

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 89-108

SITE CLEANUP REQUIREMENTS FOR:

INTEL LIVERMORE FABRICATION PLANT III
LIVERMORE, ALAMEDA COUNTY

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

1. Intel Corporation, hereinafter called the "discharger" operates a computer chip manufacturing facility at 450 North Mines Road, Livermore, Alameda County (the "Site").
2. Chemicals handled and stored on the Site included trichloroethene (TCE), xylene, and 1,1,2-trichloro - 2,2,1-trifluoroethane (Freon 113). In 1977, Intel phased out the use of TCE and replaced it with 1,1,1-trichloroethane (TCA). These volatile organic chemicals (VOC's) were stored in one-gallon bottles and 55-gallon drums in a basement solvent storage room from 1972 to 1980. The room was equipped with a spill containment sump for collection of any spilled VOC's. VOC's apparently leaked through this concrete sump into the groundwater.
3. The discharger initiated groundwater investigations at this Site in March 1982. The Board's involvement with this Site has been administrative since then. Meetings with Board staff began in May 1982 and have occurred periodically to the present. During this time, Board staff provided technical guidance on, and approval of, key investigative and cleanup actions. These included a report titled "Groundwater Investigation and Proposed Remedial Action Alternatives", which was submitted in August 1985, and another titled "Hydraulic Control Mitigation Program at Intel Livermore Fabrication Plant 3", which was submitted in March 1986. Implementation of the cleanup program was in place by July of 1986. The discharger is currently submitting yearly status reports.
4. The Site is located within the Mocho 1 groundwater subbasin about one-half mile from the subbasins western boundary. The geology underlying the Site consists of Quaternary alluvial deposits of low-to-moderate permeability overlying the generally more permeable, Plio-pleistocene deposits of the Livermore Formation. The boundary between the two units is ill-defined at depth though there is evidence in some boreholes of a possible soil horizon which may delineate the upper Livermore Formation. At the surface the alluvium

intersects low-lying hills composed of the Livermore Formation. These hills form the boundary between the Mocho 1 and Mocho 2 subbasins, southwest of the Site, and the Mocho 1 and Spring subbasins northeast of the Site. In the Mocho 1 subbasin, the thickness of the alluvium ranges from zero at the base of the hills to about 50 feet at the subbasin center, and the Livermore Formation exceeds 600 feet throughout.

5. Three water bearing zones have been encountered at the Site and are identified as the "A", "B", and "C" zones. The A zone extends from a depth of 5 to 29 feet, the B zone from a depth of 36 to 52 feet, and the C zone from a depth of 55 to 60 feet. These are maximum ranges, and thicknesses of the water-bearing zones are typically 10 to 15 feet or less. The more permeable units within these zones are horizontally discontinuous over most of the Site. Pump tests have revealed a significant hydraulic connection between the A and B zones, but none between zones B and C. Natural groundwater gradients and flow directions in the A and B water-bearing zones have been generally northward since investigations began.
6. Based on data from their own investigations and other site investigations in the area, the discharger speculates that the B and C zones lie within the Livermore Formation. According to a 1974 Department of Water Resources report, groundwater flow within the alluvium is restricted between the Mocho 1 and Mocho 2 subbasins, but flow between the basins is continuous within the Livermore Formation.
7. As a result of the groundwater investigation conducted in 1982, VOC's were detected in the groundwater adjacent to the former spill containment sump. The VOC's detected included TCE, 1,2-dichloroethene (1,2 DCE), xylene, and Freon 113. Initial concentrations ranged from 620 to approximately 3,000 parts per billion (ppb). Current concentrations range from not detectable to approximately 1,400 ppb. The discharger has installed 17 groundwater monitoring wells to characterize the Site hydrogeology and extent of VOC pollution. The VOC plume has been defined, and is limited to the upper aquifer zones. In the one well completed in the C zone, located near the former solvent sump, no VOC's have been detected. Data from several holes drilled into the B/C aquitard have shown that it extends throughout the Site, thus at this time, further monitoring of the C aquifer has been deemed unnecessary.
8. The dischargers remedial extraction system consists of two pumping wells (WM-3B and WM-13B), an extraction pit (EP) and one dewatering sump (S-2). The original sump for the solvent storage room, which is the suspected source, was removed in August 1983. Five cubic yards of soil surrounding the sump, beneath the basement floor, was converted into an EP. This system taps the A water-bearing zone and pumps groundwater at

approximately 34 gallons per day. Extraction wells WM-3B and 13B were activated in July 1986 to further remove VOC's in all 10 wells that showed initial concentrations. The additional monitoring wells have shown non-detectable to trace amounts of VOC's. Extracted groundwater is treated with granular activated carbon and discharged to the sanitary sewer under a City of Livermore permit.

9. Three sites where soil and/or groundwater pollution have been detected are located within a quarter mile up-gradient from the discharger, these include; 1) the former Industrial Ladder site, 2) Hexcel Corp., and 3) an abandoned disposal site. In addition to these known pollution sites, other possible up-gradient sources of pollution near the discharger include a group of industrial warehouses situated between Hexcel and the discharger.
10. VOC's have been detected in an up-gradient well (WM-14B) on the Site. Based on the groundwater gradient and monitoring data from this well, it appears that VOC's from an off-site source may be migrating onto the Site. The discharger recently installed (in addition to the original 17 wells) three B zone wells and two A zone wells up-gradient of WM-14B to further define the pollution in this area, and to verify that the pollution is from off-site sources. As of June 8, 1989, the results of water quality sampling from these wells is pending. The cleanup system described in Finding #8 is sufficient to capture the pollution detected in the vicinity of WM-14B.
11. The investigation and cleanup efforts to date have been sufficient to define the extent of VOC's, and to capture the groundwater containing VOC's. Remedial measures have been implemented and concentrations of VOC's are being reduced. Case closure will be considered by the Board at such time as the discharger has provided appropriate reports, including a risk assessment of residual VOC's, to demonstrate that cleanup is consistent with the Board's goals for water quality restoration and protection.
12. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986. The Basin Plan contains water quality objectives for non-tidal waters including Arroyo Mocho, Arroyo Seco, Arroyo Las Positas, Arroyo de la Laguna, and their tributaries and for Livermore-Amador Valley groundwaters.
13. The existing and potential beneficial uses of the groundwaters in the Livermore-Amador Valley groundwater basin and its subbasins include:

