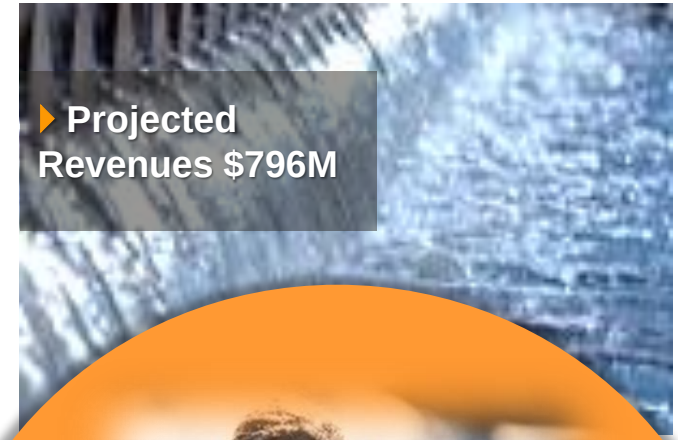
WASD Risk & Resilience Assessment and Emergency Response Plan

Outcomes & Lessons Learned

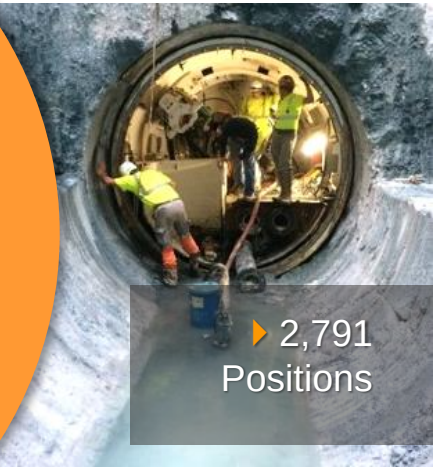
Water Utility Resilience and Risk to Climate Change Impacts
September 25, 2020

