Florida State University — Engineering

USA

Florida State University
600 W. College Avenue
Tallahassee
FL 32306

To the Ackuritlabs team,

Please find below photos of the Vulcan Descaler installed in the Florida State University College of Engineering.

These pictures show 2 x Vulcan S100 units protecting the double chiller and pumps in the FAMU/FSU College of Engineering.

Regards,

The Florida State Engineering Team

Vulcan S100 units installed on the double chiller

Vulcan S100 units installed on the double chiller

Vulcan units protecting chiller pumps from scale and rust

Spokane Public Schools Washington

USA

Spokane Public Schools

Vulcan installed in

Spokane Public Schools

Dear CWT Team,

Spokane schools now have 6 Vulcan units installed.

One of the first Vulcan units is on a small cooling tower and this stays absolutely clean during the season. The tower was full of scale when we started and after 4 weeks, scale started to fall of in big chunks and now it is completely scale free.

Installation of Vulcan Descaler for the entire buildings water supply in the Roosevelt school

Our first installation in Spokane schools was in Shaw Middle School, 50 years old building and with rusty/dirty looking water.

This was installed before the school started in the fall.
After Christmas this year, the water is always clean and the janitor does not have to flush the piping anymore.

Have a great day.
Arne Vestad
IWTNA

Installation locations

ROOSEVELT
ELEMENTARY SCHOOL

Roosevelt Elementary School
333 West 14th Ave
Spokane, WA 99204-3627
USA

SHAW

Shaw Middle School
4106 N. Cook St.
Spokane, WA 99207
USA

Barcelo Bavaro Palace

Dominican Republic

The 5-star Barceló Bávaro Palace hotel is one of the top luxury hotels in Punta Cana, designed specifically for people who love constant sunshine, the gentle sound of the Caribbean breeze whispering in the palm trees, and beautiful crystal-clear waters with a coral reef. The hotel is beside one of the 10 most stunning beaches in the world.

Installation details

Location: Barceló Bávaro Palace
La Antagracia, Dominican Republic
www.barcelo.com

Models: 2 x Vulcan S100 in hotel's main hot water lines
3 x Vulcan S250 for cooling towers
4 x Vulcan S500 for cooling towers

Installed by: InterClima

Installation purpose

Most of the hotels in the area of Bávaro/Punta Cana in eastern Dominican Republic depend on ground water wells for their domestic water supply, using traditional water softening equipment to reduce the scale and hardness of the water. The fact is that some of these resorts have very poor maintenance resulting in extensive scaling of cooling towers and domestic hot water piping and equipment.

The results

The project began with a mechanical room energy audit resulting in a great opportunity to upgrade the existing equipment with a very short payback period. The original installation was sold with an estimated payback of less than 2 years. To our customer's happy surprise, the actual payback was 9 months! The hotel maintenance manager is very impressed with the performance of the Vulcan systems, this opened up many additional opportunities including the subsequent chiller and cooling tower replacements.

Before Vulcan S100 was installed in hotel's main hot water line, the storage tanks had a solid 3 cm thick scale layer inside them and the pumping pressure from the booster set was at maximum while being unable to deliver adequate water pressure to the end of the line hotel rooms. After the 3 months period, an inspection of the inside of the storage tanks revealed that the scale layer was soft allowing them to mechanically clean them removing most of the calcium deposits. Other the following 12 to 18 months, the distribution lines also cleared up resulting in much improved flow and lower pumping costs from the booster sets.

The manager was instrumental in the approval of the resent trial installation of an S250 in the Royalton White Sands (Jamaica). We will continue to use the Barceló success in our future presentations.

