 <p style="text-align: center;"> Republic of the Philippines City of Koronadal Water District Block I, Casa Subd., Zone III, City of Koronadal, South Cotabato </p>	DOC ID No.: CKWD-QP-CMD-001	Date of Issuance: 02-03-2017
	Division/Section: Const. & Maint. Div.	Revision No.: 0
TITLE:	LEAKAGE CONTROL MANAGEMENT PROCEDURE	
		Date of Revision: -

I. OBJECTIVE

This procedure describes the process in detection of the leakage in the distribution mains and service connections in conformance to Quality Management System (QMS).

II. SCOPE

This procedure is applicable to all distribution mains and service connections.


III. DEFINITION

- a. Ground Microphone (GM) - leak detection equipment used for pinpointing leaks.
- b. Non-Revenue Water (NRW) - is water that has been produced and is LOST it reaches the costumer.
- c. Flow Meter (FM) - is a device used to measure the flow rate or quantity of a liquid moving through a pipe in a given time.
- d. CMD – Construction and Maintenance Division
- e. Pressure Gauge - refers to a gadget used to measure pressure.
- f. Volume Inflow- volume of fluid which passes per unit time entering a specified area.
- g. PRV- Pressure Reducing Valve
- h. PMV- Pressure Management Valve
- i. WIM- Work Instruction Manual
- j. RL- Request letter
- k. PR- Purchase Requisition
- l. Leak Detection Team (LDT) - is a team responsible in conducting leak detection activities.
- m. RIS- Requisition Issue Slip
- n. Technical Documents- are set of documents of Plans, Estimates, Bill of materials, Hydraulic Analysis, Structural Analysis, S- Curve, PERT-CPM, Gantt Chart, Technical Documents, Safety program and Program of Works.
- o. CKWD Distribution Index Map- shows the service coverage area of General Santos City.
- p. **REFERENCE DOCUMENT**
- q. The Manager’s Non- Revenue Water Handbook (A Guide to Understanding Water Losses)
- r. Operation and Maintenance Manual

s. RESPONSIBILITY AND AUTHORITY

- i. The Leakage Control and NRW Committee shall be responsible for:
 - ii. Conducting the leakage detection activities
 - iii. Conducting pressure management and monitoring
 - iv. Coordinate with other Section, Division or Department

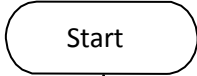
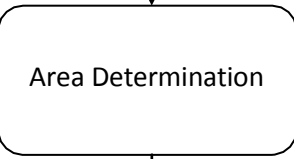
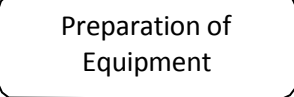
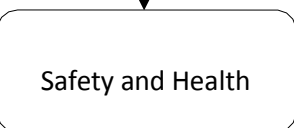
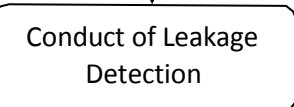
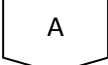
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- t. The LDT shall be responsible for:
 - i. Operating equipment used in Leak Detection activities, Pressure Monitoring and Pressure Management Activities.
 - ii. Supervise and monitor leak detection activities.
 - iii. Consolidating all reports.
 - iv. Prepare and submit Daily, Monthly Accomplishment report to Division Manager.
- u. The Division Manager shall be responsible for checking of Daily and Monthly reports.
- v. The Department Head shall be responsible for checking and reviewing of all reports.

