



VUL-SWP-076(3)-Production Excavator Operations

SAFE WORK PROCEDURE (SWP)			
Description	Production Excavator Operations		
Site	Vulcan Mine		
Department	Operations		
PPE Required		Job Hazard Analysis Reference	
 Safety helmets must be worn in this area  Ear protection must be worn  Protective footwear must be worn  Protective gloves must be worn  High visibility clothing must be worn in this area  Eye protection must be worn			
VUL SOP / PRO Reference		Other Relevant Information	
VUL-MOP-35 Emergency Management VUL-SOP-65 PPE VUL-SOP-73 Checking Mobile Plant VUL-SOP-76 Using Mobile Plant VUL-SOP-94 Check, Examine & Restrict Work Area VUL-SOP-117 Spoil Dumps, Excavated Faces VUL-MOP-128 Design & Construction of Mine Roads VUL-SOP-72h Servicing and Refueling VUL-SOP-144 Lighting VUL-TAR-003 Geotechnical Failure VUL-SWP-076-1 Dozer Operations VUL-SOP-078 – Isolation and Tagging		☐ Relevant OEM instructions & specification available	
		☐ Pre-start Meeting	
		☐ OCE Report	
People, Equipment, Materials and Tools Required			
People	Equipment	Materials	Tools
Production Supervisor	Tracked Dozer		GPS
Open Cut Examiner	Service Cart		Survey Pegs
Tracked Dozer Operator	Light Vehicles		Prestart Checklist
Emergency Response Team	Rescue Vehicles		Take 5
Service Cart Operator	Water Cart		Mine Plans
Water Cart Operator	Wheeled Grader		Isolation and Tagging Procedure
Grader Operator	Lighting Plants		
Haul Truck Operator	Rigid Haul Trucks		
Excavator Operator	Hydraulic Excavator		

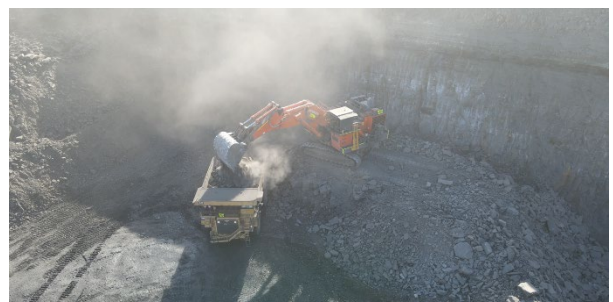


1. Area Inspection

- 1.1 Area to be inspected to determine suitability/required actions to take to improve conditions to suit operations coming into the area as per **VUL_SOP_94 Check, Examine and Restrict Work Areas**
- 1.2 Consult OCE/Geotechnical personnel regarding new or identified geotechnical issues

2. All Loading

- 2.1 Conduct a Take 5 as a minimum prior to undertaking any work.
- 2.2 A prestart check and or walk around inspection must be conducted in accordance with **VUL-SOP-073 Checking Mobile Plant and VUL-SOP-078 Isolation and Tagging.**
- 2.3 Requirements of **VUL-TAR-003 Geotechnical Failure** must be complied with.
- 2.4 If there is a pit design available, the excavator operator must comply and ensure parameters are not exceeded. If the operator is unsure of pit design stop and contact the supervisor.
- 2.5 During the hours of darkness ensure there is adequate lighting in area of operations.
- 2.6 Equipment must be parked in a suitable location for a pre-start inspection and service as per **VUL-SOP-076 Using mobile plant.**
- 2.7 Emergency access must always be available during operation and operations must cease if there is poor visibility e.g., excessive dust exposure.
- 2.8 The excavator operator must monitor the conditions of the work area through visual inspections i.e. highwall cracking, loose material and insufficient catch benches, ground conditions, location of large rocks, depth of cut, weather, and boggy conditions. If conditions become unsafe stop work immediately and contact Supervisor/OCE.
- 2.9 Dayshift crews are to set up lighting plants and bunding in correct positions for nightshift where possible.
- 2.10 Ensure that any JHA's or Geotechnical advice is understood and followed; if there are any changes immediately stop work and report to your Supervisor/OCE.
- 2.11 In areas of known highwall instability the tracks of the excavator must be perpendicular to the highwall during operation within 20m to allow quick exit if required.
- 2.12 Monitor floor and cross grade conditions, if floor grade becomes excessive i.e. greater than 10% truck stability can be affected.
- 2.13 Floors to be kept free of spillage to minimize tyre damage.
- 2.14 Constant monitoring by the excavator operator to ensure dig face is not undercut and any soft material that may affect stability.
- 2.15 The excavator and truck operators are to be always aware of the location of the loaded bucket as it is used as a guide when reversing.
- 2.16 The excavator uses horn signals (1 beep) to stop the truck in position for loading and (1 beep) when truck is at capacity to leave the loading bay. The horn is a safety device and must function correctly.
- 2.17 If the excavator is required to move away from the face, the operator must always swing to the cab side ensuring that all machinery is clear of the area.
- 2.18 Do not overload trucks or place excessive material on headboards.
- 2.19 All Excavators shall be serviced off benches, away from highwalls/dig faces and in accordance with **VUL-SOP-72h Servicing and Refueling.**





