

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 84-37

WASTE DISCHARGE REQUIREMENTS FOR:

SLUDGE STORAGE FACILITIES AND
SLUDGE APPLICATION TO DEDICATED LAND DISPOSAL SITE

LAS GALLINAS VALLEY SANITARY DISTRICT
SAN RAFAEL, MARIN COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called Board) finds that:

1. Las Gallinas Valley Sanitary District (hereinafter called the discharger) by application dated October 25, 1983 has applied for waste discharge requirements to dispose of sewage sludge (wastewater solids) generated by their operation of the wastewater treatment facilities to a dedicated land disposal site.
2. The discharger operates a secondary wastewater treatment plant with a effluent discharge to Miller Creek, a tributary to San Pablo Bay. The sewage sludge is treated by anaerobic digestion and stored in a sludge facility adjacent to the treatment plant during wet weather season. The discharger is currently in the process of expanding the treatment and disposal facilities to include effluent irrigation on nearby pasture areas.
3. The discharger proposes to dispose of their sludge directly from the digester and the sludge storage facility on approximately eleven (11) acres of Dedicated Land. The disposal site is located in the southeast corner of discharger's Effluent Disposal site as shown in Attachment A, which is incorporated herein and made part of this order. The proposed land application of the sewage sludge will commence upon completion of the expansion of the existing treatment facilities. The sludge quantity currently generated is estimated to be 400 dry tons/year. This will increase to 645 dry tons/year by 1991.
4. The proposed Dedicated Land Disposal site and the Sludge Storage Facilities are underlain by soft compressible silty clays known as Bay Mud. The bay mud is very impermeable (permeability in the range of 10^{-7} cm/sec or less) and extends to depth of over 70 feet. The levee's around the disposal site will be keyed to the underlying bay mud. In addition, the discharger proposes to construct drainage ditch just inside the perimeter dikes of the Dedicated Disposal Site to intercept all groundwater that may enter the drainage and pump it back to the sewage treatment plant. This internal ditch will also act as an additional safeguard against lateral migration of any pollutants offsite from the sludge disposal area.

7. In accordance with Section 13263 of the Water Code, these requirements are subject to periodic review and revision by this Regional Board. The Board shall take into consideration the results of the self-monitoring program whenever these periodic reviews occur.

8. Six months prior to discontinuing the use of dedicated land disposal area for waste disposal the discharger shall submit a technical report to the Board describing the methods and controls to be used to assure protection of the quality of surface and groundwaters and prevent erosion of the area during final operations and with any proposed subsequent use of the land. This report shall be prepared by or under the supervision of a certified engineering geologist or registered civil engineer. The method used to close the site and maintain protection of the quality of surface and groundwaters shall comply with waste discharge requirements established by the Board.

I, Roger B. James, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 20, 1984.

ROGER B. JAMES
Executive Officer

Attachments:

- A. Site Map

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

T E N T A T I V E
SELF-MONITORING PROGRAM
FOR

LAS GALLINAS VALLEY SANITARY DISTRICT--
SLUDGE STORAGE FACILITIES AND SLUDGE
APPLICATION TO DEDICATED LAND DISPOSAL SITE

ORDER NO. 84-37

I. GENERAL

1. All analyzes shall be performed by an approved (certified laboratory using generally acceptable methods or current EPA/State guidelines procedures for sampling and analyses of sludge, soil, and groundwater.
2. The sludge, soil, groundwater, and shall be submitted in accordance with the specifications described in this program. Any failures to conform to this program of sampling and analyses shall be explained in the subsequent report.

II. REPORTING

Reporting to the Board shall normally be accomplished by the submission of a single annual report. This report shall be prepared by, or under the supervision of, a soil scientist, soils engineer, or other individual having a recognized expertise on the impacts of sewage sludge on soils and on surface and groundwaters. The annual report shall be submitted no later than May 15 of each year, and shall include the following:

A. Annual Management Plan Update

This section shall describe the method of operation for the upcoming season and include the following as a minimum:

1. Sludge loading rate to be used, expressed in dry weight per unit area as kg/ha.
2. Method proposed for incorporating sludge into soil.

Where applicable, the management plan update should indicate changes to past practices that have been identified as being needed in the subsequent portion of the report.

B. Report on Impact of Previous Sludge Applications

The overall intent of this section is to provide a comprehensive annual assessment of the project. This section shall include data presentation and a narrative evaluation of the sludge applied to the land, and of the impacts on soils, and groundwater below the site. Where problems are found to exist, proposed solutions shall be included.

1. Sludge

Present data on sludge composition on dry weight basis. All data shall be presented, and any anomalies found shall be discussed. Any significant changes from previous analyses shall be discussed.

