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NATIONAL ENVIRONMENTAL (BASE METALS, IRON AND
STEEL MANUFACTURING/RECYCLING INDUSTRIES SECTOR)
REGULATIONS, 2011



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S. L. No. 14 of 2011

**NATIONAL ENVIRONMENTAL (BASE METALS, IRON AND
STEEL MANUFACTURING/RECYCLING INDUSTRY SECTOR)
REGULATIONS, 2011**

In exercise of the powers conferred on me by section 34 of the National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007 and all other powers enabling me in that behalf, I, MR JOHN ONEY, Honourable Minister, Federal Ministry of Environment hereby make the following Regulations.

[28th Day of April, 2011]

PART I—GENERAL PROVISIONS

1. The principal thrust of this Regulations is to prevent and minimize pollution from all operations and ancillary activities of the sector in the Nigerian Environment.

2. Every Facility shall be given equal treatment without preference as far as enforcement of relevant laws and inspections are concerned.

3.—(1) Every facility, corporation or organisation shall :

(a) carry out Environmental Impact Assessment (EIA) for new projects or modification including expansion of existing ones before commencement of activity ;

(b) submit Environmental Audit Report (EAR) for existing industries every 3 years.

(c) submit Environmental Management Plan (EMP) as contained in Schedule XI to these Regulations.

(2) New facility, corporation or organisation in this sector shall apply up-to-date, efficient "cleaner production" technologies to minimize pollution to the barest degree practicable.

4.—(1) Every facility, corporation or organisation shall plan and set up machinery for combating pollution hazards and adequately maintain equipment in the event of an emergency

(2) Every facility, corporation or organisation shall for the purposes of paragraph 4 above, have an emergency plan and a stock of pollution response equipment which shall be readily accessible and available to combat pollution hazards in the event of accidental discharges.

(3) Every facility, corporation or organisation shall put in place a functional Emergency Response Plan which shall describe measures to be taken in respect of discharge of deleterious substance(s).

Commencement.

Thrust.

Environmental Governance.

Planning.

Emergency Response Plan.

(4). The emergency procedures shall include such details as prescribed in Schedule X to these Regulations.

Pollution
Abatement
Equipment.

5.—(1) Every facility, corporation or organisation shall install anti-pollution equipment for detoxification of effluent, emissions and chemical discharges emanating from the facility to meet the prescribed effluent and emission permissible limits.

(2) Every installation made pursuant to sub-regulation (1) of this regulation shall be based on the Best Practicable Environmental option, Cleaner Production and Green Technologies to reduce pollution to meet with the minimum national standards as may be certified by the Agency.

Polluter-
Pays-
Principle.

6.—(1) The Polluter-Pays-Principle shall apply to every facility that pollutes the environment in the course of their operations.

(2) The collection, treatment, transportation and final disposal of wastes shall be the responsibility of the facility generating the wastes within extant standards and guidelines.

(3) In the event of an incident resulting in adverse impact on the environment, whether socio-economic or health wise, the facility shall be responsible for:

- (a) The cost of damage assessment ;
- (b) Damage, control and clean-up ;
- (c) Remediation ; and
- (d) Reclamation or restoration ;

Best
Practices/
Waste
Minimisation.

7.—(1) Every facility, Corporation or Organisation shall ensure the adoption of the 5 Rs which are : Reduce, Repair, Reuse, Recycle and Recover in the management of scraps generated in the course of production.

(2) Every facility, Corporation or Organisation shall, in addition to sub-regulation (1) of this Regulations, ensure that pollution prevention programmes are directed towards efficient use of :

- (a) Process chemicals ;
- (b) Reduction and recycling of water ; and
- (c) Energy.

(3) Every facility, corporation or organisation shall implement programmes on best practices as prescribed in Schedule IV to these Regulations or assign the responsibility for pollution control to a person or body corporate accredited by the Agency.

(4) Every facility, corporation or organisation shall ensure that employees are protected from exposure to hazardous conditions in the place of work.

(5) Every facility, corporation or organisation shall provide Personal Protective Equipment (PPE) for their employees working in hazards prone sections as outlined in Schedule IV to these Regulations.

8. Every facility, corporation or organisation shall prepare a voluntary action programme for global warming control measures. Such measures shall take into account energy-saving and best available technology in their production processes. The voluntary action shall be as prescribed in schedule V to these Regulations.

Global
Warming
Control.

9. Every facility, corporation or organisation shall control Volatile Organic Compounds (VOC) as prescribed in schedule VI to these Regulations.

Volatile
Organic
Compound.

10.—(1) Every facility, corporation or organisation shall put in place organizational system for pollution control and shall assign environmental pollution control and prevention duties to an Environmental Manager (EM) as prescribed in Schedule XV to these Regulations.

Pollution
Control
Organisational
System.

(2) Capacity building training and workshops including courses on pollution prevention, control and assessments shall be conducted to help environmental/pollution control managers and operators to obtain required qualifications and certification by the Agency (as prescribed in Schedule XV of these Regulations).

11.—(1) Every facility, corporation or organisation shall have Pollution prevention and control measures as prescribed in Schedule VIII to these Regulations and shall further include :

Polution
Prevention.

(a) Separating metal dust or scrap by type to promote recovery and recycling ;

(b) Reducing, treating and recycling slags from smelting ;

(c) Recycling and sand reclamation in moulding operations to reduce environmental pollution ;

(d) Recycling of iron filings, chips, rejects and metallic oxide scales from machining, forging and mechanical finishing operations ; and

(e) Recycling for recovery of valuable metals or disposal of sludge from surface finishing processes, including galvanizing, painting, hot dip galvanizing and aluminizing of metals.

(2) Every facility shall have a waste water treatment plant attached to it.

(3) Every facility, corporation or organisation shall take inventory of scraps emanating from its production processes.

(4) A copy of the inventory shall be submitted to the Agency quarterly for control measures.

(5) A standard warehouse shall be constructed for safety of scraps for easy evacuation.

(6) Every facility shall ensure a proper segregation of waste.

(7) Every facility, corporation or organisation shall control acids/metals content in mists and fumes emission as prescribed in Schedule VIII to these Regulations.

Extended
Producer
Responsibility.

12.—(1) Every manufacturer and importer shall subscribe to an Extended Producer Responsibility Program as outlined in Schedule XII to these Regulations.

(2) The Agency shall work with the sector to achieve the Extended Producer Responsibility Program within the period of three years.

Chemical
Usage.

13.—(1) Every facility, corporation or organisation shall submit, on quarterly basis to the nearest office of the Agency the following information :

(a) List of chemicals used in the manufacture of its products including the Material Safety Data Sheet (MSDS) ;

(b) Details of stored chemicals and storage conditions ;

(c) List of obsolete, expired or abandoned chemicals and the proposed plan for their environmentally sound management ;

(d) The local sources of listed precursor chemicals utilised ; and

(e) The sources of listed precursor chemicals imported by the facility, organization or body corporate.

(2) Every facility, corporation or organisation shall ensure the :

(a) Minimization of the use of organic solvents ; and

(b) Use of Ozone-Depleting Substances as prescribed under Schedule XXI to these Regulations.

Restricted
Chemicals.

14.(1) Use of Restricted chemicals listed under Schedule IX to these Regulations must be with a permit from the Agency.

(2) A facility, corporation or organisation shall not use Hexavalent chromium for plating. Other chemicals such as trivalent chromium should be used as substitutes.

Permit.

15.—(1) A facility, corporation or organisation shall not undertake any of the following without a permit from the Agency :

(a) Discharge or cause to be discharged any effluent, oil or grease in any form into a water body, public drains, underground injection and land.

(b) Use Chlorine-based chemical in the production process.

(c) Release hazardous or toxic substances into the air, water or land of Nigeria's ecosystem beyond the permissible limits as prescribed in Schedule I to these Regulations.

(d) Release Persistent Organic Pollutants (POPs) into the ambient air.

(e) Engage in the operation of activities as Prescribed in schedule XIV to these Regulations.

(2) Application for permit shall be made in the form set in Schedule XVI to these Regulations and as set out in the National Environmental (Permitting and Licensing System) Regulations, 2009, S.I. 29.

16.—(1) Every facility, corporation or organisation shall ensure that there is no contamination arising from leakage of surface/underground oil/fuel or chemicals storage tank likely to cause pollution of the environment including surface water and groundwater.

(2) Every facility, corporation or organisation shall have an impermeable base for all ancillary equipment and provide an appropriate bund wall in the event of any unanticipated discharge or spillage.

(3) Every facility, corporation or organisation with underground tanks and fuel dumps shall be installed with leak detection equipment and shall be regularly inspected for leakages to prevent leakage into ground water.

17.—(1) The National Environmental Standards in relation to effluent limitations for the sector shall be as prescribed in Schedule I to these Regulations ;

(2) Any effluent shall be deemed to be non-compliant and polluted where :

(a) The concentration of any of its parameters exceeds the permissible limits as specified in Schedule I to these Regulations ;

(b) It does not comply with the corresponding limit specified in the Schedules I to these Regulations as the case may be ;

(c) It is discharged from a facility without appropriate pre-treatment.

(3) The effluent described under sub-regulation (2) of this regulation shall not be discharged from a facility, without pre-treatment to national standards as prescribed in Schedule 1 to these Regulations.

Management
of
Chemicals,
Oil Station
and Fuel
Dumps.

Effluent
Limitation
Standards.

Restriction
on the
release of
toxic
effluent.

18.—(1) A facility, corporation or organisation shall not discharge effluent onto land, into a watercourse or water body unless the facility ensures that the parameters of the effluent do not exceed the permissible limits as prescribed in Schedule I to these Regulations.

(2) Notwithstanding sub-regulation (1) of this Regulation, any facility, corporation or organisation using an influent, the limits of concentration or value of any of the parameters which exceeds the permissible limit for that parameter as prescribed in Schedule I to these Regulations, shall ensure that the concentration or value of the parameters of the effluent conforms to the prescribed standard.

(3) Disposal of hazardous waste on water or land without prior treatment is prohibited.

Effluent
Treatment.

19.—(1) Every facility, corporation or organisation that discharges effluent into the environment shall treat the effluent to the permissible limits as prescribed in Schedule I to these Regulations

(2) Every facility, corporation or organisation shall :

(a) Carry out effective treatment, all the time that the plant or unit is operating.

(b) Ensure that Environmentally Sound Management of sludge containing heavy metals or other toxic materials are disposed in a designated disposal site/landfill by the appropriate Regulatory Authority.

(c) Ensure the treatment and disposal of toxic organics contained in both effluent and sludge as approved by the Agency.

(d) Ensure that effluent is not diluted to achieve the standards contained in Schedule I to these Regulations.

(e) Subject wastes that contain toxic organics to thermal treatment to effectively destroy or remove over 99.99% of toxic organics and the resulting residue shall be disposed of in an environmentally sound manner as prescribed by the Agency.

3. Every facility, corporation or organisation shall comply with the Hazardous Waste Management Guidelines prescribed in Schedule XIII to these Regulations

Sludge
Disposal.

