

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 89-033

NPDES NO. CA 0038652

WASTE DISCHARGE REQUIREMENTS FOR:

VALLEJO SANITATION AND FLOOD CONTROL DISTRICT,  
GLENN YENNI & SONS,  
SLUDGE APPLICATION TO LAND,  
TUBBS ISLAND, SONOMA COUNTY

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

1. Vallejo Sanitation and Flood Control District (hereinafter, the District) and Glenn Yenni & Sons, (hereinafter collectively called the Discharger), by application dated February 24, 1988 have applied for reissuance of waste discharge requirements and a permit to discharge waste under the National Pollutant Discharge Elimination System (NPDES).
2. The discharge is presently governed by waste discharge requirements, Order No. 83-11, which allow disposal of lime-stabilized sewage sludge on the southern portion of Tubbs Island, consisting of the 1,700 acre site south of Highway 37, as soil amendment. The Discharger proposes to expand the disposal area to include an 800 acre area north of Highway 37, as shown on Attachment A which is incorporated herein and made part of this Order. The current and proposed use of the areas is for the growth of animal feed crops.
3. The District operates a 12.5 million gallons per day (MGD) secondary sewage treatment plant at Vallejo, with treated effluent discharged into Carquinez Strait via a deep water outfall. This discharge is governed by a separate set of Waste Discharge Requirements, Board Order No. 88-153 (NPDES Permit No. CA0037699). Sludge generated in the sewage treatment process is stabilized by the addition of lime, and is dewatered to produce a lime sludge cake having a solids concentration of about thirty percent. The sludge quantity produced currently amounts to about 100 wet tons per day.
4. Tubbs Island is a diked historic marshland located approximately 12 miles west of the District's treatment facility. The site is bordered by Sonoma Creek on the east, Tolay Creek on the west, and San Pablo Bay on the south, as shown on Attachment A. The Reyes series of soil are predominant in Tubbs Island and consist of silty clay loam with a small amount of organic matter. The soil is strongly acid and saline. Underlying water table is of brackish quality which have been lowered to a depth of four to five feet by a system of open ditches from which water is pumped to Sonoma Creek and Tolay Creek. The water table rises to within a few inches of the surface during wet weather months. The entire site is generally flat and is zoned for agricultural uses. Currently, of the entire

2,500 acres of Tubbs Island, the District owns the 1,700 acre of land south of Highway 37. The area north of Highway 37 is currently owned by Glenn Yenni & Sons, and has not previously been used for sludge disposal.

5. Dewatered lime sludge cake from the District's treatment plant will be transported by truck to Tubbs Island on a year round basis. During the period November 1 through May 31st, the sludge will be stockpiled in a bermed containment area. During the dry period June 1 through October 31, sludge generated from the treatment plant, as well as sludge previously stockpiled, will be spread on selected portions of the site, and disced into the upper layer of soil. The District has submitted a management plan which describes in detail the method and quantity of sludge application, the crops to be grown, and an assessment of the heavy metal concentrations in sludge, soils, and crops.
6. Section 405 of the Federal Clean Water Act provides that whenever the disposal of sludge from a publicly owned treatment works would result in any pollutant from such sludge entering waters of the United States, such disposal shall be regulated in accordance with a permit under the National Pollutant Discharge Elimination System. Drainage pumped from the existing and proposed sludge disposal areas, as described in Finding 4 above, would contain pollutants from sludge applied by the Discharger, and said drainage would enter Sonoma Creek and Tolay Creek, waters of the United States.
7. On September 13, 1979, U. S. Environmental Protection Agency (EPA), under authority of the Resources Conservation and Recovery Act of 1976 (PL94-58) and Section 405 of the Federal Clean Water Act issued interim final regulations (40 CFR 257) related to sludge disposal practices of publicly owned wastewater treatment plants; "Criteria for Classifications of Solid Waste Disposal Facilities and Practices". The regulations include guidelines for sludge application to land used for the production of food-chain crops with limits on the amount of cadmium and polychlorinated biphenyls (PCB) that can be added to the soil. The limitations contained in this Order are consistent with the federal regulations cited above.
8. In April, 1983 the Sanitary Engineering Branch of California State Department of Health Services published "Manual of Good Practice for Landspreading of Sewage Sludge" (Manual) which provides guidance for the safe and healthful utilization of treated sewage sludge for agricultural and landscaping applications. The Manual contains recommendation on the maximum allowable cumulative application of heavy metals to agricultural lands. The limitations of maximum cumulative heavy metals application contained in this Order are consistent with the Manual cited above.
9. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives for Sonoma Creek, Tolay Creek and San Pablo Bay.
10. The beneficial uses of San Pablo Bay, Sonoma Creek and Tolay Creek

in the vicinity of the discharge as contained in the Basin Plan are:

