues involved in remediation and recovery of a water system.



Remediation and Recovery Guide

Introduction

In this chapter, you will learn about the key issues involved in remediation of a contaminated water system and how to return the system to normal, safe operation. Understanding the remediation process is important because, although you may not necessarily be responsible for overseeing remediation, you should be seeking ways to provide safe water while remediation is ongoing. Other parties involved in remediation should include public health agencies and drinking water agencies that will monitor water quality and the remediation, and remediation specialists who will conduct the technical work of contaminant cleanup.

Once a contamination threat or incident has been '**confirmed**', the contamination must be cleaned up, or remediated. **Remedial response actions are actions that reduce or eliminate the contaminant.** By this time, remediation experts should be on hand to clean up the contaminant.

When the remediation is completed and the water system is demonstrated to be safe, your responsibility should be to return the water system to normal, safe operation as quickly as possible. **Recovery refers to the return to normal operations after remediation.**

Chapter 6 summarizes Module 6 of the Toolbox, which can be obtained at EPA's Water Security website at www.epa.gov/watersecurity.



Who is Responsible?

Once a contamination threat is '**confirmed**' and the contamination has been contained, it is likely that a Unified Command structure will oversee remediation and recovery actions. Unified Command will manage a team of specialists from different agencies and organizations who know how to remediate the particular contaminant involved. Specialists should be able to tell you when it is safe to return to normal operations.

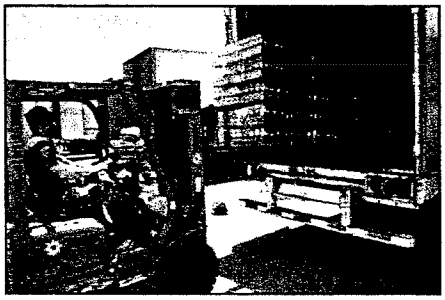
Refer to Chapter 2 for information on the National Response Plan, National Incident Management System, Incident Command and Unified Command.

You should be working to support Unified Command to provide technical assistance and to help in recovery. It is possible that your utility may be more involved in protecting the remaining unaffected water system and ensuring safe water from another source than in the actual remediation activities.

Remediation and Recovery

There are nine steps in the remediation and recovery process. Each of these steps is briefly described below. Keep in mind that it is critically important to keep the public informed throughout the entire remediation and recovery process.

Step 1. Find an Alternate Water Supply for the Long Term



If remediation and recovery actions are going to take some time, safe water should be provided for the public in the meantime. An alternate safe water supply should be identified during the planning process, before a contamination incident happens. If your utility, working with local agencies, cannot provide a long-term alternate water supply, then you should request help from state and federal emergency planning agencies such as EPA, FEMA, or the Army Corps of Engineers. Be aware of the challenges and planning details that may be involved.

Step 2. Do a System Characterization and Feasibility Study

After the contamination has been contained, Unified Command will most likely need more information to choose the right remediation method, such as the identity of the contaminant involved and how much of the water system is contaminated. Command should also identify possible remediation options and find out how effective and feasible those options are. Doing a System Characterization and Feasibility Study should provide this information. Because no single agency is likely to have all the resources needed to carry out remediation and recovery, it is likely that several agencies will be involved in remediation and recovery. Under Unified Command, the utility should coordinate with their drinking water primacy agency, public health agencies and other agencies involved in protecting public health and drinking water.

Step 3. Do a Risk Assessment

It is important to find out how risky the incident site is to workers and the public. Unified Command should do a quick risk assessment. This quick risk assessment should also be useful for deciding what response actions to take and setting remediation goals. Any risk, together with risk reduction measures, should be communicated by the Incident Commander or Unified Command to your utility, public health agencies, drinking water primacy agency and the public.

Step 4. Evaluate Remediation and Rehabilitation Alternatives

Once a System Characterization and Feasibility Study (Step 2 above) has been carried out, Unified Command can begin to evaluate and compare possible remedial actions, remediation technologies and rehabilitation methods to

restore the water system to normal. Remediation can also be done in stages, such as emergency short-term remediation to reduce dangerous levels of a contaminant to a safer level, followed by long-term remediation to remove any remaining low levels of the contaminant.

Step 5. Choose the Right Remediation Technology

Unified Command should select a remediation technology that will:

- Protect human health and the environment;
- Comply with all applicable regulations (such as the Safe Drinking Water Act); and
- Be feasible, affordable and cost-effective to the extent possible.

Step 6. Design the Remediation

After remediation actions and technology are selected, the engineering design, planning and documentation of the remediation begins. Your water utility and other technical support staff should be involved in providing technical assistance in the design of the remediation to help prevent unforeseen impacts on the remaining unaffected water system.

Step 7. Do the Remediation

Once the remedial design has been approved, the remediation and rehabilitation of the contaminated parts of the water system are carried out. Contractors may assist in these procedures. Your expertise in the normal operation of the water system will be essential during this step to avoid unforeseen impacts on the water system.



Step 8. Do Post-Remediation Monitoring

After remediation is completed, both water quality and the water system should be monitored to ensure that the remediation was effective. If the remediation was not effective, the problem should be fixed and the water tested again.

Step 9. Communicate with the Public to Restore Confidence



During all stages of remediation, you and Unified Command should keep the community informed about the remediation process, who is in charge, how it could affect human health, what is being done to restore safe water, and when things are expected to return to normal. Otherwise, the public may continue to use unsafe water, hoard water, or act in other ways that could cause unforeseen problems and even interfere with remediation.

The Final Step - Full Recovery

The final step is the resumption of safe, normal system operations and the provision of safe water to the public. With full recovery of your water system, you have achieved a key goal of effective response.

Final Thoughts

Planning for water security and emergency response may seem overwhelmingly complex. However, several key points can help you deal effectively with a contamination threat or incident:

1) Your first priority is protecting public health and safety;

2) There are many resources for assistance. These should be identified as part of the planning process, before a threat or incident occurs;

3) Always use due diligence in planning for and responding to a threat;

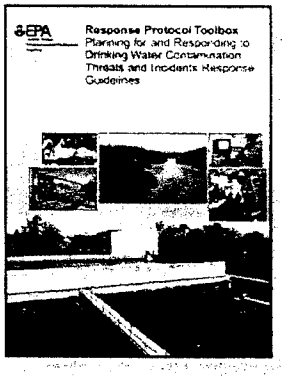
4) For a successful response, it is critical to have cooperation and good communication between your utility and other agencies and response organizations;

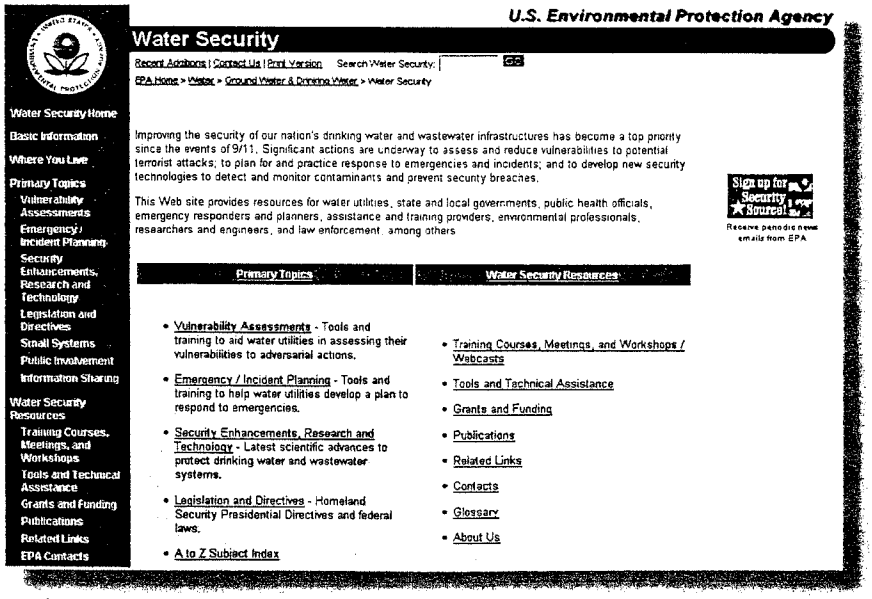
5) Plan and practice emergency response procedures ahead of time to ensure that an actual emergency response will go as quickly and smoothly as possible;

6) You should make decisions in a timely manner, based on the best information available to you at the time; and

7) You can help to ensure legally defensible decisions through organization, timeliness, quality control and good record-keeping.

Remember, if you manage a utility or its emergency response program, you are responsible for protecting public health and the environment. However, you are not alone in this mission. Establish communications now with the agencies that can help you during an emergency, and begin to plan and train for contamination threats and incidents.





www.epa.gov/watersecurity

Glossary of Terms

Basic Screen - A broad-spectrum screen to identify common chemical contaminants that may be present in a suspect water sample. The Basic Screen employs widely-used methods to analyze the sample for a variety of contaminants of concern. See Chapter 4.

Commercial labs - Labs that perform testing and analyses of samples as a business. Commercial labs may be able to analyze many kinds of contaminants in water, tissue, soil and air. See Chapter 4.

'Confirmed' - A 'confirmed' threat is a 'credible' threat that has been verified through sample analyses that prove that the water is contaminated with a harmful substance. Alternatively, in the absence of analytical data, a threat is 'confirmed' when a preponderance of evidence indicates that a contamination incident has occurred. A 'confirmed' threat becomes a contamination incident. See Chapter 2.

Contamination threat - A suggestion or an indication that water has been or will be contaminated, but no conclusive proof has been collected yet to confirm that contamination has actually occurred. A threat may be written, verbal, or based on observations or other evidence. See Chapters 1 and 2.

Contamination incident - A contamination incident has occurred when the presence of a harmful contaminant or other substance in drinking water has been 'confirmed' (i.e., verified through sample testing or by a preponderance of evidence). See definition of 'confirmed' (above) and Chapters 1 and 2.

Contamination Threat Management Matrices - Module 2 of the *Response Protocol Toolbox* contains these matrices to assist in collecting and organizing the information needed to help determine if a threat is 'possible', 'credible' or 'confirmed'. Each matrix covers: 1) Information and factors to be considered in assessing a threat; 2) Possible notifications to make; and 3) Possible response actions. These generalized matrices can be customized to a specific utility or incident. See Chapter 2.

Core field testing - The minimal recommended monitoring activities to perform when conducting a site characterization, including monitoring for radiation, cyanide, chlorine residual, conductivity and pH of the suspect water. See Chapter 3.

'Credible' - A 'credible' threat is a 'possible' threat that is believable and plausible, based on reliable information that shows there is reason to believe that the threat warning is real and that contamination is likely to have happened. A 'credible' threat is a much higher threat level than a 'possible' threat. See Chapter 2.

Due diligence - Due diligence has been exercised when all suitable, sensible and responsible actions have been taken to evaluate a contamination threat or incident and respond appropriately. See Chapter 1.

Emergency Operations Center (EOC) - A pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response to an emergency. It is not a part of on-scene incident management, but supports the on-scene Incident Commander or Unified Command by arranging for needed resources. See Chapter 2.

Emergency Response Plans (ERPs) - The 2002 Public Health Security and Bioterrorism Preparedness and Response Act required water systems serving more than 3,300 customers to develop and maintain Emergency Response Plans (ERPs) to prepare for responding to contamination threats and intentional contamination incidents. See Overview.

Environmental chemistry labs - Labs that analyze environmental samples to see if they contain chemical contaminants of concern or meet federal and state regulations for quality and safety. Many EPA, state and commercial labs perform environmental chemistry analyses. Labs performing such analyses should be government-certified to use standardized, pre-approved analytical procedures. See Chapter 4.

Environmental microbiology labs - Labs that analyze environmental samples (usually water, soil or food) to determine if pathogenic microorganisms are present, such as disease-causing bacteria, protozoans, fungi, viruses or others. See Chapter 4.

Expanded Screen - To address the limitations of the Basic Screen (see above), an Expanded Screen tests for more unusual chemical or biological contaminants or contaminants that may have been missed by the Basic Screen. See Chapter 4.

FEMA (Federal Emergency Management Agency) - The national agency that coordinates emergency and disaster relief responses. FEMA is one of several agencies included in the Department of Homeland Security. See "Additional Resources".

Field safety screening - A safety screening procedure that is performed by the Site Characterization Team in the field, before entering the site of a possible threat or contamination incident. The field safety screening is done to observe site conditions and to detect any immediate threats to the team from contaminants. It may include field testing for radioactivity, chemical agents and/or biological agents. See Chapter 3.

Government labs - Laboratories that are operated by government agencies at the city, county, state or federal level. Examples of the latter include labs operated by the EPA, FBI, and Centers for Disease Control and Prevention (CDC). A common role of government labs is to test samples to determine if regulatory standards are met. See Chapter 4.

Hazard categories (Low Hazard, Radiological Hazard, Chemical Hazard, Biological Hazard) - The hazard posed by a contamination threat or incident may be classified according to the type of hazard, the cause of the hazard, and the risks posed. Examples of hazard categories include Low Hazard (no obvious signs of contaminants; contaminants are probably diluted and not widespread), Radiological Hazard (radiation is tentatively identified at the site or in the water, posing potential risk), Chemical Hazard (highly toxic chemicals such as WMD or volatile toxic industrial chemicals are tentatively identified at the site or in the water, posing potential risk), and Biological Hazard (pathogenic microorganisms are tentatively identified, posing potential risk). See Chapter 3.

Incident Command System (ICS) - This is the national standard for the command, control and coordination of a response to a threat, incident or emergency of any kind. It requires that an individual Incident Commander, from an agency that is responsible for responding to the emergency or threat, manage the response activities. See Chapter 2.

Incident Commander - In the Incident Command System, the Incident Commander is the individual who is responsible for managing the overall response to the emergency. See Chapter 2.

Initial hazard assessment - Before the Site Characterization Team is sent to investigate the site of a threat or contamination incident, the Incident Commander should make an initial hazard assessment to evaluate potential risks and the need for special protective gear or equipment for handling hazardous materials or sampling. This initial assessment should be based on available information and an initial evaluation of the threat (i.e., is the threat 'possible' or 'credible', or not). See Chapter 3.

Laboratory Response Network (LRN) Labs - A network of labs that was specifically set up to address bioterrorism threats. The LRN was created by the Centers for Disease Control and Prevention (CDC), the Association of Public Health Laboratories, and the FBI. LRN labs include certain city, county, state and federal public health labs that can perform analyses of pathogens, some biotoxins, and other particularly dangerous pathogens. In order to have samples analyzed by an LRN lab, arrangements should be made during the response planning stage. See Chapter 4.

Non-utility labs - Laboratories that are not run by water or wastewater utilities. Examples include government labs, commercial labs, university or research labs, specialty labs and other types of labs. See Chapter 4.

National Response Plan (NRP) - The NRP provides a comprehensive, all-hazards approach to managing the response to domestic incidents or emergencies. It provides the basis for federal agency coordination with state, local and tribal governments and with the private sector to address incidents or emergencies. The NRP is based on the National Incident Management System (NIMS) for managing incident response (see below); together they provide a template for effective threat prevention and response. See Chapter 2 and "Additional Resources".

National Incident Management System (NIMS) - NIMS provides a comprehensive national framework and standard for incident management. NIMS incorporates the Incident Command System as the management system to deal with threats, emergencies and incidents. See Chapter 2 and "Additional Resources".

Operational response actions (also known as immediate operational responses) - Actions that protect public health by reducing exposure to the suspect water. Operational response actions are often carried out while a threat is being evaluated in order to protect public health in the event that the threat is confirmed to be an incident. Examples include preventing the spread of suspected contaminated water, increasing disinfection, notifying the public to take precautions, or distributing bottled water. See Chapters 2 and 5.

'Possible' - After a threat is received, the first step in evaluating the credibility of a threat is to decide if it is 'possible'. A 'possible' threat is one where the circumstances suggest that contamination could have occurred and that further investigation is needed. If the threat is found to be not 'possible', then the investigation is closed, the threat is documented, and operations are returned to normal. See Chapter 2.

Preponderance of evidence - Most of the available evidence points in a certain direction. See Chapter 2.

Public notification procedures - Procedures for notifying the public in the event that a water contamination threat or incident has occurred where there is "significant potential to have serious adverse effects on human health as a result of short-term exposure" (40 CFR § 141.202, known as the Federal Public Notification Rule under the National Primary Drinking Water Regulations). Public notification procedures include issuing a public

notice identifying the potential contaminant and providing directions for avoiding drinking or using the water. See Chapter 5.

Radiological labs - Labs that analyze and identify radioactive substances and contaminants such as radioactive isotopes, radionuclides, radiochemical compounds and radiological weapons. The EPA, Department of Energy (DOE), states and some commercial firms have radiological labs. FEMA operates the Federal Radiological Management Center (FRMAC) which can provide information on analyzing samples for radioactive materials. See Chapter 4.

Rapid field testing - Testing that is done in the field by the Site Characterization Team to try to identify the type of contaminant that may be present so that the right laboratory analyses can be done. Field testing is done to obtain preliminary information, and should be followed up by laboratory testing to 'confirm' whether contamination is present or not. See Chapter 3 and the EPA's Technology Testing and Evaluation Program (TTEP) in "Additional Resources" (under EPA NHSRC) to learn about equipment for rapid field testing.

Recovery - The return to normal operations after remediation of a contaminated water system or site has been completed. See Chapter 6.

Remediation, remedial response actions - Response actions that reduce or eliminate the contaminant from the affected water system or site. Remediation is usually performed by remedial specialists overseen by agencies with remediation oversight responsibilities. See Chapter 6.

Response Guidelines - An EPA document that contains all of the forms, checklists, and report formats from the comprehensive *Response Protocol Toolbox: Planning For and Responding to Drinking Water Contamination Threats and Incidents.* The *Response Guidelines* and this Handbook were designed as companion documents to be used together for response planning. See "Overview" and "Additional Resources".

Response Protocol Toolbox: Planning For and Responding to Drinking Water Contamination Threats and Incidents **(Toolbox, or RPTB)** - A comprehensive guidance document developed by the EPA for the water sector, the Toolbox describes planning measures to prepare for and respond to drinking water contamination threats and incidents. The chapters in this Handbook correspond to modules in the Toolbox. See "Overview" and "Additional Resources".

Site characterization - Site characterization involves the investigation of the site of a threat or incident to find out the "what, where, when, who, why and how" of the threat or incident. After the initial hazard assessment, site characterization activities include field safety screening, site investigation, rapid field testing of the water, and sampling. A site could be an entire water system or a component, such as the distribution system, source water, treatment facility, storage tanks or some other area that may have been contaminated. See Chapter 3.

Site characterization team - The group of individuals that performs site characterization and sampling activities following receipt of a threat or incident report. The team may include people from the water utility, police, fire, HazMat specialists, environmental response teams from government agencies, public health officials, FBI and EPA criminal investigators, civil support teams and representatives of other agencies. See Chapter 3.

Specialized or specialty labs - Commercial, government or university labs that perform highly specialized analyses that are not commonly performed by other labs. Examples

include chemical weapons labs and biotoxin labs. Nationwide, there are only a few chemical weapons or biotoxin labs, and analyses should usually be arranged by the proper authorities, such as the FBI or certain other federal agencies. See Chapter 4.

Threat warning - An indication that something may be wrong with water quality or the drinking water system. Threat warnings may include any, some or all of the following: security breach, witness account, direct notification by the perpetrator, notification by the news media, notification by law enforcement, unusual water quality, consumer complaints, and/or notification by public health agencies. See Chapter 2.

Unified Command - In ICS, Unified Command is a unified team effort which allows all agencies with responsibility for the incident, either geographic or functional, to manage the incident by establishing a common set of goals and strategies. This is accomplished without losing or giving up agency authority, responsibility, or accountability. See Chapter 2.

Utility labs - Labs that are run by water utilities. Utility labs routinely perform water quality monitoring to ensure that drinking water is safe for customers. See Chapter 4.

Water Utility Emergency Response Manager (WUERM) - An individual who is responsible for managing the water utility's internal emergency response procedures (also known as the water utility's emergency response coordinator). This individual may also serve as the utility's Incident Commander during emergencies. See Chapter 2.

Additional Resources

This section provides information on resources that may help you in planning and responding to contamination threats and incidents. Information was current at the time of publication of this Handbook.

Agency for Toxic Substances and Disease Registry (ATSDR): ATSDR is a national public health agency which compiles information on contaminants and disease-causing agents. See their website at www.atsdr.cdc.gov/.

Centers for Disease Control and Prevention (CDC): See the CDC website at www.cdc.gov/ or call the CDC Hotline at 1-800-CDC-INFO. CDC compiles and tracks information on diseases, illness, outbreaks, contaminants, health effects, emergency preparedness and response, the national Laboratory Response Network (LRN), bioterrorism agents and other topics.

Compendium of Environmental Testing Laboratories: This laboratory compendium is a database of laboratories, developed by the EPA, which describes the analytical capabilities and capacities of labs nationwide. The database was designed to assist EPA and other users to identify qualified and appropriate laboratories to analyze chemical, biological and radiological agents. To register on-line or to obtain additional information, visit www.epa.gov/compendium. Access to the laboratory compendium is controlled.

Department of Homeland Security (DHS): See the DHS website at www.dhs.gov/. The website provides extensive information concerning threats and posts threat levels and other bulletins. It also contains links to the National Incident Management System (NIMS), Homeland Security Information Networks for Critical Sectors or HSIN-CS, and information regarding the Freedom of Information Act (FOIA).

EPA National Homeland Security Research Center (NHSRC): The NHSRC provides technical information on methods, tools and technologies to assist in protecting public health and safety in the event of a terrorist attack. Examples include the EPA's Technology Testing and Evaluation Program (TTEP), the *Standardized Analytical Methods for Use During Homeland Security Events* and the *Security Information Collaborative – A Guide for Water Utilities*, described elsewhere in this section. See the EPA NHSRC website at www.epa.gov/nhsrc/.

EPA Safe Drinking Water Hotline: This hotline is a service of the Office of Ground Water and Drinking Water. It provides the general public, regulators, medical and water professionals, academia and media with information about drinking water and ground water programs authorized under the Safe Drinking Water Act. You can reach the hotline at 1-800-426-4791 or ask a question at the Hotline's website at www.epa.gov/safewater/hotline.

EPA Water Security Division: See EPA's website at www.epa.gov/watersecurity for information on emergency response planning, training workshops, tools and useful links. The website includes links to information on Emergency Response Plans (ERPs), the *Response Protocol Toolbox*, this Handbook, and many other water security resources.

Emergency Response Plan Guidance for Small and Medium Systems, Emergency Response Plan Outline, and other emergency response planning documents can be downloaded from EPA's water security website at www.epa.gov/watersecurity or by calling EPA's Safe Drinking Water Hotline at 1-800-426-4791 or by sending an e-mail via the Hotline's website at www.epa.gov/safewater/hotline.

Emergency Response Tabletop Exercises for Drinking Water and Wastewater Systems CD: This CD, developed by the EPA, contains tabletop exercises to help train water and wastewater utility workers in preparing and carrying out emergency response plans. The exercises provided on the CD can help strengthen relationships between a water supplier and their emergency response team (e.g., health officials, laboratories, fire, police, emergency medical services, and local, state and federal officials). Users can also adapt the materials for their own needs. Explore the CD at www.epa.gov/watersecurity.

Federal Emergency Management Agency (FEMA): See the FEMA website at www.fema.gov/ or call 1-800-621-FEMA. This national agency coordinates emergency and disaster relief response. Their website contains links to the National Response Plan, the National Incident Management System (NIMS), the Federal Radiological Emergency Response Plan and many other useful emergency response links.

InfraGard: This is an FBI-sponsored information sharing and analysis effort serving the interests and combining the knowledge base of a wide range of members. At its most basic level, InfraGard is a partnership between the FBI and the private sector. InfraGard is an association of businesses, academic institutions, state and local law enforcement agencies and other participants dedicated to sharing information and intelligence to prevent hostile acts against the United States. Learn more at www.infragard.net.

National Response Center (NRC) and National Response Team (NRT): The NRC is the federal point of contact for reporting incidents related to oil, hazardous material discharges, suspicious activity, security breaches or terrorism occurring in the United States. The NRT is an organization of 16 Federal departments and agencies responsible for coordinating emergency preparedness and response to oil and hazardous substance pollution incidents. The Environmental Protection Agency (EPA) and the U.S. Coast Guard (USCG) serve as Chair and Vice Chair, respectively. Call the NRC at 1-800-424-8802 or 1-202-267-2675 or see the NRT's website at www.nrt.org.

National Incident Management System (NIMS): The NIMS integrates effective practices in emergency preparedness and response into a comprehensive national framework for incident management. The NIMS will enable responders at all levels to work together more effectively to manage domestic incidents no matter what the cause, size or complexity. See the DHS website at http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf for the full NIMS document.

National Response Plan (NRP): The NRP establishes a comprehensive all-hazards approach to enhance the ability of the United States to manage domestic incidents. It provides the basis for federal government coordination with state, local and tribal governments and the private sector during incidents. The NRP can be downloaded from DHS's website at www.dhs.gov/dhspublic/interapp/editorial/editorial_0566.xml.

National Environmental Methods Index for Chemical, Biological and Radiological Contaminants (NEMI-CBR): NEMI and CBR Methods Advisor are two tools which will provide information on chemical, biological and radiological contaminants and analytical methods of detection, analysis and identification. These tools are being developed by the U.S. EPA. The National Environmental Methods Index (NEMI) is a free, searchable Internet-based database of environmental methods that allows comparison of methods, performance, cost and other information. NEMI is already available on the Internet at www.nemi.gov. NEMI-CBR incorporates the CBR Methods Advisor, which can help a user to quickly assess a threat, evaluate the site of the incident, collect samples and choose the best method for a given situation when there is limited information available regarding the possible identity of a contaminant.

Physician On-Line Reference Guide for Waterborne Disease: This on-line reference provides information on water-related diseases and other medical and health emergency response information. See the website at www.WaterHealthConnection.org/index.asp.

Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (also known as the Bioterrorism Act of 2002): Title IV of the Act addresses drinking water security and safety, and required drinking water systems serving more than 3,300 persons to develop response measures to incidents that could disrupt safe water supplies. To learn more, visit the EPA website on water security legislation and directives at http://cfpub.epa.gov/safewater/watersecurity/legislation.cfm.

Response Guidelines (Response Protocol Toolbox: Planning For and Responding to Drinking Water Contamination Threats and Incidents: Response Guidelines): This EPA document is a companion to this Handbook and contains many forms, checklists and report formats to help a water system organize information for emergency response planning. These documents can be downloaded from EPA's Water Security website at www.epa.gov/watersecurity.

Response Protocol Toolbox: Planning For and Responding to Drinking Water Contamination Threats and Incidents: The EPA developed and wrote the Toolbox, building on the experience and expertise of several drinking water utilities, particularly the Metropolitan Water District of Southern California. Organized in modular format, the Toolbox assists with emergency response preparedness and will be of value to drinking water utilities, laboratories, emergency responders, state drinking water programs, technical assistance providers and public health and law enforcement officials. It can be downloaded at www.epa.gov/watersecurity.

Security Information Collaborative – A Guide for Water Utilities: This short (40-page) booklet, developed by the EPA, describes how water and wastewater utilities can form beneficial collaboratives to share information on water security. Case studies are combined with step-by-step suggestions for utilities to coordinate with key water security partners. The booklet may be downloaded from the EPA's National Homeland Security Research Center's publications website at www.epa.gov/nhsrc/pubs.htm.

Standardized Analytical Methods for Use During Homeland Security Events: This comprehensive compendium of analytical methods was developed by the EPA for use during an intentional contamination event. The document, EPA Publication No. EPA/600/R-04/126, is available from the EPA NHSRC website at: www.epa.gov/nhsrc/pubs/reportSAM092904.pdf.

U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID): This Army lab conducts research on infectious diseases. For more information, visit their website at www.usamriid.army.mil/ or write to: Commander, USAMRIID, 1425 Porter Street, Frederick, MD 21702-5011.

U.S. Technical Support Working Group (TSWG): The TSWG is a federal working group that provides information on security products and tools, such as the U.S. Department of Energy's *21 Steps to Improve Cyber Security of SCADA Networks.* This document and other useful products can be downloaded from the TSWG's website at www.tswg.gov/tswg.

Water Contaminant Information Tool (WCIT): EPA developed WCIT, which is a secure on-line database that provides information on contaminants of concern for water security. To learn more about WCIT, download the WCIT Fact Sheet from EPA's water security publications website at http://cfpub.epa.gov/safewater/watersecurity/tools.cfm or connect to the WCIT website at www.epa.gov/wcit. Access to the WCIT database is controlled.

Water Information Sharing and Analysis Center (WaterISAC): This is a water security information-sharing system which is accessible via a website at www.waterisac.org. The WaterISAC website has a public portion and a secure membership-only portion available to subscribing utility personnel. WaterISAC is designed for disseminating alerts and warnings, receiving incident reports and sharing water-related information among water and wastewater utilities.

Water Security Channel (WaterSC): WaterSC is a free service of the WaterISAC which was designed to disseminate basic security information, as developed by the federal government, via e-mail and a secure website. To sign up, visit www.watersc.org.

List of Contacts for States, Commonwealths, and Territories

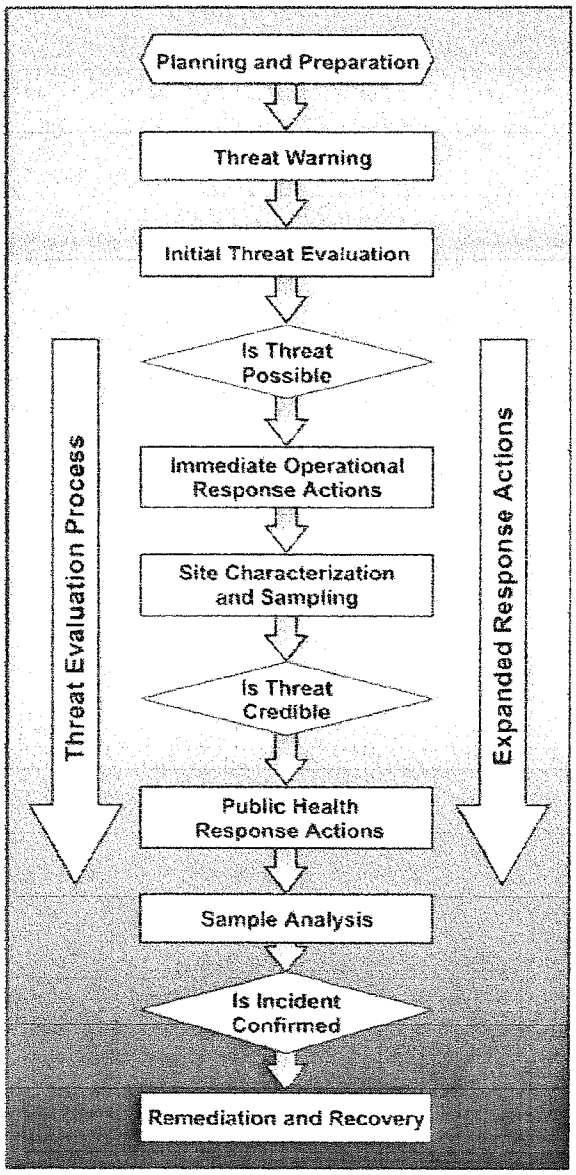
State	Drinking Water Program Website	Phone Number
Alabama	Department of Environmental Management: Water Supply Branch http://www.adem.state.al.us/WaterDivision/Drinking/DWMainInfo.htm	(334) 271-7700
Alaska	Department of Environmental Conservation: Drinking Water Program http://www.state.ak.us/dec/eh/dw/	(907) 269-7647
American Samoa	Environmental Protection Agency http://www.epa.gov/Region9/cross_pr/islands/samoa.html	(684) 633-2304
Arizona	Department of Environmental Quality: Safe Drinking Water Program http://www.azdeq.gov/environ/water/dw/index.html	(602) 771-2300 (800) 234-5677
Arkansas	Department of Health: Division of Engineering http://www.healthyarkansas.com/eng/	(501) 661-2623
California	Department of Health Services: Division of Drinking Water and Environmental Managementhttp://www.dhs.ca.gov/ps/ddwem/technical/dwp/dwpindex.htm	(916) 449-5577
Colorado	Department of Public Health and Environment: Drinking Water Program http://www.cdphe.state.co.us/wq/Drinking_Water/Drinking_Water_Program_Home.htm	(303) 692-3500
Connecticut	Department of Public Health: Drinking Water Section http://www.dph.state.ct.us/BRS/Water/DWD.htm	(860) 509-7333
Delaware	Department of Health and Social Services: Division of Public Health http://www.dhss.delaware.gov/dhss/dph/about.html	(888) 459-2943 (302) 744-4700
District of Columbia	Environmental Protection Agency, Region 3 http://www.epa.gov/reg3wapd/drinkingwater/DCdrinking/index.htm	(215) 814-5781
Florida	Department of Environmental Protection: Drinking Water Program http://www.dep.state.fl.us/water/drinkingwater/index.htm	(850) 245-8336
Georgia	Department of Natural Resources: Water Resources Branch http://www.gaepd.org/Documents/index_water_wrb.html	(404) 657-5947 (888) 373-5947
Guam	Environmental Protection Agency: Water Programs Division http://www.guamepa.govguam.net/programs/water/sdw.html	(671) 475-1638
Hawaii	Department of Health: Environmental Health Division, Safe Drinking Water Branch http://www.hawaii.gov/health/environmental/water/sdwb/index.html	(808) 586-4258
Idaho	Department of Environmental Quality: Drinking Water Program, Water Quality Division http://www.deq.state.id.us/water/prog_issues/drinking_water/overview.cfm	(208) 373-0289
Illinois	Environmental Protection Agency: Bureau of Water, Division of Public Water Supplies http://www.epa.state.il.us/water/index.html	(217) 785-8653
Indiana	Department of Environmental Management: Drinking Water Branch http://www.in.gov/idem/water/dwb/	(317) 232-8603 (800) 451-6027
Iowa	Department of Natural Resources: Water Supply Program http://www.iowadnr.com/water/drinking/index.html	(515) 725-0282
Kansas	Department of Health and Environment: Bureau of Water, Public Water Supply Section http://www.kdhe.state.ks.us/pws/	(785) 296-5503
Kentucky	Department for Environmental Protection: Division of Water http://www.water.ky.gov/dw/	(502) 564-3410

State	Drinking Water Program Website	Phone Number
Louisiana	Office of Public Health: Safe Drinking Water Program http://www.oph.dhh.louisiana.gov/engineerservice/safewater/	(225) 765-5038
Maine	Maine Department of Health and Human Services: Drinking Water Program http://www.state.me.us/dhs/eng/water/	(207) 287-2070
Maryland	Department of the Environment: Water Supply Program http://www.mde.state.md.us/Programs/WaterPrograms/Water_Supply/index.asp	(410) 537-3000 (800) 633-6101
Massachusetts	Department of Environmental Protection: Drinking Water Program http://www.mass.gov/dep/water/drinking.htm	(617) 292-5500
Michigan	Department of Environmental Quality: Water Bureau http://www.michigan.gov/deq/0,1607,7-135-3313_3675---,00.html	(517) 335-4176
Minnesota	Department of Health: Drinking Water Protection Section http://www.health.state.mn.us/divs/eh/water/index.html	(651) 201-4700
Mississippi	Department of Health: Water Supply Division http://www.msdh.state.ms.us/msdhsite/_static/44,0,76.html	(601) 576-7518
Missouri	Department of Natural Resources: Water Protection Program http://www.dnr.mo.gov/wpscd/wpcp/index.html	(573) 751-1300 (800) 361-4827
Montana	Department of Environmental Quality: Public Water Supply Program http://www.deq.state.mt.us/wqinfo/Index.asp	(406) 444-4071
Nebraska	Department of Health and Human Services: Public Water Supply Program http://www.hhs.state.ne.us/enh/pwsindex.htm	(402) 471-0521 (402) 471-2541
Nevada	State Health Division: Safe Drinking Water Program http://ndep.nv.gov/bsdw/index.htm	(775) 687-9515
New Hampshire	Department of Environmental Services: Water Division http://www.des.state.nh.us/wseb/	(603) 271-2513
New Jersey	Department of Environmental Protection: Water Supply Administration http://www.state.nj.us/dep/watersupply/	(609) 292-5550
New Mexico	Environment Department: Drinking Water Bureau: http://www.nmenv.state.nm.us/dwb/dwbtop.html	(505) 476-8625 (877) 654-8720
New York	New York State Department of Health: Drinking Water Protection Program http://www.health.state.ny.us/nysdoh/water/main.htm	(518) 402-7650
North Carolina	Department of Environment and Natural Resources: Public Water Supply Section http://www.deh.enr.state.nc.us/pws/	(919) 733-2321
North Dakota	Department of Health: Division of Municipal Facilities, Drinking Water Program http://www.health.state.nd.us/MF/index.html	(701) 328-5257
Ohio	Environmental Protection Agency: Division of Drinking and Ground Water http://www.epa.state.oh.us/ddagw/	(614) 644-2752
Oklahoma	Department of Environmental Quality: Water Quality Division http://www.deq.state.ok.us/WQDnew/index.htm	(405) 702-8100
Oregon	Department of Human Services: Drinking Water Program http://oregon.gov/DHS/ph/dwp/index.shtml	(971) 673-0405
Pennsylvania	Department of Environmental Protection: Office of Water Management http://www.depweb.state.pa.us/watermgmt/site/default.asp	(717) 772-4018
Puerto Rico	Department of Health: Public Water Supply Supervision Program http://www.epa.gov/safewater/dwinfo/pr.htm	(787) 754-6010
Rhode Island	Department of Health: Office of Drinking Water Quality http://www.health.ri.gov/environment/dwq/index.php	(401) 222-6867

State	Drinking Water Program Website	Phone Number
South Carolina	Department of Health and Environmental Control: Drinking Water Program http://www.scdhec.net/eqc/water/	(803) 898-4300 (888) 481-0125
South Dakota	Department of Environment and Natural Resources: Drinking Water Program http://www.state.sd.us/denr/des/drinking/dwprg.htm	(605) 773-3754
Tennessee	Department of Environment and Conservation: Division of Water Supply http://www.state.tn.us/environment/dws/	(615) 532-0191
Texas	Texas Commission on Environmental Quality http://www.tceq.state.tx.us/nav/util_water/	(512) 239-4691
Utah	Department of Environmental Quality: Division of Drinking Water http://www.drinkingwater.utah.gov/	(801) 536-4200
Vermont	Vermont Agency of Natural Resources, Water Supply Division http://www.anr.state.vt.us/dec/watersup/wsd.htm	(802) 241-3400 (800) 823-6500
Virginia	Department of Health: Office of Drinking Water http://www.vdh.state.va.us/dw/	(804) 864-7500
Virgin Islands (U.S.)	Department of Planning and Natural Resources: Division of Environmental Protection http://dpnr.gov.vi/dep/PublicWaterSup.htm	(340) 774-3320 (340) 773-1082
Washington	Division of Environmental Health: Office of Drinking Water http://www.doh.wa.gov/ehp/dw/	(360) 236-3100
West Virginia	Bureau for Public Health: Department of Health and Human Resources http://www.wvdhhr.org/oehs/eed/	(304) 558-6715
Wisconsin	Department of Natural Resources: Bureau of Drinking Water and Ground Water http://www.dnr.state.wi.us/org/water/dwg/index.htm	(608) 266-0821
Wyoming	EPA Region 8: Wyoming Drinking Water Program http://www.epa.gov/region08/water/dwhome/wycon/wycon.html	(307) 777-7072

List of EPA Regional Contacts

EPA Region	EPA Region Website	Phone Number
EPA Region 1	http://www.epa.gov/NE/eco/drinkwater/dw-security.html	(617) 918-1694
EPA Region 2	http://www.epa.gov/region2/water/	(212) 637-3879
EPA Region 3	http://www.epa.gov/reg3wapd/	(215) 814-5668
EPA Region 4	http://www.epa.gov/region4/water/	(404) 562-9446
EPA Region 5	http://www.epa.gov/region5/water/	(312) 886-0190
EPA Region 6	http://www.epa.gov/Arkansas/6wq/swp/security/	(214) 665-2776
EPA Region 7	http://www.epa.gov/region7/security/index.htm	(913) 551-7585
EPA Region 8	http://www.epa.gov/region8/compliance/security/secure.html	(303) 312-7021
EPA Region 9	http://www.epa.gov/region9/water/	(415) 947-8707
EPA Region 10	http://yosemite.epa.gov/R10/WATER.NSF/webpage/Water+Issues+in+Region+10	(206) 553-1389



U.S. Environmental Protection Agency
Office of Ground Water and Drinking Water
Washington, D.C. 20460

EPA Publication No. 817-B-06-001
www.epa.gov/watersecurity
April, 2006

APPENDIX C

MSDH INSPECTION REPORT AND CAPACITY ASSESSMENT FORM

Cyj DOA John James, Shelly

Generated March 15, 2017, 2:57 PM CST.

CITY OF OCEAN SPRINGS RECEIVED MAR 20 2017 MAYOR CONNIE MORAN

MISSISSIPPI STATE DEPARTMENT OF HEALTH

REPORT OF INSPECTION OF DRINKING WATER SUPPLY

PWS: 0300005 **Class:** D

An inspection of the CITY OF OCEAN SPRINGS water supply in JACKSON county was made on 03/14/2017. Present at the time of inspection was GERALD W GROUE, OPERATOR; WRITER. Official CONNIE MORAN Address P O BOX 1800 OCEAN SPRINGS MS 39564 W.W. Operator GERALD W GROUE Address 15721 CRUTHIRDS ROAD VANCLEAVE MS 39565 No. Connections 9536 No. Meters ___ Population Served 17530 Field Chemical Analysis: pH ___ Cl2(free) 0.6 Cl2(total) 0.7 H2S N/A Iron ___ Fluoride ___ Point of Sampling DISTRIBUTION Water Rates ___

COMMENTS

Technical: 5 Managerial: 5 Financial: 5

OVERALL CAPACITY RATING: 5.0 / 5.0

1. The water system appeared to be well maintained and operating properly at the time of inspection.

2. This system is currently purchasing water (1000 GPM) from the Jackson County Utility Authority. This has been calculated in the design capacity. The system is now serving 92.5% of the customers that it was designed to serve. The water system should plan to increase its source capacity in the near future to account for growth. This can be accomplished by drilling a new well, increasing the amount of purchased water the Utility Authority, etc.

3. Pumping tests for the wells from December 2016 are as follows:

   Well #3 - 974 GPM @ 60 psi
   Well #6 - 791 GPM @ 60 psi
   Well #9 - 520 GPM @ 60 psi
   Well #10 - 1230 GPM @ 70 psi
   Well #11 - 323 GPM @ 60 psi
   Well #12 - 412 GPM @ 60 psi

4. A 3,000 gallon surge tank has been installed at wells #3 and #10 to help with the chlorine contact time.

5. No pressure problems were reported at the time of inspection.

6. When repairs are made on the water distribution system, all lines affected should be properly chlorinated and flushed before they are placed back in service.

7. All dead-end water lines should be flushed on a routine schedule to clear the lines of sediment and stagnant water.

8. Whenever system pressure is lost, even for brief periods of time, contaminants may be introduced to the system through back-siphonage and back flow. When this occurs, system officials should notify all customers in the affected area to boil their drinking water until clear bacteriological samples have been obtained.

9. In 2009 the MS State Board of Health passed a regulation requiring that community water systems serving a population of at least two thousand (2,000) or more "shall be required to acquire and install fluoridation treatment capable of maintaining fluoride levels within the optimal range." Based on previous water quality tests, your system does not have a natural level of fluoride within the recommended control range. Because this public water supply serves a population of at least 2,000, and does not have a natural fluoride level within the recommended range, steps should be taken to implement a fluoridation treatment program. This could be performed in conjunction with the installation of new infrastructure to reduce costs or independently as funds become available. Grant funds are available through the MSDH's Community Water Fluoridation Program.

Completed by Wendy Ferrill, P.E. on 03/15/2017.

Reviewed by Ralph Hayes, P.E. on 03/15/2017.

If you have any questions, please call (228)297-5187.

pc:

CONNIE MORAN, OFFICIAL
GERALD W GROUE, OPERATOR

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Mississippi Department of Health
Bureau of Public Water Supply

STANDARD FORM

FY 2017 Public Water System Capacity Assessment Form

NOTE: This form must be completed whenever a routine sanitary survey of a public water system is conducted by a regional engineer of the Bureau of Public Water Supply

PWS ID#: 0300005 Class: D Survey Date: 03-14-2017 County: JACKSON
Public Water System: CITY OF OCEAN SPRINGS Conn: 9536
Certified Waterworks Operator: GERALD W GROUE Pop: 17530

CAPACITY RATING DETERMINATION

Technical (T) Capacity Rating: [5] Managerial (M) Capacity Rating [5] Financial (F) Capacity Rating [5]

Capacity Rating = $\frac{T+M+F}{3} = \frac{15}{3} = 5$

Overall Capacity Rating = 5.0

Completed by Wendy Ferrill, P.E. on 03/15/2017
Reviewed by Ralph Hayes, P.E. on 03/15/2017

Comments: _____

Technical Capacity Assessment	Point Scale	Point Award
[T1] Does the water system have any significant deficiencies? [Y (N)]	N - 1pt. Y - 0pt.	1
[T2] **1)** Was the water treatment process functioning properly? [(Y) N] (i.e. Is pH, iron, free chlorine, fluoride, etc. within acceptable range?) **2)** Was needed water system equipment in place and functioning properly at the time of survey? [(Y) N] (**NOTE:** Equipment deficiencies must be identified in survey report.) **3)** Were records available to the regional engineer clearly showing that all water storage tanks have been inspected and cleaned or painted (if needed) within the past 5 years? [(Y) N NA] (**NOTE:** All YESs required to receive point)	All Y - 1 pt. Else - 0 pt.	1
[T3] **1)** Was the certified waterworks operator or his/her authorized representative present for the survey? [(Y) N] **2)** Was log book up to date and properly maintained and did it show that MSDH Minimum JOB Guidelines for W. W. Operators were being met? [(Y) N] **3)** Was the water system properly maintained at the time of survey? [(Y) N] **4)** Did operator satisfactorily demonstrate to the regional engineer that he/she could fully perform all water quality tests required to properly operate this water system? [(Y) N] (**NOTE:** All YESs required to receive point)	All Y - 1 pt. Else - 0 pt.	1
[T4] **1)** Does water system routinely track water loss and were acceptable water loss records available for review by the regional engineer? [(Y) N] **2)** Is water system overloaded? (i.e. serving customers in excess of MSDH approved design capacity)? [Y (N)] **3)** Was there any indication that the water system is/has been experiencing pressure problems in any part(s) of the distribution system? [Y (N)] (based on operator information, customer complaints, MSDH records, other information) **4)** Are well pumping tests performed routinely? [(Y) N NA] (**NOTE:** YES FOR #1 & YES OR N/A FOR #4 AND NOs FOR #2 & #3 required to receive point)	1)Y - pt. 2)N - pt. 3)N - pt. 4)Y - pt.	1
[T5] **1)** Does the water system have the ability to provide water during power outages? (i.e. generator, emergency tie-ins, etc.) [(Y) N] **2)** Does the water system have a usable backup source of water? [(Y) N] (**NOTE:** Must be documented on survey report)	All Y - 1 pt. Else - 0 pt.	1
TECHNICAL CAPACITY RATING = [5] (Total Points)		

Public Water System: CITY OF OCEAN SPRINGS PWS ID #: 0300005

FY 2017 Public Water System Capacity Assessment Form Survey Date: 03-14-2017

Managerial Capacity Assessment	Point Scale	Point Award
[M1] Were all SDWA required records maintained in a logical and orderly manner and available for review by the regional engineer during the survey? [(Y) N]	Y - 1pt. N - 0pt.	1
[M2] 1) Have acceptable written policies and procedures for operating this water system been formally adopted and were these policies available for review during the survey? [(Y) N] 2) Have all board members (in office more than 12 months) completed Board Member Training? [(Y) N NA] 3) Does the Board of Directors meet monthly and were minutes of Board meetings available for review during the survey? (**NOTE:** Quarterly meetings allowed if system has an officially designated full time manager) [(Y) N NA] (**NOTE:** ALL YESs or NAs required to receive point. NA - Not Applicable)	All Y - 1 pt. Else - 0 pt.	1
[M3] Has the water system had any SDWA violations since the last Capacity Assessment? [Y (N)]	N - 1pt. Y - 0pt.	1
[M4] Has the water system developed a long range improvements plan and was this plan available for review during the survey? [(Y) N]	Y - 1pt. N - 0pt.	1
[M5] 1) Does the water system have an effective cross connection control program in compliance with MSDH regulations? [(Y) N] 2) Was a copy of the MSDH approved bacti site plan and lead/copper site plan available for review during the survey and do the bacti results clearly show that this approved plan is being followed? [(Y) N] (**NOTE:** All YESs required to receive point)	All Y - 1 pt. Else - 0 pt.	1
MANAGERIAL CAPACITY RATING = [5] (Total Points)		

Financial Capacity Assessment	Point Scale	Point Award
[F1] Has the water system raised water rates in the past 5 years? [(Y) N] (**NOTE:** Point may be awarded if the water system provides acceptable financial documentation clearly showing that a rate increase is not needed, i.e. revenue has consistently exceeded expenditures by at least 10%, etc.)	Y - 1pt. N - 0pt.	1
[F2] Does the water system have an officially adopted policy requiring that water rates be routinely reviewed and adjusted as appropriate and was this policy available for review during the survey? [(Y) N]	Y - 1pt. N - 0pt.	1
[F3] Does the water system have an officially adopted cut-off policy for customers who do not pay their water bills, was a copy of this policy available for review by the regional engineer, and do system records (cut-off lists, etc.) clearly show that the water system effectively implements this cut-off policy? [(Y) N]	Y - 1pt. N - 0pt.	1
[F4] Was a copy of the water system's officially adopted annual budget available for review by the regional engineer and does the water system's financial accounting system clearly and accurately track the expenditure and receipt of funds? [(Y) N]	Y - 1pt. N - 0pt.	1
[F5 - **Municipal Systems**] 1) Is the municipality current in submitting audit reports to the State Auditor's Office? [(Y) N] 2) Was a copy of the latest audit report available for review at the time of the survey? [(Y) N] 3) Does this audit report clearly show that water and sewer fund account(s) are maintained separately from all other municipal accounts? [(Y) N] (**NOTE:** Yes answer to all questions required to receive point.)	All Y - 1 pt. Else - 0 pt.	1
[F5 - **Rural Systems**] 1) Has the rural water system filed the required financial reports with the State Auditor's Office and were these reports available for review? [Y N] 2) Does the latest financial report show that receipts exceeded expenditures? [Y N] (**NOTE:** Yes answer to both questions required to receive point)	All Y - 1 pt. Else - 0 pt.	
FINANCIAL CAPACITY RATING = [5] (Total Points)		

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MISSISSIPPI DEPARTMENT OF HEALTH
BUREAU OF PUBLIC WATER SUPPLY
DESIGN CAPACITY SHEET

System: **CITY OF OCEAN SPRINGS**
ID: **0300005** Class: **D** County: **JACKSON**

Date Completed: **03/15/2017**
Connections - Actual: **9536** Equivalent: **9711**
Design Capacity: **10500** Percent Design Capacity: **9711/10500 = 92.5%**

Pumping Tests from 12-2016:

Well #3 - 974 GPM @ 60 psi
Well #6 - 791 GPM @ 60 psi
Well #9 - 520 GPM @ 60 psi
Well #10 - 1230 GPM @ 70 psi
Well #11 - 323 GPM @ 60 psi
Well #12 - 412 GPM @ 60 psi

Design Capacity = Well Capacity + (Elevated Storage / 200)

Well Capacity = 974 + 791 + 520 + 1230 + 323 + 412 + 1000
Well Capacity = 5250

Purchasing 1000 GPM from Jackson County Utility Authority

Elevated Storage = 500,000 + 500,000 + 500,000 + 400,000
Elevated Storage = 1,900,000

Design Capacity = 5250 + (1,900,000 / 200)
Design Capacity = 5250 + 9500
Design Capacity = 14,750

The Design Capacity is limited to twice well capacity = 10,500

NOTE: Design capacity is limited to twice (2X) well capacity (gpm), unless, excess elevated storage is useable. For excess elevated storage to count as useable, the water system must be capable of refilling the elevated tank in 6 hours (based on MSDH approved hydraulic calculations).

Total number of connections on system = 8240

From data provided by Public Works Dept:

Equivalent Connections = # of Connections + 0.67(# of Apartments) - # of Apartment Meters
Equivalent Connections = 8240 + 0.67(1609) - 69
Equivalent Connections = 8240 + 1078 - 69
Equivalent Connections = 9249

The Average Commercial & Industrial Use = 36,817,521 / Month
Total Average Use = 441,835,468 / Month

Ciu = Average Commercial & Industrial Use / Total Average Use
Ciu = 27,890,000 / 262,242,000
Ciu = 0.1

Equivalent Connections = # of Connections + [# of Connections * (0.5)(Ciu)]
Equivalent Connections = 9249 + [9249 * (0.5)(0.1)]
Equivalent Connections = 9,711

% of Design Capacity = (# of Existing Connections / Design Capacity) * 100
% of Design Capacity = (9,711 / 10,500) * 100
% of Design Capacity = 92.5

MISSISSIPPI STATE DEPARTMENT OF HEALTH
DIVISION OF WATER SUPPLY
PUBLIC WATER SUPPLY - MASTER DATA SHEET

Name of Supply: City of Ocean Springs **Owner:** City **County:** Jackson

PWS ID# 0300005 **Class:** D **Date of Last Inspection:** 03-14-2017 **Master Meter:** Yes

Actual Connections: 8240 **Equivalent Connections:** 9711 **Design Capacity:** 10,500

% of Design Capacity: 92.5

Source Supply: **Purchase** _____ **Surface** _____ **Ground** X **Number of Wells:** Six

Well ID	Location	Year Constructed	Capacity (gpm)	Pressure (psi)	Casing (in)	Screen (in)	Depth (ft)	Cl2 Setting
0300005-03	Handy	1980	1000	60	16	10	542	50
0300005-06	Halstead	1985	1120	55	16	10	561	65
0300005-09	Pabst	1991	1044	45	16	10	535	50
0300005-10	City Hall	1994	1400	50	16	10	955	100
0300005-11	Sunplex	1988	445	60	12	8		50
0300005-12	Deana	2008	400	60	12	8	640	50

Treatment: **Iron** _____ **Softening** _____ **Corrosion** _____ **Chlorine** X **Fluoride** _____

Treatment:	No	Location	Type	Capacity (max)	Settings	Remarks
Chlorinator	6	Each Well	Advance 200	100 ppd(each)		Switchover

Storage:	Location	Year Constructed	Material	Capacity (gallons)	Remarks	Inspection Date
Elevated	Halstead Rd.		Steel	500,000		05-27-2015
Elevated	Civic Center		Steel	500,000		05-20-2015
Elevated	Pine St.		Steel	500,000		05-19-2015
Elevated	Sunplex		Steel	400,000		05-28-2015

Generator:	Type	Location	Rating	Fuel	Routine

APPENDIX D

SUSCEPTIBILITY ASSESSMENT FORMS FOR CITY OF OCEAN SPRINGS

You requested Water Supply #300005

Applicable PWS Reports: 300005_3.htm View Report

PWS ID:300005 Source ID:3

CITY OF OCEAN SPRINGS , Jackson County

Final Susceptibility Assessment Ranking: Moderate

OLWR Permit Number: MS-GW-13847	Well Number: N0520
Latitude 30° 24' 53.734"	Longitude 88° 49' 24.125"
Location: SW SE S19 T07S R08W	Elevation: 22
USGS Quadrangle: OCEAN SPRINGS	

Well Completion and Aquifer Data

Aquifer: Graham Ferry		Aquifer Top: 470	Aquifer Bottom: 560
Screen Top: 473	Screen Base: 533	Split: No	GW Flow Dir: 225
Static Fluid Level: 82	Saturated: Yes	Completion Date: 5/1/1980	
Minimum Design: Yes	Pump Rate:662	**Aquifer Confinement Class:** Confined	Status: **Active**

E-Log: No	E-Log #:	Drillers Log: No	Permit: Yes	Pot Map: No

Comments:

Confining Layers

Top Depth (ft)	Base Depth (ft)	Lithology
433	470	Shale

Risk Assessment

1. Have raw (untreated) samples from this well been found to contain contaminants in concentrations that are equal to or exceed half of the EPA established maximum contaminant levels (MCLs) for drinking water standards. **NO**

2. Does this well withdraw water from a confined aquifer? **YES**

The aquifer being used is overlain with clay (shale) layers of sufficient thickness and lateral extent that it is afforded some degree of natural protection from potential contaminant sources located within the delineated protection area around the well.

3. Does this well meet all of the minimum design criteria established by the Mississippi State Department of Health in 1975? **YES**

4. Are there any known abandoned wells located in the SWPA of the well? **YES**

Local Well Name	Depth	Aquifer
N2117-FRANK BUSHLER	486	
N0048-L & N RAILROAD	535	GRMFL
N0047-FRANK GALLE	1239	PCGL
N0457-BERRY GOLLECTE	480	MOCN
N2249-GARY SIMMONS	470	
N2129-SPORTMAN LODGE	530	
N0523-RICHARD A NICHOLAS	1010	PCGL

Final Susceptibility Assessment Ranking: **Moderate**

Map of Source Water Protection Area

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Public Water Supply: 300005 Source: 3



You requested Water Supply #300005

Applicable PWS Reports: 300005_6.htm View Report

PWS ID:300005 Source ID:6

CITY OF OCEAN SPRINGS , Jackson County

Final Susceptibility Assessment Ranking: Moderate

OLWR Permit Number: MS-GW-13851	Well Number: N0517
Latitude 30° 24' 19.346"	Longitude 88° 47' 59.392"
Location: NE SE S29 T07S R08W	Elevation: 22
USGS Quadrangle: OCEAN SPRINGS	

Well Completion and Aquifer Data

Aquifer: Graham Ferry		Aquifer Top: 470	Aquifer Bottom: 560
Screen Top: 485	Screen Base: 555	Split: No	GW Flow Dir: 225
Static Fluid Level: 78	Saturated: Yes	Completion Date: 3/12/1985	
Minimum Design: Yes	Pump Rate:1086	**Aquifer Confinement Class:** Confined	Status: **Active**

E-Log: Yes	E-Log #: 263	Drillers Log: Yes	Permit: Yes	Pot Map: No

Comments:

Confining Layers

Top Depth (ft)	Base Depth (ft)	Lithology
184	286	Clay/Shale
330	394	Shale
424	470	Clay

Risk Assessment

1. Have raw (untreated) samples from this well been found to contain contaminants in concentrations that are equal to or exceed half of the EPA established maximum contaminant levels (MCLs) for drinking water standards. **NO**

2. Does this well withdraw water from a confined aquifer? **YES**

The aquifer being used is overlain with clay (shale) layers of sufficient thickness and lateral extent that it is afforded some degree of natural protection from potential contaminant sources located within the delineated protection area around the well.

