

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

ORDER No: 90-120

SITE CLEANUP REQUIREMENTS FOR:

SOLVENT SERVICE INC.
1021 BERRYESSA ROAD
SAN JOSE
SANTA CLARA COUNTY

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

1. Location and Responsible Party Solvent Service Inc. (SSI), hereinafter called the discharger, owns and operates a treatment, storage, and disposal facility at 1021 Berryessa Road, San Jose, Santa Clara County for the purpose of waste treatment and recycling. The site occupies 3.2 acres and is located approximately 10 miles southeast of San Francisco Bay and approximately 1/3 mile southwest of the confluence of Upper Penitencia Creek and Coyote Creek. The site is near the intersection of Berryessa Road and the Bayshore Freeway (see attached map). This is an area of industrial and commercial development and SSI has been in operation at this location since 1973. Prior use of the area was for agriculture.

Pursuant to Health and Safety Code Sections 25356.1 (c) and (d), the discharger is the only identified responsible party associated with the release of non-petroleum contaminants to the subsurface at this location and has accepted responsibility for the cleanup of the site solely as it relates to non-petroleum related contaminants. The discharger has not assumed responsibility for the petroleum related contaminants that form a plume along the site's southwestern property line. Further the discharger has not assumed responsibility for the VOCs, if any, associated with the groundwater plume in this area.

2. Chemicals Detected Volatile organic chemicals (VOCs) were first detected in groundwater in 1983 in the vicinity of underground solvent storage tanks, the spill control facilities, the barrel storage area and the solvent tank truck unloading zone. The solvents detected included xylene, acetone, 2-butanone, 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA) and cis-1,2-dichloroethylene (cis-1,2-DCE). Some of the chemicals detected most frequently and in the highest concentrations based on analytical results from the January 1987 - July 1989 period (see attached map) show the presence in onsite groundwater of: acetone at 19,000,000

parts per billion (ppb), trichloroethylene (TCE) at 150,000 ppb, 1,1,1-TCA at 100,000 ppb, and cis-1,2-DCE at 67,000 ppb.

A recent onsite sampling (December 1989) also detected levels of inorganics in groundwater above the maximum contaminant level (MCL). Arsenic was detected at a maximum level of 119 ppb and zinc at a maximum concentration of 25,400 ppb. Other inorganics detected were below the established MCLs. Additional groundwater data was collected February and March 1990 for inorganic analysis. The results of this data, as discussed in the staff report, indicate that most inorganics are not present at concentrations that are of concern.

VOCs and inorganics are identified as either carcinogenic (cancer-causing) or noncarcinogenic (not cancer-causing). The VOCs found in the subsurface at this site include several compounds which have been included by the EPA in one of the categories of human carcinogens as follows: (1) known human carcinogen (Class A) - benzene, vinyl chloride, and arsenic; (2) probable human carcinogen (Class B1 and B2) - chloroform, 1,4-dichlorobenzene (1,4-DCB), TCE, tetrachloroethylene (PCE), 1,1-DCA and methylene chloride; (3) possible human carcinogen (Class C) - 1,1-dichloroethylene (1,1-DCE), and isophorone.

3. Lead Agency Pursuant to the South Bay Multi-Site Cooperative Agreement (MSCA) and the South Bay Ground Water Contamination Enforcement Agreement, entered into on May 2, 1985 (as subsequently amended) by the Regional Board, EPA and DHS, the Regional Board has been acting as the lead regulatory agency. The Regional Board will continue to regulate the discharger's remediation and administer enforcement actions in accordance with CERCLA as amended by SARA.
4. NPL and Orders The site has been proposed for inclusion on the National Priorities List (NPL) and has been regulated by Regional Board Orders, as indicated herein:
 - a. March 1986 Regional Board adopted Waste Discharge Requirements.
 - b. April 1988 Regional Board adopted revised Site Cleanup Requirements.
 - c. June 1988 Site proposed for the NPL.
 - d. April 1989 Regional Board adopted Revised Site Cleanup Requirements.
5. Adjacent Site Chevron Inc. (Chevron) owns and operates a fuel distribution terminal at 1020 Berryessa Road, San Jose, Santa Clara County. This facility provides hydrocarbon products for

the South Bay area. Subsurface investigations at this site have revealed the presence of benzene, toluene, xylene, and ethylbenzene (BTX&E) in soil and groundwater beneath the site including separate phase hydrocarbon product (HCs). The occurrence of separate phase hydrocarbon has been documented in the subsurface at the Chevron facility since at least 1984.

Dissolved and separate-phase HCs, which appear to have migrated from Chevron, were detected by SSI during investigations along the southwest SSI site boundary, on the neighboring Jackson-Shaw property, in 1988. In addition, low levels of VOCs have been detected in some wells in this area. Based on current data collected by SSI and Chevron the HC plume apparently continues beyond the SSI site to the northwest.

6. Hydrogeology SSI is in the Santa Clara Valley which is a sedimentary basin filled with unconsolidated heterogeneous alluvial material, interspersed with layers of marine clay. The alluvium is a mixture of permeable, water-bearing sands and gravels, interbedded with less permeable silts and clays. The soils are extremely variable over short distances, both horizontally and vertically.