3 chillers were treated by 3 Vulcan S500

Aerial view of Barceló Bávaro Palace next to the Bavaro beach, Higuey

Yuqiao District Heating Station

China

Yuqiao District Heating Station

Model: Vulcan S100

Location: Yuqiao district heating station

Installed by: Dalian Jiayifang

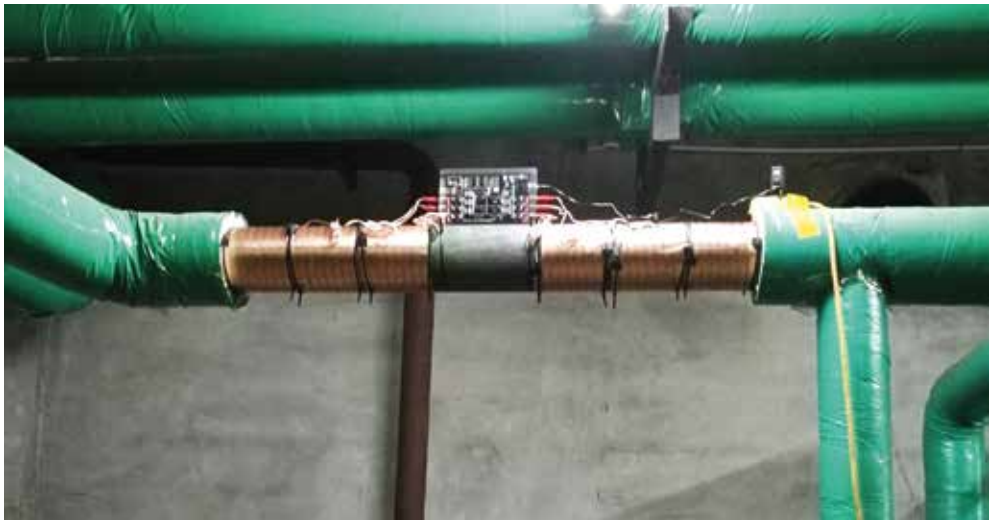
Installation reason: to solve the scaling problem of heat exchanger in the heating station

Scale can be easily wiped off, and the pipe shows the smooth wall

Yuqiao district is located in Dalian city, with in total about 160,000 square meters, 1300 households and 3900 people.

Yuqiao district heating station is responsible for heating the entire district. The heat exchanger was scaled badly, so heat transfer efficiency was reduced, also affected the heating quality.

After Vulcan was installed for only one month, it already shows very good result: the scale in the valve before the heat exchanger can be easily wiped off, and the inner wall becomes smooth agian.



Vulcan S100 was installed on the main circulation water supply, which is from the municipal water.

Air Conditioner

China

同程旅游
Tong-Cheng Travel

Installation Location:
the headquarter building of Tong-Cheng Travel (Suzhou City, Jiangsu Province, China)

Installed by CWT distributor:
Jiangsu Xinriyuan Construction Energy Saving Technology Shareholding Co., Ltd.

Model:
1 x Vulcan S100

the headquarter building of Tong-Cheng Travel in Suzhou city, China

Installation application:
Tong-Cheng Travel is a Chinese tourism leading enterprise, CWT distributor- Xinriyuan took charge of the whole building air-conditioning works. The main part of the air-conditioning uses high efficiency evaporative system, and it requires very high quality water. To ensure the long-term efficient operation of the heat exchanger and also to avoid scaling occurred, Vulcan S100 was bundled with air-conditioning evaporative system.

main air-conditioning system

Installing Vulcan S100

Vulcan S100 was installed on the main air-conditioning system

Neptune Seafood Restaurant

USA

Vulcan installed at:
Neptune Foods - Vernon
Seafood processing
90058 Vernon
California, USA

Arne Vestad - International Water Treatment North America

Dear CWT Team,

This cooling tower is one of three protected by the Vulcan S25 units in this location. The building is one of 47 buildings owned by Neptune Foods in Vernon LA, and this particular building does mainly seafood processing and packaging for consumers.

This picture was taken after 4 months the installation of the Vulcan S25. The tower was dirty/not cleaned before the Vulcan was installed.

Since the Vulcan installation, the cooling towers have been scale free and there has been no need for any chemical treatment.

Clean cooling tower after using Vulcan

Best Regards,
Arne Vestad

Commercial Cold Storage

USA

Commercial Cold Storage

1011 S 1st St,
Mt Vernon
WA 98273
USA

IWTNA
2607 Bridgeport Way West
Suite 1J University Place
WA 98466

Dear IWTNA,

Please find below the installation photos of the Vulcan S100 installed on the main line connected to 3 cooling towers.