20.—(1) A facility, corporation or organisation shall not discharge sludge directly into any water body. Any discharge to any part of the environment is prohibited except under a sludge disposal licence.

(2) Sludge disposed onto land shall be classified and none of its components shall exceed the prescribed limit in Schedule II to these Regulations.

(3) Any other sludge beside purely domestic Organic sludge and purely agricultural Organic sludge shall be treated as hazardous waste.

(4) Hazardous Sludge shall be treated and disposed off in a secure landfill approved by the Agency.

21. Every facility, corporation or organisation shall comply with the Emission Standards as prescribed in Schedule III to these Regulations.

Emission
Control.

22.—(1) Every facility, corporation or organisation with any source or potential source of emission shall measure the emission of every priority air pollutant emitted, develop and implement a plan to control such emission in accordance with the Standard prescribed in Schedule III to these Regulations.

Priority Air
Pollutants.

(2) Every facility, corporation or organisation shall be required to report the emission data, sources of emissions and undertake emission reduction in accordance with the implementation plan which shall be reviewed every three years by the Agency.

(3) Every facility, corporation or organisation shall ensure that it measures the odour detection threshold and the odorous dilution ratio of the working environment or emissions.

(4) Every facility, corporations or organisations shall adopt the dilution method of testing odours such as the American Society for Testing Materials (ASTM) or any other method as may be specified by the Agency to safeguard the health of the workers.

23.—(1) A facility, corporation or organisation shall not burn light oil fuel containing over 0.5 percent sulphur by weight as fired in an existing source or in a new source.

Burning of
Fuels.

(2) A facility, corporation or organisation shall not burn medium oil fuel containing over 1.1 percent sulphur by weight as fired.

(3) Notwithstanding subregulation (1) of this regulation heavy fuel oil with not more than 3% sulphur may be burnt at a new or existing facility with new fuel combustion sources or a combination of new and existing fuel combustion sources if :

(a) One or more of such sources operate in a manner that sulphur dioxide is absorbed by coming into contact with the product or with a scrubbing device or other material ; and

(b) The total sulphur dioxide emission from the entire facility is less than the allowable sulphur dioxide emission.

Abatement
Technology/
Treatment.

24.—(1) Every facility, corporation or organisation that discharges gaseous emissions shall reduce emissions to the permissible level as prescribed in Schedule III using appropriate reduction technologies as listed in Schedule XX to these Regulations.

(2) Reduction can be achieved through minimizing the release of significant pollutants to the air by adopting the measures prescribed in Schedule XX to these Regulations.

Atmospheric
Emissions
Permit.

25.—(1) Every facility, corporation or organisation with activities connected with those listed in Schedule XIV to these Regulations shall require an atmospheric emission permit before operation.

(2) The Agency shall, notify the operators of any of the following amendments :

(a) Adding to the list of activities in addition to those contemplated in Schedule XIV to these Regulations ;

(b) Removing activities from the list ; or

(c) Making changes to particulars on the list.

Noise
Standards.

26. Every facility, corporation or organisation shall evaluate its installations and ensure that routine controls are sufficient to prevent risks of noise pollution.

Noise
Abatement.

27. Noise abatement measures shall be in place to achieve either the levels prescribed or a maximum increase in background levels of 3 decibels (measured on the A scale) [dB(A)].

Hearing
Conservation
Programme.

28.—(1) Every facility, corporation or organisation shall administer a continuing, effective hearing conservation programme, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 90 decibels measured on the A scale (slow response) or, equivalent to a dose of 80 as stipulated by Occupational Safety and Health Act (OSHA 18001) as in Schedule XIX to these Regulations.

(2) For purposes of the hearing conservation programme, employee noise exposures shall be computed, regardless of the provision and the use of Personal Protective Equipment.

(3) An 8-hour time weighted average of 90 decibels shall be referred to as the action level.

Monitoring.

29. Any change in production process shall be communicated to the Agency and monitoring shall be repeated whenever a change in production, process, equipment or control, increases noise exposures to the extent that :

(i) additional employees may be subjected to risk at the action level ; or

(ii) the attenuation provided by hearing protectors being used by employees may be rendered inadequate to meet requirements of subregulation (1) of regulation 28 of these Regulations.

30. Every Facility, Corporation or Organisation shall have a sustainable community relations programme.

Community Relations.

PART II—SAMPLING PROCEDURES

31. For the purposes of determining licence classification and licence compliance, the facility, corporation or organisation shall examine samples according to standard analytical methods in a laboratory accredited by NESREA.

Collection and Analysis of Samples.

32. A spot sample for the purpose of analysis for all the tests including oil and grease, dissolved oxygen, pH, chlorine and sulphide shall be taken as follows:

Spot sampling for physical or chemical parameters.

(a) The whole sample volume is to be taken at one time, at the point of discharge or, if the discharge has stopped, at the nearest practicable point within zero to one kilometre upstream and downstream of the point of discharge; and

(b) The sample shall be analysed immediately after collection where possible but not later than 24 hours after taking the sample and the whole sample volume shall be used.

33. A composite sample for the purpose of analysis for all tests other than those for temperature and pH shall be taken by combining individual samples as follows:

Composite sampling for physical or chemical parameters.

(a) A minimum of five samples of equal volume of not less than 500 ml each shall be taken at the point of discharge or, if the discharge has stopped, at the nearest practicable point within zero to one kilometre upstream and downstream of the point of discharge, at approximately equal intervals of time over a minimum period of four hours within any 24 hour period:

(b) Two of the composite samples, collected when the discharge has been stopped, will be used to prove the source and extent of pollution;

(c) The samples shall be kept as cool as at site conditions licence. Sample analysis shall commence not later than 24 hours after taking the last sample; and

(d) Where the discharge has stopped or is intermittent, two grab samples shall be collected at the nearest practicable point within zero to one kilometre upstream and downstream each of the point of discharge.

Sampling for licence classification.

34. The whole volume of sample for spot and further laboratory analysis shall be taken at one time at the point of discharge.

Sampling for other parameters.

35. Where full laboratory facilities do not exist on a site, the oxygen in the sample may be "fixed" at the time of sampling by adding any of the following agents : alkaline azide, sulphuric acid, permanganate, oxalate, manganous sulphate and alkaline iodide or any other approved scientific method provided that—

(a) the stopper of the sample container shall be replaced and the solution shall be well mixed ;

(b) the remaining steps shall be carried out later in the laboratory.

Sampling for Micro-biological analysis.

36.—(1) When a number of samples for different purposes are to be taken from the same sampling point, the following precautions are to be observed—

(a) The sample for bacteriological examination shall be collected first unless special investigations are necessary ;

(b) Samples for bacteriological examination shall be kept strictly separate from all others to avoid contamination ;

(c) Boxes for the transportation of samples shall be made of materials that can be disinfected regularly, and they shall not be used for carrying anything other than samples of water for bacteriological examination.

(2) Sterile bottles used exclusively for bacteriological purposes that are fit for immediate use shall be provided by the laboratory performing the examination.

(3) Officers must ensure that the volume of each sample is at least 500 ml, and that at least one sample is taken at each sampling point.

Air Sampling for Analysis.

37.—(1) Measurements of air quality parameters shall take place at any facility, downwind and upwind.

(2) Measurement of total suspended particulate shall be by gravimetric method using air sampler as follows :

(a) A three sampling period (morning 8-10am, afternoon 12-2pm and evening 4-6pm) shall be adopted ; and

(b) The heavy metals level of total suspended particulate shall be determined using any referenced standard method.

(3) Gaseous pollutants shall be measured by any of the following or as approved by the Agency :

(a) passive sampling method shall require the submission of analysis certificate along with results and a minimum of three sampling periods (1-hour, 24-hour and 30-day) shall be adopted as appropriate.

(b) active sampling for NO_x shall use the Saltzman or any other standard method ;

(c) active sampling for SO_2 shall use the West-Gacke, hydrogen peroxide/ conductimetry or any other standard method.

(d) active sampling for hydrocarbons shall use the adsorption on activated charcoal method ; or

(e) continuous sampling of any gaseous air pollutant shall use instrument with detection range accommodating the maximum allowable limit of measured parameter and the measurement shall last for at least 1 hour in every sampling location.

38.—(1) Noise levels shall be measured with instrument having both A and C weighting, a resolution not more than 0.1 dB and fast/slow responses.

Noise
Measure-
ments.

(2) Measurement shall be taken at least 3 metres from any barrier or other sound reflecting sources, at about 1.2-1.5 metres above ground level or working platform and shall last for at least 10 seconds.

(3) Daytime (06:00-18:00) and night time (18:00-6:00) measurements shall be taken at the fence line of any facility.

PART III—PERMITS (GENERAL PROVISION)

39. Procedures for application for issuing of permits and revocation of such permits where they have already been issued, are as contained in the National Environmental (Permitting and Licensing System) Regulations, 2009, S.I.29.

Procedures
for Permitting
and
Licensing.

PART IV—INDUSTRIAL EFFLUENT/AIR EMISSION MONITORING AND REPORTING

40.—(1) The Permit holder subject to categorical standards shall comply with reporting requirements under the Agency's Permit including (but not limited to) Incidence Report and Monthly Effluent/Emission Data Sheet to the Agency's Field Offices.

Reporting
Requirements.

(2) A permit holder shall submit monthly report to the Agency.

(3) The report shall be based on sampling analysis performed in the period covered by the report and all reports shall be in compliance with format as prescribed in Schedule XVII to these Regulations.

(4) The Permit holder shall report all sample results for parameters listed on the Monitoring Requirement, on the Industrial/Commercial Effluent/Emission Discharge Monitoring Report forms as prescribed in Schedule XVII to these Regulations.

(5) The Permit holder shall install monitoring equipment to facilitate accurate observation, sampling and measurement of the quality of waste discharges as required by the permit and such equipment shall be in working order and accessible to all authorized officials at all times.

(6) The Permit holder discharging or proposing to discharge effluent to a general sewer or treatment plants shall maintain the following :

- (a) records of production,
- (b) water consumption and discharge flow records,
- (c) complete monitoring records as specified in these Regulations,
- (d) process monitoring records,
- (e) incident reports,
- (f) waste handling records: and any other records necessary to demonstrate compliance with these Regulations.

(7) The Permit holder shall be required to file reports with the Agency if the Permit holder :

- (a) commits a serious violation or fails to submit a completed Monthly Effluent Data Sheet ;
- (b) exceeds an effluent limitation for the same pollutant at the same discharge point source by any amount for four out of six consecutive months ; and
- (c) has any discharges that could cause problems to the Environment, including any sludge loadings.

Authorized
Signatory.

41.—(1) The Permit holder shall sign the report and attach a copy of the Certificate of analysis from the Agency's accredited laboratory.

(2) Each report must be signed by the appropriate Officer.

(3) All reports shall include the following certification statement :

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. This information submitted is, to the best of my knowledge and belief, true, accurate, and complete".

Monitoring
Records.

42. All records shall be made available to the Agency, and shall be retained for a minimum of ten(10) years and throughout the course of any pertinent litigation thereafter.

