California Regional Water Quality Control Board
San Francisco Bay Region

ORDER NO. 91-096

WASTE DISCHARGE REQUIREMENTS FOR:

SECURITY OWNERS CORPORATION
STONEHURST SUBDIVISION
MARTINEZ, CONTRA COSTA COUNTY

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

1. Security Owners Corporation (hereinafter called the Discharger) proposes to construct a 47 home, 235 acre subdivision called Stonehurst in the Alhambra Valley, located about two miles south of Martinez in Contra Costa County. The site is shown on Attachment A, which is hereby made a part of this order. Security Owners Corporation has applied, by application dated March 26, 1991, for Waste Discharge Requirements for treatment, disposal, and subsurface reclamation of wastewater generated by the community.

2. The Stonehurst development occupies a small valley consisting of both gently and steeply sloping hills drained by an unnamed, intermittent stream which is tributary to Arroyo del Hambre. Arroyo del Hambre runs along Alhambra Valley Road in the vicinity of the site, and is tributary to the Carquinez Straight at the Martinez Regional Shoreline.

3. Sanitary sewers are not currently available in the Alhambra Valley area. The nearest sewer line belongs to the Central Contra Costa Sanitary District, and is located nearly two miles away from the proposed development.

4. Septic systems and leachfields for each individual home were approved by the Contra Costa County Health Department in May, 1989. In July, 1990, Security Owners Corporation proposed that wastewater from the residential community be treated by individual septic tanks, and a centrally located recirculating sand filter and ultra-violet disinfection system. The wastewater is proposed to be discharged during the winter months to a leachfield, and during the summer, reclaimed for subsurface irrigation of community landscaping.

5. The community system as proposed is unique and unusual for the San Francisco Bay Region, and experimental in nature. The system is permitted by this Order only due to the fact that (1) individual septic systems were already approved for the site, and the proposed system is expected to provide better treatment than individual treatment systems therefore resulting in fewer water quality impacts; (2) frequent monitoring of treatment system performance and disposal areas will be required for compliance evaluation; (3) in the event that sanitary sewers are constructed in the vicinity of the site, wastewater flows from the subdivision will be directed to the local sanitary district; and, (4) the Discharger has proposed to establish a long term contract with a public entity as set forth in Findings 8 and 9 herein.

6. The Board's Resolution No. 78-14, Policy of Discrete Sewerage Facilities, states, in part that the "Regional Board will apply the following principles to all wastewater discharges:

   1. The system must be designed, constructed, and installed so as to be capable of preventing pollution or contamination of waters of the State, or creating nuisance for the life of the development.

   2. The system must be operated, maintained, and monitored so as to continually prevent pollution or contamination of the waters of the State and the creation of nuisance.

   3. The responsibility for both of the above must be clearly and legally assumed by a public entity with the financial and legal capability to assure that the system provides protection to the quality of the waters of the State for the life of the development. "

7. The policy described above is reiterated as part of the "Policy on Discrete Sewerage Facilities" included with the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). The Basin Plan further states that a public entity assume legal authority and responsibility for new community wastewater treatment and disposal systems.

8. The Discharger proposes to establish a long term legal contract with a public entity for management, operation, maintenance, and repair of the wastewater collection, treatment, disposal, and irrigation system at the Stonehurst development. The contracted public entity will assume legal authority and responsibility for the system, and any water quality related impacts, with the exception of septic tanks and wastewater collection pipes located on each homeowner's property, which will be owned and maintained by the individual homeowner. The contract will include a structure for ensuring that sufficient funds are available for maintenance of the system in compliance with this Order.

9. This contract between the Discharger and a public entity must be submitted to, reviewed, and approved by the Executive Officer prior to any discharge of wastewater, as provided in E.1 and E.2 herein. When a satisfactory contract has been established, this order will be amended to include the contracted public entity as a Discharger.

10. Generally, it is preferred that a public entity responsible for a community system actually assume ownership of the on-site operations. Ownership clearly defines the party responsible for protection of water quality, and leaves little or no question as to the degree of commitment and culpability. To assume anything less than ownership raises concerns about the public entity's commitment to carry responsibility over the duration of what is considered to be a long term project. In addition, the funding mechanism which enables the public entity's involvement becomes more complicated, and possibly more susceptible to problems which could affect the operation of the system. The contractual arrangement proposed by the Discharger for the Stonehurst development specifically excludes ownership by a public entity, and as such is not the Board's preferred approach to a community system. Issuance of this Order should not be interpreted as setting a precedent to allow such arrangements for other projects.

