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IDENTIFIERS *Waste Water Treatment; *Water Treatment

ABSTRACT

This document is an instructional module package prepared in objective form for use by an instructor familiar with the use of records and reports in operation and management of water and wastewater treatment systems. Included are objectives, instructor guides, and student handouts. This module considers development and use of operational, inventory, maintenance, financial, and personnel records and the writing of effective reports. (Author/RH)

RECORDS AND REPORTS

Training Module 4.305.3.77

Prepared for the

Iowa Department of Environmental Quality
Wallace State Office Building
Des Moines, Iowa 50319

by

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September, 1977

Module No:	Module Title:
	Records and Reports
	Submodule Title:
Approx. Time:	1. Records 2. Reports
7 hrs.	

Overall Objective:

Upon completion of this module the learner should be able to develop proper reports pertaining to water and wastewater plant operation.

Instructional Aids:

AV (Overhead transparancy)

Instructional Approach:

Discussion
Demonstration
Exercise

References:

Operation of Wastewater Treatment Plants, a Field Study Training Program, Sacramento State College, Chapter 17.

Class Assignments:

Develop forms

Module No:	Topic: SUMMARY

Instructor Notes:	Instructor Outline:
This module is developed to be: A. A lecture/discussion course B. A practical workshop in developing forms to aid in record keeping.	I. Records A. Importance B. 5 general types of records II. Evaluation

Module No:	Module Title: Records and Reports
	Submodule Title: Records
Approx. Time: 4 hrs.	Topic: Record Keeping

Objectives:

Upon completion of this module the learner should be able to:

1. Explain the importance of and need for proper record keeping.
2. Describe the five (5) general types of records - operational and performance records, descriptive and inventory records of the physical plant, and stock maintenance records, financial or cost records and personnel records.

Instructional Aids:

AV (Overhead transparancy)

Instructional Approach:

Discussion
Demonstration
Exercise

References:

Operation of Wastewater Treatment Plants, a Field Study Training Program, Sacramento State College, Chapter 17.

Class Assignments:

Develop forms

Module No:	Topic: Record Keeping

Instructor Notes:	Instructor Outline:
	Discuss the purpose and importance in keeping and maintaining records to operate the plant efficiently.
Show sample form developed	Discuss the type of records
1. Monthly reports	1. Plant operation
a. Graphs	2. Maintenance
2. Equipment lubrication chart	3. Plant modification
a. Equipment lubrication record	4. Residents
b. Pump maintenance record	5. Specific parameters
3. Accident report	6. Inventory
4. Lab record	7. Personnel
Plant supervisor form	Develop a form to inventory bulk chemicals used in plant operation.

Module No:	Module Title: Records
	Submodule Title: Reports
Approx. Time: 3 hours	Topic: Writing a Report

Objectives:

Upon completion of this module the learner should be able to write an effective report pertaining to individual or corporate subjects in water and wastewater plant operation.

a. Daily log
b. Report to supervisors (plant and superintendents, mayors and council).

Instructional Aids:

AV (Overhead transparancy)

Instructional Approach:

Discussion
Demonstration
Exercise

References:

Operation of Wastewater Treatment Plants, a Field Study Training Program, Sacramento State College, Chapter 17.

Class Assignments:

Write a report to the mayor

Module No:	Topic: Writing a Report

Instructor Notes:	Instructor Outline:
1. Show a memo 2. Show a report	1. Discuss the importance and principles of report writing. a. Objective b. Presentation in logical manner c. Use of simple language d. Use of facts and figures e. Brief report Reports should be: a. Concise b. Clear c. Complete d. Candor Aid the learner in writing a monthly report to the Mayor/Council