Regards,

The Mt.Vernon Cold Storage Team

www.commercialcold.com

Vulcan S100 installed on cooling towers

Vulcan S100 installed outside

Water Wise Cooling Towers

USA

Dick Van Voorhis
Salt-Free Water Systems
1429 Casco Bay Cir
Cicero IN 46034

RE: Vulcan Descaler as an alternative to chemical based cooling tower treatments

Dear Dick,

For the past two years, we have selected several of our existing customers and offered them the opportunity to have us install the Vulcan Non-Chemical Unit on their cooling towers, for the purpose of evaluating corrosion, scale and bacteria rates versus a traditional chemical treatment program.
We have installed 5 x Vulcan S25 & 2 x S10 units all in the upper New York State area.

Based on standard water test analysis, including Corrosion Coupon Testing and regular Bacteria Dip Slide results, we have concluded that the Vulcan Non Chemical System has been able to provide similar results, to those achieved using a chemical based treatment program.

Regards,

Michael Bromley
President
Water Wise of America Inc.
Rochester NY 14624

www.waterwiseofamerica.com

Chillers in a Cooling Tower

USA

INTERNATIONAL WATER TREATMENT
NORTH AMERICA
Clean, Green, Affordable

Vulcan installed in a Chiller

Dear CWT Team,

Here are two pictures from a Chiller opened for a routine cleaning, but nothing to clean after two years with Vulcan treatment.

No scale formation after using Vulcan

This Chiller is connected to a Cooling Tower which is exposed to lots of air borne contamination from surrounding farms.

Best Regards

Arne Vestad
www.IWTNA.com

Dynamit Nobel Dynamite

Germany

Dynamit Nobel

AKTIENGESELLSCHAFT

WERK LÜLSDORF

DYNAMIT NOBEL AG, Werk Lülsdorf, 5216 Niederkassel

Firma
Christiani Wassertechnik GmbH
Diepenbenden 25
5100 Aachen

Water treatment device

Dear CWT-team

Currently we have five devices from the Vulcan range in use.

Because of the high degree of hardness of our cooling tower water, we had to decalcify every few months. After we used the devices, the scale on the heat exchange pipes was drastically reduced. Thus the lifetime of these devices is getting longer.

Kind regards

DYNAMIT NOBEL AG
Werk Lülsdorf
Technical Department

VacMet Coating & Engraving Service

USA

VacMet

Coating & Engraving Service

Coating of metals with plastic or resins

IWTNA
Arne Vestad
2607 Bridgeport Way West
Suite 1J University Place
WA 98466

Vulcan anti-scale system

Dear Mr. Vestad,

I have noticed a definite improvement in the operation of our boilers. Typically, we would have several cooling coil plug ups during the hot weather season (a greatly extended season this year) and since the installation of the Vulcan, we have had zero plug ups and that translates into the saving of many hours of down time.

Based on that saving alone, the Vulcan has already paid for itself.

An additional benefit has been in the greatly reduced amount of cooling tower maintenance. The calcium buildup has been miniscule and the little bit that has accumulated can be easily washed away with a garden hose and nozzle.

I have also noticed a huge reduction in the iron stains in the bathroom fixtures here at the factory as well as at home where I installed the second unit. At home, I eliminated my water softener that was running on potassium due to the ancient iron pipes that run all through the house and barn.

The water seems to feel and react just as well with the Vulcan as it did with the softener and I no longer need to buy the expensive potassium and break my back lugging around the heavy bags to reload the water softener. I don't mean to sound like a commercial for the unit, but those are the honest facts and observations.

Please feel free to stop by the next time you are in the area.

Kindest regards,

Chuck Nelson
VacMet Inc. in California, USA
www.vacmet.com

Energetika Ravne d.o.o Heat Exchanger

Slovenia

ENERGETIKA RAVNE, d.o.o.

