“The future of water is clear”

MIOX Corporation

"Technology Today
for
Tomorrow's Environment"

E.N.G. Environmental Technologies inc.

"Solutions to Protect
Our
Environmental Resources"

Design, Fabrication, Installation & Commissioning of Treatment Processes


Fabrication


Installation


Commissioning & Training

Heart's Delight – Islington Conventional Packaged Water Plant – 100 USgpm (Surface Water Source)


Computer/SCADA
Controls & Monitoring


Neutralizing & Oxidation
Pressure Vessels


Packaged Sequential
Batch Reactor

Fogo Island Hospital – Packaged Water and Wastewater Treatment Plants

St. John's, NL o Halifax, NS o Charlottetown, PEI

My Water. My World.

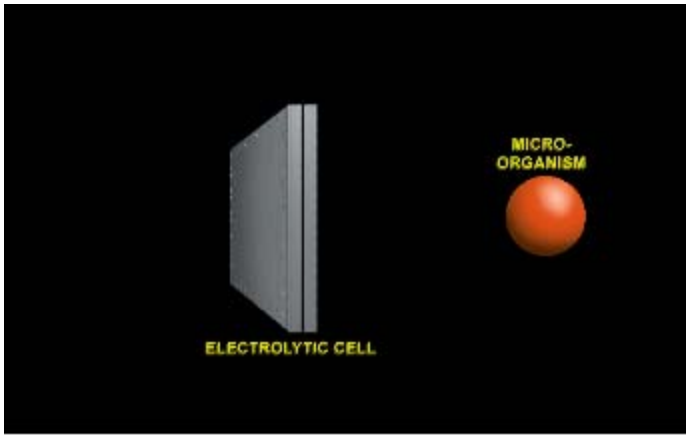
Overview of the MIOX Technology

Top Menu

On-Site Generation Simplified

On-Site Generation

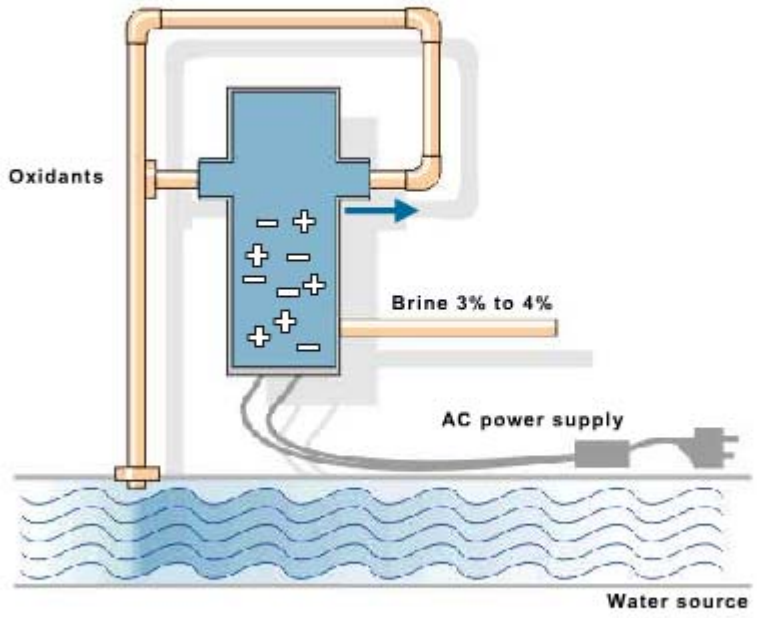
- Electrolysis of salt water to generate chlorine practiced commercially for > 100 years
- Chlorine produced at large chlor-alkali plants, packaged, and sold in bulk
- Within the last 30 years, smaller equipment was developed to generate hypochlorite on-site by the same process



Basic Electrolysis

- On-site generation uses only salt, water, and electricity
- Eliminates hazardous chemicals
- Heart of technology is the electrolytic cell

Basic Electrolysis



NaCl + H2O ↘ NaOCl + H2

On-Site Advantages

- **Safety**
  - Only salt, water, and power required for operation
  - No hazardous chemicals used, stored, or transported
  - No potential for chlorine gas leak
  - Concentration < 1% -- will not burn skin
  - No possibility of forming chlorine gas cloud by mixing with water
  - No combustible combinations
  - Improved worker safety
  - Improved community relations

On-Site Advantages (cont.)

- **Regulatory Ease**
  - No RMP
  - No HAZMAT training
  - No Scott Airpack equipment
  - No “two-man rule” for changing out cylinders
  - No chlorine gas scrubber required
  - No Department of Transportation trucking requirements

On-Site Advantages (cont.)

- **Ease of Maintenance**
  - Salt reloading
    - *Bagged salt takes 5 minutes to 1 hour per week*
    - *Bulk salt requires no handling at all*
  - Regularly check flows and chlorine production
  - Change filters when required
  - Clean tanks annually, if necessary
  - Maintenance tasks are done with standard hand tools
  - Most replacement parts are “plug and play”
  - Cell changeout takes ~15 minutes
  - Equipment integrates with existing controls and alarms

On-Site Advantages (cont.)

- **Cost-Effective**
  - Operating cost based on cost of salt and power
  - Competitive with chlorine alternatives (chlorine gas and bleach are increasing in cost)
  - Lower than Pretreatment Disinfection Technology (chlorine dioxide, ozone, UV)
  - Reduced liability exposure
  - Reduced regulatory paperwork and maintenance
  - Typically works out to lower lifecycle costs

Types of OSG

On-Site Generation Varieties

- **On-Site Hypochlorite**
  - Sodium hypochlorite solution (8000 ppm FAC)
  - Designed for maximum possible operational efficiency
  - Smaller oxidant tank and injection pump required
  - Ideal for safer operations while leaving a chlorine residual
- **On-Site Mixed Oxidants**
  - Chlorine-based oxidant solution (4000 ppm FAC)
  - Designed for maximum possible disinfection performance
  - Salt and power efficiencies are close to on-site sodium hypo
  - Ideal for sites that can benefit from chemistry advantages

What Are Mixed Oxidants?

- Performance differences
- Cell optimization
- Speciation studies
- Regulatory requirements

Mixed oxidants exhibit behavioral traits associated with a more active chlor-oxygen chemistry than traditional chlorine:

- Superior biological control
- Elimination of biofilm
- A more durable chlorine residual
- Reduced DBP formation

Superior Biological Control

- Mixed oxidants achieve:
  - *Inactivation up to 2 log greater than hypo*
  - *More rapid inactivation*
  - *Inactivation of chlorine-resistant organisms*
- Examples include:
  - *Clostridium perfringens*
  - *Legionella pneumophila*
  - *Cryptosporidium parvum*

Elimination of Biofilm

- Mixed oxidants eliminate biofilm:
  - *In distribution pipelines*
  - *On membrane surfaces*
- Examples include:
  - *Inono Hot Springs swimming pool*
  - *Orange County Water District R.O. membrane*
  - *Montana KOA Kampground potable water*

Durable Chlorine Residual

- The chlorine residual from mixed oxidants:
  - *Lasts for weeks at a time*
  - *Carries through longer distribution systems*
  - *Can be maintained even with a lower dose*
- Examples include:
  - *Cedar Knox, Nebraska*
  - *Apple Valley, California*

