ANNEX 3A

GUIDANCE ON WB SAFEGUARD POLICY ON SAFETY OF DAMS (OP 4.37) AND ESMP TEMPLATE FOR SMALL DAMS

The Bank OP 4.37 shall be triggered for water impoundment and similar water reservoirs. Most of the guidelines for mini- dam projects are in the template Environmental Management Plan and the Environmental Codes of Practice in previous Annexes. Occupational health and safety measures are also incorporated in the ECOPs above. This Annex provides additional guidance in addressing the Bank OP 4.09 and BP 4.37 and its Annex A. On the other hand, the Department of Environment and Natural Resources has environmental requirements for dams based on reservoir flooded area and water storage capacity and power facilities based on total power production capacity. The borrower and the sub-borrowers shall comply with these guidelines. .

A. WB OP 4.37 – Safety of Dams (Revised April 2012)

1. For the life of any dam, the owner1is responsible for ensuring that appropriate measures are taken and sufficient resources provided for the safety of the dam, irrespective of its funding sources or construction status. Because there are serious consequences if a dam does not function properly or fails, the Bank2is concerned about the safety of new dams it finances and existing dams on which a Bank-financed project is directly dependent.

Small Dams

2. The IPAC project will only finance small dams as defined under OP 4.37. The Bank distinguishes between small and large dams.

    (a) Small dams are normally less than 15 meters in height. This category includes, for example, farm ponds, local silt retention dams, and low embankment tanks.

3. For small dams, generic dam safety measures designed by qualified engineers are usually adequate. The task team will agree on appropriate safety measures with the Borrower, will ensure the involvement of qualified engineers, and will confirm that the environmental assessment (EA) for the project has determined that there would be no risk or negligible risk of significant adverse impacts due to potential failure of the structure to local communities and assets, including assets to be financed as part of the proposed project. Based on such determination potential adverse impacts would be addressed through OP/BP 4.01, *Environmental Assessment* and not OP/BP 4.37, and measures will be included in the Environmental Management Plan or Environmental and Social Management Framework, as applicable, in accordance with OP/BP 4.01, *Environmental Assessment*.

Definition of New and Existing Dams and Dams under Construction

4. When the Bank finances a project that includes the construction of a new dam, it requires that the dam be designed and its construction supervised by experienced and competent professionals. It also requires that the borrower adopt and implement certain dam safety measures for the design, bid tendering, construction, operation, and maintenance of the dam and associated works.

5. The Bank may finance the following types of projects that do not include a new dam but will rely on the performance of an existing dam or a dam under construction (DUC): power stations or water supply systems that draw directly from a reservoir controlled by an existing dam or a DUC; diversion dams or hydraulic structures downstream from an existing dam or a DUC, where failure of the upstream dam could cause extensive damage to or failure of the new Bank- funded structure; and irrigation or water supply projects that will depend on the storage and operation of an existing dam or a DUC for their supply of water and could not function if the dam failed. Projects in this category also include operations that require increases in the capacity of an existing dam, or changes in the characteristics of the impounded materials, where failure of the existing dam could cause extensive damage to or failure of the Bank-funded facilities.
6. If such a project, as described in para. 7, involves an existing dam or DUC in the borrower's territory, the Bank requires that the borrower arrange for one or more independent dam specialists to (a) inspect and evaluate the safety status of the existing dam or DUC, its appurtenances, and its performance history; (b) review and evaluate the owner's operation and maintenance procedures; and (c) provide a written report of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam or DUC to an acceptable standard of safety.

7. The Bank may accept previous assessments of dam safety or recommendations of improvements needed in the existing dam or DUC if the borrower provides evidence that (a) an effective dam safety program is already in operation, and (b) full-level inspections and dam safety assessments of the existing dam or DUC, which are satisfactory to the Bank, have already been conducted and documented.

8. Necessary additional dam safety measures or remedial work may be financed under the proposed project. When substantial remedial work is needed, the Bank requires that (a) the work be designed and supervised by competent professionals, and (b) the same reports and plans as for a new Bank-financed dam be prepared and implemented. For high-hazard cases involving significant and complex remedial work, the Bank also requires that a panel of independent experts be employed on the same basis as for a new Bank-financed dam.

9. When the owner of the existing dam or DUC is an entity other than the borrower, the borrower enters into agreements or arrangements providing for the measures to be undertaken by the owner.