Ravne RP
12.00/1029/RJ

SUBJECT: INSPECTION OF TUBE HEAT EXCHANGER (2X) UHP FURNACE, OPEN SYSTEM 40/30 °C

Upon the agreement with Mr Petovar, we have concluded to inspect both tube heat exchangers on the secondary part of the UHP furnace.
The front and rear covers of both exchangers shall be disassembled.

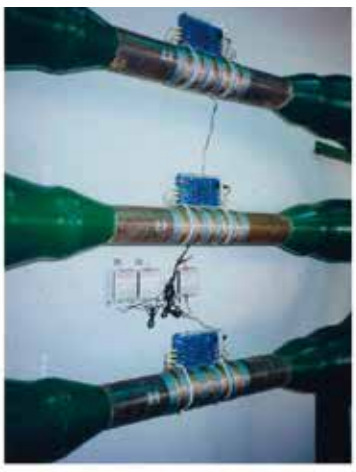
PRESENT AT INSPECTION:
Petovar – SŽ Metal Ravne, d.o.o. JUH OTO
Oderlap, Vučko, Potočnik, Jamšek, Zapušek – Energetika Ravne, d.o.o.

ESTABLISHMENTS:
The inspected tubes were clean; there were no signs of lime scale accumulation.

The device for electronic softening is functioning well.

CONCLUSION:
We suggest that the device is purchased.

ENERGETIKA RAVNE d.o.o.
RAVNE NA KOROŠKEM
①



After Vulcan installation

Control of honey comb fill of cooling tower

Holcim Cement Factory

Vietnam

Holcim Kien Luong, Vietnam

About Holcim cement factory

Holcim is one of the world's leading suppliers of cement and aggregates, and Holcim Kien Luong is the biggest cement factory in Vietnam.

The factory has problems with hard water in chiller, grinder and water supply pipe. They planned to spend nearly 400,000 USD to build and buy chemical systems to solve the problems. However, after installing Vulcan units, all the problems are solved with only 30,000 USD. This is the best investment!

Before Vulcan installation:

- scale deposits in oil heat exchanger
- oil tempurature >50°C: vey high
- to clean every month
- heat exchanger has corrosion
- scale deposits clog the pipe

Installed Vulcan models:

2 x Vulcan S250
1 x Vulcan S100
1 x Vulcan 5000

Installation locations:

- the main water supply for the cooling tower
- the cooling tower for the big grinder
- the cooling tower for the small grinder

Purpose:

- clean scale deposits
- prevent new scale
- reduce maintenance costs
- replace chemical dosing and softener systems

After Vulcan installation:

- oil heat exchanger is clean
- temperature is stable at 37°C – 40°C
- no need to stop machines to clean anymore
- save 7% electric energy at grinders

Heat exchanger before Vulcan installation

Heat exchanger after 2 months Vulcan installation

Tien Phong Technologies Co., Ltd, No. 30, Street 12, Binh Hung Hoa ward, Binh Tan District, HCM City, Vietnam | www.tpcorp.com.vn | sale@tpcorp.com.vn

THK Precision Industry

China

THK

www.thk.com

THK Precision Industry Manufacturing Liaoning Co.,Ltd.

Installation details

Model: Vulcan S25

Location: THK Precision Industry

Installation area: The main water pipe of cooling tower

Installed by: Dalian Jiayifang

We used chemicals to remove the scale of cooling tower before. After Vulcan was installed, we stopped the dosing process, and all equipment is still running well. Vulcan completely replaced the chemicals and saves cost for the company.

In winter, the cooling tower runs with less water and full of ice, we observe every week and find that the scale is gradually reduced. After 4 months running with Vulcan, the scale in the water tank and cooling tower has been significantly reduced.

THK's Linear Motion (LM) Guide devices are an indispensable component of mechanical and electronic systems in a wide variety of industries, which are manufactured by THK for supply to customers worldwide.

Vulcan S25 installed on the main water pipe of the cooling tower.

