

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

ORDER NO. 96-113

WASTE DISCHARGE REQUIREMENTS  
AND RECISSION OF ORDER NO. 92-029 FOR:

U.S. ARMY CORPS OF ENGINEERS  
SACRAMENTO DISTRICT  
HAMILTON AIR FORCE BASE, LANDFILL 26  
NOVATO, MARIN COUNTY

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

1. The U. S. Army Corps of Engineers (USACE), Sacramento District (hereinafter the discharger) has been designated by the Department of Defense to perform necessary investigations and take appropriate remedial action relative to Landfill 26 on the Hamilton Air Force Base.
2. Hamilton Air Force Base (HAFB) is located east of Highway 101 in Marin County, near the town Novato and Ignacio reservoir (Figure 1). The facility opened in 1934 as an Army Air Corps facility to train fighter and bomber pilots. The field was transferred in 1947 to the U. S. Air Force from the Army. The Base was used for pilot training, submarine surveillance and aircraft maintenance.
3. HAFB was listed in 1974 as excess property. Base Command was transferred from military command to civilian managers. The Department of Defense withdrew the housing area portion of the base from the excess property listing and transferred that portion to the U.S. Navy. The Army received permission in 1976 from the USAF to use the runway and other ancillary facilities for aircraft operation. Also in 1976 the State of California determined that lands subject to tidal action belong to the State. Consequently a portion of the land outside the levees that encircle the site were claimed by the State.
4. This order addresses Landfill 26 located on HAFB (Figure 2). The landfill encompasses an area of approximately 29 acres. The landfill is one element of concern at HAFB. Other sites at HAFB of water quality concern have been studied by the USACE and reported in separate Remedial Investigations (RI).

Landfill Characteristics

5. The landfill consists of numerous individual discharges of solid waste, which may include both hazardous and non-hazardous substances, dispersed over an extended period

of time over a large area, designated as Landfill 26. The Landfill is located within a topographically low area of a pre-existing surface drainage channel. Investigations on the landfill show that maximum thickness of the wastes is 11 feet and waste is absent at some locations within the landfill boundary. Groundwater saturates some of the wastes, which may result in contamination of circulating ground water.

6. Landfill 26 stopped receiving wastes in the mid 1970s, however, the Landfill was not properly closed at that time.
7. Chemical contaminants identified in soil borings consist of volatile and semi-volatile organics, pesticides and PCBs, petroleum hydrocarbons and heavy metals. Groundwater samples from within the landfill boundary showed the presence of total petroleum hydrocarbons, chlorobenzenes, polynuclear aromatic hydrocarbons and elevated levels of heavy metals.

#### Legal Basis

8. The work to be performed is mandated under the authority of the Defense Environmental Restoration Program, Title 10 United States Code Section 2701 et seq., and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Title 42, United States Code Section 9601, et. seq., the Superfund Law. Executive Order # 12580 designates the Department of Defense (DOD) as lead agency for implementation of CERCLA regulations on property under DOD control. CERCLA requires that a final Record of Decision (ROD) be issued after public review and comment. CERCLA permits significant, but not fundamental changes to be made to the remedial action plan through issuance of an Explanation of Significant Difference (ESD)
9. Further, the closure will be compliant with California Code of Regulations, Title 23, Chapter 15: Discharge of Wastes to Land.

#### History

10. The original preferred alternative (ROD dated August 11, 1989) was chemical fixation of hot spots within the landfill and covering the landfill with a low permeability cap. A revised alternative (ESD dated May 10, 1991), proposed elimination of the chemical fixation, with more stringent design specifications for the cap. The capping of the landfill together with groundwater extraction were considered by the discharger to provide an equivalent level of environmental protection compared to that provided by the original plan.

11. The Board issued Order No. 92-029 in March 1992, that required the discharger to implement the revised alternative that included closure of the landfill, installation of a low permeability cap and hydraulic containment. On-going groundwater monitoring was required by the Order to evaluate and monitor the effectiveness of the above remedial action.
12. This Order rescinds Order No. 92-029. This Order reflects the current status of remedial actions at Landfill 26 and requires additional reports based on data collected subsequent to Order No. 92-029. The Specifications of Order No. 92-029 are being met and remain in place in the current Order. The following Provisions of Order No. 92-029 have been completed: Provisions 1-6, 9, 12, and 14-22. Provisions 7, 8, 10, 11 and 13 have not yet been completed and will remain in place in the current Order.
13. The Board issued Resolution 93-082 in 1993 recommending water quality certification for wetland fill during the construction of the Landfill 26 cap and subsequent mitigation for that fill. The mitigation wetland has been constructed and data is being collected to evaluate whether adequate wetland functions have been established. This order includes a provision that requires a report to document the implementation of the approved wetland mitigation plan
14. On September 13, 1995, the Discharger was issued a National Pollutant Discharge Elimination System (NPDES) permit number 95-188 for the discharge of treated ground water to a stormwater drainage system that discharges to San Pablo Bay.

#### Status of Remedial Actions

15. A composite cover has been constructed over the landfill, consisting of a low permeability compacted soil layer and a flexible membrane liner. Ground water extraction wells and a ground water treatment plant were constructed. Quarterly ground water has been conducted from September 1993 through December 1995.
16. Results of current groundwater monitoring, and evaluation of all geologic, hydrologic and water quality data for the landfill and surrounding areas indicate that hydraulic containment may not be warranted at this time. This Order will require additional evaluation to determine if a modification of the proposed remedy is appropriate. If a change in the remedy is warranted, a ROD amendment shall also be required.
17. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This Order implements the water quality objectives stated in the Basin Plan.