Reduced DBP Formation

- Mixed oxidants reduce TTHMs due to:
  - *Removal of biofilms in the pipelines*
  - *Reduced chlorine dosing required*
  - *Elimination of organic precursors in the water*
- Examples include:
  - *North Table Mountain, CO*
  - *Cheraw, SC*

Speciation Studies

- **Research conducted by:**
  - California Institute of Technology
  - Jet Propulsion Laboratory
  - Miami University of Ohio
- **Attempts to measure ozone (O_3), chlorine dioxide (ClO_2), and hydrogen peroxide (H_2O_2) in solution**
- **Unable to detect other oxidants in the presence of a strong chlorine matrix**
- **If formed, these other oxidants could not co-exist with chlorine more than a few milliseconds**
- **Only chlorine measured to date**
- **Ongoing research by University of North Carolina under government funding**

Regulatory Requirements

- **Speciation studies have found only chlorine**
- **EPA mandates that mixed-oxidant customers follow chlorine regulations**
  - Monitoring for TTHMs and HAA5
  - Use of chlorine CT curves
- **Monitoring for chlorine dioxide, chlorite, and bromate is NOT required**
- **Due to solution pH, chlorite cannot be formed and has not been detected in mixed-oxidant treated water**
- **Certified by NSF International**
  - Safe for drinking water applications
  - Effective for use in pools and spas

Chlorine Concentration

- Hypochlorite systems ~8,000 ppm (0.8%)
- Mixed-oxidant systems ~4,000 ppm (0.4%)
- Concentrations < 1% do not have to meet Hazardous Communications Standard (HCS) safety requirements
- A less concentrated solution does not mean a “weaker” solution, but it does require a larger oxidant storage tank and injection system

The Difference Starts in the Cell

Mixed-Oxidant Cell

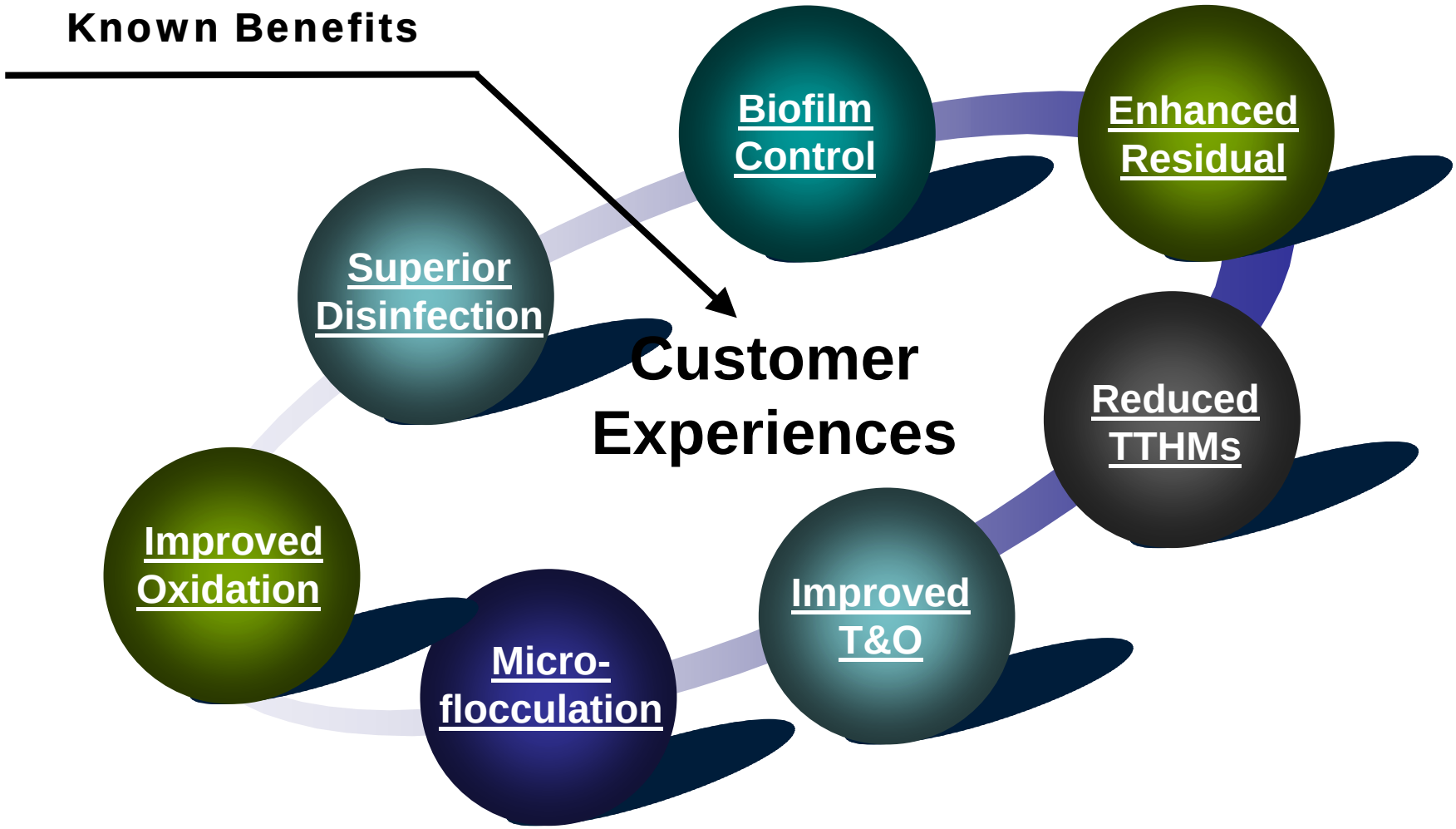
PERFORMANCE

Hypochlorite Cell

EFFICIENCY

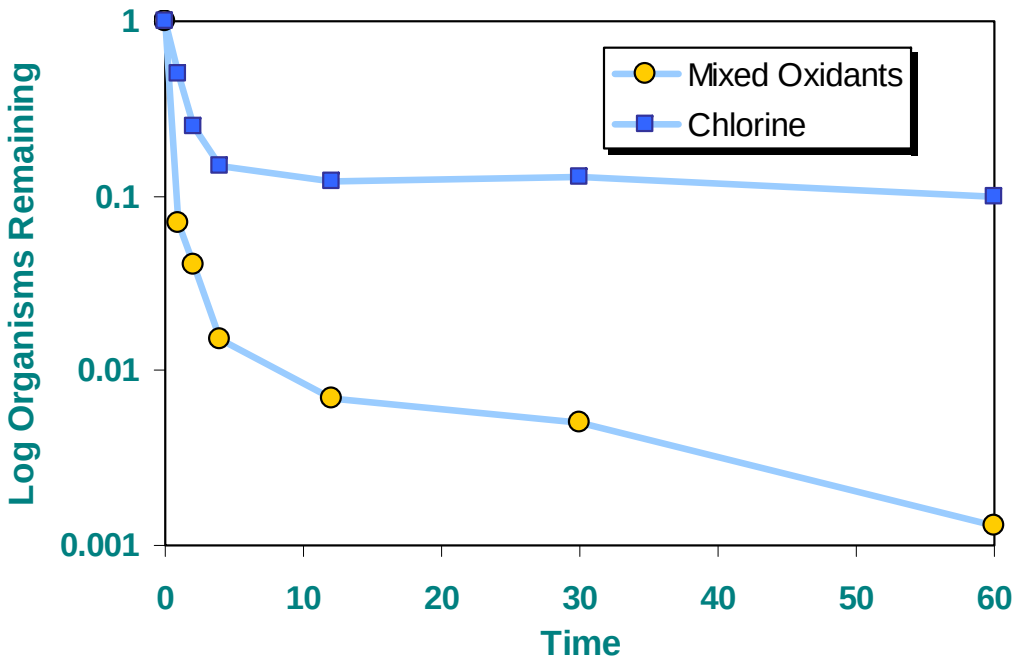
Sub Menu Top Menu

Mixed-Oxidant Advantages



Inactivation Effectiveness

Inactivation of *Clostridium perfringens*
Mixed Oxidants vs. Chlorine



***Dr. Linda Venczel, University of North Carolina**

Mixed Oxidant System Evaluation for Waterborne Disease Prevention in Bolivia, 1993

