Water Quality Projects Update

Council Presentation
January 24, 2017

Boil Water Notice May 2016

- Disinfectant residuals less than 0.5 mg/L in the City's water distribution system. Texas Commission on Environmental Quality (TCEQ) ordered the City to issue a citywide boil water notice.
- Citywide boil water notice lasted 12 days.
- City performed a disinfectant conversion from monochloramine to free chlorine to stabilize the water quality in the distribution system.
- TCEQ minimum required disinfectant level is 0.5 mg/L throughout the distribution system at all times. Texas Administrative Code 290.46 (d) (2) (B)
- Federal minimum required disinfectant level is detectable measured disinfectant level. City drinking water had a detectable disinfectant residual throughout the boil water notice. (Environmental Protection Agency Surface Water Treatment Rule)

Regulations Definitions

- 1 Texas Administrative Code 290.46 (d) (2) (B)
  - "A disinfectant residual must be continuously maintained during the treatment process and throughout the distribution system. A chloramine residual of 0.5 mg/L (measured as total chlorine) for those systems that feed ammonia."

- 2 Environmental Protection Agency Surface Water Treatment Rule
  - "A detectable disinfection residual must be maintained throughout the entire distribution system."

Water Quality Progress

- **Objective:** Improve and stabilize water quality in the City's water distribution system

- **Action:** City adopted a holistic approach and has implemented actions to address the following areas:
  - Source
  - Treatment
  - Distribution System
- **Status:**
  - Significant improvements in the stability/consistency of water quality have been achieved
  - Longer-term CIP projects are currently underway to continue to improve overall water treatment and distribution.

Source Actions

ACTIONS TAKEN

1. Addl. Raw Water Sampling
2. Weather/Seasonal Monitoring
3. Bromide Evaluation

CURRENT AND FUTURE ACTIONS

4. Solids Management (E13052/E16308)
5. Alkalinity and pH Evaluation
6. Pre-Sedimentation Evaluation
7. Raw Water Analyzers
8. Nueces River Pump Station Improvements

Solids Management

Objective

- Minimize impact on water quality
- Improve operational flexibility
- Prepare for long term operations

Status

- Contractor for Sludge Removal: Selected
- Selection of Eng. for Long Term: Pending
- Anticipated Completion : **Phase-1 by 2018**

Nueces River Raw Water Pump Station

Objective

- Increase reliability of water delivery
- Reduce operational cost
- Ultimate design flow 200 MGD.

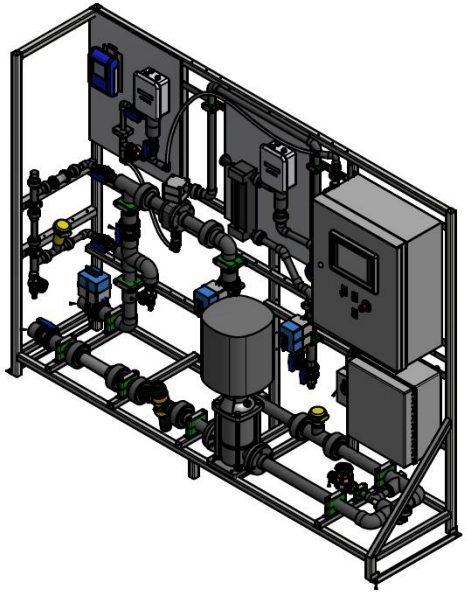
Status

- Selection of Engineers: Complete
- System Design: 60% Complete
- Anticipated Installation: 2018

Treatment Actions

1. Chemical Dosing Locations
2. Analyzer Replacement
3. Mixing Enhancements
4. Flow Pacing
5. Filter Flow Improvements
6. Process Target Changes
7. Training and Procedures
8. New Chlorine Dioxide System
9. Coagulant Evaluation
10. Chlorine System Improvements
11. Solids Removal
12. Pilot Plant System and Testing
13. Raw Water and Chem Feed Improvements (E12211/8643)

