Federal Consent Decree Exhibit A

MONITORING, REPORTING, AND CONTINGENCY PLAN

for the St. Paul Waterway Area Sediment Remedial Action and Habitat Restoration Project

September 1990

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TABLE 1. MONITORING ACTIVITIES AND REPORTING

Activity	Sample Method	Frequency	Report Due Dates	
			Draft	Final
Visual Inspection	Aerial photography, ground inspections, photos & field notes	Annually, May-June until 1998 and thereafter every 5 years as necessary	Oct. 15	Dec. 31
Bathymetry	Ground survey during extreme low tide	Annually, May-June 1991, 1992, 1993, 1995, 1998 thereafter every 5 years as necessary	Oct. 15	Dec. 15
Intertidal Transects	Ground survey during extreme low tide	March, May-June, Nov.-Dec. 1991, 1992; May-June 1993, 1995, 1998 thereafter every 5 years as necessary	Oct. 15 Jan. 31	Dec. 31 March 30
Sediment Deposition	Measure sediment depth over buried plates	As necessary	Oct. 15	Dec. 15
Intertidal Seeps	Grab sample water and surface sediment, 3 stations	Annually, May-June 1991, 1993, 1998 thereafter as necessary	Oct. 15	Dec. 15
Gas Vents	Core sample sediment, 5 stations	Annually, May-June 1991, 1992, 1993, 1995, 1998 thereafter as required	Oct. 15	Dec. 15
Surface Chemistry	Sample surface sediment, 5 stations	Annually, May-June 1991, 1992, 1993, 1995, 1998 thereafter as required	Oct. 15	Dec. 15
Subsurface Chemistry	Core sample 12 stations, sample 30-40 cm below surface, 90-100 cm and 30-40 cm above cap-sediment boundary	Annually May-June 1991, 1992, 1993, 1995, 1998 thereafter every 10 years as necessary	Oct. 15	Dec. 15

Benthos	Van Veen grab, 5 replicates at 6 stations on cap and 2 reference stations	Annually, March 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998	Oct. 15	Dec. 15
Epibenthos	Suction sampler, 6 cap stations, 1 reference station	Annually April, May, June, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998 thereafter as necessary	Oct. 15	Dec. 15
Macrophytes	Ground survey and aerial photography	June-August 1991-1998 thereafter as necessry	Oct. 15	Dec. 15
Table 1 Update (annual monitoring activities)	Not applicable	Annually for duration of monitoring	Jan. 31	March 1

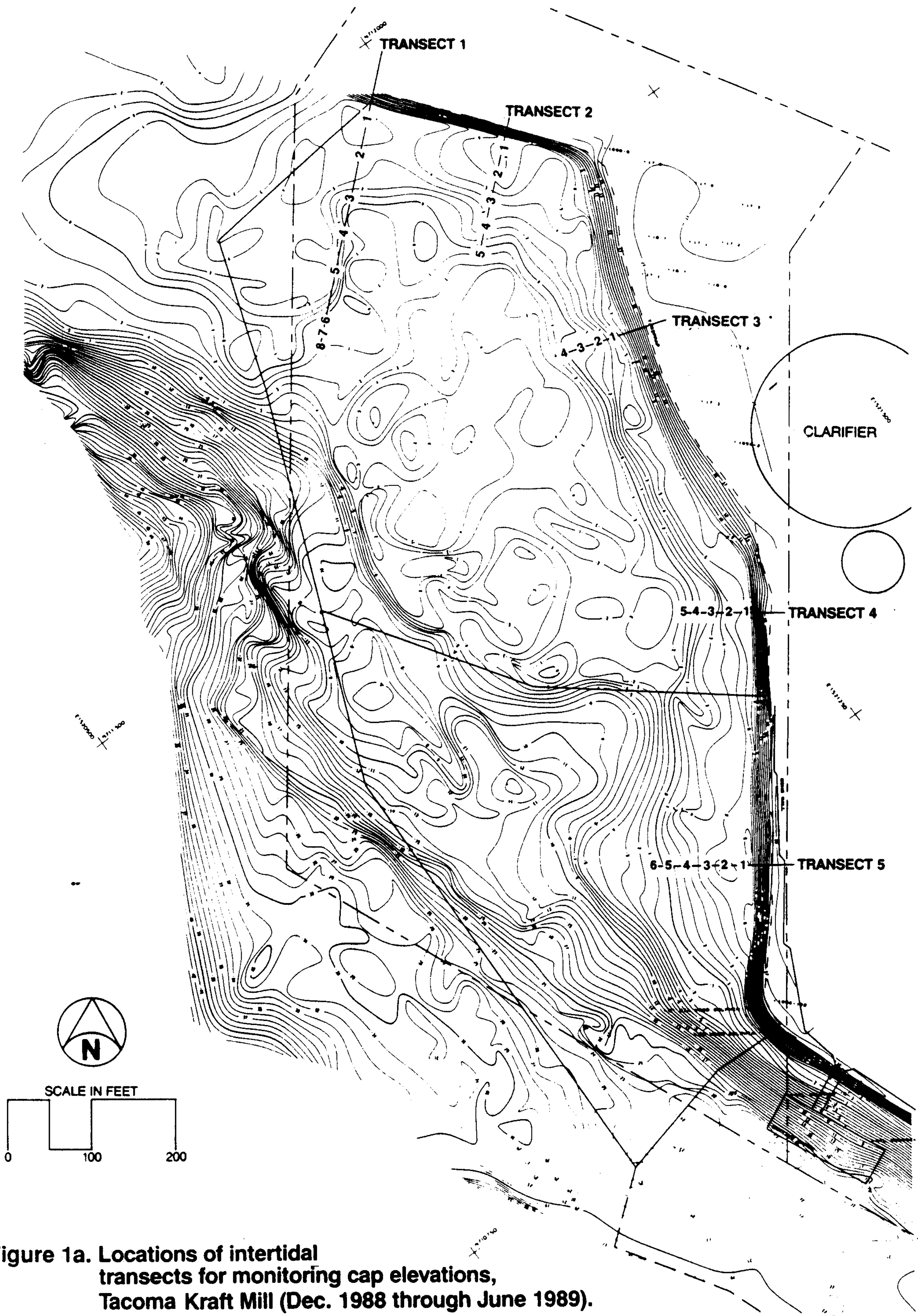

Figure 1a. Locations of intertidal transects for monitoring cap elevations, Tacoma Kraft Mill (Dec. 1988 through June 1989).

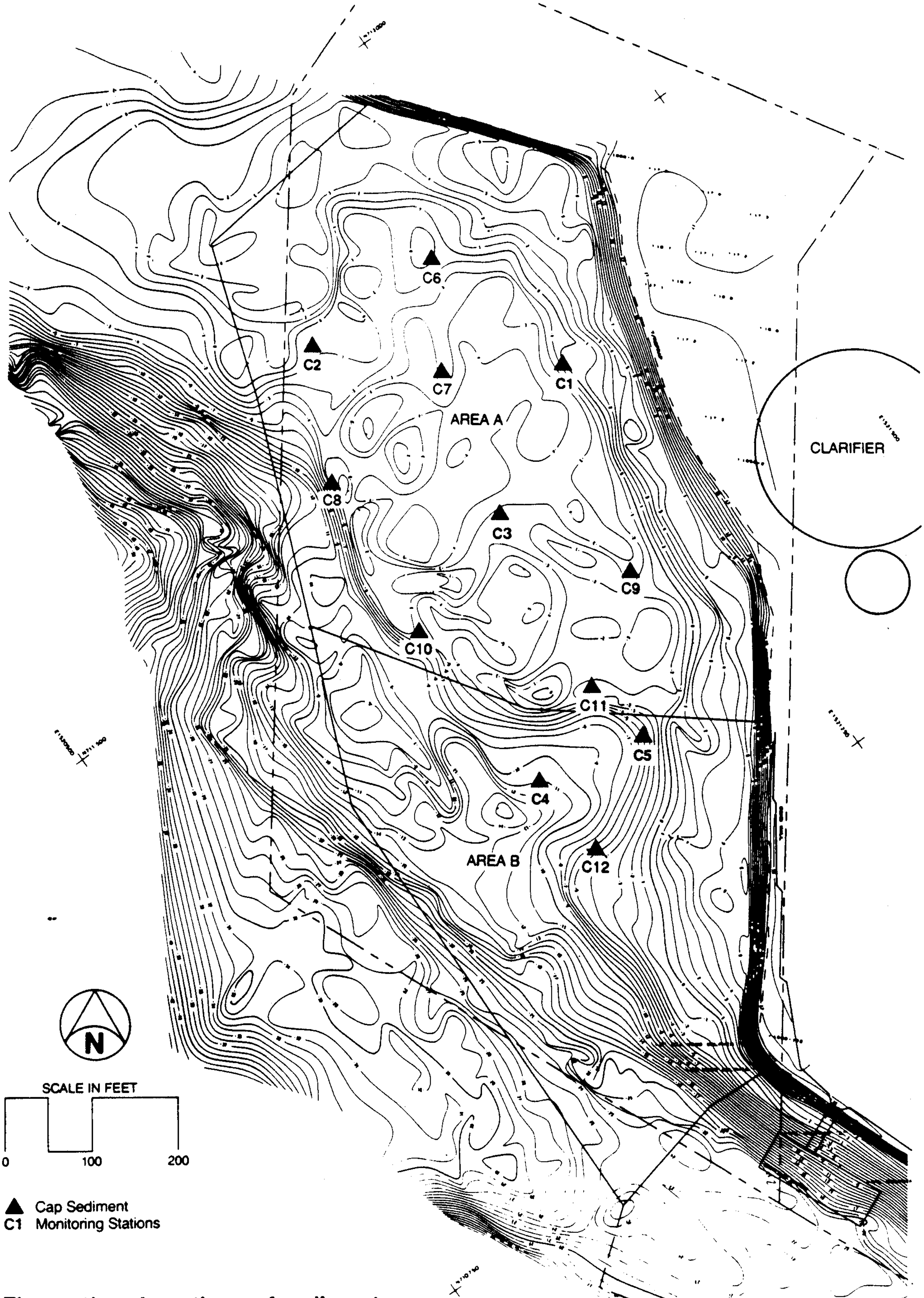

Figure 1b. Locations of sediment core monitoring stations, Tacoma Kraft Mill.

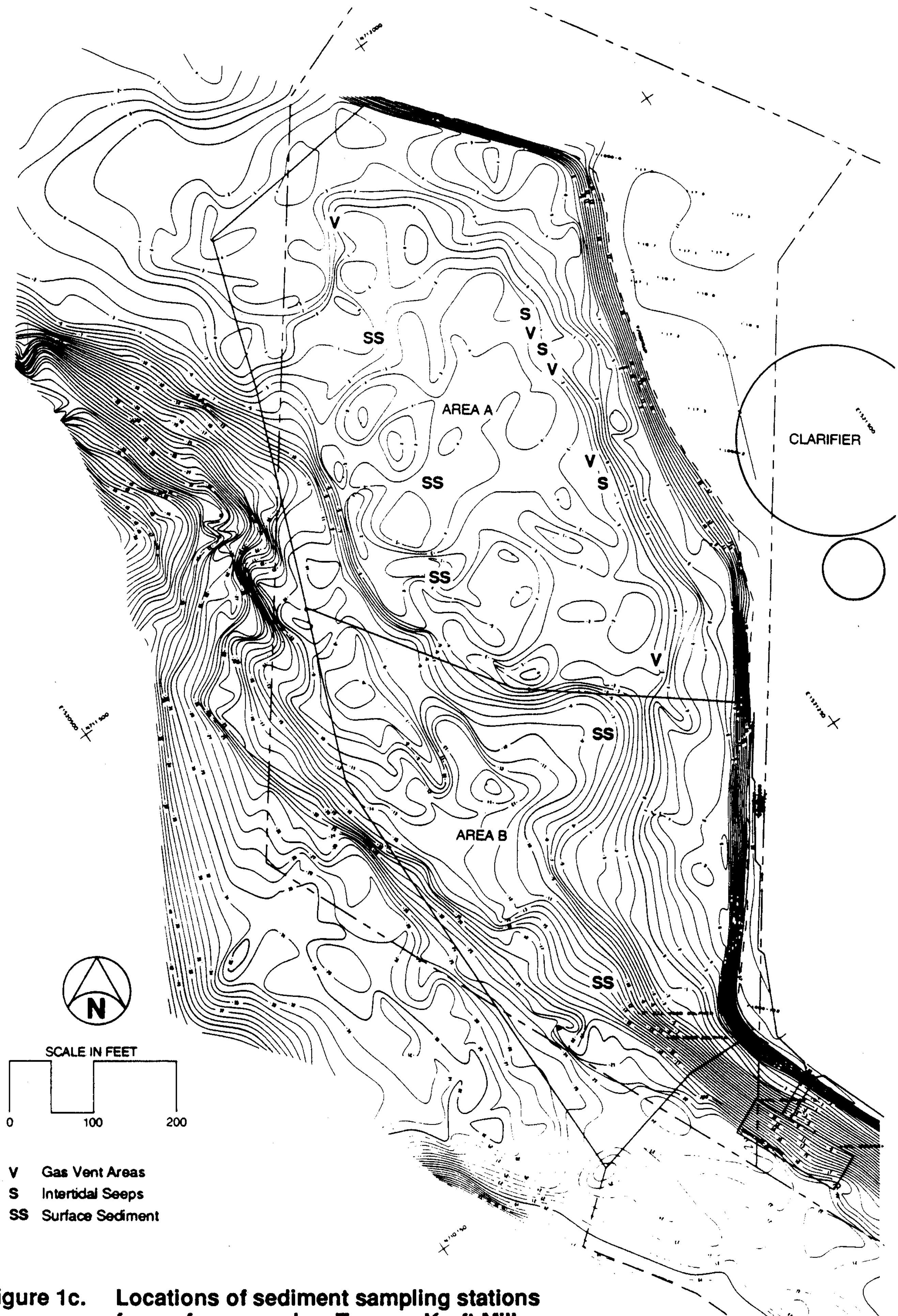

Figure 1c. Locations of sediment sampling stations for surface samples, Tacoma Kraft Mill.

