Cost of Cr(VI) Removal from Groundwater

with Support from the Water Research Foundation
Version 2.0

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Please Enter Known Information:

Cr(VI) MCL Being Targeted:

Cr(VI) MCL =	**10**	µg/L
Target % of MCL in Treated Water =	**80**	%

Well Information:

Well Capacity =	**1000**	gpm
Well % Utilization =	**60**	%

Water Quality Information:

Raw Water Cr(VI) =	**16**	µg/L
Raw Water pH =	**8.3**	
Raw Water Alkalinity =	**113**	mg/L $CaCO_3$
Raw Water Conductivity =	**280**	µS/cm
Raw Water Uranium =	**6.4**	µg/L
Raw Water Nitrate =	**2.2**	mg/L NO_3
Raw Water Sulfate =	**22**	mg/L

Capital Financing Terms:

Capital Amortization Period =	**20**	years
Amortization Interest Rate =	**5**	%

Treatment System Capacity = **533** gpm

*Please Answer the following Questions with **Yes** or **No**:*

Question 1:
The Regenerable Ion-Exchange Process (SBA) may generate a Salt Brine that contains 30 mg/L of Chromium and 53000 mg/L of Salt. Can you discharge this Brine to an onsite sewer without treatment? (Yes/No) **no**

Question 2:
If the answer to Question 1 is "Yes", skip this question and go to Question 3. If the answer to Question 1 is "No", can you discharge the waste brine to an onsite sewer if the Chromium is removed first from the brine? (Yes/No) **no**

Question 3:
The Reduction, Coagulation, & Filtration (RCF) process may generate 14 gpm of waste backwash water that contains 0.6 mg/L of Chromium. Can you discharge this waste washwater to an onsite sewer without treatment? (Yes/No) **no**

Question 4:
Is your well located in California? (Yes/No) **yes**

Opinion of Probable Costs (2012):

Capital Cost ($M):	**Lower End**	**Upper End**
SBA Treatment =	$1.8	– $3.8
WBA Treatment =	$2.5	– $5.4
RCF Treatment =	$2.5	– $5.3

Annual O&M Cost ($/yr):	**Lower End**	**Upper End**
SBA Treatment =	$127,000	– $272,000
WBA Treatment =	$182,000	– $390,000
RCF Treatment =	$152,000	– $326,000

Total Annualized Cost ($/yr):	**Lower End**	**Upper End**
SBA Treatment =	$267,000	– $573,000
WBA Treatment =	$384,000	– $824,000
RCF Treatment =	$349,000	– $747,000

Total Water Cost ($/AF):	**Lower End**	**Upper End**
SBA Treatment =	$277	– $594
WBA Treatment =	$398	– $854
RCF Treatment =	$361	– $774