

MONTAIR SUBDIVISION  
TRACT 1095  
SISKIYOU COUNTY, CALIFORNIA

DRAFT

*Revised 2/15/83*

OPERATION & MAINTENANCE MANUAL  
FOR  
WASTEWATER COLLECTION, TREATMENT & DISPOSAL

PREPARED BY: PIEMME & BRYAN, INC.  
329 W. Miner Street  
Yreka, California 96097

PROJECT NO. 7611-13

DATE: SEPTEMBER, 1981

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## SECTION 1. GENERAL DESCRIPTION OF SYSTEM

The system is designed to dispose of all wastewater generated from the Montair Subdivision which consists of a 44 lot, single family residential subdivision.

The system consists of individual septic tanks, pump sumps, septic tank effluent pumps and pump control and alarms located on individual lots. Pump discharge lines are to be connected to pressure mains that deliver the septic tank effluent to the treatment and disposal area.

Treatment consists of aerobic and anaerobic reduction of the wastewater by bacterial action in the facultative lagoon. Algal photosynthesis in the aerobic zone provides oxygen for oxidation of the wastewater. In passing through the facultative lagoon the coliform bacteria count will be drastically reduced. Overflow from the facultative lagoon will pass through a chlorination and metering structure to a chlorine contact tank.

Discharge from the chlorine contact tank is to a storage reservoir. The storage reservoir level is to be controlled by pumping from the reservoir to the land disposal site. Final disposal is by irrigation and the resultant evapo-transpiration of the treated wastewater on the land disposal site. Any runoff from the land disposal site returns to the storage reservoir.

Waste Discharge Requirements & A Monitoring & Reporting Program were adopted by the California Regional Water Quality Control Board, North Coast Region on May 28, 1981. Copies of the orders are contained in Sec. 3 of this manual. Discharge of wastes to the Shasta River or its tributaries and to land which is not controlled by the discharger are prohibited.

The discharge specifications provides for land disposal at a rate that allows maximum percolation and evaporation and minimum runoff, a maximum mean dry weather flow of 13,200 gals. per day, treatment of waste discharge shall not cause a pollution or nuisance, surface runoff from surfaces above the treatment area are to be excluded from the treatment site, and sets forth levels of wastewater constituents that are to be maintained in the treatment and disposal facilities.

The order also provides for preparation of this Operation & Maintenance Manual & training of an operator together with design criteria for the individual pumping stations and guidelines for managing the storage reservoir.

Effluent and reservoir monitoring requirements are contained in the Monitoring & Reporting Program beginning at Pg. 3-5 of this manual.

Both the Mountain Home Owners' Association and John M. Howe are named responsible parties in the discharge requirements. John M. Howe will retain the right to regulate the reservoir level and land disposal area as long as he complies with the Waste Discharge Requirements. In the event he fails to comply with these requirements the Home Owners' Association has the right and responsibility to operate and maintain the reservoir level, pump system, irrigation system and diversion ditches above the disposal area.

The Montair Home Owners' Association is solely responsible for yearly inspection of individual septic tanks, pump and control systems. The cost of maintenance and repair of the pumps and control system is also the responsibility of the association and they will stock spare parts for the systems.

The Home Owners' Association will operate and maintain the collection and treatment system including monitoring and reporting to the point of discharge to the storage reservoir. They also have the right to maintain the reservoir levels and land disposal site.

MONTAIR SUBDIVISION  
Siskiyou County, California  
December 24, 1980

Wastewater Disposal System

Design Criteria

Population

44 Units at 3 persons per unit = 132

Flows

Av. daily per capita = 100 Gals.

Peak hourly per capita = 400 Gals.

Force Main

Peak hourly flow =  $400 \times 132/24 \times 60$  = 37 G.P.M.

Peak design flow =  $1.5 \times 37$  = 55 G.P.M.

Sewage Loading

Biochemical Oxygen Demand (5 day)

Per Capita = 0.20#/day

Total = 26.4#/day

Suspended Solids

Per Capita = 0.22#/day

Total = 29.0#/day

Facultive Lagoon

Average Daily Flow = 13,200 Gals.

BOD5 Surface Loading = 35#/Ac/Day

Surface Area = 0.76 Ac

Depth = 6 Ft.

Detention Time = 95 Days

Storage Reservoir

Surface Area = 9 Ac.

Storage Capacity = 45.7 Ac-Ft

Tributary Area = 42 Ac.

Yield of Tributary Area (5 Mo.) = 14 Ac-Ft

Wastewater From Facultive Lagoon (5 Mo.) = 6.08 Ac-Ft

Rainfall on reservoir surfaces (5 Mo.)

$.65 \times 24.19 = 15.72"$  = 12.8 Ac-Ft

Pan Evaporation (5 Mo.) = 7.2 In.

Reservoir Evaporation (5 Mo.) = 5.0 In.

Loss from Reservoir Surfaces = -4.1 Ac-Ft

\*Winter Storage Requirements = 28.8 Ac-Ft

Irrigation

Evapotranspiration (7 Mo., Pasture) = 33.8 In.

Av Rainfall (7 Mo.) = 4.26 In.

Net Irrigation Water Required = 2.46 Ac-Ft/Ac

Winter Storage Carryover = 28.8 Ac-Ft

Wastewater From Facultive Lagoon (7 Mo.) = 8.5 Ac-Ft

Reservoir Evaporation =  $.75 (36-4.3) \times 8/12$  = -11.9 Ac-Ft

Irrigated Land Required =  $25.4/2.46$  = 10.3 Ac.

\*Winter Storage Requirement based on the record rainfall of 24.19" in 1897-98.  
Approximately 21% of the storage requirement is used for storing wastewater from the facultive lagoon.

California Regional Water Quality Control Board  
North Coast Region

ORDER NO. 81-131

WASTE DISCHARGE REQUIREMENTS

for

MONTAIR SUBDIVISION HOMEOWNERS ASSOCIATION, INC.  
HOLIDAY DEVELOPMENT COMPANY, INC.