Sub Menu Top Menu

Mixed Oxidants Have Killed Everything Tested

Parasites

- *Giardia lamblia* cyst
- *Cryptosporidium parvum* oocyst

Viruses

- Bacteriophage f2
- Hepatitus virus analog f2
- Bacteriophage MS2
- Vaccinia virus **(Smallpox)**

Bacteria

- *Escherichia coli*
- *Bacillus anthracis* spore **(Anthrax)**
- *Bacillus globigii* spore
- *Bacillus subtilus* spore
- *Bacillus stearothermophilus* spore
- *Clostridium perfringens* spore
- *Francisella tularensis* LVS
- *Klebsiella terrigena*
- *Legionella pneumophila*
- *Pseudomonas aeruginosa*
- *Vibrio cholerae*
- *Yersinia pestis* **(Plague)**
- Aerobic bacteria (cooling water)

Inactivation Effectiveness

Lower is Better!

Inactivation of *Cryptosporidium Oocysts* in Water by Chemical Disinfectants*

Disinfectant	*CT^{99} (mg/L x min)* [1]	*Reference*
Free Chlorine	**7,200+**	**Korich et al.**
Monochloramine	**7,200+**	**Korich et al.**
Chlorine Dioxide	**78**	**Korich et al.**
Mixed Oxidants	**<120**	**Sobsey et al.**
Ozone	**~15**	**Finch et al.**

[1]CT = Concentration x Time:

eg. Chlorine** = 80 mg/L x 90 min. = **7,200

MIOX** = 5 mg/L x 24 min. = **120

***Mark Sobsey, Ph.D., University of North Carolina**

Pathogenic Microbes in Water and their Control by Treatment Technology, Korea, 1997

Biofilm Removal: Inono Hot Springs, Japan

Sodium Hypo

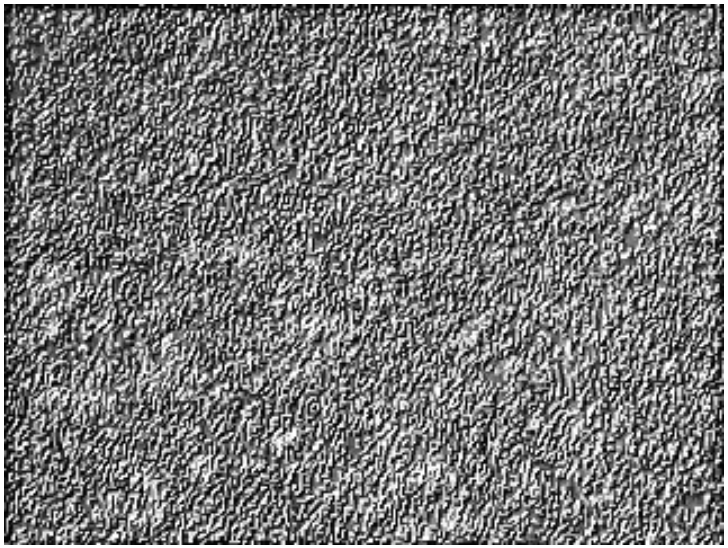
Extensive biofilm growth
Coliform and Legionella hits
1.5 mg/L FAC dose
0.2 mg/L FAC residual

Mixed Oxidants

Biofilm eliminated
No bacterial hits
0.6 mg/L FAC dose
0.4 mg/L FAC residual

MIOX Mixed Oxidants Destroy Biofilms on Membranes

Biofilm is leading cause of membrane maintenance, degradation, and replacement



Mixed Oxidants Kill the Bugs and Remove the Substrate

Orange County Water District,
Fountain Valley, CA

- Side by side studies with chlorine
- Oxidant demand of mixed oxidants is higher, BUT
- Mixed oxidants strip biofilm and polysaccharide substrate (scorched earth); chlorine only kills biofilm
  - Substrate allows biofilms to reattach quickly
- Time lapse videography of membrane surface
- Mixed oxidants achieved total removal in 5 hours and 40 minutes – most of this occurred in the last 40 minutes
- Mixed oxidants vs chlorine tolerance studies conducted at BoR Yuma on membranes – current membranes very tolerant to oxidants and chlorine

Biofilm Removal: Diana WSC, TX

- **At Diana WSC in TX, 2 line breaks occurred simultaneously:**
  - The line disinfected with chlorine was filled with a biofilm slime only 200 feet (60 meters) from the disinfection station
  - The line disinfected with mixed oxidants was totally clean 1/2 mile (800 meters) from the disinfection station
  - Both lines had been in operation for decades utilizing chlorine disinfection
  - The site had changed to mixed oxidants ~1 year prior to the line break

Replaced sodium hypo with mixed oxidants - Oct. '97

SODIUM HYPO:

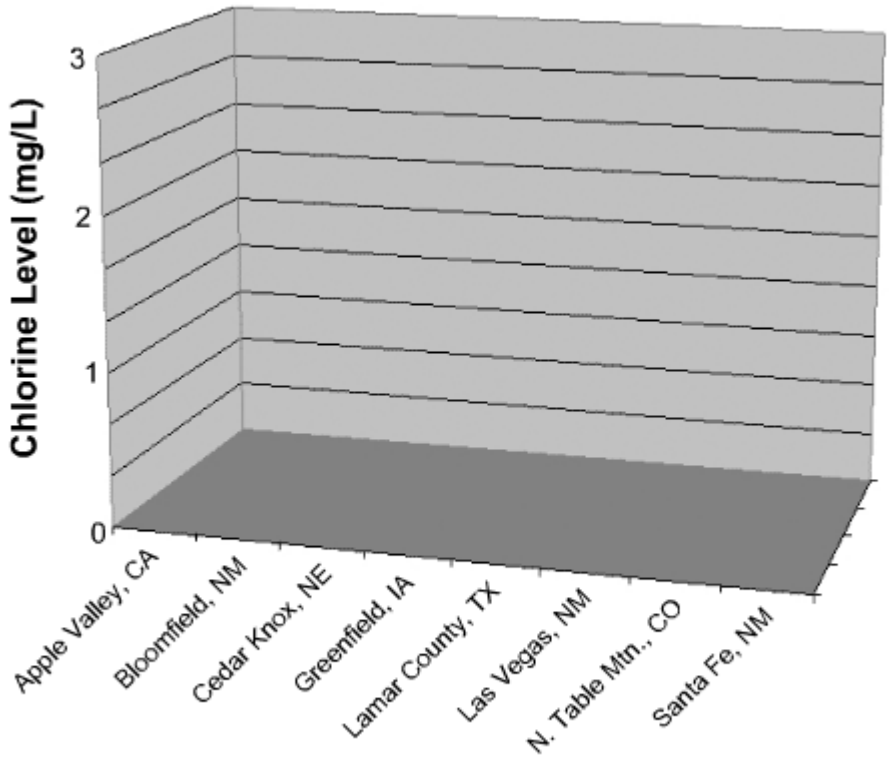
- Frequent coliform hits, even with free chlorine slug dose levels as high as 1000 ppm
- Labor intensive to dose with powdered sodium hypo
- Pressure loss during power outages caused sloughing of biofilms, requiring flushing when power was regained
- Filters cleaned every 2-3 days
- Corrosion products and slime quickly developed on new distribution system components