SSI is underlain by three distinct hydrogeologic units. Aquifer A is an unconfined, low permeability aquifer that occurs from the ground surface to a depth of 20 to 25 feet (50 to 75 feet MSL). The A aquifer is currently locally dewatered. It consists of sandy silts, clay, and a thin, continuous poorly sorted sand layer at its base. Aquifer A is underlain by a clay layer which is typically 6 to 16 feet in thickness. This clay layer may be as thick as 60 feet in some locations on site. The clay layer may impede vertical downward migration of groundwater. Ancestral stream channel deposits have also been identified along the southwestern margin of the site in the A aquifer.

Zone B/C consists of lenses of sands, silts, and clays. It extends to 50 feet below the upper clay layer (0 feet MSL) and appears to be laterally continuous across the site. Water levels in this zone are 1 to 2 feet lower than Aquifer A and little vertical leakage is believed to be occurring. The zone is probably not representative of an aquifer and will be referred to as a zone not an aquifer in this Order. A clay layer, 2 to 10 feet thick, occurs at the base of Zone B/C.

The third zone, Aquifer D/E, consists of an upper member thick sequence of silts and sands underlain by a thin layer - and a lower member - two sand layers separated by to 5 feet thick silt layer. A clay layer occurs at the base of this zone, 150 feet below the ground surface (-75 feet MSL). Zone D/E is believed to be very permeable and has been



historically for domestic water supply.

7. Interim Remedial Actions Three underground storage tanks used for solvent storage, spill control, and waste solvent storage, were removed in or about 1982. Adjacent soil was also removed, however this is not well documented. The highest levels of pollutants in soil remain beneath the existing concrete pad that presently underlies the major treatment and storage area.

The solvent truck unloading area, the barrel storage area, the spill containment facility, and other treatment and storage areas were gradually paved with concrete by 1984. Currently, most of the treatment and storage area is paved. Additional interim remedial measures have included the placement of berms in the treatment and storage area and changing operational procedures to minimize risk of additional contamination.

SSI currently operates a containment/extraction system for the groundwater plume. The system includes 5 recovery wells and 3 extraction trenches. Extracted groundwater is being treated by a biological treatment system, air stripping, and carbon adsorption. Treated water is used in the SSI cooling towers and is subsequently discharged into the sanitary sewer under authorization from the sanitary district. This system appears to be effective in containing migration of pollutants originating onsite and of removing pollutants from the extracted groundwater. However, some pollutants have migrated to and slightly beyond the property boundaries. These pollutants are believed to have migrated beyond the location of the trenches prior to installation of the trenches.

SSI has also been operating a steam injection/vacuum extraction system since December 1989 as an interim remedial action, for onsite in-situ soil remediation, to address the highly contaminated soils that remain in place beneath the concrete pad.

8. Remedial Investigation/Feasibility Study and Remedial Action Plan The discharger has submitted a Remedial Investigation and Feasibility Study (RI/FS) Report which satisfies the requirements of Regional Board Order No. 89-51, Site Cleanup Requirements, adopted by the Board April 19, 1989. The FS report includes a detailed screening of five alternatives for soil remediation and eight alternative groundwater remedial actions, a baseline risk assessment, and a proposed final remedial action plan (RAP).

The RI/FS Report, originally dated October 17, 1989, was revised and updated and submitted to the Board on January 19, 1990. Additional revisions to RI/FS were required and a the second revised RI/FS was submitted to the Board on May 30, 1990. The final draft RI/FS Report and its revisions have been

available for public review since May 31, 1990.

The proposed final Remedial Action Plan (RAP) was received by Board staff May 31, 1990. A proposed final cleanup plan was presented to the Regional Board for informational purposes at the Board Meeting of June 20, 1990. A Public Meeting to obtain comments on and public input to the proposed final RAP is scheduled for the San Jose City Hall on June 27, 1990.

The RI/FS identifies Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considereds (TBCs) according to CERCLA guidance documents. Appropriate ARARs/TBCs for this site are listed and discussed in Finding 11, Final Cleanup Standards.

The RI/FS also summarizes the potential human health and environmental effects that may result from the presence of chemicals in the soil and groundwater as presented in the Baseline Public Health Evaluation prepared by ICF/Clement under contract to the Board. The effects of exposure on the environment were determined to be negligible. Impacts upon human health were determined to be unlikely under current use conditions.

The RI/FS has evaluated no-action alternatives for soil and groundwater, four (4) alternative soil cleanup plans, and (7) alternative groundwater cleanup plans. From among these alternatives that were selected for detailed screening the Remedial Action Plan (RAP) submitted by the discharger recommends in-situ steam injection/vacuum extraction (SIVE) for soil remediation and groundwater extraction and treatment as a final remedial action for groundwater. These elements have been combined with eventual "capping" of the site by asphalt and continued groundwater monitoring in the final RAP.

