NXT®-2 Arsenic Removal Media

The Solution for Arsenic Removal

NXT®-2 is a patented filter media for removing arsenic from drinking water. A lanthanum-based product, NSF-certified NXT®-2 is uniquely formulated for high arsenic adsorption, while providing safe and stable removal. NXT®-2 benefits include:

- High capacity for Arsenic adsorption.
- Can provide low treatment cost per 1000 gallons.
- Rapid kinetics. Free-flowing dry media.
- Removes other contaminants: phosphate, chromium, selenium, fluoride, antimony and lead.
- Safe to use. Will not release bound arsenic in the event of pH upset.

In the United States and around the world, NXT®-2 is proving to be a very cost-effective filter media for arsenic remediation. Recent success studies led to an article on wateronline.com. Excerpts from that story are reprinted on the back.

EP Minerals®

(800) 366-7607
www.epminerals.com

Solutions for Removing Arsenic In The Presence of Competing Ions and High pH

The Environmental Protection Agency's US EPA arsenic rule 66 FR 6976 went into effect over 8 years ago, reducing the maximum contaminant level (MCL) of arsenic (As) in drinking water from 50 ppb to 10 ppb. Many of the water systems affected by this rule have been small, rural systems with simple low-cost adsorption technology. However, adsorption is not selective for just arsenic and other contaminants may also be removed. These ions then compete with the arsenic for adsorption sites on the media and can greatly reduce the media's capacity for arsenic removal. This ultimately drives up treatment costs.

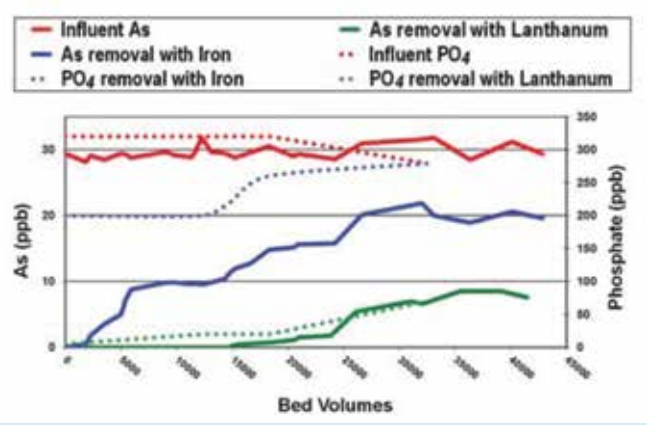
Today's commercially available adsorption media are not all made from the same materials. As such, the media on the market today reacts differently in the presence of competing ions. It is important to consider the competing ions when selecting the best media for a system. The competing ions that tend to cause the most problems for arsenic adsorption media include silica, vanadium, phosphate, and iron.

Case Study: Phosphate Competition

A small community in Contra Costa County, California has been evaluating alternatives in providing treatment. They had tested a zirconium-based adsorption technology, but unfortunately the media hit breakthrough (exceeded 10 ppb) very quickly and much sooner than estimated by the media manufacturer. This early breakthrough prior to 8000 BV (bed volumes) would have driven up the operating and maintenance costs on the system and was therefore determined to not be economical. The vendor said the high levels of phosphate (PO_4), approximately 320 ppb (measured in orthophosphate), was competing with the arsenic and greatly reduced performance.

Another pilot was run at this site with two different media, one based on iron and the other based on lanthanum, to determine if performance could be improved. The results of the pilot demonstrated that the different adsorption media reacted very differently in the presence of phosphate. The iron-based media performed similar to the zirconium-based product, however, the lanthanum based media outperformed both of the others. The kinetics of the lanthanum chemistry provided very efficient removal of arsenic while simultaneously providing the added benefit of phosphate reduction.

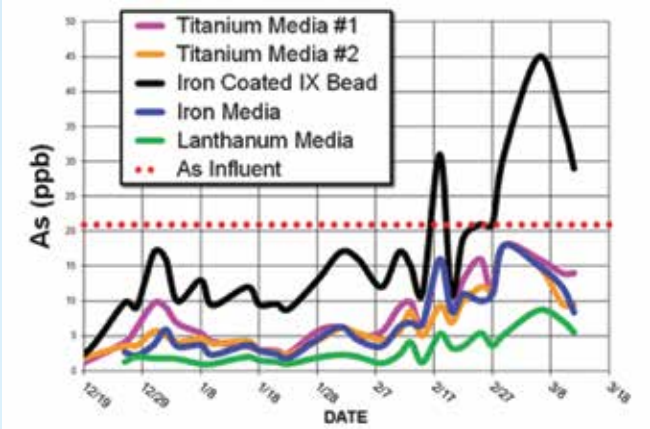
This pilot was operated continuously with approximately 3.8 minutes of empty bed contact time (EBCT) and a 5gpm/ft2 surface loading rate.



Phosphate Graphic 1

Case Study: Vanadium and pH

A system in Southern California was using an iron-based media that was not meeting the owner's expectation, so an independent engineering firm was engaged to perform a pilot test using alternative media to determine if performance could be improved. It was believed the relatively high level of vanadium and pH were impacting media life. Six different media were selected: two iron-based media, two titanium-based media, and two lanthanum-based media.



Vanadium pH Graphic 2

This pilot was run continuously with an average of 3.5 minutes EBCT at a 5 gpm/ft2 surface loading rate. The pilot results again showed that the different media provided very different performance. The lanthanum-based media provided the maximum media life and removed very little vanadium. It was also demonstrated that it was the most stable in the event of pH loss, which occurred three times over the course of the pilot.

pH stability is another important consideration for wells that have naturally high pH, greater than 8.2. Each media has its own isoelectric point based upon the materials from which it is manufactured. Each media has the ability to remove arsenic until the isoelectric point pH is reached. After the isoelectric point is exceeded, arsenic that was previously adsorbed can desorb from the media, which can cause arsenic spiking in the system. This occurred during the pilot twice, on 2/18 and 3/5, when pH control was lost and the water coming into the arsenic removal system was the natural 9.0. This exceeded the isoelectric point of some of the media and desorption occurred. A recommendation for any site would be to choose a media with an isoelectric point higher than the pH of your water without pretreatment to protect against desorption.

In summary, media performance on any system can be affected by the presence of competing ions and pH. It is important to select the appropriate media based upon the quality of your water.

To learn more about NXT®-2 contact EP Minerals at (800) 366-7607 or visit www.epminerals.com.

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