AND

JOHN M. HOWE

Siskiyou County

The California Regional Water Quality Control Board, North Coast Region, finds that:

1. On February 9, 1981, Mr. John M. Howe, President and owner of Holiday Development Company, Inc., a California Corporation, submitted a report of waste discharge describing the Montair Subdivision.
2. Mr. John M. Howe proposes to construct a 44 unit subdivision located in Shasta Valley approximately one mile west of the City of Montague and adjacent to and south of State Route 3 in Sections 20 and 29, T45N, R6W, MDB & M (Attachment A).
3. Up to 13,200 gallons of wastewater will be generated daily. Collection and sewage transport will be accomplished by a low pressure collection system. Each home will be served by a septic tank for solids removal with the effluent pumped to a facultative lagoon. Following treatment in the lagoon and after disinfection, final disposal will occur by percolation and evapotranspiration on lands upgradient from a reservoir with a capacity of 46 acre feet. Any runoff from the irrigated area will discharge to the reservoir. Winter storage of wastewater will also occur in the reservoir. Pumping facilities will permit irrigation and disposal of wastewater stored in the reservoir.

The average annual rainfall in the area is 12.5 inches. All storage and disposal facilities are designed for the recorded maximum of 24.19 inches of rain which occurred in the years 1889-1890.

Surface drainage is tributary to the Shasta River which is in turn tributary to the Klamath River.

4. The Regional Board adopted a Water Quality Control Plan for the Klamath River Basin on March 20, 1975. The Plan has been amended on March 25, 1976 and June 21, 1979.
5. Beneficial uses of the Shasta River and its tributaries include:

- a. agricultural water supply
  - b. groundwater recharge
  - c. freshwater replenishment of lakes and streams
  - d. contact and water contact recreation
  - e. warm freshwater habitat
  - f. cold freshwater habitat
  - g. wildlife habitat
  - h. migration route for anadromous fish
  - i. fish spawning area
6. The Basin Plan specifically prohibits the discharge of wastewater to the Klamath River and its tributaries.
  7. The Board has notified the discharger and interested persons and agencies of its intent to prescribe waste discharge requirements for the proposed discharge.
  8. The Board, in a public meeting, heard and considered all comments pertaining to the proposed discharge.
  9. A negative declaration was adopted for this project. The Regional Board finds that this facility will not cause adverse environmental impacts if conducted in accordance with the prohibitions, specifications and provisions contained in this Order.

THEREFORE IT IS HEREBY ORDERED that the Montair Homeowners Association, Inc., Holiday Development Company, Inc., and Mr. John M. Howe shall comply with the following:

A. DISCHARGE PROHIBITIONS:

1. The discharge of waste to the Shasta River or its tributaries is prohibited.
2. The discharge of waste to land which is not owned or controlled by the discharger is prohibited.

B. DISCHARGE SPECIFICATIONS:

1. Wastewater discharged to the irrigation disposal facility shall be applied at a rate which will allow maximum percolation and evaporation and minimize runoff.
2. The mean daily dry weather flow of waste shall not exceed 13,200 gallons per day.
3. Neither the treatment nor the discharge of waste shall cause a pollution or nuisance as defined in Section 13050 of the California Water Code.
4. Surface drainage from the surrounding upgradient areas (other than the disposal area) shall be excluded from the disposal area.
5. All surface runoff from the disposal area shall be intercepted and disposed of in a manner consistent with this Order.

6. Wastewater discharged to the irrigated disposal field and the storage reservoir shall not contain constituents in excess of the following limits:

<u>Constituent</u>	<u>Units</u>	<u>Mean</u>	<u>Maximum</u>
BOD (20°C, 5-day)	mg/l	50	80
NFR	mg/l	50	80
Settleable Matter	ml/l	1.0	2.0
Coliform Organisms	MPN/100 ml	23*	230
Hydrogen Ion	pH not less than 6.5 nor more than 8.5		

\*Median

7. The dissolved oxygen content of the wastewater in the treatment pond and the storage reservoir shall not be less than 1.0 mg/l.

C. PROVISIONS:

1. The discharger shall submit to the Regional Board a comprehensive operations and maintenance manual and designate and train an operator prior to the use of the treatment and disposal facilities.
2. Each septic tank effluent pumping station shall be equipped with alarm indicating both visually and by sound a "high water" condition. The minimum working capacity shall be 300 gallons, including a 100 gallon minimum dose and 200 gallons additional storage above the high water alarm level.
3. Adequate capacity in the storage reservoir shall be provided by October 1, of each year for storage of winter wastewater flows. This available capacity shall include storage of rainfall and runoff from the irrigation-disposal field as calculated from the recorded maximum rainfall.
4. In the event the discharger is unable to comply with any of the conditions of this Order due to:
  - a. breakdown of waste treatment equipment;
  - b. accidents caused by human error or negligence; or
  - c. other causes, such as acts of nature;

the discharger shall notify the Executive Officer by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to correct the problem and the dates thereof, and what steps are being taken to prevent the problem from recurring.

5. The discharger shall comply with the Monitoring and Reporting Program No. 81-131 and the General Provisions for Monitoring and Reporting and any modifications to these documents as specified by the Executive Officer. Such documents are attached to this Order and incorporated herein.
6. The discharger shall file a report of waste discharge at least 120 days before making any material change or proposed change in the character, location, or volume of the discharge.
7. The discharger shall permit the Regional Board:
  - a. entry upon premises in which an effluent source is located or in which any required records are kept;
  - b. access to copy any records required to be kept under terms and conditions of this Order;
  - c. inspection of monitoring equipment or records; and
  - d. sampling of any discharge.
8. The discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed to achieve compliance with waste discharge requirements.
9. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of at a legal point of disposal, and in accordance with the provisions of Division 7.5 of the California Water Code. For the purpose of this requirement, a legal point of disposal is defined as one for which waste discharge requirements have been prescribed by a Regional Water Quality Control Board and which is in full compliance therewith.

#### Certification

I, David C. Joseph, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on May 28, 1981.

ORIGINAL SIGNED BY

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David C. Joseph  
Executive Officer

California Regional Water Quality Control Board  
North Coast Region

MONITORING & REPORTING PROGRAM NO. 81-131

for

MONTAIR SUBDIVISION HOMEOWNERS ASSOCIATION, INC.  
HOLIDAY DEVELOPMENT COMPANY, INC.

AND

JOHN M. HOWE

Siskiyou County

MONITORING PROGRAM

The purpose of this Monitoring Program is to assure compliance with Waste Discharge Requirements by careful, thorough, conscientious maintenance and operating of wastewater treatment and disposal facilities. The following shall constitute the Monitoring Program:

EFFLUENT MONITORING

<u>Constituent</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
BOD	Grab	Monthly*
NFR	Grab	Monthly*
Suspended Solids	Grab	Monthly
Coliform Organisms	Grab	Monthly
Hydrogen Ion	Grab	Monthly
Flow	--	Continuous

\*This frequency shall be modified to "Quarterly" following the first year of operation.

