mud pulse telemetry or other wireless communication techniques. In FIG. 1A, an interface 14 at earth's surface receives the seismic survey data via cable 55 A or another telemetry channel and conveys the seismic survey data to a computer system 20, which may perform seismic survey data analysis as described herein.

At various times during the drilling process, the drill string 62 shown in FIG. 1A may be removed from the borehole 42. With the drill string 62 removed, wireline logging operations may be performed as shown in the wireline logging survey environment of FIG. 1B. In FIG. 1B, a wireline logging string 72 is suspended in borehole 42 that penetrates formations 40 of the earth 18. For example, the wireline logging string 72 may be suspended by a cable 55B having conductors and/or optical fibers for conveying power to the wireline logging string 72. The cable 55B may also be used as a communication interface for uphole and/or downhole communications. In at least some embodiments, the cable 55B wraps and unwraps as needed around cable reel 84 when lowering or raising the wireline logging string 72. As shown, the cable reel 84 may be part of a movable logging facility or vehicle 80 having a cable guide 82.

The wireline logging string 72 includes logging tool(s) 76 and a logging tool 74 with seismic source(s) 36 and/or seismic receiver(s) 32 to collect seismic survey data. The logging tool 74 may also include electronics for data storage, communication, etc. The seismic survey data collected by logging tool 74 is conveyed to earth's surface (e.g., via cable 55B) and/or is stored by the logging tool 74. At earth's surface, a surface interface 14 receives the seismic survey data and conveys the seismic survey data to a computer system 20 for analysis.

In at least some embodiments, collecting seismic survey data to identify subterranean conduit coordinates involves LWD and/or wireline logging operations as described for FIGS. 4A and 4B. Seismic survey data is also used to identify plug point coordinates. Additionally or alternatively, LWD and/or wireline logging operations may collect non-seismic logs (e.g., a resistivity log, a porosity log, a lithography log, etc.). To identify plug point coordinates, bed boundaries and/or other formation properties are determined from the seismic survey data or from other available log data. Such logs may be obtained from a well in the vicinity of a subterranean conduit to be plugged. In some embodiments, such logs may be obtained while drilling a relief well to intercept the subterranean conduit for the purpose of performing plugging operations. Thus, plug point coordinates may be determined before relief well drilling begins or during relief well drilling. Further, predetermined plug point coordinates may be adjusted as new log data is collected during relief well drilling or during wireline logging operations in a relief well.

coordinates (e.g., geodetic coordinates or another coordinate system). The seismic survey data may be obtained from any of a number of different seismic survey configurations as described herein. Also, the processing and/or imaging of seismic survey data may vary as described herein. The seismic survey data analysis of block 402 may be performed by a computer system (e.g., computer system 20) executing software (e.g., Compass™, DecisionSpace®, or other well planning software) to output subterranean conduit coordinates and plug point coordinates. Using, at least in part, the coordinates obtained from block 402, a relief well is drilled at block 404. Once the relief well intercepts the subterranean conduit, plugging operations are performed at block 406 as described herein (see e.g., FIG. 9).

Embodiments disclosed herein include:

A: A method that comprises collecting seismic survey data, processing the seismic survey data to identify subterranean conduit coordinates and a plug point coordinate, and performing a conduit plugging operation based at least in part on the identified subterranean conduit coordinates and the plug point coordinate.

B: A system that comprises at least one seismic source and at least one seismic receiver to collect seismic survey data in response to at least one shot fired by the at least one seismic source. The system also comprises a processing unit in communication with the at least one seismic receiver. The processing unit analyzes the collected seismic survey data to identify subterranean conduit coordinates and a plug point coordinate for use with conduit plugging operations.

Each of the embodiments, A and B, may have one or more of the following additional elements in any combination. Element 1: further comprising recovering hydrocarbons from an active well installation in vicinity of the subterranean conduit after said performing a conduit plugging operation. Element 2: further comprising identifying a region of interest for collecting said seismic survey data based on a non-seismic survey. Element 3: the non- seismic survey corresponds to an electromagnetic survey or chemical spectroscopy survey. Element 4: performing a conduit plugging operation using the identified subterranean conduit coordinates comprises drilling a relief well to intersect the subterranean conduit. Element 5: further comprising identifying a formation layer of interest, and drilling the relief well to interest the subterranean conduit at or near a bed boundary corresponding to the formation layer of interest. Element 6: further comprising performing cementing operations via the relief well to plug the subterranean conduit. Element 7: processing the seismic survey data to

identify subterranean conduit coordinates comprises identifying a two-dimensional trajectory of the subterranean conduit. Element 8: processing the seismic survey data to identify subterranean conduit coordinates comprises identifying a three-dimensional trajectory of the subterranean conduit. Element 9: processing the seismic survey data to identify subterranean conduit coordinates comprises applying at least one of conduit identification parameters or an earth model filter to the seismic survey data. Element 10: processing the seismic survey data to identify subterranean conduit coordinates comprises comparing primary wave data and shear wave data

