REPUBLIC OF THE PHILIPPINES
METROPOLITAN NAGA WATER DISTRICT
40 J. MIRANDA AVENUE, NAGA CITY

MANAGEMENT SUPPORT SERVICES

PROCEDURES AND WORK INSTRUCTIONS MANUAL (PAWIM)

(OGMPW04) SOFTWARE DEVELOPMENT

Revision Status

This list identifies the revisions made in this section. The date refers to the date this section was made effective and implemented and not to the date the document was signed or printed.

Rev. No.	Pages	Details	Date of Issuance and Effectivity
00	All	First issuance / release of procedure	13Mar2017

Prepared by:	Reviewed by:	Approved by:
Gilbert V. Eleazar Assistant QMS Leader	Vicente Aniceto D. Rubio QMS Leader	Virginia I. Nero Acting General Manager

1. PURPOSE

1.1. This document describes the procedures for software development as one of the support process under management support service of the MNWD.

1.2. The objectives of software development process are:

- **1.2.1.** Conduct preliminary analysis
- **1.2.2.** Propose alternative solutions
- **1.2.3.** Describe costs and benefits
- **1.2.4.** Submit a preliminary plan with recommendations.
- **1.2.5.** Provide a system that fits to the requirements of the user.

2. SCOPE

This procedure will apply to the MNWD- Quality Management System (QMS) on one support process which is Software Development, which focuses on the:

- **2.1.1.** System Analysis
- **2.1.2.** System Development
- **2.1.3.** Integration and Testing
- **2.1.4.** Acceptance, Installation and Deployment
- **2.1.5.** Maintenance
- **2.1.6.** Evaluation
- **2.1.7.** Disposal

3. DEFINITION OF TERMS AND ACRONYMS

Refer to "Annex A" for the GLOSSARY OF TERMS and "Annex B" for the ACRONYMS.

4. RESPONSIBILITIES

4.1. INFORMATION AND COMMUNICATION TECHNOLOGY SECTION

- **4.1.1.** Responsible for conducting preliminary analysis.
- **4.1.2.** Ensures that all user requirements are complete.
- **4.1.3.** Responsible for designing, development, integration, testing, installation, deployment, maintenance, evaluation and disposal of the system.

4.2.END-USER OF THE SYSTEM

4.2.1. Responsible for identifying the problems and its requirements.
4.2.2. Responsible for providing the data needed.
4.2.3. Ensure that system requirements are complete and consistent to address the problem.
4.2.4. Responsible for evaluating the new system.

5. PROCEDURES

This section describes the procedures involve in one support process which is the System Development under management support service of the MNWD.

•PROCEDURE DETAILS: **SYSTEM DEVELOPMENT**

5.1.PRELIMINARY ANALYSIS

5.1.1. Software development team needs to find out the organization's objectives and the nature and scope of the problem under study.
5.1.2. Even if a problem refers only to a small segment of the organization, the team needs to find out the objectives of the organization and see how the problem being studied fits in with the organization.
5.1.3. Proposed alternative solutions: In digging into the organizations objective and specific problems, the team may have already covered some solutions.
5.1.4. Alternate proposals may come from interviewing employees, clients, suppliers, and/or consultants.
5.1.5. The team can also study what competitors are doing. With that data, the team has three choices: leave the system as is, improve it, or develop a new system.
5.1.6. Describe the cost and benefits of the three choices.
5.1.7. Based on the cost and benefits analysis the team submits a preliminary plan with recommendation.

5.2.SYSTEM ANALYSIS

5.2.1. Defines project goal into defined functions and operation of the intended application.
5.2.2. The team should gather and interpret facts, diagnose the problem and recommend improvements to the system.

5.2.3. Analyzes end-user information needs and also removes any inconsistencies and incompleteness in the requirements.

5.2.4. A series of steps should be followed by the developer

- Collection of Facts: End user requirements are obtained through documentation, client interviews, observation and questionnaires.
- Scrutiny of the existing system: Identify pros and cons of the current system in-place, so as to carry forward the pros and avoid the cons in the new system.
- Analysis of the proposed system: Solutions to the shortcomings in step two are found and any specific user proposals are used to prepare the specifications.
- **Systems design**: Describes desired features and operations in detail, including screen layouts, business rules, process diagrams, pseudo code and other documentation.
- **Development**: Coding of functions into computer language.
- **Integration and testing**: Brings all the pieces together into a special testing environment, then checks for errors, bugs and interoperability.
- **Acceptance, installation, deployment**: The final stage of initial development, where the software is put into production and runs the actual business.
- **Maintenance**: The system is assessed to ensure it does not become obsolete. This is also where changes are made to initial software. It involves continuous evaluation of the system in terms of its performance.
- **Evaluation**: This is where the system that was developed, as well as the entire process, is evaluated. Some of the questions that need to be answered include:

- Does the newly implemented system meet the initial business requirements and objectives?
- Is the system reliable and fault-tolerant?
- Does the system function according to the approved functional requirements?