11. Each home in Stonehurst is to be served by a conventional septic tank, which will provide sedimentation and skimming of the influent. The effluent from each tank will be conveyed to the central treatment plant in a small diameter (two or three inch) sewer system, either by gravity or under pressure supplied by pumps. The total flow from the homes is projected to be 14,100 gallons per day.

12. The central treatment plant consists of a recirculating sand filter, which will provide biological treatment, followed by bacterial removal using ultraviolet light. The sand filter consists of two feet of fine gravel with a coarse gravel underdrain contained within a synthetic liner. Effluent from a recirculation tank is intermittently distributed evenly over the media, which contains a thin film of bacteria. The effluent then travels back to the tank, and is recirculated through the media three to five times before discharge to the ultra-violet disinfection system. The effluent from the sand filter is expected to have a concentration of 15 mg/l for both biochemical oxygen demand and total suspended solids.

13. The ultra-violet disinfection system will consist of a stainless steel housing unit that contains light bulbs. The factors which determine the degree of bacterial kill are the clarity of the liquid, the flow rate of wastewater, and the intensity of light. The clarity of the wastewater will depend upon the degree of treatment provided by the sand filter, and the flow rate will be controlled to approximately 15 gallons per minute by an equalization chamber located just upstream of the disinfection unit. The unit will automatically shut off when the light intensity drops below a specific set point. When operating under optimal conditions, the ultraviolet disinfection unit is expected to achieve a total coliform count of less than 23 MPN/100 ml.

14. Effluent disposal is to be by one of two means. During dry weather months, effluent is to be routed to a subsurface distribution system for the irrigation of community landscaping, mostly consisting of trees and shrubs located at the entrance to Stonehurst, on the north side of Arroyo del Hambre. During wet months when the landscaping does not require watering, the effluent will be discharged to a leach field located at the top of the ridge on the western edge of the property.

15. Characterization of shallow subsurface soils and geology in the vicinity of the leachfields has been based on logging of 42 test pits dug to depths ranging from two to eight feet in the spring of 1989. Descriptions for the test pits are included with a report titled "Stonehurst Waste Disposal System" prepared by Steve Wert Soil Consulting, dated December 1989, which is hereby incorporated as a part of this Order. The soil conditions vary from one test pit to another; however, they can generally be described as follows: shallow soils (silty clay and silty clay loam) underlain by a soft sandstone which is highly weathered and fractured. Groundwater was not encountered in any of the test pits (dry weather conditions). Five of the test pits were utilized as absorption trenches for hydraulic testing.

16. The slopes of the leachfields to be utilized initially for disposal range from about 10 to 20 percent. The slopes of the proposed reserve leachfield areas (to be utilized in the event that the initial leachfields fail) are in the range of 20 to 25 percent. The maximum slope for

leachfields as specified in the Regional Board's "Minimum Guidelines for the Control of Individual Waste Treatment and Disposal Systems" is 20 percent.

17. Groundwater presence beneath the site has not been characterized in detail; however, studies within the limits of residential development indicate groundwater occurs at a fairly uniform depth below the moderately sloping ground surface throughout most of the basin. Information derived from geotechnical borings made within the residential area of the site indicate that shallow groundwater is present at depths ranging from 13 to 35 feet. The depth to groundwater probably fluctuates from year to year, and with the seasons. No detailed studies have been conducted to characterize groundwater in the ridgetop areas of the site where groundwater is expected to be at slightly greater depths than in the lower valley area of the site.

18. There are approximately twelve groundwater wells of various depths and construction located within one mile of the leachfield. A number of these wells are utilized for domestic water supply, as the homes which they serve are beyond the municipal water supply system.

19. A Report of Waste Discharge dated July 25, 1990 (hereby incorporated as part of this Order), was submitted by Nolte and Associates for the proposed wastewater treatment and disposal system, and the subsurface irrigation project.

