GPG FINDINGS 019

FEBRUARY 2015

CATALYST-BASED NON-CHEMICAL WATER TREATMENT SYSTEM

OPPORTUNITY

What percentage of the U.S. has hard water?

85%

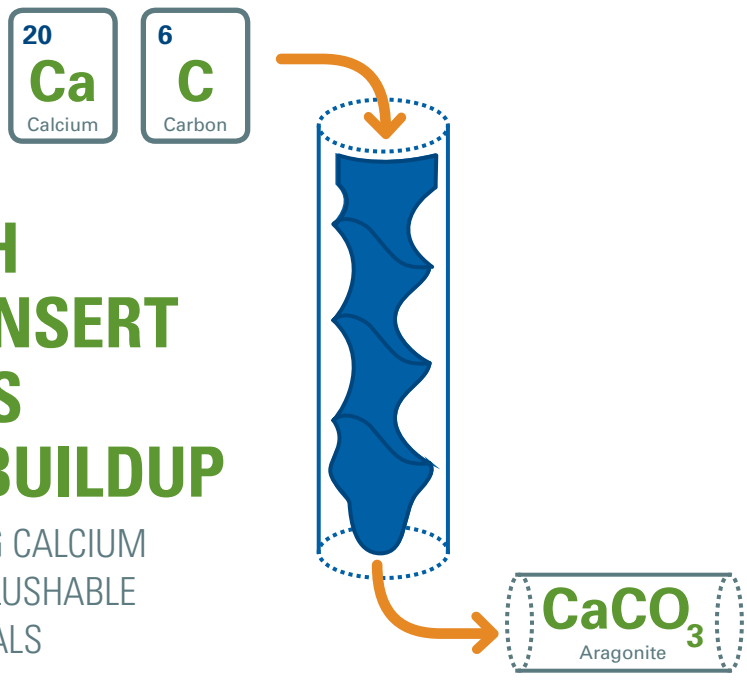
OF THE UNITED STATES HAS HARD (>121 MG/L) WATER[1]

CALCITE BUILDUP

due to hard water restricts water flow and causes heating systems to overheat and fail

TECHNOLOGY

How does the Catalyst-Based NCWT work?



PIPE WITH HELICAL INSERT PREVENTS CALCITE BUILDUP

BY TRANSFORMING CALCIUM AND CARBON TO FLUSHABLE ARAGONITE CRYSTALS

M&V

Where did Measurement and Verification occur?

OAK RIDGE NATIONAL LABORATORY assessed the effectiveness of a catalyst-based NCWT provided by Fluid Dynamics at the Moss Federal Courthouse in Salt Lake City, Utah. Before installation of NCWT, commercial-grade heating elements overheated and failed after only two months of operation.

RESULTS

How did Catalyst-Based NCWT perform in M&V?

EFFECTIVE

REDUCTION OF CALCITE

NO BUILDUP AFTER 18 MONTHS[2]

O&M

MINIMAL

NO MOVING PARTS OR CHEMICALS[3]

<2 yrs

PAYBACK; IMMEDIATE WHEN COMPARED TO CHEMICAL SYSTEMS[4]

NCWT vs. Salt-Based System in Salt Lake City

Payback for NCWT is immediate compared to a salt-based system

	Salt-Based System	NCWT
Equipment Cost	**$2,600**	**$1,192— ¾" diameter pipe** Unit pricing ranges between $798 for a ⅜" pipe and $96,360 for a 16" pipe.
Installation Cost	**$600**	**$500 —10 hours @ $50/hr** Installation for new construction is $0, as it incurs no additional costs over baseline.
Maintenance Costs/year	**$1,850—$350 chemicals, $1,500 labor**	**$100—biannual tank cleaning** Required in systems without a drain.
Simple Payback		**Immediate**

DEPLOYMENT

Where does M&V recommend deploying Catalyst-Based NCWT?

FACILITIES WITH HARD WATER

Any heating system with calcification issues including hydronic heating systems and boilers, condensing boilers, and gas and electric water heaters. The harder the water, the more likely NCWT will be cost-effective

[1]American Water Works Association, Public Notice Article, May 2007 [2]Catalyst-Based Non-Chemical Water Treatment System, Frank E. Moss U.S. Courthouse, Salt Lake City, Utah, Dan Howett (ORNL) October 2014, p.1 [3]Ibid, p.24 [4]Ibid, p.25