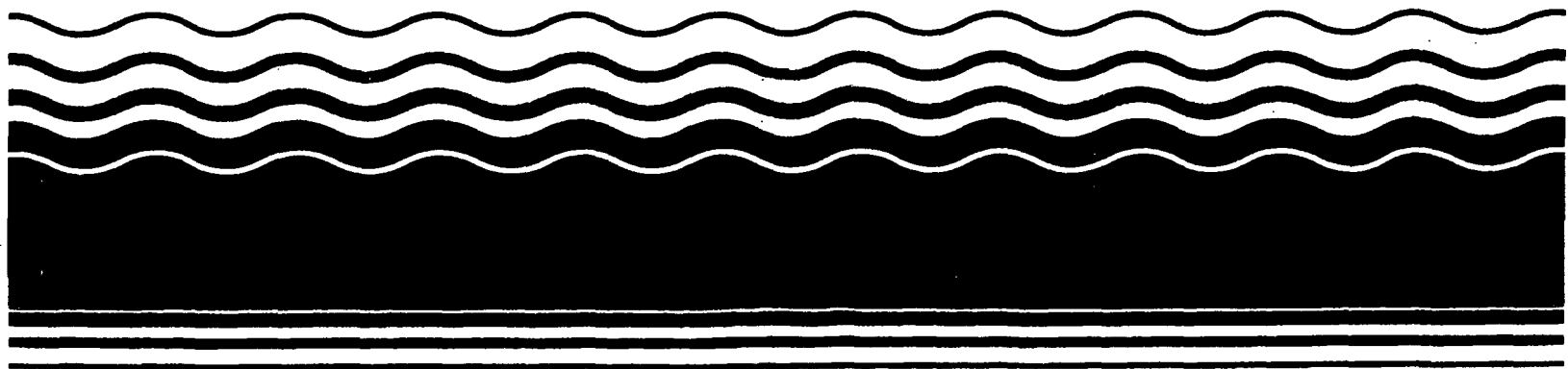


**PB97-963128
EPA/541/R-97/082
January 1998**

**EPA Superfund
Explanation of Significant Difference
for the Record of Decision:**

**Teledyne Wah Chang
Albany, OR
10/8/1996**



TELEDYNE WAH CHANG ALBANY SUPERFUND SITE
ALBANY, OREGON

EXPLANATION OF SIGNIFICANT DIFFERENCES

**From the June 10, 1994 ROD For Final Remedial Action Of Groundwater and
Sediments Operable Unit**

1.0 Introduction

1.1 Site Name and Location

Teledyne Wah Chang Albany
Millersburg, Oregon

1.2 Lead and Support Agencies

The Environmental Protection Agency (EPA) is the Lead agency on this site. The Oregon Department of Environmental Quality (DEQ) is the Support Agency on this site.

1.3 Explanation of Significant Difference

This document addresses significant change to the Groundwater and Sediments Remedy described in the Final Remedial Action of Groundwater and Sediments Operable Unit, Teledyne Wah Chang Albany, June 10, 1994. The document provides an Explanation of Significant Differences as required under Section 117c of CERCLA, and the National Contingency Plan (NCP) 40 C.F.R. §300.435(c)(2)(I).

1.4 Circumstances Leading to the Changes to the ROD

During Consent Decree negotiations for performance of the remedy, EPA and Teledyne developed a Scope of Work for performance of the remedial action. In the development of that document, Teledyne petitioned EPA to make the modifications to the perimeter containment requirements of the groundwater ROD (described in Section 5). The rationale for the perimeter changes is based on groundwater data collected subsequent to the RI/FS. The additional changes are the logical outgrowth of translating ROD requirements into an implementable Scope of Work based on the newly available data.

1.5 Administrative Record and Public Comment Period

This Explanation of Significant Differences will become part of the Administrative Record File for the site. The record is available in the EPA Region 10 Records Center located at 1200 6th Avenue, Seattle, Washington and at the information repository located at the Albany Public Library in Albany, Oregon.

This Explanation of Significant Differences is being made available for public comment concurrently with the public comment period on the Consent Decree. After evaluating the public comments, the ESD may be modified based on the comments received.

1.6 Site Background

Site Information:

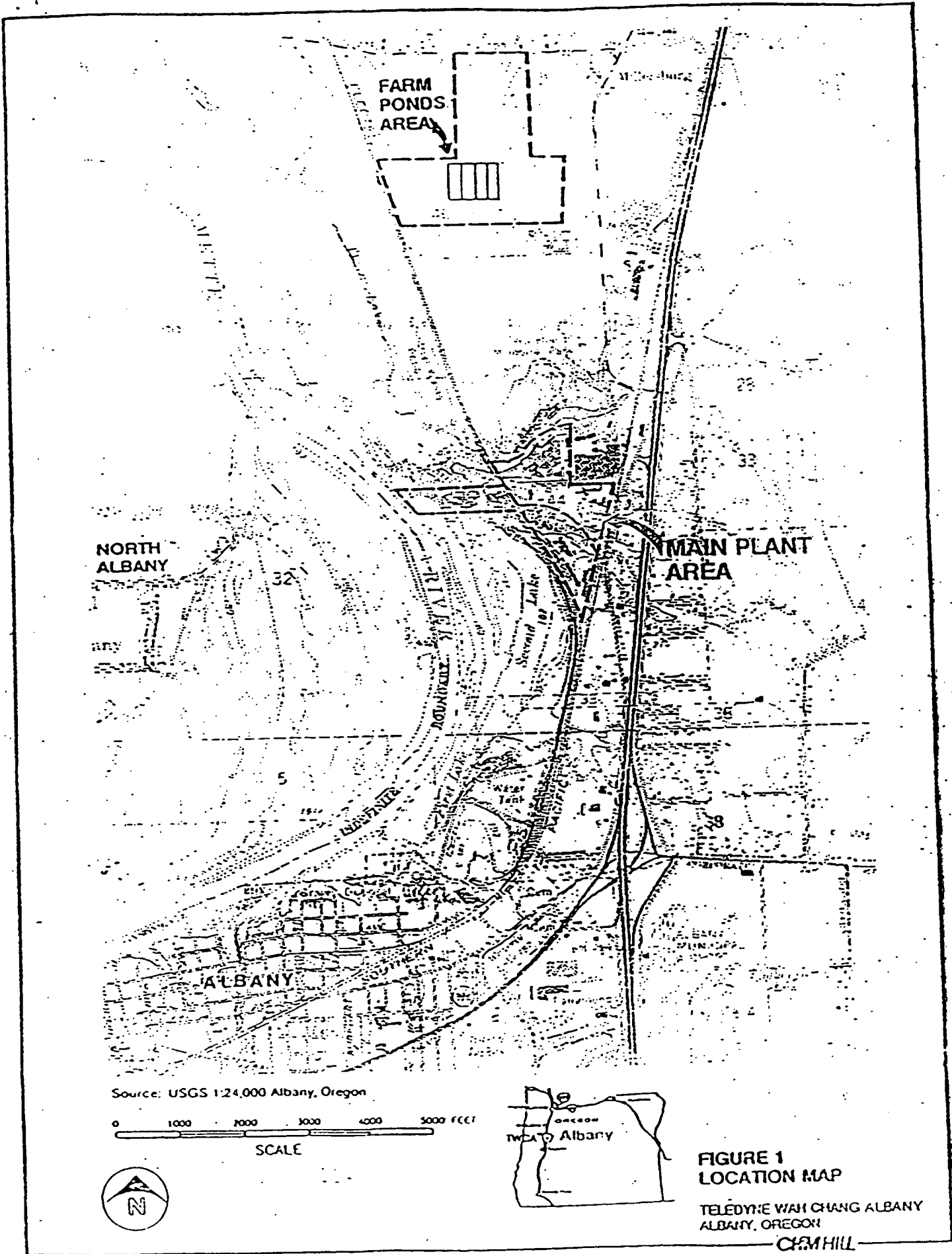
The Teledyne Wah Chang Albany (TWC) site is located in Millersburg, Oregon, adjacent to the city of Albany. The facility covers approximately 225 acres near the Willamette River. The TWC facility is divided into a 110-acre main plant area and a 115-acre Farm Ponds area (Figure 1).