- a. Navigation.
- b. Water contact recreation.
- c. Non-contact water recreation.
- d. Warm fresh water habitat.
- e. Cold fresh water habitat.
- f. Wild life habitat.
- g. Preservation of rare and endangered species.
- h. Fish migration.
- i. Fish spawning.
- j. Industrial process supply.
- k. Shellfish harvesting.
- l. Estuarine habitat.
- m. Ocean commercial and sport fishing.

11. The Discharger has completed a final Environmental Impact Report (EIR) entitled "Sludge Management Report" dated June, 1981, in accordance with the California Environmental Quality Act (Public Resource Code Section 2100, et seq.). The EIR, in general, addresses the entire Tubbs Island site.
12. The project EIR identifies the following potential adverse impacts:
  - a. Waters that might be affected by the agricultural project include groundwaters underlying irrigated fields, surface waters in the ditches that receive drainage from the fields, and surface water bodies to which waters in the ditches are pumped. Pollutants that could enter these waters through leaching and surface water runoff include Nitrogen (nitrate and ammonia), Phosphorus, and heavy metals such as Cadmium and Zinc.
  - b. Potential negative impacts on the vegetation and wildlife of the agricultural and neighboring salt marsh habitats.
  - c. Potential entry of heavy metals and other trace elements into the food chain with possible toxic effects to aquatic and terrestrial wildlife.
  - d. Possible introduction of pathogens or parasites that could infect fish and wildlife and the long-term introduction of toxic ammonia compounds and excess nitrogen and phosphorous into the wetlands adjacent to the site and to the bay system in general.
  - f. Hazards may arise to farm operators due to direct contact with pathogens contained in the sludge.
13. The Board finds that the potential adverse impacts on beneficial uses stemming from the Discharger's project as described in Finding 12 have been mitigated by measures incorporated into the project design or required by this Order.
14. The Board has notified the Discharger and interested agencies and persons of its intent to reissue waste discharge requirements and has provided them with an opportunity for a public hearing and an

opportunity to submit their written comments and recommendations.

15. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that the Discharger, pursuant to provisions contained in Division 7 of the California Water code, the Federal Clean Water Act as amended, and to regulations adopted thereunder, shall comply with the following:

A. Prohibitions

1. Application of sludge to non-designated areas is prohibited, unless written authorization has been obtained from the Executive Officer.
2. Waste disposed of at the site shall be limited to dewatered lime-stabilized sludge generated by the Discharger, unless prior written authorization is obtained from the Executive Officer. This authorization will be based upon submittal of technical data satisfactory to the Executive Officer, demonstrating compliance with all requirements of this Order.
3. Crops grown on the site shall be limited to animal feed only.
4. Sludge shall not be applied to fields between November 1 and May 31.
5. Sludge shall not be applied within 100 feet of any ditch, drainage channel, or wetland. Exception to the above will be considered when an equivalent level of environmental protection can be achieved by alternate means. In such cases, prior written authorization must be obtained from the Executive Officer.
6. Grazing animals shall not be permitted on the fields which have received sewage sludge within the preceding thirty (30) days.
7. Milking animals shall not be allowed to graze on sludge amended parcels until twelve (12) months have elapsed after the last sludge application.
8. Sludge shall not be applied to the expansion area (north of Highway 37) prior to authorization by the Executive Officer, as provided in Provision C.4. of this Order.

B. SEWAGE SLUDGE APPLICATION RESTRICTIONS

1. Neither the transport, handling, storage, nor application of sludge shall cause a condition of pollution nor nuisance as defined by Section 13050(m) of the California Water Code.
2. In the lime stabilization process, sufficient lime shall be added to the sludge to produce a pH of 12 after two hours of contact.