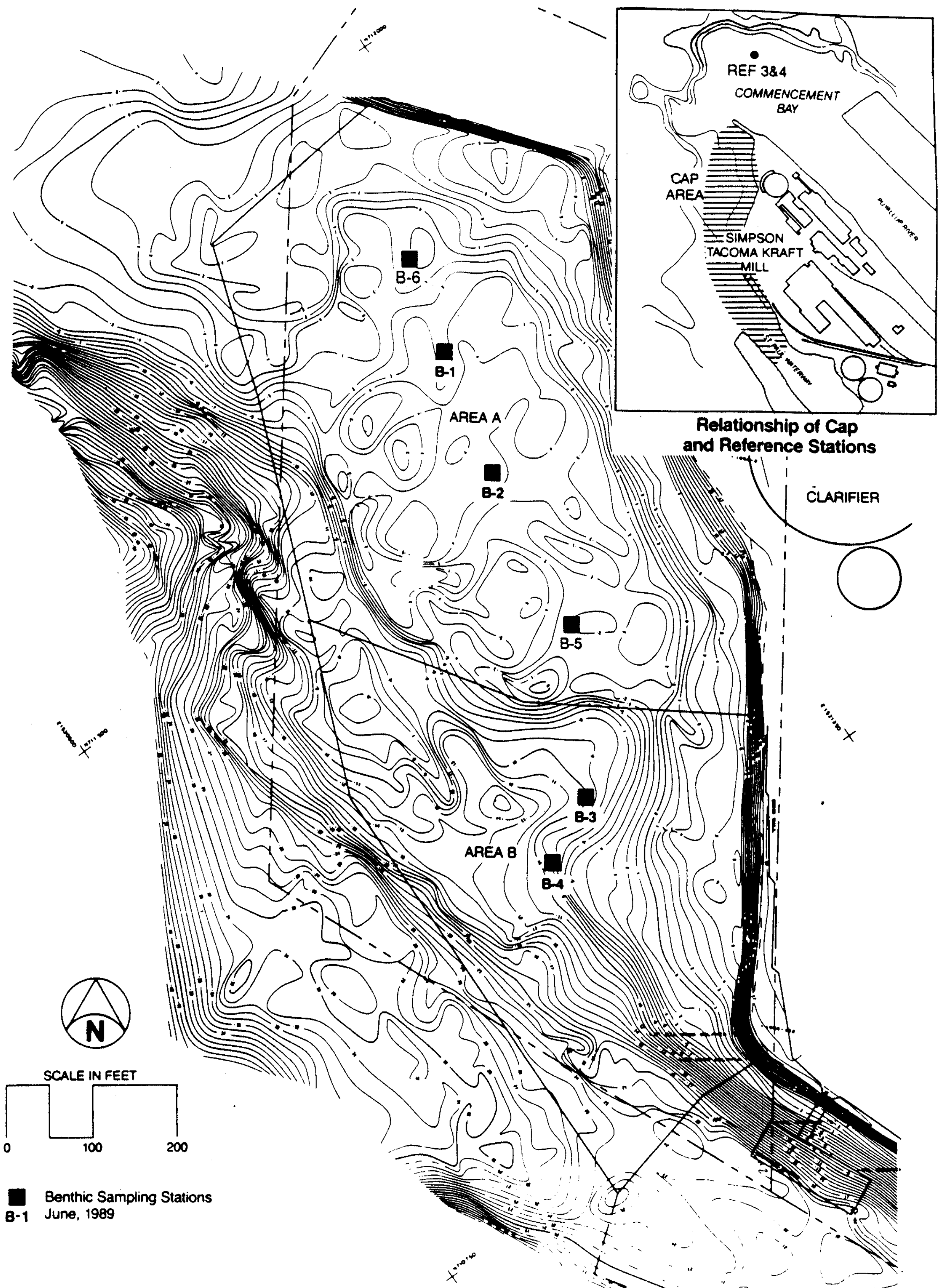

Figure 1d. Location of benthic monitoring stations, Tacoma Kraft Mill.

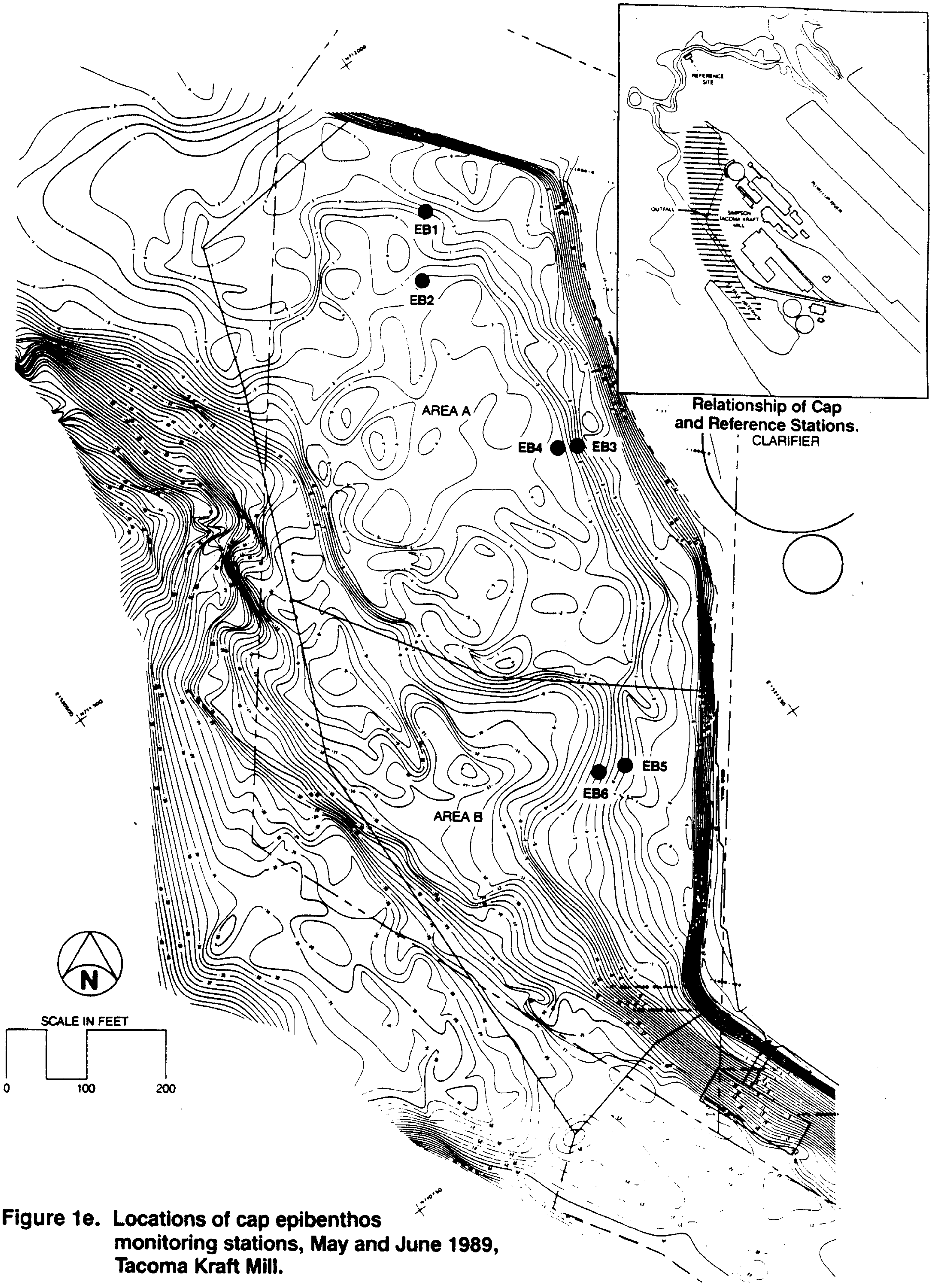

Figure 1e. Locations of cap epibenthos monitoring stations, May and June 1989, Tacoma Kraft Mill.

INTRODUCTION

Simpson Tacoma Kraft Company (Simpson), the Washington Department of Natural Resources (WDNR), and Champion International Paper Corporation (Champion) entered into a state court consent decree with the Washington Department of Ecology (Ecology) in 1987 to undertake sediment remedial action and habitat restoration. The remedial action included placement of a sediment cap over contaminated sediments and habitat restoration to provide substrate for development of a healthy biological community. The State Decree specified a monitoring program to assure the contaminated sediments remained isolated below the cap and that a healthy biological community would repopulate the area.

The remedial actions were conducted in 1988 in the problem area at the mouth of St. Paul Waterway prior to completion of the Commencement Bay Nearshore/Tideflats (CB/NT) Superfund study. The record of decision (ROD) for the CB/NT Superfund site was signed September 30, 1989 by the U.S. Environmental Protection Agency (EPA), and it identified the capping/restoration methodology, source control through the NPDES program, and comprehensive long-term monitoring as the selected remedy in the St. Paul Waterway Area. One purpose of this monitoring element is to ensure long-term protectiveness of sediment remedial actions, in accordance with Comprehensive Environmental Response Compensation and Liability Act (CERCLA) provisions and other applicable laws. This document defines the requirements of the monitoring element for the sediment remedial action in the St. Paul Waterway area. The remedy is considered effective if it isolates the contaminated sediments, supports a biological community comparable to reference areas and meets the performance standards in the federal consent decree.

The ROD also specifies that Ecology will be the lead agency for source control, and EPA will be the lead agency for sediment remedial action. Therefore, EPA will provide oversight of the Simpson sediment remedial action and Ecology will continue to oversee source control activities. A separate plan to monitor the wastewater outfall is governed by a state waste discharge and National Pollutant Discharge Elimination System (NPDES) permit. Should source control not prove effective, Ecology will require Simpson to take corrective action. Should the sediment remedial action not perform as expected, EPA will require the potentially responsible parties (PRPs) to implement contingency actions. This plan also describes how EPA will implement the contingency planning process should the sediment cap not perform as expected.[1]

This plan replaces and reflects a refinement of an existing monitoring plan (State Decree, Exhibit D). It is divided into five major sections: a description of monitoring plan objectives, required monitoring activities, monitoring methods and quality assurance/quality control (QA/QC) procedures, reporting requirements, and contingency procedures. The plan was developed with and has the concurrence of the various consulted agencies. The consulted agencies for the project are the: Washington State Department of Fisheries (WDF), Ocean Assessments Division of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of the Interior (DOI) (U.S. Fish & Wildlife Service (FWS)), Ecology, WDNR, Puyallup Tribe, and the Muckleshoot Tribe. Monitoring data for the first three years following cap construction have also been considered in refining this plan.

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1 Where appropriate, EPA will review monitoring data under the NPDES permit for the Mills' outfall and other data on potential sources of contamination in accordance with the Contingency Planning Process before determining the source of recontamination of the cap surface. If the Settling Defendants disagree with EPA's conclusions regarding the monitoring data under the NPDES permit and the source of the recontamination, the dispute will be resolved under the dispute resolution proceedings of the federal consent decree.

EPA's Remedial Project Manager (RPM) is responsible for oversight of the Monitoring Plan, and Simpson's Project Coordinator is responsible for implementation of the Plan. The RPM and Project Coordinator can designate other representatives to represent them and carry out specific tasks. However, their designation of any representations to participate in any meetings or conferences on the contingency planning process and the Table 1 Update in this plan shall be done with prior and mutual consent.