MIXED OXIDANTS:

- No coliform infractions
- Easier to use -- no undissolved granules to clog injectors and no corrosive off-gassing
- Accumulated biofilms sloughed off within 2 weeks, resulting in increased water pressure and quality
- After power outages, no discoloration evident and no flushing required
- Filters cleaned every 2-3 weeks
- No "black slime" in shower or on distribution components

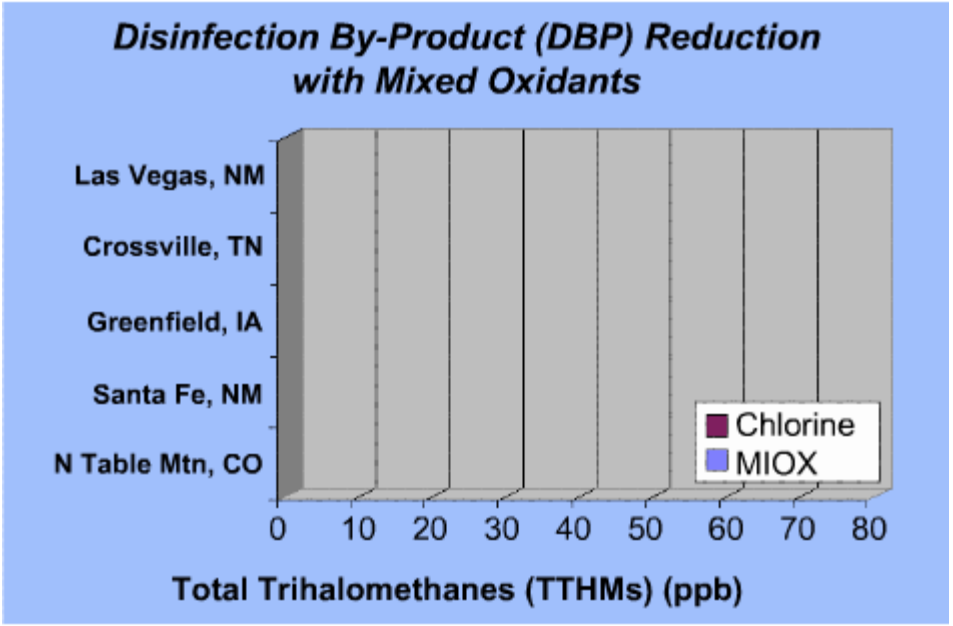
Montana State Univ. -- Center of Excellence for Biofilm Engineering

Chlorine Residual



- Mixed oxidants maintain chlorine residual levels required by law
- Mixed oxidants are used consistently at lower doses as free available chlorine (FAC) and still maintain much higher chlorine residuals than gas chlorine
- Reduction of biofilm in the distribution system reduces chlorine demand
- Mixed oxidants are able to maintain chlorine residuals in storage facilities and long distribution systems where chlorine cannot

Disinfection By-Products



- When compared to chlorine, mixed oxidants produce 30% to 50% fewer TTHMs.
- This holds true even for plants that were NOT pretreating with chlorine but use mixed oxidants for BOTH pretreatment and final disinfection.

- Though mixed oxidants perform like chlorine dioxide as far as kill rate, they produce no chlorites, and chlorates are far below the MCL.
- Elimination of biofilm in the line reduces further production of TTHMs in distribution.

How do mixed oxidants reduce THM formation?

*THMs are formed by a reaction between **organic precursors** and **chlorine**. To reduce THM formation, one of these two items must be reduced. MIOX has 3 "bites at the apple" – i.e. opportunities to reduce THM formation:*

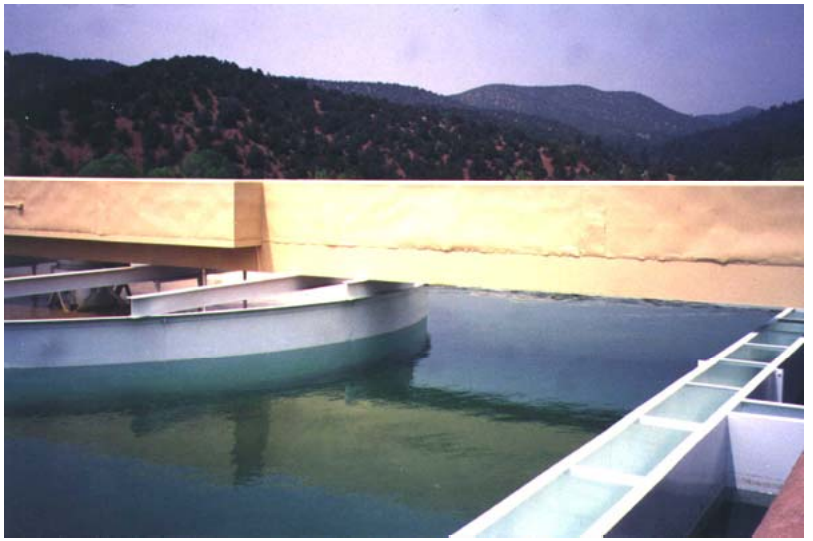
1. **Microflocculation** – removes organics into the floc, thus reducing precursors
2. **Biofilm Removal** – reduces organics in distribution, thus reducing DBP reactions
3. **Reduced Dose** – biofilm removal enables reduced chlorine dosing, thus reducing DBP formation

Taste & Odor Mitigation

- Mixed oxidants break down odor causing compounds such as phenols or organochloramines unlike chlorine
- Mixed oxidants oxidize ammonia nitrogen through breakpoint at substantially lower Cl:N ratios
- Mixed oxidants readily form monochloramine but not di- and tri-chloramine nor cyanogen chloride - noted causes of taste and odor problems
- Mixed oxidants oxidize H_2S more rapidly than chlorine without pH adjustment

Microflocculation

- Mixed oxidants enhance the microflocculation process the same way ozone does
- Criteria include Ca^{2+}, DOC, and turbidity
- The City of Santa Fe, NM reports 40% less alum and polymer use with mixed oxidants in pretreatment, a reduction in turbidity levels from 0.6 to 0.25 NTU, an increase in plant capacity from 4 to 10 MGD (15,000 to 38,000 m^3), filter run times extended 50%, about 20% less sludge production, and a reduction in TTHM formation of 20-58%



Oxidation of Iron, Manganese, & Sulfides

- Iron is precipitated at an accelerated rate for removal by filtration
- Manganese will co-precipitate if iron is present or if there is a coagulation step in the removal process
- Hydrogen sulfide is oxidized rapidly and to trace residuals usually associated with ozone

