State Water Infrastructure Authority
Meeting Date – March 4, 2016
Comment Response Document

Background:

The Division of Water Infrastructure staff presented information about the proposed grants and affordability criteria at the January 21, 2016 meeting. With the Authority's approval, the Division issued the proposed priority systems and affordability criteria for a 21-day public comment period ending February 19, 2016. The comments received and the Division's responses are listed below. Agenda Items G – H will reference this document.

Comment Number	Comment	Response
From: John D Crowder NC State Manager Southeast RCAP		
Comment 1	I want to thank you for you presentation to the funders group last week. It appears that the proposal addresses the issues of the legislation-- However I would like to make the following comments-- * It appears that a lay person from a smaller rural community would not understand "how to" and that they would have to hire a paid consultant to get through this process suggestion--Set up a dummy project as an example for someone who maybe needs some guidance through this maze-- A series of training programs across the state may be in order. * Local gov't under the management should be identified as a measurable point --Whether or not a local governmental body has had any training managing infrastructure finances. As the short period of time I have been in my position and even a past elected official its is very beneficial for the political authorities to understand what enterprise funds are and how they should be managed especially in the smaller rural communities with limited administration or management assets. *All too often I have seen local gov't failing to maintain accountability financial stability esp with respect to their enterprise funds. I would hope that the Infrastructure Commission would impose an	The Division acknowledges the above comments and has announced funding training at five locations across the state during March. Part of this training will relate to affordability criteria and how to determine eligibility. Additionally, as part of both the affordability guidance and the training, staff will provide a case study to walk people through the affordability determination process.

	accountability process for their elected officials before any grant/loans would be approved. Just my thoughts- I may have more to come at a later date-	
From: Steve Cavanaugh, P.E. President/Chief Innovation Officer Cavanaugh Solutions		
Comment 2	Category 2 - Project Benefits *2.1 Water loss in system to be rehabilitated or replaced is 30% or greater* Strong suggestion that this item be removed as "% of System Input Volume" is not an indicator of performance and was thusly abandoned by AWWA in 2003. Utilities should be auditing their systems using AWWA M36 methodology on an annual basis. These audits should further guide the utility to implement appropriately designed Non Revenue Water reduction strategies. Other states have adopted rules that require Water Audits, third party Level 1 Validation, and water loss control programs utilizing industry best practices prior to the awarding of State funds for rehabilitation or expansion projects.	We understand that there are more comprehensive measures for determining water loss; however, the priority system is designed to require only minimal documentation and to maintain consistency with Division of Water Resources policies for reporting on water loss. We feel that the level of requirement provided in the priority system is sufficient to document an enhanced project benefit. The methodology detail is more applicable to system management.
Comment 3	Category 3 - System Management *3.E Applicant has implemented a water loss reduction program* Please consider renaming this Title to "Applicant has implemented a Water Loss Control Program." The wording change from reduction to control aligns the language with industry best practices and reflects a utility's need to move towards a programmatic loss control approach rather than an arbitrary single project attempt to reduce leakage (Real Loss). The points system should also align with current Bond Rating agency categories (ref S&P). See table below. Measuring a utility's effectiveness in executing water loss control efforts has been classified as follows (priority point designation provided to match category totals): Suggested Points Description	Our guidance allows the use of either the *AWWA Water Loss Control Committee Free Water Audit Software* or the *Division of Water Resources Small System Water Audit* for documenting current leakage. The primary purpose of this line item is not the water audit process but the implementation of an active water loss detection program. We will revise our guidance to clarify the process and the purpose.

	Strong – Utility has performed a water audit consistent with the AWWA M-36 methodology on an annual basis for the prior five years. The utility has a well structured and documented Non-Revenue Water Management Program that includes ongoing leak detection work and annual accuracy testing of finished water meters and a representative sample of customer meters.	5	
	Good – Utility has performed a water audit consistent with the AWWA M-36 methodology on an annual basis for the prior three years. The utility has engaged in specific components of a Non- Revenue Water Management Program such as periodic finished water meter testing, accuracy testing of samples of customer meters and active leak detection.	4	
	Standard – Utility has performed a water audit consistent with the AWWA M-36 methodology but does not do so on an annual basis. The utility tracks some basic water loss information on a monthly basis but does not have an active Non-Revenue Water Management Program.	3	
	Vulnerable – Utility has not performed a water audit consistent with the AWWA M-36 methodology and does limited tracking of some basic water loss information on a monthly basis. This information is generally reported on a percentage of volume-supplied basis.	1	
From: Eric Hatcher Cape Fear Public Utility Authority			
	Regarding: N. C. Division of Water Infrastructure & State Water Infrastructure Authority Comment Period Comment: To Incentivize membership in the North Carolina Water/Wastewater Alert Response Network Program (NCWaterWARN)		While the comment specifically references the CDBG program, we have evaluated this comment based on the State Grant priority system that was available for public comment. We appreciate the work of NCWaterWARN and its partners. However,

Comment 4 Note: Please see Attachments 1 – 4 in the appendix that were included with this comment	for water sector utilities, we propose awarding points on the CDBG Priority Rating System to applicant utilities who are members. NCWaterWARN is the Mutual Aid and Assistance program for the water sector in North Carolina. As recommended by EPA and AWWA, this program provides the planning structure for water/wastewater utilities to request or provide assistance to neighboring utilities in time of need due to natural or man-made disaster situations. In North Carolina, NCWaterWARN has (97) member utilities. It is a voluntary, no-cost program, but members are required to adhere to certain training standards and categorize their teams and equipment in accordance with FEMA NIMS/ICS and AWWA national standards. We believe the appropriate section of the CDBG Priority Rating System Form is Category 3 – System Management. Propose adding section line question 3.F: Is applicant a member of NCWaterWARN Mutual Aid and Assistance Program (award points 3 to 5 based on discretion of NC Division of Water Infrastructure & State Water Infrastructure Authority)? Our program has a website www.ncwaterwarn.org which explains North Carolina's program in greater detail, including how to join, contracts, tools and templates for streamlining the process of asking for assistance, or providing assistance to a member utility in time of need. The e-mail attachments explain the WARN program more fully. The 4th attachment is the EPA's Water Sector Compliance Objectives for NIMS/ICS. The value of being a WARN member is cannot be over-stated as evidenced by the EPA's emphasis in 4 separate categories of the 17 performance objectives. Finally, the NCWaterWARN Mutual Aid Program is fully supported by NCEM and NCDEQ PWSS & DWQ. NCWaterWARN has a desk in the	we do not think that membership is equivalent to the other active system management activities that we currently prioritize. In addition, we will need to evaluate the applicability of this to all utilities before recommending its inclusion.

	State's Emergency Operations Center, Infrastructure Services Section when activated. If an applicant utility claims the membership on the CDGB Priority Rating System form, their membership can be validated by contacting NCWaterWARN Chairman Mike Richardson at 910 332-6723, michael.richardson@cfpua.org or Secretary Eric Hatcher at 910 332-6508, eric.hatcher@cfpua.org or: *Rebecca Sadosky, Ph.D.* N.C. Drinking Water Protection Program Coordinator and Emergency/Security Contact N.C. Division of Water Resource N.C. Department of Environmental Quality Phone: (919) 707-9096 FAX: (919) 715-4374 Rebecca.Sadosky@ncdenr.gov	
From: Chandra C. Coats, PE, Director Johnston County Department of Public Utilities		
Comment 5	Johnston County offers the following comment related to the Draft Affordability Criteria for State Reserve Project Grants, both water and wastewater: The Draft Affordability Criteria uses total households served as the basis for a rural system (less than 20,000 taps). This criterion relates to small towns. However, it is difficult for rural counties to meet the criteria. A criterion which considers system-wide average tap per mile of pipe (as reported in the latest Local Water Supply Plan) could be included. This would allow rural counties with county-wide systems, to participate in the program. We would recommend systems that average less than 20 taps per mile should be considered rural, even if they serve over 20,000 households.	Division staff acknowledges this comment. However, the Division uses residential connections as a surrogate for population, which is required in G.S. 159G-20.(1). Multiplying residential connections by the American Community Survey persons per household value for the appropriate place results in an approximate service area population, which fulfills the statutory requirement in the above-referenced statute. Using a system-wide average tap per mile of pipe would not fulfill this statutory requirement. Also, while a few counties have systems of over 20,000 residential

	We appreciate the opportunity to comment and hope that you will consider this revision to the program criteria.	connections, the impact to a bill related to a $3 million project would remain at $0.63 per connection. The Division recommends the Authority consider adding to their discretion the consideration of grant eligibility and grant percentage determination based on extreme economic distress, consistent with the statutory definition of affordability.
From: Michael E. Richardson, Water Resources Manager Cape Fear Public Utility Authority		
Comment 6 Note: Please see Attachments 1 – 4 in the appendix that were included with this comment	Regarding: N. C. Division of Water Infrastructure & State Water Infrastructure Authority Comment Period Comment: To Incentivize membership in the North Carolina Water/Wastewater Alert Response Network Program (NCWaterWARN) for water/wastewater sector utilities, we propose awarding points on the CDBG Priority Rating System to applicant utilities who are members. NCWaterWARN is the Mutual Aid and Assistance program for the water sector in North Carolina. As recommended by EPA and AWWA, this program provides the planning structure for water/wastewater utilities to request or provide assistance to neighboring utilities in time of need due to natural or man-made disaster situations. In North Carolina, NCWaterWARN has 97 member utilities. It is a voluntary, no-cost program, but members are required to adhere to certain training standards and categorize their teams and equipment in accordance with FEMA NIMS/ICS and AWWA national standards. We believe the appropriate section of the CDBG Priority Rating System Form is <u>Category 3 – System Management</u>. Propose adding section line question 3.F: Is applicant a member of NCWaterWARN Mutual Aid and	While the comment specifically references the CDBG program, we have evaluated this comment based on the State Grant priority system that was available for public comment. We appreciate the work of NCWaterWARN and its partners. However, we do not think that membership is equivalent to the other active system management activities that we currently prioritize. In addition, we will need to evaluate the applicability of this to all utilities before recommending its inclusion.

	Assistance Program (award points, up to 3, based on discretion of NC Division of Water Infrastructure & State Water Infrastructure Authority). Our program has a website www.ncwaterwarn.org which explains North Carolina's program in greater detail, including how to join, contracts, tools and templates for streamlining the process of asking for assistance, or providing assistance to a member utility in time of need. The e-mail attachments explain the WARN program more fully. The 4th attachment is the EPA's Water Sector Compliance Objectives for NIMS/ICS. The value of being a WARN member is cannot be over-stated as evidenced by the EPA's emphasis in 4 separate categories of the 17 performance objectives. Finally, the NCWaterWARN Mutual Aid Program is fully supported by NCEM and NCDEQ PWSS & DWQ. NCWaterWARN has a desk in the State's Emergency Operations Center, Infrastructure Services Section when activated. If an applicant utility claims the membership on the CDGB Priority Rating System form, their membership can be validated by contacting NCWaterWARN Chairman Mike Richardson at Michael.richardson@cfpua.org or phone 910-332-6723 , Secretary Eric Hatcher at eric.hatcher@cfpua.org or phone 910-332-6508.	
From: Alice Briggs Martin-McGill, Inc.		
Comment 7	To whom it may concern at the N.C. Division of Water Infrastructure and the State Water Infrastructure Authority: Please take the following comments into consideration as you review and finalize the guidance and scoresheets for the April 2016 funding cycle:	The Division will accept resolutions until June 15 for the April funding round in order to accommodate the changing programs and impacts on applicants.

	1. Inevitably, there will be a short turnaround time between when the guidance will be finalized and released, and the application due date of April 29, 2016. Please consider extending the due date for the applicants to submit resolutions and any other board-action-required documents to 30 days following submission deadline to facilitate getting this required documentation through the board-action process.	
Comment 8	2. The affordability criteria for grant eligibility is conflicting in 2 documents: a. In document 1, page 3 it states that, "The draft criteria limits grant funding to LGUs that have three or more indicators that are worse than the state benchmarks (e.g., as an indication of economic stress compared to the state). b. In document 3, page 2 it states that, "Applicants with less than three of the five indicators will have a 20% match requirement." c. Which one of these requirements "a" or "b" takes priority if an applicant for the Asset Inventory and Assessment Grant only has 2 of the 5 indictors worse than the state standards? Thank you for your consideration.	The affordability criteria as discussed in Document 1 are used for two main purposes: (1) To determine who is eligible to receive a project grant and (2) if eligible, to determine the percentage of project grant for which a system is eligible (e.g., 0%, 25%, 50%, 75%, 100%). Additionally, the Asset Inventory and Assessment Grant (Document 3) uses aspects of the affordability criteria to determine match and priority points, as follows: There should not be a conflict. Aspects of the affordability criteria will be used in the priority systems to determine the rank of project applications, asset inventory and assessment grant applications and merger/regionalization grant applications. However, the limitation on Page 3 of Document 1 applies only to project grants. The guidance documents for each of the grant programs will clarify this. Division staff will also ensure these aspects are clearly delineated in training.
From: Angie Mettlen, Program Manager W.K. Dickson & Co., Inc.		

Comment 9	Attached please find the comments compiled by WK Dickson & Co., Inc. in regard to the documents published for public comment on the DWI draft criteria on state reserve grants. If you have any questions, please don't hesitate to contact me via e-mail or cell at 843-540-1015. We greatly appreciate the opportunity to review these documents and provide comments. Have a wonderful weekend! BELOW ARE THE COMMENTS OFFERED BY WK DICKSON IN RESPONSE TO THE DOCUMENTS PROVIDED BY THE DIVISION OF WATER INFRASTRUCTURE FOR PUBLIC COMMENT? THEY ARE ARRANGED ACCORDING TO TOPIC/DOCUMENT. DRAFT DOCUMENT NO. 1: DRAFT AFFORDABILITY CRITERIA FOR STATE RESERVE PROJECT GRANTS 1. LGU PARAMETERS – POPULATION CHANGE THE POPULATION CHANGE PARAMETER UTILIZES THE ACS DATA TO ARRIVE AT A POPULATION CHANGE OVER A 5-YEAR PERIOD. IN SOME CASES, THESE NUMBERS ARE VERY DIFFERENT THAN THOSE PROVIDED BY THE NC OFFICE OF STATISTICS & BUDGET MANAGEMENT, WHICH ARE USED TO ALLOCATE TAX PROCEEDS FROM GASOLINE SALES, GENERAL SALES AND BEER/WINE SALES. WE FOUND A COUPLE OF GLARING EXAMPLES FOR CONSIDERATION: <u>Tabor City ACS Data</u> 2010 – 2,511 2014 – 3,970 58.04% <u>Tabor City OSBM Data</u> 2010 – 3,979 2014 – 3,979 0% <u>Fair Bluff ACS Data</u> 2010 – 915 2014 – 1,029 12.46% <u>Fair Bluff OSBM Data</u>	The commenter raised the possibility that the percent population change from data related to the American Community Survey (ACS) may vary drastically from the percent population change from the demographic data collected from the Office of State Budget and Management (OSBM) and postulated that the differences might be a result of the ACS data counting institutional populations (e.g., prison, juvenile hall, nursing facilities). The Division notes that disparities exist; however, based upon correspondence with the state demographer, the OSBM methodology does include institutional populations. Therefore, the differences are a result of the two data sources using different methodologies. Within the guidance, the Division has allowed for special situations where resident populations for certain institutions (nursing facilities, prisons, juvenile halls, residential mental facilities) reside within the community to deduct those populations as part of the percent population change.

	2010 – 951 2014 – 942 -0.95% For Tabor City, it appears that the opening of a new state prison facility (in addition to the super maximum facility) may have impacted the ACS population data. For Fair Bluff, it appears that this may be illustrative of how even a small increase in the overall population of small communities may be drastically skewed with regard to percentage increase and what that really translates to for being able to fund large infrastructure projects. Finally both examples show a fairly large discrepancy between the ACS data set and the data set used to allocate tax proceeds to municipalities.	
Comment 10	2. General Comment For an entity that is eligible for any of these funds but primarily has commercial/industrial customers, how will an application from such an entity for either the 2 study grant programs or the other funding programs be evaluated/scored? (Specifically with regard to rates or other parameters that are currently based on residential connections and/or usage.)	The Division can meet with applicants on a case-by-case basis to see how we could best fit their application into the process.
Comment 11	Draft Document No. 3: Draft Priority System for Asset Inventory and Assessment Grants 3. What is the timeframe in which these grant funds will need to be spent?	These grant funds will need to be spent within one-to-two years. The timeframe will depend on the project described in the application and will be confirmed in a meeting with the applicant once the project is funded.
Comment 12	4. How will an application need to be structured and how will it be scored if an entity is looking to complete an asset management project that includes both water and wastewater systems?	Due to accounting restrictions with the funding, the asset inventory and assessment application cannot include both water and wastewater systems. A separate application will need to be submitted for each system.

Comment 13	5. What are the ultimate deliverables that DWI expects for this grant? It is expected that system will be in different places with regard to asset management and have goals for this project that reflect this. Will DWI allow for some flexibility into the overall development of the scope of the project to be funded by this grant as long as it meet the intent of furthering more comprehensive asset management?	The Division will allow some flexibility with the scope of the project. For example, if the applicant has an accurate inventory and has done some condition assessment, the scope could include additional condition assessment plus other components of a comprehensive asset management program.
Comment 14	6. Can grant funds be used to purchase asset management hardware/software?	Asset management hardware/software can be an eligible cost, but the scope of the project needs to address asset inventory and condition assessment and not be limited to the purchase of hardware/software.
Comment 15	Draft Document No. 4: Draft Priority System for Merger/Regionalization Grants 7. What is the timeframe in which these grant funds will need to be spent?	The merger/regionalization feasibility grant funds will need to be spent within one year.
From: Stephanie Malec Highfill Infrastructure Engineering, P.C.		
Comment 16	Draft Document No. 1 – Need clarification on what property valuation should be used for the property valuation per capita calculation.	Section II.B of the affordability criteria guidance specifies where data may be found related to property valuation and the method used to determine property valuation per capita.
Comment 17	Draft Document No. 3 – For the AMP Grant priority rating system, 75% of the points are discretionary. It will be challenging for a LGU to determine if it is worthwhile to apply since an approximate score cannot be calculated at the time of application.	We hope all LGUs believe it is worthwhile to apply for these funds. The priority system is subjective, but the intent is to fund LGUs that will use the information obtained through this project in future infrastructure planning efforts. It would be difficult to determine future intent with a purely objective priority system.