This plan is incorporated by reference as an exhibit to the federal and state consent decrees. The federal consent decree is signed by U.S. EPA, the natural resource trustees and the PRPs, including Simpson, WDNR, and Champion Paper. The state consent decree is signed by Ecology, Simpson, Champion, and WDNR. The WDNR is both a PRP and a natural resource trustee and has different representation for each role.

MONITORING OBJECTIVES

The goals of the sediment remedial action taken by Simpson and Champion are to ensure that:

- Toxic concentrations of previously identified chemicals of concern in the sediments are isolated from marine biota.
- Cap sediments are not recontaminated with chemicals of concern from underlying sediments or the mill.
- Contaminated sediments remain isolated for a sufficient period of time to allow the concentrations of chemicals of concern to decrease to an acceptable level (i.e., chemical and microbial activity modify chemical composition of buried sediments over time).
- The natural habitat has been restored to support a productive biological community comparable in species composition and abundance to other relatively noncontaminated estuarine habitats in urban areas.

The integrity of the sediment cap and source control are fundamental to the achievement of these goals. Cap integrity depends upon maintenance of the designed cap thickness to avoid contaminants' contact with biota and the continued attainment of the performance standards in paragraph 48 of the federal consent decree. The following processes will be monitored:

- **Physical erosion to assure cap depth is sufficient to isolate marine organisms from contaminated sediments.** Bathymetric and chemical monitoring can detect these changes.
- **Physical mixing to assure that the cap and the underlying contaminated sediments are not being mixed and pose a threat to cap integrity.** Chemical monitoring can detect this process .
- **Upward diffusion to assure contaminants are not moving through the cap and pose a threat to cap integrity.** Chemical monitoring can detect this type of change.
- **Surface contamination to assure seeps and vents are not vehicles for recontamination.** Chemical monitoring can detect this type of charge.
- **Surface contamination from other sources.** For example, potential offsite contaminant sources could impact the remediation site and deposit chemicals of concern. Chemical monitoring can detect this process.

The objective of this monitoring plan is to detect any loss of cap integrity, and the assess if the natural habitat has been restored relative to reference areas. Physical, chemical, and biological monitoring are required to meet these objectives. The exact nature of this monitoring and the criteria used to determine cap integrity are discussed in the following section.

MONITORING ACTIVITIES

Monitoring will be conducted to measure the success of completed remedial actions and assess the fate of the capped sediments. This monitoring plan is designed to detect any future contamination of surface sediments as well as the failure to adequately confine the existing underlying contaminated sediments. Monitoring will also measure the rate and extent of repopulation of the cap area by plants and invertebrates.

The specific components of the monitoring plan are listed in Table 1 (Page iii). Each component is discussed below with a description of its relationship to the monitoring plan objectives. Specific criteria that are used to trigger additional actions are also described. Monitoring methods and associated QA/QC procedures are addressed in the next section. The maps contained in this plan indicate general locations of sampling stations. Thirty days prior to any sampling effort, EPA will be provided a copy of the proposed station locations for review, comments, and final approval. This will include a map and associated coordinates (i.e., latitude, longitude, or Washington state plane coordinates) for each station.

The Project Coordinator will notify the RPM when a complete raw data set specific to each monitoring component is received. The federal and state consent decrees contain provisions governing the availability of these data. EPA has the authority to obtain a subsample (field split) from any chemistry or biological sample collected by Simpson.

Simpson and the regulatory agencies will use the results of the first 10 years of monitoring to define the appropriate sampling type and frequency for subsequent years. Review will occur every 5 years in accordance with Superfund, although actual monitoring could occur less frequently. As part of the 5-year review, the Project Coordinator may provide information and analysis to EPA for consideration.

The 5- and 10-year reviews will provide a basis for evaluating the monitoring program and making any adjustments that may be necessary. The early warning process described in the contingency planning section provides a basis for revising the monitoring program, as necessary, based on monitoring results. Should refinement of this plan be necessary, the consent decree provides for appropriate revisions in the monitoring and contingency plans by mutual agreement, without formally amending the decree itself.

A map of the area to be monitored is shown in Figure 1 (Pages iv et seq.). Region A is the area in which the highest levels of contamination existed prior to construction of the cap. The cap is 8-12 feet thick in this area. Region B, located immediately south of Region A, is an area where low levels of contamination existed. A 4-6 foot cap was placed over this region.

Any contractor or subcontractor performing more than $100,000 worth of monitoring work is required to obtain a copy of the consent decree from Simpson.

ANNUAL VISUAL INSPECTION

Annual visual inspections of the capped areas are to be conducted during an extreme low-tide period in May-June. These inspections, to be conducted annual through 1998 and every 5 years thereafter if necessary, will include photographic and written records of observed conditions. A low-altitude overflight photograph of the area is to be a part of the photographic record. Details to be noted include, but are not limited to, general contours and topography of the site; the color, texture, and odor of surface sediments; the presence of observable biological communities and organisms; and the presence and locations of special, unusual, or abnormal features such as gas vents. These inspections will be conducted jointly by EPA and Simpson representatives; consulted agencies will be invited to attend. Simpson will notify EPA and the consulted agencies at least 3 weeks prior to the planned inspection date. This requirement does not preclude any of the parties listed from conducting additional inspections.

Information obtained during these inspections will be used to determine the overall physical condition of the cap. Comparison can be made with previous visual inspections and used to assess gross physical changes in the area. Visual data can also substantiate trends noted in the analysis of monitoring data.

BATHYMETRIC SURVEY

The physical condition of the cap will be monitored by both a topographic survey and intertidal transect surveys. The topographic survey will provide information on the loss or deposition of sediments between +6 feet and -4 feet to -7 feet mean lower low water (MLLW). Movement of sediment into deeper water, for example, will be detected using topographic data. The intertidal transect survey will provide more detailed data for the portion of the cap exposed at extreme low water. The techniques used to conduct the intertidal survey must be capable of detecting annual changes in elevation on the order of ±4 inches.

A topographic survey of the entire cap area (Regions A and B) will be conducted during a spring low tide (-3 feet MLLW or greater) in 1991, 1992, 1993, 1995 and 1998 if necessary, every 5 years thereafter while the monitoring program is in effect. Bathymetric surveys will follow the methods described in the Monitoring Methods and Quality Assurance/Quality Control section. Data will be plotted as topographic contours on maps. These maps shall include all actual survey locations and record elevations.

Intertidal transect surveys will be conducted three times per year in March, May-June, and November-December in 1991 and 1992; annually (May-June) in 1993, 1995, 1998 and, if necessary every 5 years thereafter while the monitoring program is in effect. Intertidal surveys may be required more frequently depending on the results of annual or post-storm visual inspections. These surveys will measure cap elevations at tide levels of -4 to +6 feet MLLW along five transects within Region A (Figure 1).

If a major or catastrophic storm or an earthquake of significance occurs in the immediate area, an additional low-tide visual inspection will be performed immediately by Simpson. A major storm is defined as any storm with winds blowing from the north to the northwest at 30 miles per hour or greater, for a period of 4 hours or longer. Simpson is also required to perform an intertidal transect survey immediately following such an event. The inspection and survey will be initiated without EPA direction and the results will be reported to EPA within 21 days of the storm event.

SEDIMENT DEPOSITION MONITORING

A series of elevation markers have been placed within Regions A and B to serve as permanent reference points for deposition monitoring. These markers consist of four stakes, 1.5 meters long, driven into the sediment adjacent to the four corners of a steel or plastic square plate (0.5 x 0.5 meters). The square plate was buried about 30 cm beneath the sediment surface. The location and elevation of each station was determined by theodolite and electronic distance measuring (EDM) equipment with reference to permanent shoreline monuments. The locations of the sediment-marker stations are shown in Figure 1. These deposition plates will remain in place permanently.

The elevation of the sediment surface relative to each marker will be measured during a spring low tide (-3 feet MLLW or greater) under the contingency planning process when ever sufficient need for monitoring of this nature arises.

TABLE 2. SEDIMENT SAMPLE ANALYSIS VARIABLES

ORGANICS (μg/kg dry weight)	
LPAH[a]	Total PCBs
Naphthalene	Miscellaneous Extractables
Acenaphthylene	Retene
Acenaphthene	Resin Acids and Chlorinated Guaiacols
Flourene	Abietic acid
Phenanthrene	Dehydroabietic acid
Anthracene	Monochlorodehydroabietic acid
2-Methylnapthalene	Dichloro-dehydroabietic acid
HPAH[b]	Isopimaric acid
Fluoranthene	Neoabietic acid
Pyrene	3,4,5-Trichloroguaiacol
Benzo(a)pyrene	4,5,6-Trichloroguaiacol
Indeno(1,3,3-c,d)pyrene	Tetrachloroguaiacol
Dibenzo(a,h)anthracene	Phenols
Benzo(g,h,i)perylene	Phenol
Chlorinated Benzenes	2-Methylphenol
1,3-Dichlorobenzene	4-Methylphenol
1,4-Dichlorobenzene	Pentachlorophenol
1,2-Dichlorobenzene	2-Methoxyphenol
1,2,4-Trichlorobenzene	2,4-Dimethylphenol
Hexachlorobenzene	
Metals (mg/kg dry weight)	
Arsenic	Nickel
Cadmium	Mercury
Copper	Zinc
Lead	
Conventionals	
Total solids	Oil and grease
Total volatile solids	Sulfide
Total organic carbon	Grain size

a. LPAH - low molecular weight polynuclear aromatic hydrocarbons.

b. HPAH - high molecular weight polynuclear aromatic hydrocarbons.

TABLE 3. EPA PRIORITY POLLUTANTS AND HAZARDOUS SUBSTANCES

EPA NO.[a]	Compound	EPA No.[a]	Compound
	Phenols		**Chlorinated Aliphatic Hydrocarbons**
65	Phenol	12	Hexachloroethane
HSL	2-Methylphenol	52	Hexachlorobutadiene
HSL	4-Methylphenol	53	Hexachlorocyclopentadiene
34	2,4-Dimethylphenol		
	Substituted Phenols		**Halogenated Ethers**
24	2-Chlorophenol	18	Bis(2-chloroethyl)ether
31	2,4-Dichlorophenol	42	Bis(2-chloroisopropyl)ether
22	4-Chloro-3-methylphenol	43	Bis(2-chloroethoxy)methane
21	2,4,6-Trichlorophenol	40	4-Chlorophenyl phenyl ether
HSL	2,4,5-Trichlorophenol	41	4-Bromophenyl phenyl ether
64	Phentachlorophenol		
57	2-Nitrophenol		**Phthalates**
59	2,4-Dinitrophenol		
	Low Molecular Weight Aromatics	71	Dimethyl phthalate
		70	Diethyl phthalate
		68	Di-n-butyl phthalate
		67	Butylbenzylphthalate
55	Naphthalene	66	Bis(2-ethylhexyl)phthalate
77	Acenaphthylene	69	Di-n-octylphthalate
1	Acenaphthene		
80	Fluorene		**Miscellaneous Oxygenated Compounds**
81	Phenanthrene		
78	Anthracene		
		54	Isophorone
	Low Molecular Weight PAH	HSL	Benzyl alcohol
		HSL	Benzoic acid
39	Fluoranthene	129	2,3,7,8-Tetrachlorodibenzo-p-dioxin
84	Pyrene		
72	Benzo(a)anthracene	HSL	Dibenzofuran
76	Chrysene		
74	Benzo(b)fluoranthene		**Organonitrogen Compounds**
75	Benzo(k)fluoranthene		
73	Benzo(a)pyrene	HSL	Aniline
83	Indeno(1,2,3-c,d)pyrene	56	Nitrobenzene
82	Dibenzo(a,h)anthracene	63	N-nitroso-di-n-propylamine
79	Benzo(g,h,i)perylene	HSL	4-Chloroaniline
		HSL	2-Nitroaniline
	Chlorinated Aromatic Hydrocarbons	HSL	3-Nitroaniline
		HSL	2-Nitroaniline
		36	2,6-Dinitrotoluene
26	1,3-Dichlorobenzene	35	2,4-Dinitrotoluene
27	1,4-Dichlorobenzene	62	N-nitrosodiphenylamine
25	1,2-Dichlorobenzene	5	Benzidine
8	1,2,4-Trichlorobenzene	28	3,3'-Dichlorobenzidine
20	2-Chloronaphthalene		
9	Hexachlorobenzene		

Table 3. (Continued)

EPA NO.[a]	Compound	EPA No.[a]	Compound
	Pesticides		**Volatile Halogenated Alkenes**
93	p,p'-DDE	88	Vinyl chloride
94	p,p'-DDD	29	1,1'-Dichloroethene
92	p,p'-DDT	30	Trans-1,2-dichloroethene
89	Aldrin	33	Cis- and trans- 1,3-dichloropropene
90	Dieldrin		
91	Chlordane	87	Trichloroethene
95	α-Endosulfan	85	Tetrachloroethene
96	ß-Endosulfan		
97	Endosulfan sulfate		**Volatile Aromatic Hydrocarbons**
98	Endrin		
99	Endrin aldehyde	4	Benzene
100	Heptachlor	86	Toluene
101	Heptachlorepoxide	38	Ethylbenzene
102	α-HCH	HSL	Styrene
103	ß-HCH	HSL	Total xylenes
104	δ-HCH		
105	τ-HCH		**Volatile Chlorinated Aromatic Hydrocarbons**
113	Toxaphene		
	PCBs	7	Chlorobenzene
106	Aroclor 1242		**Volatile Unsaturated Carbonyl Compounds**
110	Aroclor 1248		
107	Aroclor 1254		
111	Aroclor 1260	2	Acrolein
		3	Acrylonitrile
	Volatile Halogenated Alkanes		
			Volatile Ethers
45	Chloromethane		
46	Bromoethane	19	2-Chloroethylvinylether
16	Chloroethane		
44	Methylene chloride		**Volatile Ketones**
13	1,1'-Dichloroethane		
23	Chloroform	HSL	Acetone
10	1,2-Dichloroethane	HSL	2-Butanone
11	1,1,1-Trichloroethane	HSL	2-Hexanone
6	Carbon tetrachloride	HSL	4-Methyl-2-pentanone
48	Bromodichloromethane		
32	1,2-Dichloropropane		**Miscellaneous Volatile Compounds**
51	Chlorodibromomethane		
14	1,1,2-Trichloroethane		
47	Bromoform	HSL	Carbon disulfide
15	1,1,2,2-Tetrachloroethane	HSL	Vinyl acetate

[a] HSL - Hazardous substance list.

