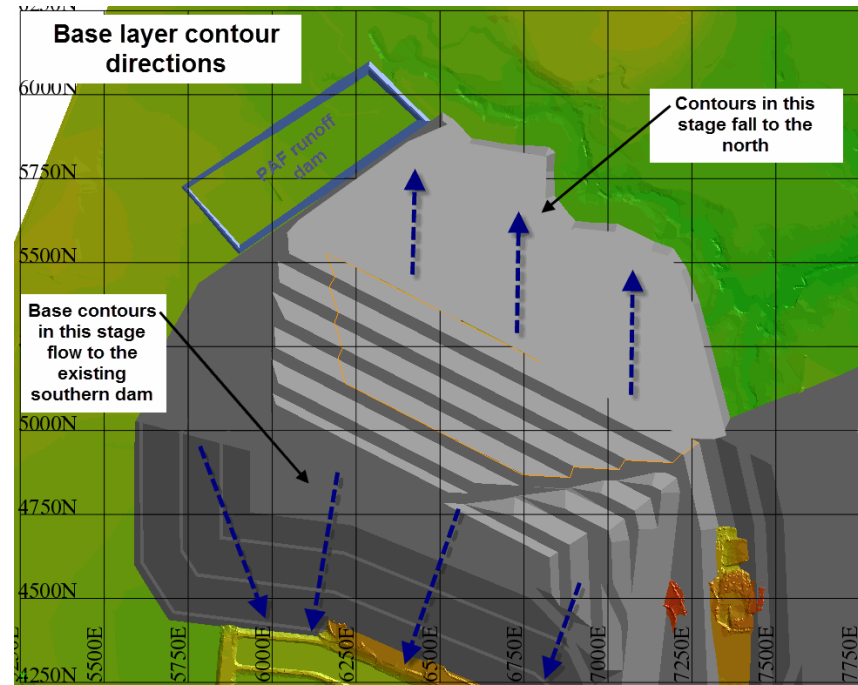


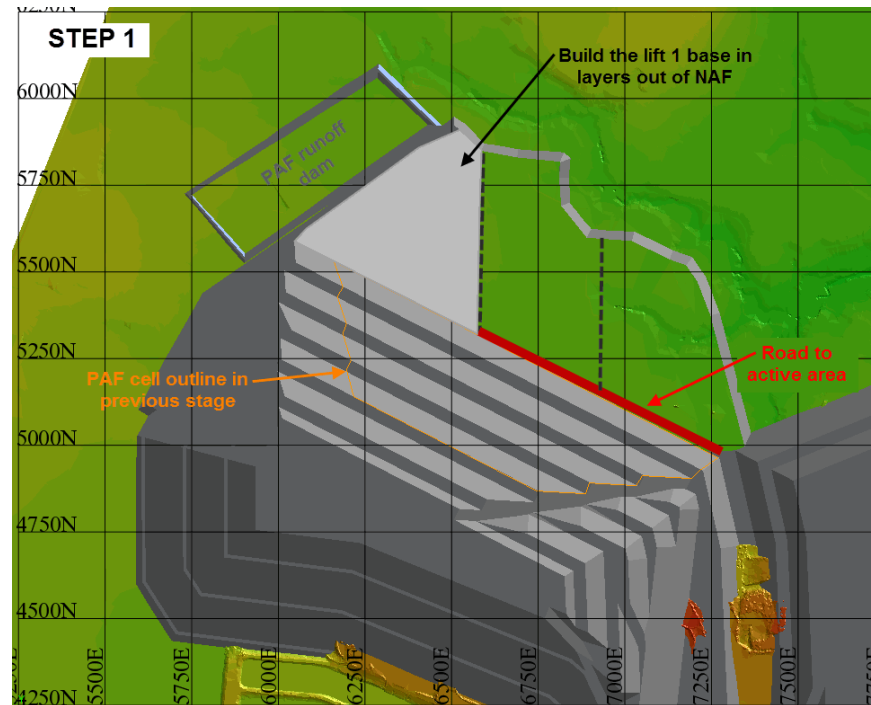
North OEF PAF Cell Construction Concept

Working from Back-To-Front

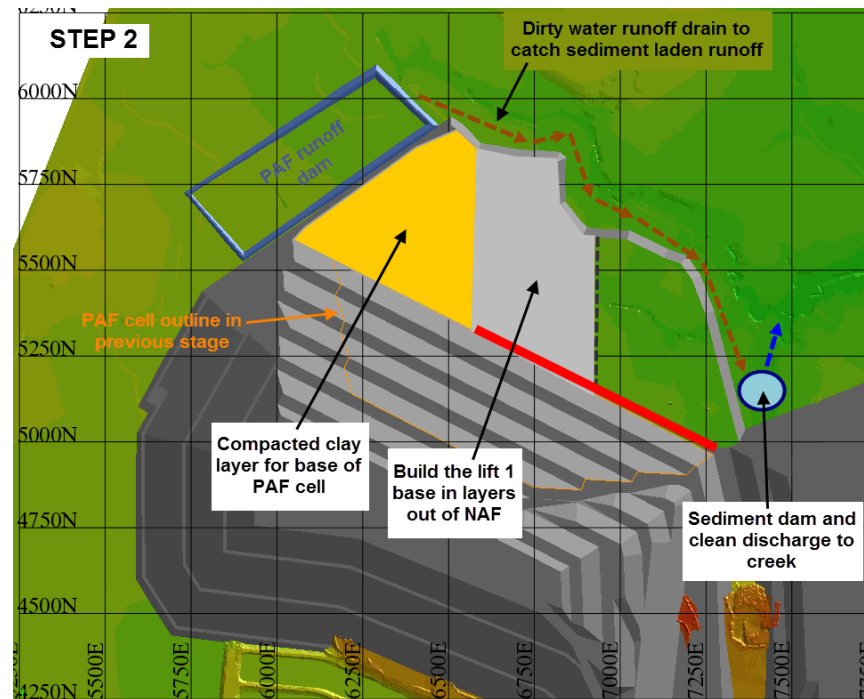
14 May 2012



The NOEF has many stages within its footprint. The slope of the base layer for each stage is specifically designed to promote drainage to the water management structures (dams, drains, sediment traps) that service that stage. An example is shown in the picture above – the southern stage has a base layer that is sloped to the south or southeast, so any runoff or seepage reports to the southern dam, whilst the northern stage shown drains to new structures located to the north and west of the stage – hence it has a slope to the north.

