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# COE DRILLING SUCCESSFULLY COMPLETES HDD WORKS ON SYDNEY PRIMARY LOOP GAS PIPELINE PROJECT FOR ALINTA.

In mid 2006 Coe Drilling Pty Ltd was awarded a design and construct contract by Alinta for the provision of Horizontal Directional Drilling services on the Sydney Primary Loop Gas Pipeline Project.

### THE PROJECT

The SPL is a 30 KM pipeline linking Liverpool in Sydney's Southwest to Marrickville. The pipeline is being built in a bid to improve security of Gas supply and increase the capacity for long-term growth in both the eastern and the South Western regions of Sydney.

The contract included HDD crossings of Salt Pan Creek at Padstow, the Cooks River at Tempe and two crossings of the Georges River at Casula and Hammondville.

In total just over 2074m of DN 500 X42 Trilaminare Coated pipeline was fabricated, tested and installed as follows;

**Salt Pan Creek: 382m**

**Cooks River: 528m**

**Georges River Hammondville: 816m**

**Georges River Casula: 348m**

### MOBILISATION, DESIGN & ENGINEERING

The contract scope of works executed by Coe included design and construction with the stringing, welding, joint coating, NDT and Hydrostatic Testing and drying of the installed mains. The nature of the project and the limited available space for constructing such HDD Crossings in Metropolitan Sydney meant that each crossing was installed in multiple strings including a four-string pullback at Mackey Park Marrickville.

With the tight construction schedule required Coe Drilling selected to use three of its rigs to complete the works within the required schedule as follows:

**Salt Pan Creek 382M- Coe Drill 180**

**Cooks River 528M - Coe Drill 550**

**Georges River Hammondville 816m – CoeDrill 680**

**Georges River Casula 348m – CoeDrill 680**



## **CONSTRUCTION**

Geology within the Sydney Basin is underlain by Hawkesbury Sandstone and Ashfield Shale, which required the use of 6¾” and 8” Wenzel Mud Motors and both 12 ¼ PDC and Tungsten Carbide bits and hole openers in order to open up boreholes up to 711mm diameter in the rock conditions. Mud return pipelines were also installed across three of the waterways using the services of divers to secure their position. All returns pipelines were pressure tested prior to use to ensure no spillage occurred during drilling fluid transfer.

The selection of the HDD methodology helped the designers overcome many of the obstacles and difficulties in laying a pipeline where such rivers and creeks need crossing without disturbance to the natural environment. In many of the crossing locations the areas were also used as old disused garbage tips which had posed its own difficulties when planning the project and during the execution particularly during the coated pipeline installation. Environmental concerns were also high priority and HDD selection allowed construction to proceed in areas where significant environmental importance existed. These areas featured endangered bushland communities, threatened flora, and habitat for native fauna and items of Aboriginal heritage significance. For example, pockets of threatened Downy Wattle and Cumberland Plain Land Snails and a tree scarred by the original inhabitants of the area were found near the proposed HDD Site in Deepwater Park. Significant areas representative of Cumberland plains woodland and dry forest also need to be negotiated.”

The urban environment also provided its fair share of obstacles, The Cooks River Crossing at Tempe design required the HDD alignment to cross beneath the existing secondary gas mains and the jet fuel line supply to Sydney Airport as it approached the HDD Exit at Mackey Park. With the use of a Vector Magnetics P2 enhanced Paratrack guidance System the Downhole steering was carried out with a high level of confidence and the separation distance could be verified to the operators. Similarly the Paratrack system was invaluable whilst crossing the Georges River at Casula where the site was located 20m offset from the busy M5 Freeway, which provided its own share of magnetic interference. To add to this the crossing passed beneath rail lines with overhead wires and the HDD Exit was designed to be 1.2m off the existing live 550mm Gas mains and 3m beneath the existing 200mm secondary mains all within a 3m wide easement where the SPL pipeline would tie-in. Precision with regards to Downhole steering was essential and the P2 Paratrack system using a AC guide wire worked excellent in these conditions and the target was achieved. The busy rail corridor was under constant monitoring during the works to ensure no settlement occurred during the course of the HDD activities with a baseline survey carried out prior to works commencing and daily monitoring to ensure compliance. The crossing was completed during the Australian Barefoot Skiing Championships, which provided some lively entertainment for the drilling crews.

At the peak of the HDD activities 3 HDD crews were operating and the support of 1 welding, 1 hydrostatic test crew and 1 restorations crew. In total 35,000 man-hours were consumed on the HDD works.

The success of the SPL project demonstrates the ability of Coe Drilling to offer clients such as Alinta, turnkey HDD solutions on multi crossing projects with up to 4 HDD rigs available.

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