3. Does this well meet all of the minimum design criteria established by the Mississippi State Department of Health in 1975? **YES**

4. Are there any known abandoned wells located in the SWPA of the well? **YES**

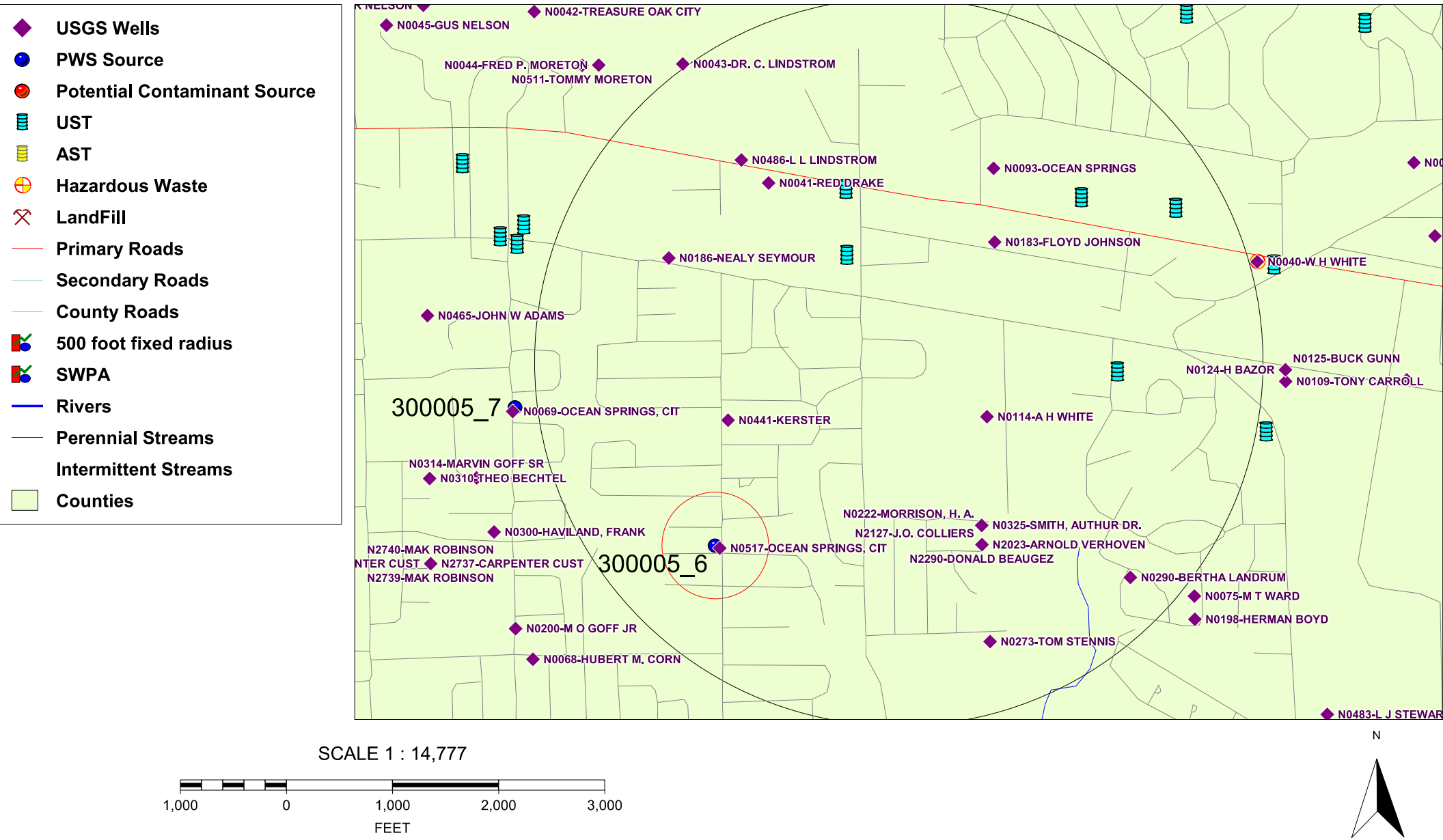
Local Well Name	Depth	Aquifer
N0114-A H WHITE	1323	PCGL
N0093-OCEAN SPRINGS	496	GRMF
N0486-L L LINDSTROM	490	MOCN
N0441-KERSTER	538	MOCN
N0290-BERTHA LANDRUM	504	PCGL
N0273-TOM STENNIS	504	PCGL
N0183-FLOYD JOHNSON	530	

Final Susceptibility Assessment Ranking: **Moderate**

Map of Source Water Protection Area

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Public Water Supply: 300005 Source: 6



You requested Water Supply #300005

Applicable PWS Reports: 300005_9.htm ▼ View Report

PWS ID:300005 Source ID:9

CITY OF OCEAN SPRINGS , Jackson County

Final Susceptibility Assessment Ranking: Moderate

OLWR Permit Number: MS-GW-11991	Well Number: N0543
Latitude 30° 24' 30.881"	Longitude 88° 46' 30.857"
Location: SE NW S27 T07S R08W	Elevation: 22
USGS Quadrangle: OCEAN SPRINGS	

Well Completion and Aquifer Data

Aquifer: Graham Ferry		Aquifer Top: 458	Aquifer Bottom: 534
Screen Top: 470	Screen Base: 531	Split: No	GW Flow Dir: 225
Static Fluid Level: 86	Saturated: Yes	Completion Date: 8/14/1990	
Minimum Design: Yes	Pump Rate:1026	**Aquifer Confinement Class:** Confined	Status: **Active**

E-Log: Yes	E-Log #: 284	Drillers Log: Yes	Permit: Yes	Pot Map: No

Comments:

Confining Layers

Top Depth (ft)	Base Depth (ft)	Lithology
166	216	Clay
294	428	Shale

Risk Assessment

1. Have raw (untreated) samples from this well been found to contain contaminants in concentrations that are equal to or exceed half of the EPA established maximum contaminant levels (MCLs) for drinking water standards. **NO**

2. Does this well withdraw water from a confined aquifer? **YES**

The aquifer being used is overlain with clay (shale) layers of sufficient thickness and lateral extent that it is afforded some degree of natural protection from potential contaminant sources located within the delineated protection area around the well.

3. Does this well meet all of the minimum design criteria established by the Mississippi State Department of Health in 1975? **YES**

4. Are there any known abandoned wells located in the SWPA of the well? **YES**

Local Well Name	Depth	Aquifer
N0196-D JALONOVICH	506	GRMF
N0140-S SKINNER	503	
N0534-OCEAN SPRINGS, CIT	493	GRMFL
N0294-COAST MARINE IN	504	GRMF
N0156-C C LAWSON	478	
N2114-KENNETH BURGESS	498	
N0039-L E MCCALL	1334	PCGL
N2271-GOE THOMAS	845	
N0265-OCEAN SPRGS BAP	514	PCGL
N0617-GERTRUDE JALANIVIC	515	GRMF
N0275-RON MIGUES	521	PCGL
N2197-GERTRUDE JALAWICK	515	
N2196-MR. JIM COKER	500	

Final Susceptibility Assessment Ranking: **Moderate**

Map of Source Water Protection Area

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Public Water Supply: 300005 Source: 9



You requested Water Supply #300005

Applicable PWS Reports: 300005_10.htm ▼ View Report

PWS ID:300005 Source ID:10

CITY OF OCEAN SPRINGS , Jackson County

Final Susceptibility Assessment Ranking: Moderate

OLWR Permit Number: MS-GW-14731	Well Number: N0566
Latitude 30° 24' 39.406"	Longitude 88° 49' 38.719"
Location: IR IR S37 T07S R08W	Elevation: 22
USGS Quadrangle: OCEAN SPRINGS	

Well Completion and Aquifer Data

Aquifer: Graham Ferry		Aquifer Top: 884	Aquifer Bottom: 962
Screen Top: 890	Screen Base: 950	Split: No	GW Flow Dir: 225
Static Fluid Level: 49	Saturated: Yes	Completion Date: 4/1/1994	
Minimum Design: Yes	Pump Rate:1400	**Aquifer Confinement Class:** Confined	Status: **Active**

E-Log: Yes	E-Log #: 290	Drillers Log: Yes	Permit: Yes	Pot Map: No

Comments:

Confining Layers

Top Depth (ft)	Base Depth (ft)	Lithology
330	462	Shale
560	817	Clay/Shale

Risk Assessment

1. Have raw (untreated) samples from this well been found to contain contaminants in concentrations that are equal to or exceed half of the EPA established maximum contaminant levels (MCLs) for drinking water standards. **NO**

2. Does this well withdraw water from a confined aquifer? **YES**

The aquifer being used is overlain with clay (shale) layers of sufficient thickness and lateral extent that it is afforded some degree of natural protection from potential contaminant sources located within the delineated protection area around the well.

3. Does this well meet all of the minimum design criteria established by the Mississippi State Department of Health in 1975? **YES**

4. Are there any known abandoned wells located in the SWPA of the well? **YES**

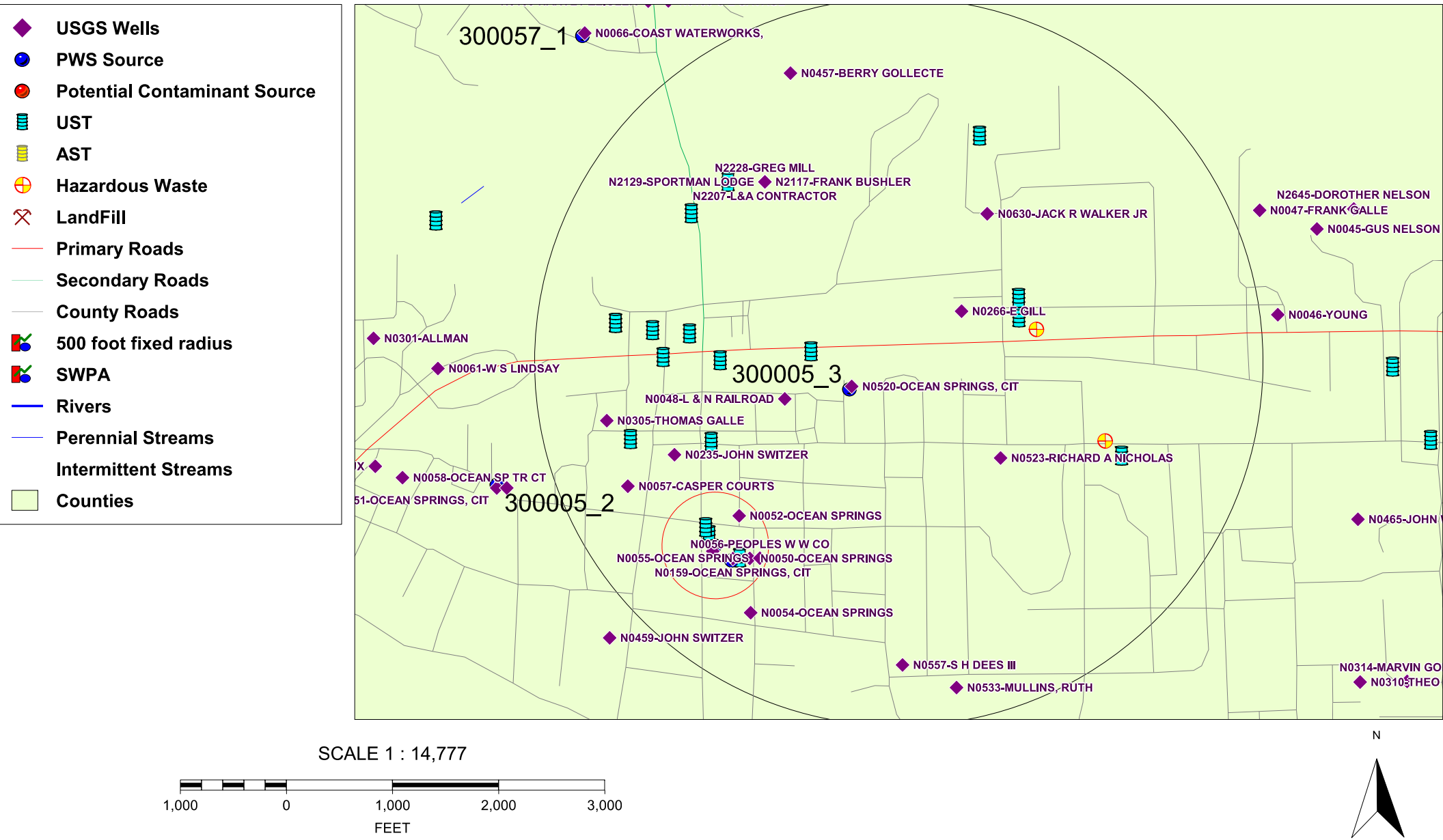
Local Well Name	Depth	Aquifer
N0159-OCEAN SPRINGS, CIT	881	PCGLU
N0056-PEOPLES W W CO	880	PCGL
N0050-OCEAN SPRINGS	896	PCGL
N0523-RICHARD A NICHOLAS	1010	PCGL

Final Susceptibility Assessment Ranking: **Moderate**

Map of Source Water Protection Area

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Public Water Supply: 300005 Source: 10



You requested Water Supply #300005

Applicable PWS Reports: 300005_11.htm ▼ View Report

PWS ID:300005 Source ID:11

CITY OF OCEAN SPRINGS , Jackson County

Final Susceptibility Assessment Ranking: Moderate

OLWR Permit Number: MS-GW-00348	Well Number: O0310
Latitude 30° 25' 22.066"	Longitude 88° 43' 9.689"
Location: SE NE S19 T07S R07W	Elevation: 23
USGS Quadrangle: GAUTIER NORTH	

Well Completion and Aquifer Data

Aquifer: Graham Ferry		Aquifer Top: 420	Aquifer Bottom: 468
Screen Top: 420	Screen Base: 470	Split: No	GW Flow Dir: 225
Static Fluid Level: 55	Saturated: Yes	Completion Date: 7/1/1986	
Minimum Design: Yes	Pump Rate:500	**Aquifer Confinement Class:** Confined	Status: **Active**

E-Log: Yes	E-Log #:	Drillers Log: No	Permit: Yes	Pot Map: No

Comments: FORMERLY 0300151-01

Confining Layers

Top Depth (ft)	Base Depth (ft)	Lithology
214	280	Clay
346	374	Clay

Risk Assessment

1. Have raw (untreated) samples from this well been found to contain contaminants in concentrations that are equal to or exceed half of the EPA established maximum contaminant levels (MCLs) for drinking water standards. **NO**

2. Does this well withdraw water from a confined aquifer? **YES**

The aquifer being used is overlain with clay (shale) layers of sufficient thickness and lateral extent that it is afforded some degree of natural protection from potential contaminant sources located within the delineated protection area around the well.

3. Does this well meet all of the minimum design criteria established by the Mississippi State Department of Health in 1975? **YES**

4. Are there any known abandoned wells located in the SWPA of the well? **YES**

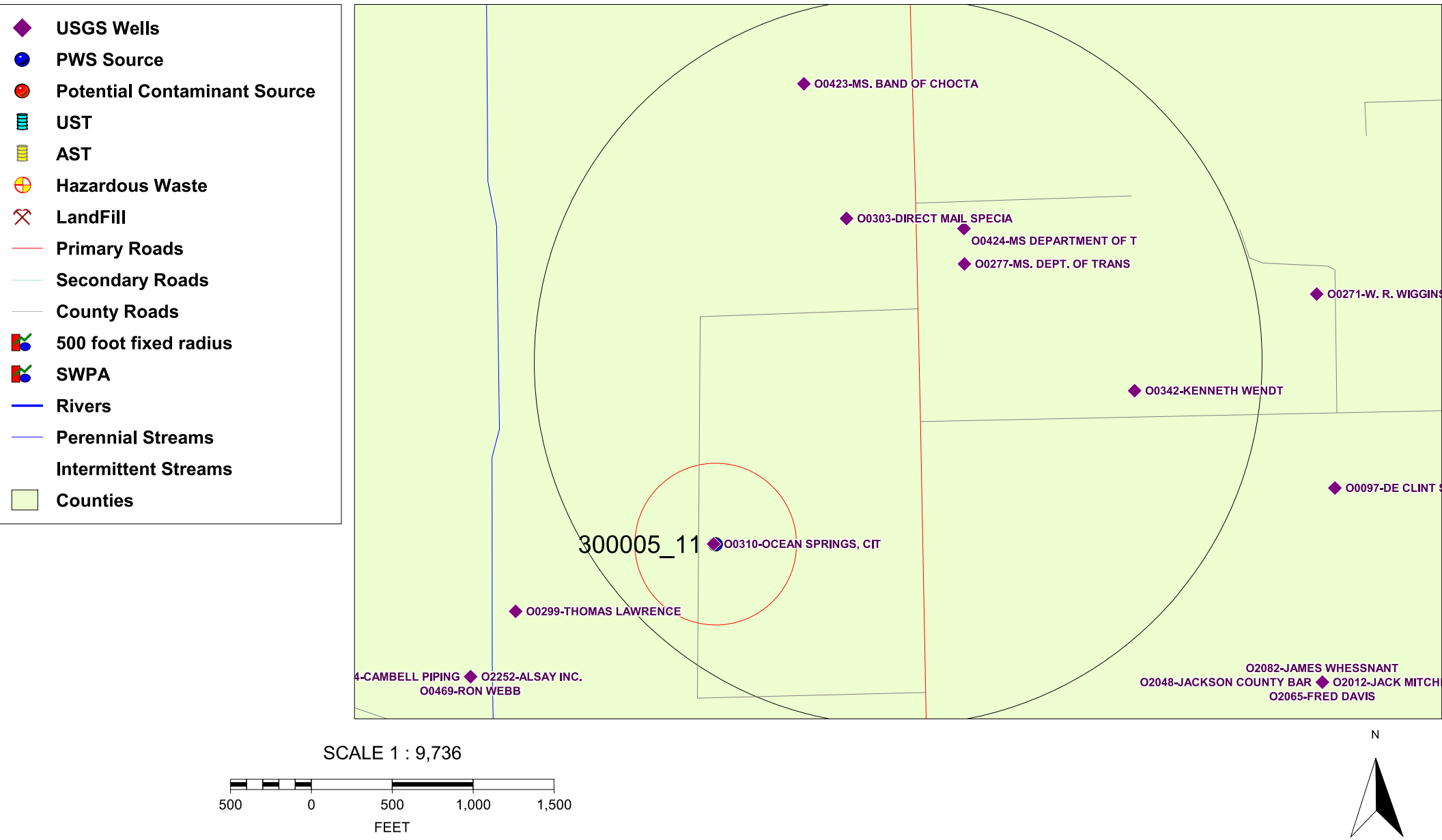
Local Well Name	Depth	Aquifer
O0277-MS. DEPT. OF TRANS	458	GRMFL
O0342-KENNETH WENDT	500	GRMF
O0424-MS DEPARTMENT OF T	460	GRMF
O0423-MS. BAND OF CHOCTA	475	PCGL
O0303-DIRECT MAIL SPECIA	473	GRMF

Final Susceptibility Assessment Ranking: **Moderate**

Map of Source Water Protection Area

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Public Water Supply: 300005 Source: 11



You requested Water Supply #300005

Applicable PWS Reports: 300005_12.htm ▼ View Report

PWS ID:300005 Source ID:12

CITY OF OCEAN SPRINGS , Jackson County

Final Susceptibility Assessment Ranking: Moderate

OLWR Permit Number: MS-GW-16345	Well Number: N1084
Latitude 30° 25' 1.520"	Longitude 88° 45' 50.550"
Location: SW SW S23 T07S R08W	Elevation: 23
USGS Quadrangle: OCEAN SPRINGS	

Well Completion and Aquifer Data

Aquifer: Gordo		Aquifer Top: 454	Aquifer Bottom: 492
Screen Top: 460	Screen Base: 500	Split: No	GW Flow Dir: 225
Static Fluid Level: 106	Saturated: Yes	Completion Date: 3/5/2008	
Minimum Design: Yes	Pump Rate:350	**Aquifer Confinement Class:** Confined	Status: **Active**

E-Log: Yes	E-Log #:	Drillers Log: Yes	Permit: Yes	Pot Map: No

Comments:

Confining Layers

Top Depth (ft)	Base Depth (ft)	Lithology
132	216	Clay
326	436	Clay

Risk Assessment

1. Have raw (untreated) samples from this well been found to contain contaminants in concentrations that are equal to or exceed half of the EPA established maximum contaminant levels (MCLs) for drinking water standards. **NO**

2. Does this well withdraw water from a confined aquifer? **YES**

The aquifer being used is overlain with clay (shale) layers of sufficient thickness and lateral extent that it is afforded some degree of natural protection from potential contaminant sources located within the delineated protection area around the well.

3. Does this well meet all of the minimum design criteria established by the Mississippi State Department of Health in 1975? **YES**

4. Are there any known abandoned wells located in the SWPA of the well? **YES**

Local Well Name	Depth	Aquifer
N2333-ALFREED SPEED	490	
N0664-SUSAN REDMAN	410	GRMF
N2298-L.A. HARVEY	476	
N0654-ALFRED SPEED	490	GRMF
N2295-SUSAN REDMAN	410	
N0361-JOE WILLIAMS JR	493	GRMF
N0534-OCEAN SPRINGS, CIT	493	GRMFL
N2287-ALBERT KISNER	510	
N2282-MITCH PARKER	479	
N2272-HIDA SHINEMAN	473	
N0360-ELMER LADNIER	924	PCGL
N0652-GEORGE McGREVEY	505	GRMF
N0430-MAURICE TAYLOR	493	GRMF
N2284-MRS. C.A TOOTLE	510	
N0614-EMMA WILLIAMS	500	GRMF
N2213-STEVE BERAORD	500	
N0315-RAY HUTSON	480	GRMF
N0603-MAURICE TAYLOR	509	GRMF
N2205-EMMA WILLIAMS	510	
N2639-JOHN TOCHE	475	
N0307-L A HARVEY	470	GRMF
N2153-MAURICE TAYLOR	509	
N2174-J.I. MOODY	430	
N2084-STEVE DIAZ	480	
N0561-MELVIN LANGLINAIS	505	GRMF

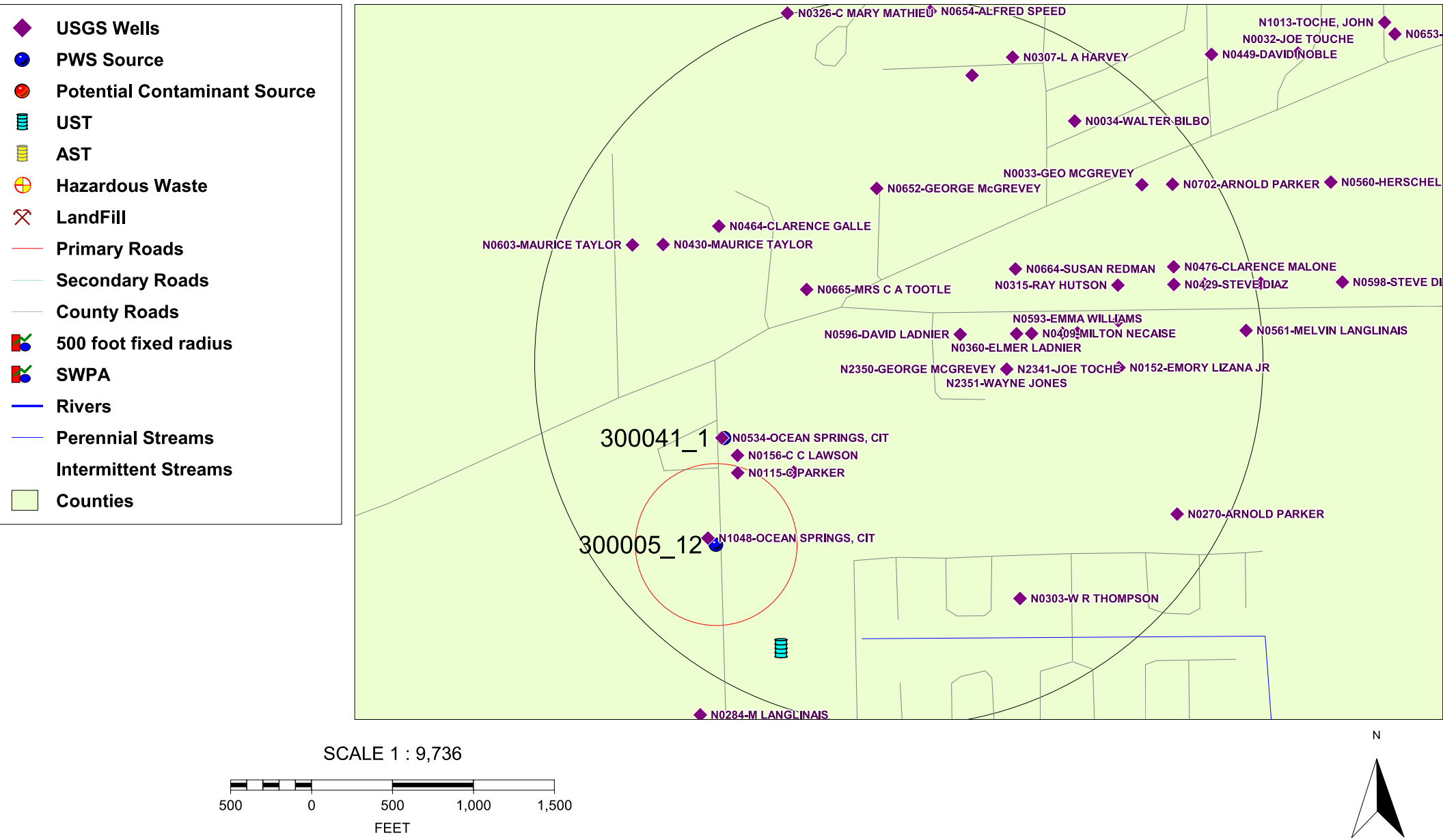
N2137-PATRICIA A. PATTER	476	
N0270-ARNOLD PARKER	462	PCGL
N0550-PRESTON AUCOIN	486	GRMF
N2079-GLENDA FOUNTAIN	480	
N2069-EMMA WILLIAMS	501	
N2351-WAYNE JONES	484	
N0156-C C LAWSON	478	
N0429-STEVE DIAZ	472	GRMF
N2055-MALONE ROOFING	510	
N2350-GEORGE MCGREVEY	505	
N0593-EMMA WILLIAMS	501	GRMF
N0409-MILTON NECAISE	480	MOCN
N2017-GEORGE NEWBURGER	502	
	500	
N2009-WAYNE TRONEY	481	
N0702-ARNOLD PARKER	470	GRMF
N0873-HARVERY, L A	450	
N0857-DICK CHILES	462	
N0033-GEO MCGREVEY	470	PCGL
N0665-MRS C A TOOTLE	505	GRMF

Final Susceptibility Assessment Ranking: **Moderate**

Map of Source Water Protection Area

This report generated: 2/10/2017 11:15:23 AM

Public Water Supply: 300005 Source: 12



APPENDIX E

SERVICE AGREEMENT FOR WATER SUPPLY

SERVICE AGREEMENT

FOR THE SUPPLY OF WATER

Between

City of Ocean Springs

And

JACKSON COUNTY UTILITY AUTHORITY

WHEREAS, pursuant to Sections 49-17-703 and 49-17-731 of the Mississippi Gulf Coast Region Utility Act ("Act") the Jackson County Utility Authority ("Authority"), an agency and political subdivision of the State of Mississippi, has been established and is currently acquiring and constructing the necessary assets to permit the collection, treatment, storage and transportation of water; and

WHEREAS, the City of Ocean Springs ("City") is a governing authority and public agency authorized under the laws of the State of Mississippi; and

WHEREAS, the Authority has received a Gulf Region Disaster Recovery Grant which will fund the construction and installation of a water well, tank, treatment and transportation system which will provide adequate potable water for the needs of the City and other water service providers in the area; and

WHEREAS, the City is in need of additional water service capacity and desires to connect the potable water system of the Authority with the City's water facilities; and

WHEREAS, the Authority and City wish to contract with each other for the sale of potable water and mutual aid; and

NOW, THEREFORE, Authority and City hereby enter into this Agreement for the Term described herein for the wholesale supply of water to the City upon the terms and conditions as follows, to-wit:

ARTICLE I

DEFINITIONS

"Act" shall mean the Mississippi Gulf Coast Region Utility Act set forth at Miss. Code Ann. §§ 49-17-701, *et seq.* (Supp. 2006).

"Authority" shall mean the Jackson County Utility Authority which is a public body corporate and politic constituting a political subdivision of the State of Mississippi and created

by the Mississippi Legislature pursuant to Miss. Code Ann. § 49-17-731. The Authority is composed of the geographic area of Jackson County as defined in Miss. Code Ann. § 19-1-59.

"Authority's jurisdictional area" shall mean the geographical area of Jackson County as defined in Miss. Code Ann. § 19-1-59, excluding the boundaries of the District as prescribed by law.

"Authority's Metering Station" means any flow meter or metering station placed at a Point of Supply or Point of Entry owned by the Authority for the purpose of measuring volumes of Water or Wastewater.

"Authority's Rules and Regulations" means any rules, regulations or ordinances adopted by the Authority, pursuant to the Act setting forth the standard and requirements for the design, planning and construction of Water and Wastewater systems within the jurisdiction of the Authority.

"Commencement of Delivery" means date mutually agreed by the City and Authority no later than 6 months after service is available.

"City" shall mean the City of Ocean Springs which is a public body corporate and politic constituting a political subdivision of the State of Mississippi and created by the Mississippi Legislature pursuant to Miss. Code Ann. § 49-17-731. The Authority is composed of the geographic area of Jackson County as defined in Miss. Code Ann. § 19-1-59.

"Effective Start Date" means the date upon which wholesale water is available to the District by the Authority.

"EPA" means the United States Environmental Protection Agency.

"Fiscal Year" means the twelve (12) Month period beginning October 1 of each year and ending September 30.

"MDEQ" means the Mississippi Department of Environmental Quality.

"Month" means a calendar month.

"Operation and Maintenance Expenses of System" means for each Fiscal Year the current expenses paid or accrued from the Effective Start Date which shall include without limitation the following: operation, maintenance, and ordinary current repairs of the System; insurance premiums; administrative expenses; salaries; power; fuel; chemicals; water testing; and such other reasonable and necessary expenses; all of the foregoing relating to the operation and maintenance of the Whole Sale Water System, and in accordance with sound accounting practices, and the delivery of good potable water.

"Point of Supply" or "Points of Supply" means the physical connection or connections between the Authority's Water System and the District's Local Water Facilities.

"City's Five Year Water Needs Plan" means the plan prepared by the City of the planned water purchase from the Authority for the City's Service area. The plan shall also include the City's desired point(s) of supply from the Authority's System and the estimated flow at each point of supply for each year of the five-year study.

"City's Service Area" means the corporate boundaries of the City, areas in which the City is currently providing service, the certificated area of the City and the reasonable area of growth

for the City as hereafter may be designated for service by the City through agreement with the Authority.

"City's Water Facilities" means the publicly owned transmission facilities of the City for transportation of Water to its retail customers.

"Retail Sales" shall mean the provision of utility service directly to the consumer based on an agreed metered or flat rate.

"System" shall mean all physical elements of the Authority's potable water supply and storage system to include elevated water storage tanks together with well(s), pump(s), water treatment equipment, water transmission pipes connecting to the City's Water Facilities, metering station(s), including any and all meters for measuring water going to water service providers other than the City, and all other related operating equipment.

"Wholesale" shall mean for purposes of this Regulation the provision of utility service to a retail utility for resale to consumers.

ARTICLE II

WATER SERVICES AND SUPPLY

2.1 The City shall have the right to consume water from the Authority's System, according to the terms and conditions of this agreement and the Authority's Rules and Regulations. The unit of measurement for water delivered shall be 1,000 gallons per day, U.S. Standard Liquid Measure ("tgd"), or such other lawful unit as the parties may determine to be appropriate and applicable. All volumes of water supplied shall be subject to the quantity and quality standards established by the Department of Health, EPA and the Authority and as defined by the Safe Drinking Water Act of 1974 and as amended.

2.2 The City and Authority agree through the rules, regulations or ordinances, adopted by the entities, to abide by the standards for drinking water supplied by or into the System meeting the standards of the Department of Health, EPA, as defined by the Safe Drinking Water Act of 1974 and as amended.

2.2.1 The Authority shall deliver water aesthetically similar to that provided by the City's Water Service in turbidity, color, taste and odor. Delivered water shall not be artificially fluoridated without written consent from the City.

2.3 Title to all water passing through the City's Point of Supply shall vest in the City and at such point, all liability for the further transportation, delivery, reception, treatment and disposal of water shall pass to the City.

2.4 The Authority shall deliver water to the Point(s) of Supply mutually agreed upon by both parties.

2.5 The Authority shall furnish, install, operate and maintain the Authority's Metering Station(s) at the Point(s) of Supply, and the necessary equipment and devices of standard type for measuring properly all water to be supplied under this Agreement. The Authority's Metering Station(s) and other measuring equipment shall remain the property

of the Authority. The Authority shall provide a device at point of supply to allow remote on/off operation by the City and their existing SCADA network.

2.6 The City shall have access to the Authority's Metering Station(s) during normal business hours for inspection and examination, but the reading, calibration and adjustment thereof shall be done only by employees or agents of the Authority. All readings of meters will be entered upon proper books of record maintained by the Authority. Upon written request, the District may have access to said record books during normal business hours. The City shall have the right to audit the Authority's books once per fiscal year.

2.7 At least once per year the Authority shall cause to be calibrated the Authority's Metering Station(s). If for any reason any meter is out of service or out for repair, or if, upon any test, the percentage of inaccuracy of any meter is found to be five percent (5%) or more, plus or minus, registration thereof shall be corrected for a period of time extending back to the time when such inaccuracy began. However, if the beginning date of the discrepancy can not be established, the correction shall be made for the three (3) consecutive billing periods immediately prior to the discovery of the discrepancy.

2.9 It is understood and agreed that the Authority's storage tanks to be constructed as part of its System may be constructed at an elevation higher than the City's tank(s), which may require the installation of an altitude valve or other device at the point of delivery to the City. Should this be necessary, such device shall be purchased and installed at the Authority's expense as part of the construction and installation of its system. The device and any related equipment shall remain the property of the Authority unless and until both parties should hereafter agree that it would be in the best interest of both parties for such equipment to be transferred to the City. The Authority, City, and/or its contractors, agents or representatives shall have full access to this equipment at all times. No device shall be installed within the City's boundaries without the City's approval.

2.10 The City agrees to provide to the Authority its five-year water needs plan in the form, and updated, as is required and provided the Department of Health as part of the annual inspection. This document shall become an attachment, with credit to the City, to the five-year plan the Authority shall provide the Department of Health for its annual inspection.

2.11 The City and Authority agree to recognize the points of connection as between the City and the Authority as "mutual aid" points. The Authority may request the City to reverse flow to the Authority's system to aid in an emergency response. Credit for reverse flow will be given on metered charges. The Authority cannot resell the mutual aid reverse flow without specific approval of the City for a defined event. Credit for any planned maintenance by the Authority, and as may be agreed by the City, would be applied at the Contract rate in force and will be applied to actual demand, or minimum purchase demand, if minimum purchase flow is not reached for that period.

2.12 Should the Authority become unable to meet the capacity demands of the City or if it becomes less cost effective to upgrade the City's distribution lines due to the location of

the POS with regard to the area of demand, the Authority will give authorization to the City to install the necessary wells and storage to meet such demands.

ARTICLE III
TERM AND OPTION

3.1 This agreement shall be effective upon approval and execution of both parties and the initial term hereof shall be for a period of (5) years commencing from and after the effective start date the System is accepted for operation by the Authority from the construction contractor. The City and Authority retain the right to "Terminate" the Contract on every fifth (5^{th}) anniversary of the agreement provided the entity wishing to terminate the Contract provides at least ninety (90) days prior notice of this intent.

ARTICLE IV
PAYMENTS

4.1 From and after the date of commencement of delivery of metered water to the City's Point(s) of Supply, the City shall pay the Authority monthly for metered water according to the Wholesale Water Rate Schedule attached hereto as Exhibit "A". Payments shall be made within forty-five (45) days of invoicing by the Authority.

4.2 Following the initial five (5) year period of the lease term, the Wholesale Water Rate Schedule may be adjusted by the Authority. The adjusted rate schedule shall then remain in effect for a one-year period and will be reviewed annually. The Authority shall give the City at least ninety (90) days notice of the adjusted rate schedule. Within any subsequent 5-year period, if the wholesale water rate increases to 25 percent or more, the City has the right to terminate the agreement with ninety (90) days notice.

ARTICLE V
RULES AND PERMITTING

5.1 COMPREHENSIVE WATER RULES AND REGULATIONS

The Authority and City shall adhere to and maintain in effect Comprehensive Water Rules and Regulations in conformity with the standards and restriction of the EPA, the MDEQ, the Mississippi Department of Health, the Act and any other governmental body having legal authority to set such standards and restrictions.

5.2 This agreement is not intended to restrict the City's ability to sell or resell water to other utilities, entities, and/or individuals whether inside or outside the City's service area. The Authority recognizes that the City operates a Public Water System and will install water supply, storage and distribution infrastructure subject to the design criteria

established by and the approval of the Mississippi State Department of Health. JCUA administrative concurrence of such infrastructure improvements shall not be unreasonably withheld.

ARTICLE VI
REPRESENTATIONS

6.1 AUTHORITY'S WARRANTIES AND COVENANTS

The Authority represents, warrants and covenants to the City as of the Effective Date that:

a. The Authority is a political subdivision of the State of Mississippi and has all requisite power and authority to enter into this Agreement, and to carry out and perform the terms and provisions of this Agreement. The Authority has been duly authorized by all necessary action on the part of the Authority, its governing body or other appropriate governing bodies and officials to execute, deliver and perform the terms of this Agreement and further represents that all requirements and procedures have occurred that are necessary to ensure the enforceability of this Agreement, including the Authority's compliance with any applicable public bidding and/or purchase requirements.

b. This Agreement constitutes a legal, valid and binding obligation of the Authority, enforceable in accordance with its terms and does not contravene any lease, indenture, credit agreement or other agreement to which the Authority is a party or by which it is bound.

c. All required consent, approval, or authorization of, registration with, or declaration to any agency or authority in connection with the execution and delivery of this Agreement has been complied with.

d. The execution, delivery and performance of this Agreement will not violate any provision of law, order of any court or agency of government applicable to the Authority nor any indenture, agreement or other instrument to which the Authority is a party, or by which it is bound.

e. The Authority is not in default (nor has any event occurred which, with notice or lapse of time, or both, would constitute a default) under any agreement or instrument to which the Authority is a party or under which the Authority or any of its assets is bound which could have any effect whatsoever upon the validity, performance, or enforceability of the terms of this Agreement.

6.2 THE CITY'S WARRANTIES AND COVENANTS

The City represents, warrants and covenants to the Authority as of the Effective Date that:

a. The City is a political subdivision of the State of Mississippi and has all requisite power and authority to enter into this Agreement, and to carry out and perform the terms and provisions of this Agreement.

b. The City has the requisite power, authority and legal right to execute, deliver and perform this Agreement and the City has been duly authorized by all necessary action on the part of the City, its governing body or other appropriate governing bodies and officials to execute, deliver, and perform the terms of this Agreement and further represents that all requirements and procedures have occurred that are necessary to ensure the enforceability of this Agreement, including the City's compliance with any applicable public bidding and/or sale and transfer of property requirements.

c. This Agreement constitutes a legal, valid and binding obligation of the City, enforceable in accordance with its terms and does not contravene any lease, indenture, credit agreement or other agreement to which the City is a party or by which it is bound.

d. There are no pending or threatened actions or proceedings before any court, administrative agency or other body which, if adversely determined, would materially affect the City's ability to perform its obligations hereunder or which could have any effect whatsoever upon the validity, performance or enforceability of the terms of this Agreement.

e. No consent, approval, or authorization of, registration with, or declaration to any agency or authority is required in connection with the execution and delivery of this Agreement.

f. The execution, delivery and performance of this Agreement will not violate any provision of law, order of any court or agency of government applicable to the City nor any indenture, agreement, or other instrument to which the City is a party, or by which it is bound.

g. The City is not in default (nor has any event occurred which, with notice or lapse of time, or both, would constitute a default) under any agreement or instrument to which the District is a party or under which the City or any of its assets is bound which could have any effect whatsoever upon the validity, performance or enforceability of the terms of this Agreement.

ARTICLE VII

GENERAL PROVISIONS

7.1 INSURANCE

The City agrees to provide and maintain comprehensive liability insurance and such other insurance or coverage for operating and maintaining its System as may be required by law.

7.2 CONSTRUCTION OF AGREEMENT

Each party, with the assistance of competent legal counsel, has reviewed this Agreement and any ambiguity should not be construed for or against any party on account of such drafting.

7.3 WAIVER OR BREACH

No waiver or indulgence of any breach or series of breaches of this Agreement shall be deemed or construed as a waiver of any breach of the same or any other provision hereof or affect the enforceability of any part or all of this Agreement. No waiver shall be valid unless executed in writing by the waiving party.

7.4 AWARENESS OF CONTENTS/LEGAL EFFECT

The parties expressly declare and represent that they have read this Agreement and that they have consulted with their respective counsel regarding the meaning of the terms and conditions contained herein. The parties further expressly declare and represent that they full understand the content and effect of this Agreement and they approve and accept the terms and conditions contained herein, and that the Agreement is executed freely and voluntarily.

7.5 AGREEMENT BINDING ON ALL

This agreement shall be binding upon and shall inure to the benefit of each of the parties, and each of their respective agents, employees, directors, officers, attorneys, representatives, principals, shareholders, sureties, parents, subsidiaries, affiliates, successors, predecessors, assigns, trustees or receivers appointed to administer their assets, and attorney of any and all such individuals or entities. All the convents contained in this Agreement are for the express benefit of each and all such persons described in this Section. This Agreement is not intended to benefit any third parties.

7.6 SEVERABILITY.

Should any non-material provision of this Agreement be held invalid or illegal, such invalidity or illegality shall not invalidate the whole of this Agreement, but, rather, the Agreement shall be construed as if it did not contain the invalid or illegal part, and the rights and obligations of the parties shall be construed and enforced accordingly.

7.7 CAPTIONS.

The captions contained herein are included solely for convenience and shall not be construed as part of this Agreement or as full or accurate descriptions of the terms hereof.

7.8 NOTICE

a. Any notice required under this Agreement shall be written and shall be served either by personal delivery, mail or fax.

b. In the case of service by personal delivery or fax, no additional time, in days, shall be added to the time in which a right may be exercised or any act may be done.

c. In the case of service by mail, notice must be deposited in a post office, mailbox, sub post office, substation, mail chute, or other like facility regularly maintained by the United States Postal Service, in a sealed envelope, with postage paid, addressed to the representative(s) of the party on whom it is to be served, at the office set forth below. The service is complete at the time of deposit. Any period of notice and any right to duty to do any act or make any response within any period or on a date certain after service of notice by mail shall be extended within a reasonable time. Any period of notice and any right or duty to do any act or make any response within any period or on a date certain after service of notice by express mail or other method of delivery providing for overnight delivery shall be extended within a reasonable time.

d. Any notice required by this Agreement shall be served on the following representative(s) of the parties:

Executive Director
Jackson County Utility Authority

Mayor
City of Ocean Springs

The parties may, upon written notice, add or substitute representatives or addresses.

7.9 AMENDMENTS OR CHANGES TO AGREEMENT

Any amendments or changes to this Agreement must be in writing, signed by a duly authorized representative of the parties hereto, and must expressly state the mutual intent of the parties to amend the Agreement as set forth herein.

7.10 FORCE MAJEURE

a. Should the Authority be forced to suspend, reduce, or interrupt service to the City because of any emergency condition reasonably beyond the control of the Authority, including, without limitation, floods, fires, ice, windstorms, lightning, equipment failure, strikes, lockouts, Acts of God, or of the public enemy, or acts, orders or directives of the Federal or State Government or Court, then Authority need not deliver any services that it is unable to deliver by reason of such conditions; nor shall the City be required to pay any charges for services not delivered. In the event a suspension of service is necessary as a consequence of a Force Majeure event, Authority will notify the City as soon as reasonable possible. Authority will use best efforts to resume service following an event of Force Majeure.

b. In the event either party hereto shall be rendered unable wholly or in part to carry out its obligations under this Agreement as a result of the occurrence of a Force Majeure, then the affected party shall give notice and full particulars of such Force

Majeure in writing to the other party within a reasonable time after occurrence of the event or cause relied on, the obligation of the party giving such notice, so far as it is affected by such Force Majeure, shall be suspended during the continuance of the inability then claimed, but for no longer period, and any such party shall endeavor to remove or overcome such inability with all reasonable dispatch.

7.11 DEFAULT

a. Default by the City. Each of the following constitutes a default by the City under this Agreement: (i) the City fails to pay any amount of a bill, including any applicable interest and penalties, within ninety (90) days of the due date; (ii) the City fails to perform or observe any obligation, condition, or term of, or arising from, this Agreement that it is to perform or observe and such failure continues ninety (90) days following a notice of default.

b. Default of Authority. Authority fails to perform or observe any obligation, condition, or term of, or arising from, this Agreement that it is to perform or observe and such failure continues ninety (90) days following a notice of default.

7.12 REMEDIES

In the event of a default, the parties shall have the following rights and remedies:

Cumulative Rights and Remedies. The parties do not intend that any right or remedy given to a party on the breach of any provision under this Agreement be exclusive. Each such right or remedy is cumulative and in addition to any other remedy provided in the Agreement or otherwise available at law or in equity. If the non-breaching party fails to exercise or delays in exercising any right or remedy, the non-breaching party does not thereby waive that right or remedy. Furthermore, no single or partial exercise of any right, power or privilege precludes any further exercise of a right, power, or privilege granted by this Agreement or otherwise.

Attorney's Fees. In the event that either party is required to pursue any action in any court to enforce the obligations, conditions, and terms of this Agreement against the other party, parties are responsible for fees assessed by their own attorney.

Forum for Any Claim or Action. Any claim or action brought by any party relating to this Agreement and its subject matter shall be brought in the Chancery or Circuit Courts of Jackson County.

7.13 ENFORCEMENT OF AGREEMENT

In enforcing the performance of the provisions of this contract, both parties shall have the right to exercise of all procedures available under the law including, but without limiting the generality of the right to make application for a mandatory injunction. It is not intended by the parties hereby to specify any, nor shall this Agreement be considered to specify, any exclusive remedy for any default, and all such other remedies existing at law or in equity may be availed by any party hereto and shall be cumulative. Recognizing, however, that the District's undertaking to provide and maintain the services of the System is an obligation, failure in the performance of which cannot be adequately compensated by money damages alone, the parties agree that, in the event of any defaults, that each party shall have available to it the equitable remedy of specific

performance in addition to any other legal or equitable remedy which may be available. No waiver or waivers of any breach of this Agreement or default in the performance of this Agreement by either party shall be deemed to be a waiver thereof in the future, nor shall any such waiver or waivers be deemed or construed to be a waiver of subsequent breaches or defaults of any kind, character, or description, under any circumstances.

IN WITNESS WHEREOF, the parties hereto, acting under authority of their respective governing bodies, have caused this Agreement to be duly executed in several counterparts, each of which shall constitute an original, all as of the 2 day of September, 2007.

JACKSON COUNTY UTILITY AUTHORITY

BY: _____
CHAIRMAN OF THE BOARD OF DIRECTORS

ATTEST:

_____
CLERK

CITY OF OCEAN SPRINGS

BY: Connie Moran
MAYOR

ATTEST:

Sue M. Kay
CLERK

EXHIBIT "A" TO SERVICE AGREEMENT
FOR THE SUPPLY OF WATER BETWEEN
CITY OF OCEAN SPRINGS AND
JACKSON COUNTY UTILITY ATHORITY

WHOLESALE WATER RATE SCHEDULE

1. Base payment of $5,000 per month for metered water usage of up to 6,000,000 gallons per month. Base payment will be applicable regardless of whether metered water usage may be less than 6,000,000 gallons per month. JCUA will convey to the City a portion of the entire system's rated capacity that is commensurate with base payment to fixed cost ratio.

2. $0.41 per thousand gallons for all metered water usage each month in excess of 6,000,000 gallons per month. Maximum demand on the system will be determined at end of construction, thus the Authority reserves the right to assign a limit on the demand beyond 6,000,000 gallons, but not less than the value required to support the number of connections conveyed that will be included in a future revision to Exhibit "A".

0.83¢ per thousand Gallons for 1st 6,000,000 gallons

First Payment
June 2013

GLMCLM01 GLHIST2013 CASH DISBURSEMENTS DATA ENTRY GLWCLM97/R4

Fund 400 WATER FUND Trans 102807 Amount 10740.41
Claim 822 Claim Date Release Date 7 2 2013 Status P (NOVDHP)
Bank 100 Check Date 7 3 2013 Check 85871 Cash Acct 000 001 Source CD
Voided Reason
Vendor No 4226 Payee JACKSON COUNTY UTILITY AUTHORITY
CLEARED Addr1 1225 JACKSON AVENUE Add 20130627 WDEVITA
7 31 2013 Addr2 Chg 00000000
Page No 1 City PASCAGOULA MS 39567 1099 Form Type
For Investments CD No Maturity Date Rate

Account	Description	Invoice	InvoiceDate	Amount
400677680	WATER SERVICE JUNE	29106	6 10 2013	10740.41

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F13-MODE F14-PAPERLINK
F3-Next_Claim,PAGE-UP_for_Prev_Claim F4-Prev_Detail F5-Next_Detail F13-Mode

Johnny

APPENDIX F

HYDRAULIC ANALYSIS
STATIC DETAILS
DYNAMIC DETAILS

DYNAMIC DETAILS

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C4-036	22.00	9.00	83.00	26.4
D7-019	24.00	21.00	93.43	30.0
D7-011	24.00	21.00	94.64	30.6
D7-017	24.00	21.00	95.65	31.0
D7-021	24.00	21.00	96.22	31.2
D7-020	24.00	21.00	96.29	31.3
D7-012	24.00	21.00	96.29	31.3
D7-014	23.87	21.00	96.20	31.3
D7-018	23.69	21.00	96.03	31.3
D7-013	23.82	21.00	96.20	31.3
D7-016	24.00	21.00	96.44	31.3
D7-023	24.00	21.00	96.51	31.4
D7-022	24.00	21.00	96.57	31.4
D7-015	24.00	21.00	96.99	31.6
D7-009	24.00	21.00	97.46	31.8
D7-010	24.00	21.00	97.46	31.8
D9-001	24.00	10.00	97.58	31.8
D7-002	26.00	21.00	99.86	32.0
D7-004	24.00	21.00	98.37	32.2
D7-003	24.00	21.00	98.77	32.4
D7-008	23.85	21.00	98.91	32.5
D7-001	24.00	21.00	100.97	33.3
D6-014	24.00	17.60	101.90	33.7
D7-007	22.33	21.00	103.27	35.0
D6-005	22.15	17.60	103.95	35.4
D6-006	22.32	17.60	106.07	36.2
D6-015	22.26	17.60	106.07	36.3
D6-007	22.00	17.60	106.86	36.7
D6-004	20.26	17.60	105.37	36.8
D6-003	22.00	17.60	107.95	37.2
C2-137	20.23	8.20	106.54	37.3
D5-008	24.00	17.30	110.51	37.4
D5-009	24.00	17.30	110.52	37.4
D5-010	24.00	17.30	110.60	37.5
D4-002	22.00	289.00	108.81	37.6
D4-001	23.56	9.00	110.50	37.6
C4-017	22.00	9.00	109.13	37.7
C4-014	22.00	9.00	109.16	37.7
C4-016	22.00	9.00	109.25	37.7
C4-013	22.00	9.00	109.31	37.8
C4-010	22.00	9.00	110.38	38.2
C4-009	22.00	9.00	110.47	38.3
C5-018	24.00	8.90	112.49	38.3
C5-017	23.66	8.90	112.49	38.4
C4-011	22.00	9.00	110.97	38.5
C4-032	22.00	9.00	110.98	38.5

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C5-069	21.86	8.90	111.11	38.6
C4-029	22.00	9.00	111.32	38.6
C4-012	21.78	9.00	111.11	38.7
C4-030	22.00	9.00	111.34	38.7
C4-031	22.00	9.00	111.39	38.7
C5-067	21.54	8.90	110.94	38.7
C4-028	22.00	9.00	111.44	38.7
D5-005	21.13	17.30	110.62	38.7
C5-038	22.00	8.90	111.58	38.8
C5-020	22.00	8.90	111.61	38.8
C5-036	22.38	8.90	112.05	38.8
C5-019	22.76	8.90	112.44	38.8
C4-027	22.00	9.00	111.76	38.8
C5-078	22.00	8.90	111.81	38.9
C5-034	22.00	8.90	112.04	39.0
C5-033	22.00	8.90	112.04	39.0
C5-016	22.51	8.90	112.56	39.0
C5-032	22.00	8.90	112.14	39.0
C5-041	22.00	8.90	112.21	39.0
D5-011	20.04	17.30	110.47	39.1
C4-026	22.00	9.00	112.46	39.1
C5-026	22.04	8.90	112.56	39.2
C4-034	22.00	9.00	112.53	39.2
D5-007	19.86	17.30	110.47	39.2
C5-013	22.18	8.90	112.82	39.2
C5-065	22.00	8.90	112.66	39.2
C4-033	22.00	9.00	112.81	39.3
D6-008	22.00	17.60	112.84	39.3
D6-002	22.00	17.60	112.84	39.3
C6-065	22.91	10.20	113.76	39.3
C5-058	22.00	8.90	112.98	39.4
C5-057	22.00	8.90	113.00	39.4
D6-012	22.00	17.60	113.00	39.4
C4-025	22.00	9.00	113.04	39.4
C5-043	22.00	8.90	113.05	39.4
C5-060	22.00	8.90	113.05	39.4
C5-056	22.00	8.90	113.06	39.4
C6-013	22.00	10.20	113.09	39.4
C6-012	22.00	10.20	113.09	39.4
C6-011	22.00	10.20	113.11	39.4
C6-046	22.00	10.20	113.13	39.4
C5-042	22.00	88.90	113.26	39.5
C4-035	21.40	9.00	112.72	39.5
C5-037	20.41	8.90	111.86	39.6
C4-024	21.23	9.00	112.81	39.6
C5-068	19.40	8.90	111.02	39.6

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
D6-016	22.00	17.60	113.64	39.6
D6-017	22.00	17.60	113.78	39.7
C5-031	20.94	8.90	112.74	39.7
C5-080	23.81	263.90	115.85	39.8
D5-002	19.70	17.30	112.02	39.9
C6-014	20.76	10.20	113.09	39.9
C5-012	22.00	88.90	114.39	40.0
C6-048	22.00	10.20	114.46	40.0
C5-061	20.56	8.90	113.04	40.0
C5-011	22.00	8.90	114.63	40.1
C5-070	20.21	8.90	113.10	40.2
C5-055	20.20	8.90	113.15	40.2
C5-079	23.14	8.90	116.20	40.3
C6-063	22.00	10.20	115.10	40.3
C6-064	22.00	10.20	115.11	40.3
D6-013	19.86	17.60	113.00	40.3
C5-062	19.45	8.90	112.73	40.4
C5-014	19.37	8.90	112.66	40.4
C5-059	19.61	8.90	112.97	40.4
C5-063	19.31	8.90	112.72	40.4
C6-047	22.00	10.20	115.42	40.4
C5-064	19.20	8.90	112.67	40.4
D7-006	23.02	21.00	116.52	40.5
C5-081	18.26	8.90	111.82	40.5
C5-010	22.85	8.90	116.57	40.5
C6-066	22.00	10.20	115.77	40.6
C6-067	22.00	10.20	115.77	40.6
B5-006	20.30	11.40	114.09	40.6
C5-054	20.03	8.90	113.89	40.6
C6-045	22.00	10.20	115.88	40.6
C4-015	15.38	9.00	109.32	40.6
C5-040	18.12	8.90	112.10	40.7
C6-015	22.00	10.20	116.00	40.7
D7-005	22.47	21.00	116.54	40.7
D6-010	18.63	17.60	112.85	40.8
D6-009	18.57	17.60	112.83	40.8
C4-037	22.00	9.00	116.30	40.8
C5-053	21.58	8.90	115.98	40.8
B5-008	19.61	11.40	114.14	40.9
C6-042	21.94	10.20	116.56	40.9
C5-030	18.09	8.90	112.74	41.0
C5-028	18.03	8.90	112.69	41.0
C6-041	21.76	10.20	116.47	41.0
C6-031	22.00	10.20	116.73	41.0
C6-076	21.95	10.20	116.88	41.1
B4-009	19.18	10.00	114.12	41.1

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C6-073	21.46	10.20	116.47	41.1
C6-034	21.46	10.20	116.47	41.1
C6-033	21.44	10.20	116.50	41.1
C5-029	17.60	8.90	112.68	41.1
C6-032	21.45	10.20	116.57	41.2
B5-013	19.29	11.40	114.42	41.2
C6-075	21.51	10.20	116.67	41.2
C6-040	21.76	10.20	116.97	41.2
C4-053	20.72	9.00	115.94	41.2
C6-068	21.69	10.20	116.93	41.2
C6-049	22.00	10.20	117.27	41.2
B4-018	18.18	10.00	113.45	41.2
B5-009	18.85	11.40	114.15	41.2
C4-023	17.19	9.00	112.53	41.3
A4-011	16.99	6.00	112.33	41.3
A5-002	18.00	6.00	113.36	41.3
A5-004	18.00	6.00	113.38	41.3
A5-001	18.00	6.00	113.38	41.3
B5-041	18.00	11.40	113.41	41.3
B4-017	18.00	10.00	113.46	41.3
C6-074	21.85	10.20	117.39	41.3
B5-016	18.59	11.40	114.16	41.3
C2-135	21.06	8.20	116.69	41.4
B5-011	18.77	11.40	114.43	41.4
A4-002	16.84	6.00	112.52	41.4
B5-032	22.00	11.40	117.70	41.4
B5-044	18.90	11.40	114.61	41.4
B5-015	18.44	11.40	114.18	41.4
C6-039	22.00	10.20	117.79	41.4
B5-014	22.00	11.40	117.81	41.5
C4-052	21.28	9.00	117.22	41.5
B4-010	18.17	10.00	114.12	41.5
B5-010	18.27	48.40	114.24	41.5
C5-066	15.03	8.90	111.04	41.5
B5-018	18.43	11.40	114.48	41.6
D5-006	14.50	17.30	110.56	41.6
B4-011	18.02	10.00	114.12	41.6
B5-029	21.32	11.40	117.48	41.6
B5-030	21.30	11.40	117.47	41.6
B4-015	21.24	10.00	117.45	41.6
C6-038	22.00	10.20	118.24	41.6
C6-030	21.60	10.20	117.88	41.7
C6-072	20.14	10.20	116.42	41.7
B5-025	19.29	11.40	115.64	41.7
B5-004	18.00	11.40	114.35	41.7
B5-005	18.00	11.40	114.36	41.7

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B5-012	18.00	11.40	114.43	41.7
C6-062	22.00	10.20	118.45	41.7
B5-019	18.00	11.40	114.48	41.7
B5-043	18.00	11.40	114.49	41.7
B5-028	20.82	11.40	117.35	41.8
C4-041	22.00	229.00	118.55	41.8
C6-050	22.00	10.20	118.64	41.8
B5-031	20.82	11.40	117.47	41.8
B5-007	20.91	11.40	117.57	41.8
C6-069	21.51	10.20	118.18	41.8
C6-061	22.00	10.20	118.69	41.8
B4-007	17.38	10.00	114.12	41.9
C6-060	22.00	10.20	118.77	41.9
C6-037	21.44	10.20	118.22	41.9
C5-025	22.00	8.90	118.83	41.9
C6-059	22.00	10.20	118.86	41.9
C6-051	22.00	10.20	118.88	41.9
C5-044	22.00	128.90	118.93	41.9
C4-038	22.00	9.00	118.93	41.9
C6-017	22.00	10.20	118.95	41.9
C6-016	22.00	10.20	118.95	41.9
C7-059	21.47	7.20	118.46	42.0
C7-062	21.40	7.20	118.46	42.0
B4-001	16.39	11.40	113.47	42.0
C5-035	14.91	8.90	112.04	42.0
B4-002	16.29	10.00	113.43	42.0
B5-026	20.00	11.40	117.15	42.0
B5-033	20.37	11.40	117.52	42.0
C6-036	20.90	10.20	118.22	42.1
B5-027	20.00	11.40	117.32	42.1
C7-057	21.13	7.20	118.46	42.1
C6-029	20.86	10.20	118.23	42.1
B4-016	16.00	10.00	113.38	42.1
B5-024	19.22	11.40	116.62	42.1
C7-058	20.96	7.20	118.46	42.2
B4-019	20.00	10.00	117.53	42.2
B4-020	19.94	10.00	117.47	42.2
E9-002	0.00	10.00	97.58	42.2
E9-001	0.00	10.00	97.58	42.2
E8-004	0.00	28.00	97.59	42.2
E8-003	0.00	28.00	97.59	42.2
E8-005	0.00	28.00	97.59	42.2
E8-002	0.00	28.00	97.59	42.2
B4-022	19.81	10.00	117.42	42.2
C7-022	20.85	7.20	118.47	42.2
C7-060	20.83	7.20	118.46	42.2

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-061	20.81	7.20	118.46	42.2
C6-035	20.50	10.20	118.22	42.3
C7-021	20.84	7.20	118.57	42.3
B5-042	19.59	11.40	117.34	42.3
E8-001	0.00	28.00	97.77	42.3
C4-039	22.00	9.00	119.80	42.3
C5-045	22.00	8.90	119.86	42.3
C6-018	22.00	10.20	119.88	42.3
C6-028	20.76	10.20	118.65	42.4
C6-009	22.00	10.20	119.90	42.4
C4-051	21.47	9.00	119.37	42.4
C6-027	20.86	10.20	118.77	42.4
C5-048	22.00	8.90	119.94	42.4
C7-020	21.14	7.20	119.12	42.4
B4-023	19.65	10.00	117.69	42.4
C5-049	21.85	8.90	119.90	42.4
C5-027	14.50	8.90	112.56	42.4
D5-001	13.50	17.30	111.56	42.4
C6-070	20.70	10.20	118.77	42.4
A4-009	14.22	6.00	112.34	42.4
C5-072	22.00	8.90	120.18	42.5
C5-071	22.00	8.90	120.19	42.5
C5-046	22.00	8.90	120.22	42.5
C4-057	21.48	9.00	119.74	42.5
C7-023	20.30	7.20	118.57	42.5
C6-026	20.70	10.20	119.01	42.5
C4-050	21.39	9.00	119.73	42.5
C7-019	20.70	7.20	119.20	42.6
C6-001	20.59	10.20	119.12	42.6
B4-066	18.86	10.00	117.40	42.6
C4-018	11.82	9.00	110.47	42.7
C6-071	20.05	10.20	118.73	42.7
C4-054	21.12	9.00	119.81	42.7
C4-059	21.38	9.00	120.07	42.7
C5-050	21.01	8.90	119.84	42.8
C7-010	20.79	7.20	119.64	42.8
B4-008	15.23	10.00	114.12	42.8
C5-052	20.79	8.90	119.75	42.8
C4-056	20.78	9.00	119.76	42.8
C7-012	20.24	7.20	119.23	42.8
C4-086	22.00	9.00	120.99	42.8
C7-011	20.22	7.20	119.25	42.8
C4-008	22.00	9.00	121.06	42.9
C7-009	20.07	7.20	119.25	42.9
B4-021	18.19	10.00	117.40	42.9
C5-075	22.00	8.90	121.24	42.9