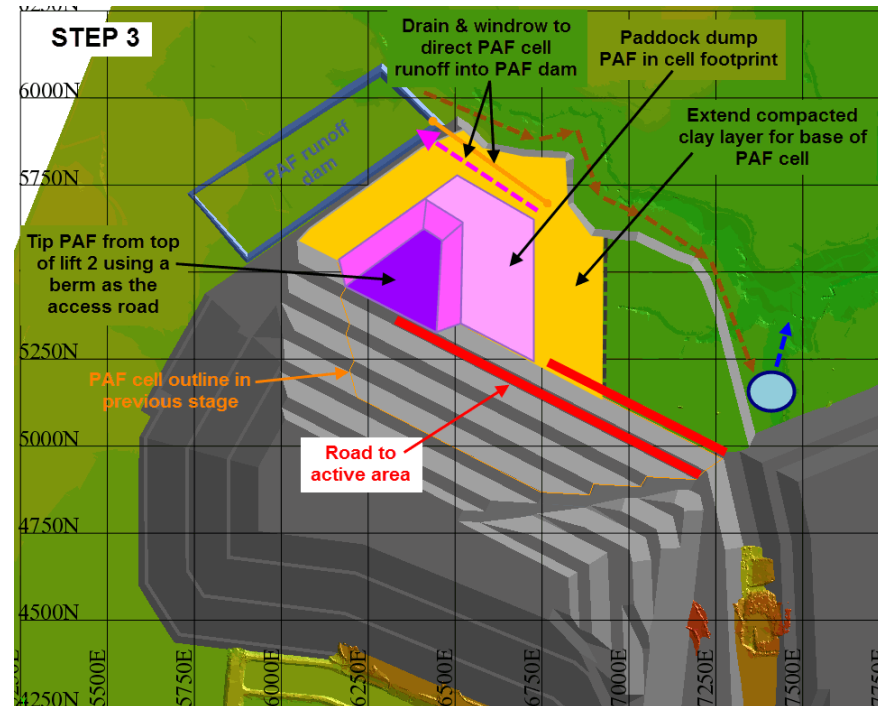


Extension of the OEF footprint only occurs during the dry season, so that water management structures can be built and changed without having to cope with active drainage. As the PAF runoff dam is being constructed, the base can be constructed out of NAF material. The footprint is expanded in sub-stages to allow more progressive clearing and development to occur. There is a stand-off from the natural drainage line to enable separation of clean and dirty water.

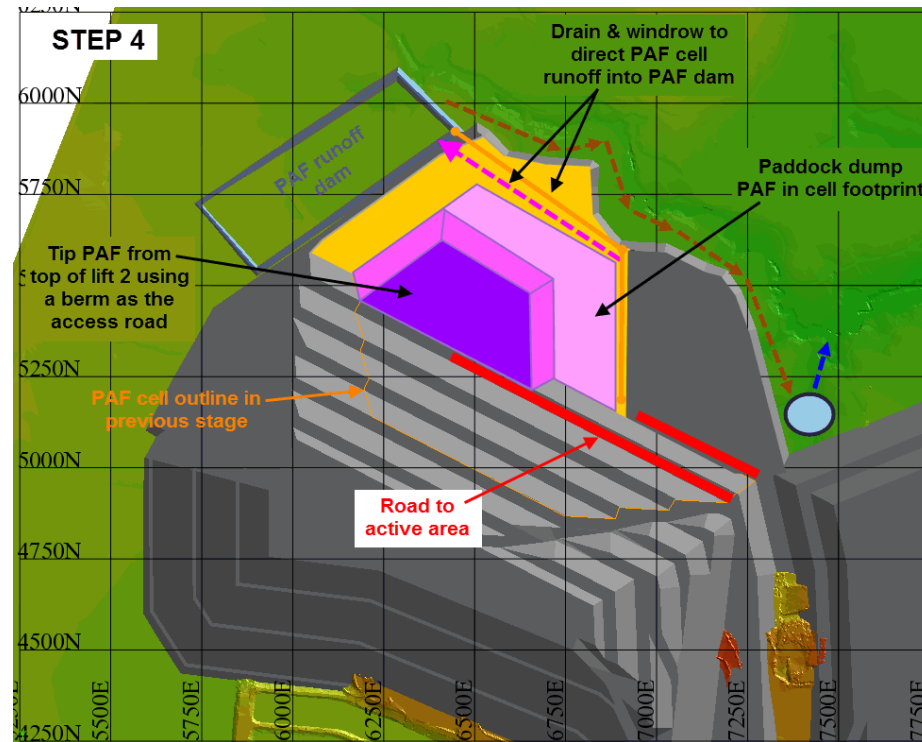


The system to segregate clean and dirty water is constructed. A drain is excavated at ground level, with the spoil used to create a windrow between the dirty water drain and the natural drainage line, which would continue to carry clean runoff to the north of the disturbed NOEF area.