2. Soils

For the Dedicated Land Site, the following table shall be completed based on the most recent data obtained:

Last date sampled _____

<u>Parameter</u>	<u>Prior Cumulative Loading</u>	<u>Soil Concentration, mg/kg</u>		
		<u>0-12"</u>	<u>12-24"</u>	<u>24-36"</u>
Sludge added as dry solid %				
Nitrogen				
Ammonium				
Nitrate				
TKN				
Arsenic				
Cadmium				
Chromium				
Copper				
Lead				
Nickel				
Mercury				
Silver				
Zinc				
PCB's				
pH				
Cation Exchange Capacity				

The data presented above shall be evaluated and discussed. This discussion shall also include the degree to which the sludge has been incorporated into soils at various depths (data may be useful in this assessment), and whether the project has had any effects on soil texture or workability.

Any changes in soil pH shall be described, together with probable reasons.

3. Groundwater

Present data on groundwater expressed in mg/l. All relevant parameters shall be compared with the background level and values in excess shall be discussed.

III. SAMPLING AND ANALYSIS

A. Sludge

1. During the period in which sludge is applied to the land directly from the sludge lagoon(s), sampling and analyses shall be performed bi-monthly over five consecutive days as follows:

- a. Samples shall be taken from each truckload leaving the plant or withdrawing from the lagoons.
- b. Equal volumes of the daily composites shall be combined into a five day composite. The 5-day composite shall be analyzed for the following:

pH, Percent Solids, Total Nitrogen, Ammonium Nitrogen, Nitrate Nitrogen, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc, and PCB's.

All concentrations shall be expressed on a dry weight basis.

If PCB's concentration is less than 5 mg/kg then it shall be analyzed once a year.

2. The sludge lagoons shall be sampled annually before disposed to the dedicated land site. The lagoons shall be sampled at twenty representative points at various depth (1 to 3 feet). These samples shall be combined into a composite and analyzed for all parameters (i.e. Dry Wt. basis) specified in 1.b. above.
3. For the analyses given above
 - a. Except for pH and percent solids, all parameters shall be expressed in dry weight basis (i.e. mg/kg).

- b. If PCB concentration in lagoons is less than 10 mg/kg then monthly analyses is not needed.
 - c. An analytical sensitivity for heavy metals of 0.1 mg/l shall be adequate.
4. Records on sludge produced, stored and disposed shall be maintained on a yearly basis.

B. Soils

1. Annual Testing

- a. Two diagonal transects shall be established for the disposal site. Each year prior to sludge application, a minimum of five (5) soil samples, spaced equidistantly shall be taken along each transect at 0 to 12 inches depth range. Soil sample shall be composited and analyzed for the following parameters:

pH, Lead, and Zinc

- b. A map showing the sample location shall be provided.

2. Comprehensive Testing

- a. Comprehensive testing shall be done prior to sludge application to define conditions that prevailed prior to the commencement of this monitoring program. After this initial testing, testing shall be conducted each time that approximately 90 dry tons of sludge per acre has been applied.
- b. For the disposal site to be sampled, two diagonal transects shall be established. Along each transect, and spaced equidistantly, a minimum of ten soil samples shall be taken at each depth.

Soil samples shall be taken for three depths: zero to twelve inches; twelve to twenty-four inches; and twenty-four to thirty-six inches. Soil samples from each depth (twenty samples per depth) shall be composited and analyzed for the parameters specified below.

c. Analyses

<u>Parameter</u>	<u>Unit</u>
pH	pH unit
CEC(2)	meq/100gm
Electric Conductivity	Millimhos/cm at 25°C
Texture(2)	
Ammonium-Nitrogen	mg/kg
Nitrate-Nitrogen	mg/kg
TKN	mg/kg
Arsenic	mg/kg
Cadmium	mg/kg
Chromium	mg/kg
Copper	mg/kg
Nickel	mg/kg
Lead	mg/kg
Zinc	mg/kg
PCB(1)	mg/kg

(1) PCB shall be analyzed only when the sludge concentration exceeds 5 mg/kg.

(2) To be analyzed only once to obtain background information in order to determine the variability in the field.

C. Groundwater

1. Sampling Stations

<u>Stations</u>	<u>Location</u>
G-1	Located outside of the northerly dike of the disposal site and within 5 feet of the dike.
G-2	Located outside of the westerly dike of disposal site and within 5 feet of the dike.
G-3	Located on the southerly dike of the disposal site.
G-4	Located on the easterly dike of the disposal site.

(See attached map on approximate locations of the wells).

The depth of these "G" wells shall be as deep as is necessary to reach the water table. Wells shall be constructed so as to exclude surface runoff.

2. Analyses

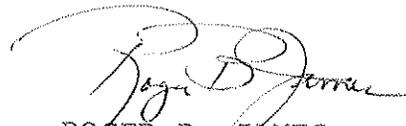
<u>Parameter</u>	<u>Unit</u>
Depth to water	ft.
pH	pH unit
Conductivity	mhos/cm at 25°C
Chloride	mg/l
Cadmium	mg/l
Chromium	mg/l
Copper	mg/l
Nickel	mg/l
Lead	mg/l
Zinc	mg/l
Arsenic	mg/l

NOTE: Standing water in each well shall be flushed prior to taking samples.