CHEMICAL MONITORING

The concentrations of chemicals of concern will be monitored within Regions A and B. Chemical monitoring includes subsurface sediment sampling and surface sediment sampling which includes a contamination pathway assessment. The subsurface data will be used to confirm the integrity of the cap over a broad area, determine the degree to which the sediment at the bottom of the cap may have been mixed with underlying contaminated sediments, and provide a frame of reference for past and subsequent comparisons with monitoring data. Subsurface samples will also be used to detect possible migration of contaminants into the cap from the underlying contaminated sediments. The chemical data obtained from the contamination pathway assessment will be used to determine if the contaminants remain confined to the area underlying the cap or if contaminants are transported by seeps and vents. Additional surface sediment sampling will be conducted to assess if contaminated from off the site may affect the surface sediment quality at the site. The contingency planning procedures section describes how monitoring data will be evaluated and what contaminant levels will trigger additional action.

Sediment samples collected for chemical analysis will be analyzed for conventional and priority pollutants and other organic parameters listed in Tables 2 and/or Table 3, as specified below, and in accordance with the monitoring methods and quality assurance/quality control section of this document. All chemical concentrations will be reported as bulk sediment concentrations on a dry weight basis. Chemicals were selected based on their presence within the region prior to remediation or their association with Kraft pulp mills. Further consideration has been given to polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) to supplement the PCDD and PCDF data collected during the RI/FS.

Descriptions of each of the types of sediment chemistry monitoring, and the additional PCDD and PCDF analyses, are outlined below.

Subsurface Sediment

Sediment borings will be obtained at twelve stations each year in 1991, 1992, 1993, 1995 and 1998 and thereafter every 10 years if necessary. (Figure 1.) These will include nine stations in Area A (8-12 foot cap) where the greatest contamination was measured. Three stations will be in Area B (4 foot cap). Samples will be taken from the 30-40 cm and 90-100 cm elevations above the cap/sediment boundary for physical and chemical analyses. A third sample will be collected from the borings at a depth of 30-40 cm below the cap surface in each of the twelve borings. All other portions of the boring between the cap-sediment boundary and 120 cm above will be stored for a six-month period should additional analyses be required.

Each sample collected for chemical analysis will be analyzed for a number of conventional, priority pollutant and other organic parameters. Conventional parameters will include:

total solids,
total volatile solids,
total organic carbons
oil and grease, and
sulfides

Subsurface sediment samples collected in 1991 will be analyzed for the parameters listed in Table 2. In subsequent years, specified above, the subsurface sediment samples will be analyzed for p-cresol (4 methylphenol) and chlorinated guaiacols unless other parameters are determined to be necessary by the contingency planning process. All chemical concentrations will be reported as total concentrations per dry weight. Each of these parameters has been measured in the baseline samples collected prior to construction.

Intertidal Seeps

In coordination with consulted agencies, three intertidal seeps in Area A will be selected for sampling. The seeps will be mapped from the May-June 1991 aerial photographs. Samples of flowing water in each seep will be collected during a May-June low tide period (-1 feet MLLW or lower). A 2 cm surface sediment sample will be collected near the lower edge of each seep where fine grained material appears to accumulate due to washing by the seep.

Water samples will be analyzed for all Table 2 parameters except grain size and total volatile solids. Sediment samples will be analyzed for all Table 2 parameters. Aliquots from all sediment samples will be archived for possible future analysis. Archived samples will be stored for at least 6 months as described for the subsurface sediment samples.

Intertidal seep sampling will be conducted in 1991, 1993 and 1998, and thereafter if necessary.

Gas Vents

In combination with the consulted agencies, five gas vents in Area A will be identified for sediment sampling in 1991, 1992, 1993, 1995 and 1998 and thereafter if necessary. Active vents will be selected and sampled during a May-June low tide period (-1 foot MLLW or lower). Vents will be mapped by means of field notes and aerial photography. Sediment samples will be collected from the top 2 cm of sediment at the vent and from below the vent opening itself by use of a hand core. A 10 cm sediment core sample will be collected at a depth of 30-40 cm below the surface of each vent opening. In 1991 sediment samples will be analyzed for all Table 2 parameters. In subsequent sampling years 1992, 1993, 1995 and 1998) sediment samples will be analyzed for p-cresol (4 methylphenol) and chlorinated guaiacols unless other parameters are determined to be necessary by the contingency planning process. Aliquots from all sediment samples will be archived for possible future analysis. Archived samples will be stored for at least 6 months as described for the subsurface sediment samples.

Surface Sediment Chemistry

In 1991, 1992, 1993, 1995 and 1998, and thereafter if necessary, surface sediment samples will be collected from cores at 5 of the subsurface sampling locations. Two samples will be analyzed for the Table 2 parameters and the remaining 3 samples will be analyzed for Table 2 and Table 3 parameters. Two surface samples will be collected from Area A cores and 3 surface samples will be collected from Area B cores. The top 2 cm of each surface sample will be analyzed.

Sediment PCDD and PCDF Monitoring

To supplement PCDD and PCDF data collected during the RI/FS additional sediment PCDD and PCDF assessment is necessary. In 1991, 1993 and 1998, therefore, eight subsurface baseline cores, one surface seep and one surface vent sediment sample, and three of the five samples collected at surface sediment stations will be analyzed for PCDDs and PCDFs. Samples from the eight subsurface cores will be collected from immediately below the cap-sediment boundary; three samples will be analyzed for PCDDs and PCDFs, the other five will be archived for possible future analysis. This monitoring will be modified following the first year of data collection based on the three following results:

- PCDDS and PCDFs are undected in any sample. If PCDDs or PCDFs are not detected in any samples, then no further monitoring for PCDDs or PCDFs in subsurface sediments is required. PCDDs and PCDFs in surface sediments should continue to be monitored on a reduced frequency relative to other chemicals. At a minimum, PCDDs and PCDFs will be monitored at one vent, one seep and three surface stations 5 and 10 years following cap construction (1993 and 1998).

- PCDDs or PCDFs are detected in subsurface sediments only. This situation may indicate that organisms could be exposed to PCDDs or PCDFs if cap failure occurs. Subsequent monitoring for PCDDs and PCDFs will be required at a minimum at those subsurface stations where the chemicals were detected during 1991, 1993, and 1998. The PCDDs and PCDFs will also be monitored at a minimum in the vent, seep and surface sediment stations 5 and 10 years following cap construction (1993) and (1998).

- PCDDs or PCDFs are detected in surface sediments. If PCDDs or PCDFs are detected at concentrations of concern in surface sediments the contingency planning process would be implemented. Additional sampling and analysis may be required to define the spatial extent, level of contamination, and source of contamination. Other contingency actions may be required as appropriate.

BIOLOGICAL MONITORING

The goals of the sediment remedial action include ensuring that the natural habitat has been restored to support a productive biological community. Biological monitoring will be performed to ensure that the fauna inhabiting the sediment cap are comparable in species composition and abundance to those found in relatively noncontaminated urban areas. Three specific types of biological data will be collected: benthic infauna, epibenthos, and macrophytes. Biological data will be used as an indicator or of potential sediment contamination in the upper layers of the cap. Data for selected epibenthic species will be used to assess the degree to which the ecological function of the cap ecosystem has been restored. Specifically, several species of epibenthic crustaceans are important in the diet of salmonids. The macrophyte census will be used to provide information on the presence and distribution of aquatic plants on the cap surface.

The establishment of appropriate reference stations is central to the successful interpretation of these biological data. It may be impossible to establish biological triggers for contingency action without data from reference stations that are comparable to the physical conditions present on the cap. Accordingly, Simpson will establish at least two reference stations by 30 June 1992. Between the date that the consent decree is signed and 30 June 1992, Simpson will investigate, sample, and establish the appropriateness of the candidate reference sites, as well as obtain EPA approval of the sites. Simpson will allow reasonable review periods for EPA and consulted agencies (i.e., at least 30 days) to examine related reports and data. The new reference stations should be established at locations that match, to the extent possible, the range in grain size, depth (intertidal height), salinity, and total organic carbon of the sediment cap and are in proximity to a river comparable in sediment load to the Puyallup. Sediment chemistry data from the reference area should not indicate the presence of chemicals above the levels in Table 7 and may use relevant existing data. Areas on the Puyallup River delta and on the Nisqually delta should be investigated as likely candidates for reference stations sites. Simpson is required to submit data (i.e., sediment chemistry, water depth, and benthic or epibenthic infauna abundance) substantiating the appropriateness of the proposed reference locations. Sampling and data reporting will proceed at a pace sufficient to ensure that reference stations are selected and approved by EPA before the 30 June 1992 deadline.

An adaptive approach will be used to develop the specific biological triggers. Specific triggers will be developed and revised as these data become available. An initial set of warning triggers and performance standards will be proposed by Simpson in time to allow EPA approval prior to 30 June 1992. Simpson will allow reasonable review periods for EPA and consulted agencies (i.e., at least 30 days) to examine related reports and data. The early warning triggers will become effective and apply to all data collected in 1993. Simpson or EPA may propose modifications to the triggers. The initial criteria to be used in selecting trigger criteria are described below for the benthic infauna and epibenthos monitoring components.

Benthic Infauna Surveys

Six benthic infauna sampling stations will be established within the cap area (Figure 1), four in Region A (at -2 to -6 feet MLLW) and two in Region B. At each station, five van Veen grab samples will be collected for benthic infauna analysis and one for physical analysis (grain size). These stations and the biological reference stations will be sampled annually in March 1991-1998. Taxa will be identified and enumerated to the species level and data will be reported as total macrofauna, major taxa (polychaetes, gastropods, bivalves, and crustaceans), total pollution-tolerant species, and total pollution-sensitive species. Simpson in consultation with EPA, will propose those taxa to be included in the pollution-tolerant and pollution-sensitive categories. Simpson, together with EPA, will evaluate similar statistical comparisons for pollution-tolerant/sensitive taxa. Individual species to be considered will include: 1) well-documented indicators of polluted or unpolluted urban areas, 2) important components in benthic food webs involving commercially important species (e.g., several species of amphipods), or 3) significant bioturbators (if present) capable of moving sediments and contaminants from within or below the cap to the surface or near the surface. Selecting individual species as triggers must balance the benefit of their use with possible problems arising from the need for increased sample replication or different sampling techniques. Significant reductions in abundance at an α level of 0.05 will trigger additional action (as specified in the Contingency Planning section). These tests will begin with the data collected in 1993. Prior data collected under the monitoring program in June are considered valid and usable for qualitative comparison with the data to be collected in March under this revised monitoring plan.

Similarity among stations will also be computed by applying the Bray-Curtis similarity index to the species data for each station pair. These similarity values will be used to assist in the interpretation of interstation differences. Three community indices will also be computed for each station: Shannon-Wiener diversity, Simpson's index, and evenness (J).

