



MIEX[®] PRESS

December, 2005 • Issue #12

A Letter From the Editor

Season's Greetings to all! It's hard to believe we're at the close of yet another year. As many of you can surely relate, we seem to be busier than ever this holiday season with a packed pilot trial schedule, new installation start-ups approaching and the close of the peak conference season.

With our Fall conference schedule winding down, the engineering team seems to be picking up the slack with a steady stream of piloting and testing requests during these winter months.

The demand for MIEX[®] trials this Fall and Winter has been exceptional despite the peak season typically occurring in the summer months. This increased activity is mainly the result of utilities looking to come into compliance with EPA Stage 1 DBP standards. We are in the mid-

dle of a full pilot schedule with pilots now completed at Cohasset, MA; Arab, AL; Ocean Shores, WA; and Wedgfield, FL-- all performing favorably.

In addition to the testing involved in the pilot trials and feasibility tests, the engineering team has also been evaluating the performance of MIEX[®] Resin on treating Nano and RO concentrate, with the preliminary results looking good.

This issue of MIEX[®]PRESS will showcase several new MIEX[®] Installations including Airey's Inlet, Green Valley and Big Elk Meadows as well as the successful pilot results of the Arab trial in Alabama. We hope you enjoy this issue of our newsletter and share in the excitement we have as we approach the New Year. As always, please feel free to contact me with any questions regarding the featured articles.

Before I close, on behalf of the entire Orica Watercare team, I wanted to extend our most sincere wishes of a wonderful holiday season for you and yours. We appreciate

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ate your support and look forward to embarking on a new and exciting year with you in 2006.

Sincerely,

Stephanie Schneider

First US MAGNAPAK[™] Installation at Big Elk Meadows, CO

The first of Orica Watercare's new package MIEX[®] treatment plants (MAGNAPAK[™]) will be installed at **Big Elk Meadows, Colorado** in January 2006. The MAGNAPAK[™] system has been developed to accommodate small utilities that need a cost-effective means of reducing distribution DBP levels to within the EPA Stage 1 limits, while remaining on free chlorine. Big Elk Meadows is a small community of about 300 people (155 connections) located between Boulder and Estes Park, close to Rocky Mountain National Park. Its water supply is drawn from a series of lakes that are fed by the Little Thompson River with TOC levels ranging from 10 to 14mg/L. The current treatment process con-

sists of a 50gpm microfiltration system followed by a GAC filter for taste and odor removal. This treatment train only removes about 10% of the TOC and the subsequent disinfection with free chlorine can result in distribution THM and HAA levels well in excess of the Stage 1 limits. A series of bench studies showed that MIEX[®] resin pretreatment can reduce raw water TOC levels by over 80% to below 2.0 mg/L, allowing the subsequent 5-day simulated distribution system (SDS) THM and HAA levels to be reduced from above 200 µg/l each to below 50 and 35 µg/l respectively.

See **Big Elk Meadows** on Page 3



MIEX[®] Trial Successful at Reducing DBPs at Arab, AL

The City of Arab, Alabama recently piloted the MIEX[®] Process at the town's 6 MGD conventional water treatment facility to determine if it could reduce the formation of disinfection by-products in the distribution system to meet the new EPA standards. Several other technologies had been previously trialed with limited success.

The City is currently obtaining a budget cost to install a 6 MGD MIEX[®] system to be operational next fall.

Orica Watercare would like to thank the staff of the Arab Water Treatment Plant for their very helpful assistance during this trial.

The results of the MIEX[®] Process trial were as follows:

- MIEX[®] pretreatment followed by coagulation resulted in TTHM levels up to 53% lower and HAA5 levels up to 71% lower than treatment with coagulation alone,
- A MIEX[®] system alone can remove nearly 50% of the DOC. When combined with downstream coagulation, DOC removals of nearly 65% can be achieved.
- With MIEX[®] pretreatment, downstream coagulation doses are significantly reduced (from 39 ppm alum to 10 ppm after MIEX pretreatment - 75% reduction) and lower settled water turbidities are achieved.
- Additional benefits of MIEX[®] pretreatment on downstream treatment include reduced sludge production, reduction of pH correction chemicals, lower solids loading on the filters which will reduce backwash frequency and allow more reliable operation and production capacity.

Green Valley WTP to Start-up in January!

Construction of the City of Vallejo's 1 MGD Green Valley WTP is almost complete and commissioning is due to commence in January 2006. Progress has been to schedule and the City is hoping to have the plant within the DBP Standards for the first quarter of 2006.



1 MGD MIEX[®] System in foreground.

	TTHM (18 day)	HAA5 (18 day)	TTHM (5 day)	HAA5 (5 day)
Plant Control (range) - µg/l	84.2 (79.2-93.9)	56.4 (53.1-60.9)	64.1	40.6
MIEX [®] /Coagulant (range) - µg/l	49.3 (43.4-54.2)	19.4 (17.3-22.9)	40.1	12.5

Big Elk Meadows *(continued from Page 1)*

Construction of the MAGNAPAK[™] MP50 system was completed in 8 weeks and will be delivered to site in late January, winter weather permitting, when the site works are complete.