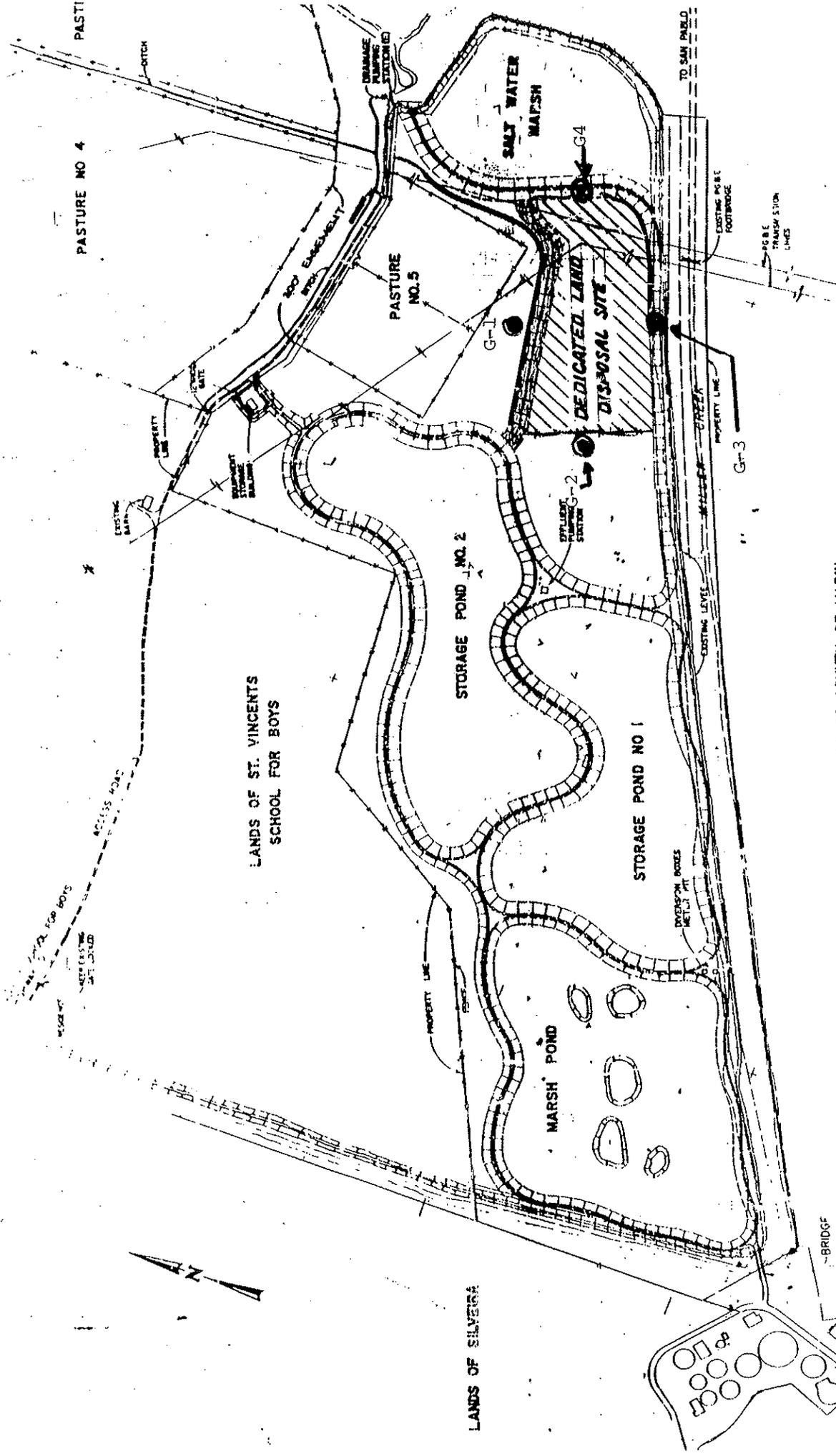
3. All stations shall be sampled two times a year, in March and October.

I, Roger B. James, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with sludge disposal specifications established in the Board Order No. 84-37.
2. Is effective on the date shown below.
3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer.


ROGER B. JAMES
Executive Officer

Attachment: Map of the Dedicated Land
Disposal Site with sampling location(s)



Las Gallinas Valley Sanitary District
 Map Showing
 Wastewater Plant, Sludge Storage Facilities,
 Sludge Dedicated Land Disposal and Locations
 of Monitoring Wells
 Order No. 84-37

LANDS OF COUNTY OF MARIN
 McINNIS PARK

LAS GALLINAS VALLEY
 SANITARY DISTRICT
 WASTEWATER TREATMENT PLANT