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-013	19.98	7.20	119.23	42.9
B4-069	18.14	10.00	117.40	42.9
B4-024	18.00	10.00	117.39	43.0
C6-052	21.98	10.20	121.49	43.1
C5-074	21.69	8.90	121.24	43.1
C5-004	22.65	8.90	122.20	43.1
C5-015	12.99	8.90	112.59	43.1
B5-017	14.97	11.40	114.62	43.1
C7-007	20.00	7.20	119.65	43.1
B4-068	17.74	10.00	117.40	43.1
C7-055	20.00	7.20	119.67	43.1
C7-054	20.00	7.20	119.67	43.1
B4-067	17.71	10.00	117.39	43.1
C5-051	20.14	8.90	119.83	43.1
C4-019	11.49	9.00	111.25	43.2
C4-055	20.00	9.00	119.77	43.2
C7-024	20.00	7.20	119.81	43.2
B4-025	17.57	10.00	117.39	43.2
C6-056	21.82	10.20	121.65	43.2
C7-045	20.00	7.20	119.85	43.2
C6-058	21.92	10.20	121.79	43.2
C5-047	22.25	8.90	122.15	43.2
C6-057	21.79	10.20	121.75	43.2
C7-006	20.00	7.20	119.98	43.3
C7-008	19.52	7.20	119.50	43.3
C5-076	22.00	8.90	121.99	43.3
C7-004	20.25	7.20	120.25	43.3
C6-008	21.96	10.20	121.97	43.3
C7-043	20.00	7.20	120.05	43.3
C5-077	22.00	8.90	122.05	43.3
C4-001	22.00	9.00	122.06	43.3
C4-042	22.00	9.00	122.08	43.3
C6-007	22.00	10.20	122.08	43.3
C5-073	21.02	8.90	121.11	43.3
C7-052	19.55	7.20	119.67	43.3
C6-010	22.00	10.20	122.12	43.3
C5-006	22.20	8.90	122.32	43.3
B5-040	13.41	11.40	113.56	43.3
C4-007	22.00	9.00	122.16	43.3
D5-003	11.38	17.30	111.55	43.3
C5-002	22.09	8.90	122.28	43.4
C7-033	19.43	7.20	119.67	43.4
C4-058	22.00	9.00	122.30	43.4
C6-053	21.46	10.20	121.80	43.4
C1-021	20.64	7.90	120.99	43.4
C4-043	22.00	9.00	122.36	43.4

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-053	19.30	7.20	119.67	43.4
C6-055	21.33	10.20	121.75	43.4
C5-005	21.72	8.90	122.20	43.5
C7-005	19.49	7.20	119.98	43.5
C5-001	22.00	8.90	122.51	43.5
C5-003	21.68	8.90	122.21	43.5
C5-021	22.00	8.90	122.56	43.5
C4-044	22.00	9.00	122.59	43.5
C4-020	11.01	9.00	111.65	43.5
C4-045	22.00	9.00	122.69	43.6
D5-004	11.03	17.30	112.02	43.7
C1-019	20.00	7.90	121.00	43.7
C1-020	20.00	7.90	121.01	43.7
C5-008	22.37	8.90	123.39	43.7
C1-023	20.00	7.90	121.15	43.8
C7-046	18.38	7.20	119.53	43.8
C7-018	18.32	7.20	119.48	43.8
C7-037	18.50	7.20	119.68	43.8
C4-088	22.00	9.00	123.20	43.8
C7-017	18.27	7.20	119.47	43.8
C4-087	22.00	9.00	123.22	43.8
C7-014	18.00	7.20	119.23	43.8
C4-040	22.00	9.00	123.24	43.8
C1-022	19.92	7.90	121.17	43.8
C5-009	22.22	8.90	123.56	43.8
C1-009	22.00	7.90	123.36	43.9
C1-013	22.00	7.90	123.36	43.9
C7-034	18.10	7.20	119.53	43.9
C1-010	22.00	7.90	123.44	43.9
C4-006	21.62	9.00	123.08	43.9
C7-032	18.18	7.20	119.70	43.9
C7-031	18.22	7.20	119.82	44.0
B6-005	18.32	11.60	119.97	44.0
B5-020	18.31	11.40	119.98	44.0
B6-004	18.35	11.60	120.11	44.0
B5-001	18.00	11.40	119.79	44.0
B6-038	18.00	11.60	119.84	44.1
B6-007	18.00	11.60	119.84	44.1
B6-037	18.00	11.60	119.84	44.1
B5-037	18.00	11.40	119.86	44.1
B5-036	18.00	11.40	119.89	44.1
C7-042	18.35	7.20	120.25	44.1
C1-011	21.39	7.90	123.34	44.1
B6-002	20.00	11.60	121.95	44.1
B6-006	18.00	11.60	119.97	44.1
C4-089	21.22	9.00	123.22	44.1

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-044	18.20	7.20	120.25	44.2
C4-021	10.06	9.00	112.15	44.2
B6-001	20.00	11.60	122.15	44.2
B6-021	20.00	11.60	122.16	44.2
C7-002	19.09	7.20	121.26	44.2
C1-041	21.94	7.90	124.13	44.2
B6-018	20.00	11.60	122.23	44.2
C6-006	22.00	10.20	124.24	44.2
B5-023	18.00	11.40	120.30	44.3
C7-041	18.00	7.20	120.35	44.3
B6-019	19.83	11.60	122.19	44.3
B5-021	18.00	11.40	120.38	44.3
B5-035	18.00	11.40	120.38	44.3
C7-001	18.87	7.20	121.32	44.3
B3-069	22.00	11.10	124.48	44.3
B6-022	20.00	11.60	122.54	44.4
C6-002	20.00	10.20	122.54	44.4
B6-010	17.56	81.60	120.13	44.4
C7-050	19.03	7.20	121.60	44.4
C7-003	18.51	7.20	121.08	44.4
C6-003	20.00	10.20	122.57	44.4
D6-001	10.52	17.60	113.10	44.4
B6-026	19.48	11.60	122.16	44.4
B5-002	17.10	11.40	119.79	44.4
C4-061	21.85	9.00	124.53	44.4
B6-023	20.00	11.60	122.86	44.5
C7-015	16.34	7.20	119.23	44.5
C4-085	22.00	9.00	124.93	44.5
B6-024	19.19	11.60	122.19	44.6
B6-043	18.82	11.60	121.82	44.6
B5-003	16.98	11.40	119.99	44.6
B7-001	19.83	7.20	122.94	44.6
B5-054	16.66	6.00	119.79	44.6
C1-048	21.51	7.90	124.66	44.6
B6-020	18.97	11.60	122.17	44.6
C7-038	16.67	7.20	119.92	44.7
B6-015	18.94	11.60	122.28	44.7
C5-039	8.70	8.90	112.04	44.7
C4-022	8.92	9.00	112.27	44.7
B6-025	18.81	11.60	122.17	44.7
C6-004	20.00	10.20	123.39	44.7
C1-039	21.87	7.90	125.28	44.7
B6-032	18.37	11.60	122.00	44.8
C1-014	19.87	7.90	123.49	44.8
B6-017	18.57	11.60	122.24	44.9
B6-031	18.40	11.60	122.13	44.9

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B5-034	17.00	11.40	120.76	44.9
B6-016	18.45	11.60	122.25	44.9
B6-041	18.00	11.60	121.84	44.9
C7-039	16.42	7.20	120.25	44.9
B6-040	18.00	11.60	121.85	44.9
B6-011	18.11	11.60	121.96	44.9
C7-035	16.00	7.20	119.89	45.0
B6-029	20.00	11.60	123.91	45.0
B5-039	18.00	11.40	121.94	45.0
C7-040	16.27	7.20	120.21	45.0
C1-017	20.00	7.90	123.95	45.0
B6-033	18.00	11.60	121.96	45.0
B5-022	16.72	11.40	120.72	45.0
B6-042	17.71	11.60	121.84	45.1
B6-027	18.00	11.60	122.16	45.1
B6-039	18.00	11.60	122.16	45.1
B6-003	16.19	11.60	120.37	45.1
D6-011	8.56	17.60	112.85	45.1
B6-034	17.62	11.60	121.94	45.1
A4-010	8.00	6.00	112.33	45.1
C1-036	20.00	7.90	124.40	45.2
B6-013	17.64	11.60	122.04	45.2
A4-004	8.00	6.00	112.44	45.2
A4-003	8.00	6.00	112.44	45.2
C7-048	17.72	7.20	122.17	45.2
C7-063	0.00	70.00	104.53	45.2
C2-120	21.96	8.20	126.50	45.2
C1-042	20.75	7.90	125.30	45.2
C3-096	22.00	8.70	126.55	45.2
C1-038	20.01	7.90	124.58	45.2
C2-115	20.72	8.20	125.32	45.3
D2-004	22.00	7.10	126.64	45.3
D2-007	22.00	7.10	126.65	45.3
D2-006	22.00	7.10	126.65	45.3
D2-005	22.00	7.10	126.65	45.3
D2-001	22.00	7.10	126.65	45.3
D2-002	22.00	7.10	126.66	45.3
C3-086	22.00	8.70	126.67	45.3
D3-004	22.00	7.10	126.67	45.3
D3-002	22.00	7.10	126.68	45.3
C3-089	22.00	8.70	126.68	45.3
D3-001	22.00	7.10	126.68	45.3
C3-088	22.00	8.70	126.68	45.3
C3-090	22.00	8.70	126.68	45.3
C7-049	16.91	7.20	121.62	45.3
C5-007	20.10	8.90	124.82	45.3

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C2-063	22.00	8.20	126.71	45.3
B6-030	17.87	11.60	122.60	45.3
C2-138	22.00	8.20	126.74	45.3
C2-015	22.00	8.20	126.81	45.3
C2-075	22.00	8.20	126.84	45.4
C2-119	22.00	8.20	126.85	45.4
C2-076	22.00	8.20	126.86	45.4
C3-085	22.00	8.70	126.87	45.4
D3-005	21.74	7.10	126.66	45.4
C3-087	21.74	8.70	126.68	45.4
C1-031	20.37	7.90	125.33	45.4
C2-073	22.00	8.20	126.97	45.4
B6-036	16.79	11.60	121.77	45.4
C1-024	20.00	7.90	125.01	45.4
B3-048	22.00	11.10	127.03	45.4
C3-081	21.94	8.70	126.98	45.4
B3-052	22.00	11.10	127.06	45.5
B3-070	22.00	11.10	127.07	45.5
B3-051	22.00	11.10	127.07	45.5
C2-077	22.00	8.20	127.08	45.5
C2-009	22.00	8.20	127.12	45.5
C1-035	20.00	7.90	125.13	45.5
C3-066	22.00	8.70	127.13	45.5
C3-065	22.00	8.70	127.13	45.5
B3-078	22.00	11.10	127.14	45.5
C2-117	20.74	8.20	125.87	45.5
C2-007	22.00	8.20	127.15	45.5
B3-036	21.98	11.10	127.13	45.5
C2-023	22.00	8.20	127.16	45.5
C3-018	21.91	8.70	127.08	45.5
B3-001	22.00	11.10	127.17	45.5
B3-056	22.00	11.10	127.19	45.5
C1-030	20.00	7.90	125.21	45.5
C1-029	20.00	7.90	125.21	45.5
C3-006	22.00	8.70	127.21	45.5
C7-047	16.98	7.20	122.21	45.5
B3-071	22.00	11.10	127.23	45.5
C3-070	22.00	8.70	127.23	45.5
B3-054	21.81	11.10	127.06	45.5
C1-034	20.05	7.90	125.33	45.5
B3-031	22.00	11.10	127.29	45.6
B3-030	22.00	11.10	127.29	45.6
B3-038	22.00	11.10	127.30	45.6
C2-131	21.78	8.20	127.09	45.6
C2-129	21.81	8.20	127.12	45.6
C1-025	20.00	7.90	125.33	45.6

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C2-062	22.00	8.20	127.37	45.6
B3-032	21.80	11.10	127.16	45.6
B6-028	16.45	11.60	121.85	45.6
C3-007	21.33	8.70	126.74	45.6
C3-078	22.00	8.70	127.42	45.6
C3-005	22.00	8.70	127.43	45.6
C3-079	22.00	8.70	127.43	45.6
C3-004	22.00	8.70	127.44	45.6
B4-026	19.04	10.00	124.50	45.6
C7-016	14.00	7.20	119.47	45.6
B3-035	21.68	11.10	127.16	45.6
C3-084	21.39	8.70	126.87	45.6
C4-077	22.00	9.00	127.53	45.7
C3-074	21.94	8.70	127.47	45.7
B5-051	18.29	11.40	123.83	45.7
C2-008	22.00	8.20	127.56	45.7
C3-082	21.42	8.70	126.98	45.7
C3-026	22.00	8.70	127.57	45.7
C2-013	21.67	8.20	127.25	45.7
C3-076	22.00	8.70	127.59	45.7
C3-017	21.56	123.70	127.16	45.7
C6-054	20.34	10.20	126.00	45.7
C2-108	21.53	8.20	127.20	45.7
B3-047	21.32	11.10	127.04	45.7
C2-004	21.86	8.20	127.59	45.7
C4-002	19.58	9.00	125.36	45.8
C2-099	21.35	8.20	127.13	45.8
C7-028	16.00	7.20	121.80	45.8
C2-016	21.33	8.20	127.15	45.8
C3-008	20.85	8.70	126.67	45.8
B5-052	18.00	11.40	123.82	45.8
B5-049	18.07	11.40	123.90	45.8
B3-023	21.55	11.10	127.38	45.8
C2-006	21.30	8.20	127.14	45.8
C2-022	20.76	8.20	126.62	45.8
B6-035	16.00	11.60	121.90	45.8
C3-075	22.00	8.70	127.91	45.8
A4-007	6.41	6.00	112.35	45.8
C3-025	22.00	8.70	127.94	45.8
B5-047	17.86	11.40	123.85	45.9
C4-079	22.00	9.00	128.00	45.9
C2-092	20.00	8.20	126.04	45.9
C3-067	21.30	8.70	127.34	45.9
B3-057	22.00	11.10	128.06	45.9
B3-058	22.00	11.10	128.07	45.9
C3-028	22.00	8.70	128.07	45.9

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C3-027	22.00	8.70	128.09	45.9
C4-003	21.77	9.00	127.87	45.9
C1-018	17.60	7.90	123.71	45.9
C2-097	20.98	8.20	127.12	45.9
C1-003	20.00	7.90	126.15	45.9
C4-068	22.00	9.00	128.16	45.9
C3-024	22.00	8.70	128.17	45.9
C7-025	13.77	7.20	119.96	45.9
D3-006	20.45	7.10	126.66	45.9
B3-037	20.95	11.10	127.16	46.0
C3-023	22.00	8.70	128.22	46.0
C3-022	22.00	8.70	128.27	46.0
C2-003	21.31	8.20	127.59	46.0
C3-021	22.00	8.70	128.29	46.0
C3-020	22.00	148.70	128.30	46.0
C3-103	22.00	8.70	128.30	46.0
C7-026	14.38	7.20	120.69	46.0
C2-109	20.46	8.20	126.77	46.0
C3-019	22.00	8.70	128.34	46.0
C3-048	22.00	8.70	128.39	46.0
C3-098	22.00	8.70	128.40	46.0
D3-007	20.27	7.10	126.67	46.0
C3-071	20.74	8.70	127.23	46.1
B3-043	20.58	11.10	127.07	46.1
C3-097	22.00	8.70	128.51	46.1
C3-050	22.00	116.70	128.53	46.1
C2-134	20.61	8.20	127.17	46.1
B3-024	20.98	11.10	127.56	46.1
B3-077	20.46	11.10	127.05	46.1
C3-044	22.00	8.70	128.64	46.1
C2-005	20.94	8.20	127.59	46.1
C1-002	19.46	7.90	126.14	46.2
A4-008	5.65	6.00	112.36	46.2
C1-006	16.88	7.90	123.60	46.2
C2-001	20.79	8.20	127.55	46.2
B3-049	20.22	11.10	126.99	46.2
D3-003	19.90	7.10	126.67	46.2
B3-046	20.47	11.10	127.27	46.2
C3-043	22.00	8.70	128.81	46.2
B3-055	20.23	11.10	127.04	46.2
C4-005	21.42	69.00	128.27	46.2
C7-027	13.80	7.20	120.69	46.2
B3-040	20.06	11.10	126.97	46.3
C3-077	20.50	8.70	127.43	46.3
B3-029	20.95	11.10	127.89	46.3
B3-020	20.00	11.10	126.97	46.3

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-056	13.76	7.20	120.72	46.3
B3-005	20.00	11.10	126.98	46.3
B3-045	20.00	11.10	126.98	46.3
B3-041	20.00	11.10	126.99	46.3
B3-044	20.00	11.10	126.99	46.3
C3-030	22.00	8.70	128.99	46.3
C2-011	20.00	8.20	126.99	46.3
C3-042	22.00	8.70	129.00	46.3
C3-029	22.00	8.70	129.00	46.3
C7-036	12.52	7.20	119.53	46.3
B3-039	20.00	11.10	127.02	46.3
B3-053	20.00	11.10	127.04	46.3
B3-025	20.38	11.10	127.51	46.3
C2-012	20.11	8.20	127.26	46.4
B6-008	20.00	11.60	127.19	46.4
C2-071	22.00	8.20	129.24	46.4
C7-030	13.87	7.20	121.11	46.4
C3-041	22.00	8.70	129.27	46.4
C3-107	22.00	8.70	129.27	46.4
C3-040	22.00	8.70	129.29	46.4
B3-079	20.08	11.10	127.38	46.4
C3-039	22.00	8.70	129.33	46.4
C2-002	20.26	8.20	127.60	46.4
C3-051	22.00	8.70	129.34	46.4
C1-008	16.17	7.90	123.53	46.4
C3-069	19.89	8.70	127.25	46.5
C2-078	20.01	8.20	127.40	46.5
B3-022	19.98	11.10	127.37	46.5
B3-026	20.11	11.10	127.51	46.5
C2-041	20.20	8.20	127.61	46.5
C3-031	22.00	8.70	129.43	46.5
C3-099	22.00	8.70	129.43	46.5
C1-037	16.52	7.90	123.97	46.5
C3-038	22.00	8.70	129.47	46.5
C3-105	22.00	8.70	129.50	46.5
C3-106	22.00	8.70	129.50	46.5
C3-104	22.00	8.70	129.50	46.5
C3-032	22.00	8.70	129.52	46.5
C2-020	20.86	8.20	128.40	46.5
C3-037	22.00	8.70	129.58	46.5
C3-068	19.72	8.70	127.31	46.6
B3-042	19.35	11.10	126.98	46.6
B2-006	4.00	10.70	111.65	46.6
C2-136	20.10	28.20	127.80	46.6
B3-061	20.00	11.10	127.78	46.6
C1-026	17.92	7.90	125.71	46.6

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B6-014	14.34	11.60	122.16	46.6
C1-005	13.59	7.90	121.41	46.6
B3-076	19.93	11.10	127.75	46.7
C3-054	19.96	8.70	127.87	46.7
C3-010	22.00	8.70	129.93	46.7
C6-005	20.76	10.20	128.71	46.7
C2-091	20.00	8.20	127.96	46.7
C2-074	21.38	8.20	129.35	46.7
C2-072	20.39	8.20	128.40	46.7
B3-050	18.96	11.10	126.99	46.7
C3-083	18.90	8.70	126.98	46.8
C4-067	21.74	9.00	129.89	46.8
C3-091	22.00	8.70	130.18	46.8
C3-002	22.00	8.70	130.20	46.8
C7-029	12.54	7.20	120.76	46.8
C3-102	22.00	8.70	130.26	46.8
C3-101	22.00	8.70	130.26	46.8
B6-012	13.59	11.60	121.85	46.8
C3-100	22.00	8.70	130.26	46.8
C3-033	22.00	8.70	130.26	46.8
C2-095	18.48	8.20	126.74	46.8
C3-035	22.00	8.70	130.29	46.9
C4-070	22.00	9.00	130.30	46.9
C4-071	22.00	9.00	130.43	46.9
C3-073	18.86	8.70	127.32	46.9
B3-065	19.33	11.10	127.79	46.9
C6-023	20.00	10.20	128.54	47.0
C1-007	14.99	7.90	123.53	47.0
B3-019	18.41	11.10	126.97	47.0
B3-075	19.14	11.10	127.76	47.0
C4-082	22.00	9.00	130.69	47.0
C4-072	22.00	9.00	130.73	47.0
C6-025	18.28	10.20	127.02	47.0
C4-073	22.00	9.00	130.84	47.1
A4-006	3.50	6.00	112.34	47.1
B4-039	20.00	10.00	128.89	47.1
B4-037	20.00	10.00	128.93	47.1
C2-133	17.09	8.20	126.02	47.1
B4-041	20.00	10.00	128.94	47.1
B4-036	20.00	10.00	128.95	47.1
B4-035	20.00	10.00	128.96	47.1
B3-067	18.00	11.10	126.97	47.1
B3-018	18.00	11.10	126.97	47.1
B4-029	20.00	10.00	128.97	47.1
B4-042	20.00	10.00	128.97	47.1
B3-017	18.00	11.10	126.98	47.2

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B2-002	20.00	10.70	128.98	47.2
B4-028	20.00	10.00	128.99	47.2
C3-036	21.20	8.70	130.22	47.2
B3-011	18.00	11.10	127.02	47.2
B3-072	18.00	11.10	127.04	47.2
B4-034	20.00	10.00	129.05	47.2
B4-031	20.00	10.00	129.09	47.2
C4-066	21.19	9.00	130.28	47.2
C2-024	20.29	8.20	129.39	47.2
B3-013	18.00	11.10	127.11	47.2
B3-009	18.00	11.10	127.12	47.2
B3-003	17.83	11.10	126.97	47.2
B3-060	18.69	11.10	127.83	47.2
B3-010	17.98	11.10	127.14	47.2
C2-098	17.95	8.20	127.12	47.2
B4-038	19.73	10.00	128.90	47.2
B5-045	16.16	11.40	125.38	47.3
C3-034	22.00	8.70	131.23	47.3
C2-090	17.87	8.20	127.12	47.3
B4-032	20.00	10.00	129.26	47.3
B4-033	20.00	10.00	129.27	47.3
B3-027	18.24	11.10	127.57	47.3
C1-033	16.47	7.90	125.82	47.3
C4-080	19.84	9.00	129.19	47.3
C3-001	20.01	8.70	129.39	47.3
C2-050	22.00	8.20	131.40	47.3
C2-049	22.00	8.20	131.40	47.3
C4-065	20.98	9.00	130.44	47.4
A5-003	3.89	6.00	113.35	47.4
B7-002	11.55	7.20	121.01	47.4
C6-024	18.19	10.20	127.68	47.4
C4-004	20.00	9.00	129.55	47.4
C3-055	22.00	8.70	131.59	47.4
C4-081	17.89	9.00	127.53	47.4
C4-074	20.97	9.00	130.66	47.5
B2-003	18.90	10.70	128.78	47.5
C3-080	17.42	8.70	127.30	47.5
C3-003	20.33	8.70	130.22	47.5
C1-047	10.00	7.90	119.90	47.5
B3-015	17.17	11.10	127.11	47.6
B3-004	17.01	11.10	126.96	47.6
C4-069	20.39	9.00	130.43	47.6
C4-060	13.17	9.00	123.22	47.6
B3-014	16.99	11.10	127.11	47.6
C2-080	18.67	8.20	128.79	47.6
B3-066	16.79	11.10	126.97	47.7

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C4-047	19.34	9.00	129.55	47.7
C4-078	22.00	9.00	132.22	47.7
A4-005	2.21	6.00	112.44	47.7
C4-083	20.33	9.00	130.63	47.7
C2-051	21.71	8.20	132.07	47.7
C6-022	18.01	10.20	128.54	47.8
C2-116	14.59	8.20	125.14	47.8
C4-062	19.33	42.00	129.89	47.8
B3-059	18.00	11.10	128.57	47.8
C2-081	18.77	8.20	129.38	47.9
C3-095	19.12	8.70	129.75	47.9
C3-049	20.19	8.70	130.83	47.9
C4-084	21.43	9.00	132.07	47.9
C4-046	16.62	9.00	127.34	47.9
B3-016	16.39	11.10	127.13	47.9
C3-092	21.10	8.70	131.95	48.0
C4-064	20.23	9.00	131.08	48.0
C6-044	20.74	10.20	131.61	48.0
C3-014	20.85	8.70	131.72	48.0
B4-027	18.00	10.00	128.93	48.0
C3-094	20.29	8.70	131.23	48.0
C4-063	20.21	9.00	131.15	48.0
C3-016	20.23	8.70	131.19	48.0
B4-030	18.00	10.00	128.97	48.0
C7-051	9.87	7.20	120.89	48.0
C2-052	22.00	8.20	133.03	48.0
B3-008	16.00	11.10	127.09	48.1
B2-012	20.00	10.70	131.12	48.1
C2-101	20.00	8.20	131.12	48.1
C2-093	15.87	8.20	127.03	48.1
C2-088	18.40	8.20	129.67	48.1
C2-056	21.11	8.20	132.45	48.2
B4-062	18.00	10.00	129.34	48.2
C2-083	20.00	8.20	131.36	48.2
C2-086	19.97	8.20	131.34	48.2
C2-084	20.00	8.20	131.37	48.2
B4-052	20.00	10.00	131.39	48.2
C2-070	20.00	8.20	131.41	48.2
C2-021	16.55	8.20	127.96	48.2
C2-085	20.00	8.20	131.42	48.2
C6-021	20.00	10.20	131.44	48.2
C3-009	19.40	8.70	130.84	48.2
C2-053	22.00	8.20	133.46	48.2
B4-064	18.00	10.00	129.46	48.2
B3-021	15.83	11.10	127.32	48.2
B3-062	16.28	11.10	127.78	48.2

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C1-049	12.48	7.90	124.04	48.3
C3-053	22.00	8.70	133.62	48.3
C3-052	22.00	8.70	133.62	48.3
B4-050	18.00	10.00	129.64	48.3
C2-018	20.77	8.20	132.49	48.3
C3-013	20.83	8.70	132.55	48.3
B3-028	16.07	11.10	127.83	48.4
C2-069	19.55	8.20	131.39	48.4
C1-004	8.37	7.90	120.21	48.4
C2-096	14.88	8.20	126.78	48.4
B4-040	16.91	10.00	128.89	48.4
B3-068	16.15	11.10	128.16	48.5
C3-015	22.00	8.70	134.08	48.5
D1-003	7.74	10.00	119.82	48.5
C2-110	22.00	8.20	134.09	48.5
C2-111	22.00	8.20	134.09	48.5
B3-034	15.24	11.10	127.36	48.5
C2-130	14.92	8.20	127.08	48.5
B4-063	17.12	10.00	129.32	48.5
C4-048	22.00	9.00	134.20	48.5
C3-063	20.00	8.70	132.29	48.6
C2-017	20.00	8.20	132.33	48.6
C2-025	20.00	93.20	132.34	48.6
C2-082	19.53	8.20	131.88	48.6
C6-043	20.03	10.20	132.45	48.6
C2-054	19.75	8.20	132.18	48.6
B5-050	11.35	11.40	123.82	48.7
C2-055	19.76	8.20	132.27	48.7
C2-132	14.20	8.20	126.71	48.7
C3-056	22.00	8.70	134.56	48.7
C2-066	20.62	8.20	133.23	48.7
C1-028	12.71	7.90	125.33	48.7
B3-012	14.42	11.10	127.06	48.7
B3-063	15.24	11.10	127.88	48.7
B4-053	20.00	10.00	132.65	48.7
C2-102	18.36	8.20	131.19	48.8
C2-048	22.00	8.20	134.84	48.8
D1-005	5.84	10.00	118.75	48.9
B4-051	18.39	10.00	131.38	48.9
B6-009	16.00	11.60	129.03	48.9
B4-065	16.38	10.00	129.46	48.9
C2-079	15.24	8.20	128.33	48.9
C2-067	20.00	8.20	133.21	49.0
B4-005	16.18	10.00	129.70	49.1
C1-032	12.01	7.90	125.60	49.1
C1-027	12.65	7.90	126.25	49.1

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B2-001	15.66	10.70	129.27	49.2
B4-057	20.00	10.00	133.63	49.2
C2-124	19.37	8.20	133.06	49.2
C1-046	5.72	7.90	119.42	49.2
C2-061	22.00	8.20	135.75	49.2
C5-022	19.34	8.90	133.11	49.2
C2-103	17.54	8.20	131.33	49.2
C2-046	22.00	8.20	135.90	49.3
C2-057	20.57	8.20	134.48	49.3
C2-047	22.00	8.20	135.95	49.3
C2-014	12.36	8.20	126.35	49.3
C3-012	20.00	8.70	133.99	49.3
B4-004	20.03	10.00	134.15	49.4
B4-073	15.53	10.00	129.66	49.4
B3-064	13.63	11.10	127.76	49.4
C3-057	22.00	38.70	136.43	49.5
C2-114	22.00	8.20	136.55	49.6
C2-010	12.47	8.20	127.05	49.6
C4-075	21.76	9.00	136.36	49.6
C4-049	22.00	69.00	136.65	49.6
B4-056	18.35	10.00	133.03	49.6
C1-043	10.42	7.90	125.11	49.6
C2-045	22.00	8.20	136.69	49.6
C2-112	22.00	8.20	136.71	49.6
C2-068	18.31	8.20	133.13	49.7
D1-004	4.29	10.00	119.13	49.7
D1-001	4.79	10.00	119.77	49.7
C2-113	22.00	8.20	137.14	49.8
B4-048	11.66	10.00	127.02	49.9
B2-009	11.85	10.70	127.22	49.9
C2-060	22.00	8.20	137.37	49.9
D1-002	3.77	10.00	119.14	49.9
C3-093	16.15	8.70	131.65	50.0
C2-107	22.00	8.20	137.76	50.1
C2-106	22.00	8.20	137.76	50.1
C2-104	22.00	8.20	137.78	50.1
C2-043	22.00	8.20	137.81	50.1
B7-003	5.03	7.20	120.89	50.1
C2-044	21.90	8.20	137.79	50.1
C2-042	21.86	8.20	137.76	50.1
C2-105	21.81	8.20	137.77	50.2
C2-058	21.23	8.20	137.19	50.2
C3-058	22.00	8.70	138.02	50.2
B3-002	11.01	11.10	127.05	50.2
C2-036	21.51	30.20	137.79	50.3
C4-076	22.00	9.00	138.29	50.3

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B5-038	4.00	11.40	120.29	50.3
B4-072	20.64	10.00	136.95	50.3
C1-044	5.26	7.90	121.60	50.3
B3-033	11.09	11.10	127.52	50.4
B4-071	20.48	10.00	136.96	50.4
C3-047	22.00	8.70	138.54	50.4
C1-016	7.05	7.90	123.59	50.4
B2-013	14.56	10.70	131.10	50.4
B2-011	14.53	10.70	131.10	50.4
B2-007	14.53	10.70	131.10	50.4
C3-045	22.00	8.70	138.59	50.4
C3-046	22.00	8.70	138.61	50.5
C2-089	10.16	8.20	126.78	50.5
C1-015	6.90	7.90	123.59	50.5
B4-054	16.00	10.00	132.84	50.6
B2-004	11.92	10.70	128.96	50.6
C2-031	20.35	8.20	137.47	50.7
B4-006	12.43	10.00	129.65	50.7
C2-019	14.69	8.20	131.95	50.7
C1-040	7.16	7.90	124.57	50.8
C2-121	20.00	8.20	137.47	50.8
C2-037	20.00	8.20	137.47	50.8
C2-032	20.00	8.20	137.48	50.8
B4-012	22.00	10.00	139.54	50.9
B2-014	11.46	10.70	129.25	51.0
C3-059	21.20	8.70	139.05	51.0
B3-074	6.96	11.10	125.04	51.1
C2-030	20.74	8.20	138.94	51.1
B2-005	9.02	10.70	127.25	51.2
C2-059	22.00	8.20	140.29	51.2
C1-012	4.96	7.90	123.32	51.2
C2-123	18.00	8.20	136.38	51.2
B4-043	20.21	10.00	138.96	51.4
C1-045	3.84	7.90	122.71	51.4
B4-044	20.00	10.00	138.95	51.5
B4-013	22.00	10.00	141.17	51.6
B3-080	20.88	11.10	140.15	51.6
C5-024	21.86	8.90	141.13	51.6
C2-118	5.91	8.20	125.21	51.6
C2-040	18.24	8.20	137.59	51.6
C3-062	18.18	8.70	137.60	51.7
C2-064	19.84	8.20	139.40	51.7
C3-011	18.00	8.70	137.59	51.7
B4-059	20.91	10.00	140.51	51.7
C6-020	20.00	10.20	139.72	51.8
C3-060	18.69	8.70	138.42	51.8

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B4-060	20.71	10.00	140.50	51.8
A3-001	7.40	11.10	127.37	51.9
C6-019	20.00	10.20	139.99	51.9
B4-070	22.00	10.00	142.00	51.9
C2-122	16.09	8.20	136.11	51.9
C2-033	17.25	8.20	137.44	52.0
B3-007	6.78	11.10	127.11	52.1
C2-029	20.71	8.20	141.14	52.1
A4-001	8.20	6.00	128.66	52.1
B5-053	20.00	61.40	140.49	52.1
C2-039	16.94	8.20	137.48	52.2
B4-047	21.04	10.00	141.61	52.2
B2-008	10.43	10.70	131.09	52.2
B4-049	7.88	10.00	128.57	52.2
B5-046	3.21	11.40	124.11	52.3
C5-023	20.27	8.90	141.22	52.3
D2-003	2.00	7.10	123.13	52.4
C1-001	6.00	7.90	127.14	52.4
C2-100	10.00	8.20	131.16	52.4
C2-087	9.87	8.20	131.16	52.5
B3-006	5.75	11.10	127.07	52.5
B3-073	5.54	11.10	126.99	52.5
C2-139	16.46	0.00	137.91	52.5
B5-048	2.64	11.40	124.13	52.6
C3-064	16.46	8.70	138.02	52.6
C3-108	16.03	0.00	137.64	52.6
B4-003	21.69	10.00	143.77	52.8
C3-061	15.91	8.70	138.05	52.8
B4-045	20.22	10.00	142.37	52.8
C2-028	20.33	8.20	142.50	52.9
B4-046	20.03	10.00	142.36	52.9
C2-128	20.19	8.20	142.53	52.9
C2-027	20.09	8.20	142.47	52.9
C2-094	4.47	8.20	127.02	53.0
B4-014	21.51	10.00	144.11	53.0
C2-125	22.00	8.20	144.62	53.1
B4-055	10.05	10.00	132.84	53.1
B2-010	4.28	10.70	127.21	53.2
B4-061	5.57	10.00	128.58	53.2
B4-074	4.00	0.00	127.11	53.3
C2-035	11.99	8.20	136.54	53.9
C2-034	12.20	8.20	137.34	54.1
C3-072	2.00	8.70	127.22	54.2
C9-001	24.00	40.30	149.69	54.4
B4-058	21.40	10.00	147.38	54.5
C2-026	16.49	8.20	142.47	54.5

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Dynamic

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C2-126	17.04	8.20	143.34	54.6
C2-127	16.25	8.20	142.90	54.8
C2-038	9.85	8.20	137.49	55.2
C2-065	12.99	8.20	141.40	55.6
C9-002	24.00	40.30	152.46	55.6
D9-007	24.72	10.00	154.73	56.2
D9-002	24.00	10.00	154.51	56.5
D9-003	24.00	10.00	154.73	56.6
D9-004	23.32	10.00	155.79	57.3
D9-006	22.18	10.00	155.79	57.8
C9-003	21.15	40.30	155.76	58.2
D9-008	21.45	10.00	158.47	59.3
D9-005	20.60	10.00	157.66	59.3
D9-009	0.00	0.00	158.44	68.5

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-2	C7-001	C7-002	8.0	0.00	166.00
P-3	C7-002	C7-003	8.0	0.00	158.80
P-4	C7-003	C7-004	8.0	0.00	151.60
P-5	C7-004	C7-005	8.0	0.00	144.40
P-6	C7-005	C7-006	8.0	0.00	7.20
P-7	C7-005	C7-007	8.0	0.00	130.00
P-8	C7-007	C7-008	8.0	0.00	115.60
P-9	C7-008	C7-009	8.0	0.00	108.40
P-10	C7-010	C7-007	8.0	0.00	-7.20
P-11	C7-011	C7-012	8.0	0.00	28.80
P-12	C7-012	C7-013	8.0	0.00	21.60
P-13	C7-013	C7-014	8.0	0.00	14.40
P-14	C7-014	C7-015	8.0	0.00	7.20
P-15	C7-016	C7-017	8.0	0.00	-7.20
P-16	C7-017	C7-018	8.0	0.00	-14.40
P-17	C7-018	C7-019	8.0	0.00	83.44
P-18	C7-019	C7-020	8.0	0.00	76.24
P-19	C7-009	C7-020	8.0	0.00	65.20
P-20	C7-020	C7-021	8.0	0.00	134.24
P-21	C7-021	C7-022	8.0	0.00	119.84
P-22	C7-021	C7-023	8.0	0.00	7.20
P-23	C6-001	C7-024	8.0	0.00	-117.02
P-24	C7-024	C7-025	8.0	0.00	-103.33
P-26	C7-026	C7-027	8.0	0.00	-21.30
P-27	C7-026	C6-002	8.0	0.00	-174.45
P-28	C6-002	C6-003	8.0	0.00	-77.82
P-29	C6-003	C7-028	8.0	0.00	130.62
P-31	C7-029	B7-002	8.0	0.00	-123.97
P-32	B7-002	C7-030	8.0	0.00	-131.17
P-33	C7-028	C6-003	8.0	0.00	-102.58
P-34	C6-003	C6-004	8.0	0.00	-321.22
P-35	C6-004	B6-001	8.0	0.00	165.50
P-36	B6-001	B6-002	8.0	0.00	166.17
P-37	B6-002	B6-003	8.0	0.00	166.09
P-39	B6-004	B6-005	8.0	0.00	61.29
P-40	B6-005	B6-006	8.0	0.00	11.60
P-41	B6-005	B6-007	8.0	0.00	38.09
P-42	B6-007	B5-001	8.0	0.00	28.80
P-43	B5-001	B5-002	8.0	0.00	11.40
P-44	B5-001	B5-054	8.0	0.00	6.00
P-45	C7-024	C7-031	8.0	0.00	-20.88
P-46	C7-031	C7-032	8.0	0.00	96.14
P-48	C7-033	C7-034	8.0	0.00	126.64
P-49	C7-034	C7-018	8.0	0.00	105.04
P-51	C7-035	C7-031	8.0	0.00	124.22

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-52	C7-035	C7-025	8.0	0.00	-63.62
P-53	C7-034	C7-036	8.0	0.00	14.40
P-55	C6-005	C6-006	8.0	0.00	398.72
P-56	C6-006	C5-001	8.0	0.00	388.52
P-57	C5-001	C5-002	8.0	0.00	184.65
P-58	C5-002	C6-007	8.0	0.00	91.35
P-59	C6-007	C6-008	8.0	0.00	128.65
P-61	C6-007	C6-010	8.0	0.00	-47.50
P-62	C6-010	C5-003	8.0	0.00	-57.70
P-63	C5-003	C5-004	8.0	0.00	17.80
P-64	C5-004	C5-005	8.0	0.00	8.90
P-65	C5-003	C5-002	8.0	0.00	-84.40
P-66	C5-001	C5-006	8.0	0.00	194.97
P-67	C5-006	C5-007	8.0	0.00	-305.86
P-68	C5-007	C6-005	8.0	0.00	-476.50
P-69	C5-007	C5-008	8.0	0.00	161.74
P-70	C5-008	C5-009	8.0	0.00	-179.26
P-72	C5-006	C5-010	8.0	0.00	491.93
P-75	C5-010	C5-011	8.0	0.00	210.23
P-76	C5-011	C5-012	8.0	0.00	201.33
P-79	C5-014	C5-015	8.0	0.00	44.97
P-81	C5-016	C5-013	8.0	0.00	-79.20
P-82	C5-016	C5-017	8.0	0.00	88.57
P-83	C5-017	C5-018	8.0	0.00	8.90
P-84	C5-017	C5-019	8.0	0.00	70.77
P-85	C5-020	D5-001	8.0	0.00	34.60
P-86	D6-001	C6-011	8.0	0.00	-17.60
P-87	C6-011	C6-012	8.0	0.00	32.40
P-88	C6-012	C6-013	8.0	0.00	12.00
P-90	D6-002	D6-003	8.0	0.00	713.20
P-91	D6-003	D6-004	8.0	0.00	443.40
P-92	D6-004	D6-005	8.0	0.00	625.20
P-93	D6-004	D6-006	8.0	0.00	-199.40
P-94	D6-006	D6-007	8.0	0.00	-234.60
P-95	D6-007	D6-003	8.0	0.00	-252.20
P-96	D6-002	D6-008	8.0	0.00	6.39
P-97	D6-008	D6-009	8.0	0.00	17.60
P-98	D6-008	D6-010	8.0	0.00	-28.81
P-99	D6-010	D6-011	8.0	0.00	17.60
P-100	D6-010	D6-012	8.0	0.00	-64.01
P-101	D6-012	C6-013	8.0	0.00	-99.21
P-102	C6-012	C6-014	8.0	0.00	10.20
P-103	D6-012	D6-013	8.0	0.00	17.60
P-105	C6-016	C6-017	8.0	0.00	23.13
P-106	C6-018	C6-016	8.0	0.00	437.59

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-107	C5-009	C5-021	8.0	0.00	166.08
P-111	C4-003	C3-001	8.0	0.00	-187.26
P-112	C3-001	C3-002	8.0	0.00	-195.96
P-115	C3-004	C2-001	8.0	0.00	-52.09
P-117	C2-002	C2-003	8.0	0.00	24.60
P-118	C2-003	C2-004	8.0	0.00	8.20
P-119	C2-003	C2-005	8.0	0.00	8.20
P-123	C4-007	C5-022	8.0	0.00	-393.37
P-124	C5-022	C5-023	8.0	0.00	-827.40
P-125	C5-023	C5-024	8.0	0.00	70.30
P-126	C5-023	C6-019	8.0	0.00	136.15
P-130	B5-004	B5-005	8.0	0.00	-11.40
P-131	B5-005	B5-006	8.0	0.00	121.60
P-133	B4-001	B4-002	8.0	0.00	52.00
P-134	C4-007	C4-008	8.0	0.00	326.61
P-137	C6-020	C6-021	8.0	0.00	777.82
P-138	C6-021	B6-008	8.0	0.00	511.01
P-139	C6-021	B6-009	8.0	0.00	256.61
P-140	B6-009	C6-022	8.0	0.00	245.01
P-141	C6-022	C6-023	8.0	0.00	10.20
P-142	C6-022	C6-024	8.0	0.00	224.61
P-144	C6-025	C6-004	8.0	0.00	496.92
P-145	C6-024	C6-025	8.0	0.00	214.41
P-146	C5-015	C5-026	8.0	0.00	36.07
P-147	C5-026	C5-016	8.0	0.00	18.27
P-148	C5-026	C5-027	8.0	0.00	8.90
P-150	C5-028	C5-014	8.0	0.00	53.87
P-151	C5-028	C5-029	8.0	0.00	8.90
P-152	C5-013	C5-030	8.0	0.00	89.47
P-153	C5-030	C5-028	8.0	0.00	71.67
P-154	C5-030	C5-031	8.0	0.00	8.90
P-157	C3-005	C3-004	8.0	0.00	-43.39
P-158	C3-005	C3-006	8.0	0.00	143.59
P-161	D3-001	D3-002	8.0	0.00	21.30
P-162	D3-002	D3-003	8.0	0.00	7.10
P-163	D3-002	D3-004	8.0	0.00	7.10
P-165	C3-008	D3-005	8.0	0.00	23.94
P-166	D3-005	D3-006	8.0	0.00	7.10
P-167	D3-005	D2-001	8.0	0.00	9.74
P-169	C2-006	C2-007	8.0	0.00	-32.80
P-170	C2-007	C2-008	8.0	0.00	-162.50
P-171	C2-009	C2-007	8.0	0.00	-87.87
P-174	C2-012	C2-013	12.0	0.00	8.62
P-175	C2-014	C2-015	8.0	0.00	-129.54
P-176	C1-001	C2-016	8.0	0.00	-7.90

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-184	B3-003	B3-004	6.0	0.00	11.10
P-186	C2-018	C2-019	8.0	0.00	146.11
P-188	C1-002	C1-003	8.0	0.00	-20.59
P-189	B4-007	B4-008	8.0	0.00	-2.55
P-190	B4-008	B4-009	8.0	0.00	-12.55
P-191	B4-009	B4-010	8.0	0.00	-1.47
P-192	B4-010	B4-011	8.0	0.00	17.45
P-193	B4-011	B4-007	8.0	0.00	7.45
P-194	B4-009	B5-008	8.0	0.00	-21.08
P-195	B5-008	B5-009	8.0	0.00	-32.48
P-196	B5-009	B4-010	8.0	0.00	28.92
P-198	B5-011	B5-012	6.0	0.00	11.40
P-199	B5-011	B5-013	6.0	0.00	11.40
P-201	C6-001	C6-026	6.0	0.00	106.82
P-202	C6-026	C6-027	6.0	0.00	75.33
P-203	C6-027	C6-028	6.0	0.00	66.02
P-204	C6-028	C6-029	6.0	0.00	91.53
P-205	C6-029	C6-030	6.0	0.00	64.99
P-207	C6-031	C6-032	6.0	0.00	51.00
P-208	C6-032	C6-033	6.0	0.00	34.11
P-210	C6-030	C6-028	6.0	0.00	-95.93
P-211	C6-028	C6-002	6.0	0.00	-131.65
P-212	C6-029	C6-035	6.0	0.00	16.34
P-213	C6-035	C6-036	6.0	0.00	4.94
P-214	C6-036	C6-037	6.0	0.00	-4.06
P-215	C6-037	C6-038	6.0	0.00	-24.46
P-216	C6-038	C6-039	6.0	0.00	56.90
P-217	C6-039	C6-040	6.0	0.00	163.02
P-218	C6-040	C6-041	6.0	0.00	142.62
P-219	C6-041	C6-042	6.0	0.00	-40.67
P-220	C6-042	C6-031	6.0	0.00	-58.93
P-221	C5-019	C5-032	6.0	0.00	126.11
P-222	C5-032	C5-033	6.0	0.00	30.41
P-223	C5-033	C5-034	6.0	0.00	4.21
P-224	C5-034	C5-035	6.0	0.00	-4.69
P-225	C5-035	C5-036	6.0	0.00	-7.70
P-226	C5-036	C5-032	4.0	0.00	-16.60
P-227	C5-033	D5-002	6.0	0.00	17.30
P-228	C5-032	C5-037	6.0	0.00	70.20
P-229	C5-037	C5-020	6.0	0.00	52.40
P-230	C5-020	C5-038	4.0	0.00	8.90
P-231	D5-001	D5-003	6.0	0.00	17.30
P-232	C5-035	C5-039	6.0	0.00	-5.89
P-233	C5-039	D5-004	6.0	0.00	17.30
P-234	C5-039	C5-040	6.0	0.00	-32.09

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-235	C5-040	C5-041	6.0	0.00	-40.99
P-236	C5-012	C5-042	8.0	0.00	325.21
P-237	C5-042	C5-013	8.0	0.00	177.57
P-238	C5-042	C5-043	6.0	0.00	58.74
P-239	C5-012	C5-044	6.0	0.00	-212.78
P-240	C5-044	C5-045	6.0	0.00	-218.09
P-241	C5-045	C5-046	6.0	0.00	-126.08
P-242	C5-046	C5-047	6.0	0.00	-103.95
P-243	C5-047	C5-008	6.0	0.00	-332.10
P-244	C5-047	C5-046	8.0	0.00	219.25
P-245	C5-046	C5-048	8.0	0.00	188.22
P-246	C5-048	C5-049	8.0	0.00	78.40
P-247	C5-049	C5-050	8.0	0.00	69.50
P-248	C5-045	C5-048	6.0	0.00	-100.91
P-249	C5-050	C5-051	6.0	0.00	8.90
P-250	C5-050	C5-052	6.0	0.00	51.70
P-251	C5-052	C5-053	6.0	0.00	518.67
P-252	C5-053	C5-054	6.0	0.00	220.84
P-253	C5-054	C5-055	6.0	0.00	97.95
P-254	C5-055	C5-056	6.0	0.00	41.13
P-255	C5-056	C5-043	6.0	0.00	12.68
P-256	C5-056	C5-057	6.0	0.00	19.55
P-257	C5-057	C5-058	6.0	0.00	40.77
P-258	C5-058	C5-059	6.0	0.00	8.90
P-259	C5-057	C5-060	6.0	0.00	-30.12
P-260	C5-060	C5-061	6.0	0.00	8.90
P-261	C5-060	C5-055	6.0	0.00	-47.92
P-262	C5-043	C5-062	6.0	0.00	62.52
P-263	C5-062	C5-063	6.0	0.00	8.90
P-264	C5-062	C5-064	6.0	0.00	44.72
P-265	C5-064	C5-065	6.0	0.00	9.14
P-266	C5-058	C5-065	4.0	0.00	22.97
P-267	C5-065	C5-041	4.0	0.00	23.21
P-268	C5-041	C5-064	4.0	0.00	-26.68
P-270	C5-054	C5-066	6.0	0.00	113.99
P-271	C5-066	D5-005	6.0	0.00	89.44
P-272	D5-005	D5-006	6.0	0.00	31.93
P-273	D5-006	D5-007	6.0	0.00	14.63
P-274	D5-007	D5-008	6.0	0.00	-19.97
P-275	D5-008	D5-009	6.0	0.00	-8.52
P-276	D5-009	D4-001	6.0	0.00	8.88
P-277	D4-001	C4-009	6.0	0.00	33.47
P-281	D4-001	D5-010	6.0	0.00	-33.59
P-282	D5-010	D5-009	6.0	0.00	34.71
P-283	D5-010	D5-005	6.0	0.00	-11.46

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-284	D5-010	C5-067	6.0	0.00	-74.13
P-285	C5-067	C5-068	6.0	0.00	-36.37
P-286	C5-068	C5-066	6.0	0.00	-15.65
P-287	C5-067	C5-069	6.0	0.00	-46.66
P-288	C5-069	C5-068	6.0	0.00	29.62
P-290	D5-008	D5-005	6.0	0.00	-28.74
P-291	C4-009	C4-010	6.0	0.00	24.47
P-292	C4-010	C4-011	6.0	0.00	-131.10
P-293	C4-011	C4-012	6.0	0.00	-56.63
P-294	C4-012	C5-069	6.0	0.00	6.68
P-295	C4-010	C4-013	6.0	0.00	146.56
P-296	C4-013	C4-014	6.0	0.00	67.77
P-297	C4-014	D4-002	6.0	0.00	63.83
P-298	D4-002	C4-015	6.0	0.00	-139.85
P-299	C4-015	C4-016	6.0	0.00	38.58
P-300	C4-016	C4-017	6.0	0.00	57.79
P-301	C4-017	D4-002	6.0	0.00	85.32
P-302	C4-014	C4-017	6.0	0.00	36.53
P-303	C4-016	C4-013	6.0	0.00	-28.21
P-304	C4-013	C4-014	6.0	0.00	41.59
P-305	C4-015	C4-018	6.0	0.00	-187.44
P-306	C4-018	C4-019	6.0	0.00	-141.35
P-307	C4-019	C4-020	6.0	0.00	-118.25
P-308	C4-020	C4-021	6.0	0.00	-100.22
P-309	C4-021	C4-022	6.0	0.00	-55.15
P-310	C4-022	C4-023	6.0	0.00	-64.15
P-311	C4-023	C4-024	6.0	0.00	-82.15
P-312	C4-024	C4-025	6.0	0.00	-118.15
P-313	C4-025	C4-026	6.0	0.00	194.43
P-314	C4-026	C4-027	6.0	0.00	131.36
P-315	C4-027	C4-028	6.0	0.00	95.33
P-316	C4-028	C4-029	6.0	0.00	54.23
P-317	C4-029	C4-030	6.0	0.00	-33.30
P-318	C4-030	C4-031	6.0	0.00	-42.30
P-319	C4-031	C5-070	6.0	0.00	-120.32
P-320	C5-070	C5-053	6.0	0.00	-288.93
P-321	C4-021	C4-026	6.0	0.00	-54.07
P-322	C4-027	C4-020	6.0	0.00	27.02
P-323	C4-019	C4-028	6.0	0.00	-32.10
P-324	C4-029	C4-032	6.0	0.00	78.53
P-325	C4-032	C4-011	6.0	0.00	14.45
P-326	C4-032	C4-018	6.0	0.00	55.08
P-327	C4-033	C4-024	6.0	0.00	-9.00
P-328	C4-023	C4-034	6.0	0.00	9.00
P-329	C4-024	C4-035	6.0	0.00	18.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-330	C4-035	C4-036	1.0	0.00	9.00
P-331	C4-025	C4-037	6.0	0.00	-321.58
P-332	C4-037	C4-038	6.0	0.00	-330.58
P-333	C4-038	C4-039	6.0	0.00	-339.58
P-334	C4-039	C4-040	6.0	0.00	-339.28
P-335	C4-041	C4-039	6.0	0.00	-229.00
P-336	C4-001	C4-042	8.0	0.00	-19.50
P-338	C4-039	C4-042	6.0	0.00	-238.30
P-341	C5-044	C5-071	6.0	0.00	-123.59
P-342	C5-071	C5-072	6.0	0.00	8.90
P-345	C5-071	C5-073	6.0	0.00	-141.39
P-346	C5-073	C5-052	6.0	0.00	475.87
P-347	C5-073	C5-074	12.0	0.00	-626.15
P-348	C5-075	C5-074	12.0	0.00	-8.90
P-349	C5-074	C5-076	12.0	0.00	-643.95
P-350	C5-021	C5-077	8.0	0.00	157.18
P-351	C5-077	C4-001	8.0	0.00	-10.50
P-352	C5-076	C5-077	12.0	0.00	-305.23
P-353	C5-077	C4-007	12.0	0.00	-146.45
P-354	C5-076	C4-043	12.0	0.00	-347.62
P-355	C4-043	C4-044	12.0	0.00	-356.62
P-356	C4-044	C4-045	12.0	0.00	-365.62
P-357	C4-045	C4-040	12.0	0.00	-374.62
P-358	C4-040	C4-046	12.0	0.00	-722.91
P-359	C4-004	C4-047	8.0	0.00	2.65
P-362	C4-047	C4-048	12.0	0.00	-1,089.09
P-363	C4-048	C4-049	12.0	0.00	-1,523.29
P-364	C4-049	B4-012	12.0	0.00	-1,384.51
P-365	B4-012	B4-013	12.0	0.00	-1,468.29
P-366	B4-003	B4-014	8.0	0.00	-419.44
P-370	C7-032	C7-037	8.0	0.00	88.94
P-372	C7-022	C7-037	12.0	0.00	-493.59
P-374	C7-038	C7-035	8.0	0.00	67.80
P-375	C7-037	C7-038	12.0	0.00	-432.21
P-377	C7-027	C7-029	12.0	0.00	-328.37
P-379	C7-030	B7-001	12.0	0.00	-622.20
P-380	B7-001	C9-001	12.0	0.00	-831.39
P-381	D6-014	D6-005	12.0	0.00	-607.60
P-382	D6-015	D6-006	12.0	0.00	-17.60
P-383	C6-020	C6-019	12.0	0.00	-788.02
P-384	C5-009	C6-043	8.0	0.00	-354.24
P-385	C6-043	C6-025	8.0	0.00	292.71
P-386	C6-019	C6-043	12.0	0.00	2,010.56
P-388	C6-044	C6-005	8.0	0.00	885.42
P-389	C6-043	C6-044	12.0	0.00	1,353.40

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-391	C7-039	C7-026	8.0	0.00	-188.55
P-392	C7-025	C7-040	8.0	0.00	-174.15
P-393	C7-040	C7-039	8.0	0.00	-64.29
P-394	C7-039	C7-040	12.0	0.00	117.06
P-395	C5-037	C5-078	4.0	0.00	8.90
P-396	C5-019	C6-011	6.0	0.00	-64.24
P-397	C6-011	C6-045	6.0	0.00	-124.43
P-398	C6-045	C6-015	6.0	0.00	-128.95
P-399	C6-013	C6-046	8.0	0.00	-97.41
P-400	C6-046	D6-002	8.0	0.00	121.22
P-401	C6-046	C6-047	6.0	0.00	-228.83
P-402	C6-047	C6-015	6.0	0.00	-249.23
P-403	C6-047	C6-048	2.0	0.00	10.20
P-404	C6-015	C6-049	8.0	0.00	-388.38
P-405	C6-049	C6-016	8.0	0.00	-404.26
P-406	C6-045	C6-049	2.0	0.00	-5.68
P-407	C6-039	C6-050	6.0	0.00	-116.32
P-408	C6-050	C6-051	6.0	0.00	-87.18
P-409	C6-051	C6-017	6.0	0.00	-97.38
P-410	C6-017	C6-009	6.0	0.00	-84.45
P-411	C6-009	C6-052	6.0	0.00	-266.36
P-412	C6-052	C6-053	6.0	0.00	-89.07
P-413	C6-002	C6-054	8.0	0.00	-238.47
P-414	C6-054	C6-044	8.0	0.00	-457.78
P-415	C6-053	C6-054	6.0	0.00	-209.11
P-416	C6-053	C6-055	8.0	0.00	109.84
P-417	C6-055	C6-056	8.0	0.00	107.92
P-418	C6-056	C6-052	8.0	0.00	187.49
P-419	C6-056	C6-057	8.0	0.00	-89.78
P-420	C6-008	C6-058	8.0	0.00	118.45
P-422	C6-057	C6-058	8.0	0.00	-108.25
P-423	C6-057	C6-055	8.0	0.00	8.27
P-424	C6-009	C6-059	6.0	0.00	171.71
P-425	C6-059	C6-060	6.0	0.00	59.75
P-426	C6-060	C6-061	6.0	0.00	29.14
P-427	C6-061	C6-050	6.0	0.00	39.35
P-428	C6-061	C6-060	6.0	0.00	-20.40
P-429	C6-059	C6-062	6.0	0.00	101.76
P-430	C6-063	C6-064	6.0	0.00	-10.20
P-431	D6-002	D6-016	12.0	0.00	-615.98
P-433	C6-064	D6-016	6.0	0.00	140.35
P-434	D6-016	D6-017	12.0	0.00	-493.23
P-436	D6-017	C6-065	6.0	0.00	10.20
P-437	C6-066	C6-067	6.0	0.00	-10.20
P-438	C6-067	C6-064	6.0	0.00	160.75

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-439	C6-067	C6-041	8.0	0.00	-181.15
P-440	C6-041	C6-042	4.0	0.00	-8.06
P-441	C6-040	C6-068	4.0	0.00	10.20
P-442	C6-036	C6-035	4.0	0.00	-1.19
P-443	C6-037	C6-069	4.0	0.00	10.20
P-444	C6-027	C6-070	4.0	0.00	-0.88
P-445	C6-070	C6-071	4.0	0.00	10.20
P-446	C6-070	C6-026	4.0	0.00	-21.28
P-447	C6-033	C6-073	6.0	0.00	30.60
P-448	C6-073	C6-034	6.0	0.00	10.20
P-449	C6-072	C6-073	4.0	0.00	-10.20
P-451	C7-038	C7-041	12.0	0.00	-397.93
P-452	C7-041	C7-027	12.0	0.00	-685.49
P-453	C7-041	C7-042	12.0	0.00	280.37
P-455	C7-043	C7-038	8.0	0.00	109.29
P-456	C7-042	C7-043	12.0	0.00	262.73
P-457	C7-042	C7-044	12.0	0.00	10.44
P-458	C7-033	C7-045	8.0	0.00	-142.28
P-459	C7-045	C7-043	8.0	0.00	-146.24
P-460	C7-044	C7-045	2.0	0.00	3.24
P-461	C7-036	C7-046	8.0	0.00	7.20
P-462	B7-001	C7-047	8.0	0.00	202.00
P-464	C7-047	C7-048	4.0	0.00	7.20
P-465	C7-047	C7-049	8.0	0.00	187.60
P-466	C7-049	C7-001	8.0	0.00	173.20
P-467	C7-049	C7-050	4.0	0.00	7.20
P-469	C5-010	C5-079	8.0	0.00	272.80
P-470	C5-079	C5-080	8.0	0.00	142.38
P-471	C5-080	C5-079	8.0	0.00	-121.52
P-472	C5-025	B5-014	8.0	0.00	276.19
P-474	C4-008	C4-050	2.0	0.00	10.24
P-475	C4-050	C4-051	2.0	0.00	10.43
P-476	C4-051	C4-052	2.0	0.00	14.70
P-477	C4-052	B4-015	2.0	0.00	-3.30
P-478	C4-053	C4-052	2.0	0.00	-9.00
P-479	B5-009	B5-015	8.0	0.00	-72.80
P-480	B5-010	B5-016	6.0	0.00	48.29
P-481	B5-016	B5-015	6.0	0.00	-11.11
P-482	B5-015	B5-017	6.0	0.00	-95.31
P-484	B5-018	B5-011	6.0	0.00	34.20
P-485	B5-017	B5-018	6.0	0.00	33.25
P-488	B5-020	B5-003	8.0	0.00	-10.70
P-489	B5-020	B5-021	8.0	0.00	-299.73
P-492	B5-021	B5-022	8.0	0.00	-322.53
P-493	B5-021	B5-023	4.0	0.00	11.40

