

Memorandum for: Record

Subject: Summary and Conclusions of the Puget Sound Dredged Disposal Analysis (PSDDA) Annual Review Meeting (Held on April 11-12, 1990), Regarding Dredged Material Management Year 1989

1. Purpose. This memorandum provides the PSDDA agency deliberations and conclusions on topics raised and discussed, and transmits to the public the minutes of the Second Annual PSDDA Annual Review Meeting (ARM) (enclosure 2 of this package) and responses to comments received (enclosure 3). It is noteworthy that many of the responses to comments/issues raised will be dealt with in scheduled or planned workshops or work groups before the next ARM; these are detailed below.

2. Annual Review Process.

a. **ARM Implementation--Discussion.** It was generally perceived that this ARM was well organized and provided an adequate forum for receiving and responding to public commentary. However, there may have been too many technically-detailed presentations. There was less public commentary on the technical (testing and sampling) issues than on the administrative (site management) issues. This is reflected in the ARM minutes (enclosure 2). In future years, noncontroversial technical clarifications may be treated by read-ahead fact sheets without verbal presentations. Meeting attendees would have the opportunity to ask questions or request further discussion on these topics if desired. This could allow the meeting to be accomplished in one day, which is desirable since the second day of the ARM was sparsely attended. Some post-ARM comments (e.g., Tulalip letter in enclosure 2) also suggested that more time should be allowed for directed public commentary, and this may provide more time.

b. **Next ARM.** There are a number of complex and potentially controversial technical issues (as opposed to clarifications) that will very likely need more than read-ahead technical notes in next year's ARM. For example:

- Proposed revisions to the SLs and MLs.
- Chronic sublethal test (subject of a technical workshop).
- Topics (e.g., bioaccumulation) which are related to the new implementation manual for Section 103 of the Marine Protection, Research and Sanctuaries Act, commonly called the "Green Book."<sup>1</sup>

---

<sup>1</sup> This manual is currently in draft. It is titled the "Draft Ecological Evaluation of Proposed Discharge of Dredged Material into Ocean Waters". The manual will define evaluative processes used for ocean disposal, and will be expanded (via another manual) to waters such as Puget Sound that are regulated under Section 404 of the Clean Water Act.

Summary and Conclusions of the PSDDA Second Annual Review Meeting (April 11-12, 1990), Dredged Material Management Year 1989

3. Conclusions of the PSDDA Agencies.

a. **The technical clarifications and the procedures for carrying out actions relating to future issue papers were approved.** Several of the clarifications required additional information to assure that they are implemented correctly based on discussions at the ARM and information subsequently developed by discussion within the PSDDA agencies.

b. **Lab accreditation.** There was discussion at the ARM of Ecology's laboratory accreditation program for chemical and biological analyses, which is in the early phases of implementation. The agencies discussed the schedule for implementing this requirement after the ARM, and agreed that additional time will be allowed for accreditation.

Many labs capable of conducting analyses have yet to enter the accreditation program. In addition, some accredited laboratories have not specified in their accreditation the Puget Sound Estuarine Program's Recommended Protocols so that their current accreditation may not include PSDDA-specified methods. The PSDDA agencies will work with Ecology's Quality Assurance Section to identify and add any protocols not included in the current accreditation program.

The schedule has been added to the clarification paper in the meeting minutes (encl. 1). Projects with completed PSDDA-approved sampling plans for which sampling commences before July 1990 will not require Washington-accredited laboratories to do the analyses. For projects with PSDDA-approved sampling plans that commence sampling between July 1, 1990, and December 31, 1990, laboratories that perform analyses must have submitted an application to Ecology's Quality Assurance (QA) Section, but need not have received final accreditation. Sampling that occurs on/after January 1, 1991 must be accompanied by analyses from Washington State-accredited laboratories. Other PSDDA QA specifications are not modified by this requirement.

b. **Microtox.** The clarification paper (in encl. 2) required that reference sediments be run within each "batch." A batch is defined as a reconstituted bottle of the bacterium, and maximum time limits for use of each bottle are added to the paper.

c. **Reference Areas.** The recognized problem of getting a reasonably close dry-weight basis grain size match between reference and test sediments was discussed in

Summary and Conclusions of the PSDDA Second Annual Review Meeting (April 11-12, 1990), Dredged Material Management Year 1989

the ARM. A description of the wet-sieving (volumetric) method for estimating dry percent fines in the field and a calibration curve are added to the clarification paper (in encl. 1). It is likely that better calibration information will be available during the year. The Corps' one-stop dredging office will provide the latest data. Note that the wet sieving volumetric method does not take the place of the dry-weight conventional fines measurement, but simply facilitates matching.

4. Reports and Schedules.

a. **Reports.** This second ARM was the first time that the PSDDA agencies have provided summary annual reports (only baseline reports were available at the first ARM). The Corps Evaluation Procedures report and the Ecology Management Plan Assessment Report were available at this ARM, as was a description of the data submission for the Corps' Dredged Analysis Information System (DAIS). The next ARM will mark the first time that monitoring information will be available via the Ecology Monitoring Report. Reports will be available before the ARM. The 1990 Dredged Material Management Year ARM will probably occur in late March or early April of 1991.

b. **Schedules.** Commitments made in the ARM or in responses to comments/queries are listed below, and annotated to indicate the lead agency, the means of accomplishing the action (or report in which it is being accomplished), and the proposed schedule. Some of the items have more than one action or active lead; these are indicated by arrows in the table.

**TABLE 1. PSDDA ACTIONS DISCUSSED AT ARM.** Abbreviations: Corps' Evaluation Procedures Application Report = EPAR; Ecology's Management Plan Application Report = MPAR. The report dates are the anticipated earliest date for availability of a reviewed version of some of the reports, and may vary somewhat. (The reports will be sent to interested public in January, 1991.) Unless otherwise specified, the dates shown are 1990.

## Summary and Conclusions of the PSDDA Second Annual Review Meeting (April 11-12, 1990), Dredged Material Management Year 1989

<u>Action</u>	<u>What</u>	<u>When</u>	<u>Who is Lead</u>
1. Respond to comments submitted at/after ARM	Encl. 2 and this memo	22 June	Corps
2. Revisit AET, screening and maximum levels	MPAR	30 Nov	Ecology
3. Trend/pattern analysis of screening and maximum levels requested by ports	Meet w/ ports =>	27 Jun	Corps
	and information in EPAR and =>	30 Sep	Corps
	MPAR =>	30 Nov	Ecology

Table 1 (con.)

<u>Action</u>	<u>What</u>	<u>When</u>	<u>Who is Lead</u>
4. Economic analysis requested by ports	Ports will be provided available data for analysis	31 Aug or as available	Corps
5. Coordination of PSDDA and PSEP	Discussions of holding times and bioaccumulation	Ongoing	All
6. Native American concerns	Letters attached in encl. 2 and meetings as needed	Ongoing	Corps
7. User Manual	Draft review; final will be available for preliminary use =>	Ongoing	Ecology
		31 Aug	

Summary and Conclusions of the PSDDA Second Annual Review Meeting (April 11-12, 1990), Dredged Material Management Year 1989

**TABLE 2. MEETINGS/WORKSHOPS AND WORK GROUPS.**

	<u>What</u>	<u>When</u>	<u>Who is Lead</u>
1. PSDDA process, sampling guidelines and other issues in letter from consultants (in encl. 2).	Meeting	July	Corps
2. Chronic/sublethal test	Work Group => Workshop =>	Ongoing Mid Nov	Ecology Corps/EPA
3. Bioassay Workshop	Workshop	10 July	Corps
4. Dioxins	Agency Training Workshop	Aug Jan 1991	Corps EPA
5. Reference areas and associated issues	Workshop	Mid Oct	Ecology
6. Data submission	Workshop	6 Jun	Corps

---

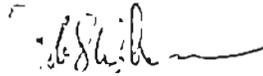
The PSDDA agencies discussed how these activities would be publicized. Some of them will be announced by special invitation letter to a target group (e.g., the data submission workshop); notices for open workshops and work groups will occur in a larger mailing or publication in PSWQA's monthly letter Soundwaves (the PSDDA ARM attendance list will be added to Soundwaves' mailing list); as possible, PSDDA special interest reports may also be submitted to PSEP's Puget Sound Notes.

The Bioassay Workshop will be held on 10 July, 1990.

June 14, 1990

Summary and Conclusions of the PSDDA Second Annual Review Meeting (April 11-12, 1990), Dredged Material Management Year 1989

4. The PSDDA agencies would like to thank all those involved for a successful and productive annual review.



(John S. Wakeman  
Biologist  
Environmental Resources Section  
Planning Branch  
Corps of Engineers

**MINUTES OF THE  
1990 PSDDA ANNUAL REVIEW MEETING**

---

**INTRODUCTION**

The 1990 Puget Sound Dredged Material Analysis (PSDDA) Annual Review Meeting was held at the offices of U.S. EPA Region X on April 11-12, 1990. The purposes of the meeting were to review activities that occurred during the 1989 dredging year (i.e., June 16, 1988 - June 15, 1989), present modifications or clarifications to existing PSDDA testing procedures, and receive comments from the public on PSDDA-related issues.

The minutes of the meeting briefly describe the discussion for each topic presented. For most of the topics, additional written descriptions of the relevant issues were submitted by the speakers. These descriptions are provided as attachments and are referred to in the minutes. It is strongly recommended that the attachments be reviewed as they often provide a greater level of detail than is presented within the minutes. The meeting agenda and list of attendees are provided as Attachments 1 and 2.

**APRIL 11, 1990**

Ron Lee, U.S. EPA 404 Program welcomed the meeting attendees.

Thomas Dunne, Acting U.S. EPA Regional Administrator, gave an introductory talk in which he commended the PSDDA program as a working example of interagency cooperation. He called the program a "healthy coordinated approach" to dealing with a complex environmental issue. Dunne put the PSDDA program in perspective by discussing increased environmental awareness throughout the country, including within the federal government and proactive industries. He closed his talk by citing the need for groups of professionals, such as those attending this meeting, to get together to address complex issues and develop workable solutions to those issues.

Frank Urabeck, Corps of Engineers and past PSDDA Study Director, moderated the meeting. He introduced members of the panel, including Mike Palko of the Washington Department of Ecology (Ecology), Ann Morgan of the Washington Department of Natural Resources (DNR), Ron Lee (U.S. EPA), and himself sitting in for Raymond Schmitz, Chief of Operations Division of the Corps of Engineers. Dave Jamison and Betsy Striplin (DNR) and John Malek (U.S. EPA) also sat on the panel. The agenda was discussed and ground rules presented to ensure an orderly meeting. Frank indicated that written comments on the Annual Review Meeting (ARM) would be accepted through April 19, 1990. He noted that the ARM is an integral part of the PSDDA process because it provides a feedback mechanism for agencies, industries, and the public to influence the PSDDA process.

Frank noted that as a result of the annual review process outlined last year, there have been significant changes in the PSDDA process, including agency head approval of program modifications and public notice. Minor changes include small technical refinements of methods. The following changes to the process since last year were noted: 1) Substitution of Neanthes bioassay for the geoduck bioassay; 2) Analysis of TBT in some areas; 3) Adoption of total acid digestion for sediment metals; 4) Detection limits for organics that follow the Puget Sound Estuary Program (PSEP) protocols, and must be less than PSDDA screening levels (SL); 5) Six week holding time for bioassays; 6) Lack of a suitable chronic sublethal bioassay; 7) Increase the inventory of reference areas; 8) Provide guidance to laboratories; 9) Provided requested information to the Washington Public Port's Association; 10) The Phase II EIS was a vehicle for making adjustments to the process established during Phase I.

Tom Gries, Ecology, presented an overview of dredging year 1989 (DY89) (Attachment 3). Discussed preparation and availability of three reports that were prepared following DY89: 1) Dredging Activities Report (DNR); 2) Dredged Material Sampling, Testing, and Disposal Guidelines Report (Corps); and 3) Management Plan Assessment Report (Ecology). Noted that according to the DNR report, approximately 500,000 yd<sup>3</sup> were dredged, with 75 percent going to upland disposal and the remainder to open water disposal. Tom anticipates this trend of disposal site use to reverse. Tom presented the following information contained in the Corps' guidelines report. Of 5 projects there were 50 samples tested chemically and 30 samples tested biologically. Samples collected from areas with a high ranking tended to have more exceedances of PSDDA criteria than areas with a low ranking. Two-thirds of the samples tested exceeded a SL value. Only two samples exceeded an ML value. The report also addressed the area ranking system, including methods to re-rank a geographic area. Tom also summarized Ecology's management plan report. He noted that currently there are insufficient new data to re-evaluate the SL and ML values, but that this task would probably be possible next year. Environmental conditions at the disposal sites are also briefly described in the baseline monitoring reports.

David Fox, Corps of Engineers, presented a clarification on data reporting in standard format. He discussed the need for standardized data reporting formats which will reduce both the required time for agency staff to review the data and the potential for quality assurance problems to be overlooked. A standardized format will also allow direct data transfer to the Corps of Engineers Dredged Analysis Information System (DAIS). The format will utilize Lotus 1-2-3 spreadsheets. DAIS outputs include a QAI flagging report; data summary report; and SEDQUAL input files. Of these, the first two outputs will be available to the public via modem. David noted that data submission in standardized DAIS format is now a PSDDA requirement, and a user's guide is under development. He announced a DAIS spreadsheet user's work group meeting on June 6 at the Corps of Engineers, Fort Lewis Room. Users can receive information on how to submit their data in the correct format at this meeting.

Tom Gries, Ecology, discussed Ecology's Laboratory Accreditation Program (Attachment 4). The purpose of this program is to increase the quality of data produced by commercial, academic, municipal, and industrial laboratories. As part of the program, chemical and bioassay laboratories will undergo performance

evaluations. There will be two programs for NPDES dischargers: large dischargers must use an accredited lab beginning in July 1992; small dischargers will have less stringent requirements. These requirements apply to either the discharger's own laboratory or to a laboratory they use. For PSDDA, data generated beginning in July 1990 should come from an accredited laboratory or one that is undergoing the accreditation process and has received an interim accreditation.

Tom Gries, Ecology, reported on the PSDDA User's Manual that is currently undergoing development (Attachment 5). The purpose of this document is to provide consistency within the PSDDA program. The manual will contain all needed information that a user would need to complete the PSDDA process, including project planning, sediment characterization, and permitting. A first draft should be produced by late April, with a draft final report available for use in late June or July. The final manual will not be prepared until after the 1991 ARM.

Jacques Faigenblum, U.S. EPA/Ecology, Office of Puget Sound, spoke on the relationships between the PSEP Recommended Protocols and the PSDDA protocols. The PSEP protocols were developed to remedy the lack of comparability among data sets and poor quality assurance. Their goal is to have one set of protocols used by everyone. PSEP is trying to get formal adoption of protocols by other agencies. At present there are 14 protocols. The newest is the draft wetlands mitigation protocol. Protocols on marine mammals and conventional marine water quality variables are currently being formulated. The bioassay, organic compounds, and metals protocols have revised versions.

Jacques noted that while there are reasons for not always using methods in the protocols, the resulting report should state the reason why the protocols were not followed and the possible consequences on data quality. Potential reasons for not using the protocols include the lack of a protocol; research indicates a new protocol is needed; an institution must follow protocols provided by another program or is legally bound to use another protocol; and project goals can not be met using protocols. As an example of a PSEP and PSDDA protocol difference, Jacques discussed sediment holding times for bioassays (2 weeks under PSEP; 6 weeks under PSDDA), and proposed that the agencies get together and discuss relevant issues. The agencies have subsequently met and discussed the way the protocols document will deal with this difference.

Jacques raised an important issue concerning the need to find an agency that will pick up responsibility for the protocols in the future.

Individuals interested in receiving the PSEP protocols or updates should contact Jacques Faigenblum, U.S. EPA, 1200 Sixth Ave., Seattle, WA 98101. Telephone 442-8511.

John Malek, U.S. EPA, added to the discussion on protocols. He noted that U.S. EPA has committed to using the PSEP protocols throughout Region X. He also added that because the PSEP protocols include options, methods may differ slightly where there are options.

John Malek presented the status of the U.S. EPA/Corps of Engineers interim guidance for dredged material testing and management for ocean disposal under Section 103 of the Marine Protection, Research and Sanctuaries Act. The revised manual is an update of the 1977 edition (i.e., the "Green Book") and is a draft to be finalized in late summer 1990. Although written for ocean waters, there may be slight modifications for estuarine waters. Tom Wright, Corps of Engineers Waterways Experiment Station (Vicksburg, MS), noted that a guidance manual (i.e., the "Gold Book") for disposal in freshwater and estuaries will be available in draft form later this summer. It will address requirements of the Clean Water Act as opposed to the Ocean Dumping Act. John noted that the new ocean guidance is similar to PSSDDA guidance. It incorporates a tiered testing procedure, screening levels, similar concepts, etc. Bioaccumulation testing requirements differ slightly. Next year the PSSDDA agencies will discuss modifications to the PSSDDA guidance to meet changing federal requirements.

A discussion period ensued. Dave Kendall, Corps of Engineers, asked how PSSDDA could accommodate a 2 week holding time for bioassay sediments, and maintain a tiered testing approach. John Malek noted that the Green Book recommends 2 weeks, but does not state a maximum holding time. Data from the Great Lakes suggests that the greatest changes in toxicity occur within the first 24 hours following collection.

Bill Elmer, Reid Middleton, asked about the requirement to use an accredited laboratory and how dredgers should meet this requirement for projects currently underway. Frank Urabeck indicated that the PSSDDA agencies must have an agreement on this issue very soon so that ongoing projects are not jeopardized. Tom Gries noted that the current data submission requirements require information that will enable immediate evaluation of the data. He sees no reason to exclude data for ongoing projects.

Morgan Bradley, Muckleshoot Tribe Fisheries, asked where the dredged material that went to upland sites in DY89 was deposited. Tom Gries said that most material was dredged from the Snohomish River, taken to the DNR disposal facility, and then was used for upland beneficial use projects.

Dianne Robbins, Invert-Aid, noted that PSSDDA currently lacks an echinoderm larval sediment protocol. John Wakeman, Corps of Engineers, noted that a draft protocol for the larval echinoderm bioassay has been included in the latest round of PSEP protocols.

Tim Thompson, Parametrix, suggested that a Macoma bioaccumulation bioassay be added to the PSEP protocols.

Roger Anderson, Ocean Analysts, asked about navigational accuracy for dredged material disposal. Frank Urabeck deferred a discussion on that question until an upcoming talk was given. He explained that the Corps and DNR are responsible for monitoring disposal positioning accuracy, and mentioned the involvement of the U.S. Coast Guard's Puget Sound Vessel Traffic Service for providing interactive positioning information at several PSSDDA sites.

Bill Elmer commended PSSDDA on the development of the User's Manual. He suggested that the PSSDDA process be as linear as possible to reduce costs to the dredger.

Frank Urabeck indicated that the dredger comes to the Corps for a 404 permit, and that the Corps then coordinates with the other agencies, which reduces the complexity for the dredger. The final decision that is disseminated by the Corps represents the views of all PSDDA agencies.

The meeting was adjourned for lunch.

Steve Wright, Corps of Engineers, discussed compliance monitoring for disposal of dredged material at the PSDDA sites (Attachment 6). During DY89 the only dredging project with open water disposal occurred at the Commencement Bay site where 6090 yd<sup>3</sup> of material was disposed. For that project, inspections were made by the Corps, Ecology, and DNR. DNR used a mobile radar unit for some inspections. Because manual inspections are time-consuming, the Corps and DNR are investigating other forms of monitoring. Results of all inspections are coordinated among the PSDDA agencies.

Bob Parry, Corps of Engineers, discussed using a global positioning system (GPS) to monitor disposal operations at PSDDA sites not covered by the Coast Guard's vessel traffic service (VTS) (i.e., Commencement Bay, Ketrone/Anderson Island, Port Gardner, and Bellingham Bay). Combined with the VTS system, the agencies would achieve 100 percent monitoring of disposal operations. The GPS system will be purchased in cooperation with DNR. Because the system will require custom-designed software, it will not be available this year.

Bill Elmer asked about backup equipment in case of equipment malfunction. Bob noted that there will be enough equipment packages for use by tugs operating at those sites, and that there would be battery backup for each unit. Also, the system will have a monitor on the tug for use by the tug operator in positioning the barge onsite.

John Lunz, SAIC, asked whether the system will be flexible to allow Loran input also. Bob responded that flexibility would require purchase of additional equipment. By the end of the year there should be enough satellites for XY positioning. Agencies have no plans to interface with Loran.

John Wakeman asked whether the GPS signal would be degraded by the military. Bob noted that the system will be a differential GPS system that would not be affected by signal degradation, and that it would be more than adequate for PSDDA positioning..

Betsy Striplin, Department of Natural Resources, reported on the volume of dredged material placed at each Phase I site through March 30, 1990 (Attachment 6). Commencement Bay received 6,090 yd<sup>3</sup>, Elliott Bay received 130,000 yd<sup>3</sup>, and Port Gardner received approximately 1,000,000 yd<sup>3</sup>. She also reviewed the status of shoreline permits for each of the eight PSDDA sites. With the exception of Anderson/Ketrone Island, all sites should be open this spring. Anderson/Ketrone Island should be open by the end of the year at the latest.

Rick Vining, Department of Ecology, reported on Ecology's compliance inspections (Attachment 6). The inspections have three objectives: 1) Determine that only the appropriate materials go to a PSDDA site; 2) Water quality monitoring; 3) Inspect the dredged material handling process.

Betsy Striplin gave an overview of the PSDDA disposal site monitoring program (Attachment 7). The 1990 monitoring program includes full monitoring at the Port Gardner site, partial monitoring at the Elliott Bay site, and additional baseline studies at the Bellingham Bay site. Full monitoring includes physical mapping, sediment chemistry, sediment bioassays, bioaccumulation testing, and an assessment of benthic community structure. Partial monitoring includes physical mapping and limited sediment chemistry and bioassay studies. The Bellingham Bay study will involve collecting Dungeness crab for bioaccumulation testing. Additional tasks include a review of the sediment chemistry trigger levels and an evaluation of the statistical design for benthic infauna assessments. The field program will occur in April and May, with the final report available in early October.

Tom Wright asked how crab bioaccumulation could fit into the PSDDA site evaluation process due to the mobility of crabs. Betsy responded that the contractor has been asked to specifically address that question, and that the study would be used primarily to confirm predictions in the EIS.

Morgan Bradley asked what variables are measured using the sediment vertical profile system during physical monitoring. Betsy responded that it photographs a vertical slice of the sediment from the water-sediment surface to up to 20 cm below that surface. Dredged material layers are evident in the photos. Morgan asked if fine particles are seen on top of the sediment. He is concerned that fines, which generally contain more contaminants, may end up on the surface. Betsy said that obvious differences in grain size could be seen in the photos.

Dave Kendall commented that biological testing of the top 2 cm is conducted off the site. If fines were concentrated at the surface in these areas, that material would be tested for biological effects.

Bonnie Orme, a private citizen from Seattle, commented that a sediment sample taken from each barge should be analyzed for contaminants. Betsy indicated that the PSDDA agencies could discuss that sampling, and that it has been discussed in previous years.

Dave Kendall presented a clarification of the PSDDA agency flexibility when applying subsurface sampling and analysis guidelines (Attachment 8). At present, subsurface areas are not ranked differently than the overlying surface sediment. For geographic areas where no surface contamination is expected, the PSDDA agencies want to re-affirm their flexibility, on a project specific basis, for determining the number of subsurface samples required for site characterization.

Ed Murrell, National Marine Fisheries Service, asked whether changes or variations from those stated in PSDDA documents would be documented, and whether there would be criteria for determining how subsurface samples would be treated. Dave noted that the PSDDA agencies currently follow strict guidelines for determining the number of subsurface samples, and that the decision to vary from those criteria would probably be made using best professional judgement on a site specific basis. Dave stated that it will be documented and that NOAA/NMFS will be given the opportunity to review the change. Perhaps as more data are available, general guidance can be developed.

Dave Kendall presented a clarification on whether biological testing would be required when a chemical of concern is present at a concentration equal to the SL. The PSDDA agencies agree that biological testing is only required when a chemical is present at a concentration greater than the SL. For concentrations at or below the SL, no biological testing is required.

Justine Smith, Corps of Engineers, presented a status report on activities to provide better reference areas (Attachment 9). The objective of these activities is to identify higher quality reference areas, including those that are located closer to dredging areas. Sediment grain size should be within 10 percent of that which is being tested. Four interim sites were identified in Ecology's Interim Performance Standards report for reference areas, including Carr Inlet, and Dabob, Samish, and Sequim Bays. Additional data on other potential reference areas are available in the Marine Sediment Monitoring Task report prepared for Ecology.

Tim Thompson suggested wet sieving sediment in the field to estimate grain size and increase the probability of collecting sediment similar to that being tested. Justine Smith commented that there is no protocol for that method, but that informal methods may be available.

Dianne Robbins, Invert-Aid, commented that there should be geographic and temporal considerations given to the accessibility of reference area sediments.

John Wakeman commented that having sediment grain sizes be within 10 percent is a goal, not a requirement.

Morgan Bradley questioned the potential presence of relatively more fine-grained sediment at the surface than at depth, due to sediment sorting. Sediment at the surface may exceed SL values. John Wakeman responded that winnowing of sediment particles does not seem to be a predominant process. Morgan summarized his concern by saying that contaminants may be present in very high concentrations in small particles and that biological effects could be more likely at the very surface of the sediment if that was where the fines settled.

John Lunz, commented that the sediment vertical profile system can often discern dredged material layers and bioturbation. Results of those studies have not shown that fine-grained sediment settles on top of coarser sediment.

Dave Kendall presented a clarification on the analysis of sediment conventionals in reference areas and water quality in bioassays (Attachment 10). The PSDDA agencies now require the analysis of total volatile solids, sediment grain size, total solids, total organic carbon, total sulfides, and ammonia on all reference sediment samples. Additionally, water quality monitoring of ammonia and sulfide is required for all bioassays except Microtox.

Tim Thompson commented that requiring the water quality monitoring for each bioassay conducted on a given sediment sample seemed unnecessary. Dave Kendall responded that this degree of monitoring is in the dredger's best interest so that he is not penalized for a non-contamination related effect. Tim asked if monitoring using probes rather than wet chemistry would be possible. Dave

responded that the agencies and consultants would need to talk more about implementation.

Tom Wright asked how the data generated by this monitoring would be used. Dave Kendall answered that the evidence to date suggests an effect due to conventional parameters, and that this information could help explain toxic effects. Bioassay results would be judged by the results of all the supportive data, not only conventional data.

Dave Kendall presented the pentachlorophenol (PCP) interim SL adjustment (Attachment 11). The previous SL value was 69 ug/kg (ppb). Laboratories had difficulty routinely achieving this concentration as a detection limit. The PSDDA agencies raised the PCP SL to 100 ug/kg as an interim measure because this concentration is routinely achievable by local analytical laboratories. This concentration is still considered environmentally protective as the LAET and HAET for PCP are 360 and 690 ug/kg, respectively, and sensitivity analysis shows that there is no difference between 69 and 100 ppb.

David Fox gave a status report on analysis alternatives for polychlorinated biphenyls (PCBs) (Attachment 12). PCBs represent a large group of compounds (i.e., 209 congeners) that were mixed in various combinations for commercial application. PCBs can be analyzed in a variety of ways, each having certain advantages and disadvantages. Data on PCBs can be derived through analysis of 1) total PCBs; 2) specific Arochlors (i.e., specific commercial mixtures of PCB congeners); 3) specific isomer groups (i.e., groups of structurally similar congeners); and 4) individual congeners. David indicated that the PSDDA agencies would continue to use existing protocols for analysis of PCBs.

Jacques Faigenblum asked about the level of confidence for analysis of toxic and non-toxic congeners. David responded that in his judgement there are insufficient data to support the analysis of congeners at this time.

John Wakeman commented that the PSDDA SL and ML values are derived from the FDA advisory level of 2 ppm, and wondered if total PCBs had been used as the basis for these levels.

Eric Johnson, Washington Public Ports Association, discussed several aspects of the PSDDA process (Attachment 13). He recommended that the PSDDA agencies undertake a pattern analysis of data collected during characterization studies. Suggested that SL values may be modified slightly upward if data clustered around the existing SL and failed to show biological effects. He argued that a slight modification of the SL could save dredgers' costs associated with biological testing. Frank Urabeck responded that the concept is a good one, and that the Corps is considering obtaining the necessary software. Dave Kendall commented that a pattern analysis should incorporate a larger database than is currently available from the characterization process. Keith Phillips, Department of Ecology, noted that Ecology may be able to conduct a pattern analysis in the coming year. Tom Gries commented that Ecology will assess the sensitivity and reliability of PSDDA SL and ML values.

Eric Johnson's second point addressed the relationship between environmental conditions at the dredging site and the disposal site. He questioned whether

PSDDA protocols were overachieving environmental protection at the disposal sites. If so, perhaps SL values could be raised. Frank Urabeck responded that it will require a few years' monitoring data before we can make such a judgement.

Eric's third point was a request for disposal costs for those sediments that failed the PSDDA screening process.

Eric's fourth point was a request for an extended indirect economic analysis of regional impacts resulting from PSDDA. This would include cancelled/reduced projects; an assessment of the claims of cancelled/reduced projects; and the extended regional economic effects of cancelled/reduced projects.

Jay Spearman, Jay Spearman Consultants, commented that he was aware of two projects that were cancelled or deferred due to requirements in PSDDA, because of 1) uncertainty of testing results; and/or 2) inability to afford the testing requirements.

Keith Phillips asked about the factors that would be used in such as economic assessment. He suggested that the Port's information might be easiest to assess because of the public nature of the decisions. Private party assessments could be less accurate.

Phyllis Myers, Stillaguamish Tribe, commented that considerable money and time could be spent carrying out an extended economic analysis, and that because PSDDA is primarily a scientific process, it may not be appropriate for the PSDDA program to perform the analysis.

Frank Urabeck suggested that the Port conduct the economic analysis, and that a presentation of the results would be welcomed at the next Annual Review Meeting. He also recommended that the analysis should examine the economic consequences of the environmental regulations that would apply if PSDDA did not exist.

Four environmental consultants provided comments on increasing the efficiency of the PSDDA process (Attachment 14). The individuals and their comments included the following:

Carl Kassebaum, CRK Environmental Management, suggested that the permitting and testing process could be streamlined. The process is currently sequential: characterization, shorelines permit, Corps permit. He wants to work toward a joint Shorelines/Corps of Engineers permit. Carl agreed with David Fox's earlier comments on the development of a standard format for data reporting. Hopes the format will be user friendly.

Philip Spadaro, Hart-Crowser, commented on the need for better sampling protocols for sampling deep sediments. Current protocols generally address the upper meter of sediment. In some cases, dredging prisms can extend 20-50' below the sediment-water interface. When sampling to such depths, problems with sediment volumes, field time, and sample holding times arise.

Philip Spadaro also spoke on laboratory methods. He noted that PSDDA stressed performance-based analyses while the PSEP protocols are primarily concerned with

laboratory methods. Due to performance-based requirements, methods conducted under PSDDA may deviate from PSEP protocols.

Jay Spearman spoke about the need for increased coordination with biological laboratories. He noted presence of conflicts in guidance for methods. He stated that there is a need for better coordination between PSDDA agency staff and dredgers and their consultants.

Phil Spadaro commented that occasionally reference area toxicity exceeds test sediment toxicity, making interpretation difficult. He suggested PSDDA may need to develop an administrative approach for reference toxicity instead of having toxicity be based on reference sediment tests.

John Lunz added comments based on experience with the Navy Homeport program. He questioned the necessity of the detailed decontamination process for sampling equipment. This involves two Alconox<sup>(R)</sup> washes, rinses with tap water, rinses with distilled water, rinses with acid followed by methylene chloride and finally acetone. The requirement alone accounted for 2-6 manweeks for Navy Element I. He also commented on subsurface testing requirements. Due to all potential PSDDA and non-PSDDA requirements, the Navy had to collect approximately 25 liters of sediment per site. He asked whether bioaccumulation testing would be required; and if it will not, the volume of sediment required could be dramatically reduced. He supported ongoing work on reference areas. He noted that because grain size can vary widely in a bay, specific reference stations are needed as opposed to an entire bay. He commented that biological procedures were not fully developed in the beginning of PSDDA, and that to some extent PSDDA does effectively require research and development efforts by the regulated community.