Epibenthos Surveys

Epibenthic monitoring will be conducted annually to characterize the community of epibenthic organisms populating Regions A and B (Figure 1) in accordance with the methods described in the following section. Epibenthos samples will be collected at two upper intertidal shoreline stations and two lower intertidal stations in Region A. Exact station locations will be proposed to EPA for approval. One lower intertidal and one upper intertidal station will be sampled in Region B (Figure 1). The locations of the stations on the transects will be changed, if necessary, to sample the same tide elevations each year. Epibenthos sampling will be conducted three times each year (1991-1998) in late April, mid-May, and early June. Epibenthos will also be sampled at similar tidal elevations at the reference station on the Puyallup River delta shown on Figure 1. EPA will review the data to confirm the suitability of the location or request another reference station be proposed. A minimum of ten samples will be collected at each station. Taxa within all samples collected prior to 30 June 1992 (date for establishing trigger value) will be identified and enumerated to the species level. One sediment sample will be collected by a van Veen grab sampler at each epibenthos station for one grain size analysis.

Pairwise statistical comparisons (t-test or Mann-Whitney U-test) will be made between each station and each reference location (see Biological Monitoring Methods). Variables to be tested will include those species of epibenthic crustaceans known to be important constituents in the diets of salmonids or other commercial species. Simpson, in consultation with EPA and the consulted agencies, will select those taxa to be identified and tested to develop a biological early warning trigger. This group will consider including the following organisms: *Tisbe sp., Harpacticus uniremis, Huntenannia jadensis, and Eogammarus confervicolus*. Similarity among station pairs will be calculated using the Bray-Curtis similarity index for all data collected prior to 30 June 1992. Three community indices will also be computed for each station including the Shannon-Wiener diversity, Simpson's index, and evenness (J). These similarity and community indices will be used to assist in the interpretation of station differences. Additional analyses of data may be required in the future, as deemed appropriate by EPA.

Aquatic Macrophytes

Aquatic plants growing on the shallow portions of the cap area will be surveyed annually by aerial photography. Photographs will be taken during a mid-day, low tide period (-3 to -4 feet MLLW) between June and August. These photographs will provide documentation of the extent of macrophytes on the cap area. During approximately the same period, a biologist will verify through a ground survey the species of plants present during the low tide. Data collected will include maps illustrating the spatial distribution and percent cover of each species.

MONITORING METHODS AND QUALITY ASSURANCE/QUALITY CONTROL

PHYSICAL MONITORING METHODS

Positioning

Positioning of sampling equipment and activities during monitoring will be recorded using one of several techniques, including range pole/range-finder, theodolite/EDM, range-range microwave, or range-azimuth equipment.

Theodolite/EDM positioning uses a land-based surveyor operating a standard theodolite together with an EDM device to measure distance, angle, and elevation from a predetermined shoreline location. This system can be used to independently verify the position of a survey vessel or activity to provide quality assurance as well as routine monitoring of position.

Range-range microwave positioning systems such as the Motorola Mini-Ranger or the Del Norte trisponder operate on the principle of pulsed signals, using a transmitter located on the survey vessel to interrogate onshore reference stations. The systems use distances from two onshore stations to triangulate the position. These systems are typically used in conjunction with a data processor and fathometer. The vessel operator can then utilize the x-y positioning information to maintain correct heading on the transect or specific position.

Range-azimuth positioning systems utilize a microprocessor-controlled shore station equipped with a laser beam range-finder. The survey vessel is equipped with a UHF-telemetry processor and a ring of target reflectors. The shore station automatically tracks the location of the vessel and transmits x-y positioning information to the onboard processor. The vessel's onboard processor stores the data along with the fathometric readings. The vessel operator utilizes x-y positioning to maintain a transect heading or specific position.

Bathymetry

Bathymetry refers to the measurement of sediment elevations relative to a datum plane, typically MLLW. Data obtained are also called the z values (depths) when used in context with x-y-z integrated computer survey systems for hydrographic surveys. Bathymetry data are obtained through theodolite/EDM land survey techniques. The bathymetric survey will encompass the cap area from +6 feet MLLW to between -4 ft. and -7 ft MLLW.

Intertidal bathymetry is measured at previously established points between +6 and -2 feet MLLW tide levels on five transects. The cap elevation will be measured with reference to a permanent shoreline benchmark. The elevation of the cap will be measured every 5 feet along five transects from +6 to -2 feet MLLW using a survey transit, leveling rod, and tape measure. These five transects will be located along lines shown in Figure 1.

Deposition Stations

Sediment deposition markers have been previously placed at each station by burying a square plate about 30 cm under the surface of the cap sediment. Five foot long iron stakes have been driven into the sediment at the four corners of each plate. The stakes extend approximately 50 cm above the original surface of the cap. Measurements will be made and recorded for the distances from the top of the stakes to both the sediment surface and the square place. The elevation of the square plate serves as a station reference for subsequent measurements. These existing sediment deposition plates will remain in place for future reference as necessary.

CHEMICAL MONITORING METHODS

All QA/QC procedures recommended by the Puget Sound Estuary Program (PSEP) (PSEP 1986-1990) will be followed during this monitoring program except where noted below. The version of PSEP protocols in effect at the time of sampling and analysis will be used. Sediment samples for chemical analyses will be placed in the sample containers and preserved according to the type of analysis to be conducted. Table 4 lists the appropriate sample handling techniques for each type of analysis.

Samples for chemical analysis will be transported from the field to the analytical laboratory in iced coolers. Chain-of-custody forms will be prepared listing every sample number transported for analysis. Samples will then be shipped with the chain-of-custody records to the contract laboratories for analysis. Chain-of-custody records will then be signed and returned to Simpson with analysis results. All samples will be extracted and analyzed within 30 days, or within the holding times specified in the methods.

Details of analytical and QA/QC requirements for major chemical categories are described in the following sections. Geographic accuracy of ±2 meters is required for all chemical sampling.

TABLE 4. SAMPLE HANDLING TECHNIQUES

Analyte Group	Container	Preparation	Preservation
Extractable organic compounds	250-mL glass jar TFE-lined lid	Detergent wash. distilled water rinse, kiln fired at 450o C for >1 hour	Ice (4° C)°
Metals	125-mL glass jar	Soak in 20% HNO_3, distilled water rinse	Ice (4° C)[a]
Conventional parameters (except sulfides)	125-mL glass jar	Detergent wash, distilled water rinse	Ice (4° C)
Grain size	Polyethylene bag	None	Ice (4° C)
Sulfide	Glass or plastic jar	Detergent wash, distilled water rinse	5-mL 2N zinc acetate solution per 30-gram sample, mix and seal, ice (4° C)

[a] Upon delivery to laboratory, samples will be analyzed immediately or frozen at -20° C.

Metals and Conventional Parameters

Analyses for trace metals in water samples and conventional parameters in water and sediment samples will be in accordance with analytical methods specified by PSEP guidelines (PSEP 1986-1990). Metals will be analyzed by EPA SW-846 methods as modified by EPA Contract Laboratory Program (CLP) statement of work (SOW). Analysis will be performed with inductively coupled plasma (ICP) spectroscopy for cadmium, copper, nickel, and zinc-, graphite furnace atomic absorption (GFAA) spectroscopy for arsenic and lead; and cold vapor atomic absorption (CVAA) spectroscopy for mercury. The limits of detection for trace metals in water samples will range from 0.02 to 7 μg/L and range from 0.01 to 4.0 mg/kg (dry weight basis) in sediment samples. Practical quantitation limits for 1 gram samples are 0.2-30 mg/kg dry weight. Recommended frequencies and control limits for metal quality assurance (QA) samples are summarized in Table 5.

Organic Compounds

Analyses performed on water and sediment samples for acid/base neutral (ABN), pesticides/PCBs, and volatile organic compounds will be in accordance with PSEP recommended guidelines (PSEP 1986-1990). These guidelines are modifications to existing EPA CLP protocols for low level analyses.

The method of isotope dilution (EPA Method 1625C) shall be used for ABN extractable compounds. Stable isotope-labeled surrogates for each ABN compound shall be added to all field samples and quality control samples prior to extraction to monitor and correct for analyte recovery.

The following analytical sensitivity is required for ABN compounds:

- Limits of detection (LOD) for ABN compounds water shall be in accordance with detection limits stated in EPA Method 1625C
- LOD for ABN compounds in sediment samples shall be 10-50 μg/kg (dry weight)
- The practical quantification limit (PQL) for ABN compounds shall be 200 μg/kg.

In order to attain these lower detection limits in sediments, **modifications** to CLP protocols are necessary. These modifications include the use of a large sample size (approximately 100 grams), a final extract volume of 0.5 ml, and an injection volume of 1-2 μl.

-- The following analytical sensitivity is required for pesticide and PCB analyses:

- LOD for water samples shall be in accordance with those stated in the EPA CLP statement of work
- LOD for pesticides shall be 0.01-1 μg/kg (dry weight) and PCBs shall be 1-5g/kg dry weight)
- PQL for pesticides shall be 2 μg/kg and PCBs shall be 10 μg/kg, both on a dry weight basis.

In order to achieve these lower detection limits, modifications to CLP protocols are necessary and will include extraction of larger sample size (approximately 100 grams), a final extraction volume of 10 ml, and an injection volume of 2 μl.

All ANB and pesticides/PCBs extracts shall be subjected to gel permeation chromatography (GPC) to reduce interferences.

Analysis of polychlorinated dibenzodioxins (PCDDs), including 2,3,7,8-TCDD, and polychlorinated dibenzofurans (PCDFs) will be analyzed following procedures specified by EPA SW-846 Method 8290. The method calibration limits shall range from 1.0 to 200 ng/kg for sediment samples. These maximum calibration limits are referenced from EPA SW-846 Method 8290, Table 1.

Recommended frequencies and control limits for QA samples are summarized in Table 6.

BIOLOGICAL MONITORING METHODS

All sampling and QA/QC recommendations contained in the PSEP protocols (PSEP 1986-1990) are requirements for the biological monitoring methods. Prior data collected under the monitoring program in June is considered valid and usable for qualitative comparison with the data to be collected in March under this revised monitoring plan. Geographic accuracy of ± 2 meters is required for all biological sampling. Highly accurate station locations allow repeatability for future sampling and better detection of contamination trends or gradients.

Benthic Infauna

Benthic infauna sampling will be conducted during mean or higher tide stages from a sampling vessel. The sampling vessel will be positioned at the previously selected stations using an EDM system. The accuracy of this system is within 1.5-3.0 cm, more accurate than a vessel can hold steady on station. Vessel motion due to wind or current increases this error to about ± 1 meter. Offset of the EDM reflecting board from the sampler wire will be accounted for in position calculations to place the wire at the station location rather than at the reflecting board. Wire angle will be measured to ensure angles less than 2° occur at the time the sampler is released. These constraints will provide a sample location with an error less than 2 meters.

TABLE 5. RECOMMENDED FREQUENCIES AND CONTROL LIMITS FOR METALS QUALITY ASSURANCE SAMPLES

Analysis	Frequency of Analysis[a,b]	Control Limit[c]
Preparation blanks	5% or one per batch[d], whichever is more frequent	Low level; $\leq$2xIDL High level; <IDL
Certified reference materials[e]	5% or one per batch[d], whichever is more frequent	80-120% recovery
Matrix spikes	5% or one per batch[d], whichever is more frequent	75-125% recovery
Analytical replicates	5% or one per batch[d], whichever is more frequent	$\pm$20% RPD

[a] Frequencies listed are minimums; some programs may require higher levels of effort.

[b] For batches of five samples or less, the minimum QA checks should include a method blank and the analysis of a certified reference material (CRM). If an analyte is not in the CRM, a matrix spike must be analyzed for that particular analyte. In general, for small batches (i.e., $\leq$ 5 samples), the priority of QC checks should be: CRM > analytical duplicates > matrix spikes. If several batches of the same matrix are analyzed sequentially (i.e., for several small projects), a CRM can be analyzed at a frequency of 5 percent overall, with at least one sample duplicate analyzed per individual batch.

[c] IDL - instrument detection limit
RPD - relative percent difference.

[d] A batch is $\leq$20 samples.

[e] Certified values not available for all elements (e.g., silver).