FLORIDA Water & Climate Alliance

MIAMI-DADE COUNTY



Serving
Over 2.3
Million
Residents



MIAMI-DADE COUNTY
miami-dade water

Risk & Resilience Assessment and Emergency Response Milestones and Timeline

TEAM

Internal — Staff from all areas and levels of the department

External — Department of Homeland Security

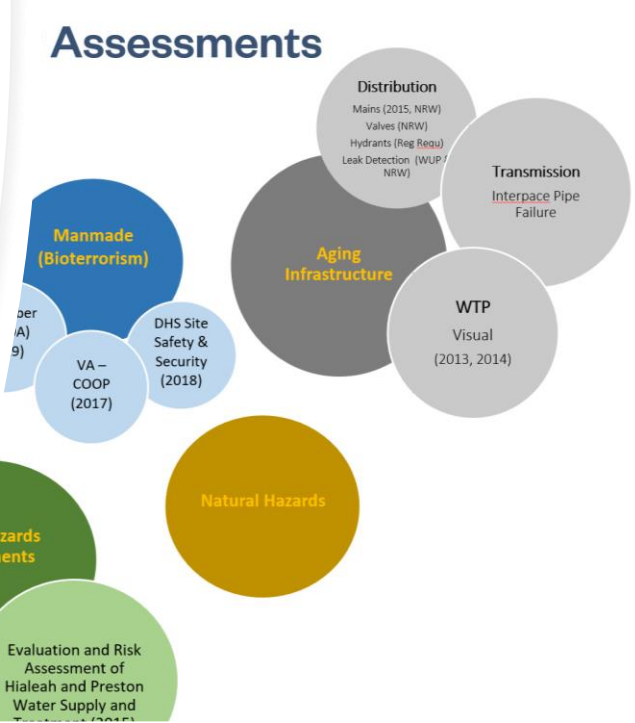
County Office of Emergency Management

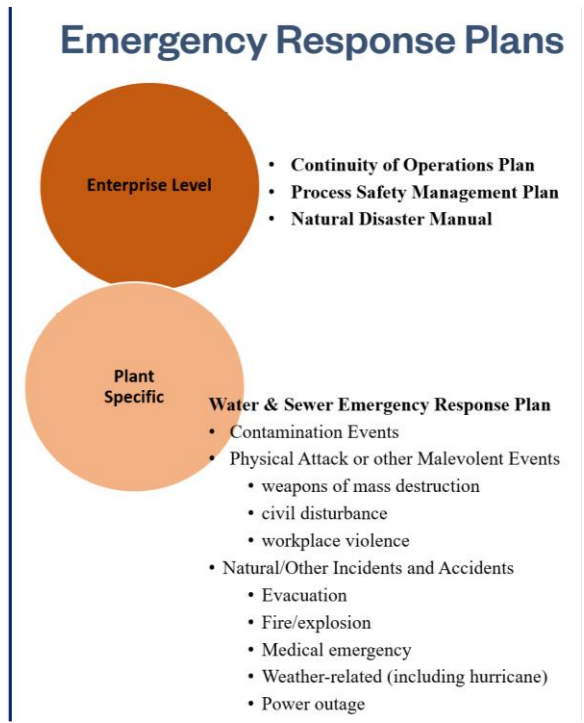
Engineering Firms: Hazen

LAUNCH! CONSULTING

Challenges

- The usual fate of planning documents
- The fate of sensitive documents
- The abundance of assessments and response plans
- Organizational silos
- Change of leadership





Approach & Benefits beyond AWIA Compliance

Approach

- Build the plan with the people that carry it out
- Capture institutional knowledge and opinions from all levels of the organization
- Align and connect other plans

Benefits

- Participants learn from others that are not part of their “branch” but make up their forest
- Build a risk aware culture - inform staff of the latest information on threats and risks:
  - Sea level rise and storm surge flood modeling
  - ground/surface water modeling related to salt water intrusion, PFAS contamination
- Review concerns that keep us up at night and analyze as part of whole system
- Justify needs for those projects that just can’t get traction

Operators, Technicians, Chemists, Geologists, Engineers, Planners, Trainers, Accountants, IT experts, Security, Communications, and more……..

Kicked off in January 2020

6 planned in-person workshops
to
30+ Zoom and Teams Sessions

WE ADAPT

R = C x V x T

Where:

- R = Risk
- C = Consequence ($)
- V = Vulnerability (0 to 1)
- T = Threat Likelihood (0 to 1)

Metric	High	Medium	Low	Negligible	None (or does not apply)	Basis for Calculation
Consequence Value	4	3	2	1	0	
Fatalities, Serious Injuries, Sickness						his category of onsequence was provided y staff during Workshop 2.
Financial Loss to Utility (Based on available reserves)						his category of onsequence was provided y staff during Workshop 2.
Economic Loss to Region (1/365 of Regional GDP)						his category of onsequence was provided y staff during Workshop 2.
Consumer Confidence						his category of onsequence was provided y staff during Workshop 2.
Time to Restore Service						his category of onsequence was provided y staff during Workshop 2.
Critical Customers, Service Area, Inhibiting National Defense	Population Served	Population Served	Population Served	Served		his category of onsequence was provided y staff during Workshop 2.

Asset Name	C	New C	V
[redacted] Well Field	[redacted]	[redacted]	0.90

Fatalities/Serious Injuries or Sickness
Financial Loss to Utility (Based on Available Reserves)
Economic Loss to Region (1/365 of Regional GDP)
Consumer Confidence
Time to Restore Service
Critical Customers, Service Area, Inhibiting National Defense

Describe both the issue and the consequence to the system:	PFAS and PAH issues at [redacted] are impacting the groundwater supply. Add chronice illness to fatalities /illnesses, add a range for longterm illnesses
What protections/mitigation measures exist today?	Saltwater front monitoriting; water quality testing; alternate groundwater sources (Medley, Miami Springs) Minimal physical security measures in place to prevent intentional contamination scenario

Some High Risk Threats

Aging Infrastructure

Human Error
(lack of knowledge or contractor error)