The Board concludes that SIVE for the soil remediation, and extraction and treatment of groundwater can both remove VOCs from the target media. Extraction and treatment of groundwater will take a long period of time to achieve cleanup standards. However, in conjunction with SIVE, for soil remediation, the VOC removal will be accelerated. The Board further concludes that additional investigative work is necessary to appropriately assess the potential effects of inorganic chemical concentrations and to establish naturally occurring concentrations or "background" and to install remedial actions for inorganic chemical concentrations in soil and groundwater to "background", if necessary.

The groundwater extraction/treatment system has been installed at an estimated capital cost of \$399,000. The annual cost of operation and maintenance is estimated to be \$884,000. The SIVE system is currently in place onsite, the estimated capital

expenditure for this installation is \$549,000. The annual operation and maintenance cost for this alternative is estimated to be \$288,000. If it is determined that it is necessary to operate the SIVE system in vacuum mode to achieve soil cleanup standards operating and maintenance cost will be reduced to \$250,000 annually.

9. Final Cleanup Plan Based primarily on information submitted by the discharger in the RI/FS Report, RAP, and review/comment, this Order provides for a final cleanup plan that includes:

- a. Groundwater Containment/Removal - Continued groundwater extraction from the A aquifer will be required until chemical concentrations are reduced to levels that will meet ARARs and are protective of human health. The rationale for these standards are detailed in Finding 10 and the actual standards are listed in Finding 11. As with any technical project there is uncertainty in the attainment of these standards. However, groundwater extraction is a proven technology for the removal of mass of contaminants from groundwater and it has been demonstrated that the system in place will contain polluted groundwater onsite.

Contaminated groundwater from the offsite portion of the contaminant plume may be "pulled" back and recovered by the extraction trenches, however this has not been demonstrated by current data. Therefore extraction from A aquifer offsite may be required, however this will be delayed until levels of pollution in onsite soil and groundwater are reduced to specified limits acceptable to the Executive Officer. The purpose of the delay in the startup of off-site extraction is to prevent off-site migration from being accelerated by off-site pumping. Continued monitoring of groundwater in the A aquifer, B/C zone, and D/E aquifer will be required and extraction from the B/C zone may also be required.

Evaluation of groundwater extraction from the offsite portions of the A aquifer, B/C zone, and D/E aquifer will also be required

- b. Soil Cleanup - SSI will operate a steam injection vacuum extraction system (SIVE) to remediate the onsite soil contamination. Vacuum extraction is a proven technology for soil remediation and is widely used at other South Bay sites. The enhancement of vacuum extraction has been demonstrated in an onsite pilot project that indicated that this technology would reduce the levels of VOCs in soil by up to two orders of

magnitude in coarse grained sediments in a short time period. The advantage that the SIVE system provides over vacuum extraction is reduced time to cleanup, however the system is designed to allow continued operation in the vacuum mode should steam enhancement not provide any advantage.

Cleanup standards for polluted soils are less than one part per million (1 ppm) total VOCs and semi-volatile organic chemicals (SOCs). The system will be operated until these levels of soil pollution are attained. A different soil cleanup level for VOCs may be acceptable if: (1) the Executive Officer determines that higher levels of total VOCs can remain in soils without adversely affecting groundwater resources now or when groundwater extraction is terminated, or (2) the Executive Officer and EPA determine that it is infeasible to achieve the cleanup standard and that public health and the environment will be protected. Information obtained from tests conducted on source area soils will be considered in determining if a different soil cleanup level should be established. Based on current data summarized in the Baseline Public Health Evaluation, inorganics in the shallow soil will not constitute a human health hazard through direct contact with the soil. Since these inorganics are not very mobile, migration into groundwater is considered to be unlikely. Therefore no cleanup standards will be proposed for soil inorganics.

c. Containment - In addition to the above elements the proposed cleanup plan will include the capping of the site with asphalt. This will eliminate potential fugitive dust emissions and will limit infiltration of surface water into the subsurface through any contaminated soil during soil remediation and will limit leaching of any soil contamination that may remain following cleanup. In addition, the capping of the site may improve the efficiency of the SIVE system. This portion of the proposed plan is dependent upon City approval for construction.

d. Water Reuse - It is the goal of this plan to continue the 100% reclamation and/or reuse of the groundwater that is extracted and treated. This standard has been met during the operation of the interim actions and is contained in part of the proposed cleanup plan.

e. Monitoring - Monitoring of groundwater will continue during the operation of the remedial systems. Long-term monitoring beyond projected cleanup times may be required if stability of cleanup levels cannot be demonstrated.



one year after standards are achieved.

- f. Institutional Controls - Deed restrictions to prevent the development of the SSI property in a manner that might allow residential development or the use of onsite groundwater prior to the attainment of cleanup standards will be required as a protective measure.
10. Hazard Indices and Cancer Risk Numbers The Hazard Index (HI) is the method used by the Board to assess the public health risk associated with the presence of multiple, non-carcinogenic chemicals. The health risk related to exposure to carcinogens is evaluated through the use of excess cancer risk numbers (ECRN). The use of the HI as a ratio between CDI and RfD for noncarcinogens and estimation of increased population cancer risk for carcinogens is detailed in the EPA Risk Assessment Guidance (July 1989).