18. The existing and potential beneficial uses of San Pablo Bay in the vicinity of the site are:
  - a. Industrial service supply
  - b. Navigation
  - c. Commercial and sport fishing
  - d. Contact and non-contact water recreation
  - e. Wildlife and estuarine habitat
  - f. Fish migration and spawning
  - g. Preservation of rare and endangered species
19. The existing and potential beneficial uses of groundwater in the vicinity of the site are:
  - a. Industrial service supply
  - b. Domestic Water Supply
  - c. Surface Water Supply
20. The action to issue Waste Discharge Requirements is an action by a regulatory agency to protect the environment and as such is exempt from the California Environmental Quality Act (Public Resources Section 2100 et. seq.) in accordance with Section 15308, Chapter 3, Title 14 of the California Code of Regulations.
21. The Board notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
22. The Board in a public hearing heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that the U.S. Army Corps of Engineers, its agents, successors and assigns in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Prohibitions

1. The treatment, discharge or storage of wastes or materials shall not be allowed to create a condition of pollution or nuisance as defined in Sections 13050 (1) (m), of the California Water Code.
2. Migration of pollutants through subsurface transport to waters of the State is prohibited.

3. There shall be no discharge of wastes to surface waters except as permitted under the National Pollutant Discharge Elimination System (NPDES).
4. Any future uses of the landfill area that would compromise the integrity the landfill cover are prohibited.

## B. Specifications

Unless otherwise noted, any references to Sections and Articles refer to Chapter 15, Title 23, of the California Code of Regulations.

The following Specifications apply as set forth in the Provisions:

1. General Specifications
  - a. During waste disposal, handling, or treatment, no wastes shall be placed in a position where they can be carried into the waters of the State.
  - b. The waste management unit shall prevent migration of wastes to adjacent geologic materials, groundwater, or surface water, throughout the closure and post closure periods.
  - c. The integrity of containment structures shall be maintained at all times.
  - d. The landfill cover must have a slope of no less than 3 percent to permit run-off.
  - e. A drainage ditch surrounding the landfill cover must be installed to carry off precipitation draining from the cover.
  - f. A 40 mil flexible liner must be installed beneath the topsoil layer of the landfill cover.
  - g. The landfill shall be protected from inundation or washout that would result in mobilization of contaminants due to floods with a 100 year return period.
  - h. The landfill cover shall meet the design criteria specified in Section 2581.
  - i. Drainage around landfill 26 shall be managed to minimize infiltration and water flow into the landfill.

2. Groundwater Sampling and Monitoring Specifications

- a. The groundwater monitoring program shall be in compliance with Section 2550, and as approved by the Executive Officer.
- b. The discharger shall conduct monitoring activities in accordance with the Monitoring and Reporting Program issued by the Executive Officer to monitor groundwater depth, gradient and quality, and to determine the extent of contamination of the upper unconfined aquifer and deeper zones if contamination is found in the upper aquifer.
- c. The discharger shall monitor groundwater to determine if groundwater contamination has occurred outside the periphery of the landfill according to the statistical tests specified in Chapter 15. In addition groundwater monitoring must be carried out within the landfill. All migration pathways must be monitored.
- d. The groundwater sampling and analysis program shall ensure that groundwater quality data are representative of the groundwater in the area of the waste management unit.
- e. Water quality protection standards will be established by the Board according to Section 2550.2. These standards shall be generated upon submittal of an approved groundwater quality monitoring program and based upon one year of background groundwater quality monitoring data.
- f. An evaluation monitoring program, as required in Section 2550.9, shall be implemented where water quality impairment has occurred, or upon determination that a statistically significant increase in indicator parameters or waste constituents has occurred during detection monitoring.

3. Remedy Evaluation and Technical Reporting

- a. The discharger will analyze all available geologic, hydrologic, soil chemistry and water quality data for landfill 26 to evaluate appropriate remedial actions for groundwater. A technical report shall be prepared to summarize findings and present a proposed remedy. An outline for the report is included as Attachment 1.
- b. The discharger shall maintain the groundwater extraction well system and groundwater treatment plant so that they can be operated as needed, to provide hydraulic containment or groundwater treatment.

C. Provisions

Unless otherwise noted, any references to Sections and Articles refer to Title 23, Chapter 15 of the California Code of Regulations.

1. The discharger shall comply with Prohibitions A.1 through A.3 immediately upon adoption of this Order.
2. Submit an AMENDMENT TO THE GROUNDWATER MONITORING PROGRAM, acceptable to the Executive Officer, no later than 60 days after this order is adopted. The program shall furnish detailed descriptions of field procedures and analytical methods, locations of monitoring points, and sampling frequencies to be used for ongoing groundwater monitoring. The groundwater monitoring program shall ensure that any release to groundwater will be detected at the landfill point of compliance.
3. Submit a TECHNICAL REPORT proposing the final design of the closed landfill and evaluating the need for hydraulic containment, based on the post-capping water levels, landfill leachate characteristics and hydrology. The technical report should include evaluation of all geologic, hydrologic and water quality data associated with Landfill 26. Specifically the report should evaluate whether the landfill has leaked based on Chapter 15 criteria and include proposals for any needed corrective actions. The report shall be acceptable to the Executive Officer and due no later than 120 days after this order is adopted.
4. If the technical report, submitted as required by Provision 2, documents that some of the sources of groundwater contamination at Landfill 26 are due to sources outside the landfill boundaries, then these sources may be characterized separately from the Landfill 26 closure work. In that case, the discharger shall submit a technical report, acceptable to the Executive Officer, that includes a schedule for site characterization and remedial actions for these sources. The report is due within 60 days after the approval of the technical report in Provision 2.

