

## PROJECT DESCRIPTION FOR SCOPING

### 1. BASIC PROJECT INFORMATION

#### 1.1. Project Information

<b>Name</b>	New Centennial Water Source – Kaliwa Dam Project
<b>Description</b>	Design and construction of a 60-meters high dam and a 27.70 km raw water conveyance tunnel
<b>Objective</b>	Redundancy of water source and augmentation of water supply to meet increasing demand
<b>Benefits</b>	Additional water supply of 600 million liters per day (600 MLD)
<b>Location</b>	Brgy. Pagsangahan, General Nakar and Brgy. Magsaysay, Infanta, both in Quezon Province
<b>Approvals</b>	<ul style="list-style-type: none"><li>• NEDA Board approval on 29 May 2014</li><li>• NEDA Board approval on 27 June 2017 on the change of project financing from PPP to ODA</li></ul>
<b>Cost Estimate</b>	Php 12.2 Billion
<b>Funding Source</b>	Official Development Assistance (ODA) – China Loan
<b>Proposed Construction Schedule</b>	2018 – 2023 (5 years)

#### 1.2. Proponent Profile

<b>Name</b>	Metropolitan Waterworks and Sewerage System
<b>Address</b>	Katipuna Road, Balara, Diliman, Quezon City 1100
<b>Authorized Signatory</b>	PDDG Reynaldo V. Velasco (Ret.) Administrator
<b>Contact Details</b>	Telephone number: +632 922 3757, 922 2969 Fax number: +632 921 2887 Website: <a href="http://www.mwss.gov.ph">www.mwss.gov.ph</a> Email address: <a href="mailto:info@mwss.gov.ph">info@mwss.gov.ph</a>

## 2. PROJECT DESCRIPTION

### 2.1. Project Location and Area

The project is approximately 53 aerial km east of Manila and located in the barangays of Magsaysay in Infanta and Pagsangahan in General Nakar, province of Quezon. The area is bounded by the following coordinates:

Corner	Latitude	Longitude
1	14°32'4.35" N	121° 21' 0.5" E
2	14°41'33" N	121°21' 0.5" E
3	14°41'33" N	121°28' 43.15" E
4	14° 32' 4.35" N	121°28' 43.15" E

The main access to the dam location is through the Manila-Infanta Road. Access to the damsite itself is via a 12-km trail from Sitio Little Baguio in Barangay Magsaysay, Infanta in the south to Barangay Queborosa or a 9-km hike along the Kaliwa river banks via Daraitan going downstream to Sitio Queborosa. The proposed locations of the water treatment facilities in Antipolo and Teresa are respectively 29 and 27 aerial kilometers southeast of Manila.

The damsite can also be reached from Daraitan, Tanay by hiking 9 kilometers along the river banks and channel of Kaliwa River downstream to Sitio Queborosa. The sites for the treatment facilities can be reached either from the Manila - Infanta Road in the north or through Manila East Road in the south.

### 2.2. Project Rationale

The NCWS-KDP was born out of the necessity to ensure an uninterrupted water supply in Metro Manila. It was conceptualized to address the concern of possible water supply deficit in Metro Manila by the year 2020. Currently, MWSS is relying on the supply from Angat Dam which supplies 95% of its Service Areas. The NCWS-KDP is among the projects prioritized by the Department of Finance (DOF) and the National Economic Development Authority (NEDA) for funding under the China Bilateral Loan Agreement that the National Government Agencies (NGAs) are currently negotiating. This Project is one of the flagship initiatives of the Government under its "Build, Build, Build" program.

### 2.3. Project Components List

The key project components are as follows:

#### 2.3.1. Kaliwa Dam

- 2.3.1.1. Dam Body
- 2.3.1.2. Spillway
- 2.3.1.3. Diversion Tunnels
- 2.3.1.4. Bottom Outlet Structure (Low Level Outlet)
- 2.3.1.5. Reservoir
- 2.3.1.6. Access Road 1 & 2
- 2.3.1.7. Camp Site Offices and Development at Kaliwa Dam

#### 2.3.2. Conveyance System

- 2.3.2.1. Intake Structure
- 2.3.2.2. Tunnel

- 2.3.2.3. Outlet Structure
- 2.3.2.4. Access Road 3
- 2.3.2.5. Camp Site Offices and Development at Tunnel Outlet