20. The Water Quality Control Plan for the San Francisco Bay Basin identifies existing and potential beneficial uses of, and water quality objectives for, the surface and ground waters in the San Francisco Bay Basin. The existing or potential beneficial uses of Arroyo del Hambre and its tributaries are:

    a. Fresh water replenishment and groundwater recharge,
    b. Municipal, agricultural, and industrial water supply,
    c. Contact and non-contact recreation,
    d. Warm water habitat and wildlife habitat.

21. The existing or potential beneficial uses of groundwater in the Alhambra Valley include:

    a. Municipal and Domestic Supply
    b. Agricultural Supply
    c. Industrial Supply.

22. The County of Contra Costa approved a negative declaration for the Stonehurst Development and its wastewater treatment and disposal system (individual septic systems and leachfields for each home), in accordance with the California Environmental Quality Act (Public Resources Code 21000 et seq.).

23. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge described above, and has provided them with an opportunity for a public hearing and an opportunity to submit written views and recommendations.

24. The Board, in a public hearing, 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 and regulations adopted thereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. There shall be no bypass or overflow of untreated or partially treated wastewater from the wastewater collection, treatment, or disposal facilities to waters of the State.

2. Effluent shall be maintained below the surface of the ground at all times, whether disposed of to leaching trenches, or applied to project landscaping via subsurface irrigation. Effluent shall not be allowed to leach, seep or flow into surface waters of the State.

3. The collection, treatment, or discharge of waste shall not create pollution, contamination or a nuisance as defined by Section 13050 of the California Water Code.

4. The discharge of waste in excess of 14,100 gallons per day as a monthly average is prohibited.

5. Effluent shall only be used for subsurface irrigation in areas approved by the Executive Officer.

6. The discharge of effluent to the disposal leachfields or the subsurface irrigation area shall not adversely impact the existing or potential beneficial uses of the surface or ground water in the vicinity of the site. The pollution or contamination of surface or ground water is prohibited.

7. The wastewater system shall not cause the following conditions to exist in surface waters in the vicinity of the development:

    1. Floating, suspended, or deposited macroscopic particulate matter or foam.

    2. Bottom deposits or aquatic growth.

    3. Alteration of temperature, turbidity, or apparent color beyond natural background levels.

    4. Toxic or other deleterious substances to be present in concentrations or quantities which may 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 concentrations.

B. EFFLUENT SPECIFICATIONS

1. Effluent discharged to either the leaching or subsurface irrigation systems shall meet the following limits of quality:

	Constituent	Units	30-day Average	Daily Maximum
a.	Biochemical Oxygen Demand (5-day, 20° C)	mg/l	15	30
b.	Total Suspended Solids	mg/l	15	25
c.	Settleable Matter	ml/l-hr	0.1	0.2

2. The moving median value for the Most Probable Number (MPN) of total coliform bacteria in any seven consecutive effluent samples shall not exceed 23 MPN per 100 milliliters (23 MPN/100 ml). Any single sample shall not exceed 240 MPN/100 ml.

3. The pH of the discharge shall not exceed 9.0 nor be less than 6.0.

C. TREATMENT FACILITY, LEACHFIELD, AND SUBSURFACE IRRIGATION SPECIFICATIONS

1. All wastewater treatment and disposal facilities, and subsurface irrigation systems shall be adequately protected from erosion, washout, and flooding from a rainfall event having a predicted frequency of once in 100 years.

2. The leachfields shall not be located within 100 feet of any groundwater well, stream, or water body, or within four times the vertical height of any cut fill or embankment, or within 50 feet of any drainageway.

3. Treated wastewater shall not be applied to the subsurface irrigation areas, (1) during periods of rainfall, (2) when soils are saturated, and, (3) when rainfall is expected to occur within 24 hours.

4. Application of treated wastewater shall not cause saturated conditions within 100 feet of any water body or wetland.

5. The leachfield and subsurface irrigation areas shall be managed to prevent ponding from occurring at any time, other than as a result of rainfall or stormwater runoff.

6. The slope of the leachfields shall not exceed 20%. A variance from this slope requirement may be considered upon demonstration, to the satisfaction of the Executive Officer, that use of the soil absorption system will not cause surfacing of effluent in the absorption field, create water quality problems, jeopardize contiguous properties, and affect soil stability. This demonstration must be made by a State registered civil engineer with soils and geological background, or a geologist.