5. Submit a CLOSURE CERTIFICATION REPORT documenting the completion of work required under Board Order No. 92-029. The report shall be acceptable to the Executive Officer and due no later than 90 days after this order is adopted. (Formerly Provision 11 of Board Order No. 92-029). This report should include:
  - a. Documentation of the implementation of the flood control plan. (Formerly Provision 7 of Board Order 92-029).
  - b. Documentation of the implementation of the approved wetland mitigation plan. (Formerly Provision 8 of Board Order 92-029).
6. Submit a DRAFT AMENDED RECORD OF DECISION for Landfill 26 no later than 180 days after this order is adopted.
7. Submit a DESIGN REVISION REPORT within 180 days of the startup of the groundwater treatment plant, if modification of the treatment processes or capacity expansion is needed based on treatment plant operating data collected. (Formerly Provision 10 of Board Order 92-029)
8. Submit a TECHNICAL REPORT, within 6 months after hydraulic containment system start-up, evaluating the effectiveness of the system. Such an evaluation shall include, but need not be limited to, an estimation of the flow capture zones of the extraction wells, establishment of the cones of depression by field measurements, volume of water to be extracted and chemical monitoring data. (Formerly Provision 13 of Board Order 92-029)
9. In the event that the U.S. Army Corps of Engineers chooses to pursue a more stringent closure alternative, the Board will consider amending this Order and modify the time schedule of the Order for implementation.
10. Monitoring reports shall be submitted to the Board on the 15th of the second month following the annual monitoring event. The reports shall include:
  - a) a summary of work performed since the previous report;
  - b) a presentation of updated piezometric surface and water table maps for all affected water bearing zones;
  - c) plan view maps showing the location of all monitoring wells and/or piezometers, at a scalable size.
  - d) Groundwater analytical data
11. All samples shall be analyzed by State certified laboratories using appropriate EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.

12. Copies of all correspondence, reports and documents pertaining to compliance with the Prohibitions, Specifications and Provisions of this Order shall be provided to the following agencies:
  - a. Department Toxic Substances Control
  - b. Integrated Waste Management Board
13. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267 of the California Water Code:
  - a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any records are kept, which are relevant to this Order.
  - b. Access to copy any records required to be kept under the terms and conditions of this Order.
  - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
  - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
14. The discharger shall file with the Regional Board a report of any material change in the character, location, or quantity of waste discharge. For the purpose of these requirements, this includes any proposed change in boundaries, contours or ownership.
15. The discharger shall maintain a copy of this Order at the site so as to be available at all times to site operating personnel.
16. The Board considers the property owner and site operator to have a continuing responsibility for correcting any problems within their reasonable control which arise in the future as a result of this Waste Discharge Order.

17. These requirements do not authorize the commission of any act causing injury to the property of another or of the public, do not convey any property rights, do not remove liability under federal, state or local laws, and do not authorize discharge of waste without the appropriate federal, state or local permits, authorizations, or determinations.
18. Board Order No. 92-029 is hereby rescinded.

I, Loretta K. Barsamian, 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, San Francisco Bay Region, on August 21, 1996