甲一方水务科技
JiaYiFang Water Technology

www.vulcan-jiayifang.com

Hyundai Motor

Korea

HYUNDAI

Installation Details

Location: A car engine manufacturing factory, Hyundai Motor Ulsan

Area: A cold water circulation pipeline for the cooling tower and the induction hardening machine

Pipe size: 100 mm

Model: Vulcan S25

Installer: Vulcan-Korea team

Scale Problems

1. Scale problems in the pipelines and the induction hardening machine.
2. There are 9 secondary small pipes, they had to be cleaned manually every 2-3 months.

Vulcan Effect

Installation of a Vulcan S25 unit:
May 21st, 2018.

Note: scale was not manually removed before the Vulcan was fitted on source pipe (see photo).

Examination of secondary piping:
November 21st, 2018

1. Since Vulcan S25 was installed, the Hyundai Engineering Team has stopped the regular manual cleaning process.

   Observation: the flow rate with the Vulcan unit is now even higher than immediately after previous manual cleaning had been done.

2. After Vulcan S25 had been installed for 6 months, the secondary pipes were opened: scale that had been left in piping had disappeared and all 9 secondary pipes had become clean (see photo).

   Observation: Biofilms in the cooling tower had disappeared since the Vulcan unit was installed.

Vulcan S25 was installed around 50 meter before the induction hardening machine.

There are 9 secondary small pipes with water meters. These meters were installed to make sure a stable flow rate. If the flow rate goes down, it would cause a problem of the induction hardening machine. Therefore, the pipes had to be cleaned manually every 2-3 months.

First inspection:
May 21, 2018.

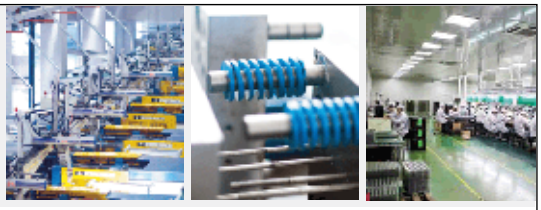
Inside of a secondary small pipe, before Vulcan S25 was installed.

Last inspection:
November 21, 2018.

After 6 months with Vulcan treatment: the pipe is free of scale.

Kunshan Xingbao Plastic

China



Installation details

Location: Kunshan Xingbao Plastic
www.xinbaoplastic.com

Model: S150 was installed for an injection molding workshop
S250 was installed for an air conditioning circulating water system

Installed by: Xinriyuan

Xingbao Plastic

It covers 40,000 square meters and has about 400 employees. The major business lines include plastic injection, product assembling, painting, non-conductive vacuum metallization and mold manufacturing, and its wide ranges of products in the fields of electronics, home appliances, auto parts, medicine, and gardening are exported throughout the world.

The scaling problems and the result

The injection molding machine had been scaled badly for years, so it was always difficult to clean the pipe, especially the heat exchanger of the mold temperature controller. The traditional cleaning way is to use a chemical, but it is costly and difficult, and it also harms the heat exchangers and pipelines.

After Vulcan S150 and S250 were installed, the clients are fully satisfied with their performance because they solved the scaling and iron filing problems on injection molding machines.

One and a half years after Vulcan was installed, we opened the mold temperature controller and checked the heat exchanger.

Untreated heat exchanger for 3 years.

After installing Vulcan for 1.5 years, the scale is gone without extra cleaning.

Beauty Star Plastic Packaging

China

Beauty Star Co., Ltd.

Beauty Star Co., Ltd. is a state-owned enterprise that produces plastic packaging boxes, cosmetic packaging boxes and other injection molding products. It also cooperates for years with Wrigley Company, SK2, Blue Moon Industry and many other famous enterprises.