## 2.4. Project Phases, Key Environmental Aspects, Wastes, Issues, Built-in Measures

Project Phase / Env'tl Aspect	Environmental Component/ Degree of Impact	Mitigation/Enhancement Measure
<b>Pre-Construction/ Construction</b>	<b>The Land/Water</b>	
	Terrain modification, soil displacement, and erosion	<ul style="list-style-type: none"> <li>• Formulation, implementation and strict monitoring of materials management</li> <li>• Scheduling of earthworks, whenever possible during the dry season</li> <li>• Identification of appropriate sites for placement of excavated materials</li> <li>• Possible use of excavated materials as part of foundation of structures where design allows</li> <li>• Immediate revegetation of exposed areas not allocated for engineering structures</li> <li>• Use of silt ponds or traps around work areas; monitoring</li> <li>• Excavated materials can be reused by the LGUs in other construction projects upon their request</li> </ul>
	Slope destabilization	<ul style="list-style-type: none"> <li>• Conduct extensive geologic and geotechnical studies of structure sites</li> <li>• Slope stability analysis inputted into design</li> <li>• Deployment of experienced engineering geologist or geotechnical engineer at site</li> <li>• Use of appropriate slope stability measures such as rock bolts, shotcreting, etc.</li> </ul>
	Increase in noise level, generation of suspended particulates and gaseous emissions	<ul style="list-style-type: none"> <li>• Scheduling of earthmoving and construction activities during daytime</li> <li>• Sprinkling of water stockpiles of excavated and construction materials</li> <li>• Proper materials handling; installation of mufflers for vehicles</li> <li>• Provision of protective gear for workers; Monitoring</li> </ul>
	Deterioration of river water quality	<ul style="list-style-type: none"> <li>• Proper materials handling; monitoring</li> <li>• Strict enforcement of solid and liquid management at the construction site</li> </ul>
	Increase in solid waste generation	<ul style="list-style-type: none"> <li>• Strict enforcement of solid and liquid management at the construction site</li> <li>• Provision of waste bins, regular waste collection and disposal to a sanitary landfill</li> </ul>

		<ul style="list-style-type: none"> <li>• Reuse of construction debris which meets foundation requirements</li> <li>• Orientation of construction workers on proper waste management</li> </ul>
	Permanent loss, disturbance to existing vegetation	<ul style="list-style-type: none"> <li>• Identification and marking of ecologically/economically important species</li> <li>• Collection of seeds/propagules of important species for propagation in other areas</li> <li>• Delineation of areas for vegetation removal and earthmoving</li> <li>• Immediate progressive rehabilitation using appropriate species at cleared areas not designated for engineering structures</li> <li>• Inclusion of project site in the MWSS Million Tree Challenge Program</li> </ul>
	Death, disturbance and displacement of wildlife species; destruction or damage to habitat	<ul style="list-style-type: none"> <li>• Restoration/rehabilitation of areas at higher elevations</li> <li>• Delineation of areas for vegetation removal and earthmoving</li> </ul>
	Disturbance of aquatic habitat death or temporary displacement of species	<ul style="list-style-type: none"> <li>• Erosion control of excavated materials and stockpiles</li> <li>• Monitoring; provision of passageways through the structures for migratory species</li> </ul>
	<b>The People</b>	
	Loss of land/farm area, properties, crops and community facilities including traditional access to these areas and attendant dislocation and loss of income due to ROW acquisition	<ul style="list-style-type: none"> <li>• Continuing IEC/consultations to update status of LARP and negotiate with remaining AF/IPs on relocation, valuation and compensation based on LARP review.</li> <li>• Secure FPIC for IP-specific LARP concerns</li> <li>• Finalize LARP incorporating refinements based on agreements with remaining group (who still have reservations on the compensatory measures proposed)</li> <li>• Active and full coordination with the National Commission on Indigenous Peoples (NCIP)</li> </ul>
	Increase in employment opportunities and benefit sharing	<ul style="list-style-type: none"> <li>• Ensure that benefits of employment will accrue to affected groups</li> <li>• Consider also other qualified community members, where appropriate to spread the benefits to the community</li> <li>• Contractors to orient workers on desirable working relationships especially if there is migrant labor</li> </ul>

