



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105

MEMORANDUM

**SUBJECT:** Five-Year Review for the Intel Santa Clara III Superfund Site, Santa Clara, CA  
CAT000612184

**FROM:** Tom Kremer, Superfund Policy Advisor  
Site Cleanup Branch

*TA Kremer 8/14/d*

**THRU:** John Kemmerer, Chief  
Site Cleanup Branch

**TO:** Keith Takata, Director  
Superfund Division

I. INTRODUCTION

Attached, please find a copy of the first Five-Year Review for the subject Superfund Site prepared by the California Regional Water Quality Control Board, San Francisco Bay Region, along with two messages which clarify and update relevant information. EPA has reviewed their Five-Year Review and adopts their recommendations as written. The Board's Five-Year Review is summarized below.

Because contaminant levels will allow for unlimited use and unrestricted exposure upon achieving ROD cleanup goals, this Five-Year Review is not required by CERCLA (Section 121©) or by Section 300.430(f)(4)(ii) of the NCP. However, because cleanup will take five years or more to attain, this Five-Year Review must be conducted as a matter of Agency policy (Comprehensive Five-Year Review Guidance, OSWER 9355.7-03B-P, June, 2001).

II. FIVE-YEAR REVIEW SUMMARY

The site is located at 2880 Northwestern Parkway, Santa Clara, CA. Investigations beginning in 1982 indicated that groundwater was contaminated by VOCs, primarily TCE, 1,1 - DCE and DCA. The source of the contamination was never positively identified. Potential sources were evaluated and eliminated. Groundwater extraction began at the site in 1985. EPA listed the site on the National Priority List in 1986.

The ROD set groundwater cleanup standards for the site and required groundwater extraction and treatment with discharge of treated water to the storm drain, groundwater monitoring, a project to evaluate pulsed pumping of groundwater and institutional controls in the form of deed restrictions to prevent installation of wells or other subsurface activities until

cleanup standards are achieved.

Intel has implemented the required remedial actions. Groundwater systems have been effective in containing the plume and reducing concentrations of contaminants in groundwater. Pulsed pumping trials began in 1991 but failed to improve contaminant extraction rates. Because the extraction system was no longer removing significant contaminant mass or efficiently further reducing contaminant levels, the extraction system was shut off in 1993 with Regional Board approval. Only TCE remains above the cleanup standards. Since extraction ceased, contamination has remained contained and levels have continued to gradually decline, with some minor fluctuations. While there was a slight increase in TCE level at the leading edge of the plume, wells designated by the Regional board as "trigger" wells have remained non-detect. If contamination is detected at the trigger wells, Intel is required to resume groundwater extraction. The most recent (April 2001) sampling showed a maximum TCE level in one well at 8.4 ppb, with all other monitoring wells below the cleanup standard of 5 ppb. Institutional controls remain in place. No exposure to contaminated groundwater is occurring or expected. The site was most recently inspected by Regional Board staff in April, 2001. Based on the trend observed in groundwater sampling results, it appears that cleanup standards may be achieved within a reasonable time without further active remediation, although projecting a full compliance date remains technically uncertain.

### III CONCLUSION

I certify that the remedy selected for this site remains protective of human health and the environment. Based on the expected continuing presence of contamination at this site at levels which preclude unlimited use and unrestricted exposure, the next Five-Year Review will be written within five years from the signature date of this review. As the groundwater pump and treat system has remained shut down for some eight years now, it may be appropriate to revise the Record of Decision to formally change the remedy to Natural Attenuation. EPA intends to discuss such a change with Regional Board staff.

Approved by: Keith Takata — Date: 8-15-01  
Keith Takata, Director  
Superfund Division

Attachments: California Regional Water Quality Control Board 5-Year Review  
Message, D. Barr to T. Kremer, 6/8/2001  
Message, M. Stallard to T. Kremer, 7/5/2001

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

**Toxics Cleanup Division**

**Five-Year Review (Type I)**

**Intel Santa Clara 3  
2880 Northwestern Parkway  
Santa Clara, California**

**I. INTRODUCTION**

**Authority Statement. Purpose.** The California Regional Water Quality Control Board, San Francisco Bay Region, conducted this review pursuant to the Multi-Site Cooperative Agreement (MSCA) between the U.S. EPA Region IX and the Regional Board, and the U.S. EPA Supplemental Five-Year Review Guidance (OSWER Directive 9355.7-02A) of July 26, 1994. It is a policy review. The purpose of a five-year review is to ensure that a remedial action remains protective of public health and the environment and is functioning as designed. This document will become a part of the Site File (No. 2189.8119). This review (Type I) is applicable to a site at which response is ongoing.