Bill Elmer commented that clients need to understand the length of time and cost to go through the PSDDA process. PSDDA agencies need to respond in a timely manner.

Frank Urabeck suggested scheduling a workshop to begin a dialogue on the comments received from the consulting community.

Ed Murrell asked the consultants how permits could be started before the testing results were known. Carl Kassebaum responded that this is possible, especially in cases where sediment is likely to be clean. If sediments fail, then permit isn't approved. Ed noted that considerable agency personnel time would be invested when the permit may not be granted. John Zammit, Corps of Engineers, noted that the regulations state that the Public Notice must include volume and characteristics of the material.

Jacques Faigenblum asked whether additional input from consultants with extensive field experience should be obtained during upcoming work on the PSEP protocols. Carl Kassebaum agreed.

Tom Wright suggested that reference areas be extensively sampled, and that the resulting data be used as reference data for a period of perhaps 3-5 years. This would dispense with reference area sampling for each project. This approach is in the "Gold Book" which is being written.

Meryl Jefferson, Lummi Tribe, made statements regarding the lack of tribal representation in PSDDA and the selection of the Bellingham Bay PSDDA site (Attachment 15). The Lummi tribe is concerned that the Bellingham Bay site will cause the bay to become more shallow, reduce the fishing area, and cause cumulative impacts. The tribe feels it should have been treated as a PSDDA lead agency because it is self-regulated and has a fisheries department. The tribe requested an alternative site selection process, an alternative site in Bellingham Bay, and preparation of a more thorough cumulative impact statement.

Mike McKay, Lummi Tribal Biologist, commented on biological concerns with the Bellingham Bay site. He objected to the PSDDA EIS statements regarding presence of few crabs in certain months. He also questioned whether seasonal trends in crab densities can be ascertained from data provided for PSDDA by the University of Washington and was concerned with chronic effects including reproductive impairment.

Bonnie Orme made a statement concerning potential environmental effects of dredged material (Attachment 16). She considers dredged material a point source of pollution, and that it should not be dumped. She noted that in NOAA's Status and Trends report, the Four-mile Rock site had the highest PAH concentrations of the stations sampled nationwide. Bonnie recognized that contaminants may also come from municipal outfalls. She recommended more upland disposal.

APRIL 12, 1990

David Fox gave a presentation on the abnormality control standard for the sediment larvae bioassay (Attachment 17). The performance standards changed from 1988 (30 percent mortality, 10 percent abnormality) to 1989 (50 percent combined mortality and abnormality). This standard assumes the test has reached its endpoint. A problem occurs if the test is terminated early because underdeveloped larvae may be counted as abnormal. The PSDDA resolution is to have a 10 percent abnormality standard for the seawater control in addition to the 50 percent combined mortality plus abnormality.

Dianne Robbins recommended a workshop for all bioassay laboratory personnel to examine how different developmental stages of the echinoderm larval sediment test are defined. Dave Kendall agreed. Frank Urabeck committed to holding the workshop.

Dave Kendall discussed testing requirements for small projects above the "no test" volumes at nondispersive sites (Attachment 18). The concern is that you can only fail sediment under the single hit rule for small projects. The saline Microtox test is being added as a biological testing requirement to give more flexibility to the characterization.

Morgan Bradley asked what would be done if the amphipod test couldn't be run or had ammonia/sulfide problems. Dave responded that the Corps would look at all corollary data.

Morgan Bradley voiced concern about repeated dredging of small volumes and the potential for ultimately disposing of a large volume. Dave Kendall responded

that under the recency guidelines, the PSDDA agencies can have the dredger test their sediments every two years.

Morgan Bradley asked how other people can be involved in site ranking. Dave Kendall responded that the agencies use the initial rankings provided in the PSDDA documents, and that there are insufficient new data to re-rank all geographic areas.

Morgan voiced concern about the effects of compounds not on the PSDDA chemicals of concern list. He recommended performing a bioassay on every sediment sample. John Wakeman responded that the SL values are based on the AET database which is an effects-based database. Therefore, effects of non-listed chemicals are already incorporated into the analysis. Frank Urabeck explained that many projects are opting for concurrent biological testing to avoid potential delays if there are SL value exceedances. Keith Phillips emphasized that known/potential sources and spills were considered during site ranking and in the reason to believe test for chemicals of concern. He also commented that bioassays are conducted at the disposal site to ensure that materials placed there are not toxic.

Bonnie Orme asked whether the dredging project conducted for the Renton outfall included bioassay testing. Frank Urabeck commented that that project occurred prior to PSDDA, but that the Corps would have required a 404 permit.

Tim Thompson noted that the amphipod test may not be appropriate for testing many south Puget Sound sediments because they tend to be very fine-grained. Dave Kendall responded that the agencies would discuss this and perhaps recommend a different test.

Keith Phillips presented a clarification on the Microtox bioassay (Attachment 19a). Problems have been noted concerning increases in luminosity and the associated difficulty in data interpretation. This occurs more often in reference sediment. To resolve this problem, light enhancement will be considered a neutral response. Furthermore, reference sediment must be included in each batch, and comparisons between reference and test data can only occur within a batch. A hit is defined as a decrease in luminosity of 20 percent that is also statistically significant from reference.

Tim Thompson asked for a definition of a batch. Ed Casies noted that NOAA defines a batch as those samples extracted and tested within one day. He also commented that a dilution series is necessary to confirm dose responsiveness. Keith Phillips responded that PSDDA does recommend a dilution series to meet PSEP protocols. (Subsequent discussion on this subject is provided in Attachment 19b.)

Jacques Faigenblum asked whether recent Microtox results were affecting overall confidence with the test. Keith Phillips responded that confidence may vary among agencies. Precision/repeatability vs. lack of interpretation. Cost is less.

Tom Wright commented that running reference sediments with each batch contradicts the "Green Book." Keith Phillips concurred that establishing administrative

default values or revisiting reference values every few years would be beneficial, but he stated that the cost of characterizing reference areas as given in the "Green Book" seems very high. There may be enough Puget Sound data to generate those values for PSDDA without additional field work.

Dave Kendall asked what is being done to justify the non-toxic response of increased luminosity. Keith Phillips noted that there are regulatory implications to the interpretation of light enhancement, and that this is an issue for the PSEP protocols.

Brett Betts, Department of Ecology, gave a presentation on the 20-day Neanthes biomass bioassay that is currently under development (Attachment 20). Work is continuing, with a workshop to scope remaining work in May-June 1990, peer review in June-July 1990, additional technical work in July-December 1990, an experts panel/workshop in November 1990, and recommendations on use of the test at the next PSDDA Annual Review Meeting in February 1990. Remaining technical issues include laboratory repeatability/replicability, PSDDA bioassay comparison, and development of interpretive guidance. Bioassay laboratories and other potential users of this test will be invited to the workshops.

Tom Wright indicated that the Corps of Engineers Waterways Experiment Station will continue to attend Neanthes workshops and review development of this test.

Dianne Robbins supported the development and use of this test, especially as there is concern with over-collection of the amphipod Rhepoxynius abronius. John Wakeman commented that Oregon State University is working on the culturing of R. abronius. Also, the Department of Wildlife is concerned about collection of sand dollars for echinoderm larvae tests. Tom Wright noted that there may be genetic drift problems with cultured organisms.

John Wakeman, John Malek, and Russ McMillan gave a status report on polychlorinated dibenzodioxins and dibenzofurans (Attachment 21). Because dioxins and furans are primarily associated with chlorine bleaching pulp mills, PSDDA may require bioaccumulation testing near those sites. Other potential sources include wood treatment facilities, pesticide manufacturers, oil refineries, urban runoff, incinerators, agriculture, and wastewater treatment plants. Field effects of dioxins are poorly characterized, and tend to be widely variable. Virtually no information exists on sediment effects. When there is a "reason to believe" that dioxins may be present, PSDDA will require testing. Detection limits may be close to minimum biological activity concentrations. In Puget Sound, dioxins do not appear to be a large problem. Wastewater treatment plants are not major sources, wood treatment plants are moderate sources. The State is involved in the identification and assessment of dioxins, and the elimination of sources. For example, as NPDES permits are reissued for pulp mills, those mills are required to reduce dioxin concentrations to below detectable levels in 3 years. Ecology is working with U.S. EPA and the Department of Health, as well as the State of Oregon on this problem. Source control technologies at pulp mills include changing from oil to water based defoamers and from elemental chlorine to chlorine dioxide in the bleaching process. In summary, John Wakeman suggested a technical workshop to discuss the current state of the art in dioxins, tracking other studies, and frequent discussions among the agencies involved in dioxin investigations.

Keith Phillips noted that the PSDDA agencies may be able to improve guidance for determining when to require dioxin testing. Dave Kendall recommended a work group of experts to discuss sampling requirements.

Bonnie Orme gave a brief talk on her concerns with the PSDDA program. She recommended a full monitoring program in Elliott Bay during 1990, including gradient stations between the Denny Way CSO and the site and the Elliott Bay marina and the site. She also recommended the addition of benchmark stations around the marina.

Frank Urabeck began closing the meeting with three procedural notes. First, the minutes of the meeting would be available within 30-45 days and would provide a record of the meeting. Second, comments received through April 19 would be included in the annual review process. Third, the next Annual Review Meeting will be in February or March, 1991.

John Wakeman summarized commitments made during the meeting:

- 1) Written comments will be considered and PSDDA will respond in writing.
- 2) PSDDA will revisit SL and ML values.
- 3) Perform a trend/pattern analysis in relation to SL values.
- 4) Encourage ports to perform economic analysis. Corps would provide data.
- 5) Coordinate between PSEP and PSDDA on protocols, especially holding times and bioaccumulation.
- 6) Meet with the Tulalip Tribes and provide a written response to and perhaps have a meeting with the Lummi Tribe.
- 7) Hold several workshops on the following topics:
  - a) Streamline PSDDA process; protocols for sampling deep sediment layers
  - b) Chronic sublethal tests
  - c) Bioassays
  - d) Dioxins and furans
  - e) Reference area characterization, administrative default values
  - f) Data submission format
- 8) Prepare newsletter/information bulletin as a way to notify public of PSDDA work.

Frank Urabeck closed the meeting by drawing two conclusions:

- 1) Clarifications presented during the meeting had been accepted.
- 2) PSDDA is generally doing well. The process is working, but we need to work on reasonability and environmental protection.

Several letters were received either before the Annual Review Meeting or between the meeting and the end of the public comment period (April 19, 1990). These letters are included in the minutes as the following attachments:

Attachment 22. Letter dated April 17, 1990 from Eric Johnson, Washington Public Ports Association

- Attachment 23. Letter dated April 18, 1990 from David Somers, Tulalip Tribes
- Attachment 24. Letter dated April 19, 1990 from Carl Kassebaum, CRK Environmental Management; Jay Spearman, Jay W. Spearman Consulting Engineer; Philip Spadaro, Hart Crowser; William Elmer, Reid Middleton; John Lunz, SAIC, Inc.; and Patricia O'Flaherty, CH2M Hill



**Puget Sound Dredged Disposal Analysis (PSDDA)**  
**Agenda for Annual Review Meeting – April 11 & 12, 1990**  
**Dredged Material Management Year 1989**  
**(June 16, 1988 - June 15, 1989)**

**APRIL 11, 1990**

*Introduction and Overview*

**930am–Greeting:** Thomas Dunne, Acting EPA Regional Administrator; Ron Lee, EPA 404 Program.

**945-1000--Statement of Meeting Objectives:** Frank Urabeck, Corps (Meeting Moderator).  
 Annual Review Process.  
 Conclusions of Previous Annual Review Meeting, Actions Taken.  
 Clarifications, Status Reports, and Public Issues

**1000-1020--Overview of DY 1989:** Tom Gries, Ecology Data Manager for PSDDA.  
 Annual Reports  
 Conclusions and Recommendations

*Presentations and Discussion Topics*  
*Identified by PSDDA Agencies*

(These topics are broken into two sessions, with publicly-identified issues falling at the end of April 11.)

*Session 1.*

**General Topics**

**1020-1030:** Data Reporting in Standard Format (Clarification). David Fox, Corps.

**1030-1045:** PSDDA User's Manual (Status Report). Tom Gries, Ecology.

**1045-1100:** Ecology's Lab Accreditation Program. (Status Report) Tom Gries, Ecology.

**1100-1115:** Puget Sound Estuarine Program Recommended Protocols and PSDDA Relationships. Jacques Faigenblum, EPA/Ecology Office of Puget Sound; John Malek, EPA.

**1115-1130:** Status of EPA/Corps Interim Guidance for Dredged Material Testing and Management for Ocean Disposal. (Status Report) John Malek, EPA.

**1130-1145:** Discussion of above topics.

**1145-1245pm:** Lunch.

## **PSDDA Site Management, Sampling and Analysis Guidelines, and Reference Areas**

**1245-110:** Compliance Inspections (Status Report). Steven Wright, Bob Parry (Corps); Betsy Striplin (DNR Disposal Site Manager) and Rick Vining (Ecology).

**110-125:** Environmental Monitoring (Status Report). Betsy Striplin (DNR).

**125-135:** PSDDA Agency Regulatory Flexibility When Applying Subsurface Sampling and Analysis Guidelines. (Clarification) David Kendall (Corps PSDDA Data Manager).

**135-140:** PSDDA Screening Level: Testing at SL--Not Required. (Clarification) David Kendall (Corps).

**140-200:** Reference Area Sediments -- Activities to Provide Better Reference Areas. (Status Report) Justine Smith (Corps), Brett Betts (Ecology).

**200-210:** Requirement for Analyzing Sediment Conventionals in Reference Areas and Water Quality in Bioassays. (Clarification) David Kendall (Corps).

**210-220:** Pentachlorophenol (PCP) Interim SL Adjustment. (Clarification) David Kendall (Corps) and Tom Gries (Ecology).

**220-250:** Polychlorinated Biphenyls (PCBs) Analysis Alternatives. (Status Report) David Fox (Corps) and Tom Gries (Ecology).

**250-305:** Discussion of above topics. (End of Session 1).

### **Public Issues and Statements.**

(Twenty minutes have been allotted to each submittal. This may include discussion. At the end of the session, open discussion and further statements will be taken.)

**305-325:** Lummi Tribe: Tribe as a PSDDA "Lead" Agency; Disagreement on Selection of Bellingham Bay Site--Resource Damages, Net Fouling; Preference for Alternative Site. Samuel M. Cagey (Chairman, Lummi Indian Business Council).

**325-345:** Tulalip Tribes: Role of Tribes in PSDDA; Guidelines; Monitoring; Dispute Resolution; Alternative Sites. David Somers (Tulalip Tribal Senior Habitat Biologist).

**345-405:** Washington Public Ports Association: Pattern Analysis; Site Performance and Disposal Criteria; Analysis of Direct Economic Impacts; and Analysis of Extended Economic Impacts. Eric Johnson (WPPA).

**405-425:** Carl R. Kassebaum (CRK Environmental), Jay Spearman (Jay Spearman Consultants) and Philip Spadaro (Hart-Crowser): Streamlining the PSDDA Process; Problems with Sampling of Deep Sediments; Acceptable Lab Methods; and Difficulty with Data Reporting Procedures.

425-445: Bonnie Orme: Mitigation Banking; Intertidal Toxicity; Alternative Disposal Sites.

445-500: Discussion of Above Topics.

APRIL 12, 1990

*Presentations and Discussion Topics  
Identified by PSDDA Agencies*

Session 2.

**Biological Testing**

900-915: Abnormality Control Standard for the Sediment Larvae Bioassay (Clarification)  
David Fox (Corps).

915-930: Testing Requirements for Small Projects above "No Test" Volumes at Nondispersive Sites. (Clarification) David Kendall (Corps).

930-945: Microtox Bioassay. (Clarification) Keith Phillips (Ecology).

945-1030: Testing with The Polychaete Worm *Neanthes* (20-Day Biomass Bioassay) - What has Been Done, and What Will be Done to Make a Useable Test?

1030-1045: Discussion of the above.

1045-1120: Polychlorinated Dibenzodioxins and Dibenzofurans. What is PSDDA Doing to Stay Current with this Developing Issue? (Status Report) John Wakeman (Corps), Rick Allbright and John Malek (EPA), Russ McMillan (Ecology).

1120-1135: Discussion of the above. (End of Session 2)

*Summary and Closing.*

1135-1200: *Issues to which PSDDA Agencies will Respond, and PSDDA Agency Commitments for Action Before the Next Annual Review Meeting.* Frank Urabeck, Corps



LIST OF ATTENDEES

<u>NAME</u>	<u>ORGANIZATION</u>	<u>ADDRESS</u>	<u>TELEPHONE</u>
Edmond Murrell	NMFS	1002 Halladay Portland OR	(503) 230-5433
Bonnie Orme	-	1949 Perkins Ln W Seattle, WA	(206) 285-6521
Mark Fugiel	AM Test	14603 NE 87th Redmond, WA 98052	(206) 885-1664
Justine Smith	Corp of Engineers	PO Box C-3755 Seattle, WA 98124	(206) 746-3654
Linda Cox	Corps of Engineers	PO Box C-3755 Seattle, WA 98124	(206) 746-3654
Tom Wright	Corps of Engineers	PO Box 631 Vicksburg, MS	(601) 634-3708
Ted Appleton	Public Works Canada	1166 Alberni Street Vancouver BC V6E 3W5	(604) 666-6782
Betsy Striplin	DNR	Mail Stop QW-21 Olympia, WA 98504	(206) 753-0263
Dave Nazy	Ecology	4350 150th Ave NE Redmond, WA 98052	(206) 867-7258
Kathleen Goodman	Enviros	12277 134th Ct NE Redmond WA 98052	(206) 820-7575
Bill Elmer	Reid Middleton, Inc.	19031 33rd West Lynnwood, WA	(206) 775-3434
Jay Spearman	Jay Spearman Consulting Engineers	PO Box 2176 Kirkland WA 98083-2176	(206) 822-6021
John Zammit	Corps of Engineers	NPDCO-R Portland, OR	

<u>NAME</u>	<u>ORGANIZATION</u>	<u>ADDRESS</u>	<u>TELEPHONE</u>
Stephen Wright	Corps of Engineers	Box C-3755 Seattle, WA 98124	(206) 764-3495
Ann J. Morgan	DNR	Mail Stop QW-21 Olympia, WA 98504	(206) 753-5326
Lawrence McCrone	Landau Associates	PO Box 1029 Edmonds, WA 98020-1029	(206) 778-0907
Philip Spadaro	Hart Crowser	1910 Fairview Ave E Seattle, WA 98102	(206) 324-9530
Allen Sanders	Bell & Ingram	PO Box 1769 Everett, WA 98206	(206) 762-3623
Randy Carman	Fisheries	General Admin Bldg Olympia, WA 98504	(206) 753-2908
John Armstrong	EPA	Office of Puget Sound 1200 Sixth Ave Seattle, WA 98101	(206) 442-1368
Morgan Bradley	Muckleshoot Tribe Fisheries	39015 172nd SE Auburn, WA 98002	(206) 939-3311
Diane E. Robbins	Invert-Aid	8414 280th East Graham, WA 98338	
David Brent	Copeland, Landye, Bennett and Wolf	1300 SW 5th Ste 3500 Portland, OR 97201	(503) 224-4100
Mark Davis	Copeland, Landye, Bennett and Wolf	1300 SW 5th Ste 3500 Portland, OR 97201	(503) 224-4100
Roger Anderson	Oceano Instruments	12737 28th NE Seattle, WA 98125	(206) 363-0500
Andrea Ogston	Ogden Beeman & Associates	33301 Ninth Ave S Federal Way, WA	(206) 874-0369

<u>NAME</u>	<u>ORGANIZATION</u>	<u>ADDRESS</u>	<u>TELEPHONE</u>
Brett Betts	Ecology	MS PV-11 Olympia, WA 98504	(206) 459-6824
David Kendall	Corps of Engineers	PO Box C-3755 Seattle, WA 98124	(206) 764-3768
David Fox	Corps of Engineers	PO Box C-3755 Seattle, WA 98124	(206) 764-3768
Mike Palko	Ecology	MS PV-11 Olympia, WA 98504	(206) 459-6237
Bob Stuart	EVS Consultants	2517 Eastlake Ave E Seattle, WA 98102	(206) 328-4188
John Wakeman	Corps of Engineers	Box C-3755 Seattle, WA 98124	(206) 764-6577
Frank Urabeck	Corps of Engineers	Box C-3755 Seattle, WA 98124	(206) 764-3768
Thomas Dunne	EPA	1200 6th Ave Seattle, WA 98101	
John Malek	EPA	1200 6th Ave Seattle, WA 98101	(206) 442-1286
Dave Jamison	DNR	Mail Stop QW-21 Olympia, WA 98504	(206) 586-2653
Tom Gries	Ecology	MS PV-11 Olympia, WA 98504	(206) 438-7706
Ron Lee	EPA	1200 6th Ave Seattle, WA	
Ed Casillas	NMFS/NOAA	2725 Montlake Blvd E Seattle, WA 98102	(206) 442-7740
Roseanne Lorenzana	Washington Dept. of Health	MS: LD-11 Olympia, WA 98504	(206) 586-5406

NAME	ORGANIZATION	ADDRESS	TELEPHONE
Nancy A. Musgrove	EVS Consultants	2517 Eastlake E Seattle, WA 98102	(206) 328-4188
Jack Gakstatter	EPA	1200 6th Avenue Seattle, WA 98101	(206) 442-0966
Mike Nelson	Laucks Testing Lab	940 S Harney Seattle, WA 98108	(206) 767-5060
Dave Somers	Tulalip Tribes	3901 Totem Beach Rd Marysville, WA 98270	(206) 653-0220
Warren Baxter	Corps of Engineers	Box C-3755 Seattle, WA 98124	(206) 764-3495
Tish Parmenter	PNPTC	7850 NE Little Boston Kingston, WA 98346	(206) 297-4792
Laura Cooper	Port of Tacoma	Box 1837 Tacoma, WA 98401	(206) 383-5401
Barbara Gleason	Laucks Testing Lab	940 S Harney Seattle, WA 98108	(206) 767-5060
Rick Albright	EPA	WD-139 1200 6th Ave Seattle, WA 98101	(206) 442-8514
Carl Kassebaum	CRK Environmental Management	2725 NE 98th St Seattle, WA 98115	(206) 525-6047
Eric Johnson	WA Public Ports Association	PO Box 1518 Olympia, WA 98501	(206) 943-0760
Peter McCormick	EcoChem	911 Western #304 Seattle, Wa 98104	(206) 233-9332
Keith Phillips	Ecology	MS PV-11 Olympia, WA 98504	(206) 459-6143

NAME	ORGANIZATION	ADDRESS	TELEPHONE
Phyllis Meyers	Suquamish Tribe	Box 498 Suquamish, WA 98392	(206) 464-5456 or 598-3311
Gene Revelas	SAIC	2911½ Hewitt Ave Everett, WA 98201	(206) 252-6800
Jim Thompson	Parametrix	13020 Northup Way Bellevue, WA 98003	(206) 455-2550
Jacques Faigenblum	OPS/Ecology	1200 6th Avenue Seattle, WA 98101	(206) 442-8511
Dale Van Donsel	Ecology	PO Box 488 Manchester, WA 98353	(206) 895-4649
John Lunz	SAIC	2911½ Hewitt Ave Everett, WA 98201	(206) 252-6800
Carol Ravano	US Navy NAVSTA Puget Sound	7500 Sandpoint Way Seattle, WA 98115	(206) 526-3463
Collin Kingman	Public Works Canada	1166 Alberni St Vancouver, BC V6E 3W5	(604) 666-6782
Lyn Faas	Metro Environmental Lab	322 West Ewing Seattle, WA	(206) 684-2306
Dave Fada	Metro	322 West Ewing Seattle, WA	(206) 684-2303
Jack Garner	City of Bellingham	210 Lottie Street Bellingham, WA	(206) 676-6961
Dave Smith	Ecology	Mail Stop PV-11 Olympia, WA 98504	(206) 438-7078
Carol M. Sanders	CH2M Hill	777 108th Ave NE Bellevue WA 98004	(206) 453-5000



# **PSDDA Agency Annual Reports DY 1989**

- **Dredging Activities Report (WDNR)**
- **Dredged Material Sampling, Testing, and Disposal Guidelines Application Report (Corps of Engineers)**
- **Management Plan Assessment Report (Ecology)**

# **Dredging Activities/ Disposal Site Use**

- **First use of a PSDDA unconfined, open-water dredged material disposal site, March 1989**
- **Commencement Bay site received 6090 cubic yards from one project**
- **22 dumps over three weeks**
- **Seven of first nine dumps observed/inspected by PSDDA personnel**

# **Corps of Engineers**

## **Guidelines Application Report**

- **Five proposed projects**
- **Sample numbers and volumes represented**
- **Chemical exceedances**
- **Biological testing**
- **Partial/full characterization**
- **Reranking dredging areas**
- **Cost analysis**

# **Guidelines Application Report**

## **Clarifications/Topics**

- **Sample archiving**
- **Reference sampling**
- **Sediment conventionals**
- **Limits of detection**
- **Larval test clarifications**
- **Saline Microtox test**

# **Ecology Management Plan Assessment Report**

- **Summarized overall dredging activity**
- **Summarized other PSDDA annual reports**
- **Identified new data sources**
- **Prepared literature review**
- **Reviewed disposal site conditions**
- **Identified possible topics for PSDDA  
Annual Review Meeting (ARM)**



**Ecology Laboratory Accreditation Program****1. Purpose**

To ensure that commercial and private labs can provide Ecology with accurate analytical data for use in compliance monitoring, decision-making on environmental issues, etc.

**2. Program Authority**

- a. RCW 43.21A.230 authorizes Ecology to establish a lab accreditation program and to charge fees to recover its program costs.
- b. The Puget Sound Water Quality Authority Plan requires major NPDES permittees (>5 mgd) to use accredited labs beginning July 1992, and others to do so by July 1993.
- c. WAC 173-50, adopted by Ecology in April 1989, establishes program elements and lab performance standards for accreditation.

**3. Program Status**

- a. Ecology is establishing a voluntary lab accreditation program, with some of the program elements still being finalized.
- b. Ecology has a policy stating that any regulations, permits and contracts should require use of accredited labs for environmental sample analysis.

**4. Program Elements**

- a. Labs may apply for accreditation, detailing their analytical capabilities.
- b. Program requirements differ between commercial labs/major NPDES permittee labs and minor NPDES discharger (<5 mgd) labs.
  - i Commercial/major permittee lab accreditation:
    - (1) Quality assurance manuals must be prepared, acceptable to Ecology, and followed.

(2) Performance evaluation (PE) samples must be analyzed.

(3) On-site audits must be performed by Ecology.

ii Minor permittee registration:

(1) Quality assurance manuals must be prepared/followed.

(2) Guaranteed assistance visits.

(3) Less stringent requirements for making progress correcting deficiencies, etc.

c. Applicants must pay an accreditation fee, based on number/complexity of parameters accredited.

d. Accreditation must be renewed annually.

5. Implementation Dates

a. Commercial labs: July 1990.

b. Major NPDES permittees: July 1992.

c. Minor NPDES permittees: July 1993.

d. State and general dischargers: July 1994.

6. Implications for PSDDA

a. Use of accredited labs not mandatory.

b. Ecology policy is for individual program managers to incorporate into regulations, permits and contracts the use of accredited labs for environmental sample analysis.

c. Ecology policy applies to dredging programs and sediment samples.

d. As of July 1990, any dredging project analytical data submitted to Ecology must come from an accredited lab (if that specific analysis is being accredited by Ecology).



# ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

## SECONDARY OBJECTIVE

HELP LABS IMPROVE THEIR  
QA/QC PROGRAMS BY---

- ✓ Providing guidance for setting up and documenting the QA program
- ✓ Assistance visits

## WHAT IS THE ACCREDITATION PROGRAM?



A program to assure labs reporting data to Ecology have a demonstrated capability to accurately analyze



environmental samples.



## WHO WILL BE AFFECTED BY THE ACCREDITATION PROGRAM?

Commercial labs submitting water quality data to WDOE - by Jul 90



Major NPDES Dischargers - Jul 92



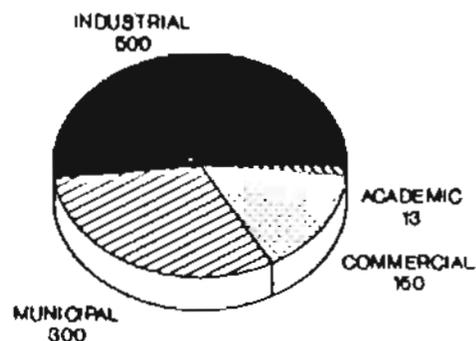
Minor NPDES Dischargers - Jul 93



Other Dischargers - Jul 94

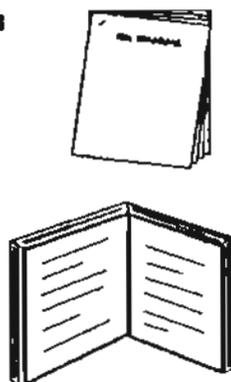


## HOW MANY LABS?



## WHAT GOES IN THE QA MANUAL?

- ✓ Organization/responsibilities
- ✓ Definitions
- ✓ QA objectives
- ✓ Methods (referenced)
- ✓ QC procedures



## WHAT'S INVOLVED IN ACCREDITATION?

✓ Submit application



✓ Pay fee



✓ Review QA Manual



✓ Analyze PE Samples



✓ Visit lab



## WHICH PARAMETERS REQUIRE PERFORMANCE EVALUATION?

Those for which PE Samples are readily available (e.g., from EPA's WP Studies).

For example:

pH	Yes
BOD	Yes
TSS	Yes
Res Cl	Yes
Fecal Coliforms	No

## WHAT HAPPENS DURING THE ON-SITE AUDIT?



Ecology team checks---

- ✓ Personnel qualifications/responsibilities
- ✓ Equipment/facilities 
- ✓ Methods 
- ✓ QA/QC program 
- ✓ Sample management 

---

## HOW DOES LAB STAY IN THE PROGRAM?

- ✓ Accreditation expires at end of FY
- ✓ Renewal

New Application  
Pay fee  
PE Sample Analyses (twice yearly, but will probably be reduced to once annually)  
On-site Audit every 3 years

---

## WHAT HAPPENS IF LAB HAS A PROBLEM?

- ✓ Little problem---  
Provisional Accreditation
- ✓ Big problem---  
Denial or revocation of accreditation

---

## IS THERE ANY SPECIAL PROGRAM FOR WASTEWATER DISCHARGERS?

Revisions to WACs 173-50, 173-220, and 173-216 will allow some dischargers to be

**REGISTERED**



rather than accredited.

Submit application, fee, QA Manual: you are REGISTERED.  
Submit PE sample results, undergo audit, make PROGRESS in correcting deficiencies, you stay REGISTERED.

---

## WHAT ELSE IS SPECIAL ABOUT REGISTRATION?

- ✓ Registered labs get more help from Ecology.



- ✓ Registered labs pay an additional fee.



- ✓ Registered labs may switch to accreditation at any time.

---

## WHAT'S AVAILABLE TO HELP LABS PREPARE?

- ✓ WAC 173-50
- ✓ Procedural Manual
- ✓ Model QA Manual
- ✓ QA Section

P.O. Box 488  
Manchester, WA 98353  
(206) 895-4649

- ✓ Roving Operators

---

## HOW CAN THE LAB PREPARE FOR ACCREDITATION/REGISTRATION?

- ✓ Establish and document good QA program



- ✓ Implement QC tests



- ✓ Training



- ✓ Purchase equipment (if necessary)



---

PSDDA Policy Statement  
on the  
State Laboratory Accreditation Program  
June 1990

1. For PSDDA projects with PSDDA-approved sampling plans where sampling commenced before July 1, 1990:

All project data will be accepted if they satisfy existing PSDDA quality assurance (QA) requirements.