From: Chris Hildreth, Director of Public Utilities & Facilities Montgomery County, NC		
Comment 18	Thank you for the opportunity to provide feedback on the proposed criteria for applications and their priority rating systems. My concern is with the Property Valuation per Capita indicator included in Line Item 3B of the Asset Inventory and Assessment Grant Priority Rating System. My assumption, which may be wrong or incomplete, is that the Division and SWIC would like to include a metric that provides an understanding of the average wealth per capita that could, in some way, be leveraged to help fund a project of this type in lieu of grant funds. Again, I could be missing the point and would welcome clarification. Whether or not I have the logic right, does not affect the fact that the resulting number is not a good indicator for Counties. It may be for municipalities who provide water service to most of the valuated properties. A County however, more especially Montgomery County, does not serve all the properties valuated. Moreover, most of the wealth is concentrated in the municipalities and Lake Tillery, all of which is not served by our water utility I apologies that I don't have a proposed alternative, but in the interest of time and the deadline, I wanted to put this concern up for consideration. Please call with any questions.	As part of the guidance provided for affordability criteria, Section II.B describes how to derive local government unit (LGU) indicators, including property valuation per capita. The Division also acknowledges that special situations may arise where property valuation needs to be calculated in a different manner. The guidance specifies those methodologies.
End of Document		

Comment Response Document Appendix

WATER /WASTEWATER AGENCY RESPONSE NETWORK

WARN FAQ

Updated May 5, 2010

1. **What is a Water/Wastewater Agency Response Network (WARN)?**
   - A WARN is a network of utilities helping utilities.
   - A WARN program uses a mutual aid and assistance agreement that allows utilities to cross jurisdictional boundaries to provide aid and assistance(personnel, equipment, and other resources) in preparing for, responding to, or recovering from an emergency.
   - Participation is voluntary; there is no obligation to respond.

2. **Why is a WARN important? What is the purpose of a WARN?**
   - A WARN establishes an agreement and protocols to access specialized resources such as knowledgeable water and wastewater utility personnel or utility specific heavy equipment, tools and supplies.
   - A WARN provides a forum for establishing and maintaining emergency contacts.
   - A WARN can facilitate training.
   - A WARN helps fill the need for personnel and resources before the arrival of government aid.

3. **What are the benefits of a WARN?**
   - There is no cost to participate.
   - WARN is like investing in a no cost insurance policy to enhance access to specialized water and wastewater resources.
   - WARN increases emergency preparedness and coordination.
   - WARN provides a single agreement to access resources statewide.
   - WARN expedites arrival of aid (don't have to work out the administrative items; the agreements and WARN protocols work them out in advance for you).
   - WARN agreement contains indemnification and worker's compensation provisions to protect participating utilities and provide reimbursement protocols.
   - WARN collaborates and responds to the needs of the public and private utility members.

4. **How does a utility get assistance during an emergency?**
   - The WARN member who needs help identifies the resources needed to respond.
   - The WARN member in need can either directly contact a fellow WARN member who has the necessary resources or use a state specific process of requesting aid.

5. **Are member utilities required to respond and send resources?**
   - There is no obligation to respond.
   - It is up to the lending utility to determine if resources are available and if it can send the requested resource.

6. **What happens if a utility sends resources and needs them back?**
   - Under no circumstances is a utility to send resources if it impacts their ability to manage daily operations or manage response to its own emergency.
   - Resources remain under the authority of the sending utility, and as such can be recalled any time.

7. **What happens if equipment on loan is damaged or stolen?**
   - Articles VII, VIII, and IX of the sample agreement offer a framework for how to manage the issue of loss or damage with clear identification of cost reimbursement, dispute resolution, and indemnification.

8. **Are WARN mutual aid and assistance activities eligible for FEMA reimbursement?**
   - FEMA reimbursement may apply only after a Presidential declaration of emergency.
   - FEMA-specific requirements related to WARN include:
     - The agreement was in effect **prior** to the response/deployment to the incident.
     - The assistance must be requested by the utility in need;
     - The work performed, supplies used and materials consumed are directly related to the disaster and is otherwise eligible for FEMA assistance;
     - The entity can provide documentation of rates and payment for services, if requested; and

9. **Will a utility be reimbursed for the use of their resources?**
   - While a utility may offer assistance free from reimbursement, Article VII of the sample agreement details how a utility that sends assistance is reimbursed by the utility in need.

10. **How is WARN different from an existing statewide mutual aid program managed by emergency management?**
    - Statewide mutual aid/assistance agreements typically require a declaration of "emergency" by a local and/or state official to activate the agreement; WARN agreements do not require the declaration of an emergency, saving critical time in response to needs identified by the utility.
    - Statewide programs typically do not include private utilities; WARN agreements do.
    - Statewide agreements are managed by the state emergency management agency; WARN is managed by utilities.

11. **Is WARN help available for disasters other than hurricanes or earthquakes?**
    - WARN is available in all types of emergencies, whether they are small, medium, or large. WARNs have been activated to respond to a wide variety of emergencies such as fires, floods, and water supply contamination as demonstrated in the report *Economic Benefits of Forming & Participating in WARN*.
    - Signatories to a WARN agreement can provide and/or request assistance any time their system needs emergency assistance.

12. **Who should be involved in helping develop and sustain a WARN?**
    - Utility owner/operators with varied professional association representation
    - State water and wastewater primacy agency (State health, environmental protection, etc.)
    - State emergency management and/or homeland security agency
    - US EPA region representation

13. What help is available to form a WARN?

- AWWA report – *Utilities Helping Utilities: An Action Plan For Mutual Aid and Assistance Networks for Water and Wastewater Utilities* provide the foundation for the formation of a WARN program.
- EPA can often help with post workshop support on a case-by-case basis, depending on available funding and the specific needs of the program. Support could include facilitation of meetings and workshops, administrative support, and answer technical questions.

14. How do WARNs work across state lines?

- The key issues of interstate response are differences in tort liability, immunity and licensing requirements.
- Currently, the Emergency Management Assistance Compact (EMAC) is being used by all fifty states and the District of Columbia to share resources across state lines, because it already addresses the key issues.
- AWWA is a member of the EMAC Advisory Council with intent to facilitate greater cooperation and coordination between WARN and EMAC.
- The water sector is evaluating issues related to improving interstate aid while working with the administrators of EMAC to ensure that it can be used effectively for the water sector.

15. Existing WARNs do not appear to be legal entities. Should they acquire non-profit organization status?

- At this point none of the WARNs have established themselves as a separate entity requiring any special status, as there are no funds transferred between the members and the WARN.
- In several instances utilities or associations have acted as a grant recipient on behalf of the WARN, thus acting as the fiduciary agent, to support training, website, and related activities
- Existing WARN programs are free for utilities to participate.

16. Are funds available to support the WARN effort?

- Each existing WARN program has handled things differently, with many using voluntary time/services that may be supplemented with funding from various sources, such as supporting associations or state primacy agency grants.
- The collaboration with primacy and emergency management agencies on the WARN program may lead to opportunities to fund specific WARN activities.
- Some existing WARNS have used Homeland Security and US EPA grants. Others have obtained local grants.

17. What does managing a WARN entail?

- Establishing regular meetings of the leadership team and/or steering committee which can be done via phone conferences, web conferences or face to face.
- Coordination with professional association meetings.
- Facilitate annual meetings or quarterly/monthly conference calls of the steering committee to address develop issues, plan WARN activities.
- Manage outreach and marketing of the WARN program for new membership, including "holding" the agreements.
- Services can be managed with in kind contributions from the members or by using grant funds.

18. How do we get a website going?

- AWWA has reserved the domain name for every state, Canadian Province, and Mexico.
- AWWA will release the domain name when a steering committee has been established and is prepared to initiate development of a website at no charge.
- Other existing WARNs have offered their source code free of charge to emerging WARNs.

19. If a resource database is established, how is it updated and who updates it?

- Many WARN websites include resource databases that are maintained by the member utilities.
- Reminder e-mails are sent to the member utilities to remind them to update the information.
- AWWA's *Water and Wastewater Mutual Aid and Assistance Resource Typing Manual* provides consistent terms and definitions for specific resources to expedite both requests and responses and has been recognized as a resource by EMAC.

20. How do WARNs support training and exercises?

- WARNs historically have held annual meetings which include training components.
- A small fee for the training has been charged to pay for material duplication and food.
- Each WARN has created a set of its own best practices, including FlaWARN's review of lessons learned from the 2005 hurricane season.
- Nationally, a variety of supporting training has been or is being developed including NIMS and can be conducted at WARN programs.
- Many WARN programs have conducted tabletop exercises based on EPA's *WARN Tabletop Exercise Facilitator Guide*.

21. How do you get members to buy-in to the WARN concept?

- While the benefits of participating in a WARN is obvious to many, others require more explicit evidence.
- A sample flyer is included in the Action Plan, and the report *Economic Benefits of Forming & Participating in WARN* was prepared to help a utility make the "business case" for leadership.
- WARNs are encouraged to participate in professional association programs to announce WARN activities.
- Presentations may be required to elected boards.
- Copies of presentations used by existing WARN may be available.
- AWWA has published a Webcast and articles on the subject.

22. How does a WARN operate before, during, and after an emergency?

- Some existing WARNs created by-laws along with the agreement that help outline the pre-emergency governance and activities.
- Each WARN is encouraged to develop an Operational Plan that outlines how it functions during and after an emergency. If the WARN does not have by-laws, the Operational Plan would include pre-emergency information as well.
- A Sample Operational Plan is located on www.NationalWARN.org and is consistent with the National Incident Management System IC 510 training module on mutual aid.

22. How does the WARN integrate with local Emergency Management Agencies?

- The relationship between WARN and local emergency management agencies is addressed in the *WARN Operational Plan*. WARNs are encouraged to meet with local and state emergency management agencies to discuss how to provide representation at the local and state emergency operation centers.
- While WARN members can request aid directly from each other, WARNs should communicate mutual aid and assistance activities with the local and state emergency management agencies to minimize potential duplication of effort and coordinate security and access needs.

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Economic Benefits of Forming and Participating in a Water/Wastewater Agency Response Network (WARN)

September 2008

Disclaimer

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Printed in the United States of America

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Project Funding

This project was funded by the American Waterworks Association (AWWA), utilizing Water Industry Technical Action Fund (WITAF) funds, as WITAF Project #506.

ECONOMIC BENEFITS OF FORMING AND PARTICIPATING IN A WATER/WASTEWATER AGENCY RESPONSE NETWORK (WARN)

INTRODUCTION

Since March 2006, the national success of creating Water Wastewater Agency Response Networks (WARNs) in each state is undeniable. At that time, four states (California, Florida, Louisiana and Texas) were the only states to have a viable agreement in place as a method of exchanging personnel, equipment and other resources during response to an emergency. As of May 2008, twenty-five states have executed agreements to form a WARN program, with multiple states close behind in various states of "readiness" with draft agreements. While the success is evident, and the request for creating more is present, the business case, integration and practicality need to be documented. As a result, AWWA initiated a study of the economic benefits of participation in WARN to utilities, which has resulted in this report.

The purpose of this report is to provide a simplified, general reference for business case analysis of participating in a WARN in order to guide utility managers and decision-makers. It provides valuable insights into the strategic context, potential benefits and outcomes, costs and resource implications for WARN signatories in enabling a utility to respond to various types of incidents.

This report is based on the results of a literature review, survey of utilities, and guidance from utility managers to help characterize the typical emergency response practices and experience, as well as the economic impact on utilities as they prepare for and respond to emergencies using mutual aid and assistance. It also includes valuable case studies of actual benefits experienced by three utilities in response to WARN activation.

LITERATURE REVIEW

Because WARNs are relatively recent in formation, there were limited examples of formal activation of a WARN and associated benefits at the time that the literature review was conducted in early 2007. In fact, no examples of documented, formal identification of the economic benefits of WARN to a utility were found. As a result, the survey was expanded to allow identification of general experience with mutual aid experience and emergency response planning. The survey data was used to develop the report findings and gather information about economic costs and benefits, and insight into utility expectations about the value proposition of WARN.

SURVEY RESULTS

A comprehensive survey instrument was developed with the project committee members. The survey was administered using Zoomerang, a web-based survey tool. The survey was posted at a specific link on the Zoomerang web site. AWWA WARN Coordinator Kevin Morley distributed the survey electronically to over 400 contacts. The survey was open from May through July 2007. Seventy-nine utilities responded to the survey. The distribution of responses is shown in Figure 1 below.

The survey was not intended to be statistically significant but rather to gather facts and opinions from utilities that likely were the most knowledgeable about the benefits of mutual aid. The detailed results from this survey are presented in Appendix A.

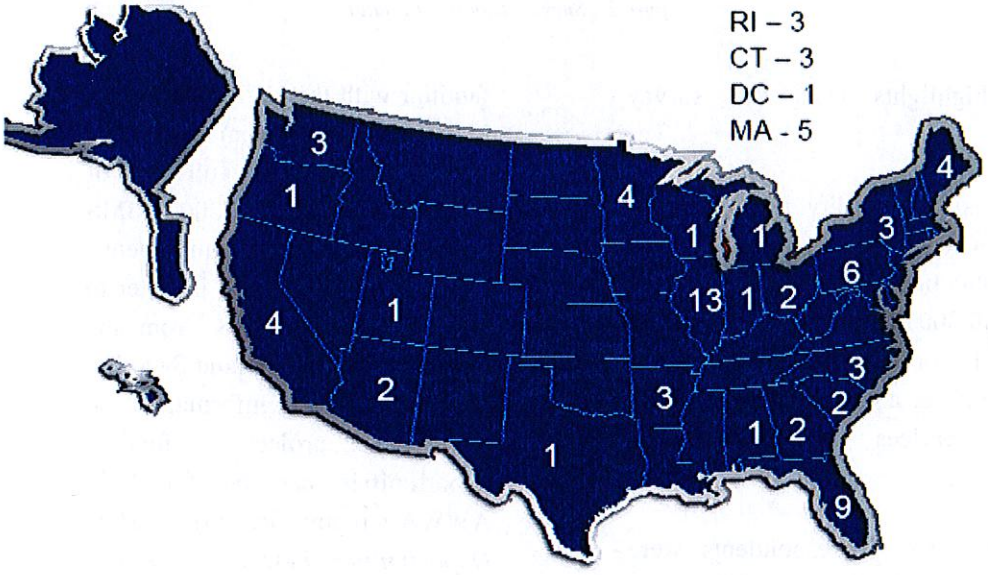
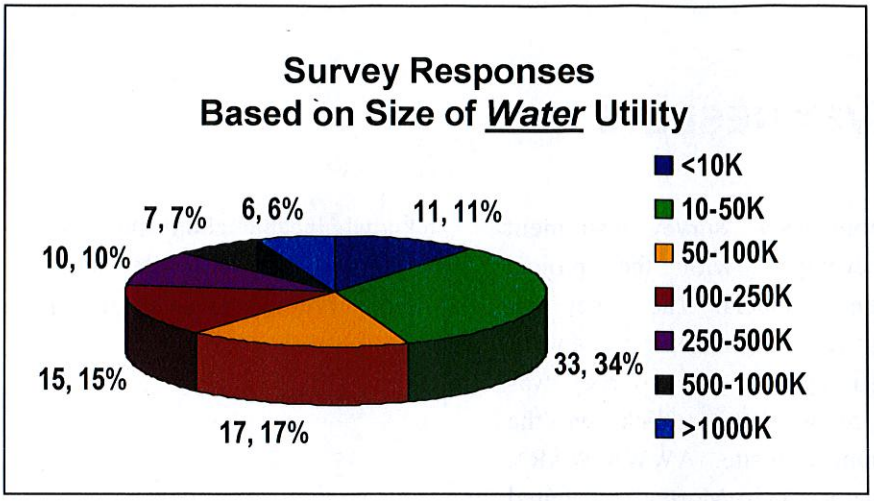


Figure 1: AWWA Survey Responders Locations



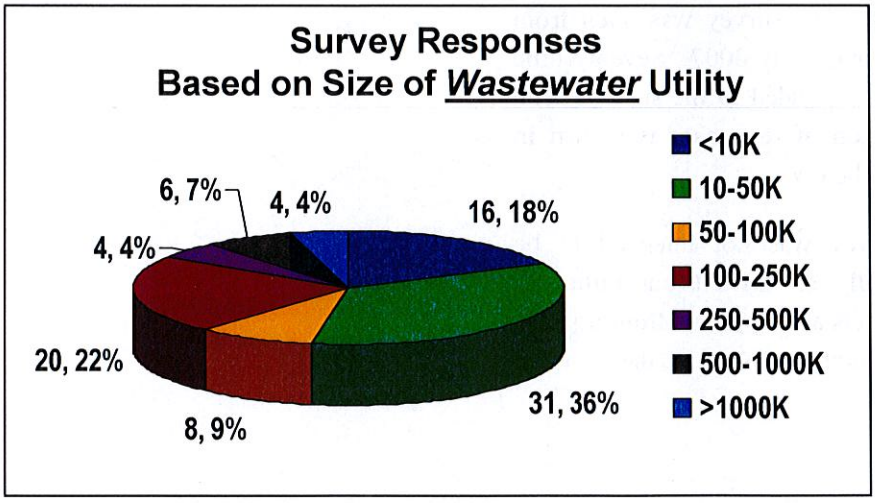


Figure 2: Survey Results – Population

Some highlights from this survey include:

- The size of utility responding to the survey ranged from less than 10,000 population served to over 1,000,000 or more, in either a retail or wholesale capacity. Therefore, a wide variety of sizes and services responded to the survey.