TWC is an active operating facility which primarily manufactures zirconium metal. The manufacturing operation consists of numerous production facilities used for the extraction and refining of zirconium and hafnium metals from zircon sands, with a small amount of tantalum, columbium, titanium and vanadium metals also being produced. The plant also has a number of waste treatment and storage facilities and several on-site ponds that were, or presently are, being used for the storage of liquid and solid wastes.

The processing of the zircon sands generates sludge, waste water, residues and gases as by-products. Contaminants of concern at the site include radionuclides, metals, polychlorinated biphenyls (PCBs), methyl isobutyl ketone (MIBK), and chlorinated organic solvents such as 1,1,1-trichloroethane, carbon tetrachloride, and tetrachloroethylene.

Until 1978, the sludges produced from various waste water treatment processes were stored in on-site ponds. The ponds included the Lower River Solids Pond (LRSP) and Schmidt Lake which are located west of the Main Plant near the banks of the Willamette River. Chlorinator residues and magnesium chloride from the plant process were stored in stockpiles along the eastern edge of the LRSP.

In 1978, process changes resulted in low-level radioactive materials being more concentrated in the chlorinator residues. These residues are now disposed in a low-level radioactive waste disposal facility in Hanford, Washington.



Source: USGS 1:24,000 Albany, Oregon

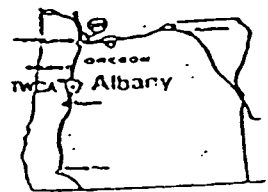
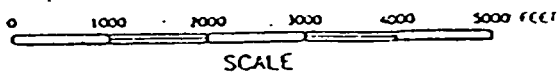


FIGURE 1
LOCATION MAP

TELEDYNE WAH CHANG ALBANY
ALBANY, OREGON

C.M. HILL

Past Cleanup Actions:

Because of concerns regarding the ponds being a possible source of groundwater contamination, the site was listed on the Superfund National Priorities List in December 1982. The National Priorities List is a list of sites which are targeted for further study and possible cleanup under Superfund authority.

In February 1991, EPA ordered TWC to clean up the sludges in the LRSP and Schmidt Lake. Under the Order, TWC submitted the necessary work plans to EPA and DEQ for review and approval.

After completion of the investigation, under an EPA order, TWC began the cleanup of the sludges in June 1991. Approximately 100,000 cubic yards of sludge were partially solidified with cement for easier handling. The solidified sludge was placed in the Finley Buttes Landfill in Boardman, Oregon. Transportation of the sludges was completed in November, 1991. TWC is currently monitoring the monocell to ensure its effectiveness in containing the waste and protecting human health and the environment. The monocell monitoring data is submitted to EPA for review.

In 1992, TWC conducted additional field investigations in and around Schmidt Lake. These field investigations confirmed the presence of materials containing zircon sands with moderate levels of thorium and uranium. In December 1992, 2016 cubic yards of materials were removed from Schmidt Lake and transported to an off-site low-level radioactive waste facility.

Summary of Remedial Investigation:

The RI/FS, completed by TWC, presents results of the site-wide field investigations.

Groundwater Contamination

Groundwater contamination beneath the Main Plant is contaminated with volatile organic compounds (VOCs), ammonium, metals, PCBs, and low levels of radionuclides. Specific VOCs include: perchloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethene (1,1-DCE), and vinyl chloride. Eight wells in the Main Plant had detectable concentrations of vinyl chloride ranging from 10 parts per billion (ppb) to 50 ppb. Some of the main areas of groundwater contamination include the areas below the Feed Makeup Building (metals and radionuclides), the chemical unloading area (VOCs), and the Spill Treatment Plant (ammonium and VOCs).

Soil Contamination:

A number of locations in the Main Plant area were found to have contaminants in soils:

Soils in the Extraction Area are contaminated with semi-volatile organic compounds, polychlorinated biphenyls polyaromatic hydrocarbons, and radionuclides. Areas of identified soil contamination include the chemical unloading area (semi-volatile organic compounds, PCBs, PAHs and radionuclides), and the V2 Pond (radionuclides).