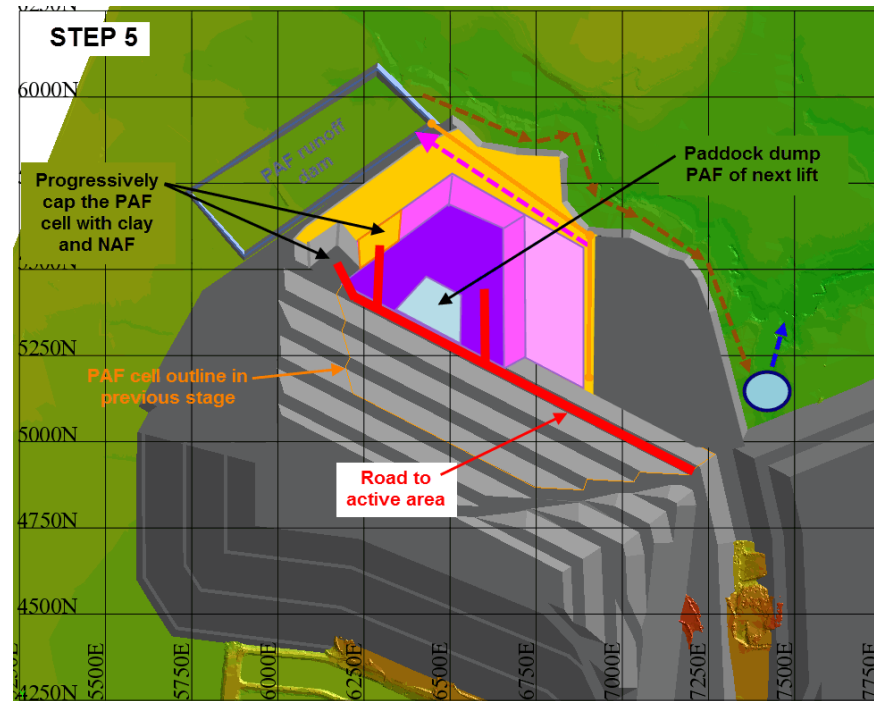
The dirty drains would flow to a suitably sized sediment dam, which would enable settling of any sediments. Subject to water quality checks, clear water would then be discharged into the drainage line.



The surface water controls for potentially contaminated water coming off the PAF cell is then constructed. A drain and matching windrow are located on the northern side of the PAF cell footprint, to direct any runoff into the PAF runoff dam. This keeps the potentially contaminated water separate to the dirty water. Once the water controls are installed, the PAF cell and commence. The footprint is paddock dumped out first with PAF on top of the compacted clay (approximately 2.5m high). The remainder of that lift of PAF is then tipped from the lift 2 berm, about 11m above the paddock dumps.

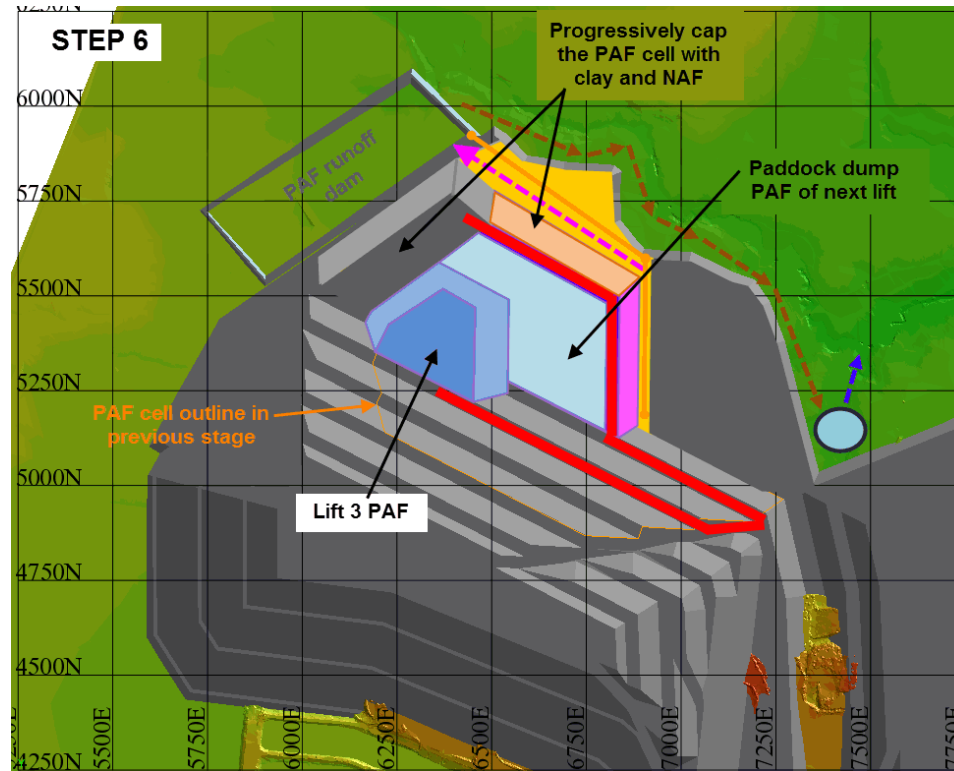


The base layer can be extended further as NAF material is available. The runoff from this area can report to the dirty water drains as there is no PAF to contaminate the runoff. The contaminated water controls are extended as the PAF cell grows to ensure the cell is fully contained and reporting to the PAF runoff dam.

