

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. 87-044  
NPDES NO. CA0028398

AN ORDER AMENDING ORDER NO. 85-36,  
WASTE DISCHARGE REQUIREMENTS FOR:

U. S. DEPARTMENT OF ENERGY  
STANFORD LINEAR ACCELERATOR CENTER  
MENLO PARK, SAN MATEO COUNTY

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

1. On April 30, 1985, the Regional Board adopted Order No. 85-36 (NPDES No. CA0028398) prescribing waste discharge requirements for the United States Department of Energy, Stanford Linear Accelerator Center (hereinafter referred to as the discharger).
2. On September 8, 1986, the discharger submitted an amended Report of Waste Discharge. The discharger is presently constructing a linear collider which will collide high energy beams of electron with similar beams of positrons from the linear accelerator. Use of the linear collider is expected to increase the current discharge rate by two to three times. Use of the linear collider is not expected to substantially change the discharge quality. The discharger expects to have the linear collider operational by the end of 1987.
3. The Stanford Linear Accelerator Center is a large research laboratory devoted to theoretical and experimental research in high energy physics and to the development of new techniques in high energy accelerator particle detectors. The main tool of the laboratory is a 2 mile long linear accelerator capable of producing electron beams in the 50 GeV range. SLC will involve electron-positron collisions at 100 GeV energies. Other facilities using the linear accelerator are the Stanford Positron-Electron Assymetrical Ring (SPEAR) and the Positron-Electron Project (PEP). SPEAR electrons are primarily for use at the Stanford Synchrotron Radiation Laboratory (SSRL), a separate Department of Energy facility. The accelerator is normally operational nine to ten months out of the year, with shutdown during the summer months when electricity demand is at its peak. Operation of the linear collider is not expected to change the operational schedule. However discharge does continue throughout the year.
4. The discharger presently discharges cooling tower blowdown water from four separate closed-loop cooling systems, ground water that has seeped into the accelerator gallery, and runoff into three natural drainage

areas. The drainages flow into San Francisquito Creek, a tributary to the San Francisco Bay, both water of the United States. The current combined average discharge rate is 26,200 gallons per day (gpd), and the maximum discharge rate is 137,800 gpd.

- a. Waste 001 currently consists of an annual average of 5,100 gpd of blowdown from cooling tower 1201. The current maximum discharge is 40,000 gpd. Use of the linear collider is expected to increase flow to an average of 15,500, and a maximum of 35,500 gpd. When the accelerator is not operating the flow may drop to the hundred to low thousand gallon per day range, if blowdown occurs at all.
  - b. Waste 002 currently consists of an annual average of 5,000 gpd of blowdown from cooling tower 1202. The current maximum discharge rate is 34,800 gpd. Use of the linear collider is expected to increase the flow to an average of 18,100, and a maximum of 60,000 gpd. When SLC is down, the NPI may be operating so blowdown will continue. SLC precludes NPI use, therefore use is sporadic.
  - c. Waste 003 currently consists of an annual average of 16,000 gpd of blowdown from cooling towers 101 and 1701. The current maximum discharge rate is 72,700 gpd. Use of the linear collider is expected to increase the flow to an average of 62,200, and a maximum of 119,000 gpd. Discharge is only expected to double because PEP and SPEAR will not be running during SLC operations, but SPEAR will operate when SLC is not operating, in order to supply SSRL.
5. Order No. 85-36 found that the discharger's flow provided enhancement of the warm fresh water habitat, wildlife habitat, and riparian habitat in San Francisquito Creek; and granted an exception to the Water Quality Control Plan for the San Francisco Bay Region.
  6. The pollutants of concern are phosphates, and temperature. The proposed change will substantially increase flow, mass loading of phosphate, and possibly effect the temperature of the creek.
  7. At the request of the Board and the Department of Fish and Game, the discharger has begun a year long biological and hydrographical study of San Francisquito Creek to determine if the Creek is phosphate dependent; the effects of the temperature of the wastewater under current and increased flow on the stream; the effects of the intermittent discharge flow on the biology and substrate of the stream; and the effects of the discharge on the Creek water quality. The results of the study will provide a significant amount of data on San Francisquito Creek, in addition to the actual effects of the discharge on the creek. The Board will determine whether the exception to the Basin Plan prohibition should be continued upon the conclusion of this study.
  8. Existing effluent limitation B.1. limits the concentrations of phosphates and oil and grease in the discharge.