The calculation of excess cancer risk numbers (ECRN), the product of a cancer slope or cancer potency factor and the chronic daily intake ($q^* \times \text{CDI}$), is the method used to evaluate the potential risk of increased cancer incidence due to exposure to carcinogenic chemicals at this site. There is no "zero-risk" level associated with the threat of exposure to carcinogens. The total ECRN for a group of chemicals is calculated by summing each individual chemical's ECRN. A number of assumptions have been made in the derivation of these values, many of which are intentional overestimates of exposure and/or toxicity. The actual incidence of cancer is likely to be lower than these estimates and may even be zero.

These tools were used by Board staff to determine appropriate, health protective, cleanup standards for soil and groundwater. An HI of less than 1 would indicate that no adverse health effects would be expected from exposure to the noncarcinogenic chemicals considered. An ECRN in the 10^{-4} to 10^{-6} range is required for Superfund sites under the National Contingency Plan (NCP) adopted March 9, 1990. These are the minimum goals for cleanup standards at the SSI site. The calculations for this site are detailed in the attached Staff Report.

The HI and total ECRN are much greater than what would be considered an acceptable risk due to the presence of the chemicals identified in useable groundwater and in soil for the no-action alternative. The chemical concentrations in groundwater can be further reduced, and may be reduced to, or below, drinking water applicable, relevant, appropriate requirements and other non-codified regulatory guidelines to be considered (ARARs/TBCs) by remediation. The chemical concentrations in soil can be further reduced by in-situ remediation to achieve background levels and to restore groundwater to its original use-suitability within a

reasonable time frame; and, if required, to provide an extra margin of protection for human health and the environment. Therefore, appropriate cleanup standards must be established.

The exposure point concentration, HI, and total ECRN result from a hypothetical scenario, the possibility that water from this site might be consumed as drinking water. These numbers are intended to be used as tools to evaluate the severity of risk or hazard that a site might represent. While the water is currently not used as drinking water the associated residual chemical concentrations expected to be present in the future and the potential health hazard presented by current concentrations are sufficient cause to pursue a remedial alternative other than no-further-action. It is the intent of the actions planned for this site to preserve the potential beneficial uses of the water, which include use as a source of drinking water, and to eliminate any possible concern of migration of chemicals into drinking water aquifers.

Using the HI-less-than-one and the 10^{-6} ECRN concentrations to establish cleanup standards would attempt to approximate primary cleanup objectives, but may not be practical for all chemicals. Less stringent cleanup standards for some chemicals may be appropriate due to the following considerations: (1) the practical detection/quantification limits for some chemicals do not permit measurement by standard methods of such low concentrations; (2) there are no water-tap exposures above health-based levels actually occurring in the vicinity of this site at present or expected in the future; (3) the potential for human exposure from pathways other than future drinking water ingestion or inhalation is minimal to none; (4) there are no sensitive populations or special environmental receptors in the immediate vicinity of the site; (5) the levels of arsenic required to be health protective may be below local background arsenic levels.

11. Final Cleanup Standards The cleanup standards for Aquifer and the B/C zone are the California DHS Action Level (AL) non-zero Maximum Contaminant Level (MCLG), or Maximum Contaminant Level (MCL), whichever is more stringent, for drinking water, or a standard based on other health-related reference information as described herein.

State Board Resolution 68-16 will also be considered as ARAR. It is the intent of this Order and the proposed cleanup levels to protect all beneficial uses of the groundwater. Since one identified beneficial use of the groundwater is a potential source of drinking water, the cleanup objectives to restore groundwater quality by removing the maximum amount of chemicals in the groundwater as is technologically feasible. In addition the economic benefit to the people of the State of California shall also be considered.



objective of major importance is to remove the potential threat posed by the presence of cancer-causing chemicals at this site. The process of removing carcinogens will result in the removal of non-carcinogens as well.

For evaluation of total risk due to the ingestion of groundwater from the site in each of the two categories (carcinogen and non-carcinogen) initial cleanup standards (in $\mu\text{g}/\text{l}$) for the site were established based on:

- a. California DHS AL or MCL values for non-carcinogens: 1,2-DCB (5), cis-1,2-DCE (6), trans-1,2-DCE (10), ethylbenzene (1750), 1,1,1-TCA (200), Freon 113 (1200), selenium (10), and xylenes (1750); and for carcinogens: arsenic (50), benzene (0.7), 1,4-DCB (0.5), 1,1-DCA (5), 1,1-DCE (6), methylene chloride (40), PCE (5), TCE (5), and vinyl chloride (0.5).
- b. U.S. MCL values for copper (1300) and zinc (5000), and toluene (2000).
- c. The Applied Action Level of the DHS Toxic Substances Control Division for chloroform (6).
- d. The EPA Integrated Risk Information System (IRIS) oral reference dose for acetone (3500).
- e. The EPA National Ambient Water Quality Criteria for Public Health Effects for antimony (14), isophorone (5200), nickel (154), phenol (3500), and thallium (1).
- f. The EPA Drinking Water Health Advisory for Naphthalene (5300).

