Selecting a Vendor

There are several approaches to working with vendors. If you hire an engineer, he or she may be the one contacting, selecting, and working with the vendor. Some water systems choose to work with vendors directly (make sure this is an acceptable practice in your state), because some vendors will provide a package that includes the design and installation of a treatment system. When contacting and selecting a vendor, you and your engineer should keep in mind the questions listed below.

General Information on Technology

Questions	Reason for Question or What to Look for in the Answer
Do you have installations in place for arsenic removal? Can you provide details on the treatment and contact information for these systems?	It is critical that you determine the vendor's experience in arsenic drinking water treatment. Ask system operators about their experience with the vendor's equipment including, treatment efficiency, water quality issues, water loss, customer assistance, guarantees, and ease of operation.
What are the technology's water quality limitations?	Some raw water constituents can limit treatment run times, media life, and costs. Reputable vendors should be able to tell you what constituents challenge their technology.
What level of treatment can the technology achieve?	You need to ensure that the technology will enable you to meet the arsenic MCL given your water quality and system characteristics.
Are coatings and contact surfaces NSF certified? Can I see the certification?	All components should have NSF Standard 61 certifications. If you are contemplating use of POU devices, ask the vendor if the unit has NSF Standard 53 or 58 certification. (Also check the NSF Web site for their listing: http://www.nsf.org/business/drinking_water_systems_center/index)
For adsorptive media: Is the medium NSF certified? Can I see the certification?	Drinking water system components must have NSF Standard 61 certification.
What are the typical design criteria for your technology (Empty Bed Contact Time [EBCT] and surface loading rate)?	Many proprietary systems have specific design criteria to ensure the technology works. Your final design will have to meet those criteria in order to get the vendor to accept responsibility for ensuring compliance. EBCT, for example, determines the size of the treatment vessels needed (which determines the building size). For coagulation/filtration plants, the same is true of the surface loading rates on the filters. Make sure that the information provided meets state design standards.

Chemical feed tank for an ion exchange system.

General Information on Technology (cont.)

Questions	Reason for Question or What to Look for in the Answer
What chemicals will I have to add? What is their cost and availability? Do they require special handling? Are they all NSF certified?	Each treatment technology is somewhat different. With some, you may have to add certain chemicals to adjust pH, oxidize the raw water, or regenerate the media. You need to know what chemicals, if any, will be needed; their costs, availability and handling/safety requirements. Any chemical that is added to the drinking water must have NSF 60 certification.
What waste streams does the technology produce and what is the approximate quantity of the wastes?	The wastes produced by the technology can sometimes be very difficult to handle and dispose of. This information could be a major determining factor in your treatment selection. You should be sure that you have a means through which to dispose of the waste.
Would the waste streams be characterized as hazardous?	Though most of the waste streams will not be hazardous, ask for certification that the waste will pass the Toxicity Characteristic Leaching Procedure test (or Waste Extraction Test, for systems in California). Have the vendor identify any contaminants that treatment will remove that may cause the waste to be characterized as hazardous. Disposal of hazardous waste is more difficult and costly.
What is the typical range of water loss (in percent of total raw water flow) when using your technology? Identify each point where water loss occurs and indicate what operating conditions increase water losses.	All treatment systems produce some water loss. Determine the degree of water loss and consider this information when choosing a technology.
What is the size of the system's footprint and the required building height and square footage?	The building needed to house the treatment plant can be a considerable expense. This is particularly important if space and land availability are at a premium in your location.
Do I have to provide pretreatment? If so, what type? Can the pretreatment cause any water quality or operational problems?	You need to know all treatment requirements at the outset. Pretreatment is typically required to oxidize the arsenic to a more treatable form. Sometimes filtration is required to minimize media fouling. Also ask your state for their pretreatment requirements.
Does the technology remove arsenic (III) and arsenic (V)? Can it remove both with equal efficiency?	Arsenic (III) is not efficiently removed by most treatment technologies. If the vendor contends that the technology will remove both species of arsenic efficiently, ask for long-term documentation.
If the system is a custom unit (i.e., the media and equipment are purchased from two different suppliers) who do you consider responsible for making the system work?	Custom designing a system can be a liability nightmare if the treatment technology does not work. Identify the criteria that must be met by each party and have performance testing as a part of full payment.
Do you have a local representative who can provide timely assistances?	There is nothing better than having local service. The vendor needs to be available to provide technical assistance in a timely manner.

