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66 National Environmental (Dams and Reservoirs) Regulations, 2014 ... B895-923

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# NATIONAL ENVIRONMENTAL STANDARDS AND REGULATIONS ENFORCEMENT AGENCY (ESTABLISHMENT) ACT, 2007

NATIONAL ENVIRONMENTAL (DAMS AND RESERVOIRS) REGULATIONS, 2014



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# S. I. No. 66 of 2014

# NATIONAL ENVIRONMENTAL STANDARDS AND REGULATIONS ENFORCEMENT AGENCY (ESTABLISHMENT) ACT, 2007

# NATIONAL ENVIRONMENTAL (DAMS AND RESERVOIRS) REGULATIONS, 2014

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 powers enabling me in that behalf, I, MRS. LAURENTIA LARABA Mallam, Minister of Environment, make the following Regulations-

[9th Day of December, 2014]

Commencement.

# PART I-GENERAL PROVISIONS

1.—(1) The objective of these Regulations is to control the effects of Objectives. Dams and Reservoirs on the environment and human health.

(2) The specific objectives are to-

(a) reduce or minimize environmental hazards and disasters such as dam break, sediment load and dam water releases causing downstream flooding and erosion;

(b) protect, minimize and address negative impacts on freshwater, wetlands and water quality;

(c) minimize the impacts from lowering the water elevation in a reservoir during a repair project, such as installing a temporary bufferdam, necessary to reduce detrimental impacts to fish and wildlife associated with the wetland environment and to reduce loss of aquatic vegetation that serves as wildlife habitat;

(d) promote the best management practices through application of appropriate sedimentation, erosion and flood control measures to prevent and where necessary, limit flooding, swamping and water shortage;

(e) protect and improve the chemical and ecological status of water systems and allowing water systems to serve socio-economic and environmental functions;

(f) ensure effective use of dams and reservoirs to regulate river flow levels and flooding downstream of the dams by temporarily storing the flood volume and releasing it later;

(g) ensure effective use of dams and reservoirs for the desired purpose; prevent hazardous substances used during repairs and other dam activities from entering any adjacent water and freshwater wetlands to protect aquatic life; (h) ensure that the environmental impact of dams and reservoirs is managed in such a way that it does not adversely affect the desired operation of the facility;

(i) restore or mitigate alterations to freshwater wetlands as deemed necessary by the Agency;

(i) promote the best method to minimize pollution of freshwater;

(k) ensure proper maintenance of the dam and the associated structures; and

(*l*) provide for the safety of lives, property and the environment in the advent of disaster or emergency.

Application.

2. These Regulations apply to all Dams and Reservoirs in Nigeria.

PART II-ADMINISTRATION OF THESE REGULATIONS

Registration with the Agency. 3.—(1) The owner of an existing facility shall register with the Agency, within ninety (90) days of promulgation of these Regulations, by completing the registration form as specified in Schedules I and II to develop appropriate database.

(2) The owner of a new facility shall notify in writing and forward the design plan to the Agency to update the existing database.

Classification of Dams.

4.—(1) A facility shall be classified by the Agency based on size and hazard potential as specified in Schedule VII to these Regulations.

(2) The Agency shall liaise with relevant authorities to determine the class of a Dam.

(3) The Agency shall maintain a list of all classified dams and make the list available to the public.

(4) The Agency in collaboration with the relevant authorities shall where appropriate, reclassify facilities.

# PART III-GUIDING PRINCIPLES

5. The Guidelines set out hereunder shall be observed in regulating all facilities-

(a) the precautionary principle shall be observed, and that is to say, where there are threats of serious or irreversible damages, the absence of scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation;

(b) the "Polluter-Pays-Principle" shall apply;

(c) dams and reservoirs operations shall be conducted using the Best Available Technologies (BAT) that are environment-friendly and compatible with public health;

Principles for Regulating Facility,

(d) extraction of resources shall be carried out with adequate consideration of the environment (plant, man, animal and the general ecosystem);

(e) statutory national and international Facility Management Bodies shall co-operate in building better practice management through sharing of information, technology and professional expertise; and

(f) adequate access to information and opportunity shall be provided for meaningful participation in planning, monitoring, ensuring compliance and encouraging best practices in the Facility.

6. Environmental Impact Assessment (EIA) shall be conducted by the project proponent and submitted to the Federal Ministry of Environment for all new Facilities before the commencement of operations as required by the EIA Act of 1992 and Environmental Impact Statement (EIS) submitted to the Agency.

7. Environmental Audit (EA) including Environmental Management Plan (EMP) shall be conducted on all existing Facilities every three (3) years and submitted to the Agency for review and Certification.

# PART IV-PROHIBITION

8.-(1) Sewage (soak-away) for every service building and dwelling in the vicinity of the dam shall not be located within 500 meters to the reservoirs.

(2) Fishing and boating shall not be carried out without obtaining permit from appropriate authority.

(3) Camping shall not be carried out without obtaining relevant permit from appropriate authority.

(4) Removal of vegetation and felling of trees around the storage area shall not be done without obtaining approval from appropriate authority.

(5) The use of hazardous chemical within the storage area is prohibited as specified in National Environmental (Chemicals, Pharmaceuticals, Soap and Detergent Manufacturing Industries) Regulations, 2009.

(6) Dams repair and maintenance shall be carried out using method that ensures the water quality is not polluted as specified in schedule IV to these Regulations.

9.--(1) A person shall not dump or discharge in any place on land or into the water of a storage area, any refuse, waste or material of any kind whatsoever which shall cause water pollution, but shall store it in containers suitable for the purpose.

Sanitation and Waste Control.

Prohibited Activities.

Environmental Impact Assessment (EIA).

Environmental

Audit.

(b) adequately provide instrumentation and properly maintain within the context of Schedule IV, all design, operation and maintenance of dams shall comply with global best practices;

(c) carry out Dam Break Studies for all facilities;

(d) have an Emergency Preparedness and Response Plan;

(e) have capability to absorb the failure or releases of the upstream dam water ;

(f) have a different hazard potential classification from the downstream dam, if the failure flood wave of the upstream dam will not cause failure of the downstream dam :

(g) ensure that a receptor dam is constructed at the downstream of any upstream dam located in a neighboring country;

(h) ensure that no dam water is released if cleanup is not done, when polluted ;

(*i*) ensure that no land disturbing activities is carried out within 1000 meters to the bank of the reservoir without the approval from the management authority;

(*j*) ensure that no sediment management method(s) are carried out without the approval of the Management authority;

(k) ensure hydrographic surveys are carried out at least once in five years;

(*I*) ensure that Environmental Flow in the ecosystem is maintained through adequate flow of water to the downstream ;

(*m*) disallow any chemical substance that can reduce water quality, increase salinity, introduce toxins and make the water unusable for drinking and irrigation in the dams and water bodies except with the approval of the Agency;

(*n*) minimize clearing of vegetation at the project inception and remove slash material from adjacent freshwater wetlands and water bodies ;

(*o*) ensure that warning, danger and caution signs are provided within the reservoir area for general safety ;

(p) carry out maintenance in accordance with established operational procedures ; and

(q) ensure that functioning hydro-meteorological stations are mounted at strategic places.

12.—(1) Catchment area management and other measures for design shall be used to optimize the life expectancy of reservoirs and reduce the environmental impact on the river and stream valley.

Standards for Design and Construction of New Dam. (2) Facilities shall be constructed in accordance with extant regulations and the design shall be based on the standards as specified in Schedule III to these Regulations.

Protection of Biodiversity.

13. A person shall protect the biodiversity and shall not kill or disturb any animal nor cut, destroy, uproot or harvest any plant in a storage area or introduce alien species without a permit issued by the appropriate authority.

Dam Break Studies. 14.—(1) Dam Break Analysis shall form an integral part of the overall dam safety program.

(2) Dam Operators shall ensure that adequate safety measure(s) are provided in the event of any catastrophic failure such as sudden, rapid and uncontrolled water releases.

(3) Emergency Action Plan (EAP) shall address the inherent flooding hazards that may arise from the breach in a dam as a result of the sudden, rapid and uncontrolled release of water.

(4) Dam Operators shall put in place preventive measures to include-

(a) Flood plain zoning;

(b) Flood plain mapping; and

(c) Issues of flood early warning.

(5) Dam Break Studies shall consist of the following-

(a) Precipitation analysis;

(b) Hydrologic modeling;

(c) Dam breaching analysis;

(d) Dam break flood wave routing; and

(e) Inundation mapping of the resultant flood.

(6) Analysis of past incidences of flooding in the country shall be applied to develop a robust Emergency Response Plan (ERP) and future land-use planning.

