

A high-quality photograph of water. On the left, a single drop is captured mid-fall, creating a crown-shaped splash on a pool of water below. On the right, a thick, dynamic stream of water flows downwards, with the top edge of the stream glowing with a bright orange light, while the rest of the water is a deep, clear blue. The background is a soft, out-of-focus white.

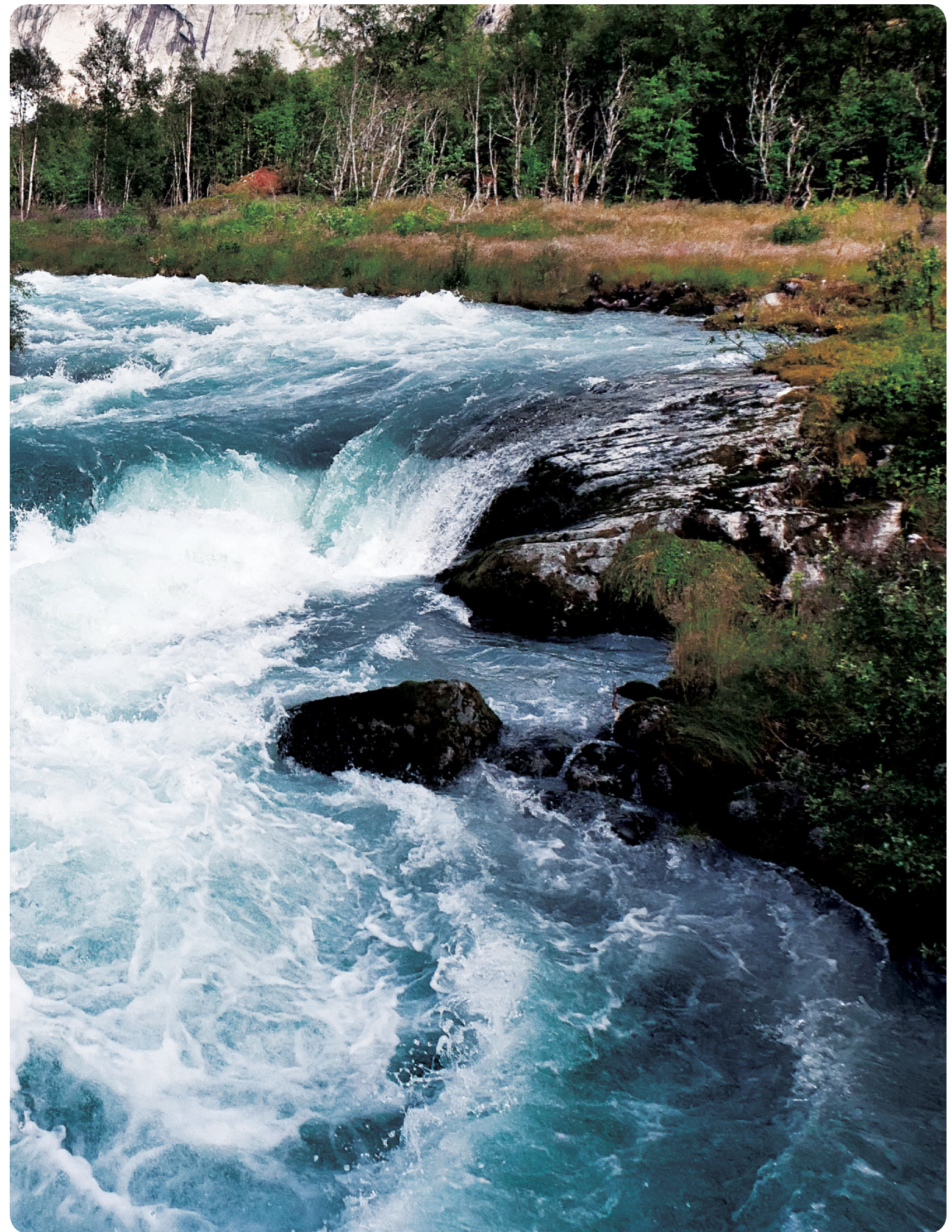
RENEWIQ™

Intelligent solutions for oilfield water reuse

CLEAN WATER IS THE WORLD'S MOST VALUABLE RESOURCE

Maturing oil and gas assets produce more water. Unconventional water demands are increasing, and the world's need for clean water continues to grow. Extracting more energy with fewer resources has become increasingly critical. Only Nalco Champion, an Ecolab company, can draw on decades of complementary energy and water expertise to design safe, effective, affordable water management solutions specifically for the oilfield.