3. The pH of the sewage sludge and soil mixture shall be 6.5 or greater at the time of incorporation, except for sludge with cadmium concentrations of 2.0 mg/kg or less.
4. The annual cadmium (Cd) application rate shall not exceed 0.5 kg/ha (0.44 lb/acre).
5. Depending on the cation exchange capacity (CEC) of the soil, the maximum cumulative application of heavy metals from the sewage sludge shall not exceed the following:

Metal	Soil Cation Exchange Capacity, meq/100g		
	0-5	5-15	>15
Zinc	250	500	1000
Copper	125	250	500
Nickel	50	100	200
Lead	400	800	800
Cadmium	5	10	20

6. Sewage sludge containing concentrations of Polychlorinated Biphenyls (PCBs) equal to or greater than 10 mg/kg (dry weight) shall be incorporated into soil immediately when applied to land. Sludge containing PCBs in excess of 50 mg/kg are prohibited from disposal on this site.
7. The application rate of sewage sludge to each field shall be based on type of crops grown, nitrogen demand of the crops and heavy metal concentrations of the sludge. This rate shall be calculated, and documentation submitted each year for Executive Officer approval prior to any land application of the sludge.
8. No sludge shall be stored outside the designated storage area as shown in Attachment A.
9. Poned water from the sludge storage area shall not enter or be discharged to the adjacent ditches.
10. Sludge shall be spread thinly and disced into soil to minimize wind erosion of sludge to surface waters.
11. The perimeter drainage ditches and other drainage facilities shall be maintained to convey the maximum anticipated rainfall runoff from the site and to prevent inundation of the site.
12. All wells located within the disposal area shall be sealed and capped, to the satisfaction of the Sonoma County Department of Health Services and the California State Department of Health

Services, to prevent contamination of groundwater from surface drainage.

13. The application of sewage sludge to land shall not cause the following conditions to exist in waters of the United States at any place:
  - a. Floating, suspended, or deposited macroscopic particulate matter or foam;
  - b. Bottom deposits or aquatic growths;
  - c. Alteration of temperature and turbidity beyond present natural background levels;
  - d. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
  
14. The application of sewage sludge shall not cause the following limits to be exceeded in waters of the United States in any place within one foot of the water surface:

a. Dissolved oxygen	5.0 mg/l minimum. Annual median - 80% saturation. When natural factors cause lesser concentration(s) than those specified above to exist, then this application shall not cause further reduction in the concentration of dissolved oxygen.
b. Dissolved sulfide	0.1 mg/l maximum.
c. pH	Variation from natural ambient pH by more than 0.5 pH units.
d. Un-ionized Ammonia as N	0.025 mg/l, annual median. 0.16 mg/l, maximum.
  
15. The application of sewage sludge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

C. Provisions

1. The requirements prescribed by this Order supersede the requirements prescribed by Order No. 83-11, adopted on April 20, 1983. Order No. 83-11 is hereby rescinded.
2. The Discharger shall file with the Board technical reports on works performed according to the attached self-monitoring program as adopted by the Board and as may be amended by the Executive Officer. Such reports shall include a site management plan to include plans for the upcoming dry season, and an assessment of the impacts of past sludge applications. This report shall be submitted by June 30 of any year in which sludge is proposed to be discharged.
3. The Discharger shall comply with all portions of this Order immediately upon adoption.
4. Prior to applying sludge onto the expansion area to the north of Highway 37, the Discharger shall submit a sludge application management plan, satisfactory to the Executive Officer, which shall include but not be limited to the following:
  - a. Results of comprehensive soil testing as specified in the self-monitoring program;
  - b. Proposed site management plan including ways of sludge storage, designation of sludge disposal areas, sludge application method, type of crops to be grown, sequence of fields rotation, etc.;
  - c. Proposed groundwater monitoring plan including the location and design details of the groundwater monitoring wells;
  - d. Background groundwater monitoring data;
  - e. Proposed locations of control Stations for both groundwater monitoring (G-C) and drainage monitoring (D-C); and
  - f. Proposed sludge disposal area and application rate for the first year of operation.
5. The Discharger shall survey the entire disposal site for existing wells and provide for proper sealing of the wells as required by Specification B.12 of this Order. The Discharger shall complete the sealing of wells and submit a report by October 31, 1989, to the satisfaction of the Executive Officer, demonstrating compliance with this provision.
6. The Discharger shall file with the Board a report at least 120 days before making any material change or proposed change in the character, treatment, or volume of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries, or ownership of the property.
7. The Discharger shall comply with all applicable items of the attached "Standard Provisions, Reporting Requirements and Definitions" dated December, 1986.
8. In accordance with Section 13263 of the Water Code, these requirements are subject to periodic review and revision by the Board. The Board shall take into consideration the results of