C. DENR REQUIREMENTS FOR SMALL DAMS

10. The Revised Procedural Manual for DENR Administrative Order No. 03-30 or the Implementing Rules and Regulations of PD 1586 or the Philippine Environmental Impact System have the following requirements:

Group II – Non-Environmentally Critical Projects (non-ECPs) in Environmentally Critical Areas (ECAs). An Initial Environmental Examination Report (IEER) is required for minor dams with a reservoir flooded area less than 25 ha of reservoir flooded area and less than 20 million cu. M. of water storage capacity.

Template of Environment and Social Management Plan for Small Dams

Project Phase	Valued Eco system Component	Potential Impact	Mitigation Measures	Institu-tional Responsi-bility	Preparation/ Monitoring Schedule	Costs
Project Siting/ Planning	Project development and Site conditions	Change in original conditions	• Prepare a Project Development Master Plan and Site Management and Rehabilitation Plan	Proponent	Feasibility study (FS)	FS cost
	Land	Change in land use affecting farming and other traditional uses of the land	• Consult the zoning plans and regulations of the concerned local government units • Conduct proper valuation of assets and resources that will be damaged or lost and provide proper compensation for these	Proponent	Feasibility study (FS)	FS cost
	Land	Land disturbance	• Control installations and measures- Map the existing topography and changes to the landform for each segment for protection. Map should identify areas which are easily erodible, such as highly erodible soils, steep slopes, haul roads or bare areas and prepare protection measures.	Proponent	Feasibility study (FS)	FS cost
	Soils and hdyrogeology	Sediment run-off	• Design of soil protection measures	Proponent	Feasibility study (FS)	FS cost
	Water	Possible loss of aquatic, wetland or terrestrial habitat due to	• During the site selection process, take into account the value of the area to be flooded.	Proponent	Feasibility study (FS)	FS cost
	Water	Alteration of water flows	During the site selection process, choose site that will require no or minimum diversion of water flows	Proponent	Feasibility study (FS)	FS cost

	Physical Cultural Resources	Loss of historical, archeological and cultural resources, displacement of indigenous groups	• During site selection, avoid sites with historical, archeological and cultural value or occupied by tribal/indigenous people • In site selection, consult the Philippines National Museum-Cultural Properties Division and their maps to determine areas with possible historical, archeological and cultural value, so as to avoid these • Proper relocation of the tribal/indigenous group, if inevitable, on areas where they can retain their lifestyle and customs, with adequate compensation will be provided for resources & livelihoods • PCR management plan in ESMP when PCR identified	Proponent	Feasibility study (FS)	FS cost

Project Phase	Valued Eco system Component	Potential Impact	Mitigation Measures	Institutional Responsibility	Preparation/ Monitoring Schedule	Costs
Project Siting/Planning	People	Displacement of people living within the site where the facility will be constructed	• Relocation of people to a suitable area • Proper compensation will be provided for the resources lost	Proponent	Feasibility study (FS)	FS cost
	Landscape	Visual impact thus affecting tourism and decreasing the aesthetic value of the area	• During site selection process, consider the aesthetic value of the area – avoid environmentally critical areas. • Consult the DENR to determine no go zones such as critical natural habitats. For environmentally critical areas ensure that site is within buffer zone	Proponent	Feasibility study (FS)	FS cost
	Ecology	Loss of important fish and other aquatic species	• During site selection process, avoid sites are natural habitats for important endemic fish and other aquatic species	Proponent	Feasibility study (FS)	FS cost
Project Design	Environmental quality	Pollutant emissions	• Select the proper equipment and the best available technology for controlling pollution emissions that will be able to comply with the Philippine Clean Air Act and the Clean Water Act and national air and water quality standards/guidelines set by DENR	Proponent	Feasibility study (FS)	FS cost
	Environmental quality	Noise generation	• Design the power plant to reduce noise to acceptable limits (for residential areas 50 decibels at peak hours and 40 decibels during the wee hours in the morning) outside the perimeter of the power plant • Sound proofing of the generator housing	Proponent	Feasibility study (FS)	FS cost
	Landscape	Environmental aesthetics	• The design of the facility should consider the preservation of environmental aesthetics	Proponent	Feasibility study (FS)	FS cost
	Ecology	Disturbance of vegetation and wildlife due to habitat loss	• In designing the route of transmission lines and access roads, take into consideration the location of	Proponent	Feasibility study (FS)	FS cost