7. The Discharger shall design and implement a surface and ground water quality monitoring program for the leachfields and the irrigation area. The program shall be designed to detect the presence of waste constituents in surface water and groundwater outside of the disposal areas. This program shall consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples that represent background water quality, and the quality of groundwater downgradient of the effluent application areas.

8. The groundwater monitoring program shall include consistent and appropriate sampling and analytical procedures that accurately measure indicator parameters and waste constituents to provide a reliable indication of groundwater quality. Initial sampling of monitoring wells installed for the program shall take place at least 90 days prior to discharge of effluent to the leachfields or irrigation system. Background water quality shall be evaluated based on a series of samples taken at appropriate intervals prior to discharge of waste. The program shall provide for annual evaluation of water quality data to determine whether the waste discharge has impacted, or is threatening to impact, the beneficial uses of surface and/or ground water. This evaluation must include a meaningful way of comparing background to downgradient water quality.

9. The Discharger shall, on a regular basis, evaluate the impacts of effluent discharge (to the leachfields and subsurface irrigation system) on surface and ground water quality. If existing or potential beneficial uses are impacted as a result of the discharge of effluent to the leachfields, or the irrigation area, then the Discharger shall establish and implement a corrective action program. Corrective action alternatives evaluated shall include ceasing discharge of treated wastewater to the leachfields and irrigation area.

D. <u>CROSS CONNECTION SPECIFICATIONS</u>

There shall be no interconnection between the raw influent, treated effluent, and potable water systems. To accomplish this the Discharger shall comply with the following:

1. All piping, valves, and outlets used for non-potable water shall be clearly identified as being either raw sewage or reclaimed water.

2. All valves or other kinds of water controllers used for non-potable water should be affixed with warning signs identifying the flow as either raw sewage or reclaimed water. Such fixtures shall also be of a type or secured in such a manner that only permits operation by personnel authorized by the discharger.

3. Installation or use of hose bibs on the subsurface irrigation system used with reclaimed water is prohibited.

4. There shall be at least a ten foot horizontal and a one foot vertical separation between all pressurized pipelines transporting raw sewage or reclaimed water, and those transporting domestic water, with the domestic water line to be above those for raw sewage or reclaimed water.

5. Supplementing reclaimed water with water used for domestic supply shall not be allowed except through an air gap or reduced pressure principle device.

6. The Discharger shall maintain as-built plans of the use area showing all buildings, street, domestic water pipelines, and pipelines for the collection of sewage and its conveyance to subsurface reclamation or disposal areas. Plans shall be updated as development proceeds and as modifications are made.

E. SYSTEM START-UP SPECIFICATIONS

1. No discharge or reclamation of wastewater shall take place until the Discharger's contract with a public entity (establishing legal authority and responsibility as described in Findings 8 and 9, and Specification E.2.a) has been approved by the Executive Officer.

2. The Discharger shall submit the following reports at least 60 days prior to the anticipated date of start-up of the system:

   a. A proposed contract with a public entity which describes in detail a long term agreement to manage, operate, maintain, repair, and monitor the wastewater collection, treatment, disposal and re-use systems at the Stonehurst development. This contract shall specify the responsibilities of the public entity, and establish a structure for guaranteeing sufficient funding for operating and maintaining the wastewater system in a manner such that compliance with this Order is maintained. Estimated operation, maintenance, and monitoring costs for the entire project, including the funding mechanism, shall be included as part of this submittal. The funding mechanism shall also provide for emergency response procedures and implementation of contingency plans in the event of system failure.

   b. An operations, maintenance, and management plan for the wastewater collection, treatment, disposal, and irrigation systems. This report shall provide a detailed description of activities necessary for maintaining the wastewater system in compliance with this Order, including responsibilities for monitoring of the treatment and disposal system, and surface and ground water quality. This report shall include procedures to be implemented in the event of failure or breakdown of the collection or distribution system, the treatment system, the leachfields, and/or the irrigation system, and a monitoring plan for detection of leakage from the pressure sewer system.

   c. A report describing in detail the irrigation program. This report shall include, at a minimum, a description of the soils in the area, plants and trees to be irrigated, estimated evaporation and transpiration, and a water balance. A detailed map showing the irrigation project and surrounding area, including Arroyo del Hambre and the unnamed tributary, shall be included. This report shall describe in detail management practices which will be used to effectively utilize wastewater flow without problems such as surfacing

of wastewater, and over watering. Discharge of effluent to the subsurface irrigation system shall not proceed until the Executive Officer has approved the irrigation area and management plan.

d. A proposed plan for pilot testing of the sand filter and the ultra-violet disinfection system. This report shall include a monitoring plan for the pilot testing, with an appropriate sampling frequency intended to demonstrate that the treatment plant can achieve the effluent limitations specified in this permit. The pilot testing shall proceed for a minimum of one month, and results shall be submitted within two weeks of completion.

e. A plan for implementation of a program providing for education of home owners and occupants on elimination, or minimization of, the discharge of household hazardous wastes to the wastewater collection system.