- Fully 95% of respondents were aware of WARN, and 95% were familiar with the National Incident Management System (NIMS). Significantly, 81% fulfilled or intended to fulfill the 2007 NIMS compliance system requirements, which is a requirement in order to be eligible for grants from the Department of Homeland Security. (Note that more information on security project funding opportunities can be found in AWWA's report, *Security Funding Opportunities: Lessons Learned & Observations from Successful*

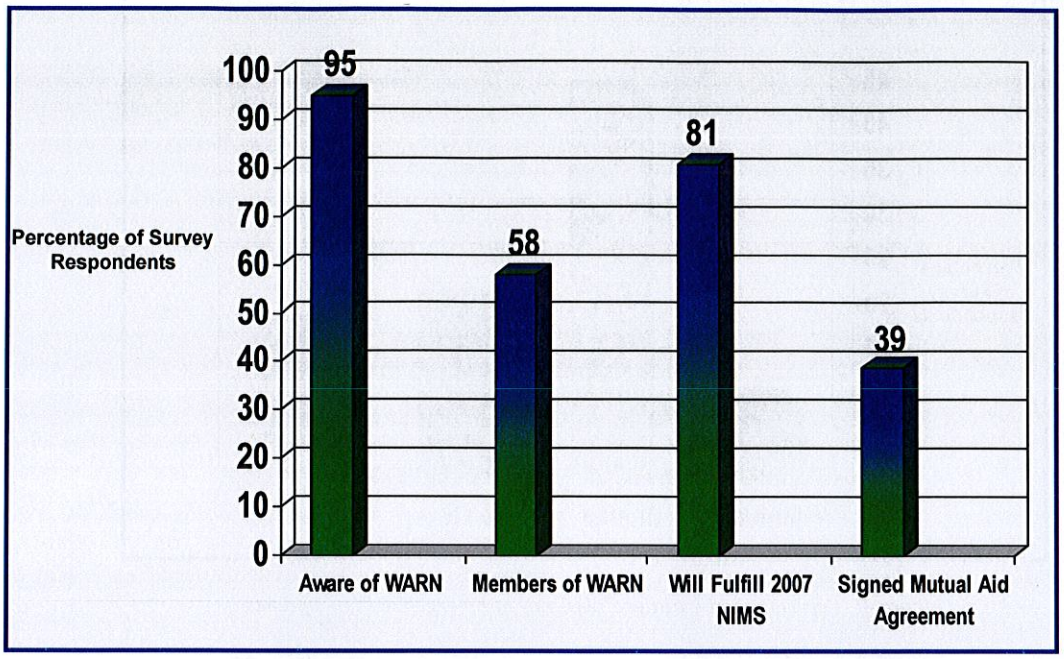


Figure 3: Survey Results – Awareness and Involvement in WARN

Water and Wastewater Utilities, published in January 2008.) In terms of experience, 58% were members of a WARN, and 39% had already signed a mutual aid agreement. This response is significant in confirming that respondents were very aware of WARN.

- For those who not yet signed a mutual aid agreement, the primary reason cited was because the agreement was still under development or being reviewed.
- 26% have a full time emergency manager on staff.
- 100% had an Emergency Response Plan (ERP), with the majority prepared in-house, but in some cases with the assistance of a consultant.

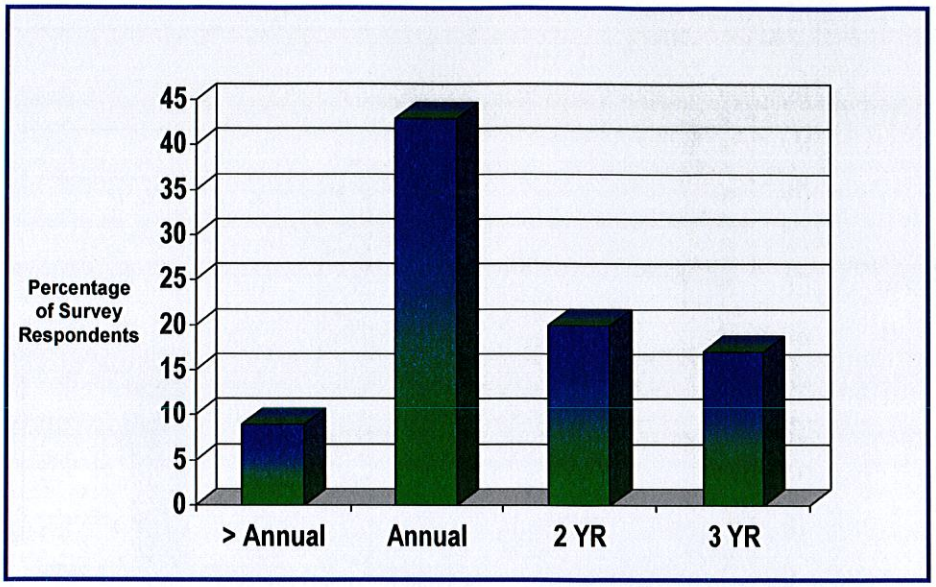


Figure 4: Percentage of Utilities Frequency of Emergency Plan Updates

- 9% update their ERP more frequently than annually, 43% update their plan annually, 20% update their plan every 2 years, 17% update their plan every 3 years.

- 80% of respondents coordinate their emergency response actions with City and/or County Emergency Operations Center(s). To practice their plan, 55% use a table top exercise, 47% use a table top exercise including organizations outside the utility, 30% use a functional exercise with a simulation team, and 9% use full scale field deployment with equipment.

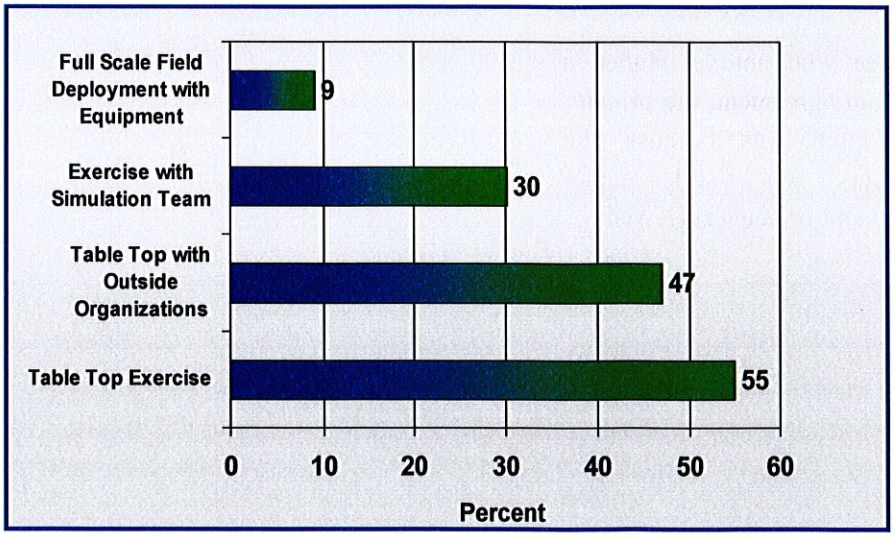


Figure 5: Coordination of Emergency Response with City and/or County

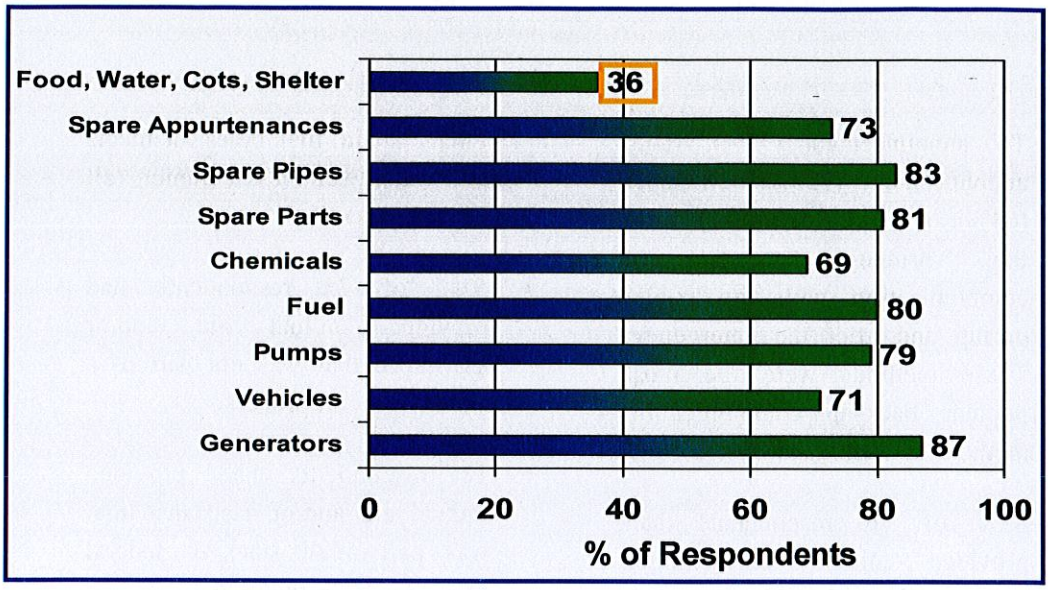


Figure 6: Equipment and Supplies On-hand for Emergencies

- In terms of supplies, 95% keep equipment and supplies on-hand for emergencies. The majority of utilities keep generators (87%), vehicles (71%), pumps (79%), fuel (80%), chemicals (69%), spare mechanical parts (81%), spare pipes (83%), and spare appurtenances (73%) beyond what they need for day-to-day operations. Relatively fewer utilities store staff supplies such as food, water, cots and emergency shelter (36%).

- Of the 38 respondents to the survey who had experienced an emergency in which they requested aid, the most common type of emergency was a wide variety of operational emergencies (38%) such as power outage, source water contamination, major water main break, and lift station flooding. Other emergencies included hurricanes (26%), flooding (13%), tornado (5%), and firestorm (3%).

- 77% of those requesting aid received it in less than 1 day. The vast majority (91%) did not rely on mutual aid or assistance to perform post-emergency assessment phase activities.

- Radio (73%) and cell phone (78%) were the most common methods of communication with other emergency responders. Since most emergencies resulted in complete loss of power, this result is not unexpected. However, some emergencies required the use of land lines, courier, ham radio and fax as the only available means of communication

- TV announcement (75%), radio announcement (72%), newspaper (64%), and website (47%) were the primary means of communication with the public during and after the emergency. These methods were the most popular back-up communication methods as well.

- 82% of 76 respondents had provided mutual aid and/or assistance in the last 20 years. The most common forms were personnel (86%), generators (38%), other equipment (67%), vehicles (49%), other rolling stock (29%), other parts and supplies (35%), and lab services (17%). Financial aid, fuel, other chemicals and water were less common (all 11% or less).

- 57% of 75 respondents had provided mutual aid and/or assistance that was not part of a state or federal process.

- 18 respondents had provided mutual aid and/or assistance that was part of a state or federal process. 67% reported a good or better experience in getting reimbursed, while 33% reported a poor experience with the need to provide a lot of documentation and/or a long time for reimbursement.

BUSINESS CASE DEVELOPMENT ANALYSIS

Business case analysis involves an evaluation of the projected benefits and costs, as well as the strategic evaluation of the relative worth of the proposal or project.

Benefits typically fall into two broad categories: tangible and intangible. Tangible benefits can be quantified with relative ease and certainty in monetary terms. Intangible benefits are not readily quantifiable but should be considered and weighed in making a decision about joining a WARN and signing a mutual aid agreement. In some cases, intangible benefits may be perceived to outweigh the tangible benefits.

In quantifying benefits and costs, the direct and indirect benefits and costs to the utility were considered. General economic benefits and costs to the region, such as the impact on local business, tourism, etc., were not part of the scope of work but these impacts can be significant.

Tangible Benefits of WARN Participation in Mutual Aid

As part of the survey, respondents indicated the relative worth of the following list of tangible benefits:

- Reduced cost to purchase and maintain back-up portable generation capability. Most utilities do not have on hand all the back-up portable generation capability needed for their system to fully function under all scenarios. Under a WARN arrangement, utilities can selectively reduce the needed generator equipment with relatively low impact on its ability to meet customer service levels. For example, in 2008, the Florida WARN will receive a $400,000 grant from the Federal Emergency Management Association for purchase of back-up portable generator purchase. (For more information on emergency power, refer to the AWWA report, *"Emergency Power: Source Planning for Water and Wastewater"*, issued in 2004.) This benefit of reduced generator equipment can be particularly important for utilities with many lift and pump stations such as those in Gulf coastal areas.

- Reduced lost water/wastewater revenue. Loss of revenue for part or all of a service area for one or more days can impact a utility's financial position. It can also greatly affect the ability of the utility to recover for an extended period of time, such as the Water and Sewerage Board of New Orleans has experienced in the aftermath of Hurricane Katrina.

- Reduced cost of carrying contingency inventory for other supplies and equipment. Most utilities responding to the survey indicated that they did not carry all the inventory needed for emergency response. Storage of such supplies and equipment has a carrying cost that can be estimated.

- Reduced cost to respond to an adverse incident. Utility managers understand that it can be much more cost effective to use back-up generators, supplies and even personnel through mutual aid and/or assistance agreements, rather than purchasing such services in market channels during an emergency event when demand often exceeds supply and pricing is driven accordingly.

Intangible Benefits of WARN Participation in Mutual Aid

Significant intangible benefits of WARN have been cited by utilities. For utilities that perceived a significant benefit, these intangible benefits included:

- Improved ability to respond to emergencies due to training, lessons learned and experiences exchanged from other WARN participants. The Community of Practice that develops in a WARN program is a significant benefit that utilities have cited. (A Community of Practice is defined as a group of people who come together to share expertise and learn from one another, both face-to-face and virtually.) WARN organizations will typically conduct training workshops and emergency response planning sessions. There are various other cost savings that can be provided by a more timely and effective recovery. For instance, after Hurricane Katrina a large expense and manpower was expended on supplying and distributing first bottled water and then later tanker trucks of water. Reducing the length of time needed to distribute water can free up valuable manpower to concentrate on restoring facilities and improving business continuity issues.

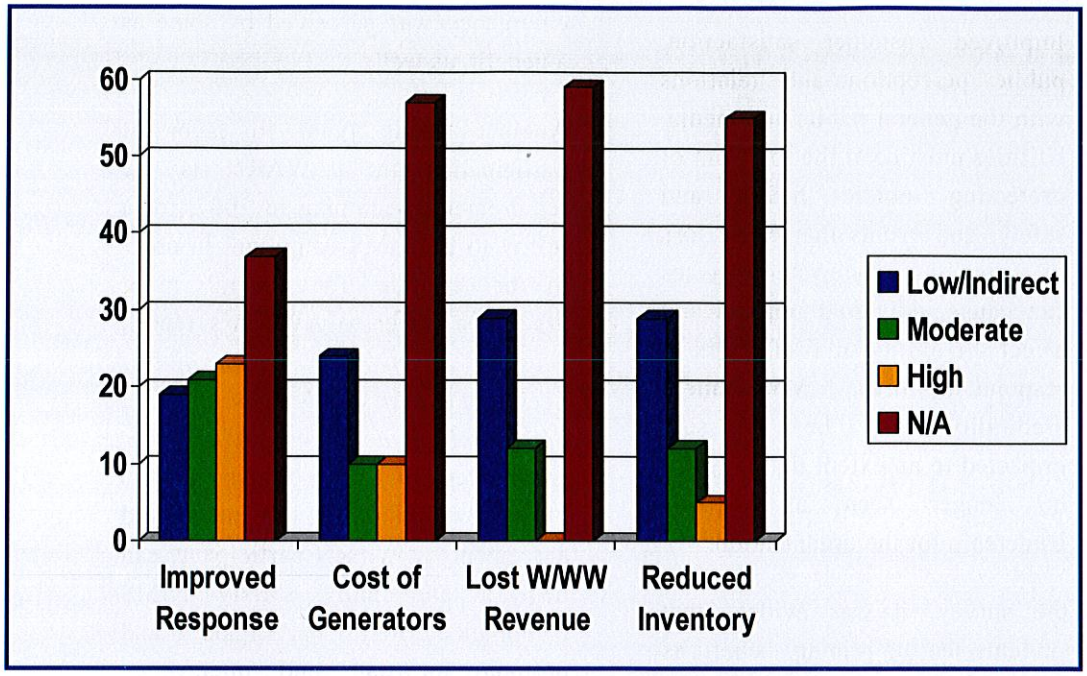


Figure 7: Respondents See the Primary Benefit as Improved Ability to Respond

- Reduced insurance cost. In Texas, the Texas Municipal League (TML) provides insurance to the majority of utilities. TML reports that membership in Texas WARN (TXWARN) is considered as a positive factor in the utilities overall risk assessment for insurance purposes.

- Improved bond rating. Utilities may finance their capital improvement programs with general obligation or revenue bonds. As a greater portion of wastewater revenues are now derived from user charges as compared to ad valorem taxes, revenue bond use has become more common. Financial condition is one of several factors that the bond rating agencies will consider in rating a general obligation or revenue bond issue. The rating received for the bond directly affects the interest rate and hence debt service costs that the utility will pay. If it is perceived that revenue can be lost and additional expenses incurred due to lack of preparedness for emergency situations based on actual performance or potential events, it can potentially negatively affect bond ratings. There is anecdotal evidence to suggest that bond rating agencies are considering risks and emergency planning and preparedness in their rating process.