Project Phase	Valued Ecosystem Component	Potential Impact	Mitigation Measures	Institutional Responsibility	Monitoring Schedule	Costs
Project Design			sensitive or valuable ecosystems • Use of existing roads, alignment selection and planning and reforestation	Proponent	Detailed EngineeringDesign (DED)	DED cost
	Ecology	Fish injuries caused by passing through the turbine or any sharp part of the structure; obstruction to movement of aquatic life resulting to loss of aquatic species	The design of the small dam must be such that fish must not be ingested into the turbine (so the mesh of the trashrack must be fine enough) and there must be a water passage by-passing the facility (fish by-pass) at all times so that fish can migrate up or downstream • To enable fish to pass upstream, the construction of a fish ladder might be needed, e.g., a series of pools one above the other, with water overflowing from the higher ones to the lower ones to enable fish to jump up from one pool to the next	Proponent	DED	DED cost
	Land	Buffer zone	• Mark out an adequate buffer zone as per DENR and local government regulations to prevent nuisances/damages to nearby communities and properties	Proponent	DED	DED cost
	Water	Siltation that can cause blockage of the flow and diversion of the river/stream and damage to the penstocks, valves, sluice gates of the small dam	• • Design the intake in such a way as to avoid silt being deposited around it, which would impede the flow to the turbine • Incorporate settling basins into the headrace channel in order to prevent and remove silt being deposited around the intake	Proponent	DED	DED cost
	Water	Water quality: thermal stratification, turbidity and temperature changes, oxygen depletion and anoxic waters	• N/A for small dams without reservoirs • Selective or multi-level water intakes or structures for re-oxygenation downstream of the reservoir	Proponent	DED	DED cost

Project Phase	Valued Ecosystem Component	Potential Impact	Mitigation Measures	Institutional Responsibility	Monitoring Schedule	Costs
Project Design	Water	Loss/creation of aquatic habitat due to altered thermal regime	• Design consideration of the facility	Proponent	DED	DED cost
	Water	Competition for water use	• If the river is also used for irrigation, the design of the mini- facility must allow for water to be removed from the river for crop irrigation • The design of the weir and intake structures must allow the diversion of the correct water river flow volume whether the river is in low or high flow condition. • Payment of compensation for adversely affected water users of the same river used for the mini-dam facility.	Proponent	DED	DED cost

Project Construction	Land	• Solid wastes and toxic and hazardous wastes from construction, e.g., grease, oil, etc • Possible generation of domestic waste due to temporary quarters or barracks and field office built for construction workers	• Compliance with RA 9003 for solid wastes • Set-up temporary disposal mechanism within the construction area and properly dispose the generated solid wastes • Contactor and its workers to observe proper housekeeping, sanitation and waste minimization. • Compliance with RA 6969 for toxic and hazardous wastes • All hazardous (ignitable, reactive, flammable, radioactive, corrosive and toxic) materials must be stored in clearly labeled containers or vessels	Proponent w/ contractor	DED	Construct-ion cost

Project Phase	Valued Ecosystem Component	Potential Impact	Mitigation Measures	Institutional Responsibility	Monitoring Schedule	Costs
Project Construction			• Fire prevention systems and secondary containment should be provided for storage facilities to prevent fires or the release of hazardous materials to the environment • Proper disposal of domestic waste will be observed by the proponent and contractors	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Environmental quality	Accumulation of solid wastes (vegetation) from clearing and	• Proper disposal of the generated solid wastes will be observed • Recover merchantable timbers	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Air	Dust generation during land preparation activities (i.e. excavation works and	• Sprinkling of water on roads and site to minimize dust	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Ecology	Disturbance of vegetation	• All clearing activities will be carried out in a manner such that damage or disruption to vegetation is minimized. • All trees that will be cut will be properly compensated • Relevant permits will be secured from concerned agencies prior to cutting • Recover merchantable timbers • Reforestation within the periphery of the facility	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Ecology	Disturbance of wildlife and rare and endangered species	• A "No Hunting" policy from the contractor to minimize the potential increase for wildlife hunting and poaching due to temporary increase of workers in the area • Avoid areas that are considered as environmentally critical areas	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost

Project Phase	Valued Ecosystem Component	Potential Impact	Mitigation Measures	Institutional Responsibility	Monitoring Schedule	Costs
Project Construction	Noise control	Noise associated with blasting, land clearing and preparation	• Noisy activities will be limited during the daytime to avoid annoyance to community. • Proper scheduling of noisy construction activities during day time. • Use mufflers for noisy equipment • Use blasting mats, noise silencers • Use warning devices for blasting activities	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Environmental quality	Soil and/or groundwater pollution due to routine and accidental release of chemicals/pollutants	• Compliance with national laws, e.g., RA 6969 and related laws and international regulations concerning hazardous materials such as the IFC Hazardous Materials Management, for materials like used batteries (storage, processing, disposal, transportation)	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Environmental quality	Spoils from excavation works and construction materials	• Proper disposal of solid wastes and proper housekeeping will be initiated by the proponent and contractors	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Land	Erosion caused by building roads or structures on steep slope and increased sedimentation from digging activities.	• Employ slope stabilization methods on areas of steep slope • Employ safety measures to minimize erosion • Establishment of sediment traps	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Landscape	The natural landscape of the project site will be altered.	• Reforestation of areas to replace those taken up by the construction of the access roads, the dam facility and ancilliary facilities	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost
	Ecology	Loss of aquatic habitat due to excavation work in watercourses	• Avoid or reduce construction activities during breeding or spawning seasons of sensitive species	Proponent w/ contractor	Contractor's Monthly report	Construct-ion cost

