



CASE STUDY
September 2013

Constructing and Managing Drill Sites

Drill sites are often the most visible aspect of an exploration program, and in hilly terrain, earthworks are often required. These must be carefully planned, implemented and managed so as to minimise environmental impacts and landholder concerns. Malachite Resources Limited has developed expertise in the construction and management of drill sites, especially in difficult terrain.



Background

Malachite Resources Limited has been exploring in the hilly terrain of the New England region of northern NSW since 1997. This terrain has presented a number of challenges with respect to constructing and managing drill sites to minimise environmental impacts.

Drill sites must be large enough for safe operations, but small enough to minimise their environmental impact. In addition, they need to be designed, constructed and managed so that rehabilitation can be undertaken as soon as possible following drilling and in an effective and timely manner. This aspect of exploration is the one to which landholders pay the closest attention, and the one that gives explorers the best opportunity to exceed the landholders' expectations.

The following construction and management strategies have been used with success and form the basis of all Malachite's drilling procedures.

Strategies for Drill Site Construction

- Relevant approvals are obtained from NSW Trade and Investment – Division of Resources and Energy (and other relevant government agencies) prior to the commencement of work.
- Aboriginal cultural heritage clearances are conducted as required.
- Drill sites are located in the most 'open' areas to minimise impacts on vegetation, pastures and crops.
- Liaison with the landholder regarding the location of each drill site is undertaken prior to the drilling program. Landholders are given a clear understanding of the program and their comments are noted. The parties discuss and agree upon a rehabilitation program before exploration begins. Liaison with the drilling contractor is undertaken to ensure the drill site will be of adequate size and to determine the preferred locations for drill trucks and sumps.
- Dead timber is removed and stacked nearby for re-use in rehabilitation. Overhanging branches may also be removed as they may fall during drilling operations.
- Only trees that are allowed by permit and agreed by the landholder are removed.
- Grass and topsoil are stripped and stacked separately, adjacent to the drill site, for replacement in the rehabilitation phase. These stacks are covered to avoid erosion during heavy rainfall.
- Trip hazards (such as rocks and tree roots) are cleared from the drill site.
- Above-ground sumps are used wherever possible, and are positioned so that they can be pumped out during the drilling program if required.
- In-ground sumps, if needed, are constructed on the down-slope side of the drill rig and are lined with plastic sheeting. Excavated materials are placed on the down slope side of the sumps in a manner that would direct any flows of surface water into the sumps.
- Multiple in-ground sumps are positioned and constructed so that excess drilling fluids can safely flow from one sump to the adjoining sump.



Sediment fence on down-slope side of plastic-lined and fenced sumps



Multiple sediment fences lined with hay bales below drill site (to right of photo) in environmentally sensitive location

- Sediment fences are constructed of silt-stop geotextile fabric and/or hay bales along the down-slope perimeter of the drill site to contain any run-off of surface water and any spills from sumps. When using silt-stop cloth, Ringlock (or Hinge Joint) fencing is attached to 3m spaced star pickets. The cloth is then attached to the up-slope side of the fencing with cable ties, digging the bottom of the cloth into the ground to prevent losses. When hay bales are used, these can be secured on the up-slope side of the sediment fence with wooden grid pegs.
- Safety fencing of the drill site (or just the sumps) is undertaken as needed, and safety signs are positioned at the entry point to the drill site.
- A bunded area is established to contain the drilling contractor's fuel, oils, muds and drilling additives.

Strategies for Drill Site Management

- A spill response kit is positioned at the drill site before the drill rig arrives.
- Black plastic sheeting (with a sheet of oil absorbent matting above it) is placed under the length of the drill rig to contain any oil or diesel leaks.
- The geologist liaises with the senior driller on each visit to the drill site. A walk around the perimeter of the drill site is undertaken to ensure that there are no leaks from sumps, the drill rig, compressor or support vehicles.
- Enlargement or construction of additional sumps is discussed with the driller during the drilling program, along with any requirement to have the above-ground or in-ground sumps pumped out before the hole is completed.
- Damage to sediment fences is promptly repaired as required.
- If during the drilling operations the ground becomes slippery, a thin layer of loose hay is spread to give the drillers a better surface on which to work.
- Drilling is stopped immediately if a diesel or oil leak is detected. The leak is then contained and the spill cleaned up. The source of the leak is repaired before drilling is recommenced.

Together with effective rehabilitation, these strategies minimise surface disturbance and facilitate future access for exploration.

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