VI. PROCEDURE

a. Leakage Detection Process

Process Flow	In- charge	Process Description	Records
			
	CMD Mngr. B	Shall identify area for schedule of leak detection activity. Shall prepare schedule and submit to Division Manager for review and approval.	CKWD Distribution Index Map
	CMD Mngr. B	Shall prepare necessary equipment in the conduct of activity.	Checklist
	CMD Mngr. B	Shall check and ensure that all personnel must wear safety protection such as reflectorized vest.	
	Leak Detection Team	Shall conduct leak detection activities. Shall record all leakages found/ detected in a standard format.	Service Line/ Connection leak Detection Daily Accomplishment Report
			

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Submission of Report	CMD Mngr. B	Shall make a report of all leakages detected and submit to Maintenance Division for the conduct of repair. Shall consolidate all detected leak reported and submit to the Division Manager monthly.	Maintenance Order and Service Request Form Service Line/ Connection leak Detection Monthly
↓			
End			

b. Pressure Monitoring using Pressure Gauge/ Data Logger Process

Process Flow	In- charge	Process Description	Records
Start			
↓			
Area Determination for Station Logs and Data Logger	CMD Mngr. B	Shall determine the area to be tag as Gauge Station. Shall determine the area for Pressure Reading deployment.	CKWD Distribution Index map
↓			
Preparation of Equipment	CMD Mngr. B	Shall prepare necessary equipment in the conduct of activity.	Checklist
↓			
Safety and Health	CMD Mngr. B	Shall check and ensure that all personnel must wear safety protection such as reflectorized vest.	
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	Leak Detection Team	<p>Shall conduct pressure monitoring activities using pressure gauge in all designated pressure station and record it in a standard form.</p>	Pressure Monitoring Station Form
	CMD Mngr. B	<p>Shall consolidate all recorded pressure data and submit to Division Manager monthly.</p> <p>Shall download all recorded data from pressure data logger.</p> <p>Shall make report of the downloaded data and submit to PDD, Division Manager and Department Manager.</p>	Pressure Monitoring Station Downloaded Data

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c. Pressure Management Process

Process Flow	In- charge	Process Description	Records
Start			
Area Determination for PRV/ PMV Installation	CMD	Shall determine the area with high pressures for installation of PRV/ PMV. Shall submit the data to EDD for plan preparation.	Pressure Monitoring Station Log CKWD Distribution Index Map Location Map
Plan Preparation	EDD	Shall prepare the installation plan. Shall approve the installation plan	Installation Plan
Requisition of Materials	CMD DM	Shall prepare SRS and receive the necessary materials to be used in the installation of PRV/ PMV. Shall approve the SRS	RIS Material Pass Slip
Safety and Health	CMD	Shall check and ensure that all personnel must wear safety protection such as reflectorized vest.	
Installation and Activation of PRV/ PMV	Leak Detection Team	Shall install a permanent PRV/ PMV in the distribution mains and set an ideal operating pressure. Note: For Installation of PRV/ PMV, refer to WIM for PRV/ PMV.	Approved Plan CKWD Distribution Index Map
A			

