Drinking Water Outline and Checklist for Operations and Maintenance (O&M) Manual Attachment ENG-08

Loan Recipient: _____ **Project:** _____

Consultant Engineer: _____ **Date:** _____

The Department of Environmental Quality (DEQ) requires that an O&M manual for construction of new or materially modified public water system components be submitted for review and approval prior to start-up of the proposed system. This checklist is intended to assist SRF loan recipients in the development of an approvable O&M Manual and may also be used by DEQ staff as a review tool.

Y = Yes N = No NA = Not Applicable

A. TABLE OF CONTENTS			
Checklist Item	**Yes**	**No**	**NA**
1. List of figures included?	☐	☐	☐
2. Manual organized well?	☐	☐	☐
3. Manual tabbed for easy reference?	☐	☐	☐
4. Page numbers used to refer to other parts of manual?	☐	☐	☐
5. Page numbers used to refer to other parts of manual?	☐	☐	☐
6. Revision page logging changes to the manual?	☐	☐	☐
B. INTRODUCTION AND OVERVIEW			
Checklist Item	**Yes**	**No**	**NA**
1. Brief Explanation of how to use manual	☐	☐	☐
C. OPERATOR RESPONSIBLITY			
Checklist Item	**Yes**	**No**	**NA**
1. Manager's responsibilities explained?	☐	☐	☐
2. Owner's responsibilities explained?	☐	☐	☐
3. List of Standard reference publications operator may consult?	☐	☐	☐
D. PERMITS AND STANDARDS			
Checklist Item	**Yes**	**No**	**NA**
1. Drinking water rules included or referenced?	☐	☐	☐
2. Treatment and monitoring requirements included?	☐	☐	☐
E. GENERAL PLANT DESCRIPTION			
Checklist Item	**Yes**	**No**	**NA**
1. Source and type of treatment described?	☐	☐	☐
2. Principal design criteria listed?	☐	☐	☐
3. Flow diagram included?	☐	☐	☐
4. Hydraulic capacity analysis included?	☐	☐	☐
5. Backflow prevention program and ordinance explained?	☐	☐	☐

6. List of unit operations given?	☐	☐	☐
F. DESCRIPTION, OPERATION, AND CONTROL OF UNIT PROCESS			
Checklist Item	**Yes**	**No**	**NA**
1. Description of process included?	☐	☐	☐
2. Function of process explained?	☐	☐	☐
3. Normal operation or control of process (valve position, flow rate) described?	☐	☐	☐
4. Major components and mechanical equipment listed?	☐	☐	☐
5. Relationship to adjacent units described?	☐	☐	☐
6. Schematic diagram of each unit included?	☐	☐	☐
7. Special features explained?	☐	☐	☐
8. Discussion of common operating problems included?	☐	☐	☐
9. Emergency operation or alternate operation explained?	☐	☐	☐
10. Bypassing unit described?	☐	☐	☐
11. Laboratory tests of unit control discussed?	☐	☐	☐
12. Winterization/Startup procedures for equipment and unit processes described?	☐	☐	☐
13. Brief operation instructions included for each piece of equipment, with reference to manufacturer's O&M manual?	☐	☐	☐
G. LABORATORY TESTING			
Checklist Item	**Yes**	**No**	**NA**
1. Sampling And testing program outlined?	☐	☐	☐
2. Sampling location, time, and method identified?	☐	☐	☐
3. List of laboratory references included?	☐	☐	☐
4. Monitoring requirements explained?	☐	☐	☐
5. Interpretation and significance of expected ranges of lab results given?	☐	☐	☐
H. MAINTENANCE			
Checklist Item	**Yes**	**No**	**NA**
1. Purpose of maintenance discussed?	☐	☐	☐
2. General maintenance information included?	☐	☐	☐
3. Sample maintenance information included?	☐	☐	☐
4. Preventative maintenance schedule given?	☐	☐	☐
5. Troubleshooting charts or guides included which reference pages in O&M manual?	☐	☐	☐
6. Housekeeping requirements included?	☐	☐	☐
7. Equipment record system explained for each type of equipment or machinery?	☐	☐	☐
a. Equipment numbering system explained?	☐	☐	☐
b. Equipment catalog available?	☐	☐	☐