RESERVOIR MONITORING

A staff gage shall be installed at a convenient location within the reservoir. The elevation of the reservoir spillway shall be referenced as zero. Distances from the spillway (reference zero) to water levels shall be calibrated in feet and tenths of feet. The level necessary to provide winter storage shall be marked with a red line. All other marks shall be black on white.

The water level shall be measured as follows:

<u>Period</u>	<u>Frequency</u>
October 1 to May 31	Once Weekly
June 1 to September 30	Once Monthly

Effluent Pumping Facilities

All septic tanks and pumping facilities shall be inspected at least once each year for sludge accumulations. When the sludge level in the septic tank is within 10 inches of the outlet device, the tank and pump station should be pumped.

During the annual inspection, all wiring, piping, etc., shall be visually inspected for any damage. The alarm shall be tested and the homeowner reminded of its purpose. The annual inspection shall be completed by October 1st of each year.

REPORTING

Monthly monitoring reports shall be submitted to the Regional Board by the 15th day of the following month. In reporting the monitoring data, the discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data will be summarized in such a manner to illustrate clearly the compliance with waste discharge requirements. A brief narrative report shall be prepared describing the findings of the annual inspection.

The monitoring and any necessary narrative reports shall be transmitted in accordance with specifications of Resolution No. 71-5 adopted by this Board on February 3, 1971.

IMPLEMENTATION

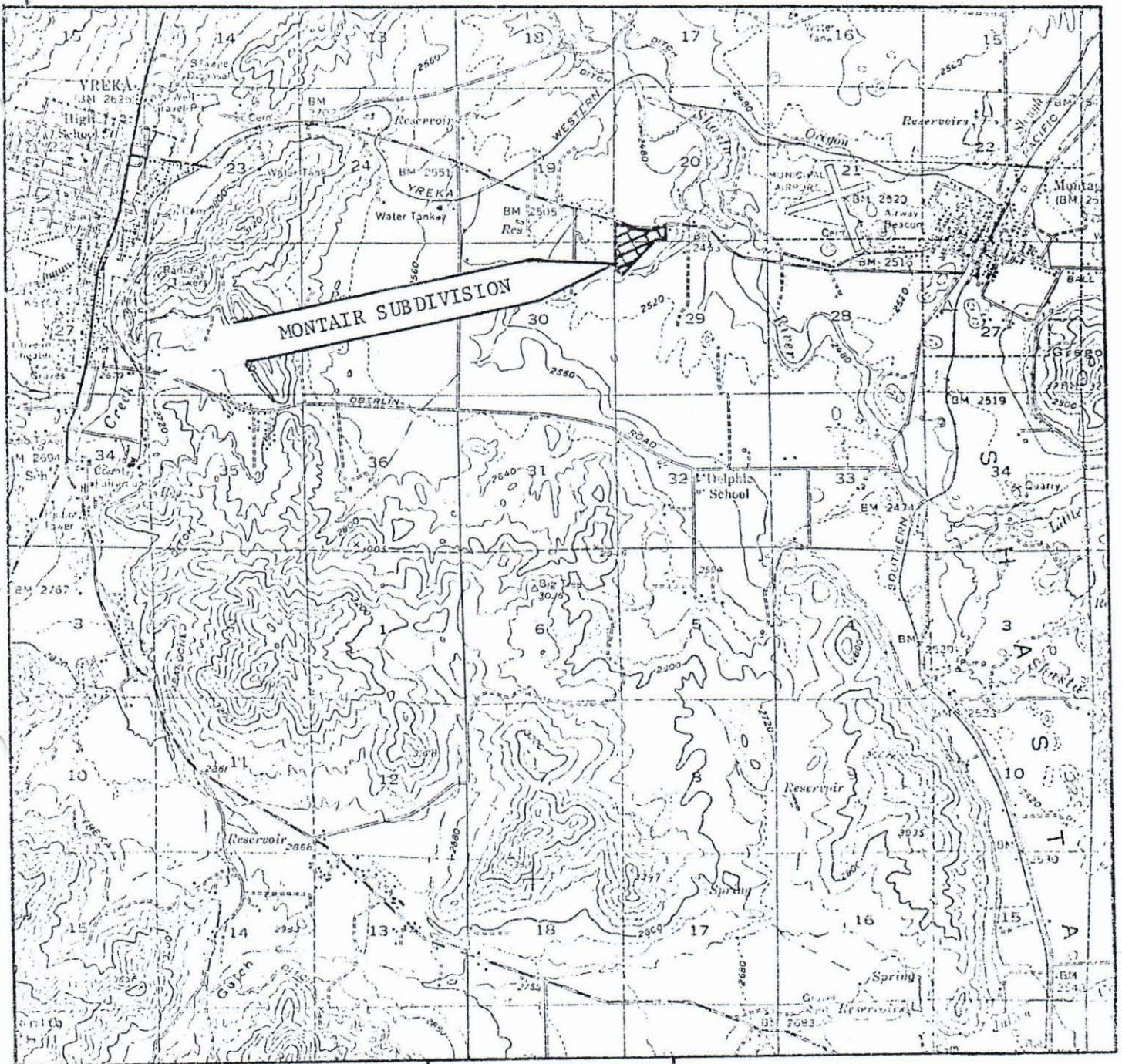
The monitoring program shall commence immediately upon start-up of the disposal operation.

ORIGINAL SIGNED BY

Ordered by \_\_\_\_\_

David C. Joseph  
Executive Officer

May 28, 1981



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California Regional Water Quality Control Board  
North Coast Region  
CONTINGENCY PLANNING AND NOTIFICATION REQUIREMENTS  
FOR ACCIDENTAL SPILLS & DISCHARGES

ORDER NO. 74-151

The California Regional Water Quality Control Board, North Coast Region, finds that:

1. Section 13225 of the Porter-Cologne Water Quality Control Act requires the Regional Board to perform general duties to assure positive water quality control.
2. The Regional Board has been advised of situations in which preparation for, and response to accidental discharges and spills have been inadequate.
3. Persons discharging waste or conveying, supplying, storing or managing wastes or hazardous materials have the primary responsibility for contingency planning, incident reporting and continuous and diligent action to abate the effects of such unintentional or accidental discharge.