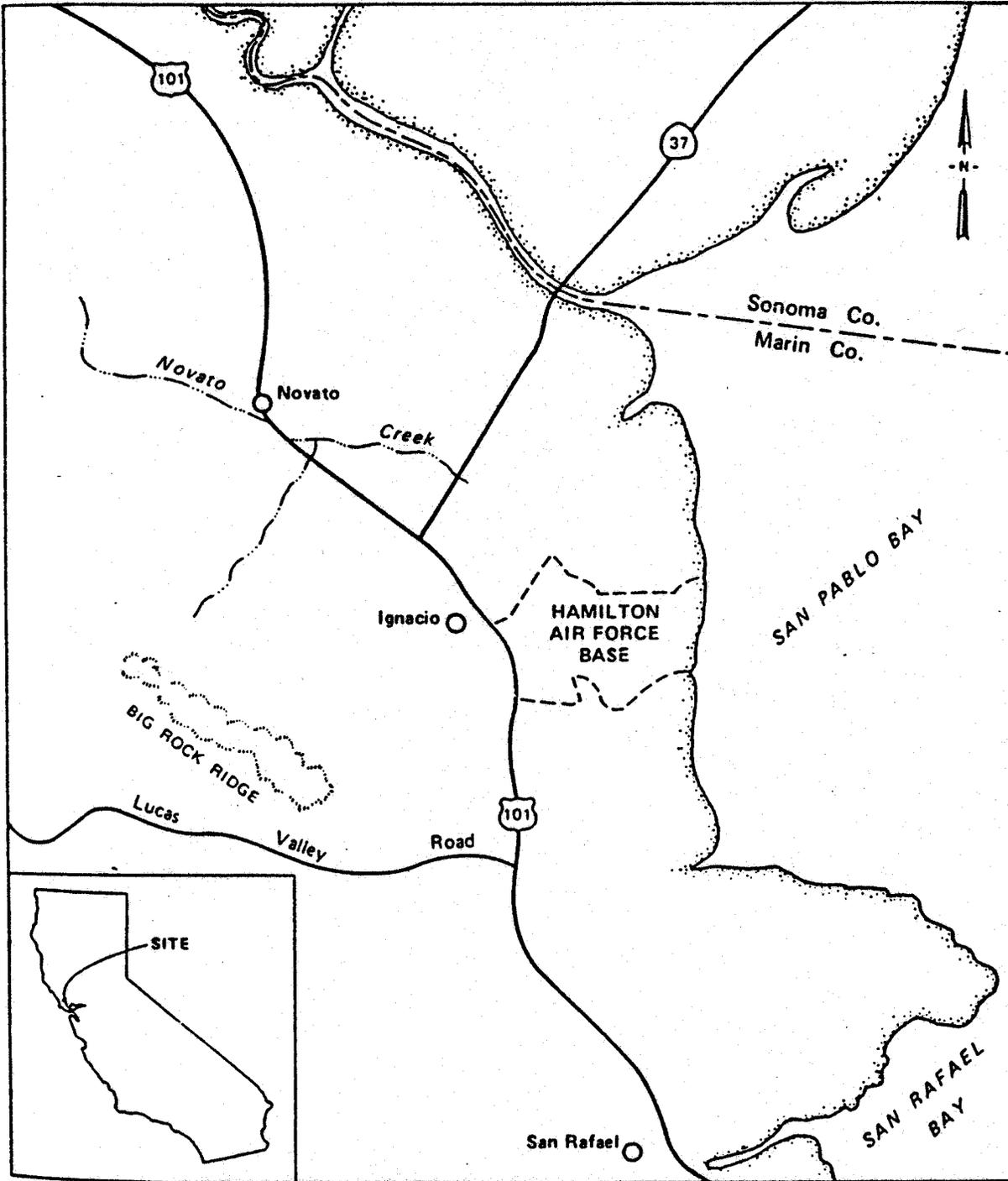
  
LORETTA K. BARSAMIAN  
Executive Officer

Attachments:

Figure 1: Location Map

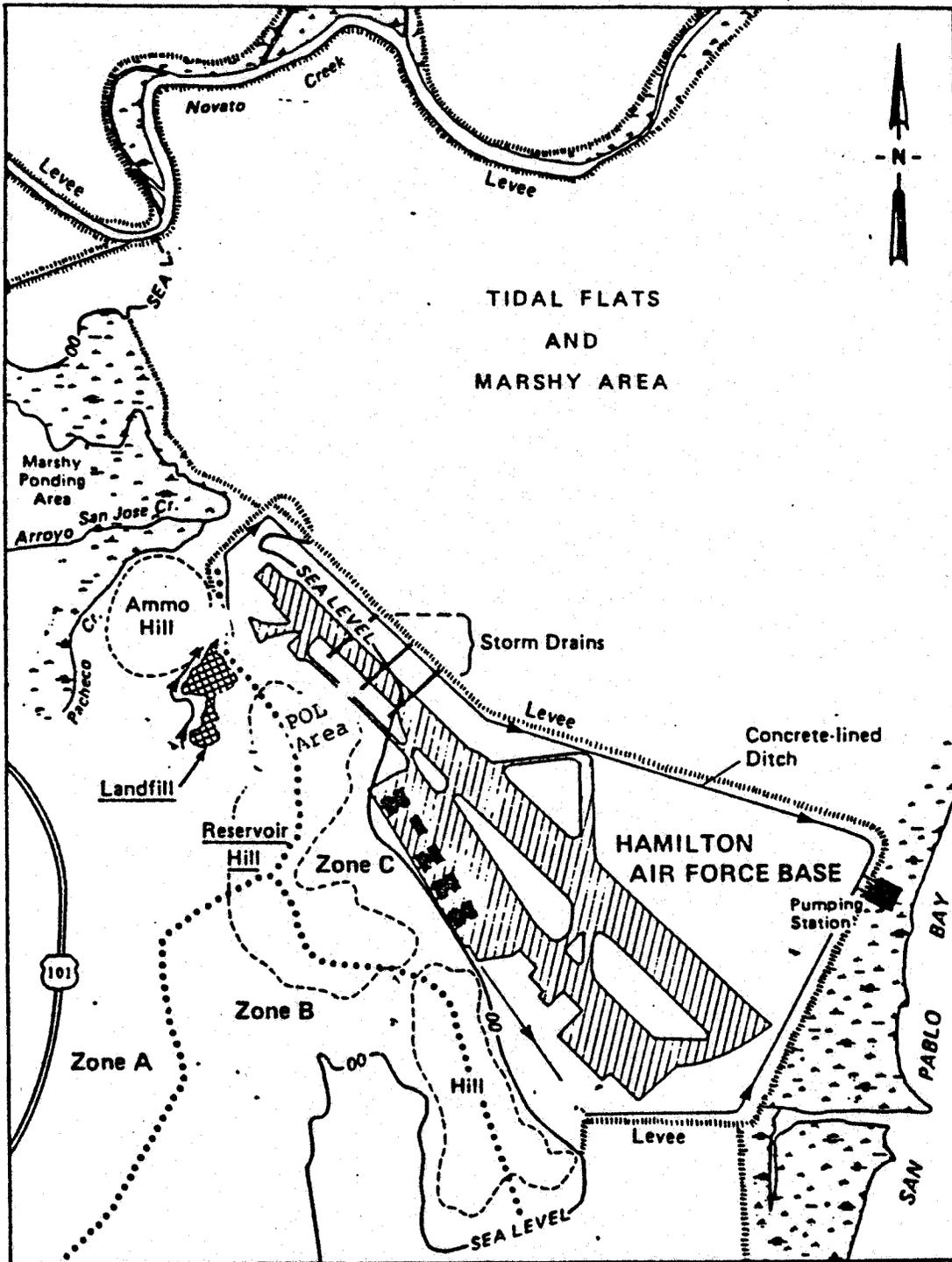
Figure 2: Site Map

Attachment 1 Self Monitoring Program



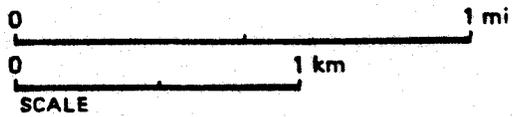
No Scale

Project No. BSC8777D	Hamilton AFB	INDEX MAP TO GENERAL AREA OF STUDY	Figure -1
Woodward-Clyde Consultants			