(7) Dam Operators shall develop and apply Flood Early Warning (FEW) measures for all facilities.

Emergency Plan. **15.**—(1) The Dam Operators shall develop Emergency Action Plans (EAPs) for all dams in Nigeria to contain the following information—

(a) guidance for evaluating emergency situations occurring at a dam;

(b) notification charts and emergency contact information ;

(c) a list of residents, businesses and entities within the downstream inundation zone;

(d) a list of resources available for responding to a dam emergency;

(f) basic physical and geographical data for the regulated dam.

(2) The Emergency Action Plans shall establish and maintain the following—

(a) emergency contact information;

(b) evacuation procedures ; and

(c) effective communication link between the Dam Operators and Emergency Management Authorities.

(3) The Agency in collaboration with other relevant authorities shall develop and periodically review facility Safety Programs.

(4) Emergency Management Authorities shall provide critical emergency contact information and assistance for dam safety and emergency response issues.

(5) Emergency Preparedness and Response Plan (EPRP) shall be developed by the facility owners or operators in collaboration with relevant authority and ensure ownership and domestication by responsible Agencies to be reviewed every five years by responsible Agencies.

(6) An EPRP shall provide all necessary information and instructions needed to allow an individual to respond to an emergency related to the dam.

(7) Dam operator shall identify stakeholders and shall bring them together to jointly develop the Plan.

(8) Respective roles and responsibilities at Federal, State and Local Government levels shall be considered and clearly stated by the Plan.

#### PART VII-PERMIT AND INSPECTION

16. Dredging of a facility shall be carried out with a permit issued by the appropriate authority in accordance with extant Regulations and also as specified in the National Environmental (Permit and Licensing System) Regulations, 2009.

17. The Agency shall carry out compliance monitoring and inspection of dams and their appurtenant works in line with the provisions of these Regulations.

18.—(1) Owner of facility shall carry out annual safety assessment.

(2) Records of dam and reservoir safety activities and operations shall be made available for sighting during compliance monitoring and inspection by the Agency.

Permit.

Inspection.

Monitoring and Inspection.

# PART VIII—ENFORCEMENT

**19.**—(1) An enforcement action shall be carried out as specified in Schedule VI to these Regulations and it may include the serving of enforcement notice.

(2) An enforcement notice shall be served if the Agency is of the opinion that an operator has contravened, is contravening or is likely to contravene any condition of a permit.

(3) An enforcement notice shall specify the-

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

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

(4) An officer of the Agency may, in the course of his duty under these Regulations, at any reasonable time—

(*a*) enter and search any premises or facility to take samples or specimen for analysis, and measurements in length and/or of level of standards to which these Regulations relate ; and

(b) seize and detain for such time as may be necessary for the purpose of these Regulations any article by means of or in relation to which he reasonably believes any provision of these Regulations has been contravened.

Enforcement Notice Reminder. **20.**—(1) Any operator who fails to comply with the terms of the enforcement notice issued pursuant to regulation 19 of these Regulations may be serviced a second notice.

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

**21.** Mode of delivery of the enforcement notice shall be by hand, registered post or courier, electronic transmission, or be pasted at the facility or registered premises of the organization.

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

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

Equity.

23. Every facility shall be given equal treatment without preference as far as inspection and enforcement of relevant laws are concerned.

Mode of Delivery.

Denvery.

Suspension of Permit.

**B 904** 

Enforcement Notice.

# PART IX—OFFENCES AND PENALTIES

24.—(1) A person who causes damage to any Government or other Offences. property within a Storage Area commits an offence.

(2) A person who contravenes any of these Regulations or fails to observe any condition contained in a permit issued in pursuant to these Regulations, commits an offence.

(3) The Agency may have the right to refuse the carrying of a firearm or any kind of weapon into the storage area without a written approval from the appropriate authority.

**25.**—(1) A person who violates any of the provisions of these Regulations or commits an offence shall on conviction be liable to a fine not less than one million Naira (N1,000,000.00) or to imprisonment for a term not less than two years or both such fine and imprisonment and an additional fine of ten thousand naira (N10,000.00) for everyday the offence subsists.

(2) A corporate body that violates any of the provisions of these Regulations or commits an offence shall on conviction, be liable to a fine not less than five million Naira (N5, 000,000.00) and an additional fine of fifty thousand naira (N50,000.00) for everyday the offence subsists.

(3) In addition to sub regulations (1) and (2) the offender shall be responsible for the remediation of the damage to the environment and any affected properties therein.

# PART X-MISCELLANEOUS

26. In these Regulations unless the context otherwise requires-

Interpretation.

Penalties

"Agency" means the National Environmental Standards and Regulations Enforcement Agency;

"Animal" means any vertebrate animal (excluding a fish and a poisonous snake);

"Biodiversity" means fauna and flora;

"Dam" means any artificial barrier, together with appurtenant works, including but not limited to dams, levees, dikes or floodwalls for the impoundment or diversion of water or other fluids where failure shall cause danger to life or property;

"Appropriate Authority" means a Federal, State or Local authority, Irrigation or Water Board or other Statutory body responsible for the management of dams and reservoirs;

"Desired Purpose" means the reason for which the facilities exist ;

"Detailed inspection" means all studies, investigations and analyses necessary to evaluate conclusively the structural safety and hydraulic capacity of a dam or reservoir and appurtenant works. This inspection shall include but is not limited to soil analysis, concrete or earth stability analysis, materials testing, foundation explorations, hydrologic analysis, including basin studies and flood potential. This inspection shall be performed by a registered engineer;

"Director-General" means the Chief Executive and Accounting Officer of the National Environmental Standards and Regulations Enforcement Agency appointed under section II of the Act or any person or Authority acting on his behalf;

"Distressed Dam" means the condition of a regulated dam, as determined by the Agency, is such that a risk of failure exists that will result in probable loss of human life or major economic loss ;

"Facility" means Dam and Reservoir;

"Fish" includes crustacean and mollusca and water fauna in general and the eggs, hatch, spawn or the young of fishes and of such water fauna;

*"Fish Ladder"* means a structure in or around artificial barriers in the dams to facilitate migration of fish between fresh and salt water ;

"Hazard Classification" the rating ranges from Low Hazard, significant hazard dam, to a High hazard dam;

"Inspector" means an inspector designated as an environmental inspector;

"Inspection" means visual examination of an existing dam or proposed dam site to determine the physical dimensions of the dam and reservoir and the hazard potential of the structure, irrespective of the structural safety of the dam itself;

"Lifeline Facilities" means essential facilities within the catchment area, the loss of which can result in indirect threat to life. Facilities shall include transportation links (high ways, bridges, rail lines) and utility systems (electric power plant, gas and liquid fuel pipe lines, telecommunication system, water supply and waste water treatment facilities);

*"Lead Agency"* means any Ministry, Agency, Parastatal, Local Government system, or Public Officer in which or upon whom any law vests functions of control or management of any segment of the environment ;

"Management Authority" means the owner or operator of a dam;

"Minister" means the Minister to whom the President has assigned responsibility for the Act;

"Owner" means the person or persons who own, control, operate, maintain, manage or propose to construct a dam or reservoir including any individual, firm, partnership, association, syndicate, company, trust, corporation, Local government, Agency, political or administrative subdivision of the State or any legal entity of any kind holding legal title to a dam;

"Operate a Dam or Reservoir" means to perform functions intended to preserve or protect the dam or reservoir (or the area potentially impacted by the dam or reservoir). Examples of operator functions include removal or replacement of flashboards, opening or closing of gates, removal of accumulated trash at the spillway, and maintenance functions such as mowing grass on the dam;

"*Pasting*" means the posting of a notice at the address of the owner or occupant of the premises or facility; or the putting of a notice in a public or conspicious place so that people including those the notice is meant for, can see it;

"Person" means any person, body corporate or organisation ;

"Polluter-Pays-Principle" means a kind of payment attached to the extent of pollution;

"*Reservoir*" means any basin, including the water, which contains or will contain the maximum amount of water impounded by a dam;

"Seepage" means the migration of water through a dam foundation ;

*"Storage Area"* means the water surface and the submerged area of a Dam, as well as all surrounding land and also any Water Works in a Water Control Area in which such Dam is Situated, in respect of which the Agency exercises rights and privileges ;

"*Tailings*" means the material generated by a mining/milling operation, which is deposited in slurry form in an impoundment for storage and/or both;

"Watershed" means the area that contributes or shall contribute surface water to a reservoir.

27. These Regulations shall be cited as the National Environmental (Dams and Reservoirs) Regulations, 2014.

Citation.