TABLE 6. RECOMMENDED FREQUENCIES AND CONTROL LIMITS FOR SEMIVOLATILE CHEMICAL QUALITY ASSURANCE SAMPLES

Analysis Type	Frequency of Analysis[a]	Control Limit
Method blanks	One per extraction batch[b] or one per 12-hour shift (whichever is most frequent)	Phthalates: 5 ug total or <50% of analyte concentration in samples Other organic compounds: 2.5 ug total or <5% of analyte concentration in samples
Certified reference materials[c]	<50 samples: one per set of samples submitted to laboratory >50 samples.- one per 50 samples analyzed	95% confidence interval for certified reference material (±1.96SD)
Matrix spikes	Not required if complete isotope dilution used <20 samples: one per set of samples submitted to laboratory ≥ 20 samples: 5% of total number of samples	≥50% recovery; ≤100%
Field and analytical replicates	<20 samples: one per set of samples submitted to laboratory ≥20 samples: one triplicate and additional duplicates for a minimum of 5% total replication	±100% coefficient of variation (for >2 replicates) or ±100% RPD (for duplicates)
Surrogate spikes	Every sample	≥50% recovery (≥10% if isotope dilution is used)
Initial calibration	Before any samples are analyzed, after each major disruption of equipment, and when ongoing calibration fails to meet criteria. Initial calibration includes 5% calibration.	≤20% coefficient of variation; ≤30% for highly polar compounds or other analytes at the discretion of the QA reviewer
Ongoing calibration	At the start of each work shift, every 10-12 samples, or every 12 hours (whichever is more frequent), and at the end of each shift for gas chromatography/mass spectrometry (GC/MS) and gas	≤25% of initial calibration for GC/MS; ≤15% of initial calibration for GC/ECD;

	chromatography/flame ionization detection (GC/FID).	$\leq$15% of initial calibration for GC/FID
	At the start of each work shift, every 6 samples, or every 6 hours (whichever is less frequent), and at the end of each shift for gas chromatography/electron captive detection (GC/ECD).	

a Frequencies listed are minimums; some programs may require more control samples.

[b] A batch is $\leq$20 samples.

[c] As available.

Sediment samples will be collected following the protocol outlined in the PSEP protocol manual (PSEP 1986-1990). Surficial sediment samples will be collected using a modified 0.1-m^2, van Veen grab sampler. The grab will be lowered and raised at a controlled speed of approximately 30 cm/second. After the sampler has been lowered, raised, and secured on deck, the sediment sample will be inspected carefully before being accepted. The following acceptability criteria will be used:

- The sampler is not overfilled with sample so that the sediment surface is pressed against the top of the sampler
- Overlying water is present (indicates little leakage)
- The overlying water is not excessively turbid (indicates little sample disturbance)
- The sediment surface is relatively flat (indicates little disturbance or winnowing)
- The desired penetration depth is achieved (4-5 cm in medium coarse sand, 6-7 cm for fine sand, >10 cm for muddy sediment).

If a sample does not meet these criteria, it will be rejected. After a sample is judged acceptable. sediment characteristics will be recorded on the field data sheets. Station locations, water depth, grab penetration depth, and other general observations will also be recorded. Sample numbers assigned to each sample will include a unique coding system that identifies the type of sample collected and the location sampled.

At each station one sample will be collected for physical analysis and five for benthic infaunal analysis. Before sampling the surface sediment for physical analysis, the overlying water will be removed from the grab by slowly siphoning the water off near one side of the sampler. Minimal sediment surface disturbance is desired prior to taking a sample. Once the overlying water is removed, the sediment can be subsampled.

Following the initial observations, the benthic samples will be transferred from the van Veen grab sampler to a sluice box, or other adequate receptacle, and washed through a 1.0-mm sieve. The sample may be washed through the sieve using a gentle stream of water from a hose when it is necessary to clean the sample.

Sieved samples will be transferred to glass or plastic jars of appropriate size. A 10 percent solution of buffered seawater-formalin will be added to the sample immediately. A waterproof label will be added before the sample jar is sealed, along with an external label on the jar and lid. These labels will have been prepared prior to sampling. All sample containers will be organized in a logical manner in wooden or other sturdy transfer cases to allow review of sample label data during transfer and storage.

After collection, grain size samples will be placed on ice in coolers and transported to the analytical laboratory. Samples will be stored in a refrigerator at 4o C until they are analyzed. The maximum holding time recommended by PSEP protocol is 6 months. Sample analysis will begin immediately upon arrival of samples at the laboratory and will be completed well within the recommended maximum 6-month holding time.

All biological samples will be transported to the analytical laboratory at the end of each sampling effort. An inventory of samples will be conducted as soon as possible after reaching the laboratory. Each sample will be rinsed to remove the formalin solution (within 48 hours of sample collection) and transferred to a solution of 70 percent alcohol. Rose bengal stain, at a concentration of 1 g/L, may be added to the alcohol-preserved samples. The rose bengal stain is used to make the organisms in the sample more easily visible to the sorters. During the preservative changing process, all internal labels will remain with the samples and new external labels will be added if the containers are changed.

In the laboratory, sediment volumes of 5-10 mL will be sorted in a Petri dish under a 20-300 power dissecting microscope. Water will be added and the sediment spread evenly over the bottom of the Petri dish. The Petri dish is then passed back and forth through the microscope viewing field unit the entire dish has been scanned. Organisms are removed during the scanning process and placed in vials labeled annelids, arthropods, mollusks, and miscellaneous. The sediment is then stirred and scanned a second time to obtain any remaining organisms. Large particles of debris (e.g., wood, bark, clay) are removed from the sample, examined, and any organisms removed before the debris is returned to the original sample container. Organisms are preserved with fresh alcohol in the vials., An internal waterproof paper label is placed in each vial recording the station number, replicate, sorter, and date of collection for each sample. This procedure will be repeated for every sample. After a sample has been sorted, the vials containing the organisms from that sample will be banded together and stored in a container with other samples from the same project.

All sorted sediments will be retained in labeled containers until completion of the annual project. Counts of each type of organism will be recorded during sorting for later use in the QC process. Sorted organisms will be provided to a qualified taxonomist for identification to species or the lowest practical taxonomic level. The qualified taxonomist will be a specialist in taxonomy of each specific group of organisms. Transfer of samples to these taxonomists will include complete chain-of-custody records and an inventory of the samples at the time of packaging. The same information will be provided upon return to the analytical laboratory.

All vials to be transferred will be packed by major taxonomic group (e.g., annelids, arthropods). Each sample will be sealed with tape or in another manner that will prevent loss of preservative during shipment and storage. Each specialist receiving such samples must sign a listing of all samples received and all samples returned to the laboratory as part of the chain-of custody requirements. The specialists will provide a written record of any reference organisms retained by the specialist when the samples are returned to the laboratory. The specialist will be required to provide the laboratory with a reference collection of all organisms identified. All identification and enumeration of data will be recorded on standard forms prepared prior to initiation of the task. The reference collection will be sent to a different taxonomist for validation.

A QC check will be conducted on each sample to ensure that all organisms have been sorted from the sample. This QC process will begin immediately following the initial sorting of the first few samples. Beginning the QC process immediately prevents inadequate sorting of large numbers of samples. A 20 percent aliquot of sediment will be removed from each sorted sample after the sample has been thoroughly mixed. The aliquot will be sorted for all organisms remaining in the sediment. The number of organisms recovered is multiplied by 5 to estimate the total number of organisms remaining in the sample after the initial sorting. If the QC test determines that more than 5 percent of the total number of organisms originally counted remain in the sample, the sample will have failed the QC test. All samples failing the QC analysis will be resorted. All QC sorting will be conducted by an individual who has not previously participated in the sorting of that particular sample.

The data derived from the laboratory analysis will be in the form of numerical abundances or densities of biological organisms by species (or lowest practical taxonomic level). These benthos data will be analyzed in several ways to characterize the benthic communities present.

Statistical comparison using numerical abundance will be performed. The numerical abundance of the major taxa (gastropods, bivalves, crustacea, and polychaetes) as well as total abundance will be compared between pairs of test stations and reference stations. Abundances will be compared using a statistical procedure that tests for differences among means (i.e., t-test for a parametric test or Mann-Whitney U-test for a nonparametric test). A parametric test will be used if the underlying assumptions can be met (e.g., equality of variance among the sampled groups). Homogeneity among the variances will be tested to determine if a parametric or nonparametric test should be used. If the variances are heterogeneous, a nonparametric test will be used. All comparisons will be judged significant at the $P<0.05$ level.

Statistical comparisons alone are not sufficient to define an adverse effect. Numerical abundance (or lack thereof) is not the only indicator of detrimental effects. A station with a high numerical abundance of polychaetes (all one species) may not be a healthier station than one with significantly less abundance but a variety of species. Therefore, the results of the statistical comparisons must be interpreted along with the qualitative comparisons.

Cluster analysis is used to compare the similarity between samples and stations. The Bray-Curtis (1957) similarity Index is calculated for all combinations of pairs of sampling stations. The similarity measure utilizes both the identity and abundance of each species for comparison.

The formula for the dissimilarity measure is:

$$\text{Similarity} = 1 - \frac{\sum_{j=1}^{n} X_{1j} + X_{2j}}{\sum_{j=1}^{n} (X_{1j} + X_{2j})}$$

where:

X_{1j} and X_{2j} = the abundance values of the species at two respective sites

n = total number of species at the two sites.

The measure equals 1.0 for complete similarity and 0.0 for complete dissimilarity.

A log transformation, which tends to decrease the effect of very large values and provide more uniform data, will be made on the abundance of each species at each station before dissimilarity values are calculated. This is done because the Bray-Curtis measure tends to be biased by large values. The large values still dominate after transformation but to a lesser degree. The clustering algorithm that will be used includes a complete linkage strategy that tends to form tight clusters because species tend to form new groups rather than chain into existing ones.

Epibenthos

Epibenthos samples will be collected using a diver-operated venturi suction sampler equipped with O.25-mm sieve bags, or by an epibenthic pump with attached cone sampler. For each diver-operated replicate at each station, a 0.018-m^2 quadrat is placed on the sediment surface and the area inside is vacuumed to a depth of 2 cm and sieved by the sampler. The remote epibenthic pump collects organisms within a 0.018-m^2 area. Samples are labeled, placed in glass jars, and preserved with a 10 percent buffered formalin-seawater solution. Upon return to the laboratory, the preservative will be changed from formalin to a 70 percent alcohol solution. Rose bengal stain may be added at this time at a concentration of 1 g/L to impart color to the organisms. This stain makes the organisms more visible and aids in the process of separating the organisms from the sediment.

Epibenthic samples generally contain a large number of organisms, far too many to readily sort from the entire sample. To aid in the sorting process, each sample will be split into equal portions with a Jones-type splitter. Each sample will likely be split 2-4 times (25-50 percent of the original sample), or until approximately 100 organisms remain in the sample. All sediments will be retained from each split to ensure that the organism count will be 100 or greater.

Sorting will be conducted under a dissecting microscope at 7-30 power. Organisms will be removed and placed in vials containing ethyl alcohol for preservation. Samples will then be shipped to taxonomic specialists for identification and enumeration.

Epibenthic crustacean densities will be computed using data from the sorting, splitting, and identification procedures. Total densities will be calculated using the organisms enumerated from the sorted portion of the sample. For example, if the sample to be enumerated was split to 6.25 percent, the number of organisms removed from the sample will be multiplied by 16 to obtain the total number of organisms for the entire sample. Harpacticoid copepods and amphipods will be identified to the species level.

Data will be analyzed similar to that for benthic infauna [i.e., statistical tests for differences in abundance (total fauna, total harpacticoids, total amphipods and interstation similarity using the Bray-Curtis index].

QC procedures will be performed on the sorting of all epibenthic samples. Because of the small amount of sediment retained in each split to be sorted, the same sediment will be entirely resorted by another sorter. Organisms that are recovered on the re-sort of the sample will be counted and the resulting numbers will be added to the data from the initial sorting.

Aquatic Macrophytes

The aquatic macrophyte survey will be conducted once each year in August. During a midday extreme low tide (-2 feet MLLW or lower), aerial photographs of the site will be taken. Low-altitude aerial photography will be conducted using true color film (Kodak 2448 Aerochrome MS or equivalent) in a 9 x 9-inch aerial camera. Photographs will be taken at an altitude appropriate to yield an image scale of about 1 inch = 100 feet.

During the same tide series a biologist will conduct a site inspection of the intertidal and subtidal portions of the cap area. This inspection will identify the types of macrophytes inhabiting the site for interpretation of the aerial photographs. The ground survey information together with the aerial photographs will be used to prepare vegetation maps of the site.

REPORTING REQUIREMENTS

DATA MANAGEMENT PLAN

Simpson, Champion, and WDNR will prepare a data management plan for review and approval by EPA relative to all data collected under this decree. This plan will be prepared and approved by EPA prior to any sampling activities. The plan will be submitted to EPA as follows:

1. Submit draft to EPA (30 days after signature of consent decree)

2. EPA review (approximate 30 day review)

3. Submit final plan to EPA (within 30 days of EPA comments).

The data management plan will describe the methods to be used to ensure that all data collected or generated since the cap was put in place are stored and reported in a consistent and systematic manner. EPA is developing a geographic information system (GIS) for the CB/NT site. The contractor will consult with the GIS staff of EPA Region 10 to develop a plan that addresses the following requirements for data processing and storage:

- Assigning a unique identification code to all monitoring and sampling stations (i.e., surface water, soil, air, animal, and vegetation sampling locations)

- Encoding location data using latitude and longitude and descriptive information for each of these monitoring and sampling stations

- Identifying, encoding, and storing in a database all sample analytical results, field measurements, qualifier codes, and observations

- Ensuring that these analytical results are correlated with respective sampling station location and descriptive information (i.e., use identification codes assigned to sampling stations)

- Storing this information in a database that can be accessed and manipulated by the EPA Region 10 GIS.