- Improved customer satisfaction, public perception and relations with the general public and media. Utilities must be at the forefront of protecting public health and safety, and events that cause loss of water and wastewater services can cause individual impacts and affect the ability of firefighters to respond to fires. Management credibility may be adversely impacted to an extent that they are no longer seen as capable leadership for the organization.

In the survey, it was evident that respondents see the primary benefit as improved ability to respond. This result is not entirely surprising as the utility respondents were, for the most part, moving ahead in participating in WARN, even without a business case.

Reduced cost to respond to an emergency was perceived by some as a benefit, as well.

Another strong point in favor of participation in a WARN is the requirement, beginning in 2007, for a utility to be NIMS-compliant in order to be eligible for federal grant assistance (refer to AWWA's report, *Security Funding Opportunities: Lessons Learned & Observations from Successful Water and Wastewater Utilities*, published in January 2008.) Further, execution of the mutual aid agreement by WARN participants can help a community satisfy NIMS compliance criteria "Participate in and promote intrastate and interagency mutual aid agreements, to include agreements with the private sector and non-governmental organizations." (Federal Emergency Management Agency, 2008).

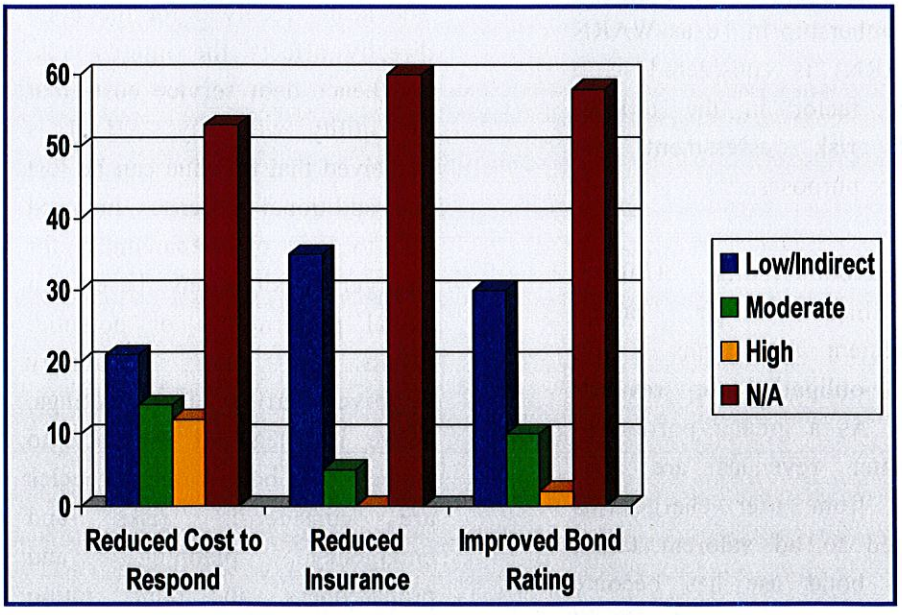


Figure 8: Reduced Cost to Respond was Perceived by Some as a Benefit

In addition, utility managers have commented on the important benefit of a WARN derived from being able to obtain manpower to fill in as the utility's own manpower fatigues or "runs out of gas" during the recovery effort, particularly for larger scale emergencies. Again, this benefit is difficult to quantify but undeniable in aiding recovery.

Also, it is thought by some utility managers that participation in a WARN may provide an affirmative defense and show due diligence on the part of the utility in the event of a lawsuit, or regulatory action arising as a result of a response to an emergency.

Costs of WARN Participation

Costs to participate in a WARN, exclusive of the cost of actually providing mutual aid, includes the following items:

- Staff time to develop/coordinate participation in WARN.
- Legal and planning costs to establish and maintain participation.
- Communication costs such as establishing and maintaining a web site for the WARN, as well as other communication mechanisms including brochures and advertising associated with the program.
- Staff time and possible travel expenses for training to be NIMS certified. Actual training is provided free of charge by the Federal Emergency Management Agency.

The majority of the survey respondents considered these costs to be low.

For most utilities, the biggest cost will be staff time for attending meetings, participating in conference calls, reviewing and in some cases preparing documents, coordination exercises and similar activities. These costs are generally absorbed within the other planning duties of staff responsible for planning and coordinating emergency response and/or operations. Therefore, staff costs can generally be considered sunk costs that would not be part of the business case.

There may some expenses incurred for legal review. For larger utilities, they have generally relied on in-house expertise. For small to medium utilities and some larger utilities, legal expenses will be incurred, particularly in the start-up phases of the WARN organization. These expenses can range from hundreds to thousands of dollars.

Communication costs were also determined to be relatively low for the majority of WARN participants. Utilities may share expenses, or one utility may volunteer to absorb the expense of establishing the web site.

Some states such as Pennsylvania have successfully pursued state grants to establish the web site. Source code is now available from Texas and Florida, so the costs are generally for recoding, hosting and maintaining the web site. Assuming technical staff are available, added costs are generally low, and would be expected to be $1,000 or less per year.

It is worth noting that utility participation in a WARN should include execution of the mutual aid agreement, i.e., signing the state WARN agreement. Signing the agreement does not obligate the utility to respond to a request for assistance. In addition, being a signatory to the WARN agreement may be required by utilities willing to provide assistance else they are not likely to take the risk of deployment. Therefore, being a signatory of the WARN agreement enhances a utility's risk management options by increasing their capability to recover their system following an incident, which ultimately improves the communities they serve.

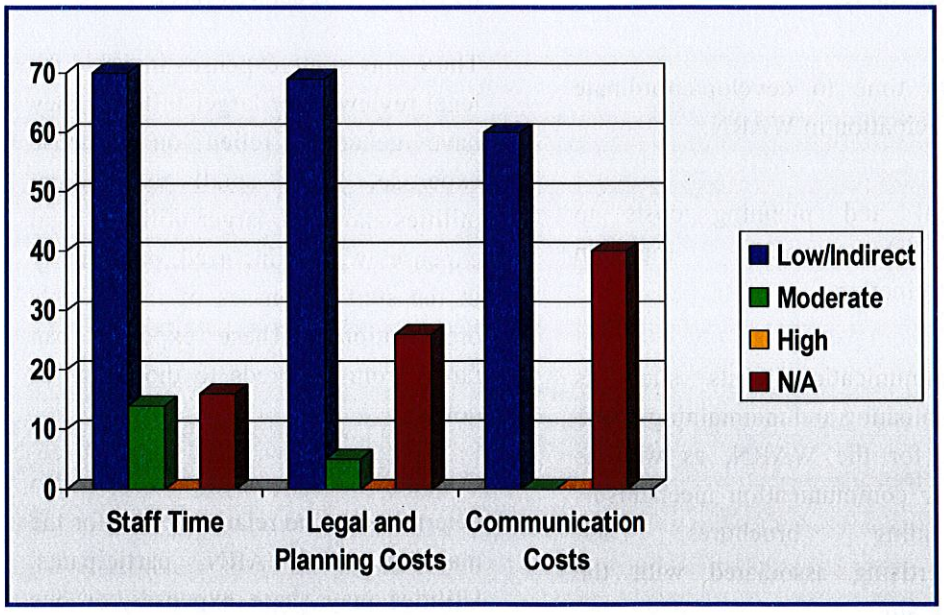


Figure 9: Costs to Participate in a WARN are Perceived as Being Low

APPLICATION TO SELECTED UTILITIES

Example business cases including an estimate of benefits and costs are provided in this section. The examples include different emergency scenarios for different sizes and types of utilities.

Users should have familiarity with the basic concepts of benefit-cost analysis if they desire to develop a financial case for participation in a WARN. Some excellent references for further understanding of such concepts include:

Newman, Donald G. et. al. *Engineering Economic Analysis*, 9th edition. Oxford University Press. 2004.

Selpulveda, Jose et. al. *Schaum's Outline of Engineering Economics*. McGraw Hill. 1984.

Business Case Example 1 – Medium Sized Utility, Operational Emergency

Windy City Utility is located in the upper Midwest. It provides 47,600 customers with water and wastewater service. It operates one water treatment plant, and one main and one very small wastewater treatment plant. The system includes approximately 770 miles of distribution system and 590 miles of collection system, 11 lift stations, two water storage tanks and six wastewater pumping stations.

Source water for the water treatment plant is the Muddy River. During late winter/early spring two years ago, an unusually intense rain storm in the headwaters of the watershed upstream of the plant, combined with the fact that vegetation had not begun to grow, caused very high levels of turbidity in its source water. Its most experienced operator had recently retired, and two lead operators had less than 5 years of experience each. In addition, several filter beds were off line for regular winter maintenance. The combination of high turbidity, lack of filter capacity and relatively inexperienced operations staff caused the Utility to lose the ability to treat water to meet drinking water standards for turbidity. As a result, the Utility issued a boil water notice for the entire service area for three days. This event resulted in a loss of revenue for the system for three days, additional operational costs incurred in getting the system back into service, and investigation by the regulatory agency into its operating procedures.

Windy City Utility is considering joining the state WARN organization that has recently formed. The General Manager has asked for the preparation of a business case to join WARN to present to its Board. In preparing the business case, staff had analyzed the cost to respond to its most recent emergency outlined above, with and without participation in a WARN.

Highlights of benefits and costs that they have identified are as follows (refer to associated spreadsheet):

- Reduced Revenue Loss: Windy City Utility lost three days revenue during previous emergency. With local and regional assistance, they believe that they would lose only 1.5 days of revenue with WARN assistance. Annual revenues are $28.4 million (water and wastewater), so 1.5 days of revenue is equivalent to $116,712.

- Reduced Inventory Savings: This savings is estimated at 5% of total inventory cost of $1,424,000. At a benefit of 6% per annum on investment of the saved inventory, Windy City Utility would realize $4,270 in annual savings.

- Reduced Equipment Cost: Windy City Utility owns three generators. It would need another eight generators to have complete back-up during a power failure. The annual benefit is estimated to be 20% of $50,000 per unit for both capital and operations and maintenance of the generators.

- Reduced Insurance Cost: Windy City Utility purchases insurance coverage for certain types of risks. Following conversation with their insurer, it estimates that the value of reduced insurance costs benefit will be $10,000 annually.

- Improved Bond Rating and Associated Debt Savings: Although Windy City Utility believes that they are more likely to get a better bond rating as part of a WARN, they already receive the highest bond rating available. Therefore, there is no monetary benefit estimated here.

In terms of cost, Windy City Utility identifies the following costs:

- Cost to Respond to Emergency: There may be some reduction in direct cost to respond but it may not be significant. Windy City Utility would reimburse the responding utilities for expenses incurred, such as overtime. Windy City recognizes that it may incur staff costs to respond to an adverse event. However, the costs would be "sunk" labor costs and overtime expenses are reimbursed by the benefiting utility. If mutual aid and assistance is actually provided by the utility as a result of a WARN activation, the costs incurred are reimbursable as defined under the terms of the agreement. (Note that if the utility incurs overtime costs for personnel working at the responding utility because other personnel are away assisting another utility and thus not available, these costs cannot be recovered through the WARN mechanism.)

- WARN Staff Cost: No additional staff is required for WARN participation because the required activities can be conducted using existing staff. For this reason, it is considered a sunk cost only.

- Legal Costs of WARN: Windy City Utility estimates that it will incur an expense of $5,000 for start-up review of the mutual aid agreement by their outside counsel.

- Communication Costs of WARN: Windy City Utility would incur an annual cost of $100 annual contribution to help defray hosting and other web site administration expenses.

Business Case Example 2 – Large Utility, Adverse Weather Event

Sunny City Utility Authority (SCUA) is a large Utility providing full water and wastewater services in Florida. This utility has analyzed risks and found that hurricanes are a top-rated risk to the utility. In addition, the Authority's managers are concerned about climate change, and the potential impact of low frequency but high consequence events such as hurricanes. Therefore, the Authority's Board of Directors has asked the staff to prepare an evaluation of the Utility's response capabilities. In this evaluation, the Authority has included an evaluation of participating in the Florida WARN (FlaWARN) program, the Florida mutual aid and assistance network. SCUA looks at the impact of a Category 3 Hurricane. Such hurricanes occur on average every 5 years in some parts of Florida.

- Revenue Loss: SCUA evaluated the potential impact of a single incident. In a typical event, with the assistance of FlaWARN, SCUA would anticipate a loss of revenue of one week due to the effects of felled trees and resulting loss of power and ability to provide water and wastewater service. With the assistance of FlaWARN providing back-up generation capability, SCUA thinks that they would have the service area partially restored (50%) in three days and fully restored in five days. Therefore, the lost revenue is assumed to be equivalent to only three days instead of 7 days, a savings of four days of revenue. Average annual daily revenue is $500,000.

- In addition, a neighboring large utility's assistance in back office operations, billing, and damage assessment was both valuable and quantifiable in assuring that the SCUA was able to maximize reimbursement from FEMA and expedite the resumption of billing and other administrative functions.

- Reduced Inventory Savings: SCUA is able to carry less inventory such as equipment, supplies and fittings for emergency response, knowing that they can made available through WARN if needed. This savings is estimated at 5% of total water and wastewater equipment and supplies inventory cost of $3,535,000. At a benefit of 6% per annum on investment of the saved inventory, SCUA would realize $10,605 in annual savings.

- Reduced Equipment Cost: In the case of SCUA, there are 130 water wells serving over 30 water treatment facilities. Even though the bulk of the water treatment facilities and an associated on-site well are served by a stationary generator, it is estimated that 30 to 40 of the remaining 100 well sites would require a portable generator during an extended power outage in order to meet demands in the system. SCUA currently has only 9 standby portable generators available to power the additional 30 to 40 wells that would need power during a major event such as a hurricane. SCUA would look to FlaWARN for those generators during an extended emergency. The capital cost for SCUA to purchase the additional 30+ generators sufficient to power the wells is estimated at over $3.5 million. The annual cost assuming a working life of 15 years at 5% is equivalent to $162,200. In addition, SCUA estimates an annual labor cost of $60,000 to maintain 40 generators.

- Wastewater service in the coastal areas of the United States including the Gulf Coast states and the southern Atlantic seaboard is typically provided through a series of pumping systems. These areas have very little topographical relief and rely on pump stations in lieu of gravity flow. SCUA which serves approximately 500 square miles of territory has over 1,150 wastewater pumping stations. Less than 100 of these stations have onsite standby power. The remaining stations depend upon mobile trailer mounted generators for power during a power failure. SCUA keeps approximately 30 standby generators available for use during power failures. It is projected that SCUA would need approximately 140 generators to power the stations on a rotational basis during an extended widespread power outage. The capital cost to purchase the additional 110 portable trailer mounted generators in sizes ranging from 40 to 300 kw is approximately $5.5 million, not including depreciation or maintenance. The annual cost assuming a working life of 15 years at 5% is equivalent to $255,000. Estimated annual labor

cost for maintenance and storage is estimated to be $120,000.

- Reduced Insurance Cost: SCUA purchases insurance coverage for certain types of risks. Following conversation with their insurer, it estimates that the value of reduced insurance costs benefit will be $10,000 annually.

- Improved Bond Rating and Associated Debt Savings: Although SCUA believes that being a WARN member will help improve their overall bond rating, they have not calculated an actual economic benefit. In terms of cost, SCUA identifies the following costs.

- Cost to Respond to Emergency: There may be some reduction in direct cost to respond but it may not be significant. SCUA would reimburse the responding utilities for expenses incurred such as overtime. SCUA recognizes that it may incur staff costs to respond to an adverse event. However, the costs would be "sunk" labor costs and overtime expenses are reimbursed by the benefiting Utility.

- WARN Staff Cost: No additional staff is required for WARN participation because the required activities can be conducted using existing staff. For this reason, it is considered a sunk cost only.

- Legal Costs of WARN: SCUA estimates that it will incur an expense of $2,000 for start-up review of the mutual aid agreement by their outside counsel. Most of the review will be handled by in-house counsel.

- Communication Costs of WARN: SCUA would incur an annual cost of $500 annual contribution to help defray hosting and other web site administration expenses.