3. The Discharger shall submit, for Executive Officer approval, at least 120 days prior to system start-up, a proposed surface and ground water quality monitoring program, and implementation time schedule, for the effluent leachfields and the irrigation area. This monitoring program shall be designed to establish background concentrations of relevant waste constituents, and shall provide for compliance with Specifications C.7 and C.8 of this Order. Upon approval of the proposed program, a Self-Monitoring Program which includes specifications for surface and groundwater monitoring, shall be issued by the Executive Officer.

F. PROVISIONS

1. If at any time sanitary sewer services become available in the Alhambra Valley, the sewage flow from Stonehurst shall be directed to the sanitary sewer line. Redirection of the sewage flows from the on-site treatment system to the sewer shall take place at the earliest possible time after construction of the sewer has been completed. A report shall be filed with the Regional Board which details the closure of the on-site wastewater treatment and disposal system.

2. If the waste discharge has impacted existing or potential beneficial uses of surface and/or ground water, the Discharger shall establish a corrective action program to remediate the problem. A proposed corrective action program shall be submitted to the Board, along with an implementation time schedule.

3. The sand filter influent wet well shall be equipped with a high water level alarm in order to prevent the occurrence of a sewage spill resulting from mechanical breakdown or power failure. The power supply for the alarm shall be independent of the normal power supply for the wastewater system.

4. All equipment, including pumps, piping, valves, etc, which may at any time contain wastewater shall either be isolated from public access by adequately secured fencing, or adequately and clearly identified with warning signs informing the public that the water contained therein is wastewater and is not safe for drinking or contact.

5. Inspection, supervision and employee training should be provided for persons operating and maintaining the irrigation system to assure proper use of the reclaimed water. Records of inspection and training should be maintained by the Discharger.

6. The Discharger shall comply with all sections of this Order immediately upon adoption.

7. The Discharger shall comply with the Self-Monitoring Program for this Order as issued, and amended by the Executive Officer.

8. The Discharger shall maintain in good working order and shall operate, as efficiently as possible, all equipment installed, or as modified to achieve compliance with this Order.

9. The wastewater treatment facilities shall be supervised and operated by persons possessing certificates of appropriate grade pursuant to Chapter 4, Subchapter 14, Title 23, of the California Code of Regulations.

10. The Discharger shall permit the Board or its authorized representatives, in accordance with Section 13267(c) of the California Water Code:

    a. Entry upon the premises where wastewater treatments, disposal or reclamation is located, or where records are kept pursuant to the conditions of this Order,

    b. Access to and copy of, at reasonable times, any records that must be kept under the conditions of this Order,

    c. Inspection of, at reasonable times, of any facility, equipment (including monitoring and control equipment), practices, or operations regulated or as required under this Order, or

    d. To photograph, sample, or monitor, at reasonable times, for the purpose of assuring compliance with this Order.

11. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify, by letter, the succeeding owner or operator of the existence of this Order. A copy of this letter shall be forwarded to this Board.

12. The Discharger shall file with the Board a Report of Waste Discharge at least 180 days before making any material change in the character, location, or volume of discharge or reuse, except for emergency conditions in which case this Board shall be notified.

13. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

    a. Violation of any term or condition of this Order;

    b. Obtaining this Order by misrepresentation or failure to disclose all relevant facts;

c. A change in any condition that requires either a temporary or permanent change in the authorized treatment, discharge, or reuse;

d. Endangerment to the public health or environment that can only be regulated to acceptable levels by Order modification or termination.

14. This Order is subject to Board review and updating as necessary to comply with changing State and Federal laws, regulations, policies, or guidelines; changes in this Regional Board's Basin Plan; or changes in the discharge characteristics. This Order will be reviewed periodically to determine the need for updating.