Some of these standards have been reduced to concentrations lower than ARARs, TBCs or other guidance. These modifications were necessary to be protective of human health in consideration of exposure to multiple chemicals. Setting of standards for some compounds described as chemicals of concern in the BPHE has been deleted following staff review of current groundwater data (see Appendix A). Health protective guidance has not been established for some chemicals. Proposed final cleanup standards based on this review depart from the above standards as follows:

Cleanup Standard Lower than ARARs/TBCs

Acetone - 400 $\mu\text{g}/\text{l}$
Naphthalene - 2000 μ/l
1,1-DCE - 1 $\mu\text{g}/\text{l}$
Ethylbenzene - 400 $\mu\text{g}/\text{l}$

Methylene Chloride - 30 µg/l
Nickel - 80 µg/l
Phenol - 2000 µg/l
Toluene - 1000 µg/l

No Guidance Currently Established

2-Butanone - 20 µg/l
4-Meth.-2-Pent. - 10 µg/l

Deleted

Antimony, Arsenic, Copper, Isophorone, Selenium, Thallium,
1,2,4-Trichlorobenzene, and Zinc

The soil remediation standard is 1 ppm for total VOCs.

An additional concern that is discussed in the FS and the Remedial Action Plan (RAP) is the potential contamination of the air at the Solvent Service site. The appropriate standards for this consideration are the regulations of the Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 47 which is an ARAR for the SSI facility. The air stripper system and vapor extraction systems at the SSI site are regulated by the BAAQMD. The air emissions from these units do satisfy the ARAR cited above as regulated by the BAAQMD.

12. Uncertainty in Achieving Cleanup Standards The goal of this remedial action is to restore groundwater to its beneficial uses. Based on information obtained during the RI and on a careful analysis of all remedial alternatives, the Board believes that the selected remedy will achieve this goal. However, studies suggest that groundwater extraction and treatment will not be, in all cases, completely successful in reducing contaminants to health-based levels in the aquifer zones. The Board recognizes that operation of the selected extraction and treatment system may demonstrate the technical impracticability of reaching health-based groundwater quality standards using this approach. If it becomes apparent, during implementation or operation of the system, that contaminant levels have ceased to decline and are remaining constant at levels higher than the remediation goal, that goal and the remedy may be reevaluated.

The selected remedy will include groundwater extraction for a period of up to 30 years, during which the system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation. Modifications may include:

- a) discontinuing operation of extraction wells in areas where cleanup standards have been attained;

- b) alternating pumping at wells to eliminate stagnation points; and
- c) pulse pumping to allow aquifer equilibration and encourage adsorbed contaminants to partition into groundwater.

13. Future Changes to Cleanup Levels If new information indicates cleanup standards cannot be attained or can reasonably be surpassed, the Regional Board will decide if further final cleanup actions beyond those completed shall be implemented at this site. If changes to the cleanup standards or amended cleanup standards are proposed, due to the claimed technical infeasibility of attaining the standards, adopted by this Order, a new Order will be submitted to the Board for consideration and to EPA Region IX for their concurrence. If changes in health criteria, administrative requirements, site conditions, or remediation efficiency occur, the discharger will submit an evaluation of the effects of these changes on cleanup levels as specified under Provision C.1.i.

The Regional Board will not require the discharger to undertake additional remedial actions with respect to the matters previously described herein unless: (1) conditions on the site, previously unknown to the Regional Board, are discovered after adoption of this Order, or (2) new information is received by the Regional Board, in whole or in part after the date of this Order, and these previously unknown conditions or this new information indicates that the remedial actions required in this Order may not be protective of public health and the environment. The Regional Board will also consider technical practicality, cost effectiveness, State Board Resolution No. 68-16 and other factors evaluated by the Regional Board in issuing this Order in determining whether such additional remedial actions are appropriate and necessary.

14. Groundwater Conservation The Regional Board strongly encourages, and requires to the extent allowed by law, the maximum reclamation or reuse of groundwater feasible either by the discharger or other public or private water users. These measures include reinjection, reuse, or reclamation of extracted groundwater. The discharger's interim groundwater extraction and treatment system includes treatment of extracted groundwater then reuse in the site cooling tower prior to release to the sanitary sewer system under permit from the San Jose Water Pollution Control Plant.

15. Evaluation of Final Plan In accordance with the Health Safety Code Section 25356.1, Section 121 of CERCLA, the final remedial action plan (including the RI/FS Report submitted by the discharger and this Order) is equivalent to a feasibility study.



study; satisfies the requirements of the California Water Code Section 13304 and is protective of human health and the environment; attains Applicable or Relevant and Appropriate Requirements (ARARs); utilizes permanent solutions and alternative treatment technologies and resource recovery technologies to the maximum extent possible for short-term effectiveness; is implementable; is cost effective; is acceptable based on State regulations, policies, and guidance; and reduces toxicity, mobility, and volume of pollutants.