Installation details

Model: Vulcan S150

Location: On the pipe of the dust-free workshop

Purpose: To solve the scaling problems of the injection molding machine

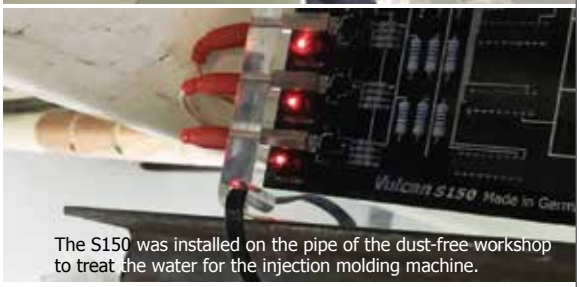
Installed by: Xinriyuan Company

Before Vulcan was installed:

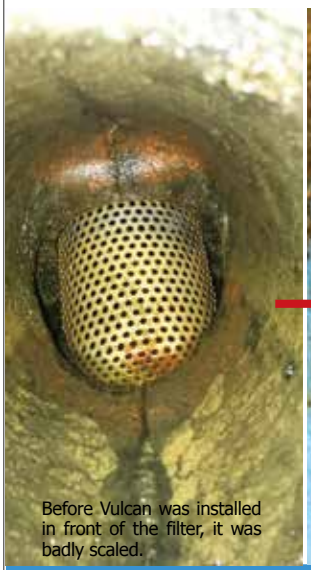
The heat exchanger and the pipe were badly scaled.

6 months after Vulcan was installed:

- When we opened the valve of the heat exchanger, we noticed that a lot of scale had disappeared
- The chiller and the cooling tower stay clean
- The "small holes" of the injection molding machine have become very clean, when they were blocked before, and the corrosion on the valve has gradually disappeared.



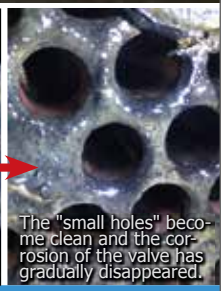
The S150 was installed on the pipe of the dust-free workshop to treat the water for the injection molding machine.



Before Vulcan was installed in front of the filter, it was badly scaled.

After Vulcan was installed, the scale on the inner wall has been removed and the coating has gradually appeared.

The valve of the injection molding machine before Vulcan was installed.



The "small holes" become clean and the corrosion of the valve has gradually disappeared.

Toray Industries

Korea

TORAY
Innovation by Chemistry

COMPANY INFORMATION

Toray Industries, Inc

Location:	Gyeongbuk, Korea
Installer:	DAWO INT Co., Ltd.
Model:	Vulcan S25
Pipe size:	100 mm

Toray Group

Toray Industries produce, process and sell the following products: Fibers and textiles, plastics and chemicals, IT-related products, carbon fiber composite materials, environment and engineering products and pharmaceuticals and medical devices.

SCALE PROBLEM AND APPLICATION

1. Scale problem on the plate heat exchanger

2. Regular (every 2-3 months) chemical clreaning of the pipes and heat exchangers

Vulcan S25 installed at Toray Industries

Before – without Vulcan

After 3 months – with Vulcan treatment.
Up to now the installed pipe line needed no cleaning.

Cooling Tower in a Medicine Factory

Japan

カタリナ SINCE 1971

Vulcan test report on cooling tower in a medicine factory

Installation details

Model:	Vulcan S100
Installation Area:	cooling tower in a medicine factory
Circulation Water Capacity:	100 m^3/h
Pipe Diameter:	150 A

The cooling tower roof of medicine factory

The purpose:

1. Prevents from scale
2. Prevents from heat exchanger effectiveness loss
3. Cleaning maintenance cost of plate heat exchanger can be reduced

The effect:

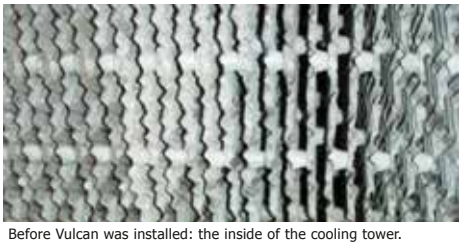
After Vulcan was installed for some months, the scale in the cooling tower, plate heat exchanger and the pipe become soft; and it can be removed easily with a finger.

Vulcan S100 installation

Cooling Tower Grid

Before Vulcan was installed: the outside of the cooling tower.

After Vulcan was installed for 5 months: the scale can be removed easily with a finger.



Before Vulcan was installed: the inside of the cooling tower.