The fill material along Truax Creek's northern bank, known as Truax Fill, contains undocumented quantities of construction debris and other solid wastes that were placed in the fill from 1958 to 1978. Contamination in Truax Fill includes radionuclides, PAHs, PCBs, and metals.

Soil sampling conducted in a portion of the Solids Area near the former Chlorinator Residue Pile revealed the presence of barium sulfate and residual chlorinator solids in the area.

PCBs were detected in soil samples taken during the RI from the slopes along Truax and Murder Creeks.

Within the Farm Ponds Area, the soil amendment area is a 47.8-acre agricultural tract located directly north of the Farm Ponds (Figure 1). In 1976 TWC placed solids from their wastewater treatment plant in this area to be used experimentally as a soil amendment. The solids were similar in composition to that of the LRSP and Schmidt Lake. Surface soil samples taken from the soil amendment area during the RI contained PCBs, SVOCs, and radionuclides.

Sediment Contamination

PCBs were detected in sediment samples throughout the Surface Water Remedial Sector. PCBs, SVOCs, and radionuclides were detected in sediments in Truax Creek.

2.0 Description of the Remedy in the ROD

The Record of Decision for Final Remedial Action of Groundwater and Sediments Operable Unit, June 10, 1994 called for the following actions:

For Contaminated Groundwater:

Remediation of groundwater via groundwater extraction in the Feed Makeup area and at areas on Site where contaminant concentrations exceed lifetime cancer risk levels of 10^{-4} and/or substantially exceed noncancer HI of 1 for worker exposure. Extraction shall continue until

contaminant concentrations in groundwater throughout the Site are reduced to below SDWA MCLs, non-zero MCLGs, or cancer risk levels of 10^{-6} and noncancer risk HI < 1 for worker exposure, or until EPA in consultation with DEQ determines that continued groundwater extraction would not be expected to result in additional cost effective reduction in contaminant concentrations at the Site. Contaminated groundwater in exceedance of SDWA MCLs, non-zero MCLs, or cancer risk levels of 10^{-6} and noncancer risk HI > 1 for residential use shall be prevented from migrating off the plant site, or beyond the current boundary of the groundwater contaminant plume at the Farm Ponds Area.

Discharge of extracted groundwater to Teledyne Wah Chang Albany's wastewater treatment plant. Pretreatment of groundwater to comply with CWA requirements prior to discharge to the wastewater treatment plant.

Treatment or removal of subsurface source material near the Feed Makeup Building on the main plant.

For Contaminated Sediments:

Slope erosion protection consisting of a geotextile covered by riprap placed along the banks of Truax Creek to prevent contaminated fill material from entering the creek.

Removal of approximately 3,600 cubic yards of contaminated sediments from the surface water bodies adjacent to, or flowing through the Site. Additional ecological characterization prior to removal to determine potential impacts of sediment removal to the local ecosystem and to provide mechanisms to mitigate those impacts.

Site-Wide Actions:

Deed restrictions and institutional controls on land and groundwater use for both the main plant and Farm Ponds area. The objective of this component of the remedy is to ensure that the property and groundwater are used only for purposes appropriate to the cleanup levels achieved.

Environmental evaluations of currently uncharacterized potential contaminant source areas, as needed to ensure achievement of groundwater RAOs. The objective of this component of the remedy is to ensure that contaminant source areas do not adversely impact the remedy.

Long-term on-Site and off-Site groundwater, surface water, and sediment monitoring which shall include at a minimum the monitoring of on-Site wells which are in exceedance of MCLs and non-zero MCLGs, cancer risk levels of 10^{-6} , and noncancer risk HI > 1 for residential exposure.

Review of selected remedy at least once every five years to ensure protection of human health and the environment.

The Record of Decision for Final Remedial Action for Surface and Subsurface Soil, September 27, 1995 called for the following actions:

Excavation of material exceeding the gamma radiation action level of 20 $\mu\text{rem}/\text{hour}$ above background, measured at one meter above the surface and averaged over 100 square meters (40CFR192.12).

Transportation of excavated material to an appropriate offsite facility for disposal.

For areas of the site where modeling indicates that radon concentrations in future buildings could exceed 4 pCi/liter, implement institutional controls requiring that future buildings be constructed using radon resistant construction methods.

Information on areas of subsurface PCB and radionuclide contamination that do not pose a risk if they are not disturbed shall be incorporated into the TWC facilities maintenance plan. This information will be made available to future site purchasers or regulatory agencies.

The determination that action is not required for certain areas of the site is based on scenarios that do not allow unrestricted use. Proper handling and disposal of excavated material in accordance with federal and state laws is required should excavation occur as part of future development of the TWC main plant or the soil amendment area.

4.0 CHANGES TO THE GROUNDWATER AND SEDIMENTS REMEDY REQUIREMENTS IN THE ROD

- I. Conditional Changes In The Western And Northern Perimeter Containment Requirements;
- II. Clarification In Requirements For the Farm Ponds Area;
- III. Correction In Identification Of Sediment Areas Exceeding The Action Level

4.1 Change I - Conditional Change in the Western and Northern Perimeter Containment Requirements

ROD Requirement:

Contaminated groundwater in exceedance of SDWA MCLs, non-zero MCLs, or cancer risk levels of 10^{-6} and noncancer risk HI > 1 for residential use shall be prevented from migrating off the plant site [the compliance point is the site boundary]. At and outside the compliance points, the PRPs shall initiate groundwater extraction anywhere the cleanup levels are exceeded, or as needed to meet RAOs.

Change:

EPA has dropped the requirement for groundwater extraction at and outside the plant boundaries on the northern and western perimeters. EPA believes that groundwater will be reduced to the ROD cleanup levels at and outside these compliance points through onsite groundwater remediation and natural attenuation. The public will be protected from exposure to groundwater in exceedance of the cleanup standards through restrictions on groundwater use. Dropping the perimeter requirements is contingent on meeting the conditions described below for each perimeter. In addition, the site cleanup levels must still be met within the ROD's time frame, the groundwater discharge into adjacent water bodies must not violate Federal and State water quality standards, and the remedy must still be protective of both public health and the environment.

The ROD focused only on meeting water quality standards for protection of human health in areas beyond the TWC property boundary. This change to the ROD adds the requirement that groundwater discharge to surface water bodies must be at levels that will not impact the water body as described in the conditions for each change.