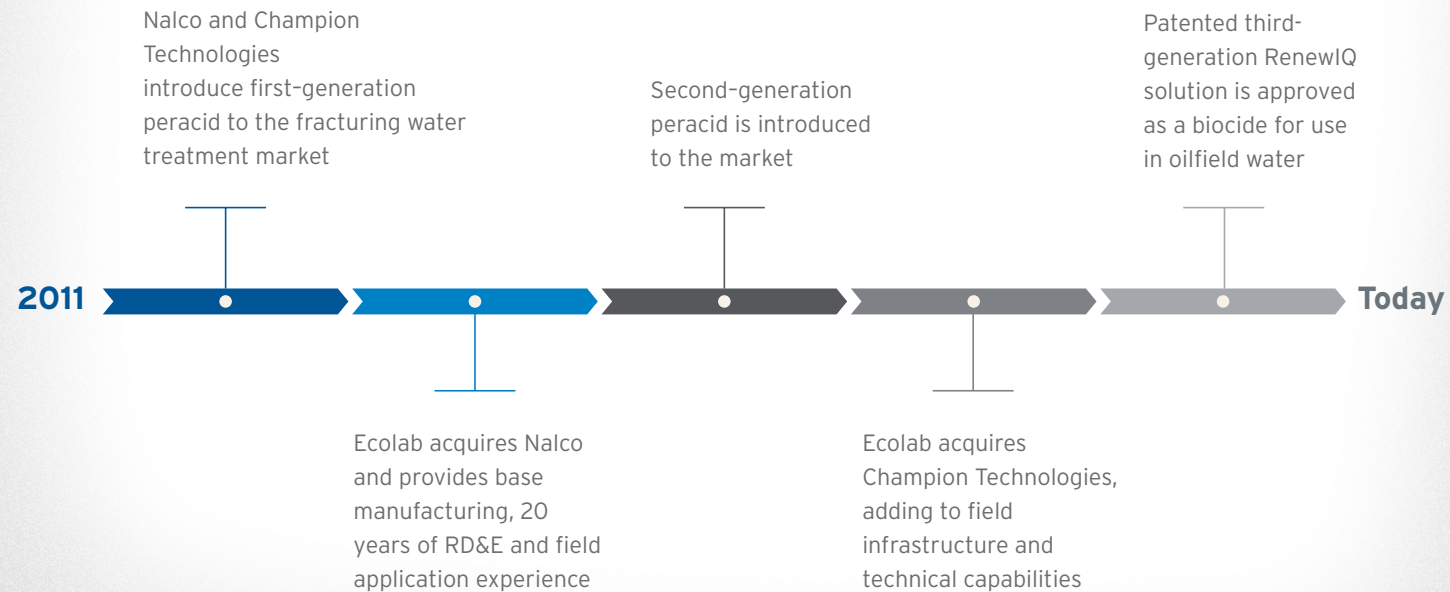
RenewIQ customized comprehensive lifecycle programs target the pretreatment of fresh water and the cleanup or reuse of flowback and produced water. Built on an oxidation technology platform, the RenewIQ solution is an effective, faster-acting, more environmentally sustainable alternative to non-oxidizing biocides.



SAFE-TO-USE, SIMPLE-TO-APPLY AND COST-EFFECTIVE

RenewIQ solutions effectively clean contaminants in your water across a wide range of applications and challenges. From fracturing water pretreatment and flowback reuse to impoundment and wellbore treatments, saltwater disposal wells and waterfloods, our selective oxidizers improve water quality without interfering with the activity of other oil and gas chemicals.

These offerings control biofouling, well and reservoir souring, and microbiologically influenced corrosion, all of which can negatively impact cost, safety and the environment. RenewIQ solutions can also reduce hydrogen sulfide and iron sulfide in the production system. Rapidly reacting, broad-spectrum biocides oxidize proteins in microbial cells for exceptional bacterial control. And all Nalco Champion RenewIQ solution chemistries degrade into byproducts with a lower environmental footprint.