I. Records

A. Introduction

B. Importance

1. Plant operation

a. Provides efficiency of plant operation

b. Indicates possible future problems

2. Maintenance

a. Type and frequency

b. Evaluation of effectiveness of maintenance programs

3. Plant modification

a. Records of any changes in operation and facilities

b. Records of suggested changes in operation and facilities

4. Accidents

a. Records of accidents caused by plant personnel

b. Record of accidents caused by public

c. Record of damages to plant facilities

5. Specific parameter

a. Test performed

b. Permit conditions

C. Type of records

1. Size of plant dictates complexity of records

a. Graphs

b. Monthly forms

2. Public - City Council - Mayor. Water management or personnel dictate complexity of records.

3. Operation records
   a. Daily records of flow
   b. Record of lab tests
   c. Amount of electricity used
   d. Amount of chemicals used
   e. Pertinent information

      Significant events

      1. Volume of by-passes
      2. Damage to facilities
      3. Severe storms
      4. Complaints

4. Inventory of physical plant and stock
   a. "As built" plans of the facilities
   b. Plans of modification to the plant facilities
   c. Operating instructions of plant equipment
   d. Identification card for major plant equipment
   e. List of tools, materials, chemicals lab reagent and supplies and office supplies

5. Financial records
   a. Personnel budget
   b. Cost of electricity
   c. Cost of chemicals
   d. Cost of maintenance of equipment
   e. Cost of injuries
   f. Cost of replacement of equipment

g. Revenue generated

h. Total cost of operating facility

i. Net profit or loss of operating facility

6. Personnel

a. Employee records

b. Employee annual rating

c. Pertinent information related to personnel progress, education, injuries awards and promotions

D. Frequency of records

1. Daily records

a. Log

b. Lab results

c. Operating activities

2. Monthly records

a. State monthly monitoring report

b. Monthly report to next management level

3. Record of public notification PL 93-523

4. Record of quarterly report EPA Form 3320-1

5. Record of yearly report

E. Evaluation of records

1. Graphs

2. Use of obtained information

II. Reports

A. Importance - A proper form of communication

B. Principles of report writing

1. Objective
2. Presentation in logical manner
3. Use of language should be simple so as to be understood
4. Use facts and figures
5. Brief report

C. Mechanics of report writing

1. List ideas and topics one plans to cover in a report
2. Arrange in a logical order
3. Gather supporting material
   a. Daily, monthly reports
   b. Personnel records
4. Write rough draft
5. Review draft
6. Check report for overall effectiveness
   a. Concise
   b. Clear
   c. Complete
   d. Candor

Typical Daily Treatment Plant Log Entry

Small Activated Sludge Plant

Thursday, August 4, 1977

D. Clempe, Superintendent. F. Smykes, Operator-Chemist. L. Jerkins, Maintenance.

7:00 a.m. Collected flow data, plant checked out. Found skimmer trough clogged with grease and floating solids. Pump #1 in lift station warm and not pumping. Chlorinator injecter line clogged. Turned pump #1 off. Reviewed log entry for Wednesday.

7:15 a.m. Cleared skimmer trough and chlorine line. Cleaned bar screen and grit chamber.

8:30 a.m. Pump #1 clogged with bed sheet. Pump was pulled, impeller cleaned and reinstalled. Put #1 back in service.

10:00 a.m. Smykes com-leted daily sampling and began analysis. Jerkins completed daily lubrication and clean up routine. Coffee break.

11:30 a.m. Received seal for effluent pump #2. Invoice #5086 from McFern Manufacturing Co.

1:45 p.m Reviewed lab data. Sent Smykes to adjust air up 5 cfm and begin westing solids to the digester.

2:30 p.m. Assisted by Jerkins effluent pump #2 was reassembled and put back into service. 1200 gal. of sludge wasted to digester.

2:45 p.m. Heavy rain began. Visited by Mayor concerning odor complaints. Explained that recent high flows have covered excessive hydraulic loadings which have washed solids to the polishing ponds causing putrification in lagoon. Stressed necessity to stop up I/I study.

3:15 p.m. Found chlorine injection line clogged again. Automatic valve partly open. Will repair tomorrow.

3:30 p.m. Notified Smykes to begin monthly industrial monitoring program on Monday, August 8.