Basis for Change:

During the development of the Scope of Work for the implementation of the Remedial Actions in the groundwater ROD, TWC provided EPA with groundwater

sampling results obtained subsequent to the RI/FS sampling events. The groundwater sampling results presented in the RI/FS were for sampling events ending in September 1991. The new data are from January and June 1994 and 1995 sampling events (attached as Appendix 1) These additional rounds of groundwater sampling indicate that groundwater concentrations at the perimeter wells and some of the site interior wells have decreased significantly since the RI/FS samples were taken.

EPA's decision to conditionally modify the perimeter requirements was based on the following:

Groundwater concentrations are decreasing at the site perimeter. When groundwater remediation via extraction commences onsite, there should be additional decreases in concentration, therefore, the areas offsite should reach the cleanup levels without additional offsite extraction.

The groundwater in offsite areas to the west of the plant is not currently used, and is unlikely to be used as drinking water in the foreseeable future. If there are no groundwater wells placed in this area until the groundwater reaches the cleanup levels, human health will be protected.

On the northern perimeter, the groundwater discharges directly into Murder Creek which forms the northern boundary of the plant. Therefore, potentially contaminated groundwater is not available for drinking water offsite, and so does not impact human health.

To the west, groundwater discharges into Second Lake, and to the north, into Murder Creek. Because water discharges into adjacent water bodies, water quality for both Second Lake and Murder Creek could be a concern, and therefore surface water protection is addressed in this ESD.

Conditions Set for Each Perimeter:

Western Perimeter

The requirement for perimeter containment and extraction will be dropped on the western perimeter subject to the following conditions to ensure protectiveness:

1. Existing groundwater data, and data collected pursuant to the performance of the remedial action, confirm that contaminant levels (and total excess cancer risk and/or hazard indices) are declining at perimeter monitoring wells along the property boundary (the compliance points) or reached an asymptotic concentration acceptable to EPA and DEQ, and/or other site data or information indicate that natural attenuation is effectively reducing contaminant levels in offsite areas. If sufficient data is not available to make a statistical determination, EPA in

consultation with DEQ may use best professional judgement in making this determination. The current baseline for reaching the cleanup levels for the site is 15 years.

2) Existing and new surface water data, indicate that discharge of groundwater to surface water bodies is not exceeding AWQCs. EPA in consultation with DEQ may require that the discharge not exceed other protective criteria for pollutants or contaminants, determined in accordance with risk assessment methodology, or contained in promulgated rules, laws or standards. Therefore, depending on the concentrations of contaminants remaining in the perimeter wells, TWC may have to demonstrate through sampling or modeling that sediment contamination, bioaccumulation, and contaminant loading will not be an environmental concern. Surface water samples will be taken at locations where the groundwater enters the surface water body for evaluation against applicable standards.

3) Within one year of initiation of the RD/RA, EPA/DEQ-approved deed restrictions or other institutional controls acceptable to EPA and DEQ shall be in place for all off-site properties where groundwater containing contaminants above cleanup levels is present. These deed restrictions or other institutional controls shall notify future potential buyers of site conditions; prevent the installation of water supply wells (and/or require proper abandonment of existing wells), and shall run with the land until groundwater contaminated above cleanup levels does not leave the site boundary, and offsite cleanup levels are achieved.

If the required deed restrictions or other institutional controls acceptable to EPA and DEQ are not in place within the one year time period, EPA may require that TWC begin design of an acceptable groundwater containment and/or off-site extraction system, and the system shall be installed and operating within 2 years of initiation of the RD/RA. If criteria 1 and 2 are not met, EPA in consultation with DEQ may require that TWC implement groundwater containment and/or offsite groundwater extraction as described in the groundwater ROD.

Implementation of this change to the ROD is dependant on the offsite property-owners voluntarily agreeing to have restrictions placed on their property. Obtaining these restrictions will be at the initiative of TWC. EPA will not provide regulatory assistance to TWC in obtaining the restrictions. If the institutional controls are not complied with, the requirement will not have been met and containment may be required.

Northern Perimeter

The requirement for perimeter containment and extraction will be dropped on the northern perimeter subject to the following conditions:

No groundwater discharge to surface water will occur that causes exceedances of

AWQC in the receiving water body or active remediation or containment will be required. EPA in consultation with DEQ may require that the discharge not exceed other protective criteria for pollutants or contaminants, determined in accordance with risk assessment methodology, or contained in promulgated rules, laws or standards. Therefore, depending on the concentrations of contaminants remaining in the perimeter wells, TWC may need to demonstrate through sampling or modeling that sediment contamination, bioaccumulation, and contaminant loading will not be an environmental concern.

Surface water samples will be taken at locations where the groundwater enters the surface water body for evaluation against applicable standards. In addition, existing groundwater data, and data collected pursuant to the remedial action, must indicate that contaminant levels (and total excess cancer risk and/or hazard indices) are declining at perimeter monitoring wells along the property boundary (the compliance points) or reached an asymptotic concentration acceptable to EPA and DEQ, and/or other site data or information indicate that remediation is effectively reducing contaminant levels. If sufficient data are not available to make a statistical determination, EPA in consultation with DEQ may use best professional judgement in making this determination. If this criterion is not met, active remediation or containment may be required.

4.2 Change II - Clarification In Requirements For The Farm Ponds Area

ROD Requirement:

The ROD provides apparently inconsistent requirements for groundwater in the Farm Ponds Area. The ROD defines the point of compliance in the Farm Ponds Area as the edge of the Farm Ponds. The ROD requires that at and outside the point of compliance, groundwater extraction is required anywhere that the cleanup levels are exceeded. Therefore, by defining the point of compliance as the edge of the Farm Ponds, the ROD requires extraction to take place throughout the plume in the Farm Ponds Area. This is inconsistent with the RODs proposed groundwater action of pumping "hot spots" (high concentration areas) as a means of reaching the groundwater cleanup levels.

