CLAIMS

1. A well testing device for conducting well test operations on an oil, gas, or water well including a production flowline, the device comprising:

a conduit connectable into the production flowline to circulate fluids from the production flowline and back into the flowline; ~~and~~

characterized by further comprising:

a testing device coupled into the conduit to receive the circulated fluids, the testing device comprising ~~any one or more of a flow measurement device, a particle separator,~~ a sampling device, ~~or~~ and a pressure differential device configured to create a pressure differential to control the flow of fluids to the sampling device;

wherein the pressure differential device is a venturi or a pump.

2. The well testing device of claim 1, wherein the conduit forms a circulation loop for the fluids disposed completely subsea.

3. The well testing device of either of claims 1 or 2, wherein the sampling device comprises a sampling chamber to collect sampled fluids from the production flowline.

4. The well testing device of claim 3, wherein the sampling chamber can be isolated from the testing device and is detachable from the testing device.

5. The well testing device of either of claims 3 or 4, further comprising a bypass loop to bypass fluids around the sampling chamber.

6. The well testing device of any preceding claim, wherein ~~the~~ a particle separator is upstream of the sampling device and wherein the conduit guides fluids to the particle separator before the sampling device.

7. The well testing device of any preceding claim, further comprising a particle detector located upstream of the particle separator, the particle detector configured to detect particles in the fluids flowing from the production flowline to the particle separator.

8. The well testing device of claim 7, further comprising:

a data storage module;

wherein the particle detector is configured to report particle data in the fluids to the data storage module; and

wherein the data storage module is configured to control the particle separator based on the particle data from the particle detector.

9. The well testing device of any preceding claim, wherein ~~the~~ a flow measurement device is upstream of the sampling device to measure a characteristic of the fluids from the production flowline.

10. The well testing device of any preceding claim, wherein the pressure differential device is disposed between the conduit and the production flowline to control the flow of the fluids into the sampling device.

~~11. The well testing device of claim 10, wherein the pressure differential device is one of a choke valve, a venturi, or a pump.~~

~~12~~11. The well testing device of any preceding claim, wherein the sampling device further comprises:

a sampling chamber comprising a tank;

an inlet line to guide fluids from the conduit to the tank;

a first outlet line to guide fluids from the tank back to the conduit;

a second outlet line to guide fluids from the tank to the first outlet line downstream of the tank;

valves for controlling flow in each of the inlet line and the first and second outlet lines; and

wherein the valves can be controlled to collect a sample of the fluids flowing from the production flowline in the tank as well as isolate the tank from the well test system.

~~13~~12. The well testing device of any preceding claim, wherein the conduit is connectable in fluid communication with a fluid diverter assembly located in the body of a choke in a branch of a subsea tree, the diverter assembly configured to divert production fluids from the tree branch to the well test device.

~~14~~13. A method of testing fluids flowing between a well and a production flowline, the method comprising:

flowing the fluids from the production flowline into a conduit;

~~performing any one or more of:~~

~~measuring a characteristic of the fluids in the conduit;~~

~~separating particles from the fluids in the conduit;~~

characterized by:

flowing the fluids through the conduit to a sampling device comprising a sampling chamber; ~~or~~

creating a pressure differential using a venturi or a pump to control the flow of fluids to the sampling device; and

returning the fluids to the production flowline.

~~15~~14. The method of claim ~~14~~13, wherein flowing the fluids from the production flowline into the conduit and returning the fluids to the production flowline occur subsea.

~~16~~15. The method of either of claims ~~14~~ 13 or ~~15~~14, further comprising any one or more of:

measuring a characteristic of the fluids in the conduit;

separating particles from the fluids in the conduit; or

sampling the fluids in the sampling device using the sampling chamber.

~~17~~16. The method of any of claims ~~14~~ 13 to ~~16~~15, wherein any one or more of the measuring, separating, flowing to the sample device, creating a pressure differential, or sampling the fluids is part of a well test procedure before primary recovery of reservoir fluids commences.

~~18~~17. The method of any of claims ~~14~~ 13 to ~~17~~16, further comprising detecting particles in the fluids flowing from the production flowline prior to separating the particles from the fluids.

~~19~~18. The method of any of claims ~~14~~ 13 to ~~18~~17, further comprising:

detecting particle data in the fluids;

reporting the particle data to a data storage module;

controlling the particle separation based on the particle data.

~~20~~19. The method of any of claims ~~14~~ 13 to ~~19~~18, further comprising isolating the sampling chamber from the fluid flow and detaching the sampling chamber from the conduit.

~~21~~20. The method of any of claims ~~14~~ 13 to ~~20~~19, further comprising bypassing fluids around the sampling chamber.

~~22. The method of any of claims 14 to 21 , further comprising using any one of a choke valve, a venturi, or a pump to create the pressure differential.~~

~~23~~21. The method of any of claims ~~14~~ 13 to ~~22~~20, wherein sampling fluids in the sampling device further comprises:

purging the sample chamber by opening a first outlet from the sample chamber;

closing the first outlet;

flowing fluids into the sample chamber by opening an inlet to the sample chamber;

opening a second outlet from the sample chamber and circulating fluids through the tank until equilibrium is reached;

closing the second outlet and collecting fluids in the sample chamber; and

isolating the sample chamber by closing the inlet and first and second outlets.

~~24~~22. The method of any of claims ~~14~~ 13 to ~~23~~21, further comprising connecting the conduit into a subsea tree, and wherein flowing the fluids from the production flowline further comprises diverting fluids from a body of a choke in a branch of the subsea tree.