2. For PSDDA projects with PSDDA-approved sampling plans where sampling commences between July 1, 1990 and January 1, 1991:

Plans must require physical, chemical and bioassay tests to be performed by an environmental laboratory which has initiated the process of becoming accredited by submitting an application for accreditation to Ecology's Quality Assurance Section.

3. For PSDDA projects with PSDDA-approved sampling plans where sampling commences after January 1, 1991:

Plans must require physical, chemical and bioassay tests to be performed by an environmental laboratory accredited by Ecology in accordance with WAC 173-50;

4. All laboratories performing analyses for a PSDDA proponent must follow the Puget Sound Estuary Program physical, chemical and bioassay protocols (including PSDDA modifications). All data generated from these projects must still satisfy existing PSDDA QA requirements.

5. Points of contact for the Ecology Laboratory Accreditation Program are:

Cliff Kirchmer	(206)895-4649
Tom Gries	(206)438-7706



## Draft Report

# **USERS MANUAL FOR UNCONFINED, OPEN-WATER DISPOSAL OF DREDGED MATERIAL IN PUGET SOUND**

For

**Washington Department of Ecology  
Olympia, Washington**

April 1990 Draft



**PTI** Environmental Services  
15375 SE 30th Place  
Suite 250  
Bellevue, Washington 98007

DRAFT REPORT

---

USERS MANUAL FOR UNCONFINED, OPEN-WATER  
DISPOSAL OF DREDGED MATERIAL IN PUGET  
SOUND

---

For  
Washington Department of Ecology  
Olympia, Washington

PTI Contract C973-01

April 1990 Draft



## CONTENTS

1. INTRODUCTION
2. BACKGROUND
  - 2.1 PUGET SOUND NAVIGATION AND DREDGING
  - 2.2 PUGET SOUND DREDGED MATERIAL DISPOSAL
    - 2.2.1 Historic Practices
    - 2.2.2 Public Unconfined, Open-Water Disposal Sites
    - 2.2.3 Key Regulatory Authorities
    - 2.2.4 Past Dredged Material Evaluation
    - 2.2.5 Goals of Puget Sound Dredged Disposal Analysis
    - 2.2.6 Puget Sound Dredged Disposal Analysis
    - 2.2.7 Annual Review
3. OVERVIEW OF PERMIT PROCESS
  - 3.1 INTRODUCTION
  - 3.2 PERMIT PROCESS
    - 3.2.1 Local Shoreline Management Permits
    - 3.2.2 Section 10/404 Permits
    - 3.2.3 Section 401 Certification, Shoreline Management Act Oversight
    - 3.2.4 Hydraulics Project Approval
    - 3.2.5 Disposal Site Permit Activities of DNR
4. PERMIT PLANNING AND PERMITTING ACTIVITIES
  - 4.1 INITIAL PROJECT STRATEGY
  - 4.2 DEVELOP INITIAL PROJECT PROPOSAL AND PERMITTING/PUBLIC RELATIONS STRATEGY
    - 4.2.1 Develop Initial Project Proposal
    - 4.2.2 Develop Strategy for Public Relations and Agency Contacts
  - 4.3 APPLICATION SUBMITTAL
  - 4.4 PERMITS AND AUTHORIZATIONS
  - 4.5 SHORELINE MANAGEMENT ACT PERMITTING REQUIREMENTS

- 4.6 CORPS OF ENGINEERS SECTION 10/404 PERMIT
- 4.7 DNR LEASE
- 4.8 DNR OPEN-WATER DISPOSAL SITE PERMIT
- 4.9 FEDERALLY SPONSORED DREDGING PROJECTS
- 5. DREDGED MATERIAL CHARACTERIZATION
  - 5.1 OVERVIEW
  - 5.2 REVIEW EXISTING DATA
  - 5.3 SAMPLING AND ANALYSIS PLAN
  - 5.4 CHEMICAL TESTING
    - 5.4.1 Chemical Characterization
    - 5.4.2 Archive Samples Below Dredging Depth
  - 5.5 CHEMICAL RESULTS
  - 5.6 BIOLOGICAL TESTING
  - 5.7 BIOLOGICAL RESULTS
  - 5.8 DATA SUBMISSION REQUIREMENTS
  - 5.9 DECISION OF SUITABILITY
- 6. DREDGING AND DISPOSAL PLAN
- 7. QUALIFIED TESTING LABORATORIES
- 8. AGENCY POINTS OF CONTACT
- 9. GLOSSARY
- 10. INDEX
- EXHIBIT A - DREDGING PROJECT CHECKLIST
- EXHIBIT B - PREAPPLICATION MATERIALS
- EXHIBIT C - ASSESS EXISTING INFORMATION
- EXHIBIT D - RANKING OF DREDGING AREAS
- EXHIBIT E - SMALL PROJECTS
- EXHIBIT F - TESTING TIERS

EXHIBIT G - PROTOCOLS

EXHIBIT H - SAMPLING AND ANALYSIS GUIDELINES

EXHIBIT I - CHEMICAL TESTS

EXHIBIT J - CHEMICAL DISPOSAL GUIDELINES AND NEED FOR TIER 2  
BIOLOGICAL TESTS

EXHIBIT K - BIOLOGICAL TESTS

EXHIBIT L - BIOLOGICAL RESPONSE DISPOSAL GUIDELINES

EXHIBIT M - DATA SUBMISSIONS

EXHIBIT N - USE OF TEST RESULTS IN PERMIT DECISIONS

EXHIBIT O - INSPECTION REPORT AND PERMIT FOR OPEN-WATER DISPOSAL

EXHIBIT P - DREDGING AND DISPOSAL PLAN



CENPS-OP-RG

11 April 1990  
SW-4,wp,sw0405-2

## MEMORANDUM FOR RECORD

SUBJECT: Compliance Speech - PSDDA Annual Review Meeting, 11 APRIL 90

1. My name is Stephen Wright. I am the Chief of the Enforcement Section, Regulatory Branch with the Corps of Engineers. Our Section is responsible for compliance of Corps permitted activities.
2. PSDDA compliance monitoring is getting into full swing now. The Corps and DNR have been focusing in on position monitoring to ensure accurate dumping within the disposal site. WA State DOE has been monitoring water quality at the sites. To date, our agencies have monitored 5 activities at 3 of the disposal sites. Monitoring of permitted dredge and disposal activities during the actual work is a new mission for my Enforcement Section. Past contract compliance inspections normally did not occur during actual dredging or disposal. We are sharing inspection results and coordinating experience gained from our inspections with the other regulatory agencies. As a result, we are presently changing some of our permit conditions, procedures, and recording forms to improve accuracy of information on disposal including positioning at non-VTS sites. VTS stands for the Vessel Traffic System used by the U.S. Coast Guard. One Corps project and one permitted activity have used the Elliott Bay Disposal Site which require positioning by the U.S. Coast Guard VTS. This has proved to be successful in positioning for disposal and verifying of on-site disposals.
3. During the Dredging Year of 1989, we inspected one dredging activity. This was for a Washington State Park and Recreation permit for dredging at Blake Island in Kitsap County with disposal of 800 cubic yards on uplands and 7,000 cubic yards at the Commencement Bay open-water disposal site. The Corps, DNR, and DOE did compliance inspections on this project. DNR used a mobile radar unit some of the time to spot check for compliance. The Corps verified position of disposal four times representing approximately 20% of the dumps from a vessel using two methods: taking bearings to known points along the shoreline and radar on the City of Tacoma's fire boat (the Defiance). As a result of this time consuming work, DNR and the Corps began investigating other methods of position monitoring.
4. Future permit conditions and pre-disposal conferences involving DNR, DOE, the Corps, permittee, agents, and contractors including tug captains will improve performance and clarify exactly what is required under this new compliance program. Dry runs for disposal and equipment calibration checks will be required. At this time, Bob Parry, Chief of the Waterways Maintenance Section, Navigation and Plant Branch will summarize our efforts to improve recording of positioning by electronic means at non-VTS sites starting in 1990.



Stephen A. Wright  
Chief, Enforcement Section

## SITE USE

COMMENCEMENT BAY, MARCH 1989: 6,090 YD<sup>3</sup>

ELLIOTT BAY, WINTER 1990: 130,000 YD<sup>3</sup>

PORT GARDNER, WINTER 1990: 850,000 YD<sup>3</sup>

# STATUS OF PSDDA SITES

## PHASE I SITES:

COMMENCEMENT BAY - OPEN

ELLIOTT BAY - OPEN

PORT GARDNER - OPEN

## PHASE II SITES:

BELLINGHAM BAY - OPEN

ROSARIO STRAIT - OPENING IN SPRING 1990

PORT TOWNSEND - OPENING IN SPRING 1990

PORT ANGELES - PERMIT APPROVED BY CITY OF PORT  
ANGELES, UNDER REVIEW BY  
ECOLOGY

ANDERSON ISLAND - AWAITING CLARIFICATION OF  
ENVIRONMENTAL DESIGNATION  
FOR SHORELINE PERMIT

DREDGING INSPECTION REPORT

DATE: 2/14/90, 3/27/90  
INSPECTOR: R. Vining  
CORPS PN #: B-2-12184  
PSDDA TRACKING #: \_\_\_\_\_  
TIME: 2:15 pm, 3:45 pm

1. Project Applicant: Duwamish Yacht Club  
Address: 1801 S. 93rd St.  
Seattle 98108

Contact Person: Roger Lowe, Consultant  
Phone: 451-2877

Contractor(s) Project Engineer: Bob Miller of Meridian Constr., Bainbridge I  
842-5955

2. Project Description: Maintenance dredge marina basin.

Water Body: Duwamish R. River Mile \_\_\_\_\_  
Location: \_\_\_\_\_ Sec. \_\_\_\_\_ TWP. \_\_\_\_\_ Range \_\_\_\_\_  
Latitude 51° 10' N Long. 122° 15' 24" W

Dewatering Site (if applicable) bare ground at north end of marina  
Final Disposal Site(s) Elliott Bay - PSDDA sediments  
V&J Landfill - Upland designated sediments

Volume of Dredge Material PSDDA ≈ 14,000 cys ; Non PSDDA ≈ 3000 cys

Attach a plan and profile of the project showing dredge cut(s) and/or management units.

3. Character of Project Sediments:

a. Was the entire dredge prism approved for PSDDA disposal?  
Yes \_\_\_\_\_ No  N/A \_\_\_\_\_

If no, the attached plan/profile should indicate the boundary(s) between PSDDA and non-PSDDA sediments as delineated by dredge management units.

b. How is dredge positioning determined to take only the sediments indicated in the plan/profile or to selectively dredge PSDDA vs. non-PSDDA sediments? Dredged mgmt units differentiated by line of sight from north edge of boat haul-out facility to farthest (waterward) piling on fender pile system located at south end of marina. Upland disposal sediments occur in corner of marina shoreward of line of sight.

Upland Landmarks Edge of boat haulout facility  
Land Survey Methods \_\_\_\_\_  
Other Fender piling

- c. Is (post dredging or in progress) a bottom profile required to determine the accuracy of removal of PSDDA vs. Non-PSDDA sediments? No

If yes, describe procedure and attach results. No vertical layering involved in project

4. How did the dredge operator determine the depth of dredge cut?  
Tidal Gauge  Land Survey \_\_\_\_\_ Other \_\_\_\_\_

If a tidal gauge was used, did tidal elevations correspond correctly with gauge marks? Yes

5. Was the hoist line to the clamshell bucket properly marked to measure water depth? Yes, as could best be determined.

6. Was any large debris (old piling, dead-heads, waste metal containers, etc.) present in the dredged material? Yes \_\_\_\_\_ No   
Photos attached? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, generally describe the type and amount of debris encountered and its removal and final disposition. \_\_\_\_\_

7. Monitoring at Dredge Site (attach data to report)

Dilution zone description No WQ monitoring required  
Dilution Zone - 150 feet radially  
- 300 feet downcurrent

Minimum WQ requirements (Water Quality Standards)

D.O. 6.0 mg/l as modified  
Turbidity \_\_\_\_\_ as modified  
Temp. \_\_\_\_\_ as modified  
pH \_\_\_\_\_ as modified

Other water quality monitoring requirements? None

Sampling frequency (describe any sampling being done while on site visit): None

8. Material Transport:

a. What type of barge/scow was used for hauling the dredged material?

PSDDA - 300± bottom dump barge; Upland - 300± flat-topped scow  
(Some form of bottom dump barge is required for disposal at a PSDDA site.)

b. Was the barge/scow effective in retaining the dredge material and any captured water? Were any special conditions or equipment required per the WQC to better contain the dredged material or control the discharge of excess water? \_\_\_\_\_

No problems observed.

9. Dredge Operator:

Was the dredge operator able to remove material and place it in the barge/scow or upland site with a minimum loss of material and impact to water quality? YES, except for final sweeps.

If no, explain circumstances. Final sweeps typically bring up more water than sediment. For upland disposal operation, the clamshell was allowed to drain for a few seconds prior to placement in the scow to minimize the quantity of entrained water.

10. Upland Disposal Site:

Was a suitable location chosen for a temporary dewatering site? How was material contained at the site? Were any effluent controls required? The "designated" temporary dewatering site functioned w/ no observable problems. No special containment was necessary as the dredged material contained little or no free water and it

Is monitoring required? Yes X No \_\_\_\_\_. If yes, attach results and note any field observations. Follow-up inspection required to confirm that dredged mat'l removed from parking lot.

Where is the final disposal site? V & J Landfill

What approvals, if any, are required for disposal at the final site? Disposal site has permits required of an inert waste landfill.

remained fairly cohesive. "Last-minute" decision to place some dredged material in parking lot was not a good selection (See Comment # 13).

11. Nearshore Disposal

Monitoring: N/A

Minimum WQ requirements (Water Quality Standards)

D.O. \_\_\_\_\_ as modified  
Turbidity \_\_\_\_\_ as modified  
Temp. \_\_\_\_\_ as modified  
pH \_\_\_\_\_ as modified

Other water quality monitoring requirements? \_\_\_\_\_

12. HPA and Shoreline Permit Requirements: Enter or reference the requirement(s) field observations, corrective action taken or required, and note whether any other agency contacted. None Noted

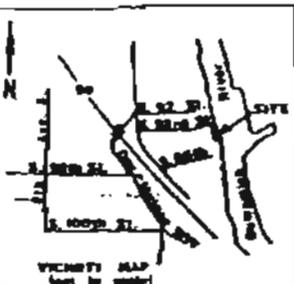
13. Other Comments:

Approximately 8 dump truck loads of dredged material (dm) were deposited in the yacht club parking lot because the contract hauler refused to haul anymore material to his landfill until he and the yacht club settled a contract dispute. The reason stated for placing dm in the parking lot was that it had to be unloaded from the scow, otherwise the scow would be left stranded at the off-loading site and it was needed to continue dredging.

14. Did any other person (regulatory) accompany the inspector during the inspection (i.e., local shoreline jurisdiction or DOF person)?

No

13. Cont. — Upon arriving at this situation, I stopped any further parking lot disposal as it could have led to significant water quality impacts, i.e., dm washed into the storm drain system by rain water. The contract dispute was subsequently settled and normal operations continued. The dm in the parking lot was to be picked up after a few days of drying and then hauled away.

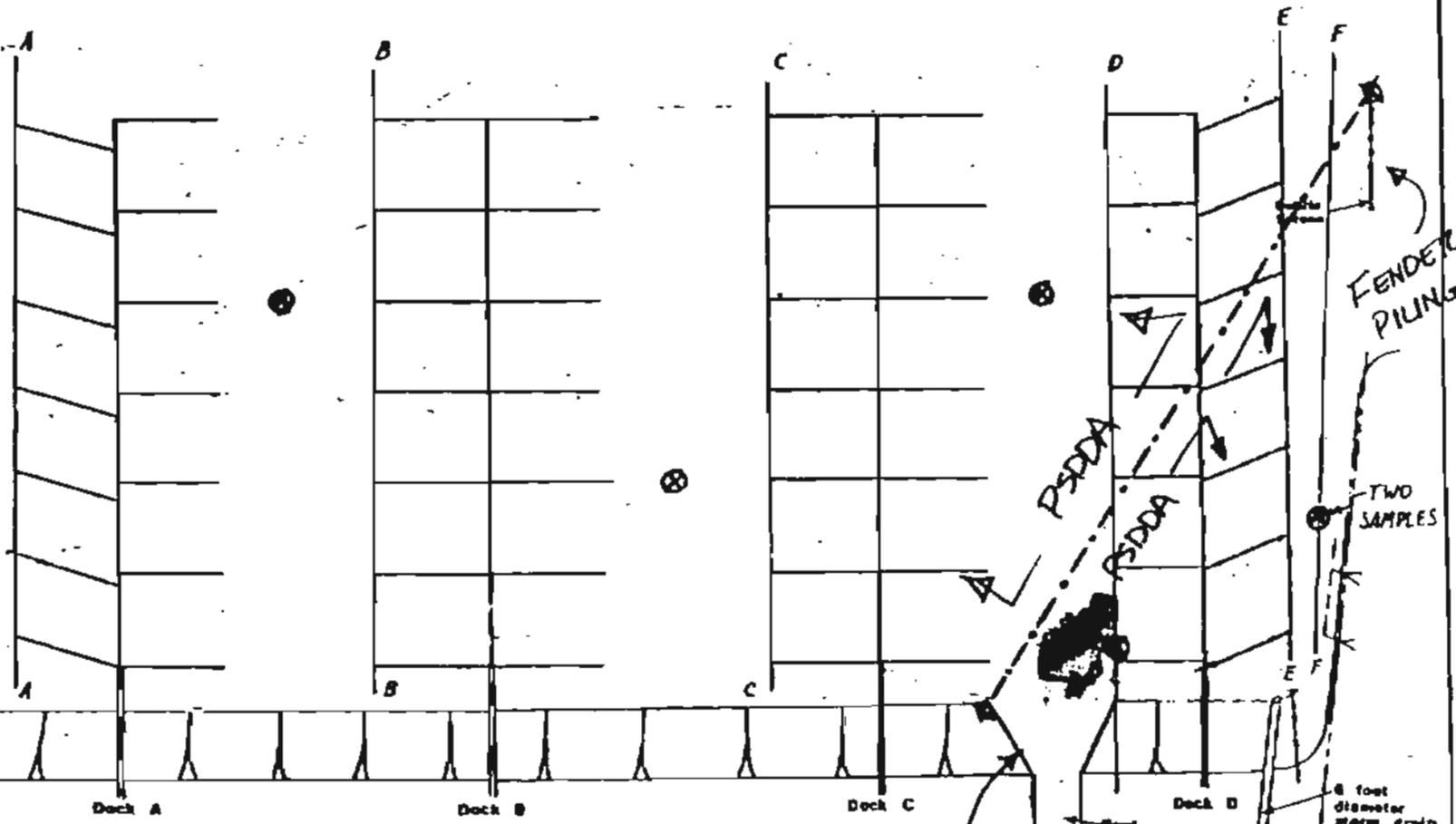


D/S

DUWAMISH CHANNEL

LEGEND  
 ⊗ PROSED SAMPLE LOCATIONS  
 --- Approximate property line

Approximate NORTH  
 SCALE: 1" = 50'



REFERENCES: Site plan and section A-A, B-B "Proposed Deepening, Rip-Rap Fencing Storage Berths, Piling, Debris Screen" Application by Duwamish Marine, revised 4/8/77.

Aerial photographs (F-2001); Duwamish Waterway Condition, August 1981, U.S. Army Corps of Engineers

DATUM: Mean lower low water = 0 Elevation = 20'

ATLAS GEOTECHNICAL ENGINEERING INC.

date: November 9, 1988

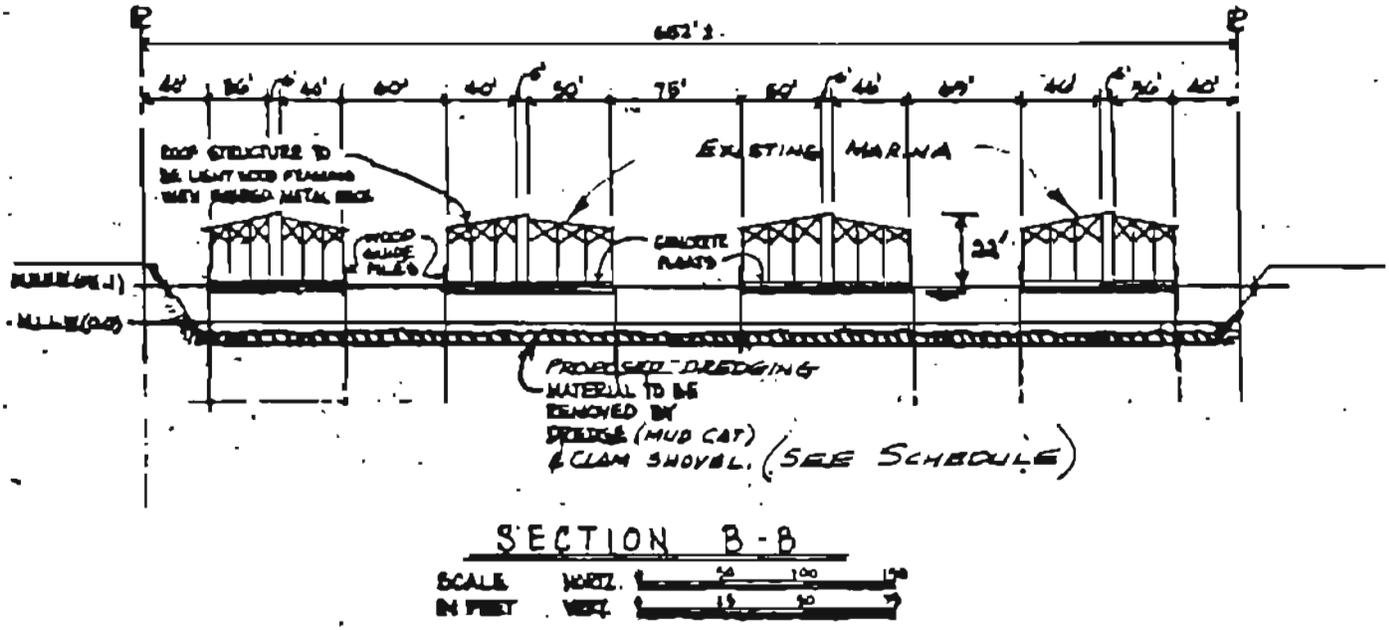
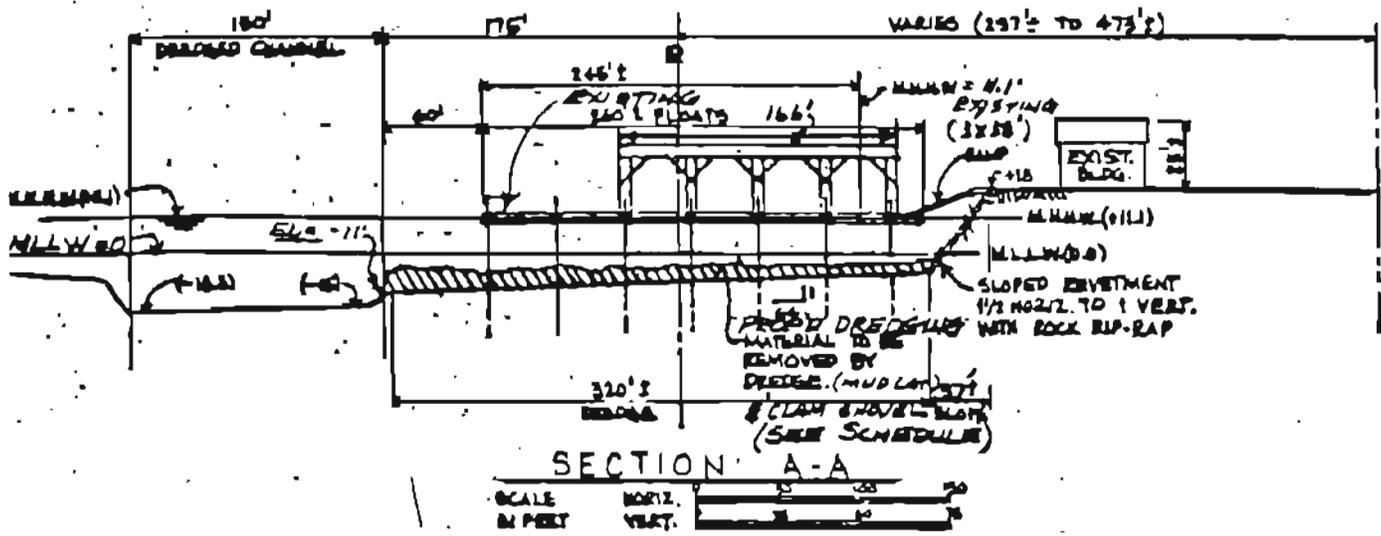
by: R. Lowe

BERGEE DISPOSAL SAMPLING AND TESTING PROPOSAL

PLOT PLAN

Boat Haulout

PLATE 2



PURPOSE: Maintain Water Depth for Boat Marina  
Datum MLLW = 0' (N,O,5)  
Adjacent Property Owners:

Proposed: Maint. Dredging/  
In Duwamish River  
Near Seattle  
County of: King State:  
Application by: Duwamish Y  
Club, 1801 South 93rd  
Seattle, Wa.  
Sheet 2 of 6 Date: June



## PSDDA ENVIRONMENTAL MONITORING

**OBJECTIVE: To ENSURE COMPLIANCE WITH SECTION  
404(B)(1) GUIDELINES AND TO FIELD VERIFY THE PSDDA  
PREDICTIONS OF SITE CONDITIONS FOLLOWING DISPOSAL.**

# PSDDA ENVIRONMENTAL MONITORING

**DOES THE DEPOSITED MATERIAL REMAIN ON SITE?**

**IS THE BIOLOGICAL EFFECTS CONDITION FOR SITE MANAGEMENT (SITE CONDITION II) EXCEEDED AT THE SITE DUE TO DISPOSAL OF DREDGED MATERIAL?**

**IS THE DISPOSAL OF DREDGED MATERIAL RESULTING IN UNACCEPTABLE ADVERSE EFFECTS TO BIOLOGICAL RESOURCES LOCATED OFFSITE?**

**1990 PSDDA**  
**ENVIRONMENTAL MONITORING PROGRAM**

**FULL MONITORING AT THE PORT GARDNER SITE**

**PARTIAL MONITORING AT THE ELLIOTT BAY SITE**

**BASELINE CRAB BIOACCUMULATION STUDY AT THE  
BELLINGHAM BAY SITE**

# FULL MONITORING

**VARIABLES: SEDIMENT VERTICAL PROFILE SYSTEM**

**SEDIMENT CHEMISTRY**

**SEDIMENT TOXICITY BIOASSAYS**

**BIOACCUMULATION**

**BENTHIC INFAUNA**

**STATION TYPES: ONSITE**

**PERIMETER**

**GRADIENT**

**BENCHMARK**

# PARTIAL MONITORING

**VARIABLES: SEDIMENT VERTICAL PROFILE SYSTEM**

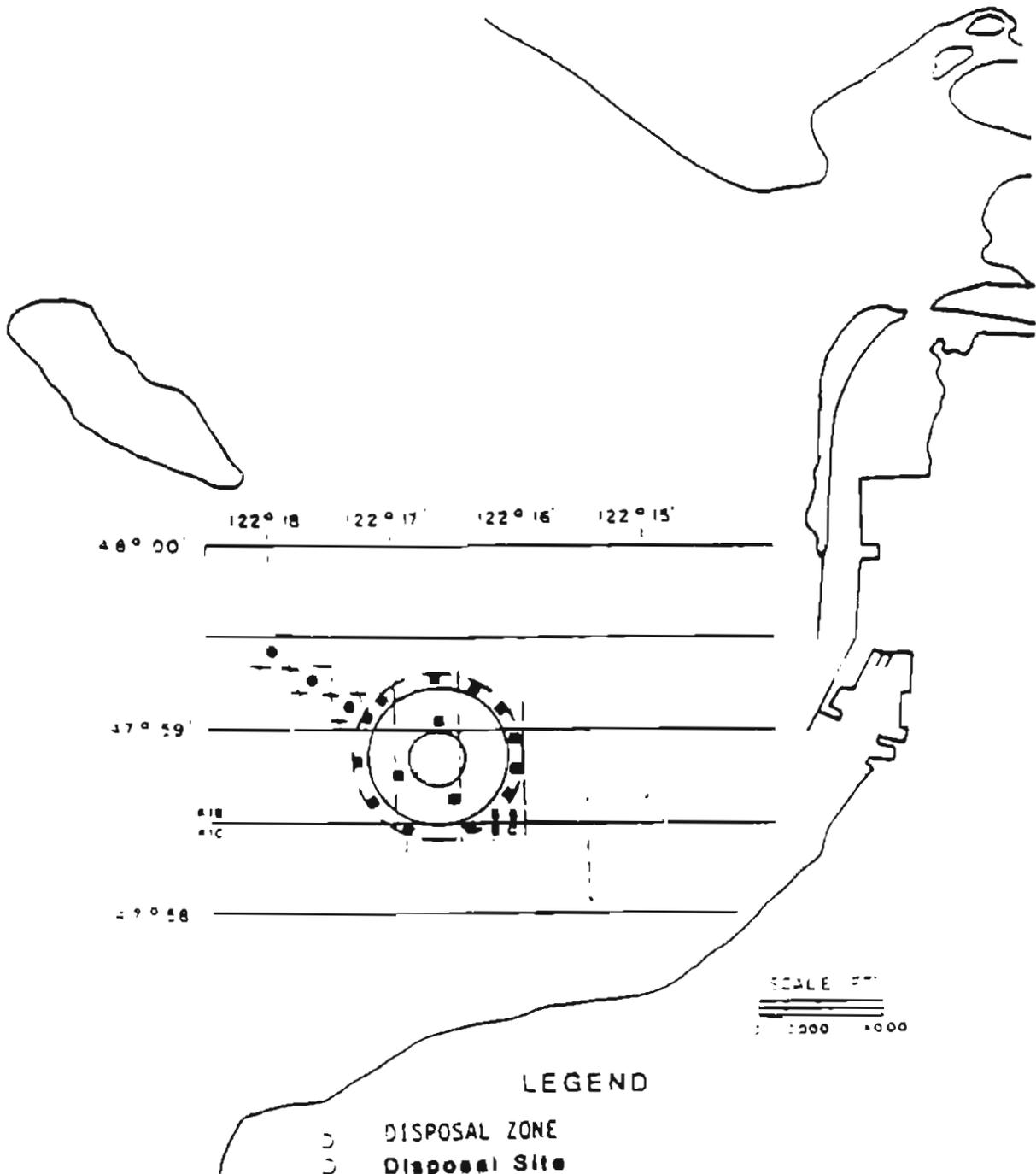
**SEDIMENT CHEMISTRY**

**SEDIMENT TOXICITY BIOASSAYS**

**STATION TYPES: ONSITE**

**PERIMETER**

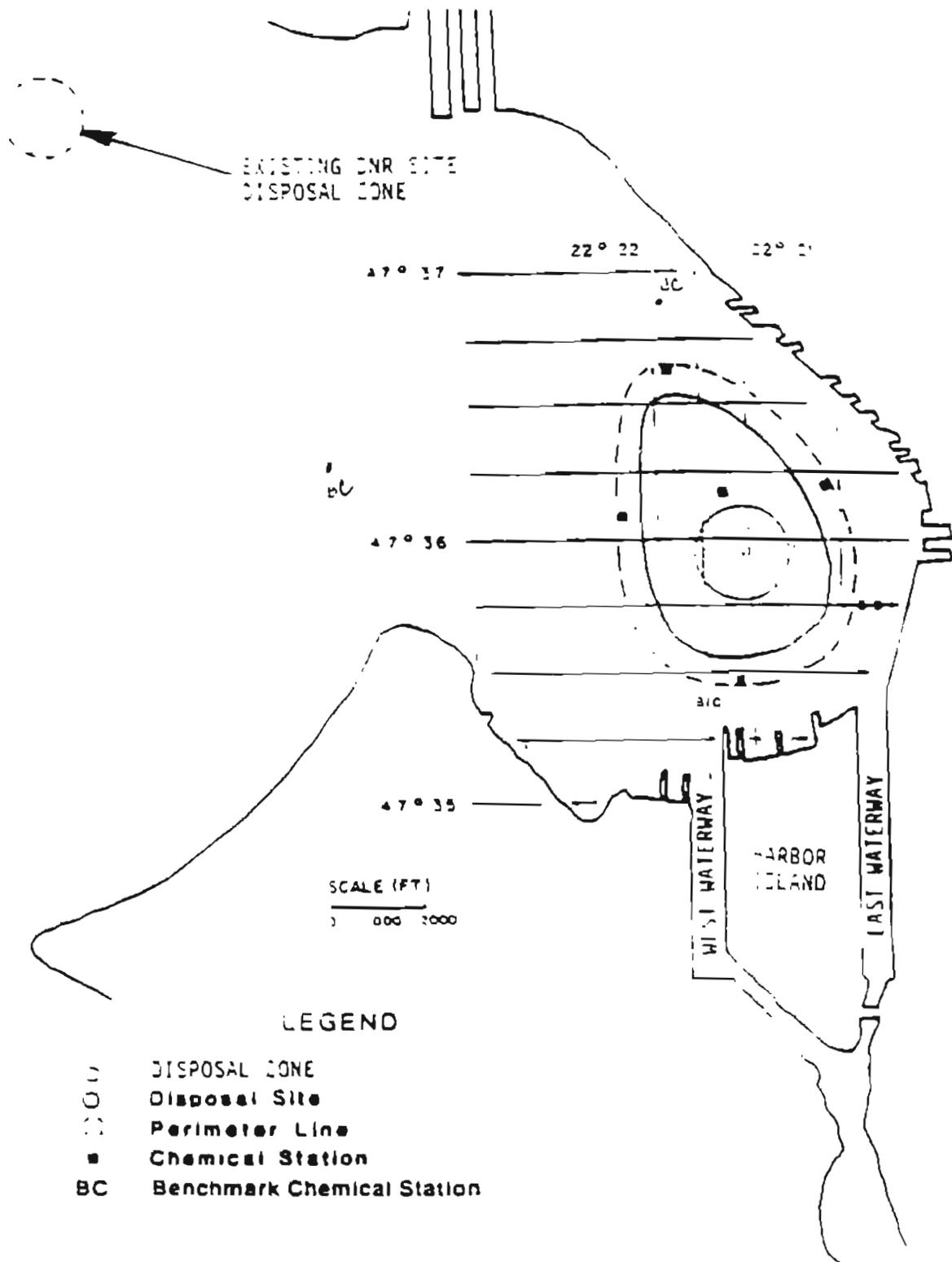
**BENCHMARK**



**LEGEND**

- DISPOSAL ZONE
  - Disposal Site
  - ⋯ Perimeter Line
  - Chemical Station
  - Benthic Biological Station (POTENTIAL DIRECTION)
  - BC Benchmark Chemical Station
  - BB Benchmark Benthic Biological Station
  - x SVP S Station Associated with biological Station
- (Sonar mapping and SVP S stations for mapping the disposal site mound and flanks are also conducted, but are not shown)