16. Community Involvement An aggressive Community Relations program has been ongoing for all Santa Clara Valley Superfund sites, including the SSI site. A notice was published in the San Jose Mercury News on June 14, 1990 announcing the proposed cleanup plan and opportunity for public comment at the Board Meeting of June 20, 1990 in Oakland, and at an evening public meeting to be held at the San Jose City Hall in the City of San Jose on June 27, 1990. Fact Sheets 1 and 2 were mailed to interested residents, local government officials, and media representatives. Fact Sheet 3, dated June 1990 described the proposed final RAP, announced opportunities for public comment at the Board Meeting and the Public Meeting, and the availability of further information at the Information Repository at the San Jose Public Library.

Public concerns expressed at the Regional Board meeting of June 20, 1990 in Oakland and at the public meeting of June 27, 1990 in San Jose, and in comments received by the Regional Board through July 20, 1990, the close of the public comment period, have been considered in this revision of the Tentative Order. Public comment did not generate any significant changes to the proposed plan. Comments received after July 20, 1990 and at the Regional Board meeting of August 15, 1990, will be addressed by review and evaluation, and incorporated by appropriate response in the final Order.

17. Data Quality Development of the Board's final Remedial Action Plan was based on the Regional Board staff evaluation of almost eight years of water and soil quality data. Random samples have been collected and analyzed by the Regional Board to confirm the validity of data generated by the discharger. Data has been validated using EPA validation guidance. The data was judged to be acceptable for qualitative purposes. This judgement, in combination with the internal consistency and size of the data set and comparison to duplicate data collected by Board staff and analyzed by the Board's contract lab, indicates that the data has been used in a manner consistent with its quality.

18. State Board Resolution 68-16 On October 28, 1968 the State Board adopted Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality Waters in California". This policy calls for maintaining existing high quality of State waters unless it is demonstrated that any change would be consistent with the maximum public benefit and not unreasonably affect beneficial uses. The original discharge of waste to the groundwater at this site was in violation of this policy; therefore, the groundwater quality needs to be restored to its original or background quality to the extent reasonable. A return to background quality means achieving a restored groundwater throughout the site that has no detectable concentration of any VOC or SOC and inorganics at the local background level. Even if this condition were achieved for one or more VOCs or SOCs temporarily, it appears unlikely that all VOCs and SOCs can be completely removed permanently without the removal of all existing polluted soil and groundwater on the site. It may not be feasible to remove all the polluted soil and groundwater at this site; therefore it may not be feasible to expect to achieve this water quality objective.

Since it is probable that return of the groundwater quality to background is technically infeasible, cleanup standards have been selected that meet or exceed ARARs and are protective of human health and the environment. In this manner beneficial uses are protected.

19. State Board Resolution 88-63 On March 15, 1989, the Regional Board incorporated the SWRCB Policy of "Sources of Drinking Water" into the Basin Plan. The policy provides for a Municipal and Domestic Supply designation for all waters of the State with some exceptions. Groundwaters of the State are considered to be suitable or potentially suitable for municipal or domestic supply with the exception of: 1) the total dissolved solids in the groundwater exceed 3000 mg/L, and 2) the water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day. Based on data submitted by the discharger, the Regional Board finds that neither of these two exceptions apply to the groundwater at SSI. Thus, the A aquifer at SSI is a potential source of drinking water.
20. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on December 16, 1986. The Basin Plan contains water quality objectives and beneficial uses for South San Francisco Bay and contiguous surface and underground waters.

21. The existing and potential beneficial uses of the groundwater underlying and adjacent to the facility include:
 - a. Industrial process water supply
 - b. Industrial service water supply
 - c. Municipal and domestic water supply
 - d. Agricultural water supply
22. 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. Final containment and remediation measures need to be implemented to alleviate the threat to the environment posed by the plume of pollutants.
23. This action is an order to enforce the laws and regulations administered by the Regional Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.
24. The Board has notified the discharger and interested agencies and persons of its intent under California Water Code Section 13304 to prescribe Site Cleanup Requirements for the discharge and has provided them with the opportunity for a public hearing and an opportunity to submit their written views and recommendations.
25. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that the discharger shall cleanup 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. Further significant migration of chemicals 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 chemicals are prohibited.

B. SPECIFICATIONS

1. The storage, handling, treatment or disposal of soil or groundwater containing chemicals shall not create a nuisance as defined in Section 13050 (m) of the California Water Code.
2. The discharger shall conduct monitoring activities as needed to define the current local hydrogeologic conditions, and the lateral and vertical extent of soil and groundwater containing chemicals. Should monitoring results show evidence of continuing pollutant migration, additional plume characterization may be required.
3. Health protective, final cleanup standards for all groundwater, both onsite and offsite, shall be set as follows:

| CHEMICAL | CONCENTRATION ($\mu\text{g}/\text{l}$) |
|-----------------|--|
| ACETONE | 400 |
| 2-BUTANONE | 20.0 |
| 1,2-DCB | 5.0 |
| cis-1,2-DCE | 6.0 |
| trans-1,2DCE | 10.0 |
| ETHYLBENZENE | 400 |
| FREON-113 | 1200 |
| 4-METH.-2-PENT. | 10.0 |
| NAPHTHALENE | 2000 |
| PHENOL | 2000 |
| 1,1,1 TCA | 200 |
| TOLUENE | 1000 |
| XYLENES | 1750 |
| BENZENE | 1.0 |
| CHLOROFORM | 6.0 |
| 1,4-DCB | 0.5 |
| 1,1-DCA | 5.0 |
| METH. CHLORIDE | 30.0 |
| 1,1-DCE | 1.0 |
| PCE | 5.0 |
| TCE | 5.0 |
| VINYL CHLORIDE | 0.5 |