the self-monitoring program whenever these periodic reviews occur.

9. These requirements do not exempt the Discharger from compliance with any other laws, regulations, or ordinances which may be applicable; they do not legalize this waste disposal facility, and they leave unaffected any further restraint on the disposal of wastes at this site which may be contained in other statutes or required by other agencies.
10. This Order expires March 15, 1994. The Discharger must file a Report of Waste Discharge in accordance with the Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days in advance of the such expiration date.
11. This Order shall serve as a National Pollution Discharge Elimination System permit pursuant to Section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall become effective 10 days after date of its adoption provided the Regional Administrator, Environmental Protection Agency, has no objection.

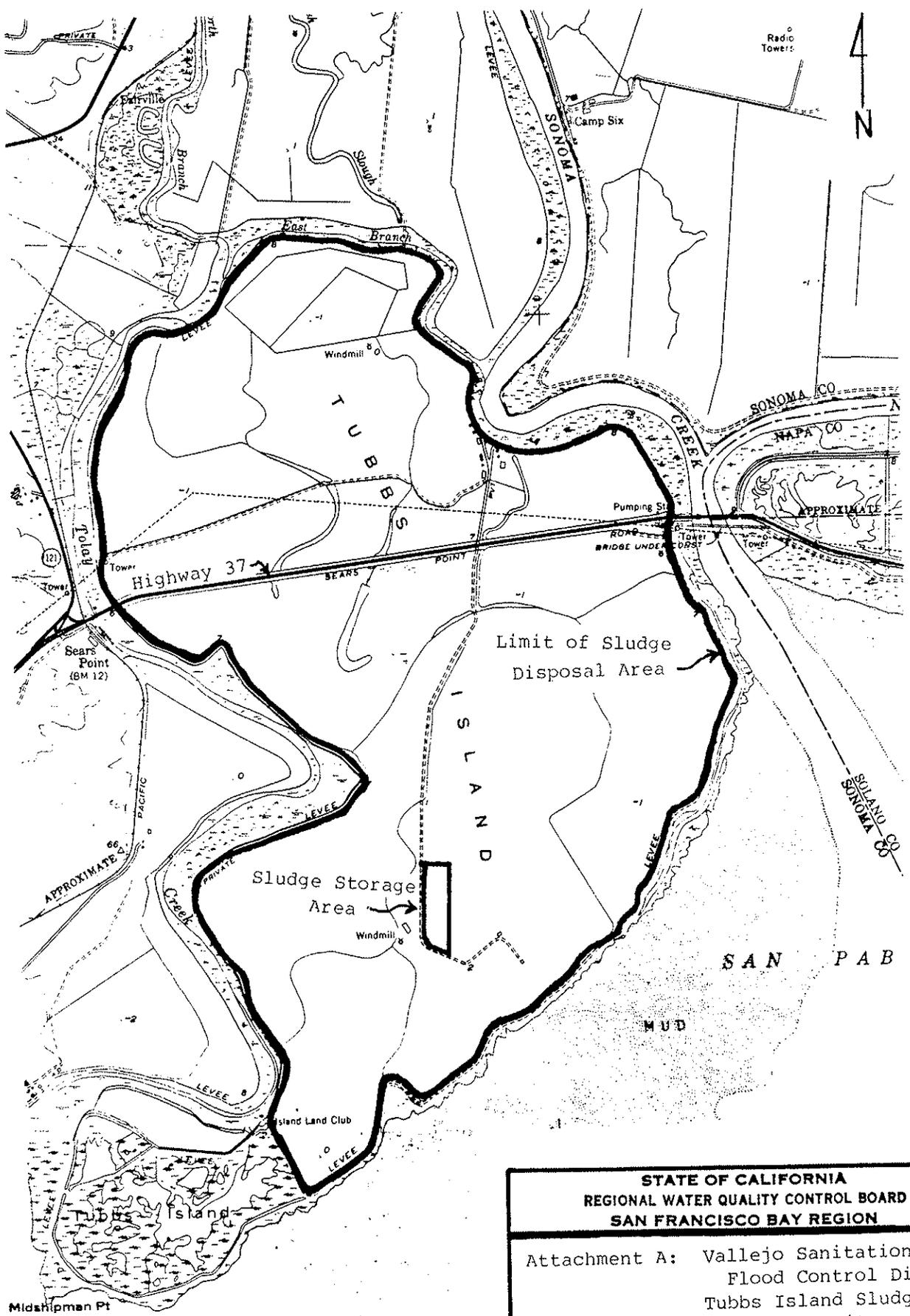
I, Steven R. Ritchie, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 15, 1989.