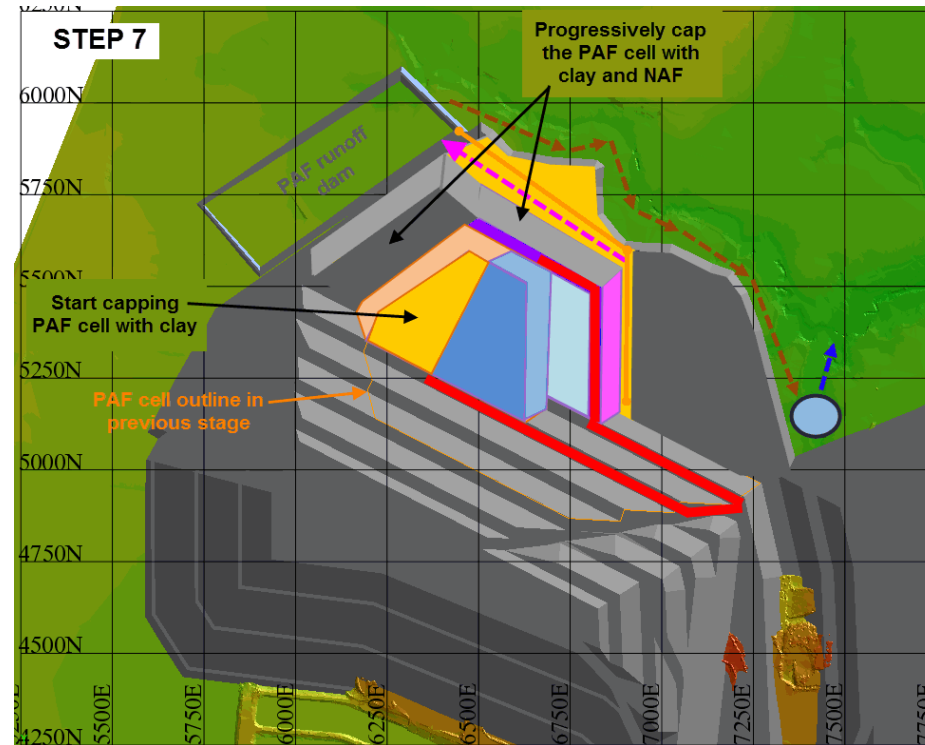


As the western end of the PAF cell on lift 2 has been completed, it can be capped with compacted clay, then NAF tipped to the final limit. It is best to do this as the OEF progresses before access is made more difficult by development of lift 3.