**EXPLANATION**

- ..... Watershed divide
- Levee and dikes



	Hamilton AFB	Generalized Hydrogeologic Map of HAFB with Emphasis on the Landfill	Figure 2
Woodward-Clyde Consultants			

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

**CLEANUP AND ABATEMENT ORDER No. 01-139  
U.S. ARMY CORPS OF ENGINEERS  
SACRAMENTO DISTRICT  
HAMILTON AIR FORCE BASE, LANDFILL 26  
NOVATO, MARIN COUNTY**

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

**DISCHARGER & SITE IDENTIFICATION**

1. The U.S. Army Corps of Engineers (COE), hereafter referred to as the Discharger, has been designated by the Department of Defense to perform the necessary remedial and closure activities at Landfill 26, Hamilton Air Force Base. Landfill 26 is hereinafter referred to as the Landfill. The Landfill is located approximately 22 miles north of San Francisco in Marin County near the City of Novato, and is generally bounded by Highway 101 on the west and San Pablo Bay on the east, as shown in Figures 1 and 2.

**PURPOSE OF ORDER**

2. In 1995 the Discharger completed closure activities for the Landfill, including installation of a final low permeability cap, groundwater extraction and treatment system, and perimeter soil gas monitoring network. Since 1995, post-closure site conditions have changed as evidenced by recent increases in soil gas and groundwater concentrations. This Order is intended to:
  - a. Require development and implementation of corrective action plans and time-schedules to assure compliance with the facility's Waste Discharge Requirements and appropriate portions of Title 27 of the California Code of Regulations (formerly known as Chapter 15, Title 23), referred to hereinafter as Title 27;
  - b. Require investigation, control, remediation and/or corrective action of releases from the Landfill;
  - c. Require post-closure maintenance activities for the Landfill in compliance with appropriate portions of Title 27; and,
  - d. Implement an improved groundwater monitoring and soil gas-monitoring program.

## **LANDFILL CHARACTERISTICS**

3. The Landfill first operated in the mid-1940s and ceased accepting waste in the mid-1970s. The Landfill encompasses approximately 29 acres and occupies a former marshland and floodplain area along the former margin of San Pablo Bay (Figure 1). Waste is contained within the refuse layer. The refuse layer is approximately 5 feet to 8 feet thick and is mostly saturated with groundwater. The refuse layer is completely covered by a low permeability cap as described in Finding No. 5. Consistent with landfill practices at that time, no liner was installed at the site. The Landfill reportedly received approximately 150,000 cubic yards of primarily solid wastes, including both hazardous and non-hazardous substances, and approximately 26,000 cubic yards of oily sludge. Chemical contaminants identified in soil borings consist of volatile and semi-volatile organics, petroleum hydrocarbons, pesticides, PCBs, and metals.

## **POST CLOSURE LAND USE**

4. At the time of the Landfill capping, the Discharger designated a 150-foot to 200-foot “buffer zone” of property around the entire Landfill perimeter (Figure 2). The Discharger created the “buffer zone” in an effort to protect the low permeability cap and to allow access to the Landfill and its groundwater extraction and treatment plant. In 1999, excess Army-owned property totaling approximately 260-acres and abutting the southern, western and northern edges of the “buffer zone” were sold to the City of Novato, who in turn, resold portions of the property to New Hamilton Partnership (NHP). Final land reuse plans for the Landfill are not known at this time, however, past discussions have included recreational and open space uses.

## **LANDFILL CLOSURE DESIGN**

5. Between 1992 and 1995 the Landfill was closed in compliance with appropriate portions of Chapter 15, Title 23 of the California Code of Regulations, a 1989 Record of Decision (ROD), and 1992 Explanation of Significant Differences (ESD). As part of the ROD, a groundwater extraction and treatment system (consisting of 13 extraction wells, a conveyance system, and treatment plant) was designed by the Discharger and installed to provide hydraulic containment under the Landfill and to treat extracted water. Between 1994 and 1995 the Landfill was capped by the Discharger with a 30-acre Resource, Conservation, and Recovery Act (RCRA) equivalent low permeability cap consisting of a vegetative soil layer, hydraulic barrier layer, and foundation layer. The cap incorporates drainage features and erosion control devices to prevent deterioration of the Landfill and cap integrity. However, the cap design did not include a landfill gas collection and treatment system.

## REGULATORY HISTORY

6. September 1995 - The Board issued a National Pollutant Discharge Elimination System Permit, Board Order No. 95-188, for the discharge of treated ground water to a storm drainage system that discharges to San Pablo Bay. The groundwater pump and treatment system was installed at the Landfill at the time of closure, but has not been operated.
7. August 1996 – The Board issued Waste Discharge Requirements, Board Order No. 96-113. The Order:
  - a. Documented the installation of the final cap materials that occurred in 1995;
  - b. Required the submittal of a final closure design and certification report;
  - c. Required the submittal of a technical report to further evaluate the nature and extent of ground water contamination and the need for corrective action;
  - d. Required on-going ground water monitoring; and,
  - e. Prohibited creating a condition of pollution or nuisance.

Current violations to Order No. 96-113 are described in Table 1 in Finding 17.