4:00 p.m. Final plant checkout completed. Rained 2.5" and still falling. Flow increasing rapidly. Agreed that Jerkins would work on extra shift. If trouble occurred to contact me at home. Bar screen and grit chamber cleared again to prevent problems through the night.

D. Clampe, Supt.

STATE OF IOWA
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY MANAGEMENT DIVISION

OPERATION PERMIT SYSTEM
MONTHLY MONITORING REPORT

FACILITY NAME _____

FACILITY NUMBER _ _ _ _ _ _ _

DISCHARGE SERIAL NUMBER _ _ _

MONTH _____ YEAR _____

CP-869706 1/

DATE	RECEIVING STREAM FLOW-CFS	PRECIPITATION INCHES/DAY	GENERAL: RAW SEWAGE TEMPERATURE	GENERAL: TOTAL FLOW 1,000'S GPD	GENERAL: BY-PASSED 1,000'S GPD	GENERAL: RECIRCULATION 1,000'S GPD	RAW SLUDGE: GALLONS PUMPED 100'S GPD	RAW SLUDGE: TOTAL SOLIDS %	RAW SLUDGE: VOLATILE SOLIDS %	DIGESTER CONTENTS: TEMPERATURE °F	DIGESTER CONTENTS: pH	DIGESTER CONTENTS: VOLATILE ACIDS MG/L	DIGESTER CONTENTS: ALKALINITY MG/L	DIGESTED SLUDGE: TOTAL SOLIDS %	DIGESTED SLUDGE: VOLATILE SOLIDS %	DIGESTED SLUDGE: DISPOSAL VOLUME UNIT _____	BOD (5 DAY 20° C): INFLUENT MG/L	BOD (5 DAY 20° C): INFLUENT LBS/DAY	BOD (5 DAY 20° C): PRIMARY EFFLUENT MG/L	BOD (5 DAY 20° C): FILTER EFFLUENT MG/L	BOD (5 DAY 20° C): FINAL EFFLUENT MG/L	BOD (5 DAY 20° C): FINAL EFFLUENT LBS/DAY	SUSPENDED SOLIDS: INFLUENT MG/L	SUSPENDED SOLIDS: INFLUENT LBS/DAY	SUSPENDED SOLIDS: PRIMARY EFFLUENT MG/L	SUSPENDED SOLIDS: FILTER EFFLUENT MG/L	SUSPENDED SOLIDS: FINAL EFFLUENT MG/L	SUSPENDED SOLIDS: FINAL EFFLUENT LBS/DAY	SETTLEABLE SOLIDS ML/L: INFLUENT	SETTLEABLE SOLIDS ML/L: PRIMARY EFFLUENT	SETTLEABLE SOLIDS ML/L: FILTER EFFLUENT	SETTLEABLE SOLIDS ML/L: FINAL EFFLUENT	AMMONIA NITROGEN: INFLUENT MG/L	AMMONIA NITROGEN: INFLUENT LBS/DAY	AMMONIA NITROGEN: FINAL EFFLUENT MG/L	AMMONIA NITROGEN: FINAL EFFLUENT LBS/DAY	pH: INFLUENT	pH: FINAL EFFLUENT MG/L	EFFLUENT DISSOLVED OXYGEN MG/L	EFFLUENT FECAL COL. FORM NO./100ml	EFFLUENT RESIDUAL CHLORINE MG/L	
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INFLUENT 24 HOUR SAMPLE COLLECTION [000]

BOD$_5$ _____ MG/L _____ LBS/DAY [76024]

SUSPENDED SOLIDS _____ MG/L _____ LBS/DAY [74024]

AMMONIA NITROGEN _____ MG/L _____ LBS/DAY [70424]

FLOW _____ MILLION GALLONS/DAY [74324]

EFFLUENT 24 HOUR SAMPLE COLLECTION [001]

BOD$_5$ _____ MG/L _____ LBS/DAY [76024]

SUSPENDED SOLIDS _____ MG/L _____ LBS/DAY [74024]