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-494	B5-020	B5-024	6.0	0.00	299.04
P-497	B4-002	B4-016	6.0	0.00	42.00
P-498	B4-016	A4-002	6.0	0.00	60.00
P-499	A4-002	A4-003	6.0	0.00	18.00
P-500	A4-003	A4-004	6.0	0.00	6.00
P-501	A4-003	A4-005	6.0	0.00	6.00
P-502	A4-006	A4-007	6.0	0.00	-6.00
P-503	A4-007	A4-008	6.0	0.00	-12.00
P-504	A4-008	A4-009	6.0	0.00	18.00
P-505	A4-009	A4-010	6.0	0.00	6.00
P-506	A4-011	A4-009	6.0	0.00	-6.00
P-507	A4-008	A4-002	6.0	0.00	-36.00
P-509	B5-016	B4-017	6.0	0.00	48.00
P-511	B4-016	B4-017	6.0	0.00	-28.00
P-512	B4-017	B4-018	6.0	0.00	10.00
P-513	B5-017	B5-025	6.0	0.00	-139.96
P-514	B5-025	B5-026	6.0	0.00	-151.36
P-515	B5-026	B5-027	6.0	0.00	-112.94
P-516	B5-007	B5-027	6.0	0.00	103.39
P-517	B5-027	B5-028	6.0	0.00	-20.94
P-518	B5-028	B5-029	6.0	0.00	-43.74
P-519	B5-029	B5-030	6.0	0.00	22.22
P-520	B5-030	B5-031	6.0	0.00	-2.47
P-521	B5-031	B4-019	6.0	0.00	-22.21
P-522	B4-019	B4-020	6.0	0.00	28.26
P-523	B4-020	B5-031	6.0	0.00	-8.34
P-525	B4-021	B4-022	6.0	0.00	-13.73
P-526	B4-022	B4-023	6.0	0.00	-53.41
P-527	B4-023	B4-019	6.0	0.00	60.47
P-529	B4-024	B4-025	6.0	0.00	0.84
P-530	B4-025	B4-024	6.0	0.00	1.16
P-531	B4-025	B4-021	6.0	0.00	-10.33
P-533	B5-014	B5-032	8.0	0.00	222.47
P-534	B5-032	B5-007	8.0	0.00	133.70
P-535	B5-032	B5-029	6.0	0.00	77.37
P-536	B5-014	B5-033	6.0	0.00	42.32
P-537	B5-033	B5-026	6.0	0.00	49.83
P-538	B5-033	B5-007	6.0	0.00	-18.91
P-539	B4-023	C4-054	6.0	0.00	-123.87
P-540	C4-054	C4-055	6.0	0.00	36.18
P-541	C4-055	C4-056	6.0	0.00	27.18
P-542	C4-056	C4-057	6.0	0.00	18.18
P-543	C4-057	C4-050	6.0	0.00	9.18
P-544	C4-006	C4-058	8.0	0.00	275.75
P-545	C4-058	C4-007	8.0	0.00	88.69

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-546	C4-058	C4-059	6.0	0.00	178.06
P-547	B6-003	B6-010	8.0	0.00	126.53
P-548	B6-010	B6-004	8.0	0.00	72.89
P-549	B6-003	B6-010	6.0	0.00	27.96
P-551	B6-011	B6-012	6.0	0.00	27.71
P-552	B6-011	B6-013	8.0	0.00	-50.83
P-553	B6-013	B6-014	8.0	0.00	-104.32
P-554	B6-014	B6-015	8.0	0.00	-116.06
P-555	B6-015	B6-016	8.0	0.00	45.68
P-556	B6-016	B6-017	8.0	0.00	34.08
P-557	B6-017	B6-018	8.0	0.00	22.48
P-558	B6-018	B6-019	8.0	0.00	81.88
P-559	B6-019	B6-020	8.0	0.00	58.68
P-560	B6-020	B6-021	8.0	0.00	35.48
P-561	B6-021	B6-001	8.0	0.00	12.28
P-562	B6-018	B6-022	8.0	0.00	-70.99
P-563	B6-022	B6-023	8.0	0.00	-255.94
P-564	B6-022	B6-015	8.0	0.00	173.34
P-565	B6-024	B6-019	8.0	0.00	-11.60
P-566	B6-025	B6-020	8.0	0.00	-11.60
P-567	B6-026	B6-021	8.0	0.00	-11.60
P-568	B6-027	B6-014	8.0	0.00	-0.14
P-569	B6-013	B6-028	6.0	0.00	41.89
P-572	B6-029	B6-008	6.0	0.00	-499.41
P-573	B6-029	B6-030	6.0	0.00	137.95
P-574	B6-030	B6-031	6.0	0.00	126.35
P-575	B6-031	B6-032	6.0	0.00	81.94
P-576	B6-032	B6-033	6.0	0.00	29.73
P-577	B6-033	B6-034	6.0	0.00	50.94
P-578	B6-034	B6-035	6.0	0.00	41.75
P-579	B6-035	B6-036	6.0	0.00	89.42
P-580	B6-036	B5-034	6.0	0.00	104.62
P-581	B5-034	B5-035	6.0	0.00	93.22
P-582	B5-035	B5-003	6.0	0.00	70.42
P-583	B5-003	B5-036	6.0	0.00	48.31
P-584	B5-036	B6-037	6.0	0.00	25.51
P-585	B6-037	B6-038	6.0	0.00	11.60
P-586	B6-037	B6-007	8.0	0.00	2.31
P-587	B5-037	B5-036	6.0	0.00	-11.40
P-588	B5-035	B5-038	4.0	0.00	11.40
P-589	B6-036	B5-039	6.0	0.00	-26.80
P-590	B5-039	B6-032	6.0	0.00	-40.61
P-591	B5-039	B6-034	6.0	0.00	2.42
P-592	B6-035	B6-039	6.0	0.00	-59.27
P-593	B6-039	B6-023	6.0	0.00	-82.32

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-594	B6-023	B6-029	6.0	0.00	-349.86
P-595	B6-031	B6-033	6.0	0.00	32.80
P-596	B6-039	B6-027	6.0	0.00	11.46
P-597	B5-005	B5-024	6.0	0.00	-144.40
P-598	B5-006	B5-040	8.0	0.00	110.20
P-599	B5-040	B4-001	8.0	0.00	63.40
P-600	B5-040	B5-041	6.0	0.00	35.40
P-601	B5-041	A5-001	6.0	0.00	24.00
P-602	A5-001	A5-002	6.0	0.00	12.00
P-603	A5-002	A5-003	6.0	0.00	6.00
P-605	C4-059	C4-054	6.0	0.00	169.06
P-609	B4-026	C4-061	6.0	0.00	-10.00
P-611	B4-028	B4-029	6.0	0.00	20.00
P-612	B4-030	B4-029	8.0	0.00	-10.00
P-613	B4-028	B4-031	6.0	0.00	-48.52
P-614	B4-031	B4-032	6.0	0.00	-58.52
P-615	B4-032	C4-062	6.0	0.00	-57.98
P-616	C4-062	B4-033	6.0	0.00	102.02
P-617	B4-033	B4-034	6.0	0.00	81.48
P-618	B4-034	B4-035	6.0	0.00	49.87
P-619	B4-035	B4-036	6.0	0.00	10.00
P-620	B4-035	B4-037	6.0	0.00	29.87
P-621	B4-037	B4-038	6.0	0.00	30.00
P-622	B4-038	B4-039	6.0	0.00	10.00
P-623	B4-038	B4-040	6.0	0.00	10.00
P-624	B4-027	B4-041	6.0	0.00	-10.00
P-626	B4-037	B4-041	6.0	0.00	-10.13
P-627	B4-041	B4-042	6.0	0.00	-30.13
P-628	B4-042	B4-028	6.0	0.00	-18.52
P-629	B4-042	B4-034	6.0	0.00	-21.61
P-630	B4-033	B4-032	6.0	0.00	10.54
P-631	C4-062	C4-063	6.0	0.00	-202.00
P-632	C4-063	C4-064	6.0	0.00	33.29
P-633	C4-064	C4-065	6.0	0.00	155.46
P-634	C4-065	C4-066	6.0	0.00	137.46
P-635	C4-066	C4-067	6.0	0.00	139.97
P-636	C4-005	C4-068	8.0	0.00	139.74
P-637	C4-068	C4-061	8.0	0.00	321.75
P-638	C4-067	C4-068	6.0	0.00	191.00
P-639	C4-065	C4-069	6.0	0.00	9.00
P-640	C4-066	C4-070	6.0	0.00	-11.51
P-641	C4-070	C4-067	6.0	0.00	60.03
P-642	C4-070	C4-071	6.0	0.00	-80.54
P-643	C4-071	C4-072	6.0	0.00	-96.06
P-644	C4-072	C4-073	6.0	0.00	-114.06

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-647	C4-072	C4-074	4.0	0.00	9.00
P-648	C4-063	C4-075	6.0	0.00	-244.29
P-649	C4-075	C4-049	6.0	0.00	-67.19
P-650	C4-049	C4-076	6.0	0.00	-274.97
P-651	C4-076	B4-013	6.0	0.00	-236.29
P-652	B4-013	B4-043	6.0	0.00	206.10
P-653	B4-043	C4-075	6.0	0.00	186.10
P-654	B4-043	B4-044	6.0	0.00	10.00
P-655	B4-013	B4-003	6.0	0.00	-299.07
P-656	B4-003	B4-045	6.0	0.00	110.38
P-657	B4-045	B4-046	6.0	0.00	10.00
P-658	B4-014	B4-047	8.0	0.00	660.51
P-660	B4-045	B4-047	6.0	0.00	90.38
P-662	C1-004	C1-005	6.0	0.00	-73.70
P-663	C1-005	C1-006	6.0	0.00	-121.10
P-664	C1-006	C1-007	6.0	0.00	36.45
P-665	C1-007	C1-008	6.0	0.00	7.90
P-666	C1-007	C1-009	4.0	0.00	12.24
P-668	C1-010	C1-007	4.0	0.00	-8.41
P-669	C1-011	C1-009	4.0	0.00	-7.90
P-671	C1-009	C1-013	4.0	0.00	-3.56
P-672	C1-013	C1-010	4.0	0.00	-19.36
P-673	C1-012	C1-013	4.0	0.00	-7.90
P-674	C1-010	C1-014	6.0	0.00	-26.75
P-675	C1-014	C1-015	6.0	0.00	-42.55
P-676	C1-015	C1-016	6.0	0.00	7.90
P-677	C1-015	C1-017	6.0	0.00	-58.35
P-678	C1-017	C2-014	6.0	0.00	-121.34
P-679	C1-017	C1-018	6.0	0.00	55.09
P-680	C1-018	C1-006	6.0	0.00	165.45
P-681	C1-019	C1-020	4.0	0.00	-7.90
P-682	C1-020	C1-021	4.0	0.00	7.90
P-683	C1-020	C1-022	4.0	0.00	-23.70
P-684	C1-022	C1-023	4.0	0.00	7.90
P-685	C1-022	C1-005	4.0	0.00	-39.50
P-686	C1-018	C1-024	6.0	0.00	-118.26
P-687	C1-024	C1-025	6.0	0.00	-84.70
P-688	C1-025	C1-026	6.0	0.00	-108.40
P-689	C1-026	C1-002	6.0	0.00	-116.30
P-690	C1-002	C2-022	6.0	0.00	-111.51
P-692	C2-023	C2-020	6.0	0.00	-149.44
P-693	C2-020	C2-024	6.0	0.00	-246.41
P-694	C2-024	C2-025	6.0	0.00	-262.81
P-696	C2-026	C2-027	6.0	0.00	11.13
P-697	C2-027	C2-028	6.0	0.00	-23.03

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-698	C2-028	C2-029	6.0	0.00	238.95
P-699	C2-029	C2-030	6.0	0.00	209.61
P-700	C2-030	C2-031	6.0	0.00	184.57
P-701	C2-031	C2-032	6.0	0.00	-10.67
P-702	C2-032	C2-033	6.0	0.00	24.60
P-703	C2-033	C2-034	4.0	0.00	16.40
P-704	C2-034	C2-035	2.0	0.00	8.20
P-705	C2-032	C2-036	6.0	0.00	-56.42
P-707	C2-037	C2-038	6.0	0.00	-11.65
P-708	C2-038	C2-039	6.0	0.00	16.40
P-710	C3-011	C3-012	6.0	0.00	328.18
P-711	C3-012	C3-013	6.0	0.00	144.87
P-712	C3-013	C3-014	6.0	0.00	120.88
P-713	C3-014	C3-015	6.0	0.00	-165.91
P-715	C3-016	C3-009	8.0	0.00	245.60
P-717	C2-001	C2-041	8.0	0.00	-148.66
P-718	C2-041	C2-002	8.0	0.00	32.80
P-722	C3-108	C2-042	6.0	0.00	-28.25
P-723	C2-042	C2-043	6.0	0.00	-36.45
P-724	C2-043	C2-044	6.0	0.00	19.35
P-725	C2-044	C2-045	6.0	0.00	176.00
P-727	C2-046	C2-047	6.0	0.00	-29.51
P-728	C2-047	C2-048	6.0	0.00	148.64
P-729	C2-048	C2-049	6.0	0.00	273.07
P-730	C2-049	C2-050	6.0	0.00	28.72
P-731	C2-050	C2-051	6.0	0.00	-231.26
P-732	C2-051	C2-052	6.0	0.00	-161.34
P-733	C2-052	C2-053	6.0	0.00	-176.82
P-734	C2-053	C2-046	6.0	0.00	-185.02
P-735	C2-051	C2-054	6.0	0.00	-78.11
P-736	C2-054	C2-055	6.0	0.00	-86.31
P-737	C2-055	C2-025	6.0	0.00	-29.84
P-738	C2-055	C2-056	6.0	0.00	-64.67
P-739	C2-056	C2-018	6.0	0.00	-44.48
P-741	C2-057	C2-058	6.0	0.00	-189.23
P-745	C2-044	C2-059	6.0	0.00	-225.48
P-746	C2-059	C2-043	6.0	0.00	138.90
P-749	C2-060	C2-061	6.0	0.00	180.54
P-750	C2-061	C2-048	6.0	0.00	149.03
P-751	C2-050	C2-062	2.0	0.00	16.40
P-752	C2-062	C2-063	2.0	0.00	8.20
P-754	C2-052	C2-056	2.0	0.00	7.28
P-755	C2-025	C2-064	6.0	0.00	-478.53
P-756	C2-064	C2-026	6.0	0.00	-507.85
P-757	C2-056	C2-064	2.0	0.00	-21.12

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-759	C2-065	C2-026	2.0	0.00	-8.20
P-760	C2-018	C2-066	6.0	0.00	-198.79
P-761	C2-066	C2-057	6.0	0.00	-181.03
P-762	C2-027	C2-066	2.0	0.00	25.96
P-763	C2-029	C2-067	2.0	0.00	21.14
P-764	C2-067	C2-068	2.0	0.00	1.98
P-765	C2-068	C2-030	2.0	0.00	-16.83
P-766	C2-067	C2-069	2.0	0.00	10.96
P-767	C2-068	C2-070	2.0	0.00	10.61
P-768	C2-061	C2-071	2.0	0.00	23.30
P-769	C2-071	C2-072	2.0	0.00	7.57
P-770	C2-072	C2-073	2.0	0.00	7.26
P-771	C2-072	C2-074	2.0	0.00	-7.89
P-772	C2-075	C2-076	6.0	0.00	-16.40
P-773	C2-076	C2-073	6.0	0.00	-54.13
P-774	C2-073	C2-077	6.0	0.00	-55.07
P-775	C2-077	C2-009	6.0	0.00	-71.47
P-776	C2-076	C2-015	6.0	0.00	29.53
P-777	C2-015	C2-016	6.0	0.00	-108.20
P-778	C2-016	C2-078	6.0	0.00	-124.30
P-779	C2-078	C2-079	6.0	0.00	-140.70
P-780	C2-079	C2-080	6.0	0.00	-148.90
P-781	C2-080	C2-074	6.0	0.00	-219.28
P-782	C2-074	C2-050	6.0	0.00	-235.37
P-783	C2-080	C2-020	6.0	0.00	62.18
P-784	C2-024	C2-081	6.0	0.00	8.20
P-785	C2-025	C2-082	6.0	0.00	92.69
P-786	C2-082	C2-019	6.0	0.00	-35.36
P-787	C2-019	C2-083	6.0	0.00	102.55
P-788	C2-083	C2-084	6.0	0.00	-12.58
P-789	C2-084	C2-069	6.0	0.00	-20.78
P-790	C2-069	C2-070	6.0	0.00	-18.02
P-791	C2-070	C2-085	6.0	0.00	-15.61
P-792	C2-085	C2-086	6.0	0.00	125.11
P-793	C2-086	B2-001	6.0	0.00	108.71
P-794	B2-001	B2-002	6.0	0.00	87.31
P-795	B2-002	B2-003	6.0	0.00	65.91
P-796	B2-004	B2-002	6.0	0.00	-10.70
P-797	B2-003	B3-002	6.0	0.00	55.21
P-798	B3-002	B3-006	6.0	0.00	-9.50
P-799	B3-006	B3-007	6.0	0.00	-28.01
P-800	B3-007	A3-001	6.0	0.00	-57.46
P-801	A3-001	A4-001	6.0	0.00	-108.21
P-802	B3-007	B3-008	6.0	0.00	18.35
P-805	B3-009	B3-010	6.0	0.00	-23.39

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-806	B3-010	B3-011	6.0	0.00	48.10
P-807	B3-008	B3-012	6.0	0.00	14.78
P-808	B3-012	B3-006	6.0	0.00	-7.42
P-810	B3-008	B3-013	6.0	0.00	-7.54
P-812	B3-013	B3-014	6.0	0.00	-6.35
P-813	B3-014	B3-015	6.0	0.00	1.39
P-814	B3-015	B4-074	6.0	0.00	-3.93
P-815	B4-074	B3-016	6.0	0.00	-9.71
P-816	B3-016	B3-014	6.0	0.00	18.84
P-817	B3-015	B4-074	6.0	0.00	-5.78
P-818	B3-016	A3-001	6.0	0.00	-39.65
P-819	B3-013	B3-009	2.0	0.00	-0.94
P-820	B3-011	B3-017	6.0	0.00	37.94
P-821	B3-017	B3-018	6.0	0.00	11.10
P-822	B3-017	B3-019	6.0	0.00	15.74
P-823	B3-019	B3-020	6.0	0.00	5.14
P-824	B3-021	B3-022	6.0	0.00	-22.70
P-826	B3-023	B3-024	6.0	0.00	-66.92
P-827	B3-024	B3-025	6.0	0.00	32.01
P-828	B3-025	B3-026	6.0	0.00	0.39
P-829	B3-025	B3-027	6.0	0.00	-33.87
P-830	B3-027	B3-028	6.0	0.00	-54.87
P-831	B3-027	B3-024	6.0	0.00	9.90
P-832	B4-004	B3-029	6.0	0.00	246.35
P-834	B3-024	B3-029	6.0	0.00	-100.13
P-836	B3-030	B3-001	6.0	0.00	65.20
P-837	B3-030	B3-031	6.0	0.00	8.80
P-838	B3-031	B3-032	6.0	0.00	53.34
P-839	B3-031	B3-023	6.0	0.00	-55.64
P-840	B4-048	B4-049	2.0	0.00	-10.00
P-842	B3-028	B3-033	6.0	0.00	84.36
P-843	B3-033	B3-034	6.0	0.00	62.55
P-844	B3-034	B3-021	6.0	0.00	61.12
P-845	B3-010	B3-021	6.0	0.00	-72.72
P-846	B3-026	B3-033	6.0	0.00	-10.71
P-847	B3-034	B3-022	6.0	0.00	-9.67
P-848	B3-010	B3-032	6.0	0.00	-9.87
P-849	B3-032	B3-035	6.0	0.00	32.37
P-850	B3-035	B3-001	6.0	0.00	-29.93
P-852	B3-036	B3-037	6.0	0.00	-27.82
P-853	B3-029	B3-038	6.0	0.00	135.12
P-854	B3-038	B3-030	8.0	0.00	85.10
P-855	B3-037	B3-038	6.0	0.00	-38.92
P-857	B3-039	B3-011	6.0	0.00	0.94
P-858	B3-019	B3-040	6.0	0.00	-0.50

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-859	B3-040	B3-020	6.0	0.00	5.96
P-860	B3-040	B3-041	6.0	0.00	-17.56
P-861	B3-041	B3-039	6.0	0.00	-34.41
P-863	B3-041	B3-042	6.0	0.00	5.75
P-864	B3-042	B3-005	6.0	0.00	18.22
P-865	B3-042	B3-043	6.0	0.00	-23.57
P-866	B3-043	B3-044	6.0	0.00	28.04
P-867	B3-044	B3-045	6.0	0.00	16.97
P-868	B3-045	B3-005	6.0	0.00	5.87
P-869	B3-043	B3-046	6.0	0.00	-62.72
P-870	B3-046	C3-017	6.0	0.00	44.95
P-871	C3-017	C3-018	6.0	0.00	46.08
P-872	C3-018	B3-047	6.0	0.00	28.68
P-873	B3-047	B3-048	6.0	0.00	17.58
P-874	B3-048	B3-049	6.0	0.00	22.23
P-875	B3-049	B3-050	6.0	0.00	11.13
P-876	B3-050	B3-044	6.0	0.00	0.03
P-877	B3-048	B3-051	6.0	0.00	-15.75
P-879	B3-052	B3-053	6.0	0.00	11.10
P-880	B3-052	B3-054	6.0	0.00	-1.24
P-882	C3-017	C3-019	6.0	0.00	-124.83
P-883	C3-019	C3-020	6.0	0.00	48.13
P-884	C3-020	C3-021	6.0	0.00	4.43
P-885	C3-021	C3-022	6.0	0.00	55.78
P-886	C3-022	C3-023	6.0	0.00	51.24
P-887	C3-023	C3-024	6.0	0.00	44.55
P-888	C3-024	C3-025	6.0	0.00	109.61
P-889	C3-025	C3-026	6.0	0.00	98.20
P-891	B3-056	B3-051	6.0	0.00	57.19
P-892	B3-057	B3-058	6.0	0.00	-11.10
P-893	B3-058	C3-027	6.0	0.00	-22.20
P-894	C3-027	C3-028	6.0	0.00	8.70
P-895	C3-027	C3-021	6.0	0.00	-39.60
P-897	C3-029	C3-030	6.0	0.00	8.70
P-898	C3-029	C3-031	6.0	0.00	-133.21
P-899	C3-031	C3-032	6.0	0.00	-128.43
P-900	C3-032	C3-033	6.0	0.00	-163.23
P-901	C3-033	C3-034	6.0	0.00	-206.53
P-902	C3-034	C3-002	6.0	0.00	203.32
P-903	C3-034	C3-035	6.0	0.00	174.22
P-904	C3-002	C3-036	8.0	0.00	-45.19
P-905	C3-036	C3-003	8.0	0.00	8.70
P-906	C3-035	C3-036	6.0	0.00	62.59
P-907	C3-035	C3-037	6.0	0.00	102.93
P-908	C3-037	C4-004	6.0	0.00	11.65

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-910	C3-038	C3-037	6.0	0.00	-29.79
P-911	C3-037	C3-039	6.0	0.00	52.79
P-912	C3-039	C3-040	6.0	0.00	35.39
P-913	C3-040	C3-041	6.0	0.00	17.69
P-915	C3-042	C3-043	6.0	0.00	88.84
P-916	C3-043	C3-044	6.0	0.00	91.16
P-919	C3-045	C3-046	6.0	0.00	-30.29
P-920	C3-046	C3-047	6.0	0.00	34.80
P-921	C3-047	C3-045	6.0	0.00	-21.59
P-922	C3-046	B4-012	6.0	0.00	-73.79
P-923	C4-076	C3-047	6.0	0.00	-47.69
P-924	C3-041	C4-077	2.0	0.00	9.00
P-925	C4-073	C4-078	6.0	0.00	-247.21
P-926	C4-078	C4-048	6.0	0.00	-265.01
P-927	C3-042	C4-078	2.0	0.00	-8.79
P-928	C3-043	C4-048	2.0	0.00	-11.02
P-929	C4-079	C3-040	2.0	0.00	-9.00
P-930	C3-048	C3-039	2.0	0.00	-8.70
P-932	C4-047	C4-080	8.0	0.00	211.23
P-933	C4-080	C4-005	8.0	0.00	208.74
P-934	C4-080	C4-071	2.0	0.00	-6.52
P-935	B3-054	B3-036	6.0	0.00	-29.17
P-936	B4-050	B4-006	6.0	0.00	-10.00
P-938	B4-052	B4-005	8.0	0.00	374.54
P-939	B4-051	B4-052	6.0	0.00	-10.00
P-941	B4-053	B4-052	8.0	0.00	394.54
P-942	B4-053	B4-054	6.0	0.00	-41.09
P-943	B4-054	B4-055	6.0	0.00	10.00
P-944	B4-054	B4-056	6.0	0.00	-61.09
P-945	B4-004	B4-057	8.0	0.00	444.54
P-946	B4-057	B4-053	8.0	0.00	363.45
P-947	B4-056	B4-057	6.0	0.00	-71.09
P-949	C2-087	C2-088	6.0	0.00	140.48
P-950	C2-088	B2-005	6.0	0.00	132.28
P-952	B2-005	C1-027	6.0	0.00	89.48
P-953	C1-027	C1-028	6.0	0.00	56.90
P-955	C1-029	C1-030	6.0	0.00	9.50
P-957	C1-031	C1-032	6.0	0.00	-76.66
P-958	C1-032	C1-033	6.0	0.00	-87.26
P-959	C1-033	C1-003	6.0	0.00	-103.06
P-960	C1-003	C1-027	6.0	0.00	-24.68
P-961	C1-003	C2-089	6.0	0.00	-106.88
P-962	C2-089	C2-090	6.0	0.00	-123.28
P-963	C2-020	C2-091	8.0	0.00	150.94
P-964	C2-091	C2-021	8.0	0.00	8.20

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-965	C2-090	C2-091	6.0	0.00	-134.54
P-966	C1-034	C1-031	6.0	0.00	-5.19
P-968	C1-030	C1-035	6.0	0.00	49.36
P-969	C1-035	C1-024	6.0	0.00	40.14
P-970	C1-024	C1-035	2.0	0.00	-1.32
P-971	C1-036	C1-025	2.0	0.00	-7.90
P-972	C1-025	C1-037	2.0	0.00	7.90
P-973	C1-038	C1-002	2.0	0.00	-7.90
P-976	C1-034	C1-032	2.0	0.00	-2.71
P-977	C1-028	C1-039	6.0	0.00	41.10
P-978	C1-039	C1-029	6.0	0.00	21.38
P-980	C1-028	C1-040	2.0	0.00	7.90
P-981	C2-092	C2-078	2.0	0.00	-8.20
P-982	C2-010	C2-093	8.0	0.00	52.03
P-983	C2-093	C2-011	8.0	0.00	28.53
P-984	C2-093	D2-003	2.0	0.00	7.10
P-985	C2-094	C2-093	6.0	0.00	-8.20
P-986	D2-001	D2-005	8.0	0.00	2.64
P-987	D2-005	D2-002	8.0	0.00	-25.76
P-989	D2-004	D2-006	6.0	0.00	-7.10
P-990	D2-006	D2-005	6.0	0.00	-21.30
P-991	D2-006	D2-007	6.0	0.00	7.10
P-992	D2-002	C2-095	6.0	0.00	-32.86
P-993	C2-095	C2-096	6.0	0.00	-49.26
P-994	C2-096	C2-011	6.0	0.00	-65.66
P-995	C2-011	C2-097	6.0	0.00	-45.32
P-996	C2-097	C2-098	6.0	0.00	8.20
P-998	C2-013	C2-001	6.0	0.00	-93.33
P-999	C2-001	C2-008	6.0	0.00	-4.96
P-1000	C2-008	C2-012	6.0	0.00	68.02
P-1001	C2-007	C2-099	8.0	0.00	33.63
P-1002	C2-099	C2-010	8.0	0.00	60.23
P-1004	C2-008	C2-071	6.0	0.00	-243.69
P-1006	C2-049	C2-071	6.0	0.00	236.15
P-1007	C2-087	C2-082	6.0	0.00	-119.85
P-1008	C2-083	C2-100	6.0	0.00	60.59
P-1009	C2-100	C2-087	6.0	0.00	28.83
P-1010	C2-100	C2-101	6.0	0.00	23.55
P-1012	B2-007	B2-008	6.0	0.00	7.77
P-1017	C2-102	C2-083	6.0	0.00	-46.35
P-1018	C2-017	C2-085	6.0	0.00	148.92
P-1019	C2-086	C2-103	6.0	0.00	8.20
P-1020	C2-017	C2-031	6.0	0.00	-187.05
P-1021	C3-014	C3-049	6.0	0.00	188.07
P-1022	C3-049	C3-019	6.0	0.00	181.66

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1023	C3-020	C3-050	6.0	0.00	-105.00
P-1024	C3-050	C3-051	6.0	0.00	-151.26
P-1025	C3-051	C3-052	6.0	0.00	-230.40
P-1026	C3-052	C3-053	6.0	0.00	8.70
P-1027	C3-051	C3-050	6.0	0.00	70.45
P-1028	C3-009	C3-049	6.0	0.00	9.54
P-1029	C3-009	B3-059	6.0	0.00	227.36
P-1030	B3-059	B3-060	6.0	0.00	66.04
P-1032	B3-061	B3-062	6.0	0.00	-0.56
P-1033	B3-062	B3-063	6.0	0.00	-130.42
P-1034	B3-063	B3-059	6.0	0.00	-150.22
P-1035	B3-062	B3-046	6.0	0.00	118.76
P-1036	B3-063	C3-054	6.0	0.00	8.70
P-1037	B3-060	B3-065	6.0	0.00	54.94
P-1038	B3-065	B3-061	6.0	0.00	10.54
P-1041	B3-066	B3-003	8.0	0.00	17.83
P-1042	B3-005	B3-067	8.0	0.00	12.99
P-1043	B3-067	B3-003	8.0	0.00	4.37
P-1044	B3-066	B3-067	6.0	0.00	2.47
P-1045	C3-034	C3-055	12.0	0.00	-592.77
P-1046	C3-055	C3-052	12.0	0.00	-812.67
P-1047	C3-052	C3-056	12.0	0.00	-1,060.47
P-1048	C3-056	C3-057	12.0	0.00	-1,069.17
P-1049	C3-057	C3-058	12.0	0.00	-1,282.48
P-1050	C3-058	C3-059	12.0	0.00	-1,291.18
P-1051	C3-059	C3-060	12.0	0.00	795.25
P-1052	C3-060	C3-061	12.0	0.00	786.55
P-1053	C3-061	C3-062	12.0	0.00	345.71
P-1054	C3-062	C3-011	12.0	0.00	337.01
P-1058	C2-038	C2-040	6.0	0.00	-36.25
P-1059	C2-040	C3-011	6.0	0.00	-0.13
P-1060	C2-017	C3-063	8.0	0.00	29.93
P-1062	C3-012	C3-063	6.0	0.00	166.42
P-1063	C3-061	C3-064	12.0	0.00	432.15
P-1064	C2-040	C2-139	6.0	0.00	-44.32
P-1065	C2-139	C3-108	6.0	0.00	197.82
P-1066	C3-064	C2-139	12.0	0.00	423.45
P-1067	C2-139	C2-036	12.0	0.00	181.30
P-1068	C2-058	C2-104	6.0	0.00	-77.88
P-1069	C2-104	C2-043	6.0	0.00	-74.90
P-1070	C2-036	C2-104	12.0	0.00	94.68
P-1071	C2-058	C2-105	6.0	0.00	-119.54
P-1072	C2-105	C2-044	6.0	0.00	-60.64
P-1073	C2-104	C2-105	12.0	0.00	83.50
P-1074	C2-105	C2-106	12.0	0.00	16.40

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1075	C2-106	C2-107	12.0	0.00	8.20
P-1076	C4-046	C4-081	12.0	0.00	-746.98
P-1077	C4-081	C4-047	12.0	0.00	-871.52
P-1078	C4-003	C4-081	8.0	0.00	178.26
P-1079	C4-081	C4-002	8.0	0.00	293.80
P-1080	C4-031	C4-011	6.0	0.00	69.02
P-1081	C4-012	C5-081	6.0	0.00	-72.32
P-1082	C5-070	C5-081	6.0	0.00	159.71
P-1083	C5-081	C5-069	6.0	0.00	78.50
P-1084	C2-097	C2-108	6.0	0.00	-61.72
P-1085	C2-108	C2-013	6.0	0.00	-93.75
P-1086	C2-108	C3-065	6.0	0.00	23.83
P-1087	C3-065	C3-066	6.0	0.00	6.93
P-1088	C3-066	C3-006	6.0	0.00	-45.36
P-1089	C3-006	C3-067	6.0	0.00	-30.73
P-1090	C3-067	C3-068	6.0	0.00	24.29
P-1091	C3-068	C3-069	6.0	0.00	19.73
P-1092	C3-069	C3-070	6.0	0.00	26.10
P-1093	C3-070	C3-071	6.0	0.00	10.49
P-1094	C3-071	C3-072	6.0	0.00	8.70
P-1095	C3-071	C3-070	6.0	0.00	-6.91
P-1096	C3-069	C4-046	6.0	0.00	-15.07
P-1097	C3-068	C3-073	6.0	0.00	-4.14
P-1098	C3-073	C3-067	6.0	0.00	-21.54
P-1099	C3-067	C3-074	6.0	0.00	-85.25
P-1102	C3-074	C3-075	6.0	0.00	-88.71
P-1103	C3-075	C3-076	8.0	0.00	148.94
P-1104	C3-076	C3-005	8.0	0.00	108.90
P-1105	C3-076	C3-074	6.0	0.00	31.34
P-1106	C3-074	C3-077	6.0	0.00	26.10
P-1107	C3-077	C3-078	6.0	0.00	8.70
P-1108	C3-079	C3-077	6.0	0.00	-8.70
P-1109	C3-073	C3-080	6.0	0.00	8.70
P-1110	C3-066	C3-081	6.0	0.00	43.58
P-1111	C3-006	C3-082	8.0	0.00	120.26
P-1113	C3-081	C3-082	6.0	0.00	7.76
P-1114	C3-082	C3-083	6.0	0.00	8.70
P-1115	C3-082	C3-084	8.0	0.00	110.62
P-1116	C3-084	C3-007	8.0	0.00	120.34
P-1117	C3-081	C3-084	6.0	0.00	27.12
P-1118	C3-084	C3-085	6.0	0.00	8.70
P-1120	C3-087	C3-008	8.0	0.00	32.64
P-1121	C3-086	C3-087	6.0	0.00	-8.70
P-1122	C3-007	C3-088	8.0	0.00	65.53
P-1123	C3-088	C3-087	8.0	0.00	50.04

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1124	C3-088	C3-089	6.0	0.00	6.79
P-1125	C3-089	D3-007	6.0	0.00	7.10
P-1126	C3-007	C3-090	8.0	0.00	46.11
P-1127	C3-090	D3-001	8.0	0.00	28.40
P-1128	C3-089	C3-090	6.0	0.00	-9.01
P-1129	C3-002	C3-091	8.0	0.00	43.85
P-1130	C3-091	C3-075	8.0	0.00	246.35
P-1131	C3-091	C3-055	6.0	0.00	-211.20
P-1132	C2-096	C2-109	6.0	0.00	8.20
P-1133	C1-030	C1-042	6.0	0.00	-47.76
P-1134	C1-042	C1-031	6.0	0.00	-63.56
P-1135	C1-041	C1-042	2.0	0.00	-7.90
P-1136	C1-043	C1-033	2.0	0.00	-7.90
P-1137	C2-048	C2-110	2.0	0.00	8.20
P-1138	C2-111	C2-048	2.0	0.00	-8.20
P-1139	C2-060	C2-113	6.0	0.00	206.87
P-1140	C2-113	C2-047	6.0	0.00	186.35
P-1141	C2-112	C2-113	2.0	0.00	-8.20
P-1142	C2-045	C2-114	6.0	0.00	167.80
P-1143	C2-114	C2-046	6.0	0.00	163.72
P-1144	C2-113	C2-114	2.0	0.00	4.12
P-1145	C2-115	C3-065	2.0	0.00	-8.20
P-1146	C2-116	C2-117	2.0	0.00	-8.20
P-1147	C2-117	C2-118	2.0	0.00	8.20
P-1148	C2-117	C2-006	2.0	0.00	-24.60
P-1149	C2-119	C2-009	2.0	0.00	-8.20
P-1150	C2-077	C2-120	2.0	0.00	8.20
P-1151	C1-044	C1-010	2.0	0.00	-7.90
P-1152	C1-014	C1-045	2.0	0.00	7.90
P-1153	C1-004	C1-046	2.0	0.00	7.90
P-1155	C1-047	C1-004	6.0	0.00	-57.90
P-1156	C1-047	D1-002	2.0	0.00	10.00
P-1157	D1-001	D1-003	6.0	0.00	-20.00
P-1158	D1-003	C1-047	6.0	0.00	-40.00
P-1159	D1-003	D1-004	2.0	0.00	10.00
P-1160	C2-032	C2-121	6.0	0.00	12.95
P-1161	C2-121	C2-037	6.0	0.00	-3.45
P-1162	C2-121	C2-122	2.0	0.00	8.20
P-1163	C2-123	C2-039	2.0	0.00	-8.20
P-1164	C3-012	C2-124	2.0	0.00	8.20
P-1165	C3-092	C3-013	2.0	0.00	-8.70
P-1166	C3-063	C3-093	8.0	0.00	187.65
P-1167	C3-093	C3-016	8.0	0.00	185.53
P-1168	C3-013	C3-093	2.0	0.00	6.59
P-1169	C3-014	C3-094	6.0	0.00	90.02

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1170	C3-094	C3-016	6.0	0.00	68.77
P-1171	C3-094	C3-095	2.0	0.00	12.55
P-1172	C3-095	C3-049	2.0	0.00	-7.25
P-1173	C3-095	B3-068	2.0	0.00	11.10
P-1174	C3-096	C3-018	2.0	0.00	-8.70
P-1175	B3-056	B3-069	2.0	0.00	11.10
P-1176	B3-051	B3-070	6.0	0.00	30.33
P-1177	B3-070	B3-052	6.0	0.00	20.96
P-1178	C3-026	B3-071	6.0	0.00	92.21
P-1179	B3-071	B3-056	6.0	0.00	79.39
P-1180	B3-070	B3-071	2.0	0.00	-1.72
P-1181	C3-026	C3-025	2.0	0.00	-2.71
P-1182	C3-021	C3-097	6.0	0.00	-99.65
P-1183	C3-097	C3-029	6.0	0.00	-115.81
P-1185	C3-023	C3-098	2.0	0.00	-2.01
P-1186	C3-098	C3-097	2.0	0.00	-7.46
P-1187	C3-022	C3-098	2.0	0.00	-4.16
P-1188	C3-031	C3-099	6.0	0.00	-13.47
P-1189	C3-099	C3-038	6.0	0.00	-21.09
P-1190	C3-098	C3-099	2.0	0.00	-7.41
P-1191	C3-099	C3-100	2.0	0.00	-8.49
P-1192	C3-033	C3-100	8.0	0.00	34.59
P-1193	C3-100	C3-101	8.0	0.00	17.40
P-1194	C3-101	C3-102	8.0	0.00	8.70
P-1195	D6-014	D7-001	12.0	0.00	590.00
P-1196	D7-001	D7-002	12.0	0.00	569.00
P-1198	D7-003	D7-004	12.0	0.00	341.19
P-1199	D7-004	E8-001	12.0	0.00	170.00
P-1200	E8-001	E8-002	12.0	0.00	142.00
P-1201	E8-002	E8-003	12.0	0.00	86.00
P-1202	E8-003	E8-004	12.0	0.00	28.00
P-1203	E8-005	E8-002	12.0	0.00	-28.00
P-1204	E8-003	E9-001	12.0	0.00	30.00
P-1205	E9-001	E9-002	12.0	0.00	10.00
P-1206	E9-001	D9-001	12.0	0.00	10.00
P-1207	C9-001	C9-002	10.0	0.00	-871.69
P-1210	C9-002	D9-002	10.0	0.00	-324.06
P-1211	D9-002	D9-003	10.0	0.00	-334.06
P-1212	D9-003	D9-004	10.0	0.00	-354.06
P-1213	D9-004	D9-005	10.0	0.00	-374.06
P-1214	D9-005	C9-003	10.0	0.00	628.23
P-1215	C9-003	C9-002	10.0	0.00	587.93
P-1216	D9-006	D9-004	8.0	0.00	-10.00
P-1217	D9-007	D9-003	8.0	0.00	-10.00
P-1225	B4-014	B4-058	12.0	0.00	-2,732.67

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1230	C2-059	C2-125	6.0	0.00	-372.58
P-1231	C2-125	C2-060	6.0	0.00	395.60
P-1237	C2-126	C2-127	10.0	0.00	821.96
P-1238	C2-127	C2-128	10.0	0.00	278.38
P-1239	C2-128	C2-028	10.0	0.00	270.18
P-1240	C2-127	C2-026	8.0	0.00	535.38
P-1241	C3-024	C3-103	6.0	0.00	-73.76
P-1242	C3-103	C3-044	6.0	0.00	-82.46
P-1247	C7-009	C7-011	10.0	0.00	36.00
P-1248	A5-001	A5-004	6.0	0.00	6.00
P-1249	B2-005	B2-009	6.0	0.00	32.10
P-1250	B2-009	B2-006	1.3	0.00	10.70
P-1251	B2-009	B2-010	6.0	0.00	10.70
P-1252	B2-008	B2-011	6.0	0.00	-2.93
P-1255	B2-012	C2-102	6.0	0.00	-38.15
P-1256	B2-011	B2-012	6.0	0.00	-13.63
P-1257	C2-101	B2-013	6.0	0.00	15.35
P-1258	B2-013	B2-007	6.0	0.00	18.47
P-1259	B2-012	B2-013	6.0	0.00	13.82
P-1260	B2-001	B2-014	6.0	0.00	10.70
P-1262	B3-072	B3-012	6.0	0.00	-11.10
P-1263	B3-002	B3-073	8.0	0.00	53.61
P-1264	B3-073	B3-066	8.0	0.00	31.41
P-1265	B3-073	B3-074	2.0	0.00	11.10
P-1266	B3-013	B3-009	6.0	0.00	-11.35
P-1267	B3-064	B3-075	6.0	0.00	-11.10
P-1268	B3-075	B3-065	6.0	0.00	-33.30
P-1269	B3-075	B3-076	6.0	0.00	11.10
P-1270	B3-035	B3-055	6.0	0.00	51.20
P-1271	B3-055	B3-039	6.0	0.00	46.45
P-1272	B3-054	B3-077	6.0	0.00	16.83
P-1273	B3-077	B3-055	6.0	0.00	6.35
P-1274	B3-001	B3-078	6.0	0.00	24.17
P-1275	B3-078	B3-036	6.0	0.00	12.45
P-1276	B3-077	B3-078	1.3	0.00	-0.62
P-1277	B4-047	B4-059	8.0	0.00	740.89
P-1279	B4-059	B4-060	6.0	0.00	10.00
P-1280	B4-005	B4-061	6.0	0.00	180.33
P-1281	B4-061	B4-049	6.0	0.00	20.00
P-1282	B3-028	B4-061	6.0	0.00	-150.33
P-1283	B3-022	B3-079	6.0	0.00	-43.47
P-1284	B3-079	B3-023	6.0	0.00	-0.18
P-1285	B3-025	B3-079	6.0	0.00	54.39
P-1287	B4-062	A4-001	8.0	0.00	114.21
P-1288	B4-062	B4-063	4.0	0.00	10.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1290	B4-064	B4-062	8.0	0.00	134.21
P-1291	B4-064	B4-065	6.0	0.00	10.00
P-1292	B4-022	B4-066	6.0	0.00	29.67
P-1293	B4-066	B4-024	6.0	0.00	9.67
P-1294	B4-066	B4-067	6.0	0.00	10.00
P-1295	B4-021	B4-068	6.0	0.00	-6.59
P-1296	B4-068	B4-020	6.0	0.00	-26.59
P-1297	B4-068	B4-069	6.0	0.00	10.00
P-1298	B5-028	B5-042	6.0	0.00	11.40
P-1299	B4-013	B4-070	12.0	0.00	-1,621.62
P-1300	B4-070	B4-014	12.0	0.00	-1,642.72
P-1301	B4-070	B3-080	2.0	0.00	11.10
P-1302	B4-059	B4-071	8.0	0.00	720.89
P-1303	B4-071	B4-004	8.0	0.00	700.89
P-1304	B4-071	B4-072	6.0	0.00	10.00
P-1305	B4-005	B4-073	8.0	0.00	184.21
P-1306	B4-073	B4-064	8.0	0.00	154.21
P-1307	B4-006	B4-073	8.0	0.00	-20.00
P-1308	B4-015	B5-030	6.0	0.00	-13.30
P-1309	B5-018	B5-043	6.0	0.00	-12.35
P-1310	B5-043	B5-019	6.0	0.00	11.40
P-1311	B5-024	B5-044	6.0	0.00	143.24
P-1312	B5-044	B5-010	6.0	0.00	96.69
P-1313	B5-043	B5-044	6.0	0.00	-35.15
P-1314	C5-022	B5-045	8.0	0.00	425.13
P-1317	B5-045	B5-047	8.0	0.00	317.74
P-1318	B5-047	B5-022	8.0	0.00	333.93
P-1319	B5-045	B5-048	6.0	0.00	95.99
P-1320	B5-048	B5-046	6.0	0.00	11.40
P-1322	B5-047	B5-049	6.0	0.00	-27.59
P-1323	B5-049	B5-048	6.0	0.00	-73.19
P-1325	B5-049	B5-051	6.0	0.00	34.20
P-1326	B5-051	B5-050	6.0	0.00	11.40
P-1327	B5-051	B5-052	6.0	0.00	11.40
P-1328	C5-024	B5-053	6.0	0.00	61.40
P-1330	B6-011	B6-002	8.0	0.00	11.52
P-1333	B6-040	B6-028	6.0	0.00	-30.29
P-1334	B6-040	B6-041	4.0	0.00	11.60
P-1335	B6-012	B6-042	6.0	0.00	16.11
P-1336	B6-042	B6-040	6.0	0.00	-7.09
P-1337	B6-042	B6-043	4.0	0.00	11.60
P-1338	C7-028	C7-051	8.0	0.00	226.00
P-1339	C7-051	C7-029	8.0	0.00	211.60
P-1340	C7-051	B7-003	6.0	0.00	7.20
P-1341	C1-039	C1-048	2.0	0.00	11.82

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1342	C1-048	C1-029	2.0	0.00	-3.98
P-1343	C1-048	C1-049	2.0	0.00	7.90
P-1346	C2-129	C2-090	6.0	0.00	-3.07
P-1347	C2-022	C2-130	2.0	0.00	-4.08
P-1349	C2-022	C2-131	6.0	0.00	-115.62
P-1350	C2-131	C2-129	6.0	0.00	-136.11
P-1351	C2-130	C2-131	6.0	0.00	-12.28
P-1352	C2-129	C2-023	6.0	0.00	-141.24
P-1353	C2-089	C2-132	4.0	0.00	8.20
P-1354	C2-075	C2-133	2.0	0.00	8.20
P-1355	C2-012	C2-134	6.0	0.00	51.20
P-1356	C2-134	C2-099	6.0	0.00	34.80
P-1357	C2-134	C2-135	1.3	0.00	8.20
P-1358	C3-108	C2-136	6.0	0.00	226.06
P-1359	C2-136	C2-041	6.0	0.00	189.66
P-1360	C2-136	C2-137	1.0	0.00	8.20
P-1361	C2-095	C2-138	6.0	0.00	8.20
P-1362	C3-057	C3-015	6.0	0.00	174.61
P-1363	C3-032	C3-104	6.0	0.00	26.10
P-1364	C3-104	C3-105	6.0	0.00	8.70
P-1365	C3-104	C3-106	6.0	0.00	8.70
P-1366	C3-041	C3-107	6.0	0.00	-0.01
P-1367	C3-107	C3-042	6.0	0.00	88.75
P-1368	C3-010	C3-107	6.0	0.00	97.45
P-1369	C4-073	C4-082	6.0	0.00	124.15
P-1370	C4-082	C3-010	6.0	0.00	106.15
P-1371	C4-082	C4-083	4.0	0.00	9.00
P-1373	C4-048	C4-084	6.0	0.00	149.17
P-1374	C4-084	C4-064	6.0	0.00	131.17
P-1375	C4-084	C4-085	1.3	0.00	9.00
P-1376	C4-008	C4-086	8.0	0.00	307.36
P-1377	C4-086	C5-025	8.0	0.00	285.09
P-1378	C4-051	C4-086	2.0	0.00	-13.28
P-1379	C4-042	C4-087	8.0	0.00	-266.80
P-1380	C4-087	C4-002	8.0	0.00	-284.80
P-1381	C4-087	C4-088	4.0	0.00	9.00
P-1382	C4-061	C4-089	8.0	0.00	302.75
P-1383	C4-089	C4-006	8.0	0.00	284.75
P-1384	C4-089	C4-060	8.0	0.00	9.00
P-1385	C6-032	C6-033	4.0	0.00	6.69
P-1386	C6-030	C6-074	6.0	0.00	150.73
P-1387	C6-074	C6-031	6.0	0.00	120.13
P-1388	C6-074	C6-075	2.0	0.00	10.20
P-1389	C6-074	C6-076	2.0	0.00	10.20
P-1390	C6-062	C6-038	6.0	0.00	91.56

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1391	C7-037	C7-052	8.0	0.00	20.36
P-1393	C7-052	C7-053	6.0	0.00	7.20
P-1394	C7-052	C7-054	8.0	0.00	5.96
P-1395	C7-054	C7-033	8.0	0.00	-8.44
P-1396	C7-054	C7-055	6.0	0.00	7.20
P-1397	D1-001	D1-005	2.0	0.00	10.00
P-1398	D5-007	D5-011	6.0	0.00	17.30
P-1399	D6-017	D7-005	12.0	0.00	-521.03
P-1400	D7-005	C7-022	12.0	0.00	-563.03
P-1401	D7-005	D7-006	6.0	0.00	21.00
P-1402	C7-027	C7-056	12.0	0.00	-385.63
P-1403	C7-056	C7-030	12.0	0.00	-483.83
P-1406	D7-002	D7-008	12.0	0.00	548.00
P-1407	D7-008	D7-003	12.0	0.00	362.19
P-1409	D7-008	D7-010	6.0	0.00	164.81
P-1410	D7-010	D7-009	6.0	0.00	21.00
P-1416	D7-012	D7-011	2.0	0.00	21.00
P-1417	D7-012	D7-013	6.0	0.00	38.81
P-1418	D7-013	D7-014	6.0	0.00	-3.19
P-1420	D7-015	D7-004	6.0	0.00	-150.19
P-1421	D7-010	D7-016	6.0	0.00	122.81
P-1422	D7-016	D7-012	6.0	0.00	80.81
P-1423	D7-016	D7-017	2.0	0.00	21.00
P-1424	D7-013	D7-018	4.0	0.00	21.00
P-1425	D7-014	D7-019	2.0	0.00	21.00
P-1426	D7-014	D7-020	6.0	0.00	-45.19
P-1428	D7-020	D7-021	4.0	0.00	21.00
P-1429	D7-020	D7-022	6.0	0.00	-87.19
P-1430	D7-022	D7-015	6.0	0.00	-129.19
P-1431	D7-022	D7-023	4.0	0.00	21.00
P-1432	C7-022	C7-057	8.0	0.00	43.20
P-1433	C7-057	C7-058	8.0	0.00	12.61
P-1434	C7-057	C7-059	8.0	0.00	11.19
P-1435	C7-057	C7-060	8.0	0.00	12.19
P-1436	C7-058	C7-061	8.0	0.00	2.21
P-1437	C7-058	C7-062	8.0	0.00	3.21
P-1444	C7-062	C7-059	8.0	0.00	-3.99
P-1445	C7-061	C7-060	8.0	0.00	-4.99
P-1452	C2-125	FCV-2	10.0	0.00	-776.39
P-1453	FCV-2	R-9	10.0	0.00	-776.39
P-1454	C2-126	FCV-3	10.0	0.00	-830.16
P-1455	FCV-3	R-10	10.0	0.00	-830.16
P-1456	B4-058	FCV-4	12.0	0.00	-1,008.06
P-1457	FCV-4	R-11	12.0	0.00	-1,008.06
P-1458	C5-023	FCV-5	12.0	0.00	-1,042.75

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Dynamic

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1459	FCV-5	R-12	12.0	0.00	-1,042.75
P-1460	C6-018	FCV-6	12.0	0.00	-447.79
P-1461	FCV-6	R-13	12.0	0.00	-447.79
P-1462	D9-008	FCV-7	12.0	0.00	-254.41
P-1463	FCV-7	R-14	12.0	0.00	-254.41
P-1464	B4-058	Halstead Road	12.0	0.00	-1,734.61
P-1465	C3-059	Pine Drive Tank	12.0	0.00	-2,095.14
P-1466	C6-019	Civic Center Tank	12.0	0.00	-2,672.62
P-1467	D9-008	D9-009	12.0	0.00	244.41
P-1468	D9-009	D9-005	12.0	0.00	1,012.29
P-1470	C7-056	C7-063	4.0	0.00	91.00
P-1471	C7-063	D7-007	4.0	0.00	21.00
Sunplex Tank	D9-009	T-7	12.0	0.00	-767.88

STATIC DETAILS

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C6-018	22.00	0.00	120.87	42.8
C6-016	22.00	0.00	127.87	45.8
C6-017	22.00	0.00	129.54	46.5
C6-051	22.00	0.00	130.62	47.0
C6-049	22.00	0.00	130.92	47.1
C6-015	22.00	0.00	133.32	48.2
C6-045	22.00	0.00	133.57	48.3
C6-047	22.00	0.00	134.49	48.7
C6-048	22.00	0.00	134.49	48.7
C6-050	22.00	0.00	135.66	49.2
C6-061	22.00	0.00	136.83	49.7
D7-002	26.00	0.00	141.00	49.8
C6-060	22.00	0.00	137.94	50.2
C6-059	22.00	0.00	138.86	50.6
C6-039	22.00	0.00	138.87	50.6
D6-014	24.00	0.00	141.00	50.6
D7-001	24.00	0.00	141.00	50.6
D7-003	24.00	0.00	141.00	50.6
D7-004	24.00	0.00	141.00	50.6
D9-001	24.00	0.00	141.00	50.6
D7-009	24.00	0.00	141.00	50.6
D7-010	24.00	0.00	141.00	50.6
D7-011	24.00	0.00	141.00	50.6
D7-012	24.00	0.00	141.00	50.6
D7-015	24.00	0.00	141.00	50.6
D7-016	24.00	0.00	141.00	50.6
D7-017	24.00	0.00	141.00	50.6
D7-019	24.00	0.00	141.00	50.6
D7-020	24.00	0.00	141.00	50.6
D7-021	24.00	0.00	141.00	50.6
D7-022	24.00	0.00	141.00	50.6
D7-023	24.00	0.00	141.00	50.6
D7-014	23.87	0.00	141.00	50.7
D7-008	23.85	0.00	141.00	50.7
D7-013	23.82	0.00	141.00	50.7
C6-062	22.00	0.00	139.20	50.7
D7-018	23.69	0.00	141.00	50.8
C6-009	22.00	0.00	139.36	50.8
C6-038	22.00	0.00	139.42	50.8
C6-046	22.00	0.00	139.88	51.0
C6-011	22.00	0.00	139.92	51.0
C6-012	22.00	0.00	139.92	51.0
C6-013	22.00	0.00	139.93	51.0
C6-040	21.76	0.00	139.80	51.1
D6-012	22.00	0.00	140.05	51.1
C6-068	21.69	0.00	139.80	51.1

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C6-065	22.91	0.00	141.43	51.3
C6-066	22.00	0.00	140.68	51.3
C6-067	22.00	0.00	140.68	51.3
D6-006	22.32	0.00	141.00	51.3
C6-069	21.51	0.00	140.22	51.4
D6-008	22.00	0.00	140.72	51.4
D6-015	22.26	0.00	141.00	51.4
C6-041	21.76	0.00	140.54	51.4
C6-037	21.44	0.00	140.22	51.4
C6-063	22.00	0.00	140.84	51.4
C6-064	22.00	0.00	140.84	51.4
D6-005	22.15	0.00	141.00	51.4
C6-042	21.94	0.00	140.85	51.4
D6-002	22.00	0.00	141.00	51.5
D6-003	22.00	0.00	141.00	51.5
D6-007	22.00	0.00	141.00	51.5
C6-014	20.76	0.00	139.92	51.6
C6-031	22.00	0.00	141.31	51.6
D6-016	22.00	0.00	141.31	51.6
D6-017	22.00	0.00	141.43	51.7
C6-036	20.90	0.00	140.68	51.8
C6-076	21.95	0.00	141.77	51.8
C6-073	21.46	0.00	141.31	51.9
C6-034	21.46	0.00	141.31	51.9
C6-032	21.45	0.00	141.31	51.9
C6-033	21.44	0.00	141.31	51.9
C6-074	21.85	0.00	141.77	51.9
D6-013	19.86	0.00	140.05	52.0
C6-075	21.51	0.00	141.77	52.0
C6-030	21.60	0.00	142.00	52.1
C5-024	21.86	0.00	142.31	52.1
D7-006	23.02	0.00	143.50	52.1
D6-004	20.26	0.00	141.00	52.2
C6-052	21.98	0.00	142.94	52.3
C5-018	24.00	0.00	144.99	52.3
C6-035	20.50	0.00	141.51	52.4
D7-005	22.47	0.00	143.50	52.4
C6-029	20.86	0.00	141.99	52.4
C6-072	20.14	0.00	141.31	52.4
C5-017	23.66	0.00	144.99	52.5
C6-056	21.82	0.00	143.30	52.6
C6-057	21.79	0.00	143.64	52.7
C6-058	21.92	0.00	143.79	52.7
D6-010	18.63	0.00	140.51	52.7
C6-053	21.46	0.00	143.46	52.8
C5-023	20.27	0.00	142.31	52.8

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C5-019	22.76	0.00	144.81	52.8
C6-055	21.33	0.00	143.46	52.8
C5-080	23.81	0.00	145.94	52.8
D6-009	18.57	0.00	140.72	52.9
C6-028	20.76	0.00	142.98	52.9
B5-053	20.00	0.00	142.31	52.9
C5-036	22.38	0.00	144.96	53.0
C6-008	21.96	0.00	144.55	53.0
C6-027	20.86	0.00	143.49	53.1
C5-016	22.51	0.00	145.15	53.1
C5-004	22.65	0.00	145.38	53.1
D5-008	24.00	0.00	146.76	53.1
D5-009	24.00	0.00	146.77	53.1
D5-010	24.00	0.00	146.77	53.1
C5-079	23.14	0.00	145.94	53.1
C5-020	22.00	0.00	144.85	53.2
C5-032	22.00	0.00	144.85	53.2
C5-038	22.00	0.00	144.85	53.2
C5-078	22.00	0.00	144.85	53.2
C5-033	22.00	0.00	144.93	53.2
C6-007	22.00	0.00	144.96	53.2
C5-034	22.00	0.00	144.99	53.2
C2-125	22.00	0.00	145.09	53.3
C5-010	22.85	0.00	145.94	53.3
C6-010	22.00	0.00	145.12	53.3
C5-026	22.04	0.00	145.17	53.3
C6-070	20.70	0.00	143.88	53.3
D4-001	23.56	0.00	146.77	53.3
C5-013	22.18	0.00	145.45	53.3
C7-059	21.47	0.00	144.75	53.3
C7-062	21.40	0.00	144.75	53.4
C5-041	22.00	0.00	145.36	53.4
D7-007	22.33	0.00	145.72	53.4
C5-002	22.09	0.00	145.49	53.4
C6-026	20.70	0.00	144.10	53.4
C7-057	21.13	0.00	144.75	53.5
C5-005	21.72	0.00	145.38	53.5
C5-003	21.68	0.00	145.38	53.5
C6-001	20.59	0.00	144.28	53.5
C5-065	22.00	0.00	145.74	53.5
C5-042	22.00	0.00	145.74	53.5
C5-006	22.20	0.00	145.97	53.5
C7-058	20.96	0.00	144.75	53.6
C5-043	22.00	0.00	145.82	53.6
C6-071	20.05	0.00	143.88	53.6
C5-012	22.00	0.00	145.89	53.6

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C5-011	22.00	0.00	145.90	53.6
C5-001	22.00	0.00	145.90	53.6
C7-022	20.85	0.00	144.75	53.6
C7-060	20.83	0.00	144.75	53.6
C7-061	20.81	0.00	144.75	53.6
C5-056	22.00	0.00	145.96	53.6
C5-058	22.00	0.00	145.98	53.6
C5-057	22.00	0.00	145.98	53.6
C7-021	20.84	0.00	144.84	53.6
C5-060	22.00	0.00	146.04	53.7
C7-020	21.14	0.00	145.28	53.7
C6-006	22.00	0.00	146.15	53.7
C2-060	22.00	0.00	146.23	53.7
C2-112	22.00	0.00	146.28	53.8
C2-113	22.00	0.00	146.28	53.8
C5-008	22.37	0.00	146.75	53.8
C2-061	22.00	0.00	146.43	53.8
C5-037	20.41	0.00	144.85	53.8
C5-022	19.34	0.00	143.77	53.8
C5-031	20.94	0.00	145.41	53.9
C5-047	22.25	0.00	146.74	53.9
C2-059	22.00	0.00	146.49	53.9
C7-023	20.30	0.00	144.84	53.9
C2-047	22.00	0.00	146.55	53.9
C2-048	22.00	0.00	146.56	53.9
C2-110	22.00	0.00	146.56	53.9
C2-111	22.00	0.00	146.56	53.9
C5-009	22.22	0.00	146.79	53.9
C7-019	20.70	0.00	145.30	53.9
B5-032	22.00	0.00	146.63	53.9
B5-014	22.00	0.00	146.64	53.9
C5-044	22.00	0.00	146.65	53.9
C5-025	22.00	0.00	146.66	53.9
C4-086	22.00	0.00	146.69	53.9
C4-008	22.00	0.00	146.70	54.0
C4-007	22.00	0.00	146.71	54.0
C5-045	22.00	0.00	146.71	54.0
C5-048	22.00	0.00	146.72	54.0
C5-046	22.00	0.00	146.72	54.0
C2-023	22.00	0.00	146.73	54.0
C5-071	22.00	0.00	146.74	54.0
C5-072	22.00	0.00	146.74	54.0
C4-009	22.00	0.00	146.78	54.0
C1-009	22.00	0.00	146.78	54.0
C1-013	22.00	0.00	146.78	54.0
C1-010	22.00	0.00	146.78	54.0