Project Phase	Valued Ecosystem Component	Potential Impact	Mitigation Measures	Institutional Responsibility	Monitoring Schedule	Costs
Project Operation	Environmental quality	Threat to public health if domestic solid waste generated from the operation not properly disposed of.	• A Solid Waste Management Plan which includes recycling, proper housekeeping and waste disposal will be formulated and implemented.	Proponent	Quarterly self-monitoring report	Operation & maintenance (O&M) cost
	Water	Upon transformation into an impoundment, there is possible reduction of capacity for self-cleaning of the water (oxygen depletion, increase in nutrient content)	• Addition of re-oxygenation devices downstream of water impoundment	Proponent	Quarterly self-monitoring report	O&M cost
	Water	Drying out of riverbed between the intake and the outlet	• Ensure water level is maintained to keep riverbed submerged at all times	Proponent	Quarterly self-monitoring	O&M cost
	Water	• Water pollution by domestic effluent from the administration building. • Water pollution due to emission of pollutants during operation and maintenance practices	• Effluent will be treated in a conventional septic system • Treat domestic effluents in an adequate septic tank system (at least 3-chambers) • Provide adequate wastewater treatment facilities	Proponent	Quarterly self-monitoring report	O&M cost
	Water	Potential change of sedimentation; flowing water in the river may carry small sediments that can cause accumulation of organic matter and acidification of waters	• Regular cleaning of the settling pond will be conducted to prevent siltation and to remove large organic debris before any incipient decomposition occurs. • Remove sediments before the water enters the penstock	Proponent	Quarterly self-monitoring report	O&M cost
	Environmental quality	Accumulation of floating debris at the intake	• Employ measures to avoid accumulation of floating debris at the intake. • Regular removal of floating debris at the intake.	Proponent	Quarterly self-monitoring report	O&M cost

Project Phase	Valued Ecosystem Component	Potential Impact	Mitigation Measures	Institutional Responsibility	Monitoring Schedule	Costs
Project Operation	Water	There will be competition on water resource as a result of the plant operation.	• Planning and management of facility in context of regional development plans • Compensation to be given for negative impacts	Proponent	Quarterly self-monitoring report	O&M cost
	Water	Sudden change in volume of water flow due to intermittent operation of the scheme resulting to loss in aquatic life	• Employ best known operation practices to minimize surges. • Manage flow regime or spillway during downstream movement of migratory fish.	Proponent	Quarterly self-monitoring report	O&M cost
	Water	Loss of aquatic habitat due to flushing of the impoundment and de-watering of basins and channels during maintenance work	• N/A if there is no impoundment • Provision and implementation of flushing guidelines	Proponent	Quarterly self-monitoring report	O&M cost
	Water	Possible loss of aquatic, wetland and/or terrestrial habitat due to flooding	• Generally, low dams that allow no or limited storage capabilities will produce none or minimal flooding. • N/A for run-of-river facilities with low dams that allow no or limited storage capabilities and will produce none or minimal flooding • Proper management of reservoir water levels • Establish and maintain minimum levels of water flow.	Proponent	Quarterly self-monitoring report	O&M cost
	Water	Obstruction to movement of aquatic life resulting to loss of aquatic species	• Include fishway or by-pass or other structures that will aid in fish migration/ movement	Proponent	Quarterly self-monitoring report	O&M cost

	Water	Fish injuries caused by passing through the turbine or any sharp part of the structure	• Incorporate in the design of the facility features that will minimize injury or loss of aquatic species	Proponent	Quarterly self-monitoring report	O&M cost
Project Decommissioning/ Abandonment	Water	• Contamination of soil and water due to abandoned structures and equipment. • Solid waste from demolition of buildings or used equipment. • Flooding due to blocking of abandoned dam.	• Decommissioning plan must be in place. Structures and used equipment must be dismantled and disposed of properly to allow free flow of water	Proponent	Environmental Completion report	O&M cost