All sample and analytical data must be submitted in accordance with the EPA-approved data management plan.

MONITORING REPORTS

Monitoring reports are to be submitted in accordance with Table I. Except for the Table 1 Update, these reports will describe the data collection activities and analyses performed since the previous reporting period. These reports should address and be organized as follows:

- **Executive Summary**--A description of all data collection efforts and major findings.

- **Introduction**--A brief description of the monitoring efforts to be reported.

- **Materials and Methods**--Description of methods used to collect data, highlighting any departure from the specifications in this plan, QA/QC protocol, or field decisions. Subsections will address station positioning, sediment chemistry, benthic infauna, epibenthos, macrophytes, and bathymetry.

- **Results**--All data generated during monitoring activities. Data shall be presented in an easy-to-read tabular format in accordance with the data management plan. Results of all statistical tests, data comparisons with trigger values, computations required by this plan, and any departures from the prescribed reporting requirements shall be included. If large amounts of data are being presented (e.g., species abundance), data summaries can be included in the Results section and all detailed data listed in an appendix. All data including individual observations for each field and laboratory replicate will be presented in the report.

- **Discussion**--Integration of all data collected since cap construction. Data should be discussed as they relate to objectives of the monitoring plan, reference areas, early warning triggers, cap integrity, and biological recovery.

- **Recommendations**--Recommendations for reduced, additional, or modified monitoring or other modifications to the Monitoring Plan should also be included (e.g., reduction or increase in sample replication, changes in the variables measured, early warning triggers, changes in the number or location of stations).

- **Quality Assurance Reviews**--Results from any quality assurance audits performed on the data. Results of all QA/QC audits and analyses required by or described in the *Monitoring Methods and Quality Assurance/Quality Control* section are to be reported. This QA/QC section will be organized according to data type (i.e., sediment organics, sediment metals, sediment conventionals, benthic infauna, epibenthos). Chemical data types will generally address the following issues:

  - Sample collection
  - Shipping and holding time
  - Completeness
  - Analytical methods (calibration, detection limits, compound confirmation)
  - Accuracy (sediment reference materials, matrix spikes, surrogate recoveries)
  - Precision
  - Blanks.

  Data package validation for chemistry will follow EPA data validation functional guidelines for organic or inorganic analyses, if appropriate. If the functional guidelines do not apply, then criteria will be developed on a site-specific basis and will include the main headings in the functional guidelines.

  Benthic infauna and epibenthic QA reports will address the following:

  - Sorting efficiency
  - Taxonomic accuracy (names of taxonomists, independent verification, reference collection)
  - Total counts
  - Adequacy of replication (power analysis giving minimum detectable difference achieved with observed standard error and mean at an a of 0.05 and power of

0.8). Plots of minimum detectable differences vs. the number of replicate samples are to be included. The statistical techniques used to create these plots should be referenced.

Techniques and data used to validate all station positioning requirements should also be included.

On January 31 of each year Simpson will submit a Table 1 Update to EPA. The Update will summarize the work to be conducted in the coming monitoring season including any changes in sampling methods. The updated table will be finalized by March 30 to ensure all necessary components of the annual monitoring are being addressed.

Simpson will submit five copies of all reports to EPA on the dates specified in Table 1. Concurrently, Simpson will forward a copy of each report to the consulted agencies.

- **Certification**--A responsible Official representing the Settling Defendants shall certify that the information contained in the report is true, accurate, and ocmplete. This statement shall read as follows:

  "I certify that the information contained in or accompanying this (submission) (document) is true, accurate, and complete.

  "As to (the) (those) identified portion(s) of this (submission) (document) for which I cannot personally verify (its) (their) truth and accuracy, I certify as the company official having supervisory responsibility for the person(s) who, acting under my direct instructions, made the verification, that this information is true, accurate, and complete."

As indicated in the decree, all required work plans, reports, and other documents ("documents") shall be subject to review and approval by EPA. Except as otherwise provided: (A) EPA shall notify the Settling Defendants in writing of approval or disapproval of the document, or any part thereof, within thirty (30) calendar days of receipt of any document required by this Consent Decree. In the event EPA needs a longer review period, EPA shall notify Settling Defendants of its revised response date within thirty (30) calendar days of receipt of the document. (B) In the event of disapproval, EPA shall specify in writing any deficiencies and modifications to the document. Nothing in this provision shall negate EPA's right to approve or disapprove a submittal by the Settling Defendants should the time periods stated in this paragraph be exceeded by EPA, nor shall such delay by EPA subject Settling Defendants to any enforcement action. (C) Within thirty (30) calendar days of receipt of any document disapproval or comments for revision, the Settling Defendants shall either: (1) submit a revised document to EPA which incorporates EPA's modifications or summarizes and addresses EPA's concerns or (2) provide a notice under the dispute resolution process.

CONTINGENCY PLANNING PROCEDURES

INTRODUCTION

The contingency planning procedures consist of four parts: (1) early warning, (2) contingency planning, (3) contingency response, and (4) expedited review. Each is briefly discussed below, followed by a more detailed description. Note that the procedures are similar to those outlined in Appendix D of the State Decree with the main difference being EPA's decision-making role and the technical requirements. The technical requirements (e.g., triggers) have been revised.

Early Warning Process

The purpose of the early warning process is to identify potential problems early enough to conduct a rational and deliberate process to determine whether there is in fact a problem and, if so, how serious the problem may be.

Because laboratory measurements are based on analysis of small quantities of sediments and expected concentrations of some chemicals are near the analytical detection limit, there is a possibility of problems arising in the laboratory testing of these samples. Therefore, the first step (following receipt of information that suggests a problem may exist) will usually involve confirming the accuracy of the sampling results (verification).

The early warning process will enable the agencies and Simpson to determine what kinds of data verification or response is appropriate, so that contingency planning or response actions are based on proper assumptions.

Contingency Planning Process

The purpose of the contingency planning process is to develop plans for contingency actions that may become necessary depending on future monitoring results. As monitoring data are collected they will be examined and interpreted relative to possible cap failure. Five areas of monitoring were identified on page 2 of the plan:

- Physical erosion of the cap;
- Physical mixing of contaminated sediments and cap material;
- Diffusion of contaminants through the cap;
- Surface contamination from seeps, vent and other sources
- Other specific, but currently undefined, processes.

The monitoring plan was designed to detect these processes as well as the biological recovery of the cap area. Should the monitoring data indicate that potential problems exist, then plans, developed per the contingency planning process must be prepared to correct or mitigate or otherwise address the situation.

The contingency planning process could result in an approved contingency response action to be implemented in accordance with an approved schedule. It could also result in agreement on a conceptual approach or a set of criteria for taking further action, pending the results of future monitoring. The process incorporates applicable permit requirements, interagency consultation, and public review of contingency plans prior to approval.

Contingency Response Process

The purpose of the contingency response process is to implement approved plans for contingency actions. This includes agreement on a final schedule, any amendments to the consent decree if necessary, and completion and monitoring of the response action.

Expedited Review Process

The purpose of the expedited review process is to allow the parties to shorten the time frame of the standard process or to implement one or more of the above steps simultaneously when reliable early warning data indicate that a problem warrants immediate action.

Notes on the Overall Contingency Planning and Decisionmaking Process

The contingency planning procedures set forth below are described in terms of *tasks* and *steps*. The steps are numbered consecutively rather than being renumbered under each task. Figure 2 provides an outline of the contingency planning process. However, these tasks and steps may not occur in strict chronological order, because certain actions may occur simultaneously or more than once in the planning process.

Two items should be noted with respect to those situations where final decisions are required on potential contingency actions:

1) A number of agencies have expressed a desire to be involved in such decisions because of their role in the permitting and approval process for this remedial action. These agencies are collectively referred to below as consulted agencies and include Ecology, WDNR, WDF, NOAA, DOI (FWS and BIA), the Puyallup Tribe, and the Muckelshoot Tribe. This monitoring and contingency plan is a condition of several of these agencies' permits or approvals for the remedial action, and these agencies have agreed to use the procedures in this plan in the event that contingency planning is needed.

2) Because of the need for a coordinated decision-making process and a focus of responsibility, EPA will make final decisions under the terms of the accompanying consent decree. These decisions will be subject to the consultation process set forth below. In the event of dispute, a judge will review and make the ultimate decision. EPA will also be responsible for convening meetings and sending notices of major decision points. Simpson will send reports and data packages to the consulted agencies. EPA and Simpson may invite other entities to participate in the contingency planning procedures and may update the consulted agency list in response to agency requests.

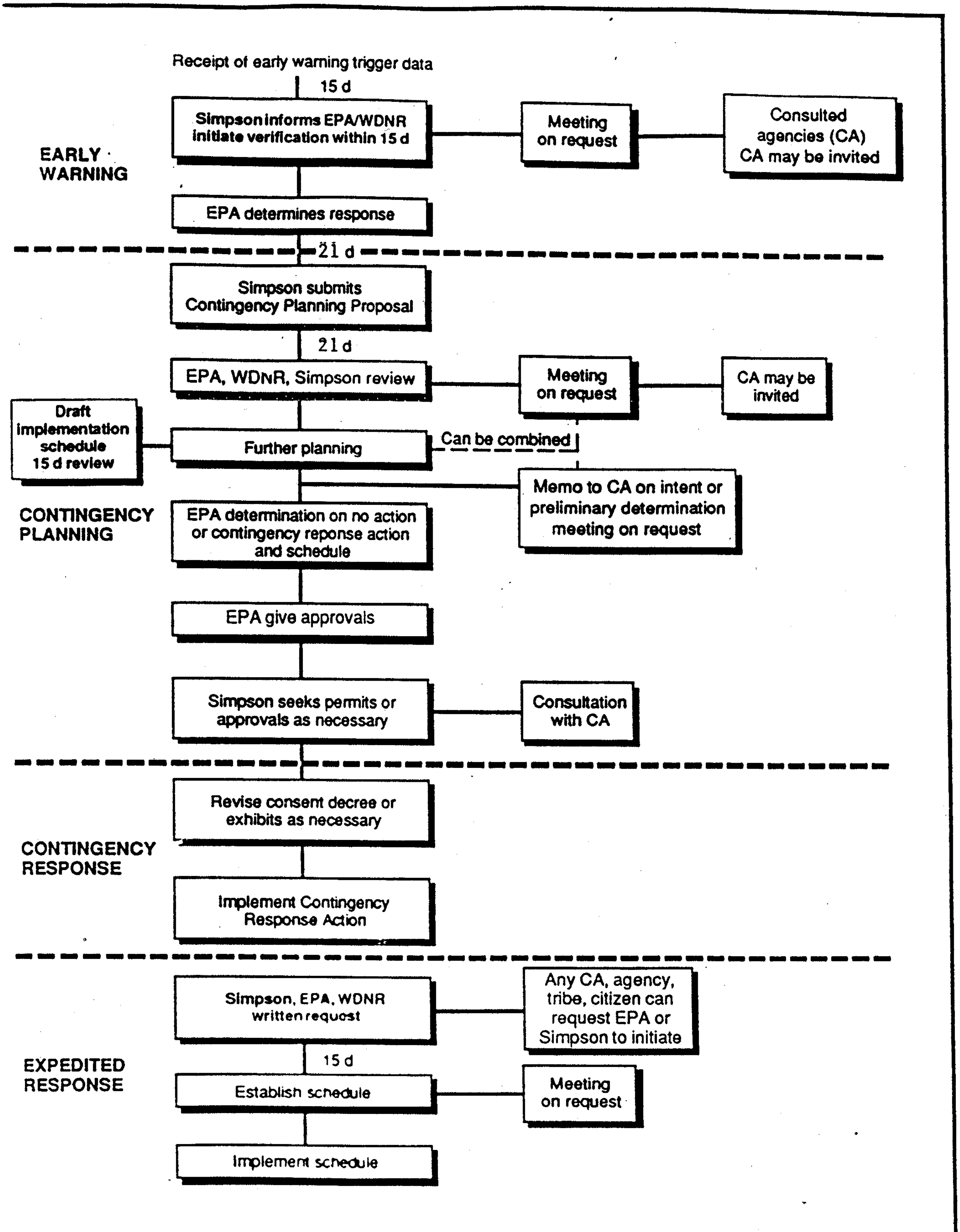

Figure 2. Contingency planning process

EARLY WARNING PROCESS

Task 1. Triggers (Any One of Which Initiates the Early Warning Process)

Step 1: Chemical--Under the monitoring plan, Simpson receives sampling results that indicate contamination levels for the chemicals of concern equal to or greater than 80 percent of the lowest established apparent effects threshold (AET) for benthic organisms, oyster larvae, or amphipods, based on samples collected within 30-90 cm (1-2 feet) above the contaminated sediments or at the sediment surface. The applicable chemicals of concern and their corresponding AET levels are listed in Table 7. No AET currently exist for some chemicals (e.g., PCDDS, PCDFs, resin acids, and chlorinated guaiacols). The detection of PCDDS, PCDFs, or chlorinated guaiacols will be evaluated on a case by case basis by EPA, Simpson and the consulted agencies with a decision made on the need for additional action. The trigger value for resin acids is 1,000 ug/kg dry weight. In addition, a 5-times increase in the concentration of a non-AET chemical measured in the subsurface migration samples relative to baseline will initiate the contingency planning process.

