Company Name:	**Equipment/Job Identification:** Blasting **Type of Equipment:** **Make:** **Model:** **Year:** **Use:**
Mine Name:	
Date of Analysis:	

Pre-Assessment

- **List pre-requisites here**
  - ATF Certification
  - Blaster's License
  - Part 46 Training
  - Personal Protective Equipment
  - Proper Lifting Requirements
  - Haz Com Training (Hazardous Chemicals)
  - Part 62 Training (Noise)
  - Health
    - Silica
    - Heat Stress
  - Traffic patterns and haulage
  - Fall Protection (donning harness, etc.)

Duty 1: Conduct pre-blast meeting

Learner will be able to conduct a thorough pre-blast meeting. Learner will explain the job steps, why they are conducted, any associated risk, and how to implement appropriate controls. A thorough pre-blast meeting includes the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Review weather conditions	Could result in unplanned detonation of explosives			
Communicate number of holes	To control the amount of ms for noise control and vibration control			Information from supervisor for communication purposes only
Calculate bags per hole	Miscalculation of anfo may cause fly rock or property damage			Calculate 3.94 lbs of anfo per linear foot
Discuss reasons to turn electronic devices off i.e. 2 way radio	Additional safe guards against premature detonation			
Discuss reasons to avoid stepping on detonator cords	Could result in a misfire later			Minimize foot traffic in blast area and No motorized vehicles.
Review reasons to always face the highwall (Don't turn you back to the ledge)	To prevent stepping over edge			
Discuss stemming process	To prevent fly rock hazards			One shovel of coarse stone and one shovel of fines/chips (layered)
Discuss blast gases	Prevent Health hazards			Yellowish-orange Stay out of cloud Do not breathe gases
Remind Driller to communicate every hour with supervisor of status	Make supervisor aware of status, any difficulties			Communicate any needs and status of the Driller Note: this is very important for those working alone

Duty 2: Complete Blaster's Log

Learner will demonstrate how to complete the blaster's log. Learner will also explain the job steps, why they are conducted, any associated risk, and how to implement appropriate controls. Completing the Blaster's Log includes the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Log must be completed in it's entirety	ATF Requirements			
Enter Date	ATF Requirements			
Enter Time	ATF Requirements			
Enter Name of quarry	ATF Requirements			
Enter Specific location of face (north, south, east, west)	ATF Requirements			
Describe Weather conditions	ATF Requirements			
• Wind (speed, direction)	ATF Requirements			
• Clouds	ATF Requirements			
Enter Blaster's name	ATF Requirements			
Enter Number of holes	ATF Requirements			
Enter Depth of holes	ATF Requirements			
Enter Spacing of holes	ATF Requirements			
Enter Spacing of burden	ATF Requirements			
Enter Amount of the 25 ms 700 ms detonators	ATF Requirements			
Enter Amount of boosters	ATF Requirements			
Enter Amount of detonating cord	ATF Requirements			
Enter Amount of 17 ms delays	ATF Requirements			
Sketch Drill pattern	ATF Requirements			Burden, Spacing, Face
Enter Total # of anfo bags	ATF Requirements			
Enter # of Lbs of anfo per hole	ATF Requirements			
Enter time of detonation	ATF Requirements			
Note any misfires	ATF Requirements			

Duty 3: Site preparation

Learner will demonstrate how to prepare the site for blasting. Learner will explain the job steps, why they are conducted, any associated risk, and how to implement appropriate controls. Preparing the site for blasting includes the following duties:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Deliver stemming materials to blast site (front end loader operator)	To prevent down time and additional traffic			Request made by blaster or supervisor
Locate or place blaster's shed behind or to the side of shot	To give the blaster protection from fly rock			Blaster shed must be constructed of a minimum of 3/8" steel; place 300-500 feet away from blasting area.
Place and/or check for proper signage	To prevent unauthorized persons; communicate and warn of blast dangers			Signs are for general public and employees; Signs should be written in both English and Spanish.

