CLAIMS

What is claimed is:

1. A system for sampling fluid from a production wellsite, the production wellsite having a tubular extending into a subsea unit for producing a fluid therefrom and a port at the wellsite for accessing the fluid, the system comprising:

an interface operatively connectable to the port for establishing fluid communication therewith;

a separation circuit operatively connectable to the interface for establishing fluid communication with the interface and the port, the separation circuit comprising:

a pumping unit comprising a plurality of pumping chambers, each of the plurality of pumping chambers having cylinder with a piston therein defining a fluid cavity and a buffer cavity, each of the fluid cavities defining a separation chamber for receiving the fluid and allowing separation of the fluid therein into a plurality of phases, each of the buffer cavities having a buffer fluid selectively movable therebetween whereby the fluid flows through the separation circuit at a controlled rate; and

at least one sample chamber for collecting at least one sample of the plurality of phases of the fluid.

2. The system of claim 1, further comprising a fluid separator.

3. The system of claim 2, wherein the fluid separator is upstream of the pumping unit.

4. The system of claim 2, wherein the fluid separator is downstream of the pumping unit.

5. The system of claim 1, further comprising at least one sensor for detecting one of density, flow rate, pressure, temperature, composition, phase and combinations thereof .

6. The system of claim 1, further comprising a pump for selectively moving the buffer fluid between the buffer cavities.

7. The system of claim 1, wherein the pumping unit utilizes a pressure differential at the port for selectively moving the buffer fluid between the buffer cavities.

8. The system of claim 1, further comprising a flushing unit for flushing fluid through the separation circuit.

9. The system of claim 1, further comprising a remote operated vehicle operatively connectable to the separation circuit.

10. The system of claim 1, further comprising a surface unit operatively connectable to the separation circuit.

11. The system of claim 1, wherein operatively connectable comprises one of hydraulically connectable, electrically connectable, and combinations thereof.

12. The system of claim 1, further comprising a plurality of valves for selectively diverting fluid through the separation circuit.

13. The system of claim 1, further comprising at least one fluid control component comprising one of at least one pressure transmitter, at least one temperature sensor, at least one orifice, at least one restrictor, at least one probe, at least one meter, at least one flow diverter, at least one valve, at least one pump, at least one fluid separator, at least one flowline, and combinations thereof.

14. The system of claim 1, further comprising an electrical component for operating the separation circuit.

15. The system of claim 1, further comprising a retrievable skid for housing the interface and the separation circuit.

16. The system of claim 1, further comprising a sand filter.

17. The system of claim 1, further comprising a temperature controller for selectively controlling a temperature of the fluid.

18. The system of claim 1, wherein the plurality of phases comprise at least two of water, gas, oil, sand and combinations thereof.

19. The system of claim 1, wherein the plurality of pumping chambers are positioned at an angle to facilitate separation therein.

20. A method of sampling fluid from a production wellsite, the production wellsite having a tubular extending into a subsea unit for producing a fluid therefrom and a port at the wellsite for accessing the fluid, the method comprising:

establishing fluid communication between an interface and the port;

establishing fluid communication between a separation circuit and the interface, the separation circuit comprising at least one sample chamber and a pumping unit, the pumping unit comprising a plurality of pumping chambers, the plurality of pumping chambers each having a cylinder with a piston therein defining a fluid cavity and a buffer cavity;

selectively flowing the fluid between the separation circuit, the interface and the port at a controlled rate by selectively manipulating the buffer fluid between the buffer cavities of the plurality of pumping chambers;

receiving the fluid in the fluid cavity of at least one of the plurality of pumping chambers and allowing separation of the fluid into a plurality of phases therein; and

collecting at least one sample of at least one of the plurality of phases of the fluid in the at least one sample chamber.

21. The method of claim 20, wherein the buffer fluid is selectively manipulated using a pressure differential across the port.
22. The method of claim 20, wherein the buffer fluid is selectively manipulated using a pump.
23. The method of claim 20, further comprising electrically connecting the separation circuit to the interface and the port for selective activation thereof.
24. The method of claim 20, further comprising deploying at least a portion of the separation circuit with a remote operated vehicle deployed from a surface unit.
25. The method of claim 20, further comprising retrieving at least a portion of the separation circuit with a remote operated vehicle deployed from a surface unit.
26. The method of claim 20, further comprising flushing at least a portion of the fluid from the separation circuit.
27. The method of claim 20, further comprising performing at least one pressure test.
28. The method of claim 20, further comprising passing the downhole fluid through a fluid separator.