**Site Characteristics:**

**Location.** The Santa Clara 3 (SC3) Facility is located on Northwestern Parkway where it intersects Central Expressway in the City of Santa Clara. Central Expressway bounds the site on the north. The predominant groundwater flow direction is towards the northeast, towards San Francisco Bay. The underlying sediments are a heterogeneous alluvial material consisting of sands and gravels interbedded with silts and clays. The regional groundwater basin in this area can be divided into two general zones, the upper zone and the lower zone. The lower zone consists of an extensive deep regional aquifer found below about 200 to 250 feet. This deep regional aquifer supplies 50 percent of the municipal water supply to local communities. The upper zone consists of a complex, heterogeneous system of water bearing zones separated by aquitards which may be leaky or very tight. The upper zone extends to within 10 - 15 feet of the surface. The lower zone is separated from the upper zone by an extensive regional aquitard which ranges from 20 feet to over 100 feet in thickness. Groundwater pollution at the SC3 site is confined to the shallowest zone of the upper aquifer zone.

Two shallow aquifer zones have been investigated at the SC3 site. These shallow aquifer zones are subdivisions of the upper aquifer zone described above. The shallowest, identified as the A aquifer zone (A zone), occurs at about 10-25 feet below ground surface (BGS). The next encountered water bearing zone is identified as the B aquifer zone (B zone). The B zone lies between about 30 and 45 feet BGS. The two zones are separated by a 4 to 10 foot thick

aquitard composed of clayey deposits. There could be some hydraulic connection between the two zones due to the discontinuous nature of the sediment types. Contamination is confined to the A zone. Groundwater in the A and B zones flows toward the northeast. The aquifer sediments are very heterogeneous, and aquifer characteristics in the A zone can vary markedly across the site.

**Source of Contamination.** The SC3 Facility was built in 1975. The source of contamination was never positively identified. Three potential sources were proposed, and to the extent practical, evaluated. The potential sources were: 1) leaks from the acid waste neutralization area, 2) spills near the above ground solvent storage facility, and 3) solvent spills associated with cleaning out pipes put in place during construction of the facility. Data collected during the evaluation of these sources indicates that it is unlikely that a source currently exists which could contribute to the existing VOC pollution in groundwater.

**Maximum Contamination.** The historical maximum VOC concentrations in the groundwater were TCE - 490 ug/l, 1,1,1-TCA - 810 ug/l, 1,1-DCE - 84 ug/l, 1,1-DCA - 8.2 ug/l, 1,2 DCA - 16 ug/l, and Freon 113 - 1300 ug/l. Currently, only TCE is above the cleanup level. The current maximum TCE concentration in groundwater is less than 50 ug/l.

## II. DISCUSSION OF REMEDIAL OBJECTIVES

### Remedial Actions:

**Groundwater.** Groundwater extraction began at the site in February 1985 with the installation of two A zone extraction wells. The discharger did a feasibility study which evaluated different remedial action alternatives. A complete description of the alternatives is contained in the February 1990 Remedial Investigation/Feasibility study report. The Regional Board adopted Site Cleanup Requirements (SCRs), Order No. 90-105, for the site in July 1990. The alternative that was selected in the SCRs as the final cleanup plan consisted of: 1) a deed restriction prohibiting the use of shallow groundwater, 2) groundwater monitoring, 3) groundwater pumping from the A zone from two existing extraction wells and from one additional well, 4) treatment of extracted groundwater with activated carbon and discharge of the treated groundwater to the storm drain under an NPDES permit, 5) proposal and implementation of a pulsed pumping demonstration project.