Fee.

43.—(1) The Agency shall adopt charges and fees that shall include :

- (a) fees for processing application for permit ;

(b) fees for reviewing accidental discharge, prevention procedures and construction ;

(c) other fees as the Agency may deem necessary to carry out the requirements contained herein which may include emergency incident response and cost of personnel and equipment.

(2) These fees relate solely to the matters covered by these Regulations and are separate from all other fees chargeable by the Agency.

44. Public access to records shall be governed by NESREA Act and effluent constituents and characteristics, shall not be recognized as confidential information to the Agency.

Confidential
Information
and Public
Access to
Records.

PART V—ENFORCEMENT

45.—(1) An enforcement notice shall be served on an Operator where the Agency is of the opinion that the operator has contravened, is contravening or is likely to contravene any condition of the permit.

Enforcement
Notices.

(2) An enforcement notice shall specify the—

(a) matters constituting the contravention or the matters making it likely that the contravention will arise, as the case may be ;

(b) steps that must be taken to remedy the contravention or to remedy the matters making it likely that the contravention will arise, as the case may be; and

(c) period within which those steps must be taken.

(3) Sub-regulation (2) of this regulation shall apply whether or not the particular manner of operating the facility in question, is regulated by or contravenes a condition of the permit.

46.—(1) Any Operator who fails to comply with the terms of the enforcement notice issued pursuant to Regulation 45 of these Regulations shall attract the service of a second notice.

Enforcement
Notice
Reminder.

(2) Failure to comply with the second notice (reminder) within the specified time limit will lead to the issuance of a suspension notice or any other punitive action as may be necessary.

47. The mode of delivery of the enforcement notice shall be by hand, registered post or courier, electronic transmission, or posted at the facility or registered premises of the organization.

Mode of
Delivery.

48.—(1) Where a suspension notice is served under these Regulations the permit shall, on the service of such notice, cease to have effect as stated in the notice.

Suspension
of Permit.

(2) The Agency may withdraw a suspension notice after verification of compliance.

Equity. 49. Every Facility shall be given equal treatment without preference as far as inspection and enforcement of relevant laws are concerned.

PART VI—OFFENCES

Contravention of Permit Conditions. 50. It is an offence if any facility, corporation or organisation fails to comply with—

- (a) condition of a permit ;
- (b) the requirements of an enforcement notice, or a closure notice under these Regulations ; and
- (c) any requirement imposed by a notice served by the Agency.

False Statement. 51.—(1) It shall be an offence for a facility, corporation or organisation to make a statement which is known to be false or misleading particularly, where the statement is made—

- (a) in purported compliance with a requirement to furnish any information imposed by or under any provision of these Regulations ;
- (b) for the purpose of obtaining a permit for the facility for variation, transfer or surrender of a permit ;
- (c) to intentionally make a false entry in any record pertaining to the permit ; and
- (d) with intent to deceive, to forge or use a document issued or authorized to be issued under a condition of the permit.

(2) It is an offence to make a statement or circulate a document that is likely to mislead or deceive the Agency.

Failure to comply with Abatement Measures. 52.—(1) A facility, corporation or organisation commits an offence where it fails to :

- (a) take appropriate measures to remove or otherwise treat and dispose of any effluent to minimize adverse effects ;
- (b) take measures required by the Agency after unauthorized release of effluent ;
- (c) remediate the environment to the standard prescribed by the Agency ;
- (d) furnish all information to the inspector ;
- (e) remove equipment or contain materials causing release into the environment when requested by inspector ;
- (f) produce document when requested by the inspector ; and
- (g) comply with guidelines with respect to the handling, storage and transporting of any hazardous material(s).

(h) ensure the use of Personal Protective Equipment (PPE) while handling, storing, treating, or disposing of wastes.

(2) A facility, corporation or organisation commits an offence where it—

(a) handles effluent in a manner which causes adverse effect to human and the environment ;

(b) dispose of industrial/factory effluent treated with pesticides contrary to Regulations ;

(c) knowingly obstructs the inspectors from performing their duties ;

(d) dismisses, suspends or imposes penalty on employee(s) who report(s) contravention of the Act or these Regulations ;

(e) transports any effluent and sludge not completely enclosed, secured or covered by a manifest ; and

(f) transports effluent and sludge in bulk without prior authorization from the Agency.

53. A facility, corporation or organisation commits an offence where it fails to—

(a) maintain records of all discharges ;

(b) file quarterly and annual reports of all discharges ;

(c) submit record of receipt of and/or removal of effluent and sludge within the time frame prescribed by these Regulations ; and

(d) submit an atmospheric pollution prevention plan or Air quality impact report arising from its operations.

Failure to Report.

54. A facility, corporation or organisation commits an offence where it—

(a) releases effluent and sludge into the environment in excess of permissible level in the Regulations.

(b) fails to report release of effluent and sludge into the environment in excess of permissible level as prescribed in Schedules I and II of these Regulations.

(c) Fails to take reasonable measures to prevent, reduce or remedy the adverse effect of effluent, sludge and emissions into the environment.

Discharge of pollutants beyond permissible level.

55. A Facility commits an offence where it engage in the operation of listed activities as prescribed in Schedule XI of these Regulations without a permit from the Agency.

Operating without a Permit.

PART VII—PENALTY

Penalty.

56.—(1) Any person who violates any of the provisions of regulations 50 to 55 of these Regulations commits an offence and shall on conviction, be liable to a fine not exceeding ₦200,000.00 or to imprisonment for a term not exceeding six months or to both such fine and imprisonment and an additional fine of ₦5,000 for every day the offence subsists.

(2) Where offence under the provisions of regulations 50 to 55 is committed by a body corporate, it shall on conviction, be liable to a fine not exceeding ₦1,000,000.00 and an additional fine of ₦50,000.00 for every day the offence subsists

(3) Without prejudice to the provisions of these regulations, the Agency shall have power to enter and seal any facility contravening any of the provisions of these Regulations

PART VIII—INTERPRETATION

Interpretation.

57. In these Regulations unless the context otherwise requires—

“Act” means the National Environmental Standards and Regulations Enforcement Agency (Establishment) Act 2007 ;

“Agency” means the National Environmental Standards and Regulations Enforcement Agency (NESREA) ;

“ASTM” means American Society for Testing Materials. It is an international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services available as techniques covering the development on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator ; and

“Base metals” includes industrial non - ferrous metals like copper, lead, nickel, tin and zinc but excluding precious metals ;

“Best” means the most effective method of achieving a high general level of protection of the environment as a whole ;

“Composite Sample” means representative mixture of several different samples (Usually bulk sample) ;

“Designated Officer” means a person who has been appointed by the Agency to be responsible for processing applications with respect to activities designated under these Regulations, and includes an acting officer ;

“*Designated Site*” means a site or place reserved for a purpose ;

“*Director General/Chief Executive Officer (DG/CEO)*” means the Director General of the National Environmental Standards and Regulations Enforcement Agency (NESREA) ;

“*EAF*” means Electric Arc Furnace ;

“*Effluent*” means waste water treated or untreated : that is discharged from a treatment plant, sewer, or industrial outfall resulting from the commercial or industrial use of water ;

“*EIA*” (Environmental Impact Assessment;) means the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of development proposals prior to major decisions being taken and commitments made ;

“*Emission*” means the direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in a facility into the air, water or land ;

“*Emission limit*” means the mass, expressed in terms of specific parameters, concentration or level of an emission, which may not be exceeded during one or more periods of time ;

“*Environmental policy*” include laws, codes, scientific standards, operational procedures and industrial Regulations concerning environmental protection issued by Federal, state and local authorities, to prevent environmental pollution ;

“*Extension*” means an increase in size, volume or other physical dimensions of an activity such that the increase may cause an adverse effect if not properly mitigated ;

“*Facility*” means ‘Iron and Steel industry’ defined to include iron and steel mills ; electrometallurgical ferroalloy product manufacturers; and iron, steel, and steel investment foundries; Iron and steel mills comprise integrated producers and mini-mills ;

“*Grab Sample*” means a single sample or measurement taken at a specific time or over a short period of time as feasible ;

“*Influent water*” means either processed waste water or raw water from a river, stream, spring or canal, or water abstracted from underground and used by a facility ;

“*Inspector*” means an official responsible for control and supervision of a particular activity or area of public interest ;

“*Landfill*” means an approved location or site where land is opened and filled with specific waste types.

“*Minister*” means the Honourable Minister of Environment ;

"*Modification*" means a change in any activity that may cause an adverse effect if not properly mitigated and includes, but not limited to, the expansion of the same process, addition of product lines and replacement of equipment with different technology other than that presently in use ;

"*Other facility Wastewater*" means effluent originating from the washing and general maintenance of a facility ;

"*Operator*" means a person managing the facility ;

"*Permit*" means an official document, authorization, license, or equivalent control document issued by the Agency to implement the requirements of these Regulations to discharge effluent especially for a limited period of time ;

"*Permit holder*" means an individual or group of individual(s), organization(s) or facility(ies) that have been empowered by the permit to discharge effluent ;

"*Polluter*" means anyone who discharges substances beyond the permissible limits ;

"*Responsible Corporate Officer*" means Chief Executive, or Managing Director, or Chairman, of the corporation in charge of a principal business function, or any designated person who performs similar policy or decision making functions for the corporation ;

"*Sample*" means a small part of something intended as a representative of the whole ;

"*Sand blasting*" means a procedure for cleaning of metal surfaces, for which fine Silica Sand is propelled or blasted through a nozzle unto the surface by compressed air to remove scale as well as other coverings ;

"*Scrap*" means used metal products ;

"*Standards*" means a consensus document with limits ;

"*Time Weighted Sample*" means a composite sample consisting of equal volume aliquot collected at a constant time interval ;

"*Techniques*" as both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned ;

"*Volatile Organic Compounds*" (VOC) means compounds such as phenols, benzene, toluene, xylene ;

"*Water bodies*" means underground water, river, stream, spring, canal, reservoir, well, lake, lagoon, ocean etc.

"*Water efficient device*" means any device that minimizes the use of water in the production process ;

“Wastewater system” means a sewer, conduit, pump, engine or other appliance used or intended to be used for the reception, conveyance, removal, treatment and disposal of industrial effluent ;

“Watercourse” means any natural or artificial channel, pipe or conduit, excluding the sewerage system, carrying, or that may carry, and discharging water directly or indirectly into a water body ;

58. These Regulations shall be cited as the National Environmental (Base Metals, Iron and Steel Manufacturing and Recycling Industries) Regulations, 2011.

Citation.

