JOB HAZARD ANALYSIS	JOB TITLE: Rock Drill (Pico/Poinjar) Use and Maintenance	DATE:	x NEW □ REVISED
TITLE OF WORKER(S): Maintenance Worker Leader, Maintenance Workers, Laborers.	NAME OF ORGANIZATION: Rocky Mountain National Park	LOCATION: RMNP all trails	ANALYSIS BY:
DEPARTMENT: Maintenance--Trails	SUPERVISOR:	APPROVED BY:	REVIEWED BY:

REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPTMENT	Hearing protection, eye-protection, respirator (required for Poinjar use), long pants, good boots, gloves (anti- vibration), hardhat.

7. SEQUENCE OF BASIC JOB STEPS	8. POTENTIAL HAZARDS	9. RECOMMENDED ACTION OR PROCEDURE
Identify need for drill, select and transport to work site.	Injuries or property damage due to inappropriate application, improper use, or lack of training/PPE.	-Crew leaders and supervisors will be responsible for identifying the need for drills, training employees how to properly and safely use rock drills, and provide employees with the appropriate PPE (see block 11). -Training should cover routine operation and daily maintenance (correct fuel mix, clean airfilter, etc.), participation in the Respiratory Protection Program, and drill theory and applications (blasting, splitting, etc). -*All annual and non-routine maintenance will be performed by, or under the direction of crew leaders and supervisors*.
	Injuries or property damage caused by transportation and handling of machinery.	-All crewmembers should take an active roll in assuring no damage or injuries are caused by method of transportation or handling. Poinjar rock drills are heavy and cumbersome, but their cases are magnesium and sensitive to falls and impacts. -Drills should never be leaned against anything (e.g. a tree) where they can slip, slide or fall. -Frame packs and backboards are available for transporting drills by foot. -Anyone carrying a drill should be extra careful of rough or loose footing, and get assistance while loading and unloading. -Packers or other trained staff must lash drills tight and secure to pack stock. -**Poinjars should be purged whenever being transported or not in use**.
Poinjar/Pico operations—drilling bore holes.	Injuries to respiratory system from inhalation of drill fines and silica dust.	-Poinjar operators are required to participate in the Park's respiratory protection program (ideally, 3 to 4 people per crew). -Participants will be assigned an appropriate respirator, and **it will be the individual's responsibility to maintain, clean and care for their respirator.** -Anyone working very close or up wind of Poinjar operations should also protect their airways. Participation in the Volunteer Respirator Protection Program is open to all crewmembers, and everyone should have access to a disposable, P-100 air-mask.

7. SEQUENCE OF BASIC JOB STEPS	8. POTENTIAL HAZARDS	9. RECOMMENDED ACTION OR PROCEDURE
	Muscle strains, pulls, twists, and repetitive use injuries.	-Operators need to find the safest, most effective position for themselves and the machine. -If possible, consider moving materials so that drills can be operated from such a position to allow the driller to maintain good footing and posture. -If necessary, a spotter, or an additional operator can help support the machine or guide the bit.
Poinjar/Pico operations—drilling bore holes.	Muscle strains, pulls, and twists.	-Drill operators should maintain a relaxed grip on the handles, reducing the conduction of vibrations and impacts to hands, wrists, arms and elbows. -Allow the weight of the drill to drive the bit, while guiding the shank in the middle of the hole, with minimal pressure from the driller. -Poinjar operators should take frequent breaks of appropriate length, and stretch often.
	Burns, misc.	Be aware of casings or components that may build up heat, move, or attract loose articles of hair or clothing (such as mufflers, shanks, and flywheels).
	Frozen bit, sudden stop, or fatigue/frustration.	-Drillers need to be attentive to the behavior of the drill and conscious of the type of rock they are drilling. -Micro-fractures and unforeseen seeps can jamb a bit, causing a sudden reaction with the drill. -Drillers should monitor the following: *Changing tones*-often signal a bit is about to break completely through a rock. *Fast and slow drilling*-often indicates different layers and hardness of rock. *Color of the drill fines*-a good indicator of the type of rock below. -When all else fails, take a step back and a big, deep breath, maybe stretch a little, and try again or try something different.
Poinjar/Pico operations—using feathers and wedges.	Injuries from driving wedges, metal burrs/chips.	-Plugs should be frequently ground or filed so that no “mushroom” or burrs develop. -All personnel in close proximity to splitting operations need to be in full PPE. -In case of a partial miss or deflection, workers need to give a 5 to 10 foot safety circle around anyone driving wedges. -Recommended that when driving wedges, workers use the special driver bit in jackhammer mode to reduce potential hazards above.
	Cuts or scrapes, from freshly cut edges.	-Freshly cut stone is extremely sharp, and workers need to exercise caution while handling or moving this material. -Clear work area often to reduce the chance of tripping or falling.
Poinjar/Pico operations—tamping, chiseling, jack-hammering, etc	Slips, sudden bit or rock release, uneven terrain,	-Exercise caution until familiar with the nature and properties of new or different materials.

JSA Instructions

The JSA shall identify the location of the work project or activity, the name of employee(s) writing the JSA, the date(s) of development, and the name of the appropriate line officer approving it. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.

Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory

Block 7: Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).

Block 8: Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

a. Research past accidents/incidents.
b. Research the Health and Safety Code or other appropriate literature.
c. Discuss the work project/activity with participants
d. Observe the work project/activity
e. A combination of the above

Block 9: Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment and furniture.
b. Substitution. For example, switching to high flash point, non-toxic solvents.
c. Administrative Controls. For example, limiting exposure by reducing the work schedule.
d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills, portable water pumps)
e. A combination of the above.

Block 10: The JSA must be reviewed and approved by a supervisor.

Block 11: List all recommended and required PPE relevant for job/activity.

Emergency Evacuation Instructions

Work supervisors and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the work site.

Be prepared to provide the following information:

a. Nature of the accident or injury (avoid using victim's name).
b. Type of assistance needed, if any (ground, air or water evacuation).
c. Location of accident or injury, best access route into the work site (road name/number), identifiable ground/air landmarks.
d. Radio frequency(s).
e. Contact person.
f. Local hazards to ground vehicles or aviation.
g. Weather conditions (wind speed & direction, visibility, temp).
h. Topography.
i. Number of person(s) to be transported
j. Estimated weight of passengers for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

JSA and Emergency Evacuation Procedures Acknowledgement

As supervisor I acknowledge that the following employees have participated in the development of this JSA, accompanying evacuation procedures and have also been briefed on the provisions thereof:

Supervisor's Signature: _____