AMMONIA NITROGEN _____ MG/L _____ LBS/DAY [70424]

FECAL COLIFORM _____ ORGANISMS/100 ML [76324]

SIGNATURE OF EXECUTIVE OFFICER OR AGENT

TITLE

FORM WQMD-VI TRICKLING FILTER

PLANT SUPERVISOR FORM

EX = Excellent

G = Good

AVE = Average

P = Poor

UN = Unacceptable

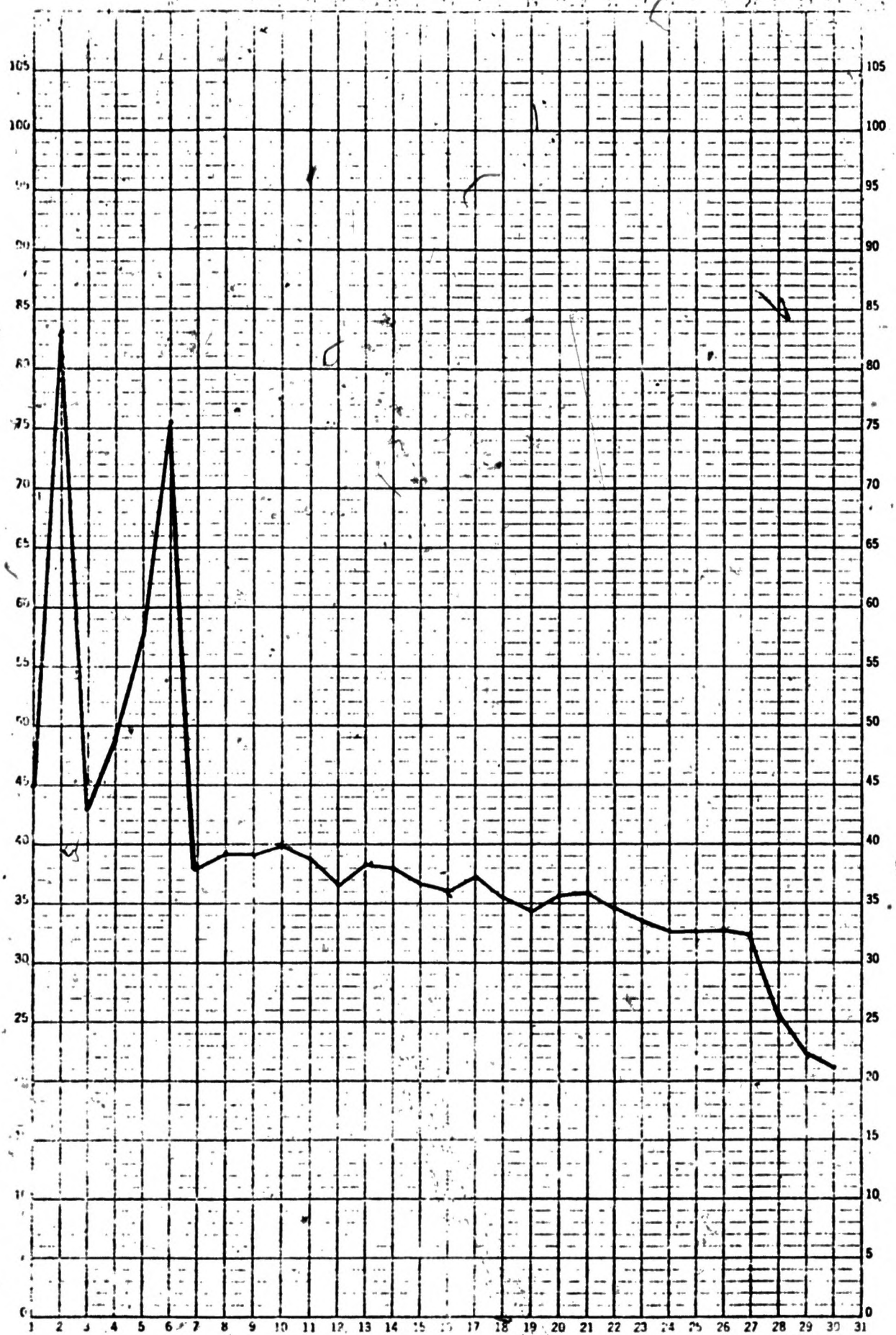
Name_____ Date_____

	EX	G	AVE	P	UN
1. General attitude.					
2. Natural ability in field of training					
3. Amount of effort put forth					
4. Progress being made.					
5. Cooperation with instructor					
6. Quality of work done.					
7. Efficiency in use of time.					
8. Relationship with others in class.					
9. Willingness to accept instruction.					
10. Ability to accept responsibility.					
11. Acceptance of constructive criticism.					
12. Rating as prospective employee in this area of study					
13. Punctuality.					
14. Care and use of equipment					
15. Leadership ability					
16. Awareness and use of safety procedures					

Please make other comments pertinent to this individual for placement purposes.

GENERAL COMMENTS:

SIGNATURE_____



Month 18 19

EQUIPMENT
LUBRICATION RECORD
PILOT WASTEWATER TREATMENT PLANT

EQUIPMENT	Instructions: Write date serviced in each square or fill in anticipated schedule and check (✓) when completed.											
Raw Lift Pump No. 1												
Raw Lift Pump No. 2												
Settled Sewage Pump No. 1												
Settled Sewage Pump No. 2												
Recirculation Pump No. 1												
Recirculation Pump No. 2												
Comminuter												
Blower No. 1												
Blower No. 2												
Air Compressor												
Protected Water Pump												
Manual Sludge Pump												
Sludge Recirculation Pump												
