NWFP Environmental Protection Agency

Environmental Assessment Checklists and Guidelines

Marble Units

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Contents

1. Introduction

Marble industry is important medium size industrial sector. Marble factories process raw marble to produce finished goods such as tiles, tableware and decoration pieces.

1.1 Scope of the Guidelines

These guidelines are applicable to the future developments of marble units in the province of NWFP having a total cost of less than Rupees ten million.

These guidelines are not applicable to mining of marble.

1.2 How to use these Guidelines

The project proponent is to fill in an environmental assessment form. The following steps are to be taken in this regard:

Step 1: Provide information on project [use **Section I**]

Step 2: Determine Applicability (*Are you sure that IEE or EIA is not required?*) [use **Section II**]

Step 3: Describe the physical, biological and social environment [use **Section III**]

Step 4: Assess potential impacts and applicable mitigation measures [use **Section IV**]

Step 5: Provide undertaking to the EPA on mitigation measures and compliance [use **Section V**]

Completed form is to be submitted to the NWFP Environmental Protection Agency for evaluation. NWFP EPA may request for additional information or decide to undertake visit to the proposed project site in order to assess the environmental impact of the proposed project.

1.3 Glossary

Act means the Pakistan Environmental Protection Act, 1997

Coagulation means the use of chemicals (the coagulants) to make suspended solids to gather or group together to form larger masses or flocs, which can settle to the bottom

Dust are fine powdery material such as dry earth or pollen that can be blown about in the air

Environment means (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the inter-relationships between any of the factors in sub-clause (a) to (f).

Environmental Assessment a technique and a process by which information about the environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the planning authority in forming their judgments on whether the development should go ahead.

Filtration means subjecting any effluent to pass through a membrane or a layer of sand or gravel to separate the suspended particles

Impact on Environment means any effect on land, water, air or any other component of the environment, including any effect on the social and cultural environment or on heritage resources.

Liquid Effluent is the used water coming out of the stone crushing unit

Lime is the common name for oxides of calcium

Mitigation Measure means a measure for the control, reduction or elimination of an adverse impact of a development on the environment, including a restorative measure.

Noise is defined as unwanted sound; sound that is loud, unpleasant or unexpected.

Regulations means the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations, 2000

Suspended Solids are solid particles suspended in water that can be removed by filtration or settlement

Sedimentation means settling of particles by gravity

2. Project Profile

2.1 Project Description

Marble industry is an important industrial sector in the country engaged in producing finished goods such as tiles, tableware and decoration pieces The marble crushing units can be seen in the vicinity of almost all major cities and towns.

Marble processing is a simple process. Raw marble block, weighing several tones, is transported to the factory by road through trucks or tractor trolleys. It is unloaded in the storage are using fork-lift or through pulleys. The marble block is then cut in to smaller pieces or slabs on cutting machine. Both dry and wet cutting machines are used. Using various smaller machines and manual process the marble is finally brought to the desired shape depend on the product. Polishing is the last step in which various polishing buffs are used. Smaller pieces and waste from the process is crushed to make marble chip used in floor finishing. Marble dust is also marketed for use as abrasive.

2.2 Environmental Aspects

The major environmental aspects for marble crushing units are discussed for each of the process steps.

Raw and Finished Material Transportation

This activity can bring about significant increase in the noise levels in the vicinity of the marble unit due to the heavy transport deployed to bring the raw material to the site. The loaded trucks are also slow moving vehicles and if the access roads are not wide enough they can cause overall traffic slowdowns and congestion during peak hours. Further, the transport of raw and finished marble in bulk through open trucks also causes the emission of dusts into the air.

Cutting and Processing

The main aspects of these activities are generation of noise, dust and liquid effluent. Excessive use of freshwater in wet processing is another environmental aspect. These are discussed below:

- Dry cutting of marble results in generation of marble dust. Depending on the size of the operation and equipment the dust can spread locally and can affect the health of the community apart from being a general nuisance.
- Wet cutting and polishing uses water. The water containing marble dust, if discharged to the environment pollutes watercourses.
- In areas where water resources are limited, marble factories are competing with the local communities for the available water. Conservation, and re-use of water in these areas is critical.
- Dust emission, apart from being an environmental issue is also a serious occupational health hazard. The workers operating various machines and engaged in polishing of marble

pieces are exposed to unacceptable levels of dust.

- Marble cutting operation can be major source of noise pollution. Excessive levels of noise can cause nuisance to the surrounding community and can also be an occupational hazard.

2.3 Mitigation Options

Traffic Management

Location of plant has to be such that ingress of heavy vehicles does not block the traffic. Evening and late night operation is to be avoided if passage is through residential areas.

Dust Containment

- In general enclosures provided for dust control in equipment and conveyors are inadequate. Dust containment enclosures are required for the purpose of containing the emissions within an enclosure and to prevent wind currents, which can spread the dust to larger areas. Such enclosures are recommended for all areas where dry processing takes place.
- The enclosures should be, complete from all four sides and roof. There should not be open windows and other openings. The gaps should be sealed using gaskets or wool type packing etc.