THEREFORE, IT IS HEREBY ORDERED THAT:

- I. All persons who discharge wastes or convey, supply, store or otherwise manage wastes or other hazardous material shall:
  - A. Prepare and submit to this Regional Board, according to a time schedule prescribed by the Executive Officer, a contingency plan defining the following:
    - (1) potential locations and/or circumstances under which accidental discharge incidents might be expected to occur,
    - (2) possible water quality effects of accidental discharges,
    - (3) the conceptual plan for cleanup and abatement of accidental discharge incidents, including:
      - (a) the individual who will be in charge of cleanup and abatement activities, on behalf of the discharger,
      - (b) the equipment and manpower available to the discharger to implement the cleanup and abatement plans.
  - B. Immediately report to the Regional Board any accidental discharge incidents. Such notification shall be made by telephone as soon as the responsible person or his agent has knowledge of the incident.

Order No. 74-151

- C. Immediately begin diligent and continuous action to cleanup and abate the effects of any unintentional or accidental discharge. Such actions shall include temporary measures to abate the discharge prior to completing permanent repairs to damaged facilities.
  - D. Confirm the telephone notification in writing within two weeks of the telephone notification. The written notification shall include: reasons for the discharge, duration and volume of the discharge, steps taken to correct the problem, and steps being taken to prevent the problem from recurring.
- II. Upon original receipt of phone report (I.B), the Executive Officer shall immediately notify all affected agencies and known users of waters affected by the unintentional or accidental discharge.
- III. Provide updated information to the Regional Board in the event of change of staff, size of the facility, or change of operating procedures which will affect the previously established contingency plan.
- IV. The Executive Officer or his employees shall maintain liaison with the discharger and other affected agencies and persons to provide assistance in cleanup and abatement activities.
- V. The Executive Officer shall transmit copies of this order to all persons whose discharges or waste handling activities are governed by Waste Discharge Requirements or an NPDES Permit. Such transmittal shall include a current listing of telephone numbers of the Executive Officer and his key employees to facilitate compliance with Item I.A(3)(a) of this Order.

Ordered by



David G. Joseph  
Executive Officer

July 24, 1974

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
NORTH COAST REGION

GENERAL MONITORING AND REPORTING PROVISIONS

February 3, 1971

GENERAL PROVISIONS FOR SAMPLING AND ANALYSIS

Unless otherwise noted, all sampling, sample preservation, and analyses shall be conducted in accordance with the current edition of "Standard Methods for the Examination of Water and Waste Water" or approved by the Executive Officer.

All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health or a laboratory approved by the Executive Officer.

All samples shall be representative of the waste discharge under the conditions of peak load.

GENERAL PROVISIONS FOR REPORTING

For every item where the requirements are not met, the discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.

By January 30 of each year, the discharger shall submit an annual report to the regional board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

The discharger shall file a written report within 90 days after the average dry-weather flow for any month that equals or exceeds 75% of the design capacity of the waste treatment or disposal facilities. The report shall contain a schedule for studies, design, and other steps needed to provide additional capacity or limit the flow below the design capacity prior to the time when the waste flow rate equals the capacity of the present units.

## Contingency Planning

### 1. Potential Locations of Accidental Discharges

- a) Collection system pipelines.
- b) Failure of dike at the facultative lagoon.
- c) Overflow of spillway or failure of dam at the storage reservoir.

### 2. Possible Causes

- a) Breaks in a pipeline can be caused by future excavation down to the pipeline, extremely heavy wheel loads or larger rocks left in contact with the pipe during installation of the pipe. To protect against damage from heavy wheel loads and rocks against the pipe, the pipe is bedded on and covered to a depth of 6 inches above the pipe with pea gravel.

Leaks in a pipeline will generally occur at joints or in hair line cracks existing in the pipe or fitting at the time of installation. Upon completion of the pipe installation the pipeline is to be pressure tested at a pressure of 50 p.s.i. above the working pressure. This will normally disclose any defective joints or cracks in the pipeline.

- b) Failure of the dike at the facultative lagoon is very unlikely if inspection and maintenance is provided in accordance with Sec. 5.04 of this O & M Manual. Without maintenance, failures or spills from the lagoon could be caused by an obstructed outlet and subsequent over-topping of the dike or weakening of the dike by burrowing animals. At full buildout it will take approximately 40 days, with no discharge from the outlet pipe, for the liquid level to rise to the top of the dike.
- c) Discharges from the spillway of the reservoir could result from failures of the diversion ditches above the reservoir or rainfall in excess of the maximum recorded for the area.

Dam Failure. The dam for the storage reservoir is an earth fill dam designed by the U. S. Department of Agriculture, Soil Conservation Service in 1974. The dam was constructed the same year under the supervision of the Soil Conservation Service. The dam height is 15.5 feet, has a top width of 12 feet, upstream slope of 3:1 and downstream slope of 2:1. There is side channel spillway having a design capacity of 40 c.f.s.. With normal maintenance there is no reason for a dam failure.

### 3. Possible Water Quality Effects of Accidental Discharges

#### a) Breaks or Leaks in Pipeline.

The pipelines are conveying septic tank effluent from the individual pumping facilities to the common treatment area. A break at the low point of the force main would result in a spill of approximately 2,800 gallons of untreated septic tank effluent into an intermittent stream that flows during the wet weather season and in response to irrigation in the summer. The stream is tributary to the Shasta River. Breaks in other locations along the line would discharge lesser amounts. Breaks in the line should be detected immediately.

Leaks in the line probably will not be detected until moisture from the leak surfaces. With proper procedures during repair of leaks discharges from the lines can be prevented.

#### b) Facultative Lagoon.

As previously discussed, a discharge from the lagoon is unlikely. If a break in the lagoon dike did occur by overtopping the dike the upper 5 feet of the lagoon contents could be spilled resulting in a discharge of approximately 4 acre-feet of treated wastewater. Accumulated sludge should be in the lower 3 feet of the lagoon and these would not be discharged by a break in the dike. The discharge would be to the storage reservoir and no discharge should result unless the reservoir is at or near capacity. Any discharge from the reservoir would be further diluted by the contents of the reservoir prior to being discharged over the spillway.

#### c) Overflow of Spillway or Failure of Dam.

With proper maintenance there will be no discharge from the spillway or reservoir. Any discharge would have a maximum of about 15% treated wastewater. Discharge from the spillway would probably reach the Shasta River during the wet weather season.