Figure: 1, PORT GARDNER FULL MONITORING



(Sonar mapping and S V P S stations for mapping the disposal site mound and flanks are also conducted, but are not shown)

Figure:  ELLIOTT BAY PARTIAL MONITORING

## ADDITIONAL TASKS

### **TASK 1. EVALUATE CHEMICAL TRIGGER LEVEL**

- ANALYTICAL VARIABILITY
- FIELD VARIABILITY, USING EXISTING AND NEW DATA

### **TASK 2. EVALUATE STATISTICAL DESIGN FOR BENTHIC INFAUNA**

- HYPOTHESIS TESTING
- INDICATORS

# PHASE I BASELINE STUDY

**SITES: PORT GARDNER, ELLIOTT BAY, COMMENCEMENT BAY**

**VARIABLES: SEDIMENT VERTICAL PROFILE SYSTEM**

**SEDIMENT CHEMISTRY**

**SEDIMENT TOXICITY BIOASSAYS**

**BIOACCUMULATION (2 OF 3 SITES)**

**BENTHIC INFAUNA**

**STATION TYPES: ONSITE**

**PERIMETER**

**GRADIENT**

**BENCHMARK**

**RESULTS: DOCUMENTED PRE-DISPOSAL CONDITIONS**

**ML FOR MERCURY EXCEEDED AT 1 STATION IN  
ELLIOTT BAY**

**SITE CONDITION II EXCEEDED AT 2 STATIONS IN  
COMMENCEMENT BAY AND 1 STATION IN PORT  
GARDNER**

# BASELINE CRAB BIOACCUMULATION IN BELLINGHAM BAY

## OBJECTIVES:

- 1) TO GENERATE BASELINE DATA ON THE CONCENTRATIONS OF SELECT CHEMICALS IN MUSCLE AND HEPATOPANCREAS TISSUES OF DUNGENESS CRAB.
- 2) TO DEVELOP GUIDELINES FOR THE USE OF CRAB BIOACCUMULATION DATA FOR PSDDA SITE MANAGEMENT.

VARIABLE: TISSUE CHEMISTRY

STATIONS: TWO TRAWL STATIONS ACROSS THE PSDDA SITE

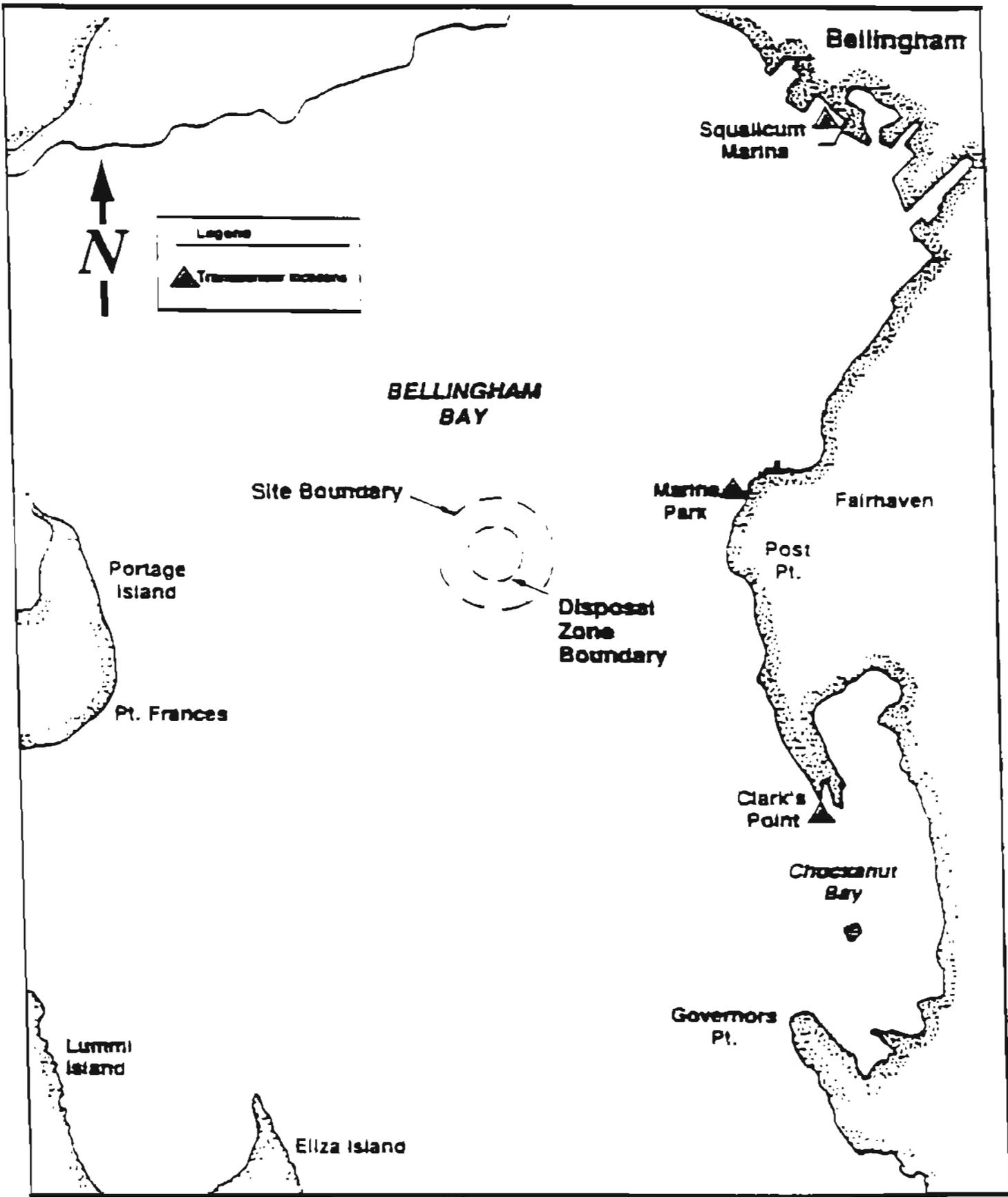


Figure 5. Transponder locations in Bellingham Bay

## SCHEDULE

**SVPS SAMPLING: 27-30 APRIL**

**SEDIMENT AND CRAB SAMPLING: 14-30 MAY**

**DRAFT REPORT ON STATISTICAL DESIGN: 1 JULY**

**DRAFT REPORT ON MONITORING PROGRAM: 15 AUGUST**

**FINAL REPORT ON MONITORING PROGRAM: 30 SEPTEMBER**

## PSDDA SECOND ANNUAL REVIEW MEETING

**Topic:** PSDDA Agency Regulator flexibility when applying subsurface sampling and analysis guidelines; Clarification 6.

**Presenter:** David Kendall, Corps, 206-764-3768

**Background:** Existing PSDDA guidelines specify minimum sampling and analysis requirements for both surface (0-4 feet) and subsurface (below 4 feet) sediments. These guidelines are considered appropriate to follow for most projects. However, in cleaner project areas, the guidelines may require more sampling/analysis than needed to characterize the subsurface material to be dredged. In the future, PSDDA agency regulators may reduce, but not eliminate (e.g., by additional sample compositing prior to analysis), subsurface sampling requirements where previous data (on sources and/or surface or subsurface sediments) indicate no "reason to believe" that subsurface sediments have been contaminated (by direct actions or indirectly via ground water sources). This clarification reaffirms the existing PSDDA provisions for regulator discretion and flexibility when applying the PSDDA guidelines. As currently required by PSDDA, when the agency regulators exercise professional judgement different from the guidelines, the reasons for their judgment will be documented in the project files.

**Pertinent Documents:** PHASE II MPR, page A-14 to A-18; EPTA, page II-

**Proposed Resolution:** PSDDA agency discretion and flexibility is reaffirmed when applying the subsurface sampling and analysis guidelines in areas where no subsurface contamination exists or is suspected.



## PSDDA ANNUAL REVIEW MEETING

### Status Report

Presenters: Justine Smith, Corps, (206)764-3654

Brett Betts, Ecology, (206)459-6824

Issue: Activities to Provide Better Reference Areas

#### 1. Problem Statement:

a. Reference sediments are used to account for physical effects of sediments (as opposed to chemical) and are required to perform sediment bioassays in the PSDDA program. In particular, the interpretation of the amphipod test is thought to be affected by grain size. Sediments are a complex mixture and many factors may affect toxicity responses of bioassay organisms to reference and project sediments. PSDDA specifies that reference sediment grain size match test sediment grain size, and also specifies performance standards (maximum allowable mortalities) in reference sediments. The Department of Ecology is devising criteria for the selection of reference areas.

The following topics still require effort by the PSDDA agencies:

(a) improve reference area performance in tests, both by eliminating unexpected failures in reference, and by making it easier/less expensive for applicants to find areas with a suitable grain size distribution (within 5-10% of test sediment),

(b) study reference areas to improve knowledge of physical, biological, and chemical characteristics.

Ideally, at some point in the future, the expected response for each PSDDA-required bioassay organism will be known for various grain sizes. At that time reference sediments may no longer be required.

b. During the past year, PSDDA agencies have attempted to improve reference area performance by gathering/providing better, more complete information on reference areas and by compiling information when reference area testing is performed. Department of Ecology funded a report entitled, "Interim Performance Standards for Puget Sound Reference Areas," June 1989. Interim performance standards for chemical variables were generally defined as the 90th percentile values for frequency distributions of chemical concentrations in potential reference areas (upper limits for the concentrations of chemicals in acceptable reference samples). The amphipod bioassay was quantitatively used, while other available information was qualitatively used to identify interim reference areas. Interim reference areas identified in the report were Carr Inlet, Dabob Bay, Samish Bay, and Sequim Bay. These are the same reference areas specified in the Phase I Evaluation Procedures Technical Appendix (EPTA).

Department of Ecology's Puget Sound Ambient Monitoring Program (PSAMP) produced a report entitled, "Marine Sediment Monitoring," January 1990. This program is performing Sound-wide background analyses of areas away from contaminant sources (status and trends work). A number of samples were taken in areas under consideration for reference areas. This information is included in their

report, and has also been transferred to the Puget Sound Water Quality Authority's Geographic Information System (GIS).

2. Pertinent References: PSDDA Management Plan Report, September 1989, section 5.6, pp. 5-32 to 5-34. PSDDA Evaluation Procedures Technical Appendix Phase I, June 1988, pp. II-68. DeWitt, T.H., G.R. Ditsworth, and R.C. Swartz. 1988. Effects of Natural Sediment Features on Survival of the Phoxocephalid Amphipod, Rhepoxynius abronius. Mar. Environ. Res. 25:99-124. Pastorok, R.A., R. Sonnerup, J.J. Greene, M.A. Jacobson, L. B. Read, and R. C. Barrick. 1989 (June). Interim Performance Standards for Puget Sound Reference Areas. Report submitted by PTI Environmental Services Inc., to Ecology.

### 3. Proposed Resolution.

a. New Reference Areas. Project proponents have suggested a number of other potential reference sediment collection sites. These sites may be utilized if:

- biological tests are initially run using the proposed reference area along with an already recognized reference area,
- and/or chemistry (PSDDA contaminants of concern) analysis is performed for the proposed area.

PSDDA agencies are discussing needed information for new reference sites. Once a project proponent has gathered this initial information, or PSDDA agencies are satisfied that enough confirmatory information exists for a new reference area, the project proponent may reuse the area without additional testing. PSDDA agencies will consider information developed through PSAMP and other programs as well. A tool such as the PSWQA GIS maps or the PSDDA database can be used to convey the information to applicants.

b. Mixing Sediments. In order to obtain a reference sediment grain size match within 5-10% of the test sediment fine grained fraction, mixing sediments from known reference areas has been suggested. Over the next year, the PSDDA agencies will continue to look into this issue. Current literature seems to indicate that increased handling (mixing or remixing) of material results in increased toxicity. In conjunction with upcoming Federal projects, some studies will compare artificially blended (mixed) sediments with natural sediments.

c. Additional Work by Ecology. Additional work on reference areas funded by Ecology and EPA (PSEP). This study will look at Carr Inlet, Samish Bay, and Useless Bay. The study will cover 7 grain sizes and 1 water depth. No organics or benthic sampling/analyses will be performed. Tests run will include amphipod, oyster larvae/echinoderm, neanthes, saline microtox, grain size, and TOC.

CENPS-EN-PL-ER (400A)

May 29, 1990

Memorandum for: RECORD

Subject: Wet Sieving Method for Percent Fines to Match  
Test Sediments and Reference Sediments

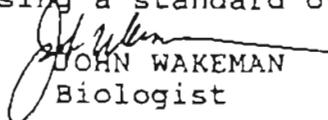
1. PSDDA requires running reference sediments which are matched against dredged material by percent fines (that is, the dry weight of sediment passing a standard 63 um sieve divided by the total dry weight of the sediment). This is difficult to do because the easily-obtained field measurements (wet weight, volume) are only surrogates for the dry-weight basis used in the laboratory. This memorandum describes an interim protocol for collecting field information that will allow a grain-size approximation.

2. The wet sieve method was developed by Dr. Tom Ginn, Dr. Scott Becker and Mr. John Green of PTI during studies conducted for EPA's PSEP. The technique (but not the figures used here) studies is described in a technical memorandum from PTI to EPA's Office of Puget Sound, titled "Reconnaissance Survey of Reference Area Sediments in Shallow Waters of Carr Inlet," dated February 1990. The following data and methods were verbally transmitted to John Wakeman of Seattle District by Scott Becker on May 29, 1990.

a. The method for the Carr Inlet cruise used a starting volume of 65 mL of sediment collected in a marked beaker. The sediment was gently washed on a 63 um sieve until the water passing the sieve was clear. The retained material was then carefully rinsed into a 100 ml graduated cylinder and allowed to settle until the supernatant water was also clear. For a sandy sediment, this will occur quickly, within one minute; for a silty sediment, it may take up to 15 minutes. (Should colloidal materials remain in suspension after 15 minutes, then the sediment was not washed sufficiently on the sieve.) However, the endpoint is usually not determined by clarity, but instead the degree of compacted flocculated sediment. One should see, at least a clear delineation between floc and supernatant water at endpoint.

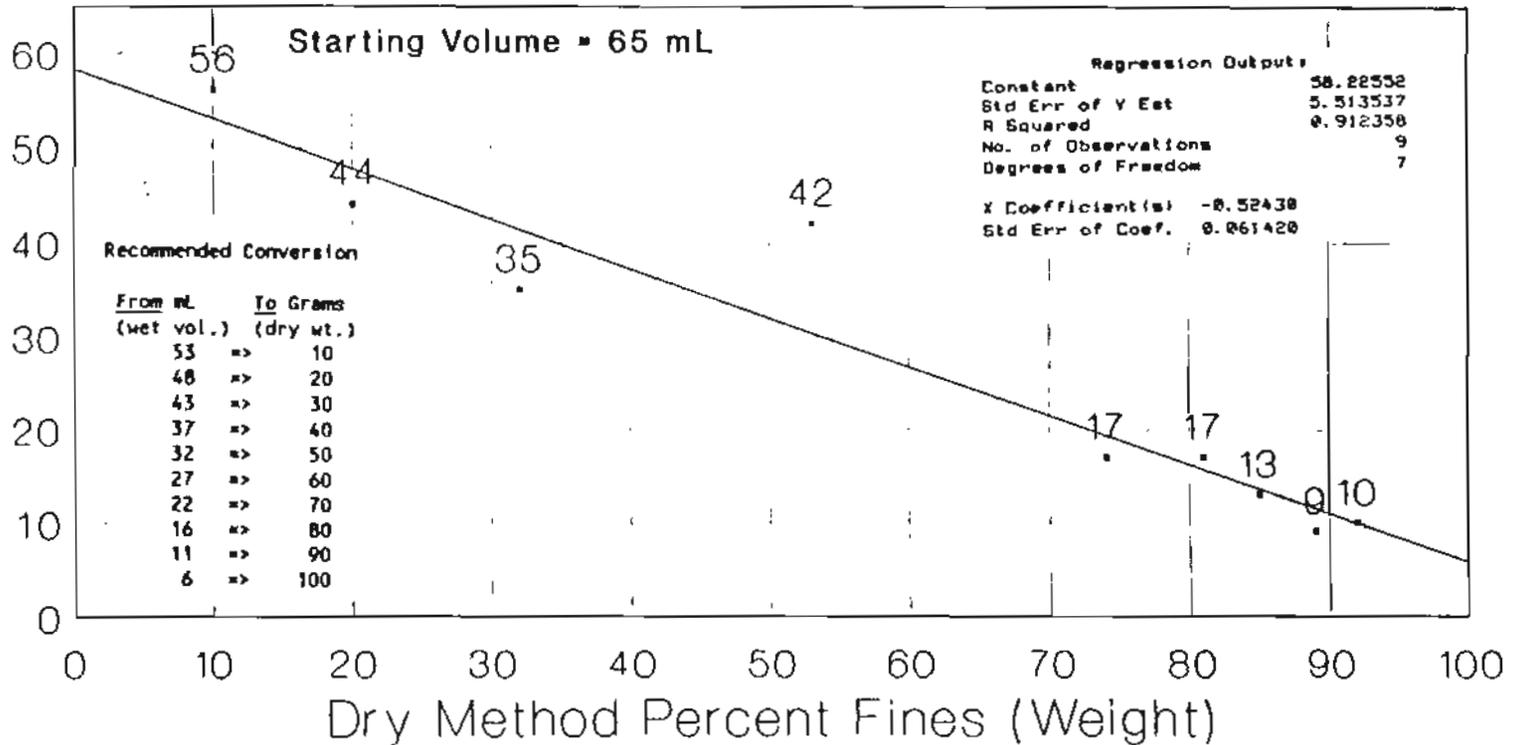
b. Interpretation. Figure 1 shows the relationship that was developed by comparing field values with lab values. This relationship probably only holds for the Raft Island area. In general, the values appear to agree with the assumption that the wet density is equal to the dry weight: one would predict that 10% fines (=90% sands) would be  $0.9 \times 65\text{mL}$  (grams), or 58.5; the realized value is 56. For 89% fines (11% sands retained)  $0.11 \times 65 = 7.2$  predicted, and 9 were recovered.

3. EPA commissioned PTI to do further studies on reference areas, and they will be developing this technique further during the studies; they are now using a standard of 50 mL of material.

  
JOHN WAKEMAN  
Biologist

# Reference Sediment Grainsize Comparison of Wet and Dry Sieve Methods

Wet Method Percent Fines (Volume)



— Carr Inlet--Raft Is.

Data from EPA; collected by PTI, Inc.

## PSDDA SECOND ANNUAL REVIEW MEETING

**Topic:** Requirement for Analyzing for Sediment Conventionals in Reference Areas and Water Quality in Bioassays.

**Presenter:** David R. Kendall, Seattle District, 206/764-3768

**Background:** PSDDA agency review of recent bioassay test data has noted some apparent toxicity occurring in Puget Sound reference area sediments and test sediments, which appears to be related to the sediment "conventional" parameters of ammonia and sulfides, and grain size. In future, measurement of sediment conventional parameters (grain size, TOC, Total Volatile Solids, Total Solids, Ammonia, Total Sulfides) will be required of all reference area sediments during biological testing. Additionally, water quality monitoring of reference and test sediments will be required at the beginning and end of the amphipod bioassay, Neanthes 10-day acute bioassay, and sediment larvae (i.e., bivalve or echinoderm) bioassays unless specifically waived by the PSDDA regulatory agencies prior to testing. These data are deemed necessary to aid in the interpretations of the bioassay test results as noted in the Phase II MPR (page 5-27 and 5-32 to 5-33).

**Pertinent Documents:** Phase II MPR (pages 5-27 and 5-32 to 5-33; page A-18)

**Proposed Resolution:**

(1) Sediment conventional parameters will be run on all reference samples.

(2) Ammonium/ammonia and total sulfides should will be measured as water quality parameters in the amphipod bioassay, Neanthes 10-day acute bioassay, and the sediment larvae (bivalve or echinoderm) bioassay, unless waived by the PSDDA regulatory agencies.



## PSDDA SECOND ANNUAL REVIEW MEETING

Topic: Screening Level adjustment for Pentachlorophenol  
– CLARIFICATION.

Presenter: David Kendall, Corps, 206-764-3768; Tom Gries, Ecology, 206-438-7706

Background: Phase II Screening Level (SL) and Maximum Level (ML) adjustments were implemented on December 12, 1989. These changes dropped the 1988 pentachlorophenol SL from 140 ppb to 69 ppb. Projects undergoing PSDDA testing to date have generally been unable to achieve LOD's below 69 ppb for PCP. Labs have generally reported a Limit of Detection (LOD) for PCP of 100 ppb using Modified EPA Contract Lab Program methods, which is well below the Low Apparent Effects Threshold (LAET) value of 360 ppb. Apparent Effects Threshold (AET) updates for 1988 were used to establish the 1989 PSDDA SL/ML value updates. These updates established a Low Apparent Effects Threshold (LAET) and High Apparent Effects Threshold (HAET) sediment quality value for Pentachlorophenol of 360 ppb (amphipod bioassay) and 690 ppb (benthic AET), respectively. Failure to achieve detection limits below the current SL triggers a requirement by the dredging proponent/lab to either retest the analyte or conduct biological tests (i.e., bioassays). After reviewing this problem, PSDDA agencies agreed to adjust the PCP SL on an interim basis to 100 ppb (PSDDA memorandum dated 5 March 1990). A technical review of this change included a comparative sensitivity and reliability analysis (i.e., ability of SL to predict biological effects) by Ecology's sediment quality data management system of both the 1989 SL versus the proposed SL prior to the Annual Review Meeting. This analysis demonstrated that there was little difference in the predicatability of the proposed 100 ppb SL versus the 1989 SL of 69 ppb, and therefore, the proposed SL should be adopted as a clarification.

Pertinent Documents: PHASE II MPR, page 5-6, fifth paragraph (2), page A-19 to A-21 (Table A.7)

Proposed Resolution: PSDDA agencies have already raised the PCP SL to 100 ppb on an interim basis. The proposed SL change should be formally adopted as an Evaluation Procedures clarification/adjustment.



## PSDDA SECOND ANNUAL REVIEW MEETING

Topic: PCB Analysis Alternatives (Status Report)

Presenter: David Fox (Corps, 206-764-3768)

Background: There are 209 possible polychlorinated biphenyl (PCB) congeners, each consisting of a unique combination of chlorine atom attachments to the basic biphenyl structure. These congeners vary widely in terms of toxicity, environmental occurrence and bioaccumulation potential. The ability to selectively focus on those congeners which have the greatest potential for environmental effects is limited by available technology and cost. Several alternatives were identified for PCB analysis and a preliminary investigation of these alternatives was conducted.

Total PCBs. Currently PSDDA requires the quantitation of total PCBs. The advantage of this approach is relatively low cost, with PCBs being analyzed simultaneously with pesticides. The major disadvantage is that no distinction is made among congeners on the basis of potential biological effects. Also, values reported for total PCBs must be considered approximations due to the complexity of PCB chromatograms.

Aroclor Analysis. Most PCBs in the environment originated in commercial compounds called Aroclors. Many labs currently perform Aroclor analysis in which chromatograms of environmental samples containing PCBs are matched against Aroclor standards. Advantages include low cost, a relationship to the source of contamination and somewhat greater selectivity than total PCB analysis. Disadvantages include the difficulty and approximation involved in comparing environmental samples to nondegraded Aroclor standards.

Isomer Group Analysis. PCBs can be quantified by isomer group, identified by level of chlorination. The main advantage with this approach is that toxicity is generally related to the level of chlorination so that this type of analysis is more selective than the preceding methods. Existing technology in the form of capillary column mass spectrometry could possibly be used. Disadvantages include the lack of absolute differences in environmental effects among the isomer groups. Analysis is still complex and somewhat approximate.

Congener-specific Analysis. This alternative would focus on those congeners which have the greatest likelihood of environmental effects. Identification and quantitation of PCB components in environmental samples would be much more precise. Major disadvantages are cost and technical practicality. Long instrument run times, extensive calibration and new laboratory techniques would be required.

Pertinent Documents: Clarke, et al, 1989, Preliminary Recommendations for a Congener-Specific PCB Analysis in Regulatory Evaluation of Dredged Material, US Army Engineer Waterways Experiment Station; McFarland, et al, 1989, Environmental Occurrence, Abundance, and Potential Toxicity of Polychlorinated Biphenyl Congeners: Considerations for a Congener-Specific Analysis, Environmental Health Perspectives, Vol. 81, pp. 225-239.; Alford-Stevens, Ann L., 1986, Analyzing PCBs, Environmental Science Technology, Vol. 20, No. 12.

Proposed Resolution: The PSDDA agencies will continue to monitor developments by the Waterways Experiment Station and other researchers. Data specific to Puget Sound will be investigated and alternative analysis strategies further formulated and analyzed.



**ISSUE PAPER: 1990 PSDDA ANNUAL REVIEW MEETING**

**PROPOSER: Washington Public Ports Association**  
[contact: Eric D. Johnson, (206) 943-0760]

**ISSUE: WPPA comments regarding "Sampling, Testing and Disposal Guidelines Application Report".**

**ISSUE #1 PATTERN ANALYSIS**

The "Dredged Material Sampling, Testing and Disposal Guidelines Application Report" should display the patterns in the year's test results.

Presenting the highest measurement seen during the entire year for each chemical gives very little useful information for program review:

- (a) Peak values give no indication of the spread of results seen during the year.
- (b) The displays give no picture of whether a high percentage of the failures are sensitive to a few SL's and ML's, or whether the failures occur in multiple chemicals and are far from the thresholds.
- (c) The displays do not allow scanning for determination whether chemical failures are usually substantiated by subsequent bioassays.

The PSDDA agencies have stated their intent to integrate into their computer systems a pattern analysis capability, as automated analysis will become all the more necessary in future years when data may be voluminous. The WPPA is interested in assisting the agencies with the implementation of this pattern analysis, if the agencies desire.

**ISSUE #2: FEEDBACK OF MEASURED SITE CONDITIONS TO DISPOSAL CRITERIA**

The PSDDA Annual Review should formally examine the site monitoring data to measure how well the site condition designation for each site is being achieved.

PSDDA agency representatives have recognized that site monitoring results can lead to a change in disposal criteria if test results show that:

- (1) The chemical characteristics of the dredged material have tended towards the upper limits of allowable disposals, and
- (2) disposal has occurred over a number of years, and

- (3) the test interpretations initially adopted have led to an underestimation of actual toxicity on site.

If all of these conditions are shown to exist, steps would be taken to adjust the definition of the disposal criteria for the sites.

#### **ISSUE #3: ANALYSIS OF DIRECT ECONOMIC IMPACTS**

Future "Dredged Material Sampling, Testing, and Disposal Guidelines Application Reports" should include data and summary calculations of the direct disposal costs incurred (or later to be incurred) for materials failing that year.

Without this information, the program operates in an economic vacuum, as the differential in unconfined and confined disposal costs can far outstrip the testing costs with which the program has always been concerned.

#### **ISSUE #4: ANALYSIS OF EXTENDED ECONOMIC IMPACTS**

The PSDDA Annual Review should include an analysis of the more extended local and regional economic impacts of the program.

Questions which should be addressed include:

- (1) How many dredging projects were claimed by their proponents to have been canceled or curtailed due to the incremental costs of the PSDDA program?
- (2) What is the assessment of these claims?
- (3) What are the possible extended regional economic effects (including effects on national competitiveness) of such cancellations or curtailments?

The Association has stated its willingness to provide such analyses in future years, as appropriate.



Mr. Raymond G. Schmitz  
April 2, 1990  
Page two

With this in mind, I have prepared an issue paper in the format requested for last year's meeting, and have included it for your review. This document could be used as a handout at the meeting. We may also have an additional overhead or two to use in the presentation.

If you or your staff have any questions or comments, please do not hesitate to contact me. I am sorry that you will be unavailable to participate in this year's annual review, but we look forward to a productive meeting with your staff as well as the other agencies and interested parties.

Your truly,

WASHINGTON PUBLIC PORTS ASSOCIATION



Eric D. Johnson  
Environmental Specialist

c: PSDDA Study Director

enclosure



## ENVIRONMENTAL MANAGEMENT

April 6, 1990

John Wakeman  
Seattle District  
US Army Corps of Engineers  
P.O. Box C-3755  
Seattle, WA 98124-2255

Dear John:

This is in response to our phone conversation of April 6, in which you indicated that I must submit topics of discussion before 9:00 A.M. Monday or forfeit opportunity to make a presentation at the PSDDA annual review meeting. I have identified below topics which Jay Spearman, Philip Spadaro and I have discussed.

The topics listed are ideas which I have put together based on my thoughts and understanding of what Jay and Phil would like to talk about. Since this letter has not been reviewed by Jay or Phil, it is likely that actual topics presented will be modified. I have not provided detail with the topics because it has not yet been prepared.

### Topics for discussion:

1. Permitting/PSDDA relationship and ways to streamline overall process.
2. Problems with sampling of deep sediments.
3. Difficulties with using reference bay sediments in bioassay procedures.
4. Confusion which exists over what constitutes acceptable lab methods.
5. Difficulty with current data reporting procedures.