Costs

Questions	Reason for Question or What to Look for in the Answer
If adsorbents are used, what is cost of the media in dollars/ft^3 and how often will the media need to be replaced?	Replacing and disposing of media can be very expensive. Find out if the vendor will dispose of the spent media and get an estimate of the associated costs. Ask for a full disclosure of capital and operation and maintenance costs including testing for hazardous waste characteristics.
What types of guarantees do you provide for treatment equipment? Life of capital components? Life and capacity of media? Finished water quality?	Guarantees are only as good as the company that provides them. Ask for performance bonds for unit processes and establish performance testing Ask for a life expectancy of media, replacement costs, and disposal. Make sure that the finished water quality meets state and federal requirements and that the performance bond ensures that you will be able to meet those lets.
Do you offer a leasing option or lease/purchase option?	Some vendors will let you lease the equipment with a discounted purchase price at the end of the lease. Make sure that you have the legal right to lease equipment.
Are installation costs included?	In some cases, installation costs will be almost as much as the capital equipment costs. You need to know this prior to purchasing the technology.

Start-up

Questions	Reason for Question or What to Look for in the Answer
Is conditioning of the new treatment plant or media necessary?	Some media needs to be conditioned on-site; ask whether this is part of the initial media cost. Some conditioning processes require large volumes of water, which have to be disposed of.
How is the equipment delivered? Who is responsible for the equipment on-site until it is installed?	You should know how the equipment will be delivered and what to do if equipment arrives damaged. Inspect the equipment thoroughly when it is delivered. Do not accept damaged equipment or agree to have damaged equipment repaired until you have decided who is responsible for the repair cost.
Who will install the system? Do you provide on-site technical assistance and troubleshooting during installation, startup, and beyond?	Knowing who will install the system and ensuring that they have the proper training and experience is important. Having technical assistance during start-up is very important. Build a start-up plan into the purchase agreement that identifies a schedule, amount of assistance provided, and availability for assistance after start-up.
Do you offer extended service agreements? What are the terms and cost?	Many vendors will provide extended agreements beyond the typical warranty period.

Operations

Questions	Reason for Question or What to Look for in the Answer
What is the ease of operation? What level of operator expertise is necessary?	Get a detailed description of how the system operates and a list of existing plants in operation that you can contact for more information.
Can the facility be automated? Will I have to provide special monitoring and communication equipment? How much time will operation and maintenance require?	Some treatment technologies can be easily automated. Ask whether you can add automation in the future at a reasonable cost.
Will there be headlosses through the system that are likely to require a change-out or modification of the well's pump? If so, how much?	Some systems have significant head loss through the treatment plant. Determine if the source water pump is capable of meeting the head loss and providing adequate system pressure and flow.
Can the technology be easily updated to increase capacity or to use another media? Can it remove other contaminants?	If the equipment is adaptable you will not be tied to one supplier. For example, if the vessel has a typical EBCT, then the replacement media can be from any supplier that can provide the treatment with the same EBCT. Also, with some modification, adsorptive media treatment systems could be adapted to coagulation/filtration.
Will you pilot your technology at my site? How much will that cost?	Some suppliers have a database available such that they do not need to pilot test their technology at your site. Some vendors will pilot test their technology if you provide their research center with enough water. If they will not conduct a pilot test, ask for performance certifications and guarantees.

A row of ion exchange tanks in parallel.

A bag filter set up outdoors.

POU/POE

Questions	Reason for Question or What to Look for in the Answer
Are the units NSF/ANSI certified? Can I see the certification?	Ask the vendor if their units meet NSF Standard 53 or Standard 58 if it is a reverse osmosis system. (You can also check the NSF Web site for their listing at http://www.nsf.org/business/drinking_water_systems_center/index.)
Is the unit equipped with a warning or shutoff device to alert the customer that the unit is malfunctioning or in need of service?	A warning device will be required on all POU systems. Some states do not allow the shutoff device; contact your state regarding these requirements. Determine how the device operates (e.g., is it based on time or water quality?)
What are some of the water quality limitations of this technology?	Provide the vendor with your system's water quality data. Ask if there are any limiting constituents in the water that would impact the use of their treatment technology.
Based on my water quality, what is the necessary frequency of service?	All treatment technologies react to specific water quality and use characteristics; these will impact the mandatory maintenance schedule. Extensive site testing may be necessary to get state approval for the technology and the monitoring plan.
Can you pilot your units on a limited number of homes? At what cost?	Also contact your state to see if pilot testing is required.
Is it necessary to oxidize the source water to convert arsenic (III) to arsenic (V)?	Nearly all treatment technologies are more effective at removing arsenic (III) oxidized to arsenic (V). If the vendor indicates this is not necessary, ask for documentation and make sure your state does not require pre-oxidation.
Is any other pre-treatment necessary?	Many systems require pretreatment such as filtration and dechlorination to protect either membranes or media.
Is chromatographic peaking a potential risk? If so, how can it be avoided?	Concentrating contaminants and driving them into the system can occur with some technologies (specifically ion exchange).