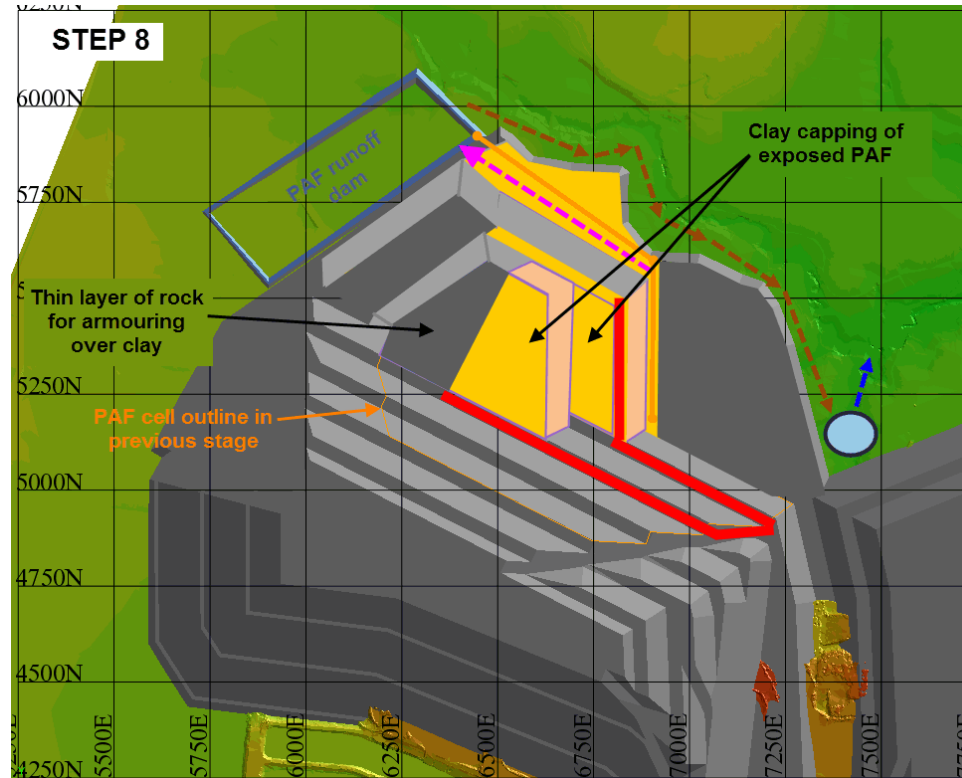
The paddock dump base for the PAF cell on lift 3 can be started, with the lift 2 PAF cell advancing to the east ahead of lift 3. Note that the PAF cell has not been extended all the way to the south of the OEF stage – the extents that the PAF cell is expanded each year during the dry season is planned so that the minimum footprint is open over the wet season. It is preferable to have a multi-lift PAF cell with a smaller footprint than a large area of PAF over a limited height – this reduces the area for potential water infiltration, and reduces the amount of compacted clay required to be placed before the wet season.



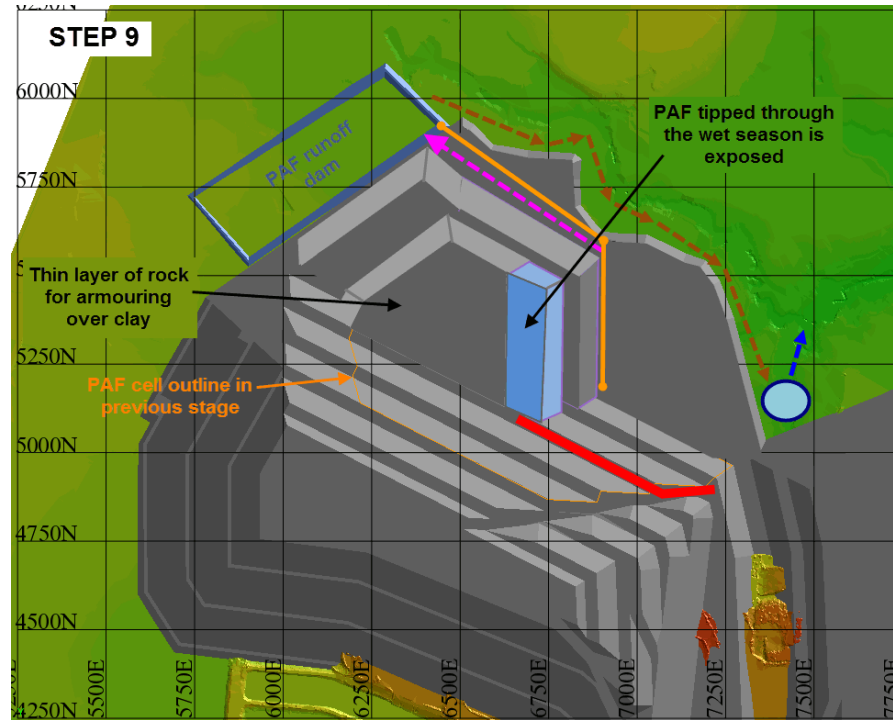
The western end of lift 2 is now completely capped. Final contouring and rehabilitation could commence at this stage. As some rehab works are specialised and may be contracted out, final rehab may be undertaken in campaigns once several sites are ready. The lift 3 PAF cell is growing.