#### SCHEDULES

## SCHEDULE I

#### REGISTRATION AND NOTIFICATION

[Regulation 3 (1)]

(1) The owner of Facilities shall file an application with the Agency, within ninety (90) days of Promulgation of these Regulations, a fully completed registration form to be provided by the Agency.

(2) The owner of a regulated dam shall notify the Agency and the Appropriate Authority having jurisdiction, of the transfer of legal title of such dam or a change in the mailing address, telephone number or emergency contact person not later than sixty (60) days after the date of such transfer or change and provide to the Agency the new owner, mailing address, telephone number, or emergency contact person.

(3) The owner of a regulated dam, upon written request from the Agency, shall make available all the existing surveys, plans, drawings, designs and reports related to the dam, in possession of or available to the owner, that shall be required by the Agency for the purpose of environmental monitoring.

#### SCHEDULE II

#### **REGISTRATION FORM FOR FACILITIES**

[Regulation 3 (1)]

1. Applicant :

Name(s) :	
Signature :	
Address :	
City :	
State :	
Local Government Area :	
Telephone No :	
E-mail :	

2. PROPERTY OWNER(S) :

Name(s) :
Signature(s):
Address:
City:

B 909

State :	
Local Government Area :	
Telephone No. :	
E-mail :	

# 3. Description of the Facility :

Address or Location of the Dam:
Hydrological Area :
State :
Local Government Area:
Longitude :
Latitude :
Altitude (m asl):
Assessor's Map No.:

# DAM CHARACTERISTICS :

Туре :
Height (m) :
Crest Length (m) :
Reservoir Area (km <sup>2</sup> ) :
Reservoir Storage Capacity (MCM) :
Spillway Type :
Spillway Design Flood (m <sup>3</sup> /s):
Catchment Area (km <sup>2</sup> ):

# Other Information on the Dam :

Purpose :
Instrumentation :
Year of Completion :
Consulting Engineer :
Contractor :

Certificate Number :
Date applied for :
Application No. :
Date Filed :
Approved :
Denied :

## SCHEDULE III

## STANDARDS FOR DESIGN OF FACILITIES

(1) Sediment trap shall retain gravel and sand which shall ensure evacuation of all the fine sand, silt and shale fractions.

(2) Residual water and sediment evacuation conduit shall provide the residual water downstream of the reservoir and sediments shall be evacuated, mainly during flood situations, without transition through the main reservoir and with a minimum damage to the riverine ecosystem.

(3) Water supply to the main reservoir shall be fed by a conduit that starts in the surface waters of the water trap, without any gravel or coarse and medium sand.

(4) The main reservoir shall be selected so that the final deep basin is characterized by simple biological structure and a short basin axis, to facilitate flushing of the basin sediments.

(5) Bottom outlet of the dam shall be used, if necessary, in combination with other passive and/or active measures to evacuate fine sediments from the deep basin by flushing operations.

(6) Fish ladder shall be constructed around or on the dam to facilitate migration of fish between fresh and salt water.

(7) Main conduit for hydroelectric or other reservoir use shall be maintained.

#### SCHEDULE IV

#### MAINTENANCE OF FACILITIES

[*Regulations* 8 (6); 11 (b)]

(1) Maintenance of a high hazard dam or significant hazard dam, except for certain cutting or removal of trees, does not require an approval from the Agency.

(2) To be exempt from Agency approval, the cutting or removal of trees must be limited to those trees with a diameter less than 6 inches (measured 0.6 metres above the ground level) or that does not affect the integrity of the dam.

(3) If trees have a diameter greater than 6 inches (measured 0.6 metres above the ground level) then the dam owner shall first consult with a qualified engineer who will determine if the cutting or removal could jeopardize the integrity of the dam.

(4) The owner shall obtain a written report from the qualified Engineer, if the qualified Engineer determines that the cutting or removal is not a threat to the integrity of the dam, and keep a copy of the report in file.

(5) The report does not have to be filed with the Agency. The owner shall file an application for repair of the dam in accordance with these Regulations if the qualified Engineer determines that the cutting or removal is a threat to the integrity of the dam.

(6) Mowing or cutting of vegetation shall be performed without an approval from the Appropriate Authority provided it is limited to areas on the dam and adjacent to the dam such that an area does not exceed five (5) metres from the embankment, spillway or low level control structure.

(7) All other mowing or cutting of vegetation within freshwater wetlands will require a permit from the appropriate authority unless specifically exempted under the National Environmental (Wetlands, River Banks and Lake Shores Protection) Regulations, 2009.

(8) Areas exceeding five (5) metres from the embankment, spillway or low level control structure that have been historically mowed and maintained are specifically exempted. These areas can continue to be mowed without a permit from the Agency.

(9) All maintenance activities shall comply with the following-

(*a*) best management practices for erosion and sediment controls shall be used. All controls must be maintained in effective operating condition during the activity, and all exposed soil and other fills must be permanently stabilized at the earliest possible date ;

(b) all equipment used for maintenance activities shall be removed from any freshwater wetland upon completion of the maintenance project; and (c) all repair and maintenance activities shall be protective of water quality and freshwater wetland functions and values so as to prevent pollutants, sediment, direct discharge of storm water runoff, or any material foreign to waters including freshwater wetlands, or hazardous to life, from entering any waters including freshwater wetlands.

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#### SCHEDULE V

#### GUIDELINES FOR REGULATING DISTRESSED FACILITY

[Regulation 11]

(1) Whenever the appropriate authorities determine that a dam is distressed, it shall determine whether the water in the reservoir shall be drawn off in whole or in part, and the actions necessary to make the dam safe.

(2) The Agency may notify the owner or person maintaining or having control of the dam, by certified mail, that the dam is unsafe, the actions necessary to make the dam safe and a schedule to complete the actions.

(3) The Agency may notify the owner or person maintaining or having control of the dam, by certified mail that the dam is distressed after completing the inspection or after receiving an inspection report completed by a qualified Engineer.

(4) The Agency may issue an immediate compliance order stating the existence of the unsafe condition and the action deemed necessary to correct the unsafe condition. It shall order the water in the reservoir to be drawn off, in whole or in part. The immediate compliance order shall become effective immediately upon service or within such time as is specified by the Agency in such order.

(5) Any emergency action taken by the Owner of the facility shall immediately be reported to the Agency and the Local Government(s) in which the facility is located The facility shall also report, by telephone within twentyfour (24) hours and in writing within three (3) days, the emergency action taken.

(6) If water has been drawn off or the dam has been altered pursuant to an order by the Agency, the reservoir shall not be refilled without approval of the Agency.

(7) If the Owner of the facility fails to comply with an order, the Agency may also, by summons and complaint, seek to enforce the order in a court of competent jurisdiction.

#### SCHEDULE VI

#### ENFORCEMENT ACTIONS

# [Regulation 19 (1)]

(1) As set forth by Section 8 of the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act 2007, the Agency may have the power to issue enforcement notices, orders, administrative penalties or other requirements to ensure compliance with these Regulations.

(2) The Agency may also provide written or verbal warning of its intent to undertake enforcement action. Nothing in these Regulations shall limit the authority of the Attorney General of the Federation to prosecute offenders as required by law.

(3) The Agency may forward a copy of the enforcement notices and/or orders to recognized court of law in accordance with the laws of the land and the State Government wherein the dam is located.

#### SCHEDULE VII

# DAM CLASSIFICATION

## [Regulation 4(1)]

(1) All dams and reservoirs subject to these Regulations shall be classified according to their size and hazard potential. Classifications shall be made in accordance with this section and are subject to final approval by the appropriate authority. It may be necessary to reclassify dams as additional information becomes available.

(2) The classification for size is based on the height of the dam and storage capacity. Size classification may be determined by either storage or height, whichever gives the larger size capacity as specified under the FGN (2007) Compendium of Nigerian Dams.

(3) The classification for potential hazard shall be in accordance with the magnitude of the loss of life and damage to property. The hazards pertain to potential loss of human life or property damage in the event of failure or improper operation of the dam or appurtenant works. Probable future development of the area downstream from the dam that would be affected by its failure shall be considered in determining the classification. Dams shall be subject to reclassification if the appropriate authorities determine that the hazard has changed.

(4)(*a*) *High Hazard* (*Class* I)—Dams located where failure will likely cause loss of life or serious damage to property, industrial and commercial facilities, important public utilities, main highways or railroads.

(b) Significant Hazard (Class II)—Dams located where failure will not likely cause loss of life but may damage property, industrial and commercial facilities, secondary highways or railroad(s) or cause interruption of use or service of relatively important public utilities.