### 4. Conceptual Plan For Cleanup and Abatement of Accidental Discharges.

#### Responsible Parties:

Montair Home Owners Association, Inc.  
and John M. Howe

Rt. 1, Box 501  
Montague, California 96064

#### Conceptual Plans

#### a) Collection system pipeline breaks or leaks.

1. Shut off all pumping into that portion of the pipeline affected.
2. Isolate the section of pipeline as far as possible from existing

valves.

3. Where possible, prevent the wastewater from entering a stream that flows to the Shasta River by excavating or spreading on flat lands where it will dissipate.
4. Excavate and repair break or leak.

The parties responsible for maintenance and repair of the system must have repair fittings for the 4 inch force main, 3 inch collection lines and 1 1/4 inch service lines at all times. The outside diameters of the installed pipelines are 4.5, 3.5 and 1.66 inches respectively.

A backhoe must be available for pipeline repairs at all times.

b) Facultative Lagoon

1. Clear the outlet structure so that water level in the lagoon is lowered as rapidly as possible.
2. Inspect discharges from the break and make certain they are entering the storage reservoir.
3. Lower the lagoon level by transporting the portable irrigation pump to the site and pumping from the lagoon to the reservoir.
4. Repair dike.

Again a backhoe should be available for repairs at all times. Special earthwork equipment would be required for permanent repair of the dike.

c) Spillway Discharges

1. If caused by a problem with the diversion ditches the ditches should be repaired immediately.
2. If the level of the reservoir reaches a point where there is overflow from the spillway or it appears that overflow is likely to occur the irrigation system is to be operated during dry periods of the wet weather season.

A backhoe should be available at all times for emergency repairs to diversion ditches.

Equipment and Manpower

There are a number of owner-operator backhoes available in the Yreka-Montague area. Jim Robinson of Yreka has done all the trench excavation and backfill work for the project. It is recommended that he be retained

on a standby basis for backhoe services.

Presently John M. Howe is an owner and the manager of the Shasta Valley Golf Course adjacent to the subdivision. Initially, operation and maintenance for the sewer system will be performed by the golf personnel. In the future, the Home Owners Association may contract with other parties for operation and maintenance of the system.

## SECTION 5. OPERATION & MAINTENANCE

5.01 Septic Tank shall be constructed in accordance with the approved improvement plans and requirements of the Regional Water Quality Control Board and County Health Department. All septic tanks shall have an inspection port for easy access to determine the depths of sludge and scum blanket in the upper compartment of the tank.

Septic tanks must be cleaned before too much sludge or scum accumulates. If sludge or scum passes through the septic tank to the pump sump there is the danger of clogging the pump or pump discharge line.

The septic tank shall be inspected yearly and cleaned when necessary. There are wide ranges in the rates that sludge and scum accumulate from one tank to the next; however, tanks normally require cleaning every three to five years.

Tanks shall be cleaned if either the:

- (a) bottom of the scum mat is within approximately 3 inches of the top of the outlet device in the upper chamber; or
- (b) the top of the sludge is within 10 inches of the bottom of the outlet device.

Scum can be measured with a stick to which a weighted flap has been hinged, or with any device that can be used to feel out the bottom of the scum mat. The stick is forced through the mat, the hinged flap falls into a horizontal position, and the stick is raised until resistance from the bottom of the scum is felt. With the same tool, the distance to the bottom of the outlet device can be found.

A long stick wrapped with rough, white toweling and lowered to the bottom of the tank will show the depth of sludge and the liquid depth of the tank. The stick should be lowered behind the outlet device to avoid scum particles. After several minutes, if the stick is carefully removed, the sludge line can be distinguished by sludge particles clinging to the toweling.

Typical septic tank and possible measuring devices are illustrated on the following page.

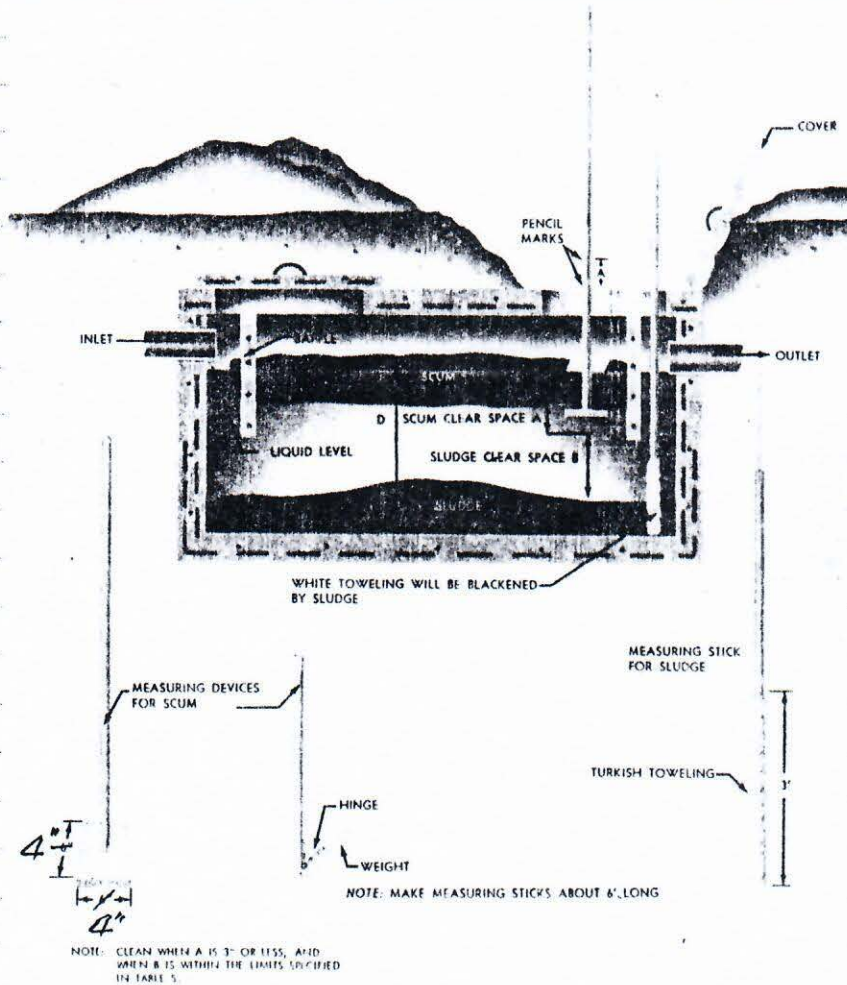
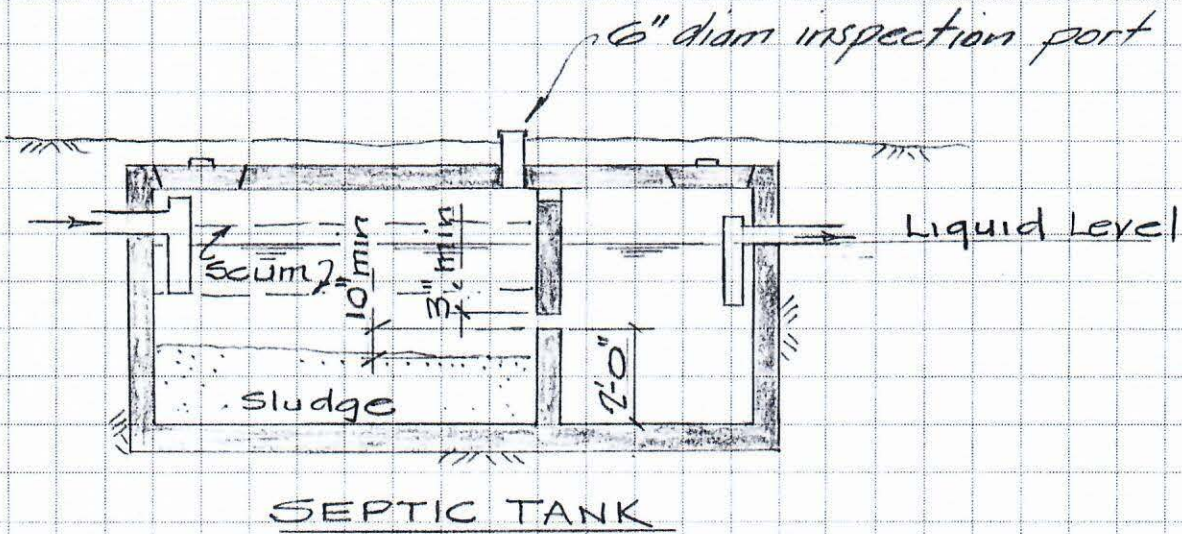


