

Pike River Unmanned Entry Project – Update Overview by Solid Energy

15 August 2017

BACKGROUND

On 15 February 2017 the Government announced that it would support the investigation of an un-manned entry in the Pike River Mine drift¹. It requested that Solid Energy stop activities relating to sealing the mine in the meantime.

The Terms of Reference finalised on 12 April 2017 set out three objectives:

1. To establish to a reasonable degree of certainty whether the remains of the deceased miners are present in the drift
2. To provide any information on the cause of the initial explosion
3. To provide insights that could improve future mine safety

Specifically, the Unmanned Entry proposal involves addressing the three objectives set by the Government in relation to the Drift and to the mine. Objective 1 involves exploring sections of the Pike River Mine drift that were not inspected following the Pike River explosion on the 19th November 2010, with a remotely controlled robot equipped with cameras.

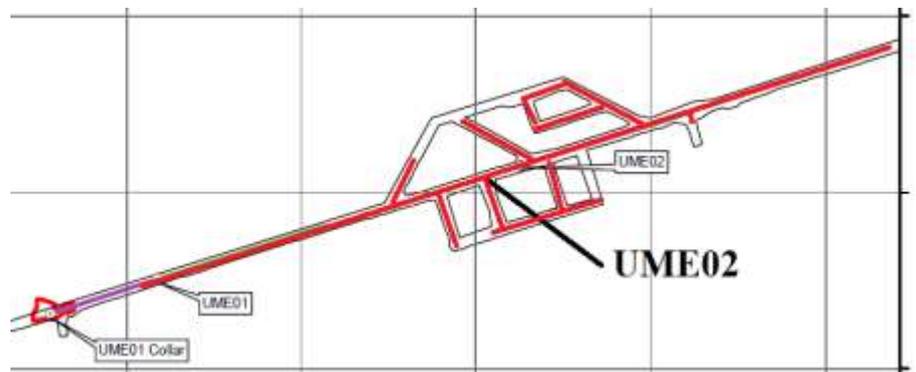


Figure 1 - Plan highlighting potentially accessible parts of the drift that have not yet been explored

Since that time Solid Energy has been working with various experts and proponents of the remote entry concept to determine if unmanned entry using remote controlled vehicles is feasible.

ACTIVITIES TO DATE

- Terms of reference finalised with Crown (received **12 April** 2017).
- Collation of technology options presented to the Crown, Families and the Company
- Initial assessment team formed (first meeting **27 April** 2017) to review technology options and scope investigations required and skillsets required
- Formulation of Trial Robot Project for Risk Assessment.
- **Second meeting 8 June** – Robot Functional Requirements Derived by Failure Mode & Effects Analysis & Operations Risk Assessment: to provide the

¹ The drift is the 2.3km tunnel (including the section shown in the plan above) – that gives access to the coal seam.

designers with key information needed to finalise the robot design specifications

- Updated Project scope prepared including drilling options evaluation to determine location of boreholes circulated for review **30 June 2018**
- Updated project scoping meeting **12 July** to review engineering information on the robot and drilling options.
- Funding request to allow long leadtime supply ordering and field work sent to Crown **21 July** and approved **25 July**
- Drilling field team (Geologists, Drillers, civil/structural engineers) formed for drill pad evaluation and standing by for weather window to fly into the potential sites
- Draft final specification of Robot based on updated information from supplier **26 July**
- Drilling Field team managed to visit proposed site areas by helicopter **11 August** during a suitable weather window
- Next step is geotechnical evaluation of preferred location when weather permits.

KEY OUTCOMES TO DATE

Preferred technology option

The proposed robot is a device that can be inserted into a borehole where it unfolds before exploring on crawler tracks with power in and video out through a tether. The supplier is a specialist in remote exploration in difficult situations.

The proposed robot is capable of being lowered into the mine through a 150mm diameter borehole and deployed for underground investigation. This avoids the need for compromising the existing seals which maintain a stable mine atmosphere, and for having to re-travel the 1.5km already explored by robot. That robot was blocked by a diesel transporter stopped in the middle of the roadway, so entry via the po²rtal is considered unviable.

Evaluation and determination of preferred drilling options

Initially it was proposed to carry out a trial, where the robot would be deployed down an existing borehole to undergo operational trials to test the concept but this was reviewed and

² The portal is where the tunnel starts

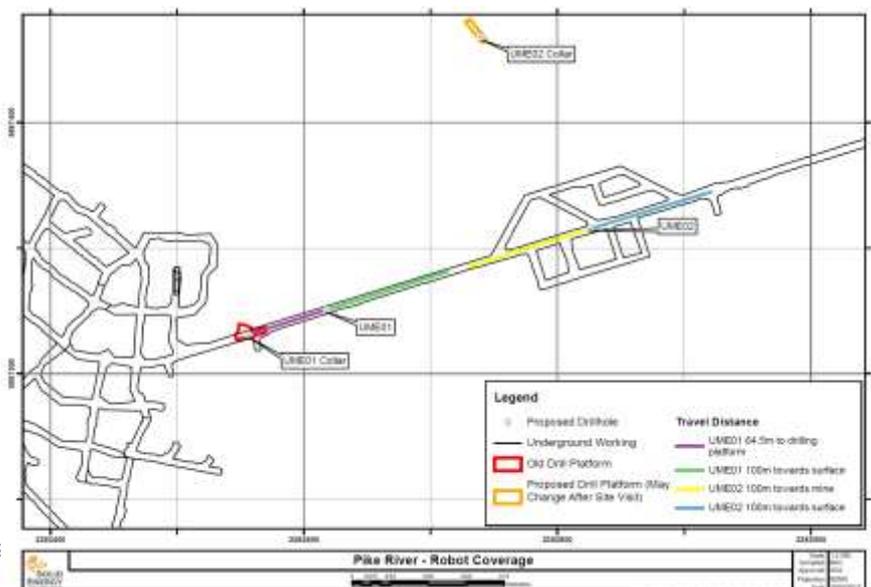


Figure 2 - Possible drillhole entry points and 100m nominal exploration distances

it was considered more prudent to drill a new hole directly into a section of previously unexplored drift. The assessment and engineering work has identified the preferred locations.

