Summary of Invention

[0004a] A first aspect of the present invention provides a well system, comprising:

a casing string extending from a surface location within a wellbore, an annulus being defined between the casing string and the wellbore;

a casing collar included in the casing string and having one or more sensors configured to measure at least one fluid property of a fluid present within the annulus;

a cement wiper plug arranged within the casing string and communicably coupled to the casing collar such that measurement data obtained by the one or more sensors is conveyed to and received by the cement wiper plug; and

a pulser included in the cement wiper plug and configured to transmit pressure pulses to the surface location, wherein the pressure pulses correspond to the measurement data received from the one or more sensors.

[0004b] A second aspect of the present invention provides a method, comprising:

arranging a casing string extending within a wellbore extending from a surface location, an annulus being defined between the casing string and the wellbore;

measuring at least one fluid property of a fluid present within the annulus using one or more sensors associated with a casing collar included in the casing string;

receiving measurement data obtained by the one or more sensors with a cement wiper plug arranged within the casing string and communicably coupled to the casing collar; and

transmitting the measurement data to the surface location in the form of pressure pulses with a pulser associated with the cement wiper plug.

[0004c] A third aspect of the present invention provides a method, comprising:

arranging a casing string extending from a surface location within a wellbore, an annulus being defined between the casing string and the wellbore and one or more casing collars being arranged about the casing string along a length of the casing string;

circulating a fluid through the casing string and the annulus; and

measuring a fluid property of the fluid in the annulus with sensors associated with the one or more casing collars and thereby obtaining measurement data, wherein the fluid property comprises at least one of pressure, temperature, density, viscosity, pH, chemical composition, gas-cut, and presence of oil and/or gas within the fluid.