In addition to evaluating the software that was released, it is important to assess the effectiveness of the development process. If there are any aspects of the entire process, or certain stages, that management is not satisfied with, this is the time to improve. Evaluation and assessment are difficult issues. However, the company must reflect on the process and address weaknesses.

- **Disposal**: In this phase, plans are developed for discarding system information, hardware and software in making the transition to a new system. The purpose here is to properly move, archive, discard or destroy information, hardware and software that are being replaced, in a manner that prevents any possibility of unauthorized disclosure of sensitive data. The disposal activities ensure proper migration to a new system. Particular emphasis is given to proper preservation and archival of data processed by the previous system. All of this should be done in accordance with the organization's security requirements.

5.3. OPERATION AND MAINTENANCE

5.3.1. Deployment of the system includes changes and enhancements before the decommissioning or sunset of the system.

5.3.2. Maintaining the system is an important aspect of System Development Life Cycle (SDLC). As key personnel change positions in the organization, new changes will be implemented.

5.3.3. There are two approaches to system development; there is the traditional approach (structured) and Object Oriented Programming (OOP).

5.3.4. Information Engineering includes the traditional system approach, which is also called the structured analysis and design technique.

5.3.5. The object oriented approach views the information system as a collection of objects that are integrated with each other to make a full and complete information system.

5.4.EVALUATION

5.4.1. The final phase of the SDLC is to measure the effectiveness of the system and evaluate potential enhancements.

TERMS	DEFINITION
SOFTWARE DEVELOPMENT	A PROCESS OF COMPUTER PROGRAMMING, DOCUMENTING, TESTING, AND BUG FIXING INVOLVED IN CREATING AND MAINTAINING APPLICATIONS AND FRAMEWORKS RESULTING IN A SOFTWARE PRODUCT
SYSTEM ANALYSIS	A PROCESS OF STUDYING AN ACTIVITY IN ORDER TO DEFINE ITS GOALS OR PURPOSES AND TO DISCOVER OPERATIONS AND PROCEDURES FOR ACCOMPLISHING THEM MOST EFFICIENTLY.
PSEUDO CODE	A HIGH-LEVEL DESCRIPTION OF THE OPERATING PRINCIPLE OF A COMPUTER PROGRAM OR OTHER ALGORITHM. IT USES THE STRUCTURAL CONVENTIONS OF A NORMAL PROGRAMMING LANGUAGE, BUT IS INTENDED FOR HUMAN READING RATHER THAN MACHINE READING
PROCESS DIAGRAM	ALSO KNOWN AS FLOW CHART DIAGRAM IT IS A VISUAL REPRESENTATION OF THE SEQUENCE, ALGORITHM OF STEPS AND DECISIONS NEEDED TO PERFORM A PROCESS
BUGS	REFERS TO A LIST OF ERRORS WHILE COMPILING A PROGRAM
SOFTWARE	REFERS TO THE PROGRAM AND OTHER OPERATING INFORMATION WE USED BY A COMPUTER
HARDWARE	A PHYSICAL COMPONENT OF A COMPUTER SYSTEM THAT CONTAINS A CIRCUIT BOARD, INTEGRATED CIRCUITS (ICS), OR OTHER ELECTRONIC

ACRONYM	DEFINITION
MNWD	METROPOLITAN NAGA WATER DISTRICT
OGM	OFFICE OF THE GENERAL MANAGER
ICT	INFORMATION AND COMMUNICATION TECHNOLOGY
DARMS	DAILY ACCOMPLISHMENT REPORT MANAGEMENT SYSTEM
QMS	QUALITY MANAGEMENT SYSTEM
OOP	OBJECT ORIENTED PROGRAMMING
SDLC	SYSTEM DEVELOPMENT LIFE CYCLE