

## MAGNETIC RANGING SOLUTIONS | ACCESS-INDEPENDENT RANGING SYSTEMS

# Aurora™ Surface Access Magnetic Ranging Service

Accurate well placement in SAGD applications without downhole intervention

## BENEFITS

- Reduce logistic challenges by no longer needed downhole access to wellbores
  - Remove need to run guide strings for conveyance
  - Reduce wireline costs by removing the need to convey a magnetic source downhole
  - Eliminate equipment and personnel from surface operations to reduce HSE risks and surface infrastructure costs
- Maximize reservoir recovery through accurate well placement

## FEATURES

- Connection to the target wellhead via the surface instead of downhole (limited access)
- No wireline conveyance (removes tractor or e-coil)
- Parallel ranging with real-time survey accuracy qualifiers
- Readings integrated into the drilling bottomhole assembly (BHA)

Operators producing heavy crude oil and bitumen require in-situ thermal recovery techniques such as steam-assisted gravity drainage (SAGD) development to recover hydrocarbons. The Aurora™ surface-access magnetic ranging service from Halliburton is designed for SAGD applications where parallel stacked horizontal wells require to be drilled into the reservoir just a few meters apart with a high degree of accuracy. The service uses surface excitation to determine a ranging distance and direction relative to the drilling wellbore.

## Overcomes drilling challenges

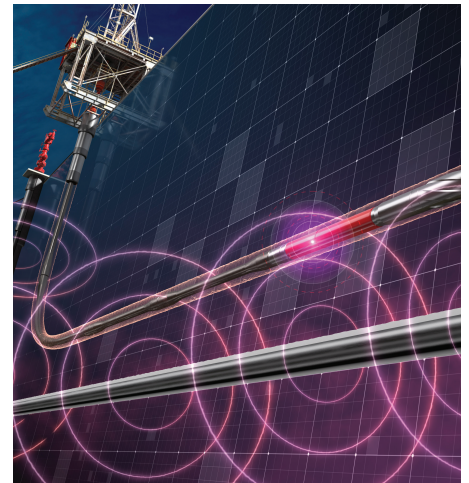
The Aurora service helps operators overcome challenges, including high infrastructure and operational costs, large pad design and wide slot spacing, uncertain well placement, conveyance challenges and removal of wireline conveyed tools that have temperature limitations.

## Surface access simplifies ranging

An industry first, the Aurora service connects to the target wellbore via the wellhead. The surface access allows operators to eliminate the need for wireline ranging conveyance. Streamlining the ranging process helps reduce rig time, operation costs, and health, safety, and environmental (HSE) risks.

## Optimize pad layout

The Aurora service helps reduce the surface footprint at the well site. By eliminating the need for wireline conveyance, the spacing required to allow equipment access is also eliminated. This change helps reduce HSE risks and allows operators to install more wells on a pad. By optimizing the pad layout, the operator can maximize asset value through increased production and lower costs per barrel of oil equivalent (BOE) in SAGD field development.



Drilling BHA with Aurora sensors can determine a distance and a direction to the target wellbore.

**Aurora™ Surface-Access Magnetic Ranging Service Technical Specifications**

SAMPLE	6.75-INCH	8.00-INCH
Collar length	6 ft (1.83 m)	6.14 ft (1.87 m)
Connection	4-1/2 IF box	6-5/8 REG API
Max operating temperature	176°F (80°C)	
Max pressure	20,000 psi (137 MPa)	
Make-up torque	30,000-33,000 ft-lbs (13 345-14 679 daNm)	53,000-58,000 ft-lbs (23 576-25 800 daNm)
Max weight on bit (WOB)	45,000 lbf (20 017 daN)	60,000 lbf (26 689 daN)
Max RPM	180	180
Max dogleg severity (sliding)	21°/100 ft	14°/100 ft
Max dogleg severity (rotating)	10°/100 ft	8°/100 ft
Max vibration/shock	20 g	20 g
Max Mass flow rate	10,000 lbm/min	20,000 lbm/min
Max collar outside diameter (OD)	7.19 in. (2.8 cm)	9.625 in. (3.79 cm)
Tool inside diameter (ID), minimum bore	1.92 in. (49 mm)	2.375 in. (60 mm)
Distance Accuracy	5%	5%
Direction Accuracy	3°	3°

For more information, contact your local Halliburton representative or visit us on the web at [www.halliburton.com](http://www.halliburton.com)

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