STEVEN R. RITCHIE  
Executive Officer

Attachments:

- A. Site Map
- B. Standard Provisions, Reporting Requirements and Definitions (dated December, 1986)
- C. Self-Monitoring Program



**STATE OF CALIFORNIA  
REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION**

Attachment A: Vallejo Sanitation & Flood Control Dist.,  
Tubbs Island Sludge Disposal Site,  
Sonoma County

<b>DRAWN BY:</b>	<b>DATE:</b>	<b>DRWG. NO.</b>
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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

FINAL  
SELF-MONITORING PROGRAM  
FOR

VALLEJO SANITATION AND FLOOD CONTROL DISTRICT AND

GLENN YENNI & SONS

SLUDGE APPLICATION AT TUBBS ISLAND, SONOMA COUNTY

NPDES NO. CA0038652

ORDER NO. 89-033

## I. GENERAL

1. All analyses 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, water and plants.
2. The sludge, soil, groundwater, drainage channel, receiving water and plants analyses 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, agronomist, 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. Fields to which sludge is to be applied and the crop to be grown.
2. Sludge loading rate to be used, expressed in dry tons per field and as kg/ha.
3. Method proposed for incorporating sludge into soil.
4. Fields for which soil sampling is planned in the coming dry weather season.

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, water and crops. Where appropriate, data presentation and discussion shall be specific to individual fields. Where problems are found to exist, proposed solutions shall be included.

#### 1. Sludge

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

## 2. Soils

For each field, the following table shall be completed based on the most recent data obtained:

Field: ( \_\_\_\_\_ )  
 Sampling Date: ( \_\_\_\_\_ )  
 Weather Condition: ( \_\_\_\_\_ )

Parameter	Prior Cumulative Loading, kg/ha	Soil Concentration, mg/kg		
		0"-6"	6"-12"	12"-36"
Sludge added as dry solids				
Nitrogen				
Ammonium				
Organic				
Nitrate				
TKN				
Phosphorus				
Potassium				
Zinc				
Copper				
Nickel				
Cadmium				
Lead				
Chromium				
PCB's				
Boron				
pH				

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 (copper data may be useful in this assessment), and whether the project has had any effects on soil texture or workability.

Any change in soil pH shall be described, together with probable reasons. Special attention shall be paid to any tendency for soil pH to return to acid conditions in years following sludge application.

## 3. Water

Present data on water pumped to the creeks in terms of both mg/l and lbs per day. All relevant parameters shall be compared with limits contained in the District's NPDES permit (CA0037699), and

values in excess shall be discussed. Receiving water data shall also be presented and evaluated.

#### 4. Crops

The nature and yield of the previous year's crops shall be presented and evaluated. This discussion shall be specific to each field. Yields shall be compared with those achieved in previous years, and any significant differences found shall be evaluated. Pollutant concentrations shall be reported and evaluated for all crops sampled.