Figure 18.—Devices for measuring sludge and scum.

5.02 Pump & Controls. The pump and pump controls shall be inspected at least once a year. Pump on, off and high water alarm switches shall be checked for proper liquid level control and alarm. To check switches it will be necessary to manually trip them.

The Montair Subdivision Home Owner's Association shall provide personnel and replacement parts for all components of the pumps and control systems. The pump sump is to provide a minimum of 200 gallons storage above the high water alarm; therefore it is essential that repair or replacement of the pump or controls can be accomplished within 24 hours of the time a failure occurs.

Manufacturer's operation and maintenance literature and drawings for each piece of operating equipment is included in Exhibit D of this manual.

5.03 Force Main. The force main is buried so it will not be possible to inspect the line; however, repair fitting for each size pipe in the system shall be stocked.

Any major breaks in the pipeline will be evident shortly after they occur. Small leaks along the force main from the subdivision boundary to the facultative lagoon will not be evident. This section of the force main should be patrolled every 2 months for the appearance of wet spots or surface water.

Sewer service, ball valve and air relief valve boxes should be inspected once a year. The boxes should be cleaned and broken or damaged covers or boxes replaced. Valves should be operated to see that they are still operating.

5.04 Facultative Lagoon Prior to start up the bottom of the lagoon and the temporary dike shall be treated with a soil sterilant. The soil sterilant shall be as recommended by the Siskiyou County Farm Advisor's office and approved by the Siskiyou County Agricultural Commissioner.

After application of the soil sterilant the sub-lagoon created by the temporary dike shall be filled with water to a depth of 2.5 feet. This will require about 63,000 gallons of water. Pumping at 20 g.p.m., this will require 53 hours.

Initial flow from the subdivision will be small, for instance with 10 homes connected to the system and no allowance for evaporation and infiltration it would require 29 days to fill the sub-lagoon.

After startup the lagoon should be inspected weekly. The dikes are to be seeded with grasses after construction and may require reseeding if the initial seeding does not take hold. The lagoon should be kept clear of wind-blown debris and tumbleweeds. Noxious weed growth on the dikes and the bottom of the lagoons should be removed by burning in the fall. Burrowing animals must be controlled in the lagoon area.

After the lagoon starts overflowing to the storage reservoir the site must be visited once a week to wind 8 day clock. At this time the overflow structure should be checked and cleared of debris to prevent stoppage of the overflow.

Seasonal maintenance of the lagoon will consist of the following:

Spring Seed dikes (if needed). Make necessary repairs to pond structure and the access road.

Summer Control noxious weed growth on dikes. Remove emergent vegetation and blowing debris as required. Watch for mosquito larvae and apply larvacide as necessary.

Fall Seed dikes (if needed). Remove tumble weeds and debris from pond. Maintain access road.

Winter Check pond overflow weekly. Burn off or remove any weed or tree growth. Control burrowing animals.

5.05 Chlorinator Disinfection is to be accomplished by a wastewater chlorinator, "Sanuril" Model 1000. The manufacturer's literature for operation and maintenance is included in Exhibit D.

The chlorination device is located on the end of the 6 inch overflow line at the head of the metering structure. It is a flow through device with 4 tubes for storage of chlorine tablets. The rate of chlorine feed is regulated by the number of tubes used and the depth of flow through the feeder. The depth of flow is regulated size weir plate used at the discharge end of the chlorinator.

Once the lagoon starts overflowing it will be necessary to activate the chlorinator. To determine how many tubes to use and which weirs to use it will be necessary to operate the chlorinator at various settings for several days. The goal is to discharge from the chlorine contact basin with a chlorine residual of 0.5 to 1.0 mg/l.

Since flows will be low it is recommended that the first trial be made using the 1 inch weir and one tube.

The chlorine feed rate to obtain a chlorine residual of 0.5 to 1.0 mg/l. will depend on the character of the lagoon effluent. It is estimated that the chlorine feed rate will be in the range of 10 mg/l. The feed rate will have to be determined by experiment.

If the 10 mg/l feed rate is adequate to produce the desired chlorine residual, it is calculated that 1.1 lbs per day of chlorine will be adequate to treat the design discharge of 13,200 gallons or 9.17 g.p.m..