New Chlorine Dioxide System



Objective

- Improve control of nitrification
- Reduce chlorine demand
- Reduce Disinfection Byproduct Formation

Status

- Exception request from TCEQ: Approved
- Design documents to TCEQ: Complete
- Final approval of design by TCEQ: Complete
- Anticipated Completion : **April 2017**

Chlorine System Improvements

Objective

- Increase Reliability
- Improve Safety of Operations
- Optimize System Control

Status

- Initial System Assessment: Complete
- Selection of Engineer: Pending
- Anticipated Completion : TBD

Raw Water and Chemical Feed Improvements

Objective

- Update Chemical Feed Equipment
- Improve Chemical Mixing
- Optimize System Performance

Status

- Selection of Engineers: Complete
- System Design: 30% Complete
- Anticipated Installation: 2018

Pilot Plant System and Testing

Objective

- Evaluate Changing Water Quality
- Test Alternative Treatment Strategies
- Optimize System Performance

Status

- System Design: Complete
- Pilot Construction: Pending
- Anticipated Installation: May 2017

Distribution System Actions

ACTIONS TAKEN:

- Cleaned all storage tanks
- Evaluated and automated chlorine booster stations
- Updated Nitrification Action Plan
- Evaluated and changed current Conversion Procedures
- Modified distribution system operations

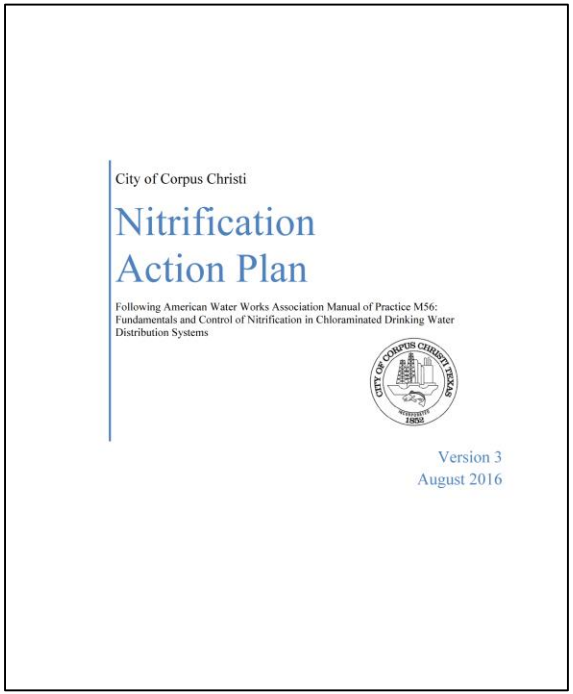
FUTURE ACTIONS:

- Back-up power for Navigation and Staples Pump Stations
- Additional pumps at Staples Pump Station
- New analyzers at Staples and Sand Dollar Pump Stations

IN PROGRESS:

- Tank sampling and inspections
- Navigation Pump Station Monochlor Tank Shark Pilot study
- Tank mixing systems

Updated Nitrification Action Plan


City of Corpus Christi

Nitrification Action Plan

Following American Water Works Association Manual of Practice M56: Fundamentals and Control of Nitrification in Chloraminated Drinking Water Distribution Systems

Version 3
August 2016

Objective

- More Conservative Treatment Goals
- Revised Action Levels
- Refined Monitoring Plan

Status

- Document Revision: Complete
- New Target Implementation: Complete
- Monitoring and Site Actions: On-going