We are not expecting decisions regarding our input to be made at this annual meeting. However, we do expect our comments to serve as a catalyst for changes and

modifications over the next year. We are convinced that excellent quality environmental protective decisions can be made more efficiently than is currently done.

Our comments are meant to be constructive.

Sincerely,

A handwritten signature in cursive script that reads "Carl".

Carl Kassebaum  
President

cc: Jay Spearman  
Philip Spadaro

### Topics For Discussion

1. Permitting/PSDDA relationship and ways to streamline overall process.
2. Problems with sampling of deep sediments.
3. Difficulties with using reference bay sediments in bioassay procedures.
4. Confusion which exists over what constitutes acceptable lab methods.
5. Difficulty with current data reporting procedures.





## LUMMI INDIAN BUSINESS COUNCIL

2616 KWINA RD. • BELLINGHAM, WASHINGTON 98226-9298 • (206) 734-8180

DEPARTMENT \_\_\_\_\_

EXT \_\_\_\_\_

March 30, 1990

APR 2 1990

Mr. Raymond G. Schmitz, P.E.  
 Chief, Operations Divisions  
 Seattle District, Corps of Engineers  
 P.O. Box C-3755  
 Seattle, WA 98124-2255

RE: PSDDA ANNUAL REVIEW ISSUE STATEMENT BY THE LUMMI TRIBE

Dear Mr. Schmitz:

In July, 1989, the Tribes entered into a State/Tribal MOU which on August 4, 1989, resulted in the Centennial Accord. Copies of these documents are appended for your information. The Accord recognizes that Tribes and the State may place differing priorities and significance levels with regard to specific biological resources. In context of the Accord, it is clear that the State (WDF, WDW, WDNR, WDOE) does not speak for the Tribes either in terms of the "relative importance" of these resources, or the interpretation of "significant risks."

With respect to the Phase II PSDDA selection process applied to Bellingham Bay as a disposal site, we understand that a Record of Decision has been signed that would designate the preferred site described in the Environmental Impact Statement as a future non-dispersive dredge disposal area.

It is the position of the Lummi Tribe that especially in light on the Centennial Accord the Phase II selection process was flawed. As you know the identified "Lead" agencies did not include the Lummi Tribe. Although our technical staff was invited to participate in working groups initiated by your staff, the exclusion of the Tribe as a policy-level decision maker resulted in a failure to resolve specific natural resource concerns the Tribe has at the chosen site: (1) Potential damage to the Dungeness Crab Resource; and (2) Use of salmon gill nets.

First, in regard to the crab resource, WDF comments to the Environmental Impact Statement suggest that the site chosen was based on comparatively lower crab densities as derived from University of Washington trawl data which were admittedly based on a "limited number of observations." (letter of comment dated 5/19/89) Although someone has determined that these densities are below "harvestable levels," we know of several crab fishermen who have fished these site with good success.

WILLIAM E JONES  
 Vice Chairman

GERALD I JAMES  
 Chairman

VIRGIL L WILLIAMS  
 Secretary

ERNEST J JEFFERSON  
 Chairman

SAMUEL M CASEY  
 Chairman

RICHARD P JEFFERSON  
 Treasurer

MERLE B JEFFERSON  
 Chairman

HENRY M. CAGNEY  
 Chairman

VERN JOHNSON JR.  
 Chairman

JAMES R. HILLAIRE  
 Chairman

LARRY G. KINLEY  
 Chairman

As a second point in regard to the crab resource, the Impact Statement Summary states that the following resource damage is likely to occur from sediment disposal:

"The bottom-feeding fish and mobile shellfish (crabs and shrimp) utilizing nondispersive, unconfined, open-water disposal sites are expected to be physically damaged by falling material, or temporarily displaced from where the disposal has most recently occurred."

"...less mobile individuals within the sites (or perhaps partially dug into the surface of the site) could be buried and lost."

"chemical impacts on biological resources at the non-dispersive disposal sites should be limited to chronic/sublethal effects. Acute toxicity is expected to <affect> only a few onsite very sensitive species."

The PSDDA disposal guidelines would allow chronic sublethal effects to occur at the Anderson-Ketron Island and the Bellingham Bay disposal sites due to the presence of chemicals in dredged material."

As the appropriate local "Lead" agency, the Lummi Tribe is very concerned about the foregoing admitted risks to the Dungeness Crab. The Dungeness Crab is a major Bellingham Bay resource with extremely high value to the Tribe. Because it is local, it may have been judged by the Washington State Department of Fisheries to be less significant to the state-wide Dungeness Crab resource. That is not at issue. It is the conclusion of our own Fisheries Department that use of the Bellingham Bay site constitutes an unacceptable and significant risk to crab occupying the site both in terms of direct physical damage and impaired reproductive success.

The Lummi Tribe also has a serious concern about the impacts from underwater obstructions on the salmon gillnet fishery. Like the crab fishery, the salmon gillnet fishery in Bellingham Bay is very important to Lummi's economy and culture. Our fishermen have reported snagging gillnet gear on debris located at previous Bellingham Bay disposal sites. Tribal concern is that fishermen may avoid the proposed site due to actual or perceived threats from gear fouling. This will result in negative impact to the extensive coho, chinook, pink, and chum salmon gillnet fisheries. The lack of proper site management, compliance monitoring, and debris cleanup at several "abandoned" disposal sites have caused fishermen avoidance in previous instances.

Based on the position of Tribes as recognized in the Centennial Accord and the very real admitted impacts to resources of particular concern to the tribe and others dependent on the local fisheries, the Lummi Tribe requests a site location change and a supplemental Environmental Impact Statement. We are convinced that due to the large geographical scope of the Phase II process,

an error was made in selecting a site in Bellingham Bay. We encourage a process that allows a combined WDF/Tribal position relating to the determination of resource significance.

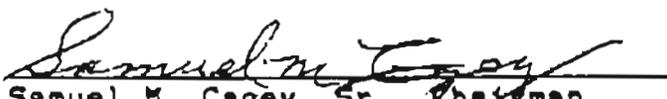
As stated in the FEIS, the site selection process is the only primary type of mitigation offered:

"The primary mitigation feature of PSDDA is embodied in the siting process."

What this means is that if no alternate site is found, the Tribal fishermen will have little mitigation available to them. This will undoubtedly result in litigation unless some other form of compensation can be found.

We appreciate this opportunity to participate in the Annual Review Process, and look forward to working with you in the selection of an alternative disposal site.

Sincerely,

  
Samuel M. Cagey, Sr., Chairman  
Lummi Indian Business Council

cc: Christine Gregoire, WDOE  
Brian Boyle, DNR  
Dan Raas, Reservation Attorney  
Thomas P. Dunne, EPA

PSDDA.MM:JRV/NTN/BHC/ymc

# The State of Washington



## Proclamation

### STATE/TRIBAL GOVERNMENTAL RELATIONS POLICY

WHEREAS, it is the intent of the Governor of the State of Washington to confirm its government-to-government relationship with Washington tribes; and

WHEREAS, the State of Washington recognizes that there are 26 separate and distinct federally recognized Indian tribal governments located within the boundaries of the state; and

WHEREAS, the State of Washington and the tribal governments recognize the state contains 39 counties and numerous other local governments with independent and often overlapping interests and legal authority; and

WHEREAS, the State and tribal governments acknowledge that tribes and the state have historical relationships and unique rights shaped by federal and state constitutions, statutes, and treaties with the United States government and executive orders of the President;

NOW, THEREFORE, I, Booth Gardner, Governor of the State of Washington do hereby proclaim that the State of Washington accepts the fundamental principle and integrity of the government-to-government relationship between the State and the Indian Tribes, and that this principle shall be the basis of the State's Indian Tribal Governmental Policy.



Signed, this 3rd day of January, 1989

A handwritten signature in black ink, appearing to read "Booth Gardner".

Governor Booth Gardner

# CENTENNIAL ACCORD

## between the FEDERALLY RECOGNIZED INDIAN TRIBES in WASHINGTON STATE and the STATE OF WASHINGTON

### I. PREAMBLE AND GUIDING PRINCIPLES

*This ACCORD dated August 6, 1989, is entered between the federally recognized Indian tribes of Washington signatory to this ACCORD and the State of Washington, through its governor, in order to better achieve mutual goals through an improved relationship between their sovereign governments. This ACCORD provides a framework for that government-to-government relationship and implementation provisions to assure execution of that relationship.*

*Each Party to this ACCORD respects the sovereignty of the other. The respective sovereignty of the state and each federally recognized tribe provide permanent authority for that party to exist and to govern. The parties share in their relationship particular respect for the values and values represented by tribal governments. Further, the parties share a desire for a complete accord between the State of Washington and the federally recognized tribes in Washington reflecting a full government-to-government relationship and will work with all elements of state and tribal governments to achieve such an accord.*

### II. PARTIES

*There are twenty-six federally recognized Indian tribes in the state of Washington. Each sovereign tribe has an independent relationship with each other and the state. This ACCORD, provides the framework for that relationship between the state of Washington, through its governor, and the signatory tribes.*

*The parties recognize that the state of Washington is governed in part by independent state officials. Therefore, although this ACCORD has been initiated by the signatory tribes and the governor, it welcomes the participation of, inclusion to and execution by chief representatives of all elements of state government so that the government-to-government relationship described herein is completely and broadly implemented between the state and the tribes.*

### III. PURPOSES AND OBJECTIVES

*This ACCORD illustrates the commitment by the parties to implementation of the government-to-government relationship, a relationship reaffirmed as state policy by gubernatorial proclamation January 9, 1989. This relationship respects the sovereign status of the parties, enhances and improves communications between them, and facilitates the resolution of issues.*

*This ACCORD is intended to build confidence among the parties in the government-to-government relationship by outlining the process for implementing the policy. Not only is this process intended to implement the relationship, but also it is intended to institutionalize it within the organizations represented by the parties. The parties will continue to work for complete institutionalization of the government-to-government relationship by seeking an accord among all the tribes and all elements of state government.*

*This ACCORD also commits the parties to the tribal acts that will enhance the government-to-government relationship to provide more efficient, improved and beneficial services to Indian and non-Indian people. This ACCORD encourages and provides the foundation and framework for specific agreements among the parties outlining specific acts to address or resolve specific issues.*

*The parties recognize that implementation of this ACCORD will require a comprehensive educational effort to promote understanding of the government-to-government relationship within their own governmental organizations and with the public.*

### IV. IMPLEMENTATION PROCESS AND RESPONSIBILITIES

*While this ACCORD addresses the relationship between the parties, its ultimate purpose is to improve the services deliv-*

ered to people by the parties. Immediately and periodically, the parties shall establish goals for improved services and identify the obstacles to the achievement of these goals. At an annual meeting, the parties will develop joint strategies and specific agreements to outline tasks, overcome obstacles and achieve specific goals.

The parties recognize that a key principle of their relationship is a requirement that individuals working in native lands of mutual concern are accountable to act in a manner consistent with this ACCORD.

The state of Washington is organized into a variety of large but separate departments under its governor, other independent state officials and a variety of boards and commissions. Each tribe, on the other hand, is a unique government organization with different management and decision-making structures.

The chief of staff of the governor of the state of Washington is accountable to the governor for implementation of this ACCORD. State agency directors are accountable to the governor through the chief of staff for the related activities of their agencies. Each director will initiate a procedure within his/her agency by which the government-to-government policy will be implemented. Among other things, these procedures will require persons responsible for dealing with issues of mutual concern to respect the government-to-government relationship within which the issue must be addressed. Each agency will establish a documented plan of accountability and may establish more detailed implementation procedures in subsequent agreements between tribes and the particular agency.

The parties recognize that their relationship will successfully address issues of mutual concern when communication is clear, direct and between persons responsible for addressing the concern. The parties recognize that in state government, accountability is best achieved when this responsibility rests solely within each state agency. Therefore, it is the objective of the tribes that each particular agency be directly accountable for implementation of the government-to-government relationship in dealing with issues of concern to the parties. Each agency will facilitate this objective by identifying individuals directly responsible for issues of mutual concern.

Each tribe also recognizes that a system of accountability within its organization is critical to successful implementation of the relationship. Therefore, tribal officials will direct their staff to communicate within the spirit of this ACCORD with the particular agency which, under the organization of state government, has the authority and responsibility to deal with the particular issue of concern to the tribe.

In order to accomplish their objectives, each tribe must ensure that its current tribal organization, decision-making process and relevant tribal personnel is known to each state agency with which the tribe is addressing an issue of mutual concern. Further, each tribe may establish a more detailed organizational structure, decision-making process, system of accountability, and other procedures for implementing the government-to-government relationship in subsequent agreements with various state agencies. Finally, each tribe will establish a documented system of accountability.

As a component of the system of accountability within state and tribal governments, the parties will review and evaluate at the annual meeting the implementation of the government-to-government relationship. A management report will be issued summarizing this evaluation and will include joint strategies and specific agreements to outline tasks, overcome obstacles, and achieve specific goals.

The chief of staff also will use his/her organizational discretion to help implement the government-to-government relationship. The Office of Indian Affairs will assist the chief of staff in implementing the government-to-government relationship by providing state agency directors information with which to educate employees and management groups as defined in the accountability plan about the requirements of the government-to-government relationship. The Office of Indian Affairs shall also perform other duties as defined by the chief of staff.

## V. SOVEREIGNTY and DISCLAIMERS

Each of the parties respects the sovereignty of each other party. In executing this ACCORD, no party waives any rights, including treaty rights, immunities, including sovereign immunities, or jurisdiction. Neither does this ACCORD diminish any rights or protections afforded other Indian persons or entities under state or federal law. Through this ACCORD parties strengthen their collective ability to successfully resolve issues of mutual concern.

While the relationship described by this ACCORD provides increased ability to solve problems, it shall not result in a resolution of all issues. Therefore, inherent in their relationship is the right of each of the parties to exercise an issue of importance to any decision-making authority of another party, including, where appropriate, that party's executive office.

Signatory parties have executed this ACCORD on the date of August 4, 1983, and agreed to be duly bound by its terms:

APR , 2 1990 - *hand delivered*

30 March 1990

PSDDA.

Re: Issues unresolved:  
Enforcement of Clean Water Act and Endangered Species

Dear Sirs,

Dredge disposal in Puget Sound is still unacceptable by me and my community club - Magnolia and Perkins Lane waterfront property owners. Taking shorelines, and shellfish, threatening family health, and failure to warn is not in the public interest.

①

PSDDA efforts should have preceded with an apology from the "Interagency" rather than continued justification, and coverups - capping.- B.A.T. has not been utilized, and marine spoils will continue to bioaccumulate. Dredged material can be a natural resource if contained, and retrievable.

②

③

1. Mitigation banking should precede permitted disposal.
2. Magnolia's Beach Assessment by D.N.R. and Metro does not correlate to NOAA's Mussel Watch - why?
3. Disposal turbulence in sewage polluted waters does increase intertidal toxicity.
4. Every marine, D.N.R. disposal site should have had an alternative upland site - provided and managed by D.N.R.
5. Marine disposal cost savings by the Port of Seattle, Metro, and the City of Seattle should be determined by PSDDA prior to litigation, and offered to impacted waterfront property owners. (comparable to the Puyallup settlement)
6. P.T.I. should publish a Magnolia Waterfront Cancer Death Rate comparison to National Norms before the State accepts their sediment levels as "goals", rather than gouge.
7. "Waste" disposal should be circular rather than linear - nature's way, and after treatment returned to its source.
8. County Health Directors should be elected.

④

⑤

⑥

⑦

⑧

⑨

⑩

⑪

PSDDA  
30 March 1990  
Page two

May our responsible stewardship continue. There is a higher authority.

Sincerely,

*Bonnie Orme.*

Bonnie Orme  
1949 Perkins Lane West  
Seattle, WA 98199

P.S. Until the biological assessment for bald eagles addresses toxic chemicals in their feeding habitat, C.O.E. should withhold permits in Magnolia until the shellfish are for consumption.

(12)

## PSDDA SECOND ANNUAL REVIEW MEETING

**Topic:** Abnormality Control Standard for the Sediment Larvae Bioassay (Clarification)

**Presenter:** David Fox (Corps, 206-764-3768)

**Background:** For sediment larvae bioassay data to be used in regulatory decision-making it is critical that the test reach its proper endpoint. Data may be rejected if the test is terminated early. An objective criterion is needed in test endpoint termination.

When PSDDA was implemented in 1988 the bioassay protocols established by the Puget Sound Estuary Program (PSEP) were adopted. These protocols established the sediment larvae control abnormality performance standard at ten percent and the mortality standard at thirty percent. In several early PSDDA projects the thirty percent mortality performance standard could not be met due to high natural mortality in sediment larval populations. As a result, for Phase II the performance standard was changed and limited combined mortality and abnormality to fifty percent.

This combined performance standard is based on the assumption that the test has reached its correct endpoint. An abnormality performance standard, to be used as an objective endpoint criterion, was not explicitly established in the Phase II Management Plan Report. A bioassay which has been terminated early may have large numbers of underdeveloped larvae in the seawater control being scored as "abnormal". This large abnormality count might meet the combined mortality and abnormality performance standard of fifty percent but would violate the underlying assumption that the test had reached its proper endpoint. It is impossible in reviewing data to distinguish between underdeveloped (but normal) larvae and other abnormal larvae. The Puget Sound Estuary Program has consistently maintained a performance standard of ten percent for abnormality and a recommendation coming out of the PSDDA/PSEP Sediment Larval Workshop of June 1989 was that the abnormality limit of ten percent is "routinely achievable" and should be kept.

**Pertinent Documents:** Evaluation Procedures Technical Appendix - Phase I (June 1988); Puget Sound Estuary Program Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound (Tetra Tech, 1986); PSDDA Management Plan Report - Phase II (September 1989); PSDDA/PSEP Sediment Larval Workshop Minutes (June 1989).

**Proposed Resolution:** This clarification explicitly establishes the sediment larval bioassay seawater control abnormality performance standard at ten percent. The performance standard for combined mortality and abnormality remains at fifty percent.



## PSDDA SECOND ANNUAL REVIEW MEETING

**Topic:** Reduced Testing Requirements for Small Projects above "No Test" Volume: **BIOLOGICAL TESTING REQUIREMENTS FOR NONDISPERSIVE DISPOSAL SITES**, clarification to Evaluation Procedures.  
**Presenter:** David R. Kendall, Seattle District, 206/764-3768

**Background:** PSDDA currently requires chemical testing of all small projects ranked from Low-Moderate to High, when dredged volumes exceed 500 c.y but are less than 4,000 c.y.. These limits define the small project limits above the "No Test" volume. No chemical testing is required for Low ranked Small Projects less than 8,000 c.y.. Biological testing currently defined for Small Projects only requires a single amphipod bioassay test, when chemicals of concern exceed screening level. A single amphipod bioassay is also an alternative to chemical testing for dredging volumes less than 500 c.y. in high ranked areas (Phase II MPR, page A-13). Current interpretation guidelines for bioassays stipulate a "two hit" and a "single hit" rule for failing sediments (Phase II MPR, page A-28 to A-29).

Under the "single hit" rule test sediment mortalities must exceed control sediment by 20 percent absolute and reference sediment by 30 percent absolute and be statistically significant (t-Test;  $p < 0.05$ ) from reference in order to "fail". Test sediment responses exceeding sediment control by 20 percent absolute, but less than 30 absolute over reference, which are also statistically different from reference are considered a "hit" under the "two hit rule", but would not "fail" under the existing Small Project guidelines.

At the present time only the "single hit" interpretation rule can be applied to small project dredged material to be disposed of in nondispersive sites, because only a single amphipod bioassay is run. To provide consistency in interpreting dredged material test data to be disposed of at a PSDDA nondispersive disposal site, a second bioassay is being proposed to enable interpretation under the "two hit" rule.

**Pertinent Documents:** EPTA; PHASE II MPR, A-12 to A-14; Table A.2 and A.3

**Proposed Resolution:**

1. Add the Saline Microtox bioassay to the testing requirements for Small Projects for dredging areas ranked Low-Moderate to High being tested relative to the nondispersive disposal site guidelines. This would allow bioassay interpretations using both the "two hit" and "single hit" rules. In this case, the microtox bioassay will be used only as a corroborating bioassay in conjunction with the amphipod bioassay under the "two hit rule", and cannot fail a tested sediment (i.e., dredged material management unit) by itself.

2. For Small Projects in High ranked areas less than 500 c.y., optional biological testing (amphipod bioassay) would also include the microtox bioassay for interpretation consistency as described above (see Phase II MPR, page A-13, Table A.2).

## PSDDA ANNUAL REVIEW MEETING

**Topic: Microtox Bioassay -- Clarifications to Protocol and Disposal Guidelines**

**Presenter: Keith Phillips, Ecology, 206-459-6143**

**Date: April 11, 1990**

**BACKGROUND.** The PSDDA suite of biological tests includes use of the saline extract microtox test as one of four tests considered when applying the biological disposal guidelines. The test measures the light produced by the microtox bacteria in response to sediment extracts. As described in the PSDDA Phase II MPR, a "hit" with the microtox test requires that the measured mean light output from the test sediment extract (five replicates of the highest concentration in the dilution series) be more than 20% below, and statistically different from, the measured light output in the reference sediment extract, and that the test extract be dose responsive (show decreased light output with increasing concentration of the extract).

Recent experience with this test suggested the need for further clarification of the microtox test protocols and interpretation. The need for these clarifications is described below.

1. Dose-response relationships from dilution series sometimes show enhancement of light rather than a decrease in light during the test, most often for reference sediments and occasionally for test sediments. There is currently no interpretation of light enhancement responses relative to the PSDDA disposal guidelines or the PSEP Protocols.

2. Though the microtox test has a relatively high precision, response among different batches of the test organism can be a source of variability. Relative responses of a replicate sample measure outside of a batch have shown different responses over a dilution series, although the slope is essentially the same (as determined from untransformed data: linear regression analysis). This variability could affect comparisons between test and reference sediments.

3. Test sediments found to be have a luminosity of less than 20% below, and statistically different from, reference sediments, but are not found to be dose-responsive are currently flagged as "questionable." Whether or not to consider this result as a "hit"

or "non hit" under the PSDDA disposal guidelines needs to be clarified.

**PERTINENT DOCUMENTS.** PSDDA Phase II MPR, pg 5-24; PSEP Protocols, Sediment Bioassays, pgs 45-48.

**PROPOSED RESOLUTION.**

1. All light enhancement responses will be considered as neutral and nontoxic. It is not possible to establish dose-response relationships of sediments exhibiting light enhancement (unless untransformed data are used). The PSDDA interpretation in this case will be the comparison of the five replicate responses at the highest concentration for the test sediment and reference sediment. Future completion of ongoing NOAA research in this area could allow for an improved interpretation of the enhancement response.

2. Because of the inherent variability in any given response outside of a batch, only within-batch comparisons will be used when applying the PSDDA guidelines. Therefore, every batch must necessarily run a reference sediment for comparison at the highest concentration.

3. A test response (at the highest concentration) which is more than 20% below, and statistically different from, the reference sediment will be considered a "hit" under the PSDDA guidelines, even when the test result is not dose-responsive over the standard dilution series. This interpretation is now appropriate since all test sediment and reference sediment comparisons will be conducted within a batch, which reduces variability. (This interpretation is also more efficient and defensible than rerunning the test using a higher dilution series as a way of determining potential dose-responsiveness.)

# PSDDA PHASE II

## Microtox Test Interpretation

- Comparison between:
  - test and reference luminosity
  - highest concentration
  - mean of five replicates
- “Hit” -- test luminosity:
  - 20% below reference
  - statistically different from reference
  - dose responsive

# Microtox Test

## Need for Clarification

- Interpreting light enhancement
- Comparing among batches
- Interpreting significant differences without dose responsiveness

# Light Enhancement

- Interpret as neutral/nontoxic
- Compare highest concentrations
- Review pending NOAA research

# Batch Comparisons

- Require reference with every batch
- All comparisons within batch

# No Dose Response?

- “Hit” --
  - 20% below, and
  - statistical difference
  - regardless of dose responsiveness
- Rationale --
  - appropriate given within-batch
  - more efficient/defensible than rerun at higher dilution
  - conservative interpretation of confirmatory test



CENPS-EN-PL-ER

May 21, 1990

Memorandum for: Record

Subject: Microtox (R) Clarification--Further Specification.

1. As stated in the Clarification Paper by Keith Phillips at the PSDDA Second Annual Review Meeting, there are two significant changes or elucidations needed in the Microtox test.

2. Light Enhancement and Requirement for Dose-Responsive Results in the Test. The Microtox test sometimes shows enhancement of light, not the expected decrease in comparing test to reference sediments. There is no clear present interpretation for this response. As Keith Phillips suggested in the PSDDA annual review meeting:

a. We should regard increases in luminosity as questionable.

(1) We cannot transform these data, and thus cannot calculate an EC50 .

(2) There is no known toxicological relationship between the untransformed data, light enhancement and toxicity. (NOAA is working on this, however.)

b. Light enhancement appears to be neutral or very low response, if a toxic response at all. It will not be considered as a positive value in the comparison of light output between samples. (That is, a reference sediment light enhancement will be counted as no light diminution.)

c. We will continue to compare five replicate responses at the highest extract concentration. A response which is more than 20% and statistically different from reference sediment will be considered a hit, regardless of the dose-responsiveness of the standard dilution series.

These changes were accepted by the participants at the PSDDA ARM. However, there was a discussion about a further recommended modification, which follows.

3. High Relative Response Variability may occur should the reference sediment and the test sediment be in different "batches." This could affect comparisons between reference and test sediments. The key problem is how to define a "batch."

a. During the Microtox test, there are five steps. Asterisks indicate possible batch delimiters.

\*Prepare the sediment by shaking for 24 h in dark at 4C

\*Centrifuge to clear extract

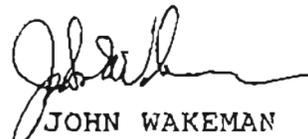
Prepare dilution series or highest conc. as appropriate

\*Hydrate bacteria in the reagent vial provided by Microtox

Inoculate and measure luminosity decrease over 15 min

b. Discussions with laboratory practitioners (enclosure 1) suggest that the batch is initiated by the hydration of the individual bottles of freeze-dried bacteria. That is, the reference should be repeated with each bottle of bacteria that is mixed. A diminution of sensitivity through time may subsequently occur, apparently because of the aging of the culture. The PSEP Recommended Protocols suggests that 5 hours is the maximum for a single bottle of bacteria after rehydration. However, knowledgeable opinion tends to suggest that diminution of light may occur after 2 hours. Therefore, PSDDA's specification is that the reference sediment must be run on the same bottle of rehydrated Microtox bacteria within 2 hours of the hydration event.

These data will be reported in the standard reporting sheets.



JOHN WAKEMAN  
Biologist

Enclosure 1: Coordination.

A. Bud Walbourne, MICROBICS Corp.: The critical factor for the bacterial sensitivity shift after hydration is the integrity of the lyophilized bacterial phial. If this reagent is old or has not been held correctly (e.g., kept at higher than -20C), then the maximum time for stability is about 2 hours. This is the recommendation of the company.

He added that the batch could be extended to 8 hours if a positive control phenol dilution series is used to compare the EC50 to check for loss of sensitivity through time. The PSEP Recommended Protocols suggest use of sodium arsenate as the positive control. Walbourne stated that phenol will better demonstrate the loss of sensitivity.

B. Ed Casillas, NOAA, agreed that the lyophilized bacterial hydration should define the batch; he stated that two different bottles can give somewhat different results. He did not think that a toxic sediment could turn nontoxic because of the change, but that quantitative comparisons would be better made in this fashion. He further indicated that 5 hours maximum holding of the bottle appears to be satisfactory.

NOAA also uses phenol as the positive control because it gives a reasonable response and also because NOAA doesn't believe that metals are good models for toxicants in marine ecosystems. Ed suggested that running phenol at the beginning and end of the batch and using max. 5 hours would be reasonable.

C. Tim Thompson, Parametrix, was also contacted. He agreed that this was an appropriate batch delimiter. He thought there would be no problem in using a 2-hour maximum holding for the reagent/bacteria mix. This confirms his own observations that after 2 hours there is a light diminution even in controls. Parametrix has taken to using a phenol dilution series also.

D. Les Williams, Tetra Tech, Inc. He agreed that the bottle defines the batch. He used up to 5 hours and a phenol positive control to confirm his studies in Commencement Bay.



**PSDDA ANNUAL REVIEW MEETING**

**Topic:** Development and use of the Meanthes growth test as a PSDDA bioassay for chronic/sublethal effects in dredged material

**Date:** April 12, 1990  
**Presenter:** Brett Betts, Ecology, (206)459-6824

**PROBLEM STATEMENT**

The Section 404(b)(1) Guidelines specify the types of potential adverse effects to the aquatic environment that must be considered when making regulatory decisions on dredged material disposal, which include the persistence and permanence of effects. These considerations can also include short and long term effects on aquatic communities, and the potential for sublethal effects such as impairment to animal growth and reproduction. To-date, PSDDA has primarily relied on sensitive acute indicators or the use of the benthic infaunal abundance test to provide an estimate of the combined effects of acute and chronic exposure to chemicals of concern present in some dredged material. Although the Puget Sound Dredged Disposal Analysis (PSDDA) remains committed to improving the measurement and evaluation of chronic/sublethal effects from dredged material disposal, there is presently no accepted test to directly do so.

**STATUS**

During Phase I, PSDDA considered multiple ways to evaluate potential unacceptable chronic/sublethal effects of dredged material disposal. The Evaluation Procedures Technical Appendix - Phase I, identifies that PSDDA initially considered use of an intrinsic rate of population growth (IRPG) test to address chronic/sublethal effects of dredged material disposal. The IRPG test indicates whether the test sediment population is growing at a rate comparable to reference conditions, but was not recommended by PSDDA until a suitable test species could be identified. To develop a usable test alternative, PSDDA funded the National Marine Fisheries Service (NMFS) to investigate and if possible, recommend a chronic sediment test. After completing work with juvenile geoducks and sand dollars, NMFS concluded they could not recommend either animal or another test as an alternative for a long term marine sediment bioassay, at that time. Per the NMFS recommendation, PSDDA decided to address potential

chronic/sublethal effects of dredged material using existing sensitive acute bioassays and chemical surrogate measures of benthic community effects, until an acceptable test could be developed. These indicators include abnormality in bivalve larval, sublethal effects in the Microtox bioassay, and the chemical disposal guidelines based on benthic infaunal abundance.

As part of Phase II, PSDDA funded test further development of two "high potential species" for a chronic/sublethal bioassay, Ampelisca abdita and Neanthes arenaceodentata. This work demonstrated the juvenile Neanthes biomass test to be dose responsive in the tested sediments (a limited range of clean and contaminated sediment and mixtures thereof), and the most promising for continued chronic/sublethal development.

Recent work on the development of the juvenile Neanthes arenaceodentata sediment bioassay indicates the test has a high potential for evaluating the chronic/sublethal effects of dredged material disposal. The chronology of Neanthes test development follows:

- \* Development work began as a sublethal test demonstration study (Johns 1988) for the Seattle District of the U.S. Army Corps of Engineers (Corps) and the PSDDA program. This test demonstration was conducted concurrent with an EPA study comparing multiple sediment bioassays (Pastorok and Becker, 1989).

- \* In February 1989, the Washington Department of Ecology (Ecology) funded development of a draft Neanthes protocol (Johns 1989a) and an experts workshop to discuss the draft protocol. The experts panel evaluated the draft protocol to determine the information and research that may be needed for further test development. An interim protocol (Johns, Ginn, and Reish 1989) was developed based on the workshop recommendations. The workshop participants identified eight high priority topics for further test development. Most of these topics addressed how nontreatment factors could affect test response.

- \* Ecology also funded an evaluation of growth as a sublethal indicator of sediment quality, the relationship between growth and reproduction, and an assessment of approaches to establish interpretive guidelines for the juvenile Neanthes sublethal bioassay (Johns 1989b).