Figure 2 shows the preferred entry points with 100m long stretches which are the target range for the machine in each direction.

Earlier proposals for the UME project proposed using inclined boreholes from existing drill pads, but assessment by the suppliers has advised that the holes need to intersect within 10 degrees of vertical for launching and retrieval of the machine.

In turn this creates limitations on where the drill pads need to be that can only be resolved by field assessments. The field assessments have been delayed by unfavourable weather for helicopter operations in the relevant area of the Paparoa Ranges.

Functional requirements defined for design of the robot and camera arrangement

The risk assessment program has identified the key functional requirements specific to the Pike River application so as to, so far as is reasonably practicable, supply a robot that is safe to use in the proposed application and compliant with the statutory requirements of the New Zealand Health and Safety at Work legislation.

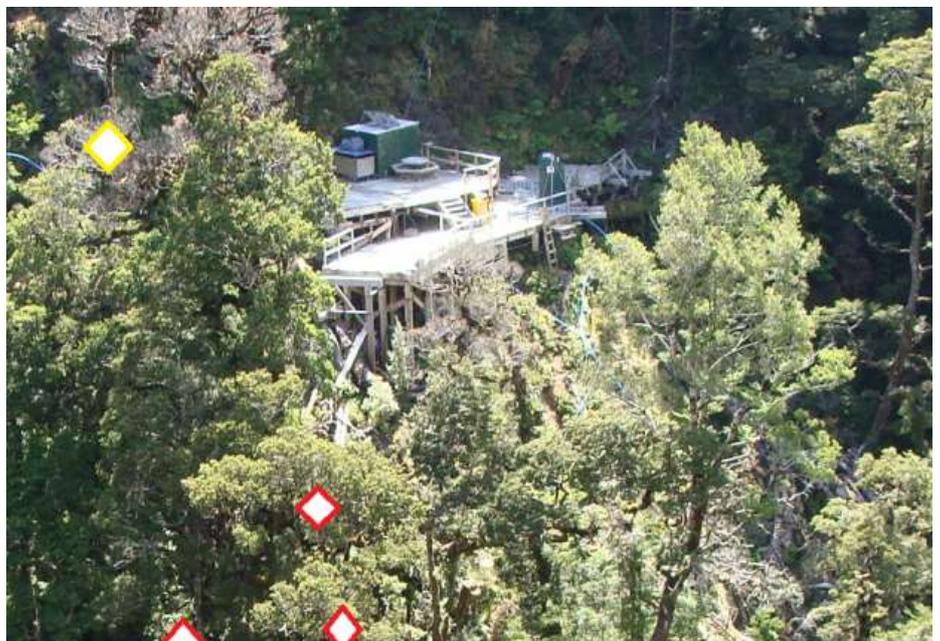


Figure 3- Existing platform as example of what a drill pad looks like

The existing regulations applying to Pike River do not specifically cater for the type of remote exploration of a sealed mine that is proposed.

This work has shown that it is practically impossible to create a compliant machine that could be inserted via a borehole. Therefore the preferred approach (subject to confirmation) is a more standard robot machine for which exemptions from regulations will be required. The exact exemptions are being considered along with supporting material to demonstrate that the proposal is safe.

Funding and Approval

The terms of Reference contemplated that the full assessment would be completed and if a feasible and safe option identified then it would be proposed to the Government for a funding and go-ahead decision.

As issues have been identified and addressed, it has become apparent that to maintain a good rate of progress, funds need to be committed for critical path or long lead time items in advance of the full project formulation.

Accordingly the Crown has approved an initial tranche of funding of \$374,000 to allow progress to continue and to cover costs to date.

NEXT STEPS

- Finalise Robot design, establish time and cost for supply
- Confirm (or otherwise) locations of suitable drill pads
- Design and construct drill pads
- Confirm and apply for any exemptions from regulations required
- Finalise project scope and budget and obtain final approvals
- Drill hole(s)
- Commission robot
- Undertake the unmanned exploration

This is expected to meet Objective 1 if all goes well. If the various aspects proceed to plan (including weather dependent operations on the hill) then unmanned exploration of the drift could start in November or December.

A subsequent stage of drilling and exploration of the mine itself to address objectives 2 and 3 can then be contemplated and undertaken.

Solid Energy's Situation

Solid Energy is operating under a Deed of Company arrangement that requires the sale of all assets and the liquidation of the company.

Solid Energy is almost certain to complete the sale of its remaining mines to BT Mining at the end of August. The company will then largely be a shell operation with mine closure activities at Huntly and Spring Creek (near Greymouth) being completed in the next few months, in addition to activities at Pike River.

There are a range of administrative activities also required and it is expected that these will be largely completed by the end of November. By no later than mid March 2018 Solid Energy will be placed into solvent liquidation and will no longer exist.

The UME project is being established with a team that can carry on the work if required after Solid Energy is no longer undertaking operational activities.

The Pike River UME project is expected to be transferred (if still incomplete) to another agency before Christmas. Similarly, responsibility for the Pike River site as a whole will be transferred at this time.

End