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C2-050	22.00	0.00	146.78	54.0
C2-062	22.00	0.00	146.78	54.0
C2-063	22.00	0.00	146.78	54.0
C2-052	22.00	0.00	146.78	54.0
C2-049	22.00	0.00	146.78	54.0
C2-053	22.00	0.00	146.78	54.0
C2-046	22.00	0.00	146.79	54.0
C5-075	22.00	0.00	146.79	54.0
C5-021	22.00	0.00	146.80	54.0
C4-011	22.00	0.00	146.80	54.0
C4-010	22.00	0.00	146.80	54.0
C4-031	22.00	0.00	146.80	54.0
C5-077	22.00	0.00	146.81	54.0
C1-041	21.94	0.00	146.75	54.0
C4-030	22.00	0.00	146.81	54.0
C5-076	22.00	0.00	146.81	54.0
C4-032	22.00	0.00	146.81	54.0
C4-013	22.00	0.00	146.81	54.0
C4-014	22.00	0.00	146.81	54.0
C4-017	22.00	0.00	146.82	54.0
C4-016	22.00	0.00	146.82	54.0
D4-002	22.00	0.00	146.82	54.0
C4-029	22.00	0.00	146.82	54.0
C4-058	22.00	0.00	146.84	54.0
C4-028	22.00	0.00	146.85	54.0
C4-027	22.00	0.00	146.87	54.0
C5-049	21.85	0.00	146.73	54.0
C1-039	21.87	0.00	146.75	54.0
C2-015	22.00	0.00	146.89	54.0
C4-026	22.00	0.00	146.91	54.0
C4-001	22.00	0.00	146.91	54.0
C5-069	21.86	0.00	146.77	54.0
C4-034	22.00	0.00	146.92	54.0
C2-129	21.81	0.00	146.73	54.0
C4-043	22.00	0.00	146.92	54.0
C7-010	20.79	0.00	145.72	54.0
C4-033	22.00	0.00	146.93	54.0
C4-036	22.00	0.00	146.93	54.0
C4-025	22.00	0.00	146.93	54.1
C2-131	21.78	0.00	146.73	54.1
C2-114	22.00	0.00	146.96	54.1
C4-044	22.00	0.00	146.99	54.1
C4-012	21.78	0.00	146.78	54.1
C2-075	22.00	0.00	147.00	54.1
C2-076	22.00	0.00	147.00	54.1
C2-045	22.00	0.00	147.00	54.1

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C2-071	22.00	0.00	147.01	54.1
C4-045	22.00	0.00	147.02	54.1
C4-037	22.00	0.00	147.02	54.1
C2-028	20.33	0.00	145.39	54.1
C2-051	21.71	0.00	146.78	54.1
C2-073	22.00	0.00	147.09	54.1
C4-038	22.00	0.00	147.09	54.1
C5-074	21.69	0.00	146.79	54.1
C2-029	20.71	0.00	145.82	54.1
C4-039	22.00	0.00	147.11	54.1
C4-041	22.00	0.00	147.11	54.1
C4-042	22.00	0.00	147.13	54.1
C4-040	22.00	0.00	147.16	54.1
C5-053	21.58	0.00	146.74	54.2
C2-077	22.00	0.00	147.18	54.2
C2-128	20.19	0.00	145.39	54.2
C2-009	22.00	0.00	147.20	54.2
C2-119	22.00	0.00	147.20	54.2
C2-008	22.00	0.00	147.21	54.2
C2-007	22.00	0.00	147.21	54.2
C2-120	21.96	0.00	147.18	54.2
C5-067	21.54	0.00	146.77	54.2
D5-002	19.70	0.00	144.93	54.2
C4-087	22.00	0.00	147.24	54.2
C4-088	22.00	0.00	147.24	54.2
C1-048	21.51	0.00	146.75	54.2
C7-012	20.24	0.00	145.49	54.2
C4-051	21.47	0.00	146.72	54.2
C7-011	20.22	0.00	145.49	54.2
C4-057	21.48	0.00	146.76	54.2
C2-027	20.09	0.00	145.39	54.2
C7-024	20.00	0.00	145.30	54.2
B5-029	21.32	0.00	146.64	54.2
B5-030	21.30	0.00	146.64	54.2
C7-054	20.00	0.00	145.34	54.2
C7-055	20.00	0.00	145.34	54.2
C4-061	21.85	0.00	147.19	54.2
C4-006	21.62	0.00	146.97	54.2
C4-050	21.39	0.00	146.76	54.2
C2-044	21.90	0.00	147.28	54.2
C1-011	21.39	0.00	146.78	54.2
C4-059	21.38	0.00	146.77	54.2
C2-138	22.00	0.00	147.40	54.3
B4-015	21.24	0.00	146.64	54.3
C2-074	21.38	0.00	146.79	54.3
C4-052	21.28	0.00	146.69	54.3

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-009	20.07	0.00	145.49	54.3
C2-106	22.00	0.00	147.42	54.3
C2-107	22.00	0.00	147.42	54.3
C7-045	20.00	0.00	145.43	54.3
C2-043	22.00	0.00	147.43	54.3
D2-002	22.00	0.00	147.44	54.3
D2-004	22.00	0.00	147.45	54.3
D2-005	22.00	0.00	147.45	54.3
D2-006	22.00	0.00	147.45	54.3
D2-007	22.00	0.00	147.45	54.3
C3-065	22.00	0.00	147.45	54.3
D2-001	22.00	0.00	147.46	54.3
C2-104	22.00	0.00	147.47	54.3
C3-086	22.00	0.00	147.48	54.3
C7-043	20.00	0.00	145.48	54.3
C3-088	22.00	0.00	147.48	54.3
C5-061	20.56	0.00	146.04	54.3
C3-089	22.00	0.00	147.48	54.3
D3-001	22.00	0.00	147.48	54.3
D3-002	22.00	0.00	147.48	54.3
D3-004	22.00	0.00	147.48	54.3
C3-090	22.00	0.00	147.48	54.3
C3-066	22.00	0.00	147.49	54.3
C3-085	22.00	0.00	147.49	54.3
C7-013	19.98	0.00	145.49	54.3
C3-006	22.00	0.00	147.51	54.3
C3-004	22.00	0.00	147.51	54.3
C4-035	21.40	0.00	146.93	54.3
C3-005	22.00	0.00	147.52	54.3
C2-016	21.33	0.00	146.87	54.3
B5-006	20.30	0.00	145.85	54.3
C3-081	21.94	0.00	147.49	54.3
C3-070	22.00	0.00	147.58	54.3
C3-076	22.00	0.00	147.58	54.3
C3-078	22.00	0.00	147.59	54.3
C3-079	22.00	0.00	147.59	54.3
C6-054	20.34	0.00	145.94	54.3
C2-105	21.81	0.00	147.42	54.3
C2-004	21.86	0.00	147.47	54.3
D5-005	21.13	0.00	146.76	54.4
C4-054	21.12	0.00	146.76	54.4
C3-075	22.00	0.00	147.64	54.4
C3-074	21.94	0.00	147.59	54.4
C2-042	21.86	0.00	147.52	54.4
C4-068	22.00	0.00	147.68	54.4
C2-056	21.11	0.00	146.80	54.4

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C4-024	21.23	0.00	146.93	54.4
C2-013	21.67	0.00	147.36	54.4
C7-004	20.25	0.00	145.96	54.4
B5-007	20.91	0.00	146.62	54.4
C7-007	20.00	0.00	145.72	54.4
D3-005	21.74	0.00	147.46	54.4
C5-050	21.01	0.00	146.74	54.4
C3-087	21.74	0.00	147.48	54.4
C5-073	21.02	0.00	146.79	54.4
C7-052	19.55	0.00	145.33	54.4
C4-089	21.22	0.00	147.00	54.4
B5-028	20.82	0.00	146.62	54.4
C2-108	21.53	0.00	147.37	54.4
B5-031	20.82	0.00	146.66	54.4
C6-002	20.00	0.00	145.85	54.5
C2-020	20.86	0.00	146.72	54.5
C7-006	20.00	0.00	145.86	54.5
C2-030	20.74	0.00	146.61	54.5
C4-003	21.77	0.00	147.66	54.5
C5-055	20.20	0.00	146.09	54.5
C2-064	19.84	0.00	145.73	54.5
C2-099	21.35	0.00	147.26	54.5
C2-006	21.30	0.00	147.21	54.5
C6-003	20.00	0.00	145.93	54.5
C4-070	22.00	0.00	147.95	54.5
C7-033	19.43	0.00	145.38	54.5
C3-091	22.00	0.00	147.96	54.5
C4-071	22.00	0.00	147.97	54.5
C5-052	20.79	0.00	146.76	54.5
C3-002	22.00	0.00	147.97	54.5
C4-053	20.72	0.00	146.69	54.5
C2-022	20.76	0.00	146.74	54.5
C5-014	19.37	0.00	145.35	54.5
C4-056	20.78	0.00	146.76	54.5
C3-037	22.00	0.00	147.99	54.5
C4-072	22.00	0.00	148.00	54.5
C1-042	20.75	0.00	146.75	54.5
C3-039	22.00	0.00	148.00	54.5
C3-048	22.00	0.00	148.00	54.5
C4-073	22.00	0.00	148.00	54.5
C4-082	22.00	0.00	148.00	54.5
C3-035	22.00	0.00	148.01	54.5
C3-040	22.00	0.00	148.01	54.5
C4-079	22.00	0.00	148.01	54.5
C3-010	22.00	0.00	148.01	54.5
C3-041	22.00	0.00	148.01	54.5

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C4-077	22.00	0.00	148.01	54.5
C4-085	22.00	0.00	148.01	54.5
C3-107	22.00	0.00	148.02	54.5
C4-078	22.00	0.00	148.02	54.5
C6-005	20.76	0.00	146.79	54.5
C3-042	22.00	0.00	148.03	54.5
C4-048	22.00	0.00	148.03	54.5
C7-053	19.30	0.00	145.33	54.5
C3-038	22.00	0.00	148.04	54.5
C3-043	22.00	0.00	148.04	54.5
C3-044	22.00	0.00	148.05	54.5
C2-018	20.77	0.00	146.83	54.5
C3-103	22.00	0.00	148.07	54.5
C3-099	22.00	0.00	148.07	54.5
C3-031	22.00	0.00	148.07	54.5
C3-032	22.00	0.00	148.07	54.5
C3-104	22.00	0.00	148.07	54.5
C3-105	22.00	0.00	148.07	54.5
C3-106	22.00	0.00	148.07	54.5
C3-029	22.00	0.00	148.07	54.5
C3-030	22.00	0.00	148.07	54.5
C3-033	22.00	0.00	148.07	54.5
C3-100	22.00	0.00	148.07	54.5
C3-101	22.00	0.00	148.07	54.5
C3-102	22.00	0.00	148.07	54.5
C3-097	22.00	0.00	148.07	54.5
C3-098	22.00	0.00	148.07	54.5
C2-036	21.51	0.00	147.58	54.5
C3-024	22.00	0.00	148.07	54.5
C3-023	22.00	0.00	148.07	54.5
C3-022	22.00	0.00	148.08	54.5
C3-021	22.00	0.00	148.08	54.5
B3-057	22.00	0.00	148.08	54.5
B3-058	22.00	0.00	148.08	54.5
C3-027	22.00	0.00	148.08	54.5
C3-028	22.00	0.00	148.08	54.5
C3-082	21.42	0.00	147.50	54.5
C3-034	22.00	0.00	148.08	54.5
C3-025	22.00	0.00	148.08	54.5
C3-026	22.00	0.00	148.09	54.6
C3-019	22.00	0.00	148.09	54.6
C3-055	22.00	0.00	148.09	54.6
C3-096	22.00	0.00	148.10	54.6
C3-084	21.39	0.00	147.49	54.6
C3-020	22.00	0.00	148.10	54.6
B3-048	22.00	0.00	148.10	54.6

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B3-071	22.00	0.00	148.10	54.6
B3-056	22.00	0.00	148.11	54.6
B3-069	22.00	0.00	148.11	54.6
C1-021	20.64	0.00	146.75	54.6
B3-051	22.00	0.00	148.11	54.6
C3-050	22.00	0.00	148.12	54.6
B3-070	22.00	0.00	148.12	54.6
C7-008	19.52	0.00	145.64	54.6
B3-052	22.00	0.00	148.12	54.6
C4-049	22.00	0.00	148.13	54.6
C3-051	22.00	0.00	148.13	54.6
C2-058	21.23	0.00	147.37	54.6
C3-007	21.33	0.00	147.48	54.6
C2-003	21.31	0.00	147.47	54.6
C4-067	21.74	0.00	147.90	54.6
B3-078	22.00	0.00	148.16	54.6
B3-001	22.00	0.00	148.17	54.6
B3-030	22.00	0.00	148.17	54.6
B3-031	22.00	0.00	148.17	54.6
B3-038	22.00	0.00	148.17	54.6
C4-076	22.00	0.00	148.18	54.6
B3-036	21.98	0.00	148.16	54.6
C3-018	21.91	0.00	148.10	54.6
C3-047	22.00	0.00	148.20	54.6
C3-045	22.00	0.00	148.20	54.6
C3-046	22.00	0.00	148.20	54.6
C3-015	22.00	0.00	148.20	54.6
C3-052	22.00	0.00	148.21	54.6
C3-053	22.00	0.00	148.21	54.6
B4-012	22.00	0.00	148.22	54.6
C2-135	21.06	0.00	147.29	54.6
B5-033	20.37	0.00	146.62	54.6
C3-056	22.00	0.00	148.25	54.6
C6-004	20.00	0.00	146.26	54.6
C2-066	20.62	0.00	146.89	54.6
B4-013	22.00	0.00	148.27	54.6
C4-005	21.42	0.00	147.69	54.6
C3-067	21.30	0.00	147.58	54.6
C6-044	20.74	0.00	147.03	54.6
B4-070	22.00	0.00	148.29	54.6
C5-062	19.45	0.00	145.76	54.6
C3-057	22.00	0.00	148.33	54.7
B3-054	21.81	0.00	148.14	54.7
C4-075	21.76	0.00	148.13	54.7
B6-001	20.00	0.00	146.37	54.7
B6-002	20.00	0.00	146.37	54.7

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C5-059	19.61	0.00	145.98	54.7
B3-032	21.80	0.00	148.17	54.7
C7-005	19.49	0.00	145.86	54.7
C1-031	20.37	0.00	146.75	54.7
C2-097	20.98	0.00	147.36	54.7
C2-024	20.29	0.00	146.68	54.7
C3-058	22.00	0.00	148.40	54.7
B6-021	20.00	0.00	146.41	54.7
B6-018	20.00	0.00	146.45	54.7
C5-063	19.31	0.00	145.76	54.7
C2-117	20.74	0.00	147.21	54.7
C2-057	20.57	0.00	147.05	54.7
B3-035	21.68	0.00	148.17	54.7
B6-022	20.00	0.00	146.49	54.7
C5-007	20.10	0.00	146.59	54.7
B5-008	19.61	0.00	146.10	54.7
B6-023	20.00	0.00	146.52	54.7
C2-005	20.94	0.00	147.47	54.7
C3-017	21.56	0.00	148.09	54.7
C5-064	19.20	0.00	145.74	54.7
C5-070	20.21	0.00	146.77	54.8
C5-054	20.03	0.00	146.58	54.8
B5-051	18.29	0.00	144.86	54.8
B5-024	19.22	0.00	145.80	54.8
B5-026	20.00	0.00	146.58	54.8
C2-025	20.00	0.00	146.58	54.8
C4-084	21.43	0.00	148.01	54.8
C2-072	20.39	0.00	146.97	54.8
C5-051	20.14	0.00	146.74	54.8
B6-019	19.83	0.00	146.44	54.8
B6-029	20.00	0.00	146.60	54.8
B5-027	20.00	0.00	146.61	54.8
B3-023	21.55	0.00	148.18	54.8
C3-008	20.85	0.00	147.47	54.8
B4-003	21.69	0.00	148.35	54.8
C2-001	20.79	0.00	147.46	54.8
B4-019	20.00	0.00	146.67	54.8
C2-134	20.61	0.00	147.29	54.8
C1-034	20.05	0.00	146.75	54.8
D5-011	20.04	0.00	146.76	54.8
B4-020	19.94	0.00	146.67	54.8
C2-091	20.00	0.00	146.73	54.8
C2-115	20.72	0.00	147.45	54.8
C1-038	20.01	0.00	146.74	54.8
C1-003	20.00	0.00	146.75	54.8
C1-019	20.00	0.00	146.75	54.8

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C1-020	20.00	0.00	146.75	54.8
C1-023	20.00	0.00	146.75	54.8
C1-025	20.00	0.00	146.75	54.8
C1-036	20.00	0.00	146.75	54.8
C1-030	20.00	0.00	146.75	54.8
C1-029	20.00	0.00	146.75	54.8
C1-035	20.00	0.00	146.75	54.8
C1-024	20.00	0.00	146.75	54.8
C4-066	21.19	0.00	147.94	54.8
C4-055	20.00	0.00	146.76	54.8
B3-047	21.32	0.00	148.10	54.8
C2-067	20.00	0.00	146.78	54.9
C3-036	21.20	0.00	147.98	54.9
B5-013	19.29	0.00	146.08	54.9
B5-049	18.07	0.00	144.86	54.9
C1-017	20.00	0.00	146.79	54.9
C7-037	18.50	0.00	145.31	54.9
C1-022	19.92	0.00	146.75	54.9
C2-101	20.00	0.00	146.82	54.9
B7-001	19.83	0.00	146.65	54.9
B2-012	20.00	0.00	146.84	54.9
C2-078	20.01	0.00	146.85	54.9
C3-071	20.74	0.00	147.58	54.9
B4-014	21.51	0.00	148.36	54.9
C2-092	20.00	0.00	146.85	54.9
B6-008	20.00	0.00	146.85	54.9
C2-083	20.00	0.00	146.85	54.9
B5-052	18.00	0.00	144.86	54.9
C6-023	20.00	0.00	146.87	54.9
B4-022	19.81	0.00	146.67	54.9
C2-031	20.35	0.00	147.25	54.9
D5-007	19.86	0.00	146.76	54.9
B4-009	19.18	0.00	146.10	54.9
C1-014	19.87	0.00	146.78	54.9
B6-026	19.48	0.00	146.41	54.9
C2-109	20.46	0.00	147.39	54.9
C3-092	21.10	0.00	148.04	54.9
C4-065	20.98	0.00	147.96	54.9
C7-046	18.38	0.00	145.37	54.9
C2-055	19.76	0.00	146.76	54.9
D3-006	20.45	0.00	147.46	55.0
C2-054	19.75	0.00	146.77	55.0
C4-074	20.97	0.00	148.00	55.0
B4-058	21.40	0.00	148.43	55.0
B4-023	19.65	0.00	146.68	55.0
B5-042	19.59	0.00	146.62	55.0

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-018	18.32	0.00	145.36	55.0
B5-047	17.86	0.00	144.91	55.0
C2-084	20.00	0.00	147.05	55.0
B5-025	19.29	0.00	146.34	55.0
B5-044	18.90	0.00	145.98	55.0
C7-017	18.27	0.00	145.36	55.0
C3-077	20.50	0.00	147.59	55.0
C6-043	20.03	0.00	147.13	55.0
C5-040	18.12	0.00	145.23	55.0
C7-031	18.22	0.00	145.33	55.0
C7-032	18.18	0.00	145.32	55.0
C6-021	20.00	0.00	147.16	55.0
B3-024	20.98	0.00	148.18	55.0
C7-002	19.09	0.00	146.29	55.0
C7-042	18.35	0.00	145.55	55.0
C2-002	20.26	0.00	147.47	55.0
C3-013	20.83	0.00	148.04	55.0
D3-007	20.27	0.00	147.48	55.0
C2-012	20.11	0.00	147.32	55.0
B3-037	20.95	0.00	148.16	55.0
C3-014	20.85	0.00	148.07	55.0
B3-029	20.95	0.00	148.18	55.0
C2-082	19.53	0.00	146.76	55.1
C2-137	20.23	0.00	147.48	55.1
B6-024	19.19	0.00	146.44	55.1
C3-059	21.20	0.00	148.44	55.1
B5-009	18.85	0.00	146.10	55.1
C7-034	18.10	0.00	145.37	55.1
C2-041	20.20	0.00	147.47	55.1
C1-002	19.46	0.00	146.74	55.1
B4-047	21.04	0.00	148.33	55.1
B5-011	18.77	0.00	146.08	55.1
C5-030	18.09	0.00	145.41	55.1
B5-020	18.31	0.00	145.65	55.1
C5-028	18.03	0.00	145.38	55.1
C7-044	18.20	0.00	145.55	55.1
C7-050	19.03	0.00	146.38	55.1
C2-011	20.00	0.00	147.36	55.1
C5-068	19.40	0.00	146.76	55.1
C2-070	20.00	0.00	147.37	55.1
C2-136	20.10	0.00	147.48	55.1
B3-080	20.88	0.00	148.29	55.1
B5-016	18.59	0.00	146.01	55.1
B4-059	20.91	0.00	148.33	55.1
C7-001	18.87	0.00	146.30	55.1
B6-020	18.97	0.00	146.42	55.1

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C7-014	18.00	0.00	145.49	55.2
C2-032	20.00	0.00	147.51	55.2
B3-043	20.58	0.00	148.10	55.2
C2-085	20.00	0.00	147.53	55.2
C2-121	20.00	0.00	147.53	55.2
B6-015	18.94	0.00	146.46	55.2
C2-037	20.00	0.00	147.54	55.2
B5-021	18.00	0.00	145.56	55.2
B5-023	18.00	0.00	145.56	55.2
C2-086	19.97	0.00	147.53	55.2
C4-069	20.39	0.00	147.96	55.2
C7-041	18.00	0.00	145.58	55.2
D3-003	19.90	0.00	147.48	55.2
C2-069	19.55	0.00	147.15	55.2
B6-043	18.82	0.00	146.43	55.2
C2-017	20.00	0.00	147.61	55.2
B4-060	20.71	0.00	148.33	55.2
B6-025	18.81	0.00	146.42	55.2
B3-046	20.47	0.00	148.09	55.2
B5-018	18.43	0.00	146.08	55.2
B4-072	20.64	0.00	148.29	55.2
C3-003	20.33	0.00	147.98	55.2
B5-015	18.44	0.00	146.10	55.2
C4-083	20.33	0.00	148.00	55.2
B2-002	20.00	0.00	147.68	55.2
B3-077	20.46	0.00	148.15	55.2
C3-069	19.89	0.00	147.58	55.2
B5-010	18.27	0.00	146.00	55.3
C7-003	18.51	0.00	146.23	55.3
B4-018	18.18	0.00	145.91	55.3
C3-094	20.29	0.00	148.04	55.3
C4-004	20.00	0.00	147.77	55.3
C5-029	17.60	0.00	145.38	55.3
C4-064	20.23	0.00	148.00	55.3
B3-025	20.38	0.00	148.18	55.3
B4-071	20.48	0.00	148.29	55.3
C3-016	20.23	0.00	148.04	55.3
B4-066	18.86	0.00	146.67	55.3
C6-020	20.00	0.00	147.82	55.3
C4-063	20.21	0.00	148.05	55.3
B5-004	18.00	0.00	145.84	55.3
B5-005	18.00	0.00	145.84	55.3
C4-002	19.58	0.00	147.42	55.3
C6-019	20.00	0.00	147.84	55.3
C3-001	20.01	0.00	147.87	55.3
B5-041	18.00	0.00	145.86	55.3

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
A5-001	18.00	0.00	145.86	55.3
A5-002	18.00	0.00	145.86	55.3
A5-004	18.00	0.00	145.86	55.3
C3-068	19.72	0.00	147.58	55.3
C3-049	20.19	0.00	148.07	55.3
B3-049	20.22	0.00	148.10	55.3
B6-017	18.57	0.00	146.45	55.3
B6-005	18.32	0.00	146.21	55.3
B6-004	18.35	0.00	146.26	55.3
C4-080	19.84	0.00	147.75	55.3
B4-017	18.00	0.00	145.91	55.3
C2-081	18.77	0.00	146.68	55.3
B3-055	20.23	0.00	148.16	55.3
C3-063	20.00	0.00	147.93	55.4
B4-010	18.17	0.00	146.10	55.4
B4-043	20.21	0.00	148.21	55.4
B6-016	18.45	0.00	146.46	55.4
C3-012	20.00	0.00	148.01	55.4
B5-036	18.00	0.00	146.02	55.4
B5-037	18.00	0.00	146.02	55.4
B4-028	20.00	0.00	148.05	55.4
B4-029	20.00	0.00	148.05	55.4
B4-031	20.00	0.00	148.05	55.4
B4-032	20.00	0.00	148.05	55.4
B4-033	20.00	0.00	148.05	55.4
B4-034	20.00	0.00	148.05	55.4
B4-035	20.00	0.00	148.05	55.4
B4-036	20.00	0.00	148.05	55.4
B4-037	20.00	0.00	148.05	55.4
B4-039	20.00	0.00	148.05	55.4
B4-041	20.00	0.00	148.05	55.4
B4-042	20.00	0.00	148.05	55.4
B5-019	18.00	0.00	146.05	55.4
B5-043	18.00	0.00	146.05	55.4
B3-026	20.11	0.00	148.18	55.4
B3-061	20.00	0.00	148.07	55.4
B4-011	18.02	0.00	146.10	55.4
B5-012	18.00	0.00	146.08	55.4
B6-031	18.40	0.00	146.48	55.4
B3-040	20.06	0.00	148.15	55.4
B6-032	18.37	0.00	146.47	55.4
B3-079	20.08	0.00	148.18	55.4
B6-037	18.00	0.00	146.10	55.4
B6-038	18.00	0.00	146.10	55.4
B6-007	18.00	0.00	146.10	55.4
B5-001	18.00	0.00	146.10	55.4

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B3-044	20.00	0.00	148.10	55.4
B3-045	20.00	0.00	148.10	55.4
B3-005	20.00	0.00	148.10	55.4
C3-054	19.96	0.00	148.07	55.4
C2-080	18.67	0.00	146.79	55.4
B4-045	20.22	0.00	148.34	55.4
B3-053	20.00	0.00	148.12	55.4
B5-035	18.00	0.00	146.13	55.4
B3-076	19.93	0.00	148.07	55.4
B3-041	20.00	0.00	148.15	55.4
B4-026	19.04	0.00	147.19	55.4
B3-020	20.00	0.00	148.15	55.4
B3-039	20.00	0.00	148.15	55.4
B3-022	19.98	0.00	148.18	55.5
B6-006	18.00	0.00	146.21	55.5
C2-126	17.04	0.00	145.25	55.5
B4-044	20.00	0.00	148.21	55.5
B4-004	20.03	0.00	148.27	55.5
B4-052	20.00	0.00	148.24	55.5
B4-053	20.00	0.00	148.25	55.5
B4-057	20.00	0.00	148.26	55.5
B6-011	18.11	0.00	146.41	55.5
B4-046	20.03	0.00	148.34	55.5
B4-038	19.73	0.00	148.05	55.5
C6-025	18.28	0.00	146.66	55.5
C2-088	18.40	0.00	146.79	55.6
C4-047	19.34	0.00	147.77	55.6
B6-040	18.00	0.00	146.43	55.6
B6-041	18.00	0.00	146.43	55.6
B6-027	18.00	0.00	146.46	55.6
B5-039	18.00	0.00	146.46	55.6
B6-039	18.00	0.00	146.46	55.6
B6-033	18.00	0.00	146.46	55.6
C2-102	18.36	0.00	146.84	55.6
B4-021	18.19	0.00	146.67	55.6
C5-081	18.26	0.00	146.77	55.6
B4-069	18.14	0.00	146.67	55.6
B5-045	16.16	0.00	144.70	55.6
C6-024	18.19	0.00	146.76	55.6
C2-068	18.31	0.00	146.88	55.6
C3-083	18.90	0.00	147.50	55.6
C3-009	19.40	0.00	148.05	55.7
C2-124	19.37	0.00	148.01	55.7
B6-030	17.87	0.00	146.52	55.7
B4-024	18.00	0.00	146.67	55.7
B6-010	17.56	0.00	146.26	55.7

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B6-042	17.71	0.00	146.43	55.7
B4-007	17.38	0.00	146.10	55.7
C4-062	19.33	0.00	148.05	55.7
C3-073	18.86	0.00	147.58	55.7
C7-038	16.67	0.00	145.41	55.7
B3-065	19.33	0.00	148.07	55.7
B3-042	19.35	0.00	148.10	55.7
B5-022	16.72	0.00	145.49	55.7
C7-048	17.72	0.00	146.51	55.7
B6-013	17.64	0.00	146.44	55.7
B2-003	18.90	0.00	147.72	55.7
C1-026	17.92	0.00	146.75	55.7
B6-034	17.62	0.00	146.46	55.7
C6-022	18.01	0.00	146.87	55.7
C2-090	17.87	0.00	146.73	55.8
C2-026	16.49	0.00	145.37	55.8
A4-011	16.99	0.00	145.88	55.8
C2-095	18.48	0.00	147.40	55.8
C3-095	19.12	0.00	148.05	55.8
B3-075	19.14	0.00	148.07	55.8
B4-068	17.74	0.00	146.67	55.8
B4-067	17.71	0.00	146.67	55.8
B5-003	16.98	0.00	145.96	55.8
B5-002	17.10	0.00	146.10	55.8
A4-002	16.84	0.00	145.88	55.8
C2-127	16.25	0.00	145.31	55.8
B4-025	17.57	0.00	146.67	55.9
C7-039	16.42	0.00	145.52	55.9
B3-050	18.96	0.00	148.10	55.9
C7-015	16.34	0.00	145.49	55.9
C1-018	17.60	0.00	146.77	55.9
B5-034	17.00	0.00	146.22	55.9
C7-040	16.27	0.00	145.51	55.9
B3-060	18.69	0.00	148.07	56.0
C7-035	16.00	0.00	145.38	56.0
D6-001	10.52	0.00	139.92	56.0
C2-098	17.95	0.00	147.36	56.0
B5-054	16.66	0.00	146.10	56.0
C7-049	16.91	0.00	146.38	56.0
B4-001	16.39	0.00	145.87	56.0
C3-060	18.69	0.00	148.20	56.0
C7-047	16.98	0.00	146.51	56.0
B4-002	16.29	0.00	145.87	56.1
B6-036	16.79	0.00	146.43	56.1
C2-040	18.24	0.00	147.94	56.1
C4-081	17.89	0.00	147.60	56.1

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C4-023	17.19	0.00	146.92	56.1
B3-019	18.41	0.00	148.16	56.1
C2-123	18.00	0.00	147.79	56.2
C7-028	16.00	0.00	145.84	56.2
B4-051	18.39	0.00	148.24	56.2
C3-062	18.18	0.00	148.03	56.2
B4-016	16.00	0.00	145.88	56.2
C1-006	16.88	0.00	146.77	56.2
B4-056	18.35	0.00	148.26	56.2
C2-133	17.09	0.00	147.00	56.2
B3-027	18.24	0.00	148.18	56.2
B6-028	16.45	0.00	146.43	56.2
C2-103	17.54	0.00	147.53	56.2
C3-011	18.00	0.00	148.03	56.3
B4-027	18.00	0.00	148.05	56.3
B4-030	18.00	0.00	148.05	56.3
B3-059	18.00	0.00	148.06	56.3
B6-003	16.19	0.00	146.28	56.3
B3-067	18.00	0.00	148.10	56.3
C5-035	14.91	0.00	145.01	56.3
B3-072	18.00	0.00	148.16	56.3
B3-017	18.00	0.00	148.16	56.3
B3-018	18.00	0.00	148.16	56.3
C3-080	17.42	0.00	147.58	56.3
B3-011	18.00	0.00	148.16	56.3
B3-013	18.00	0.00	148.17	56.3
B3-009	18.00	0.00	148.17	56.3
C2-021	16.55	0.00	146.73	56.3
B3-010	17.98	0.00	148.17	56.3
B4-062	18.00	0.00	148.22	56.3
B4-064	18.00	0.00	148.22	56.3
B4-050	18.00	0.00	148.22	56.3
C1-037	16.52	0.00	146.75	56.3
C2-033	17.25	0.00	147.51	56.4
B3-003	17.83	0.00	148.10	56.4
C1-033	16.47	0.00	146.75	56.4
B6-035	16.00	0.00	146.45	56.4
C1-008	16.17	0.00	146.77	56.5
C5-027	14.50	0.00	145.17	56.5
C2-039	16.94	0.00	147.79	56.6
B4-008	15.23	0.00	146.10	56.6
B6-009	16.00	0.00	146.92	56.6
C4-046	16.62	0.00	147.58	56.7
B3-015	17.17	0.00	148.17	56.7
B3-004	17.01	0.00	148.10	56.7
B4-063	17.12	0.00	148.22	56.7

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
B4-040	16.91	0.00	148.05	56.7
B3-014	16.99	0.00	148.17	56.8
B5-017	14.97	0.00	146.16	56.8
B3-066	16.79	0.00	148.10	56.8
C7-026	14.38	0.00	145.69	56.8
D5-001	13.50	0.00	144.85	56.8
C7-016	14.00	0.00	145.36	56.8
C2-093	15.87	0.00	147.30	56.9
C2-122	16.09	0.00	147.53	56.9
C4-015	15.38	0.00	146.82	56.9
C2-139	16.46	0.00	147.93	56.9
C3-064	16.46	0.00	148.02	56.9
C2-079	15.24	0.00	146.81	56.9
C7-025	13.77	0.00	145.40	57.0
A4-009	14.22	0.00	145.88	57.0
C5-066	15.03	0.00	146.75	57.0
C1-007	14.99	0.00	146.77	57.0
B3-016	16.39	0.00	148.17	57.0
B3-062	16.28	0.00	148.07	57.0
C2-130	14.92	0.00	146.73	57.0
B4-065	16.38	0.00	148.22	57.0
C3-108	16.03	0.00	147.87	57.0
C3-093	16.15	0.00	147.99	57.0
B3-068	16.15	0.00	148.05	57.1
C7-027	13.80	0.00	145.70	57.1
D6-011	8.56	0.00	140.51	57.1
C7-056	13.76	0.00	145.72	57.1
B2-001	15.66	0.00	147.66	57.1
C9-001	24.00	0.00	156.02	57.1
C7-030	13.87	0.00	145.89	57.1
B4-005	16.18	0.00	148.22	57.1
B6-014	14.34	0.00	146.46	57.2
B3-028	16.07	0.00	148.19	57.2
C2-019	14.69	0.00	146.83	57.2
C3-061	15.91	0.00	148.05	57.2
B3-008	16.00	0.00	148.16	57.2
C5-015	12.99	0.00	145.23	57.2
D5-006	14.50	0.00	146.76	57.2
B4-054	16.00	0.00	148.26	57.2
B2-013	14.56	0.00	146.83	57.2
B2-011	14.53	0.00	146.84	57.2
B2-007	14.53	0.00	146.83	57.2
B3-021	15.83	0.00	148.18	57.3
C2-065	12.99	0.00	145.37	57.3
B5-040	13.41	0.00	145.86	57.3
C2-096	14.88	0.00	147.39	57.3

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C2-132	14.20	0.00	146.74	57.3
C2-116	14.59	0.00	147.21	57.4
B4-073	15.53	0.00	148.22	57.4
B6-012	13.59	0.00	146.42	57.5
B3-063	15.24	0.00	148.07	57.5
C7-036	12.52	0.00	145.37	57.5
D9-007	24.72	0.00	157.61	57.5
C9-002	24.00	0.00	156.91	57.5
B3-034	15.24	0.00	148.18	57.5
C1-005	13.59	0.00	146.75	57.6
C7-029	12.54	0.00	145.72	57.6
D5-003	11.38	0.00	144.85	57.7
B5-050	11.35	0.00	144.86	57.8
D9-002	24.00	0.00	157.55	57.8
D9-003	24.00	0.00	157.61	57.8
B3-012	14.42	0.00	148.16	57.9
C4-060	13.17	0.00	147.00	57.9
C1-028	12.71	0.00	146.75	58.0
D5-004	11.03	0.00	145.13	58.0
C1-027	12.65	0.00	146.76	58.0
C1-049	12.48	0.00	146.75	58.1
B7-002	11.55	0.00	145.85	58.1
B3-064	13.63	0.00	148.07	58.2
C2-014	12.36	0.00	146.88	58.2
D9-004	23.32	0.00	157.89	58.2
C1-032	12.01	0.00	146.75	58.3
C2-010	12.47	0.00	147.29	58.3
B2-009	11.85	0.00	146.77	58.4
C4-018	11.82	0.00	146.83	58.4
C2-034	12.20	0.00	147.51	58.5
C4-019	11.49	0.00	146.85	58.6
C2-035	11.99	0.00	147.51	58.6
D9-006	22.18	0.00	157.89	58.7
B2-004	11.92	0.00	147.68	58.7
B4-006	12.43	0.00	148.22	58.8
C4-020	11.01	0.00	146.87	58.8
C7-051	9.87	0.00	145.74	58.8
B2-014	11.46	0.00	147.66	58.9
C1-043	10.42	0.00	146.75	59.0
B2-008	10.43	0.00	146.83	59.0
C5-039	8.70	0.00	145.13	59.0
B4-048	11.66	0.00	148.21	59.1
C2-089	10.16	0.00	146.74	59.1
C1-047	10.00	0.00	146.70	59.1
C9-003	21.15	0.00	157.85	59.1
C2-100	10.00	0.00	146.82	59.2

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
C4-021	10.06	0.00	146.90	59.2
C2-087	9.87	0.00	146.81	59.2
D9-008	21.45	0.00	158.51	59.3
B3-002	11.01	0.00	148.09	59.3
B3-033	11.09	0.00	148.18	59.3
D9-005	20.60	0.00	158.33	59.6
B2-005	9.02	0.00	146.77	59.6
A4-003	8.00	0.00	145.88	59.7
A4-004	8.00	0.00	145.88	59.7
A4-010	8.00	0.00	145.88	59.7
C2-038	9.85	0.00	147.79	59.7
C4-022	8.92	0.00	146.90	59.7
B4-055	10.05	0.00	148.26	59.8
C1-004	8.37	0.00	146.72	59.9
D1-003	7.74	0.00	146.70	60.1
A4-007	6.41	0.00	145.88	60.3
C1-040	7.16	0.00	146.75	60.4
C1-016	7.05	0.00	146.79	60.5
C1-015	6.90	0.00	146.79	60.5
A4-001	8.20	0.00	148.20	60.6
A4-008	5.65	0.00	145.88	60.7
B4-049	7.88	0.00	148.21	60.7
B7-003	5.03	0.00	145.74	60.9
A3-001	7.40	0.00	148.17	60.9
D1-005	5.84	0.00	146.68	60.9
C1-001	6.00	0.00	146.87	60.9
C1-046	5.72	0.00	146.72	61.0
E8-001	0.00	0.00	141.00	61.0
E8-002	0.00	0.00	141.00	61.0
E8-003	0.00	0.00	141.00	61.0
E8-004	0.00	0.00	141.00	61.0
E8-005	0.00	0.00	141.00	61.0
E9-001	0.00	0.00	141.00	61.0
E9-002	0.00	0.00	141.00	61.0
B3-074	6.96	0.00	148.09	61.1
C2-118	5.91	0.00	147.21	61.1
B3-007	6.78	0.00	148.16	61.2
C1-044	5.26	0.00	146.78	61.2
B5-046	3.21	0.00	144.82	61.3
C1-012	4.96	0.00	146.78	61.4
D1-001	4.79	10.00	146.68	61.4
A5-003	3.89	0.00	145.86	61.4
B5-038	4.00	0.00	146.13	61.5
B5-048	2.64	0.00	144.82	61.5
A4-006	3.50	0.00	145.88	61.6
B3-006	5.75	0.00	148.15	61.6

City of Ocean Springs Water Model
FlexTable: Junction Table
Active Scenario: Static

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
D1-004	4.29	0.00	146.70	61.6
B2-010	4.28	0.00	146.77	61.7
B3-073	5.54	0.00	148.09	61.7
B4-061	5.57	0.00	148.21	61.7
B2-006	4.00	0.00	146.77	61.8
C2-094	4.47	0.00	147.30	61.8
D1-002	3.77	0.00	146.70	61.8
C1-045	3.84	0.00	146.78	61.8
A4-005	2.21	0.00	145.88	62.2
B4-074	4.00	0.00	148.17	62.4
D2-003	2.00	0.00	147.30	62.9
C3-072	2.00	0.00	147.58	63.0
C7-063	0.00	0.00	145.72	63.0
D9-009	0.00	0.00	158.52	68.6

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-2	C7-001	C7-002	8.0	0.00	83.15
P-3	C7-002	C7-003	8.0	0.00	83.15
P-4	C7-003	C7-004	8.0	0.00	83.15
P-5	C7-004	C7-005	8.0	0.00	83.15
P-6	C7-005	C7-006	8.0	0.00	0.00
P-7	C7-005	C7-007	8.0	0.00	83.15
P-8	C7-007	C7-008	8.0	0.00	83.15
P-9	C7-008	C7-009	8.0	0.00	83.15
P-10	C7-010	C7-007	8.0	0.00	0.00
P-11	C7-011	C7-012	8.0	0.00	0.00
P-12	C7-012	C7-013	8.0	0.00	0.00
P-13	C7-013	C7-014	8.0	0.00	0.00
P-14	C7-014	C7-015	8.0	0.00	0.00
P-15	C7-016	C7-017	8.0	0.00	0.00
P-16	C7-017	C7-018	8.0	0.00	0.00
P-17	C7-018	C7-019	8.0	0.00	35.20
P-18	C7-019	C7-020	8.0	0.00	35.20
P-19	C7-009	C7-020	8.0	0.00	83.15
P-20	C7-020	C7-021	8.0	0.00	118.35
P-21	C7-021	C7-022	8.0	0.00	118.35
P-22	C7-021	C7-023	8.0	0.00	0.00
P-23	C6-001	C7-024	8.0	0.00	-143.61
P-24	C7-024	C7-025	8.0	0.00	-82.81
P-26	C7-026	C7-027	8.0	0.00	-64.01
P-27	C7-026	C6-002	8.0	0.00	-47.30
P-28	C6-002	C6-003	8.0	0.00	-126.55
P-29	C6-003	C7-028	8.0	0.00	39.42
P-31	C7-029	B7-002	8.0	0.00	-84.24
P-32	B7-002	C7-030	8.0	0.00	-84.24
P-33	C7-028	C6-003	8.0	0.00	-30.96
P-34	C6-003	C6-004	8.0	0.00	-196.92
P-35	C6-004	B6-001	8.0	0.00	-44.70
P-36	B6-001	B6-002	8.0	0.00	-1.44
P-37	B6-002	B6-003	8.0	0.00	35.14
P-39	B6-004	B6-005	8.0	0.00	35.14
P-40	B6-005	B6-006	8.0	0.00	0.00
P-41	B6-005	B6-007	8.0	0.00	35.14
P-42	B6-007	B5-001	8.0	0.00	0.00
P-43	B5-001	B5-002	8.0	0.00	0.00
P-44	B5-001	B5-054	8.0	0.00	0.00
P-45	C7-024	C7-031	8.0	0.00	-60.79
P-46	C7-031	C7-032	8.0	0.00	34.43
P-48	C7-033	C7-034	8.0	0.00	35.20
P-49	C7-034	C7-018	8.0	0.00	35.20
P-51	C7-035	C7-031	8.0	0.00	95.22

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-52	C7-035	C7-025	8.0	0.00	-28.50
P-53	C7-034	C7-036	8.0	0.00	0.00
P-55	C6-005	C6-006	8.0	0.00	138.88
P-56	C6-006	C5-001	8.0	0.00	138.88
P-57	C5-001	C5-002	8.0	0.00	255.99
P-58	C5-002	C6-007	8.0	0.00	153.04
P-59	C6-007	C6-008	8.0	0.00	255.99
P-61	C6-007	C6-010	8.0	0.00	-102.95
P-62	C6-010	C5-003	8.0	0.00	-102.95
P-63	C5-003	C5-004	8.0	0.00	0.00
P-64	C5-004	C5-005	8.0	0.00	0.00
P-65	C5-003	C5-002	8.0	0.00	-102.95
P-66	C5-001	C5-006	8.0	0.00	-117.12
P-67	C5-006	C5-007	8.0	0.00	-144.66
P-68	C5-007	C6-005	8.0	0.00	-94.84
P-69	C5-007	C5-008	8.0	0.00	-49.82
P-70	C5-008	C5-009	8.0	0.00	-75.53
P-72	C5-006	C5-010	8.0	0.00	27.54
P-75	C5-010	C5-011	8.0	0.00	27.54
P-76	C5-011	C5-012	8.0	0.00	27.54
P-79	C5-014	C5-015	8.0	0.00	58.00
P-81	C5-016	C5-013	8.0	0.00	-84.82
P-82	C5-016	C5-017	8.0	0.00	142.82
P-83	C5-017	C5-018	8.0	0.00	0.00
P-84	C5-017	C5-019	8.0	0.00	142.82
P-85	C5-020	D5-001	8.0	0.00	0.00
P-86	D6-001	C6-011	8.0	0.00	0.00
P-87	C6-011	C6-012	8.0	0.00	-7.09
P-88	C6-012	C6-013	8.0	0.00	-7.09
P-90	D6-002	D6-003	8.0	0.00	0.00
P-91	D6-003	D6-004	8.0	0.00	0.68
P-92	D6-004	D6-005	8.0	0.00	0.00
P-93	D6-004	D6-006	8.0	0.00	0.68
P-94	D6-006	D6-007	8.0	0.00	0.68
P-95	D6-007	D6-003	8.0	0.00	0.68
P-96	D6-002	D6-008	8.0	0.00	117.82
P-97	D6-008	D6-009	8.0	0.00	0.00
P-98	D6-008	D6-010	8.0	0.00	117.82
P-99	D6-010	D6-011	8.0	0.00	0.00
P-100	D6-010	D6-012	8.0	0.00	117.82
P-101	D6-012	C6-013	8.0	0.00	117.82
P-102	C6-012	C6-014	8.0	0.00	0.00
P-103	D6-012	D6-013	8.0	0.00	0.00
P-105	C6-016	C6-017	8.0	0.00	-744.39
P-106	C6-018	C6-016	8.0	0.00	-1,302.01

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-107	C5-009	C5-021	8.0	0.00	-14.47
P-111	C4-003	C3-001	8.0	0.00	-64.74
P-112	C3-001	C3-002	8.0	0.00	-64.74
P-115	C3-004	C2-001	8.0	0.00	36.51
P-117	C2-002	C2-003	8.0	0.00	0.00
P-118	C2-003	C2-004	8.0	0.00	0.00
P-119	C2-003	C2-005	8.0	0.00	0.00
P-123	C4-007	C5-022	8.0	0.00	193.14
P-124	C5-022	C5-023	8.0	0.00	328.22
P-125	C5-023	C5-024	8.0	0.00	0.00
P-126	C5-023	C6-019	8.0	0.00	-307.18
P-130	B5-004	B5-005	8.0	0.00	0.00
P-131	B5-005	B5-006	8.0	0.00	-16.26
P-133	B4-001	B4-002	8.0	0.00	-16.26
P-134	C4-007	C4-008	8.0	0.00	29.44
P-137	C6-020	C6-021	8.0	0.00	198.39
P-138	C6-021	B6-008	8.0	0.00	124.11
P-139	C6-021	B6-009	8.0	0.00	74.28
P-140	B6-009	C6-022	8.0	0.00	74.28
P-141	C6-022	C6-023	8.0	0.00	0.00
P-142	C6-022	C6-024	8.0	0.00	74.28
P-144	C6-025	C6-004	8.0	0.00	152.22
P-145	C6-024	C6-025	8.0	0.00	74.28
P-146	C5-015	C5-026	8.0	0.00	58.00
P-147	C5-026	C5-016	8.0	0.00	58.00
P-148	C5-026	C5-027	8.0	0.00	0.00
P-150	C5-028	C5-014	8.0	0.00	58.00
P-151	C5-028	C5-029	8.0	0.00	0.00
P-152	C5-013	C5-030	8.0	0.00	58.00
P-153	C5-030	C5-028	8.0	0.00	58.00
P-154	C5-030	C5-031	8.0	0.00	0.00
P-157	C3-005	C3-004	8.0	0.00	36.51
P-158	C3-005	C3-006	8.0	0.00	28.68
P-161	D3-001	D3-002	8.0	0.00	0.00
P-162	D3-002	D3-003	8.0	0.00	0.00
P-163	D3-002	D3-004	8.0	0.00	0.00
P-165	C3-008	D3-005	8.0	0.00	23.42
P-166	D3-005	D3-006	8.0	0.00	0.00
P-167	D3-005	D2-001	8.0	0.00	23.42
P-169	C2-006	C2-007	8.0	0.00	0.00
P-170	C2-007	C2-008	8.0	0.00	12.93
P-171	C2-009	C2-007	8.0	0.00	-49.65
P-174	C2-012	C2-013	12.0	0.00	-68.20
P-175	C2-014	C2-015	8.0	0.00	-20.41
P-176	C1-001	C2-016	8.0	0.00	0.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-184	B3-003	B3-004	6.0	0.00	0.00
P-186	C2-018	C2-019	8.0	0.00	12.14
P-188	C1-002	C1-003	8.0	0.00	-3.03
P-189	B4-007	B4-008	8.0	0.00	0.75
P-190	B4-008	B4-009	8.0	0.00	0.75
P-191	B4-009	B4-010	8.0	0.00	0.15
P-192	B4-010	B4-011	8.0	0.00	0.75
P-193	B4-011	B4-007	8.0	0.00	0.75
P-194	B4-009	B5-008	8.0	0.00	0.60
P-195	B5-008	B5-009	8.0	0.00	0.60
P-196	B5-009	B4-010	8.0	0.00	0.60
P-198	B5-011	B5-012	6.0	0.00	0.00
P-199	B5-011	B5-013	6.0	0.00	0.00
P-201	C6-001	C6-026	6.0	0.00	143.61
P-202	C6-026	C6-027	6.0	0.00	123.25
P-203	C6-027	C6-028	6.0	0.00	143.61
P-204	C6-028	C6-029	6.0	0.00	145.50
P-205	C6-029	C6-030	6.0	0.00	-10.39
P-207	C6-031	C6-032	6.0	0.00	0.00
P-208	C6-032	C6-033	6.0	0.00	-0.12
P-210	C6-030	C6-028	6.0	0.00	-109.77
P-211	C6-028	C6-002	6.0	0.00	-111.66
P-212	C6-029	C6-035	6.0	0.00	155.89
P-213	C6-035	C6-036	6.0	0.00	131.97
P-214	C6-036	C6-037	6.0	0.00	155.89
P-215	C6-037	C6-038	6.0	0.00	155.89
P-216	C6-038	C6-039	6.0	0.00	63.03
P-217	C6-039	C6-040	6.0	0.00	-175.36
P-218	C6-040	C6-041	6.0	0.00	-175.36
P-219	C6-041	C6-042	6.0	0.00	-82.95
P-220	C6-042	C6-031	6.0	0.00	-99.37
P-221	C5-019	C5-032	6.0	0.00	-44.96
P-222	C5-032	C5-033	6.0	0.00	-26.45
P-223	C5-033	C5-034	6.0	0.00	-26.45
P-224	C5-034	C5-035	6.0	0.00	-26.45
P-225	C5-035	C5-036	6.0	0.00	18.51
P-226	C5-036	C5-032	4.0	0.00	18.51
P-227	C5-033	D5-002	6.0	0.00	0.00
P-228	C5-032	C5-037	6.0	0.00	0.00
P-229	C5-037	C5-020	6.0	0.00	0.00
P-230	C5-020	C5-038	4.0	0.00	0.00
P-231	D5-001	D5-003	6.0	0.00	0.00
P-232	C5-035	C5-039	6.0	0.00	-44.96
P-233	C5-039	D5-004	6.0	0.00	0.00
P-234	C5-039	C5-040	6.0	0.00	-44.96

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-235	C5-040	C5-041	6.0	0.00	-44.96
P-236	C5-012	C5-042	8.0	0.00	108.63
P-237	C5-042	C5-013	8.0	0.00	142.82
P-238	C5-042	C5-043	6.0	0.00	-34.19
P-239	C5-012	C5-044	6.0	0.00	-81.08
P-240	C5-044	C5-045	6.0	0.00	-51.42
P-241	C5-045	C5-046	6.0	0.00	-18.80
P-242	C5-046	C5-047	6.0	0.00	-8.27
P-243	C5-047	C5-008	6.0	0.00	-25.72
P-244	C5-047	C5-046	8.0	0.00	17.45
P-245	C5-046	C5-048	8.0	0.00	6.91
P-246	C5-048	C5-049	8.0	0.00	-25.70
P-247	C5-049	C5-050	8.0	0.00	-25.70
P-248	C5-045	C5-048	6.0	0.00	-32.61
P-249	C5-050	C5-051	6.0	0.00	0.00
P-250	C5-050	C5-052	6.0	0.00	-25.70
P-251	C5-052	C5-053	6.0	0.00	32.40
P-252	C5-053	C5-054	6.0	0.00	54.52
P-253	C5-054	C5-055	6.0	0.00	79.15
P-254	C5-055	C5-056	6.0	0.00	47.68
P-255	C5-056	C5-043	6.0	0.00	59.41
P-256	C5-056	C5-057	6.0	0.00	-11.73
P-257	C5-057	C5-058	6.0	0.00	19.74
P-258	C5-058	C5-059	6.0	0.00	0.00
P-259	C5-057	C5-060	6.0	0.00	-31.47
P-260	C5-060	C5-061	6.0	0.00	0.00
P-261	C5-060	C5-055	6.0	0.00	-31.47
P-262	C5-043	C5-062	6.0	0.00	25.22
P-263	C5-062	C5-063	6.0	0.00	0.00
P-264	C5-062	C5-064	6.0	0.00	25.22
P-265	C5-064	C5-065	6.0	0.00	1.28
P-266	C5-058	C5-065	4.0	0.00	19.74
P-267	C5-065	C5-041	4.0	0.00	21.02
P-268	C5-041	C5-064	4.0	0.00	-23.94
P-270	C5-054	C5-066	6.0	0.00	-24.63
P-271	C5-066	D5-005	6.0	0.00	-11.82
P-272	D5-005	D5-006	6.0	0.00	-1.86
P-273	D5-006	D5-007	6.0	0.00	-1.86
P-274	D5-007	D5-008	6.0	0.00	-1.86
P-275	D5-008	D5-009	6.0	0.00	-5.77
P-276	D5-009	D4-001	6.0	0.00	-5.31
P-277	D4-001	C4-009	6.0	0.00	-12.07
P-281	D4-001	D5-010	6.0	0.00	6.76
P-282	D5-010	D5-009	6.0	0.00	0.46
P-283	D5-010	D5-005	6.0	0.00	6.05

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-284	D5-010	C5-067	6.0	0.00	0.25
P-285	C5-067	C5-068	6.0	0.00	5.83
P-286	C5-068	C5-066	6.0	0.00	12.81
P-287	C5-067	C5-069	6.0	0.00	-5.57
P-288	C5-069	C5-068	6.0	0.00	6.98
P-290	D5-008	D5-005	6.0	0.00	3.91
P-291	C4-009	C4-010	6.0	0.00	-12.07
P-292	C4-010	C4-011	6.0	0.00	1.33
P-293	C4-011	C4-012	6.0	0.00	19.72
P-294	C4-012	C5-069	6.0	0.00	12.21
P-295	C4-010	C4-013	6.0	0.00	-13.41
P-296	C4-013	C4-014	6.0	0.00	-5.27
P-297	C4-014	D4-002	6.0	0.00	-3.45
P-298	D4-002	C4-015	6.0	0.00	-6.85
P-299	C4-015	C4-016	6.0	0.00	6.56
P-300	C4-016	C4-017	6.0	0.00	1.65
P-301	C4-017	D4-002	6.0	0.00	-3.39
P-302	C4-014	C4-017	6.0	0.00	-5.05
P-303	C4-016	C4-013	6.0	0.00	4.91
P-304	C4-013	C4-014	6.0	0.00	-3.23
P-305	C4-015	C4-018	6.0	0.00	-13.41
P-306	C4-018	C4-019	6.0	0.00	-21.24
P-307	C4-019	C4-020	6.0	0.00	-23.48
P-308	C4-020	C4-021	6.0	0.00	-20.73
P-309	C4-021	C4-022	6.0	0.00	-12.55
P-310	C4-022	C4-023	6.0	0.00	-12.55
P-311	C4-023	C4-024	6.0	0.00	-12.55
P-312	C4-024	C4-025	6.0	0.00	-12.55
P-313	C4-025	C4-026	6.0	0.00	34.20
P-314	C4-026	C4-027	6.0	0.00	26.02
P-315	C4-027	C4-028	6.0	0.00	23.27
P-316	C4-028	C4-029	6.0	0.00	25.51
P-317	C4-029	C4-030	6.0	0.00	17.54
P-318	C4-030	C4-031	6.0	0.00	17.54
P-319	C4-031	C5-070	6.0	0.00	14.96
P-320	C5-070	C5-053	6.0	0.00	22.12
P-321	C4-021	C4-026	6.0	0.00	-8.18
P-322	C4-027	C4-020	6.0	0.00	2.75
P-323	C4-019	C4-028	6.0	0.00	2.23
P-324	C4-029	C4-032	6.0	0.00	7.96
P-325	C4-032	C4-011	6.0	0.00	15.80
P-326	C4-032	C4-018	6.0	0.00	-7.84
P-327	C4-033	C4-024	6.0	0.00	0.00
P-328	C4-023	C4-034	6.0	0.00	0.00
P-329	C4-024	C4-035	6.0	0.00	0.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-330	C4-035	C4-036	1.0	0.00	0.00
P-331	C4-025	C4-037	6.0	0.00	-46.75
P-332	C4-037	C4-038	6.0	0.00	-46.75
P-333	C4-038	C4-039	6.0	0.00	-46.75
P-334	C4-039	C4-040	6.0	0.00	-32.23
P-335	C4-041	C4-039	6.0	0.00	0.00
P-336	C4-001	C4-042	8.0	0.00	-61.70
P-338	C4-039	C4-042	6.0	0.00	-14.52
P-341	C5-044	C5-071	6.0	0.00	-29.67
P-342	C5-071	C5-072	6.0	0.00	0.00
P-345	C5-071	C5-073	6.0	0.00	-29.67
P-346	C5-073	C5-052	6.0	0.00	58.10
P-347	C5-073	C5-074	12.0	0.00	-87.77
P-348	C5-075	C5-074	12.0	0.00	0.00
P-349	C5-074	C5-076	12.0	0.00	-87.77
P-350	C5-021	C5-077	8.0	0.00	-14.47
P-351	C5-077	C4-001	8.0	0.00	-61.70
P-352	C5-076	C5-077	12.0	0.00	92.93
P-353	C5-077	C4-007	12.0	0.00	140.16
P-354	C5-076	C4-043	12.0	0.00	-180.70
P-355	C4-043	C4-044	12.0	0.00	-180.70
P-356	C4-044	C4-045	12.0	0.00	-180.70
P-357	C4-045	C4-040	12.0	0.00	-180.70
P-358	C4-040	C4-046	12.0	0.00	-212.92
P-359	C4-004	C4-047	8.0	0.00	37.75
P-362	C4-047	C4-048	12.0	0.00	-231.68
P-363	C4-048	C4-049	12.0	0.00	-262.71
P-364	C4-049	B4-012	12.0	0.00	-214.82
P-365	B4-012	B4-013	12.0	0.00	-224.20
P-366	B4-003	B4-014	8.0	0.00	-52.00
P-370	C7-032	C7-037	8.0	0.00	34.43
P-372	C7-022	C7-037	12.0	0.00	-327.48
P-374	C7-038	C7-035	8.0	0.00	66.72
P-375	C7-037	C7-038	12.0	0.00	-256.99
P-377	C7-027	C7-029	12.0	0.00	-154.62
P-379	C7-030	B7-001	12.0	0.00	-388.60
P-380	B7-001	C9-001	12.0	0.00	-471.75
P-381	D6-014	D6-005	12.0	0.00	0.00
P-382	D6-015	D6-006	12.0	0.00	0.00
P-383	C6-020	C6-019	12.0	0.00	-198.39
P-384	C5-009	C6-043	8.0	0.00	-61.06
P-385	C6-043	C6-025	8.0	0.00	77.94
P-386	C6-019	C6-043	12.0	0.00	562.29
P-388	C6-044	C6-005	8.0	0.00	233.72
P-389	C6-043	C6-044	12.0	0.00	423.29