3. Single Bench Loading

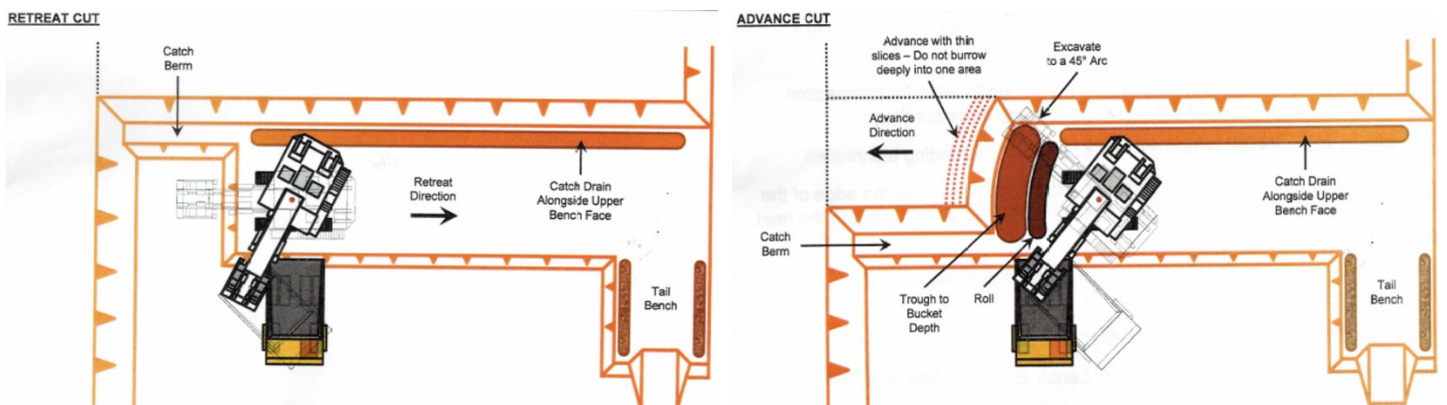
- 3.1 Maximise dig efficiency by limiting swing travel to truck.
- 3.2 Do not allow cabs to go within 10m of the highwall/end wall as per **VUL-SOP-117 Spoil Dumps and Excavated Faces 4.5.1.**
- 3.3 Ensure bench widths are maintained within design limits.
- 3.4 Self-spotting can only be carried out with **"On side loading"**.
- 3.5 If offside loading is carried out, truck operators must wait until the bucket is presented before initiating reverse.
- 3.6 It is important to let the truck operator know what to align up with, whether it is the teeth, under the bucket, front of the tracks or the idler.
- 3.7 When digging along walls ensure you have enough room, so the counterweight does not hit the wall.
- 3.8 Notify truck operators if loading large rocks, where possible lay a bucket of fines downs first to cushion rocks.
- 3.9 The height of the working bench must be appropriate to the loading unit, the material type present and must not exceed maximum bench heights.