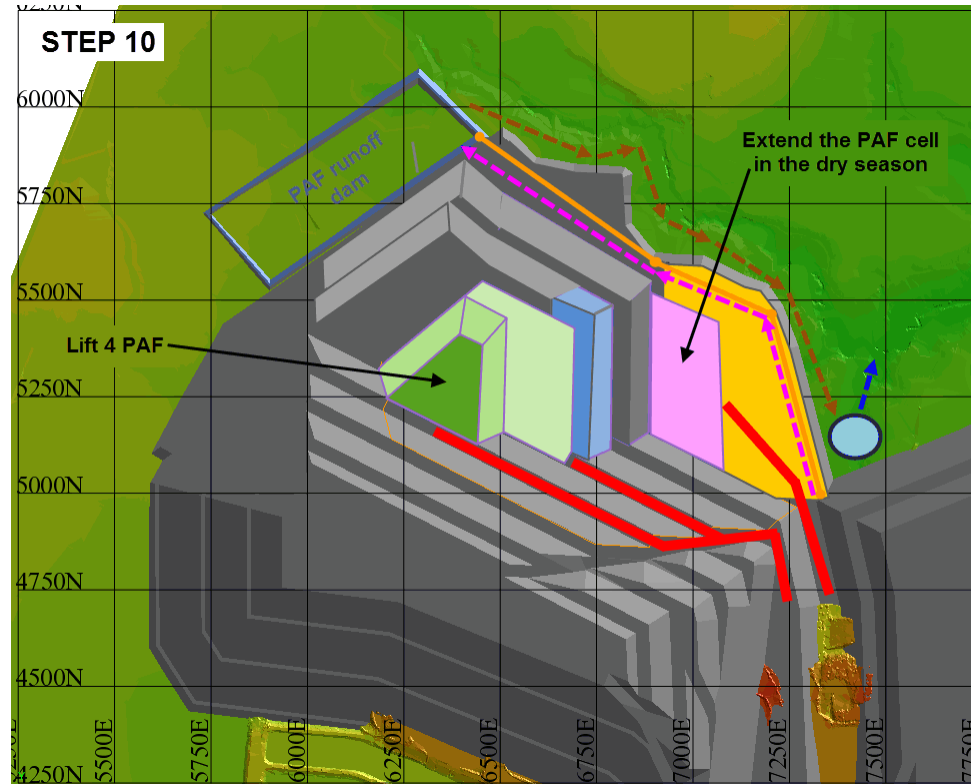


As the dry season is drawing to an end, preparations for the wet season need to begin. Before the rains come, any exposed PAF should be capped in compacted clay and a thin layer of rock (to protect from scouring) to minimise water and oxygen ingress. This picture shows the western end of the lift 3 PAF cell being clay capped.