1	0.1	mg/l	Lead
2	0.2	mg/l	Aluminium
3	0.1	mg/l	Asbestos
4	0.1	mg/l	Cadmium
5	0.1	mg/l	Chromium (total)
6	0.1	mg/l	Chromium (hexavalent)
7	0.1	mg/l	Copper
8	0.1	mg/l	Iron
9	0.1	mg/l	Mercury
10	0.1	mg/l	Nickel
11	0.1	mg/l	Vanadium
12	0.1	mg/l	Zinc
13	0.1	mg/l	Fluoride
14	0.1	mg/l	Phosphate
15	0.1	mg/l	Sulfate
16	0.1	mg/l	Total Solids
17	0.1	mg/l	Total Suspended Solids
18	0.1	mg/l	Total Dissolved Solids
19	0.1	mg/l	Total Hardness
20	0.1	mg/l	Total Chloride
21	0.1	mg/l	Total Sulfide
22	0.1	mg/l	Total Nitrogen
23	0.1	mg/l	Total Phosphorus
24	0.1	mg/l	Total Ammonia Nitrogen
25	0.1	mg/l	Total Nitrite Nitrogen
26	0.1	mg/l	Total Nitrate Nitrogen
27	0.1	mg/l	Total Organic Carbon
28	0.1	mg/l	Total Organic Nitrogen
29	0.1	mg/l	Total Organic Phosphorus
30	0.1	mg/l	Total Organic Sulfur
31	0.1	mg/l	Total Organic Halogen
32	0.1	mg/l	Total Organic Chlorine
33	0.1	mg/l	Total Organic Bromine
34	0.1	mg/l	Total Organic Iodine
35	0.1	mg/l	Total Organic Fluorine
36	0.1	mg/l	Total Organic Sulfur
37	0.1	mg/l	Total Organic Nitrogen
38	0.1	mg/l	Total Organic Phosphorus
39	0.1	mg/l	Total Organic Sulfur
40	0.1	mg/l	Total Organic Halogen
41	0.1	mg/l	Total Organic Chlorine
42	0.1	mg/l	Total Organic Bromine
43	0.1	mg/l	Total Organic Iodine
44	0.1	mg/l	Total Organic Fluorine
45	0.1	mg/l	Total Organic Sulfur
46	0.1	mg/l	Total Organic Nitrogen
47	0.1	mg/l	Total Organic Phosphorus
48	0.1	mg/l	Total Organic Sulfur
49	0.1	mg/l	Total Organic Halogen
50	0.1	mg/l	Total Organic Chlorine
51	0.1	mg/l	Total Organic Bromine
52	0.1	mg/l	Total Organic Iodine
53	0.1	mg/l	Total Organic Fluorine
54	0.1	mg/l	Total Organic Sulfur
55	0.1	mg/l	Total Organic Nitrogen
56	0.1	mg/l	Total Organic Phosphorus
57	0.1	mg/l	Total Organic Sulfur
58	0.1	mg/l	Total Organic Halogen
59	0.1	mg/l	Total Organic Chlorine
60	0.1	mg/l	Total Organic Bromine
61	0.1	mg/l	Total Organic Iodine
62	0.1	mg/l	Total Organic Fluorine
63	0.1	mg/l	Total Organic Sulfur
64	0.1	mg/l	Total Organic Nitrogen
65	0.1	mg/l	Total Organic Phosphorus
66	0.1	mg/l	Total Organic Sulfur
67	0.1	mg/l	Total Organic Halogen
68	0.1	mg/l	Total Organic Chlorine
69	0.1	mg/l	Total Organic Bromine
70	0.1	mg/l	Total Organic Iodine
71	0.1	mg/l	Total Organic Fluorine
72	0.1	mg/l	Total Organic Sulfur
73	0.1	mg/l	Total Organic Nitrogen
74	0.1	mg/l	Total Organic Phosphorus
75	0.1	mg/l	Total Organic Sulfur
76	0.1	mg/l	Total Organic Halogen
77	0.1	mg/l	Total Organic Chlorine
78	0.1	mg/l	Total Organic Bromine
79	0.1	mg/l	Total Organic Iodine
80	0.1	mg/l	Total Organic Fluorine
81	0.1	mg/l	Total Organic Sulfur
82	0.1	mg/l	Total Organic Nitrogen
83	0.1	mg/l	Total Organic Phosphorus
84	0.1	mg/l	Total Organic Sulfur
85	0.1	mg/l	Total Organic Halogen
86	0.1	mg/l	Total Organic Chlorine
87	0.1	mg/l	Total Organic Bromine
88	0.1	mg/l	Total Organic Iodine
89	0.1	mg/l	Total Organic Fluorine
90	0.1	mg/l	Total Organic Sulfur
91	0.1	mg/l	Total Organic Nitrogen
92	0.1	mg/l	Total Organic Phosphorus
93	0.1	mg/l	Total Organic Sulfur
94	0.1	mg/l	Total Organic Halogen
95	0.1	mg/l	Total Organic Chlorine
96	0.1	mg/l	Total Organic Bromine
97	0.1	mg/l	Total Organic Iodine
98	0.1	mg/l	Total Organic Fluorine
99	0.1	mg/l	Total Organic Sulfur
100	0.1	mg/l	Total Organic Nitrogen

SCHEDULE I

Effluent Limitations for Metal Manufacturing (metallurgical) Industries
Regulations 15(1) (c), 17(1), (2) (a) and (3), 18(1)(2), 19(1) (2) (d), 54(b).

S/N	Parameter	Unit	Guideline value
1.	pH	S.I	6-9
2.	COD	mg/l	250
3.	TSS	mg/l	50
4.	Oil and grease	mg/l	25 (electroplating)
5.	Aluminium	mg/l	10
6.	Arsenic	mg/l	3.0
7.	Cadmium	mg/l	0.1
8.	Chromium (total)	mg/l	0.1
9.	Chromium (hexavalent)	mg/l	0.1
10.	Copper	mg/l	3.0
11.	Iron	mg/l	0.2
12.	Lead	mg/l	0.2
13.	Mercury	mg/l	0.01
14.	Nickel	mg/l	0.5
15.	Silver	mg/l	0.2
16.	Tin	mg/l	2.0
17.	Zinc	mg/l	2.0
18.	Cyanides (total)	mg/l	1.0
19.	Cyanides (free)	mg/l	0.2
20.	Ammonia	mg/l	10.0
21.	Flourides	mg/l	20.0 (electroplating)
22.	Phenols	mg/l	20.0
23.	Total Nitrogen	mg/l	0.5
24.	Total Phosphorus	mg/l	15.0
25.	Sulphides	mg/l	5.0
26.	VOX	mg/l	1.0
27.	Toxicity	To be determined on a case specific basis	0.1
28.	Temperature increase	°C	<3a*

*a At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity. The effluent should result in a temperature increase of not more than 3°C at the edge of the zone where initial mixing and dilution takes place. Where the zone is not defined, use 0 -500 meters from the point of discharge.

EFFLUENTS LIMITATIONS FOR FOUNDRIES

<i>Parameter</i>	<i>Units</i>	<i>Guideline values</i>
pH -	-	6-9
Total suspended solids	mg/l	35
Oil and grease	mg/l	10
Temperature increase	°C	3a
COD	mg/l	125
Phenol	mg/l	1
Cadmium	mg/l	0.01
Chromium (total)	mg/l	0.5
Copper	mg/l	0.5
Lead	mg/l	0.2
Nickel	mg/l	0.5
Zinc	mg/l	0.5
Tin	mg/l	2.0
Ammonia	mg/l	(as N) 5
Fluoride	mg/l	(as F) 5
Iron	mg/l	5.0
Aluminum	mg/l	0.02b

Notes :

(a) At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity.

(b) Aluminum smelting and casting.

SCHEDULE II Regulation 20(2), 54(b)

SLUDGE DISPOSAL PERMISSIBLE LIMIT

DRY SLUDGE (DS)		GENERATION FROM WASTEWATER TREATMENT
Parameters	Sludge Production Kg DS/tonne	
Sludge (total)	200	
Primary Treatment		
Mixing- sedimentation	80	
Mixing-Chemical Treatment+ Sedimentation	150-200	
Mixing Chemical Treatment+ Flotation	150-200	

SCHEDULE III Regulations 21,22(1), 24(J)

AIR EMISSION LIMITATIONS FOR METAL PRODUCTS MANUFACTURING INDUSTRIES

S/N	Pollutant	Unit	Guideline Value
	VOCs — surface cleaning	mg/Nm ³	20-75(1)
	VOCs — metal coating	mg/ Nm ³	100 (up to 15 ton/y solvent consumption) 75 (more than 15 ton/y solvent consumption) 50 (drying processes)
	Volatile Halogenated Hydrocarbons—metal surface treatments	mg/ Nm ³	20
	Particulate Matter metal surface treatments	mg/ Nm ³	5
	Hydrogen Chloride	mg/ Nm ³	10
	Nitrogen Oxides(3)	mg/ Nm ³	350
	Ammonia	mg/ Nm ³	50

Notes :

- As 30 minute mean for contained sources 20 mg/Nm³ for waste gases from surface cleaning using VOCs classified as carcinogenic, mutagenic or toxic to reproduction (risk phrases R45, R46 R49, R60, R61) with mass flow greater than or equal to 10g/ hour, and or halogenated VOC classified with risk phrase R40 and having a mass flow greater than or equal to 100 g/hour); 75 mg/Nm³ for waste gases from other surface cleaning.
- Facilities with solvent consumption greater than 15 tonnes/year.
- Dry air at 11 percent O₂.

AIR EMISSION LIMITATIONS FOR FOUNDRIES

Industry-specific pollutants that may be emitted from point or fugitive sources during routine operations consist of numerous organic and inorganic compounds, including sulphur oxides (SO_x), ammonia (NH_3), ethylene, propylene, aromatics, alcohols, oxides, acids, chlorine, EDC, VCM, dioxins and furans, formaldehyde, acrylonitrile, hydrogen cyanide, caprolactam, and other volatile organic compounds (VOCs) and semi volatile organic compounds (SVOC).