- \* Seven of the eight high priority Neanthes test development topics from the 1989 Ecology workshop were addressed in work

funded by the U.S. Environmental Protection Agency, (EPA), Region 10 (Johns and Ginn 1990a). A draft final Neanthes protocol (Johns, Ginn and Reish 1990) was developed based on the interim protocol, using the results from the seven EPA funded experiments.

\* Another experiment was conducted under the EPA funded study to address the eighth Neanthes experts workshop topic (Johns and Ginn 1990b). This study evaluated the relationship between changes in juvenile biomass (i.e., the critical response criterion in the Neanthes sublethal bioassay) to other long-term endpoints that are measures of reproductive success.

The work above establishes a strong foundation for future use of the Neanthes growth test in PSDDA evaluations of dredged material for chronic/sublethal adverse effects to the aquatic environment. At this time, there remain issues of intra/inter laboratory evaluation, field demonstration on dredging projects, and regulatory application and interpretation of a final Neanthes protocol.

#### PROPOSED ACTION

The proposed four step process below identifies proposed tasks to be completed prior to determining whether and how PSDDA might use the Neanthes sublethal test to evaluate dredged material. These four categories do not sequentially organize the tasks, however a general timeframe for tasks is noted.

1) Intra/Inter Agency Coordination - This step would assemble a PSDDA agency workgroup to:

- \* Review completed technical development work (May to June 1990);
- \* Identify scope of remaining work to be completed (May to June 1990);
- \* Establish respective roles of the PSDDA agencies (May to June 1990);
- \* Prioritize remaining tasks in light of available resources (May to June 1990);
- \* Develop draft regulatory interpretive guidelines for dredged material disposal (July to December 1990);
- \* Direct and oversee technical review (step 2) and any technical development work (step 3) (July to December 1990);
- \* Recommend whether and how PSDDA should use the Neanthes

- test (November to December 1990); and
- \* Present results at the PSDDA Annual Review Meeting in February 1991.

2) **Technical Review** - This step of the process would:

- \* Ensure peer review of technical development documents completed to-date for the Neanthes test (June to July 1990);
- \* Consider peer review comments in determining remaining work for the Neanthes test and secure peer review of proposed further development tasks (June to July 1990);
- \* Assemble a scientific experts review panel to provide technical review of results of technical development tasks, and evaluate the status of other available chronic/sublethal bioassay tests (November 1990); and
- \* Provide a technical workshop on the development, interpretation, and use of the Neanthes test (November 1990).

3) **Technical Development** - This step includes completion of any essential remaining test development technical tasks as identified and prioritized by the agency workgroup, within available resources. This additional development work could occur in the July to December 1990 timeframe. Work tasks could possibly include:

- \* **Laboratory Repeatability/Replicability** - To identify intra- and interlab variability for multiple runs of the Neanthes test using an approved statistical design.
- \* **PSDDA Bioassays Comparison** - Compile and evaluate available information on the range of response for Neanthes with the other PSDDA bioassay animals for a variety of representative sediment contaminant types.
- \* **Technical Interpretive Guidance** - To establish Neanthes interpretive guidance, including consideration of the relationship of individual growth to population growth.

4) **DY 1990 Annual Review Meeting (Spring 1991)** - Presentation of products from steps one through three, and a report on the recommended application/use of the Neanthes test by PSDDA. These products and the annual review process are scheduled for Spring 1991.

## PERTINENT REFERENCES

PSDDA Evaluation Procedures Technical Appendix Phase I, June 1988, pp. II-72-77.

Johns, D. M. 1988. Puget Sound Dredged Disposal Analysis sublethal test demonstration. Prepared for U.S. Army Corps of Engineers, Seattle District. PTI Environmental Services, Bellevue, WA.

Johns, D.M. 1989a. Unpublished. Draft Protocol For Juvenile Neanthes Bioassay. Prepared for Washington Department of Ecology. PTI Environmental Services, Bellevue, WA.

Johns, D.M. 1989b. Evaluation Of Growth As An Indicator Of Toxicity In Marine Organisms. Prepared for Washington Department of Ecology. PTI Environmental Services, Bellevue, WA.

Johns, D.M., T.C. Ginn, and D.J. Reish. 1989. Interim Protocol for Juvenile Neanthes Bioassay, Draft Report. Prepared for Washington Department of Ecology. PTI Environmental Services, Bellevue, WA.

Pastorok, R.A., and D.S. Becker. 1989. Comparison of bioassays for assessing toxicity in Puget Sound. Prepared for U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Seattle, WA. PTI Environmental Services, Bellevue, WA.

Johns, D.M., and T.C. Ginn 1990a. Development of a Neanthes sediment bioassay for use in Puget Sound. Draft Report. Prepared for U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Seattle, WA. PTI Environmental Services, Bellevue, WA. 62 pp + appendices.

Johns, D.M., T.C. Ginn, and D.J. Reish. 1990. Protocol for Juvenile Neanthes Bioassay, Draft Report. Prepared for U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Seattle, WA. PTI Environmental Services, Bellevue, WA.

Johns, D.M., and T.C. Ginn 1990b. Neanthes Long Term Exposure Experiment: The Relationship Between Juvenile Growth and Reproductive Success. Prepared for U.S. Environmental Protection Agency Region 10, Office of Puget Sound, Seattle, WA. PTI Environmental Services, Bellevue, WA.

PROBLEM STATEMENT

CONSIDERATION OF "PERSISTENCE AND PERMANENCE", I.E., CHRONIC (LONG TERM) AND SUBLETHAL (E.G., GROWTH/REPRODUCTION) EFFECTS

PSDDA HAS TO-DATE RELIED ON SENSITIVE ACUTE INDICATORS AND USE OF BENTHIC INFAUNAL ABUNDANCE TEST TO ESTIMATE COMBINED EFFECTS

CURRENTLY NO ACCEPTED CHRONIC/SUBLETHAL TEST

## STATUS

### PHASE I

- INTRINSIC RATE OF POPULATION GROWTH - LACK OF SUITABLE TEST SPECIES
- NATIONAL MARINE FISHERIES SERVICE - JUVENILE GEODUCKS/SAND DOLLARS - NO SUCCESS/NO TEST ALTERNATIVES AT THAT TIME
- PSDDA CURRENT APPROACH - LARVAL ABNORMALITY, SUBLETHAL EFFECTS IN MICROTOX, AND CHEMICAL GUIDELINES FOR BENTHIC INFAUNAL ABUNDANCE

### PHASE II

- SUBLETHAL TEST DEMONSTRATION - NEANTHES DOSE RESPONSIVE
- COMPARISON OF SEDIMENT BIOASSAYS - RECOMMENDED FURTHER TEST DEVELOPMENT

### RECENT WORK

- EXPERTS WORKSHOP - REVIEW OF DRAFT PROTOCOL, IDENTIFICATION OF EIGHT TEST DEVELOPMENT TOPICS, INTERIM PROTOCOL DEVELOPED FROM RECOMMENDATIONS
- EVALUATION OF GROWTH AS TOXICITY INDICATOR - RELATIONSHIP BETWEEN GROWTH AND REPRODUCTION, AND TEST INTERPRETIVE GUIDELINES
- WORKSHOP TEST DEVELOPMENT TOPICS STUDY - DRAFT FINAL NEANTHES PROTOCOL
- RELATIONSHIP OF GROWTH TO REPRODUCTION IN NEANTHES

**KEY STEPS IN TENTATIVE CHRONOLOGY**

<b>WORKGROUP DEVELOP SCOPE OF REMAINING WORK</b>	<b>MAY TO JUNE 1990</b>
<b>PEER REVIEW OF WORK SCOPE</b>	<b>JUNE TO JULY 1990</b>
<b>TECHNICAL DEVELOPMENT WORK</b>	<b>JULY TO DECEMBER 1990</b>
<b>EXPERTS PANEL AND TECHNICAL WORKSHOP</b>	<b>NOVEMBER 1990</b>
<b>PSDDA ANNUAL REVIEW</b>	<b>FEBRUARY 1991</b>

## POTENTIAL TECHNICAL DEVELOPMENT

- LABORATORY REPEATABILITY / REPLICABILITY - INTRA/INTERLAB VARIABILITY
  
- PSDDA BIOASSAYS COMPARISON - EVALUATE EXISTING INFORMATION ON THE RANGE OF RESPONSE FOR A VARIETY OF SEDIMENT CONTAMINANTS
  
- TECHNICAL INTERPRETIVE GUIDANCE - ESTABLISH TEST INTERPRETIVE GUIDANCE, INCLUDING RELATIONSHIP OF INDIVIDUAL GROWTH TO POPULATION GROWTH



## PSDDA Second Annual Review Meeting

*Topic:* Polychlorinated Dibenzodioxins and Dibenzofurans (PCDD and PCDF): What is PSDDA Doing to Stay Current with this Developing Issue?

*Presenters:* John Wakeman (Corps 206/764-6577), John Malek (EPA, 206/442-1286), Rick Allbright (EPA, 206/764-6814), and Russ McMillan (Ecology, 206/459-6814).

*Background:* These compounds have only recently been detected in sediments from the Puget Sound region (EPA National Bioaccumulation Study). Due to the fact that certain congeners of PCDD and PCDF are extremely potent toxicants or probable carcinogens, the compounds are worthy of continuing attention in the PSDDA program to assure that most recent information and evaluation technologies are used as appropriate. The PSDDA Phase II documents presented a risk management strategy that targets sediments in the vicinity of bleach-process pulp and paper mills, and specified that bioaccumulation testing using the *Macoma* bivalve was the appropriate means of determining the biological availability of the compounds to biota. To date, no project has been required to do PCDD/PCDF testing. Developments in other Pacific Northwest regions (Grays Harbor estuary and the Columbia River) have increased the knowledge of the distribution of these compounds, and tend to support the decision made by PSDDA, since paper mills are the principal contributors of quantities of these compounds to sediments. Compared to these other areas, the Puget Sound region appears to have lower sediment levels of PCDD and PCDF.

*Pertinent Documents:* Phase II Management Plan Report (pp. 5-12 through 5-14); Evaluation Procedures Technical Appendix Section II-7.2.3.3; Corps/EPA-OMEP, 1990 (Jan.). Draft Ecological Evaluation of Proposed Discharge of Dredged Material into Ocean Waters. EPA-503-8-90/002; Rubinstein, N.L., R.J. Pruell, B.K. Taplin, J.A. LiVolsi and C.B. Norwood. 1990 (in press). Bioavailability of 2,3,7,8-TCDD, 2,3,7,8-TCDF and PCBs to marine benthos from Passaic River Sediments. *Chemosphere*.

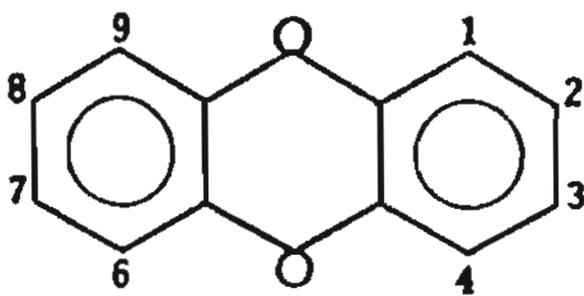
*Proposed Resolution:* The PSDDA agencies have developed a strategy for keeping abreast of Pacific Northwest and national developments in PCDD/PCDF interpretations and appropriate testing. The strategy involves coordination and training within each agency to assure that most current information is considered and that appropriate techniques are used; between agencies; and amongst regional groups that are dealing with the same issues (e.g., on the Columbia River and in Grays Harbor). We are closely tracking the draft guidance for bioaccumulation and genotoxicity testing. Also, risk assessment is being increasingly used to characterize and estimate ecological and human health risks; the agencies have identified a need for inter- and intraagency discussion and education in this methodology. By the next Annual Review Meeting, the agencies will meet and report on these activities.

# Polychlorinated Dibenzodioxins 1/ and Polychlorinated Dibenzofurans 2/

---

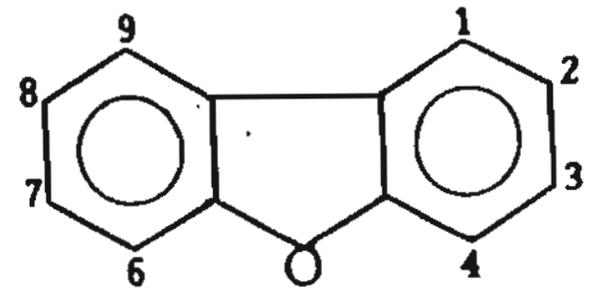
What is PSDDA doing to assure that appropriate information and testing requirements are included in the program?

---



DIOXINS

← 1/ PCDD  
2/ PCDF →



FURANS

# Comprehensive Testing Approach for DM (Draft Guidance)

Tier I. *Evaluate Existing Information* -- reason to believe there is contamination.

Tier IIa. *Bulk Sediment Chemical Analysis*

Tier IIb. *Elutriate Chemical Analysis for Water Column*

-- compare to water quality standards after mixing applied.

Tier IIIa. *Acute Bioassay Toxicity Testing*

Water Column (Elutriate: Dissolved and Suspended Phases)

Benthic (Solid Phase)

Tier IIIb. *Bioaccumulation*

Water Column (Suspended Solids Phase)

Benthic (Solid Phase)

Tier IV. *Chronic Effects*

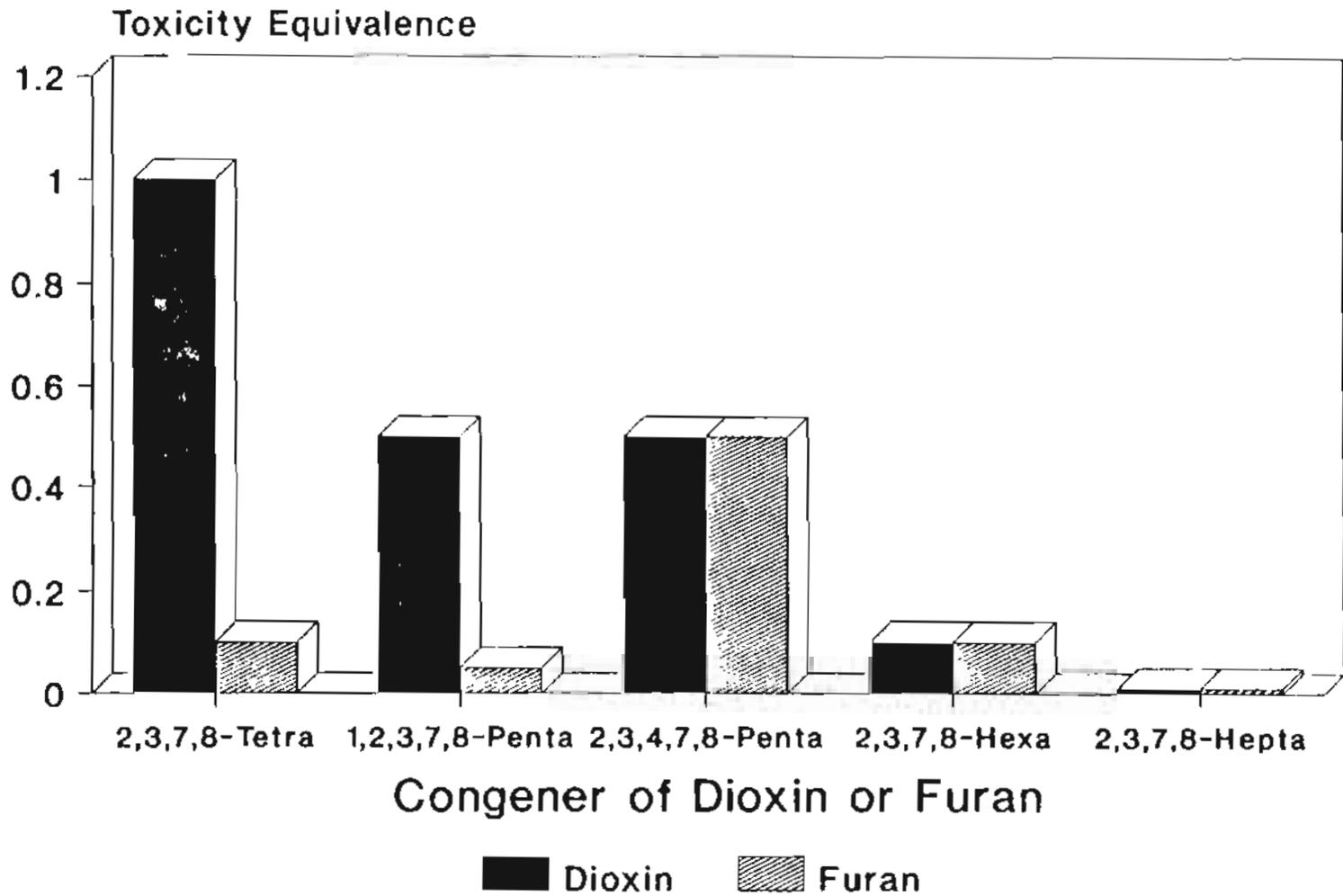
Chronic Sublethal Testing

Water Column

Benthic

Genotoxic Testing (Carcinogenicity, Mutagenicity,  
Teratogenicity)

# Toxicity Equivalence of PCDD/F Congener



After Barnes, et al., 1989

# Considerations for PCDD/PCDF

Bioaccumulation Testing near Known Sources

Sediment Values only Limited Information

Theoretical Bioacc. Pot.:

$$\text{Bioacc. Pot.} = \text{AF} \cdot (\text{Sed Conc}) / (\text{Org C}) \cdot (\text{Lipid})$$

AF = Accumulation Factor

$$\text{Max} = 1.72$$

$$\text{Obs} = 0.84 \text{ (Rubinstein with } \textit{Macoma} \text{)}$$

Bioaccumulation Measures -- Tested

At Levels of 3 Parts per Trillion 2,3,7,8-TC

No Significant Bioaccumulation Found.

Lack of Generally Accepted Interpretive Guideline  
State, Region, Site Specificity

# PSDDA's Human Health Decisionmaking Framework:

Interval from SL to ML

(0.7)



Bioaccumulation Trigger<sup>1/</sup>



Bioaccumulation Testing using  
Macoma



Comparison of Bioaccumulation to  
Human Health Index (Often FDA Level)



Determination of Suitability

<sup>1/</sup> May Also Use Theoretical Bioaccum. Potential

# Genotoxicity Test Development

## Recommendations of Workshop

### Biomarkers

- Enzyme Systems (Mixed Function Oxidases)

- Bile Metabolites

- DNA Abnormal Replication

### Integrators of Toxic Effect

- Carcinogenesis

- Abnormal Embryonic Development

### General Indicators

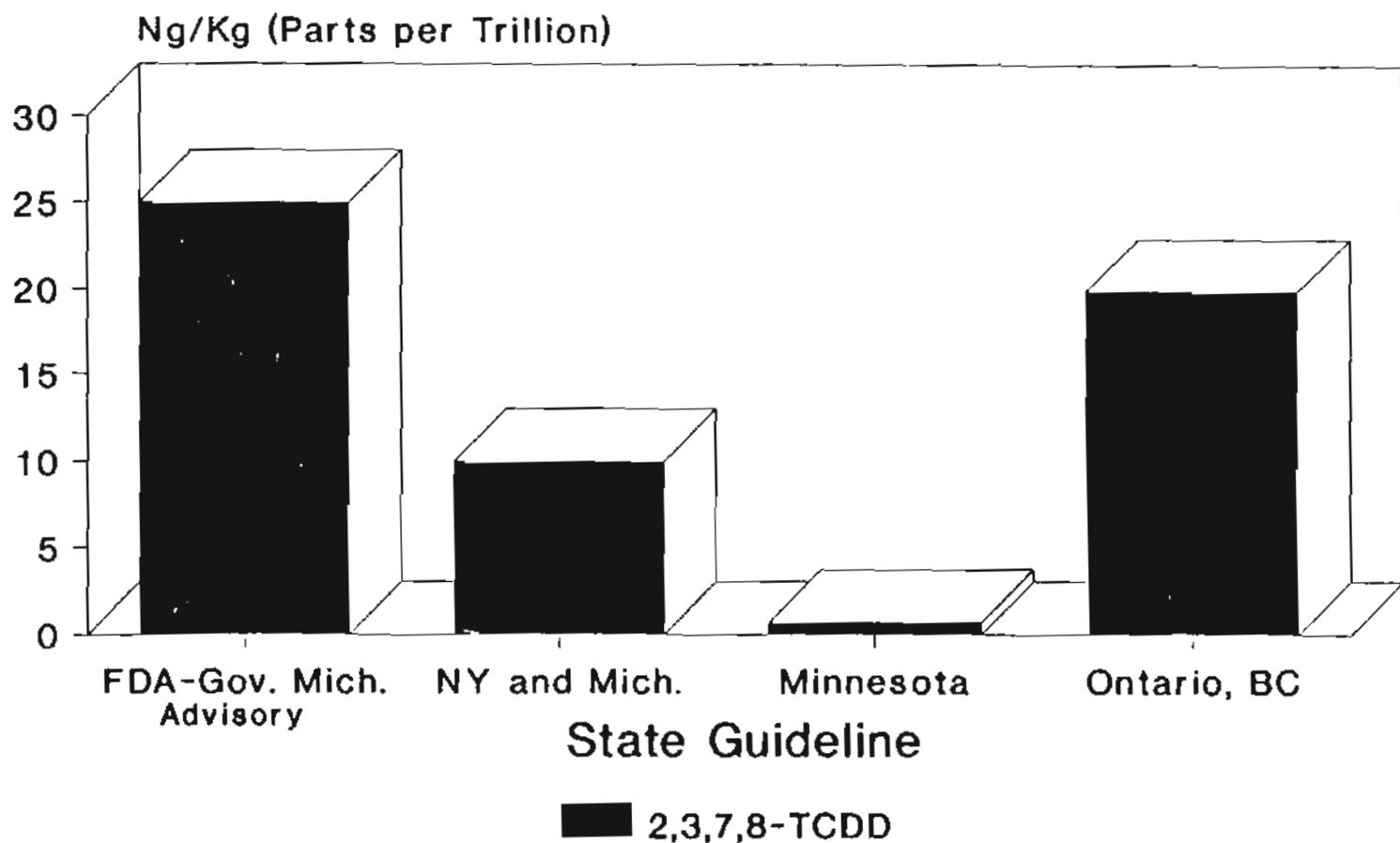
- Mutations

- Chromosomal Abnormalities

- DNA Strand Breaks

Organisms: Fish Models (*Medaka*)

# State Guidelines for Fish Consumption Based on 2,3,7,8-TCDD in Tissue



# Risk Management

---

Toxicity Assessment: 2,3,7,8-TCDD Probable Carcinogen  
Toxicity Equivalency Factor Approach

Exposure Assessment:

Pathways of Exposure (e.g., Sed-->Clam-->Fish-->Human)

Population Exposed

Food Tissue Conc: Measured or Calculated

Consumption Rate

Duration of Exposure

Lifetime Exposure

Risk Characterization

Lifetime Cancer Risk: Low, Moderate, Severe Cases

Comparison to Acceptable Levels of Risk

Consideration of Uncertainties in Estimates

Risk Management

Weigh and Balance Levels of Risk, Populations Exposed,

Weight of Evidence, and Uncertainties

Decision

# STRATEGY FOR PSDDA AGENCIES PCDD/PCDF

1. Within Agency Discussion, Training
2. Between Agency Discussions
3. Track Developments --
  - a. Grays Harbor Estuary
  - b. Columbia River
  - c. New York
  - d. WES Genotoxic Test Development
  - e. WES and PSDDA Chronic/Sublethal Testing
4. Technical Workshop on PCDD/PCDF
5. Report on Findings at next ARM



April 17, 1990

Mr. Raymond G. Schmitz  
Chief, Operations Division  
U.S. Army Corps of Engineers  
Seattle District  
P.O. Box C-3755  
Seattle, WA 98124-2255

Dear Mr. Schmitz,

Congratulations on the successful completion of the second annual review meeting of the Puget Sound Dredged Disposal Analysis (PSDDA) program. The Washington Public Ports Association was pleased to be able to participate in this review. The four agencies did a very thorough job in preparation for this meeting, and most participants obviously felt that it was a beneficial program.

The ports presented all four of the major points that we outlined to you in our April 2 letter. It is our understanding that as a result of this meeting, there is a commitment from the four PSDDA agencies to incorporate a pattern analysis program for the data from the various dredging projects.

Development of this type of program will help the PSDDA program managers interpret the dredging data patterns to make better management decisions for the program. It is our opinion that developing this capability will require some data management effort, and the ports are willing to provide some of our consultant resources to you in this endeavor.

We also understand that the PSDDA agencies have not committed to an analysis of the direct economic costs of the program, beyond the commitments for sampling and testing costs that have already been made. We did understand, however, that the Seattle District is willing to provide information from federal projects that might help the ports in this analysis.

It is also our understanding that the agencies are willing to listen to a presentation of this type of cost analysis at future annual review meetings. Please let me know if this is not also your understanding.

**Executive Committee**

John McCarthy  
President  
Fred Bennett  
Vice President  
Paige Miller  
Secretary  
Sue Watkins  
Treasurer  
Robert M. Cronk  
Past President

Donald A. White  
Executive Director

Port of Allyn  
Port of Anacortes  
Port of Bellingham  
Port of Bemis  
Port of Bremerton  
Port of Brownsville  
Port of Camas-Washouga  
Port of Centralia  
Port of Chehalis  
Port of Chelan County  
Port of Clarkston  
Port of Columbia  
Port of Coupeville  
Port of DeWitt  
Port of Douglas  
Port of Edmonds  
Port of Ephrata  
Port of Everett  
Port of Friday Harbor  
Port of Gamble  
Port of Grandview  
Port of Grays Harbor  
Port of Hoodspoor  
Port of Ilwaco  
Port of Ilwaco  
Port of Kalama  
Port of Kennewick  
Port of Keyport  
Port of Kingston  
Port of Kirkland  
Port of Longview  
Port of Lopez  
Port of Manchester  
Port of Mattawa  
Port of Moses Lake  
Port of Olympia  
Port of Othello  
Port of Pasco  
Port of Penn. Delle  
Port of Peninsula  
Port of Port Angeles  
Port of Port Townsend  
Port of Poulsbo  
Port of Quincy  
Port of Ridgefield  
Port of Royal Slope  
Port of Seattle  
Port of Shelton  
Port of Silverdale  
Port of Skagit County  
Port of Skamania County  
Port of South Whidbey Island  
Port of Sunnyside  
Port of Tacoma  
Port of Tanuys  
Port of Vancouver  
Port of Wahkiakum Co. #1  
Port of Wahkiakum Co. #2  
Port of Walla Walla  
Port of Warden  
Port of Waterman  
Port of Whitman County  
Port of Willapa Harbor  
Port of Woodland

Mr. Raymond G. Schmitz  
April 17, 1990  
Page Two

Again, thank you very much for inviting us to participate in the second PSDDA annual review meeting. Please contact me if you have any questions about our presentation, or about our understandings of the results of the meeting.

Yours truly,

WASHINGTON PUBLIC PORTS ASSOCIATION



Eric D. Johnson  
Environmental Specialist

c: Ron Lee, Environmental Protection Agency  
Ann Morgan, Department of Natural Resources  
Mike Palko, Department of Ecology  
Frank Urabeck, Seattle District Corps of Engineers  
WPPA Environmental Committee

APR 19 1990



## THE TULALIP TRIBES

**Board of Directors:**

Stanley G. Jones, Sr., *Chairman*  
Bernard W. Gobin, *Vice-Chairman*  
Herman A. Williams, Sr., *Treasurer*  
Debra L. Posey, *Secretary*  
Dawn E. Simpson, *Board Member*  
Stan Jones, Jr., *Board Member*  
Herman A. Williams, Jr., *Board Member*  
Clarence H. Hatch, *Executive Director*

6700 TOTEM BEACH ROAD  
MARYSVILLE, WA 98270  
853-4685  
FAX 653-0255

The Tulalip Tribes are the successors  
in interest to the Snohomish,  
Snoqualmie and Skykomish tribes  
and other tribes and bands signatory to  
the Treaty of Point Elliott.

April 18, 1990

Mr. Raymond E. Schmitz  
Chief, Operations Division  
Seattle District Corps of Engineers  
P.O. Box C-3755  
Seattle, WA 98124-2255

Dear Mr. Schmitz:

The Tulalip Tribes would like the following issues included in the current PSDDA annual review.

1. Role of Tribes in PSDDA decision making:

(a) Tribal governments have never been an integral part of the PSDDA decision-making process despite their co-management status with the State of Washington on fisheries management issues. The Tribes were not part of the original site selection team and their input during public comment periods is routinely ignored. During the PSDDA annual meetings, the opportunity to discuss management issues important to the Tribes are limited to 15-20 minute "public comment" periods. This is an inadequate and inappropriate forum for involving tribal government and carrying out your federal trust responsibilities to the tribes. There should also be more opportunity for the general public for open discussion at the annual review meeting.

(b) The Tulalip Tribes hereby requests that it be included in the group of governmental entities determining appropriate sampling plans (including, for example, when a project falls within the pulp mill proximity criteria for testing for polychlorinated dibenzodioxins (PCDD's) and polychlorinated dibenzofurans (PCDF's) following bioaccumulation testing), and evaluating test results. The Tribes also requests it be part of any governmental group deciding whether a departure from PSDDA guidelines for a Port Gardner project is appropriate.

2. Criteria for determining when PSDDA sampling guidelines may be violated:

As evidenced by the recent PSDDA agencies' decisions regarding the adequacy of sampling by the Port of Everett, the sampling guidelines may be substantially departed from and still be acceptable as the result of a vague "professional judgment" exception. See, October 11, 1989 Memo, Everett Marina, PN 071-04B-2-11067-R, from John Malek, EPA. Thus, criteria developed after months and even years of investigation become dispensable. We feel that this situation is unacceptable and results in significant management decisions being made which are outside the scope of the original EIS and which occur without the benefit of direct public involvement. We would like the PSDDA agencies to develop criteria for assessing when deviations from the PSDDA sampling guidelines may be allowed. These criteria should be strict, to avoid the exception becoming the rule. As discussed above, the Tribes should be among the agencies deciding when testing is acceptable and when particular guidelines should be waived. The Tribes should also be part of the group deciding the criteria for any such waivers.

3. Criteria for determining when chlorinated guaiacol testing, and testing for other chemicals of concern near specific pollution sources, is required:

The PSDDA Management Plan calls for testing for chlorinated guaiacols and other chemicals of concern in those areas near sources of these compounds. See, Management Plan Report, Unconfined Open-Water Disposal of Dredged Material, Phase II (North and South Puget Sound) (September, 1989), pp. A-21 through A-23. Again, the recent Port of Everett project was not required to do this testing despite documentation by EPA that these compounds have been found in the estuary and the present and historic presence of sources in the immediate project area. Further, these sources are hydrologically connected to the Port's project site. What criteria do the PSDDA agencies use in determining when this testing will be required and why haven't the Tribes, who manage fish and shellfish harvesting in the vicinity of the disposal site, been consulted during this decision-making process?

4. Bioassay efficacy for determining chronic effects to the aquatic ecosystem around the disposal site area:

The current set of biological tests have no known relationship to long-term, sub-lethal effects in the environment, such as reproduction impairment, increased disease susceptibility, and bioaccumulation through the food chain. We also have little baseline information by which actual impacts to marine fauna might be determined in the future and little information will

be collected during the PSDDA monitoring process to test for sub-lethal effects. However, the Port Gardner area has been shown to have a high incidence of tumor growth in bottom fish and shellfish. The Site Condition I screening levels recommended by the Tribes would have been the more cautious, prudent approach, from a resource protection point of view, in light of this concern. What program have the PSDDA agencies developed, or are relying on, to increase our ability to monitor actual sub-lethal effects in the environment and tie this information to the current PSDDA bioassay guidelines? Will there be any expanded fish survey requirements, e.g., sampling in more than one direction, checking for tumors? Will use of Site Condition I be reconsidered? If not, why not?

5. Long-term monitoring of disposal area:

As currently constructed, the monitoring of the PSDDA disposal site will not allow assessment of sub-lethal dredge disposal impacts to biological resources.