- a. municipal and domestic water supply
 - b. industrial supply
 - c. industrial service supply
 - d. agricultural water supply
14. The existing and potential beneficial uses of the surface waters in the Livermore-Amador Valley groundwater basin including Arroyo Mocho, Arroyo Seco, Arroyo Las Positas, Arroyo de la Laguna and their tributaries include:
- a. contact and non-contact water recreation
 - b. wildlife habitat
 - c. groundwater recharge.
 - d. fish and migration and spawning
15. The discharger has caused or permitted, and threatens to cause or permit, waste to be discharged or deposited where it is or probably will be discharged to waters of the State and creates or threatens to create a condition of pollution or nuisance.
16. This action is an order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to Section 15321 of the Resources Agency guidelines.
17. The Board has notified the discharger and interested agencies and persons of its intent under Section 13304 of the California Water Code to prescribe Site Cleanup Requirements for implementing remedial measures and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
18. The Board heard, and considered in a public meeting all comments pertaining to the Site Cleanup Requirements.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS

- 1. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.
- 2. Significant migration of pollutants through subsurface transport to waters of the State is prohibited.

3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of wastes, are prohibited.

B. SPECIFICATIONS

1. The treatment or disposal of soil or groundwater containing wastes shall not create a nuisance as defined in Section 13050 (m) of the California Water Code.
2. The discharger shall conduct activities reasonably necessary to monitor the current local hydrogeologic conditions, and the lateral and vertical extent of wastes present in the soil and groundwater at the Site. Should monitoring results show evidence of migration of wastes which originated at the Site, beyond the hydraulic capture zone, additional characterization will be required.
3. Any wells and/or soil borings penetrating the B/C Aquitard shall be constructed so as to minimize the potential for waste migration between the shallow zones and the C zone.
4. Any wells identified as potential conduits for the migration of wastes shall be properly abandoned, in compliance with applicable and appropriate guidance and regulations. A detailed workplan shall be submitted for review and approval, which describes the proposed methods of abandonment for each well identified.

C. PROVISIONS

1. The discharger shall review its existing groundwater monitoring program and shall propose within 60 days of the adoption of the Order, modifications as necessary to comply with this Order. This monitoring program shall be acceptable to the Board's Executive Officer. The proposed monitoring program shall include, but need not be limited to, the identification/location of sampling wells, the frequency of water level and water quality sampling, and the identification of methods chosen for sample analysis.
2. On a semi-annual basis, the discharger shall submit a technical report one month following the end of each 6-month period, commencing with a report for the period ending June 30, 1989 and due July 31, 1989. These technical reports shall include, but need not be limited to, the results of groundwater quality sampling of on-site wells, updated water table and potentiometric surface maps for all affected water bearing zones, and

any updated cross-sectional geologic maps describing the hydrogeological setting, and appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells, and identifying adjacent facilities and structures (including well locations at adjacent sites). The Board urges that data collection be coordinated with relevant studies at Hexcel Corp. and at the abandoned disposal site.

3. On an annual basis, for the previous calendar year, by the end of the second month following the calendar year, the discharger shall submit an annual technical report acceptable to the Executive Officer which shall document and evaluate the progress of remedial actions. This report shall contain, but not be limited to, information on the number of gallons of groundwater pumped and treated, where the waters were discharged, changes in groundwater quality, changes in the monitoring network, problems encountered in the past year with implemented and/or proposed solutions, and projected remedial actions anticipated for the coming year.
4. All hydrogeological reports, documents, plans, and specifications, shall be certified by one of the following: a registered geologist, registered pursuant to Section 7850 of the Business and Professions Code; a certified engineering geologist, certified pursuant to Section 7842 of the Business and Professions Code; or a civil engineer registered pursuant to Section 6762 of the Business and Professions Code.
5. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order for reasons beyond its reasonable control, the discharger shall promptly notify the Executive Officer and the Board may consider revision to this Order extending the time for compliance for a reasonable period.
6. All samples shall be analyzed by State certified laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.
7. The discharger shall maintain in good working order, and operate, as efficiently as reasonably possible, any facility or control system installed to achieve compliance with the requirements of this Order.
8. 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. Alameda County Health Department
 - b. City of Livermore
 - c. State Department of Health Services/TSCD
9. The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:
- a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required 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 pursuant to this Order.
10. The discharger shall file a report on any changes in Site occupancy and ownership associated with the facility described in this Order.
11. If after the effective date of this Order, any hazardous substance is newly discharged in or on any waters of the State, or newly discharged or deposited where it is, or probably will be discharged in or on any waters of the State, the discharger shall report such discharge to this Regional Board, at (415) 464-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-business hours. A written report shall be filed with the Regional Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of the incident, cause of spill, Spill Prevention, Control, and Countermeasures Plan (SPCC) in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.
12. The Board will review this Order periodically and revise the requirements as necessary to effectuate the

intent of this Order in a prompt and reasonable manner.

I, Steven R. Ritchie, 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 June 21, 1989.



Steven R. Ritchie
Executive Officer