4. Groundwater cleanup objectives are: (1) restore the quality of a polluted water source to its potential suitability as a drinking water supply, (2) prevent exposure to polluted water, and (3) prevent migration of polluted groundwater to the deeper aquifers which presently supply water for domestic (drinking) and other beneficial uses.

5. The discharger shall implement the final cleanup plan described in Finding 9.

C. PROVISIONS

1. The discharger shall comply with Prohibitions A.1., A.2., and A.3., and Specifications B.1., B.2., B.3., B.4, and B.5. above, in accordance with the following time schedule and tasks. Any reports, including quarterly reports, due concurrently may be combined in a single submission:

ONSITE TASKS/COMPLETION DATE:

a. GROUNDWATER EXTRACTION AND TREATMENT SYSTEM:

Submit a technical report acceptable to the Executive Officer documenting construction and implementation of groundwater extraction and treatment systems as approved by the Regional Board in the Remedial Action Plan.

COMPLETION DATE: November 31, 1990

b. SOIL REMEDIATION SYSTEM:

Submit a technical report acceptable to the Executive Officer documenting construction and implementation of a soil remediation system as approved by the Regional Board in the Remedial Action Plan.

COMPLETION DATE: November 31, 1990

c. REVISED SAMPLING AND ANALYSIS PLAN

Submit a technical report acceptable to the Executive Officer containing a proposed Sampling and Analysis Plan, as described in CERCLA/SARA guidance. This plan should include a schedule for soil and groundwater sampling during operation of the SIVE system and a description of wells that will be sampled to monitor migration of chemicals in the subsurface during operation of the SIVE system. This plan should also include analysis by appropriate EPA series 8000 analysis techniques.

This report shall also contain a second schedule for sampling and analysis that will following the attainment of soil cleanup standards. This plan should include a schedule for soil and groundwater sampling following cessation of operation of the SIVE system and a description of wells that will be sampled to monitor migration of polluted groundwater in the subsurface and wells that will sampled and analyzed to verify that

cleanup standards for groundwater have been achieved. This plan should also include analysis by appropriate EPA series 8000 analysis techniques.

COMPLETION DATE: DECEMBER 15, 1990

d. PROPOSAL TO TERMINATE OPERATION OF THE SOIL CLEANUP SYSTEM.

Submit a technical report acceptable to the Executive Officer and the EPA containing a proposal for terminating operation of the soil remediation system and criteria used to justify this action. This report shall include a proposal indicating the locations of borings and sampling intervals to determine concentrations of VOCs remaining in the soil.

COMPLETION DATE: 30 days prior to expected termination of soil cleanup

e. COMPLETION OF ONSITE SOIL REMEDIATION.

Document in the appropriate quarterly report the completion of the necessary tasks identified in the technical report submitted for Task C.1.d including the results of chemical analyses of samples from the soil borings.

COMPLETION DATE: Due date for quarterly status report for the quarter in which operation of the soil remediation system is terminated.

f. ONSITE WELL PUMPING CURTAILMENT CRITERIA AND PROPOSAL.

Submit a technical report acceptable to the Executive Officer containing a proposal for curtailing pumping from onsite groundwater extraction well(s) and trench(s) and the criteria used to justify such curtailment. This report shall include data to show that cleanup standards for all VOCs have been achieved and have stabilized or are stabilizing, and that the potential for pollutant levels rising above cleanup standards is minimal. This report shall also include an evaluation of the potential for pollutants to migrate downwards to the D/E aquifer at this location. If the discharger claims that it is not technically feasible to achieve cleanup standards, the report shall evaluate the alternate standards that can be achieved. Cessation of pumping will require the concurrence of the Regional Board and EPA, should either

party not concur, continued pumping will be required.

COMPLETION DATE: 90 days prior to proposed implementation of onsite groundwater extraction curtailment

g. IMPLEMENTATION OF ONSITE CURTAILMENT.

Submit a technical report acceptable to the Executive Officer documenting completion of the necessary tasks identified in the technical report submitted for Task C.1.f.

COMPLETION DATE; 30 days after the Regional Board approves onsite curtailment

h. FIVE-YEAR STATUS REPORT AND EFFECTIVENESS EVALUATION.

Submit a technical report acceptable to the Executive Officer containing the results of any additional investigation including the soil remediation study; an evaluation of the effectiveness of installed final cleanup measures and cleanup costs; additional recommended measures to achieve final cleanup objectives and standards, if necessary; a comparison of previous expected costs with the costs incurred and projected costs necessary to achieve cleanup objectives and standards; and the tasks and time schedule necessary to implement any additional final cleanup measures.

