

# NWFP Environmental Protection Agency

## Environmental Assessment Checklists and Guidelines

### Small Housing Schemes

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## 1. Introduction

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Housing is an obvious and pressing human need. Until quite recently, the formidable task of providing housing has overshadowed environmental considerations. However, with increasing pressure on land and resources has come a growing understanding of the major and severe environmental impacts generated by residential development.

### 1.1 Scope of the Guidelines

These guidelines are applicable to the developments of all formal housing schemes, government or privately

funded, having 20 or more units but less than 100 units.

### 1.2 How to Use These Guidelines

The project proponent (the local government, municipal government, city government, the cantonment board, private association or organization) is obliged to use these guidelines. The project proponent has to fill in an environmental impact assessment form. The following steps are to be taken in this regard:

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

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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

**Aesthetic Value/Aesthetic Quality** beauty or landscape (of an area)

**Contamination** introduction of impurities in the environment

**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).

**Endangered Species** a species in danger of becoming extinct

**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.

**Environmental Management** to carry out the developmental activities in sustainable manner

**Habitat** the general place or physical environment in which a population lives

**Impact on Environment** means any effect on land, water, air or any other component of the environment, as well as on wildlife harvesting, and includes any effect on the social and cultural environment or on heritage resources.

**Landslides** a slide of a large mass of dirt and rock down a mountain or cliff

**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.

**Project Proponent** a person, company, NGO or any agency that sponsors and promotes a project.

**Public Sector** that part of an economy, industry, etc., controlled by the State

**Private Sector** the part of an economy, industry, etc., which is free from direct State control

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

**Soil Erosion** physical removal of soil either by wind or by running water

**Siltation** accumulation of silt in a water body

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**Subsidence** the sudden collapse of land into a hollow beneath it

moisture, especially when regarded as the natural habitat of wildlife

**Wetland** A lowland area, such as a marsh or swamp, that is saturated with

## 2. Project Profile

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### 2.1 Project Description

Depending upon the needs of the local community and the local sociopolitical framework, housing may be provided by either the public or private sectors, or a combination of both. Housing projects come in several forms:

1. Unplanned informal projects where people convert their private land, mostly agricultural, to residential land. Although the houses in such housing schemes are usually well built, there is no overall town planning. Such schemes are characterized by lack of community facilities (such as open spaces, community centers, proper shopping areas, and transport facilities), narrow and rarely straight streets, poor sewage system, and being prone to flooding during rainfall due to poor drainage.
2. Squatter settlements often on encroached lands. Houses in these schemes are often poorly made. The general town planning conditions are often even worse than the first form discussed above. In some cases, government ultimately legitimizes the squatter settlements by providing services and legalizing ownership.

3. Government-sponsored or privately-owned housing project in which the builder not only does the town planning but also constructs the houses and sells the finished houses to the buyers.
4. Government-sponsored or privately-owned housing project in which the builder does the town planning, develops plots, constructs the amenities and sells the plots to the buyers. The owners of the plots then make their own arrangement to construct houses on the plots.

These guidelines are restricted to the third and fourth form discussed above.

For the purpose of environmental management the discussion in this guidelines are divided into following phases:

- ▶ Phase 1: Siting and design of housing schemes
- ▶ Phase 2: Site development and construction of amenities. This includes leveling, construction of roads, laying of sewer system and utility lines, and construction of mosques, community centers, parks and other common facilities.
- ▶ Phase 3: Construction of individual houses. For schemes where this is undertaken by the developer, this

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phase often coincides with the previous one and is completed in relatively short period, usually 2 to 3 years. If the houses are constructed by the owners of the plots, this activity starts after the completion of previous phase and the construction of houses in the entire scheme may take many years, sometime decades.

- ▶ Phase 4: Operation of housing schemes

tourism potential from poor siting of the project

- ▶ Increase in storm water run-off from the site and consequent increase in downstream flooding caused by excessive pavement or compaction of the site
- ▶ Potential social and cultural conflict between surrounding population and occupants of the proposed housing scheme due to differences in values

## **2.2 Environmental Aspects**

### ***Housing Scheme Siting and Design***

- ▶ Issues related to compensation for land and assets, particularly, if the land is acquired by the government from private owners
- ▶ Loss of prime agriculture land
- ▶ Destruction of forests, wetlands and habitats containing rare and endangered species of plant and animals
- ▶ Contamination of soil, surface water and groundwater from poorly planned sewage and solid waste management system
- ▶ Creation of breeding grounds disease vectors from poorly planned sewage and solid waste management system
- ▶ Change in traffic pattern and increased traffic load on roads that were designed for smaller traffic volume
- ▶ Increased erosion and risk of landslides from poor siting of the project
- ▶ Loss of aesthetic value of the location and consequently the

