

Pilot - Case Study

Central California - 250 gpm

NXT-2[®]
Arsenic Removal Media

Problem:

Current iron-based media (E-33) not providing expected life and bed volumes (BV)

Process:

Ran a pilot evaluation to benchmark the performance of NXT-2[®] versus the iron based media currently being used.

Goal:

To treat more than 50,000 bed volumes (BV) prior to breakthrough

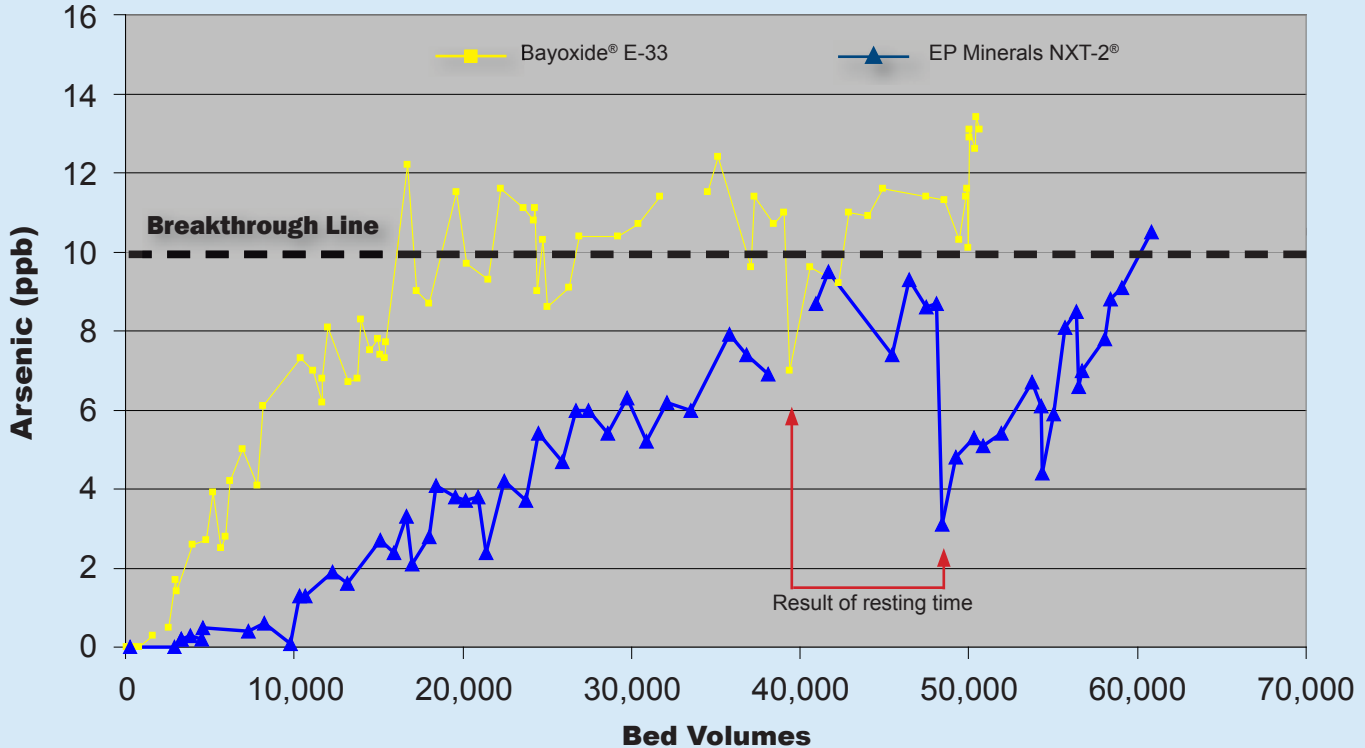
Results:

NXT-2[®] demonstrated superior performance, by treating nearly four times more bed volumes prior to breakthrough than E-33 (see table 1.0). The pilot started 6/04/08 and was taken offline 3/25/09 when NXT-2 broke through at 60,800 BV. The pilot was operated continuously with the use of pressurized storage tanks, with the exception of a shut-down in December. In the full scale plant, operation is not continuous and resting time is available. It is widely known that resting time will extend the life of the media. The beneficial effect of resting time was also observed during the trial after the holiday shut down. The effluent arsenic levels in the NXT-2 vessel dropped from 8.7 ppb to 3.1 ppb with resting. This was a 64% improvement, while the effluent arsenic values from the E-33 vessel went from 11 ppb to 7.0 ppb which was only a 36% improvement.

Based on the pilot results it can be concluded the NXT-2[®] met the project goal. NXT-2 is the most economic treatment choice. The high capacity of NXT-2 allows it to treat more water with an equivalent volume of media to reduce the treatment cost per gallon. Additional savings will also be realized due to the reduced costs associated with media change outs and disposal.



Arsenic Treatment Pilot Test Results



Source Water Quality

Parameter	Concentration (mg/l)	Parameter	Concentration (mg/l)	Parameter	Concentration (mg/l)
Arsenic	0.016	Silica	36	Copper	<0.050
pH (adjusted)	8.0	TDS	430	Iron	0.012
Total Alkalinity	190	Orthophosphate	0.2	Magnesium	4.4
Bicarbonate	230	Total Phosphorus	0.2	Manganese	0.034
Carbonate	<1.0	Nitrate	<1.0	Vanadium	<0.010
Chloride	130	Sodium	140	Potassium	1.2
Fluoride	0.14	Calcium	11	Hardness	45
Sulfate	<1.0	Zinc	0.022		

Note: Source water pH adjusted from 8.0 to 7.0 w/CO₂ addition

Pilot Parameters

Media	Type	Surface Area (m ² /gram) ¹	Dry Loaded Volume	Mesh Size	Avg. EBCT ² (min)	BV to Breakthrough
EP Minerals NXT-2®	Granular, lanthanum, mixed metal oxy-hydroxide	267	2160 ml	20 x 65	4.3	60,800
Bayoxide® E-33	Granular, iron oxy-hydroxide	140	2160 ml	10 x 35	5.1	16,700

¹ As tested by EP Minerals using BET analysis

² Empty bed contact time