Communication method	Description	Advantages	Disadvantages
Wired communication	The robot is physically connected to a hand held controller or a computer through a cable.	- Bidirectional communication - Consistent communication - Can provide power along with communication link	- Creates a large constraint on movement around corners and up bends - Limits range to the length of available cable - Function is similar to that of the current pigging solution
Acoustic wave	Tracking via the acoustic wave generated by the friction between the robot and pipe wall.	- Provides tracking capability without requiring a transmitter	- Acoustic signals generated are cluttered by noise from vehicles and machinery above ground - Unidirectional communication from the robot to receiver above ground - Not capable of transmitting more complex data
ELF wave	Communication through the use of Extremely Low Frequency (ELF) waves which are characterised as being in the range of 3-30 Hz	- Bidirectional communication - Small and lightweight transceivers - Doesn’t experience a lot of noise interference	- Experiences large attenuation and requires complex software to recover signal
Static Magnetic field	Equip the robot with static magnetic field and detect it with a magnetometer	- Low attenuation when used at low frequencies	- Unidirectional communication - Bulky permanent magnets required to be put on robot in order to create static magnetic field