c. Nameplate data cards available?	☐	☐	☐
d. Maintenance record cards available?	☐	☐	☐
e. Manufacturer's maintenance schedule summarized for routine adjustment lubrication, etc., with reference to page numbers in manufacturer's O&M manual?	☐	☐	☐
f. Work order system described?	☐	☐	☐
8. Sample forms provided?	☐	☐	☐
I. RECORDS & REPORTS			
Checklist Item	**Yes**	**No**	**NA**
1. Importance and location of records and reports, including record drawings, described?	☐	☐	☐
2. Daily operating log described, with sample format provided?	☐	☐	☐
3. Maintenance records described, with examples given?	☐	☐	☐
4. Laboratory records and reports described, with samples provided?	☐	☐	☐
5. Monthly report described, with format shown?	☐	☐	☐
6. Requirements of monitoring reports explained, with examples given?	☐	☐	☐
7. Annual report explained, with sample format provided?	☐	☐	☐
8. Operating cost record keeping system explained?	☐	☐	☐
9. Personnel record keeping system explained?	☐	☐	☐
10. Method for reporting system problems explained?	☐	☐	☐
11. Method for maintain an accident report explained?	☐	☐	☐
J. STOREROOM AND INVENTORY SYSTEM			
Checklist Item	**Yes**	**No**	**NA**
1. List of spare parts recommended?	☐	☐	☐
2. Inventory sample forms and records included?	☐	☐	☐
3. Special tools list included?	☐	☐	☐
4. Cross-reference lubricant list included?	☐	☐	☐
5. List of warranted equipment and warranty provisions included?	☐	☐	☐
6. List of outside contract maintenance tasks included?	☐	☐	☐
7. List of manufacturers of equipment included?	☐	☐	☐
K. PERSONNEL			
Checklist Item	**Yes**	**No**	**NA**
1. Manpower requirements given?	☐	☐	☐
2. Qualifications of personnel given?	☐	☐	☐
3. Licensure of personnel explained?	☐	☐	☐
L. EMERGENCY OPERATING PLAN			
Checklist Item	**Yes**	**No**	**NA**
1. Vulnerability analysis included?	☐	☐	☐

2. Emergency equipment list given?	☐	☐	☐
3. Police/fire departments coordination explained?	☐	☐	☐
4. Mutual aid list included?	☐	☐	☐
5. Chemicals used and their potential hazards explained?	☐	☐	☐
6. Procedures outlined to follow in case of electrical emergency?	☐	☐	☐
7. Detailed list included of jobs each person must carry out during emergency?	☐	☐	☐
M. SAFTEY PROGRAM			
Checklist Item	**Yes**	**No**	**NA**
1. Emergency phone list included?	☐	☐	☐
2. Safety equipment list included?	☐	☐	☐
3. System hazards and precautions explained?	☐	☐	☐
4. Mechanical equipment hazards described?	☐	☐	☐
5. Electrical hazards described?	☐	☐	☐
6. Explosion and fire hazards described?	☐	☐	☐
7. Health hazards described?	☐	☐	☐
8. Chlorine hazards described?	☐	☐	☐
9. Oxygen deficiency hazards described?	☐	☐	☐
10. Laboratory hazards described?	☐	☐	☐
11. Chemical hazards described?	☐	☐	☐
N. UTILITIES			
Checklist Item	**Yes**	**No**	**NA**
1. Description of utilities included?	☐	☐	☐
2. Distribution system described?	☐	☐	☐
3. Diagrams and manufacturers' drawings included?	☐	☐	☐
4. Electrical emergency procedures described?	☐	☐	☐
5. Gas and/or water capacities and limitations of responsibility described?	☐	☐	☐
6. Head described?	☐	☐	☐
7. Telephone services described?	☐	☐	☐
8. Emergency procedures described?	☐	☐	☐
O. APPENDIX			
Checklist Item	**Yes**	**No**	**NA**
1. Detailed design criteria included?	☐	☐	☐
2. Schematics included?	☐	☐	☐
3. Sample forms provided?	☐	☐	☐
4. List of lab chemicals included?	☐	☐	☐
5. Manufacturer's manuals referenced?	☐	☐	☐
6. Warranties included?	☐	☐	☐

7. Valve indices or schedule included?	☐	☐	☐
8. Approved shop drawings included?	☐	☐	☐
9. Construction photos included?	☐	☐	☐
10. Drinking Water Rules included?	☐	☐	☐
11. Piping color code included?	☐	☐	☐
12. Recommended references included?	☐	☐	☐
13. Drinking water ordinance included?	☐	☐	☐
14. Backflow prevention ordinance included?	☐	☐	☐
P. FINAL TEST OF MANUAL			
Checklist Item	**Yes**	**No**	**NA**
1. Is the manual written so that a reasonably experienced reviewer could adequately operate and maintain the facility by using the manual?	☐	☐	☐
2. Comments:			