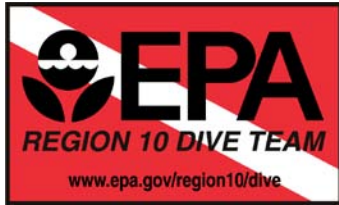


US EPA ARCHIVE DOCUMENT




## [EPA Region 10 Dive Team](#)

### **Occidental Survey, Hylebos Waterway, Tacoma, WA**

**What:** The EPA Region 10 Dive Team with support from EPA Environmental Response Team divers (Edison, NJ) assisted the Superfund program in providing a video and hand-held Hydrolab survey, as well as installation of piezometers, passive diffusion samplers, and seepage meters for nearshore sediments off the Occidental site.

**Why:** Due to the discharge of contaminated ground water from the facility, diver survey objectives were to locate any seeps that were visible to divers and document water quality in transition zone groundwater.

**When:** Dive surveys were conducted April through August, 2004.

**How:** Diver investigations included searches for seeps, water quality measurements on the bottom via Hydrolab, and installation of piezometers, passive diffusion samplers, and seepage meters. For more information on sample collection techniques used, see the [EPA presentation at the March 2006 American Academy of Underwater Sciences \(AAUS\) conference \(PDF\)](#) (30 pp. 4.5MB). For more information on the AAUS, go to the [AAUS website](#)  Surface supply was used for seepage meter emplacement/retrieval and for retrieval of the diffusion samplers. Diver decon was necessary due to the contaminants being discharged from the site. See the [safety / SOP](#) page for more information on diver decon and polluted water scientific diving.

[Duncan P.B., R. Henry, E.R. Pedersen, S. Sheldrake, D. Thompson, 2007. Adaptation of Groundwater Evaluation and Sampling Tools for Underwater Deployment. Proceeding of the American Academy of Underwater Sciences 25th Symposiumpp. 55-83. \(PDF\)](#) (29 pp. 4.0MB)

**Results:** Though areas of visible, emerging seepage were not located on these dives, divers found white precipitate in areas where seepage had been reported in the past. Divers installed a number of piezometers across the facility (see Figure below). Water produced by the piezometers at times had pH exceeding 11, indicating the persistence of upland contamination in transition zone groundwater. Passive diffusion samplers were left in place for 3 weeks.

**Where:** Hylebos Waterway, approximately N47 16.89 W122 24.34

**More Details:** <http://yosemite.epa.gov/R10/CLEANUP.NSF/webpage/Hylebos+Waterway>  
**Video:** [Precipitates on the bottom \(broadband only, 24MB\)](#)

**Contact:** Bruce Duncan, [Duncan.Bruce@epa.gov](mailto:Duncan.Bruce@epa.gov)

Photos:

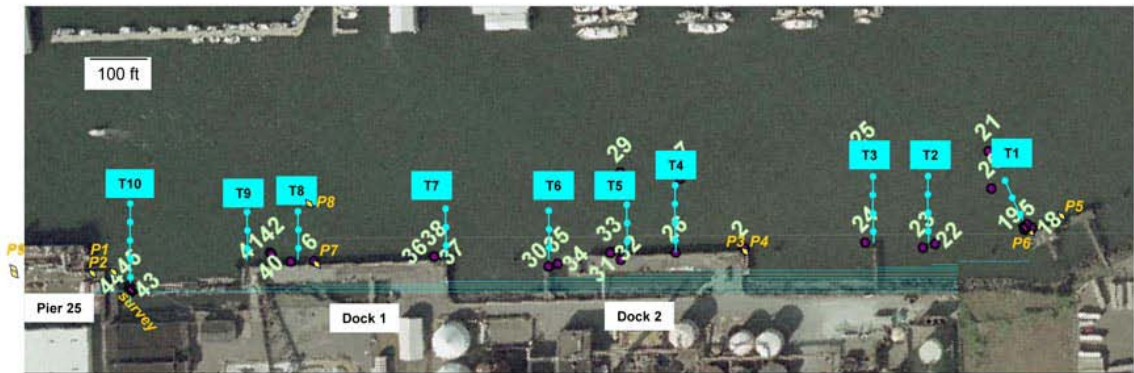


Bruce Duncan (R10) and Rich Henry (USFWS attached to ERT dive team) discuss tasks