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-391	C7-039	C7-026	8.0	0.00	-111.31
P-392	C7-025	C7-040	8.0	0.00	-111.31
P-393	C7-040	C7-039	8.0	0.00	-39.46
P-394	C7-039	C7-040	12.0	0.00	71.85
P-395	C5-037	C5-078	4.0	0.00	0.00
P-396	C5-019	C6-011	6.0	0.00	187.78
P-397	C6-011	C6-045	6.0	0.00	194.87
P-398	C6-045	C6-015	6.0	0.00	186.81
P-399	C6-013	C6-046	8.0	0.00	110.73
P-400	C6-046	D6-002	8.0	0.00	-252.03
P-401	C6-046	C6-047	6.0	0.00	362.75
P-402	C6-047	C6-015	6.0	0.00	362.75
P-403	C6-047	C6-048	2.0	0.00	0.00
P-404	C6-015	C6-049	8.0	0.00	549.57
P-405	C6-049	C6-016	8.0	0.00	557.62
P-406	C6-045	C6-049	2.0	0.00	8.06
P-407	C6-039	C6-050	6.0	0.00	238.39
P-408	C6-050	C6-051	6.0	0.00	446.89
P-409	C6-051	C6-017	6.0	0.00	446.89
P-410	C6-017	C6-009	6.0	0.00	-297.50
P-411	C6-009	C6-052	6.0	0.00	-413.14
P-412	C6-052	C6-053	6.0	0.00	-117.18
P-413	C6-002	C6-054	8.0	0.00	-32.42
P-414	C6-054	C6-044	8.0	0.00	-189.57
P-415	C6-053	C6-054	6.0	0.00	-157.14
P-416	C6-053	C6-055	8.0	0.00	39.96
P-417	C6-055	C6-056	8.0	0.00	131.22
P-418	C6-056	C6-052	8.0	0.00	295.96
P-419	C6-056	C6-057	8.0	0.00	-164.74
P-420	C6-008	C6-058	8.0	0.00	255.99
P-422	C6-057	C6-058	8.0	0.00	-255.99
P-423	C6-057	C6-055	8.0	0.00	91.25
P-424	C6-009	C6-059	6.0	0.00	115.63
P-425	C6-059	C6-060	6.0	0.00	208.50
P-426	C6-060	C6-061	6.0	0.00	122.65
P-427	C6-061	C6-050	6.0	0.00	208.50
P-428	C6-061	C6-060	6.0	0.00	-85.85
P-429	C6-059	C6-062	6.0	0.00	-92.86
P-430	C6-063	C6-064	6.0	0.00	0.00
P-431	D6-002	D6-016	12.0	0.00	-369.85
P-433	C6-064	D6-016	6.0	0.00	-75.98
P-434	D6-016	D6-017	12.0	0.00	-445.83
P-436	D6-017	C6-065	6.0	0.00	0.00
P-437	C6-066	C6-067	6.0	0.00	0.00
P-438	C6-067	C6-064	6.0	0.00	-75.98

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-439	C6-067	C6-041	8.0	0.00	75.98
P-440	C6-041	C6-042	4.0	0.00	-16.43
P-441	C6-040	C6-068	4.0	0.00	0.00
P-442	C6-036	C6-035	4.0	0.00	-23.93
P-443	C6-037	C6-069	4.0	0.00	0.00
P-444	C6-027	C6-070	4.0	0.00	-20.35
P-445	C6-070	C6-071	4.0	0.00	0.00
P-446	C6-070	C6-026	4.0	0.00	-20.35
P-447	C6-033	C6-073	6.0	0.00	0.00
P-448	C6-073	C6-034	6.0	0.00	0.00
P-449	C6-072	C6-073	4.0	0.00	0.00
P-451	C7-038	C7-041	12.0	0.00	-244.06
P-452	C7-041	C7-027	12.0	0.00	-394.97
P-453	C7-041	C7-042	12.0	0.00	150.91
P-455	C7-043	C7-038	8.0	0.00	79.65
P-456	C7-042	C7-043	12.0	0.00	149.21
P-457	C7-042	C7-044	12.0	0.00	1.70
P-458	C7-033	C7-045	8.0	0.00	-71.26
P-459	C7-045	C7-043	8.0	0.00	-69.56
P-460	C7-044	C7-045	2.0	0.00	1.70
P-461	C7-036	C7-046	8.0	0.00	0.00
P-462	B7-001	C7-047	8.0	0.00	83.15
P-464	C7-047	C7-048	4.0	0.00	0.00
P-465	C7-047	C7-049	8.0	0.00	83.15
P-466	C7-049	C7-001	8.0	0.00	83.15
P-467	C7-049	C7-050	4.0	0.00	0.00
P-469	C5-010	C5-079	8.0	0.00	0.00
P-470	C5-079	C5-080	8.0	0.00	0.68
P-471	C5-080	C5-079	8.0	0.00	0.68
P-472	C5-025	B5-014	8.0	0.00	32.89
P-474	C4-008	C4-050	2.0	0.00	-1.95
P-475	C4-050	C4-051	2.0	0.00	2.94
P-476	C4-051	C4-052	2.0	0.00	1.44
P-477	C4-052	B4-015	2.0	0.00	1.44
P-478	C4-053	C4-052	2.0	0.00	0.00
P-479	B5-009	B5-015	8.0	0.00	0.00
P-480	B5-010	B5-016	6.0	0.00	-15.04
P-481	B5-016	B5-015	6.0	0.00	-31.30
P-482	B5-015	B5-017	6.0	0.00	-31.30
P-484	B5-018	B5-011	6.0	0.00	0.00
P-485	B5-017	B5-018	6.0	0.00	24.38
P-488	B5-020	B5-003	8.0	0.00	-79.40
P-489	B5-020	B5-021	8.0	0.00	135.08
P-492	B5-021	B5-022	8.0	0.00	135.08
P-493	B5-021	B5-023	4.0	0.00	0.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-494	B5-020	B5-024	6.0	0.00	-55.68
P-497	B4-002	B4-016	6.0	0.00	-16.26
P-498	B4-016	A4-002	6.0	0.00	0.00
P-499	A4-002	A4-003	6.0	0.00	0.00
P-500	A4-003	A4-004	6.0	0.00	0.00
P-501	A4-003	A4-005	6.0	0.00	0.00
P-502	A4-006	A4-007	6.0	0.00	0.00
P-503	A4-007	A4-008	6.0	0.00	0.00
P-504	A4-008	A4-009	6.0	0.00	0.00
P-505	A4-009	A4-010	6.0	0.00	0.00
P-506	A4-011	A4-009	6.0	0.00	0.00
P-507	A4-008	A4-002	6.0	0.00	0.00
P-509	B5-016	B4-017	6.0	0.00	16.26
P-511	B4-016	B4-017	6.0	0.00	-16.26
P-512	B4-017	B4-018	6.0	0.00	0.00
P-513	B5-017	B5-025	6.0	0.00	-55.68
P-514	B5-025	B5-026	6.0	0.00	-55.68
P-515	B5-026	B5-027	6.0	0.00	-40.77
P-516	B5-007	B5-027	6.0	0.00	25.89
P-517	B5-027	B5-028	6.0	0.00	-14.88
P-518	B5-028	B5-029	6.0	0.00	-14.88
P-519	B5-029	B5-030	6.0	0.00	-22.79
P-520	B5-030	B5-031	6.0	0.00	-21.35
P-521	B5-031	B4-019	6.0	0.00	-9.47
P-522	B4-019	B4-020	6.0	0.00	5.21
P-523	B4-020	B5-031	6.0	0.00	11.88
P-525	B4-021	B4-022	6.0	0.00	-3.43
P-526	B4-022	B4-023	6.0	0.00	-6.67
P-527	B4-023	B4-019	6.0	0.00	14.68
P-529	B4-024	B4-025	6.0	0.00	1.33
P-530	B4-025	B4-024	6.0	0.00	-1.91
P-531	B4-025	B4-021	6.0	0.00	3.24
P-533	B5-014	B5-032	8.0	0.00	23.86
P-534	B5-032	B5-007	8.0	0.00	31.77
P-535	B5-032	B5-029	6.0	0.00	-7.91
P-536	B5-014	B5-033	6.0	0.00	9.03
P-537	B5-033	B5-026	6.0	0.00	14.91
P-538	B5-033	B5-007	6.0	0.00	-5.88
P-539	B4-023	C4-054	6.0	0.00	-21.35
P-540	C4-054	C4-055	6.0	0.00	4.89
P-541	C4-055	C4-056	6.0	0.00	4.89
P-542	C4-056	C4-057	6.0	0.00	4.89
P-543	C4-057	C4-050	6.0	0.00	4.89
P-544	C4-006	C4-058	8.0	0.00	108.66
P-545	C4-058	C4-007	8.0	0.00	82.42

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-546	C4-058	C4-059	6.0	0.00	26.24
P-547	B6-003	B6-010	8.0	0.00	28.78
P-548	B6-010	B6-004	8.0	0.00	35.14
P-549	B6-003	B6-010	6.0	0.00	6.36
P-551	B6-011	B6-012	6.0	0.00	-8.61
P-552	B6-011	B6-013	8.0	0.00	-27.97
P-553	B6-013	B6-014	8.0	0.00	-36.58
P-554	B6-014	B6-015	8.0	0.00	-27.36
P-555	B6-015	B6-016	8.0	0.00	19.69
P-556	B6-016	B6-017	8.0	0.00	19.69
P-557	B6-017	B6-018	8.0	0.00	19.69
P-558	B6-018	B6-019	8.0	0.00	43.27
P-559	B6-019	B6-020	8.0	0.00	43.27
P-560	B6-020	B6-021	8.0	0.00	43.27
P-561	B6-021	B6-001	8.0	0.00	43.27
P-562	B6-018	B6-022	8.0	0.00	-23.58
P-563	B6-022	B6-023	8.0	0.00	-70.63
P-564	B6-022	B6-015	8.0	0.00	47.05
P-565	B6-024	B6-019	8.0	0.00	0.00
P-566	B6-025	B6-020	8.0	0.00	0.00
P-567	B6-026	B6-021	8.0	0.00	0.00
P-568	B6-027	B6-014	8.0	0.00	9.22
P-569	B6-013	B6-028	6.0	0.00	8.61
P-572	B6-029	B6-008	6.0	0.00	-124.11
P-573	B6-029	B6-030	6.0	0.00	32.32
P-574	B6-030	B6-031	6.0	0.00	32.32
P-575	B6-031	B6-032	6.0	0.00	22.84
P-576	B6-032	B6-033	6.0	0.00	9.61
P-577	B6-033	B6-034	6.0	0.00	19.09
P-578	B6-034	B6-035	6.0	0.00	21.35
P-579	B6-035	B6-036	6.0	0.00	33.30
P-580	B6-036	B5-034	6.0	0.00	44.26
P-581	B5-034	B5-035	6.0	0.00	44.26
P-582	B5-035	B5-003	6.0	0.00	44.26
P-583	B5-003	B5-036	6.0	0.00	-35.14
P-584	B5-036	B6-037	6.0	0.00	-35.14
P-585	B6-037	B6-038	6.0	0.00	0.00
P-586	B6-037	B6-007	8.0	0.00	-35.14
P-587	B5-037	B5-036	6.0	0.00	0.00
P-588	B5-035	B5-038	4.0	0.00	0.00
P-589	B6-036	B5-039	6.0	0.00	-10.97
P-590	B5-039	B6-032	6.0	0.00	-13.23
P-591	B5-039	B6-034	6.0	0.00	2.26
P-592	B6-035	B6-039	6.0	0.00	-11.94
P-593	B6-039	B6-023	6.0	0.00	-21.16

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-594	B6-023	B6-029	6.0	0.00	-91.79
P-595	B6-031	B6-033	6.0	0.00	9.48
P-596	B6-039	B6-027	6.0	0.00	9.22
P-597	B5-005	B5-024	6.0	0.00	16.26
P-598	B5-006	B5-040	8.0	0.00	-16.26
P-599	B5-040	B4-001	8.0	0.00	-16.26
P-600	B5-040	B5-041	6.0	0.00	0.00
P-601	B5-041	A5-001	6.0	0.00	0.00
P-602	A5-001	A5-002	6.0	0.00	0.00
P-603	A5-002	A5-003	6.0	0.00	0.00
P-605	C4-059	C4-054	6.0	0.00	26.24
P-609	B4-026	C4-061	6.0	0.00	0.00
P-611	B4-028	B4-029	6.0	0.00	0.00
P-612	B4-030	B4-029	8.0	0.00	0.00
P-613	B4-028	B4-031	6.0	0.00	0.22
P-614	B4-031	B4-032	6.0	0.00	0.22
P-615	B4-032	C4-062	6.0	0.00	0.42
P-616	C4-062	B4-033	6.0	0.00	0.42
P-617	B4-033	B4-034	6.0	0.00	0.22
P-618	B4-034	B4-035	6.0	0.00	0.47
P-619	B4-035	B4-036	6.0	0.00	0.00
P-620	B4-035	B4-037	6.0	0.00	0.47
P-621	B4-037	B4-038	6.0	0.00	0.00
P-622	B4-038	B4-039	6.0	0.00	0.00
P-623	B4-038	B4-040	6.0	0.00	0.00
P-624	B4-027	B4-041	6.0	0.00	0.00
P-626	B4-037	B4-041	6.0	0.00	0.47
P-627	B4-041	B4-042	6.0	0.00	0.47
P-628	B4-042	B4-028	6.0	0.00	0.22
P-629	B4-042	B4-034	6.0	0.00	0.25
P-630	B4-033	B4-032	6.0	0.00	0.20
P-631	C4-062	C4-063	6.0	0.00	0.00
P-632	C4-063	C4-064	6.0	0.00	25.71
P-633	C4-064	C4-065	6.0	0.00	37.24
P-634	C4-065	C4-066	6.0	0.00	37.24
P-635	C4-066	C4-067	6.0	0.00	43.35
P-636	C4-005	C4-068	8.0	0.00	45.98
P-637	C4-068	C4-061	8.0	0.00	108.66
P-638	C4-067	C4-068	6.0	0.00	62.68
P-639	C4-065	C4-069	6.0	0.00	0.00
P-640	C4-066	C4-070	6.0	0.00	-6.12
P-641	C4-070	C4-067	6.0	0.00	19.33
P-642	C4-070	C4-071	6.0	0.00	-25.44
P-643	C4-071	C4-072	6.0	0.00	-27.98
P-644	C4-072	C4-073	6.0	0.00	-27.98

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-647	C4-072	C4-074	4.0	0.00	0.00
P-648	C4-063	C4-075	6.0	0.00	-25.71
P-649	C4-075	C4-049	6.0	0.00	3.21
P-650	C4-049	C4-076	6.0	0.00	-44.68
P-651	C4-076	B4-013	6.0	0.00	-35.30
P-652	B4-013	B4-043	6.0	0.00	28.91
P-653	B4-043	C4-075	6.0	0.00	28.91
P-654	B4-043	B4-044	6.0	0.00	0.00
P-655	B4-013	B4-003	6.0	0.00	-45.30
P-656	B4-003	B4-045	6.0	0.00	6.70
P-657	B4-045	B4-046	6.0	0.00	0.00
P-658	B4-014	B4-047	8.0	0.00	50.02
P-660	B4-045	B4-047	6.0	0.00	6.70
P-662	C1-004	C1-005	6.0	0.00	-10.00
P-663	C1-005	C1-006	6.0	0.00	-10.00
P-664	C1-006	C1-007	6.0	0.00	-5.26
P-665	C1-007	C1-008	6.0	0.00	0.00
P-666	C1-007	C1-009	4.0	0.00	-2.44
P-668	C1-010	C1-007	4.0	0.00	2.82
P-669	C1-011	C1-009	4.0	0.00	0.00
P-671	C1-009	C1-013	4.0	0.00	-2.44
P-672	C1-013	C1-010	4.0	0.00	-2.44
P-673	C1-012	C1-013	4.0	0.00	0.00
P-674	C1-010	C1-014	6.0	0.00	-5.26
P-675	C1-014	C1-015	6.0	0.00	-5.26
P-676	C1-015	C1-016	6.0	0.00	0.00
P-677	C1-015	C1-017	6.0	0.00	-5.26
P-678	C1-017	C2-014	6.0	0.00	-20.41
P-679	C1-017	C1-018	6.0	0.00	15.15
P-680	C1-018	C1-006	6.0	0.00	4.74
P-681	C1-019	C1-020	4.0	0.00	0.00
P-682	C1-020	C1-021	4.0	0.00	0.00
P-683	C1-020	C1-022	4.0	0.00	0.00
P-684	C1-022	C1-023	4.0	0.00	0.00
P-685	C1-022	C1-005	4.0	0.00	0.00
P-686	C1-018	C1-024	6.0	0.00	10.41
P-687	C1-024	C1-025	6.0	0.00	7.26
P-688	C1-025	C1-026	6.0	0.00	7.26
P-689	C1-026	C1-002	6.0	0.00	7.26
P-690	C1-002	C2-022	6.0	0.00	10.29
P-692	C2-023	C2-020	6.0	0.00	10.55
P-693	C2-020	C2-024	6.0	0.00	43.43
P-694	C2-024	C2-025	6.0	0.00	43.43
P-696	C2-026	C2-027	6.0	0.00	-21.52
P-697	C2-027	C2-028	6.0	0.00	-11.78

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-698	C2-028	C2-029	6.0	0.00	-127.42
P-699	C2-029	C2-030	6.0	0.00	-120.65
P-700	C2-030	C2-031	6.0	0.00	-117.41
P-701	C2-031	C2-032	6.0	0.00	-72.73
P-702	C2-032	C2-033	6.0	0.00	0.00
P-703	C2-033	C2-034	4.0	0.00	0.00
P-704	C2-034	C2-035	2.0	0.00	0.00
P-705	C2-032	C2-036	6.0	0.00	-25.54
P-707	C2-037	C2-038	6.0	0.00	-47.19
P-708	C2-038	C2-039	6.0	0.00	0.00
P-710	C3-011	C3-012	6.0	0.00	15.63
P-711	C3-012	C3-013	6.0	0.00	-16.65
P-712	C3-013	C3-014	6.0	0.00	-17.98
P-713	C3-014	C3-015	6.0	0.00	-36.05
P-715	C3-016	C3-009	8.0	0.00	-32.60
P-717	C2-001	C2-041	8.0	0.00	-39.52
P-718	C2-041	C2-002	8.0	0.00	0.00
P-722	C3-108	C2-042	6.0	0.00	49.92
P-723	C2-042	C2-043	6.0	0.00	49.92
P-724	C2-043	C2-044	6.0	0.00	50.77
P-725	C2-044	C2-045	6.0	0.00	84.11
P-727	C2-046	C2-047	6.0	0.00	72.29
P-728	C2-047	C2-048	6.0	0.00	-11.20
P-729	C2-048	C2-049	6.0	0.00	-62.90
P-730	C2-049	C2-050	6.0	0.00	6.60
P-731	C2-050	C2-051	6.0	0.00	14.23
P-732	C2-051	C2-052	6.0	0.00	-8.45
P-733	C2-052	C2-053	6.0	0.00	-7.35
P-734	C2-053	C2-046	6.0	0.00	-7.35
P-735	C2-051	C2-054	6.0	0.00	22.68
P-736	C2-054	C2-055	6.0	0.00	22.68
P-737	C2-055	C2-025	6.0	0.00	52.00
P-738	C2-055	C2-056	6.0	0.00	-29.32
P-739	C2-056	C2-018	6.0	0.00	-38.09
P-741	C2-057	C2-058	6.0	0.00	-59.98
P-745	C2-044	C2-059	6.0	0.00	120.85
P-746	C2-059	C2-043	6.0	0.00	-82.19
P-749	C2-060	C2-061	6.0	0.00	-58.01
P-750	C2-061	C2-048	6.0	0.00	-51.70
P-751	C2-050	C2-062	2.0	0.00	0.00
P-752	C2-062	C2-063	2.0	0.00	0.00
P-754	C2-052	C2-056	2.0	0.00	-1.10
P-755	C2-025	C2-064	6.0	0.00	152.19
P-756	C2-064	C2-026	6.0	0.00	159.87
P-757	C2-056	C2-064	2.0	0.00	7.68

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-759	C2-065	C2-026	2.0	0.00	0.00
P-760	C2-018	C2-066	6.0	0.00	-50.24
P-761	C2-066	C2-057	6.0	0.00	-59.98
P-762	C2-027	C2-066	2.0	0.00	-9.74
P-763	C2-029	C2-067	2.0	0.00	-6.78
P-764	C2-067	C2-068	2.0	0.00	-2.16
P-765	C2-068	C2-030	2.0	0.00	3.23
P-766	C2-067	C2-069	2.0	0.00	-4.62
P-767	C2-068	C2-070	2.0	0.00	-5.39
P-768	C2-061	C2-071	2.0	0.00	-6.31
P-769	C2-071	C2-072	2.0	0.00	1.37
P-770	C2-072	C2-073	2.0	0.00	-1.90
P-771	C2-072	C2-074	2.0	0.00	3.27
P-772	C2-075	C2-076	6.0	0.00	0.00
P-773	C2-076	C2-073	6.0	0.00	-47.75
P-774	C2-073	C2-077	6.0	0.00	-49.65
P-775	C2-077	C2-009	6.0	0.00	-49.65
P-776	C2-076	C2-015	6.0	0.00	47.75
P-777	C2-015	C2-016	6.0	0.00	27.34
P-778	C2-016	C2-078	6.0	0.00	27.34
P-779	C2-078	C2-079	6.0	0.00	27.34
P-780	C2-079	C2-080	6.0	0.00	27.34
P-781	C2-080	C2-074	6.0	0.00	4.36
P-782	C2-074	C2-050	6.0	0.00	7.63
P-783	C2-080	C2-020	6.0	0.00	22.98
P-784	C2-024	C2-081	6.0	0.00	0.00
P-785	C2-025	C2-082	6.0	0.00	-56.77
P-786	C2-082	C2-019	6.0	0.00	-31.46
P-787	C2-019	C2-083	6.0	0.00	-19.32
P-788	C2-083	C2-084	6.0	0.00	-54.66
P-789	C2-084	C2-069	6.0	0.00	-54.66
P-790	C2-069	C2-070	6.0	0.00	-59.28
P-791	C2-070	C2-085	6.0	0.00	-64.67
P-792	C2-085	C2-086	6.0	0.00	-24.22
P-793	C2-086	B2-001	6.0	0.00	-24.22
P-794	B2-001	B2-002	6.0	0.00	-24.22
P-795	B2-002	B2-003	6.0	0.00	-24.22
P-796	B2-004	B2-002	6.0	0.00	0.00
P-797	B2-003	B3-002	6.0	0.00	-24.22
P-798	B3-002	B3-006	6.0	0.00	-15.74
P-799	B3-006	B3-007	6.0	0.00	-11.23
P-800	B3-007	A3-001	6.0	0.00	-10.49
P-801	A3-001	A4-001	6.0	0.00	-14.33
P-802	B3-007	B3-008	6.0	0.00	-0.74
P-805	B3-009	B3-010	6.0	0.00	-1.41

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-806	B3-010	B3-011	6.0	0.00	11.24
P-807	B3-008	B3-012	6.0	0.00	4.50
P-808	B3-012	B3-006	6.0	0.00	4.50
P-810	B3-008	B3-013	6.0	0.00	-5.24
P-812	B3-013	B3-014	6.0	0.00	-3.84
P-813	B3-014	B3-015	6.0	0.00	-1.31
P-814	B3-015	B4-074	6.0	0.00	-0.25
P-815	B4-074	B3-016	6.0	0.00	-1.31
P-816	B3-016	B3-014	6.0	0.00	2.53
P-817	B3-015	B4-074	6.0	0.00	-1.06
P-818	B3-016	A3-001	6.0	0.00	-3.84
P-819	B3-013	B3-009	2.0	0.00	-0.05
P-820	B3-011	B3-017	6.0	0.00	6.81
P-821	B3-017	B3-018	6.0	0.00	0.00
P-822	B3-017	B3-019	6.0	0.00	6.81
P-823	B3-019	B3-020	6.0	0.00	2.90
P-824	B3-021	B3-022	6.0	0.00	-3.60
P-826	B3-023	B3-024	6.0	0.00	-8.95
P-827	B3-024	B3-025	6.0	0.00	1.28
P-828	B3-025	B3-026	6.0	0.00	-2.05
P-829	B3-025	B3-027	6.0	0.00	-4.46
P-830	B3-027	B3-028	6.0	0.00	-7.49
P-831	B3-027	B3-024	6.0	0.00	3.03
P-832	B4-004	B3-029	6.0	0.00	23.73
P-834	B3-024	B3-029	6.0	0.00	-7.20
P-836	B3-030	B3-001	6.0	0.00	11.60
P-837	B3-030	B3-031	6.0	0.00	-3.06
P-838	B3-031	B3-032	6.0	0.00	8.94
P-839	B3-031	B3-023	6.0	0.00	-12.00
P-840	B4-048	B4-049	2.0	0.00	0.00
P-842	B3-028	B3-033	6.0	0.00	11.17
P-843	B3-033	B3-034	6.0	0.00	9.12
P-844	B3-034	B3-021	6.0	0.00	10.26
P-845	B3-010	B3-021	6.0	0.00	-13.86
P-846	B3-026	B3-033	6.0	0.00	-2.05
P-847	B3-034	B3-022	6.0	0.00	-1.14
P-848	B3-010	B3-032	6.0	0.00	1.22
P-849	B3-032	B3-035	6.0	0.00	10.16
P-850	B3-035	B3-001	6.0	0.00	-4.77
P-852	B3-036	B3-037	6.0	0.00	-7.98
P-853	B3-029	B3-038	6.0	0.00	16.53
P-854	B3-038	B3-030	8.0	0.00	8.55
P-855	B3-037	B3-038	6.0	0.00	-7.98
P-857	B3-039	B3-011	6.0	0.00	-4.43
P-858	B3-019	B3-040	6.0	0.00	3.91

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-859	B3-040	B3-020	6.0	0.00	-2.90
P-860	B3-040	B3-041	6.0	0.00	6.81
P-861	B3-041	B3-039	6.0	0.00	-10.36
P-863	B3-041	B3-042	6.0	0.00	17.17
P-864	B3-042	B3-005	6.0	0.00	11.80
P-865	B3-042	B3-043	6.0	0.00	5.36
P-866	B3-043	B3-044	6.0	0.00	-5.01
P-867	B3-044	B3-045	6.0	0.00	-3.31
P-868	B3-045	B3-005	6.0	0.00	-3.31
P-869	B3-043	B3-046	6.0	0.00	10.37
P-870	B3-046	C3-017	6.0	0.00	-7.15
P-871	C3-017	C3-018	6.0	0.00	-7.02
P-872	C3-018	B3-047	6.0	0.00	-7.02
P-873	B3-047	B3-048	6.0	0.00	-7.02
P-874	B3-048	B3-049	6.0	0.00	1.69
P-875	B3-049	B3-050	6.0	0.00	1.69
P-876	B3-050	B3-044	6.0	0.00	1.69
P-877	B3-048	B3-051	6.0	0.00	-8.71
P-879	B3-052	B3-053	6.0	0.00	0.00
P-880	B3-052	B3-054	6.0	0.00	-23.82
P-882	C3-017	C3-019	6.0	0.00	-0.13
P-883	C3-019	C3-020	6.0	0.00	-16.07
P-884	C3-020	C3-021	6.0	0.00	10.11
P-885	C3-021	C3-022	6.0	0.00	2.86
P-886	C3-022	C3-023	6.0	0.00	2.48
P-887	C3-023	C3-024	6.0	0.00	2.34
P-888	C3-024	C3-025	6.0	0.00	-15.11
P-889	C3-025	C3-026	6.0	0.00	-14.70
P-891	B3-056	B3-051	6.0	0.00	-14.66
P-892	B3-057	B3-058	6.0	0.00	0.00
P-893	B3-058	C3-027	6.0	0.00	0.00
P-894	C3-027	C3-028	6.0	0.00	0.00
P-895	C3-027	C3-021	6.0	0.00	0.00
P-897	C3-029	C3-030	6.0	0.00	0.00
P-898	C3-029	C3-031	6.0	0.00	7.26
P-899	C3-031	C3-032	6.0	0.00	-9.37
P-900	C3-032	C3-033	6.0	0.00	-9.37
P-901	C3-033	C3-034	6.0	0.00	-10.16
P-902	C3-034	C3-002	6.0	0.00	59.39
P-903	C3-034	C3-035	6.0	0.00	43.35
P-904	C3-002	C3-036	8.0	0.00	-32.48
P-905	C3-036	C3-003	8.0	0.00	0.00
P-906	C3-035	C3-036	6.0	0.00	32.48
P-907	C3-035	C3-037	6.0	0.00	10.87
P-908	C3-037	C4-004	6.0	0.00	37.75

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-910	C3-038	C3-037	6.0	0.00	17.93
P-911	C3-037	C3-039	6.0	0.00	-8.95
P-912	C3-039	C3-040	6.0	0.00	-8.95
P-913	C3-040	C3-041	6.0	0.00	-8.95
P-915	C3-042	C3-043	6.0	0.00	-17.18
P-916	C3-043	C3-044	6.0	0.00	-17.44
P-919	C3-045	C3-046	6.0	0.00	-3.73
P-920	C3-046	C3-047	6.0	0.00	5.65
P-921	C3-047	C3-045	6.0	0.00	-3.73
P-922	C3-046	B4-012	6.0	0.00	-9.37
P-923	C4-076	C3-047	6.0	0.00	-9.37
P-924	C3-041	C4-077	2.0	0.00	0.00
P-925	C4-073	C4-078	6.0	0.00	-20.19
P-926	C4-078	C4-048	6.0	0.00	-19.75
P-927	C3-042	C4-078	2.0	0.00	0.44
P-928	C3-043	C4-048	2.0	0.00	0.26
P-929	C4-079	C3-040	2.0	0.00	0.00
P-930	C3-048	C3-039	2.0	0.00	0.00
P-932	C4-047	C4-080	8.0	0.00	43.44
P-933	C4-080	C4-005	8.0	0.00	45.98
P-934	C4-080	C4-071	2.0	0.00	-2.54
P-935	B3-054	B3-036	6.0	0.00	-14.43
P-936	B4-050	B4-006	6.0	0.00	0.00
P-938	B4-052	B4-005	8.0	0.00	32.98
P-939	B4-051	B4-052	6.0	0.00	0.00
P-941	B4-053	B4-052	8.0	0.00	32.98
P-942	B4-053	B4-054	6.0	0.00	-4.64
P-943	B4-054	B4-055	6.0	0.00	0.00
P-944	B4-054	B4-056	6.0	0.00	-4.64
P-945	B4-004	B4-057	8.0	0.00	32.98
P-946	B4-057	B4-053	8.0	0.00	28.34
P-947	B4-056	B4-057	6.0	0.00	-4.64
P-949	C2-087	C2-088	6.0	0.00	10.03
P-950	C2-088	B2-005	6.0	0.00	10.03
P-952	B2-005	C1-027	6.0	0.00	10.03
P-953	C1-027	C1-028	6.0	0.00	2.33
P-955	C1-029	C1-030	6.0	0.00	2.33
P-957	C1-031	C1-032	6.0	0.00	5.29
P-958	C1-032	C1-033	6.0	0.00	5.48
P-959	C1-033	C1-003	6.0	0.00	5.48
P-960	C1-003	C1-027	6.0	0.00	-7.70
P-961	C1-003	C2-089	6.0	0.00	10.15
P-962	C2-089	C2-090	6.0	0.00	10.15
P-963	C2-020	C2-091	8.0	0.00	-9.89
P-964	C2-091	C2-021	8.0	0.00	0.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-965	C2-090	C2-091	6.0	0.00	9.89
P-966	C1-034	C1-031	6.0	0.00	-0.19
P-968	C1-030	C1-035	6.0	0.00	-3.14
P-969	C1-035	C1-024	6.0	0.00	-3.04
P-970	C1-024	C1-035	2.0	0.00	0.10
P-971	C1-036	C1-025	2.0	0.00	0.00
P-972	C1-025	C1-037	2.0	0.00	0.00
P-973	C1-038	C1-002	2.0	0.00	0.00
P-976	C1-034	C1-032	2.0	0.00	0.19
P-977	C1-028	C1-039	6.0	0.00	2.33
P-978	C1-039	C1-029	6.0	0.00	2.21
P-980	C1-028	C1-040	2.0	0.00	0.00
P-981	C2-092	C2-078	2.0	0.00	0.00
P-982	C2-010	C2-093	8.0	0.00	-33.85
P-983	C2-093	C2-011	8.0	0.00	-33.85
P-984	C2-093	D2-003	2.0	0.00	0.00
P-985	C2-094	C2-093	6.0	0.00	0.00
P-986	D2-001	D2-005	8.0	0.00	23.42
P-987	D2-005	D2-002	8.0	0.00	23.42
P-989	D2-004	D2-006	6.0	0.00	0.00
P-990	D2-006	D2-005	6.0	0.00	0.00
P-991	D2-006	D2-007	6.0	0.00	0.00
P-992	D2-002	C2-095	6.0	0.00	23.42
P-993	C2-095	C2-096	6.0	0.00	23.42
P-994	C2-096	C2-011	6.0	0.00	23.42
P-995	C2-011	C2-097	6.0	0.00	-10.43
P-996	C2-097	C2-098	6.0	0.00	0.00
P-998	C2-013	C2-001	6.0	0.00	-51.24
P-999	C2-001	C2-008	6.0	0.00	24.79
P-1000	C2-008	C2-012	6.0	0.00	-39.47
P-1001	C2-007	C2-099	8.0	0.00	-62.58
P-1002	C2-099	C2-010	8.0	0.00	-33.85
P-1004	C2-008	C2-071	6.0	0.00	77.19
P-1006	C2-049	C2-071	6.0	0.00	-69.50
P-1007	C2-087	C2-082	6.0	0.00	25.31
P-1008	C2-083	C2-100	6.0	0.00	25.25
P-1009	C2-100	C2-087	6.0	0.00	35.34
P-1010	C2-100	C2-101	6.0	0.00	-10.08
P-1012	B2-007	B2-008	6.0	0.00	-2.67
P-1017	C2-102	C2-083	6.0	0.00	-10.08
P-1018	C2-017	C2-085	6.0	0.00	40.44
P-1019	C2-086	C2-103	6.0	0.00	0.00
P-1020	C2-017	C2-031	6.0	0.00	44.69
P-1021	C3-014	C3-049	6.0	0.00	-0.08
P-1022	C3-049	C3-019	6.0	0.00	-15.94

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1023	C3-020	C3-050	6.0	0.00	-26.18
P-1024	C3-050	C3-051	6.0	0.00	-17.86
P-1025	C3-051	C3-052	6.0	0.00	-26.18
P-1026	C3-052	C3-053	6.0	0.00	0.00
P-1027	C3-051	C3-050	6.0	0.00	8.32
P-1028	C3-009	C3-049	6.0	0.00	-15.08
P-1029	C3-009	B3-059	6.0	0.00	-17.52
P-1030	B3-059	B3-060	6.0	0.00	-4.03
P-1032	B3-061	B3-062	6.0	0.00	-4.03
P-1033	B3-062	B3-063	6.0	0.00	13.48
P-1034	B3-063	B3-059	6.0	0.00	13.48
P-1035	B3-062	B3-046	6.0	0.00	-17.52
P-1036	B3-063	C3-054	6.0	0.00	0.00
P-1037	B3-060	B3-065	6.0	0.00	-4.03
P-1038	B3-065	B3-061	6.0	0.00	-4.03
P-1041	B3-066	B3-003	8.0	0.00	-6.02
P-1042	B3-005	B3-067	8.0	0.00	8.49
P-1043	B3-067	B3-003	8.0	0.00	6.02
P-1044	B3-066	B3-067	6.0	0.00	-2.47
P-1045	C3-034	C3-055	12.0	0.00	-112.91
P-1046	C3-055	C3-052	12.0	0.00	-171.50
P-1047	C3-052	C3-056	12.0	0.00	-197.68
P-1048	C3-056	C3-057	12.0	0.00	-197.68
P-1049	C3-057	C3-058	12.0	0.00	-233.73
P-1050	C3-058	C3-059	12.0	0.00	-233.73
P-1051	C3-059	C3-060	12.0	0.00	475.00
P-1052	C3-060	C3-061	12.0	0.00	475.00
P-1053	C3-061	C3-062	12.0	0.00	72.11
P-1054	C3-062	C3-011	12.0	0.00	72.11
P-1058	C2-038	C2-040	6.0	0.00	-47.19
P-1059	C2-040	C3-011	6.0	0.00	-56.49
P-1060	C2-017	C3-063	8.0	0.00	-85.13
P-1062	C3-012	C3-063	6.0	0.00	32.27
P-1063	C3-061	C3-064	12.0	0.00	402.89
P-1064	C2-040	C2-139	6.0	0.00	9.30
P-1065	C2-139	C3-108	6.0	0.00	89.44
P-1066	C3-064	C2-139	12.0	0.00	402.89
P-1067	C2-139	C2-036	12.0	0.00	322.75
P-1068	C2-058	C2-104	6.0	0.00	-29.98
P-1069	C2-104	C2-043	6.0	0.00	83.04
P-1070	C2-036	C2-104	12.0	0.00	297.21
P-1071	C2-058	C2-105	6.0	0.00	-30.00
P-1072	C2-105	C2-044	6.0	0.00	154.19
P-1073	C2-104	C2-105	12.0	0.00	184.19
P-1074	C2-105	C2-106	12.0	0.00	0.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1075	C2-106	C2-107	12.0	0.00	0.00
P-1076	C4-046	C4-081	12.0	0.00	-214.51
P-1077	C4-081	C4-047	12.0	0.00	-226.00
P-1078	C4-003	C4-081	8.0	0.00	64.74
P-1079	C4-081	C4-002	8.0	0.00	76.23
P-1080	C4-031	C4-011	6.0	0.00	2.58
P-1081	C4-012	C5-081	6.0	0.00	7.50
P-1082	C5-070	C5-081	6.0	0.00	-7.16
P-1083	C5-081	C5-069	6.0	0.00	0.34
P-1084	C2-097	C2-108	6.0	0.00	-10.43
P-1085	C2-108	C2-013	6.0	0.00	16.96
P-1086	C2-108	C3-065	6.0	0.00	-27.39
P-1087	C3-065	C3-066	6.0	0.00	-27.39
P-1088	C3-066	C3-006	6.0	0.00	-22.34
P-1089	C3-006	C3-067	6.0	0.00	-22.13
P-1090	C3-067	C3-068	6.0	0.00	-0.94
P-1091	C3-068	C3-069	6.0	0.00	-1.59
P-1092	C3-069	C3-070	6.0	0.00	0.00
P-1093	C3-070	C3-071	6.0	0.00	0.38
P-1094	C3-071	C3-072	6.0	0.00	0.00
P-1095	C3-071	C3-070	6.0	0.00	0.38
P-1096	C3-069	C4-046	6.0	0.00	-1.59
P-1097	C3-068	C3-073	6.0	0.00	0.65
P-1098	C3-073	C3-067	6.0	0.00	0.65
P-1099	C3-067	C3-074	6.0	0.00	-20.54
P-1102	C3-074	C3-075	6.0	0.00	-27.31
P-1103	C3-075	C3-076	8.0	0.00	58.42
P-1104	C3-076	C3-005	8.0	0.00	65.19
P-1105	C3-076	C3-074	6.0	0.00	-6.77
P-1106	C3-074	C3-077	6.0	0.00	0.00
P-1107	C3-077	C3-078	6.0	0.00	0.00
P-1108	C3-079	C3-077	6.0	0.00	0.00
P-1109	C3-073	C3-080	6.0	0.00	0.00
P-1110	C3-066	C3-081	6.0	0.00	-5.05
P-1111	C3-006	C3-082	8.0	0.00	28.47
P-1113	C3-081	C3-082	6.0	0.00	-7.81
P-1114	C3-082	C3-083	6.0	0.00	0.00
P-1115	C3-082	C3-084	8.0	0.00	20.66
P-1116	C3-084	C3-007	8.0	0.00	23.42
P-1117	C3-081	C3-084	6.0	0.00	2.76
P-1118	C3-084	C3-085	6.0	0.00	0.00
P-1120	C3-087	C3-008	8.0	0.00	23.42
P-1121	C3-086	C3-087	6.0	0.00	0.00
P-1122	C3-007	C3-088	8.0	0.00	18.19
P-1123	C3-088	C3-087	8.0	0.00	23.42

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1124	C3-088	C3-089	6.0	0.00	-5.23
P-1125	C3-089	D3-007	6.0	0.00	0.00
P-1126	C3-007	C3-090	8.0	0.00	5.23
P-1127	C3-090	D3-001	8.0	0.00	0.00
P-1128	C3-089	C3-090	6.0	0.00	-5.23
P-1129	C3-002	C3-091	8.0	0.00	27.14
P-1130	C3-091	C3-075	8.0	0.00	85.73
P-1131	C3-091	C3-055	6.0	0.00	-58.59
P-1132	C2-096	C2-109	6.0	0.00	0.00
P-1133	C1-030	C1-042	6.0	0.00	5.48
P-1134	C1-042	C1-031	6.0	0.00	5.48
P-1135	C1-041	C1-042	2.0	0.00	0.00
P-1136	C1-043	C1-033	2.0	0.00	0.00
P-1137	C2-048	C2-110	2.0	0.00	0.00
P-1138	C2-111	C2-048	2.0	0.00	0.00
P-1139	C2-060	C2-113	6.0	0.00	-87.96
P-1140	C2-113	C2-047	6.0	0.00	-83.49
P-1141	C2-112	C2-113	2.0	0.00	0.00
P-1142	C2-045	C2-114	6.0	0.00	84.11
P-1143	C2-114	C2-046	6.0	0.00	79.64
P-1144	C2-113	C2-114	2.0	0.00	-4.47
P-1145	C2-115	C3-065	2.0	0.00	0.00
P-1146	C2-116	C2-117	2.0	0.00	0.00
P-1147	C2-117	C2-118	2.0	0.00	0.00
P-1148	C2-117	C2-006	2.0	0.00	0.00
P-1149	C2-119	C2-009	2.0	0.00	0.00
P-1150	C2-077	C2-120	2.0	0.00	0.00
P-1151	C1-044	C1-010	2.0	0.00	0.00
P-1152	C1-014	C1-045	2.0	0.00	0.00
P-1153	C1-004	C1-046	2.0	0.00	0.00
P-1155	C1-047	C1-004	6.0	0.00	-10.00
P-1156	C1-047	D1-002	2.0	0.00	0.00
P-1157	D1-001	D1-003	6.0	0.00	-10.00
P-1158	D1-003	C1-047	6.0	0.00	-10.00
P-1159	D1-003	D1-004	2.0	0.00	0.00
P-1160	C2-032	C2-121	6.0	0.00	-47.19
P-1161	C2-121	C2-037	6.0	0.00	-47.19
P-1162	C2-121	C2-122	2.0	0.00	0.00
P-1163	C2-123	C2-039	2.0	0.00	0.00
P-1164	C3-012	C2-124	2.0	0.00	0.00
P-1165	C3-092	C3-013	2.0	0.00	0.00
P-1166	C3-063	C3-093	8.0	0.00	-52.86
P-1167	C3-093	C3-016	8.0	0.00	-51.52
P-1168	C3-013	C3-093	2.0	0.00	1.33
P-1169	C3-014	C3-094	6.0	0.00	18.15

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1170	C3-094	C3-016	6.0	0.00	18.92
P-1171	C3-094	C3-095	2.0	0.00	-0.77
P-1172	C3-095	C3-049	2.0	0.00	-0.77
P-1173	C3-095	B3-068	2.0	0.00	0.00
P-1174	C3-096	C3-018	2.0	0.00	0.00
P-1175	B3-056	B3-069	2.0	0.00	0.00
P-1176	B3-051	B3-070	6.0	0.00	-23.37
P-1177	B3-070	B3-052	6.0	0.00	-23.82
P-1178	C3-026	B3-071	6.0	0.00	-15.11
P-1179	B3-071	B3-056	6.0	0.00	-14.66
P-1180	B3-070	B3-071	2.0	0.00	0.45
P-1181	C3-026	C3-025	2.0	0.00	0.41
P-1182	C3-021	C3-097	6.0	0.00	7.25
P-1183	C3-097	C3-029	6.0	0.00	7.26
P-1185	C3-023	C3-098	2.0	0.00	0.14
P-1186	C3-098	C3-097	2.0	0.00	0.02
P-1187	C3-022	C3-098	2.0	0.00	0.39
P-1188	C3-031	C3-099	6.0	0.00	16.64
P-1189	C3-099	C3-038	6.0	0.00	17.93
P-1190	C3-098	C3-099	2.0	0.00	0.51
P-1191	C3-099	C3-100	2.0	0.00	-0.78
P-1192	C3-033	C3-100	8.0	0.00	0.78
P-1193	C3-100	C3-101	8.0	0.00	0.00
P-1194	C3-101	C3-102	8.0	0.00	0.00
P-1195	D6-014	D7-001	12.0	0.00	0.00
P-1196	D7-001	D7-002	12.0	0.00	0.00
P-1198	D7-003	D7-004	12.0	0.00	-0.30
P-1199	D7-004	E8-001	12.0	0.00	0.00
P-1200	E8-001	E8-002	12.0	0.00	0.00
P-1201	E8-002	E8-003	12.0	0.00	0.00
P-1202	E8-003	E8-004	12.0	0.00	0.00
P-1203	E8-005	E8-002	12.0	0.00	0.00
P-1204	E8-003	E9-001	12.0	0.00	0.00
P-1205	E9-001	E9-002	12.0	0.00	0.00
P-1206	E9-001	D9-001	12.0	0.00	0.00
P-1207	C9-001	C9-002	10.0	0.00	-471.75
P-1210	C9-002	D9-002	10.0	0.00	-172.41
P-1211	D9-002	D9-003	10.0	0.00	-172.41
P-1212	D9-003	D9-004	10.0	0.00	-172.41
P-1213	D9-004	D9-005	10.0	0.00	-172.41
P-1214	D9-005	C9-003	10.0	0.00	299.35
P-1215	C9-003	C9-002	10.0	0.00	299.35
P-1216	D9-006	D9-004	8.0	0.00	0.00
P-1217	D9-007	D9-003	8.0	0.00	0.00
P-1225	B4-014	B4-058	12.0	0.00	-345.13

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1230	C2-059	C2-125	6.0	0.00	203.04
P-1231	C2-125	C2-060	6.0	0.00	-145.97
P-1237	C2-126	C2-127	10.0	0.00	-297.04
P-1238	C2-127	C2-128	10.0	0.00	-115.64
P-1239	C2-128	C2-028	10.0	0.00	-115.64
P-1240	C2-127	C2-026	8.0	0.00	-181.39
P-1241	C3-024	C3-103	6.0	0.00	17.44
P-1242	C3-103	C3-044	6.0	0.00	17.44
P-1247	C7-009	C7-011	10.0	0.00	0.00
P-1248	A5-001	A5-004	6.0	0.00	0.00
P-1249	B2-005	B2-009	6.0	0.00	0.00
P-1250	B2-009	B2-006	1.3	0.00	0.00
P-1251	B2-009	B2-010	6.0	0.00	0.00
P-1252	B2-008	B2-011	6.0	0.00	-2.67
P-1255	B2-012	C2-102	6.0	0.00	-10.08
P-1256	B2-011	B2-012	6.0	0.00	-2.67
P-1257	C2-101	B2-013	6.0	0.00	-10.08
P-1258	B2-013	B2-007	6.0	0.00	-2.67
P-1259	B2-012	B2-013	6.0	0.00	7.41
P-1260	B2-001	B2-014	6.0	0.00	0.00
P-1262	B3-072	B3-012	6.0	0.00	0.00
P-1263	B3-002	B3-073	8.0	0.00	-8.49
P-1264	B3-073	B3-066	8.0	0.00	-8.49
P-1265	B3-073	B3-074	2.0	0.00	0.00
P-1266	B3-013	B3-009	6.0	0.00	-1.36
P-1267	B3-064	B3-075	6.0	0.00	0.00
P-1268	B3-075	B3-065	6.0	0.00	0.00
P-1269	B3-075	B3-076	6.0	0.00	0.00
P-1270	B3-035	B3-055	6.0	0.00	14.93
P-1271	B3-055	B3-039	6.0	0.00	5.93
P-1272	B3-054	B3-077	6.0	0.00	-9.39
P-1273	B3-077	B3-055	6.0	0.00	-9.00
P-1274	B3-001	B3-078	6.0	0.00	6.83
P-1275	B3-078	B3-036	6.0	0.00	6.45
P-1276	B3-077	B3-078	1.3	0.00	-0.39
P-1277	B4-047	B4-059	8.0	0.00	56.72
P-1279	B4-059	B4-060	6.0	0.00	0.00
P-1280	B4-005	B4-061	6.0	0.00	18.65
P-1281	B4-061	B4-049	6.0	0.00	0.00
P-1282	B3-028	B4-061	6.0	0.00	-18.65
P-1283	B3-022	B3-079	6.0	0.00	-4.74
P-1284	B3-079	B3-023	6.0	0.00	3.05
P-1285	B3-025	B3-079	6.0	0.00	7.79
P-1287	B4-062	A4-001	8.0	0.00	14.33
P-1288	B4-062	B4-063	4.0	0.00	0.00

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1290	B4-064	B4-062	8.0	0.00	14.33
P-1291	B4-064	B4-065	6.0	0.00	0.00
P-1292	B4-022	B4-066	6.0	0.00	3.24
P-1293	B4-066	B4-024	6.0	0.00	3.24
P-1294	B4-066	B4-067	6.0	0.00	0.00
P-1295	B4-021	B4-068	6.0	0.00	6.67
P-1296	B4-068	B4-020	6.0	0.00	6.67
P-1297	B4-068	B4-069	6.0	0.00	0.00
P-1298	B5-028	B5-042	6.0	0.00	0.00
P-1299	B4-013	B4-070	12.0	0.00	-243.11
P-1300	B4-070	B4-014	12.0	0.00	-243.11
P-1301	B4-070	B3-080	2.0	0.00	0.00
P-1302	B4-059	B4-071	8.0	0.00	56.72
P-1303	B4-071	B4-004	8.0	0.00	56.72
P-1304	B4-071	B4-072	6.0	0.00	0.00
P-1305	B4-005	B4-073	8.0	0.00	14.33
P-1306	B4-073	B4-064	8.0	0.00	14.33
P-1307	B4-006	B4-073	8.0	0.00	0.00
P-1308	B4-015	B5-030	6.0	0.00	1.44
P-1309	B5-018	B5-043	6.0	0.00	24.38
P-1310	B5-043	B5-019	6.0	0.00	0.00
P-1311	B5-024	B5-044	6.0	0.00	-39.42
P-1312	B5-044	B5-010	6.0	0.00	-15.04
P-1313	B5-043	B5-044	6.0	0.00	24.38
P-1314	C5-022	B5-045	8.0	0.00	-135.08
P-1317	B5-045	B5-047	8.0	0.00	-107.94
P-1318	B5-047	B5-022	8.0	0.00	-135.08
P-1319	B5-045	B5-048	6.0	0.00	-27.15
P-1320	B5-048	B5-046	6.0	0.00	0.00
P-1322	B5-047	B5-049	6.0	0.00	27.15
P-1323	B5-049	B5-048	6.0	0.00	27.15
P-1325	B5-049	B5-051	6.0	0.00	0.00
P-1326	B5-051	B5-050	6.0	0.00	0.00
P-1327	B5-051	B5-052	6.0	0.00	0.00
P-1328	C5-024	B5-053	6.0	0.00	0.00
P-1330	B6-011	B6-002	8.0	0.00	36.58
P-1333	B6-040	B6-028	6.0	0.00	-8.61
P-1334	B6-040	B6-041	4.0	0.00	0.00
P-1335	B6-012	B6-042	6.0	0.00	-8.61
P-1336	B6-042	B6-040	6.0	0.00	-8.61
P-1337	B6-042	B6-043	4.0	0.00	0.00
P-1338	C7-028	C7-051	8.0	0.00	70.38
P-1339	C7-051	C7-029	8.0	0.00	70.38
P-1340	C7-051	B7-003	6.0	0.00	0.00
P-1341	C1-039	C1-048	2.0	0.00	0.13

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1342	C1-048	C1-029	2.0	0.00	0.13
P-1343	C1-048	C1-049	2.0	0.00	0.00
P-1346	C2-129	C2-090	6.0	0.00	-0.26
P-1347	C2-022	C2-130	2.0	0.00	0.35
P-1349	C2-022	C2-131	6.0	0.00	9.94
P-1350	C2-131	C2-129	6.0	0.00	10.29
P-1351	C2-130	C2-131	6.0	0.00	0.35
P-1352	C2-129	C2-023	6.0	0.00	10.55
P-1353	C2-089	C2-132	4.0	0.00	0.00
P-1354	C2-075	C2-133	2.0	0.00	0.00
P-1355	C2-012	C2-134	6.0	0.00	28.73
P-1356	C2-134	C2-099	6.0	0.00	28.73
P-1357	C2-134	C2-135	1.3	0.00	0.00
P-1358	C3-108	C2-136	6.0	0.00	39.52
P-1359	C2-136	C2-041	6.0	0.00	39.52
P-1360	C2-136	C2-137	1.0	0.00	0.00
P-1361	C2-095	C2-138	6.0	0.00	0.00
P-1362	C3-057	C3-015	6.0	0.00	36.05
P-1363	C3-032	C3-104	6.0	0.00	0.00
P-1364	C3-104	C3-105	6.0	0.00	0.00
P-1365	C3-104	C3-106	6.0	0.00	0.00
P-1366	C3-041	C3-107	6.0	0.00	-8.95
P-1367	C3-107	C3-042	6.0	0.00	-16.74
P-1368	C3-010	C3-107	6.0	0.00	-7.80
P-1369	C4-073	C4-082	6.0	0.00	-7.80
P-1370	C4-082	C3-010	6.0	0.00	-7.80
P-1371	C4-082	C4-083	4.0	0.00	0.00
P-1373	C4-048	C4-084	6.0	0.00	11.53
P-1374	C4-084	C4-064	6.0	0.00	11.53
P-1375	C4-084	C4-085	1.3	0.00	0.00
P-1376	C4-008	C4-086	8.0	0.00	31.39
P-1377	C4-086	C5-025	8.0	0.00	32.89
P-1378	C4-051	C4-086	2.0	0.00	1.50
P-1379	C4-042	C4-087	8.0	0.00	-76.23
P-1380	C4-087	C4-002	8.0	0.00	-76.23
P-1381	C4-087	C4-088	4.0	0.00	0.00
P-1382	C4-061	C4-089	8.0	0.00	108.66
P-1383	C4-089	C4-006	8.0	0.00	108.66
P-1384	C4-089	C4-060	8.0	0.00	0.00
P-1385	C6-032	C6-033	4.0	0.00	0.12
P-1386	C6-030	C6-074	6.0	0.00	99.38
P-1387	C6-074	C6-031	6.0	0.00	99.38
P-1388	C6-074	C6-075	2.0	0.00	0.00
P-1389	C6-074	C6-076	2.0	0.00	0.00
P-1390	C6-062	C6-038	6.0	0.00	-92.86

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1391	C7-037	C7-052	8.0	0.00	-36.06
P-1393	C7-052	C7-053	6.0	0.00	0.00
P-1394	C7-052	C7-054	8.0	0.00	-36.06
P-1395	C7-054	C7-033	8.0	0.00	-36.06
P-1396	C7-054	C7-055	6.0	0.00	0.00
P-1397	D1-001	D1-005	2.0	0.00	0.00
P-1398	D5-007	D5-011	6.0	0.00	0.00
P-1399	D6-017	D7-005	12.0	0.00	-445.83
P-1400	D7-005	C7-022	12.0	0.00	-445.83
P-1401	D7-005	D7-006	6.0	0.00	0.00
P-1402	C7-027	C7-056	12.0	0.00	-304.36
P-1403	C7-056	C7-030	12.0	0.00	-304.36
P-1406	D7-002	D7-008	12.0	0.00	0.00
P-1407	D7-008	D7-003	12.0	0.00	-0.30
P-1409	D7-008	D7-010	6.0	0.00	0.30
P-1410	D7-010	D7-009	6.0	0.00	0.00
P-1416	D7-012	D7-011	2.0	0.00	0.00
P-1417	D7-012	D7-013	6.0	0.00	0.30
P-1418	D7-013	D7-014	6.0	0.00	0.30
P-1420	D7-015	D7-004	6.0	0.00	0.30
P-1421	D7-010	D7-016	6.0	0.00	0.30
P-1422	D7-016	D7-012	6.0	0.00	0.30
P-1423	D7-016	D7-017	2.0	0.00	0.00
P-1424	D7-013	D7-018	4.0	0.00	0.00
P-1425	D7-014	D7-019	2.0	0.00	0.00
P-1426	D7-014	D7-020	6.0	0.00	0.30
P-1428	D7-020	D7-021	4.0	0.00	0.00
P-1429	D7-020	D7-022	6.0	0.00	0.30
P-1430	D7-022	D7-015	6.0	0.00	0.30
P-1431	D7-022	D7-023	4.0	0.00	0.00
P-1432	C7-022	C7-057	8.0	0.00	0.00
P-1433	C7-057	C7-058	8.0	0.00	0.54
P-1434	C7-057	C7-059	8.0	0.00	-0.24
P-1435	C7-057	C7-060	8.0	0.00	-0.29
P-1436	C7-058	C7-061	8.0	0.00	0.29
P-1437	C7-058	C7-062	8.0	0.00	0.24
P-1444	C7-062	C7-059	8.0	0.00	0.24
P-1445	C7-061	C7-060	8.0	0.00	0.29
P-1452	C2-125	FCV-2	10.0	0.00	349.01
P-1453	FCV-2	R-9	10.0	0.00	349.01
P-1454	C2-126	FCV-3	10.0	0.00	297.04
P-1455	FCV-3	R-10	10.0	0.00	297.04
P-1456	B4-058	FCV-4	12.0	0.00	824.73
P-1457	FCV-4	R-11	12.0	0.00	824.73
P-1458	C5-023	FCV-5	12.0	0.00	635.40

City of Ocean Springs Water Model
FlexTable: Pipe Table
Active Scenario: Static

Label	Start Node	Stop Node	Diameter (in)	Length (User Defined) (ft)	Flow (gpm)
P-1459	FCV-5	R-12	12.0	0.00	635.40
P-1460	C6-018	FCV-6	12.0	0.00	1,302.01
P-1461	FCV-6	R-13	12.0	0.00	1,302.01
P-1462	D9-008	FCV-7	12.0	0.00	147.27
P-1463	FCV-7	R-14	12.0	0.00	147.27
P-1464	B4-058	Halstead Road	12.0	0.00	-1,169.86
P-1465	C3-059	Pine Drive Tank	12.0	0.00	-708.73
P-1466	C6-019	Civic Center Tank	12.0	0.00	-1,067.86
P-1467	D9-008	D9-009	12.0	0.00	-147.27
P-1468	D9-009	D9-005	12.0	0.00	471.75
P-1470	C7-056	C7-063	4.0	0.00	0.00
P-1471	C7-063	D7-007	4.0	0.00	0.00
Sunplex Tank	D9-009	T-7	12.0	0.00	-619.03

APPENDIX G

CENSUS DATA

QuickFacts

Ocean Springs city, Mississippi

QuickFacts provides statistics for all states and counties, and for cities and towns with a ***population of 5,000 or more***.

All Topics ▼	OCEAN SPRINGS CITY, MISSISSIPPI
People	
Population	
Population estimates, July 1, 2016, (V2016)	17,652
Population estimates, July 1, 2015, (V2015)	17,636
Population estimates base, April 1, 2010, (V2016)	17,442
Population estimates base, April 1, 2010, (V2015)	17,442
Population, percent change - April 1, 2010 (estimates base) to July 1, 2016, (V2016)	1.2%
Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	1.1%
Population, Census, April 1, 2010	17,442
Age and Sex	
Persons under 5 years, percent, July 1, 2015, (V2015)	X
Persons under 5 years, percent, April 1, 2010	5.6%
Persons under 18 years, percent, July 1, 2015, (V2015)	X
Persons under 18 years, percent, April 1, 2010	22.9%
Persons 65 years and over, percent, July 1, 2015, (V2015)	X
Persons 65 years and over, percent, April 1, 2010	16.5%
Female persons, percent, July 1, 2015, (V2015)	X
Female persons, percent, April 1, 2010	52.3%
Race and Hispanic Origin	
White alone, percent, July 1, 2015, (V2015) (a)	X
White alone, percent, April 1, 2010 (a)	85.4%
Black or African American alone, percent, July 1, 2015, (V2015) (a)	X
Black or African American alone, percent, April 1, 2010 (a)	7.4%
American Indian and Alaska Native alone, percent, July 1, 2015, (V2015) (a)	X
American Indian and Alaska Native alone, percent, April 1, 2010 (a)	0.4%
Asian alone, percent, July 1, 2015, (V2015) (a)	X
Asian alone, percent, April 1, 2010 (a)	3.1%
Native Hawaiian and Other Pacific Islander alone, percent, July 1, 2015, (V2015) (a)	X
Native Hawaiian and Other Pacific Islander alone, percent, April 1, 2010 (a)	0.1%
Two or More Races, percent, July 1, 2015, (V2015)	X
Two or More Races, percent, April 1, 2010	2.2%
Hispanic or Latino, percent, July 1, 2015, (V2015) (b)	X
Hispanic or Latino, percent, April 1, 2010 (b)	4.2%
White alone, not Hispanic or Latino, percent, July 1, 2015, (V2015)	X
White alone, not Hispanic or Latino, percent, April 1, 2010	83.0%
Population Characteristics	
Veterans, 2011-2015	2,271
Foreign born persons, percent, 2011-2015	5.1%
Housing	
Housing units, July 1, 2016, (V2016)	X
Housing units, April 1, 2010	7,814
Owner-occupied housing unit rate, 2011-2015	71.7%
Median value of owner-occupied housing units, 2011-2015	$146,800
Median selected monthly owner costs -with a mortgage, 2011-2015	$1,341
Median selected monthly owner costs -without a mortgage, 2011-2015	$421
Median gross rent, 2011-2015	$925
Building permits, 2016	X
Families and Living Arrangements	
Households, 2011-2015	6,417
Persons per household, 2011-2015	2.71
Living in same house 1 year ago, percent of persons age 1 year+, 2011-2015	82.4%
Language other than English spoken at home, percent of persons age 5 years+, 2011-2015	7.6%
Education	
High school graduate or higher, percent of persons age 25 years+, 2011-2015	91.0%
Bachelor's degree or higher, percent of persons age 25 years+, 2011-2015	37.3%
Health	
With a disability, under age 65 years, percent, 2011-2015	11.6%
Persons without health insurance, under age 65 years, percent	⚠ 16.1%
Economy	
In civilian labor force, total, percent of population age 16 years+, 2011-2015	59.3%
In civilian labor force, female, percent of population age 16 years+, 2011-2015	54.6%

In civilian labor force, female, percent of population age 16 years+, 2011-2015	54.6%
Total accommodation and food services sales, 2012 ($1,000) (c)	51,711
Total health care and social assistance receipts/revenue, 2012 ($1,000) (c)	D
Total manufacturers shipments, 2012 ($1,000) (c)	D
Total merchant wholesaler sales, 2012 ($1,000) (c)	23,784
Total retail sales, 2012 ($1,000) (c)	291,653
Total retail sales per capita, 2012 (c)	$16,703
Transportation	
Mean travel time to work (minutes), workers age 16 years+, 2011-2015	21.6
Income and Poverty	
Median household income (in 2015 dollars), 2011-2015	$53,495
Per capita income in past 12 months (in 2015 dollars), 2011-2015	$31,347
Persons in poverty, percent	⚠ 9.3%
Businesses	
Total employer establishments, 2015	X
Total employment, 2015	X
Total annual payroll, 2015 ($1,000)	X
Total employment, percent change, 2014-2015	X
Total nonemployer establishments, 2015	X
All firms, 2012	1,866
Men-owned firms, 2012	949
Women-owned firms, 2012	674
Minority-owned firms, 2012	261
Nonminority-owned firms, 2012	1,487
Veteran-owned firms, 2012	199
Nonveteran-owned firms, 2012	1,543
Geography	
Population per square mile, 2010	1,513.5
Land area in square miles, 2010	11.52
FIPS Code	2853520

⚠ This geographic level of poverty and health estimates are not comparable to other geographic levels of these estimates

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info icon to the left of each row in TABLE view to learn about sampling error.