Change and Basis for Change:

EPA has made the remediation requirements for the Farm Ponds Area consistent with the rest of the site. Within the Farm Ponds Area, remediation will take place through extraction of hot spots. However, the plume in the Farm Ponds must be kept from significantly expanding. Compliance with this requirement will be demonstrated by existing groundwater data, and data collected pursuant to the remedial action indicating that contaminant levels (and total excess cancer risk and/or hazard indices) in wells in the Farm Ponds area are not increasing, or are declining, and /or other site data or information indicate that natural attenuation is effectively reducing contaminant levels. For consistency with the rest of the site,

EPA has changed the point of compliance to the property boundaries in the Farm Ponds Area.

4.3 Change III - Correction In Identification Of Sediment Areas Exceeding The Action Level

ROD requirement:

The ROD requires the removal of PCB contaminated sediments exceeding 1 ppm total PCBs from the surface water bodies adjacent to, or flowing through the Site. The ROD identified areas on the Main Plant where sediment concentrations exceeded the site action level of 1 ppm total PCBs. In addition, Conser Slough was identified as exceeding the action level of 1 ppm total PCBs.

Change and Basis for Change:

A review of the RI/FS sediment data indicated that not all of the areas identified in the ROD exceeded the sediment action level. Areas not exceeding the 1 ppm total PCBs action level will not be remediated.

The areas not exceeding the sediment action which will not be remediated are the following:

Conser Slough: The highest concentration was 0.5 ppm total PCBs.

Murder Creek at MTC-2: The highest concentration was 0.79 ppm total PCBs.

The areas exceeding the action level which were correctly identified in the ROD and will be remediated are the following:

The Murder Truax confluence at sample location MTC-2. The highest concentration was 1.14 ppm total PCBs.

Truax Creek at the confluence with Second Lake overflow (sample location TC-6 at 1.16 ppm total PCBs).

The portion of Truax Creek that passes along the toe of the Truax Fill (locations TC-3.3 to TC-5 showed concentrations up to 20.8 ppm total PCBs).

5.0 Statutory Determinations

Considering the new information that has been developed and the changes that have been made to the selected remedy, the EPA and DEQ believe that the remedy remains protective of human health and the environment, complies with federal and state requirements that were identified in the ROD as applicable or relevant and appropriate to this remedial action at the time the original ROD was signed, and is cost effective.

6.0 Support Agency Comments

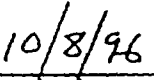
Consistent with EPA guidance, the Oregon Department of Environmental Quality (DEQ) reviewed the ESD. Suggested changes were incorporated into the text. DEQ supports this action and the implementation of the changes to the Record of Decision.

7.0 Public Participation Activities:

EPA will hold a public comment period on the Explanation of Significant Differences. The public comment period will be held concurrently with the public comment period for the Consent Decree. Implementation of the ROD changes will be subsequent to and subject to EPA addressing the public comments.



Randall Smith, Director
Office of Environmental Cleanup



Date

Appendix: Groundwater Concentration Trends

Figure 1a
Concentration Trends of 1,1,1-TCA
- Fabrication Area -
Telodyne Wah Chang

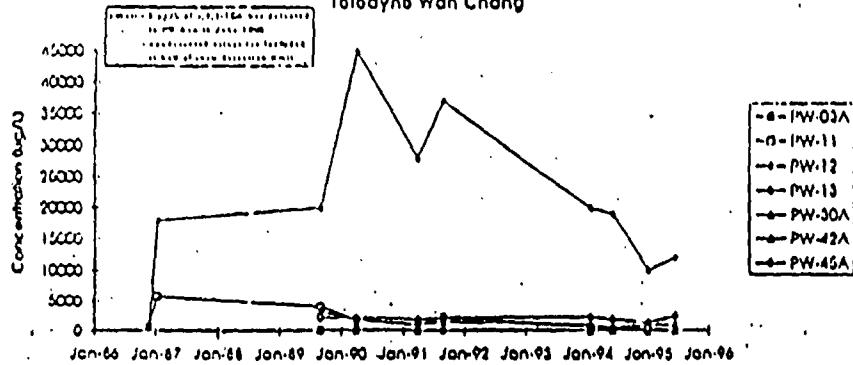


Figure 1b
Concentration Trends of 1,1-DCE
- Fabrication Area -
Telodyne Wah Chang