#### 5. Accounting for Heavy Metals

An accounting shall be made in the sludge applied for each field for the fate of heavy metals. This mass balance shall be made for each field, and be based on the cumulative total sludge applied. This mass balance shall include the following possible sinks:

- a. Retained in the soil
- b. Lost from the site with the crop
- c. Lost from the site as drainage water pumped over the dikes
- d. Present in soluble form in underlying groundwater

### III. SAMPLING AND ANALYSIS

#### A. Sludge

1. During the period in which sludge is applied to the land directly from the treatment plant, sampling and analyses shall be performed at three month intervals (twice per season) over five consecutive days as follows:
  - a. Samples shall be taken from each truckload leaving the plant.
  - b. Daily composites shall be analyzed for the pH, Percent Solids, Ammonia N, Nitrate, Organic Nitrogen and TKN.
  - c. Equal volumes of the daily composites shall be combined into a five day composite. This shall be analyzed for the following: pH, Percent Solids, Phosphate, Potassium, Zinc, Copper, Nickel, Cadmium, Lead, Chromium, PCB's and Boron.
2. The sludge storage pile shall be sampled annually immediately prior to spreading each year. The pile shall be sampled at twenty representative points. These samples shall be combined into a composite and analyzed for all the parameters specified in 1.b. and 1.c. above.

3. For the analyses given above:
  - a. Except for pH, percent solids, and boron results shall be expressed as mg/kg.
  - b. Boron shall be analyzed as a saturation extract, and results present expressed as mg/l.
  - c. An analytical sensitivity for heavy metals of 0.1 mg/l shall be adequate.

B. Soils

1. Annual Testing

- a. Two diagonal transects shall be established for each field. Each year, after harvest and prior to sludge application, a minimum of five samples shall be taken along each transect, and shall be representative of the 0 to 12" depth range. Soil samples from a given field shall be composited and analyzed for the parameters specified below.
- b. Analyses

<u>Parameter</u>	<u>Unit</u>
pH	pH unit
Acidity or Basicity	mg/kg as CaCO <sub>3</sub> *
Copper	mg/kg

\*the amount of acid or base, expressed as CaCO<sub>3</sub>, necessary to adjust pH to 6.5.

2. Comprehensive Testing

- a. Comprehensive testing shall be done prior to the next sludge application for any given field 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 to any given field.
- b. For any given field 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 from three depths: zero to six inches; six to twelve inches; and twelve inches to three feet. Soil samples from each depth (twenty samples per depth per field) shall be composited and analyzed for the

parameters specified below.

c. Analyses

<u>Parameter</u>	<u>Unit</u>
pH	pH unit
Acidity or Basicity	mg/kg as CaCO <sub>3</sub>
CEC <sup>(1)</sup>	meq/100gm
Electric Conductivity	Millimhos/cm at 25°C
Texture <sup>(1)</sup>	
Ammonium Nitrogen	mg/kg
Organic Nitrogen	mg/kg
Nitrate Nitrogen	mg/kg
TKN	mg/kg
Total Phosphorus	mg/kg
Total Potassium	mg/kg
Cadmium	mg/kg
Chromium	mg/kg
Copper	mg/kg
Nickel	mg/kg
Lead	mg/kg
Zinc	mg/kg
PCB <sup>(2)</sup>	mg/kg
Boron <sup>(3)</sup>	mg/l

- (1) To be analyzed only once per field to obtain background information in order to determine the variability in the field.
- (2) PCB shall be analyzed only when the sludge concentration exceeds 5 mg/kg.
- (3) To be analyzed in saturation extract as extractable or soluble Boron.

d. Soil samples and analyses for the control field where no sludge has been applied shall be performed as described in 2.b. and 2.c. above.

C. Groundwater

1. Sampling Stations

For the southern portion (south of Highway 37) of Tubbs Island, the existing groundwater monitoring wells include:

<u>Stations</u>	<u>Location</u>
G-1	Located in Field "S-IV", north of the sludge storage area.
G-2	Located in the northeast portion of Field "N-I".
G-3	Located in Field "S-III".

- G-4 Located in the northwest portion of Field "N-I".
- G-5 Located in the southern portion of Field "S-IV".
- G-C (control well) Currently located in the control field north of Highway 37. Prior to the commencement of sludge application in the northern portion of Tubbs Island, this control station may need to be relocated to avoid possible contamination caused by sludge application in the expansion area. In that case, the final location of the control station is yet to be determined.