(c) Low Hazard (Class III)—Dams located where failure may cause minimal property damage, loss of life is not expected.

(5) Currently, there is inadequate information to classify the existing dams and reservoirs in the country according to the above classifications. Consequently, the classifications of the reservoirs (by size) according to the Compendium of Dams in Nigeria (FGN, 2007) are adopted in the interim. The 179 dams in Nigeria are listed in the following tables according to the adopted classifications. Large is 109, Medium is 17 and Small is 53. Hazard Potential

Classification.

Classification.

Hazard Potential Classification Table

B 915

General.

Size

<i>L.c.A</i> Ilorin South Katsina Odedę Jere Barkin Ladi Aisegba Egbeda Fiditi Iwo Bebeji Birnin Gwari Talata Mafara Hawul	IATA     River       Ilorin South     Agba       Ilorin South     Agba       Katsina     'lagwai       Odedę     Afagbata       Jerc     Ngadda       Jerc     Ngadda       Barkin Ladi     'lenti       Aisegba     Apariko       Figbeda     Oshun       Fiditi     Awon       Iwo     Ayiba       Baceji     Kura/Bagauda       Birnin Gwari     Kusheriki       Talata Mafara     Sokoto       Havul     Ndivana	IATA         River         I.m           Ilorin South         Agba         4"           Ilorin South         Agba         4"           Katsina         Tagwai         7"           Odedę         Alagbata         3"           Jere         Ngadda         13"           Jere         Ngadda         13"           Jere         Ngariko         5"           Barkin Ladi         Tenti         8"           Isebeda         Oshun         4"           Fiditi         Awon         3"           Iwo         Ayiba         4"           Barkin Gwari         Kura/Bagauda         8"           Birnin Gwari         Kusheriki         6"           Hawul         Ndivana         12"	Francos     4       Doma     4       Dutsinma     1       Fighe     6       Fikuku     4       Firinle     6       Firo     6       Firo     6       Firos     8       Giado Nasco     8       Giari     8	Francisco       Donia       Dutsinma       ligbe       ligbe       likuku       lirinle       birinle       liro       liros       liros       lirindo       lirinsu - Arigidi       lisa-Odo       Giado Nasco       Gianta       8	Doma     4       Dutsinma     1       Figbe     6       Ekuku     4       Urinle     6       Ero     6	Francisco       Donia       Dutsinma       Figbe       Bigbe       Bigb       Bigb	Dona     4       Dutsinma     1       lėgbo     6       likuku     4       lirinle     6       lirino     6	Doma 4 Dutsinma 1 Pigbe 6 Pikuku 4 Pirinle 6 Piro 6 Pirusu - Arigidi 6 Pisa-Odo 6	Ponia 4 Dutsinma 1 Figbe 6 Ekuku 4 Brinle 6 Ero 6 Erusu - Arigidi 6	Doma     4       Dutsinma     1       Egbe     6       Ekuku     4       Erinle     6       Erro     6       Erros     6	Doma 4 Doma 1 Lutsinma 1 Egebe 6 Ekuku 4 Erinle 6 Ero 6	Doma 4 Dutsinma 1 Egbe 6 Ekuku 4 Erinle 6	Doma 4 Dutsinma 4 Egbe 6 Ekuku 4 Erinte 6	Doma     4       Dutsinna     1       ligbe     6       likuku     4	Doma 4 Dutsinma 1 Egbe 6	Doma 4 Dutsinma 1	Doma 4	. Alimine	18 Dallaice 1 Katsina	17. Dadinkowa 4 Gombe	16. Challawa Gorge 8 Kano	15. Bosso 2 Niger	14. Bokkos 4 Plateau	13. Biu 8 Borno	12. Bakolori I Zamfara	11. Bagoma 2 Kaduna	10. Bagauda 8 Kano	9. Ayiba 6 Osun	8. Awon 6 Oyo	7. Asejire 6 Oyo	6. Apariko-Aisegba 6 Ekiti	5. Ankwill 1 4 Platcau	4. Alau 8 Borno	3. Alagbata 6 Ogun	2. Ajiwa I Katsina	I. Agba 2 Kwara	S N Name IIA State
River Agba Tagwai Alagbata Ngadda TGati Apariko Oshun Awon Awon Awon Awon Kura/Bagauda Kura/Bagauda Kusheriki Sokoto Ndivana	r / a 3 a 3 a 1.3 y 5 5 5 5 5 5 5	Lougg $Lougg         Lagg           4" 35"         8" 3           4" 35"         8" 3           a         3" 15"         7" 0           a         3" 15"         11"           8" 41"         9" 3           5" 27"         7" 3           4" 10"         7" 3           5" 27"         7" 3           4" 10"         7" 3           5" 27"         7" 3           4" 10"         7" 3           5" 27"         7" 3           4" 10"         7" 3           5" 27"         7" 3           4" 10"         7" 3           5" 27"         7" 3           5" 27"         7" 3           5" 27"         7" 3           5" 27"         7" 3           5" 27"         7" 3           5" 27"         7" 3           5" 27"         7" 3           5" 27"         7" 3           5" 27"         7" 3           6" 20"         10"           1         12" 05"         10"           1         12" 05"         10"  $	Minna Karaye Yamaltu a Dalllaje awa Doma a Dutsinma a Dutsinma Yagba East Bde Noba Akoko Edo Obokun Naseru Dambatta	Wa	¥a	Wa	Va	Wa	Wa	Wa	Wa	Wa	Wa	wa	Wa	wa	wa						u Mabel	Hawul			Bebeji	Iwo	Fiditi	Egbeda	Aisegba		Jere	Odedę			
	Longe           4.º. 35°           7.º. 45°           3.º. 15°           1.3º. 12°           8º. 41°           5º. 27°           4.º. 10°           3.º. 56°           8º. 25°           8º. 25°           6º. 20°           12°. 05°	La 8"3 2" 2" 11" 7" ( 9" 2" 11" 7" ( 7" ( 7") 7" ( 11" 7" ( 11") 7" ( 11") 7" ( 11") 7" ( 11") 7" ( 7" ( 7" ( 7" ( 7" ( 7" ( 7" ( 7" (	Katuko Challawa Gongola Dakau Ohima Safana Safana Safana Safana Safana Safana Safana Safana Uro Uro Uyanni Erinle Liro Oyanni Biro Oyanni Cialala Cioubi	Katuko Challawa Gongola Dakau Ohima Safana Safana Little Osse Katakun Little Osse Katakun Firinle Liro Uyanmi Dyanmi Oyani Shaddagubi Galala Goubi	Katuko Challawa Gongola Dakau Ohima Safana Safana Little Osse Katakun Erinle Fro Uro Uyanmi Oyanmi Osun Shaddagubi	Katuko Challawa Gongola Dakau Ohima Safana Little Osse Katakun Erinle Ero Uro Osun Osun	Katuko Challawa Gongola Dakau Ohima Safana Safana Safana Little Osse Katakun Lirinle Katakun Lirinle Liro Oyanmi Osun Shaddagubi	Katuko Chaltawa Gongola Dakau Ohima Safana Safa Saf	Katuko Challawa Gongola Dakau Ohima Safana Safana Little Osse Katakun Erinle Ero Osun	Katuko Challawa Gongola Dakau Ohima Safana Safana Little Osse Katakun Erinle Erinle	Katuko Challawa Gongola Dakau Ohima Safana Little Osse Katakun Erinle Iiro	Katuko Challawa Gongola Dakau Dakau Ohima Safana Little Osse Katakun Erinle	Katuko Challawa Gongola Dakau Dakau Ohima Safana Safana Safana Little Osse Katakun Frinle	Katuko Chaltawa Gongola Dakau Dakau Ohima Safana Safana Little Osse Katakun	Kaluko Challawa Gongola Dakau Ohima Safana Little Osse	Kaluko Challawa Gongola Dakau Ohima Safana	Kaluko Challawa Gongola Dakau Ohima	Kaluko Challawa Gongola Dakau	Kaluko Challawa Gongola	Kaluko Challawa	Kaluko		Mabel	Ndivana	Sokoto	Kusheriki	Kura/Bagauda	Ayiba	Awon	Oshun	Apariko	Tenti	Ngadda	Alagbata	Tagwai	Agba	River
Lar.         Height (m)           8" 30         16.50           12" 57         11.52           7" 08"         10.00           11" 40"         9.50           9" 21"         27.00           7" 34"         12.60           7" 45"         13.10           7" 45"         13.10           7" 45"         12.50           11" 50"         20.73           10" 35"         14.32           12" 34"         18.00	11.eright (m) 16.50 11.52 10.00 9.50 9.50 27.00 27.00 12.60 12.60 12.50 12.50 13.10 12.50 13.10 12.50 14.32		5.00 20.00 930.00 2.800.00 19.50 37.50 37.50 37.50 23.00 5.86 94.00 20.00 4.50 8.20 1.80 2.14.00	5.00 20.00 930.00 19.50 37.50 37.50 23.00 23.00 5.86 94.00 20.00 4.50 4.50 8.20 1.80 23.00	5.00 20.00 930.00 19.50 19.50 37.50 37.50 23.00 5.86 94.00 20.00 4.50 8.20 1.80	5.00 20.00 930.00 19.50 37.50 37.50 37.50 23.00 23.00 5.86 94.00 20.00 4.50 8.20	5.00 20.00 930.00 2.800.00 19.50 37.50 37.50 37.50 23.00 5.86 5.86 94.00 20.00 4.50 8.20	5.00 20.00 930.00 19.50 37.50 37.50 37.50 5.86 5.86 94.00 20.00 20.00 8.20	5.00 20.00 930.00 19.50 19.50 37.50 37.50 23.00 23.00 5.86 94.00 20.00 4.50	5.00 20.00 930.00 2.800.00 19.50 37.50 37.50 37.50 23.00 5.86 5.86 94.00 20.00	5.00 20.00 930.00 2.800.00 19.50 37.50 37.50 37.50 5.86 5.86 94.00	5.00 20.00 930.00 2,800.00 19.50 19.50 37.50 37.50 23.00 5.86 5.86	5.00 20.00 930.00 2,800.00 19.50 19.50 37.50 37.50 5.86 5.86	5.00 20.00 930.00 2,800.00 19.50 37.50 37.50 37.50 5.86	5.00 20.00 930.00 2,800.00 19.50 37.50 37.50	5.00 20.00 930.00 2.800.00 19.50 37.50	5.00 20.00 930.00 2,800.00 19.50 19.50	5.00 20.00 930.00 2,800.00 19.50	5.00 20.00 930.00 2,800.00	5.00 20.00 930.00	5.00 20.00	5.00		11.10	450.00	5.46	22.14	1.64	10.00	32.91	4.70	31.00	153.00	1.00	20.70	3.00	('APACHY)