Ammonia Oxidation

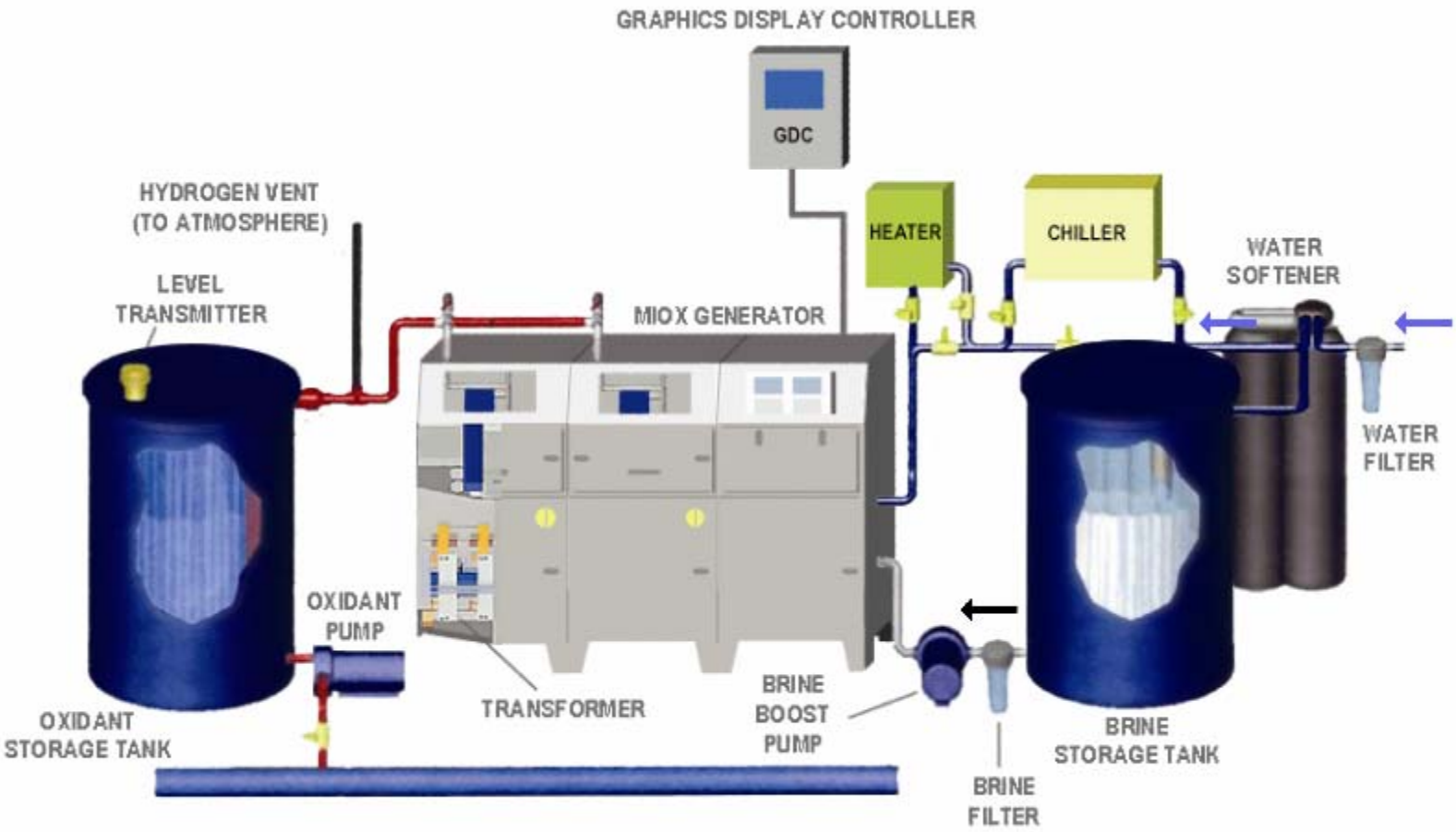
Fonda, IA was above the MCL of 1 mg/L of nitrite and needed a way to prevent nitrite formation.

Pilot Plant Results - Filter A (control) and Filter B (oxidant) running in parallel

	Filter A: No Chemical Feed	Filter B: Mixed-Oxidant Feed (25.2 mg/L FAC)
Ammonia In	3.0	3.0
Nitrite In	< 0.1	0.04
Ammonia Out	1.7	0.2
Nitrite Out	2.84	< 0.1

- Mixed oxidants achieved breakpoint at a dose that was half that required using bleach.
- Breakpoint was substantially complete at a chlorine to ammonia-nitrogen dose ratio of 8.4:1, even without accounting for oxidant demand from other substances in the raw water. (The practical range is 8-10:1, if only NH_3-N is considered.)

Process Flow



MIOX Product Line

SMALL SYSTEMS
2.5–20 ppd
(1–9 kg/day)

MID-SIZE SYSTEMS
25–800 ppd
(11–360 kg/day)

(AE & BPS)

LARGE SYSTEMS
250–1000 ppd
(110–450 kg/day)
(per cell)