After Vulcan was installed for 5 months: the scale has been reduced.

www.catalina.co.jp

カタリナ
SINCE 1971

Plate Heat Exchanger

After Vulcan was installed for 9 months: ready open the plate heat exchanger and clean.

After Vulcan was installed for 9 months: the plate heat exchanger was taken apart for cleaning.

The scale on the plate heat exchanger becomes soft.

The scale can be easily removed.

Circulation Pipe

Circulation pipe

The scale in the circulation pipe can also be easily removed with a finger.

Vulcan Effects on Cooling Towers

USA

Data and Observations of the Effects of the Vulcan Electronic Descaler on Cooling Towers

Installation site:
The unit was installed on the 10 inch diameter line that feeds twin cooling towers (CT-1 and CT-2) at the FAMU/FSU College of Engineering.

Model installed:
Vulcan S250

Objectives:
The objectives are to prevent scale buildup on the cooling towers, remove the existing scale, eliminate the need for chemicals or time-consuming cleaning procedures, and to reduce energy costs.

History:
The maintenance for these cooling towers previously involved continuous injection of descaling chemical cleansers. The use of these cleansers was discontinued over a year prior to the installation of the Vulcan. In that time, the cooling tower flutes became encrusted with both scale and biofilm. Throughout the time period described below, there were no cleaning procedures in place with these cooling towers besides the treatment provided by the Vulcan.

Observations over time after the Vulcan Installation:

Between the time of the installation on July 16th and examination on August 1st, the green biofilm had begun to recede and gradually disappear. The next visit was about 3 weeks after the installation, on August 9th. At that point, the green biofilm had been further reduced and the scale deposits had begun to separate from the flutes in coin-sized flakes.

By August 20th, about a month after installation, the green biofilm had almost completely disappeared from the surfaces in contact with the Vulcan-treated water. The flakes of scale previously observed had fallen off in most places. The cooling tower flute surface area covered with scale deposits had been decreased by over 60%.
We are very optimistic about continued improvement with this application. In addition to these observations, water quality measurements were also obtained from each cooling tower and are summarized in the following charts.

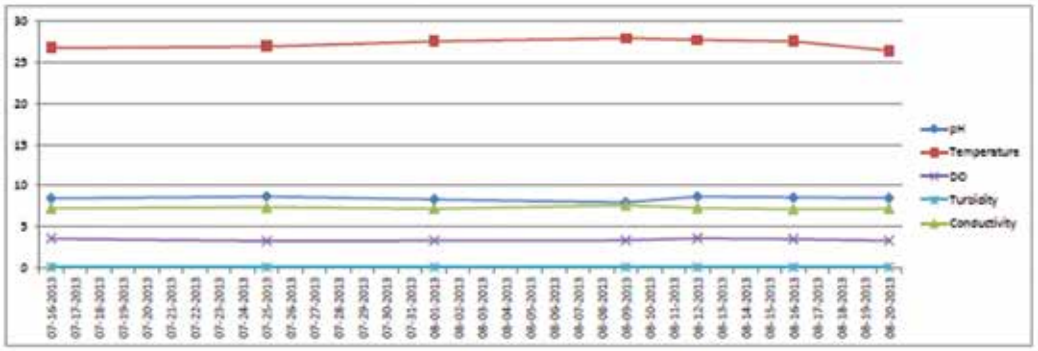
Data and Observations of the Effects of the Vulcan Electronic Descaler on Cooling Towers

The Vulcan does not change the water quality beyond its affect on its propensity to cause scale buildup. As illustrated below, the pH, conductivity, dissolved oxygen level, and turbidity remained relatively constant during observation from before the installation to over a month after. Temperature is included, because of its affect on the other measurements and seems to correlate with the slight fluctuations observed.