Tank Mixing and Operation

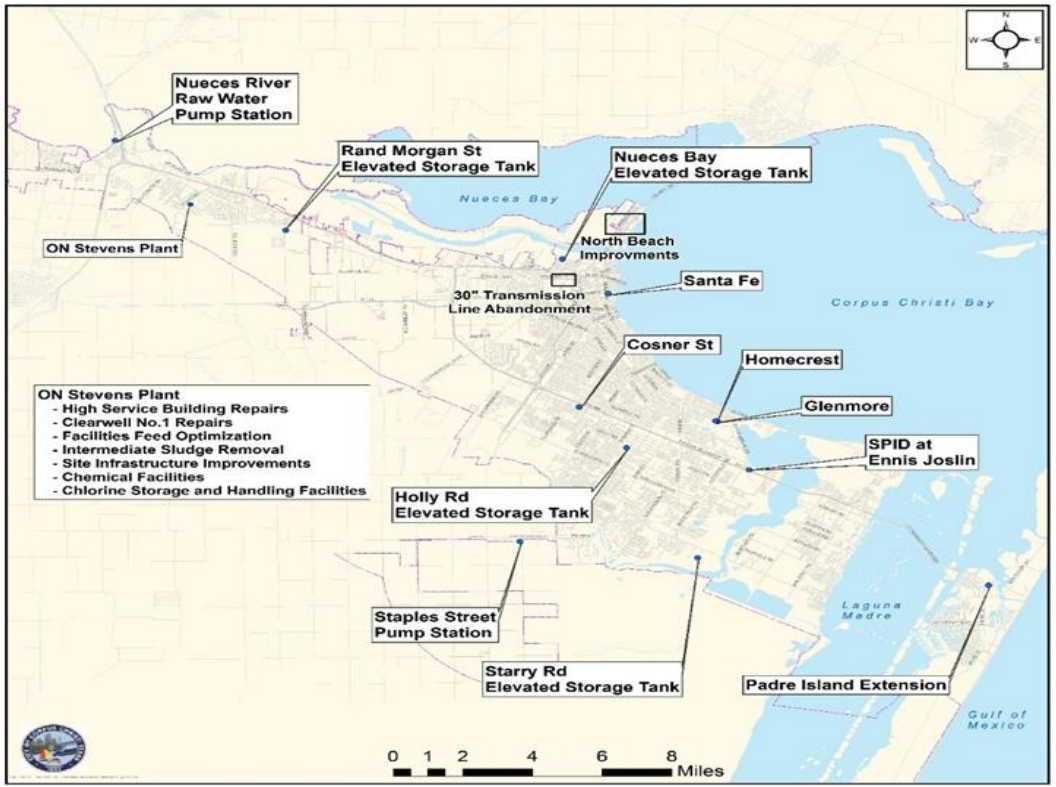
Objective

- Increase Turnover
- Reduce Water Age
- Improve Chlorine Residual Stability

Status

- Operational Changes: Complete
- New Mixer Testing: On-going
- Anticipated Installation: TBD

Current Capital Improvement Plan



Current Capital Improvement Plan (CIP)

Project Name	Cost ($M)	Start	Completion
Nueces River Raw Water Pump Station	16.8	Sep 2014	Jul 2018
ON Stevens Chlorine Storage and Handling Facilities Improvements	9.0	Mar 2017	Feb 2019
ON Stevens Chemical Facilities (Alum, Polymer and LAS) Replacement	16.7	May 2016	Jan 2020
ONSWTP Raw Water Influent Improvements	25.0	May 2016	Jan 2020
ONSWTP Interim Sludge Management Improvements	6.5	May 2016	Sep 2017
ONSWTP Fluoride Feed System Improvement	1.1	Oct 2015	Jul 2017
Alternative Capacity Power Generation (ACR Phase 1)	1.2	May 2015	Sep 2017
Staples Street Pump Stations Phase 2 - Third and Forth Pumps	3.3	May 2015	Jun 2017
Elevated Water Storage Tanks (ACR Implementation Phase 2)	12.5	Jun 2014	Feb 2018
Elevated Water Storage Tanks (ACR Implementation Phase 3)	18.0	Oct 2016	Nov 2020

Source

Treatment

Distribution System

Summary of Current Status

- City has implemented source, treatment, and distribution system actions to address water quality concerns.
- City has seen significant improvements in the stability of water quality throughout the distribution system as a result of these actions.
- City has several long-term projects that are currently underway to modernize the water treatment plant and distribution system.