Height (m)           16.50           7"           10.00           0"           9.50           12.60           12.60           13.10           12.50           20.73           13.10           14.32           5"           14.32           5"           14.32           5"           14.32           5"           14.32           5"           14.32           5"           14.30		C (qpucity (ACNI)           3.00           20.70           1.00           153.00           31.00           4.70           32.91           10.00           22.14           5.46           450.00           11.10	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00 52.00 673.54 673.54 673.54 140.00	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00 52.00 673.54 595.00 673.54 595.00	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00 52.00 673.54 595.00 673.54 140.00	3,850.00 1,100.00 63,00 2,000.00 580.00 52.00 52.00 52.00 673.54 595.00 673.54 140.00	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00 52.00 673.54 673.54 140.00	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00 52.00 673.54 673.54	3,850.00 1,100.00 63,00 2,000.00 580.00 52.00 52.00 673.54 673.54	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00 52.00 52.00 52.00	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00 673.54	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00	3,850.00 1,100.00 63.00 2,000.00 580.00 52.00	3,850.00 1,100.00 63.00 2,000.00 580.00	3,850.00 1,100.00 63.00 2,000.00	3,850.00	3,850,00	3,850.00	3,850.00				500.00	3,750.00	177.72		91.00		5,130.00	1.00	228.00	251.00		174.00		Spill Flood (m3 s)
Ileight         Capacity (m)         Capacity (MCM)           16.50         3.00           7         11.52         20.70           10.00         1.00           27.00         153.00           12.60         31.00           12.60         32.91           13.10         10.00           11.52         20.71           27.00         31.00           12.60         4.70           12.60         1.64           13.10         10.00           13.10         16.40           20.73         22.14           5'         14.32           5'         14.30           4'         48.00           4'         18.00		Capacity (MCM)         Spill Flood (m3/s)           3.00         (m3/s)           20.70         174.00           100         251.00           153.00         251.00           31.00         228.00           32.91         5,130.00           32.91         5,130.00           16.00         1.00           22.14         91.00           22.14         177.72           450.00         3,750.00           11.10         500.00	1990 1946 1992 1987 1988 1988 1974 1973 1978 1987 1977 1977 1977 1973	1990 1946 1992 1987 1988 1988 1974 1978 1978 1987 1977 1973 1977 1973	1990 1946 1992 1987 1988 1988 1974 1974 1978 1983 1978 1973 1977 1973	1990 1946 1992 1987 1988 1988 1974 1978 1978 1988 1978 1973 1973	1990 1946 1992 1987 1988 1988 1974 1978 1978 1988 1988 1988 1977 1977	1990 1946 1992 1987 1988 1988 1974 1974 1988 1988 1988 1987 1977	1990 1946 1992 1987 1987 1974 1978 1978 1978 1978 1973	1990 1946 1987 1987 1988 1988 1974 1978 1978 1988 1988	1990 1946 1992 1987 1987 1987 1988 1974 1978 1988	1990 1946 1992 1987 1987 1988 1974 1974 1978 1988	1990 1946 1992 1987 1987 1988 1988 1988	1990 1946 1992 1987 1987 1988 1978	1990 1946 1992 1987 1987 1988 1974	1990 1946 1992 1987 1988 1988	1990 1946 1992 1987 1988	1990 1946 1992 1987	1990 1946 1992 1987	1990 1946 1992	1990	0661		Come of the second	1982	1974	1970	1957	1942	1972	1958	1964	1989	1861	1974	1949	Year
Ileight         Capacity         Spill Flood (m)           16.50         3.00         (m3 s)           11.52         20.70         174.00           7         11.52         20.70         174.00           60         9.50         1.53.00         251.00           7         12.60         4.70         1.00           1         26.20         32.91         5.130.00           1         12.60         4.70         1.00           1         12.60         3.00         251.00           1         12.60         3.91         5.130.00           1         12.50         1.64         91.00           2         20.73         22.14         5.46           1         14.32         5.46         177.72           4         48.00         450.00         3.750.00	Compacity (MCM)         Spit1 1/Lood (m3/s)           3.00         (m3/s)           20.70         174.00           20.70         174.00           153.00         251.00           153.00         251.00           31.00         258.00           32.91         5,130.00           32.91         5,130.00           10.00         228.00           11.00         2.21.30           22.14         91.00           22.14         177.72           450.00         3,750.00           11.10         500.00	utrity         Spitt 1/Lood           'M)         (m3/s)           00         174.00           1         251.00           1         228.00           1         5,130.00           1         91.00           1         5,130.00           1         5,130.00           1         177.72           00         3,750.00           500.00         500.00	IR, WS         IR, WS, FI, RC, LS         IR, WS, FI, RC, LS         IR, WS, FI         IR, WS, FI         WS         IR, WS, FI, RC         IR, WS, FI, RC         IR, PI, RC, WI.	IR, WS         IR, WS, FI, RC, LS         IR, WS, III;         IR, WS, FI         IR, WS, FI         WS         IR, WS, FI, RC         IR, WS, FI, RC         IR, WS, FI, RC, WI.	IR, WS, FI, RC, LS         IR, WS, FI, RC, LS         IR, WS, FI         IR, WS, FI         WS         IR, WS, FI, RC         IR, WS, FI, RC	IR, WS IR, WS, FI, RC, LS IR, WS, HI IR, WS IR, WS WS WS WS WS WS WS IR, WS	IR, WS IR, WS, FI, RC, LS IR, WS, FI IR, WS IR, WS WS WS WS WS WS IR, WS	IR, WS       IR, WS, FI, RC, LS       IR, WS, FI       IR, WS, FI       WS	IR, WS IR, WS, FI, RC, LS IR, WS, III: IR, WS IR, WS, FI WS WS WS WS WS WS WS WS WS	IR, WS IR, WS, FI, RC, LS IR, WS, FI IR, WS IR, WS, FI WS WS WS WS WS WS	IR, WS       IR, WS, FI, RC, LS       IR, WS, III       IR, WS, III       IR, WS, III       WS       WS	IR, WS IR, WS, FI, RC, LS IR, WS, FI IR, WS IR, WS, FI WS WS WS WS	IR, WS IR, WS, FI, RC, LS IR, WS, FI IR, WS IR, WS, FI WS WS WS	IR, WS IR, WS, FI, RC, LS IR, WS, FI IR, WS IR, WS, FI WS WS WS	IR, WS IR, WS, FI, RC, LS IR, WS, FI IR, WS IR, WS, FI IR, WS, FI WS WS	IR, WS IR, WS, FI, RC, LS IR, WS, HI IR, WS IR, WS, FI WS	IR, WS IR, WS, FI, RC, LS IR, WS, HE IR, WS IR, WS, FI	IR, WS IR, WS, FJ, RC, LS IR, WS, HE IR, WS	1R, WS 1R, WS, FI, RC, LS 1R, WS, HE	IR, WS IR, WS, FI, RC, LS	IR, WS		IR, WS	IR, WS, FI	IR, WS, FI, HE, RC	IRR, WS	IR, WS, FI, RC		WS	WS	IR, WS	IIIE	IR, WS, FI	IR, WS, FI	IR, WS, FI	WS	Purpose