CASE STUDY EXAMPLE 1 - WINDY CITY UTILITIES

Scenario: Operational Emergency Resulting in Loss of Source Water

Interest Rate for Net Present Value Calculation 6%

	COST CATEGORY													
Benefits	**Net Benefit with WARN Assistance**	**Comments**	**Frequency of Benefit or Cost**	**Net Present Value (Calculated)**	**YR 0**	**YR 1**	**YR 2**	**YRS 3-7***	**YR 8**	**YRS 9-11***	**YR 12**	**YRS 13-15***	**YR 16**	**YRS 17-20***
Estimated difference in system revenue under this scenario	$116,712	Lost 3 days revenue during previous emergency. Assume only 1.5 days lost with WARN assistance. Annual revenues are $28.4 million (water and wastewater).	Per occurrence. Assume Year 2, 8, 12, 16.				$116,712		$116,712		$116,712		$116,712	
Reduced inventory costs (parts, supplies)	$4,270	Estimated at 5% of total inventory cost of $1,424,000, 6% per annum	Annual			$4,270	$4,270	$4,270	$4,270	$4,270	$4,270	$4,270	$4,270	$4,270
Reduced cost of owning/operating generators	$50,000	Windy City Utility owns 3 generators. It would need another 8 generators to have complete back-up during a power failure. The annual benefit is estimated to be 20% of $50,000 per unit, times 8 units, including capital as well as O&M cost.	Annual			$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Decreased insurance cost	$10,000	The utility estimates that this benefit will be $10,000 annually.	Annual			$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000
Decreased debt service cost (due to bond rating)	$0	Although Windy City Utility believes that they are more likely to get a better bond rating as part of a WARN, they already receive the highest bond rating available. Therefore, there is no monetary benefit estimated here.												
Improved customer satisfaction	$0	Priceless but no quantified benefit identified.												
Total Benefits					**$0**	**$64,270**	**$180,982**	**$64,270**	**$180,982**	**$64,270**	**$180,982**	**$64,270**	**$180,982**	**$64,270**
Expenses														
Cost to respond to the emergency	$0	There may be some reduction in direct cost to respond but it may not be significant. Windy City Utility would reimburse the responding utilities for additional expenses incurred such as overtime. These expenses would not be different under a WARN or not. Windy City recognizes that it may incurr staff costs to respond to an adverse event. However, the costs would be "sunk" labor costs with the exception of possible overtime expenses at the responding utility to cover for those away responding, which are not reimbursed by the benefiting utility.												
Staff time for WARN Participation	$0	No additional staff - sunk cost only.												
Legal costs of WARN	$5,000	$5,000 for start-up review of the mutual aid agreement.	Year 0		$5,000									
Communication costs of WARN	$100	$100 annual contribution from utility to defray expenses.	Annual			$100	$100	$100	$100	$100	$100	$100	$100	$100
Total Expenses					**$5,000**									
Net Benefit (Expense)				**$1,013,217**	**(5,000)**	**64,270**	**180,982**	**64,270**	**180,982**	**64,270**	**180,982**	**64,270**	**180,982**	**64,270**

***The columns for these years are identical.**

CASE STUDY EXAMPLE 2 - SUNNY CITY UTILITIES AUTHORITY

Scenario: Category 3 Hurricane

Interest Rate for Net Present Value Calculation 6%

	COST CATEGORY							
Benefits	**Net Benefit with WARN Assistance**	**Comments**	**Frequency of Benefit or Cost**	**Net Present Value**	**YR 0**	**YRS 1-6***	**YR 7**	**YRS 8-20***
Estimated difference in system revenue under this scenario	$2,000,000	Anticipated net loss of 4 days of revenue at average of $500K per day.	Per occurrence. Assume Year 7.				$2,000,000	
Reduced inventory costs (parts, supplies)	$10,605	Estimated at 5% of total inventory cost of $3,535,000, 6% per annum	Annual			$10,605	$10,605	$10,605
Reduced cost of owning/operating generators	$597,200	$162,200 annual capital cost and $60,000 O&M cost of water generators. $255,000 annual capital cost and $120,000 O&M cost for wastewater generators.	Annual			$597,200	$597,200	$597,200
Decreased insurance cost	$50,000	The utility estimates that this benefit will be $50,000 annually.	Annual			$50,000	$50,000	$50,000
Decreased debt service cost (due to bond rating)	$0	No direct monetary benefit is assumed here.						
Improved customer satisfaction	$0	Priceless but no quantified benefit identified.						
Total Benefits					**0**	**$657,805**	**$2,657,805**	**$657,805**
Expenses								
Cost to respond to the emergency	$0	Similar to Windy City Example 1.						
Staff time for WARN Participation	$0	No additional staff cost - sunk cost only.						
Legal costs of WARN	$2,000	$2,000 for start-up review of the mutual aid agreement.	Year 0		$2,000			
Communication costs of WARN	$500	$500 annual contribution from utility to defray expenses of WARN organization.	Annual			$500	$500	$500
Total Expenses					**$2,000**	**$500**	**$500**	**$500**
Net Benefit (Expense)				**$8,867,351**	**-$2,000**	**$657,305**	**$2,657,305**	**$657,305**

***The columns for these years are identical.**

WARN ACTIVATION CASE STUDIES

In addition to the above business case evaluation, three case study examples of benefits from having a WARN were examined.

Case Study 1: Orange County Utilities (OCU), Florida

According to Ray Hanson, Deputy Director of OCU, prior to the creation of FlaWARN, there was no apparent need for such an extensive aid agreement coordination process. The last big storm to hit Florida was the Category 5 Hurricane Donna in 1960. In those days, Orlando was small and Florida had not yet experienced the explosive growth to come. The large metropolitan areas didn't blossom until the 1970s. There were not enough major storm events to cause concern, particularly for utilities in Central Florida so there were no drivers to change the way business was done. Orange County Utilities (OCU) did not exist.

Over time, OCU formed and developed informal mutual aid arrangements with other utilities but nothing more. There was no process to track or manage resource requests nor was there expectation of reimbursement for offering aid. OCU had emergency preparedness plans that were very basic. Improved security processes were being developed in response to issues arising from 9/11. There were some form of aid agreements in the works prior to 2004, but they were in the formative stages.

In 2004, five hurricanes hit the State in one season - Bonnie, Charley, Frances, Ivan, and Jeanne, with 3 out of 5 impacting the Orlando/Orange County metro area. OCU was virtually unprepared for this previously unimaginable multi-storm scenario. The existing emergency plans did not address a situation like this. OCU was crippled with 75% of approximately 500 pump stations inoperable due to lack of power. Extended loss of power had a major impact on operations. OCU did not have enough generators or staff to service the out-of-service pump stations. OCU had no system for tracking needs, and no extensive contact list to call upon. The Florida Water Environment Association Utility Council quickly drew up a call-list to jump start calls for assistance but that was the extent of the mutual aid response plan.

Hurricane Charley was a small, fast moving storm and OCU was the biggest Utility affected in Central Florida and needed lots of help. The two storms that followed within weeks affected other utilities as well and therefore there was no one available to help because they either staged for the storms with no extra capacity or focused on their own emergency response after the storm.

OCU advised utilities that helped in responding to Hurricane Charley that they would be reimbursed but there was no formal arrangement or statement of costs and liability protection. There was also no guarantee in place that FEMA would reimburse OCU. OCU learned later on that FEMA requires mutual agreements to be in place to provide reimbursement. Luckily, OCU was able to document the process in detail and FEMA did provide reimbursement. The process and paperwork however was daunting.

Managing multiple aid requests was difficult. Adding that task to OCU staff that was already tapped out was too much and ineffective. Coordinating any resources received was also very challenging. The need to book hotels, arrange meals for staff on loan, and coordinate communications with them was totally unanticipated. Luckily, OCU had extra radios for outside teams to cross communicate with staff, which eased the response burden somewhat. Documenting the entire event was a tremendous burden. Thus, obtaining assistance was hard but coordinating it made it double-duty. It would have helped to have a third party involved just to coordinate those efforts.

Thankfully, OCU hasn't yet had a need to utilize the new mutual aid system since 2004. Because of size and location, OCU's emergency management philosophy is to direct our considerable resources toward becoming self-sufficient and view FlaWARN as an important supplemental assistance provider. Being a member of FlaWARN and able to help other utilities is regarded as an essential community partnership and has provided an unexpected valuable benefit by providing OCU staff the opportunity to train and apply emergency response skills. With staff retirements increasing, FlaWARN membership is also an important contributor to knowledge transfer needs. So, the most important benefit of FlaWARN to OCU is the knowledge gained in terms of sharing emergency response plans and best practices in addition to providing supplemental assistance.

In the southeastern and coastal areas of the U.S., major storms often affect large geographic areas. Storms can impact large areas of Florida and can render any mutual aid system ineffective on a state level. Therefore, FlaWARN should consider broadening and strengthening the FlaWARN "network" to a regional level. This would provide members with the ability to share resources out of state for assistance, as well as expand training and testing preparedness and promote best practices for our staff.

Case Study 2: Detroit, Oregon

The City of Detroit is located in Marion County, Oregon. In February 2008, a 50 year snow storm event occurred in Marion County which stretched local resources. The half-

mile road up to the City water treatment plant was no longer passable or plowable. The area had no power. A propane-powered emergency generator keeping the water treatment plant on line would run out of fuel in a day or so. High snow berms necessitated the use of backhoes which were not available from the County as they were all being deployed elsewhere. Propane delivery was vital and so the Utility was living on borrowed time. Being an Oregon WARN (ORWARN) member, the City contacted ORWARN. Mike Gotterba, the Emergency Manager at the City of Salem and primary ORWARN contact, provided the necessary backhoes for two days, allowing plows to move in and re-open the road for additional propane delivery.

From Christone Pavoni, City Recorder, the City of Detroit, "*There aren't words big enough to thank you for the incredibly quick response in our time of need. The Salem Crew was just awesome! This is just a quick note to thank Mike, the City of Salem, and all those who have called and offered assistance. ORWARN WORKS!!!!! Thank you.*"

Case Study 3: Alamosa, Colorado

Alamosa is a town with a population of about 10,000, located south of Colorado Springs, Colorado. The Town's drinking water supply comes from groundwater - two water supply wells at a depth of 800 to 1,200 feet are fed by an aquifer of geothermally heated water that provide water at a temperature ranging from 80 to 90 degrees Fahrenheit. In March 2008, a sharp increase in the number of cases of illnesses was reported by Alamosa residents. The source of the illnesses was not initially known but it was determined fairly quickly that the cause was *salmonella.* Often, *salmonella* illness is caused by contamination in food. However, since over a dozen bottle-fed only babies became sick, Colorado Department of Public Health & Environment (CDPHE) epidemiologists began to suspect contamination of the water supply in mid-March.

On March 19, CDPHE instructed the Town to issue a boil-water notice and called the Colorado Water/Wastewater Agency Response Network (CoWARN) for assistance. CoWARN has a secure web-based event tracking system and provides resources and training for planning and responding to emergencies. CoWARN works with various industry groups and public agencies linked to the Colorado Water community to provide these resources and services.

CoWARN also provides a practical mutual aid agreement designed to reduce bureaucratic red tape in times of emergency. It deals with issues that might delay assistance from a responding utility, including liability and reimbursement. The Town of Alamosa had not signed the mutual aid

agreement, although they were familiar with CoWARN. When informed that CoWARN was willing to help the system recover provided that they follow the provisions outlined in the mutual aid agreement, the Town of Alamosa quickly went about the task of signing the mutual aid agreement.

In response to its communications with the Town of Alamosa, CDPHE asked CoWARN to issue a standby notice to members. Almost immediately thereafter on March 19 CoWARN formally activated to ask members for assistance. Response calls came in almost immediately and within a mere 2 hours, an extensive list of available personnel and equipment was available. The following morning, Denver Water Staff met with CDPHE to prepare a preliminary response plan. The plan comprised two key elements: methods to distribute potable water and a process to troubleshoot and then address the underlying cause of contamination.

To provide potable water, the National Guard brought water tankers and handed out a lot of bottled water. Organizations such as Anheuser Busch and WalMart donated water. WalMart and other suppliers also sold bottled water.

Denver Water sampled both water supply wells as well as in the distribution system. The supply wells had no detectable total coliform (TC), while TC was detected at five points in the distribution systems. Although it was not conclusive, it indicated that the source of contamination was more likely the distribution system rather than the supply wells; to this date, the source of contamination has not been definitively confirmed. No cross-connection or other contamination point has been identified as the likely source.

Since Alamosa did not chlorinate their drinking water, they did not have trained personnel or supplies to do it. Denver Water, Aurora Water and other responders provided chlorine feed systems, pumps, diffusers (to attach to fire hydrants), day tanks and other equipment to help with flushing the system. Denver Water initially supplied four personnel, which was quickly expanded to 6 crews with up to three people, including personnel from Aurora Water, City of Boulder, and several other utilities. The City of Aurora also provided granular calcium hypochlorite (swimming pool chlorine, or HTH). Other cities, as well as a distributor, provided additional granular calcium hypochlorite.

To disinfect it, the distribution system was flushed with high levels of granular sodium hypochlorite added to achieve 25 ppm for three days, followed by 10 ppm for 24 hours, and then tapering off to achieve 1 to 2 ppm to take a cautious, staged approach. As a result, an unusually large quantity of DPD (N,N′-diethyl-p-phenylenediamine) reagent test

packets that measure free chlorine were also needed. Again, other Colorado utilities as well as a distributor were able to provide the needed packets.

The National Rural Water Association was able to provide assistance as well. They provided a trailer that had been funded by CDPHE in January 2008. Although it had not been fully equipped at that point, it was used as a Command Center. Because the trailer is intended to be used primarily as a training vehicle, communication equipment and computers will be added to make it fully usable as a Command Center as well in the future.

The drinking water system was cleared on April 9, to provide potable water without restrictions. During the incident, schools, businesses and residents had a hard time functioning. Many of the response crews actually stayed seventeen miles out of town because of lack of showers and drinking water in Alamosa.

The benefits of CoWARN have been clearly demonstrated. Resources were able to be mobilized very quickly with WARN, once the mutual aid agreement was executed by Town officials. It is believed that it would have taken weeks longer to get the Alamosa system running again without CoWARN. Denver Water and other utilities were able to respond completely and confidently with the mutual aid agreement in place, knowing that liability was not an issue. The Town of Alamosa will reimburse the utilities as requested, primarily for supplies. The responding utilities donated a large amount of staff time, fuel, and lodging expenses. Since the Town of Alamosa incident, many more utilities have executed the mutual aid agreement after seeing the clear benefits that it brings. (Membership almost doubled in the following 8 to 10 weeks, increasing from 33 to 61 utility members.)

CONCLUSIONS AND RECOMMENDATIONS

This project has shown that the biggest purely economic benefit to a utility from being a member of a WARN is a faster recovery from the emergency and the corresponding revenue gain. However, for some utilities, savings on generators and other equipment and supplies could also be substantial.

In addition, it has been determined that costs to participate in WARN are low. Further, costs for a utility to respond to an event are generally recoverable through the WARN mechanism as permitted in the mutual aid agreement.

Perhaps most important to the utility, there is the issue of public confidence – hard to quantify monetarily but huge in terms of benefit. Lack of potable water has direct economic consequences to the businesses and residences that a utility serves. If a utility loses its reputation and the public's confidence to provide service, the ability to regain such trust again is a challenging, expensive and long-term proposition.

The decision to participate in a WARN, as well as an evaluation of benefits and costs, involves considering a variety of scenarios. These scenarios range from higher frequency but more limited events such as loss of water due to power failure, localized flooding or water main break, to lower frequency but more widespread events such as may be caused by a hurricane, snowstorm, earthquake or tornado. The need for planning for more frequent events should not be overlooked by the utility manager.

Part of this planning includes execution of the mutual aid agreement so as not to delay the arrival of aid when needed. WARN members will require the execution of this agreement before providing aid due to the protections and assurances it provides the requesting and responding utility. A utility that does not sign the mutual aid and assistance agreement puts their utility and community at risk for delaying the recovery of their operations.

Participation in WARN should be a core element of any utilities overall business continuity strategy and risk management program. The costs are relatively small and the benefits, both to the utility and to the community it serves, are large.

RESOURCES

AWWA (January 2008) *Security Funding Opportunities: Lessons Learned & Observations from Successful Water and Wastewater Utilities*- Report provides information on security project funding opportunities.

AWWA (2004) *Emergency Power: Source Planning for Water and Wastewater* - Report provides information on emergency power.

Federal Emergency Management Agency FY 2008 NIMS Compliance Objectives. Summary chart available at www.fema.gov.

Newman, Donald G. et al, 2004. Engineering Economic Analysis, 9th edition. *Oxford University Press.*

Selpulveda, Jose et al, 1984. Schaum's Outline of Engineering Economics. *McGraw Hill.*

ECONOMIC BENEFITS OF FORMING AND PARTICIPATING IN A WATER/WASTEWATER AGENCY RESPONSE NETWORK (WARN)

APPENDIX A

AWWA WARN Survey to Develop Business Case

Survey Status: Active Launched: 5/22/2007 2:52 PM Closed: *N/A*

Email Invites: 0	**Visits:** 281	**Partials:** 0	**Completes:** 79 *(Does not include blank responses)*

Since March 2006, the national success of creating Water Wastewater Agency Response Networks (WARN) in each state is undeniable. Last year at this time, four states (California, Florida, Louisiana and Texas) were the only states to have a viable agreement in place as a method of exchanging personnel, equipment and other resources during response to an emergency. Since then, three states (Oregon, South Carolina and Georgia) have executed agreements to form a WARN program, with 12 more states close behind in various states of "readiness" with draft agreements. While the success is evident, and the request for creating more is present, the business case, integration and practicality need to be documented.

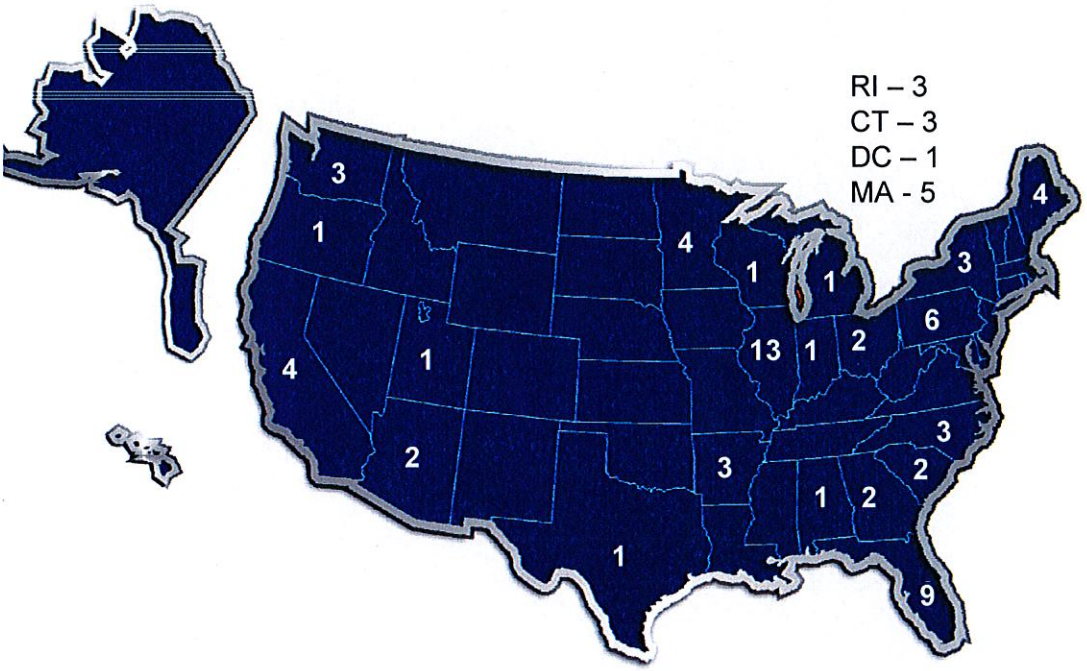
AWWA is conducting a study to establish the value of WARN to utilities. As part of this study, this survey is designed to: 1. Obtain sufficient information to be able to clarify the business case for utilities to participate in WARN. 2. Characterize the economic impact on utilities as they prepare for and respond to emergencies using mutual aid and assistance.