Distributor Drive												
Sump Pump												

IDENTIFICATION Raw Sewage Pump
2 Pumps

PILOT WASTEWATER TREATMENT PLANT

PUMP SPECIFICATIONS AND MAINTENANCE RECORD

MANUFACTURER Berkeley Pump Co.

REPAIR PARTS ADDRESS: P. O. Box 7
Station A
Berkeley, California

SPECIFICATIONS

Model No: 3 TS 10	Frame No:	Serial No: 3746
Impeller No:	Packing Size:	Number of Rings:
Shaft Diameter: in.	Lubrication:	Quantity, Lubricant:
Intake Diameter 2 in.	Discharge Diameter: 2 in.	Speed: 1750 R.P.M.
Normal Pumping Head: 30' ft.	Motor: Reliance 1.5 HP	Rated Output: @ 30' Head 40 G.P.M.

MAINTENANCE RECORD

Date	Repair or Service	Cost, Parts	Cost, Labor	Total Cost

Spare Parts Inventory

EQUIPMENT LUBRICATION CHART

EQUIPMENT	APPROVED LUBRICANT									
	A	B	C	D	E	F	G	H	I	J
Comminuter Drive								x		
Raw Lift Pump No. 1		x	x							
Raw Lift Pump No. 2		x	x							
Sludge Collector Drive P. Sett. Tank								x		
Sludge Collector P. Sett. Tank					x					
Trickling Filter Distributor					x			x		
Settled Sewage Pump No. 1					x					
Settled Sewage Pump No. 2					x					
Recirculation Pump No. 1		x	x							
Recirculation Pump No. 2		x	x							
Sludge Collector Final Sett. Tank									x	
Sludge Collector Drive Final Sett. Tank								x		
Manual Sludge Pump										
Blower No. 1 (Gardner-Denver)				x	x					
Blower No. 2 (Hoffman)							x			
Air Compressor						x				
Protected Water Pump										
Chemical Pump		x								

LUBRICANT IDENTIFICATION KEY

A. Light oil, S.A.E. 10

B. Shell, Alvina No. 2

C. Graphited Pressure Gun, Grease, Calol, # 2

D. S.A.E. 30 H.D.

E. Alemite High Pressure Grease

F. Air Compressor Oil above 30° F.

G. Chevron SRI (NLGI # 2)

H. Lubriplate No. 3

I. Water Lubricated

J.