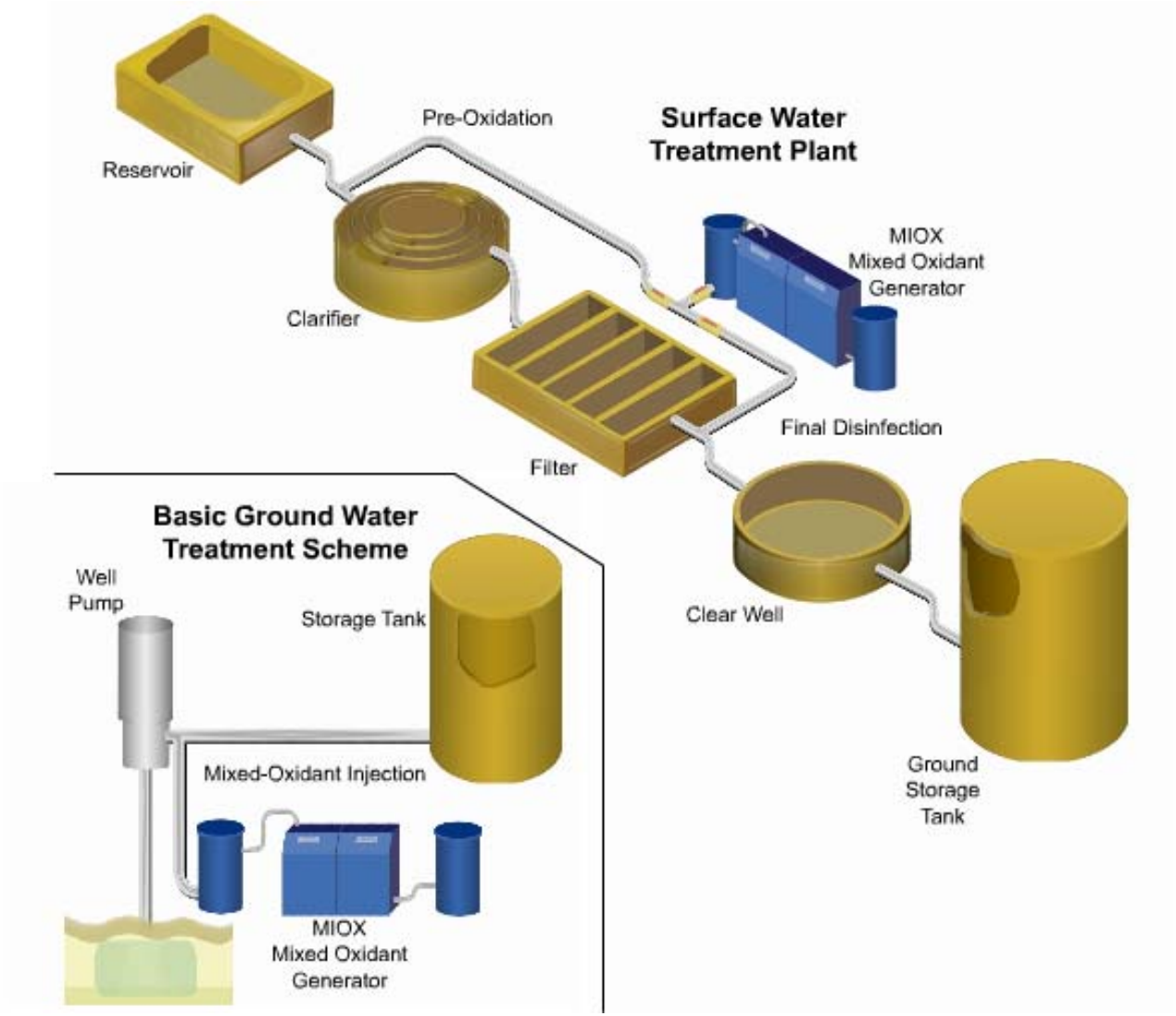
Sub Menu Top Menu

Potable Water Applications

- **Final Disinfection**
  - Biofilm and algae control
  - Reduced THM formation
  - Residual maintenance
  - Improved taste and odor
  - Iron bacteria control
  - H_2S oxidation
  - Ammonia oxidation
  - Maintenance and savings
- **Pre-Treatment**
  - Microflocculation
  - Fe and Mn oxidation
  - Biofilm control on membranes
- **Chloramines**
  - Total & free chlorine mixing
  - Chloramine boosting
  - Chloramine production
  - Breakpoint chlorination
- **Rechlorination / Residual Boosting**

Potable Water Installation Photos

Potable Water Treatment Facility Layout

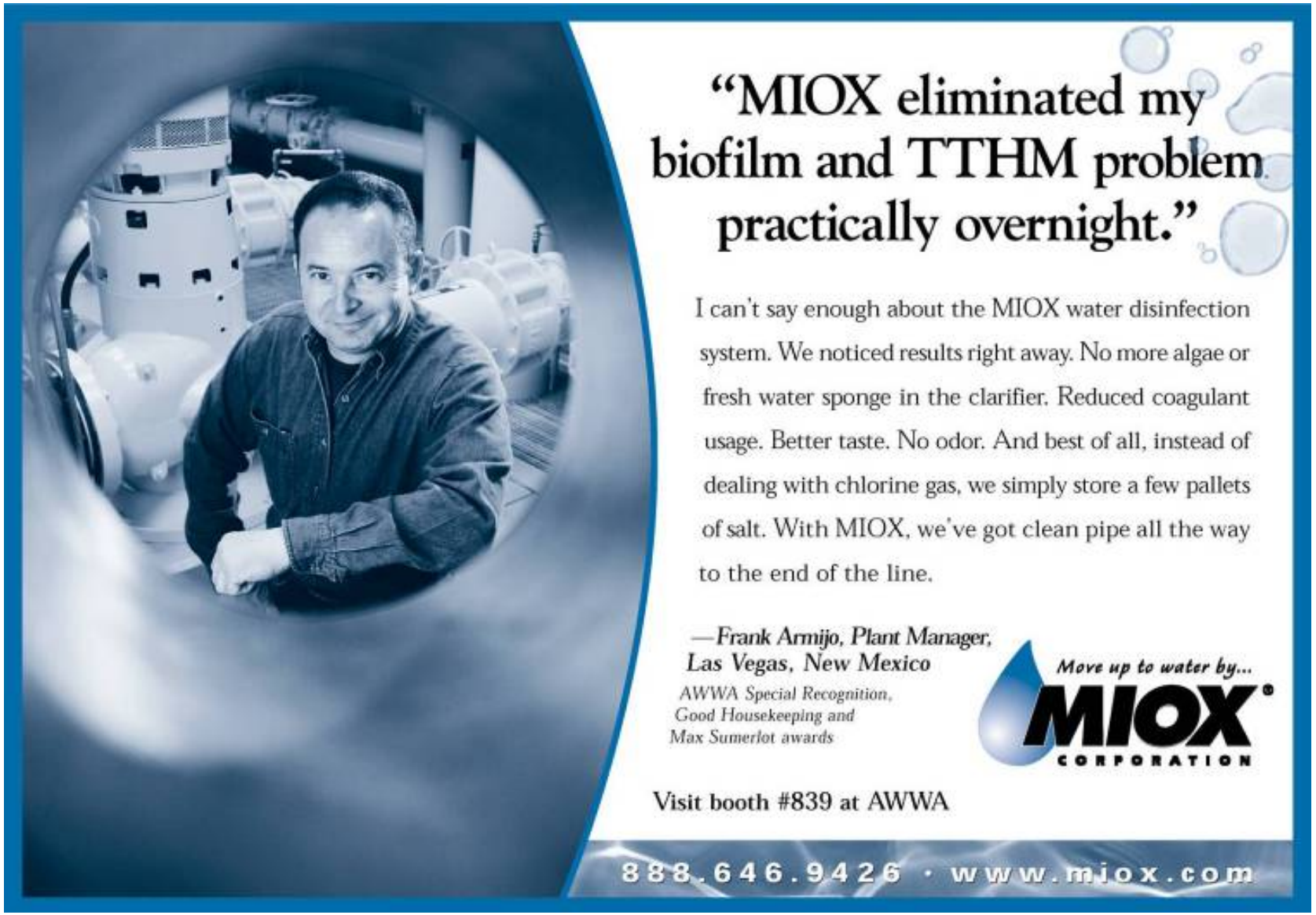


Case References

- USA
- Japan
- Saskatchewan
- Nova Scotia
- Newfoundland

My Water. My World. MIOX

Las Vegas, New Mexico



Potable Water : Las Vegas, NM

3.5 MGD SWTP:

- 42% reduction in alum use
- 44% reduction in formation of TTHMs
- 15% to 30% reduction in FAC dose with an increase in chlorine residual from 0.2-0.3 ppm to 0.8-1.0 ppm
- Sponge and algae growth in clarifiers reduced from 1.5” (3.8 cm) per month to 0” (0 cm)
- Eliminated maintenance of 20 hours spent scrubbing away algae mat every 3 weeks
- Decrease in taste and odor complaints to 0