The survey will require approximately 20-30 minutes to complete. There are ten questions related to utility characteristics so we can do cross-correlations. NOTE to Survey Participants: Information to answer questions 2 through 6 may be available by consulting your latest Comprehensive Annual Financial Report (CAFR), budget, or other similar financial document.

1. Contact Information (please fill in the blanks)

View 79 Responses

AWWA Survey Responders Locations



2. Governance (please check one):			
Public Agency owned by a government, non-enterprise (i.e., part of a Public Works Department or other governmental department, etc.)		9	12%
Public Agency owned by a government that is an enterprise fund (i.e., water utility department, sewer utility, etc.)		39	50%
Public Agency with independent governance (i.e., an authority, a regional agency such as a district, etc.)		23	29%
Investor Owned Utility		1	1%
Private Not-For-Profit Utility		2	3%
Other, please specify View Responses		4	5%
	Total	78	100%

3. Core Services Provided (check all that apply):			
Potable Water Treatment		62	82%
Potable Water Distribution		68	89%
Raw Water Transmission (wholesale)		12	16%
Wastewater Collection		44	58%
Wastewater Treatment		37	49%
Reclaimed Water Treatment		7	9%
Reclaimed/Irrigation Water Distribution		7	9%
Core services Provided by a Private Contractor		0	0%

4. Other Services Provided (check all that apply):

Stormwater Collection	20	61%
Stormwater Treatment	5	15%
Electric Generation	8	24%
Electric Distribution	7	21%
Natural Gas Distribution	2	6%
Solid Waste Collection	10	30%
Solid Waste Transfer/Disposal	4	12%
Other, please describe: View Responses	6	18%

1. District energy (high and low pressure steam).
2. Administrative services for other utilities.
3. Potable water wholesales.
4. Street light billing.
5. By contract.
6. Combined sewer overflow treatment.

5. Population Served (Sum of Wholesale and Retail Services)

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Less than 10,000	10,001 to 49,999	50,000 to 99,999	100,000 to 249,999	250,000 to 499,999	500,000 to 999,999	1,000,000 or more	N/A
Water	8 11%	24 33%	12 17%	11 15%	7 10%	5 7%	4 6%	1 1%
Wastewater	8 16%	15 31%	4 8%	10 20%	2 4%	3 6%	2 4%	5 10%
Reclaimed Water	5 24%	0 0%	0 0%	2 10%	0 0%	0 0%	0 0%	14 67%

6. Wholesale Accounts (your agency bills directly to communities or utilities)

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Less than 5	5 to 10	11 to 25	26 to 50	More than 50	N/A
Water	39 57%	8 12%	3 4%	1 1%	1 1%	17 25%
Wastewater	22 51%	1 2%	0 0%	2 5%	0 0%	18 42%
Reclaimed Water	6 24%	0 0%	0 0%	0 0%	0 0%	19 76%

7. Total Retail and Commercial/Industrial Accounts

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Less than 10,000	10,001 to 49,999	50,000 to 99,999	100,000 to 249,999	250,000 to 499,999	500,000 to 999,999	1,000,000 or more	N/A
Water	29 40%	28 38%	7 10%	4 5%	2 3%	0 0%	0 0%	3 4%
Wastewater	23 45%	16 31%	2 4%	2 4%	1 2%	0 0%	0 0%	7 14%
Reclaimed Water	9 32%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	19 68%

8. Most Recent Year Annual Operating Revenue obtained principally from water and sewer service charges ($000):

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Less than 5,000	5,001 to 10,000	10,001 to 25,000	25,001 to 50,000	50,001 to 100,000	100,001 to 250,000	250,001 to 500,000	More than 500,000	N/A
Water	15 22%	9 13%	11 16%	9 13%	5 7%	2 3%	3 4%	13 19%	1 1%
Wastewater	12 25%	4 8%	9 19%	3 6%	1 2%	1 2%	3 6%	9 19%	6 12%
Reclaimed Water	5 21%	0 0%	0 0%	1 4%	0 0%	0 0%	0 0%	0 0%	18 75%

9. WATER System Characteristics

View 73 Responses

Ground Water (Yes or No)	Surface Water (Yes or No)	Number of WTP or Prod. Facilities	Number of Wells	Total Average Daily Water Production (mgd)	List Average Daily Flow Treated at Up to Three Largest WTP-1	List of Average Daily Flow Treated at Up to Three Largest WTP-2	List Average Daily Flow Treated at Up to Three Largest WTP-3	Total Number of Pump & Storage Stations	Length of Water Distribution System (Miles)	Total Service Area in Square Miles (Retail Only)
yes	no	1	15	7	4.5			7	190	12
yes	no	1	13	2.2	2.2			7	70	9.98
no	yes	1	8	10				3	560	
no	yes	1	8	11	11					
no	no									
no	yes	1		55	55			8	1400	380
no	yes	0	5	0	0	0	0	4	100.2	9.5
no	yes	1	19	17		17		5	785	
no	yes	1	19	17			17	5	785	
no	yes	2	11	13	12.5	700,000		5	522	63
	yes		3	20				20	750	45
no	yes	1	0	3.25	3.75			3	130	
no	yes	1	0	9.4	9.4	9.4	9.4	3	190	
no	yes	2	5	2.8	2.8	2.8	2.8	17	205	65
yes	no	1	4	1	1			3	74	22
yes		2	0	9.375	8.84	536		4	330	25
no	yes	1		9	9			5	120	
yes	no	1	3	0.7	0.7			7	400	200
yes	no	2	0	12	11	1	0	40	550	22
no	yes								1016	
	yes			4.8					200	13.4
no	yes	6	32	243	300			150	6630	540
no	yes	1		5.2	5.2			4	230	16
no	yes	2	7	4.7	4.7			4	198	5
no	yes	1		38	17			70	1701	2100
yes	no	5	7	1.3	1.2	1.3	1.3	11	65	
no	yes	5	0	210	125	35	25	133	4085	325
no	yes	1	0	16	16			5	182	
no	yes	1		47	47			1		
	yes			7					217	15
yes	no		20					7	260	
	yes	1		2.8				5	70	20
yes	yes	8	34	89	17	15	15	3	1700	
no	yes	2	8	45	45	45	45	7	800	40
yes	no	1	3	350	350			2	25	2
no	yes	3	37	100	100			110	2083	143.3
yes	no	0	18	9.5	0	0	0	26	18	16
no	yes	1	0	5.3	5.3			9	224	16
no	yes	1	0	1.6	1.6	1.9	1.6	3	50	20
yes	yes	2	5	3.17	0.5	3		5	119.5	12
yes		1	23	6	3	3		5	250	38
no	yes	1	10	22				4	500	49
no	yes	2	0	49.5	37	12.5		71	778	58.3
yes	yes	0	2	2	0	0	0	2	8	0
no	yes	1		3	3			0	130	68
no	yes	2	0	0	23			13	555	25
no	yes	0		2				2	112	15
yes	no	0	7	3.5				3.5	12	6
yes	no	0	8	12 n/a				10	350	35
	yes	3	0	52.5	70	40	12	5	1500	1250
no	yes	4	0	250	75	75	60	22	5000	640
no	yes	1	0	1	1				4	75
no	yes	1	2	0.25	0.25			2	16	53
no	yes	2	0	40	40				30	1800
	yes	0	4	2.8				7	85	6
yes	no	39	22	28	4	2.8	2.5	66	200	28
no	yes	1	9	36	36			29	1332	430
no	yes	1	0	250	250			20	300	
no	yes	9	11	55	35	6	6	25	1500	
no	yes	1	10	30	30			39	747	47
no	yes	4	20	50	18	6	5	13	825	103
yes	no	1	6	3.5	3.5			1	200	8
no	yes	2	11	13	12	1		4	515	48
	no	1	30	3.5				1	98	3.43
no	yes	1		5.2	5.2			4	230	12
yes	no	5	7	1.5	1.5	1.5	1.5	11		
no	yes	1	10	32				6	487.5	60
no	yes	0	5	0	0	0	0	10	100	10
	yes	1						9	81	
yes	no	4	8	2.9	1.14	0.84	0.58	4	91	5
no	yes	1	0	74	64			15	937	72
yes	no	2	37	50.6	50.6	50.6	50.6	10	753	34
no	yes	4	0	207.5	121.5	59.5	26.4	22	2900	

10. WASTEWATER System Characteristics

View 48 Responses

Number of Wastwater Treatment Plants	Total Average Daily Flow Treated (MGD)	List Average Daily Flow Treated at Up to Three Largest WTP-1	List of Average Daily Flow Treated at Up to Three Largest WTP-2	List Average Daily Flow Treated at Up to Three Largest WTP-3	Length of WW Collection System (Miles)	Total Number of Pump (Lift) Stations	Total Service Area in Square Miles (Retail Only)
1	2.5	2.5			80	9	9.98
1	8.5				450	31	
2	22.6	22	0.6		637	185	
1	4	4	4	4	166	7	9
1	13	50			350	21	15
2	16.5	6.6	9.9		375	30	
1	1	1			60	7	7
1	20	20					
2	9	8	1	0	230	9	12
					1,448		
1	7				200	12	13.4
3	190.3	190.3			4696	29	518
2	14.5	9	5.5		190	13	16
1	1.3	1.36	1.3	1.3	70	19	
1	82	82	0			15	83
0	0	0	0	0	0	15	3
					493	25	30
0					29	2	
2	24	24	24	24	550	4	40
0	0	0	0	0	0	0	0
2	6.4	6.1	0.3		185	6	16
0					50	3	20
1	10	10	0	0	300	36	120
0							
1	3.5	3.5			120	20	68
1	2.9					71	6
1	12	12			300	10	35
4	70	60	5	4	1400	55	1250
1	0.27				12	4	53
2	30			30	1800	125	
1	2.8				90	5	6
0					100	0	28
2	28	28			950	69	430
1	350	350			250	5	
0	0	0	0	0	0	0	0
	44	44			774	29	47
1	0.17				30	14	5
1	2.7	2.7			180	72	8
1	1.7				16.2	40	3.43
2	10.4	5.5	4.9		195	13	12
1	1.6	1.6	1.6	1.6		16	
1	36				400	125	60
1	4.1	0	0	0	166	7	10
2	1.8	1.8			60	23	
2	2.2	1.6	0.6		80	31	5
1	38	38	38	38	516	150	30
1	94.4	94.4			2800	33	

11. Please add any clarifying comments:

View 23 Responses

1. Wastewater is handled by a separate government agency.
2. Flow includes .04 MGD (average) from neighboring community.
3. We are a state agency that regulates drinking water systems.
4. Water is municipal site (city); wastewater is a county site.
5. Highly fluctuating water demands; 2 MGD in the winter months and 6-7 MGD during the summer tourist season (population served rises to about 100,000).
6. Water is different from wastewater on many questions above. You are getting answers from water with a knowledge of wastewater.
7. We are a drinking water only, rural water system – not-for-profit.
8. The City of EP is also served by a second WWTF operated by a state corporation.
9. Didn't understand the difference between list avg daily flow at up to three largest WTP/WWTP (1-3). And for water, it's the sum production of all the water treatment plants.
10. Out S Slope WWTP is a regional facility, which receives waste stream from Coal Valley, East Moline, Rock Island County, in addition to Moline.
11. BWD is a wholesale potable water supplier only with no retail customers. Our customers provide their own transmission facilities from our plant to their distribution systems.
12. I am answering these ww questions as a transporter of waste to the regional treatment plant (owned by others). While we have several small, remote treatment plants, and collection systems, I am not including them in the response for simplicity sake. I am including relief facilities to the main interceptor.
13. Note: Primary supply surface water with 200 MGD capacity. Only treatment is disinfection and pH adjustment. (Unfiltered system) 100 MGD groundwater backup system.
14. All water is purchased.
15. We are a ground water system. The only treatment we do is the addition of chlorine and fluoride.
16. The Mars Hill Utility District provides municipal water and sewer to approximately 600 users. The towns of Mars Hill and Blaine are included in their District's boundaries. A small portion of the Town of Westfield is also served with municipal water.
17. These responses are based upon Raleigh Public Utilities.
18. The Village receives and distributes Lake Michigan water from the DuPage Water Com. Wastewater is collected and transmitted to one plant for treatment and release.
19. Wastewater collection system only. All wastewater flow and is treated by the City of San Bernardio.
20. None.
21. This response includes data for Moline's municipally owned wastewater system, which also supports development of a WARN in Illinois.
22. Mundelein purchases water from the Central Lake County Joint Action Water Agency, which is then distributed to our customers.
23. #9, 6 tanks at two plants, plus two elected storage tanks off-site with pumps. #10. 381 miles gravity; 135 miles force.

The following six questions relate to WARN/Mutual Aid Participation:

12. Are you aware of the WARN program or effort in your state?

Yes	73	95%
No	4	5%
Total	77	100%

13. Are you a member of the WARN program?

Yes	44	58%
No	32	42%
Total	76	100%

14. If your state WARN program or effort has a website, please indicate how useful it is:

Very Useful	17	29%
Somewhat Useful	6	10%
Not Useful at All	1	2%
Still Under Development	24	41%
No Opinion	10	17%
Total	58	100%

15. Have you signed a mutual aid agreement?

Yes	30	39%
No	46	61%
Total	76	100%

16.	If you responded "no" to the previous question, why not? (check all that apply):		
Legal Concerns		4	9%
Political Concerns		1	2%
Financial Concerns		0	0%
Final Agreement not Available Yet		28	60%
Don't Know		1	2%
Other, please describe View Responses		19	40%

1. Still in process of setting up WARN.
2. We are in development stage of WARN program.
3. We are the backup to many communities that can no a.
4. Draft currently being circulated for comments.
5. Not yet available – we will consider it.
6. Starting the process to receive permission.
7. The process is just being initiated in this state.
8. Just becoming aware of IL WARN efforts.
9. Not available – being developed.
10. PA WARN is still in the developmental stage.
11. Our state is presently working on a WARN program.
12. Working thru process now. Will sign by July '07.
13. Just received it, solicitor is reviewing it.
14. This is the first time that I have heard of WARN.
15. I am the WI WARN start-up committee chair.
16. WARN system in Maine is still in development.
17. There isn't one.
18. Just recently got involved. Don't know enough yet.
19. Need to obtain City Council approval.

The next eighteen questions relate to your Emergency Planning Experience:

17. Do you have a full time emergency manager on staff within the utility?

Yes	20	26%
No	57	74%
Total	77	100%

18. Do you have an Emergency Operations, Emergency Response or Emergency Preparedness Plan?

Yes	77	100%
No	0	0%
Total	77	100%

19. How was your plan prepared? (check all that apply):

In-House	64	83%
Consultant	30	39%
Other, please describe: View Responses	5	6%

1. In-house & consultant on portions.
2. In-house and Consultant Partnership.
3. Both in-house and a consultant.
4. In-house with assistance on graphics by consultant.
5. Fire Chief, Committee, County.

20. Do you periodically update your utility's emergency plan?

Yes	74	97%
No	2	3%
Total	76	100%

21.	If you responded "yes" to the previous question, how often?		
Less than 1 year		7	9%
1 year		32	43%
2 years		15	20%
3 years		13	17%
4 years		3	4%
5 years		5	7%
	Total	75	100%

22.	Do you periodically practice your plan using a tabletop approach conducted internally within the utility?		
Yes		42	55%
No		35	45%
	Total	77	100%

23.	If you responded "yes" to the previous question, how often?		
More frequently than once per year		6	14%
Once per year		24	57%
Once each two years		6	14%
Once each three years		6	14%
Once each four years		0	0%
Once each five years		0	0%
	Total	42	100%

24.	Do you periodically practice your plan using a tabletop approach involving organizations outside the utility?		
Yes		36	47%
No		40	53%
	Total	76	100%

25. If you responded "yes" to the previous question, how often?

More frequently than once per year		2	6%
Once per year		15	42%
Once each two years		11	31%
Once each three years		8	22%
Once each four years		0	0%
Once each five years		0	0%
	Total	36	100%

26. Do you periodically practice your plan using a Functional Exercise (uses a simulation team to simulate an event) approach?

Yes		23	30%
No		54	70%
	Total	77	100%

27. If you responded "yes" to the previous question, how often?

More frequently than once per year		0	0%
Once per year		10	43%
Once each two years		4	17%
Once each three years		7	30%
Once each four years		1	4%
Once each five years		1	4%
	Total	23	100%

28. Do you periodically practice your plan using a full-scale exercise approach (actually deploys equipment into the field to a specific scene(s) to take field action)?