This report shall also describe the reuse of extracted groundwater, evaluate and document the cleanup of polluted groundwater, and evaluate and document the removal and/or cleanup of polluted soil. If safe drinking water levels, through the removal of the chemicals for which this Order specifies cleanup standards, have not been achieved onsite and are not expected to be achieved through continued groundwater extraction and/or soil remediation, this report shall also contain an evaluation addressing whether it is technically feasible to achieve drinking-water quality onsite, and if so, a proposal for procedures to do so.

COMPLETION DATE: August 21, 1995

i. EVALUATION OF NEW HEALTH CRITERIA:

Submit a technical report acceptable to the Executive Officer which contains an evaluation of how the final plan and cleanup standards would be affected, if the concentrations as listed in Specification B.4. change as

a result of changes in source-document conclusions or promulgation of drinking water standards, maximum contaminant levels or action levels.

COMPLETION DATE: 60 days after request made by the Executive Officer

OFFSITE TASKS/COMPLETION DATES:

j. SUBMIT A WORKPLAN FOR REMEDIATION OF THE DOWNGRAIDENT OFFSITE GROUNDWATER POLLUTION:

Submit a technical report acceptable to the Executive Officer summarizing the extent of offsite groundwater pollution northwest of the site in the vicinity of well 102A where VOCs have been discovered. This report should include an evaluation of the impact of groundwater extraction in the downgradient area on the onsite plume, methods for the determination of when to begin operation of groundwater extraction in this area, and a proposed implementation schedule for the startup of extraction in the downgradient offsite area.

COMPLETION DATE: February 28, 1991

2. The submittal of technical reports evaluating immediate, interim and final remedial measures will include a projection of the cost, effectiveness, benefits, and impact on public health, welfare, and environment of each alternative measure. The remedial investigation and feasibility study shall be consistent with the guidance provided by Subpart E of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); Section 25356.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".
3. If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the discharger(s) shall promptly notify the Executive Officer and the Board may consider revision to this Order.
4. Technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted to the Board on a quarterly basis, according to the schedule below, commencing on October 31, 1990 and covering the previous quarter. The quarterly reports shall include, but need not be limited to, the following

information:

- a. A summary of work completed since the previous quarterly report,
- b. results of water quality sampling analyses.
- c. updated water table and piezometric surface maps (second and fourth quarters only) for all affected water bearing zones, and isoconcentration maps for key pollutants in all affected water bearing zones,
- d. a cumulative tabulation of all well construction details, groundwater levels, and chemical analyses results,
- e. A cumulative tabulation of volume of extracted groundwater, estimates of pounds of pollutants removed in groundwater, and chemical analyses for all site groundwater extraction wells,
- f. a cumulative tabulation of volume of liquid and vapor removed by the SIVE system and an estimate of the total pounds of pollutants removed by the SIVE system,
- g. geological cross-sections describing the hydrogeological setting of the site,
- h. appropriately scaled and detailed base maps showing the location of all monitoring wells and extraction wells, and identifying adjacent facilities and structures,
- i. identification of potential problems which will cause or threaten to cause noncompliance with this Order and what actions are being taken or planned to prevent these obstacles from resulting in noncompliance with this Order,
- j. in the event of noncompliance with the Provisions and Specifications of this Order, the report shall include written justification for noncompliance and proposed actions to achieve compliance, and
- k. the report for the fourth quarter of each calendar year shall contain the data for the quarter and shall serve as a summary report for the calendar year containing a summary tabulation of all data for the preceding year.

SCHEDULE FOR REPORT SUBMITTAL:

| <u>Quarter</u> | <u>1st quarter</u> | <u>2nd Quarter</u> | <u>3rd Quarter</u> | <u>4th Quarter</u> |
|-----------------|--------------------|--------------------|--------------------|--------------------|
| <u>Period</u> | <u>Jan-March</u> | <u>April-June</u> | <u>July-Sept</u> | <u>Oct-Dec</u> |
| <u>Due Date</u> | <u>April 30</u> | <u>July 31</u> | <u>October 31</u> | <u>January 31</u> |

5. All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or professional engineer.
6. All samples shall be analyzed by State certified laboratories or 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(s) shall maintain in good working order, and operate, as efficiently as 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. Santa Clara Valley Water District
 - b. Santa Clara County Health Department
 - c. City of San Jose
 - d. U. S. Environmental Protection Agency, Region IX H-6-3

The Executive Officer may additionally require copies of correspondence, reports and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order to be provided to the U.S. Environmental Protection Agency, Region IX, and to a local repository for public use.

9. The discharger(s) 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.

10. The discharger(s) shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order.
11. If any hazardous substance is discharged in or on any waters of the state, or discharged and 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 incident, cause of spill, Spill Prevention, Control, and Countermeasure Plan (SPCC) in effect, if any, estimated size of affected area, nature of effect, 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 may revise the requirements when necessary.

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 August 15, 1990.


Steven R. Ritchie
Executive Officer