(Mineral Resources Infrastructure Work)

NTQF Level -1

Learning Guide # 37

Unit of Competence: - Use Hand and Power Tools

Module Title: **-** Using Hand and Power Tools

LG Code: **MIN MRI1 M10 LO4-LG-37**

TTLM Code: **MIN MRI1 TTLM 0819v1**

LO 4: Clean up

Instruction Sheet	Learning Guide # 37

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Environmental management plan
- Clearing work area and disposing or recycling materials
- Machineries, tools and equipment

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Follow environmental management plan
- Clear work area and disposing or recycling materials
- Clear , check, maintain and store Machineries, tools and equipment

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 8.
3. Read the information written in the "Information Sheets 1". Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish from "Self-check 1 up to Self-check 3
5. Ask your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check).
6. If you earned a satisfactory evaluation proceed to "Information Sheet 2". However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Information Sheet 2
7. If you earned a satisfactory evaluation from the "Self-check" proceed to "Operation Sheet in page 13.
8. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Follow environmental management plan

1. Apply Environmental Management Plan

Legislation requires that an Environmental Management Plan (EMP) be prepared for any work site. The purpose of the plan is to minimize the impact of operations on the surrounding environment. You must identify from the plan the environmental protection requirements relating to your task and apply them to your work. The plan will include the following procedures and practices;

- Dust prevention and minimization
- water quality control
- noise and vibration control
- minimizing loss or damage of vegetation and topsoil
- use, carriage and storage of fuels, oils and other chemicals
- clean up of oil, lubricant or chemical spills
- waste management
- Handling of dangerous substances and chemicals.

The environmental management plan will also contain a list of control measures that must be in place. If you notice any of these control measures are damaged or missing, report it to your supervisor immediately

Figure-1.1. Environmental management plan

Self-Check -1	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is the purpose of environmental management plan? 2.5 point
2. Write the procedures and practices that will include in plan? 2.5 point

Note: **Satisfactory rating – 2.5 points** **Unsatisfactory - below 2.5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-2	Clear work area and disposing or recycling materials

2.1 Site preparation and clearing

If a mine site is located in a remote, undeveloped area, the project proponent may need to begin by clearing land for the construction of staging areas that would house project personnel and equipment. Even before any land is mined, activities associated with site preparation and clearing can have significant environmental impacts, especially if they are within or adjacent to ecologically sensitive areas.

2.2 Disposal of Materials by using 3R

To reduce waste problems in future, reduction in waste generation and re-use of old products and possible reduction at the consumption level include better buying habits and cutting down on the use of disposable products and packaging. The following 3R are mostly used in waste prevention methods

1. **Reduce**: Buy only what you need because a better way to reduce waste is by not creating it.
2. **Reuse**: If you have to acquire goods, try getting used ones or obtaining substitutes.
3. **Recycle**: When discarding your waste, find ways to recycle it instead of letting it go to landfill.
    - Residual wastes which cannot be used by any means should be **disposed** properly.

2.3 Solid Waste from Mines

Waste rock and tailing, no matter which kind of development program was utilized in a mine, are the upper most solid waste in the duration of exploitation of mineral resource. The discharging of waste rock and tailings has large portion of mine land use and higher safety requirements. Simultaneously, it also brings great destruction to the mine area environment.

2.3. 1 Waste rock: – Waste rock is one of the maximum solid wastes occurred in the mining industry. In order to extract ore, large amount of rock is stripped or excavated and transported to the waste-rock dump.

2.3.2 Tailings-: Tailings are the major solid wastes produced in the process of mineral beneficiation. In order to extract usable minerals, ore was crushed and milled to appropriate size, then, the usable minerals were separate from unusable minerals via different beneficiating methods

2.4 **Reclamation of Solid Wastes**

2.4.1 Utilization of waste rock for construction

Waste rock results from stripping in an open-pit or excavation of an underground mine. Usually, according to the difference utilities of waste rock, it could be used directly or dressed to various sizes for using.

The following embodies utilization methods of waste rock:

A. A very good material for construction of roads. The coarser size waste rock can be used for Sub grade building and the fine size for road surface paving;
B. A very good material for construction of dams;
C. A very good material for beneficiating coarse and fine aggregate of concrete;
D. It could be used for making construction bricks when beneficiated to suitable size; and
E. To backfill the mined out area, subsidence area and other area needed to be filled.

2.4.2 Utilization of tailings for construction

The usages of tailings as construction material are described as following:

A. Used for making wall bricks and floor tiles for construction;
B. Used for filling depressions, the mined out area or subsidence area;
C. Used for improving of the soil; and
D. Separating out coarser size for fine aggregate of concrete and building sand usage.

2.4.3 Recycling usable minerals

With the development of mineral processing technology, it becomes possible that the usable minerals in tailings could be recycled.