6. Long-term monitoring of fate and transport of contaminants in food chain:

As primary harvesters and consumers of fish and shellfish resources in the disposal site area, tribal members are at high risk from any exposure to toxins which enter the food chain and either bioaccumulate or are consumed directly by tribal members. We have related this concern repeatedly during the PSDDA process with no response. What studies were done, or will be done, to assess the unique risk to tribal members from release of contaminants into the marine environment?

7. Monitoring of use of disposal area by fish and shellfish:

As discussed previously, fish and shellfish monitoring is inadequate to determine changes in use of the area or project vicinity or effects on biologic populations in the disposal site area.

8. Dispute resolution process:

The current decision-making process appears to allow no avenue for tribal participation outside the normal public comment period on applications and the 15-20 minute public comment opportunity provided at the annual PSDDA review meeting. This is not an adequate opportunity to resolve the significant concerns of the Tribes regarding the PSDDA program. At our

meeting last fall, the Corps claimed that the Tribes must pursue legal action in order to resolve their concerns, since none of the requested changes would be made or would be considered during any pre-litigation negotiation. Is that still the Corps' position?

9. Notification to Tribes of dredging activities and schedules:

Currently, we receive no information regarding project scheduling or implementation. We would like early notification to our fisheries office of project activities in the Port Gardner area. The name(s) of contact persons will be provided upon request.

10. Development of alternative disposal sites:

We continue to oppose the use of the Port Gardner site due to its proximity to the reservation and aquatic resources harvested by the Tribes. We believe continued efforts should be made to secure the ability to use the alternate site in Saratoga Passage, should the Port Gardner site be closed temporarily or permanently.

11. Definition of terms in testing/assessment guidelines:

SL's are set for "total PCB's" and yet, with the Port of Everett project, for example, only 4 out of 10 main PCB groups were tested. What does "total" mean?

12. Clarification of threshold determinations:

What happens when sediment contaminant levels which are less than the detectable amount for that sample can still add up to more than the stated threshold? For example, the Port of Everett project tested for only 4 of the 10 main types of PCB's and each was below detection limits. However, the total could very well have exceeded the screening level for total PCB's. Being below DL does not equate to zero.

We hope that our concerns will be addressed in the PSDDA annual review and that a process more conducive to resolution of these issues than the annual meeting forum will be established. We urge, again, that the PSDDA program be designed to err on the side of caution, e.g., performing surveying, sampling, and testing which may prove unnecessary after several cycles but is justified now from the current state of scientific knowledge or lack thereof, instead of eliminating at the outset testing which the agencies aren't sure will be productive.

Mr. Raymond G. Schmitz  
April 18, 1990  
Page 5

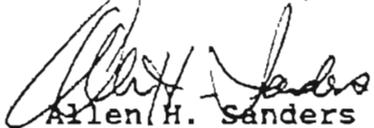
In PSDDA decisions, the federal agencies must, of course, keep in mind their special trust responsibility to Indian tribes and for protection of the treaty fishing resource. This responsibility calls for the strictest fiduciary standards and the cautious, prudent approach the Tribes have been urging.

Sincerely,

THE TULALIP TRIBES OF WASHINGTON

  
David J. Somers  
Senior Habitat Biologist

BELL & INGRAM, P.S.

  
Allen H. Sanders  
Tulalip General Counsel

DJS/AHS/mka

cc: Tulalip Board Members  
Clarence Hatch, Executive Director  
Terry Williams, Fisheries Director



April 19, 1990

John Wakeman  
 Seattle District  
 US Army Corps of Engineers  
 P.O. Box C-3755  
 Seattle, WA 98124-2255

Dear John:

Thank you for the opportunity to present our concerns at the PSDDA annual meeting. We are very pleased by your summary comments in which you indicated workgroup sessions will be held to address our concerns. We intend to participate in these sessions.

Our concerns relate to the PSDDA process and it's complexities; not with the environmental criteria. We believe high quality (environmentally protective) decisions can be made more efficiently. Our clients are extremely concerned with the amount of time and expense needed to negotiate the PSDDA and permitting processes.

Areas we recommend for more detailed analyses are:

1. PSDDA/Permitting relationship and ways to streamline the overall process

The current PSDDA analysis, Shoreline Management Act (SMA), and Corps permitting processes are largely sequential. First, sediments must be completely characterized using the PSDDA procedures. Second, the local SMA permit is advertised and issued. Third, the Corps permit is advertised and issued. The entire process is extremely time consuming. (1)

Potential process modifications which we would like to see investigated:

- A. Joint application and permitting procedures with the SMA authorities and Corps.
- B. Concurrent public notice and PSDDA procedures.
- C. Any other creative procedures which could save processing time.

2. Subsurface sediment sampling and testing requirements

The specialized and very costly equipment required to collect subsurface sediments make it extremely important to identify conditions where the requirements for subsurface sampling and testing may be relaxed. (2)

We strongly support the decision reached at the annual meeting which will allow PSDDA regulatory officials the ability to on a case-by-case basis to determine whether there is need to sample subsurface sediments. If subsurface sampling can be reduced or eliminated, this will result in tremendous cost and time savings for our clients.

The basis for such decisions will be based on the "reason to believe" test. Based on comments received at the annual meeting, there appears to be concern as to what factors should be considered in making this decision. We would like to work with you to further define these factors.

### 3. Reference sediments

There appear to be endless procedural difficulties in collecting, analyzing and using reference bay sediments. Problems range from inability to collect the correct grain size sediments to having so called "reference sediments" display a high degree of toxicity.

We believe that development of a reference area PSDDA Regional Area Decision (RAD) should be investigated. This RAD would define acceptable PSDDA reference sediment values for use in each of the bioassays.

Once identified, it would be the dredger's choice of whether to use the RAD reference or to collect his own reference material for comparison. If the dredger chooses to use the RAD reference and his bioassays fail, he should have the option of collecting new sediment samples and retesting using a reference sediment.

### 4. Laboratory analytical methods

Each chemical analyses laboratory is using slightly different procedures. Based on our discussions with each other, it became apparent that there is confusion at the laboratory level regarding what constitutes the preferred PSEP methods and what constitutes acceptable PSEP/PSDDA methods. In some instances the later approach, although not preferred by PSEP, will be the method of choice by the laboratories.

We believe it important that a work group session, in which all the commercial laboratories are present, be held to thoroughly explore the available protocols currently being used. Better understanding regarding

acceptable protocols of choice will result from these sessions.

Additionally, this work group could serve as a forum to discuss horror stories which have occurred (eg. interferences which cause detection limits to exceed maximum level values) and to identify contingency procedures which should be followed if these situations occur in the future.

5. Data reporting

5

Use of the current LOTUS data input system is laborious. With some format changes, the program can become significantly more user friendly. We are pleased that Dave Fox has scheduled a workgroup on June 6 to address this issue.

Again we would like to reiterate our offer to work with you to resolve the above issues. If you have any questions or would like further clarification, please contact any or all of us.

Sincerely,



-----  
Carl Kassebaum  
CRK Envr. Mngt.  
525-6047



-----  
Jay Spearman  
Jay W. Spearman,  
Consulting Engineer  
822-6021



-----  
Philip Spadaro  
Hart Crowser  
324-9530



-----  
William Elmer  
Reid Middleton  
775-3434



-----  
John Luna  
SAIC Inc.  
252-6800



-----  
Patricia O'Flaherty  
CH2M Hill  
453-5000



# INVERT•AID

Diane E. Robbins

BIOLOGICAL CONSULTANT

8414 - 280TH STREET EAST  
GRAHAM, WA 98338  
(206) 846-2774



Recently a test which INVERT•AID conducted in December of 1989 was deemed invalid by the Corps PSDDA Manager. Although we had conducted the test several times in order to perfect the laboratory procedures, it was a new test for INVERT•AID and we were unfamiliar with data requirements. Accordingly, we asked the Corps for information and were directed the Management Plan pp. 5-16 through 5-24. We used protocols recommended by the Corps in the Management Plan (i.e. the protocol of Dinnel and Stober) and adhered to the control limits stated repeatedly within MPR i.e. 50% mortality + abnormality in the seawater negative control. The control mortality-abnormality for this particular test was 18%, which we believed to be well within the 50% rule. ①

Data for this test was rejected due primarily to unacceptably high mortality-abnormality of the seawater negative control. The acceptable level stated is 10%, a figure that does not appear anywhere in PSDDA documents in reference to the Echinoderm Larval bioassay. An experts' larval workshop, to which INVERT•AID was not invited (ostensibly because we were not experts) recommended that 10% control mortality-abnormality be considered the performance standard. This performance standard figure does not appear in PSDDA literature, in fact a "change page" circulated and dated 2/2/90 recommends the Mortality Performance limit at <50% in the seawater Control.

If INVERT•AID had been aware of this requirement, we would never have submitted the results for this test and would have rerun the test within the allowable sediment holding times, saving ourselves, the consultant for whom we contracted this work, and the client considerable time, worry, and, last but not least, money.

The upshot of all this is: IF WE CAN'T FIND THE RULES, WE CAN'T PLAY THE GAME!



### Enclosure 3. Responses to Comments Received.

The following responses are attached in the order given below.

1. Lummi Indian Business Council: letter from Samuel M. Cagey, Sr., Chairman of Business Council, dated March 30, 1990. This letter is Attachment 15 to Enclosure 2 of this package (ARM Minutes). Response was by letter dated June 1, 1990.

2. Tulalip Tribe: letter from David Somers, Senior Habitat Biologist, and Allen H. Sanders, General Counsel, dated April 18, 1990. This letter is Attachment 23 of Enclosure 2 of this package (ARM Minutes). Response was by letter dated June 4, 1990.

3. Washington Public Ports Association: letter from Eric Johnson, dated April 2 and April 17, 1990. This letter is Attachment 22 of Enclosure 2 of this package (ARM Minutes). Response was by letter dated June 20, 1990.

4. Bonnie Orme, Private Citizen. Letter dated March 30, 1990. This letter is Attachment 16 of Enclosure 2 of this package (ARM Minutes). Response is by information in this memorandum.

5. Carl Kassebaum, CRK Environmental; Jay Spearman, Jay Spearman Associates; Philip Spadaro, Hart Crowser; William Elmer, Reid Middleton; John Lunz, SAIC Inc.; and Patricia O'Flaherty, CH2M Hill: Letter dated April 19, 1990. This letter is Attachment 24 of Enclosure 2 of this package (ARM Minutes). Response is by information in this memorandum.

6. Diane E. Robbins, Invert-Aid. Letter is undated, but was hand-delivered on April 12, 1990. Letter is attachment 25 to Enclosure 2 to this package (ARM Minutes). Response is by information in this memorandum.





REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
SEATTLE DISTRICT CORPS OF ENGINEERS  
P. O. BOX C-3755  
SEATTLE, WASHINGTON 98124-2255

Regulatory Branch

JUN 1 1990

Samuel M. Cagey, Sr., Chairman  
Lummi Indian Business Council  
2616 Kwina Road  
Bellingham, Washington 98226-9298

Dear Mr. Cagey:

Thank you for taking the time to prepare an issue paper for the PSDDA Second Annual Review Meeting regarding Lummi Tribe concerns. This letter responds to concerns addressed in your letter dated March 30, 1990, (enclosure).

We recognize that the Lummi Tribe has an important interest in managing the fishery resources in Bellingham Bay. The Centennial Accord sets the framework for mutual respect and acknowledgement of responsibilities in resolving issues between tribes and the State of Washington. As such, the Department of Ecology understands that the open water disposal site in Bellingham Bay is still an issue with the Tribe. Accordingly, Ecology is seeking a resolution of this issue as part of the PSDDA process.

In your letter you had indicated concern with the EIS and requested that a supplemental EIS be written with the Tribe as a lead agency. We do not believe that a supplemental EIS is required as supported by further discussions in this letter. In answer to the question of lead agencies it might be helpful to explain the reason that U.S. Environmental Protection Agency Region 10 (EPA), Seattle District Corps of Engineers, and the Washington State Departments of Natural Resources and Ecology cooperated in conducting the PSDDA study. EPA, Corps and Ecology are regulatory agencies that have the responsibility for implementing the Clean Water Act (CWA) in the Puget Sound area. DNR is also a regulatory agency responsible for issuing site use permits, and has the proprietary responsibility for managing state lands, including those designated for dredged material disposal. PSDDA was intended to assist our four agencies in carrying out these responsibilities. However, we have sought inputs from others, especially the tribes regarding treaty fishing activities. We will continue to seek your input as we implement the PSDDA management plans.

In your questioning of the selected Bellingham Bay disposal site you indicated a belief that there would be damage to Dungeness crab and to gill nets due to dredged material disposal at that location. The disposal site selection process was an open process and involved close coordination with all interested parties including the Tribes and Federal and State resource agencies. We do not feel that a site location change is warranted, or that a

supplemental Environmental Impact Statement is needed. However, we are receptive to further discussions of your concerns.

The PSDDA Phase II Final Environmental Impact Statement (Exhibit F; pp F-2) and Record of Decision, document previous coordination with the Lummi Tribe on potential crab resource and net obstruction issues relative to the Bellingham Bay disposal site. It is unfortunate that tribal crab catch data requested by Mr. Frank Urabeck in letter to Mr. Merle Jefferies dated July 12, 1989 was not provided. Therefore, these data could not be evaluated in the FEIS. Nevertheless, trawl data from the University of Washington Fisheries Research Institute provided a great deal of information on marine resources throughout Bellingham Bay, and was deemed sufficient to evaluate resource concerns relative to the selected and alternative disposal sites. These data were carefully reviewed relative to marine resource and human use issues and the PSDDA agencies believe that the selected site is the most environmentally practicable alternative site available.

With respect to crab resources, the 100 crab per hectare guideline was established by the Washington Department of Fisheries (WDF) in a letter dated January 26, 1986 to the PSDDA study director. This guideline was only used as a qualitative yardstick to evaluate crab resource concerns at all of the PSDDA disposal sites throughout Puget Sound. Seasonal and average crab densities at alternative and selected Bellingham Bay disposal sites were well below the WDF guideline. Other important factors were also taken into consideration when evaluating these data, including numbers and locations of gravid female crabs, seasonal population dynamics, and proximity to major crab concentration areas. The data suggest that few gravid female crabs were found in the vicinity of any of the alternative sites including the selected site throughout the year-long study with seasonal sampling in February, May, July, and October 1987. Major crab concentration areas appeared to be restricted to the 10 - 20 meter isobath due west of Post Point. In response to your comment that "several crab fishermen ... have fished this site with good success", we ask that you provide us with whatever information that you might have to document this fishery. It is possible that Lummi Tribal crab fishermen fishing in the vicinity of the selected site (presumably using pots) may be attracting crabs from the high concentration area approximately 0.6 nautical miles to the east.

Potential impacts to Dungeness crab resources in Bellingham Bay are not considered to be significant (see Phase II FEIS, page 4-58 to 4-60 for discussion of crab impacts). To further verify that "human health" concerns will not result from crab proximity to the disposal site, crab bioaccumulation studies are being conducted in May 1990 as part of the Bellingham Bay baseline monitoring activities. We would be willing to consider conducting a limited crab study in the disposal area this year, during the open dredging/disposal window (June 16 - October 31), in cooperation with the Lummi Tribe. Data from this study would be expected to verify our findings that few crabs are present

in the disposal area. We do not anticipate any disposal at the Bellingham Bay site this year. Therefore, the crab survey would expand our knowledge of the pre-disposal or baseline condition.

We feel that we have adequately addressed your concerns regarding impacts from underwater obstructions on the salmon gillnet fishery in the Management Plan for the disposal site. We have specifically stipulated debris removal requirements and guidelines for dredged material to eliminate this impact to the gillnet fishery (see Phase II MPR, pages C-15 to C-16). Dredging plans will include methods of separating and removing debris from dredged material prior to open-water disposal. In addition, the regulatory agencies are carefully reviewing each project proposed in terms of the volume and nature of the dredged material to ascertain the potential for unacceptable mound formation which could adversely impact fishing operations. If the potential for unacceptable mound formation exists, we may require disposal at alternative locations or special disposal operations.

In order to provide the Lummi Tribe with a greater opportunity to participate in the PSDDA program, we propose to increase our coordination on dredging/disposal projects located within the Tribe's usual and accustomed fishing grounds. This will allow tribal input to the PSDDA agency dredged material evaluation process. With regard to sampling and testing plans, our current policy is that no sampling and testing is to commence until the agent/dredging applicant has a PSDDA agency approved sampling and testing plan. It is proposed that the Corps provide the proposed sampling/testing plan submitted by the applicant to a designated POC (point of contact) for the Tribe at the same time the plan is being coordinated with the other PSDDA agencies (Ecology, WDNR, EPA). A deadline for review comments will be established for each project, to facilitate timely reviews. All comments submitted by the Tribe within the deadline period will be considered by the PSDDA agencies prior to finalizing the Sampling/Testing Plan, and the Tribe will be advised of all changes requested by the PSDDA agencies prior to plan approval.

Additionally, dredging test data (for material to be disposed within the Tribe's usual and accustomed fishing grounds) submitted by the dredging applicant to the Corps, and subsequently sent to the PSDDA agencies for review, will be made available to the Tribe for review on request. This request should be made at the time the Tribe submits comments on the sampling and testing plans to the Corps. At a minimum, a copy of the PSDDA agency decision memorandum documenting the determination of suitability of the dredged material tested for unconfined disposal at a PSDDA disposal site will be sent to the tribal POC for projects where disposal at the Bellingham Bay disposal site is proposed. This memorandum will document any departures from the PSDDA guidelines and set forth the reason for applying "Best Professional Judgement" in lieu of exact adherence to the guidelines.

Please let me know if you are interested in our proposal allowing an opportunity for tribal participation in dredged material evaluations, and your interest in participating in a cooperative crab study this summer. Please contact me (206) 764-3431 or Mr. Frank Urabeck at (206) 764-3708 if you have any questions. Thank you again for taking the time to participate in the Second Annual Review process.

Sincerely,



Raymond G. Schmitz, P.E.  
Chief, Operations Division

Enclosure

Copies Furnished:

Warren Baxter, Seattle District, U.S. Army Corps of Engineers  
Bob Parker, Seattle District, U.S. Army Corps of Engineers  
Siri Nelson, Seattle District, U.S. Army Corps of Engineers  
Frank Urabeck, Seattle District, U.S. Army Corps of Engineers  
David Kendall, Seattle District, U.S. Army Corps of Engineers  
Mike Palko, Washington State Department of Ecology  
Keith Phillips, Washington State Department of Ecology  
Tom Gries, Washington State Department of Ecology  
David Jamison, Washington State Department of Natural Resources  
Betsy Striplin, Washington State Department of Natural Resources  
Ron Lee, U.S. Environmental Protection Agency  
John Malek, U.S. Environmental Protection Agency



DEPARTMENT OF THE ARMY  
SEATTLE DISTRICT, CORPS OF ENGINEERS  
P.O. BOX C-3755  
SEATTLE, WASHINGTON 98124-2255

REPLY TO  
ATTENTION OF

Regulatory Branch

JUN - 4 1990

Messrs. David J. Somers and Allen H. Sanders  
Tulalip Tribes  
6700 Totem Beach Road  
Marysville, Washington 98270

Dear Messrs. Somers and Sanders:

This letter responds to the issues raised during and after the Second PSDDA Annual Review Meeting in your letters dated April 2, 1990 and April 18, 1990 (enclosures 1 and 2). Since your letter dated April 18 restates and elaborates on the issues raised in your earlier letter, we will direct our responses specifically toward the later letter. Our specific responses relative to each concern raised follow:

(1) Page 1, no. 1. "Role of Tribes in PSDDA decision making:".

(a) "Tribes were not part of the original site selection team"...

Response: A review of the history behind the inception of the "site selection team" is helpful in order to answer this question. In 1984, several disposal sites were closed and the public expressed concern over the dredged material evaluation procedures in use at that time. Further closures occurred through 1988. As a result of the closure of disposal sites and the lack of publicly acceptable evaluation procedures, the Seattle District, U.S. Army Corps of Engineers (Corps), U.S. Environmental Protection Agency (EPA), Washington State Department of Natural Resources (DNR), and Washington State Department of Ecology (Ecology) agreed to undertake a comprehensive study of dredging and unconfined open-water disposal of dredged material. The agencies also agreed to write a combined environmental impact statement (EIS) for the advance identification of unconfined open-water disposal sites in the Phase I area (Central Puget Sound) pursuant to 40 CFR 230.80. This project became known as the Puget Sound Dredged Disposal Analysis or PSDDA and these agencies are referred to as the PSDDA Agencies. The reason EPA, the Corps, and Ecology were involved in the project is because of their regulatory authority under the Clean Water Act. DNR is also a regulatory agency responsible for the issuing of site-use permits and has the proprietary responsibility

for managing state lands, including those designated for dredged material disposal. In order to undertake the project, including preparation of the EIS, these agencies formed three technical working groups in April 1985. One of these groups was the Disposal Site Work Group (DSWG).

Though not included as a PSDDA agency member of the Disposal Site Work Group (DSWG), the Tribes were invited to participate in all DSWG Meetings. The Tulalip Tribes were mailed announcements of all work group meetings and sent summary memoranda of all DSWG meetings. DSWG meetings were open to the public, and the work group attempted to satisfactorily address all concerns raised during these meetings. The Tulalip Tribes did not attend the DSWG meetings nor participate in the site selection process. Early tribal input to the siting process would have been welcomed. The first indication of concern by the Tulalip Tribes was informally expressed in late October 1986 by Mr. Terry Williams, Fisheries Director, in a telephone call to Dr. David Kendall, PSDDA Disposal Site Work Group Chairman. This call was after over twenty-five separate DSWG and/or public meetings and a special meeting with Central Puget Sound Tribes in early October 1986, attended by Mr. Daryl Williams, Tulalip Tribal representative. In response to Mr. Terry Williams's concerns several meetings were held with him. Attempts were made to satisfy him that normal disposal activity would not be allowed to complicate tribal fishing (Navy Homeport disposal was a special case), that adult salmon that may mill around in the disposal site area would not be at the depths of the disposal site (420 feet MLLW), and that the PSDDA dredged material evaluation procedures were sufficiently protective to preclude unacceptable adverse effects to shrimp and crab fishery resources that may be in the vicinity of the Port Gardner preferred disposal site. Ongoing disposal site monitoring will provide a means of verifying that PSDDA is sufficiently protective to preclude unacceptable adverse effects to shrimp and crab resources in Port Gardner. As a result of the Tribes' comments, several changes were made regarding the Port Gardner Site. A proposed navigation position buoy for the disposal site was eliminated to avoid conflicts with tribal fishing activities. During subsequent coordination meetings, changes were made to the disposal site management plans to eliminate night-time use of the disposal site when tribal fishing is occurring at this location.

Tribal concerns were again expressed during public review of the Draft Phase I EIS when the Tribes indicated a preference for an alternate site located in Saratoga Passage. Exhibit C of the FEIS documents those concerns and the responses by the PSDDA agencies. Given that most of the dredged material that is likely to be discharged at the Port Gardner site is expected to be dredged by projects located within the City of Everett or Snohomish County, it is highly

unlikely that Island County would grant a permit for the Saratoga Passage disposal site which is about 20 nautical miles round trip greater haul distance for Everett projects. The Port Gardner site has received about 920,000 cubic yards of dredged material from the Everett Navy Homeport Project since disposal began in November 1989, with concurrence by the Tulalip Tribes. Accordingly, the Port Gardner site has already been impacted, whereas the Saratoga Passage site is presently undisturbed.

(b) Tribes "input during public comment periods is routinely ignored."

Response: Tribal comments are fully considered. As noted above, a proposed navigation positioning buoy was abandoned and additional site use restrictions were included in the site use management plan.

(c) "During the PSDDA annual meetings, the opportunity to discuss management issues important to the Tribes are limited to 15-20 minute "public comment" periods."

Response: Though the 1990 PSDDA Annual Review Meeting (ARM) did have a 15 to 20 minute limit for oral public comment, this was not the only opportunity for the Tribes to present their concerns. The purpose of the ARM is to assess impacts and the need for plan revisions based on both environmental and economic considerations (Management Plan Report, 9-4). The 15 to 20 minute comment period limit was used to insure that the meeting was conducted in an efficient manner. Nevertheless, the ARM does provide one opportunity in which the Tribes may and have been able to participate. A Tribal representative (Mr. Somers) did in fact participate in part of the recent ARM held on April 11-12, 1990. Despite this announced limit on oral comments, it was stated at the meeting that further opportunity for discussions could occur during the second session (April 12). Written comments were also invited through April 19, 1990, with a promise that these would be responded to by letter. This letter reflects that commitment.

Furthermore, the ARM does not present the only forum in which the Tribes may present Tribal concerns. In fact, prior to the ARM, a separate meeting between the Tribes and the Corps was set for April 16, 1990. It was believed that such a meeting would provide a better forum to discuss tribal concerns. The meeting was subsequently held on April 16, 1990.

(d) "This is an inadequate and inappropriate forum for involving tribal government and carrying out your federal trust responsibilities to the tribes."

Response: We agree that the ARM may not be sufficient for dealing with long-standing tribal issues. However, it does provide the Tribes an important opportunity to express its concerns in a public forum. Separate meetings can and have been arranged with the Tribes to discuss tribal issues.

(e) "There should also be more opportunity for the general public for open discussion at the annual review meeting."

Response: We will consider format changes for the next ARM. The PSDDA Annual Review process is generally intended to deal with special issues and their resolution in order to make the necessary adjustments and changes in the program. Even without a change in the ARM format, the Tribes have the opportunity to clarify issues and concerns in writing. These then become a part of the meeting record. Issues raised during the meeting are responded to as part of the written record of the meeting. Additional follow up meetings with the Tribes may be arranged if needed to deal with unresolved issues.

(f) "The Tulalip Tribes hereby requests that it be included in the group of governmental entities determining appropriate sampling plans .... and evaluating test results."

Response: To provide the Tribes with a greater opportunity to participate in the PSDDA program we propose to increase our coordination on dredging/disposal projects located within the Tribes' usual and accustomed fishing places. This will allow tribal input to the PSDDA agency dredged material evaluation process. With regard to sampling and testing plans, our current policy is that no sampling and testing is to commence until the agent/dredging applicant has a PSDDA agency approved sampling and testing plan. It is proposed that the Corps provide the proposed sampling/testing plan submitted by the applicant to a designated POC (point of contact) for the Tribes at the same time the plan is being coordinated with the other PSDDA agencies (Ecology, DNR, EPA). A deadline for review comments will be established for each project, to facilitate timely reviews. All comments submitted by the Tribes before the deadline will be considered by the PSDDA agencies prior to finalizing the sampling/testing plan, and the Tribes will be advised of all changes requested by the PSDDA agencies prior to plan approval.

Additionally, dredging test data (for material proposed to be disposed within the Tribes' usual and accustomed fishing places) submitted by the dredging applicant to the Corps, and subsequently sent to the PSDDA

agencies for review, will be made available to the Tribes for review on request. This request should be made at the time the Tribes submit comments on the sampling and testing plan to the Corps. At a minimum, a copy of the PSDDA agency decision memorandum documenting the determination of suitability of the dredged material tested for unconfined disposal at a PSDDA disposal site will be sent to the tribal POC for projects where disposal at the Port Gardner disposal site is proposed. This memorandum will document any departures from the PSDDA guidelines and set forth the reason for applying "Best Professional Judgement" in lieu of exact adherence to the guidelines.

(g) "The Tribes also requests it be part of any governmental group deciding whether a departure from PSDDA guidelines for a Port Gardner project is appropriate."

Response: See responses to comments 1(f) above and 2(b) below. The above proposed coordination will allow the Tribes to make their views known to the PSDDA agencies prior to any agency decision being made regarding the suitability of project sediments for discharge at the Port Gardner disposal site. We recognize the Tulalip Tribes' important interest in the management of the fishery resources in Port Gardner (Possession Sound). The Centennial Accord sets the framework for mutual respect and acknowledgement of responsibilities in resolving issues between Tribes and the State of Washington. As such, the Department of Ecology understands that the open-water disposal site in Port Gardner (Possession Sound) is still an issue with the Tribes. Accordingly, Ecology is seeking a resolution of this issue as part of the PSDDA process.

(2) Page 1, no. 2. "Criteria for determining when PSDDA sampling guidelines may be violated:".

(a) "Criteria developed after months and even years of investigation become dispensable. We feel that this situation is unacceptable and results in significant management decisions being made which are outside the scope of the original EIS and which occur without the benefit of direct public involvement."

Response: The PSDDA EIS covered disposal site locations and site management conditions, not dredged material evaluation procedures (see Phase I FEIS, pp. 4-93 to 4-128). The Evaluation Procedures Technical Appendix (EPTA) and Appendix A of the Management Plan Reports (MPRs for Phase I and II) discuss the evaluation procedures for sampling and testing recommended under the PSDDA program. The PSDDA guidelines set forth in the MPR and EPTA are just that, "guidelines", they are not criteria. PSDDA allows for departures or variations in its guidelines (Phase I MPR, page A-25). Documentation of the rationale for a departure

is required when it occurs. The PSDDA evaluation procedures are fully consistent with the Clean Water Act (CWA) 404 (b)(1) guidelines (EPTA, pp. II-1 to II-20). In every case where there has been a departure from the PSDDA guidelines, the interpretation of the data was generally more conservative and environmentally protective than that prescribed by the PSDDA guidelines. Less latitude was allowed the Port of Everett in making the decision on material suitability or unsuitability for unconfined open-water disposal.

(b) "We would like the PSDDA agencies to develop criteria for assessing when deviations from the PSDDA sampling guidelines may be allowed. These criteria should be strict ... The Tribes should also be part of the group deciding the criteria for any such waivers."

Response: PSDDA Agency technical evaluators attempt to apply the PSDDA sampling and analysis guidelines uniformly across dredging projects. PSDDA evaluation procedures for assessing dredged material suitability for unconfined open-water disposal should not be confused with "rules" or "standards" which might be construed as inviolate. The procedures were set up as "guidelines" to be generally followed. Implementation of these guidelines allows for and often requires exercising "Best Professional Judgement" (BPJ) when scoping project sampling/analysis, interpreting chemistry and bioassay data, and when minor procedural variations occur. The reasons for departures are explained and documented, as provided in the guidelines. It is reasonable to expect that during the early implementation of a complex program such as PSDDA, some procedural variations would occur as PSDDA regulatory personnel, dredgers/applicants, and contract laboratories became familiar with the PSDDA evaluation procedures. So-called deviations/variations have become markedly less frequent, and most applicants currently conducting PSDDA sampling/testing readily comply with the PSDDA sampling and testing guidelines laid out in the PSDDA documents. PSDDA regulatory personnel exercised BPJ in the case of the Port of Everett Marina Project, and are satisfied that the variations in no way jeopardized the regulatory decision made. Sampling and analysis guideline departures for the Port of Everett Project referred to in your letter and in a previous letter dated January 26, 1990, were previously discussed and reasons for departures were documented in the Corps permit decision (Amendment to the Statement of Findings, Environmental Assessment and Findings of No Significant Impact of 25 January 1990) dated February 14, 1990.

With regard to sharing lead responsibility with the PSDDA agencies it might be helpful to reiterate the reason that EPA, the Corps and the Washington State Departments of

Natural Resources and Ecology cooperated in conducting the PSDDA study. EPA, the Corps and Ecology are regulatory agencies that have the responsibility for implementing the Clean Water Act (CWA) in the Puget Sound area. DNR is also a regulatory agency responsible for issuing site-use permits, and has the proprietary responsibility for managing state lands, including those designated for dredged material disposal. PSDDA was intended to assist our four agencies in carrying out our responsibilities. However, we have sought inputs from the Tribes regarding treaty fishing activities and we will continue to use your input as we implement the PSDDA management plans.

(3) Page 2, no 3. "Criteria for determining when chlorinated guaiacol testing, and testing for other chemicals of concern near specific pollution sources, is required."

Response: Existing guidelines are considered to be sufficient to evaluate chemical concerns, but further work in evaluating and refining guidelines is ongoing and will be forthcoming when appropriate. One aspect of Ecology's annual Management Plan Assessment Report (MPAR) is to address this concern on an annual basis as new chemical concerns arise and/or better evaluation procedures are developed, or as a body of data becomes available to assess the likelihood of certain contaminants near certain sources.