Liquid Effluent Treatment

- Volume and strength reduction of the effluent is to be achieved by preventing mixing of waters from washing activities and processing activities
- Liquid effluent is to be treated by sedimentation process meaning subjecting the effluent to flow through settling tanks
- Effluent is to be treated by coagulation that is adding any coagulant to the settling tanks. Nevertheless, this treatment is expensive as compared to the sedimentation process yet it is more efficient.
- Effluent is to be treated by coagulation and filtration. Treated effluent can be reused but the treatment process is expensive comparatively.

Noise

- It is the responsibility of the factory owners to ensure that the operation of the marble factory does not cause nuisance for the community. Proper siting can eliminate many of the noise related issues.
  - If the factory is located in industrial area, it is less likely that sensitive receptors would be present in the surroundings.
  - If the proposed site of the factory is not in an industrial area, keeping a distance of at least 500 m from communities is desirable.
  - If the required distance cannot be maintained, or the land around the proposed site is designated for communities or other sensitive receptors, noise walls may required to prevent noise from the factory disturbing the existing or future communities.
- The recommended density of the noise walls is 10 kilogram per square meter. The height of the wall should

be such that a line drawn from the noise source to the wall and extend in the direction of the receptor should pass at least 2 meters above the receptor.

Occupational Safety

- Personal protective equipment should be provided to the workers. It is observed that often there is reluctance on the part of the workers to use the equipment. Inconvenience is generally cited as the main reason. All such complaints should be investigated and attempts should be made to identify the reason and rectify it. However, providing awareness about the long-term health effects of the dust and noise is very important. Worker who are aware of the safety and health hazards and are motivated will modify his their work habits and use PPE even if creates some inconvenience.

Environmental Assessment Checklist

Section I: Project Description

File No _____ (To be filled by EPA)

Date _____

General Information

1. Project Name or Title _____
2. Project Proponent (Department or Organization) _____
3. Address _____
4. Telephone _____
5. Fax _____
6. E-mail _____
7. Representative of the Proponent _____
8. Designation _____
9. Name of the person who conducted this assessment _____
10. Designation _____
11. Qualification _____

Project Information

12. Project Location _____
13. Cost of the Project _____
14. Area of the proposed land for the plant

    Total_____m^2

    Proposed covered _____m^2

    Open space _____m^2
15. Brief description of the plant_____

    _____

    _____

    _____

    _____

Please attach a plot plan of the proposed project site showing the location of the key structures, access, utilities, units, etc.

16. List key equipment of the plant_____
_____
_____
_____
17. Design production capacity of the unit _____
18. Number and qualification of required staff to run the unit? _____
_____
19. What will be the expected water requirement for the unit?_____ m^3/d
20. What is the proposed source of water? _____
21. Where will the wastewater from the unit be disposed?_____
22. Describe the type of material that will be discharged with the wastewater? ___
_____
_____
23. Please describe any treatment system for the wastewater planned?_____
_____
24. Type and quantity of raw material for the unit?_____
_____
25. What is the expected source of the raw material? _____
26. What are the expected operating hours? _____
27. Is night shift planned?_____
28. How many vehicles carrying raw material and finished product are likely to enter or leave the unit daily? _____

Construction

29. Who owns the proposed land for the project? _____
30. What is the present use of the land? _____
31. Are there any squatter settlements on the land? _____

    If yes, please specify

    Number of settlements_____

    Will any compensation be paid to them? _____
32. Are there any structures on the proposed site now? ☞ Yes ☞ No
33. If yes, will any structure be demolished? ☞ Yes ☞ No
34. If yes, where the demolition waste will be disposed? _____
35. Are there any trees on the proposed site? ☞ Yes ☞ No
36. Will any tree be removed? ☞ Yes ☞ No

If yes, how many?_____

37. Period of construction (start and end dates)_____

38. What major construction equipment (dozer, grader, crane, etc.) will be used?

_____

39. Is construction work during the night planned? ☞ Yes ☞ No

Section II: Screening

Is the proposed project located in an ecologically sensitive area?

☞ Yes ☞ No

Is the total cost of the proposed project Rupees 10 million or more?

☞ Yes ☞ No

If the answer to any of the above questions is yes, then the project would require an initial environmental examination or an environment impact assessment. Refer to the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations, 2000 for appropriate category.

Section III: Environmental Profile

1. Describe the terrain of the project area:
   - ☞ Flat or Level (Slope < 3%)
   - ☞☞ Level to moderately steep (Slope 3%-30%)
   - ☞☞ Moderately steep to mountainous (Slope > 30%)
2. Are there signs of soil erosion or landslide anywhere within 500 m of the proposed site?
   - ☞☞ Yes
   - ☞☞ No

   If yes, please describe (where, nature)_____

   _____
3. Is there any surface water body (river, canal, stream, lake, wetland) within 1,000 m of the proposed site?
   - ☞☞ Yes
   - ☞☞ No

If yes, describe each water body:

Name (including type, ie, river, canal or stream)	**Dimensions**	**Status and Uses** (Is it polluted? Is domestic or other wastewater discharged to it? What are its uses, eg, agriculture, domestic, industrial, washing, fishery

4. Is there any groundwater well on the proposed site or within 500 m of the proposed site?

☞☞ Yes

☞☞ No

If yes, describe each well:

Type (Dug well, tube well, hand pump	**Location** (Village, road, mohalla, etc. and distance from the site)	**Depth and Yield**	**Uses** (Drinking, agriculture, domestic, industrial, washing, livestock)

5. Based on the interview of the surrounding population or a wildlife expert, is any form of wildlife found on, or around the proposed site of the project?