For the northern portion (north of Highway 37) of Tubbs Island:

- G-6 through G-'n' (The number, location, and design details of the groundwater monitoring wells will be determined upon submittal of a satisfactory sludge application management plan.)

The sampling wells shall be located at least 50 feet from the nearest ditch or drainage channel. 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 contamination by 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

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

## 3. Frequency: All stations shall be sampled two times a year,

in March and October.

D. Drainage Channels

1. Sampling Stations

<u>Stations</u>	<u>Location</u>
D-1	Drainage discharge from pump #1 to Sonoma Creek.
D-2	Drainage discharge from pump #2 to Tolay Creek.
D-C <sup>(1)</sup> (control)	This control station shall be located at a point in the drainage ditch where the drainage is collected from areas excluded from sludge application. (Existing control station is located in a control field north of Highway 37. Depending on the proposed sludge application practices in the expansion area (north of Highway 37), this station may need to be relocated.)

2. Analyses<sup>(2)</sup>

<u>Parameter</u>	<u>Unit</u>
pH	pH unit
Conductivity	mhos/cm at 25°C
Ammonia Nitrogen	mg/l
Organic Nitrogen	mg/l
Nitrate Nitrogen	mg/l
TKN	mg/l
Total Phosphorus	mg/l
Cadmium	mg/l
Total Chromium	mg/l
Copper	mg/l
Nickel	mg/l
Lead	mg/l
Zinc	mg/l
Fish Bioassay <sup>(3)</sup>	mg/l

Note: (1) Control Station - Composite sample shall consist of four (4) grab samples of equal quantity during 24-hour period.

(2) All analyses shall consist of 24-hour composite.

(3) "Bioassay" to be analyzed once a month.

3. Frequency

Sampling at Stations D-1 and D-2 shall consist of a 24 hour composite which shall commence as soon as pumps are activated. If the pumps are operated for a continuous period of time then an additional composite sample shall be taken on the fifth day and again prior to shut off (if pumping continues for more than 8 days). A maximum of three samples within 30 days period shall be sampled (24-hour composite) and analyzed.

E. Bay Receiving Water

1. Sampling Stations

<u>Station</u>	<u>Location</u>
R-1 (upstream)	At about 100 feet upstream from the point of discharge from D-1 pump station, in the middle of the Sonoma Creek.
R-2 (discharge)	At a point in the Sonoma Creek immediately downstream of the point of discharge from D-1 pump station.
R-3 (downstream)	At about 500 feet downstream from the point of discharge from pump D-1, in the middle of the Sonoma Creek.

2. Analyses

<u>Parameter</u>	<u>Unit</u>
pH	pH unit
Conductivity	mhos/cm at 25°C
Ammonia Nitrogen	mg/l
Organic Nitrogen	mg/l
Nitrate Nitrogen	mg/l
TKN	mg/l
Un-ionized Ammonia	mg/l
Total Phosphorus	mg/l
Cadmium	mg/l
Total Chromium	mg/l
Copper	mg/l
Nickel	mg/l
Lead	mg/l
Zinc	mg/l
Temperature	°C

3. Frequency

Once a month during pumping period at slack water.

F. Crops

1. For each field to which sludge has been applied, representative samples shall be taken annually from whatever portion of the plant is removed from the property (example - leaf grain, seed or bale). If more than one crop is grown then a representative of each type shall be analyzed. Results shall be reported specifically for each field, and the method and number of samples should be described.

2. Analyses

	<u>Parameter</u>	<u>Unit</u>
Leaf, Hay Bale or Seed	Chromium	mg/g
	Cadmium	mg/g
	Nickel	mg/g
	Copper	mg/g
	Zinc	mg/g
	Lead	mg/g
	Yield	Tons/acre

3. Frequency

Samples shall be taken annually at the time of harvesting.

I, Steven R. Ritchie, 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's Order No. 89-033.
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.