DESCRIPTION OF DAMS AND RESERVOIRS IN NIGERIA

63.	62.	61.	60.	59.	58.	57.	56.	55.	54.	53.	52.	51.	50.	49.	48.	47.	46.	45.	44.	43.	42.	41.	40.	39.	38.	37.	36.	35.	34.	33.	32.
Laminga (Liberty)	Kurra	Kubli	Kontagora (Auna)	Kontagora	Kiri	Kawali	Karaye	Kango	Kangimi	Kainji (Fill)	Kainji (Concrete)	Kagara	Kafinzaki	Kalinchiri	Jibiya	Jebba Aux.2	Jebba Aux, I	Jebba (Saddle)	Jebba (Main)	Jebba	Jare	Jakara	Jabi	Itapaji	Isanlu	Ikere Gorge	Igboijaye	lgboho	Idofian	Guzu-guzu	Guzan
24	4	2	12	2		00	00	~	12	2	2	2	80	8	-	2	1.V	12	2		4	00	2	6	4	6	6	6	2	00	1.2
Platent	Plateau	Niger	Niger	Niger	Adamawa	Bauchi	Kano	Kano	Kaduna	Nigor	Niger	Niger	Bauchi	Kano	Katsina	Niger	Niger	Nigor	Niger	Niger	Adamawa	Kano	HC.I.	likiti	Kogi	Ovo	Oyo	Oyo	Kwara	Jigawa	Niger
Jos North	Barkin Ladi	Borgu	Auta	Kontagora	Shelleng	Foggo	Karaye		Ignbi	New Bussa	New Bussa	Kagara	Ningi	Garko	Jibiya	Jebba	Jebba	Jebba	Jebba	Mokwa	Jada	Wasai	Abuja	Ikole	Yagba Iiast	Iscyin	Ibarapa	Igboho	Ifelodun	Gwarzo	Guzan
Rafa Sanvi	G"Nar/ Tenti	Swashi	kotangora	Kotangora	Gongola	Bunga	Karma	Kanea	Kangini	Niger	Niger	Lugu Wayan	Bunga	Dudurum	Gadda	Niger	Niger	Niger	Niger	Niger	Inne	Jakara	Jabi	He	Katakun	Ogun	Opeki	Koinsein	Idofian	Guzuguzu	Yiko
8" 57"	8" 45'	4" 35'	4" 21'	S" 30'	12" 00"	9" 55'	8" 05'	9" 05"	10" 38'	4" 42"	4" 42"	6" 10"	9" 04"	8" 55'	7" 10"			4" 50'	4" 50'	4" 47"	12" 15'	8" 50'	7" 20'	5" 27"	5" 47"	3" 44	3" 50'	3" 50'	4" 41"	7" 57	
9" 56'	9" 24	10" 55"	10" 09'	10" 25'	9" 40'	11" 20'	11" 50'	59" 59"	7" 35'	9" 52'	9" 52"	10" 10'	11 08.	11" 35'	13" 10'			9" 05"	9" 05"	9" 08'	8. 21,	11. 10.	9" 05"	7" 57"	8" 13"	.7" 58'	7" 40"	8" 50'	8" 21"	11" 56'	
27 00	19.00	17.00	32.00	20.00	37.00	15.00	10.00	14.51	19.00	65.50	65.50	31.00	40.00	16.00	21.50	26.50	14.00	29,00	40.00	40.00	21.00	14.33	15.00	20.00	12.00	51.00	18.00	10.00	12.00	17.40	20.00
20.00	17.00	70.00	350.00	17.70	615.00		17.22	8.73	74.10	15,000,00	15,000.00	43.00	2,700.00	13.12	142.00	3,800.00	3,800.00	38,000.00	38,000,00		240.00	65.27	6.00	1.50	5.85	265.00	5.60	1.20		24.60	20.00
96.00	571.00	407.00	209.00		4,000.00		F		237.00	7,900.00	123.01		1,460.00		2,200.00	13,600.00	13,600.00	13,600.00	13,600.00	13,600.00	351.00			580,00	52.00	6,850.00			12.60		67.00
1972	1929	1992	UC	8861	1982	UC	1971	UC	1977	1968	8961	UC	UC	1977	0661	1984	1984	1984	1984	1984		1976	1982	1975	1978	1661	1984	8861	9661	1979	UC
WS	HE	IR	IR	WS	IR	IR, WS, HE, RC, FC		IR, WS, RC, WI.	IR, WS	IR, WS, HE, FI, RC	IR, WS, HE, FI, RC	IR, WS, FI, RC, WI.	IR, WS, HE, RC, FC	IR, WS, FI, RC, WI.	IR, WS, HE, FI, FC	THE, WS	HE, WS	HE, WS	HE, WS			JR, FJ, RC, WL	WS	WS	WS	IR, WS,FJ	IR, WS	IR, WS	ws	IR, RC, FI, WI.	IR, FI

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95.	94.	93.	92.	91.	90.	89.	88	87.	86.	85.	84.	83.	82.	81.	80.	79.	78.	77.	76.	75.	74.	73.	72.	71.	70.	69:	68.	67.	66.	65.	64.
-		Suloja	Sobi	Shiroro	Shendam	Shagari	Ruwan Kanya	P.edan	Pankshin	Pada	Oyun	Oyan	Owena M/purpose	Owena I	Ouree	Osun	()sara	Omi	Okuku	Okene	Ojerami	Ofiki A	()ha	Nasco	Mohayuba	Marashi	Mairawa.	Magaga	Little Osse (Egbe)	Lekan Are	Langlang
2	~	1.7	1.7	13	4	-	8	12	4	00	12	6	6	6	4	6	13	2	6	1.7	6	6	6	12	80	30	-	×.		0	4
Nitter	Niger	Nigor	Kwara	Niger	Plateau	Sokoto -	Kano	ICT	Plateau	Kano	Kwara	Ogun	Ondo	Ondo	Platcau	Osun	Kogi	Kogi	Osun	Kogi	lido	Oyo	Oyo	Niger	Jigawa	Kano	Katsina	Kano	Ondo	Ogun	Platçau
Chanchaga.	Вогри	Ejiba	Moro	Shiroro	Shendam	Shagari	Rano	Abuja	Pankshin	Gwarzo	Oyun Offa	Abcokuta	Hedore	Idanre .	Bassa	Esa-odo	Adani/Pokili	Yagba West	Odede	Okene	Akoko Edo	Atisbo	Ogbomoso		Kazaure	Dankwandi	Funtua ·	Gude	Gbonyin	Odede	Langtang
Thasaba	Swashi	- Iku	Moro	Kaduna	Nkong Hoss		Kano	Pedan	Kwangwal	Pada	Oyun .	Oyan	Ожена	Owona	Ourçe	Osun	Osara/Oron	Kampe .	Alabata	Okuhabi	Oyanmi	Offki	Odo-Oba	Shaddagubi	Tuwari	Marashi	Sokoto	Magaga	Little Osse	Alabata	Idyem
6" 40"	4" 35"	7" 14"	4" 32"	6" 50"	9" 30"		8" 27"	7" 35"	9" 25'	7" 53"	4" 44"	3. 15.	S" 13"	5" 01"	8" 42".	4" 55"	6" 21'	. S" 38"	4" 40"	6" 15	6" 09"	3" 19"	4" 11"	5" 35'	8" 25"	0" 1S	7" 15"	8" 02"	. S" 34"	3" 25"	9" 50"
9" 32"	9" 55	9" 13'	8" 34"	9" 59"	8" 56		11" 30	7" 03"	9" 20	11. 22	118	7. 13.	7" 16"	7" 11"	9" 46'	.7" 40"	7" 41"	8" 12"	7" 59"	7" 30	7" 17"	8" 27"	8. 10.	10" 40"	12" 40"	11. 02.	11. 30.	11. 20.	7. 36	7" 12"	9" 10
25.00	21,00	27.80	15.00	115.00	13.00	10.98	21.95	33.00	29.50	12.23	15.00	32.50	31.00	15.00	21.00	11.00	25.00	42.50	10.40	11.00.	14.50	12.60	13.90	12.00	15.85	11.50	12.00	19.35	21.50	10.00	21.00
28.30	16.00	52.00 .	40.00	6,000.00	6.90	15.00	58.00	5.80	45.18	12.00	205.00	270.00	36.25	36.25	6.68		23.00	250.00	0.73		4.50	1.30		1.80	5.54	6.77	5.50	19.68		1.00	4.60
	375.00		52.00	7,500.00	1,843.00				165.00			3,440.00	1,161.24	1,161.24	257.00	2,300.00	52.00	3.550.00	174.93		\$95.00		452.00	140.00		3,850.00					19.00
1978	1992	1994	1982	0661	1984	2006	1976	1993	1982	1980	1964	1983	2007	2007	1936	1977	1993	6661	1942	1937	1973	1983	1964	0661	1975	0861	1970	0661	1983	1982	1.861
'IR, WS, FI, HE, RC	IR	WS, FI, RC, WI.	WS	105	w.s	IR, WS	JR, 17, RC, WI.	IR. WS	WS	IR, WS, RC	WS	JR, WS, FJ, IH:			111:	WS	WS	IR, WS	WS	WS	WS	IR.WS	WS	IR, WS, FI, WE	WS, FI, RC, WI.	IR, WS, FI, RC	IR, WS	IR, WS, FI, RC, WI.	WS	IR, WS, FI	WS