Whenever the lagoon is overflowing the chlorinator should be checked weekly. The feed tubes will require filling, the weir plate should be cleaned and the chlorine residual checked at the discharge from the chlorine contact tank.

The chlorine residual can be checked with a common swimming pool test kit. A record should be kept of the measurements.

5.06 Flow Meter The flow meter is a Steven Model 61R with weather proof enclosure and stand. Manufacturer's operation and maintenance literature is included in Exhibit D.

During installation of the flow meter the float is to be set for a zero reading when the depth of water is level with the bottom of the v-notch weir.

The recorder is actuated by a eight-day spring driven clock; therefore it will be necessary to visit the site weekly. During each weekly visit the v-notch weir should be cleaned, the float should be checked for freedom of movement and the 2 inch pipe between the float well and the weir box inspected.

The total flow on the totalizer should be recorded monthly and the strip chart must be changed every 60 days.

5.07 Storage Reservoir The existing reservoir is to provide winter storage for wastewater overflows from the facultative lagoon. In order to provide this storage it is necessary to divert natural drainage around the reservoir and to lower the reservoir during the irrigation season.

Diversion of the natural drainage is to be accomplished by maintaining the Diversion Ditches shown on the General Plan, Montair Subdivision, Sh. No. 1 of 7, which is Exhibit C of this O & M Manual.

The diversion ditches are to be inspected and repaired, if necessary, during the month of September of each year. During the wet weather season, October through March, the ditches are to be inspected once each week. It is essential that the integrity of the ditches be maintained throughout the wet weather season.

In order to provide storage in the reservoir for the wet weather season it is calculated that the reservoir level be 3.8 feet below the spillway on October 1st of each year. To provide for a margin of safety, the record rainfall of 24.19 inches has been used to calculate the necessary storage and no allowance has been made for seepage losses through the dam or the bottom of the reservoir.

In addition the reservoir level necessary to obtain winter storage has been marked at 4.0 feet below the spillway level.

A staff gage has been installed in the reservoir on the upstream face of the dam. The water level in the reservoir must be recorded weekly from October 1 through May 31 and monthly from June 1 to September 30.

Storage space available in the reservoir has been calculated as follows:

Res. Elev.	Distance Below Spillway (Staff Gage Reading)	Storage Space	
		Ac-Ft	Million Gals
2519.5	0.0	0.0	0.0
2518.5	1.0	9.5	3.095
2517.5	2.0	17.5	5.694
2516.5	3.0	24.0	7.828
2515.7	3.8	28.9	9.416
2515.5	4.0 (max Oct 1 Level)	29.9	9.472
2514.5	5.0	33.2	10.818

If the reservoir level approaches the spillway level it will be necessary to pump from the reservoir into the spray or flood irrigation system, regardless of the time of year. It is not anticipated that this will occur.

In an average year it is estimated that it will be necessary to dispose of 25.4 acre-feet of water when the subdivision is fully built out. During the period that the subdivision is building out records of flows from the facultative lagoon should be compared with the design values.

Assuming full buildout and the necessity to dispose of 25.4 acre-feet of water during the irrigation season, the reservoir should be lowered by 6.35 acre-feet during each month from June 1 through September 30. Following are reservoir levels that should occur to meet this schedule and the hours of pumping required:

Period	*Reservoir Level Below Spillway	Hours Pumping (300 g.p.m.)
June	0.76	115
July	1.63	115
Aug	2.66	115
Sept	4.00	115

\*Measured at the end of the month

Any runoff of irrigation water used from the storage reservoir after the facultative lagoon begins overflowing must return to the reservoir.

The subdivider has reserved the right to regulate the reservoir level; however, his operation must conform to the requirements of the North Coast Regional Water Quality Control Board, the Siskiyou County Health Department and this O & M Manual. In the event the subdivider does not meet these requirements it shall be the responsibility of the Montair Subdivision Homeowner's Association.

In any event it is the responsibility of the Homeowner's Association to monitor and report the information required by Monitoring & Reporting Program No. 81-131.

Assuming that a maximum summer rainfall occurs following a maximum winter rainfall year I find the following:

Irrigation

Evap. transpiration (7 Mo. Pasture)		33.8 in.
Max. Rainfall (7 Mo.) = $0.35 \times 24.19$	=	8.4 in.
Net Irrigation Water Req'd.		2.12 Ac Ft/Ac
Winter Storage Carryover		28.8 Ac Ft
Wastewater From Facutative Lagoon (7 Mo.)		8.5 Ac Ft
Reservoir Evap. = $(8.4 - 0.75 \times 28.8) \times 8/12$	=	-8.8 Ac Ft
Net Pumping Required = $28.8 + 8.5 - 8.8$	=	28.5 Ac Ft
Irrigated Land Required = $28.5/2.12$	=	13.44 Ac

With full buildout and 28.5 Ac.-ft. to dispose of during the irrigation season the reservoir should be lowered to the same levels shown in the table on Pg. 5-6; however the number of pumping hours per month would have to be increased to 130 hours per month. The real key is the number of hours pumping required to obtain the desired reservoir levels at the end of each month through the irrigation season. There will be differences in rainfall and evaporation during each day and month of the season.

5.08 Irrigation Several alternatives are available for providing an irrigation system suitable for maintaining the storage reservoir at the levels specified in Section 5.07. A final decision will be made prior to completion of the improvements. At that time this section will be revised.

To maintain the storage reservoir at the specified levels water will be pumped from the reservoir, during the irrigation season, using either an electric motor and pump or a trailer pack consisting of a diesel engine and pump. The minimum pump capacity will be 300 g.p.m..

Water will be spread over the Land Disposal Site shown on the General Plan (Exhibit C) by either a sprinkler system or flood irrigation methods.

If a sprinkler system is used, a 4 to 6 inch pipe will be installed from the pump to the south end of the land disposal site and laterals installed connected to the sprinklers which will distribute the water over the site.

If flood irrigation methods are used a 4 to 6 inch pipe will be installed from the pump to the south end of the disposal site and existing ditches used to spread the water.

All runoff from irrigation operations shall return to the storage reservoir.

