SUMMARY OF THE PRESENT DISCLOSURE

[0004a] According to a first aspect of the present invention, there is provided an apparatus for controlling fluid flow in a borehole, the apparatus comprising:

a basepipe having a throughbore and defining at least one perforation, the throughbore conveying the fluid flow, the at least one perforation communicating the throughbore outside the basepipe; and

a flow device comprising a barrier disposed at the at least one perforation, the barrier at least temporarily preventing fluid communication through the at least one perforation and being dissolvable over time, the barrier being resistant to a pressure differential thereacross and increasing the at least temporary prevention of the fluid communication through the at least one perforation in response to an increase in the pressure differential thereacross.

[0004b] According to a second aspect of the present invention, there is provided an apparatus for controlling fluid flow in a borehole, the apparatus comprising:

a basepipe having a through-bore and defining at least one perforation, the throughbore conveying the fluid flow, the at least one perforation communicating the throughbore outside the basepipe; and

a flow device comprising a barrier disposed at the at least one perforation, the barrier at least temporarily preventing fluid communication through the at least one perforation and comprising at least two elements composed of different materials, the barrier being resistant to a pressure differential thereacross and being dissolvable over time.

[0004c] According to a third aspect of the present invention, there is provided a method of controlling fluid flow from a borehole, the comprising:

running a basepipe into the borehole, the basepipe having a throughbore and defining at least one perforation, the throughbore conveying the fluid flow, the at least one perforation communicating the through-bore with the borehole;

at least temporarily preventing fluid communication through the at least one perforation with at least one barrier disposed at the at least one perforation, the at least one barrier being resistant to pressure and being dissolvable over time; and

allowing fluid communication through at least one nozzle disposed at the at least one perforation after dissolution of the at least one barrier.

[0005] There is disclosed an apparatus for controlling fluid flow in a borehole. The apparatus comprises a basepipe and a flow device. The basepipe has a through-bore conveying the fluid flow and defines at least one

perforation communicating the through-bore outside the basepipe. The flow device comprises a barrier disposed at the at least one perforation. The barrier at least temporarily prevents fluid communication through the at least one perforation. The barrier is resistant to a pressure differential thereacross and is dissolvable over time.

[0006] In one arrangement, the barrier comprises at least two elements composed of different materials. In addition or in an alternative arrangement, the barrier increases the at least temporary prevention of the fluid communication in response to an increase in the pressure differential thereacross.

[0007] The flow device can include at least one nozzle disposed relative to the at least one perforation. The at least one nozzle creates a pressure drop in fluid communication therethrough.

[0008] The flow device can include a fixture affixed at the at least one perforation and defining an orifice therethrough. The fixture holds the barrier captive in the at least one perforation. The orifice of the fixture can include a nozzle disposed thereon for creating a pressure drop in fluid communication therethrough. In general, the nozzle can be composed of a tungsten carbide material. For its part, the fixture can thread into a threaded counterbore of the at least one perforation, although other techniques can be used to affix the fixture.

[0009] In one arrangement, the barrier having the at least two elements of different materials comprise a plurality of barrier layers held captive in the at least one perforation with the fixture. The barrier layers at least temporarily prevent fluid communication between the at least one perforation of the basepipe and the orifice of the fixture.

[0010] The barrier layers can include an inner layer of a first dissolvable material encapsulating in an outer layers of a second dissolvable material different from the first dissolvable material. In an alternative, the barrier layers can include an intermediate layer of a first dissolvable material disposed between first and second layers of a second dissolvable material different from the first dissolvable material.

[0011] In another arrangement, the barrier of the flow device can comprises at least two elements composed of different materials. For example, a first of the at least two elements

[0015] As one example, the apparatus can be a joint for a completion string having the basepipe with the throughbore for conveying the production fluid to the surface. To prevent sand and other fines from passing through openings in the basepipe to the throughbore, a filter or screen can be disposed on the basepipe for screening fluid produced from the surrounding borehole, although a filter or screen may not be always used. Disposed on the basepipe, the flow device having the housing defines a housing chamber in fluid communication with screened fluid from the screen. During production, fluid passes through the screen, enters the housing chamber, and eventually passes into the basepipe's bore through the pipe's perforations.

[0016] To prevent the flow of the fluid at least temporarily through the screen joint during run-in and for a time thereafter, the flow device disposed on the joint includes barriers as discussed herein disposed at the perforations of the basepipe.

[0017] To control the flow of the fluid and create a desired pressure drop for even-flow along the screen joint, the flow device disposed on the joint controls fluid communication from the housing's chamber to the openings in the basepipe. In one implementation, the flow device includes one or more nozzles.

[0018] There is disclosed a method for controlling fluid flow from a borehole. A basepipe is run into the borehole. The basepipe has a throughbore for conveying the fluid flow and defines at least one perforation for communicating the throughbore outside the basepipe. At least one barrier disposed at the at least one perforation at least temporarily prevents fluid communication through the at least one perforation. The at least one barrier is resistant to pressure and is dissolvable over time. Eventually, after dissolution of the at least one barrier, fluid communication is allowed through at least one nozzle disposed at the at least one perforation.

[0019] The foregoing summary is not intended to summarize each potential embodiment or every aspect of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Fig. 1 illustrates a completion system having screen joints according to the prior art deployed in a borehole.

[0021] Fig. 2A illustrates, in partial cross-section, a screen assembly having a screen disposed on a basepipe in conjunction with an inflow control device having a temporary barrier according to the present disclosure.