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 June 19, 1991.

Steven R. Ritchie
Executive Officer

Attachments:

Standard Provisions and Reporting Requirements, December 1986
Location Map

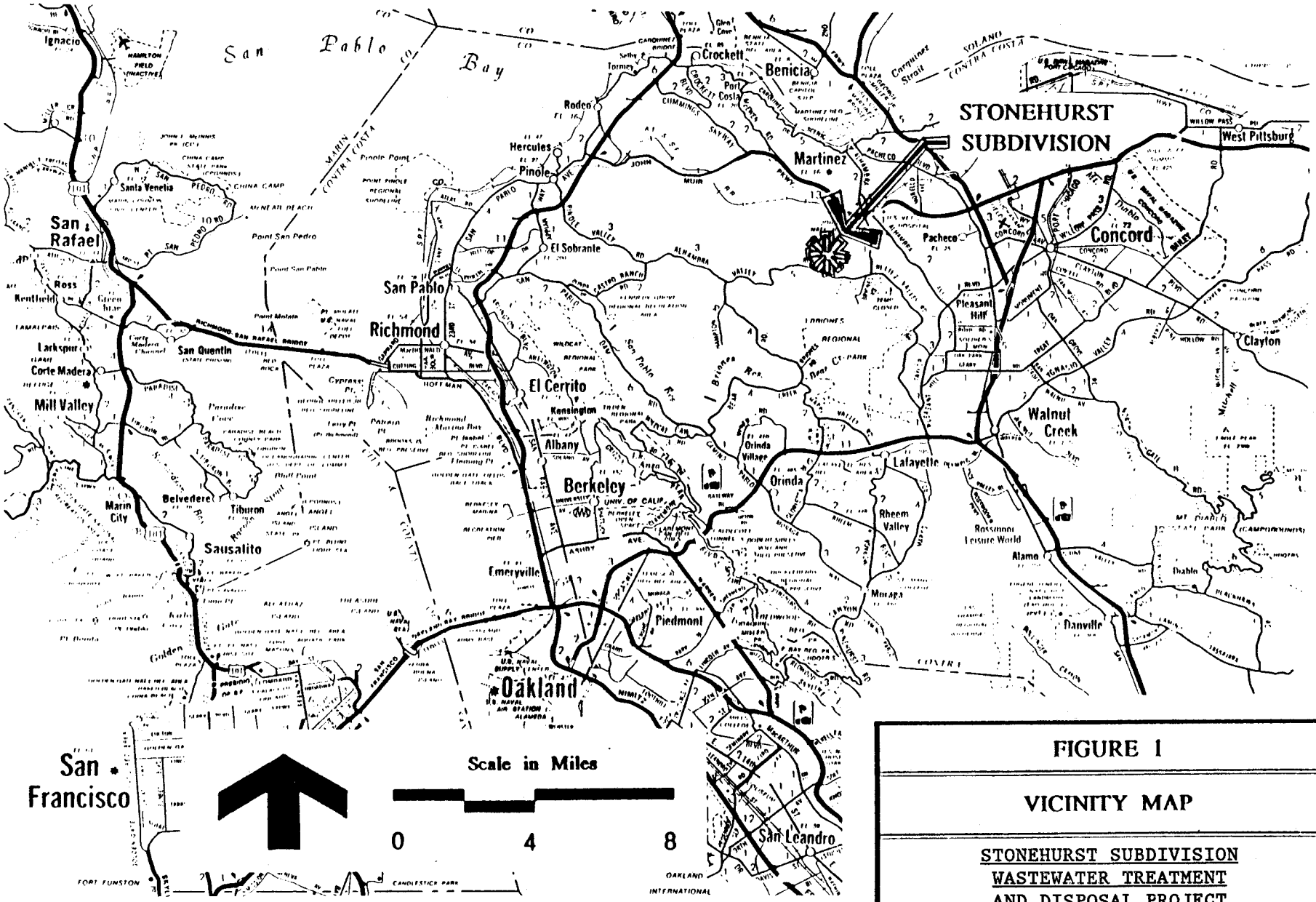

FIGURE 1

VICINITY MAP

STONEHURST SUBDIVISION
WASTEWATER TREATMENT
AND DISPOSAL PROJECT

map from Nolte & Associates Report of Waste Discharge, August 1990