The MAGNAPAK[™] MP50 system is to be installed as pre-treatment to the membrane system, and as well as reducing DBP formation, it is expected to improve membrane flux rates by reducing the organic load on the membranes. The membrane system performance will be monitored closely and reported on in a future MIEX[®]PRESS article.

This is a great example of how a small utility



50 gpm MAGNAPAK[™] System prior to installation at Big Elk Meadows

can benefit from the MAGNAPAK[™] system, where fast manufacture of a standardized design followed by quick and cost-effective installation of the skid-mounted system will allow Big Elk Meadows to meet the EPA DBP standards in less than 7 months from the initial inquiry.

We would like to acknowledge the contribution of **Fred Pontius** of **Pontius Water Consultants** for managing the approval process with the State (CDPHE) as well as **Roy McCutchen** and **Nelson Renouf** of the Big Elk Water Association for helping to bring this project to implementation so quickly.

WQTC Showcases Benefits of MIEX[®] Technology

This year's WQTC was held in Quebec, Canada, November 6-10, and despite the location abroad and cold weather typical of Canada in the winter, attendance and traffic in the exhibit hall was very good, and the city of Quebec offered a beautiful setting as the host site for the conference.

The MIEX[®] Technology was featured heavily in presentations and posters again this year where a large focus of the conference was on Disinfection By-Products and strategies to meet the new EPA standards. There were 4 papers relating to trials at Palmdale and Covina, California as well as research conducted at the University of North Carolina and the University of Colorado. MIEX[®] was also mentioned in several other papers discussing treatment alternatives for meeting new EPA D/DBP Regulations.

With next year's conference being held in Denver, we are looking forward to having a strong presence in our home state and seeing all of you there.

Employee Spotlight: Bryan Cook



Bryan Cook started with the Watercare team in July as a field engineer after graduating from the Colorado School of Mines with a Bachelor's degree in Mechanical Engineering in May of 2005.

Though Bryan helps the team on many levels, his work has been most vital in administering pilot trials at various locations and performing the feasibility tests to determine the effectiveness of MIEX[®] Resin on different water samples.

Bryan most enjoys the traveling his job entails and making new friends at the sites he visits.

During his spare time, Bryan enjoys reading how-to books covering a vast range of projects. As of late, the home improvement how-to books have taken priority as Bryan renovates the house he recently bought in September.

MIEX[®] Technology Put to the Test at New Installation

The most recent MIEX[®] plant to be installed in Australia was challenged by worst-case water quality conditions upon it being commissioned earlier this year. A significant rainfall event occurred in the water catchment during commissioning that led to dissolved organic carbon (DOC) levels in the water more than doubling over a couple of days. Faced with this challenge, the MIEX[®] technology came through with flying colors!

This MIEX[®] plant is located at **Airey's Inlet**, a coastal town located 90 miles from Melbourne, Australia. The town has a permanent population that can increase two to three times over summer when Melbournians head to Airey's Inlet for vacations. The MIEX[®] technology was installed as a pre-treatment to the existing 2.85 MLD (0.75 MGD) plant which consists of alum

of 1.5 MLD (0.4 MGD or 280gpm) was installed in December 2004. This plant is capable of treating all of the water required for Airey's Inlet throughout the majority of the year.

The raw water source for this plant is the Painkalac reservoir, which is characterized as soft water that has seasonally high levels of DOC and color, and variable turbidity. The existing plant was capable of treating this water satisfactorily to Australian Drinking Water guidelines. The MIEX[®] pre-treatment system was installed to further improve water quality with respect to DOC, color and disinfection by-products (DBP's) and to improve the ease of operation of the coagulation, clarification and filtration steps.

The MIEX[®] plant was designed to treat raw water with maximum DOC levels of 15 mg/L (historical high) but upon the MIEX[®] plant starting up, heavy rainfall increased the DOC levels in the water to greater than 20 mg/L. The conventional plant would have required large doses of alum (up to 300 mg/L as supplied) to maintain good water quality. Coagulation would have been very difficult with constant

monitoring being required to ensure aluminum residuals were kept under control. The addition of MIEX[®] pre-treatment however led to a greatly reduced coagulant dose (70 mg/l as supplied), stable plant operation and the production of excellent quality water with low aluminum residuals.

While raw water DOC levels are still above 20 mg/L, the plant has continued to produce improved water quality at reduced coagulant doses. Trihalomethane (THM) levels in the treated water have been reduced by an average of 40% compared to previous plant performance (on water with lower levels of DOC). Other benefits seen with MIEX[®] pre-treatment include reduced turbidity levels out of the filters and the treated water chlorine dose has been reduced by up to 70%.

This MIEX[®] plant is using some of the new innovations developed by Orica Watercare's engineering team. The latest high efficiency "G2" regeneration system is operating and a waste brine treatment process is currently being used at this site. Further innovations to the MIEX[®] process are planned to be introduced at this site in the future.

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Airey's Inlet 280 gpm MIEX[®] installation.

coagulation, flash mixing, flocculation, sludge blanket clarification, filtration and chlorine disinfection. A MIEX[®] plant with maximum capacity