*Maximum
Excavator Bench
Height*
Up to 200t = 3.5m
Up to 400t = 4m
Up to 600t = 4.5m

*If these maximum
bench height need
to be increased a
JHA shall be
completed and
approved by the
relevant
Superintendent
and shift OCE.*

4. Double Benching

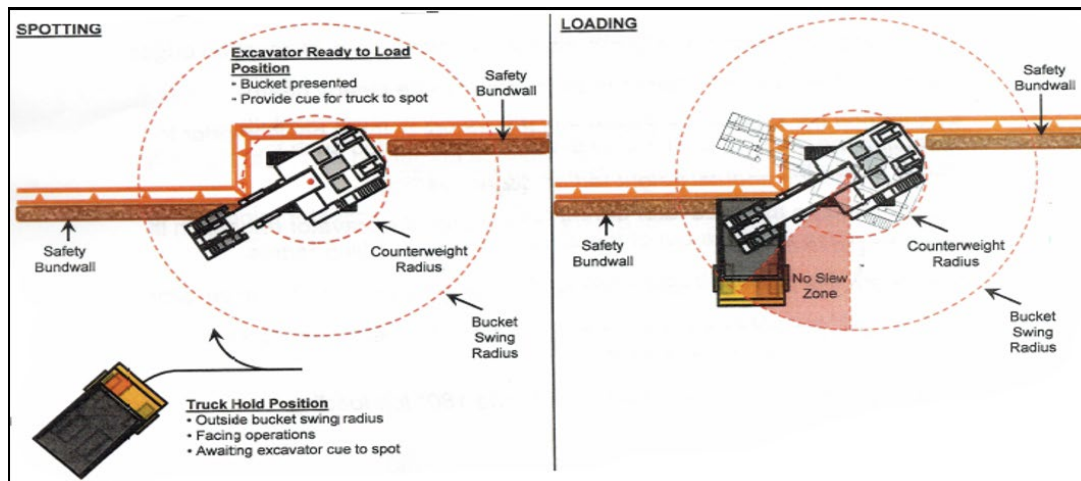
- 4.1 Maximum bottom benches shall not exceed heights stated in Single Bench Loading section .3
- 4.2 Excavator operators must ensure trucks back in square to the bench unless specified otherwise by the excavator operator.
- 4.3 While excavating material from the upper bench the excavator operator must ensure a safe batter is maintained ie (the excavated face is not undercut).
- 4.4 A catch trough of at least 1 bucket width shall be left beside the excavator to prevent material from striking the track frame.
- 4.5 When using the bucket to push rolls forward, the rill must be kept to a minimum making it easier to push and prevent damage to grease lines/undercarriage. Operators to ensure that the heel of the bucket is being used to push roll forward.
- 4.6 When double benching machine position is critical, excavate material to a 45-degree angle off the right-hand track.
- 4.7 Maintain a minimum catch bench of 1 bucket width to prevent material falling onto the dig floor.
- 4.8 Upper bench heights must not exceed excavator cab height as per **VUL-SOP-117 Spoil Dumps and Excavated Faces 4.5.1.**