Step 2: Physical--Bathymetric, intertidal, or sediment deposition surveys received by Simpson (under the monitoring plan) show cap thickness in Regions A or B has changed 12 inches from the previous survey, or an average of more than 10 inches/year over a period of 2 years and unusual information obtained from the annual visual inspection or post-storm inspections (e.g. methane vents or surface erosion) may also trigger contingency action.

Step 3: Biological--Simpson will propose appropriate indicators of biological stress to EPA by December 31, 1992. After EPA approval, these indicators will become effective in 1993. Should macrophyte beds be established in an area, subsequent large decreases in cover (>50 percent) for a single species relative to the previous sampling period will trigger additional action.

Task 2. Notice and Verification

Step 4--Simpson will provide written and verbal notification to EPA and the consulted agencies within 7 days of the receipt of this information and will not wait until submitting a data report. Consulted agencies should provide their comments to EPA within 7 days of receipt of the information.

Step 5--Any involved party may decide to undertake verification (e.g, checking laboratory procedures, evaluating split samples, resampling) or EPA may direct Simpson to undertake verification sampling. Simpson will set up a meeting with EPA prior to undertaking verification actions, unless EPA determines a meeting is unnecessary. Simpson will initiate mutually agreed upon verification sampling within 15 days unless EPA authorizes more time.

TABLE 7. APPARENT EFFECTS THRESHOLD SEDIMENT QUALITY VALUES
(ug/kg dry weight for organics; mg/kg dry weight for metals)

Chemical	Amphipod AET	Oyster AET	Benthic AET
Low molecular weight PAHs[a]	5,500	5,200	6,100
Naphthalene	2,400	2,100	2,700
Acenaphthylene	1,300	560G[b]	1,300
Acenaphthene	2,000	500	730
Fluorene	3,600	540	1,000
Phenanthrene	6,900	1,500	5,400
Anthracene	13,000	960	4,400
2-Methylnapthalene	1,900	670	1,400
High molecular weight PAHs	38,000	17,000	51,000G
Fluoranthene	30,000	2,500	24,000
Pyrene	16,000	3,300	16,000
Benzo(a)pyrene	3,000	1,600	3,600
Indeno(1,2,3-c,d)pyrene	1,800	690	2,600
Dibenzo(a,h)anthracene	540	230	970
Benzo(g,h,i)perylene	1,400	720	2,600
Total chlorinated benzenes	680	400	400
1,3-Dichlorobenzene	170G	170G	170G
1,4-Dichlorobenzene	120	120	110G
1,2-Dichlorobenzene	110G	50	50
1,2,4-Trichlorobenzene	51	64	--
Hexachlorobenzene	130	230	22
Total PCBs[c]	2,500	1,100	1,100
Phenols			
Phenol	1,200	420	1,200
2-Methylphenol	63	63	72
4-Methylphenol	3,600	670	1,800
2,4-Dimethylphenol	72	29	210
Pentachlorophenol	360	140G	690
2-Methoxyphenol	930	930	580
Miscellaneous extractables			
Retene	1,700	2,000G	2,000
Metals			
Arsenic	93	700	57
Cadmium	6.7	9.6	5.1
Copper	1,300	390	530
Lead	660	660	450
Mercury	2.1	0.59	2.1
Nickel	120G	39	--
Zinc	960	1,600	410

[a] PAH - polycyclic aromatic hydrocarbon.

[b] G - indicates that a definite AET could not be established because there were *no effects* stations with chemical concentrations above the highest concentration among *no effects* stations.

[c] PCB - polychlorinated biphenyls.

Step 6--Simpson is committed to verifying the sample results in question as long as the verification procedure is reasonable under the circumstances. If there is disagreement after following the procedures set forth in this section, the signatories to this decree will use the dispute resolution procedure in the consent decree to resolve the issue.

Task 3. Meeting and Consultation

Step 7--Consulted agencies or other entities identified by EPA and Simpson may be invited to attend the meeting or meetings discussed in Step 5. Meeting notices and agendas will specify that the meeting is part of an early warning review to determine what kind of verification or response to the data is appropriate. EPA and the consulted agencies reserve the right to meet and consult throughout the early warning and contingency planning process and prior to final contingency planning decisions (see Task 3 of the contingency planning process below).

Task 4. Response to Early Warning

Step 8-EPA will make a final determination of the most appropriate response based on all available information. Potentially appropriate responses to early warning data include but are not limited to one or more of the following actions:

- Concluding the situation does not require further action at this time
- Verifying the data
- Seeking expert advice on the interpretation of monitoring data
- Preparing a report of analyses needed to define or describe the problem or situation in terms of potential threat to human health and the environment
- Developing more specific criteria to evaluate the data or future sampling
- Revising the sampling plan for the specific area, media, or chemical of concern (e.g., more frequent sampling, additional stations, groundwater monitoring, testing for additional parameters) on a temporary or ongoing basis
- Conducting sediment bioassays
- Initiating the contingency planning process (see below)
- Initiating expedited review and planning response actions (see below).

CONTINGENCY PLANNING PROCESS

Task 1. Initiation

Step 1--The contingency planning process may be initiated after the early warning process.

Task 2. Contingency Planning Proposal

Step 2--Within 21 days (or within any time frame on which the signatories to this decree mutually agree), Simpson will propose contingency response actions that will be taken if necessary to address the problems identified in the early warning process (i.e., a contingency planning proposal). The proposal will include the type of action to be initiated and a proposed schedule for implementation.

Step 3--EPA will review the contingency planning proposal within 21 days (or within the time frame on which they mutually agree). EPA may decide to (1) refrain from further action at this time, (2) require further planning, or (3) proceed with implementation (see contingency response process below). A meeting will be held prior to the conclusion of this review period if requested by any one party.

Task 3. Meeting, Consultation, and Further Planning

Step 4--Consulted agencies or other entities identified by EPA and Simpson may be invited to attend contingency planning process meetings. Consulted agencies will be sent a memorandum by EPA summarizing the preliminary decision and requesting comments. A meeting will be held prior to a final decision if a consulted agency so requests.

Step 5--Meeting notices and agendas will specify that the meeting is part of the contingency planning process to determine the nature and timing of appropriate response actions necessary to address potential problems identified in the early warning process.

Step 6--The contingency planning proposal identified in Step 2 may be conceptual in nature. The precise technology, cost, timing, and other matters may be refined through a series of revisions, consultations, and meetings as part of further planning. The signatories of this decree may establish a schedule for completing the planning of a contingency response action under Step 3; however, Simpson must provide a detailed plan to EPA within 30 days of approval of the contingency planning proposal (Task 2. Step 3). Disagreement on the schedule will be handled through the dispute resolution process in the consent decree.

Task 4. Approvals for Contingency Planning Proposal

Step 7--Prior to the conclusion of the contingency planning process, EPA will issue a final determination as to the necessity and type of further remedial action required to be implemented by Simpson. EPA will also determine, after consultation with Simpson, whether permits, other approvals, or public participation are needed to implement the contingency planning proposal. Consulted agencies will be given an opportunity to review such decisions before EPA makes its final determination.

Step 8--If EPA deems it necessary, the PRPs will develop a more detailed implementation schedule for the contingency planning proposal, including reasonable time periods for any permits, approvals, public participation, or amendments to the consent decree. Simpson will draft the implementation schedule.

Step 9--EPA has 30 days to review the draft implementation schedule. EPA will not make a determination on a final schedule without prior consultation with Simpson and the consulted agencies, although EPA is the final decision-maker for accepting the schedule.

Step 10--Unless specifically prohibited by law, EPA will approve all facets of a contingency response action over which it has jurisdiction prior to requesting on requiring Simpson to seek any permits or other approvals.

Step 11--EPA and Simpson will initiate permit or approval processes in accordance with the implementation schedule. EPA will assist in obtaining any federal, state, or local permits or approvals. This process may occur prior to the contingency response process (below) if obtaining prior approvals is necessary or desirable to facilitate prompt contingency response action.

CONTINGENCY RESPONSE PROCESS

Task 1. Initiation

Step 1--The contingency response process will be initiated after the contingency planning process.

Task 2. Implementation

Step 2--Upon approval of the contingency response proposal, it is anticipated that the signatories to this decree will revise the consent decree by adding a description of the work to be performed and a schedule for implementing the approved proposal (contingency response action). The consent decree may be amended if appropriate under the amendment process set forth in the consent decree. Work will proceed according to the plans and schedules agreed to in previous tasks while the amendment is being drafted and signed by the agency and signatories.

Step 3--The contingency response plans, and implementation schedule and actions will become an enforceable part of this consent decree except as the decree may be amended under Step 2 above.

EXPEDITED REVIEW PROCESS

Task 1. Initiation

Step 1--The expedited review process may be initiated at any time in the contingency planning procedures. EPA will inform or notify the consulted agencies when this occurs.

Step 2--The signatories to this decree may initiate the expedited review process by submitting a written request to the other parties if a party reasonably believes that (1) the early warning process is unnecessary to commence contingency planning, (2) a release or threatened release of hazardous substances at much higher levels than the early warning triggers indicate has been discovered, (3) a previously unknown threat to human health or the environment is discovered, or (4) there is cause for concern about the adequate performance of the remedial action plan that the normal contingency planning procedures may not sufficiently address.

Step 3--In addition, any consulted agency; federal, state, or local agency with jurisdiction; Indian tribe, or citizen may request that EPA or Simpson consider initiating expedited review. EPA, in cooperation with Simpson, will establish a mailing list and inform persons on the list of the availability of any annual or semiannual reports submitted under this plan. If mutually agreed upon, this list may be combined with notification systems for other Commencement Bay or EPA program activities. EPA or Simpson may hold informal discussions with the requester to learn about or respond to the requester's concern. The request may be withdrawn at any time. Prior to initiating the expedited review process, EPA or Simpson will convene a meeting to discuss the request with the requester, EPA, Simpson, and any other agencies or entities identified by EPA and Simpson to discuss the request.

Task 2. Expedited Procedures and Planning Schedule

Step 4--In consultation with PRPS, EPA will determine whether to conduct an expedited early warning process (see Step 4 below) or whether to proceed directly to the contingency planning or contingency response procedures.

Step 5--Within 15 days of initiation of the expedited review process, the signatories to this decree will establish a schedule for accomplishing the steps set forth in the normal contingency planning procedures (expedited planning schedule). They may add or omit steps, or shorten the time periods associated with particular steps. The schedule will allow reasonable time for Simpson to meet with EPA and WDNR and review any contingency response actions recommended by either agency. EPA will not approve an expedited planning schedule without prior consultation with Simpson and WDNR, including a meeting (if requested) and an opportunity to resort to the dispute resolution process in the consent decree.

Potentially appropriate responses include but are not limited to the actions noted above in response to early warning and detailed analyses, such as a focused remidial investigation or feasiblity study.

Step 6--Disagreements will be resolved under the dispute resolution procedures, however, EPA may invoke the endangerment or other applicable provisions of the consent decree in order to take action to protect human health and welfare or the environment.

RELATED MATTERS

The consent decree makes the monitoring and contingency plan an enforceable part of the decree. Therefore, the terms and conditions of the consent decree apply to the implementation of the monitoring and contingency plan, as further specified in the decree.

Lack of specific and timely comment by a consulted agency or entity that is given the opportunity to consult or comment under this monitoring and contingency plan shall be construed as lack of objection.

Nothing in the consent decree or monitoring and contingency plan regulates or limits Simpson from voluntarily conducting additional monitoring, sampling, or contingency planning at its own expense beyond the requirements of the monitoring and contingency plan. These actions do not require consultation with EPA or other agencies or entities under the plan or consent decree.

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