Pollutant	Units	Guideline Value
Particulate Matter	mg/Nm ³	20 ⁽³⁾
		50 ⁽³⁾
Oil Aerosol/ Mist	mg/Nm ³	5
NO _x	mg/Nm ³	400 ⁽⁴⁾
		120 ⁽⁵⁾
		150 ⁽⁶⁾
SO ₂	mg/Nm ³	400 ⁽⁶⁾
		50 ⁽⁹⁾
		120 ⁽⁷⁾
VOC	mg/Nm ³	20 ⁽¹⁰⁾
		30
		150 ⁽¹¹⁾
PCDD/F	ngTEQ/ Nm ³	0.1
CO	mg/Nm ³	200 ⁽¹²⁾
		150 ⁽¹³⁾
Amines	mg/Nm ³	5 ⁽¹⁴⁾
Chlorine	mg/Nm ³	5 ⁽¹⁵⁾
Pb, Cd and their compounds	mg/Nm ³	1-2 ⁽¹⁶⁾
Ni, Co, Cr Sn and their compounds	mg/Nm ³	5
Cu and their compounds	mg/Nm ³	5-20 ⁽¹⁷⁾
		5 ⁽¹⁸⁾
Chloride	mg/Nm ³	5 ⁽¹⁹⁾
Fluoride	mg/Nm ³	5 ⁽¹⁹⁾
H ₂ S	mg/Nm ³	5

SCHEDULE IV Regulations 7(3) and (5)

BEST PRACTICES AND WASTE MINIMISATION

(a) Embracing cleaner production with emphasis on waste water reuse and recycling ;

(b) Environment friendly technologies should be embraced by facilities e.g the use of heat treatment furnaces that utilizes cleaner sources of energy ;

(c) Encourage more efficient use of process chemicals ;

(d) Recovering and reusing process chemicals and paints ;

(e) Substituting less hazardous materials with less-toxic chemicals ;

(f) Use steel scrap with low lead and cadmium content as a raw material ;

(g) Eliminate the generation of reactive desulphurization slag generated in foundry work by using a less hazardous material in place of calcium carbide. ;

(h) Install dust control system to prevent the release of toxic air pollutants into the environment ;

(i) Replace highly toxic and persistent ingredients with less toxic, degradable ones ;

(j) Recover sulphuric acid using low temperature separation of acid and metal crystals ;

(k) Recover ferric sulphate or ferric chloride from pickle liquor through crystallization ;

(l) Recover zinc from electric arc furnace dust ;

(m) Recover acids by removing dissolved iron salts from spent acid ; e.g employ thermal decomposition for recovery of hydrochloric acid from spent pickle liquor ;

(n) Minimize wastage by inventory control, and find uses for off-specification products ;

(o) Control of Fugitive Emissions mostly VOC emissions associated with handling of chemicals in open vats and mixing processes. The prevention and control techniques recommended include the following :

- o Substitution of less volatile substances, such as aqueous solvents ;
- o Collection of vapours through air extractors and subsequent treatment of gas stream by removing VOCs with control devices such as condensers or activated carbon absorption ;

- Collection of vapours through air extractors and subsequent treatment with destructive control devices such as Catalytic Incinerators, Thermal Incinerators, Enclosed Oxidizing Flares, etc. ;
- Use of floating roofs on storage tanks to reduce the opportunity for volatilization ;
- Reducing and treating slags from smelting operations, forging, machining, and mechanical finishing, which may contain metal ions ;
- Proper management of metals removed from wastewaters for recovery or disposal ;
- disposal of sludge from surface finishing processes (e.g. galvanizing, painting, hot dip galvanizing/aluminizing) ;
- If reuse or recycling is not possible, the waste should be disposed in accordance with NESREA industrial waste management guidelines ;
- Appropriate PPE should be worn at all times especially during sand blasting so that it does not pose threat to Human health.

SCHEDULE V

Regulation 8

GLOBAL WARMING AND THE STEEL INDUSTRY'S VOLUNTARY ACTION PROGRAMME

Control measures for global warming in the steel industry shall :

- (a) reduce its energy consumption by establishing an effective logistics system through utilizing waste plastics in blast furnaces.
- (b) Implement technology such as next generation coke oven which has been developed, this enables dry distillation at a lower temperature. The energy consumption expected from this new coke oven is approximately 20 percent lower than existing coke ovens.
- (c) Recover and reuse waste heat generated by coke quenching system for power generation and preheating within the facility.
- (d) Distribute unused energy to surrounding areas.
- (e) Measures should be put in place to contain emissions from raw material processing such as coke oven, heating and iron processing.

SCHEDULE VI

Regulation 9

VOLATILE ORGANIC COMPOUND (VOC) CONTROL

PREAMBLE

(a) Should install refrigerator coils (or additional coils) above the degreaser vapour zone ;

(b) Apply an air flow over the top of the degreaser that should not typically exceed 40 m/minute ;

(c) Rotation of parts before removal from the vapour degreaser should include :

(i) installation of thermostatic heating control on solvent reservoirs and tanks ;

(ii) installation of in-line filters to prevent particulates build up ;

(iii) use of solvent recovery to reduce emissions of VOC from currying ovens ;

(iv) use of activated carbons to recover solvent vapour ;

(v) metals surface should be carefully cleaned before smelting and coating ;

(vi) coating should be removed from the base metal before smelting using mechanical cleaning (e.g. blasting with CO₂ pellets) instead of solvent.

SCHEDULE VII

Regulation 11(7)

ACIDS AND METALS CONTENT IN MISTS AND FUMES EMISSION CONTROL

(a) Use of fume suppressants as additives to electroplating baths to reduce air emission of electroplated metals (e.g. chromium).

(b) Installation of in-line aspirators with filters to eliminate acid compounds.

(c) For metals/metal oxides abatement, installation of filters capable of handling complex metals.

(d) Smelting fumes (mixture of metals, oxides and smoke from burning of oil) should be controlled by removing coatings from base metals.

(e) Chlorinated hydrocarbons should be used for this purpose to prevent the risk of phosgene formation.

EFFLUENT POLLUTION ABATEMENT MEASURES

OIL-BASED EFFLUENTS :

- Effluent separation from wastewater, and special disposal if recycling is not possible ;
- standardization of use of oil types, and efficient scheduling of processes that require use of varying oil types ;
- Extend the life of cooling liquid through use of centrifuges, introduction of periodical analyses, use of biocides and ultrafiltration, and removal of oils by disk or belt skimmers ;
- Use appropriate housekeeping techniques to prevent cutting oils from being contaminated with solvents ;
- Oil quench baths should be recycled by filtering out metals ;
- Metal-working fluids should be recovered using collection (or drip) pans under machinery ;
- In cold forming or other processes where oil is used, automatic oilers should be used to reduce grease accumulation. A stamping lubricant suitable for conditions leading up to thermal treatment processes should be considered.

SOLVENT AND WATER-BASED EFFLUENTS :

- Solvents should be carefully managed to prevent spills and fugitive emissions.
- *Less hazardous degreasing agents (e.g. petroleum solvents, vegetable cleaning agents (VCA), supercritical CO₂, or alkali washes)* should be considered, in addition to the use of countercurrent solvent cleaning (two-stage : first cleaning with dirty solvent, followed by fresh solvent) ;
- Aqueous non-VOC-containing alkali washes should be used for metal cleaning whenever possible. Some of these can be regenerated by microfiltration ;
- Spent degreasing solvents should be recycled on site, reusing batch stills and waste solvents Cold cleaning with recycled mineral spirits should be implemented before final vapor degreasing ;
- Acids in wastewaters should be recovered through evaporation ;

- Reduce rinse contamination via drag-out by optimization of part operation, using surfactants and other wetting agents ;
- Use mechanical cleaning techniques instead of chemicals where possible (e.g. a vibrating abrasion apparatus for brass rather than acid pickling ; mechanical scraping instead of acid solution to remove oxides of titanium; and rotating brush machines with pumice to clean copper sheets) ;
- Concentrations of dissolved metal ions should be controlled and reduced (e.g. molybdenum concentration reduction through reverse osmosis/precipitation systems ; use of non-chromate solutions for alkaline etch cleaning of wrought aluminum; use of sulfuric acid/hydrogen peroxide dip instead of cyanide and chromic acid dip for copper-bright dipping process) ;
- Acid or alkaline pickling solutions should be replaced, if possible, with alternative cleaning agents (e.g. use of caustic wire cleaner with biodegradable detergent and use of linear alcohols instead of sulfuric acid to pickle copper wire, provided that adequate safety and fire prevention is implemented) ;
- Flow restrictors/control meters should be installed and a foot pump (or photosensor for automatic lines) should be used to activate rinse ;
- Process wastewaters should be treated and recycled, using ion exchange, reverse osmosis, electrolysis, and electro dialysis with ion exchange.

SURFACE TREATMENT / FINISHING WASTEWATERS :

- Strong complexing agents like EDTA and toxic surfactants like NPE and PFOS should be substituted by less hazardous alternatives ;
- Anodizing and alkaline silking baths should be regenerated by recuperation of metallic (e.g. aluminum) salts through use of hydrolysis of sodium aluminate ;
- Limit stocks of finishing material with short shelf lives ;
- Painting jobs (light to dark) and the selection of spraying techniques should minimize wastewater production (e.g. use of a spray gun for particular applications, use of an electrostatic finishing system instead of conventional air spray) ;
- Avoid and substitute the use of chlorinated solvents (including carbon tetrachloride, methylene chloride, 1,1,1-trichloroethane, and perchloroethylene) with non-toxic or less toxic solvents as cleaning agents ;
- Chromic acid and trisodium phosphate should be substituted by less toxic and non fuming cleaners (e.g. sulfuric acid and hydrogen peroxide), and cyanide cleaners substituted by ammonia ;

- Less toxic bath components should be used (e.g. zinc in place of cadmium in alkaline / saline solutions; nitric or hydrochloric acids in place of cyanide in certain plating baths; zinc chloride in place of zinc cyanide);
- Drain boards, drip guards, drip bars, and dedicated dragout tanks should be installed, after process baths.

METALS IN WASTEWATER :

- Wastewaters with recoverable metals should be separated from other wastewater streams. Metals should be recovered from solution (e.g. using electrolytic cells or hydroxide precipitation);
 - Used metal pickling baths should be sent to a continuous electrolysis process for regeneration and metal recovery;
 - Metals from bright dipping solutions should be recovered using suitable processes (e.g. ion exchange system for copper, or segregating phosphates from treatment of aluminium based alloys);
 - Solutions containing cyanide salts (e.g. for hardening processes) should be replaced with solutions using a fluidized bath of nitrogen and corundum;
 - No facility shall use Hexavalent chromium for plating.
- Other chemicals such as trivalent chromium should be used as substitutes.

SCHEDULE IX

Regulation 14 (1)

BANNED AND RESTRICTED CHEMICALS

CONTROLLED SUBSTANCES UNDER THE MULTILATERAL ENVIRONMENTAL
AGREEMENTS ON ENVIRONMENT

<i>Chemical/Pesticide</i>	<i>CAS Number</i>	<i>Status</i>
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Rotterdam Convention :

PART I—BANNED CHEMICALS AND PESTICIDES

<u>2,4,5-T</u>	93-76-5	
Aldrin	309-00-2	
Binapacryl	485-31-4	
Captafol	2425-06-1	
Chlordane	57-74-9	
Chlordimeform	6164-98-3	
Chlorobenzilate	510-15-6	
DDT	50-29-3	
Dieldrin	60-57-1	
<u>DNOC and its salts (such as ammonium salt, potassium salt and sodium salt)</u>	534-52-1 ; 2980-64-5 ; 5787-96-2 ; 2312-76-7	
<u>Dinoseb and its salts and esters</u>	88-85-7	
<u>EDB (1,2-dibromoethane)</u>	106-93-4	
Ethylene dichloride	107-06-2	
Ethylene oxide	75-21-8	
Fluoroacetamide	640-19-7	
<u>HCH (mixed isomers)</u>	608-73-1	
Heptachlor	76-44-8	
Hexachlorobenzene	118-74-1	
<u>Lindane (gamma-HCH)</u>	58-89-9	
Mercury Compounds	—	
Monocrotophos	6923-22-4	
Parathion	56-38-2	
Parathion (all formulations – aerosols, dustable powder (DP), emulsifiable concentrate (EC), granules (GR) and wettable powders (WP) – of this substance are included, except capsule suspensions (CS))	56-38-2	