The vintage year (e.g., V2015) refers to the final year of the series (2010 thru 2015). Different vintage years of estimates are not comparable.

(a) Includes persons reporting only one race
(b) Hispanics may be of any race, so also are included in applicable race categories
(c) Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

D Suppressed to avoid disclosure of confidential information
F Fewer than 25 firms
FN Footnote on this item in place of data
NA Not available
S Suppressed; does not meet publication standards
X Not applicable
Z Value greater than zero but less than half unit of measure shown

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, State and County Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

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APPENDIX H

DEPARTMENT OF THE ARMY/CORPS OF ENGINEERS

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Ms. Allison Monroe
U.S. Army Corps of Engineers
Mobile District, Regulatory Division
109 St. Joseph Street
Mobile, AL 36602

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Ms. Monroe:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

RECEIVED
JUL 10 2017

DEPARTMENT OF THE ARMY
MOBILE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, AL 36628-0001

REPLY TO
ATTENTION OF:

July 3, 2017

Mississippi Branch
Regulatory Division

City of Ocean Springs
c/o Compton Engineering, Inc.
Attention: Mr. James Douglass
Post Office box 686
Pascagoula, Mississippi 39568

Dear Mr. Douglass:

I refer to your recent submittal of a request for a Department of the Army jurisdictional determination in Ocean Springs, Jackson County, Mississippi. This project has been assigned file number **SAM-2017-00764-PAH**. It is important that you refer to the assigned number in all communication with this office concerning this matter.

If after reviewing your submittal we determine that additional information is required, we will contact you. However, should you have any questions, please feel free to contact me at (251) 690-3222, or by email at Philip.A.Hegji@usace.army.mil.

Sincerely,

Philip A. Hegji
Project Manager
Regulatory Division

RECEIVED
JUL 10 2017

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, MOBILE DISTRICT
CORPS OF ENGINEERS
P.O. BOX 2288
MOBILE, ALABAMA 36628-0001

REPLY TO
ATTENTION OF:

July 6, 2017

South Mississippi Branch
Regulatory Division

SUBJECT: Department of the Army Jurisdictional Determination Number SAM-2017-764-PAH, City of Ocean Springs

City of Ocean Springs
C/o Compton Engineering, Inc.
Attention: Mr. James Douglass
Post Office box 686
Pascagoula, Mississippi 39568

Dear Mr. Douglass:

Reference is made to your June 20, 2017 request for comments in regards to your application for the Drinking Water Improvements Project. Your project has been assigned Number SAM-2017-764-PAH; please refer to it in all future correspondence. Specifically the project site is located in Ocean Springs, Jackson County.

A desk review of the material submitted revealed that a Department of the Army (DA) permit pursuant to Section 404 of the Clean Water Act may be required. The project areas are considered primarily uplands based upon the U.S. Army Corps of Engineers' (USACE) 1987 Wetland Delineation Manual and Regional Supplement with the exception of the area indicated above.

Thank you for your cooperation with our permit program. If you have any questions or require further information concerning this matter, please contact me at (251) 690-3222.

For additional information about our Regulatory Program, please visit our web site at www.sam.usace.army.mil/Missions/Regulatory.aspx. Also, please take a moment to complete our customer satisfaction survey located near the bottom of the webpage. Your responses are appreciated and will help us improve our services.

Sincerely,

Philip A. Hegji
Project Manager
South Mississippi Branch
Regulatory Division

APPENDIX I

NATURAL HERITAGE PROGRAMS

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Mr. Charles Knight
Mississippi Museum of Natural Science
Natural Heritage Program
2148 Riverside Drive
Jackson, MS 39202-1353

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Knight:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

RECEIVED
JUL 24 2017

MISSISSIPPI
DEPARTMENT OF WILDLIFE, FISHERIES, AND PARKS

Sam Polles, Ph.D.
Executive Director

July 17, 2017

Compton Engineering
1706 Convent Avenue
PO Box 686
Pascagoula, MS 39568

Re: Water System Improvements
Ocean Springs
Jackson County, Mississippi

R# 13065
216-039.006

To James Douglass:

In response to your request for information dated June 13, 2017, we have searched our database for occurrences of state or federally listed species and species of special concern that occur within 2 miles of the site of the proposed project. Please find our concerns and recommendations below.

The following species of concern may occur within 2 miles of the proposed project area:

SCIENTIFIC NAME	COMMON NAME	FED	STATE	STATE RANK
Accipiter cooperii	Cooper's Hawk			S3?B
Accipiter striatus	Sharp-shinned Hawk			S1?B
Acipenser oxyrinchus desotoi	Gulf Sturgeon	LT	LE	S1
Ammodramus henslowii	Henslow's Sparrow			S3N
Ammodramus leconteii	Le Conte's Sparrow			S3N
Ammodramus maritimus	Seaside Sparrow			S3
Ammodramus nelsoni	Nelson's Sharp-tailed Sparrow			S3N
Ammodramus savannarum	Grasshopper Sparrow			S3B,S3N

Anas fulvigula	Mottled Duck			S2B,S4N
Anas rubripes	American Black Duck			S2N
Anhinga anhinga	Anhinga			S3B,S1N
Asio flammeus	Short-eared Owl			S3N
Botaurus lentiginosus	American Bittern			S3N
Burmannia biflora	Northern Burmannia			S1
Calidris canutus	Red Knot			S2N
Calopogon multiflorus	Many-flower Grass-pink			S1
Carex verrucosa	Wartysedge			S1S2
Charadrius melodus	Piping Plover	LE,LT	LE	S2N
Charadrius wilsonia	Wilson's Plover			S1
Columbina passerina	Common Ground-Dove			S1S2
Coturnicops noveboracensis	Yellow Rail			S2N
Cyperus articulatus	Jointed Flatsedge			S1
Egretta caerulea	Little Blue Heron			S2B,S2N
Egretta rufescens	Reddish Egret			S2N
Egretta thula	Snowy Egret			S4B,S1N
Egretta tricolor	Tricolored Heron			S2B,S1N
Eudocimus albus	White Ibis			S2B,S3N
Euphagus carolinus	Rusty Blackbird			S2N
Falco peregrinus	Peregrine Falcon		LE	S1N
Fundulus jenkinsi	Saltmarsh Topminnow			S3
Haematopus palliatus	American Oystercatcher			S1
Haliaeetus leucocephalus	Bald Eagle			S2B,S2N
Hibiscus coccineus	Brilliant Hibiscus			S1S2
Himantopus mexicanus	Black-necked Stilt			S3B
Juniperus virginiana var. silicicola	Southern Red Cedar			S2
Lepidochelys kempii	Kemp's or Atlantic Ridley			S1N
Limosa fedoa	Marbled Godwit			S2N
Macrochelys temminckii	Alligator Snapping Turtle			S3
Macrodiplax balteata	Marl Pennant			S3
Malaclemys terrapin pileata	Mississippi Diamondback Terrapin			S2
Malaclemys terrapin pileata	Mississippi Diamondback Terrapin			S2
Mollusk reef	Oyster			S3
Nerodia clarkii clarkii	Gulf Salt Marsh Snake			S2
Nyctanassa violacea	Yellow-crowned Night-Heron			S3B,S1N
Pandion haliaetus	Osprey			S3B,S1S2N
Pelecanus erythrorhynchos	American White Pelican			S3N
Pelecanus occidentalis carolinensis	Eastern Brown Pelican			S1N

Physalis angustifolia	Coast Ground-cherry			S2
Physalis angustifolia	Coast Ground-cherry			S2
Picoides borealis	Red-cockaded Woodpecker	LE	LE	S1
Porphyrio martinica	Purple Gallinule			S3B
Rallus elegans	King Rail			S3
Rhadinaea flavilata	Pine Woods Snake			S2S3
Rhynchospora cephalantha	Capitate Beakrush			S3
Rhynchospora tracyi	Tracy's Beakrush			S1
Rynchops niger	Black Skimmer			S2B,S3N
Sarracenia leucophylla	Crimson Pitcher-plant			S2
Spiranthes brevilabris var. floridana	Florida Ladies'-tresses			S1S2
Thalasseus maximus	Royal Tern			S1B,S4N
Thalasseus sandvicensis	Sandwich Tern			S1B,S4N
Thryomanes bewickii	Bewick's Wren		LE	S2B,S3N

State Rank

S1 — Critically imperiled in Mississippi because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

S2 — Imperiled in Mississippi because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it vulnerable to extirpation.

S3 — Rare or uncommon in Mississippi (on the order of 21 to 100 occurrences).

State and Federal Status

LE Endangered — A species which is in danger of extinction throughout all or a significant portion of its range.

LT Threatened — A species likely to become endangered in foreseeable future throughout all or a significant portion of its range.

Based on information provided, we conclude that if best management practices are properly implemented, monitored, and maintained (particularly measures to prevent, or at least, minimize negative impacts to water quality), the proposed project likely poses no threat to listed species or their habitats.

Recommendations:

We recommend that best management practices be properly implemented, monitored, and maintained for compliance, specifically measures that will prevent suspended silt and contaminants from leaving the site in stormwater run-off as this may negatively affect water quality and habitat conditions within nearby streams and waterbodies.

Please feel free to contact us if we can provide any additional information, resources, or assistance that will help minimize negative impacts to the species and/or ecological communities identified in this review. We are happy to work with you to ensure that our state's precious natural heritage is conserved and preserved for future Mississippians.

Sincerely,

Kyle Swanier, Conservation Biologist
Mississippi Natural Heritage Program
(601) 576-6047

The Mississippi Natural Heritage Program (MNHP) has compiled a database that is the most complete source of information about Mississippi's rare, threatened, and endangered plants, animals, and ecological communities. The quantity and quality of data collected by MNHP are dependent on the research and observations of many individuals and organizations. In many cases, this information is not the result of comprehensive or site-specific field surveys; most natural areas in Mississippi have not been thoroughly surveyed and new occurrences of plant and animal species are often discovered. Heritage reports summarize the existing information known to the MNHP at the time of the request and cannot always be considered a definitive statement on the presence, absence or condition of biological elements on a particular site.

APPENDIX J

MISSISSIPPI DEPARTMENT OF ARCHIVES AND HISTORY

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Mr. Greg Williamson
Mississippi Department of Archives and History
Historic Preservation Division
P.O. Box 571
Jackson, MS 39205-0571

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Williamson:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

MISSISSIPPI DEPARTMENT of ARCHIVES AND HISTORY

MDAH

HISTORIC PRESERVATION DIVISION
P. O. BOX 571
Jackson, MS 39205-0571
Phone 601-576-6940 Fax 601-576-6955
Website: mdah.ms.gov

RECEIVED
JUL 24 2017

July 19, 2017

Mr. James M. Douglass
Compton Engineering
1706 Convent Avenue
Pascagoula, Mississippi 39567

RE: Job No. 216-039-006; Draft Facilities Plan for Drinking Water System Improvements by the City of Ocean Springs, (MDEQ) MDAH Project Log #06-084-17, Jackson County

Dear Mr. Douglass:

We have reviewed your request for a cultural resources assessment, received on June 21, 2017, for the above referenced project in accordance with our responsibilities under Section 106 of the National Historic Preservation Act and 36 CFR Part 800. After review, it is our determination due to the presence of recorded sites within the APE and recorded sites in close proximity, that a cultural resources survey should be performed by a qualified archaeologist in Area A, north of Highway 90, and Halstead Bayou Drive and Kirkland Drive in Area B. The resulting report should reference the project log number above on the title page.

A list of individuals who have represented themselves as being willing and qualified to do archaeological survey work in Mississippi will be furnished upon request. A copy of this letter should be made available to the contracting archaeologist(s).

If we can be of further assistance, please do not hesitate to contact us at (601) 576-6940.

Sincerely,

Hal Bell

Hal Bell
Review and Compliance Officer

FOR: Katie Blount
State Historic Preservation Officer

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

PASCAGOULA

BILOXI

BAY ST. LOUIS

September 20, 2017

Mr. Hal Bell
Mississippi Department of Archives and History
Historic Preservation Division
P.O. Box 571
Jackson, MS 39205-0571

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
MDAH Project Log #06-084-17
(C.E. Job No.: 216-039.006)

Dear Mr. Bell:

We are in receipt of your letter dated July 19, 2017, regarding the above referenced project, and offer the following response to your concerns. Per our conversations with your office and with archeologists familiar with the project area, MDAH requests that cultural resources surveys, including shovel tests along the length of the project at 100 foot intervals, be performed in Area A north of Highway 90 and Area B along Halstead Bayou Drive and Kirkland Drive. Alternatively, we can require an archeologist to be on-site throughout construction in these areas, in order to monitor the activities. Due to the timeline required for finalizing the facilities plan in order to receive funding, these actions cannot be carried out prior to the October 1, 2017 deadline. Additionally, the City of Ocean Springs does not currently have sufficient budget to complete this requirement, and would prefer the required survey be included in the facilities plan in order to receive the necessary funding. In order to address your concerns, we would recommend that the actions required to complete the cultural resources surveys be carried out during the construction phase of the project, prior to breaking ground. As such, we would require that the contractor retain a qualified archeologist to perform the cultural resources survey as a part of their contract with the City of Ocean Springs, as outlined above.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

JMD:kl

Enclosure

S:\Pascagoula\0-Projects\2016\216-039 City of Ocean Springs\216-039.006 Water Facilities Plan\Docs\Design\Facilities Plan\Appendices\J - MDAH Ltr 9-20-17.doc

APPENDIX K

U.S. FISHERIES AND WILDLIFE SERVICE

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Mr. David Felder
United States Department of the Interior
Fish and Wildlife Service
6578 Dogwood View Parkway, Suite A
Jackson, MS 39213

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Felder:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mississippi Ecological Services Field Office
6578 Dogwood View Parkway, Suite A
Jackson, Mississippi 39213
Phone: (601)965-4900 Fax: (601)965-4340

July 3, 2017

RECEIVED
JUL 06 2017

IN REPLY REFER TO:
2017-I-765

Mr. James M. Douglass
Compton Engineering
1706 Convent Avenue
Pascagoula, Mississippi 39568

Dear Mr. Douglass:

The Fish and Wildlife Service (Service) has reviewed the information in your letter dated June 20, 2017, regarding the draft facilities plan for drinking water systems improvements for the City of Ocean Springs in Jackson County, Mississippi. Our comments are submitted in accordance with the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

There are no known federally listed species or their habitats within the project area, therefore, the Service has determined that the proposed project will have "No Effect" on federally listed species. No further consultation under the ESA is required with this office unless there are changes in the scope or location of the proposed project.

If you have any questions, please contact David Felder in our office, telephone: (601) 321-1131, or visit our website at http://www.fws.gov/mississippiES/.

Sincerely,

David Felder

for Stephen M. Ricks
Field Supervisor
Mississippi Field Office

APPENDIX L

DEPARTMENT OF MARINE RESOURCES

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Ms. Willa Brantley
Department of Marine Resources
1141 Bayview Avenue, Suite 101
Biloxi, MS 39530

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Ms. Brantley:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

RECEIVED
JUL 10 2017

STATE OF MISSISSIPPI
Phil Bryant
Governor

MISSISSIPPI DEPARTMENT OF MARINE RESOURCES
Jamie M. Miller, Executive Director

July 5, 2017

James M Douglass
Compton Engineering, Inc.
P.O. Box 686
Pascagoula, MS 39568

RE: DMR-170350; City of Ocean Springs Drinking Water Systems Improvement

Dear Mr. Douglass:

The Department of Marine Resources in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The Department has received a request from the City of Ocean Springs to review the proposed replacement of water distribution lines and the installation of an emergency connection in Jackson County in Mississippi. Please note that construction or replacement of transmission lines through wetlands, canals, or bayous is an activity that is regulated by this office as well as the U.S. Army Corps of Engineers. If such wetland impacts are anticipated, an application form should be submitted to this office for review of the proposed project.

We ask that impacts to wetlands be avoided and minimized wherever possible. Crossing of creeks or bayous by directional drilling is preferable to more invasive installation methods as are temporary impacts with wetland restoration following line installation. Routes should be designed to avoid impacts to wetlands where practicable and to minimize impacts where unavoidable. Thank you for the opportunity to comment on your project.

For more information, questions concerning this correspondence, to obtain an application packet, or to schedule a pre-application meeting, contact Holland Lamier with the Bureau of Wetlands Permitting at (228) 523-4157 or holland.lamier@dmr.ms.gov.

Sincerely,

Willa J. Brantley
Bureau Director, Wetlands Permitting

WJB/hml

APPENDIX M

FLOOD PLAIN MAP

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Mississippi East FIPS Zone 2301. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services, NOAA, N/NGS12
National Geodetic Survey SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the State of Mississippi. This information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated January 2006.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

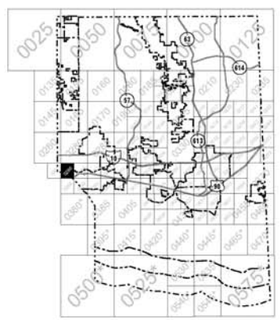
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

Elevation Reference Marks

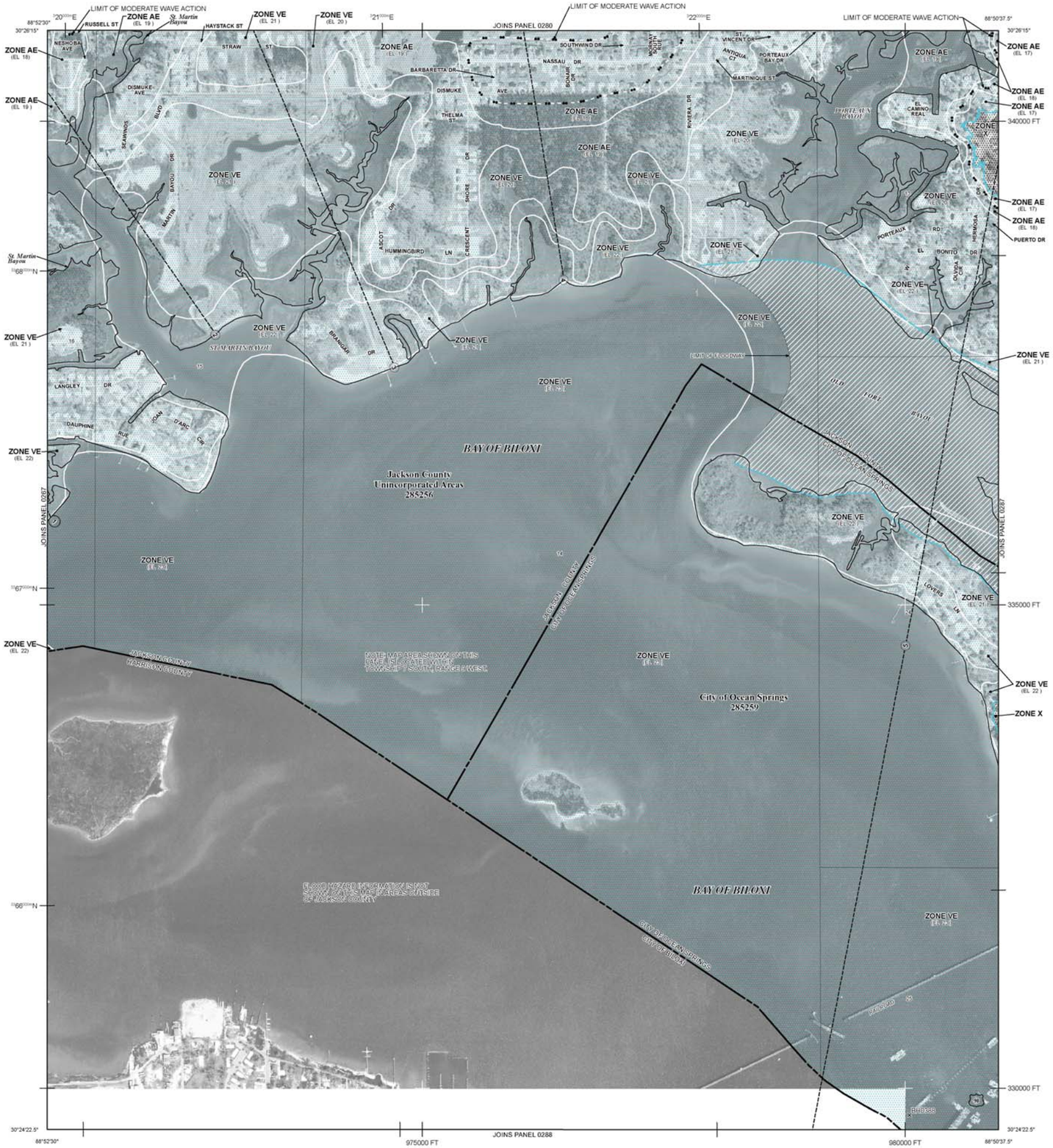
BH0388



* PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- Limit of Moderate Wave Action Delineation
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4775000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 16
- 6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0286G

FIRM

FLOOD INSURANCE RATE MAP

JACKSON COUNTY, MISSISSIPPI AND INCORPORATED AREAS

PANEL 286 OF 575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0286	G
OCEAN SPRINGS, CITY OF	285259	0286	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0286G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

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National Geodetic Survey SSMC-3, #9202
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Silver Spring, Maryland 20910-3282
(301) 713-3242

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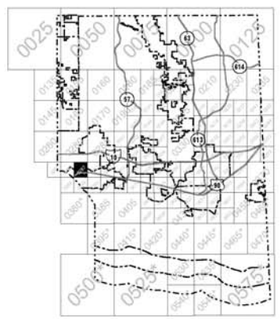
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Elevation Reference Marks

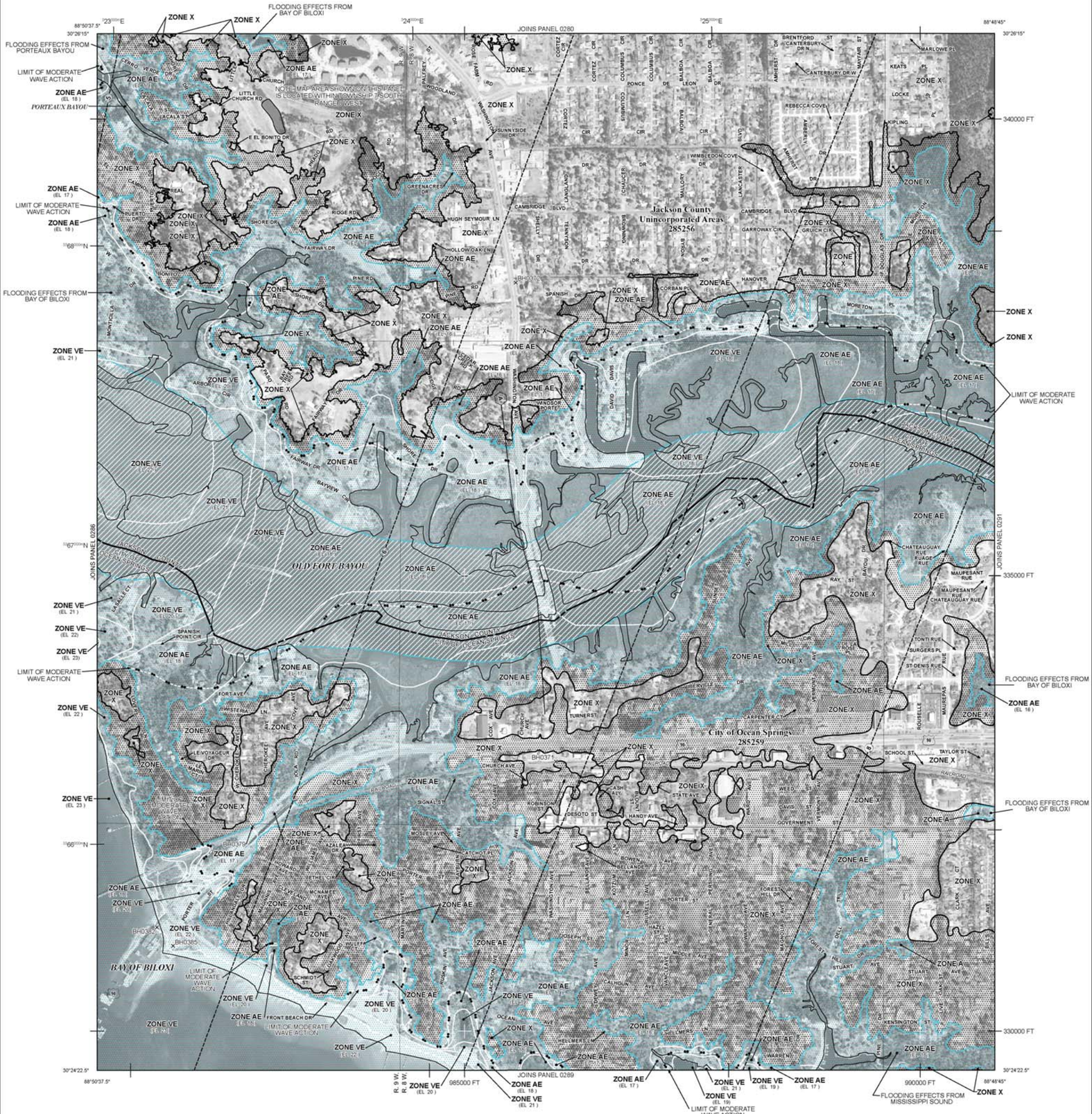
BH0370 BH0385
BH0371
BH0372
BH0379
BH0382



* PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- Limit of Moderate Wave Action Delineation
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 16
- 6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0287G

FIRM

FLOOD INSURANCE RATE MAP

JACKSON COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

PANEL 287 OF 575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0287	G
OCEAN SPRINGS, CITY OF	285259	0287	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0287G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Mississippi East FIPS Zone 2301. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services, NOAA, N/NGS12
National Geodetic Survey SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the State of Mississippi. This information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated January 2006.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

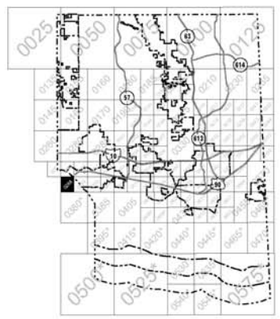
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Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report*, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

Elevation Reference Marks



* PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
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6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0288G

FIRM

FLOOD INSURANCE RATE MAP
JACKSON COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

PANEL 288 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OCEAN SPRINGS, CITY OF	285259	0288	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0288G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

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To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Mississippi East FIPS Zone 2301. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

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Silver Spring, Maryland 20910-3282
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This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in *the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

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Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

The AE Zone category has been divided by a **Limit of Moderate Wave Action (LiMWA)**. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. Base flood conditions between the VE Zone and the LiMWA will be similar to, but less severe than those in the VE Zone.

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Elevation Reference Marks



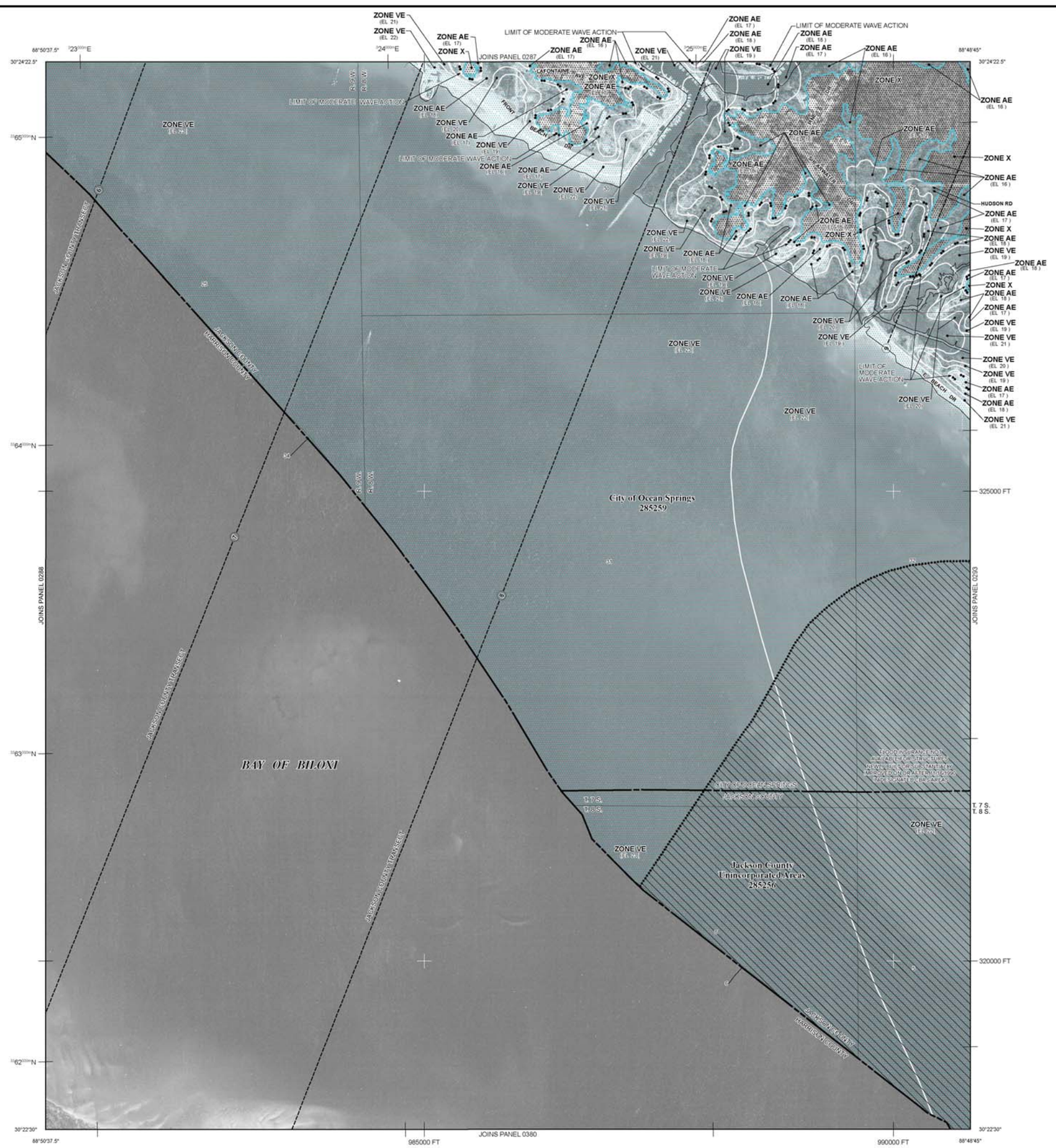
* PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

COASTAL BARRIER RESOURCES SYSTEM (CBRS)

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this FIRM were transferred from the official CBRS source map(s) for this area and are depicted on this FIRM for informational purposes only. The official CBRS maps are enacted by Congress via the Coastal Barrier Resources Act, as amended, and maintained by the U.S. Fish and Wildlife Service (FWS). The official CBRS maps used to determine whether or not an area is located within the CBRS are available for download at http://www.fws.gov. For an official determination of whether or not an area is located within the CBRS, or for any questions regarding the CBRS, please contact the FWS field office for this area at (601) 965-4900.

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** — Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- Limit of Moderate Wave Action Delineation
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- (A) (A) — Cross section line
- (23) (23) — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4 175 000 E — 1000-meter Universal Transverse Mercator grid ticks, zone 16
- 6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0289G

FIRM

FLOOD INSURANCE RATE MAP

JACKSON COUNTY, MISSISSIPPI

AND INCORPORATED AREAS

PANEL 289 OF 575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0289	G
OCEAN SPRINGS, CITY OF	285259	0289	G

-NOTE-

THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION.

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0289G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

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NGS Information Services, NOAA, N/NGS12
National Geodetic Survey SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

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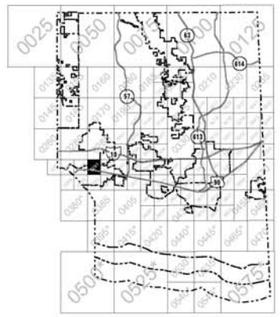
The AE Zone category has been divided by a **Limit of Moderate Wave Action (LIMWA)**. The LIMWA represents the approximate landward limit of the 1.5-foot breaking wave. Base flood conditions between the VE Zone and the LIMWA will be similar to, but less severe than those in the VE Zone.

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If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.

Elevation Reference Marks

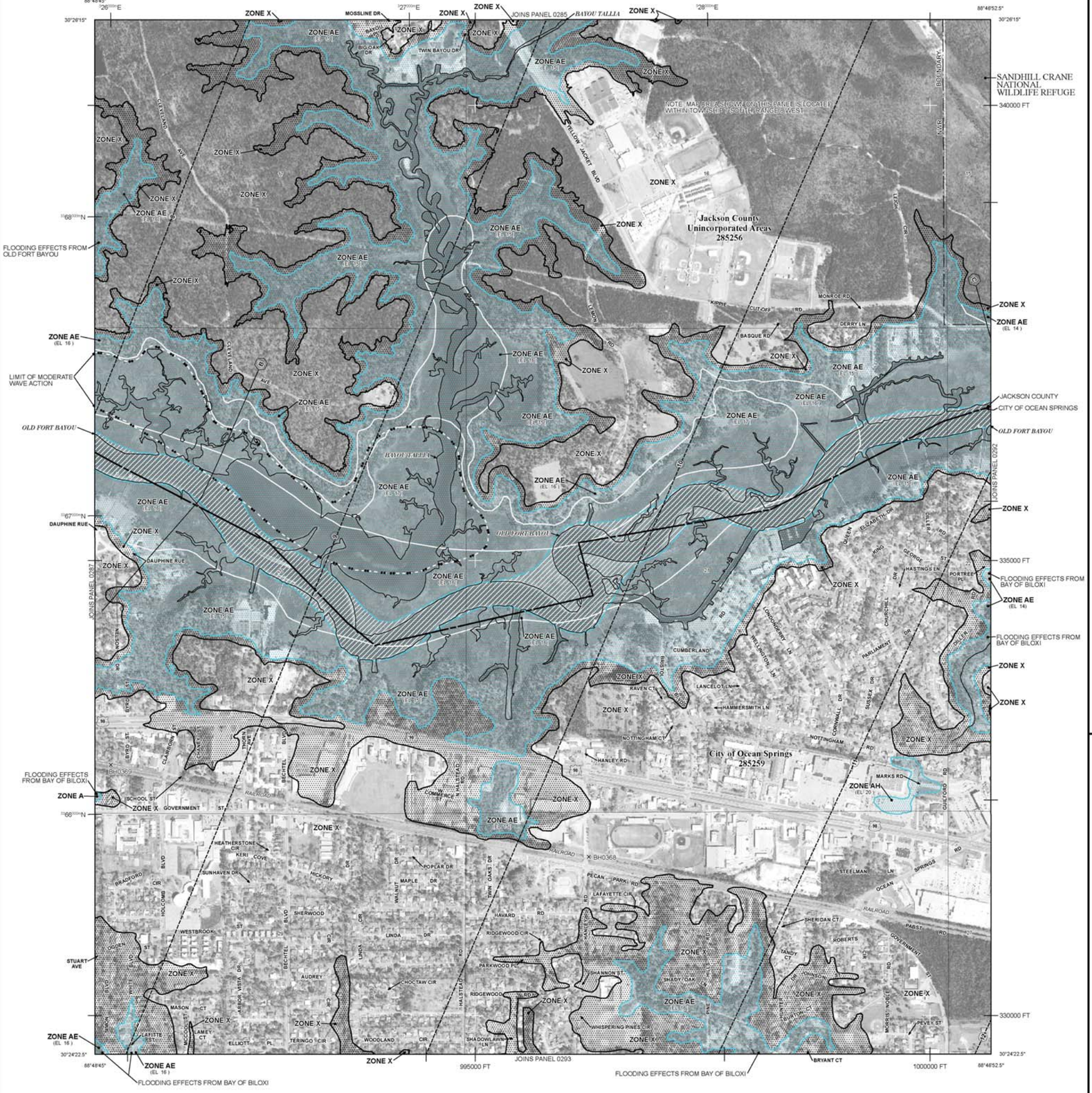
BH0368
BH0369



*PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- Limit of Moderate Wave Action Delineation
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 16
- 6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0291G

FIRM

FLOOD INSURANCE RATE MAP
JACKSON COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

PANEL 291 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0291	G
OCEAN SPRINGS, CITY OF	285259	0291	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0291G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Mississippi East FIPS Zone 2301. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services, NOAA, N/NGS12
National Geodetic Survey SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was provided in digital format by the State of Mississippi. This information was photogrammetrically compiled at a scale of 1:12,000 from aerial photography dated January 2006.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

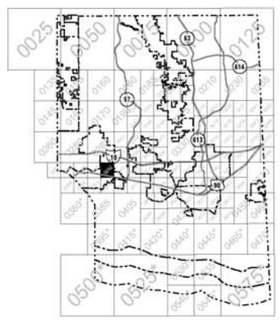
The AE Zone category has been divided by a **Limit of Moderate Wave Action (LiMWA)**. The LiMWA represents the approximate landward limit of the 1.5-foot breaking wave. Base flood conditions between the VE Zone and the LiMWA will be similar to, but less severe than those in the VE Zone.

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Elevation Reference Marks

BH0365
BH0367



*PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
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ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- Limit of Moderate Wave Action Delineation
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

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- 6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
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- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0292G

FIRM

FLOOD INSURANCE RATE MAP
JACKSON COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

PANEL 292 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0292	G
OCEAN SPRINGS, CITY OF	285259	0292	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0292G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

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The **projection** used in the preparation of this map was State Plane Mississippi East FIPS Zone 2301. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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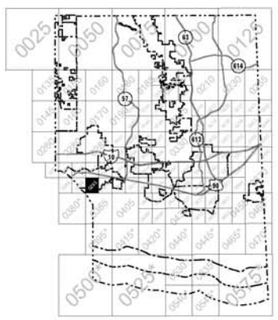
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Elevation Reference Marks



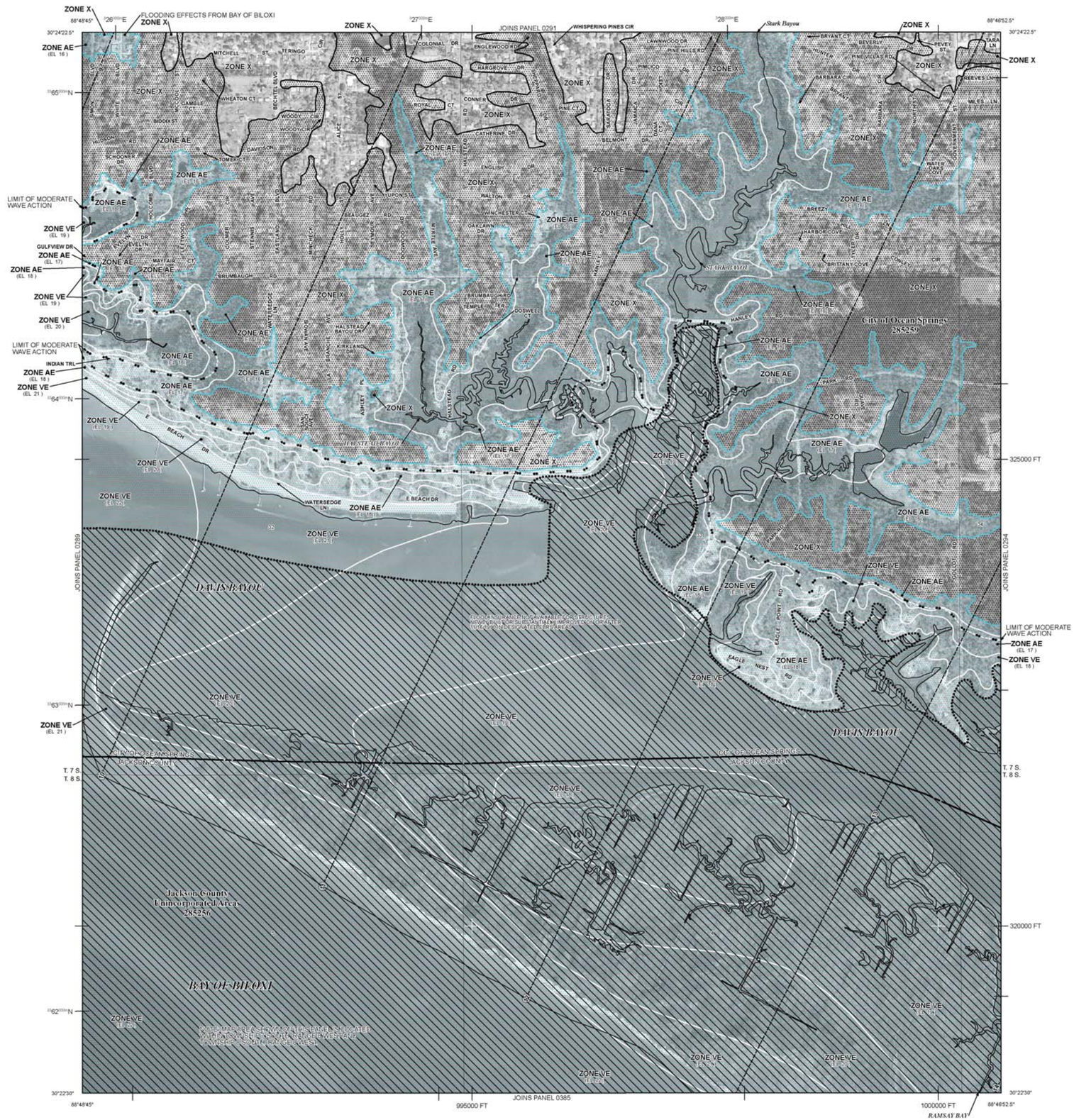
* PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

COASTAL BARRIER RESOURCES SYSTEM (CBRS)

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this FIRM were transferred from the official CBRS source map(s) for this area and are depicted on this FIRM for informational purposes only. The official CBRS maps are enacted by Congress via the Coastal Barrier Resources Act, as amended, and maintained by the U.S. Fish and Wildlife Service (FWS). The official CBRS maps used to determine whether or not an area is located within the CBRS are available for download at http://www.fws.gov. For an official determination of whether or not an area is located within the CBRS, or for any questions regarding the CBRS, please contact the FWS field office for this area at (601) 965-4900.

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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- **ZONE A** — No Base Flood Elevations determined.
- **ZONE AE** — Base Flood Elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
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- **ZONE V** — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

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- Limit of Moderate Wave Action Delineation
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

* Referred to the North American Vertical Datum of 1988

- (A) — (A) Cross section line
- (23) — (23) Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4775000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 16
- 6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
- DX5510 ✕ — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0293G

FIRM

FLOOD INSURANCE RATE MAP

JACKSON COUNTY, MISSISSIPPI

AND INCORPORATED AREAS

PANEL 293 OF 575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0293	G
OCEAN SPRINGS, CITY OF	285259	0293	G

NOTE:
THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION.

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0293G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

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Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

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National Geodetic Survey SSMC-3, #9202
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Silver Spring, Maryland 20910-3282
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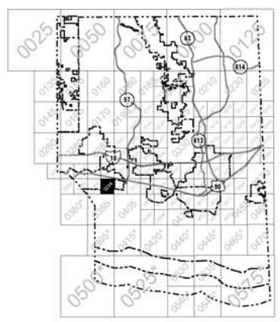
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Elevation Reference Marks

BH0359
BH0360
BH0361
BH0362
BH0364



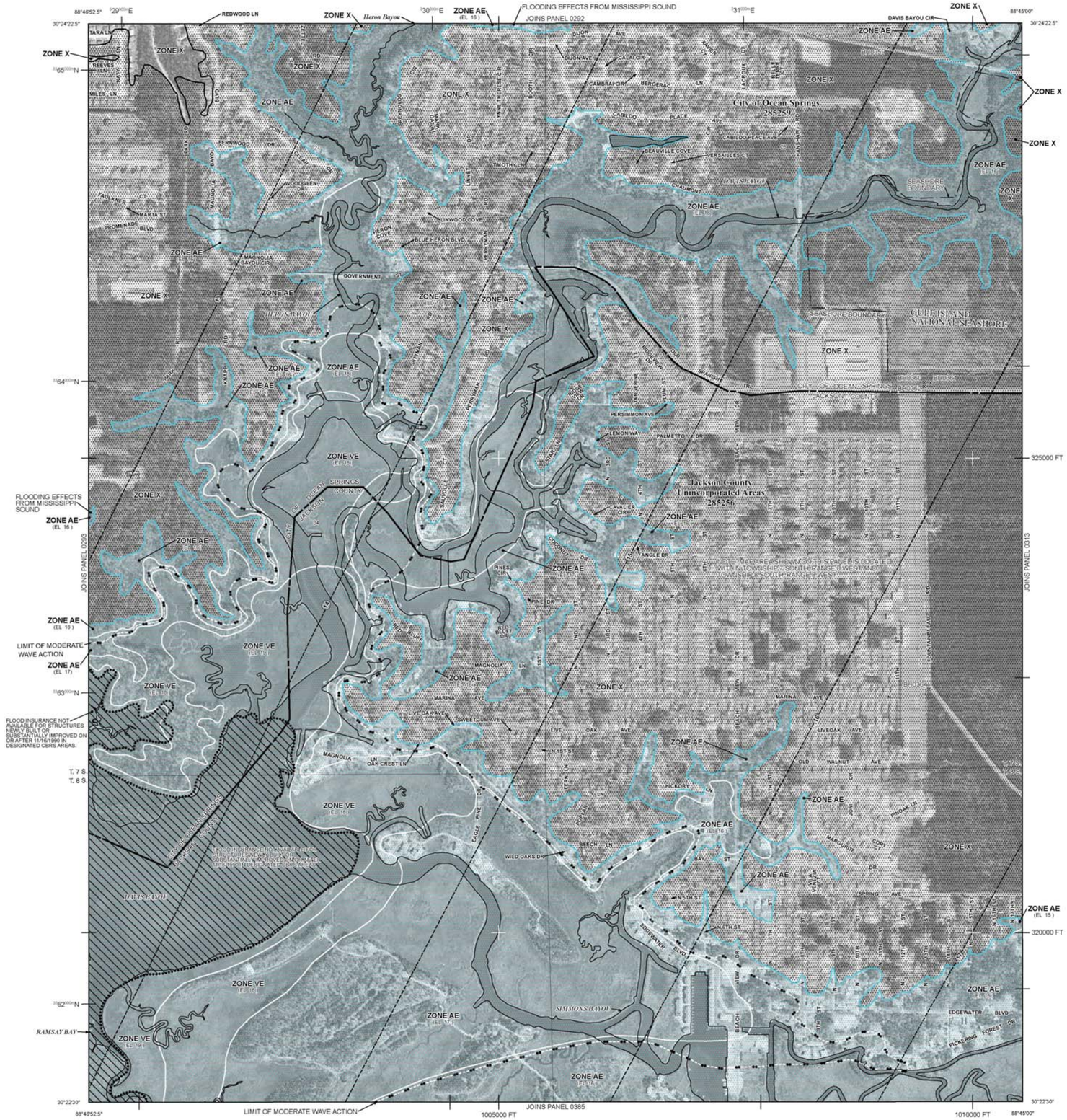
* PANEL NOT PRINTED.

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

COASTAL BARRIER RESOURCES SYSTEM (CBRS)

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this FIRM were transferred from the official CBRS source map(s) for this area and are depicted on this FIRM for informational purposes only. The official CBRS maps are enacted by Congress via the Coastal Barrier Resources Act, as amended, and maintained by the U.S. Fish and Wildlife Service (FWS). The official CBRS maps used to determine whether or not an area is located within the CBRS are available for download at http://www.fws.gov/. For an official determination of whether or not an area is located within the CBRS, or for any questions regarding the CBRS, please contact the FWS field office for this area at (601) 965-4900.

This map was produced through the Mississippi Flood Map Modernization Initiative, a cooperative partnership between the State of Mississippi and Department of Homeland Security - Federal Emergency Management Agency.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
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ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
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(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
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97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4275000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 16
6000000 FT — 5000-foot grid values: Mississippi State Plane coordinate system, East Zone (FIPSZONE = 2301), Transverse Mercator projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
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MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0294G

FIRM

FLOOD INSURANCE RATE MAP

JACKSON COUNTY, MISSISSIPPI

AND INCORPORATED AREAS

PANEL 294 OF 575

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0294	G
OCEAN SPRINGS, CITY OF	285259	0294	G

NOTE:
THIS MAP INCLUDES BOUNDARIES OF THE COASTAL BARRIER RESOURCES SYSTEM ESTABLISHED UNDER THE COASTAL BARRIER RESOURCES ACT OF 1982 AND/OR SUBSEQUENT ENABLING LEGISLATION.

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0294G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

NOTES TO USERS

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Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

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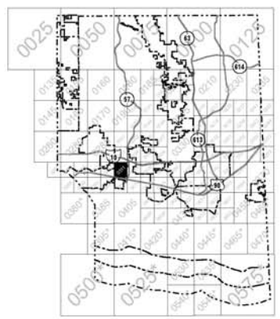
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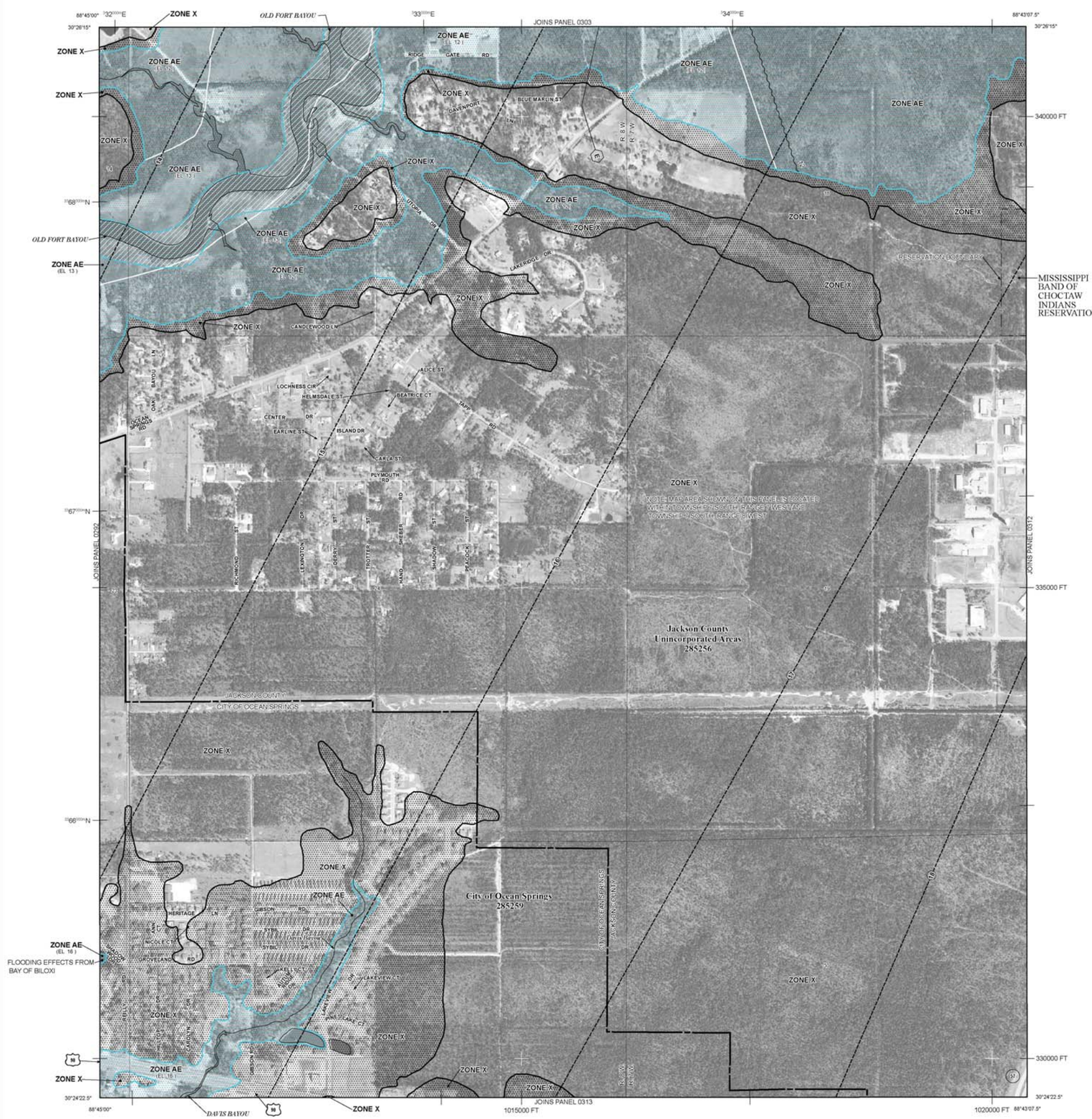
Elevation Reference Marks



* PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

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LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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FLOODWAY AREAS IN ZONE AE

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OTHER FLOOD AREAS

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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
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Zone D boundary
CBRS and OPA boundary
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513 — Base Flood Elevation line and value; elevation in feet*
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EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0311G

FIRM

FLOOD INSURANCE RATE MAP
JACKSON COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

PANEL 311 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0311	G
OCEAN SPRINGS, CITY OF	285259	0311	G

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MAP NUMBER
28059C0311G

EFFECTIVE DATE
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Federal Emergency Management Agency

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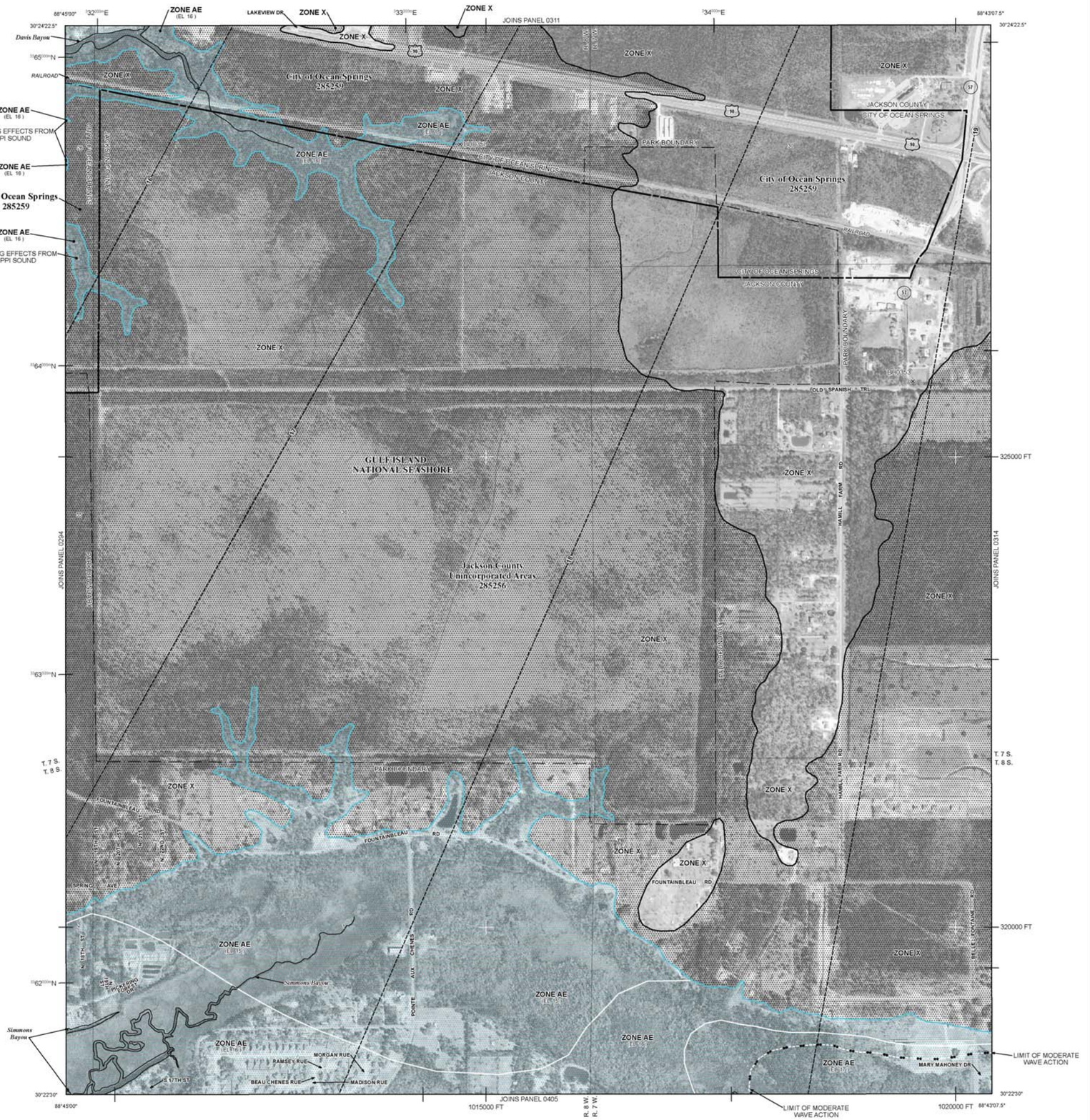
BH0353
BH0358



* PANEL NOT PRINTED

JACKSON COUNTY AND INCORPORATED COMMUNITIES
FIRM PANEL LOCATOR

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LEGEND

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MAP REPOSITORIES
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EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 16, 2009

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0313G

FIRM

FLOOD INSURANCE RATE MAP

JACKSON COUNTY, MISSISSIPPI
AND INCORPORATED AREAS

PANEL 313 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	285256	0313	G
OCEAN SPRINGS, CITY OF	285259	0313	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
28059C0313G

EFFECTIVE DATE
MARCH 16, 2009

Federal Emergency Management Agency

APPENDIX N

FINANCIAL CAPABILITY SUMMARY

FINANCIAL CAPABILITY SUMMARY

Loan Recipient City of Ocean Springs Date June 2017
Project Description

1. Estimated Construction Costs (See DWSIRLF Regs. Appendices A and B for allowable cost information.)

	Total	Eligible
Consolidation	$	$
Supply	$	$
Treatment	$	$
Storage	$	$
Distribution	$ 4,100,000.00	$ 4,100,000.00
Land Acquisitions	$	$
Planning & Design Phase Services	$ 275,000.00	$ 275,000.00
Construction Phase Services	$ 205,000.00	$ 205,000.00
Construction Contingency	$ 410,000.00	$ 410,000.00
Other( )	$ 10,000.00	$ 10,000.00
Subtotal	$ 5,000,000.00	$ 5,000,000.00
DWSIRLF Administrative Fee	$	$
a. Total	$ 5,000,000.00	$ 5,000,000.00

2. Estimated Annual Operation, Maintenance and Replacement (OM&R) Costs

Labor	$	Miscellaneous	$ 2,000.00
Utilities	$	a. Annual OM&R (new facilities)	$ 7,000.00
Materials	$5,000.00	b. Existing OM&R(carried over)	$1,686474.98
Outside Services	$	c. Total OM&R	$1,693,474.98
Equipment Replacement	$		

3. Funding Sources

Total Construction Costs (from 1.a)	$ 5,000,000.00
(-)DWSIRLF funding	$ 5,000,000.00
(-) Grants	$
(-) Other Loans	$
(-) Bonds	$
(-) Other	$

4. Long-term Financing

Financing Method	Amount	Interest Rate	Term of Maturity	Annual Payment
DWSIRLF Loan	$5,000,000.00	1.95%	20 yrs (up to 20)	$304,310.00
Other Loan	$	%	yrs	$
Bonds	$	%	yrs	$
Other	$	%	yrs	$

a. Total $ 304,310.00

5. Total Estimated Annual Costs

Existing Debt Service	
RUS (formerly FmHA)	$
Other	$ 423,812.04
New Facilities Debt Service (from 4.a)	$ 304,310.00
Total Annual O.M.&R (from 2.c)	$ 1,693,474.98
a. Total Annual Costs	$ 2,421,597.02

6. User Charges

a. Existing Monthly Rates

Usage (1000 gal)	Class 1	Class 2	Class 3
First ____ (or flat fee)	$_____	$_____	$_____
_____ to _____	_____$/1000 gal	_____$/1000 gal	_____$/1000 gal
_____ to _____	_____$/1000 gal	_____$/1000 gal	_____$/1000 gal
Over _____	_____$/1000 gal	_____$/1000 gal	_____$/1000 gal

b. Proposed Monthly Rates (if increase is proposed)

Usage (1000 gal)	Class 1	Class 2	Class 3
First ____ (or flat fee)	$_____	$_____	$_____
_____ to _____	_____$/1000 gal	_____$/1000 gal	_____$/1000 gal
_____ to _____	_____$/1000 gal	_____$/1000 gal	_____$/1000 gal
Over _____	_____$/1000 gal	_____$/1000 gal	_____$/1000 gal

c. Proposed Revenue

	Avg. Use (1000 gal/mo)	Avg. Bill ($/mo)	No. of Users	Revenue ($/mo)
Class 1		$19.94	7415	$147,855.00
Class 2		$51.92	799	$41,480.00
Class 3				
Subtotal				$189,335.00

ANNUAL TOTAL (Revenue Subtotal x 12) $2,272,000.00

7. Source of Funding for Annual Drinking Water Facilities Costs

User Charges (6.c TOTAL)	$ 2,272,000.00
Property Taxes	$
Other ( )	$ 167,000.00
Connection Fees	$ 60,000.00
Surcharges	$
Total (must exceed 5 TOTAL)	$ 2,499,000.00

8. Annual Cost Per Household

Total Annual Costs (from 5.a)	$2,272,000.00
Non-residential Share of Total	$497,760.00
Residential Share of Total	$1,774,240.00
Existing Households to be Served	7415
a. Average Annual Systemwide Cost Per Household	$306.41

9. High Cost Comparison

a. Annual cost per household (from 8.a)	$306.41
b. Median household income	$53,415.00
c. Percentage (a / b x 100)	0.57%
d. High cost threshold	1.5%
e. Is this a high cost project (Is 9.c greater than 9.d)?	NO

APPENDIX O

NEWSPAPER ADVERTISEMENT FOR PUBLIC HEARING

Publish in The Ocean Springs Gazette on 08/03/17

PUBLIC NOTICE

The City of Ocean Springs is applying for a $5,000,000.00 loan from the Drinking Water Systems Improvements Revolving Loan Program. The anticipated interest rate for the loan is 1.95%. In general, the proposed project includes improvements of approximately 217,500 linear feet of water mains ranging in size from 4" to 12" to provide improved service to existing customers within the City's boundary and installation of a new tie-in to the West Jackson County Utility District's water distribution system to provide for an emergency connection.