8. Summer 1996 – Following installation of the low permeability cap, methane was detected in one perimeter soil gas probe at concentrations exceeding 5% methane by volume, a violation of Title 27, Section 20921 and Order No. 96-113. No corrective action was taken by the Discharger in response to the violation.
9. September 1999 - Methane gas exceeding 5% methane by volume was again detected in a perimeter soil gas probe during routine post-closure monitoring of Landfill gas.
10. 2000 - Soil gas sampling conducted in 2000 showed that methane accumulates under the low permeability Landfill cap and migrates laterally to beyond the southern and eastern edges of the cap. Independent (non-discharger) soil gas measurements collected from semi-permanent soil gas monitoring probes installed on private property abutting the southern and eastern edges of the Landfill confirm:
  - a. Methane gas exceeding the regulatory limit of 5% methane by volume has been repeatedly and consistently detected beyond the southern Landfill property boundary; and,
  - b. Detectable concentrations of sulfur compounds and volatile organic compounds, including 2-Butanone, 1,1,1-Trichloroethane, vinyl chloride, chloroform, MTBE, toluene, ethylbenzene, xylenes, and benzene have been detected in the same soil gas probes that have also shown detectable methane concentrations in the past.

The occurrence of the above listed pollutants and methane gas at concentrations exceeding the regulatory limit of 5% outside the waste boundary is a violation of Order No. 96-113, the 1999 Landfill 26 Closure and Post Closure Maintenance Plan, and Title 27. This violation is further discussed in Table 1.

11. February 7, 2001 - Under Water Code Section 13267, Board staff requested the U.S. Army submit a technical report, acceptable to the Executive Officer, by March 30, 2001 on:
  - a. Reducing methane concentrations at monitored property boundaries to below compliance levels as described in Appendix E of the LF26 Closure and Post-Closure Maintenance Plan dated June 1999; and,
  - b. Evaluating the potential for volatile organic compounds impact to groundwater resulting from Landfill gas migration.
  
12. March 30, 2001 - In response to the Board 13267 request, the Discharger submitted a report titled "Methane Remedial Measures Study." The report proposed and evaluated seven conceptual approaches for controlling methane migration from the Landfill. The remedial options evaluated included:
  - a. Continued Landfill gas probe monitoring;
  - b. Monitoring combined with Installation of a passive cap-venting system;
  - c. Monitoring combined with installation of passive buffer-zone venting trench;
  - d. Monitoring combined with installation of an active buffer-zone venting system;
  - e. Monitoring combined with installation of utility protection;
  - f. Monitoring combined with activation of the existing groundwater pump and treat system; and,
  - g. Monitoring combined with an active extraction system with pre-established system shutdown criteria.

The Discharger's recommended option was monitoring combined with construction of a segmented, passive venting trench to be located within the buffer zone along the southern Landfill boundary. Board staff consider the Dischargers recommended alternative corrective action to be an interim action to locally intercept gas released from the Landfill and not a corrective action to resolve gas generation at the Landfill.

13. April 12, 2001 – Board staff sent the Discharger a letter which requested:
  - a. Immediate implementation of interim stopgap measures to intercept the Landfill gas migrating towards the Hamilton Meadows housing development;
  - b. Long-term management of the methane gas at its source; and,
  - c. A time-schedule for implementing the required gas collection and treatment activities.

14. April 2001 to present – A number of newspaper articles have been published regarding the methane problems at the Landfill. Additionally, the Discharger conducted a number of community meetings to respond to concerned citizens, parents of school children, and neighboring residents who had purchased new homes adjoining the Landfill regarding the potential risks associated with the Landfill gas and future plans to investigate and remedy the situation. Board staff attended the meetings. Although the methane gas problems were causing or threatening to cause nuisance, at no time did the Discharger commit to long-term management of methane at its source of generation as Board staff had requested on April 12, 2001.
  
15. June 1, 2001 - The Discharger provided the Board with a time-schedule one week after the May 28, 2001 requested submittal date. The time-schedule request was for designing and installing a passive soil gas venting trench within the buffer-zone to intercept gas migrating towards the Hamilton Meadows housing development. Staff found the time-schedule unacceptable because it failed to include long-term management of methane gas at its source and within the landfill footprint.
  
16. June 20, 2001 – A Board staff letter informed the Discharger that it is violating Order No. 96-113 and that the time-schedule submittal is unacceptable because it omitted control and containment of gas and groundwater pollution within the Landfill.

**VIOLATIONS AND/OR THREATENED VIOLATIONS**

17. Based on the above findings, the Board finds that the Discharger has violated or threatens to violate the requirements of Order No. 96-113. Specific violations and/or threatened violations are tabulated below and include:

**Table 1** – Summary of Violations and/or Threatened Violations of Order No. 96-113 at Landfill 26, Hamilton Army Airfield, Novato

Waste Discharge Requirement	Violation and/ or Threatened Violation
1). Prohibition A.1 specifies that “the treatment, discharge or storage of wastes or materials shall not be allowed to create a condition of pollution or nuisance as defined in Section 13050 (l) and (m) of the California Water Code.”	1). Soil gas and groundwater data collected at the Landfill show methane migration beyond the Landfill’s permitted boundary and onto the Hamilton Meadows development. The gas nuisance or threatened nuisance caused the Discharger to conduct meetings to respond to the concerns of citizens of the community and surrounding areas (two of which were attended by more that 100 people), and resulted in a number of newspaper articles about the Landfill.
2). Prohibition A-2 states that the “migration of pollutants through subsurface transport to waters of the State is prohibited.”	2). Data show that methane and volatile organic compounds are present in soil gas and groundwater outside the Landfill boundary to the

	south. Impact to groundwater and soil gas is unknown on the other three sides (west, north and east) of the Landfill.
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**Table 1** continued

Waste Discharge Requirement	Violation and/ or Threatened Violation
3). Specification B.1.b. states “the waste management unit shall prevent migration of wastes to adjacent geologic materials, groundwater, or surface water, throughout the closure and post-closure periods.”	3). Data show that methane and volatile organic compounds are present in soil gas and groundwater beyond LF26 buffer zone and property. Additionally, data show that diesel hydrocarbons are present in a monitoring well downgradient of LF26 suggesting that groundwater pollution is not contained to the Landfill.
4). Specification 3.b. – The Discharger shall maintain the groundwater extraction well system and groundwater treatment plant so that they can be operated as needed to provide hydraulic containment or groundwater treatment.	4). The Discharger has reported that activation of the existing groundwater extraction and treatment system would require significant effort and cost. The Discharge has moved forward in decommissioning the groundwater extraction and treatment system, including removal of the electric feed to the groundwater treatment plant, in violation of specification 3.b., and without Board staff notification or approval.