CLAIMS

What is claimed is:

1. A system for sampling fluid from a production wellsite, the production wellsite having a tubular extending into a subsea unit for producing a fluid therefrom and a port at the wellsite for accessing the fluid, the system comprising:

an interface operatively connectable to the port for establishing fluid communication therewith;

a separation circuit operatively connectable to the interface for establishing fluid communication with the interface and the port, the separation circuit comprising:

a pumping unit comprising a plurality of pumping chambers, each of the plurality of pumping chambers having a cylinder with a piston therein defining a fluid cavity and a buffer cavity, each of the fluid cavities defining a separation chamber for receiving the fluid and allowing separation of the fluid therein into a plurality of phases, each of the buffer cavities having a buffer fluid selectively movable therebetween whereby the fluid flows through the separation circuit at a controlled rate; and

at least one sample chamber for collecting at least one sample of the plurality of phases of the fluid;

wherein a first buffer cavity is adapted to discharge buffer fluid to an outtake flowline in response to a first fluid cavity receiving fluid while a second buffer cavity is discharging buffer fluid to the outtake flowline in response to a second fluid cavity receiving fluid.

2. The system of claim 1, further comprising a fluid separator.

3. The system of claim 2, wherein the fluid separator is upstream of the pumping unit.

4. The system of claim 2, wherein the fluid separator is downstream of the pumping unit.

5. The system of claim 1, further comprising at least one sensor for detecting one of density, flow rate, pressure, temperature, composition, phase and combinations thereof.

6. The system of claim 1, further comprising a pump for selectively moving the buffer fluid between the buffer cavities.

7. The system of claim 1, wherein the pumping unit utilizes a pressure differential at the port for selectively moving the buffer fluid between the buffer cavities.

8. The system of claim 1, further comprising a flushing unit for flushing fluid through the separation circuit.

9. The system of claim 1, further comprising a remote operated vehicle operatively connectable to the separation circuit.

10. The system of claim 1, further comprising a surface unit operatively connectable to the separation circuit.

11. The system of claim 1, wherein operatively connectable comprises one of hydraulically connectable, electrically connectable, and combinations thereof.

12. The system of claim 1, further comprising a plurality of valves for selectively diverting fluid through the separation circuit.

13. The system of claim 1, further comprising at least one fluid control component comprising one of at least one pressure transmitter, at least one temperature sensor, at least one orifice, at least one restrictor, at least one probe, at least one meter, at least one flow diverter, at least one valve, at least one pump, at least one fluid separator, at least one flowline, and combinations thereof.

14. The system of claim 1, further comprising an electrical component for operating the separation circuit.

15. The system of claim 1, further comprising a retrievable skid for housing the interface and the separation circuit.

16. The system of claim 1, further comprising a sand filter.

17. The system of claim 1, further comprising a temperature controller for selectively controlling a temperature of the fluid.

18. The system of claim 1, wherein the plurality of phases comprise at least two of water, gas, oil, sand and combinations thereof.

19. The system of claim 1, wherein the plurality of pumping chambers are positioned at an angle to facilitate separation therein.

20. A method of sampling fluid from a production wellsite, the production wellsite having a tubular extending into a subsea unit for producing a fluid therefrom and a port at the wellsite for accessing the fluid, the method comprising:

establishing fluid communication between an interface and the port;

establishing fluid communication between a separation circuit and the interface, the separation circuit comprising at least one sample chamber and a pumping unit, the pumping unit comprising a plurality of pumping chambers, the plurality of pumping chambers each having a cylinder with a piston therein defining a fluid cavity and a buffer cavity;

selectively flowing the fluid between the separation circuit, the interface and the port at a controlled rate by selectively manipulating the buffer fluid between the buffer cavities of the plurality of pumping chambers;

discharging buffer fluid from a first buffer cavity to an outtake flowline in response to receiving fluid in a first fluid cavity while discharging buffer fluid from a second buffer cavity to the outtake flowline in response to receiving fluid in a second fluid cavity;

receiving the fluid in the fluid cavity of at least one of the plurality of pumping chambers and allowing separation of the fluid into a plurality of phases therein; and

collecting at least one sample of at least one of the plurality of phases of the fluid in the at least one sample chamber.

21. The method of claim 20, wherein the buffer fluid is selectively manipulated using a pressure differential across the port.

22. The method of claim 20, wherein the buffer fluid is selectively manipulated using a pump.

23. The method of claim 20, further comprising electrically connecting the separation circuit to the interface and the port for selective activation thereof.

24. The method of claim 20, further comprising deploying at least a portion of the separation circuit with a remote operated vehicle deployed from a surface unit.

25. The method of claim 20, further comprising retrieving at least a portion of the separation circuit with a remote operated vehicle deployed from a surface unit.

26. The method of claim 20, further comprising flushing at least a portion of the fluid from the separation circuit.

27. The method of claim 20, further comprising performing at least one pressure test.

28. The method of claim 20, further comprising passing the downhole fluid through a fluid separator.