The SCRs set cleanup standards at California proposed or adopted Maximum Contaminant Levels (MCLs), EPA MCLs, California Action

Levels, or levels based on a risk assessment. These cleanup levels are:

Chemical	Cleanup Standard (ug/l)
Chloroform	100
1,1-dichloroethane (1,1-DCA)	5
cis-1,2-dichloroethene (cis-1,2-DCE)	6
trans-1,2-dichloroethene (trans-1,2-DCE)	10
1,1-dichloroethene (1,1-DCE)	4
Freon 113	1,200
methylene chloride	40
tetrachloroethene	5
toluene	40
1,1,1-trichloroethane (1,1,1-TCA)	200
1,1,2-trichloroethane (1,1,2-TCA)	32
trichloroethene (TCE)	5

Currently, only TCE exceeds the cleanup standards. TCE concentrations in the area of highest contamination are about 45 ug/l.

**Soils.** No areas of excess soil contamination were identified and hence no soil remediation was done.

### III. APPROPRIATE AND RELEVANT APPLICABLE REQUIREMENTS (ARARs) REVIEW

Board staff are not aware of any changes to ARARs for the compounds present at the site.

### IV. EFFECTIVENESS EVALUATION

**Discharger's Evaluation.** The 5-year status report is the discharger's evaluation of the selected final cleanup remedy and cleanup costs. This report also contains an evaluation by the

discharger, if drinking water standards have not been achieved, addressing whether it is technically feasible to achieve drinking water quality on-site.

**Effectiveness of Site Remediation.** Groundwater contamination has been fully defined. Since groundwater extraction began in 1985, nearly 45 million gallons of groundwater have been extracted and treated, and approximately 38 pounds of VOCs have been removed (28 pounds of TCE and 10 pounds of Freon 113). About 40 million gallons of groundwater were extracted from February 1985 through April 1991. In April 1991 the pulsed pumping trials began. Approximately 4.6 million gallons of groundwater were extracted during the pulsed pumping trials. VOC removal rates had been declining steadily at the site and there was little difference between the removal rates for pulsed pumping versus continuous extraction. The VOC removal rate at the site had apparently reached asymptotic levels. Currently the only VOC above the cleanup standards is TCE which is present at about 45 ug/l.

The cleanup plan has worked in that groundwater extraction has reduced the VOC concentrations in groundwater at the site and has contained the plume onsite. However, due to the limitations of groundwater extraction as a means of removing VOCs from groundwater, cleanup standards were not achieved. The extraction system was shut off because groundwater extraction was no longer removing significant VOC mass. Since the extraction system was shut off in 1993, there has been a gradual decrease in TCE concentrations in most monitoring wells at the site. There has been a slight increase in the TCE concentration at the leading edge of the plume. This is probably the result of diffusion of TCE from the center of the plume towards the leading edge. Declines in TCE concentrations have been limited. The discharger attributes this to the processes that move TCE into the groundwater (diffusion from less permeable sediments and desorption from sediments) almost keeping pace with the processes that remove TCE from the groundwater (advection, dispersion, diffusion into less permeable sediments, degradation, and volatilization). Eventually, the TCE concentration should drop below the cleanup level of 5 ug/l. The discharger estimates that 13 years will be required to reach the cleanup goal. This estimate is based on the rate of decline over the last seven years since the groundwater extraction system has been off.

**Cost Evaluation.** In the last five year review the discharger estimated costs for the period 1995-2000. The discharger projected costs for that period of \$172,513. Actual costs were \$284,000. The difference is primarily the costs that were incurred as part of the dischargers attempts to see if the site could be delisted from the U.S. Environmental Protection Agency's

National Priority List (NPL) (superfund list). The site was not delisted and remains on the NPL.

Projected costs for the next five years are \$131,483.

#### **V. SUMMARY OF SITE VISIT**

The most recent site visit occurred in April 2001, when a compliance inspection was conducted by a member of the Board's Staff. The groundwater extraction and treatment system was not operating. The system had been shut down since 1993 as had been agreed to by Board Staff. The inspection did not reveal any violations, and the site was found to be in full compliance.