Copies of the facilities plan are available at Ocean Springs City Hall located at 1018 Porter Avenue, Ocean Springs, and will be available for review for the next 30 days. The public is invited to review, and voice any comments regarding the project alternatives, the environmental review documentation, and all other information included in the facilities plan. A public hearing will be scheduled for **September 5, 2017 at 2:00 p.m.** at Ocean Springs City Hall.

OCEAN SPRINGS GAZETTE
PROOF OF PUBLICATION

PUBLIC NOTICE

The City of Ocean Springs is applying for a $5,000,000.00 loan from the Drinking Water Systems Improvements Revolving Loan Program. The anticipated interest rate for the loan is 1.95%. In general, the proposed project includes improvements of approximately 217,500 linear feet of water mains ranging in size from 4" to 12" to provide improved service to existing customers within the City's boundary and installation of a new tie-in to the West Jackson County Utility District's water distribution system to provide for an emergency connection.

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Personally appeared before me, the undersigned authority, one

James Ricketts

known to me to be the Publisher of the OCEAN SPRINGS GAZETTE, a weekly newspaper published in Ocean Springs, Jackson County, Mississippi; who, having been by me duly sworn, states on oath that the notice, a true copy of which is annexed hereto, was published and appeared in the following issues of said newspaper:

Date 8/3/2017
Date _____
Date _____
Date _____
Date _____

Placed by:

James Douglass
JAMES DOUGLASS-WATER PLAN
Title

No. of Words 162 or

Size of Ad _____

Published 1 time(s)

Printer's Fee $ 19.44
Making Proof $ _____

Total $ 19.44

Signed _____

Sworn to and subscribed before me this 1st day of Sept, 2017.

_____
Notary Public

STATE OF MISSISSIPPI NOTARY PUBLIC ID # 103340 MELISSA NELL CEASAR Commission Expires Sept. 4, 2020 JACKSON COUNTY

APPENDIX P

MINUTES AND COMMENTS FROM PUBLIC HEARING

COMPTON ENGINEERING, INC.
ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

PASCAGOULA
BILOXI
BAY ST. LOUIS

MEMORANDUM

To: File

From: James M. Douglass, E.I. JMD

Date: September 29, 2017

Subject: City of Ocean Springs
Draft Facilities Plan for Water System Improvements
Public Hearing
(C.E. Job No.: 216-039.006)

A Public Hearing was held on September 5, 2017 regarding the above referenced project. No outside personnel were present at the Public Hearing and no comments were received.

PUBLIC HEARING
LIST OF ATTENDEES
FACILITIES PLAN FOR WATER SYSTEM IMPROVEMENTS
FOR
CITY OF OCEAN SPRINGS

SEPTEMBER 5, 2017 AT 2:00 P.M.

Representative/ Company Name	Address	Phone Numbers and Email Address
James Douglass Compton Engineering	1706 Convent Ave Pascagoula, MS	Office: (228) 762 - 3970 Fax: ( ) - Cell: (228) 627 - 3036 Email: jdouglass@comptonengineering.com
David Compton Compton Engineering	1706 Convent Ave Pascagoula, MS	Office: (228) 762 - 3970 Fax: ( ) - Cell: (228) 355 - 0390 Email: david@comptonengineering.com
James Foster City of Ocean Springs		Office: (228) 875 - 5395 Fax: ( ) - Cell: ( ) - Email:
		Office: ( ) - Fax: ( ) - Cell: ( ) - Email:
		Office: ( ) - Fax: ( ) - Cell: ( ) - Email:
		Office: ( ) - Fax: ( ) - Cell: ( ) - Email:
		Office: ( ) - Fax: ( ) - Cell: ( ) - Email:
		Office: ( ) - Fax: ( ) - Cell: ( ) - Email:
		Office: ( ) - Fax: ( ) - Cell: ( ) - Email:
		Office: ( ) - Fax: ( ) - Cell: ( ) - Email:

APPENDIX Q

RESPONSE TO COMMENTS FROM PUBLIC HEARING

COMPTON ENGINEERING, INC.
ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

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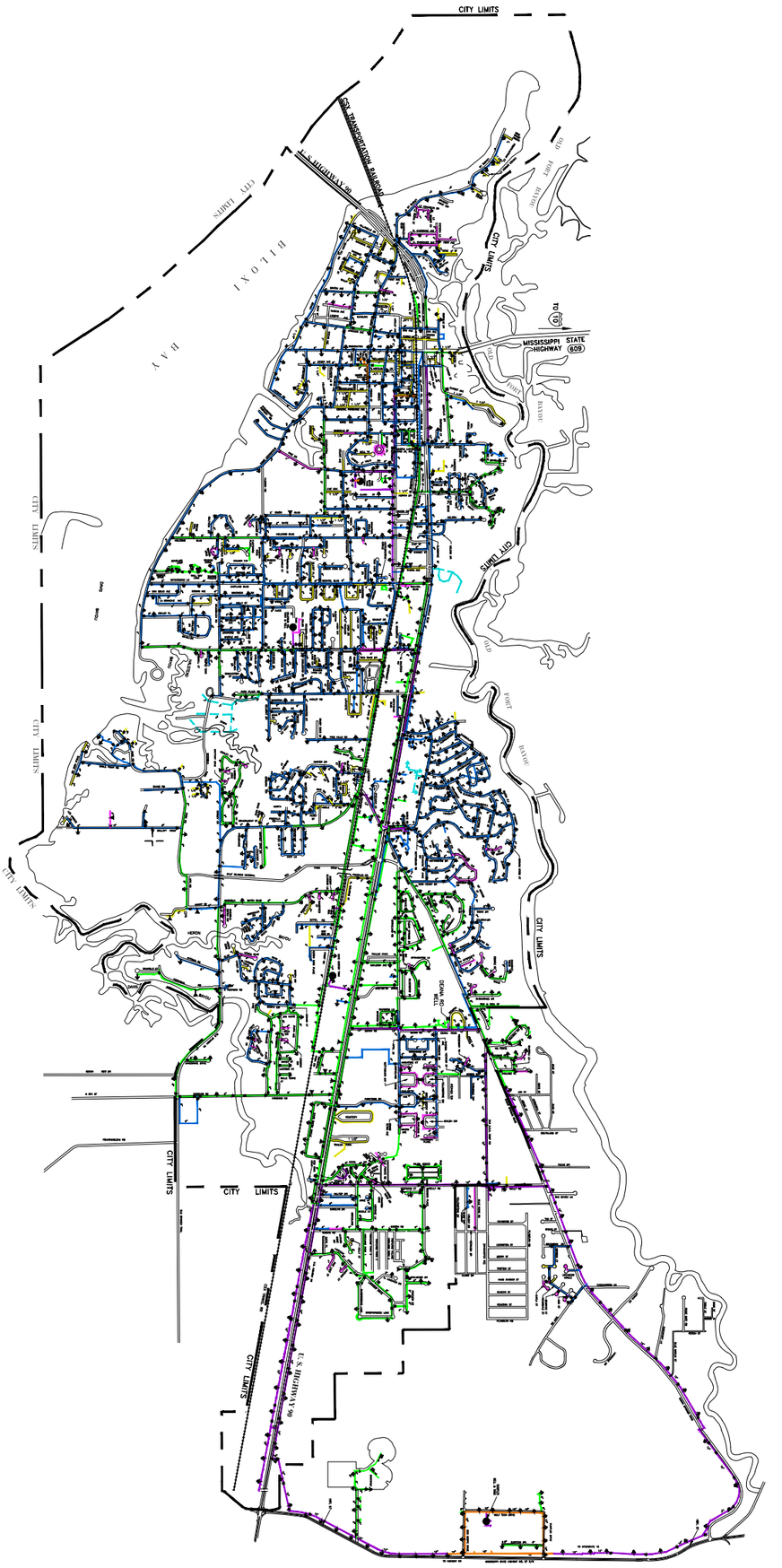
APPENDIX R

CITY OF OCEAN SPRINGS
BOUNDARIES

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DATE	DESCRIPTION	BY	APVD
02/25/17	ISSUED FOR REVIEW	JDL	JMD

NORTH



Rev. B

SHEET OF

APPENDIX R

VERIFY SCALES

BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY.

0 1"

SCALE:	1=2000
JOB NO.:	214-034.026
DATE:	FEBRUARY 2017
DSGN.:	JMD
DWG. BY:	JDL
CHK.:	
APVD.:	

CITY OF OCEAN SPRINGS
WATER SYSTEM MAP

WATER FACILITY MAP
BOUNDARIES

COMPTON ENGINEERING, INC.
Engineering, Surveying, and Environmental Services
1706 Convent Avenue
Pascagoula, Mississippi 39567
Phone: (228) 762-3970 Fax: (228) 769-9079
E-mail: compton@comptonengineering.com

APPENDIX S

LOAN ANALYSIS

Amortization Table

A simple amortization table covering 24 payment periods of a loan.
1) To use , change any of the values in the "inital data" area.
2) To print the table, just choose "Print" . The print area is defined.

Initial Data

LOAN DATA

Loan amount:	**5,000,000**
Annual interest rate:	1.95%
Term in years:	20
Payments per year:	1
First payment due:	1/1/2019

TABLE DATA

Table starts at date:	
or at payment number:	1

PERIODIC PAYMENT

Entered payment:		*The table uses the calc. payment amount*
Calculated payment:	**$304,310**	*unless you enter a value - "Entered payment".*

CALCULATIONS

Use payment of:	$304,310	Beginning balance at payment 1:	5,000,000
1st payment in table:	1	Cumulative interest prior to payment 1:	0.00

Table

No.	Payment Date	Beginning Balance	Interest	Principal	Ending Balance	Cumulative Interest
1	1/1/2019	5,000,000	97500.00	206810.13	4793189.87	97500.00
2	1/1/2020	4,793,190	93467.20	210842.93	4582346.94	190967.20
3	1/1/2021	4,582,347	89355.77	214954.36	4367392.58	280322.97
4	1/1/2022	4,367,393	85164.16	219145.97	4148246.61	365487.12
5	1/1/2023	4,148,247	80890.81	223419.32	3924827.28	446377.93
6	1/1/2024	3,924,827	76534.13	227776.00	3697051.29	522912.06
7	1/1/2025	3,697,051	72092.50	232217.63	3464833.66	595004.56
8	1/1/2026	3,464,834	67564.26	236745.87	3228087.78	662568.82
9	1/1/2027	3,228,088	62947.71	241362.42	2986725.37	725516.53
10	1/1/2028	2,986,725	58241.14	246068.98	2740656.38	783757.68
11	1/1/2029	2,740,656	53442.80	250867.33	2489789.05	837200.48
12	1/1/2030	2,489,789	48550.89	255759.24	2234029.81	885751.36
13	1/1/2031	2,234,030	43563.58	260746.55	1973283.26	929314.94
14	1/1/2032	1,973,283	38479.02	265831.11	1707452.15	967793.97
15	1/1/2033	1,707,452	33295.32	271014.81	1436437.34	1001089.28
16	1/1/2034	1,436,437	28010.53	276299.60	1160137.74	1029099.81
17	1/1/2035	1,160,138	22622.69	281687.44	878450.30	1051722.50
18	1/1/2036	878,450	17129.78	287180.35	591269.95	1068852.28
19	1/1/2037	591,269.95	11,529.76	292,780.37	298,489.58	1,080,382.04
20	1/1/2038	298,489.58	5,820.55	298,489.58	0.00	1,086,202.59

APPENDIX T

CITY OF OCEAN SPRINGS
BUDGET

Budgeted Revenue & Expenditures w/Encumbrances
2016 - 2017 Fiscal Year through March

Obj.	Description	Adjusted to Date	Encumbrance	Total	Annual Budget	Prorated Budget	50.00 Percent to Date	Unencumbered Balance
400-000	WATER FUND	ALL						
340	INTEREST EARNED							
360	METERED SALES	748,020.99		748,020.99	2,272,000.00	1,136,000.00	32.9	
361	OTHER SALES	19,769.00		19,769.00	80,000.00	40,000.00	24.7	
362	SERVICE CONNECTION CHARGES	23,629.79		23,629.79	60,000.00	30,000.00	39.3	
364	PENALTIES & LATE CHARGES	21,906.98		21,906.98	65,000.00	32,500.00	33.7	
394	SALE OF ASSETS							
397	BEGINNING CASH BALANCE				1,034,580.00	517,290.00		
399	OTHER INCOME	12,583.00		12,583.00	22,000.00	11,000.00	57.1*	
300 - 399	REVENUES	825,909.76		825,909.76	3,533,580.00	1,766,790.00	23.3	
	DEPT REVENUE TOTALS	825,909.76		825,909.76	3,533,580.00	1,766,790.00	23.3	
	DEPT DISBURSEMENT TOTALS							
400-650	WATER FUND	UTILITY BILLING & COLLECTION						
420	SALARIES	81,604.80		81,604.80	169,955.55	84,977.77	48.0	88,350.75
445	OVERTIME PAY	2,923.73		2,923.73	6,000.00	3,000.00	48.7	3,076.27
448	PERSONAL (TERMINAL) PAY							
449	COMP (TERMINAL) PAY							
460	STATE RETIREMENT-CITY'S SHARE	13,313.28		13,313.28	27,713.00	13,856.50	48.0	14,399.72
470	FICA TAXES - CITY'S SHARE	6,111.83		6,111.83	13,460.60	6,730.30	45.4	7,348.77
480	EMPLOYEE GROUP INSURANCE	17,563.40		17,563.40	35,348.16	17,674.08	49.6	17,784.76
491	WORKERS' COMPENSATION	4,033.43		4,033.43	4,033.43	2,016.71	100.0*	
400 - 499	PERSONAL SERVICES	125,550.47		125,550.47	256,510.74	128,255.36	48.9	130,960.27
500	OFFICE SUPPLIES	2,743.17	164.37	2,907.54	6,500.00	3,250.00	44.7	3,592.46
501	OFFICE FURNITURE & EQUIPMENT	179.99		179.99				-179.99
525	GAS AND OIL	2,486.03	21.95	2,507.98	6,000.00	3,000.00	41.7	3,492.02
549	SMALL TOOLS & EQUIPMENT	302.80	324.61	627.41	1,500.00	750.00	41.8	872.59
560	MATERIALS & SUPPLIES	901.00	29.85	930.85	1,500.00	750.00	62.0*	569.15
590	TIRES AND TUBES		732.42	732.42	1,000.00	500.00	73.2*	267.58
599	REPAIR PARTS & SUPPLIES				500.00	250.00		500.00
500 - 599	CONTRACTUAL SERVICES	6,612.99	1,273.20	7,886.19	17,000.00	8,500.00	46.3	9,113.81
600	CONTRACTUAL SERVICES	11,347.31		11,347.31	30,380.00	15,190.00	37.3	19,032.69
602	COMPUTER SOFTWARE & SUPPORT	2,822.76	1,058.19	3,880.95	2,500.00	1,250.00	155.2*	-1,380.95
605	TELEPHONE	2,850.46		2,850.46	6,500.00	3,250.00	43.8	3,649.54
606	POSTAGE	13,240.49	80.00	13,320.49	43,205.25	21,602.62	30.8	29,884.76
635	GENERAL REPAIRS & MAINTENANCE	373.26	276.30	649.56	2,000.00	1,000.00	32.4	1,350.44
655	WATER METERS AND REPLACEMENT	28,329.97	15,120.00	43,449.97	54,400.00	27,200.00	79.8*	10,950.03
688	DUES/MEMBERSHIPS/SUBSCRIPTIONS	30.00		30.00	600.00	300.00	5.0	570.00

Budgeted Revenue & Expenditures w/Encumbrances
2016 - 2017 Fiscal Year through March

Obj.	Description	Adjusted to Date	Encumbrance	Total	Annual Budget	Prorated Budget	50.00 Percent to Date	Unencumbered Balance
400-650 WATER FUND	UTILITY BILLING & COLLECTION							
695	UNIFORM ALLOWANCES & SERVICE	549.04	111.98	661.02	1,839.32	919.66	35.9	1,178.30
698	CASH OVER/SHORT	-26.35		-26.35				26.35
699	OTHER SERVICES & CHARGES	184.94	74.94	259.88	250.00	125.00	103.9*	-9.88
600 - 699	CONSUMABLE SUPPLIES	59,701.88	16,721.41	76,423.29	141,674.57	70,837.28	53.9*	65,251.28
730	MACHINERY & EQUIPMENT							
700 - 799	GRANTS & SUBSIDIES							
	DEPT REVENUE TOTALS							
	DEPT DISBURSEMENT TOTALS	191,865.34	17,994.61	209,859.95	415,185.31	207,592.64	50.5*	205,325.36
400-677 WATER FUND	UTILITY OPERATIONS							
420	SALARIES	99,415.20		99,415.20	215,738.02	107,869.01	46.0	116,322.82
429	FESTIVAL OVERTIME							
445	OVERTIME PAY	12,488.83		12,488.83	18,000.00	9,000.00	69.3*	5,511.17
448	PERSONAL (TERMINAL) PAY							
449	COMP (TERMINAL) PAY							
460	STATE RETIREMENT-CITY'S SHARE	17,624.92		17,624.92	36,813.74	18,406.87	47.8	19,188.82
470	FICA TAXES - CITY'S SHARE	8,345.10		8,345.10	17,880.96	8,940.48	46.6	9,535.86
480	EMPLOYEE GROUP INSURANCE	15,830.52		15,830.52	36,856.68	18,428.34	42.9	21,026.16
491	WORKERS' COMPENSATION	6,495.15		6,495.15	6,495.15	3,247.57	100.0*	
400 - 499	PERSONAL SERVICES	160,199.72		160,199.72	331,784.55	165,892.27	48.2	171,584.83
525	GAS AND OIL	9,903.44	1,064.41	10,967.85	20,000.00	10,000.00	54.8*	9,032.15
541	CHEMICALS	7,941.00	18,000.00	25,941.00	30,601.00	15,300.50	84.7*	4,660.00
549	SMALL TOOLS & EQUIPMENT	3,656.85		3,656.85	5,170.98	2,585.49	70.7*	1,514.13
560	MATERIALS & SUPPLIES	1,722.90	475.19	2,198.09	2,650.58	1,325.29	82.9*	452.49
575	UTILITY SYSTEMS PARTS & SPLYS	65,228.91	12,082.16	77,311.07	112,895.00	56,447.50	68.4*	35,583.93
590	TIRES AND TUBES	784.96		784.96	3,284.96	1,642.48	23.8	2,500.00
599	REPAIR PARTS & SUPPLIES	2,710.40	730.85	3,441.25	19,541.40	9,770.70	17.6	16,100.15
500 - 599	CONTRACTUAL SERVICES	91,948.46	32,352.61	124,301.07	194,143.92	97,071.96	64.0*	69,842.85
600	CONTRACTUAL SERVICES	5,400.00		5,400.00	15,000.00	7,500.00	36.0	9,600.00
601	ENGINEER PROFESSIONAL SERVICES	25,004.78		25,004.78	65,965.20	32,982.60	37.9	40,960.42
605	TELEPHONE	1,695.62		1,695.62	4,200.00	2,100.00	40.3	2,504.38
610	TRAVEL/TRAINING/SEMINARS	891.74	37.50	929.24	5,000.00	2,500.00	18.5	4,070.76
630	UTILITIES	50,651.16		50,651.16	125,000.00	62,500.00	40.5	74,348.84
635	GENERAL REPAIRS & MAINTENANCE	39,602.88	34,720.69	74,323.57	100,189.81	50,094.90	74.1*	25,866.24
640	RENTALS							

Budgeted Revenue & Expenditures w/Encumbrances
2016 - 2017 Fiscal Year through March

Obj.	Description	Adjusted to Date	Encumbrance	Total	Annual Budget	Prorated Budget	50.00 Percent to Date	Unencumbered Balance
400-677 WATER FUND	UTILITY OPERATIONS							
641	CSX EASEMENTS	100.00		100.00	3,000.00	1,500.00	3.3	2,900.00
680	WATER SERVICE JCUA	37,807.87		37,807.87	130,000.00	65,000.00	29.0	92,192.13
688	DUES/MEMBERSHIPS/SUBSCRIPTIONS				3,000.00	1,500.00		3,000.00
695	UNIFORM ALLOWANCES & SERVICE	1,275.98		1,275.98	3,568.91	1,784.45	35.7	2,292.93
699	OTHER SERVICES & CHARGES							
600 - 699	CONSUMABLE SUPPLIES	162,430.03	34,758.19	197,188.22	454,923.92	227,461.95	43.3	257,735.70
720	IMPROVEMENTS OTHER THAN BLDGS							
726	WATER EXTENSIONS	185.00		185.00	60,000.00	30,000.00	.3	59,815.00
728	WATER SYSTEM IMPROVEMENTS	94,456.90	23,837.00	118,293.90	145,701.00	72,850.50	81.1*	27,407.10
730	MACHINERY & EQUIPMENT	24,466.27		24,466.27	84,736.28	42,368.14	28.8	60,270.01
736	RESTORE ACT ENGINEERING							
700 - 799	GRANTS & SUBSIDIES	119,108.17	23,837.00	142,945.17	290,437.28	145,218.64	49.2	147,492.11
	DEPT REVENUE TOTALS							
	DEPT DISBURSEMENT TOTALS	533,686.38	90,947.80	624,634.18	1,271,289.67	635,644.82	49.1	646,655.49
400-800 WATER FUND	DEBT SERVICE							
800	PRINCIPAL	144,613.80		144,613.80	339,609.03	169,804.51	42.5	194,995.23
810	INTEREST	28,916.30		28,916.30	84,203.01	42,101.50	34.3	55,286.71
840	PAYING AGENT FEES							
800 - 899	DEBT SERVICE	173,530.10		173,530.10	423,812.04	211,906.01	40.9	250,281.94
	DEPT REVENUE TOTALS							
	DEPT DISBURSEMENT TOTALS	173,530.10		173,530.10	423,812.04	211,906.01	40.9	250,281.94
400-999 WATER FUND	TRANSFER TO OTHER FUNDS							
900	TRANSFER TO OTHER FUNDS				223,292.00	111,646.00		223,292.00
901	TRF TO GENERAL FUND				200,000.00	100,000.00		200,000.00
955	ENDING CASH BALANCE				1,000,000.98	500,000.49		1,000,000.98
900 - 999	CAPITAL OUTLAY & OTHER				1,423,292.98	711,646.49		1,423,292.98
	DEPT REVENUE TOTALS							
	DEPT DISBURSEMENT TOTALS				1,423,292.98	711,646.49		1,423,292.98
	FUND REVENUE TOTALS	825,909.76		825,909.76	3,533,580.00	1,766,790.00	23.3	
	FUND DISBURSEMENT TOTALS	899,081.82	108,942.41	1,008,024.23	3,533,580.00	1,766,789.96	28.5	2,525,555.77
	REPT REVENUE TOTALS	825,909.76		825,909.76	3,533,580.00	1,766,790.00	23.3	
	REPT DISBURSEMENT TOTALS	899,081.82	108,942.41	1,008,024.23	3,533,580.00	1,766,789.96	28.5	2,525,555.77

Budgeted Revenue & Expenditures w/Encumbrances
2016 - 2017 Fiscal Year through March

Obj.	Description	Adjusted to Date	Encumbrance	Total	Annual Budget	Prorated Budget	50.00 Percent to Date	Unencumbered Balance
410-000	SEWER	ALL						
283	SECTION 592 SEWER REHAB				600,099.36	300,049.68		
200 - 299	REVENUES				600,099.36	300,049.68		
340	INTEREST EARNED							
362	SERVICE CONNECTION CHARGES	14,826.66		14,826.66	55,000.00	27,500.00	26.9	
363	SEWER CHARGES	1,016,412.48		1,016,412.48	3,151,000.00	1,575,500.00	32.2	
364	PENALTIES & LATE CHARGES	32,435.74		32,435.74	98,000.00	49,000.00	33.0	
382	TRANSFER FROM FUND 400				223,292.00	111,646.00		
394	SALE OF ASSETS							
397	BEGINNING CASH BALANCE				-262,668.00	-131,334.00		
399	OTHER INCOME				1,000.00	500.00		
300 - 399	REVENUES	1,063,674.88		1,063,674.88	3,265,624.00	1,632,812.00	32.5	
	DEPT REVENUE TOTALS	1,063,674.88		1,063,674.88	3,865,723.36	1,932,861.68	27.5	
	DEPT DISBURSEMENT TOTALS							
410-650	SEWER	UTILITY BILLING & COLLECTION						
420	SALARIES							
445	OVERTIME PAY							
449	COMP (TERMINAL) PAY							
460	STATE RETIREMENT-CITY'S SHARE							
470	FICA TAXES - CITY'S SHARE							
480	EMPLOYEE GROUP INSURANCE							
491	WORKERS' COMPENSATION							
400 - 499	PERSONAL SERVICES							
501	OFFICE FURNITURE & EQUIPMENT							
525	GAS AND OIL				500.00	250.00		500.00
560	MATERIALS & SUPPLIES				500.00	250.00		500.00
500 - 599	CONTRACTUAL SERVICES				1,000.00	500.00		1,000.00
600	CONTRACTUAL SERVICES	21,184.00		21,184.00	11,000.00	5,500.00	192.5*	-10,184.00
602	COMPUTER SOFTWARE & SUPPORT				1,000.00	500.00		1,000.00
606	POSTAGE	13,034.89		13,034.89	38,205.25	19,102.62	34.1	25,170.36
635	GENERAL REPAIRS & MAINTENANCE				5,000.00	2,500.00		5,000.00
600 - 699	CONSUMABLE SUPPLIES	34,218.89		34,218.89	55,205.25	27,602.62	61.9*	20,986.36
730	MACHINERY & EQUIPMENT							

Budgeted Revenue & Expenditures w/Encumbrances
2016 - 2017 Fiscal Year through March

Obj.	Description	Adjusted to Date	Encumbrance	Total	Annual Budget	Prorated Budget	50.00 Percent to Date	Unencumbered Balance
410-650 SEWER	UTILITY BILLING & COLLECTION							
700 - 799	GRANTS & SUBSIDIES							
DEPT REVENUE TOTALS								
DEPT DISBURSEMENT TOTALS		34,218.89		34,218.89	56,205.25	28,102.62	60.8*	21,986.36
410-677 SEWER	UTILITY OPERATIONS							
420	SALARIES	111,394.40		111,394.40	242,602.67	121,301.33	45.9	131,208.27
429	FESTIVAL OVERTIME	989.34		989.34				-989.34
445	OVERTIME PAY	2,283.59		2,283.59	10,000.00	5,000.00	22.8	7,716.41
448	PERSONAL (TERMINAL) PAY	728.13		728.13				-728.13
449	COMP (TERMINAL) PAY							
460	STATE RETIREMENT-CITY'S SHARE	18,174.73		18,174.73	39,784.92	19,892.46	45.6	21,610.19
470	FICA TAXES - CITY'S SHARE	8,453.80		8,453.80	19,324.10	9,662.05	43.7	10,870.30
480	EMPLOYEE GROUP INSURANCE	23,642.36		23,642.36	51,818.52	25,909.26	45.6	28,176.16
491	WORKERS' COMPENSATION	9,828.31		9,828.31	9,828.31	4,914.15	100.0*	
400 - 499	PERSONAL SERVICES	175,494.66		175,494.66	373,358.52	186,679.25	47.0	197,863.86
525	GAS AND OIL	2,374.24	3,238.37	5,612.61	10,000.00	5,000.00	56.1*	4,387.39
541	CHEMICALS	31,170.04	60,066.22	91,236.26	73,340.12	36,670.06	124.4*	-17,896.14
549	SMALL TOOLS & EQUIPMENT				3,300.00	1,650.00		3,300.00
560	MATERIALS & SUPPLIES	1,205.07	15.00	1,220.07	2,218.57	1,109.28	54.9*	998.50
575	UTILITY SYSTEMS PARTS & SPLYS	31,453.35	11,611.85	43,065.20	67,177.16	33,588.58	64.1*	24,111.96
590	TIRES AND TUBES	565.05		565.05	3,000.00	1,500.00	18.8	2,434.95
599	REPAIR PARTS & SUPPLIES	4,140.39	1,455.81	5,596.20	21,085.22	10,542.61	26.5	15,489.02
500 - 599	CONTRACTUAL SERVICES	70,908.14	76,387.25	147,295.39	180,121.07	90,060.53	81.7*	32,825.68
600	CONTRACTUAL SERVICES	5,400.00		5,400.00	13,000.00	6,500.00	41.5	7,600.00
601	ENGINEER PROFESSIONAL SERVICES	27,457.66		27,457.66	55,902.02	27,951.01	49.1	28,444.36
605	TELEPHONE	368.59		368.59	3,000.00	1,500.00	12.2	2,631.41
610	TRAVEL/TRAINING/SEMINARS	984.74		984.74	5,000.00	2,500.00	19.6	4,015.26
630	UTILITIES	47,283.23		47,283.23	118,000.00	59,000.00	40.0	70,716.77
635	GENERAL REPAIRS & MAINTENANCE	43,400.16	15,104.69	58,504.85	80,060.00	40,030.00	73.0*	21,555.15
640	RENTALS							
641	CSX EASEMENTS	1,188.73		1,188.73	1,300.00	650.00	91.4*	111.27
680	WATER SERVICE JCUA	830,123.84		830,123.84	2,036,000.00	1,018,000.00	40.7	1,205,876.16
688	DUES/MEMBERSHIPS/SUBSCRIPTIONS				1,000.00	500.00		1,000.00
695	UNIFORM ALLOWANCES & SERVICE	1,217.48		1,217.48	4,157.41	2,078.70	29.2	2,939.93
699	OTHER SERVICES & CHARGES							
600 - 699	CONSUMABLE SUPPLIES	957,424.43	15,104.69	972,529.12	2,317,419.43	1,158,709.71	41.9	1,344,890.31

Budgeted Revenue & Expenditures w/Encumbrances
2016 - 2017 Fiscal Year through March

Obj.	Description	Adjusted to Date	Encumbrance	Total	Annual Budget	Prorated Budget	50.00 Percent to Date	Unencumbered Balance
410-677 SEWER	UTILITY OPERATIONS							
717	SEWER EXTENSIONS							
718	SEWER IMPROVEMENTS	73,471.04	8,329.00	81,800.04	316,743.34	158,371.67	25.8	234,943.30
730	MACHINERY & EQUIPMENT	11,810.29		11,810.29	57,561.29	28,780.64	20.5	45,751.00
736	RESTORE ACT ENGINEERING	7,197.85		7,197.85	27,450.00	13,725.00	26.2	20,252.15
759	CDBG-DEQ WATER SEWER							
790	SECTION 592 SEWER REHAB	33,429.13	1,855.00	35,284.13	42,039.89	21,019.94	83.9*	6,755.76
700 - 799	GRANTS & SUBSIDIES	125,908.31	10,184.00	136,092.31	443,794.52	221,897.25	30.6	307,702.21
DEPT REVENUE TOTALS								
DEPT DISBURSEMENT TOTALS		1,329,735.54	101,675.94	1,431,411.48	3,314,693.54	1,657,346.74	43.1	1,883,282.06
410-800 SEWER	DEBT SERVICE							
800	PRINCIPAL	58,464.55		58,464.55	141,348.00	70,674.00	41.3	82,883.45
810	INTEREST	17,582.05		17,582.05	19,042.00	9,521.00	92.3*	1,459.95
800 - 899	DEBT SERVICE	76,046.60		76,046.60	160,390.00	80,195.00	47.4	84,343.40
DEPT REVENUE TOTALS								
DEPT DISBURSEMENT TOTALS		76,046.60		76,046.60	160,390.00	80,195.00	47.4	84,343.40
410-999 SEWER	TRANSFER TO OTHER FUNDS							
901	TRF TO GENERAL FUND				200,000.00	100,000.00		200,000.00
927	TRANSFER TO 405 SEWER ELECTRIC				77,123.00	38,561.50		77,123.00
955	ENDING CASH BALANCE				57,311.57	28,655.78		57,311.57
900 - 999	CAPITAL OUTLAY & OTHER				334,434.57	167,217.28		334,434.57
DEPT REVENUE TOTALS								
DEPT DISBURSEMENT TOTALS					334,434.57	167,217.28		334,434.57
FUND REVENUE TOTALS		1,063,674.88		1,063,674.88	3,865,723.36	1,932,861.68	27.5	
FUND DISBURSEMENT TOTALS		1,440,001.03	101,675.94	1,541,676.97	3,865,723.36	1,932,861.64	39.8	2,324,046.39
REPT REVENUE TOTALS		1,063,674.88		1,063,674.88	3,865,723.36	1,932,861.68	27.5	
REPT DISBURSEMENT TOTALS		1,440,001.03	101,675.94	1,541,676.97	3,865,723.36	1,932,861.64	39.8	2,324,046.39

CITY OF OCEAN SPRINGS
LOAN PAYMENT SCHEDULE
2016-2017

NAME	Loan	Interest	Start Date	Maturity	Monthly	Principal	Interest	10/01/16	09/30/17
State Revolving Loan Loan DWI-H280035-03 400-800-800 400-800-810	1,943,294.00	1.95%	April 2010	Nov 2029	$ 9,920.50	$ 92,936.29	$ 26,109.71	$ 1,381,405.69	$ 1,288,469.40
MS Dev Auth Cap #2 Civic Center/Halstead Water Tanks Loan 0-282-CP-01 400-800-800 400-800-810	273,115.00	3%	Oct. 2001	Sept. 2021	$ 1,514.68	$ 15,864.17	$ 2,311.99	$ 84,297.96	$ 69,774.03
State Revolving Loan - Water deduct from Sales Tax DWI-H280035-01-3 400-800-800 400-800-810	634,072.00	3%	May 2001	Feb 2023	$ 3,549.06	$ 37,827.07	$ 4,761.65	$ 175,965.63	$ 138,138.56
Drinking Water Sys Improvement DWI-H280035-02-0 deduct from Sales Tax 400-800-800 400-800-810	1,054,818.00	3.5%	July 2004	April 2026	$ 6,171.05	$ 53,834.60	$ 20,218.00	$ 602,175.56	$ 548,340.96
MS Development Authority Loan 9-282-CP-01 400-800-800 400-800-810	500,000.00	3%	April 2001	March 2021	$ 2,772.97	$ 29,481.36	$ 3,794.28	$ 139,914.66	$ 110,433.30
State Revolving Loan Loan DWI-H280035-04 400-800-800 400-800-810	1,029,345.00	1.95%	Dec 2008	Aug 2028	$ 5,236.61	$ 50,266.61	$ 12,572.71	$ 677,712.51	$ 617,445.90
MS Development Authority Loan 0466 400-800-800 400-800-810	$ 328,752.00	2%	Sept 2010	Dec 2027	$ 1,871.60	$ 18,102.72	$ 4,356.48	$ 227,582.46	$ 209,509.86
State Revolving Loan Loan DWI-H280035-05 400-800-800 400-800-810	835,711.00	1.95%	Nov 2008	May 2028	$ 4,281.20	$ 41,296.21	$ 10,078.19	$ 535,690.89	$ 494,394.68
						$ 339,609.03	**$ 84,203.01**		

NAME	Loan	Interest	Start Date	Maturity	Monthly	Principal	Interest	10/01/16	09/30/17
State Revolving Loan - Sewer deduct from Sales Tax SRF-C280752-01-3 410-800-800 410-800-810	1,100,100.00	4.5%	June 1998	Jan 2018	$ 8,077.00	$ 93,196.42	$ 3,727.58	$ 125,203.83	$ 32,007.41
Water Pollution Control Emergency Deduct from Sales Tax SRF-C280752-02-2 410-800-800 410-800-810	1,059,133.00	2%	Apr. 2013	Dec. 2032	$ 5,288.82	$ 48,151.95	$ 15,313.89	$ 897,080.37	$ 848,928.42
						$ 141,348.37	**$ 19,041.47**		

APPENDIX U

MISSISSIPPI DEPARTMENT OF HEALTH

COMPTON ENGINEERING, INC.
Engineering, Surveying & Environmental Services

Post Office Box 686
Pascagoula, Mississippi 39568-0686
Phone (228) 762-3970
Fax (228) 769-9079
compton@comptonengineering.com

LETTER OF TRANSMITTAL

PROJECT:

**CITY OF OCEAN SPRINGS –
WATER FACILITIES PLAN**

TO: **VIA FEDERAL EXPRESS**

Mr. Ulysses Conley
DWSIRLF Program Support Specialist
MSDH – Bureau of Public Water Supply
P.O. Box 1800
Jackson, MS 39215-1700

DATE: May 10, 2017

CE PROJECT NUMBER: **216-039.006**

WE ARE SENDING:
☐ Plans ☐ Specifications ☐ Letter ☐ Prints
☐ Addendums ☐ Change Orders ☐ Field Orders ☐ Drawings ☐ Photos
☐ Attached ☑ Other _____

COPIES	DATE	NO.	DESCRIPTION	
1			**Original** DWSIRLF Request for Ranking and Consideration for Funding Form for your review and comment or approval.	

Transmitted: ☐ For signature ■ For your use ☐ As requested ☐ Sign and return

Remarks:	

pc: File

NOTE: Submittal and shop drawing review is for general compliance with the contract documents. No responsibility is assumed for correctness of dimensions, quantities or details.

By: _____
W. Andrew Douglass, P.E.
Project Engineer

RECEIVED BY:

_____ _____
Name Date

If attachments are not as noted, please advise at once.

This transmittal is confidential and is intended solely for the use of the recipient (the part to whom it is addressed). This message may contain material protected by the attorney-client privilege. If you are not the intended recipient, be advised that you have received this transmittal in error and that any use, dissemination, forwarding, printing, or copying of this transmittal is strictly prohibited.

DWSIRLF Request for Ranking and Consideration for Funding

1. Federal Fiscal Year (FFY) Ranking/Funding Desired (Check one):

FFY-2015 (10/01/14-09/30/15)	FFY-2016 (10/01/15-09/30/16)	FFY-2017 (10/01/16-09/30/17)
_____	_____	X

2. Entity (Water Assoc, District, Town, City, etc.) Requesting Ranking:

PWS Name and ID: City of Ocean Springs (300005)
Contact Person: James Foster
Entity Name: City of Ocean Springs
Address: P.O. Box 1800
Ocean Springs, MS 39566

Phone: 228-875-4236
Fax: 228-875-9671
E-mail: jfoster@oceansprings-ms.gov

3. Entity's Consulting Engineer:

Contact Person: David Compton / Andy Douglass
Firm Name: Compton Engineering, Inc.
Address: P.O. Box 686
Pascagoula, MS 39568-0686

Phone: 228-762-3970
Fax: 228-769-9079
E-mail: david@comptonengineering.com
adouglass@comptonengineering.com

4. Entity's Legal Counsel:

Contact Person: Kevin Melchi
Firm Name: Dogan & Wilkinson
Address: 734 Delmas Avenue
Pascagoula, MS 39568-1618

Phone: 228-762-2272
Fax: 228-762-3223
E-mail: kmelchi@dwwattorneys.com

5. Population (Entire service area):	6. # of Connections / # of Population (Affected by proposed project):	7. # of Existing Wells (System-wide):
21,000	1700 / 5300	11

8. Zip Codes (List all served by the drinking water facilities):

39564, 39566

9. Project Purpose/Need Categories (Check all that apply):

___ a) Primary Drinking Water Stds. Compliance	X g) Rehab/Replacement of Existing Facilities
___ b) Back-up Well or Emergency Tie-in	___ h) Fluoride Addition
___ c) Pressure Deficiencies	___ i) Secondary Drinking Water Stds. Compliance
___ d) Source Water Protection	___ j) Consolidation
X e) Service to Existing Unserved Areas	___ k) Other (Explain):
X f) Additional Supply Needs	

10. Project Description:

The project generally includes increasing diameter for existing water mains throughout the City ranging in size from 4" to 14". The project also includes a new energy tie in to West Jackson County Utility District to improve system pressures and capacity in outlying areas.

11. Consolidation Eligibility

a) Is there an existing regional water supply infrastructure available in the area that could meet the needs proposed by the project? _____ Yes ___X___ No

b) If a) is yes, has the system requesting DWSIRLF Funding researched the possibility of using the regional infrastructure? _____ Yes _____ No ___X___ N/A

c) If b) is yes, was it determined that using the regional infrastructure is economically and technically feasible? ____ Yes ____ No ___X___ N/A

Note: If the water supply requesting DWSIRLF funding is in a county with a utility authority, approval of the proposed project by the utility authority may be necessary.

Local Governments and Rural Water Systems Improvements Board

Local Governments and Rural Water Systems Improvements Board

12. Estimated Project Cost Breakdown:

	Total Project Cost	Other Funding	[Other Source]	DWSIRLF Loan
Construction Cost	$ 4,100,000	$ N/A	[N/A]	$ 4,100,000
Construction Contingency (10%)	$ 4,100,000	$ N/A	[N/A]	$ 4,100,000
Planning/Design Services	$ 275,000	$ N/A	[N/A]	$ 275,000
Construction Phase Services	$ 205,000	$ N/A	[N/A]	$ 205,000
Equipment, Supplies, and Testing	$ 10,000	$ N/A	[N/A]	$ 10,000
Total Eligible Cost	$ 5,000,000	$ N/A	[N/A]	$ 5,000,000

13. Project Scheduling Information:

Desired Date of Loan Award: January 2018

Desired Construction Start Date: February 2018

Estimated Construction Time: 360 days (Calendar Days)

14. Assertions:

- This request for ranking and consideration for DWSIRLF funding has been authorized by, and is hereby submitted to the Board on behalf of, the entity specified in Item 2, above.
- It is understood that, for the above described project to be appropriately ranked and considered by the Board for funding in a given Fiscal Year (FY), a complete DWSIRLF facilities plan (including all intergovernmental review comments, a transcript of the public hearing comments, plan revisions pursuant to comments, and a summary of how each comment was addressed) must be submitted by the facilities plan deadline for that FY. (Projects for which that deadline is not met, will be listed on the "future planning" portion of the Priority List for that FY.)
- It is understood that, if the requesting entity has existing debt with Rural Utilities Service (RUS), formerly Farmers Home Administration, a copy of the DWSIRLF facilities plan should be submitted to RUS with a request for their approval to incur this additional debt.
- It is understood that the requirements of the DWSIRLF Regulations must be met during all phases (planning, design, construction, etc.) of the project.

James C. Hadley 2
Signature

Interim Director of Public Works
Title

May 9, 2017
Date

Ranking Form Guidelines

The following are instructions for completion of the request for ranking and consideration for funding form

1. Please indicate which Federal fiscal year funding is requested for each project.
2. PWS ID, system name, name of responsible official, address, phone number(s), and email address of person authorized by entity to request ranking.
3. Name, address, phone number(s), and email address of entity's registered engineer(s) on the project, if known.
4. Name, address, phone number(s), and email address of entity's legal counsel who will assist with land acquisition, if known.
5. Indicate the current population in the loan applicant's service area.
6. Indicate the number of connections and population which will benefit from this drinking water project for which ranking is requested.
7. Indicate the number of existing wells utilized by the system.
8. Identify all zip code areas that are served by the drinking water facility.
9. Indicate the purpose of the project by checking the appropriate box based on the project descriptions below:
   a) Projects to facilitate compliance with Primary Drinking Water Standards. To qualify for this category projects must correct deficiencies resulting in non-compliance with the primary drinking water standards.
   b) Projects to provide additional supply to systems that have neither a back-up well nor an emergency tie-in, that is MSDH approved, to another system to ensure safe drinking water, and thereby protecting the health of the existing population.
   c) Projects to correct deficiencies that result in existing system failing to maintain minimum acceptable dynamic pressure (20 psi). (Documentation of these problems must be included in the facilities plan.)
   d) Source Water Protection Projects- Projects to manage potential sources of contaminants/ pollutants and/or prevent contaminants/pollutants from reaching sources of drinking water as approved by the MDEQ Groundwater Planning Branch.
   e) Projects to either expand existing system capacity or construct a new drinking water system to ensure safe drinking water (source, treatment and/or distribution) to serve existing residences/businesses in currently unserved areas.
   f) Projects to provide additional supply to systems with insufficient back-up water supply sources to ensure safe drinking water, and thereby protect the health of the existing population. As a minimum, a system using ground water should be able to lose any one of the wells supplying the system and still maintain minimum acceptable dynamic pressure throughout the entire system.
   g) Projects to rehabilitate, replace, protect, or upgrade deteriorated, worn, aged or obsolete equipment, facilities, etc., in order to assure continued, dependable operation of water systems where such systems are already meeting Primary Drinking Water Standards.
   h) Projects that either rehabilitate existing fluoride treatment facilities at well or treatment plant sites, or add new facilities to existing well or treatment plants.
   i) Projects to provide treatment that brings systems into compliance with Secondary Drinking Water Standards.
   j) Projects to consolidate ownership and management of separate existing systems into a single system for purposes other than included in a) through h) above. Consolidation projects are for the purpose of promoting reliability, efficiency and economy of scale that can be achieved with larger water systems.
   k) Other - Projects that do not meet the criteria of any other listed category, and have been determined loan eligible in accordance with the DWSIRLF loan program regulations.

Please Note: Projects that are primarily for future growth, development and/or fire protection are not eligible projects under this Program's federal regulations and cannot be funded.

10. Provide a brief description of the drinking water facilities project for which ranking is requested. If two or more priority categories were checked in project categories, please describe the scope of work for each priority category indicated.
11. Indicate with the water system has the ability to have its requested infrastructure needs through consolidation with a surrounding utility authority rather than pursue funding for the proposed project. The system may be required to provide a letter of approval for the proposed project in the event that a consolidation is not considered feasible.
12. Provide a brief cost breakdown of the proposed project. While there is no limit to funding amount, the Board may decide to set a funding limit to prevent a majority of funds being distributed to one entity. To aid in the determination of eligible cost, please use current DWSIRLF loan program regulations.
13. If known, please indicate the desired date of the loan award. The date selected should be between October 1st of the present year and September 30th of the following year. Additionally, please indicate the desired construction start date and the anticipated construction time required in calendar days.
14. This is a certification that the authorized official acknowledges that a completed facilities plan is required in order to be ranked within the priority system. This certification is also a reminder that DWSRF Regulations must be complied with from the planning through the construction process of projects.
15. After completion, mail to the attention of:
    Ulysses Conley
    DWSIRLF Program Support Specialist
    MSDH – Bureau of Public Water Supply
    P.O. Box 1700
    Jackson, MS 39215-1700
    Email: ulysses.conley@msdh.ms.gov

RECEIVED
MAY 15 2017

MISSISSIPPI STATE DEPARTMENT OF HEALTH

May 10, 2017

City of Ocean Springs
c/o James Foster, Director of Public Works
P.O. Box 1800
Ocean Springs, MS 39566

Re: DWSIRLF Program FY2017-FY2018 Funding Request
City of Ocean Springs
Replace Water Mains/Tie-in with WJCUD

Dear Mr. Foster:

We have received your request for ranking and consideration for funding on the FY-2017 Priority System List under the Drinking Water Systems Improvements Revolving Loan Fund (DWSIRLF) Program. Enclosed is a copy of the DWSIRLF facilities planning guidance. We encourage you and your consulting engineer to immediately review this guidance. Ana Yamat, a project manager from our office, will contact the engineer listed on your Ranking Form by May 24, 2017 to arrange a pre-planning conference to address any questions you may have. This will ensure that the facilities planning effort is begun in a timely manner in order that you may meet the following schedule established by the Local Governments and Rural Water Systems Improvement Board:

- By July 1, 2017: Submit a draft DWSIRLF facilities plan to all Intergovernmental Review (IGR) agencies for their review and comments.

- By August 1, 2017: Advertise and conduct a DWSIRLF facilities plan public hearing.

- By October 1, 2017: Submit the complete DWSIRLF facilities plan including all IGR agency comments, proof of publication for the public hearing advertisement, a transcript of the public hearing comments, copies of any other comments received from the public, and a summary of how each comment was addressed. As you know, if this deadline is not met, your project may not be considered for funding during 2017.

Included with this letter are the facilities plan checklist, EPA 4700-4 Form, and a Green Consideration Form to aid in plan preparation. The additional forms required for the loan application process are available on our website www.healthyms.com/dwsrf. If you require hardcopies of these documents please let us know.

We appreciate your interest in the DWSIRLF program. Please Contact Ana Yamat at (601) 576-7518 if you need any assistance in your effort to construct this project.

Sincerely,

Ulysses Conley, MPPA
DWSRF Program Support Specialist
Bureau of Public Water Supply

Enclosures: Facilities Plan Checklist; EPA Form 4700-4; Green Consideration Form
cc: Compton Engineering, Inc. – David Compton/Andy Douglass, P. E.
File

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Mr. Ulysses Conley
DWSIRLF Program Support Specialist
MSDH – Bureau of Public Water Supply
P.O. Box 1700
Jackson, MS 39215-1700

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Conley:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

October 3, 2017

Ms. Anna Yamat, E.I.
Mississippi Department of Health
P.O. Box 1700
Jackson, MS 39215-1700

Re: City of Ocean Springs
Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Ms. Yamat:

Enclosed please find a revised Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements addressing comments received from agency review, for your review and comment.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

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APPENDIX V

EPA FORM 4700-4

Approved By OMB: No. 2030-0020 Expires 06-30-2017

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read instructions on other side before completing form.

I.	Applicant/Recipient (Name, Address, State, Zip Code).	DUNS No.
	City of Ocean Springs, P.O. Box 1800, Ocean Springs, MS 39566	04-787-9747

II. Is the applicant currently receiving EPA assistance?

No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7. See instructions on reverse side.)

None

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective action taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7. See instructions on reverse side.)

None

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

None

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

Yes ✓ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b). Yes No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. § 7.70) applies. Yes No

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its programs or activities? (40 C.F.R. § 5.140 and § 7.95) ✓ Yes No

a. Do the methods of notice accommodate those with impaired vision or hearing? ✓ Yes No

b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications? ✓ Yes No

c. Does the notice identify a designated civil rights coordinator? Yes ✓ No

VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. § 7.85(a))

Demographic data is obtained from the Census Bureau

IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)

No request has been made. We would seek a translator if requested.

X. If the applicant/recipient is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

ADA Coordinators HR & Risk Mgmt Director Mindy McDowell and Building Official Hilliard Fountain

XI. If the applicant/recipient is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet address for, or a copy of, the procedures.

No

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
James C. Heath, Jr.	Interim Director of Public Works	9-28-2017

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized EPA Official	B. Title of Authorized EPA Official	C. Date
See * note on reverse side		

EPA Form 4700-4 (Rev. 06/2014). Previous editions are obsolete.

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General

Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.

Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment).

Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities.

Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities.

The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission.

Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution.

40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972.

40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973.

The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items

"Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25.

"Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25.

"Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed.

"Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability.

Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission.

If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable."

In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification.

* Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

"Burden Disclosure Statement"

EPA estimates public reporting burden for the preparation of this form to average 30 minutes per response. This estimate includes the time for reviewing instructions, gathering and maintaining the data needed and completing and reviewing the form. Send comments regarding the burden estimate, including suggestions for reducing this burden, to U.S. EPA, Attn: Collection Strategies Division (MC 2822T), Office of Information Collection, 1200 Pennsylvania Ave., NW, Washington, D.C. 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503.

The information on this form is required to enable the U.S. Environmental Protection Agency to determine whether applicants and prospective recipients are developing projects, programs and activities on a nondiscriminatory basis as required by the above statutes and regulations.

APPENDIX W

CITY OF OCEAN SPRINGS
COMMENTS AND RESPONSE

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Mr. James Foster, Interim Public Works Director
City of Ocean Springs
P.O. Box 1800
Ocean Springs, MS 39566-1800

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Foster:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

P.O. Box 1800
Ocean Springs, MS
39566-1800

1018 Porter Avenue
Ocean Springs, MS 39564

PH 228.875.4236
FX 228.875.7249

Shea Dobson
Mayor

Bobby Cox
Alderman at Large

John Gill
Alderman Ward 1

Rickey Authement
Alderman Ward 2

Joseph Bellman, Jr.
Alderman Ward 3

Ken Papania
Alderman Ward 4

Robert Blackman
Alderman Ward 5

Michael (Mike) Impey, II
Alderman Ward 6

City Clerk
228.875.4236

Police Chief
228.875.2211

Fire Chief
228.872.4407

Public Works
228.875.3955

Community
Development and
Planning
228.875.4415

Human Resources
and Risk Management
228.872.3338

Parks and
Leisure Services
228.875.8665

City of Ocean Springs

September 18, 2017

Mr. James M. Douglass, E.I.
Compton Engineering, Inc.
P.O. Box 686
Pascagoula, MS 39568-0686

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water System Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Douglass:

The City of Ocean Springs has completed their review of the above referenced facilities plan for Drinking Water System Improvements in Ocean Springs, MS and has no comments at this time.

If you have any questions, please advise.

Sincerely,

James C. Foster

James Foster
City of Ocean Springs
Interim Public Works Director

APPENDIX X

JACKSON COUNTY UTILITY AUTHORITY

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
P.O. Box 686
Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

June 20, 2017

Mr. Chase Glisson, P.E.
Jackson County Utility Authority
1225 Jackson Avenue
Pascagoula, MS 39567

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Glisson:

Enclosed please find a draft Facilities Plan for the City of Ocean Springs Drinking Water Systems Improvements. The improvements consist of the replacement of water distribution lines and the installation of an emergency connection with the West Jackson County Utility District distribution system. All proposed distribution lines will be constructed within existing right-of-ways, easements, or City-owned properties. This program replaces existing lines that are undersized or past their design life and improves water distribution capability.

Funding for this project through the Mississippi Drinking Water Systems Improvements Revolving Loan Fund Program (DWSIRLF) is imperative; therefore, we request that your office review the attached Facilities Plan and forward your comments back to me within 30 days.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure

PASCAGOULA

BILOXI

BAY ST. LOUIS

JACKSON COUNTY UTILITY AUTHORITY

Serving the People...Protecting the Environment

Directors
Kevin Coggin ▪ Jackson County
Tommy Eldridge ▪ Jackson County
Andrew J. Elly ▪ Moss Point
Kevin Miller ▪ Jackson County
Michael R. Murphy ▪ Pascagoula
Ken Papania ▪ Ocean Springs
Marshall Smith ▪ Gautier

RECEIVED

AUG 01 2017

July 28, 2017

Doc #41054

Mr. James Douglass, E.I.
Compton Engineering, Inc.
P.O. Box 686
Pascagoula, MS 39568

RE: City of Ocean Springs
Draft Facilities Plan for Drinking Water System Improvements

Dear Mr. Douglass,

The Authority is in receipt of the proposed Facilities Plan for Drinking Water System Improvements dated June 2017 for the City of Ocean Springs. As the planning and coordination entity for water and sewer systems within the geographic area of Jackson County, the Authority requests the following information be included in the facility plan or provided to the Authority for clarification:

1. Emergency Connection via WJCUD
   - Confirmation the proposed connection will indeed be an emergency connection as defined under Part V, Section B.6-C of the MSDH's Minimum Design Criteria for Mississippi Public Water Systems.

     The Authority has an obligation to notify the City that Regional Water Supply, funded by the Gulf Water & Wastewater Plan, is available and could be extended to an area of need if requested by the City.
   - Will serve letter from West Jackson County Utility District confirming District has capacity available to meet City's need.
   - Copy of terms & conditions, including resolution between both parties for proposed emergency connection.
   - MSDH correspondence confirming their awareness of the proposed emergency connection.

2. Service Agreement for Water Supply
   - As a reminder and in accordance to the Water Service & Supply Contract with the Authority, the City shall provide an updated Water Needs Plan detailing its needs for the next five (5) years.

Upon receipt of the requested items, the Authority can complete review and comment of the proposed facility plan.

Sincerely,

Chase Glisson, P.E.
Engineering Manager, JCUA

cc: Mr. James Foster, Public Works Director – City of Ocean Springs
Mrs. Wendy Ferrill, MSDH Bureau of Public Water Supply
Mr. Tommy Fairfield, Jr. – Executive Director, JCUA

COMPTON ENGINEERING, INC.

ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES

1706 Convent Avenue
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Pascagoula, MS 39568

Phone: 228.762.3970
Fax: 228.769.9079

comptonengineering.com

PASCAGOULA

BILOXI

BAY ST. LOUIS

September 18, 2017

Mr. Chase Glisson, P.E.
Jackson County Utility Authority
1225 Jackson Avenue
Pascagoula, MS 39567

Re: City of Ocean Springs
Draft Facilities Plan for Drinking Water Systems Improvements
(C.E. Job No.: 216-039.006)

Dear Mr. Glisson:

In response to your letter dated July 28, 2017, regarding the above referenced project, please see the responses to request for additional information below:

1. Emergency Bypass Connection via WJCUD
   - Confirmation the proposed connection will indeed be an emergency connection as defined under Part V, Section B.6-C of the MSDH's Minimum Design Criteria for Mississippi Public Water Systems.
     - The work proposed by this facilities plan is still in the preliminary planning phase. Once the facilities plan has received approval and moves into the design phase, all necessary steps will be undertaken to ensure that the MSDH guidelines for proposed emergency connections are met, as outlined in the referenced section of the Minimum Design Criteria.
   - Will serve letter from West Jackson County Utility District confirming District has capacity available to meet City's need.
     - The work proposed by this facilities plan is still in the preliminary planning phase. Preliminary discussions have been held between WJCUD and the City of Ocean Springs regarding the emergency connection. As the proposed connection goes through the design phase and a concept is agreed upon, a will-serve letter can be provided to the Authority for review.
   - Copy of terms & conditions, including resolution between both parties for proposed emergency connection.
     - The work proposed by this facilities plan is still in the preliminary planning phase. Preliminary discussions have been held between WJCUD and the City of Ocean Springs regarding the emergency connection. These discussions will continue during the design phase. Once a final concept is agreed upon and a resolution is put in-place, the resolution can be provided to the Authority for review.

- MSDH correspondence confirming their awareness of the proposed emergency connection.
    - The proposed emergency connection is included in the referenced Facilities Plan for Drinking Water Systems Improvements, which is funded through the MSDH. The facilities plan has been submitted to the MSDH for review and comment or approval.

2. Service Agreement for Water Supply
    - As a reminder and in accordance to the Water Service & Supply Contract with the Authority, the City shall provide an updated Water Needs Plan detailing its needs for the next five (5) years.
        - The City does not currently foresee any change in its water supply needs, outside of the work proposed in this facilities plan, within the next five years. If necessary, the City can prepare and provide an updated Water Needs Plan outside the scope of this facilities plan.

If you have any questions, please advise.

Sincerely,

COMPTON ENGINEERING, INC.

James M. Douglass, E.I.
Project Manager

Enclosure