### ***Site Development***

- ▶ Vegetation removal and consequent erosion of land by water or wind
- ▶ Contamination of surface water from improper disposal of construction waste, runoff from on-site machine maintenance (oil change, refueling, washing) affecting surface and groundwater supplies; and lack of adequate sanitary facilities for construction workers.
- ▶ Siltation of surface water caused by runoff from earth left barren by removal of vegetation
- ▶ Dust from earthworks and wind-borne dust caused by removal of ground cover
- ▶ Noise and air pollution from construction equipment and vehicles
- ▶ Spread of diseases by creation of an environment favoring disease vectors, such as, standing water that may serve as a breeding ground for mosquitoes
- ▶ Lowering of aesthetic quality of the project area and its surrounding

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by improper disposal of construction waste

- ▶ Labor related issues such that jobs for local population and social conflicts between labors from other areas and the local population

**Construction of Individual Houses**

- ▶ Noise from construction activity is a nuisance to the surrounding residents, particularly if the construction is carried out during the night
- ▶ Blockage of road and streets from storage of construction material (bricks, sand and gravel) on the road
- ▶ Dispersion of sand and silt on the street by run-off, wind, and carryout with vehicle tyres
- ▶ Filth and stench and possible spread of disease vector due to lack of adequate sanitary facility for construction workers
- ▶ Lowering of aesthetic quality of the project area due to improper disposal of construction waste

**Operation**

- ▶ Groundwater and surface water contamination due to absence or inadequate maintenance of sewerage system
- ▶ Soil and surface water contamination caused by absence or inadequate maintenance of solid waste management system
- ▶ Erosion and siltation of surface water due to absence or inadequate maintenance of vegetation cover

**2.3 Mitigation Options**

Most of the environmental issues associated with the development of a housing scheme can be addressed if the scheme is designed on the principles of good environmental and engineering practices. Construction impact are usually more intense on a short time scale, however, many of these are often reversible.

In housing schemes where houses are constructed by individual homeowners, control on construction practices will be challenge. As project proponent, the developer of the scheme will be legally bound to implement the mitigation measures during the design and site development phases. However, once the scheme is developed the constructed or the plots will be handed over to individuals. In what form the environmental commitments can be transferred to the homeowners during construction of individual houses will require some additional legal tools. Similarly, once the construction of the scheme is complete its operation is taken over by a cooperative society. Any commitments for the operation phase may have to be transferred to the society. The development of these tools is beyond the scope of these guidelines. The options that are available include, amending the byelaws of the local government to include the condition that any construction of houses in housing scheme will comply with the conditions of environmental approval. Similar conditions can also be included in the cooperative housing society law for operations of housing schemes.

**Design and Planning**

Key elements of environmental sound design and planning are:

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- ▶ Compensate the landowners for their land loss
- ▶ Avoid ecologically sensitive areas
- ▶ Avoid prime agricultural areas
- ▶ Avoid steep slopes
- ▶ Use permeable paving to allow percolation of water back into the soil
- ▶ Stabilize steep slopes with vegetation
- ▶ Preservation and use of natural drainage patterns in lieu of piped or concrete channels with curbs and inlets
- ▶ Trees to be planted in streets
- ▶ Construct lined sewer systems to avoid seepage to the ground
- ▶ Plan access to the housing scheme to minimize impact on existing traffic. This may include widening existing road, providing access ramp and merge lanes from main road, etc.

### ***Scheme Development***

- ▶ Manage the work in a way to avoid siltation of water bodies. This may include construction of temporary check dams or settling ponds
- ▶ Avoid cutting and damaging vegetation as much as possible
- ▶ Replant recovered plants and local flora as soon as possible
- ▶ Cover pile with plastic sheeting, prevent runoff with hay bales or similar structures
- ▶ Sprinkle water to avoid dust dispersion
- ▶ Use mufflers on construction equipments to minimize noise

- ▶ Schedule work timings in order to avoid nuisance to the communities
- ▶ Solid waste produced during the construction should be collected and disposed off at a landfill
- ▶ Disposal of waste material in the water bodies is to be prohibited
- ▶ Provide temporary sanitary facilities for the workers
- ▶ Maximize use of local labor

### ***Construction of Houses***

- ▶ Provide temporary sanitation facility for workers
- ▶ Avoid dumping of construction material on the streets
- ▶ Avoid construction work during the night if houses close to the construction site are occupied

### ***Housing Scheme Operation***

- ▶ Ensure proper maintenance of sewerage system. This includes maintenance of sewer lines to avoid overflow and seepage.
- ▶ Ensure that the solid waste collection, segregation, and disposal system is functioning properly
- ▶ Ensure proper maintenance of vegetation cover to prevent erosion and siltation of surface water bodies