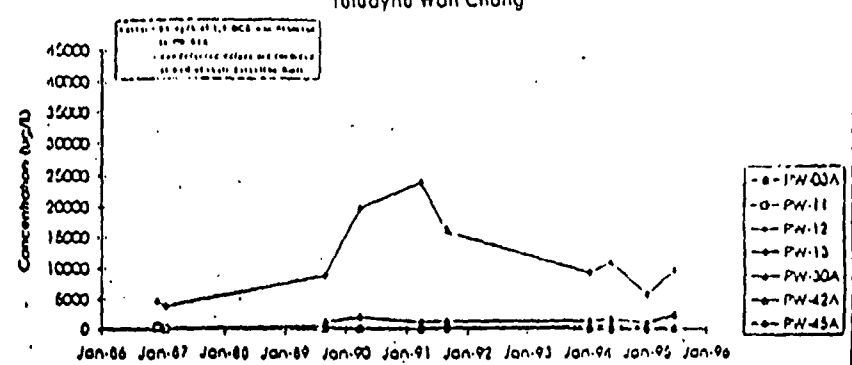


Figure 1c
Concentration Trends of PCE
- Fabrication Area -
Telodyne Wah Chang

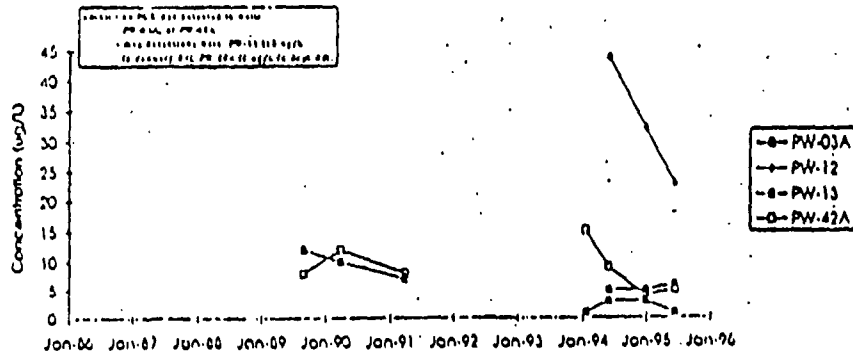


Figure 1d
Concentration Trends of ICE
- Fabrication Area -
Telodyne Wah Chang

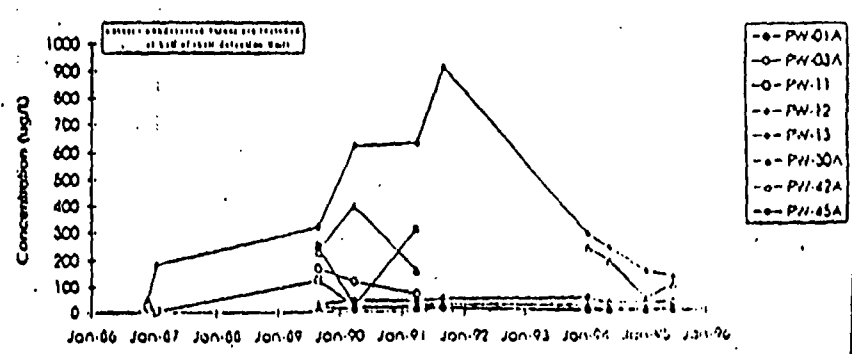


Figure 1e
 Concentration Trends of MIBK
 - Fabrication Area -
 Teledyne Wah Chang

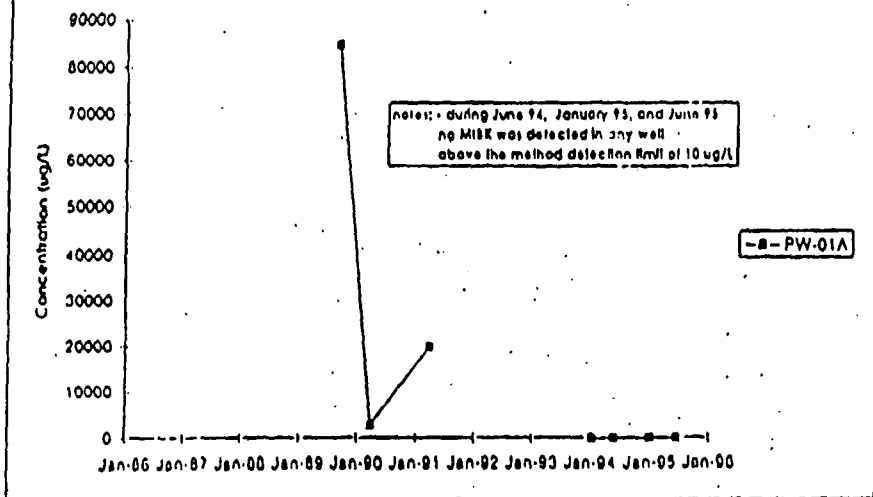


Figure 1f
 Concentration Trends of Vinyl Chloride
 - Fabrication Area -
 Teledyne Wah Chang

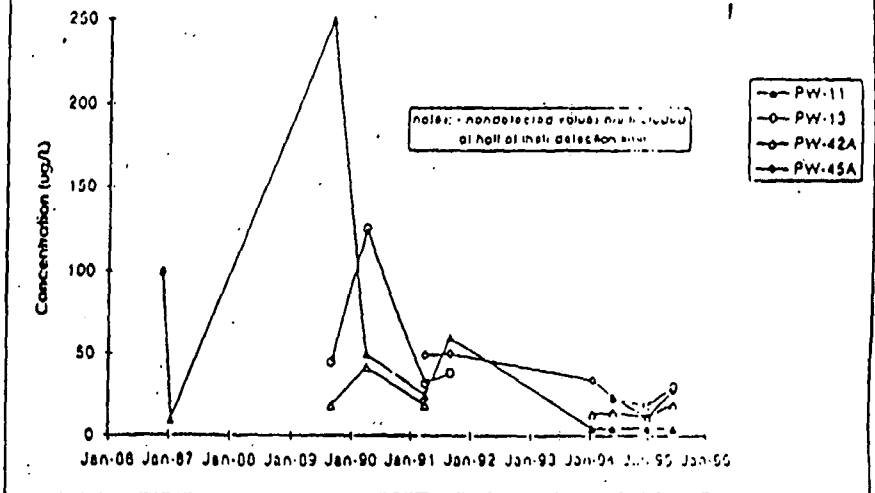


Figure 1g
 Concentration Trends at Well PW-12
 - Fabrication Area -
 Teledyne Wah Chang

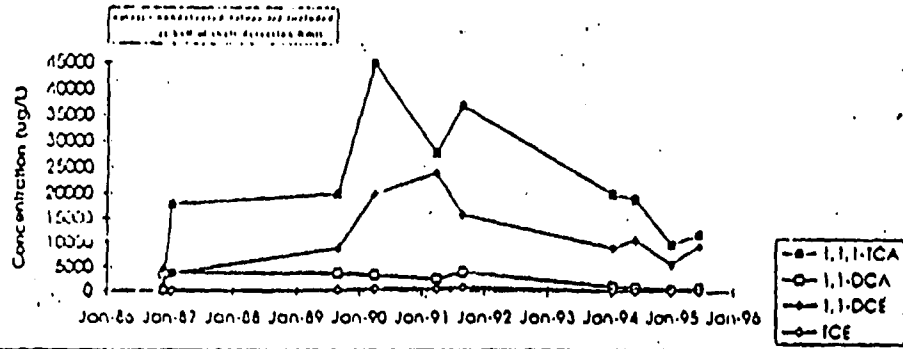


Figure 1h
 Concentration Trends at Well PW-42A
 - Fabrication Area -
 Teledyne Wah Chang

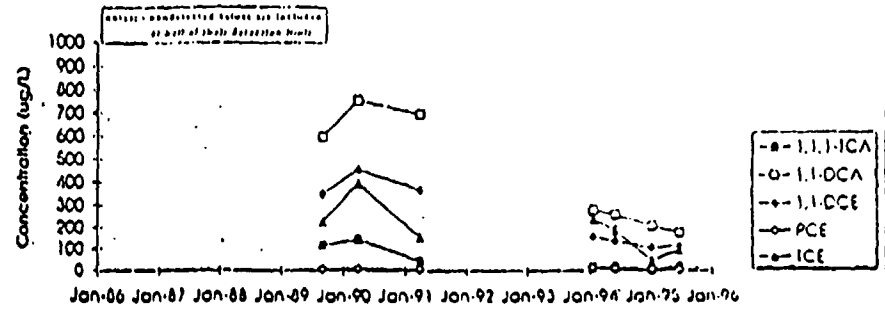


Figure 1i
 Concentration Trends at Well PW-01A
 - Fabrication Area -
 Teledyne Wah Chang