Operation & Maintenance Cost

1. Pump Maintenance

Full & inspect ea. pump annually  
 4 man days @ \$120 \$480.00

Emergency Calls  
 3 man days @ \$120 360.00

Pump Replacement (41 Units)  
 10 Years @ 7% 1483.74  
~~3619~~  
~~\$500 x 14238 x 41~~ 2918.00

2. Pressure Line Maintenance

1.2 Mi. @ \$100 180.00

3. Monitoring & Reporting Test Frequency

	Frequency	Est Cost Per Year
BODs	Quarterly	\$140.00
Settleable	"	64.00
Solids		
Non-Filterable	"	80.00
Residue		
Chlorine	Daily (1/2 hr @ \$15)	2737.50
Residual		
Hydrogen Ion	Weekly	—
Average Daily Flow	Continuous	—
		3427.50

TSS

4. Irrigation (7 Mo)

28 Man-Days @ \$64 1792.00

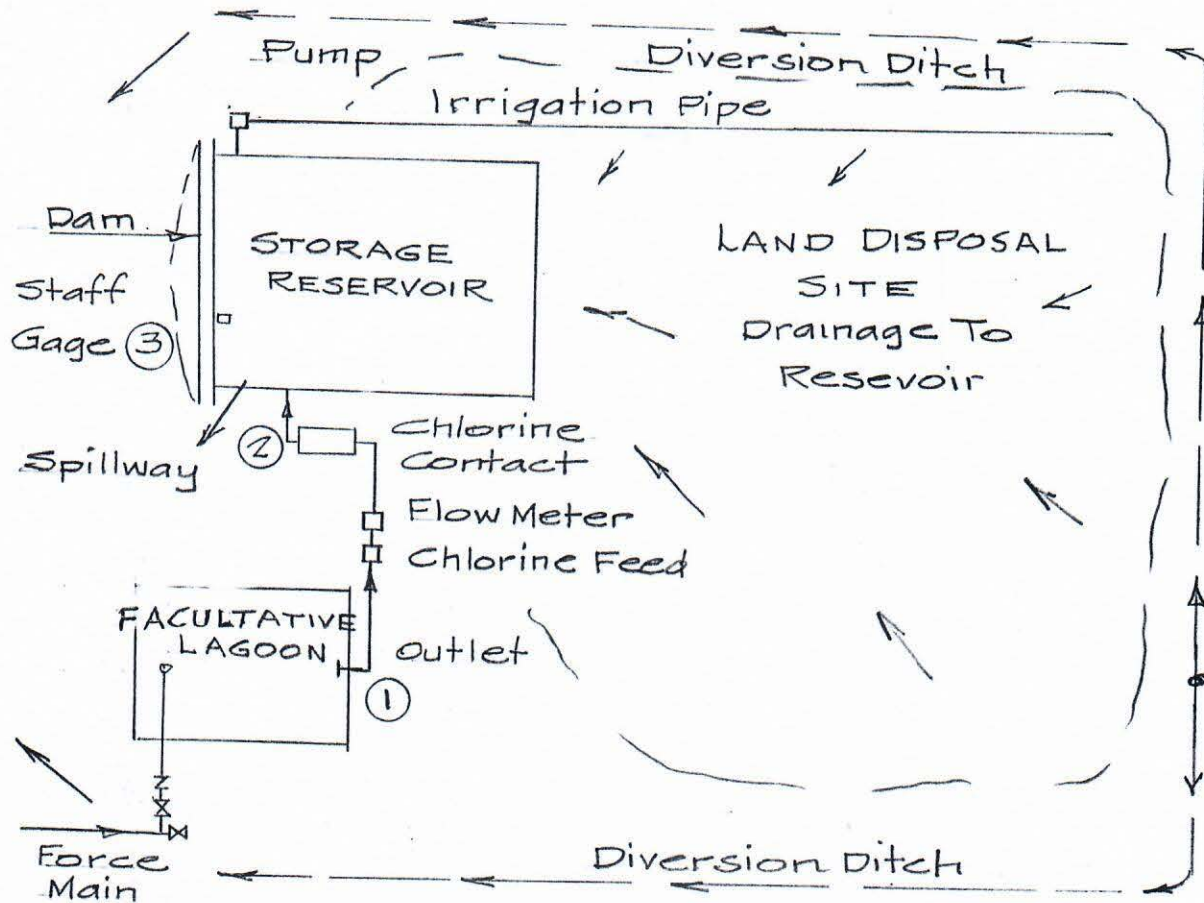
Power (1246 KW H / Mo) 392.00

797.26

5. Collection & Treatment Replacement Cost ~~4672.00~~

Total

~~14,521.50~~  
 9212.50



SCHEMATIC DIAGRAM  
TREATMENT & DISPOSAL SITE

Sample Locations

- ①. Lagoon Outlet  
Dissolved Oxygen Content
- ②. Discharge Pipe from Chlorine Contact Tank  
BOD, NFR, Settleable Matter, Coliform Organisms,  
Hydrogen Ion, Chlorine Residual
- ③. Staff Gage  
Dissolved Oxygen Content

EXHIBIT A

Maintenance Schedule

<u>Component</u>	<u>Frequency</u>	<u>Description</u>
Septic Tanks	Yearly	Check sludge and scum levels. Pump as required.
Pump & Controls	Yearly	Inspect pumps. Manually operate switches and highwater alarm.
Force Main	Yearly	Inspect and clean valve and service boxes.
Facultative Lagoon	Bi-monthly	Patrol force main.
	Weekly	After startup
	Weekly	Inspect overflow (after overflow begins).
	Spring	Repairs and seeding, if necessary.
	Summer	Weed and mosquito control.
	Fall	Repairs and seeding, if necessary.
	Winter	Burn off weed and trees, control burrowing animals.
Chlorinator	Weekly	Check chlorine tablet level in chlorinator.
Flow Meter	Weekly	Wind 8 day clock, inspect float operation and clean weir.
	Monthly	Record flow recorder totalizer reading.
	Bi-monthly	Change flow recorder chart.
Storage Reservoir	Weekly	Oct. 1 thru May 31, record staff gage water level reading.
	Monthly	June 1 thru Sept. 30, record staff gage water level reading and check against recommended levels.
Irrigation	June thru Sept.	Reservoir levels are to be kept at the recommended levels by irrigating as necessary.
Diversion Ditches	Sept.	Repair all ditches
	Weekly	During wet weather season

## EXHIBIT B

### Samples

Samples shall be taken for effluent monitoring and reporting in accordance with the provisions of Program No. 81-131, Pages 3-5 of this manual.

Samples shall be collected and delivered by the plant operator to an approved laboratory for analysis.

The locations for collecting samples shall be as designated on the Schematic Diagram of the Treatment & Disposal Area attached hereto.