	Increase in livelihood and business opportunities	<ul style="list-style-type: none"> <li>MWSS to adopt policy requiring as much as possible sourcing or purchase of construction supply requirements from locally available sources within Tanay, General Nakar and Infanta or the province</li> <li>Food requirements of migrant workers/staff to be supplied locally</li> </ul>
	Potential health, sanitation and safety problems	<ul style="list-style-type: none"> <li>Temporary housing facilities for contractors provided with adequate water and sanitation facilities</li> <li>Contractors to implement proper solid waste management in the work site, workers will be oriented to observe proper hygiene and sanitation practices and provided with appropriate protection gears while working</li> <li>Construction areas to be enclosed as necessary and provided with appropriate signage to avoid accidents from curious residents and workers</li> </ul>
	Loss of Navigational Access	<ul style="list-style-type: none"> <li>A temporary mooring facility for the rafts and bancas to be installed in the vicinity of the upstream cofferdam. An access road from this point to Sitio Queborosa shall be provided</li> </ul>
<b>Operation</b>	<b>The Land and Water</b>	
	Submergence of some springs and caves in Daraitan	<ul style="list-style-type: none"> <li>Improvement of access/maintenance of remaining caves and springs</li> </ul>
	Decrease of flooding of downstream areas	<ul style="list-style-type: none"> <li>Dam will lessen the amount of flood waters that can reach the downstream area</li> </ul>
	Disruption of migration pattern of aquatic organisms	<ul style="list-style-type: none"> <li>Provision of structures that will allow upstream and downstream movement of migratory aquatic species</li> </ul>
	Habitat loss and fragmentation	<ul style="list-style-type: none"> <li>Restoration/rehabilitation of areas at higher elevations</li> <li>MOA executed with General Nakar for watershed management. For Infanta, same MOA will be executed</li> </ul>
	<b>The People</b>	
	Water use conflict	<ul style="list-style-type: none"> <li>Formulate water allocation policy to be implemented during temporary drought period under the strict supervision of the National Water Resources Board (NWRB) and coordination with the National Irrigation Administration (NIA)</li> <li>Establish hydrologic monitoring network consisting of rainfall and river</li> </ul>

		gauges and streamflow discharges at the Kaliwa Dam watershed area
		<ul style="list-style-type: none"> <li>Watershed management program</li> </ul>
	Loss of food source and navigational access from Daraitan to Sitio Queborosa	<ul style="list-style-type: none"> <li>Establish permanent mooring facility for bancas at a safe distance from the dam and spillway. Construct an all-weather road from this point to Sitio Queborosa to complete the Daraitan-Queborosa linkage</li> <li>Put in place navigational safety features and regulations in the vicinity of the diversion tunnel, dam and spillway</li> <li>Provide alternative fishing livelihood outside of the reservoir area</li> </ul>
	Increased Water Supply for Metro Manila, Cavite and Rizal	<ul style="list-style-type: none"> <li>Implement LARP properly and formulate benefit sharing schemes for the host LGUs so that the benefit will not only accrue to Metro Manila and environs but also to the impacts LGUs and communities; and improve credibility of MWSS thru effective communication plan coupled with sustained actions to demonstrate sincerity and commitment to fulfill its obligations to generate goodwill and social acceptability; monitor LARP</li> </ul>
	Increased employment opportunities	<ul style="list-style-type: none"> <li>Sharing of benefits from employment between affected and non-affected groups</li> </ul>
	Increased revenues for LGUs (+S)	<ul style="list-style-type: none"> <li>Use revenue generated from project to improve social services and infrastructures in the DIA</li> </ul>
	Increased migration and population (MS)	<ul style="list-style-type: none"> <li>Concerned LGUs (barangay and municipal/city) to regulate encroachment in watershed areas (forestland) through proper zoning and enforcement in conjunction with the PA Management Plan</li> <li>LGUs to adequately plan/provide for social services and infrastructures including health services, waste management and facilities and road network</li> </ul>