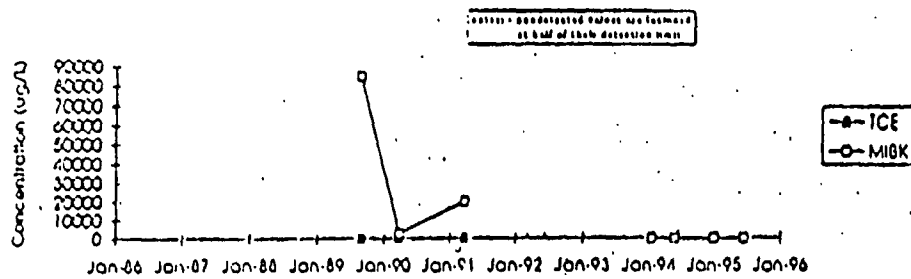


Figure 2a
Concentration Trends of 1,1,1-ICA
- Extraction Area -
Toladyne Wah Chang

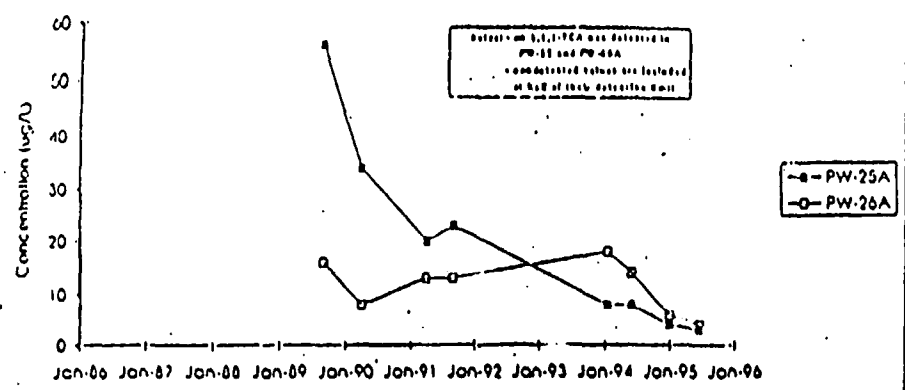


Figure 2b
Concentration Trends of 1,2-DCE
- Extraction Area -
Toladyne Wah Chang

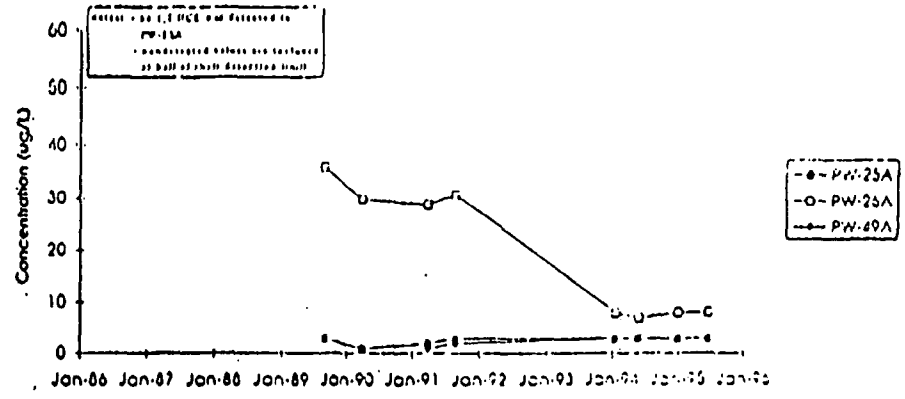


Figure 2c
Concentration Trends of PCE
- Extraction Area -
Toladyne Wah Chang

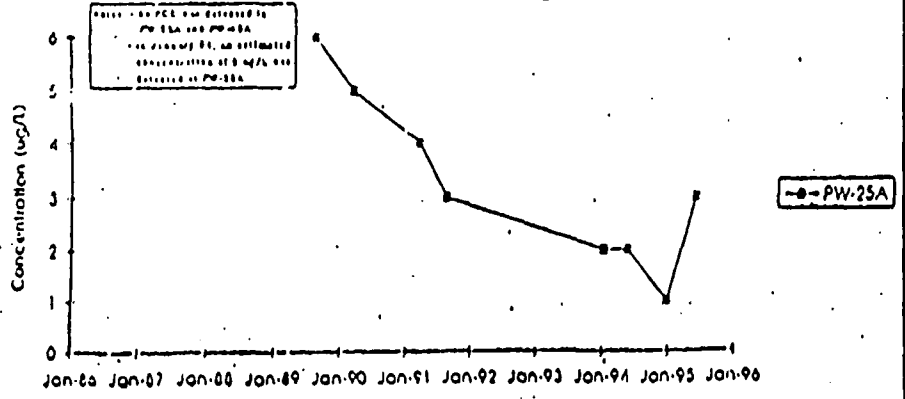


Figure 2d