CONTROLLED SUBSTANCES UNDER THE MULTILATERAL ENVIRONMENTAL
AGREEMENTS ON ENVIRONMENT—*Continued*

<i>Chemical/Pesticide</i>	<i>CAS Number</i>	<i>Status</i>
Rotterdam Convention		
<u>Pentachlorophenol</u>	87-86-5	
<u>Toxaphene (Camphechlor)</u>	8001-35-2	
<u>Dustable powder formulations containing a combination of benomyl at or above 7%, carbofuran at or above 10% and thiram at or above 15%</u>	17804-35-2; 1563-66-2; 137-26-8	
<u>Methamidophos (Soluble liquid formulations of the substance that exceed 600 g active ingredient/l)</u>	10265-92-6	
<u>Methyl-parathion (emulsifiable concentrates (EC) with 19.5%, 40%, 50%, 60% active ingredient and dusts containing 1.5%, 2% and 3% active ingredient)</u>	298-00-0	
<u>Monocrotophos</u>	6923-22-4	
<u>Phosphamidon (Soluble liquid formulations of the substance that exceed 1000 g active ingredient/l)</u>	13171-21-6 (mixture, (E) and (Z)-isomers) 23783-98-4 ((Z)-isomer), 297-99-4 ((E)-isomer)	
Actinolite asbestos	77536-66-4	
Amosite, asbestos	12172-73-5	
Anthophyllite	77536-67-5	
Tetraethyl lead	78-00-2	
Tetramethyl lead	75-74-1	
Tremolite	77536-68-6	
<u>Tris (2,3 dibromopropyl)phosphate</u>	126-72-7	

CONTROLLED SUBSTANCES UNDER THE MULTILATERAL ENVIRONMENTAL
AGREEMENTS ON ENVIRONMENT—*Continued*

<i>Chemical/Pesticide</i>	<i>CAS Number</i>	<i>Status</i>
PART 2—SEVERELY RESTRICTED		
CHEMICALS AND PESTICIDES		
Polybrominated Biphenyls (PBBs)	36355-01-8(hexa-) 27858-07-7(octa-) 13654-09-6(deca-)	
Polychlorinated Biphenyls (PCBs)	1336-36-3	
Polychlorinated Terphenyls (PCTs)	61788-33-8	
Stockholm Convention		
PART 3—PERSISTENT ORGANIC POLLUTANTS – (POPs)		
Aldrin	309-00-2	
Chlordane	57-74-9	
DDT	50-29-3	
Dieldrin	60-57-1	
Dioxins		
Endrin		
Furans		
Heptachlor	76-44-8	
Hexa Chloro Benzene (HCB)	11-74-1	
Polychlorinated Biphenyls (PCBs)	1336-36-3	
Mirex		
Toxaphene	8001-35-2	
Montreal Protocol		
PART 4—OZONE DEPLETING SUBSTANCES		
Trichlorofluoromethane	75-69-4	
Dichlorodifluoromethane	75-71-8	
Trichlorotrifluoroethane	76-13-1	
Dichlorotetrafluoroethane	76-14-2 76-15-3	
Bromochlorodifluoromethane	353-59-3	
Bromotrifluoromethane	75-63-8	
Dibromotetrafluoroethane	76-15-3	
Chlorotrifluoromethane	75-72-9	

CONTROLLED SUBSTANCES UNDER THE MULTILATERAL ENVIRONMENTAL
AGREEMENTS ON ENVIRONMENT—*Continued*

<i>Chemical/Pesticide</i>	<i>CAS Number</i>	<i>Status</i>
Pentachlorofluoroethane	354-56-3	
Tetrachlorodifluoroethane	76-12-0	
Tetrachloromethane or carbon tetrachloride	56-23-5	
Trichloroethane or methyl chloroform	71-55-6	
Chlorodifluoromethane	75-45-6	
Dichlorotrifluoroethane	306-83-2	
Chlorotetrafluoroethane	2837-89-0	
Dichlorofluoroethane	1717-00-6	
Chlorodifluoroethane	75-68-3	
Methyl Bromide or Bromoethane	74-83-9	
1,2-dibromoethane (EDB)	106-93-4	

BASEL CONVENTION :

All wastes arising from the chemicals covered under the Rotterdam and Stockholm Conventions as well as the Montreal Protocol.

OTHERS

Acetic acid	64-19-7	
Acetyl bromide	506-96-7	
Acetone	67-64-1	
Allyl isothiocyanate	57-06-7	
Ammonia (35% or greater)	—	
Ammonia (less than 35%)	7664-41-7	
Antimony pentachloride	7647-18-9	
Antimony trihydride	7803-52-3	
Arsine	7784-42-1	
Arsenical substances	—	
Ammonium Nitrate	6484-52-2	
Boric acid; Sodium borate	10043-35-3, 1330-43-4	
Boron tribromide	10294-33-4	
Boron trichloride	10294-34-5	
Boron trifluoride	7637-07-2	
Bromine; Bromine solutions	7726-95-6,	

CONTROLLED SUBSTANCES UNDER THE MULTILATERAL ENVIRONMENTAL
AGREEMENTS ON ENVIRONMENT—*Continued*

<i>Chemical/Pesticide</i>	<i>CAS Number</i>	<i>Status</i>
Captafol	2939-80-2, 2425-06-1	
Carbamates,	598-55-0	
Bendiocarb	22781-23-3	
BPMC (Fenobucarb)	3766-81-2	
Mercaptodimethur (methiocarb)	2032-65-7	
Carbon monoxide	630-08-0	
Carbon tetrafluoride	75-73-0	
Chlorinated hydrocarbons	85422-92-0	
Chlorine	7782-50-5	
Chlorine trifluoride	7790-91-2	
Chlorobenzenes	108-90-7	
Chlorophenols	25167-80-0	
Chlorophenoxyacids ; their Salts, esters, amines	94-74-6,	
Chlorosilanes	—	
Chlorosulphonic acid	7790-94-5	
Chromic acid	1333-82-0	
Cyanides	—	
Calcium Ammonium Nitrate	—	
Diborane	19287-45-7	
Dibromochloropropane	96-12-8	
Diethyl sulphate	77-78-1	
Epichlorohydrin	106-89-8	
Ethyl mercaptan	75-08-1	
Ethylene imine	151-56-4	
Ferric chloride	7705-08-0	
Fipronil	120068-37-3	
Fluorine	7782-414	
Fluoroacetamide	640-19-7	
Formic acid	64-18-6	
Germane	—	
Hydrazine anhydrous ; Hydrazine aqueous solutions	302-01-2	

CONTROLLED SUBSTANCES UNDER THE MULTILATERAL ENVIRONMENTAL
 AGREEMENTS ON ENVIRONMENT—Continued

<i>Chemical/Pesticide</i>	<i>CAS Number</i>	<i>Status</i>
Hydrochloric acid	7647-01-0	
Hydrofluoric acid	7664-39-3	
Hydrogen chloride	7647-01-0	
Hydrogen cyanide ; Hydrocyanic acid	74-90-8,	
Hydrogen selenide	7783-07-5	
Hydrogen Peroxide	7722-84-1	
Isocyanates	—	
Mercury compounds including inorganic mercury compounds, alkyl mercury compounds, alkyloxyalkyl and aryl mercury compounds, and other organic compounds of mercury	—	
Metanil yellow (sodium salt of metanilylazo-diphenylamine)	587-98-4	
Methyl chloride	74-87-3	
Methyl mercaptan	74-93-1	
Monomethyl-tetrachlorol diphenyl methane	76253-60-6	
Monomethyl-dichloro-diphenyl methane	76253-60-24	
Monomethyl-dibromodiphenyl methane	99688-47-8	
Neonicotinoid compounds used as pesticides	138261-41-3	
Nitric acid (95% or greater)	7697-37-2	
Nitric acid (less than 95%)	—	
Nitric oxide	10102-43-9	
Nitrogen trifluoride	7783-54-2	
Nitromethane	75-52-5	
Oleum	8014-95-7	
Orange II [sodium salt of p-(2-hydroxy-1-naphthylazo) benzenesulphonic acid]	—	
Organic peroxides	—	
Organo-tin compounds	—	
Perchloromethyl mercaptan	594-42-3	

CONTROLLED SUBSTANCES UNDER THE MULTILATERAL ENVIRONMENTAL
 AGREEMENTS ON ENVIRONMENT—*Continued*

<i>Chemical/Pesticide</i>	<i>CAS Number</i>	<i>Status</i>
Perfluorooctane sulfonate (PFOS)	29457-72-5	
Phenols	—	
Phenol ethoxylate	9016-45-9	
Phosgene	75-44-5	
Phosphides	—	
Phosphine	603-35-0	
Phosphorus compounds, excepting Dimethoate, Fenchlorphos, Fenitrothion, Phenthoate, Profenophos, Prothiophos, Quinalphos	—	
Phosphorus oxybromide	7789-59-5	
Phosphorus oxychloride	10025-87-3	
Phosphorus pentabromide	7789-69-7	
Phosphorus pentachloride	10026-13-8	
Phosphorus pentafluoride	7647-19-0	
Phosphorus trichloride	7719-12-2	
Polybrominated diphenyl ethers	—	
Potassium hydroxide	1310-58-3	
Prochloraz	67747-09-5	
Pyrethroid compounds used as pesticides	—	
Potassium Nitrate	7757-79-1	
Potassium Chlorate	3811-04-9	
Potassium Perchlorate	7778-74-7	
Sodium azide	26628-22-8	
Sodium hydroxide	1310-73-2	
Sodium Nitrate	7631-99-4	
Sodium Chlorate	7775-09-9	
Sulphur tetrafluoride	7783-60-0	
Sulphur trioxide	7446-11-9	
Sulphuric acid	7664-93-9	
Sulphuryl chloride	7791-25-5	
Sulphuryl fluoride	2699-79-8	
Titanium tetrachloride	7550-45-0	
Tungsten hexafluoride	7783-82-6	
Urea	57-13-6	

SCHEDULE X

Regulation 4(4)

GUIDE TEMPLATE FOR EMERGENCY PROCEDURES IN INDUSTRY

Contents :

STEP 1—ESTABLISH A PLANNING TEAM

There must be an individual or group in charge of developing the emergency management plan.

1. Form the Team
2. Establish Authority
3. Issue a Mission Statement
4. Establish a Schedule and Budget

STEP 2—ANALYZE CAPABILITIES AND HAZARDS

This step entails gathering information about current capabilities and about possible hazards and emergencies, and then conducting a vulnerability analysis to determine the facility's capabilities for handling emergencies.

- * Where Do You Stand Right Now ?
- * Meet with Outside Groups
- * Identify Codes and Regulations
- * Identify Critical Products, Services and Operations
- * Identify Internal Resources and Capabilities
- * Identify External Resources
- * Do an Insurance Review
- * Conduct a Vulnerability Analysis
- * List Potential Emergencies
- * Estimate Probability
- * Assess the Potential Human Impact
- * Assess the Potential Business Impact
- * Assess the Potential Property Impact
- * Assess Internal and External Resources
- * Add the Columns

STEP 3—DEVELOP THE PLAN

Emergency planning must become part of the corporate culture.