Yes		7	9%
No		68	91%
	Total	75	100%

29. If you responded "yes" to the previous question, how often?

More frequently than once per year	0	0%
Once per year	2	25%
Once each two years	3	38%
Once each three years	2	25%
Once each four years	1	12%
Once each five years	0	0%
Total	8	100%

30. Do you regularly keep equipment and supplies on hand for emergencies (beyond what you need for day-to-day operations or just in time stock)?

Yes	71	95%
No	4	5%
Total	75	100%

31. Check all of the equipment and supplies you keep on hand:

Generators	65	87%
Vehicles	53	71%
Pumps	59	79%
Other equipment	38	51%
Fuel	60	80%
Additional storage for fuel	19	25%
Chemicals	52	69%
Additional storage for chemicals	11	15%
Spare mechanical parts	61	81%
Spare pipes	62	83%
Spare appurtenances	55	73%
Staff support supplies such as water, food, cots, emergency shelter	27	36%

32.	With whom do you coordinate emergency planning to ensure adequate supplies for emergencies? (check all that apply):		
Meet with neighboring utilities on a periodic basis		18	27%
Coordinate through a City or County Emergency Operations Center		53	80%
State primacy agency (e.g. Department of Health)		15	23%
Coordinate through WARN organization		10	15%
Other, please specify: View Responses		13	20%

1. Village of Mundelein.
2. No one.
3. NY WARN is under development.
4. Not done at this time.
5. Participate in the Cal. Utilities Emerg. Assoc.
6. FEMA
7. None.
8. Utility manager & key personnel.
9. Vendors of all descriptions.
10. We stock many "spare parts" for emergencies.
11. State mutual aid network; local emergency agencies.
12. Du Page County PWMA
13. Nothing formal – call for assistance.

33.	For your most critical facilities, do you have remote monitoring SCADA capability?		
Yes		67	88%
No		9	12%
	Total	76	100%

34.	If you responded "yes" to the previous question, is it useful during emergencies?		
Yes		65	98%
No		1	2%
	Total	66	100%

The next questions relate to your most recent Emergency Response experience for which you requested aid (regardless of whether you are an official WARN member). If you have not had an Emergency Response experience, please skip to Question 43.

35. For your most recent emergency for which you requested aid, which type of emergency did you experience?

Earthquake		0	0%
Hurricane		10	26%
Flooding		5	13%
Blizzard		0	0%
Fire/Firestorm		1	3%
Domestic Terrorism		0	0%
Tornado		2	5%
Other, please describe: View Responses		20	53%
	Total	38	100%

1. No aid requested in memory.
2. Power outage.
3. No aid requested.
4. Water contamination.
5. Major water line break.
6. Wide spread power outage.
7. Lift station flooding.
8. Main break on a 36" Water Main.
9. Electrical fire.
10. Wind storm.
11. High turbidity of raw water.
12. We have been able to handle our own emergencies.
13. N/A
14. No water.
15. Water main disruption.
16. Have not required outside aid as of yet.
17. Blackout.
18. Transmission main break.
19. Water main break.
20. Lift station flooded.

36. For the emergency listed above indicate for each item the length of time it took to receive the initial aid response. Please check all that apply (if you did not request aid, select N/A):

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Less than one day	1 to 2 days	2 to 3 days	3 to 4 days	More than 4 days	N/A
Neighboring Utilities, City or County Government	19 58%	4 12%	1 3%	0 0%	1 3%	8 24%
Regional Organization	3 11%	2 7%	0 0%	0 0%	1 4%	21 78%
State-Wide Organization	2 7%	6 21%	0 0%	0 0%	1 3%	20 69%
Federal Aid (e.g., FEMA)	0 0%	1 3%	2 7%	0 0%	7 24%	19 66%

37. Please indicate the type of aid (check all that apply):

Financial	10	31%
Personnel	12	38%
Generators	5	16%
Other Equipment	15	47%
Vehicles	6	19%
Other Rolling Stock	2	6%
Fuel	1	3%
Chemicals Other Than Fuel	0	0%
Other Parts and Supplies	4	12%
Lab Services	3	9%
Other Services	3	9%
Other, please describe: View Responses	10	31%

1	crew and vehicles equiped with Dist. tools
2	open interconnects
3	Support services for personnel
4	We needed a valve that is not stocked.
5	It takes awhile to process claim
6	Treated water through an interconnect agreement
7	WE have requested and received Fed reimbursement
8	Potable Water in Water Buffaloes
9	Alternate source of water
10	Debris removal assistance

38.	If Federal Aid was selected, was it a public assistance program?		
Yes		4	20%
No		16	80%
	Total	20	100%

39.	Did you rely on mutual aid or assistance to perform post-emergency assessment phase activities?		
Yes		3	9%
No		31	91%
	Total	34	100%

40.	How did you communicate with other emergency responders during the emergency response? (Check all the apply):		
Radio		27	73%
Cell Phone		29	78%
Email		16	43%
Satellite Phone		5	14%
Other, please describe: View Responses		9	24%

1. One land line was the only one working.
2. Direct communication.
3. Land line telephone.
4. Land line phone.
5. Fax
6. Land line phones.
7. Courier and ham radio.
8. Other radio systems.
9. Internet website for FlaWARN.

41.	What primary communication methods did you use to communicate with the public during and after the emergency? (Check all that apply):		
Newspaper		23	64%
Flyer		5	14%
Website		17	47%
TV Announcement		27	75%
Siren		1	3%
Radio Announcement		26	72%
Reverse 911		6	17%
Other, please describe: View Responses		5	14%

1. Neighborhood spreading messages.
2. No communication necessary.
3. Community sign.
4. District news letter.
5. Maintained visibility, opened our office to public.

42.	What back-up communication methods did you use to communicate with the public during and after the emergency? (Check all that apply):		
Newspaper		22	79%
Flyer		6	21%
Website		14	50%
TV Announcement		15	54%
Siren		1	4%
Radio Announcement		13	46%
Reverse 911		5	18%
Other, please describe: View Responses		2	7%

1. N/A
2. Code Red communication system (like reverse 911).

43.	In the last 20 years, have you provided aid to those who experienced emergencies?		
Yes		62	82%
No		14	18%
	Total	76	100%

44.	If you responded "yes" to the above question, please select from the list below (check all that apply):		
Financial		5	8%
Personnel		54	86%
Generators		24	38%
Other Equipment		42	67%
Vehicles		31	49%
Other Rolling Stock		18	29%
Fuel		7	11%
Chemicals Other Than Fuel		6	10%
Other Parts and Supplies		22	35%
Lab Services		11	17%
Other Services		6	10%
Other, please describe: View Responses		14	22%

1. Leak detection, line locates, plant start-up.
2. Field testing.
3. Administrative services, billing, etc.
4. Open interconnects.
5. Water
6. Specialized teams and equipment.
7. Water through emergency interconnects.
8. Engineering
9. Fleet, security, ICS task force and strike teams.
10. Water
11. Potable water.
12. Potable water to neighboring utilities.
13. Debris removal.
14. Personal contact in South Florida.

45. Have you had any enforcement actions such as notice of violation, consent orders, administrative orders, administrative penalty orders or judicial orders as a result of a response to a previous emergency?

Yes	1	1%
No	73	99%
Total	74	100%

46. If you responded "yes" to the previous question, please briefly describe:

0 Responses

47. Are you familiar with the National Incident Management System (See NIMS compliance matrix at http://www.awwa.org/Advocacy/Govtaff/Advocacy/ Documents/NIMS_Tribal_Local.pdf)?

Yes	72	95%
No	4	5%
Total	76	100%

48. Have you fulfilled or do you intend to fulfill the 2007 National Incident Management System compliance requirements?

Yes	62	81%
No	4	5%
Not Sure - Need more information	11	14%
Total	77	100%

49. Whom do you rely on for routine fleet maintenance?

Utility Staff	37	49%
Another Branch of Local Government	24	32%
Private Sector	18	24%
Other, please describe: View Responses	6	8%

1	State Motor Pool
2	Public Works Department - Vehicle Mt. Divison
3	Master Mechanic on staff works with contractor
4	vendors
5	Utility divisions are within Public Works Dept.
6	private company at our own maintenance facility

50. Have you provided mutual aid or assistance that was not part of a state or federal process?

Yes		43	57%
No		32	43%
	Total	75	100%

51. Has your utility provided mutual aid or assistance through a state or federal process?

Yes		18	24%
No		57	76%
	Total	75	100%

52. If you responded "yes" to the previous question, what has been your experience in getting reimbursed?

Excellent; no problems		2	11%
Very Good; with any issues being easy to resolve		6	33%
Good; some issues that were worked out		4	22%
Poor; had to provide a lot of documentation and wait a long time for reimbursement		6	33%
	Total	18	100%

53. Have you provided mutual aid or assistance through the Emergency Management Assistance Compact (EMAC)?

Yes		5	7%
No		69	93%
	Total	74	100%

54. If you responded "yes" to the previous question, what has been your experience in getting reimbursed?

Excellent; no problems	2	40%
Very Good; with any issues being easy to resolve	2	40%
Good; some issues that were worked out	0	0%
Poor; had to provide a lot of documentation and wait a long time for reimbursement	1	20%
Total	5	100%

Business Case for Participating in a WARN. If you responded "yes" to being a member of the WARN program or effort in your state, please respond to the following questions. If you responded "no", please skip to Question 61.

55. What benefits have you received from participating in a WARN? (indicate whether Low/Indirect, Moderate, or High Level of Benefit on those that apply; else choose N/A)

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Low/Indirect Benefit	Moderate Benefit	High Level of Benefit	N/A
Improved ability to respond to emergencies due to training, lessons learned and experience from other WARN participants	8 19%	9 21%	10 23%	16 37%
Reduced capital cost to purchase and maintain back-up portable generation capability	10 24%	4 10%	4 10%	24 57%
Reduced lost water/wastewater revenue	12 29%	5 12%	0 0%	24 59%
Reduced cost of carrying contingency inventory for other supplies and equipment	12 29%	5 12%	2 5%	23 55%
Reduced cost to respond to an adverse event (streamlined procedural steps, reduced provision of alternate water supplies, housing for personnel)	9 21%	6 14%	5 12%	23 53%
Reduced insurance costs	14 35%	2 5%	0 0%	24 60%
Improved bond rating	12 30%	4 10%	1 2%	23 58%
Improved customer satisfaction/ public perception/communication with the general public and the media	6 14%	11 26%	4 10%	21 50%

56. What costs have you incurred from participating in a WARN? (Note these costs include administration, planning and preparation and are not intended to include actual emergency response costs) (indicate whether Low, Medium, or High Cost on all that apply; else select N/A)

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Low Cost	Medium Cost	High Cost	N/A
Staff time to develop/coordinate participation in WARN	30 70%	6 14%	0 0%	7 16%
Legal and planning costs to establish and maintain WARN	29 69%	2 5%	0 0%	11 26%
Communication costs (such as establishing and maintaining a website) that the utility incurred to establish a WARN	25 60%	0 0%	0 0%	17 40%

57. Have you completed an evaluation of the costs and benefits of participating in a WARN?

Yes		1	2%
No		44	98%
	Total	45	100%

58. Are you willing to participate in providing a case study that would require an estimated 4 to 8 hours of your time to prepare and provide financial analyses? If "YES", we appreciate your willingness and you will be contacted.

Yes		18	35%
No		33	65%
	Total	51	100%

59. Please add any clarifying comments:

View 18 Responses

1	The answers I have given are based on organizing and running a volunteer water restoration effort for a neighboring community, and working for a responder. We are in the preliminary stages of developing Minnesota WARN.
2	The WARN Program in North Carolina is under development. Greenville Utilities is a member of several other mutual aid organizations through Electricities, State Municipal Mutual Aid Agreement and the NC Eastern Water & Wastewater Mutual Aid Network.
3	we have just recently joined SCWARN, so would have limited experiences or data to share at this time. However, ask after thsi hurrican season is over, we might have had more experience at that time.
4	Have yet to experinence in a case study eligible repsonse. WARN in Illinois is still being developed.
5	Prior to WARN this we participated in a mutual aid agreement with 20 other cities in South Carolina. That system was working well.
6	But, no experiane yet. ORWARN is only 45 day old.
7	Only minor incidents have occured so would be of little service to the process. Can contact me to clarify.

8	Seven water utilities in Southern Maine (serving over 1/3 million people) have entered into a (written) Mutual Aid Agreement, of which our utility is a member. I can submit a copy to you if you so desire.
9	Please contact the City's DPW Commissioner.
10	As to question 58, I would need more detail before I answer yes as I would be committing resources other than myself.
11	I say yes if I can be of assistance.
12	We are just in the formative satges for AZ Warn. THere is much work to do but it will happen.
13	Our state is just now forming a WARN. WE are participating in the process. We have participated in an EMAC deployment. We could talk about that.
14	We are only the second signatory in Pa and have no track record as of yet.
15	No only because we are just beginning to form our WARN. So, no real experience yet.
16	Have not experienced an emergency that required mutual aid
17	Reference to Question 60: We are currently under contract for a seismic vulnerability study which will estimate economic costs of such a disaster
18	In Illinois, we are including Public Works in addition to utilities. To do otherwise is very short sighted, as many utilities fall under a Public Works Department, rather than being a seperate agency.

60. Have you estimated the economic cost to your community for lack of service during an emergency?

Yes	6	11%
No	48	89%
Total	54	100%

Business Case for Participating in a WARN. If you responded "no" to being a member of the WARN program or effort in your state, please respond to the following questions.

61. What benefits might you receive from participating in a WARN? (indicate whether Low/Indirect, Moderate, or High Level of Benefit on those that apply; else choose N/A)

Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Low/Indirect Benefit	Moderate Benefit	High Level of Benefit	N/A
Improved ability to respond to emergencies due to training, lessons learned and experience from other WARN participants	5 10%	20 41%	21 43%	3 6%
Reduced capital cost to purchase and maintain back-up portable generation capability	20 41%	16 33%	7 14%	6 12%
Reduced lost water/wastewater revenue	25 51%	9 18%	9 18%	6 12%
Reduced cost of carrying contingency inventory for other supplies and equipment	17 35%	19 40%	5 10%	7 15%
Reduced cost to respond to an adverse event (streamlined procedural steps, reduced provision of alternate water supplies, housing for personnel)	10 20%	25 51%	8 16%	6 12%
Reduced insurance costs	23 49%	10 21%	6 13%	8 17%
Improved bond rating	22 48%	9 20%	6 13%	9 20%
Improved customer satisfaction/ public perception/communication with the general public and the media	6 12%	21 43%	17 35%	5 10%

62. What costs might you incur from participating in a WARN? (Note these costs include administration, planning and preparation and are not intended to include actual emergency response costs) (indicate whether Low, Medium, or High Cost on all that apply; else select N/A)

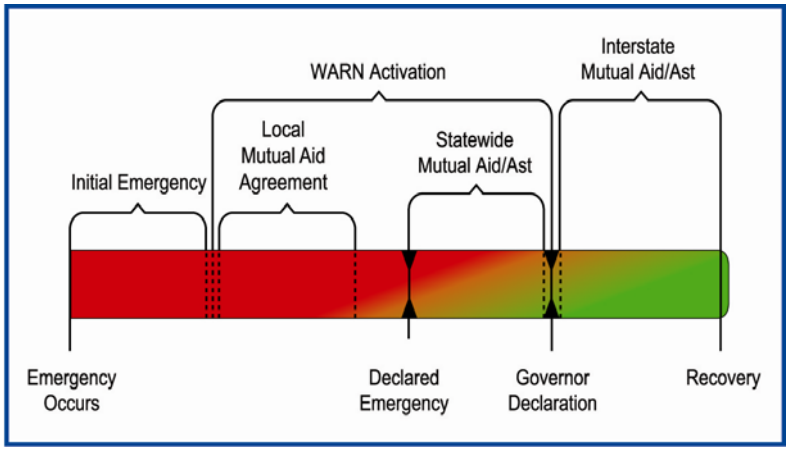
Top number is the count of respondents selecting the option. Bottom % is percent of the total respondents selecting the option.	Low Cost	Medium Cost	High Cost	N/A
Staff time to develop/coordinate participation in WARN	23 43%	24 44%	4 7%	3 6%
Legal and planning costs to establish and maintain WARN	30 58%	19 37%	0 0%	3 6%
Communication costs (such as establishing and maintaining a website) that the utility incurred to establish a WARN	31 58%	17 32%	3 6%	2 4%

Water Sector Mutual Aid and Assistance: Utilities Helping Utilities

Background: The events of 9/11, Hurricanes Katrina and Rita in 2005, and severe flooding in New England and the Midwest in 2007 have shown the need for water and wastewater systems to share resources to overcome disasters occurring at a local or regional level. The Water Sector's professional associations, with support from U.S. Environmental Protection Agency (EPA) Water Security Division (WSD), are working to encourage local utilities in every State to establish intrastate mutual aid and assistance agreements between both drinking water and wastewater utilities.

These agreements, formally known as Water/Wastewater Agency Response Networks (WARN), embrace a utility-driven model to facilitate an effective and efficient flow of personnel and resources after an emergency. By adopting the WARN approach to mutual aid and assistance, drinking water and wastewater utilities in each state are able to sign a single agreement covering issues such as indemnification, workers' compensation, and reimbursement. Unlike existing statewide mutual aid agreements, WARN membership is open to both public and private utilities. The agreement also allows for utilities to share equipment, personnel, and other resources required to respond effectively to any crisis. WARN helps utilities reduce the typical response "gap" between local agreements and activation of statewide agreements, as it does not require an emergency declaration prior to activation.

WARN Activation Timeline: Reducing the Response "Gap" During Emergencies



Mission: The mission of WARN is to provide expedited access to specialized resources needed to respond to and recover from natural and human caused events that disrupt public and private drinking water and wastewater utilities.