Duty 4: Loading the hole

Learner will demonstrate how to safely load the holes for blasting. Learner will explain the job steps, why they are conducted, any associated risk, and how to implement appropriate controls. Procedures for safe loading of the holes include the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Load holes closest to the face and work your way back	To assure all holes are loaded and in case of problem, you can blast one row at a time.			Loading done by 2 persons, Best Practice (time)
Spot the explosives around the hole	Keep items separated			
• place anfo on one side of hole				
• place booster on opposite side on hole				
• place detonator on free side of hole				

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Slide detonator cord through booster and fasten in second hole in the booster	May cause misfire			Follow proper task training according to manufacturer instructions
Lower detonator and booster into the hole	To Prevent unplanned detonation of explosives			
Pour ANFO into hole	Cause fly rock hazards			
• Pour ANFO into hole				
• Measure depth of anfo with wooden pole				This should be done by a second person.
• Stop adding anfo at 10' from top of hole or maximum of 3 bags for a 35' hole				Different hole depths will require different calculations
Place stemming into hole				
• Place one shovel of coarse and one shovel of fine	Improves plugging and to prevent excessive fly rock			
• Stemming must be level with top of hole	To prevent excessive fly rock			
Repeat process for each hole				
Never leave blast site unattended	To prevent unauthorized access			

Duty 5: Connecting the shot

Learner will demonstrate how to safety connect the shot. Learner will explain the job steps, why they are conducted, any associated risk, and how to implement appropriate controls. Procedures for safely connecting the shots include the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Clear area except for authorized personnel	To control blast site			
Remove van and all equipment	To prevent property damage			
Run detonating cord to blasters shed	Shed is used as protection for blaster.			

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Make primer cord and blast hole connections	To ensure proper connections			Refer to blasters chart
Walk the blast site and check connections after all connections are made	To prevent misfires and identify any additional hazards; make sure all connections have been made properly			

Duty 6: Blast notification

Learner will demonstrate how to conduct a safe and thorough notification prior to blasting. Learner will explain the job steps, why they are conducted, any associated risk, and how to implement appropriate controls. A safe and thorough blast notification includes the following duties:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Notify all equipment operators with radios to barricade roads	To prevent unauthorized persons in blast area; prevent personal injury			
Notify scale house to contact fire department	In case of general public complaints			
Remove all personnel from blast area (at least 1000' from site)	To prevent injuries and property damage			
Call shot firer and instruct him to prime the blast				
Radio each check point for final confirmation				
Licensed blaster will make a final check and initiate blast				

Duty 7: Post-blast procedures

Learner will demonstrate how to conduct safe and thorough post-blast activities. Learner will explain the job steps, why they are conducted, any associated risk, and how to implement appropriate controls. Safe and thorough post-blast activities include the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Prohibit entrance to site for 30 minutes	To prevent safety and health hazards			
Release access roads				
Resume business activities as normal				
Return to blast area after 30 minutes	To prevent safety and health concerns			Check area for misfires; avoid gas exposure created by blast
Visually check 700 ms for visible detonation				
• Look for cap to be blown	To locate possible misfired shots			Will be opened up with black powder; Last one on each row indicates detonation

Duty 8: Unusual occurrences

Learner will discuss and explain how to deal with unusual occurrences associated with blasting. The proper procedures will include the following job steps:

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
Misfires	Potential of a unplanned detonation of explosives			
• Notify affected workers	To prevent injury and property damage			
• Re-initiate blast notification	To prevent injury and property damage			

Job Steps	Importance Narrative (Consider Safety, Production, Maintenance)	Importance Ranking 1=Important 2=Very Important 3=Critical	Satisfactory or Needs Work	Procedures/Risk Resolution/ Notes/Comments
• Check connections and reconnect the 700 ms detonators	To prevent injury and property damage			
• Run new primer cord to blaster's shed	To prevent injury and property damage			
• Repeat blast notification procedures	To prevent injury and property damage			
• Blast				
• Repeat post-blast procedures	To prevent injury and health concerns			
Lost hole	The hole collapsed prior to loading blasting materials.			
• Cancel the hole (back fill hole)				To prevent misdirection of blast energy
• Return explosives to inventory	To account for all explosives as per ATF requirements; prevent stolen explosives			Note return of explosives to inventory
• Note cancelled hole on blaster's log				x-thru explosives used or note "cancel"
Approaching storm				
• Stop loading				
• Evacuate				
• Secure area				
Column shift				
• Treat as a misfire	To prevent an unplanned shot			
• Wash explosives from hole	To neutralize detonator/booster			