Element 11: one of at least one seismic source and the at least one seismic sensor is positioned downhole while the other is positioned at earth's surface. Element 12: the at least one seismic source and the at least one seismic receiver are positioned downhole. Element 13: the at least one seismic source and the at least one seismic receiver are positioned at earth's surface. Element 14: further comprising a drilling tool to receive the subterranean conduit coordinates and to drill a relief well to intersect the subterranean conduit. Element 15: further comprising a survey tool to identify a bed boundary of interest, wherein the relief well intersects the subterranean conduit at or near the bed boundary of interest for conduit plugging operations. Element 16: further comprising a cementing tool to perform cementing operations via the relief well to plug the subterranean conduit. Element 17: further comprising a non-seismic survey tool to identify a region of interest for collecting said seismic survey data. Element 18: further comprising a LWD tool or a wireline logging tool to adjust a downhole position of the at least one seismic source or the at least one seismic receiver. Element 19: further comprising an active well installation in vicinity of the subterranean conduit to recover hydrocarbons after said subterranean conduit is plugged.

Numerous variations and modifications will become apparent to those skilled in the art once the above disclosure is fully appreciated. It is intended that the following claims be interpreted to embrace all such variations and modifications.

CLAIMS

1. A method that comprises:

collecting seismic survey data;

processing the seismic survey data to identify subterranean conduit coordinates and a plug point coordinate;

performing a conduit plugging operation based at least in part on the identified subterranean conduit coordinates and the plug point coordinate.

2. The method of claim 1, further comprising recovering hydrocarbons from an active well installation in vicinity of the subterranean conduit after said performing a conduit plugging operation.

3. The method of claim 1, further comprising identifying a region of interest for collecting said seismic survey data based on a non-seismic survey.

4. The method of claim 3, wherein the non-seismic survey corresponds to an electromagnetic survey or chemical spectroscopy survey.

5. The method of claim 1, wherein performing a conduit plugging operation using the identified subterranean conduit coordinates comprises drilling a relief well to intersect the subterranean conduit.

6. The method of claim 5, further comprising identifying a formation layer of interest, and drilling the relief well to interest the subterranean conduit at or near a bed boundary corresponding to the formation layer of interest.

7. The method of claim 5, further comprising performing cementing operations via the relief well to plug the subterranean conduit.

8. The method according to any one of claims 1 to 7, wherein processing the seismic survey data to identify subterranean conduit coordinates comprises identifying a two-dimensional trajectory of the subterranean conduit.

9. The method according to any one of claims 1 to 7, wherein processing the seismic survey data to identify subterranean conduit coordinates comprises identifying a three-dimensional trajectory of the subterranean conduit.

10. The method according to any one of claims 1 to 7, wherein processing the seismic survey data to identify subterranean conduit coordinates comprises applying at least one of conduit identification parameters or an earth model filter to the seismic survey data.

11. The method according to any one of claims 1 to 7, wherein processing the seismic survey data to identify subterranean conduit coordinates comprises comparing primary wave data and shear wave data.

12. A system that comprises:

at least one seismic source;

at least one seismic receiver to collect seismic survey data in response to at least one shot fired by the at least one seismic source; and

a processing unit in communication with at least one seismic receiver,

wherein the processing unit analyzes the collected seismic survey data to identify subterranean conduit coordinates and a plug point coordinate for use with conduit plugging operations.

13. The system of claim 12, wherein one of at least one seismic source and the at least one seismic sensor is positioned downhole while the other is positioned at earth's surface.

14. The system of claim 12, wherein the at least one seismic source and the at least one seismic receiver are positioned downhole.

15. The system of claim 12, wherein the at least one seismic source and the at least one seismic receiver are positioned at earth's surface.

16. The system according to any one of claims 12 to 15, further comprising a drilling tool to receive the subterranean conduit coordinates and to drill a relief well to intersect the subterranean conduit.

17. The system of claim 16, further comprising a survey tool to identify a bed boundary of interest, wherein the relief well intersects the subterranean conduit at or near the bed boundary of interest for conduit plugging operations.

18. The system of claim 16, further comprising a cementing tool to perform

cementing operations via the relief well to plug the subterranean conduit.

19. The system according to any one of claims 12 to 15, further comprising a non-seismic survey tool to identify a region of interest for collecting said seismic survey data.

20. The system according to any one of claims 12 to 14, further comprising a logging-while-drilling (LWD) tool or a wireline logging tool to adjust a downhole position of the at least one seismic source or the at least one seismic receiver.

21. The system according to any one of claims 12 to 15, further comprising an active well installation in vicinity of the subterranean conduit to recover hydrocarbons after said subterranean conduit is plugged.