Concentration Trends of ICE
- Extraction Area -
Toladyne Wah Chang

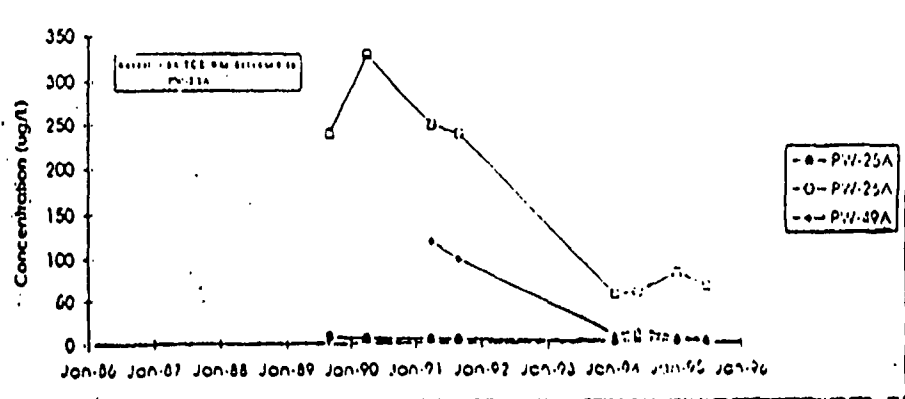


Figure 2e
Concentration Trends of MIBK
- Extraction Area -
Teledyne Wah Chang

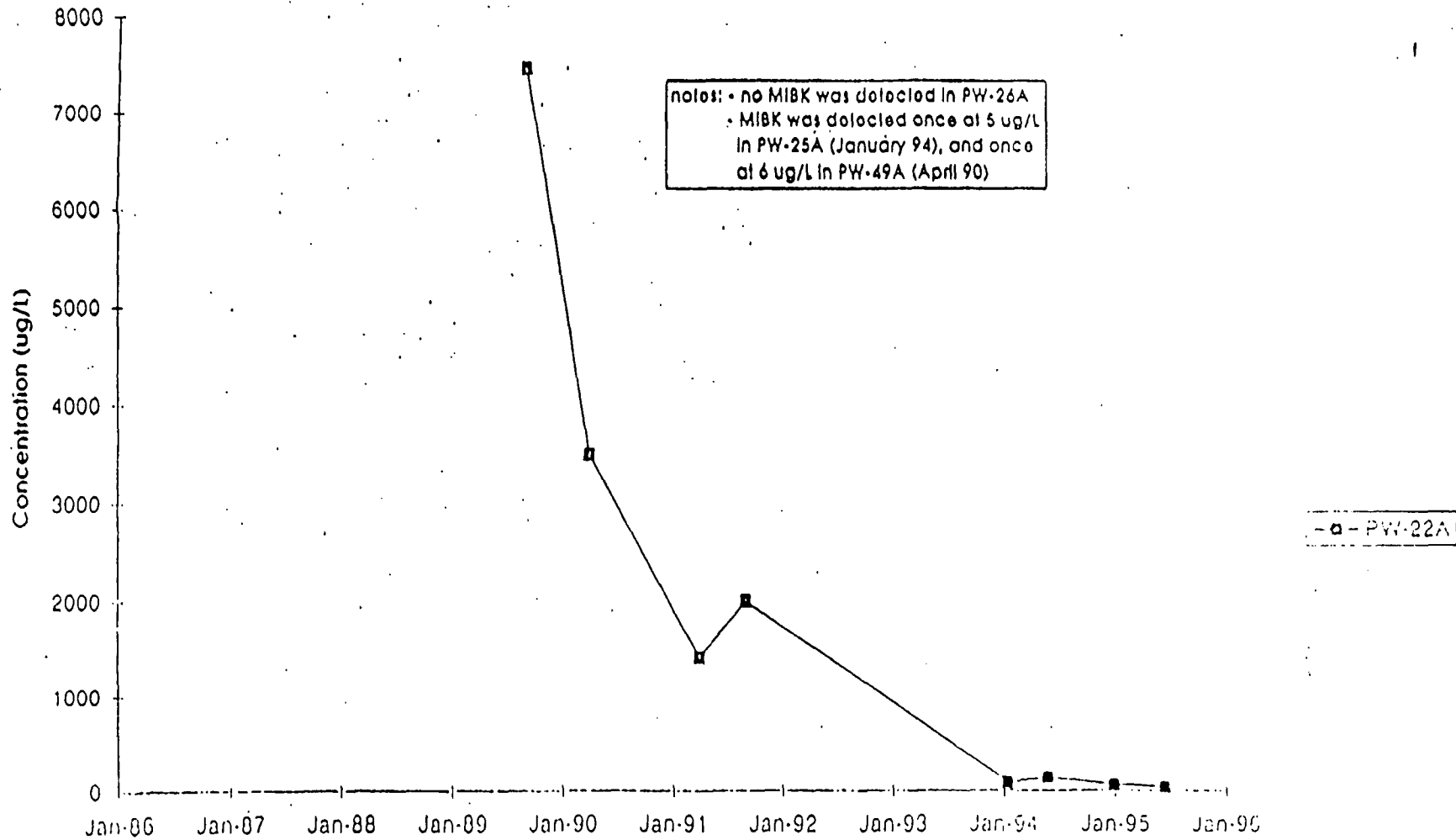


Figure 2f
 Concentration Trends at Well PW-25A
 - Extraction Area -
 Teledyne Wah Chang

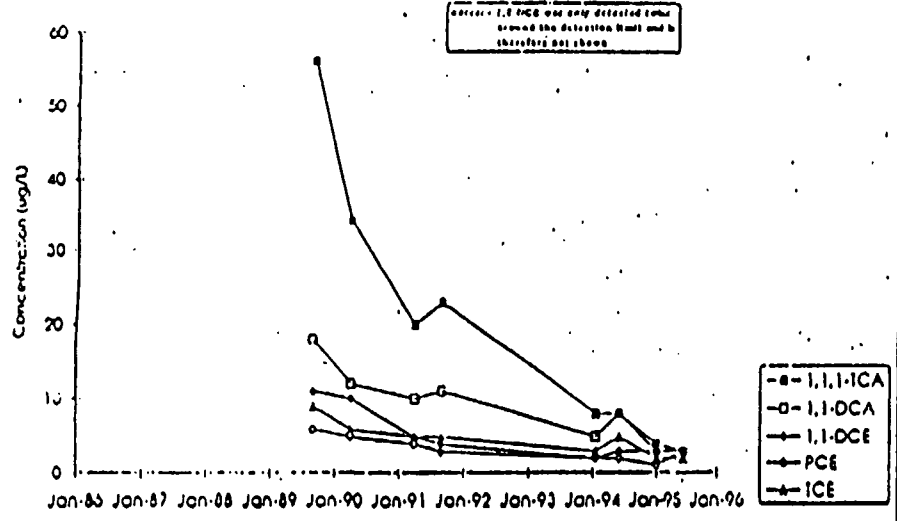


Figure 2g
 Concentration Trends at Well PW-25A
 - Extraction Area -
 Teledyne Wah Chang