☞ Yes ☞ No

If yes, please describe _____

_____

Person Interviewed_____

6. Are there any existing trees or vegetation on the proposed site?

☞ Yes ☞ No

If yes, how many?_____

7. Are there any reserved forest or protected area within 1,000 m of the proposed site?

☞ Yes ☞ No

If yes, please describe? _____

8. Please provide the traffic count for all main roads adjacent to the proposed site or roads that will provide access to the site. The count should be based on data collected, for both directions, on at least three typical working days. Use the following format:

Road _____ Count Location _____

	6:00 am-9:00 am	9:00 am-12:00 noon	12:00 noon-3:00 pm	3:00 pm-6:00 pm	6:00 pm-9:00 pm
Large vehicles (trucks, buses, tractor trolleys, Minibuses)					
Medium sized vehicles (Suzuki pickups, cars, jeeps, taxis)					
Small vehicles (Rickshaws, motorcycles, scooters)					
Slow vehicles (animal-driven carts, tongas)					
Others					

(*Please add additional sheets for every road*)

9. What is the present land use in the vicinity (roughly a radius of 500 m) of the proposed site?

	Residential (Thick, Moderate, Sparse)	**Commercial** (Office, Shops, Fuel Stations)	**Open Land** (Parks, Farmlands, unutilized plots, barren land	**Sensitive Receptors and Sites of Cultural Importance**	**Other**
Description					

(*Please attach a map of the proposed project site and indicate roughly the area that you have considered for this evaluation*)

10. For any agricultural farmland on the proposed site and a radius of 500 m around it, provide the following information:

    Main crop(s) and average yield _____

    Source of irrigation water _____

    Area affected by salinity or water logging_____

11. Please describe all the sensitive receptors within 500 m of the proposed site:

Type (schools, colleges, hospitals, and clinics)	**Name**	**Size** (Number of students or number of beds)	**Location** (Village, road, mohalla, etc.)	**Distance from Site**

12. Roughly, how many houses are within a radius of 500 m of the proposed site? _____

13. What proportion of the houses in the area are *pukka, semi-pukka, and* kutcha?_____

14. How are the general hygienic conditions of the project area?

    ☞☞ Generally clean

    ☞☞ Fair

    ☞☞ Poor

15. Is there any bad odor in the project area?

    ☞☞ Yes

    ☞☞ No

    What is the source of the odor? _____

16. What are the main sources of income of the surrounding community? _____

    _____

17. Is there any site of cultural importance (graveyard, shrine, mosque, archeological site) within 1,000 m of the proposed scheme?

    ☞☞ Yes

    ☞☞ No

    If yes, please describe? _____

18. What other main sources of pollution exist within a radius of 500 m of the proposed site:

Name of the Source	**Type of Pollution** (Noise, air water)	**Location** (Village, road, mohalla, etc.)	**Distance from Site**

Section IV: Impact Assessment

Potential Negative Environmental Impacts	*Tick, if relevant*	*Mitigation Measures*	*Tick, if proposed*	*Monitoring*
Siting	☞	Factory will not be located in an industrial zone	☞	
		Factory will not be located within 500 m of any community, educational institution or health facility		
Traffic	☞	Plant is located such that ingress of heavy vehicles does not block the traffic	☞	
Dust	☞	Dust containment enclosures will be provided	☞	
Noise	☞	Noise wall will be built	☞	
		Evening and late night operation of material and product trucks will be avoided	☞	
Wastewater	☞	Volume and strength reduction of the effluent is to be achieved by preventing mixing of waters from washing activities and processing activities	☞	
		Liquid effluent is to be treated by sedimentation process meaning subjecting the effluent to flow through settling tanks	☞	
		Effluent is to be treated by coagulation that is adding any coagulant to the settling tanks	☞	
		Effluent is to be treated by coagulation and filtration	☞	
Occupational safety	☞	Workers will be provided with protective equipments	☞	

Section V: Undertaking

I, _____ (*full name and address*) as proponent for _____ (*name, description and location of project*) do hereby solemnly affirm and declare:

1. The information on the proposed project and the environment provided in Forms I, II and III are correct to the best of my knowledge

2. I fully understand and accept the conditions contained in the Guidelines for _____
(*name, number and version of the guidelines*)

3. I undertake to design, construct and operate the project strictly in accordance with the project described in Form I, submitted with this undertaking.

4. I undertake to implement all mitigation measures and undertake monitoring stated in Form IV, submitted with this undertaking.

Date _____ Signature _____

Name _____

Designation _____

(with official stamp/seal)

Witnesses:

	Signature	Name	Address
1	_____	_____	_____
2	_____	_____	_____