9. Order 85-36 states in part:

"B. Effluent Limitations ...

"2. The discharge of phosphate (PO<sub>4</sub>) shall not exceed the following limits:

<u>Waste</u>	<u>Units</u>	<u>30-Day Average</u>	<u>Maximum Daily</u>
001	lbs/day	0.54	0.90
002	lbs/day	0.63	1.05
003	lbs/day	2.16	3.60

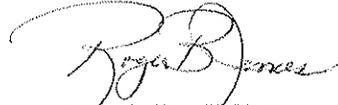
"3. The discharge of oil and grease resulting from Waste 001, 002, and 003 combined shall not exceed 1.4 lbs/day (0.63 kg/day) as a 30-day average value and 2.8 lbs/day (1.2 kg/day) as a maximum daily value."

10. Existing effluent limitations B.2., and B.3., preclude the increase in mass loadings, and thus effluent flow, to San Francisquito Creek. An amendment included in this Order would allow the mass limits and effluent flow to increase during the one year study period. The Department of Fish and Game concur with this proposed test period.
11. An environmental assessment for the project was prepared in September 1982, in accordance with the National Environmental Policy Act of 1969.
12. The Regional Board adopted a revised Water Quality Plan for the San Francisco Bay Region (Basin Plan) on July 21, 1982. The Basin Plan contains water quality objectives for San Francisquito Creek and San Francisco Bay. This order implements the water quality objectives stated in that plan.
13. The Board has notified the discharger and interested agencies and persons of its intent to amend waste discharge requirements for the discharge, and has provided them with an opportunity to submit their written views and recommendations.
14. The Board in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, that this Board's Order No. 85-36 is amended as follows:

1. Effluent Limitations B.2., and B.3. are deleted.
2. This permit and attached revised Self-Monitoring Program will continue in effect for six months after completion of the stream study and its review and evaluation by the Executive Officer, or until April 30, 1990, whichever is earlier.

I, Roger B. James, Executive Officer do hereby certify the foregoing is a full true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on May 20, 1987.

A handwritten signature in cursive script that reads "Roger B. James".

ROGER B. JAMES  
Executive Officer

Attachment:  
Amended Self-Monitoring Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

Stanford Linear Accelerator Center

U. S. Department of Energy

Menlo Park, San Mateo County

NPDES NO. CA 0028398

ORDER NO. 87-44

CONSISTS OF

PART A

AND

PART B

## PART A

### A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No.73-16. This Self-Monitoring Program is issued in accordance with Section C.3 of Regional Board Order No. 87-xxx.

The principal purposes of a self-monitoring program by a waste discharger are: (1) to document compliance with waste discharge requirements and prohibitions established by the Board, (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of effluent standards of performance, pretreatment and toxicity standards, and other standards, and (4) to prepare water and wastewater quality inventories.

### B. SAMPLING AND ANALYTICAL METHODS

#### Sampling

Sample collection, storage, and analyses shall be performed according to most recent version of Standard Methods for the Analysis of Wastewater and in accordance with an approved sampling and analysis plan.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

### C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time; a composite sample is a
2. Receiving waters(s) refers to any water which actually or potentially receives wastewater from the discharger. In this case San Francisquito Creek and the San Francisco Bay are considered the receiving waters.
3. Standard observations refer to:
  - a. Receiving Waters
    - 1) Dicoloration and turbidity: description of color, source, and size of affected area.
    - 2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
    - 3) Evidence of beneficial use: presence of water associated wildlife.
    - 4) Flow rate.
    - 5) Weather conditions: wind direction and estimated velocity, total

precipitation during the previous five days and on the day of observation.

D. SCHEDULE OF SAMPLING, ANALYSIS, AND OBSERVATIONS

The discharger is required to perform sampling, analysis, and observations according to the schedule specified in Part B of this Self-Monitoring Program.

E. RECORDS TO BE MAINTAINED

Written reports shall be maintained by the discharger, and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board. Such records shall show the following for each sample:

1. Identity of sample and sample station number.
2. Name of person of sampling, and date and time of sampling.
3. Date and time that analyses are started and completed, and name off the personnel performing the analyses.
4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used. A reference to a specific section of a reference required in Part A Section B is satisfactory.
5. Calculation of results.
6. Results of analyses, and detection limits for each analyses.

F. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Written self-monitoring reports shall be filed by the 15th day of the month following the report period. In addition an annual report shall be filed as indicated in F.2. The reports shall be comprised of the following:

a. Letter of Transmittal

A letter transmitting the essential points in each self-monitoring report should accompany each report. Such a letter shall include a discussion of any requirement violations found during the last report period, and actions taken or planned for correcting the violations, such as, operation and/or facilities modifications. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the corespondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the

facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

- b. Each monitoring report shall include a compliance evaluation summary sheet.
  - c. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.
  - d. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.
    1. The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other than EPA approved methods or Standard Methods, are used the exact methodology must be submitted for review.
    2. In addition to the results of the analyses, laboratory quality control/quality assurance (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that is less than 80%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.
2. By January 31 of each year the discharger shall submit an annual report to the Regional Board covering the previous calendar year. This report shall contain:
- a. Tabular and graphical summaries of the monitoring data obtained during the previous year.
  - b. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements.
  - d. A written summary of the waste water and receiving water analyses indicating any change in the quality of the waste water or receiving water.

PART B

I. DESCRIPTION OF SAMPLING STATIONS AND SCHEDULE OF SAMPLING, ANALYSES, AND OBSERVATIONS

Analyses, observations, and examinations shall be performed according to the specifications shown in Table I.

A. EFFLUENT

<u>Station</u>	<u>Description</u>
E-001	At the point at which all waste tributary from the West Cooling Tower is present.
E-002	At the point at which all waste tributary from the East Cooling Tower is present.
E-003	At the point at which all wastes tributary from the cooling towers located at the Central Utility Building and the Beam Switchyard and Research Area are present.

B. RECEIVING WATER

<u>Station</u>	<u>Description</u>
C-R	At a point in San Francisquito Creek 50 feet upstream of the point where any cooling tower water is discharged.
C-1	At a point in San Francisquito Creek 50 feet downstream of the point where all cooling tower discharges are present.

II. MODIFICATION TO PART A

1. Omit the following paragraphs of Part A:

C.3, C.4, C.5.c, C.5.d, C.5.e, D.1, D.3.b, D.4, E.4 and F.2.

I, Roger B. James, Executive Officer, hereby certify the foregoing amended 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 waste discharge requirements established in Regional Board Order No. 87-44.
2. Has been ordered by the Regional Board on the date shown below and becomes effective immediately.

3. May be reviewed at any time upon written notice from either the Executive Officer or the discharger, and revisions will be ordered by the Executive Officer.



ROGER B. JAMES  
Executive Officer

JUNE 10, 1987

Date Ordered

Attachment:  
Table I

TABLE I  
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSES

SAMPLING STATIONS	E-001, E-002 and E-003			C-R & C-1				
	O	C-24	G	G				
Flow rate (gallons/day)		cont						
Settleable Matter (ml/l/hr)			W					
Oil & Grease (mg/l and lbs/day)			2/W	(2) W				
pH (units)		cont		2/W <sup>(2)</sup>				
Temperature (°F)		cont		(2) 2/W				
Toxicity (% survival)			M <sup>(3)</sup>					
All Applicable Standard Observations	W			W <sup>(2)</sup>				
Chlorine Residual & Dosage (mg/l and lbs/day)			(1) E					
Total Phosphate (as PO <sub>4</sub> ) (mg/l and lbs/day)			E	(2) 2/W				
Cooling Water Chemicals (mg/l and lbs/day)	2/M			(2) 2/M				
Total Suspended Solids (TSS) (mg/l & kg/d)			E	(2) 2/W				
Total Dissolved Solids (TDS) (mg/l & kg/d)			E	(2) 2/W				

LEGEND FOR TABLE

Type of Sample

G = grab sample  
C = composite sample - 24-hour  
O = observation

Frequency of Sampling

M = once each month  
2/W = twice a week  
E = each discharge  
W = weekly  
Q = quarterly

1. To be sampled after each instance of chlorine application directly from the cooling water and prior to recommencing discharge.
2. To be sampled on days coincident with effluent sampling.
3. To be performed using a salomoid or equally sensitive species in a static renewal bioassay.