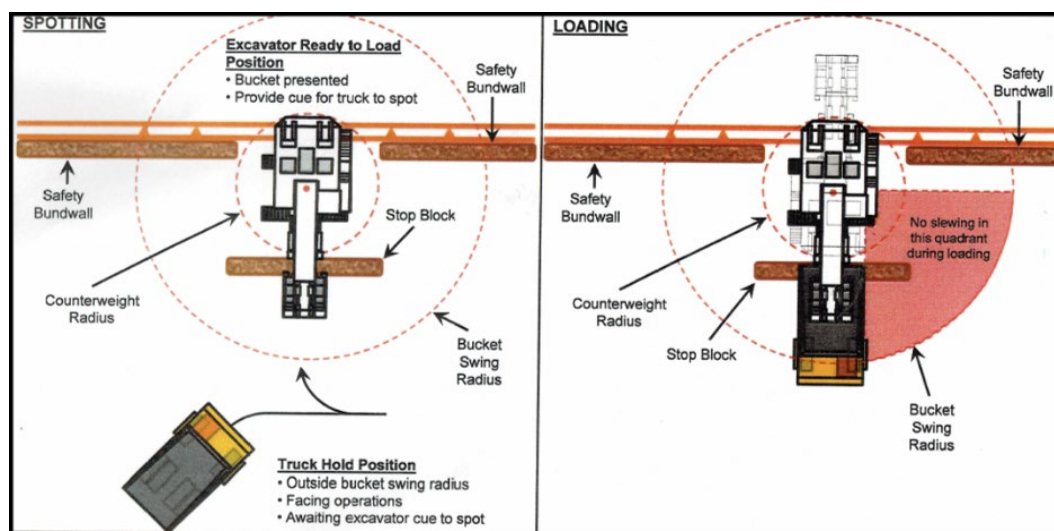
5. Top Loading at 90 Degrees

- 5.1 Trucks are not to self-spot during top loading.
- 5.2 Trucks are not to be loaded on the offside (back of the bucket) during top loading.
- 5.3 Ensure a bund wall is maintained a minimum of half the wheel height along excavated edges.
- 5.4 The bucket must be presented so trucks will not be inside the counterweight radius during loading



6. Top Loading at 180 Degrees

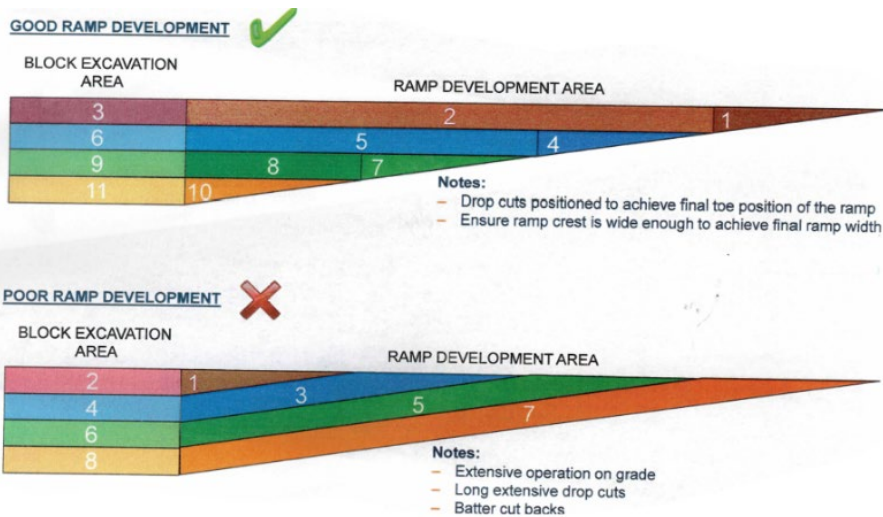
- 6.1 Trucks must not self-spot during top loading operations.
- 6.2 Trucks must not be loaded on the off side (back of the bucket) during top loading operations.
- 6.3 A "stop bund" must be established to ensure that trucks cannot contact the excavator (see below)
- 6.4 The excavator must present the bucket in the ready to load position prior to haul trucks reversing.
- 6.5 Ensure the bucket is presented far away enough so the counterweight will not contact the truck, use a spotter if necessary.





7. Drop Cuts

- 7.1 Ensure execution of the following excavation process:
- 7.2 The initial face (~ 1m) is established by ripping and pushing up a face with a dozer
- 7.3 If room allows, top load trucks from behind or beside the drop cut until the face reaches approximately 2m. Once the face reaches approximately 2m, conventionally load trucks from within the drop cut
- 7.4 Ensure a safety bund wall is maintained around crest of the drop cut excavation.
- 7.5 Ensure correct top loading techniques are utilized.
- 7.6 Ensure the floor of the drop cut is maintained at the required grade, free of rocks capable of damaging tyres and that ground conditions are being effectively managed.



8. Payloads and Correct Loading

- 8.1 During loading operations, the loading unit operator shall ensure loads are distributed evenly down the center line of the truck without excessive material on the headboards or tail of the truck.