Electric Motors not Included in this Schedule.

PERSONAL INJURY REPORT

STUDENT AFFAIRS OFFICE

KIRKWOOD COMMUNITY COLLEGE

Injury or Illness _____

Name _____ Telephone _____

Local Address _____

Personal Physician _____

Circumstances:

Location _____

Date _____ Time _____

Class/Instructor (if applicable) _____

Brief Description: _____

_____

_____

_____

Witnesses: _____

_____

Treatment Given/Action Taken: _____

_____

_____

Signature:

Date Reported:

For Office Use Only

Action Taken _____

_____

_____

_____

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS - INTERIM

Permit No. IA-0022012

1. During the period beginning on the effective date and lasting through December 1, 1976, permittee is authorized to discharge from outfall Serial Number 001.

Such discharges shall be limited and monitored by the permittee as specified:

	Effluent Limitations				Minimum Monitoring Requirements		
	kg/day (lbs/day)		Other Units (Specify				
Wastewater Parameter	Daily Ave.	Max.	Daily Ave.	Max.	Measurement Frequency	Sample Type	Sample Location*
***Biochemical Oxygen Demand (5-day)	109 (241)	126 (283)	145 mg/l	170 mg/l	monthly	composite	2
					quarterly	composite	1
**EQAP	----	----	----	----	monthly	grab	2
***Suspended Solids	71 (158)	90 (293)	95 mg/l	120 mg/l	monthly	composite	2
***Flow - m^3/day (MGD)	----	----	757 (.2)	1892 (.5)	daily	----	
***6.5-9.0		(not to be averaged)			daily	grab	2
Temperature - C^o or F^o	----	----	----	----	daily	grab	1.2
Relative Stability	----	----	----	----	daily	grab	2

There shall be no discharge of floating or settleable substances in other than trace amounts.

*Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: (1) raw sewage influent to sewage treatment plant, (2) primary treated effluent from spiragester, (3) final effluent from new facility.

**Sample submitted for the Effluent Quality Analysis Program (EQAP) conducted in accordance with Chapter 18 of the Rules of the Iowa Department of Environmental Quality (1973 I.D.R.)

***Only these monitoring data shall be summarized and reported to the Environmental Protection Agency.

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Module No:	Module Title:
	Records and Reports
	Submodule Title:
Approx. Time:	
1 Hr/	EVALUATION

Objectives:

1. The learner will demonstrate the ability to determine correctly the answers to 8 out of 10 questions related to records and report writing.
2. The learner will write a one page report on his/her activities performed as a water or wastewater plant personnel.

Circle the best answer

1. a. To justify the salary of a superintendent
   b. To provide essential information in operating a plant
   c. A waste of time since no one uses them
   d. Needed by the State and Federal government in order to enforce the laws
2. Personnel should keep records of
   a. Operation
   b. Inventory
   c. Maintenance
   d. All of the above
3. Daily records should be kept by
   a. Management
   b. Operators
   c. Lab technicians
   d. All of the above
4. Reports should be written by using previous records
   a. True
   b. False

5. A visual way of presenting records is best done using a graph.

   a. True

   b. False

6. Circle the best answer or answers. A report should be:

   a. Concise

   b. Clear

   c. Complete

   d. Candor

7. Brief reports indicate

   a. Lack of education

   b. Proper writing technique

   c. Unprepared author

   d. Memos and not records

8. Accidents should never be recorded. Remember records tend to incriminate.

   a. True

   b. False

9. Records from lab tests need only be reported to State and Federal authorities.

   a. True

   b. False

10. Records should never be made available to the public.

   a. True

   b. False

Write a one page report of duties performed yesterday.

Module No:	Topic: EVALUATION
Instructor Notes:	**Instructor Outline:**
1.	Give evaluation questions
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
The report should be:	
Concise	
Clear	
Complete	
Candor	