## 2.5. Project Cost and Duration

2.5.1. Project Cost Estimate: Php12.2 Billion

2.5.2. Estimated Construction Schedule: 2018 – 2023 (5 years)

### 3. ANNEXES

#### 3.1. Photos Project Site



*Dam Site (Downstream)*

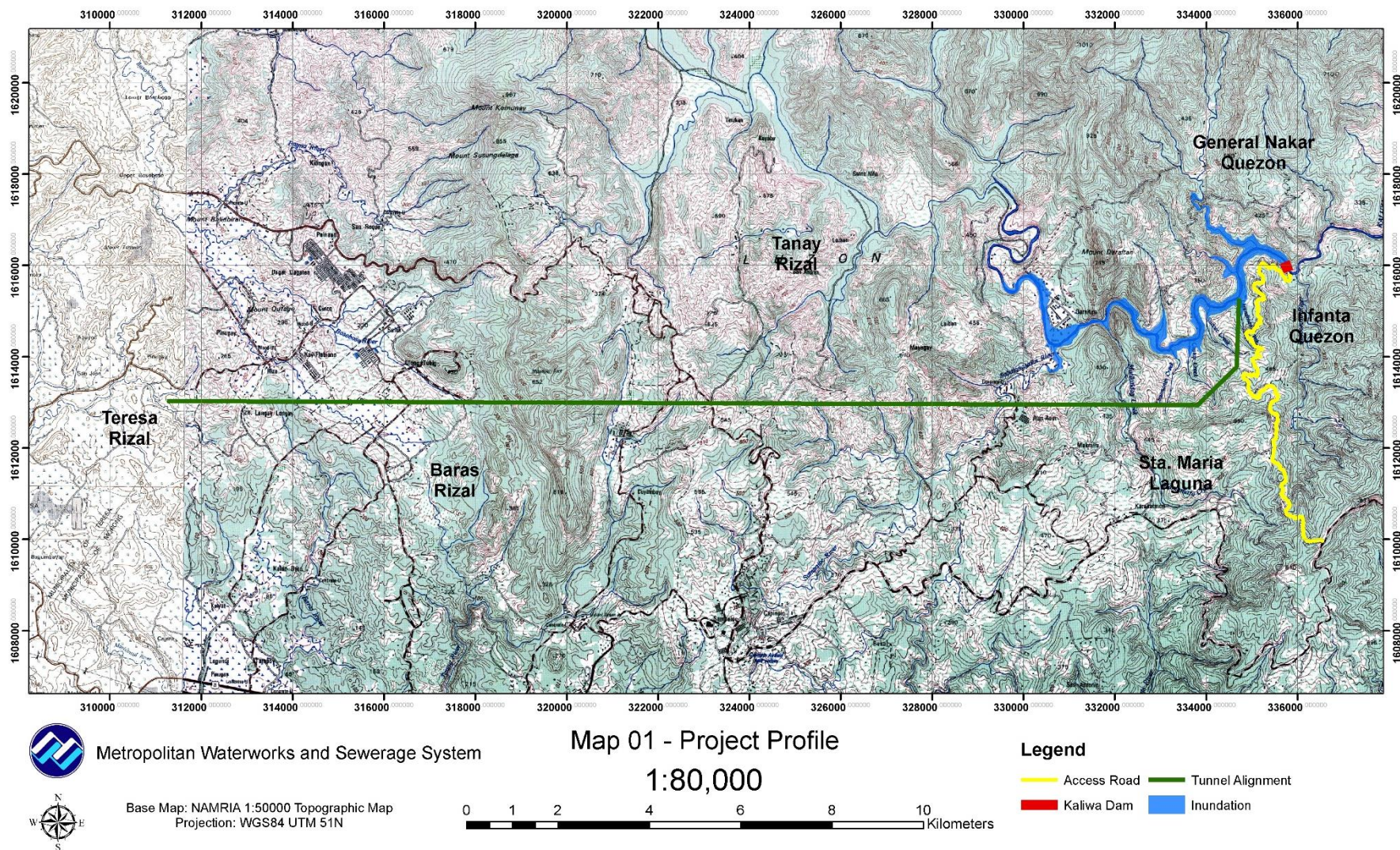


*Dam Site (Upstream)*



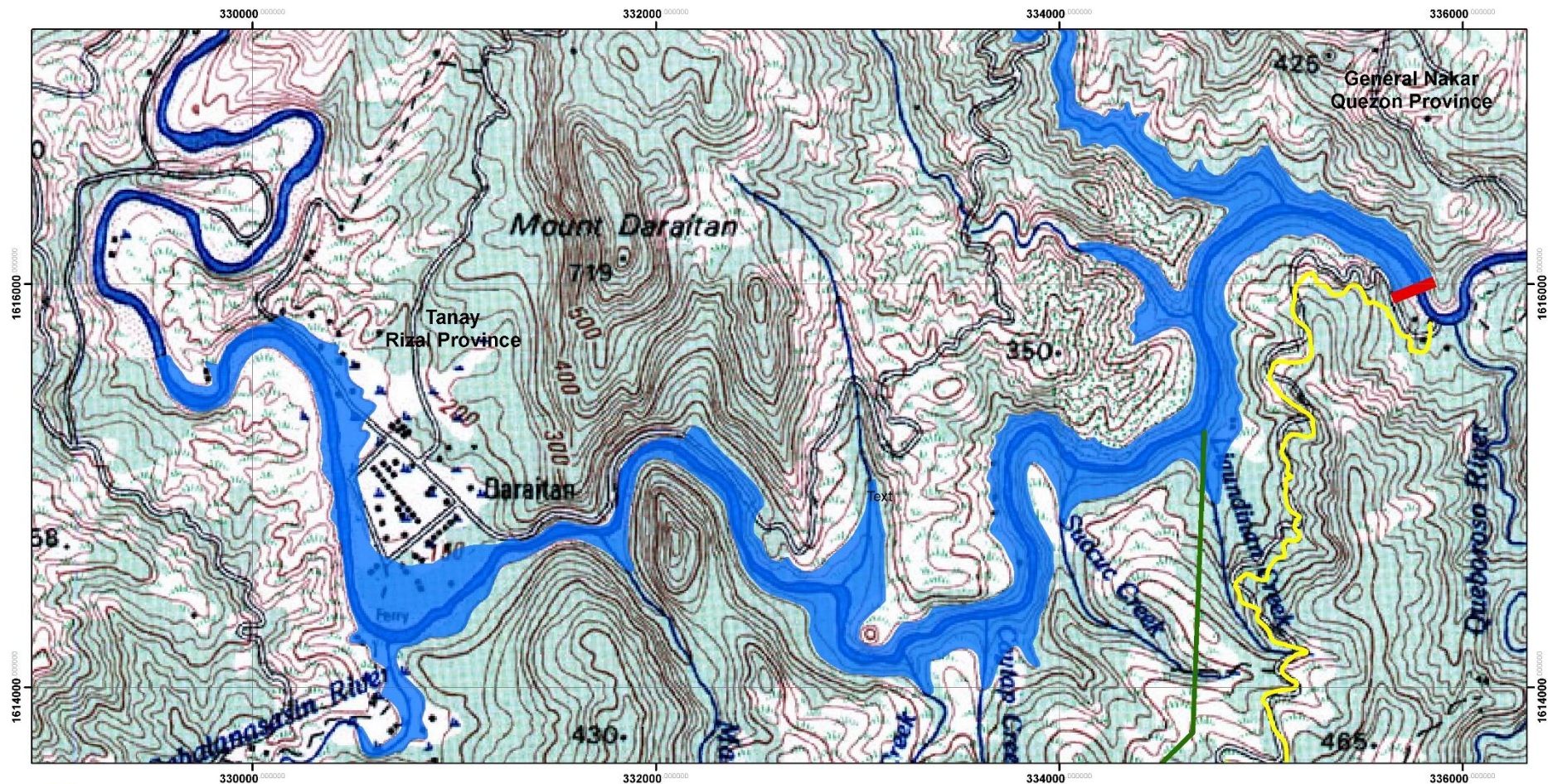
### 3.2. Map of the New Centennial Water Source Project

## New Centennial Water Source - Kaliwa Dam Project





# New Centennial Water Source - Kaliwa Dam Project



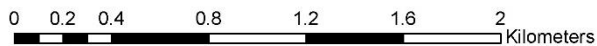
Metropolitan Waterworks and Sewerage System



Base Map: NAMRIA 1:50000 Topographic Map  
Projection: WGS84 UTM 51N

Map 02 - Dam and Reservoir

1:20,000



## Legend

- Access Road
- Tunnel Alignment
- Kaliwa Dam
- Inundation