



MINISTRY OF ENVIRONMENT AND NDU

ENVIRONMENTAL GUIDELINE No. 15

Refining and processing of edible oils and fats

1.0 Purpose of guideline

This environmental guideline for the setting up of a plant for the refining and processing of edible oils and fats has been prepared by Ministry of Environment & NDU to ensure that all environmental issues are duly taken into consideration by stakeholders.

2.0 Nature of development

The refining process for edible oils consists principally of removing undesirable impurities most commonly through the following steps:

- **Neutralisation** – removal of free fatty acids with caustic soda whereby a soapstock (residue) is formed in the process. The soapstock is removed from the oil by a centrifuge and washing of the oil is also carried out.
- **Bleaching** – Heating of oil with bleaching earth to remove colour. After bleaching, the earth is removed from the oil by filtration.
- **Deodorisation** – Steam is passed through the oil to remove odours. The resulting product is cooled and filtered. A refined and transparent oil is then obtained.

3.0 Potential impacts

The major environmental issues associated with an oil refining plant are odour, noise, air pollution and effluent generation. The different aspects, impacts and nuisances associated related to such activities are listed below:

Activity	Aspects	Impacts/ Nuisances
Construction phase		
Site preparation / Construction of buildings (where applicable)	- Generation of excavated soil , debris and construction wastes - Use of heavy machinery	-Dumping into barelands, water bodies and drains -Dust, noise and mud -Visual impacts
Operation phase		
Movement of vehicles	- Generation of noise - Generation of smoke	- Nuisance to the neighbourhood - Air pollution - Traffic implication

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Refining process	- Generation of solid wastes, wastewater and sludge - Generation of volatile organic compounds	- Land and water contamination - Odour
Generation of steam through the use of boilers	- Combustion of fuels	- Air pollution - Noise pollution
Storage of fuels	- Fuel spillage	- Land and water contamination - Fire

4.0 Siting of activity

The processing plant should be located outside residential areas.

5.0 Environmental conditions

The major environmental issues are **odour, noise, air pollution and effluent disposal** and the following conditions shall be observed:-

- (i) All electric motors such as stand-by generator and compressors shall be housed in soundproof enclosures to keep noise level within permissible limits as per the Environment Protection (Environmental Standards for Noise) Regulations 1997. The noise exposure limits as per the above regulation are as follows:

Industrial noise		Neighbourhood noise	
7:00 – 21:00	60*dB(A) Leq	7:00 – 18:00	60 dB(A) Leq
21:00 – 7:00	55*dB(A) Leq	18:00 - 21:00	55 dB(A) Leq
		21:00 – 7:00	50 dB(A) Leq

* A tonal character adjustment of +5 dB(A) should be applied to the measured value where the noise has a definite continuous note such as a whine or hiss.

- (ii) Flue and odorous gases shall be channeled through ducts connected to a chimney stack which shall be designed as per good engineering practices.
- (iii) All gaseous emissions from the bakery shall be within permissible limits as per the Environment Protection (Standards for Air) Regulations 1998. The stack emissions standards applicable to this undertaking are:

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Pollutant	Standard
(i) Smoke	Ringelmann No. 2 or equivalent opacity (not to exceed more than 5 minutes in any period of one hour)
(ii) Solid particles	200 mg/ m ³
(iii) Sulphuric acid mist or sulphur trioxide	120 mg/ m ³ as sulphur trioxide
(iv) Hydrogen sulphide	5 ppm as hydrogen sulphide gas
(v) Nitric acid or oxides of nitrogen	1 000 mg/ m ³ as nitrogen dioxide
(vi) Carbon monoxide	1 000 mg/ m ³ as carbon monoxide

- (iv) Exhaust steam from the deodorisation process shall be condensed and treated to eliminate odours.
- (v) All hazardous wastes shall be collected and disposed of as per Environment Protection (Standards for Hazardous Wastes) Regulations 2001.
- (vi) All petroleum products and dangerous chemicals must have secondary containment. Areas enclosed by secondary containment shall be maintained, and all accumulated water within secondary containment areas should be disposed of. The secondary containment shall have a storage capacity of 110 % of the capacity of the storage tank.
- (vii) A contingency plan as provided for under section 30 (3)(a) of the Environment Protection Act 2002 shall be prepared and implemented to combat any case of accidental spillage of fuels or chemicals.
- (viii) All solid wastes generated from the plant shall be collected and disposed of.
- (ix) All waste packaging and by-products including fatty acids or soapstock shall be reused and recycled.
- (x) Wastewaters shall be collected, treated and disposed of.
- (xi) No nuisance by way of noise, odour and air pollution shall be caused to the public and surrounding environment during site preparation, infrastructural works and during operation of the activity.
- (xii) The Department of Environment of the Ministry of Environment and NDU shall be informed in writing of the dates of commencement of works on site and operation of the activity for monitoring purposes.

6.0 Enforcement

Under Section 13 of the Environment Protection Act 2002, the enforcing agencies for the different environmental medium or pollutants are as follows:

S. No	Environmental media/ pollutant	Enforcing Agency
1	Noise, odour	Ministry of Health and Quality of Life
2	Effluents	Ministry of Public Utilities
3	Hazardous and solid wastes	Ministry of Local Government
4	Air pollution	Ministry of Environment

The above-mentioned enforcing agencies shall monitor compliance with the conditions falling under their purview.

7.0 Offences

As per section 85 of the Environment Protection Act 2002, any person who contravenes this act or any regulations made thereunder shall commit an offence, unless it is otherwise specifically provided, shall:-

- (i) on a first conviction, be liable to a fine not exceeding 50, 000 rupees and to imprisonment for a term not exceeding two years.
- (ii) On a second or subsequent conviction, be liable to a fine not exceeding 100,000 rupees and to imprisonment for a term not exceeding 8 years.

For further information, please contact

Information Counter,
Department of Environment,
Ground Floor Ken Lee Tower,
1, St Georges Street
Port-Louis

Tel: 203 6200-203 6210

Website : <http://environment.gov.mu>

Email : menv@mail.gov.mu