Loss of Staff

Hurricane

Flooding

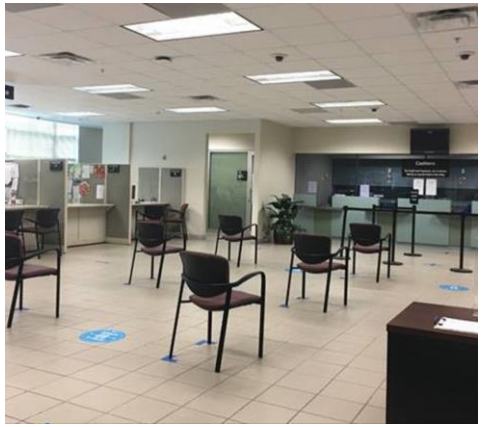
Loss of Supply

Measure Highlights:

- Increase automation of plants
- Increase predictive maintenance through enhanced asset management, including a champion
- Upgrade electrical distribution systems
- Enhance emergency procurement

Findings:
Our Threats
Our Incident Action Plans

- Hurricane / Tropical Storms
- Pipe Break: Distribution System
- Pipe Break: Raw Water Line
- Destruction / Sabotage of Water System
- Active Assailant
- Possible Contamination & Confirmed Contamination
- Electrical Failure
- Fire / Explosion
- Pandemic
- Loss of Communication Systems
- Loss of SCADA / Monitoring Failure
- Wellfield Contamination: ASR and Production Wells
- Civil Disturbance
- Dry Periods (Water Shortage)



Prepare
Respond
Recover

DRAFT: *Large Diameter Pipe Break – Distribution System* Incident Action Checklist

Name of Event: _____

Date of Event: _____

Prepare

✓	Task	Required Resources	Resource Location	Responsible Personnel
Pre-Incident Preparation				
□	Exercise interconnects with other WTP (Make sure valves are functional - valve exercise program).			Operations - Water Distribution
□	Maintain on-call emergency contracts with pipeline repair contractors – especially for those tasks that exceed in-house repair capabilities.			Planning
□	Maintain stock of common pipeline and valve sizes.			Water Distribution
□	Keep up-to-date and familiarize with GIS system tracing tool to identify IDs valves to close if a situation presents itself.			Water Distribution Construction Management GIS Unit
□	Refine/confirm existing GIS tracing functionality to identify valves to be closed to isolate sections of the network using information from the hydraulic water system model. The refinement should focus on isolating critical assets and identify what happens to system pressures to ensure fire flow and desired customer service levels, and a more accurate count of customers impacted.			Planning

Respond

✓	Task	Required Resources	Resource Location	Responsible Personnel
Initiation and Notification				
□	Upon notification of pipeline failure or break over 16 inches, the Communications Center, Incident Commander (the first high ranking officer at the scene of the incident), Valve Crew to operate the valves and Chief Plant Operator should be notified. a. Smaller diameter breaks may also require notification (e.g., if they area in a right-of-way, disrupt traffic, cause property damage, etc.)			Distribution Systems Operations
□	Perform a unidirectional flush and disinfect the newly replaced/repaired infrastructure, if required (Operations Section)			Water Distribution
Monitoring				
□	Perform a bacteriological testing and collect chlorine residuals to ensure water quality is maintained			Labs
□	Document damage and repairs for root cause analysis			Water Distribution Planning

Recover

✓	Task	Required Resources	Resource Location	Responsible Personnel
Recovery and Return to Normal Operations				
□	Return any operated distribution system valves to their original positions			Water Distribution
□	Notify affected customers when system is returned to service			Water Distribution Public Information Officer
Report Findings				
□	Conduct a root cause analysis to determine the cause of the failure/break, if possible			Water Distribution Planning
□	Maintain documentation and forward to the Upper Management at the conclusion of the emergency event			Water Distribution Planning
□	Conduct an after-action review to identify lessons learned that may prevent future occurrences or improve WASD's response to an emergency. Update this Incident Action Checklist as required.			All applicable Departments