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## 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, organization, or owner) \_\_\_\_\_
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. Period of construction (start and end dates) \_\_\_\_\_
15. Scheme type  
 Government Sponsored       Private
16. The developer will provide:  
 Constructed houses       Housing Plots
17. Number of housing units in the proposed scheme \_\_\_\_\_
18. Brief Project Description \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*Please attach a map of the proposed project area*

19. Area of the housing scheme

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Total \_\_\_\_\_ m<sup>2</sup>  
Proposed covered \_\_\_\_\_ m<sup>2</sup>  
Open space \_\_\_\_\_ m<sup>2</sup>

20. Indicate what facilities will be provided in the scheme and the land use:

Housing units \_\_\_\_\_ m<sup>2</sup>  
Mosque \_\_\_\_\_ m<sup>2</sup>  
Paved roads \_\_\_\_\_ m<sup>2</sup>  
Unpaved roads \_\_\_\_\_ m<sup>2</sup>  
Parking lots \_\_\_\_\_ m<sup>2</sup>  
Community centers \_\_\_\_\_ m<sup>2</sup>  
Shopping areas \_\_\_\_\_ m<sup>2</sup>  
Parks \_\_\_\_\_ m<sup>2</sup>  
Other \_\_\_\_\_ m<sup>2</sup>

21. The total construction material that will be utilized? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

22. Land acquisition

The total area: \_\_\_\_\_  
Present ownership of land \_\_\_\_\_  
What is the present use of the land? \_\_\_\_\_  
How the land will be acquired (Through Land Acquisition Act or Direct Purchase)? \_\_\_\_\_  
When the compensation will be paid? \_\_\_\_\_

23. In case of state land, are there any squatter settlements on the land? \_\_\_\_\_

If yes, please specify

Number of settlements \_\_\_\_\_  
Will any compensation be paid? \_\_\_\_\_  
When the compensation will be paid? \_\_\_\_\_

24. Is construction work during the night planned? \_\_\_\_\_

25. How many trees will be removed for the construction of the scheme? \_\_\_\_\_

26. How many new trees will be planted? \_\_\_\_\_

27. Will the developer undertake landscaping and plant grass and ornamental plants for the entire scheme? \_\_\_\_\_



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28. Number and type of major equipment and vehicle that will be used \_\_\_\_\_

\_\_\_\_\_

29. Number and type of staff that will work on the project \_\_\_\_\_

\_\_\_\_\_

30. Describe the proposed sewerage disposal scheme:

Expected quantity of wastewater \_\_\_\_\_

Length and type of sewers \_\_\_\_\_

Any treatment system for the sewer \_\_\_\_\_

Proposed final disposal \_\_\_\_\_

31. What will be the source of water for the scheme? \_\_\_\_\_

32. Will natural gas be supplied? \_\_\_\_\_

### Section II: Screening

Is the proposed housing scheme or part of the proposed scheme located in an ecologically sensitive area?  Yes  No

Is the number of housing units in the scheme 100 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.

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**Section III: Environmental Profile**

1. Describe the terrain of the proposed site of the housing scheme:

- Flat or Level (Slope < 3%)
- Level to moderately steep (Slope 3%-30%)
- Moderately steep to mountainous (Slope > 30%)

2. Is there any surface water body (river, canal, stream, lake, wetland) within 1,000 m of the proposed scheme?

- Yes
- No

If yes, describe each water body:

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

3. 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? \_\_\_\_\_

4. Are there signs of soil erosion or landslide anywhere within 500 m of the project area?

- Yes
- No

If yes, please describe (where, nature) \_\_\_\_\_  
 \_\_\_\_\_

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

- Yes
- No

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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) |
|---------------------------------------|--|-----------------|--|
|                                       |  |                 |  |
|                                       |  |                 |  |
|                                       |  |                 |  |
|                                       |  |                 |  |

6. What is the present land use in the vicinity (roughly a radius of 500 m) of the proposed housing scheme?

|             | Residential<br>(Thick, Moderate, Sparse) | Commercial<br>(Office, Shops, Fuel Stations) | Open Land<br>(Parks, Farmlands, unutilized plots, barren land) | Industrial | Other |
|-------------|--|--|--|------------|-------|
| Description |  |  |  |            |       |

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

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

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Road \_\_\_\_\_ Count Location \_\_\_\_\_

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

*(Please add additional sheets for every road)*

8. 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 housing scheme?