Sub Menu Top Menu

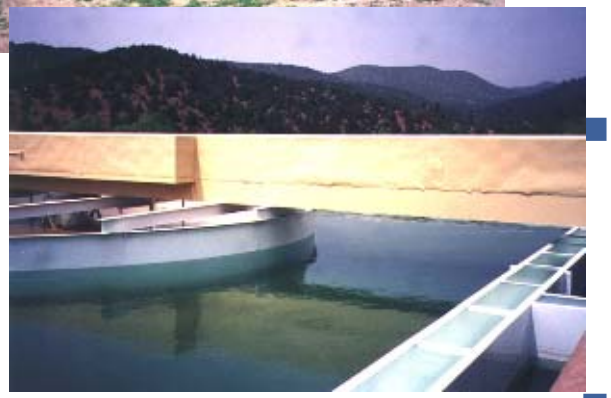
Potable Water : Cedar Knox, NE

- Eliminated 45-mile (72-km) transport of chlorine gas from warehouse to treatment plant via pick-up truck
- Reduced dose 30% from 3 mg/L to 2 mg/L
- Hold a 0.6 mg/L after *6-7 weeks* in distribution vs. no residual with chlorine gas
- Additional detention time of 3-4 weeks in neighboring Village of Obert with *no boosting required*
- TTHMs reduced from > 100 μg/L to < 80 μg/L
- Jar testing shows favorable results for microflocculation

"The system has helped us a lot. There's no doubt in my mind if it were not for MIOX, we would not be able to hold the residual we do.**"**

--Gene Schroeder, Project Mgr

Potable Water : Santa Fe, NM



10 MGD SWTP, 6 well sites

- TTHMs - reduced from > 60 μg/L (with spikes > 100 μg/L) to an avg. of 33 μg/L
- Microflocculation - 60%-66% reduction in alum dose, settling achieved in < 20 min., even at 38°F (3°C)
- Turbidity - reduced from 0.6 NTU to 0.25 NTU; are able to maximize plant flows at 10 MGD (38,000 m^3) in spring instead of having to reduce to 4 MGD (15,000 m^3) to control turbidity
- Filters - filter runs extended 50%
- Residual - chlorine dose cut 31% for 0.3 ppm FAC residual
- T. & O. - complaints reduced to 1%-2% of previous level
- Costs - operating costs cut 34%; recovery of capital costs expected in 3 years time

Potable Water : North Table Mt. CO

- **Safety** - no RMP, HAZMAT issues, or liability concerns
- **Chlorine Dose** - reduced by 33%
- **Chlorine Odor** - no longer detectable in taps at the plant
- **Maintenance** - no increase from chlorine gas; spend only 10-15 minutes per week
- **Lime Use** - reduced 50% since pH of mixed-oxidant solution is near neutral
- **TTHMs** - reduced 44% (now 23 µg/L)
- **HAAs** - reduced 44% (now 16 µg/L)

Potable Water : Apple Valley, CA

"MIOX holds a lot longer in that zone than sodium hypochlorite -- that's where we noticed it."

--Scott Weldy, Superintendent

Well Sites
(0.35 to 2.7 MGD)
(1,300 m^3 to 10,000 m^3):

- Improved safety - no more eyewash stations for sodium hypochlorite
- 40% reduction in FAC dose. With bleach, 0.8 mg/L dose required boosting with 0.2 mg/L for residual maintenance. With MIOX, dose was reduced to 0.6 mg/L with no boosting.
- Residual lasts 3 times longer in remote storage tank (15 days instead of 5 days)
- Monthly taste complaints eliminated
- Total costs reduced 12%

Sub Menu Top Menu

Membrane Filtration Plant

- SAL-80 installed October of 2000
- Mixed oxidants applied prior to hydropneumatic tanks. Water goes through a pre-filter to a UF system, then to ground storage tanks.
- Membrane filter backwashed every 2 hours -- the longest duration that Koch recommends and that is allowed on the control software

"We like MIOX better because it's less dangerous…and the operation has been exceptionally trouble-free."

--Steven Fonville, General Manager/Operator

- MIOX keeps the membrane free of algae and other organic particles
- Cleaning is required every 6 months due to water pressure increase
- Dose of 1.5 to 1.8 mg/L leaves the plant at 1.4 mg/L -- residual lasts throughout distribution system with a good holding time
- No positive Bac-T counts ever
- Easy to maintain w/ only 2 operators

Potable Water : Bloomfield NM

"We're happy as heck we bought it! We're really pleased with the system and happy with the responsive service from the MIOX people. We wouldn't go back to chlorine gas even if it were furnished for nothing. We did not like chlorine gas -- we never felt safe."

--Cas Ruybalid, Engineer

- Improved safety for both operators and the community
- 30% reduction in FAC dose. With chlorine, 2 mg/L dose required for 1.2 mg/L residual. With MIOX, dose reduced to 1.4 mg/L.
- Residual does not dissipate overnight -- plant immediately operational in morning
- Easy to run; user friendly. Operators trained in one day.
- Savings on water usage

Hot Springs: Hyuga Sun Park - Miyazaki, Japan

- Hot Springs opened June 1, 2002 with sodium hypochlorite
- Initial treatment with sodium hypochlorite at 0.2 to 0.3 mg/L
- *Legionella* claimed 9 lives in first month of operation, shutting down facility

- Evaluation showed 1,500,000 cfu/cm^2 *Legionella* in facility piping
- New national legislation introduced for hot springs facilities to set minimum chlorine residual standard at 0.5 to 0.6 mg/L

Hot Springs: Hyuga Sun Park - Miyazaki, Japan

- Research and biofilm removal performance at Inono Hot Springs led to selection of MIOX mixed-oxidant technology
- MIOX-251 system installed
- Facility reopened Oct 1, 2003

- Mixed oxidant dose set at 0.5 mg/L measured as free available chlorine to comply with new regulations
- Daily slide testing now required – zero positive counts for coliforms and *Legionella since re-start*

Hot Springs: Inono - Akita, Japan

SAL-80 installed 2003

- **Before (Sodium Hypochlorite)**
  - Dose of 1.5 mg/L resulted in less than 0.2 mg/L residual
  - Not effective at pH > 8
  - Positive coliform and *Legionella* hits
- **After (Mixed Oxidants)**
  - Immediate biofilm sloughing
  - Bore scope camera in pipes verified biofilm removal
  - Dose of 0.6 mg/L results in a 0.4 mg/L residual
  - Effective in any pH water, including high alkaline water
  - No more positive coliform or *Legionella* hits
  - Miyazaki was given the *Highest Water Quality Award* in November of 2004

Sub Menu Top Menu

Hot Springs: Inono - Akita, Japan

Biofilm sloughed into pool water, and was physically removed by operators

After only 6 days, the pool was sparkling clean

Hot Springs: Inono - Akita, Japan

Feed water pipe with sodium hypo

Feed water pipe after 6 days with mixed oxidants

Feed water pipe after 22 days with mixed oxidants

Hot Springs: Inono - Akita, Japan

Filter recirculation pipe with sodium hypo

Filter recirculation pipe 22 days after mixed oxidants

Sub Menu Top Menu

Potable Water : Hazlet, Saskatchewan

- Controlled persistent iron bacteria, eliminating brown water problems
- Extended filter backwash cycle 100% and cut filter backwash time in half
- White laundry can now be done locally; fixtures don't discolor overnight
- Eliminated biofilm growth in cisterns

My Water. My World. MIOX

Brooklyn Power, Nova Scotia

MIOX SAL 80

Cooling Tower

Bio Film Reduction

- Had Issues with high organics & biological fouling in the condenser tubes
- MIOX has proven to be more effective to reduce bio film than liquid sodium hypochlorite and is low cost in operations and maintenance
- Payback for the MIOX system was approx. 2 years from the point of cost of sodium hypochlorite alone.
- Operating since Feb 2006, maintenance time is minimal, and the MIOX cell tubing is replaced once per year as the unit is in constant operation.