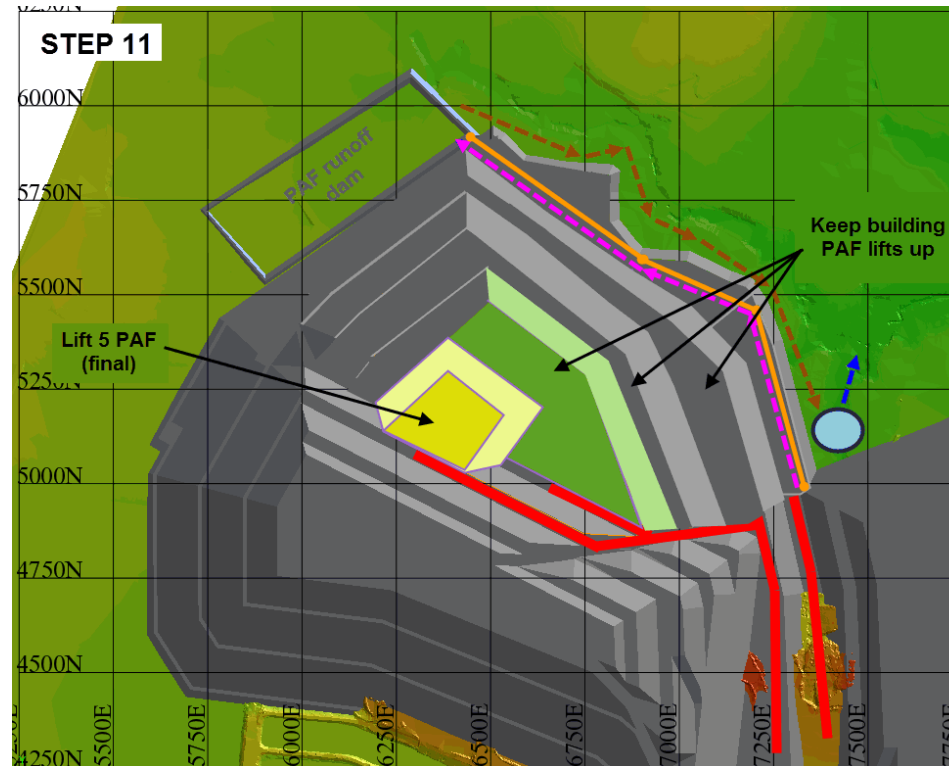


The capping of exposed PAF continues at the end of the dry season. Note that PAF will be still coming out of the pit, so small piles of uncapped PAF will be present.

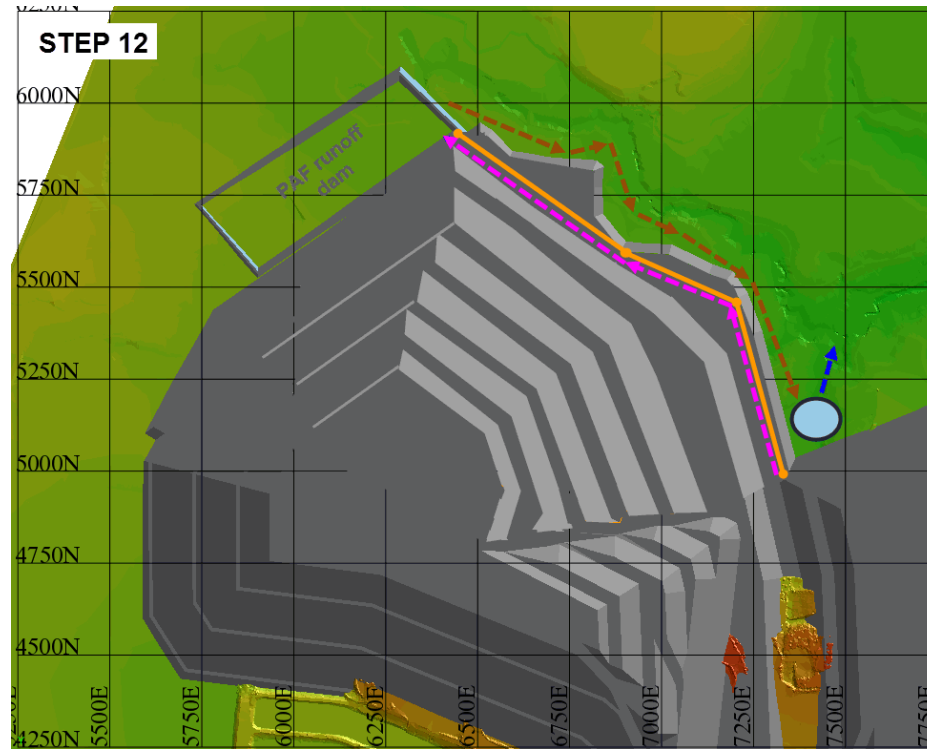




The PAF cell was extended up during the wet season, with no further footprint developed to the east. Once the dry season commences, the PAF cell can be extended to the east on lift 2, as shown in the pink colour.



Each lift of PAF is built up. In this case, the capping is shown to occur progressively as the next PAF cell is on the eastern side of the NOEF, so the north edge of this PAF cell will be exposed in the next wet season.



After the last PAF is placed in the cell on lift 5, the PAF cell can be sealed off with a top cap of clay and 20m of NAF rock. Rehabilitation works are then able to be completed, including:

- Detailed re-profiling of the surface to control surface water
- Construct and/or complete drop structures down the face to convey runoff water to ground level, where it would report to a sediment dam
- Rock armouring and cover layer construction
- Topsoil and planting