Yes

No

If yes, please describe \_\_\_\_\_  
\_\_\_\_\_

9. 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 \_\_\_\_\_

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## Section IV: Impact Assessment

| <i>Potential Negative Environmental Impacts</i>                      | <i>Tick, if relevant</i> | <i>Mitigation Measures</i>  | <i>Tick, if proposed</i> | <i>Monitoring</i> |
|--|--------------------------|---|--------------------------|-------------------|
| Loss of environmentally important land (forests, wetlands, habitats) | <input type="checkbox"/> | Ecologically sensitive areas have been avoided  | <input type="checkbox"/> |                   |
|  |                          | Steep slopes have been avoided  | <input type="checkbox"/> |                   |
|  |                          | Prime agricultural areas have been avoided  | <input type="checkbox"/> |                   |
| Land and asset   | <input type="checkbox"/> | All landowners have been identified and a price negotiated, to the satisfaction of both parties | <input type="checkbox"/> |                   |
|  |                          | Compensation for all assets on the land will be paid at acceptable market rates                 | <input type="checkbox"/> |                   |
| Water pollution  | <input type="checkbox"/> | Wastewater will be treated before disposal  | <input type="checkbox"/> |                   |
|  |                          | Disposal of waste material in the water bodies will be prohibited                               | <input type="checkbox"/> |                   |
|  |                          | Lined sewer systems will be constructed to avoid seepage to the ground                          | <input type="checkbox"/> |                   |
|  |                          | Material piles will be covered with plastic sheeting to prevent runoff                          | <input type="checkbox"/> |                   |
| Air pollution  | <input type="checkbox"/> | Water will be sprinkled to avoid dust dispersion  | <input type="checkbox"/> |                   |
|  |                          | Material piles will be covered with plastic sheeting to prevent dust emission                   | <input type="checkbox"/> |                   |
| Solid waste  | <input type="checkbox"/> | Solid waste will not be disposed in open  | <input type="checkbox"/> |                   |
|  |                          | Solid waste collection system will be developed   | <input type="checkbox"/> |                   |

*Continued...*

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| <i>Potential Negative Environmental Impacts</i>                           | <i>Tick, if relevant</i> | <i>Mitigation Measures</i>   | <i>Tick, if proposed</i> | <i>Monitoring</i> |
|---|--------------------------|--|--------------------------|-------------------|
|   |                          | Solid waste produced during the construction will be collected and disposed off at a landfill        | <input type="checkbox"/> |                   |
| Erosion and siltation   | <input type="checkbox"/> | Steep slopes will be stabilized with vegetation  | <input type="checkbox"/> |                   |
|   |                          | Work will be managed in a way to avoid siltation of water bodies                                     | <input type="checkbox"/> |                   |
|   |                          | Temporary check dams will be constructed   | <input type="checkbox"/> |                   |
|   |                          | Natural drainage patterns will be preserved and used, as much as possible, for storm water discharge | <input type="checkbox"/> |                   |
|   |                          | Permeable pavement will be used to allow percolation of water back into the soil                     | <input type="checkbox"/> |                   |
| Removal of vegetation   | <input type="checkbox"/> | Vegetation cutting and damaging will be avoided as much as possible                                  | <input type="checkbox"/> |                   |
|   |                          | Recovered plants and local flora will be replanted as soon as possible                               | <input type="checkbox"/> |                   |
|   |                          | Tress will be planted by the developer   | <input type="checkbox"/> |                   |
| Noise   | <input type="checkbox"/> | Mufflers will be used on construction equipments to minimize noise                                   | <input type="checkbox"/> |                   |
|   |                          | Work timings will be scheduled in order to avoid nuisance to the communities                         | <input type="checkbox"/> |                   |
| Congestions of the existing roads and access points/<br>Increased traffic | <input type="checkbox"/> | Access to the housing scheme is planned to minimize impact on existing traffic                       | <input type="checkbox"/> |                   |
|   |                          | Existing access road will be widened   | <input type="checkbox"/> |                   |

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...Continues

| <i>Potential Negative Environmental Impacts</i>          | <i>Tick, if relevant</i> | <i>Mitigation Measures</i>   | <i>Tick, if proposed</i> | <i>Monitoring</i> |
|--|--------------------------|--|--------------------------|-------------------|
|  |                          | Access ramp and merge lanes will be provided on the main road                          | <input type="checkbox"/> |                   |
| Shortages and wasteful exploitation of natural resources | <input type="checkbox"/> | Workers will be trained about the efficient use of the raw materials to avoid wastages | <input type="checkbox"/> |                   |
| Construction of houses                                   | <input type="checkbox"/> | Temporary sanitation facility will be provide for workers                              | <input type="checkbox"/> |                   |
|  |                          | Construction material will not be dumped on streets                                    | <input type="checkbox"/> |                   |
|  |                          | Construction work will be avoided during the night                                     | <input type="checkbox"/> |                   |
| Labor  |                          | Use of local labor will be maximized   | <input type="checkbox"/> |                   |

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**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

\_\_\_\_\_