Look for opportunities to build awareness ; to educate and train personnel ; to test procedures; to involve all levels of management, all departments and the community in the planning process; and to make emergency management plan part of what personnel do on a day-to-day basis.

- * Plan Components ;
- * The Development Process ;

STEP 4—IMPLEMENT THE PLAN

Implementation means more than simply exercising the plan during an emergency. It means acting on recommendations made during the vulnerability analysis, integrating the plan into company operations, training employees and evaluating the plan.

- * Integrate the Plan into Company Operations ;
- * Conduct Training, Drills and Exercises ;

SCHEDULE XI *Regulations 3(1) (c), 55*

GUIDELINE FOR PREPARING ENVIRONMENTAL MANAGEMENT PLAN (EMP)

An Environmental Management Plan (EMP) describes the process that an organization will follow to maximize its compliance and minimize harm to the environment. This plan also helps an organization map its progress toward achieving continual improvements.

Regardless of the organization's situation, all environmental plans must include the following elements :

- * Policy ;
- * Planning ;
- * Implementation and Operation ;
- * Checking and Corrective Action ;
- * Management Review and commitment.

POLICY : Policy statements are important to an organisation because they help anchor the organisation on a core set of belief. These environmental guiding principles will enable all members of an organisation to focus on the same objective. They provide an opportunity for outside interests to understand the operation of the organisation. The policy should be focused, concise and easy to read. The environmental policy should address the following :

- Compliance with legal requirements and voluntary commitments ;
- Minimising waste and preventing pollution ;
- Continual improvement in environmental performance, including areas not subject to Regulations ;
- Sharing information on environmental performance with the community.

PLANNING : The planning should define the organisation's environmental footprints and set goals. Goals and objectives should be focus on maximising their positive impacts on the environment. When evaluating, the following elements should be considered :

- * Impacts on the environment through its activities, products and services ;
- * Legal requirements associated with protecting the environment ;
- * Meaningful and focused environmental objectives and targets.

IMPLEMENTATION AND OPERATION : Implementation and operation should define the activities that the organisation will perform to meet its environmental objectives and targets. This section should identify activity each person is responsible for, ensure completion and set targets for each of the identified activity. In addition, this area should specify employee training, communication and outreach activities that are necessary to ensure successful implementation of the plan.

CHECKING AND CORRECTIVE ACTION : The EMP should describe the process that will be followed to verify proper implementation and how problems will be corrected in a timely manner. Routine evaluation and continual improvement to the process is necessary to make sure that the plan successfully leads towards the completion of environmental objectives and targets.

MANAGEMENT REVIEW AND COMMITMENT TO IMPROVEMENT : Routine management review and support is a necessary and meaningful tool for the organization. This should identify the routine management evaluations that will be conducted to ensure that the plan is appropriately implemented to meet its environmental objectives.

SCHEDULE XII *Regulation 12(1)*

GUIDELINES FOR EXTENDED PRODUCER RESPONSIBILITY PROGRAMME

As part of the Strategic Alliance Programme of the Agency, all manufacturers and importers of chemicals, pharmaceuticals, cosmetics, battery and paint products shall partner with the Agency to establish an effective Extended Producer Responsibility Programme.

(a) The manufacturers and importers shall submit a proposal for an Extended Producer Responsibility Programme to the Agency for approval ;

(b) such a proposal shall include elements for successful implementation of the scheme as follows ;

(c) establish a process for the collection, handling, transportation and final treatment of a post-consumer products regardless of who is the original brand owner ;

(d) incorporate the principles of a pollution prevention hierarchy by moving progressively from disposal to reduction, reuse, recycling and recovery of post-consumer products ;

(e) submit on or before June 30 in each year to the Agency, an annual report on their consumer products stewardship program during the previous fiscal year including, but not limited to, information with respect to :

(i) the total amount of consumer base metals products sold and post-consumer products collected ;

(ii) the total amount of post-consumer base metals products processed or in storage ;

(v) the types of processes used to reduce, reuse, recycle or recover post-base metal products, including but not limited to details of efforts to incorporate the priorities of a pollution prevention hierarchy by moving progressively from disposal to reduction, reuse, recycling and recovery of post-consumer base metal products ;

(vi) the location of return collection facilities or depots ;

(vii) the location of any long-term containment or final treatment and processing facilities for post-consumer ;

(viii) the types of educational information and programs provided ;

(ix) the process of internal accountability used to monitor environmental effectiveness ; and

(x) any other information requested by the Agency.

GUIDELINES FOR HAZARDOUS WASTE MANAGEMENT AND TECHNIQUES
FOR TREATING WASTEWATER

Hazardous Materials are those materials that represent an excessive risk to property, the environment or human health because of their physical and/or chemical characteristics. These materials (including mixtures and solutions) subject to these guidelines can be classified according to the hazard they present, as follows :

- * Explosives.
- * Toxic or flammable gases.
- * Flammable liquids.
- * Flammable solids.
- * Oxidizing substances.
- * Toxic and infectious substances.
- * Radioactive material.
- * Corrosive substances.
- * Miscellaneous dangerous materials.

These Guidelines apply when any quantity of Hazardous materials are present in any waste produced in industrial facilities.

KEY REQUIREMENTS

The key requirements of these Guidelines are summarized as follows :

1. *Screening*—Determine the characteristics and threshold quantities of each Hazardous material.

2. *Hazardous Materials Management Program*—Manage the risks associated with all the hazardous materials produced as waste from the facility through :

- * *Management Actions* : training, workers health and safety, record keeping, and reporting.
- * *Preventive Plans* : for transportation, processes and operations, and hazardous wastes.
- * *Emergency Preparedness and Response Plans* : response activities, medical assistance, communications, and incident reporting.

3. *Community Involvement and Awareness*—Inform the potentially affected community and provide for public feedback.

Every facility shall employ the following Techniques for treating industrial process wastewater in this sector :

Source segregation and pretreatment of concentrated wastewater streams grease traps, skimmers, dissolved air floatation or oil water separators for separation of oils and floatable solids ; filtration for separation of filterable solids ; flow and load equalization ; sedimentation for suspended solids reduction using clarifiers ; biological treatment, typically aerobic treatment, for reduction of soluble organic matter (BOD); biological nutrient removal for reduction in nitrogen and phosphorus ; chlorination of effluent when disinfection is required ; dewatering and disposal of residuals in designated hazardous waste landfills.

SCHEDULE XIV

Regulations 15(1)(e), 25(1) and (2)(a)

ACTIVITIES REQUIRING ATMOSPHERIC EMISSION LICENCE

Based on precautionary consideration to safeguard environment and public health, the following activities shall require Atmospheric Emission Licence.

- (1) Use of solvents in activities such as painting processes.
- (2) painting processes including the use of ammonia, formaldehyde, methanol and other alcohols, esters, aliphatic hydrocarbons, and several monomers.
- (3) The use of perchloroethylene.
- (4) Any other activity whose process may result in atmospheric emission .

SCHEDULE XV *Regulation 10(1) and (2)*

ORGANIZATIONAL SYSTEM AND THE FUNCTIONS OF POLLUTION CONTROL MANAGER(S)

Each facility shall be mandated by the Agency to have an organizational system that will carryout Internal Environmental Auditing of the facility as well as liaise with NESREA and other Relevant Government Authorities.

The Organizational system shall have Pollution Control Supervisor, Pollution Control Manager and Pollution Control Chief Manager which shall be elected/appointed. These shall be certified by the Agency through a National examination/qualifying examination.

ORGANIZATION FOR POLLUTION PREVENTION



- A—Manages the pollution prevention and control issues of the facility.
 B—Supervises and directs the Pollution Control Officers (only applicable in facilities where large amount of smoke and sewage is generated).
 C—Deals with technical matters like inspection of the facility and raw materials.

Note : C depends on the size of the facility; for a large facility there shall be PCM for Air, Land and Water.

SPECIFIC DUTIES OF THE POLLUTION CONTROL MANAGER (PCM)

The specific duties of the PCMs are :

- To ensure that the responsibilities are very clear for all the staff involved in pollution prevention and control ;
- To ensure that daily pollution prevention and control practices are complied with ; and
- To maintain smooth and proper environmental and safety communications within the facility and the regulatory authorities as well as the host community.

CONCRETE POLICIES CONCERNING INDUSTRIES' POLLUTION CONTROL

1. Management concerning pollution control at facilities :

- improvement and operation of effective Environmental Management System (EMS) modeled after ISO.14001
 - communication with NESREA's headquarters
 - ability to know when a system is malfunctioning
 - documentation of the environmental management procedure and control of the records and documents
 - co-operation with interested parties such as other related companies
- Regulations

2. Addressing corporate-wide environmental measures :
- Recognition of the business risk relative to the environmental management system.
 - Resource management including maintenance of human resources for pollution control and their competency.
 - Establishing a corporate-wide environmental management system including risk information feed-back system.
 - Establishing a redundant monitoring, assessment and self-improvement system
 - Establishing a contingency plan and its verification

SCHEDULE XVI *Regulation 15(2)*

PERMIT FORM

FORM I

APPLICATION FOR EFFLUENT AND EMISSION DISCHARGE

1. Name of Applicant :
2. Year of Incorporation and Registration Number of Business Name :
3. Location of Business Premises :
4. Description of plant facilities, outfall location(s), Effluent Characteristic(s) (to be Geo-referenced) :
5. Qualifications and experience of staff involved in pollution control :
6. A listing of all toxic substances used or manufactured on the site :
7. Does the establishment have any other permit issued to the facility? (State type)

8. Description of pollution abatement/monitoring facilities on site (including details of year of installation, capacity, etc. and also copies of design plans of sewerage and/or drainage plans :.....
.....
9. A listing of all chemicals in use at the facility (trade names not acceptable)
.....
.....
10. Present discharge locations (to be geo-referenced)(illustrate) and position of inspection tap for compliance monitoring :.....
.....
.....
11. For new sources—submission of EIS report is mandatory. Request for permit must be made 3 months before the expected date of discharge.
12. Volume of raw water consumption (cubic meters/year)
.....
.....
13. Source of energy at facility and quantitative estimate of consumption on a monthly basis :
.....
14. Any safety/contingency plan/EMP :
.....
15. Distance of facility from residential area :
.....
.....
16. Detailed description of effluent treatment/disposal methods :
.....
.....
17. Production capacity :
 - (a) current production capacity :.....
.....
 - (b) estimated production especially as a result of any proposed expansion
.....
.....
 - (c) estimated effluent organic load per year(kg / year COD) :
.....
.....
18. Air pollution emission points - with stack height and diameter (Drawing may be attached).