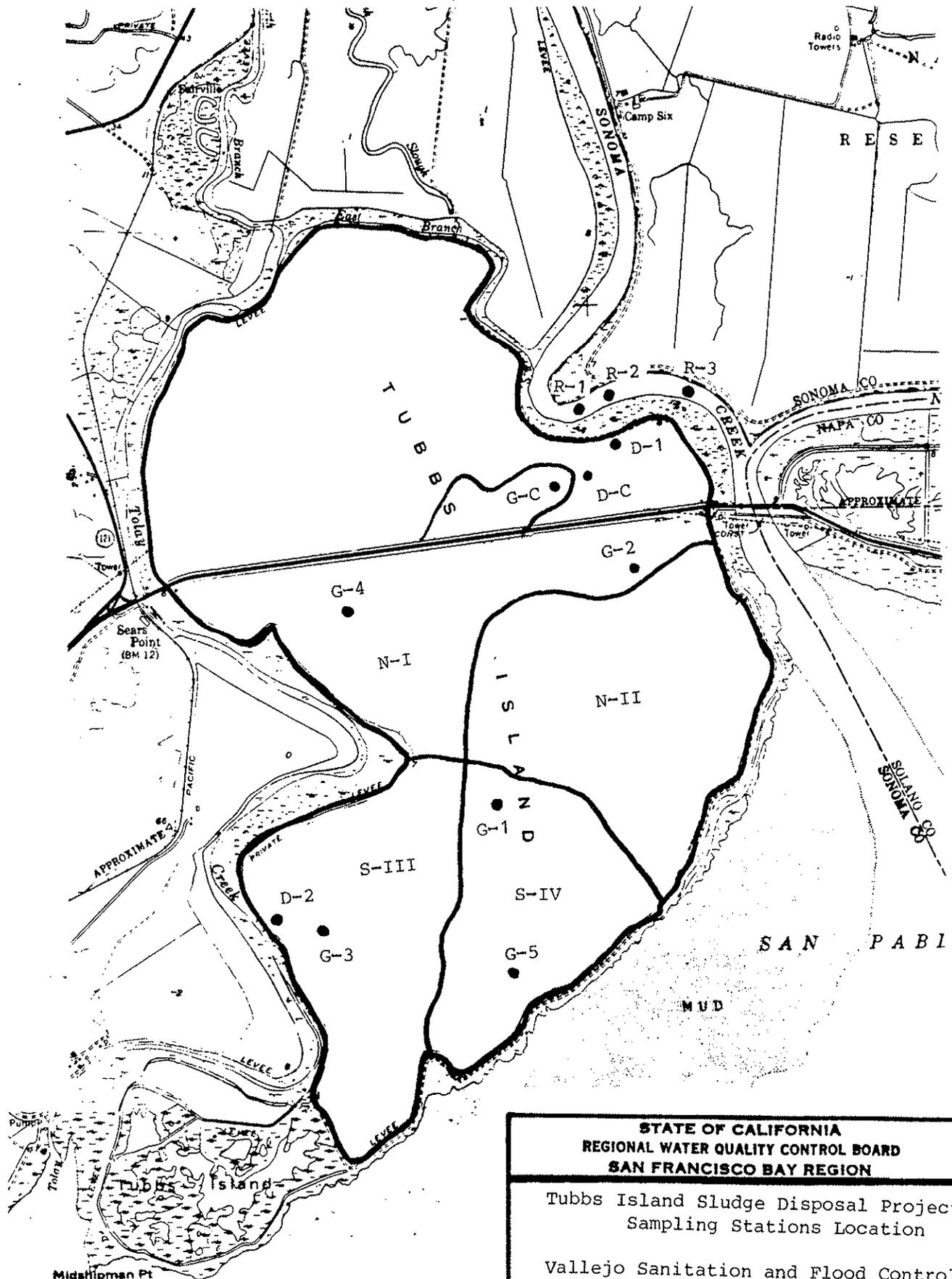


STEVEN R. RITCHIE  
Executive Officer

Effective Date: 3/15/89

Attachment:

Map of the Tubbs Island with  
sampling locations



**STATE OF CALIFORNIA**  
**REGIONAL WATER QUALITY CONTROL BOARD**  
**SAN FRANCISCO BAY REGION**

Tubbs Island Sludge Disposal Project  
 Sampling Stations Location

Vallejo Sanitation and Flood Control  
 District

**DRAWN BY:**      **DATE:**      **DRWG. NO.**