#### **VI. AREAS OF NONCOMPLIANCE**

The discharger has fully implemented the approved remedial action plan, consistent with the remedial objectives, and is in compliance with all current Board Orders.

#### **VII. RECOMMENDATIONS**

In general Board Staff agrees with the discharger's characterization of the site in the 5-year Review. Staff recommends continuing to allow the discharger to leave the groundwater extraction and treatment system shut down. The pollutant plume appears to be stable and contained onsite. TCE concentrations continue to slowly decrease. The discharger has requested that groundwater monitoring at the site be reduced from semi-annually to annually. Based on the past five years of monitoring data, Board Staff agrees that annual monitoring is acceptable at this site based on the demonstrated stability of the pollutant plume.

#### **VIII. STATEMENT OF PROTECTIVENESS**

We certify that the remedy selected for this site remains protective of human health and the environment.

#### **IX. NEXT FIVE-YEAR REVIEW**

The next 5-year review will be conducted by December 2005.



David Barr  
<DB@rb2.swrcb.ca.go  
v>

To: Tom Kremer/R9/USEPA/US@EPA  
cc:  
Subject: Re: Intel SC3

06/08/2001 04:54 PM

Tom,

In answer to your questions:

1. A deed restriction is in place that prohibits the use of groundwater from the shallow aquifer and requires notification of the Regional Board and Regional Board approval before drilling any additional wells on the property. There is a requirement for notification of workers who may be involved in excavations that could expose them to contaminants. Intel also has a health and safety plan that addresses potential exposure to workers.

2. The movement I was talking about is subtle at best. My analysis of the monitoring data was that concentrations in the source area had decreased while concentrations at the downgradient edge had increased slightly. The difference is small. It falls within what could be said was attributable to analytical variability. There was what looked like a trend, but the latest sampling results buck the trend. This shows the problem with trying to spot trends when the differences are small. We're talking about a range of around 5 - 16 ppb. Most of the initial change occurred within a year after extraction stopped. Things have been pretty stable since then considering the built in variability of the analytical methods. The current monitoring program is adequate to detect plume movement.

The contingency plan for resuming groundwater pumping is that if VOCs are detected at the downgradient trigger wells (currently non detect), the extraction wells will be turned on.

>>> <Kremer.Tom@epamail.epa.gov> 05/17/01 08:10AM >>>

David, I've reviewed the 5 Year Report on Intel SC3 and have 2 areas of concern:

1. Can you confirm what institutional controls (re land and/or groundwater use) are in place?
2. Re the TCE concentration slightly increasing at the leading edge of the plume:

What are the current and previous concentrations at the leading edge?

What is the contingency plan for resuming pumping of groundwater?

What if any evidence is there of movement of the leading edge of the plume? Is the current monitoring program adequate to detect plume movement?

Thanks,

Tom Kremer (415) 744-2257



Mary Stallard  
<MLS@weiss.com>  
07/05/2001 11:46 AM

To: Tom Kremer/R9/USEPA/US@EPA  
cc:  
Subject: latest Intel SC3 data

Tom:

David Barr at the RWQCB informs me you are currently reviewing the Five-Year Review for the above-referenced site. To provide you with the latest ground water results for the site, the water level and VOC data are included in the attached Excel workbook. The most recent (April 2001) VOC results show well SC3-1 and SC3-3 TCE concentrations dropping down to levels consistent with the declining trend we were seeing up until about 1 ½ years ago, and well SC3-7A dropping way down to 8.4 ppb from a previous low of 23 ppb. All other wells/VOCs remain non-detectable.

Overall, the site data collected since the pump-and-treat system was turned off eight years ago show a declining TCE concentration trend, with minor fluctuations along the way. The minor fluctuations do not appear to be tied to water level changes or flow direction variations, and most likely reflect sampling/analytical variability. Not pumping still appears to be as effective as pumping for both plume control and plume reduction at this site. As you know, Intel wants to leave the pump-and-treat system off and continue monitoring/reporting (reducing the frequency from semi-annual to annual). Please call me at 510-450-6132 if you wish to discuss.

Thanks,  
Mary Stallard



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