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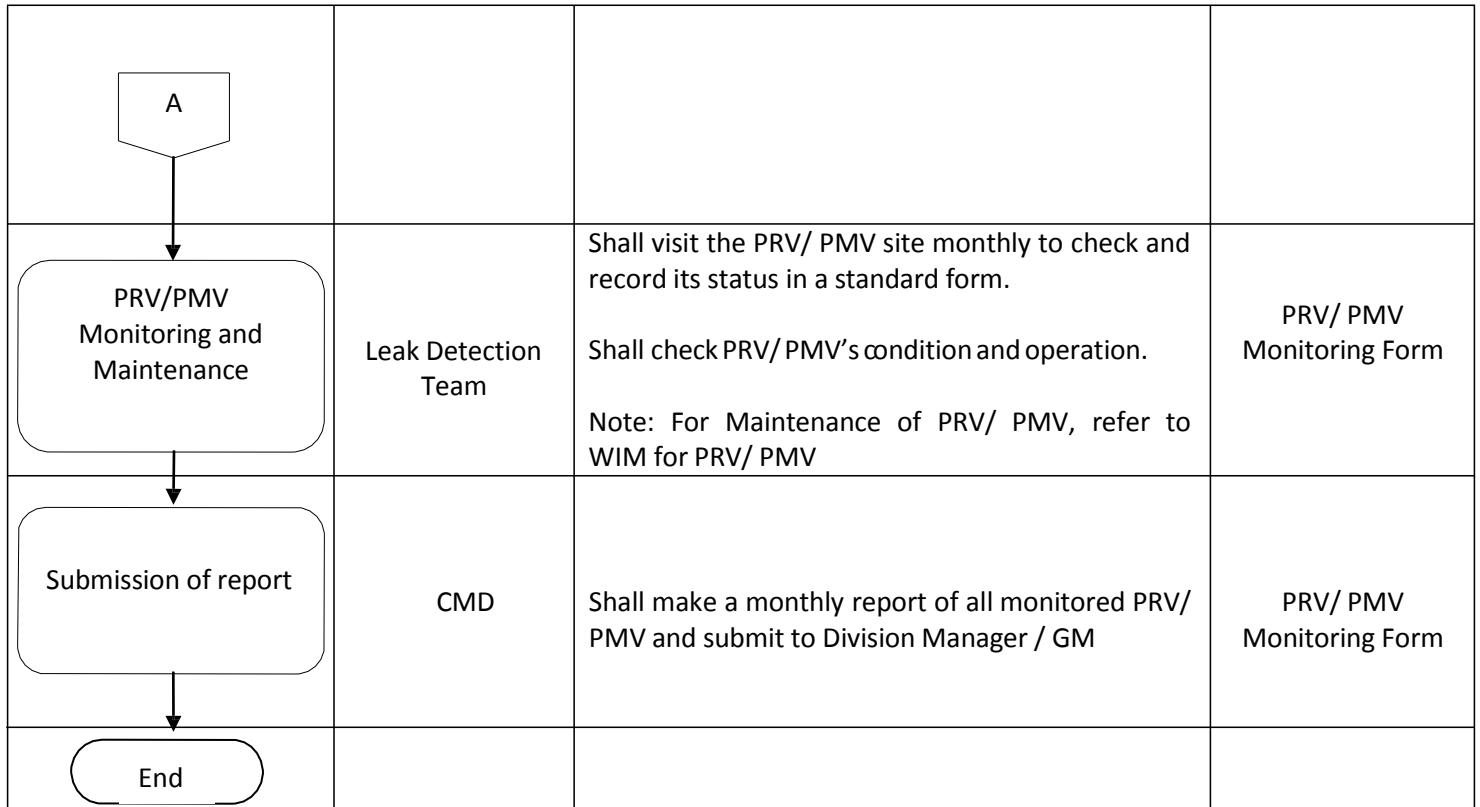
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d. Reports

Reports	Frequency	Responsible
Service Line/ Connection Leak Detection Daily Report	Daily	CMD and NRW Committee
Service Line/ Connection Leak Detection monthly Report	Monthly	CMD and NRW Committee
PRV/ PMV Monitoring Form	Monthly	CMD and NRW Committee
Pressure Monitoring Station Log	Monthly	CMD and NRW Committee
Data Logger Monitoring Form	Monthly	CMD and NRW Committee
Downloaded Data	Every time there is a request	CMD and NRW Committee

VII. PERFORMANCE INDICATORS

- a. Pressures, PRV's/ PMV's and DMA's are monitored monthly.
- b. The system has sufficient pressure.
- c. There will be reduction of NRW.
- d. There will be an increase in revenue.
- e. Leakage point will be protected from contamination.
- f. Improve reaction time on leakage repairs.
- g. Minimize excavation and restoration cost.

VIII. ATTACHMENTS AND FORMS

- a. Table 1- Work Instruction Manual (WIM) for PRV/ PMV
- b. Table 2- Work Instruction Manual (WIM) for Mechanical Meter and Electromagnetic Full- bore Meter
- c. CMD-001-0 - Service Line/ Connection Leak Detection Accomplishment Daily Report
- d. CMD-002-0 - Service Line/ Connection Leak Detection Accomplishment Monthly Report
- e. CMD-003-0 - Maintenance Order/ Service Request Form
- f. CMD-004-0 - Pressure Monitoring Station Form
- g. CMD-005-0 - PRV/ PMV Monitoring Form

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