96.	Tenti	4	Plateau	Bokkos	Tenti	8" 48"	9" 22"	14.10	114.00		-	1943
97.	Tiga	90	Kano .	Rano	Каво	8" 40"	11 12	54.20		1,968.00	1,968.00 3,257.00	-
98.	Tomas	20	Kano	Danbatta	Tomas	8" 40'	110 20'	13.72		60.30	60.30	60.30 1976
99.	'Judun Wada	30	Kano	Tudun Wada	Waina	8" 25'	S111	21.00		20.80	20.80	20.80 1977
100	Tungankawo	2	Niger	Wushishi	Bankugi	6" 07'	9" 40"	11.75		22.00	22.00 200.00	
101.	Turo Malumfashi	-	Katsina	Malumfashi	Borindawa	7" 45'	11. 50.	12.00		3.37	3.37 220.00	
102.	Usuma (Main) -	2	FCL	Bwari	Usuma	7" 30"	9" 10'	45.00		120.00	-	-
103.	Usuma (Saddle)	2	ICT	Bwari	Usuma	7" 30"	ô. 10.	20.00		120.00	120.00	120.00 1984
104.	Warwado	00	Jigawa	Dutse	Dudurun Warwade 9" 20'	Ne 9" 20'	11. 20,	10.00	0.1	12.30	12.30	12.30
105.	Watari	90	Kano	Bagwai	Watari	8" 08"	12" 10"	19.81		104.55	104.55	104.55 1980
106.	Yakubu Gowon	4	Plateau	-Barkin Ladi	Shen	8" 55	9" 5S'	35.00		30.00	_	30.00
107	Zawia	1.5	Kaduna	Zaria	Cialma	7" 50'	11. 10.	15.00	8	00 15.91		15.91
108.	Zobe	-	Katsina	Zobe	Karadawa	7" 30"	12" 30'	18	18.90	.90 177.00		177.00
109.	Zaru		Kebbi -	Zuru	Cirmache	5" 15"	11" 24"	15	15.00	00 5.85		5.85

Operations, Federal Ministry of Agriculture and Water Resources, Abuja

	N	11	Chate	11:1	River	1 Jane.	Lat.	Height	('apacity	Spil	Mand	Flood Year
N S	Nemte	IL	State	LL IN	River	Lang.	Latt.	(m)	-		(MC.NI) (m.3 s) apacity spin renov	(m3 s)
-	Ankwil 2	4	Plateau	Barkin Ladi	Temi	8. 40.	9" 20'	9.00	-	1.16	.16 343.00	
12	Asa	9	Kwara	Horin South	N:a	4" 33"	8" 27	27.00		43.00	43.00 7,900.00	-
~	C'ham	2	Gombe	Balanga	Chan	-11. 23.	9" 45"	10.00		5.00	5.00 200.00	
4	Fko-linde	0	Osun	líclodun	Otin	4" 35"	7" 56"	13.70		5.45	5.45 877.30	
	P.P.	2	Ova	Saki	Fofo	3. 22'	8" 41	14.63		0.67	0.67 127.35	
3.	FOID				- Culti	0" 20"	100 201	77 00	-	38 40	38 40 783.00	_
6.	Gubi	00	Baucht	Isauchi	GUDI	AC &	101 201	11.00	-	0.00	+	
7.	Ibrahim Adamu	30	Jigawa	Kazauro	Warwar Rafi	8" 25	12" 38"	9.14	a lines	8.00	8.00	8.00 1974
	Ikare	6	Ondo	Awara	Asande	5" 45"	7" 15"	11.70	Acres 1	7.70	7.70	7.70 1958
0	Jekko 1	4	Platcau	Riyom	Sanga (Tenti)	8" 41"	9" 23"	9,75	1.	1.40	1.40 685.00	
5	Kubani	1.2	Kaduna	Zaria	Kubani			8.50	-		10.00	10.00 1975
=	Lamingo (R/Sanyi)	-	Plateau	Jos North	Rafin Sanyi	9. 10'	9" 56"	11.50	1	0.45	-	-
12	Lassel	4	Вспис	Ushango	Agbudu	9" 02"	7" 06"	15.10	1.	4.00		4.00
13	N'Gell	4	Plateau	Bassa	N'Gell	- 8" 38"	9" 49"	9.00	1	0.03	0.03 108.00	
4	Naka	7	Benue	Ankpa	Naka	8" 25"	7" 36"	8.50		2.50	2.50 21.00	
IS	Obagaji	4	Benne	Agatu	Etila	7" 55'	7" 45"	8.10		1.10	1.10	1.10
16.	Opeki	6	Оуе	liruwa	Opeki	3" 20'	7" 30"	10.50	10	0 2.60	+-	2.60
17.	Waya	5	Bauchi	Bauchi	Waya	10" 30"	10. 10.	18.00	-	30.00		30.00

Source : FGN (2007). Compendium of Nigerian Dams Their Briefs, Statistics and Purposes. Compiled, produced and published by Department of Dams and Reservoir Operations , Federal Ministry of Agriculture and Water Resources, Abuja.

	N		Chate	11:1	River	1 Jane.	Lat.	Height	('apacity	Spil	1 Hood	1 Flood Year
N S	Neme	II.	State	LLIA	River	Lang.	Latt.	(m)	-		(MC.W) (m3 s) apacity spin rition	(m3 s)
-	Ankwil 2	4	Plateau	Barkin Ladi	Temi	8" 40"	9" 20'	9.00		1.16	.16 343.00	
13	Asa	0	Kwara	Horin South	N:a	4" 33	8" 27	27.00	100 C	43.00	43.00 7,900.00	-
~	C'hann	3	Gombe	Balanga	Chan	-11" 53"	9" 45"	10.00		5.00	5.00 200.00	_
4	Hko-linde	0	Osun	lfelodun	Olin	4" 35"	7" 56'	13.70		5.45	5.45 877.30	-
n  :	Eafa	2	Ovo	Saki	Fofo	3" 22"	8" 41"	14.63	-	0.67	0.67 127.35	-
	C L	c (	Bouchi	Banchi	- Gubi	9" 50"	10" 20"	27.00	-	38.40	-	38.40
0.	Conor	0 0	11 UDUCI	Dancin	Warner Daff	2: 22	12. 38	9.14		-+	8.00	8.00
1.	Inutration Vitability	0	PAARTEE	Nazauty	11011101111111	En 151	71 14	11 70	_	+	+	+
.00	Ikare	6	Ondo	Awara	Asande	3 43	1 12	11.10	1	+	1.10	1.10
9	Jekko 1	4	Platcau	Riyom	Sanga (Tenti)	8" 41"	9" 23"	9.75		1.40	1.40 685.00	-
5	Kubani	1.2	Kaduna	Zaria	Kubani			8.50			10.00	
=	Lamingo (R/Sanyi)	-	Plateau	Jos North	Rafin Sanyi	9. 10'	9" 56"	11.50	9	0 0.45	-	-
12	Lassel	4	Вспис	Ushango	Agbudu	9" 02"	7" 06"	15.10	0	0 4.00		4.00
13	N'Gell	4	Plateau	Bassa	N'Gell	- 8" 38"	9" 49"	9.00		0.03	-	0.03
4	Naka	7	Benue	Ankpa	Naka	8" 25"	7" 36"	8.50		2.50	-	2.50
15	Obagaji	4	Benne	Agatu	Etila	7" 55'	7" 45"	8.10		1.10	-	-
16.	Opeki	6	Оуо	liruwa	Opeki	3" 20'	7" 30"	10.50	ő	50 2.60	+	2.60
17.	Waya	5	Bauchi	Bauchi	Waya	10" 30"	10. 10.	18.00	00	30.00		30.00

Source : FGN (2007). Compendium of Nigerian Dams Their Briefs, Statistics and Purposes. Compiled, produced and published by Department of Dams and Reservoir Operations , Federal Ministry of Agriculture and Water Resources, Abuja.