**JUSTIFICATION FOR 13304 ORDER**

18. Based on the above findings, the Board finds the Discharger has caused or permitted waste to be discharged or deposited where it is or probably will be discharged into Waters of the State and creates or threatens to create a condition of pollution or nuisance in violation of Order 96-113. This Order, therefore, requires corrective actions to achieve compliance with Order 96-113, to monitor compliance and to file an Amended Report of Waste Discharge covering the Landfill and the corrective actions to be implemented.

**CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)**

19. This Order is an action to enforce the California Water Code, and as such is exempt from the California Environmental Quality Act (CEQA), pursuant to Section 15321(a) of Title 14, California Code of Regulations.

**NOTIFICATION**

20. The Board has notified the Discharger and interested agencies and persons of its intent under California Water Code Section 13304 to consider adoption of a Cleanup and Abatement Order for the discharge, and has provided them with an opportunity to submit their written comments.

## **PUBLIC HEARING**

21. The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

**IT IS HEREBY ORDERED**, pursuant to Section 13304 of the California Water Code, that the Discharger, its agents, successors and assigns, shall cleanup the waste discharged, abate the effect of further discharge, and take other remedial actions as follows:

### **A. TASKS**

1. **Landfill Corrective Action Investigation Work Plan:** The Discharger shall prepare and submit a Corrective Action Investigation Work Plan, which is acceptable to the Executive Officer, that:
  - a. Evaluates existing soil gas, groundwater, and surface water data collected from within the Landfill and adjacent property and identifies data-gaps in the soil gas, ground water, and surface water monitoring network; and,
  - b. Proposes locations for the installation and testing of new monitoring wells, soil gas sampling points, and surface water sampling locations that are needed to fully investigate the data-gaps identified in Task 1.a.

The Corrective Action Investigation Work Plan shall propose fieldwork that is designed to investigate the data-gaps identified in Task 1.a. and ultimately identify and evaluate corrective actions for soil gas, groundwater and surface water deemed necessary at the Landfill. At a minimum, the investigation shall include an evaluation of:

- a. The potential radial impacts to soil and groundwater of the migration of Landfill gas around the perimeter (west, north and east sides) of the Landfill;
- b. The potential radial impacts to groundwater from leachate originating within the Landfill, including investigation of groundwater downgradient of the Landfill in the vicinity of Ammo Hill; and,
- c. The potential impacts of the Landfill to surface water, including but not limited to, the Landfill's perimeter drainage ditch network.

In addition, the Landfill Corrective Action Investigation Work Plan shall:

- a. Describe the analytical methods and testing procedures for collecting and analyzing surface water, ground water and soil gas samples. The analytic suite shall include the full suite of chemical constituents reportedly contained in the Landfill;

- b. Ensure that all potential migration pathways are monitored and that the data quality adequately measure the quality of groundwater, surface water, and soil gas in the area surrounding the Landfill;
- c. Include pump tests on existing Landfill extraction wells to determine their radius of influence/capture area, sustained yield, etc.; and,
- d. Present a time schedule for completion of individual identified tasks in the Task 2 requirements (i.e., completion of the Corrective Action Investigation and Corrective Action Study). The schedule will be developed so all work in Task 2 will be completed by December 30, 2005.

**COMPLIANCE DATE:**

**March 1, 2005**

2. **Corrective Action Investigation and Corrective Action Report:** In accordance with the approved time-schedule described in Task 1, the Discharger shall:

- a. Complete the corrective action investigation identified in approved corrective action work plan; and,
- b. Evaluate the data collected as part of the corrective action investigation and submit a technical Corrective Action Report, acceptable to the Executive Officer, which evaluates corrective actions for ventilation and treatment of methane gas located beneath the RCRA cap. The goal of the Corrective Action Report is to identify mitigation of Landfill gas generation and accumulation, at its source, thus reducing the potential for buildup and lateral migration of Landfill gas to surrounding soil and groundwater. The Corrective Action Report options evaluated shall not result in adverse health effects and/or nuisance conditions and shall comply with all applicable Federal, State and local regulations regarding discharges to air. The Landfill Corrective Action Report may include alternatives, but one alternative shall include, at a minimum, Landfill gas monitoring combined with passive gas venting through the landfill cap.

The technical evaluation of remedial options shall:

- a. Evaluate and discuss corrective action performance goals;
- b. Present cost estimates in sufficient detail to permit full consideration of the proposed corrective actions; and,
- c. Include general construction plans in sufficient detail to permit full consideration of the proposed corrective actions.

**COMPLIANCE DATE:**

**December 30, 2005**

3. **Landfill Corrective Action Remedial Design:** The Discharger shall:
- a. Prepare and submit detailed construction plans and system design drawings for the approved corrective action identified in Task 2; and,
  - b. Present a time-schedule for completion of identified tasks in the construction/installation, startup, and operation of the approved corrective action identified in Task 2. All system construction, installation, startup and operation shall be completed on or before September 30, 2006.