Preparing to tie up at piezometer station #P6

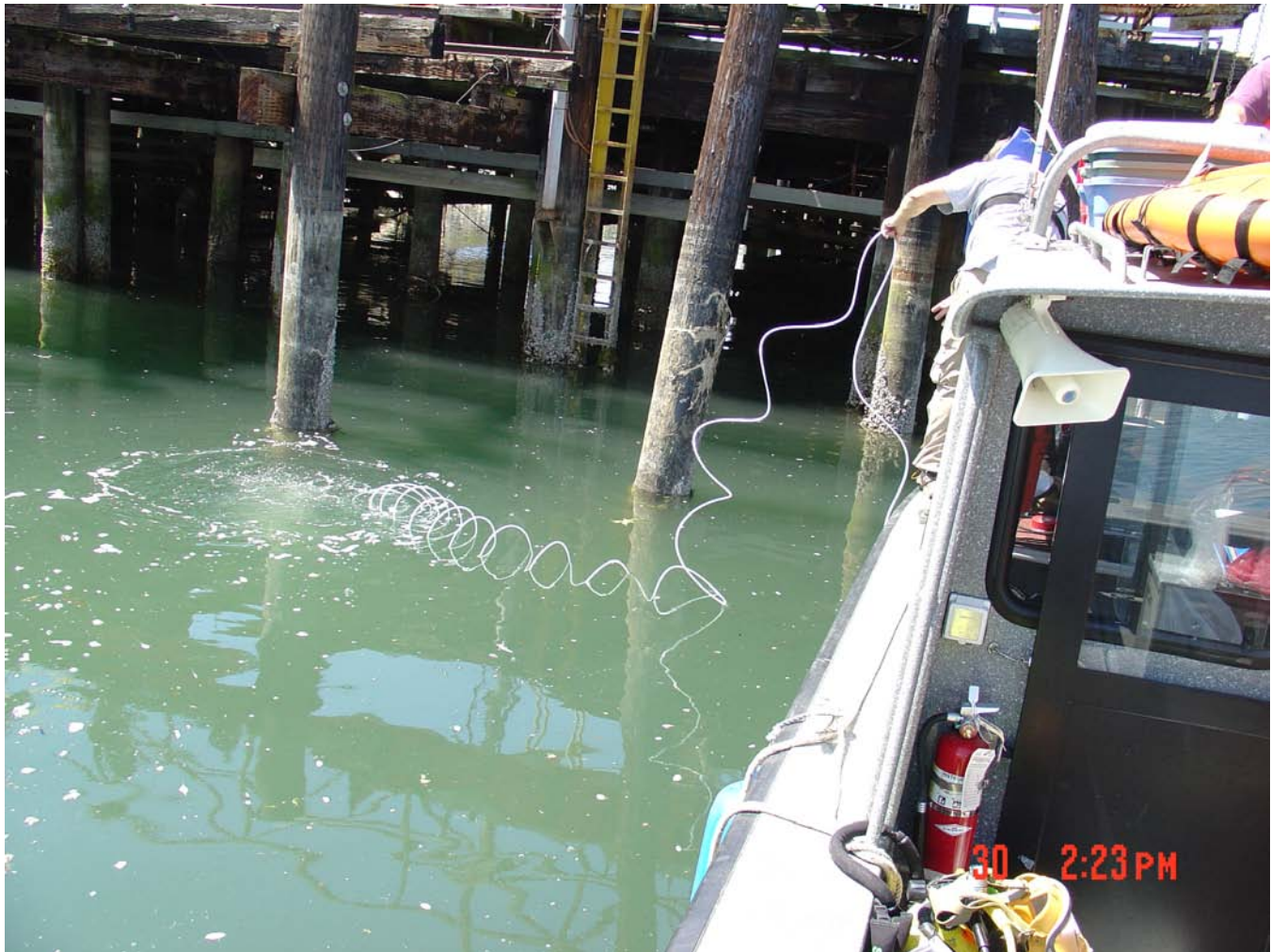
**Locations for piezometers (P), diffusion samplers (T), and survey area at Occidental**



**Notes on the scale & the location of boat GPS coordinates**

- Waypoint numbers are indicated diagonally;
- Piezometers are indicated in italics [exact locations differ slightly from boat location]
- Diffusion sample locations are indicated by dots along transects
- Distance between WP 45 and 18 is 1584 feet (0.300 mile)
- length of ortho photo = 1946 ft
- Horizontal lines indicate distance from site boundary

T1 = 0 ft offset + 4 node = 98.4 ft	3 node = ●●●
T2, T3, T4 = 20 ft offset + 4 node = 118.4 ft	4 node = ●●●●
T5, T6, T7, T8, T9 = 20 ft offset + 3 node = 85.6 ft	5 node = ●●●●●
T10 = 50 ft offset + 5 node = 181.2 ft	20 ft offset = —
Nodes are 32.81 ft apart (10 m)	50 ft offset = —



Tubing connected to the piezometer is released to the surface by the diver



Rob Pedersen preparing to videotape zone of precipitate



Typical finger pier, rip rapped shoreline, and facility tanks

Return to [EPA Region 10 Dive Team](#) homepage.