"The increased electrical production and reduced heat rate are the two major benefits to Brooklyn Power and have significantly reduced the payback period" Tom Walsh.

Cornwallis WTP, Nova Scotia

MIOX SAL 80, 10 lbs (4.5kg) /day

- Providing disinfection for a conventional water plant treating a surface source
- MIOX replaced a chlorine gas system
- Safer and easier operations
- The operator, James, stated: “the MIOX system requires the least amount of time and effort on my part compared to other plant operations and equipment”
- Improved free chlorine residuals though out the distribution system and reduced THM’s
- This MIOX system is presently the oldest operating unit in Atlantic Canada. It has been in service for over 6 years. The operator purchased his first cell replacement last year for a maintenance back up.

Heart's Delight – Islington, NL

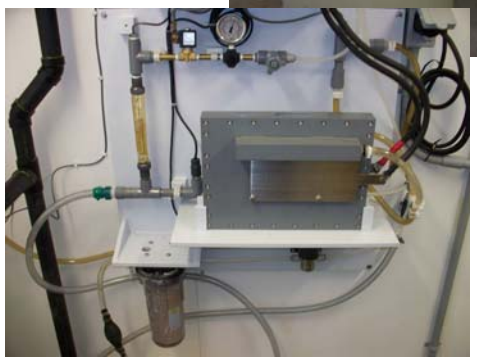
- Commenced Pilot Study March 2007
- Miox replaced liquid Sodium Hypo Disinfection & pre-oxidant KMNO4
- The following Benefits were observed:
  - improved taste & reduced odour
  - free chlorine residuals improved in the distribution system
  - maintained low THM levels
  - reduction of colour improved
  - reduced levels of Fe & Mg
  - reduced level of chlorine injection
  - reduced level of Sodium
  - easy maintenance & operations
  - eliminated off loading & handling heavy drums of liquid chlorine

Heart's Delight – Islington, NL

- Permanent MIOX SAL 40 installed in November 2007
- Produces 4.0 lbs(1.8 kg)/day FAC
- Continues to provide disinfection advantages as seen with the Pilot
- Operator receiving positive comment from the town residences (improved taste, less odour and colour issues).
- First fully functional MIOX OSG in Newfoundland & Labrador

My Water. My World. MIOX

Town of Lawn, NL

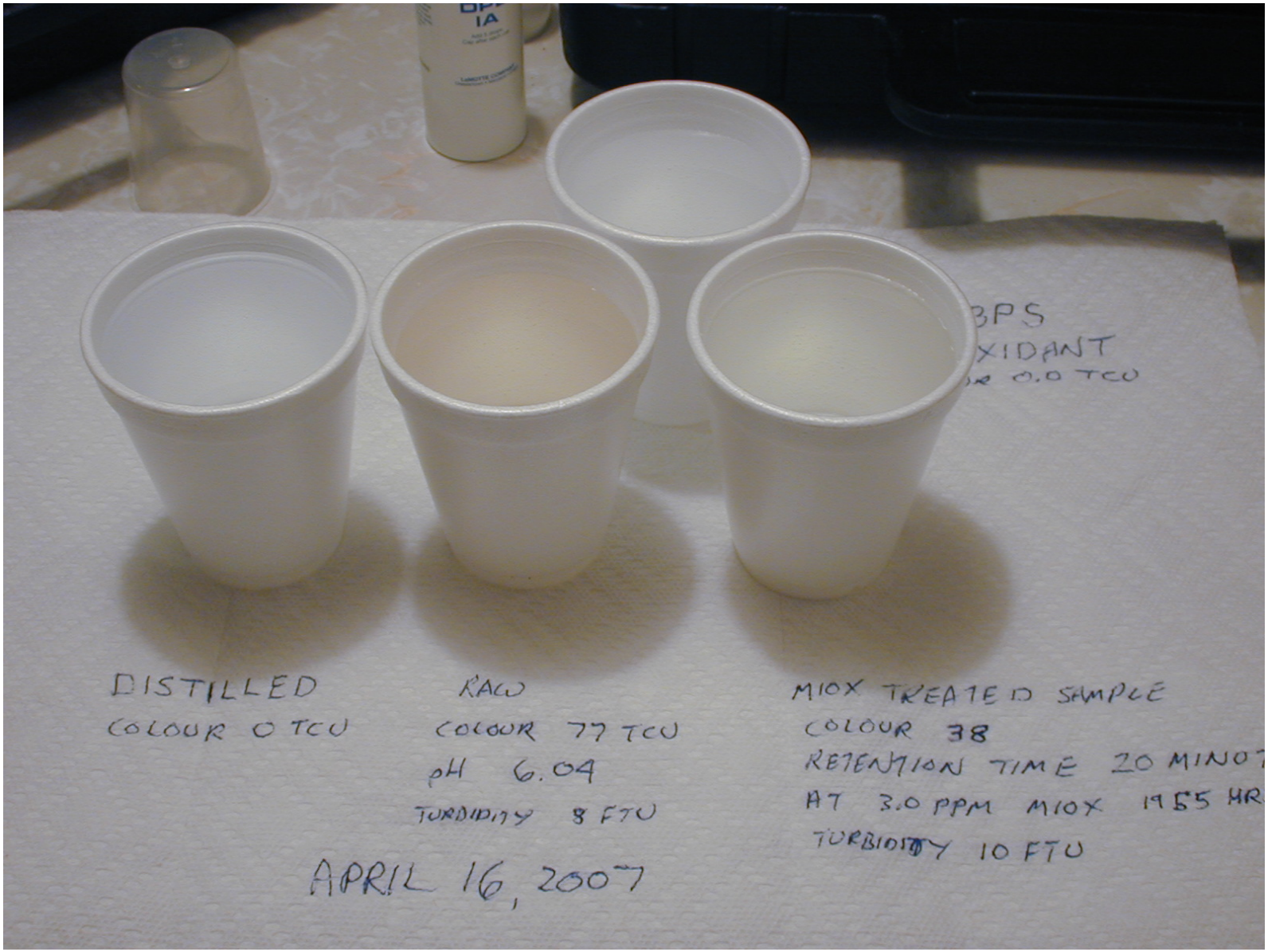


SAL 80

- Commenced pilot operations on February 13, 2008
- Providing disinfection for an untreated raw water surface source
- Replaced a liquid sodium hypo disinfection system
- Isolated and virtually unmanned
- System is checked once a day, easy operations and simple to maintain
- Operator trained in one day
- During a routine hydrant flush it was observed that the lines are cleaning up
- Residence now claim that the water appeared clearer in their bathtubs
- Ongoing testing continuing to measure THM's and chlorine residuals

My Water. My World. MIOX

Town of Lawn, NL (Miox Bench Test)



Upcoming Pilot Projects

- **Town of Come By Chance (SAL 40)**
  - Raw Water Surface Source for disinfection
  - Existing liquid Sodium Hypo System

- **Port Au Port West – Aguathuna-Felix Cove (SAL40)**
  - Ground Water Source for treatment removal
  - MIOX Combined with filtration equipment and retention vessels to provide oxidation and disinfection

“The future of water is clear”

MIOX Corporation