2.4.4 Backfill mined out area

Waste rock and tailings could also be used in the backfill mined area of a mine in transition from open-pit to underground mining. Backfill the mined area is not only significant to the environmental restoring and improving the mining condition, but also a good idea of disposal method on solid waste from mines.

2.4.5 Regeneration of ground vegetation

The investigation result shows that vegetation planted on the surface of iron tailings was not only propitious to tranquilizing and reducing soil erosion but also enhancing growth of vegetation.

2.4.6 Producing glass or fertilizer

According to the varieties of mineral composition in tailings of different mine, tailings could be used to produce glass or fertilizer

Self-Check -2	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Say true if the statements is correct and say false if the statement is incorrect

1. Tailings are the major solid wastes produced in the process of mineral beneficiation. 2 point
2. With the development of mineral processing technology, it becomes possible that the usable minerals in tailings could be recycled. 2 point
3. When discarding your waste, find ways to recycle it instead of letting it go to landfill. 2 point
4. According to the varieties of mineral composition in tailings of different mine, tailings could be used to produce glass or fertilizer. 2 point
5. Residual wastes which cannot be used by any means should be disposed improperly. 2 point

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Information Sheet-3	Clear , check, maintain and store Machineries, tools and equipment

3.1Introduction

If you are mining worker, you'll be responsible for the condition of all the tools and equipment in the work site. This is a very important job. Inspect all tools as they are returned to determine if they need repairs or adjustment.

Wipe clean all returned tools and give their metal surfaces a light coat of oil. Check all precision tools upon issue and return to determine if they are accurate. Keep all spaces clean and free of dust to prevent foreign matter from getting into the working part of tools. Plan to spend a portion of each day reconditioning damaged tools. This keeps the tools available for issue and prevents an accumulation of damaged tools.

3.2 3s Approaches (Sort, Set in order and Shine)

1. Sort

- Focuses on eliminating unnecessary items from the workplace
- Categorize equipment, machine, tool in your working place into the following 3 categories

1. Necessary
2. Unnecessary
3. May not necessary

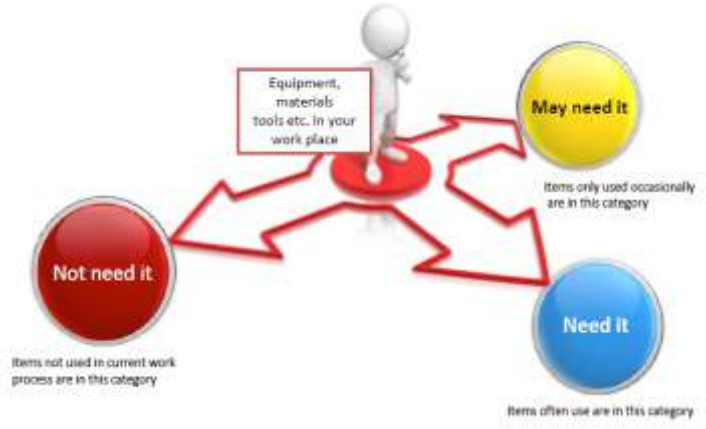

Figure- 3.1 Category of Tools

2. Set in order

- Set in order is based on finding efficient and effective storage of necessary items
- Apply “Can see, Can take out, and Can return” philosophy
- This will save time and energy to look for something

Example of “Set in order “activities

- Labeling , numbering, zoning for clear identification of storage areas to keep necessary items
- Set necessary items matching with workflow to minimize unnecessary movement and transportation time

Figure 3.2. Set In order Activity

3. Shine

- Cleaning up one’s workplace daily so that there is no dust on floors, machines or equipment.
- It will create ownership and build pride in the workers

Figure 3.3- Shining activities

Self-Check -3	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Say true if the statements is correct and say false if the statement is incorrect

1. If you are mining worker, you'll be responsible for the condition of all the tools and equipment in the work site. 2 point
2. Keep all spaces clean and free of dust to prevent foreign matter from getting into the working part of tools. 2 point
3. Cleaning up one's workplace daily so that there is no dust on floors, machines or equipment. 2 point
4. Shine is based on finding efficient and effective storage of necessary items. 2 point
5. Set in order focuses on eliminating unnecessary items from the workplace .2 point

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

Operation Sheet 1	Follow environmental protection planning

1. Steps of the Continuous Cycle for environmental protection planning

Step 1- Plan: Planning, identifying environmental aspects and establishing goals

Step 2-Do: Implementing, includes training and operational controls

Step 3- Check: Checking, includes monitoring and corrective action

Step 4- Act: Reviewing, includes progress reviews and acting to make needed changes

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within --- hour.

Task 1. Mention the Steps of the Continuous Cycle for environmental protection planning?

List of Reference Materials

1- Environmental management plan,2013

2- Hand and portable power tool safety guidelines,2014

3- Power tool safety

4- Transmission Line Project, Kajiado County, Kenya,2012

5- Use hand and power tools learner guide