REFERENCES

Findings: Utility Resilience Index – Baseline 64.5%

Emergency Response Plan (ERP)			**0.14**	0.0350
No ERP		**0.00**		
ERP developed and/or updated		**0.25**		
Staff trained on ERP (i.e., Table Top)	X	**0.50**		
Resource typed assets/teams defined and inventoried		**0.75**		
Functional exercises on the ERP conducted		**1.00**		
National Incident Management System (NIMS) Compliance			**0.16**	0.0800
No ICS/NIMS Training		**0.00**		
ICS 100/200 provided to key staff		**0.25**		
ICS 700/800 provided to key staff	X	**0.50**		
ICS 300/400 provided to key staff		**0.75**		
Utility certified as NIMS compliant		**1.00**		
Mutual Aid & Assistance			**0.19**	0.1900
None		**0.00**		
Mutual Aid/ Intramunicipal (within own city/town agencies)		**0.25**		
Mutual Aid/ Local-Local (with adjacent city/town)		**0.50**		
Mutual Aid/ Intrastate (e.g., Water/Wastewater Agency Response Network [WARN])		**0.75**		
Mutual Aid/ Interstate and Intrastate	X	**1.00**		
Emergency power for critical operations			**0.06**	0.0600
None		**0.00**		
Up to 24 hrs		**0.25**		
25–48 hrs		**0.50**		
49–72 hrs		**0.75**		
Greater than or equal to 73 hrs	X	**1.00**		
Ability to meet minimum daily demand (water) or treatment (wastewater)			**0.1**	0.0500
None		**0.00**		
Up to 24 hrs		**0.25**		
25–48 hrs	X	**0.50**		
49–72 hrs		**0.75**		
Greater than or equal to 73 hrs		**1.00**		
Critical parts and equipment			**0.09**	0.0675
3-4 weeks or greater		**0.00**		
1-2 weeks		**0.25**		
3-5 days		**0.50**		
1-2 days	X	**0.75**		
Less than 24 hours		**1.00**		

Critical Staff Resilience			**0.06**	0.0450
<10%		**0.00**		
10-25%		**0.25**		
>25-50%		**0.50**		
>50-75%	X	**0.75**		
>75-100%		**1.00**		
Business Continuity Plan			**0.05**	0.0250
No BCP		**0.00**		
BCP under development		**0.25**		
BCP completed	X	**0.50**		
BCP fully implemented		**0.75**		
Annual commitment of resources & BCP exercised		**1.00**		
Utility Bond Rating			**0.06**	0.0450
Caa, less than or equal to		**0.00**		
B-Ba		**0.25**		
Baa-A		**0.50**		
AA	X	**0.75**		
AAA		**1.00**		
GASB Assessment			**0.02**	0.0150
Less than 20% assessed		**0.00**		
20–40% assessed		**0.25**		
41–60 % assessed		**0.50**		
61–80% assessed	X	**0.75**		
Greater than 81% assessed		**1.00**		
Unemployment			**0.04**	0.0200
≥ 5% National Average		**0.00**		
> 2–4 % National Average		**0.25**		
+/–2% National Average	X	**0.50**		
< 2–4 % National Average		**0.75**		
≤ 5% National Average		**1.00**		
Median Household Income			**0.05**	0.0125
≤ 10% State Median		**0.00**		
< 5–10 % State Median		**0.25**		
+/–5% State Median		**0.50**		
> 5–10 % State Median		**0.75**		
≥ 10% State Median		**1**		

Additional Resilience Indicators

- Water saved through implementation of the Water Use Efficiency Plan: *270,000 gallons per day (2019)*
- Percentage of infrastructure projects that incorporate the consideration of sea level rise for the life of the asset: *100%*
- Number of infrastructure projects delivered using the LEED or Envision Sustainability Rating Systems: *2*

Key Results and Takeaways

- An Implementation Plan listing mitigation measures including cost-benefit estimates
  - Inform budget process
- An Emergency Response Plan:
  - Digital integration with other plans
  - Incident Action Checklists
  - Refresh Incident Management Team
  - Provide training and scenario exercises
- Involve all stakeholders – take the time to facilitate discussions
- Take opportunity to educate on new and evolving risks
- Reference other utility plans and priorities
- Customize the tools to benefit your utility

WASD CONTINUES TO PROVIDE ESSENTIAL SERVICES

Thank You.

Questions?

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