(a) "Again, the recent Port of Everett project was not required to do this testing despite documentation by EPA that these compounds have been found in the estuary and the present and historic presence of sources in the immediate project area."

Response: The report to which you refer is the Tetra Tech (1988) report for the "Everett Harbor Action Program: Analysis of Toxic Problem Areas". This report demonstrates that chlorinated guaiacols were largely restricted to the East Waterway with no indication of chlorinated guaiacols at a station located near the Port of Everett marina (sta. SR-07). Chlorinated guaiacols were largely restricted to a single station within the East Waterway (sta. EW-01) located at the northeastern end of the waterway. Chlorinated guaiacols were also analyzed by the Navy as a chemical of concern (COC) under the terms stipulated by the Settlement Agreement during Element I testing and all samples demonstrated that this COC was undetected. PSDDA guidelines state that additional chemicals may be required to be tested if there is a "reason to believe" they are present. These data fail to establish a "reason to believe" that chlorinated guaiacols were a problem chemical at the Port of Everett Marina dredging site, and were not required to be tested. All relevant data including historical data and potential chemical sources are evaluated by the PSDDA

agencies prior to formulating requirements for chemical testing.

(b) "Further, these sources are hydrologically connected to the Port's project site."

Response: There is little or no significant hydrologic connection from the Port of Everett's marina to the East Waterway, relative to the concern for chlorinated guaicols as demonstrated in the Tetra Tech study conducted for the Environmental Protection Agency. The Navy Homeport Environmental Assessment for the Element I project area discusses the potential sources of kraft mill effluents. The nearest kraft mill site is the Weyerhaeuser mill site, which discharges through settling ponds on Smith Island into Steamboat Slough north of Smith Island, about 3 miles north of the Port of Everett Marina dredging area. Scott Paper located directly south of the Element I site is not a kraft mill and the Tetra Tech report did not show elevated levels of chlorinated guaicols in its vicinity (see Tetra Tech (1988), page 35 (Figure 5) and page 132 (Figure 28)).

(c) "What criteria do the PSDDA agencies use in determining when this testing will be required..."

Response: The PSDDA agencies exercise Best Professional Judgement to establish a "reason to believe" that a particular chemical is a concern, after evaluating all potential sources within a project area, all relevant historical environmental data available, and reviewing the PSDDA guidelines (MPR 5.5; EPTA 7.1.1).

(d) "why haven't the Tribes, who manage fish and shellfish harvesting in the vicinity of the disposal site, been consulted during this decision-making process?"

Response: See response to comment 1(a). The Tulalip Tribes were given opportunity to participate in all evaluation procedures work group meetings, but elected not to participate. The Tribes are sent copies of all Public Notices regarding proposed dredging and disposal at the Port Gardner disposal site, and have the opportunity to review test data and provide written comments prior to the permit decision. Concerning the Port of Everett project, the Tribes were provided with the testing results and provided comments prior to the permit decision being made (also see response to comment 2(b)). As noted in response to comment 1(f), additional opportunities are being extended to the Tribes for influencing the decision-making process.

(4) Page 2, no. 4. "Bioassay efficacy for determining chronic effects to the aquatic ecosystem around the disposal site area:".

Response: Apparent Effects Threshold (AET) development does provide some information regarding sublethal/chronic effects. AETs are the concentration of each chemical above which no sample containing that chemical is found to be without biological impact. The development of AETs provides some chronic sublethal effects information because the benthic infaunal response was used as one of the four biological effects evaluation factors (the four biological indicators are the benthic infauna index, amphipod bioassay, sediment larvae bioassay, and saline microtox bioassay) to establish an AET for any given chemical of concern. These AETs were established independently for each biological test on a chemical specific basis for each of 71 chemicals (EPTA page II-91). The AETs were used in the development of the PSDDA maximum levels (MLs) and screening levels (SLs). An SL for chemical testing is a guideline used to define the concentration of a chemical in dredged material below which there is no reason to believe unacceptable adverse impacts would result from unconfined open-water disposal. An ML is the concentration level for each chemical above which there is reason to believe that the material would be unacceptable for unconfined open-water disposal. The MLs are equivalent to the Highest AET (HAET) value for a given chemical of concern. PSDDA screening levels (SLs) were generally established as 10 percent of the MLs, and were set between reference area and the lowest AET (LAET) value for a set of biological indicators (EPTA page II-96). In most cases, the LAET was derived from one of the three PSDDA bioassays (amphipod, sediment larvae, microtox) rather than the benthic infaunal response. The PSDDA bioassays, two of which have sublethal end points (microtox and sediment larvae), generally showed greater sensitivity than the benthic infaunal response. Ongoing full monitoring activities now underway at the Port Gardner site are expected to provide an assessment of the postdisposal site condition relative to baseline conditions and onsite/offsite impacts. (Also see response 4(d) below.)

(a) "The current set of biological tests have no known relationship to long-term, sub-lethal effects in the environment, such as reproduction impairment, increased disease susceptibility, and bioaccumulation through the food chain."

Response: The benthic resources assessment technique (BRAT) analysis of the Port Gardner site during siting studies and baseline monitoring investigations (including benthic infauna assessments) provide a good picture of baseline predisposal conditions downcurrent and offsite. Comparison of these data with postdisposal downcurrent and offsite stations will allow appropriate comparisons with monitoring triggers for changes in benthic community structure. The offsite benthic infaunal response and

bioaccumulation assessment in part, reflects the integration of long-term, sub-lethal effects such as reproductive impairment, increased disease susceptibility, and human health assessments. Physical impacts onsite obscure any assessment of impacts to benthic infauna, which might be attributable to subtle chronic/sublethal effects.

(b) "We also have little baseline information by which actual impacts to marine fauna might be determined in the future and little information will be collected during the PSDDA monitoring process to test for sub-lethal effects. However, the Port Gardner area has been shown to have a high incidence of tumor growth in bottom fish and shellfish."

Response: A substantial database on benthic community structure exists for Port Gardner. Coupled with the assessment of benthic community structure resulting from postdisposal monitoring, we will have the ability to assess chronic effects at the community level. A change in benthic community structure may result from acute (e.g., mortality) or chronic (e.g., reproductive impairment) toxicity. Benthic community structure is a sensitive variable because adverse impacts to a few species may cause measurable changes to many other species that compete with or rely on the impacted species. Regarding chronic/sublethal effects to other marine fauna, we are aware of the extensive studies by Malins et. al. demonstrating a high incidence of tumor growth in bottom fish and snellfish in the shallower areas of Port Gardner and other urban embayments throughout Puget Sound. However, predisposal environmental conditions within the area occupied by the Port Gardner disposal site, as demonstrated by the PSDDA site investigations and baseline monitoring studies, do not show the sediments in the area of the disposal site to be a potential source of these tumors. Poor sediment quality documented in portions of the East Waterway appear to be a more probable source for the tumors (Tetra Tech, 1988). Ongoing PSDDA monitoring of the Port Gardner site includes sampling and analysis for bioaccumulation to assess human health concerns. Also see response 7(a).

(c) "Site Condition I screening levels recommended by the Tribes would have been the more cautious, prudent approach, from a resource protection point of view,... concern."

Response: There appears to be some confusion as to what constitutes a Site Condition I response versus a Site Condition II response. Screening Levels (SLs) are the same for both Site Condition I and II. The magnitude of the biological responses, not chemistry, largely determines whether the material meets the definition of Site Condition I or II. For Site Condition I material, no biological (bioassay) "hits" (under two hit rule) are allowed. No

bioassay may exhibit a statistically significant (P less than 0.05) response over reference sediment and exceed 20 percent absolute mortality over control (EPTA page ES-14). Whereas, a single "hit" (under two hit rule) is allowed for Site Condition II.

For material to qualify under Site Condition I guidelines all chemicals must be lower than the ML1 values (EPTA pages ES-14 (Table 1), and II-120 to II-123 (Table II.8-4): note ML1=LAET (Lowest Apparent Effects Threshold Value)) and have no biological "hits". Site Condition II material may have some chemicals exceeding SL and ML1 values but less than ML2 (ML2 = HAET (Highest Apparent Effects Threshold Value) and show minor biological effects (i.e., one bioassay hit under two hit rule). Therefore, Site Condition I is generally more protective than Site Condition II.

The analysis of disposal alternatives for the PSDDA EIS evaluated fully the impacts of the disposal guidelines for Site Condition I, Site Condition II, and Site Condition III material at the Port Gardner disposal site, and supported the selection of the Site Condition II disposal guideline as the most practicable alternative to ensure no "unacceptable adverse effects" offsite.

(d) "What program have the PSDDA agencies developed, or are relying on, to increase our ability to monitor actual sub-lethal effects in the environment and tie this information to the current PSDDA bioassay guidelines?"

Response: We feel that data forth coming from full site monitoring at the Port Gardner site will provide a good assessment of the condition of the site and offsite areas relative to physical/chemical/biological impacts. The benthic infaunal data will provide an indication of potential sublethal chronic effects of disposal activities. Other monitoring data collected, including chemistry, tissue bioaccumulation assays, and bioassay data from onsite and offsite stations will also provide significant data relative to the onsite/offsite and predisposal/postdisposal impact assessment. Development and refinement of a chronic/sublethal test is ongoing and expected to be ready for regulatory use in about one year. This test, when ready for implementation, may be added to the suite of biological tests done as part of full and partial monitoring at the PSDDA nondispersive sites in the future.

(e) "Will there be any expanded fish survey requirements, e.g., sampling in more than one direction, checking for tumors?"

Response: No fish surveys will be accomplished this year during full monitoring of the site. We have added an

onsite one-time only bioaccumulation test this year as part of the ongoing full monitoring activities, to further verify the low potential for human health risk (also see response to comment 4(b) and 7(a)).

(f) "Will use of Site Condition I be reconsidered? If not, why not?"

Response: Yes, after several years of monitoring the Site Condition issue will be reexamined for each site. It should be noted that some interests have argued that Site Condition II is too restrictive and that Site Condition III should be acceptable.

(5) Page 3, no. 5. "Long-term monitoring of disposal area:

(a) "As currently constructed, the monitoring of the PSDDA disposal site will not allow assessment of sub-lethal dredged disposal impacts to biological resources."

Response: See response to comment 4(d) above.

(6) Page 3, no. 6. "Long-term monitoring of fate and transport of contaminants in food chain:

(a) "As primary harvesters and consumers of fish and shellfish... We have related this concern repeatedly during the PSDDA process with no response."

Response: Some tribal salmon fishing is known to occur in the disposal site, but no known shellfish harvesting takes place there. There is no reason to believe that any toxic chemicals will be taken up by fish caught by the tribal members from the vicinity of the disposal site (see Phase I FEIS, pp 4-103 to 4-104, and 4-109 to 4-110). Salmon are generally not found at the depths of the disposal site, and the seasonal siting studies confirmed the low abundance of crabs in the vicinity of the disposal site (see Phase I FEIS, pp 4-100 to 4-104, also pp C-19 to C-21).

(b) "What studies were done, or will be done, to address the unique risk to tribal members from release of contaminants into the marine environment?"

Response: Site selection studies were conducted by PSDDA agencies to identify a site with low natural resource and human-use conflicts and concerns. The Port Gardner site is removed from natural resource and human-use concentration areas (also see response 6(a) above). The development and implementation of PSDDA evaluation procedures were designed to provide protection to the environment and also to protect human health (see EPTA; Phase II MPR; and Phase I FEIS, pp 4-93 to 4-115). Disposal site monitoring will verify

whether unacceptable impacts are occurring offsite or onsite.

(7) Page 3, no. 7. "Monitoring of use of disposal area by fish and shellfish:".

(a) "As discussed previously, fish and shellfish monitoring is inadequate.. disposal site area."

Response: Fish and shellfish monitoring is not required, and would be of limited value in assessing impacts of disposal site use. The PSDDA strategy is to avoid conditions where there is any significant risk to harvested foodfish and shellfish, and to those persons that eat those fish and shellfish products. To further verify that there is a low potential for human health risk, the PSDDA agencies propose to conduct a one-time-only bioaccumulation test of onsite material as part of the ongoing full monitoring of the Port Gardner Site.

(8) Page 3, no. 8. "Dispute resolution process:".

(a) "The current decision-making process appears to allow no avenue for tribal participation outside the normal public comment period on applications, and the 15-20 minute public comment opportunity provided at the Annual PSDDA review meeting. This is not an adequate opportunity to resolve the significant concerns of the Tribes regarding the PSDDA program."

Response: See responses to comments 1(e) and 1(f).

(b) " At our meeting last fall, the Corps claimed that the Tribes must pursue legal action in order to resolve their concerns, since none of the requested changes would be made or would be considered during any pre-litigation negotiation. Is that still the Corps' position?"

Response: As was explained at the meeting with Mr. Sanders on April 16, 1990, this was not our understanding of what transpired at the meeting last fall. The meeting last fall concerned the Tribes' notice of intent to sue that was sent to EPA. The notice concerned the PSDDA advance identification decision. At the meeting last fall, it was explained to the Tribes that it would be premature for the Tribes to sue, because the PSDDA decision concerned advanced identification of a disposal site pursuant to 40 CFR 230.80. It was explained that as such, PSDDA did not constitute a final agency decision. It was further explained that a final agency decision would be a permit decision. This information was set forth in a letter dated September 28, 1989, from the Department of Justice to Mr. Douglas L. Bell (enclosure 3). Mr. Bell attended the fall meeting along with Mr. Sanders.

It was never the Corps' intent to leave the impression that the only way the Tribes could resolve their concerns was through legal action. It has always been our hope to resolve Tribal concerns without litigation. Our continued dialogue supports this fact.

(9) Page 4, no. 9. "Notification to Tribes of dredging activities and schedules:

(a) "Currently, we receive no information regarding project scheduling or implementation. We would like early notification ... contact persons will be provided upon request."

Response: We will work with the Tribes to set up an early notification procedure for projects scheduled for disposal at the Port Gardner site. The Tribes will need to establish a point of contact (POC) for this coordination. You should inform Mr. Stephen Wright, Chief of the Regulatory Enforcement Section, Seattle District Corps of Engineers (206/764-3495) of your designated POC, including address and telephone number. We are available to discuss coordination needed to address your concerns.

(10) Page 4, no. 10. "Development of alternative disposal sites:

(a) We continue to oppose the use of the Port Gardner site due to its proximity to the reservation and ... closed temporarily or permanently."

Response: We remain convinced that the selected Port Gardner site is the most practicable site available in serving the City of Everett and Snohomish County area. In the event the selected site was closed down either temporarily or permanently, the nearest available alternative site would be used, or material may be left in the nearshore environment/channel. Only permitted sites can be used (e.g., Elliott Bay, Rosario Strait, Commencement Bay).

(11) Page 4, no. 11. "Definition of terms in testing/assessment guidelines;"

(a) "SLs are set for "total PCB's" and yet, with the Port of Everett project, for example, only 4 out of 10 main PCB groups were tested. What does "total" mean?"

Response: PSDDA currently requires the reporting of total PCBs only. There are 209 possible PCB congeners, approximately 100 of which are commonly found in environmental samples nationwide. Total PCB quantification for PSDDA projects involves the summation of all PCB

congeners present in a sediment sample. One method routinely used for total PCB quantification is Aroclor analysis. Aroclors are commercial mixtures of PCB congeners. Each Aroclor includes numerous PCB congeners covering a broad range of chlorination levels. Aroclors selected for analysis have ranges which overlap so that any extant PCB chromatogram peaks will be included in the summation for total PCBs. The Aroclors reported for the Port of Everett project (1242, 1248, 1254 and 1260) cover the full spectrum of PCB congeners. All were reported as undetected which indicates that there were no quantifiable PCB congener peaks in the sample. Therefore, total PCBs are reported as undetected. Corroborating evidence may be found in the raw data report in which three other Aroclors (1016, 1221 and 1232) were quantified and also reported as undetected.

For clarity perhaps it should be stated that bioassays were performed on all Port of Everett marina sediments tested, and these data, not the chemistry data per se, were pivotal to the dredged material "suitability decision" made.

(12) Page 4, no. 12. "Clarification of threshold determinations:".

(a) "What happens when sediment contaminant levels...Being below DL does not equate to zero."

Response: The accepted convention when summing the individual undetected Aroclors to establish the total PCB value in a sample when all the Aroclors are undetected is to set the total value equal to the highest detection limit reported for an individual Aroclor. It is not correct to sum the individual detection limits for the undetected Aroclors to establish the total PCB quantification value. Only individual Aroclors detected in the sample are summed to establish the total PCB value.

(b) "We hope that our concerns will be addressed in the PSDDA annual review and that a process more conducive to resolution of these issues than the annual meeting forum will be established ... instead of eliminating at the outset testing which the agencies aren't sure will be productive."

Response: We have attempted to address your concerns in this letter. Immediate actions to address your concerns are as follows:

(1) We offer the Tribes the opportunity to participate in sampling/testing plan evaluation and the test data evaluation process.

(2) We will conduct a limited bioaccumulation test of onsite sediments to address "human health concerns" and

assess the food-chain mediated transfers of chemicals of concern.

(3) We will improve our coordination procedures to allow the Tribes earlier notification of projects scheduled for disposal at Port Gardner disposal site.

(c) "In PSDDA decisions, the federal agencies must, of course, keep in mind their special trust responsibility to Indian tribes and for protection of the treaty fishing resource. This responsibility calls for the strictest fiduciary standards and the cautious, prudent approach the Tribes have been urging."

Response: We agree and feel we have taken a very cautious and prudent approach that is protective of the marine environment and also protective of tribal treaty fishing rights.

Finally, at the April 16, 1990 meeting it was suggested that the Tribes provide the Corps with the name and number of a contact person for the Corps to contact regarding notification of impending disposal at the Port Gardner disposal site (see response to comment 9). It was also suggested that the Tribes provide a contact person for the Corps to contact regarding information on tribal fishing activity at the disposal site. Please send the above information to Mr. Steve Wright at (206/764-3495). Please also let me know by June 25, 1990, whether the coordination proposal is acceptable to the Tribes. We hope that this letter has adequately addressed the concerns raised in your two letters. Please contact me (206) 764-3431 or Dr. David R. Kendall (206) 764-3768 of my staff if you have any questions. Thank you for taking the time to participate in the Second Annual Review process.

Sincerely,

Raymond G. Schmitz, P.E.  
Chief, Operations Division

Enclosures

Copies Furnished:

Warren Baxter, Seattle District, U.S. Army Corps of Engineers  
Bob Parker, Seattle District, U.S. Army Corps of Engineers  
Siri Nelson, Seattle District, U.S. Army Corps of Engineers  
Frank Urabeck, Seattle District, U.S. Army Corps of Engineers  
David Kendall, Seattle District, U.S. Army Corps of Engineers  
Mike Palko, Washington State Department of Ecology

Keith Phillips, Washington State Department of Ecology  
Tom Gries, Washington State Department of Ecology  
David Jamison, Washington State Department of Natural Resources  
Betsy Striplin, Washington State Department of Natural Resources  
Ron Lee, U.S. Environmental Protection Agency  
John Malek, U.S. Environmental Protection Agency





REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
SEATTLE DISTRICT, CORPS OF ENGINEERS  
P.O. BOX C-3735  
SEATTLE, WASHINGTON 98124-2255

JUN 20 1990

Regulatory Branch

Mr. Eric D. Johnson  
Washington Public Ports Association  
Post Office Box 1518  
Olympia, Washington 98507

Dear Mr. Johnson:

I was pleased to have your participation at the second annual review meeting (ARM) of the Puget Sound Dredged Disposal Analysis (PSDDA) program. This letter provides the PSDDA Agencies response to the points raised in your letters dated April 2, 1990, and April 17, 1990.

As stated at the Annual Review meeting, the Corps will work with Ecology to incorporate pattern analysis for the various dredging projects assessed in the Corps' annual "Dredged Material Evaluation Application Report" (DMEAR) and in Ecology's "Management Plan Assessment Report" (MPAR). The Corps' pattern analysis will focus on projects having undergone testing and evaluation during the dredged material management year covered by the Corps report. Ecology's pattern analysis will focus on the broader multiyear overview perspective. A meeting has been arranged for June 27, 1990 at Seattle District (Albeni Falls Conference Room) between your consultant Mr. Thomas Nesbitt and representatives of the PSDDA agencies to discuss what types of data will undergo this analysis, including software and database format requirements necessary to conduct this type of analysis. Ecology will use this analysis in conjunction with chemical and biological monitoring data in our review of the PSDDA testing guidelines and relative to site management condition in the MPAR.

While the PSDDA agencies will not analyze direct economic costs or extended economic impacts as part of our annual cost analysis overview, we will provide cost information from federal projects to the ports for the ports use in undertaking such an analysis. We will continue to evaluate sampling and testing costs in the Corps' Annual PSDDA report, when dredging applicants provide these data to us on a voluntary basis. Moreover, we will provide a place on the next annual review meeting agenda so the ports may present their findings.

Thank you very much for participating in the second PSDDA annual review meeting. We look forward to working with the ports to fine tune the PSDDA process. Please contact me (206) 764-3431 or Dr. David Kendall of my staff at (206) 764-3768 if you have any questions.

Sincerely,

Raymond G. Schmitz, P.E.  
Chief, Operations Division

Enclosures

Copies furnished:

Warren Baxter, Seattle District, U.S. Army Corps of Engineers  
Bob Parker, Seattle District, U.S. Army Corps of Engineers  
Frank Urabeck, Seattle District, U.S. Army Corps of Engineers  
David Kendall, Seattle District, U.S. Army Corps of Engineers  
Mike Palko, Washington State Department of Ecology  
Tom Gries, Washington State Department of Ecology  
David Jamison, Washington State Department of Natural Resources  
Ann Strong, Washington State Department of Natural Resources  
Betsy Striplin, Washington State Department of Natural Resources  
Ron Lee, U.S. Environmental Protection Agency  
John Malek, U.S. Environmental Protection Agency

Response to Bonnie Orme.

1. Comment noted. We disagree. As stated in the FEIS for Phase I of PSDDA, the PSDDA agencies do not anticipate that the PSDDA program has unacceptable adverse impacts to intertidal fauna, shellfish, or human health.
2. Comment noted. We disagree. The PSDDA documents have been completely forthright and publicly circulated. Effects based testing is the legally mandated means to predict possible impacts of dredged material disposal. Only if there were such impacts would appropriate management technologies be applied. As stated in the PSDDA documents, the impacts of disposal under the selected management conditions would not have unacceptable impacts.
3. We agree that dredged material is a natural resource, and the regulatory structure allows for beneficial uses.
4. Since permitted uses of PSDDA sites for disposal would have no unacceptable impacts, mitigation would not be necessary. However, it is possible that dredging may require mitigation for loss of wetlands or fisheries habitat. This would be determined by an environmental impact analysis that is conducted by the permit applicant or Federal agency that wishes to dredge during the Clean Water Act 404 permit process.
5. Question noted. This is not a PSDDA program feature.
6. Comment noted. Turbulence and mixing of water caused by disposal of dredged materials at PSDDA sites will not significantly alter existing currents. The turbidity associated with disposal is short-term and does not cause a significant impact to either water column or to intertidal organisms, as discussed in the FEIS for Phase I of PSDDA.
7. Comment noted. This is not a PSDDA program feature.
8. Comment noted.
9. Comment noted. This is not a PSDDA program feature.
10. Comment noted. PSDDA encourages beneficial uses of dredged material and does not regard dredged material as "waste."
11. Comment noted. This is not a PSDDA program feature.
12. The FEIS for Phase I of PSDDA included a biological assessment of impacts to bald eagles, and concluded that there would be no significant effect. Closure of shellfish beds is not related to PSDDA disposal activities but instead to bacterial levels and red tides.



Response to Carl Kassebaum, Jay Spearman, Philip Spadaro, William Elmer, John Lunz, and Patricia O'Flaherty.

1. The PSDDA agencies have agreed to a working "streamline the PSDDA Process" meeting during the month of July and several other special topic meetings to address the issues raised. The consultants and other interested parties will be included in the invitation.
2. Sampling and testing will be discussed at that meeting.
3. Note the additional information that has been added to the clarification paper on reference areas, and which facilitates low-cost mobilization and field matching of reference and test sediments. The PSDDA agencies are planning an October meeting to discuss reference area "administrative defaults" for some of the bioassays as suggested in this letter. By that time, the Ecology/PSEP study on reference area performance standards will be complete and will be the basis for an informed decision.
4. Comment noted. The bioassay meeting is scheduled for July 10, 1990. However, we would prefer a setting such as a campout around a cheery fire in a dark and stormy night to tell our PSDDA horror stories.
5. The PSDDA data submission workshop occurred on June 6, 1990. The feedback obtained at that workshop indicated that relatively minor changes will improve the workability of the submission format.



## Response to Diane E. Robbins

1. Comment noted. The PSDDA agencies are aware of the difficulty that some laboratories have experienced with regard to the echinoderm larval sediment test in the absence of a written protocol. Chapter 5 of the Phase II Management Plan Report went to some lengths to clarify the usage of the test, and a clarification was submitted for the Second Annual Review Meeting to assure that the performance standard was understandable. PSDDA agency representatives talked to Ms. Robbins after the meeting and assured her that other problems (reading the abnormality/normality endpoint) will be addressed in the upcoming July bioassay workshop. There is also a draft protocol available in the 1990 PSEP Recommended Protocols Guidelines update.



## Bioassay Workshop Announcement

This announces a biological testing workshop for the Puget Sound Dredged Disposal Analysis (PSDDA) program. The workshop was requested by participants in the PSDDA Annual Review Meeting in April, 1990.

The objective of the workshop is to review protocols used for determining dredged material suitability for disposal at PSDDA sites and get your feedback on their workability. The workshop will discuss the PSDDA quality assurance guidelines and the test endpoints. It is jointly sponsored by the Corps of Engineers, Seattle District, and EPA's Puget Sound Estuarine Program (PSEP). The impact of revisions in the PSEP Recommended Protocols Guidelines will also be discussed.

The workshop agenda and place are attached. To assist our planning for appropriate space and efficient information transfer, please return the enclosed statement of interest. We hope for a maximum of 40 participants.

Should you have questions on the enclosed information, Dr. David Kendall at telephone (206) 764-3768 may assist you.

### **Tentative Agenda**

Puget Sound Dredged Disposal Analysis  
(PSDDA)

### Bioassay Workshop

Sponsors: PSDDA and Puget Sound Estuarine Program

Corps of Engineers, Seattle District Office  
July 10, 1990: 9:30 am to 3:30 pm

South Conference Room

1. Introduction and Objectives
2. Sediment Larval Test
3. Rhepoxynius Amphipod Test
4. Neanthes Polychaete Acute Test
5. Microtox (r) Bioluminescence Test
6. Discussion

The location is the Corps' Seattle District Office, 4735 E. Marginal Way S; a map to this location is attached. The South Conference room is in the south end of this long building, and is best reached by walking from the parking lot across E. Marginal Way S. and following the building front which faces the street down to the entrance which is located under an overhanging roof. Enter here and continue straight ahead to the first left. There will be signs.

Reserving a Place at the Workshop

Please mail the following to--

U.S. AED, Seattle District

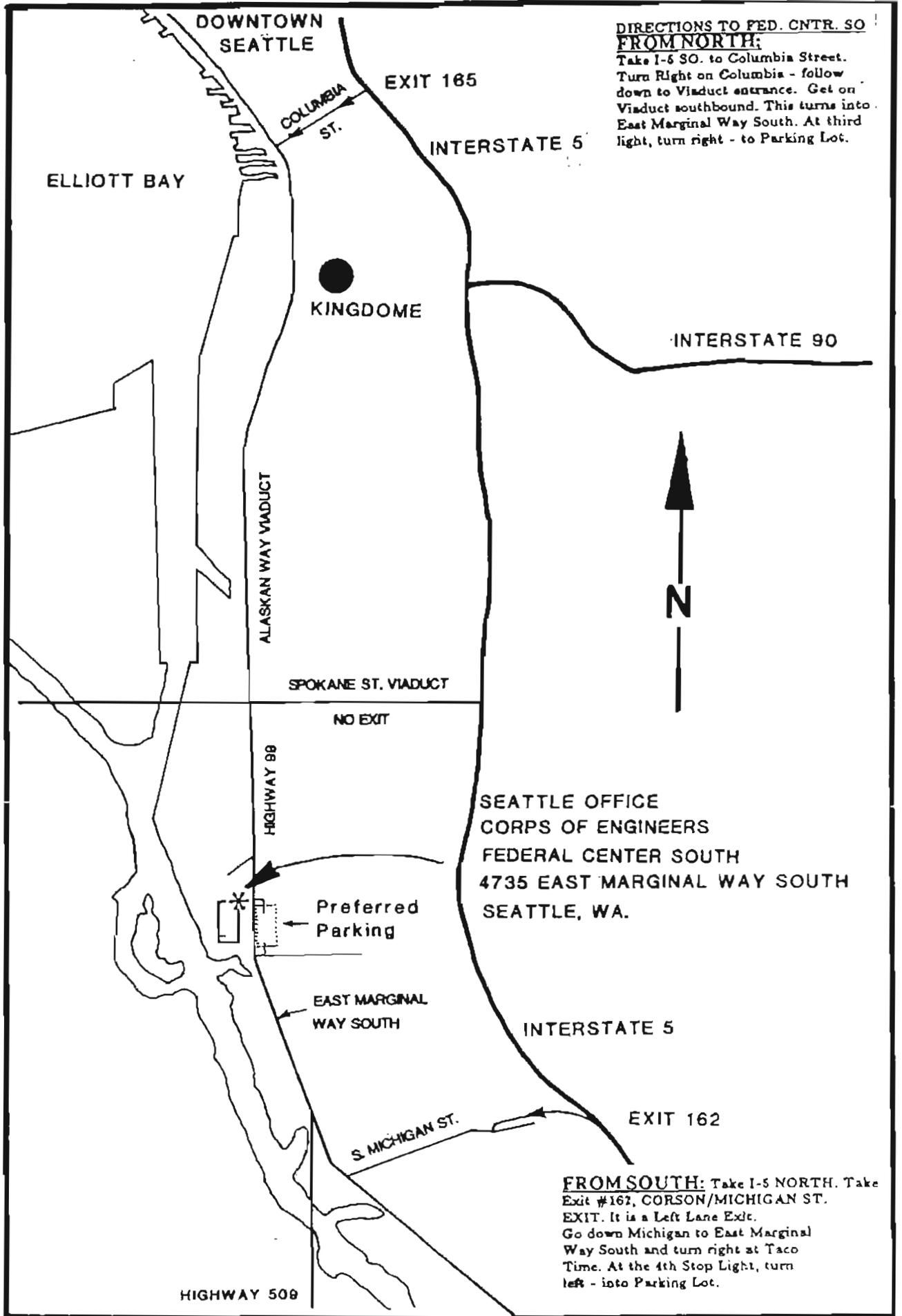
attn: Dr. David Kendall, CENPS-OP-DMMU

PO Box C-3755

Seattle, WA 98124-2255

(Telephone: 206-764-3768)

<input type="checkbox"/>	Yes, I am interested in the workshop. ___ will attend.
<input type="checkbox"/>	No, I will not attend. Please keep me on mailing list.
<input type="checkbox"/>	No, I will not attend. Please remove me from list.
Name:	_____
Organization:	_____
Address:	_____
	_____
City:	_____



**DIRECTIONS TO FED. CNTR. SO FROM NORTH:**

Take I-5 SO. to Columbia Street. Turn Right on Columbia - follow down to Viaduct entrance. Get on Viaduct southbound. This turns into East Marginal Way South. At third light, turn right - to Parking Lot.

SEATTLE OFFICE  
CORPS OF ENGINEERS  
FEDERAL CENTER SOUTH  
4735 EAST MARGINAL WAY SOUTH  
SEATTLE, WA.

**FROM SOUTH:** Take I-5 NORTH. Take Exit #167, CORSON/MICHIGAN ST. EXIT. It is a Left Lane Exit. Go down Michigan to East Marginal Way South and turn right at Taco Time. At the 4th Stop Light, turn left - into Parking Lot.

HIGHWAY 509