FORM 2

WASTE DISCHARGE PERMIT

The National Environmental Standards and Regulations Enforcement Agency (NESREA) hereby acknowledges the receipt of the application for effluent/emission/waste discharge dated.....day of20..... and grants a permit in respect of the following:

- (i) Full Name and Address of Permit Holder :
.....
.....
- (ii) Location of site (geo-reference) to which permit relates :
.....
.....
- (iii) Mode of discharge to which permit relates:
.....
.....
- (iv) Type/Volume/Quality of Waste/Wastes/Waste Streams of which discharge or disposal is authorized :
.....
.....
2. The permit is subject to the following conditions :
- Payment of prescribed fees.
 - Becomes invalidated on violation of mandatory precautions prescribed level of polluting substances contained in schedule II)
 - Permit is not transferable.
 - The Agency reserves the right to ensure compliance with the provisions of relevant national Regulations.
 - The Agency shall not be liable to any claim(s) under the permit.
- The permit is valid for the period as stated in the permit.

Date :.....

SCHEDULE XVII

Regulation 40(3) and (4)

MONTHLY DISCHARGE MONITORING REPORT (MDMR)
[NESREA DISCHARGE MONITORING REPORT]

PLEASE COMPLETE AND SUBMIT ONE COPY EACH MONTH
THIS REPORT MUST BE POSTMARKED NOT LATER THAN THE
28TH DAY OF THE FOLLOWING MONTH.

Facility Name and Address :

Mail to :

National Environmental Standards and Regulations Enforcement Agency
(NESREA),No. 4, Oro-Ago Crescent,
Abuja.

Sampling Point Location :

--	--	--	--

Month Year

Sampling Dates and Time :

Types of Sampling Parameters	Units	Weekly Results				Nesrea's Regulatory Limits Average
		1 ST	2 ND	3 RD	4 TH	
PHYSICAL :						
Appearance						
Odour						
Temperature	°C					
Ph	—					
Conductivity	µs/cm					
Turbidity	NTU					
Dissolved Oxygen (DO)	mg/l					
Total Suspended Solids	mg/l					
Total Dissolved Solids (TDS)	mg/l					
BOD	mg/l					
COD	mg/l					

TYPES OF SAMPLING						
Parameters		Weekly Results				Nesrea's Regulatory Limits
		1 ST	2 ND	3 RD	4 TH	Average
INORGANIC :	UNITS					
Chloride	mg/l					
Nitrate	mg/l					
Sulphate	mg/l					
Sulphite	mg/l					
Cyanide	mg/l					
Nitrites	mg/l					
Chromium (hexavalent)	mg/l					
Copper	mg/l					
Zinc	mg/l					
Lead	mg/l					
Cadmium	mg/l					
Manganese	mg/l					
Silver	mg/l					
Mercury	mg/l					
Arsenic	mg/l					
ORGANICS :						
Phenols	mg/l					
Oil and Grease	mg/l					
MICRO-BIOLOGICAL :						
Feecal Coli form	CFU					
NOISE MEASUREMENTS						
LOCATIONS				NOISE LEVEL		
Signature of Certified Operator	Date (Month, Day, Year)	Date :				I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.
		Signature :				

FORM 2

NATIONAL ENVIRONMENTAL STANDARDS AND REGULATIONS ENFORCEMENT
AGENCY (NESREA)

INCIDENT REPORT FORM

This report is to be completed when accidental discharge, occupational illness or incident occurs. If an employee is injured or develops gradually a job-related illness as a result of his/her employment at the facility. She must complete and submit the "Incident Report". If the employee is unable to complete the form, the supervisor must complete on his/her behalf.

Incident reporting ensures there is a record on file with the employer, in no way does this waive the employee's right to work's compensation benefits. If an injury occurs, first aid may be administered before any appropriate treatment.

1. FACILITY

Name and Address of Facility : _____

No of Employees : _____

Department where the discharge occurred : _____

Place of the accidental discharge : _____

2. DISCHARGE

Cause(s) of discharge :

Did the discharge occur as a result of mechanical/technical/unskilled application? Please specify.

Was the discharged gaseous, liquid or solid? Please specify.

What was the nature of discharge, sludge, effluent or influent? Please specify.

Into which medium was it discharged to *i.e.* water body, land, or air? Please specify.

- * If water body, specify type of water; pond, stream, lake, river etc.

- * If land ;
 - o Name and location (Geo-reference) of the land where discharge occurred.

 - o Ways of disposing of discharge; *i.e.* burying, burning etc. Please specify.

Was there any previous accidental discharge of this kind ? **Yes** **No**

If yes, when ? _____

How ? _____

Who was/were the victim(s) ? _____

SCHEDULE XVIII

Regulation 11(7)

TYPICAL WASTE FROM (METAL MANUFACTURING) IRON AND STEEL INDUSTRIES

S/N Process Emission Process Water Solid Waste

S/N	Process	Emission	Process Water	Solid Waste
1.	Sintering	Fugitive dust, particulates, carbon monoxide, sulfur dioxide, nitrogen oxides, chloride and fluoride compounds, VOCs (e.g. polystyrene vapors, hydrocarbons), metallic fumes (volatilized metal and metal oxides)	Metal oxides, phenols, grease, spilled oils, suspended and dissolved solids and metals (metal-bearing sludges).	Particulate, powders from Coke, Iron oxide and fluxing agents.
2.	Coal and Coke processing	Particulates, volatile organic compounds, coke oven gases	Dissolved organic compounds or gases, phenols etc.	Particulates of coal and coke.

Metal Shaping				
3.	Metal cutting, grinding and/or forming (including forging, wire drawing, pressing, stamping, among others)	Fume and cutting fluid mists (in processes where cutting/lubricating/cooling fluids are heated (e.g. wire drawing)). In case of hotworks or high wearing effects, some lubricants may decompose and produce VOCs	Waste machining fluids (e.g. ethylene glycol, oil-based fluids; oil-water-emulsions, synthetic emulsions) and acid (e.g. hydrochloric, sulfuric, nitric), alkaline, and solvent wastes	Metal particles (e.g. iron filings, and chips or swarf arising from machining operations) metal-bearing machining fluid sludges, and solvent still-bottom wastes
Thermal Treatments				
	Quenching, annealing and other general treatments	Mist, VOC/solvents, fumes, particulates (e.g. chromium or nickel oxidized vapors), ammonia, gaseous hydrocarbons, CO, and various gases used in heat treatment	Oxide scales, dissolved salts	Solid oxide scales.
Surface Preparation				
	Abrasive treatments (e.g. shot, sand blasting)	Dust, comprising abrasive particles, metals and metal oxides.		
	Solvent degreasing and emulsion, alkaline, and acid cleaning	Solvents (associated with solvent degreasing and emulsion cleaning only), VOC, fumes, acid or alkaline vapors containing ammonia, ammonium chloride	Surfactants, emulsifiers, detergents, terpenes, alkaline or acid wastes, metal salts, dissolved base materials	Process sludge(s)

	Smelting	Particulate, chromium (VI) and nickel oxidized vapors, ozone, vapors (as metals or as oxides) of lead, cadmium, zinc, tin, iron, molybdenum, manganese, cobalt, vanadium, silica and silicates, fluorides, nitrogen oxides, carbon monoxide, carbon dioxide, phosgene (carbonyl chloride), phosphine Smoke, sulphur dioxide, dust, oil and solvent fumes, odours, oxide fumes, acid fumes.	Waste water containing oxide particles, dissolved gases and ore particles.	Metal oxides (e.g. oxides of Ti, Al, Fe, Ni, Cr, Cu, Zn or Sn) and slag drops
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Surface Finishing

	Anodizing, chemical conversion coating, electroplating	Metal-iron-bearing mists and acid mists, hydrochloric acid, sulfuric acid, ammonia, ammonium chloride, zinc oxide, particulate matter, lead, copper, chlorine	Acid / alkaline wastes, metals, metal salts, zinc, chromium (VI), cyanide	Metal sludge(s), base metal and reactive compounds
	Painting	Solvent fumes	Solvent wastes, spills, and still bottom	Still bottoms, sludge(s, dried), paint, and metals

Other metal finishing techniques (including polishing, hot dip coating, and etching)	Metal fumes and acid fumes, zinc oxide (from water quench), VOC, strong acids, particulate matter, sulfur oxide (from heating the zinc bath)	Metal (e.g. zinc, chromium (VI)) and acid or alkaline wastes	Solid waste - Polishing sludge(s), metal (e.g. Zinc, Chromium) dross, etching sludges, oxide dross, metal sludge(s)
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SCHEDULE XIX

Regulation 28(1)

HEARING CONSERVATION TABLE

A-Weighted Sound Level(dB)	Duration (hours)
80dB*	32
85+	16
90‡	8
95	4
100	2
105	1
110	0.5
115	0.25
120	0.125
125	0.063
130#	0.031

Where :

- * Measuring threshold
- + Hearing Conservation begins - 50% dose
- ‡ Eight hour criteria level
- # Minimum upper range

A dosimeter is the instrument in noise assessment. It determines the noise level to which employee are exposed by measuring sound over time and analyzing information to produce a noise dose, expressed in a percentage. The employee exposure exceeds the OSHB limits if the noise dose exceeds unity or 100%

Noise dose (D) is defined as $D=C/T$

D= Noise Dose, C= Actual duration of exposure in hours, T= Noise Exposure limit in hours.

SCHEDULE XX *Regulation 24(1) and (2)*

APPROPRIATE ABATEMENT/TREATMENT TECHNOLOGIES

- (a) Stack gas scrubbing, carbon adsorption or combustion (for toxic organics);
- (b) bag houses (for particulate matter removal);
- (c) biological filters;
- (d) cyclone or any other appropriate technology.

SCHEDULE XXI *Regulation 13(2)(b)*

OZONE DEPLETING SUBSTANCES (ODS)

Several chemicals are classified as ozone depleting substances (ODSs) and are scheduled for phase-out under the Montreal Protocol on Substances that Deplete the Ozone Layer. Nigeria's date for phase out is Jan 2010. Examples of these substances include:

- chlorofluorocarbons (CFCs); halons;
- 1,1,1-trichloroethane (methyl chloroform);
- carbon tetrachloride;
- hydrochlorofluorocarbons (HCFCs);
- hydrobromofluorocarbons (HBFCs); and
- methyl bromide.

They are currently used in a variety of applications including:

- domestic, commercial, and process refrigeration (CFCs and HCFCs);
- domestic, commercial, and motor vehicle air conditioning (CFCs and HCFCs);
- for manufacturing foam products (CFCs); for solvent cleaning applications (CFCs, HCFCs, methyl chloroform, and carbon tetrachloride);
- as aerosol propellants (CFCs); in fire protection systems (halons and HBFCs); and
- as crop fumigants (methyl bromide). No new systems or processes should be installed using CFCs, halons, 1,1,1-trichloroethane, carbon tetrachloride, methyl bromide or HBFCs.

HCFCs should only be considered as interim/bridging alternatives as determined by the National Ozone office of the Federal Ministry of Environment. Additional information is available through the Montreal Protocol Secretariat web site available at : <http://ozone.unep.org>

Made at Abuja this 28th day of April, 2011.

MR JOHN ODEY
*Honourable Minister,
Federal Ministry of Environment*