BEST-IN-CLASS CHEMISTRY, MONITORING AND SERVICE

Nalco Champion is the market leader and innovator in oxidation technologies and the programs that most effectively deliver them to the field. Every application begins with a field meeting where water samples are collected to better understand the issues. Armed with up-to-the-minute information, rapid-turnaround AccuCount™ microbial enumeration technology and state-of-the-art analytical labs, we can help determine the best solution to your challenge.

Beyond identifying the appropriate chemistry as part of the RenewIQ offering, we can also survey your equipment layout to determine the optimal chemistry injection location and specially designed equipment is provided to safely pump the oxidative solution. Furthermore, we train your employees on the equipment's proper use and work with you to define and monitor program metrics. We regularly report on performance against these metrics.

As the world's largest water treatment company, Nalco Champion delivers unparalleled bacteria control developed with a water heritage extending more than 85 years. Our programs offer more than best-in-class chemistry—they include leading analytical, application and monitoring support, as well as unmatched service.



ENVIRONMENTALLY AND ECONOMICALLY SUSTAINABLE

Through the application of RenewIQ programs, operators can reduce freshwater consumption and its associated handling costs, from sourcing to disposal. By decreasing hydrogen sulfide treatments, improving injectivity, and reducing well workover costs and required filter changes, operators realize lower production costs and improved profitability. Additionally, operators benefit from reduced plugging, corrosion and well souring, as well as their costly treatment and correction.

RenewIQ solutions also offer measurable safety and environmental benefits. Unlike chlorine dioxide that requires mixing up to three hazardous raw materials in the field, our equipment delivers finished chemistry for safe and easy application. Our oxidative solutions break down to sustainable byproducts such as vinegar and water when their useful life is complete. Nalco Champion has safely applied oxidizers worldwide for more than 25 years.



Proven ROI



BETTER TECHNOLOGY, BETTER PROGRAMS, BETTER OUTCOMES

EC6779 CONTRIBUTES TO A 25 PERCENT REDUCTION IN TOTAL WATER-TREATMENT COST

Hydraulic Fracturing | New Mexico, USA

SITUATION: A Mancos shale operator was repurposing fracturing fluids and produced water for reuse in multiple completion stages but also paid premium prices for additional high-quality water to ensure fracturing fluids performed as intended. It was increasingly difficult to obtain water and the escalating cost of acquiring enough water to support drilling and completion activity made this strategy untenable.

SOLUTION: Nalco Champion collected field fluid samples, identified incumbent chemicals used by the operator, conducted a series of performance tests to assess the efficacy of current and potential biocides, and recommended its oxidizing biocide EC6779. Since replacing the incumbent biocide, the operator reduced their total water-treatment cost by 25 percent. Additional savings were also seen by reducing water-hauling and water-purchasing costs while minimizing water-disposal fees. Logistical savings have amounted to \$15,000 to \$18,000 for every 10,000 barrels of water repurposed compared to the incumbent.

EC6734A COUNTERACTS PERSISTENT WATER QUALITY ISSUES, INCLUDING H₂S

Salt Water Disposal Well | Wyoming, USA

SITUATION: A saltwater disposal well (SWD) operator was injecting both produced water trucked in from various local operations and delivered by pipelines from two water-collection facilities. Water quality varied substantially and treating for issues including high bacteria levels, H₂S, and dissolved and suspended solids was challenging. These issues caused safety, corrosion and well plugging concerns and led to additional maintenance, pumping energy and chemical costs to manage the risks.

SOLUTION: Nalco Champion recommended the application of EC6734A biocide to reduce bacteria and H₂S levels in both the aqueous and gas phases and to improve water clarity. The program delivered this and more: improved oil quality reduced the volume of fluids going to the slop tank for additional settling time. Additionally, the operator was able to replace the injection of five separate treatment chemicals with one injection of EC6734A, which saved approximately \$500,000 annually in chemical and operating costs. Safe implementation was paramount, and the customer was happy with the level of testing, training and engagement provided.



\$500 THOUSAND
ANNUAL CHEMICAL AND OPERATIONAL SAVINGS

Together, We're Taking Energy Further™

Nalco Champion, an Ecolab company, offers a singular focus on providing specialty chemistry programs and related services for upstream and midstream oil and gas, refining and petrochemical operations. Through onsite problem solving and the application of innovative technologies, we deliver sustainable solutions to overcome complex challenges in the world's toughest energy frontiers. Together, we're taking energy further. [Visit nalcochampion.com to learn more.](http://nalcochampion.com)

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