Cooling Tower 1 Basin

	Date	pH (SU)	Temperature (°C)	Conductivity (umhos/cm) *	Dissolved Oxygen (mg/L)	Turbidity (NTU)
Before Vulcan -->	07-16-2013	8.46	26.7	7.22	3.56	0.1
After Vulcan -->	07-25-2013	8.67	26.9	7.35	3.26	0.1
	08-01-2013	8.32	27.5	7.2	3.33	0.1
	08-09-2013	7.97	27.9	7.59	3.36	0.1
	08-12-2013	8.67	27.7	7.29	3.6	0.1
	08-16-2013	8.56	27.5	7.16	3.52	0.1
	08-20-2013	8.47	26.4	7.2	3.31	0.1

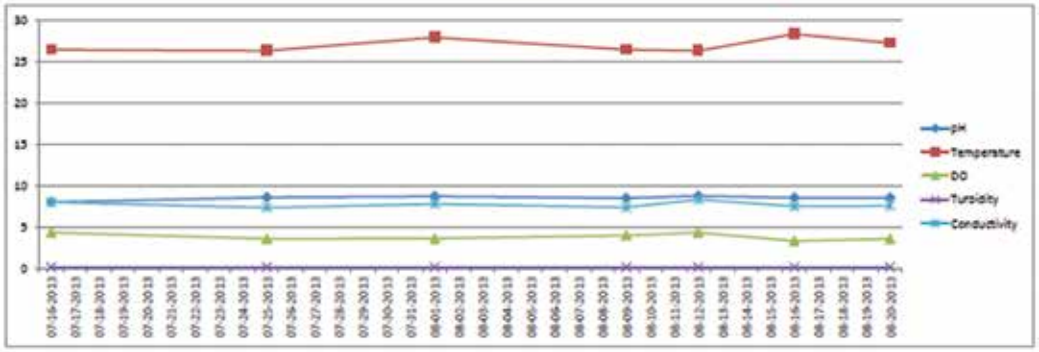
* divided by 100 to fit within the chart scale



Cooling Tower 2 Basin

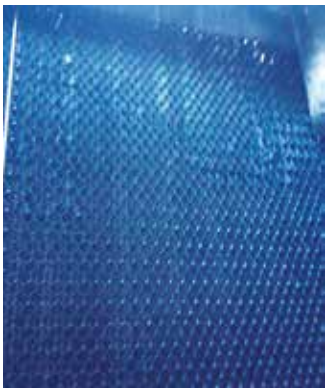
	Date	pH (SU)	Temperature (°C)	Conductivity (umhos/cm) *	Dissolved Oxygen (mg/L)	Turbidity (NTU)
Before Vulcan -->	07-16-2013	7.97	26.4	7.96	4.3	0.1
After Vulcan -->	07-25-2013	8.56	26.3	7.29	3.52	0.1
	08-01-2013	8.67	27.9	7.76	3.56	0.1
	08-09-2013	8.44	26.4	7.35	3.96	0.1
	08-12-2013	8.73	26.3	8.28	4.3	0.1
	08-16-2013	8.5	28.3	7.46	3.26	0.1
	08-20-2013	8.52	27.2	7.53	3.52	0.1

* divided by 100 to fit within the chart scale



Data and Observations of the Effects of the Vulcan Electronic Descaler on Cooling Towers

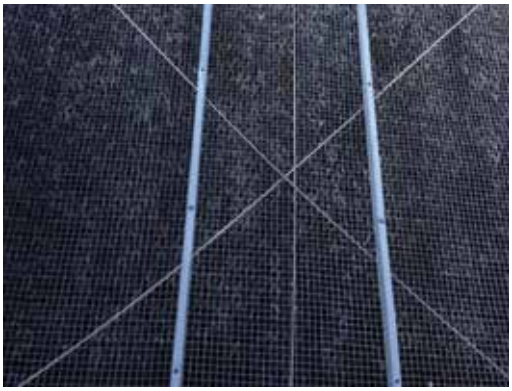
Vulcan S250 installed on a 10 inch diameter line that feeds twin cooling towers (CT-1 and CT-2)



This photo was taken of the inside of CT-1.

It illustrates clean flutes that are in constant contact with Vulcan-treated water and a few dry (untreated) areas that still have some remaining green biofilm.

The photographs above were taken of CT-1 about 3 weeks after the Vulcan was installed.



These photos were taken of CT-1 after about 6 weeks.