**COMPLIANCE DATE:**

**April 28, 2006**

4. **Landfill Corrective Action System Installation and Operation:** The Discharger shall:
- a. Construct/install, startup/troubleshoot, and put into operation the approved corrective action remedial option identified in Task 2 and designed in Task 3;
  - b. Prepare and adhere to a Corrective Action System Operation and Maintenance Manual, that is acceptable to the Executive Officer, to ensure proper operation of the system; and
  - c. Prepare and implement a Corrective Action Monitoring Plan for groundwater, surface water, and soil gas, that is acceptable to the Executive Officer, and that evaluates the performance of the corrective action system design. The Corrective Action Monitoring Plan shall include a time schedule for monitoring and reporting that begins at the time of the corrective action system installation and operation (i.e., no later than September 30, 2006) and extends through March 30, 2008.

**COMPLIANCE DATE:**

**September 30, 2006**

5. **Landfill Groundwater/Surface Water and Soil Gas Corrective Action Evaluation Monitoring Program:** The Discharger shall conduct monitoring and reporting of soil gas, groundwater, and surface water as described in the approved Corrective Action Monitoring Plan generated under Task 4 of this Order. The soil gas, surface water, and groundwater monitoring shall be conducted after installation of the Corrective Action System specified in Task 2, designed in Task 3 and installed as part of Task 4 of this Order. Staging the work as described should allow time for equilibrium of the subsurface system (vadose zone and saturated zone) after installation of the approved remedy.

The Corrective Action Monitoring Plan shall begin at the time of the corrective action system installation and operation (i.e., no later than September 30, 2006) and extends through March 30, 2008.

The results of the corrective action monitoring program shall be compiled and evaluated and the results presented in an Amended Report of Waste Discharge, acceptable to the Executive Officer, as required under Task 6 of this Order.

**COMPLIANCE DATE:**

**March 30, 2008**

6. **Amended Report of Waste Discharge for Landfill 26:** The Discharger shall prepare and submit a complete Report of Waste Discharge (ROWD) application for revised Waste Discharge Requirements (WDRs), which is acceptable to the Executive Officer. This ROWD shall include an updated application form (Form 200) and technical report. The application form shall identify all current facility owners and responsible parties involved in control and operation of the Landfill and its treatment systems. The technical report shall incorporate all applicable conditions and/or mitigation measures in compliance with local permitting requirements and CEQA.

Additionally, the ROWD will include a compilation and evaluation of the perimeter soil gas, groundwater, and surface water environmental investigation conducted under Task 4 of this Order. The technical report will evaluate the adequacy and, if necessary, the need for additional control (Landfill gas, groundwater and surface water) based on:

- a. Evaluation of all geologic, hydrologic, and soil gas and water quality data historically associated with Landfill 26 and collected as part of this Order; and,
- b. Title 27 regulations.

In the event pollution is detected beyond the limits of waste, the technical evaluation shall:

- a. Evaluate and recommend gas and/or leachate control corrective measures;
- b. Evaluate corrective action system effectiveness and discuss corrective action system performance goals;
- c. Present detailed cost estimates for the corrective action options evaluated as part of this study;
- d. Include construction plans and drawings for the corrective action(s) plan(s) recommended; and,
- e. Present a time-schedule for construction, installation/ operation and reporting on the installation of the approved corrective action plan.

After receipt of an ROWD that is acceptable to the Executive Officer, Staff intend to schedule Tentative Revised Waste Discharge Requirements for the Board's consideration. A revised Post-Closure Operation and Maintenance Plan will be required under revised Waste Discharge Requirements.

**COMPLIANCE DATE:**

**July 30, 2008**

**B. SPECIFICATIONS**

1. The Discharger shall install any reasonable additional groundwater, leachate, and Landfill gas monitoring devices required to fulfill the terms of this Order.
2. The Discharger shall comply with all applicable provisions of Title 27 that are not specifically referred to in this Order.
3. The Discharger shall submit quarterly progress reports, with the first report due November 15, 2004, on compliance with the requirements of this Order. It is not the Board's intent to duplicate any reports due under other Orders; therefore, any reports due concurrently under this Order and another Order may be combined.
4. Copies of all formal written correspondence, reports and documents pertaining to compliance with the Tasks and Specifications of this Order shall be provided to the following agencies:
  - a. Department of Toxic Substances Control;
  - b. Integrated Waste Management Board;
  - c. Marin County Department of Environmental Health; and,
  - d. U.S. Environmental Protection Agency.

Final copies of reports and documents pertaining to compliance with the Tasks and Specifications of this Order shall be provided to the following entities:

- a. City of Novato – Ken Bell
  - b. Novato Community Partners – Rob Wainwright
  - c. Novato Unified School District – Michelle Plumbtree
  - d. Shea Homes – Thomas Gamble; and,
  - e. The Landfill's local information repository so as to be locally available for public review.
5. The Discharger shall provide Board staff with at least 72 hours notice of the date and time of any field activity associated with compliance with this Order.

6. The Board considers the property owner and site operator to have a continuing responsibility for correcting any problems within their reasonable control which arise in the future as a result of this Order.

Pursuant to the California Water Code sections 13304 and 13350, if a Discharger fails to comply with the provisions of this Order, the Board may schedule a hearing to consider assessing civil monetary penalties and/or to consider requesting the Attorney General to take appropriate enforcement action against the Discharger, including injunctive and civil monetary penalties.

I, Loretta K. Barsamian, 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, San Francisco Bay Region, on November 28, 2001.

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Loretta K. Barsamian  
Executive Officer

Attachments: Figure 1: Site Location Map  
Figure 2: Site Vicinity Map