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28.	27.	26.	25.	-14-	2 L	23.	22.	121.	20.	-19	18.	17.	16.	15.	14.	13.	12.	Ξ.	10.	9.	90	7.	6.	5	4	3	2	-	N N
1		Lafa	Kwall Stream	NWa	+	Konshisha	Kogingiri	Kisi	Karkirko	Karami	Jekko 2	Iku	Ikpoba	Igheti	Guna	Girei	lizzamgbo	Firuwa	Eleiyele	Isbunwana	Dinawa	Birnin Kudu	Benue Valley	Balanga	Avedo	Awaru	Amazzari/ Amaigho	Achida	Name
1.7	s	4	4		4	-	4	6	-	4	4	2	6	6	7	در.	3	6	6	5	-	30	4	42		9	5	-	111
Kwara	Abia	Nassarawa	Plateau		Platcau	Benuc	Platcau	Oyo	Sokoto	Plateau	Plateau	Niger	Edo	Oyo	Вспис	Adamawa	Ebonyi	Oyo	Oyo	Abia	Sokoto	Jigawa	Adamawa	Ciombo	Ekiti	Ondo	haves	Sokato	State
Moro		Lafa	Bassa		Oun'an Pan	Konshisha	Jos North	Irepo		Jos South	Riyom	Sulcja	lirgor	Olorunsogo	Gunn	Mayobelwa	lizzamebo	Ibarapa	Odeda	Affkpo		Birnin Kudu	Fufore	Balanya	()vc	Akoko NE	Isiala Mhano	Warso	LGA
	Hidede	Amba	Ource	· Rain Water	Harvested	Konshisha	Kogin Giri	Tege Bandara		Karami	Sanga	Iku	Ikpoba		Baka	Girci	Aboine	Opeki	Apele	Igwugwo		Dogwała	Beti	Balanga	Avede	Ashodi	Nwaagela	Storm Water Renot	MW
4" 27	9 00.	8" 30'	8. 30		9" 15"		8" 56'	3" 56	5" 25"	8" 17	8. 56,			4. 09	8" 54"	12" 35'	7" 56"	3" 22"	4" 05"	7".43"	5" 25"	9" 28'	12" 11"	11" 55"	5. 20	5" 40"		Thom	Since
8" 45	6" 00"	8" 30'	9" 48"	-	10 .6		9" 53"	9. 03.	13" 20"	10" 37	9" 53"				7" 53"	9" <u>20</u> "	6" 24"	7" 31"	7" 45"	5" 47"	13" 20"	11" 26'	9" 36"	9. 55	7. 53.	7" 30"		5" 25"	ean.
6.00	0.30	4.00	9.00		6.00	15.00	-8.23	11.00	Γ.	T	1	7.00	8.00	10.00	9.20	5.00	2.44	11.00	2.44		4.00	6.71	2.50	4.40	13.00	11.70	8.50	13. 20	(10)
5.85		0.20	0.63	T	0.20	44.00	-0.21	-	-	+	+-	2.30	1.50	+	+	0.25	8.20	2.60	7.05		0.15	1.19	1.00	72.70	1.50			4.00	1
	12.00	170.00	271.00			1.00	19.00						102.00			10,00		778.20	367.80					2,500.00			1.50		(m3 x)
	1987		1923		9661	1	1935	5861		T	0561		2661	1980	6661		1964	1967	1942			1970		1986	1979	1958	UC		
	IR, WS	WS	WS, HE		IR, WS	IR, WS	WS	1K, WS, 91		IK, WS	III:, WO	WS	WS	IK, WS	IR, WS	WS	WS	WS, FI	SM	WS		IR, WS, FI, RC	IR. FL, I.S	IR	WS	IRR, WS	WS		

1	3	31.	N	33.	34	35	36.	37	38.	Τ	.39	40.	41.	42.	43.	44.	45	40.	47.	48.	10	<	51.	T	52	53.
	Misibil	Nassarawa	Nkari	Obcagu-Ohatekwe	Obudu	Ofiki B	Ogboro	Ohatekwe	Oke Odan		Omi-Aran	Rijau	Rimin Gado	Sepeteri A	Sepeteri B	Suru	Telle-Maribe	Ukhun/Erha	Umogidi	Uneje	Warake	Wurao	Wureabba		Vakurr	Yota
	-	4	7	4	7	6	-	1	6	$\uparrow$	12	14	90	6	6	-	4	6	7		6	4	<i>ب</i> د:		1	د.
	Katsina	Nassarawa	Akwa Ibom	Ebonyi	Cross River	Oyo	Oyo	Ebonyi	Ogan		Kwara	Niger	Kaao	Оуо	Oyo	Kebbi	Plateau	Edo	Benue	Ekiti	Edo	Sokoto	Adamawa	-	Cross River	Adamawa
W UTHO	Ingawa	Nassarawa	Ini	Ikow, South	Obudu	Atisbo	Saki lihst	Abakaliki	Yewa South		Irepodum	Rijau	Rimin Gado	Saki East	Saki East	Suru	Bokkos	Esan West	Umogidi/Aduka Ogabakpa	Ado-Ekiti	Esan East	Wurno	Mayobelwa		Yakurr	Yola
Kwandaba	Kuki	UKE	Ibom	Okporo	Abeb	Ofiki	Opeki		Ојнию	Oke-Odan	Orisa/ Rom	Butulu	Rimin Gado	Adewate	Abo		Rafin Sanyin	Okwego	Ogabakpa	Ureje	Owan East	Rima (Robowsky)	Harvested	Rainwater	Mgbeke	Chauchi
2. 72	8" 02"	7. 42	7" 41"	8. 07	9- 10	3" 20"	3. 37	8" IS'	2" 54"		5" 07"	2. IO.	-	3. 45	3" 38"	4. 02.	8. 21.	6. 10.	7. 59'	5" 13"	6" 57	5" 24"	12" 01'		8" 08"	12. 30
1.3" 20"	12:36		5-23	6 03.	6. 40'	8" 28"	8. 45	6. 11.	6" 43		8 00.			8" 35"	8" 34"	12" 05	9" 58"	6" 51"	7" 33'	7" 35'	6" 11"	13" 14"	9" 40'		15 51.	9" 10"
7.00	3.40	3.00	11.50	3.60	15.00	12.30	6.00	3.60	12.00		6.00	7.00	7.04	13.60	13.50	6.30	7.60	12.00	5.50	12.00	4.50	8,00	3.00		2.20	5.00
0.28	0 77	0.60	3.50	0.03	2.50	0.60	0.32	0.30	5.50			1.30	0.26	2.60	1.90	5.00	0.41	0.80	2.50		0.65		1.00		0.05	0.30
		150.00	180.00		165.00		7.00				\$2.00	40.00			T	83.00	T	82.10								
IR, 1.5	1	1024	110	0801	1990	1961	1086	1090	1995		1978	1990	1	1984	6861	1	1901	1994	- 9861	1957	0661	1961	2005		1984	1083
	ID We	We Wa	C.M.	We	IN WS FI	IR WS	ID WC	W/C	IR WC		WS	ID WC	WS RC.	IR WS	IR WS	IR WS	ID WC	20	IR WS		IR	IR, WS	IR, 1.S		IR. M	

published by Department of Dams and Reservoir Operations, Federal Ministry of Agriculture and Water Resources, Abuja.

# MADE at Abuja this 9th day of December, 2014.

Mrs Laurentia Laraba Mallam Honourable Minister of Environment

# EXPLANATORY NOTE

# (This Note does not form part of these Regulations but is intended to explain its purport)

These Regulations provide for measures for the control of the effects of dams and reservoirs on the environment and human health, reduce or minimize environmental hazards and disasters such as dam break, sediment load and dam water releases causing downstream flooding and erosion; protect, minimize and address negative impacts on freshwater wetlands and water quality.