Purpose: EPA supports the development of WARNs to:

- Promote the establishment of intrastate mutual aid and assistance agreements to enhance preparedness, improve incident response, and provide utility resilience in the face of a disaster.
- Support individual WARNs by providing tools and technical assistance such as tabletop exercise materials and guidance on developing WARN implementation protocols.
- Support Department of Homeland Security requirements for compliance with the National Incident Management System (NIMS).

Recognition: Due to the outstanding support EPA and the American Water Works Association (AWWA) provided to this grassroots, utility-driven effort, the International Association of Emergency Managers (IAEM) awarded them the 2006 "Partners in Preparedness" award. The model agreement implemented by WARN is recognized as a "Model Agreement" by the DHS/FEMA National Integration Center (NIC) Incident Management Systems Division.

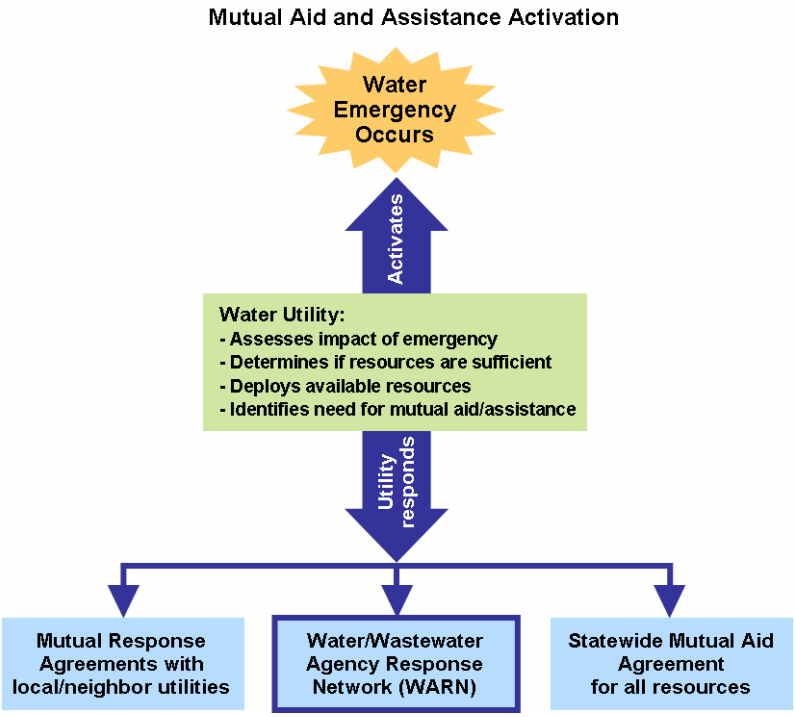
Stakeholders:

- Utility owner/operators as the key participants
- State water and wastewater primacy agencies participate as advisors and in a supporting role
- State emergency management/homeland security agencies help integrate WARN into state programs
- Water Sector professional associations such as AWWA, NRWA, WEF, AMWA, ASDWA, NACWA, NAWC, and ASIWPCA, who in February 2006, signed a joint policy statement on mutual aid and assistance titled, "Utilities Helping Utilities," to promote programs such as WARN

EPA Support: EPA is fully committed to the development of WARNs, providing extensive outreach, facilitation, and technical support through:

- WARN Workshops – An EPA grant to AWWA supported twelve WARN Workshops with participation from 48 states and the District of Columbia. Workshop speakers included EPA staff, as well as other WARN experts supported through EPA contracts.
- Work Products and Outreach – EPA facilitated the development of the March 2006 "Utilities Helping Utilities Action Plan," numerous fact sheets, a Frequently Asked Questions document, and has presented the WARN concept at a number of national conferences and meetings.

Next Steps: The number of statewide agreements has more than tripled in the past year, leading to a better prepared and more resilient Water Sector. This success has led to a need to exercise and validate the processes and protocols utilized during activation and implementation of a WARN. EPA has responded to that need by developing tabletop exercises and a protocols guidance document. The tabletop exercises will help WARN members coordinate more effectively with state and local emergency management agencies, state primacy agencies, and federal agencies. They will also enable participating utilities and agencies to define their roles and responsibilities more precisely and realistically.



WARN includes both public and private drinking water and wastewater utilities and does not require a formal disaster declaration for activation

While initially focused on intrastate networks, interstate mutual aid and assistance agreements may be needed to share resources across state lines. EPA and WARN partners are exploring the use of mechanisms, such as the National Emergency Management Agency's (NEMA) Emergency Management Assistance Compact (EMAC), to meet this critical objective. EPA has developed an outreach document, titled "EMAC Tips for the Water Sector," which includes information the Water Sector can apply to utilize EMAC more effectively when requesting or providing mutual aid and assistance across state lines.

For Additional Information: Visit www.NationalWARN.org, or contact John Whitler of EPA (whitler.john@epa.gov).

Water Sector National Incident Management System (NIMS) Implementation Objectives

As utility personnel plan and prepare for emergencies, a common question arises: "How do I implement the National Incident Management System (NIMS) at my utility?" Although the Federal Emergency Management Agency (FEMA) developed NIMS compliance requirements for state, local, and tribal governments, they have not developed requirements for individual sectors, such as the water sector. In the absence of specific requirements, this document provides recommended water sector NIMS implementation objectives that integrate NIMS principles into utility operations and planning. It is recommended that public drinking water and wastewater systems coordinate with their local emergency management agency (EMA) when implementing these objectives to check whether the local government NIMS compliance requirements also apply to their utilities.

What is NIMS?

Homeland Security Presidential Directive (HSPD) 5 tasked the Department of Homeland Security to develop and administer NIMS. HSPD 5 also requires federal departments and agencies to adopt NIMS planning and response concepts. States, territories, local jurisdictions, and tribal entities must adopt NIMS in order to receive federal preparedness assistance.

NIMS, originally published in 2004, establishes a comprehensive, national approach to incident management that is applicable at all jurisdictional levels, across all agencies, and to all domestic incidents regardless of size. NIMS is flexible but still provides a set of standardized organizational structures, as well as requirements for processes, procedures, and systems designed to improve the ability of responders (public and private) to work together. NIMS supports the effective use of mutual aid and assistance agreements. Many Water and Wastewater Agency Response Networks (WARNs) use the concepts of NIMS for a more successful program.

What are the Main Components of NIMS?

There are five main components of NIMS:

- Preparedness;
- Communications and information management;
- Resource management;
- Command and management; and
- Ongoing management and maintenance.

Each of these components is described in detail in the NIMS document and includes a number of key themes. As utilities begin to incorporate NIMS concepts and principles into their preparedness planning, many are surprised to learn that they are now considered first responders. HSPD 8, published in 2003, formally acknowledged the vital role that public works (which, as defined by HSPD 8, includes drinking water and wastewater utilities) personnel play in response to an incident. NIMS encourages and helps all first responders to work together to provide mutual aid and assistance to one another as effectively and efficiently as possible.

Preparedness

Many water utility professionals believe that implementing NIMS only requires taking one or two classes. However, a utility should adopt NIMS by incorporating it into its emergency preparedness, response, and security activities. Some utilities have formally issued a policy requiring the use of NIMS. Subsequently, these utilities have updated their existing plans and procedures to ensure consistency with NIMS. As defined in the NIMS document, preparedness covers the elements of planning, training, and exercises.

What are the Benefits of NIMS?

- Strengthens response capabilities by following a nationally adopted, standard, flexible practice for emergency response;
- Improves mobilization, deployment, utilization, tracking, and demobilization of needed resources;
- Establishes protocols for improved communication with other first responders and support personnel;
- Reduces the time delay to access mutual aid and assistance resources; and
- Allows integration with other local and state emergency response agencies.

NIMS Implementation Objectives for the Water Sector*
Preparedness
Planning
1. Revise Emergency Response Plans (ERPs) to incorporate NIMS principles such as ICS.
2. Maintain mutual aid and assistance agreements with response partners and participate in a Water and Wastewater Agency Response Network (WARN).
Training
3. Use existing resources for NIMS trainings, such as USEPA's Water Sector ICS-NIMS Training.
4. All staff completes IS-100PWa (ICS) and IS-700a (NIMS) at a minimum.
5. Managers/Supervisors complete ICS-200a, ICS-300a, ICS-400a, and IS-800B National Response Framework (NRF) as appropriate.
Exercises
6. Incorporate NIMS principles into exercises, such as a corrective action process.
7. Participate in an all-hazards, multi-agency, and multi-jurisdictional exercise program such as those offered by LEPCs and EMAs.
Communications and Information Management
8. Use NIMS terminology and clear text, avoid using acronyms.
9. Use tools during an incident or event to promote a common operating picture (e.g., ICS Form 209 and/or SitRep).
Resource Management
10. Inventory resources and type them according to local protocols and the AWWA Water & Wastewater Mutual Aid & Assistance Resource Typing Manual.
11. Purchase interoperable equipment (e.g., radios).
12. Use a WARN program to help obtain needed resources.
13. Participate in jurisdictional credentialing (e.g., first responder ID cards) if applicable.
Command and Management
Incident Command System
14. Use ICS to manage all incidents and events.
Multi-Agency Coordination System
15. Use your jurisdiction's Emergency Operations Center (EOC) for incident support in addition to mutual aid and assistance such as a WARN.
Public Information
16. Use the Joint Information System during an incident or event, for example, designating a Public Information Officer.
17. Ensure that all water use advisories and notices are compliant with the Public Notification Rule and fully coordinated with other public notifications regarding the incident.

** Based on FEMA's FY2008 NIMS Compliance Objectives*

Planning

Many utilities are implementing NIMS by preparing emergency response plans (ERPs) and business continuity plans (BCPs), and by becoming members of Water and Wastewater Agency Response Networks (WARNs). If your utility has not yet developed an ERP or BCP, or considered joining a WARN, it is in your best interest to do so. Be sure to coordinate your planned response actions with other local first responders.

Training

The second element of preparedness is training. At a minimum, all utility staff who would likely be involved in the response to an incident should complete the following courses:

- Basic Incident Command System (ICS) IS-100PWa; and
- NIMS, An Introduction IS-700a.

These courses are offered for free online through FEMA's Independent Study website at http://training.fema.gov/IS/NIMS.asp. USEPA is currently offering free in-person versions of these trainings at various locations throughout the country.

One advantage to attending a USEPA-sponsored training is that the standard FEMA courses have been tailored to the water sector and contain relevant teaching examples and group activities. To find a USEPA training location near you and to register, please visit http://cfpub.epa.gov/safewater/watersecurity/outreachresult.cfm?outreach_id=92&type=1. The water sector-specific materials used during USEPA's in-person classes are also available online (see the link at the end of this fact sheet).

If you hold a supervisory or management role within your utility, more training is recommended. For example, utility personnel who serve as first-line supervisors or in management roles should also complete ICS IS-200a training. Utility executives and senior officials may wish to consider taking the 2-hour state-offered ICS Overview G402 course. Complete details regarding NIMS courses and who at your utility should complete them can be found in the NIMS Five Year Training Plan, available at http://www.fema.gov/emergency/nims/NIMSTrainingCourses.shtm.

Exercises

Exercises comprise the last element of preparedness. Many preparedness organizations, such as Local Emergency Planning Committees (LEPCs) and either local or state EMAs, already plan and conduct all-hazard exercises that incorporate NIMS. Utilities should reach out to these preparedness organizations and take part in the exercises they conduct. This will ensure that a utility's ERP is coordinated with other local emergency plans. In addition, this participation allows utility staff to take part in professionally facilitated exercises with minimal utility resource expenditure. It also allows utility personnel to develop working relationships with other local first responders before an emergency occurs.

Utilities with more resources may wish to consider conducting their own exercises and inviting other first responders to attend. Exercises should to be designed and conducted in accordance with the Homeland Security Exercise and Evaluation Program (HSEEP) guidance. Scenarios and exercise materials can be obtained from the USEPA's Water and Wastewater Emergency Response Tabletop Exercises tool at http://www.epa.gov/safewater/watersecurity/tools/trainingcd/. This tool will be updated with new all-hazards scenarios and a new format to comply with HSEEP guidance. Once the tool is finalized, it will be posted on USEPA's website at http://cfpub.epa.gov/safewater/watersecurity/tools.cfm.

Also consider these points when you are developing, conducting, or participating in exercises:

- Incorporate NIMS components, such as ICS;
- Ensure key staff have a role;
- Capture and incorporate lessons learned into an exercise after action report; and
- Implement corrective actions identified in the after action report by updating your utility's ERP and other plans and procedures.

Communications and Information Management

Communications and information management is another component of NIMS that should be implemented. An important aspect of communications is for utilities to use common NIMS terminology and what is referred to as clear text. Common NIMS terminology includes, for example, using the title Incident Commander for the person with overall responsibility for managing an incident. The use of common terminology greatly reduces confusion between jurisdictions and agencies working together during a larger incident, since all first responders across the country are learning the same, common NIMS terminology.

Clear text refers to the principle that utility personnel should always use plain English when communicating during an incident. Other agencies and jurisdictions are not familiar with your utility-specific acronyms or jargon, and your use of them will only lead to confusion on larger incidents and when mutual aid and assistance agreements are activated. For example, the acronym SCADA is not understood by everyone outside of a utility!

Information management is necessary so that everyone responding to an incident is on the same page, or shares a common operating picture. One information management tool that already exists and can be readily adopted by utilities is the Situation Report, or SitRep. The SitRep format has been in use for years, and is a proven way to present incident information to others so that a common operating picture can be developed and shared. The daily national SitRep can be found on FEMA's website at http://www.fema.gov/emergency/reports/index.shtm. Another tool that can be used at the local level is the ICS Form 209 - Incident Status Summary.

Resource Management

Resource management is another critical component of NIMS implementation. Resources include utility personnel, equipment, supplies, and materials. Under NIMS, all resources should be typed, which means that resources are classified by their function (category), class (kind), and their performance or capability (type). Once a resource is typed, it is very clear to first responders what resource they are asking for, and it helps to ensure that the first responder receives the resource that he or she requested.

Utilities should consider inventorying and typing their resources. This can be done in conjunction with jurisdiction efforts (local, county, or state level). The American Water Works Association's Water and Wastewater Mutual Aid and Assistance Resource Typing Manual provides a large number of typed water sector resources that are commonly requested during water sector related incidents. This free document is available at http://www.nationalwarn.org. Resource inventories can be kept using a hard copy system, such as a card catalog, or by using a spreadsheet, database or other digital program, such as the online resource lists maintained by many WARN programs.

Additional NIMS implementation objectives under this component include:

- Procurement and/or use of interoperable equipment, such as radios. This allows utility response personnel to readily communicate with other first responders in their jurisdiction.
- Participation in your jurisdiction's development or implementation of a credentialing system. This will help verify the identity and qualifications of emergency personnel responding to an incident.

Command and Management

The Command and Management component within NIMS is designed to enable effective and efficient incident management and coordination by providing a flexible, standardized incident management structure. The structure is based on three key organizational constructs: the ICS, Multiagency Coordination System (MACS), and Public Information.

Incident Command System (ICS)

HSPD 5 requires that federal agencies manage all domestic incidents under ICS. During large incidents, utilities should be prepared to coordinate with state and federal agencies using ICS. Utilities can practice using ICS when responding to routine emergencies such as main breaks. This will ensure that utility personnel are familiar with NIMS common terminology and how the ICS functions, which will be an advantage when working with other local, state, and federal first responders during a larger incident.

Multiagency Coordination System (MACS)

The primary function of the MACS is to coordinate activities above the field level and to prioritize the incident demands for critical or competing resources. At the management level, the MACS assists with the coordination of field operations. The MACS consists of a combination of elements: personnel, procedures, protocols, business practices, and communications integrated into a common system.

The MACS can be implemented from a fixed facility (such as an Emergency Operations Center or EOC) or by other arrangements outlined within the system. Utilities should learn the location, contact information, and organizational structure of the EOC that serves their community. In addition, utilities should ensure that they are represented within their local EOC during emergencies. The EOC can help a utility to obtain resources during an incident.

Public Information

If public information or notices (e.g., water use advisories) are to be disseminated during an incident, the Public Notification Rule must be followed. NIMS principles regarding public information further support this rule. In addition, utilities should have templates for foreseeable public notifications such as boil order or system bypass notices. These templates help to ensure that no detail is overlooked and that notifications are consistent. A Public Information Officer (or individual serving in that capacity) prepares the notification, which is then approved by the Incident Commander prior to issuance. At larger incidents, the Public Information Officer may need to coordinate the utility's public notice with public notices from other agencies involved in the response. The bottom line is that a clear, consistent message needs to go to the public from all agencies and jurisdictions taking part in public notifications.

Ongoing Management and Maintenance

Just like your ERP, NIMS is constantly being revised and changed based on best management practices and lessons learned. NIMS was first revised in 2008. If you have comments about NIMS or have suggestions to improve NIMS, you can contact the NIMS National Integration Center at 202-646-3850 or FEMA-NIMS@dhs.gov.

NIMS implementation may appear daunting, but in actuality it relies on many best practices already in use by water and wastewater utilities as well as other agencies and jurisdictions. These best practices have been adopted under NIMS so that mutual aid and assistance can be as effective as possible.

To learn more about NIMS, please visit:

http://www.epa.gov/watersecurity
(click on "Emergency/Incident Planning" and scroll down to NIMS)

http://www.fema.gov/emergency/nims
(FEMA's official NIMS website)

http://cfpub.epa.gov/safewater/watersecurity/outreachresult.cfm?outreach_id=92&type=1
(learn about U.S. EPA's water sector ICS and NIMS training)

http://cfpub.epa.gov/safewater/watersecurity/home.cfm?program_id=8#nims
(download the water sector ICS and NIMS presentations here)