
MEETING NOTES
AUGUST 19-20, 1998

COLUMBIA RIVER DREDGED MATERIAL DISPOSAL SITE WORKSHOP
Working-Group Meeting
August 19 - 20, 1998

Meeting Notes

Introduction

On August 19, 1998, the U.S. Army Corps of Engineers, Portland District (Corps) convened a two day meeting at the Corps of Engineers, Portland District Offices. As stated in the agenda for the meeting, the purpose of the first day, August, 19, 1998, was to provide participants with information regarding status at the mouth of the Columbia River (MCR), the Dredged Material Management Study and the Columbia River Feasibility Report. In addition, the methodology to evaluate candidate sites was discussed. The thrust of the second day, August 20, 1998, was to discuss the pros and cons of the candidate sites and discuss factors of consideration for candidate sites. In the second day, the participants also had the opportunity to evaluate the candidate sites. Representatives from state, local, and federal agencies were in attendance, as were individuals representing crab and oyster fishing industries. A neutral facilitator, Valerie Lee of Environment International Ltd. (EI), led the meeting and notes of the proceedings were recorded by Wendy Barber of EI. An attendance list is attached from both days.

First Day: August 19, 1998

Opening Remarks

The Facilitator noted how much hard work, time and energy the working group has devoted to the process and the progress that has been made by the group. She noted that this was a positive step and should be helpful to the Corps and EPA's decision making process.

Laura Hicks summarized the timeline for the process to which the participants had agreed in the very first meeting. She reviewed the dates of past Working Group meetings and how these meetings had been conducted according to the timeline that the group had established in its first meeting.

Update on the Litigation

Dave Hlebechuk discussed the litigation and its impact on the Corps' current operations. Expanded sites B and E were challenged based upon five environmental statutes including the National Environmental Policy Act (NEPA), the Clean Water Act (CWA) Sec 404, the Coastal Zone Management Act (CZMA), the Ocean Dumping Act, and the Washington Shoreline Management Act. The plaintiff alleged that the Corps had not complied with the laws and sought an order from the court to restrain the Corps' activities with respect to Sites B and E. Dave described that there was an agreement in June of 1998 that would resolve management

operations this year. The mutual agreement is as follows: plaintiff agreed not to file a motion to enjoin defendant and defendant agreed not to go to Site B in 1998. It was also agreed that the western half of expanded site E would not be used after August 22, 1998. Dave stated that the parties agreed that it was not necessary to go to trial with live testimony instead the issues would be resolved through a summary judgement. The plaintiff has filed their summary judgement brief and the defendant is preparing its response, which was due August 24, 1998.

Status/Update on Mouth of the Columbia River Dredging and Disposal

Eric Braun displayed a status report for MCR dredging/disposal in 1998. (Sheet 1) As of the most recent date, August 18, 1998, a new survey of the entrance of the channel had been completed and showed 1.77 mcy remaining to be dredged. Eric also presented the following surveys of site E:

- (1) May 1997;
- (2) July 9, 1998;
- (3) August 11, 1998;
- (4) the difference between surveys from July 23, 1998 and May 1997; and
- (5) the difference between surveys from August 11, 1998 and May 1997.

The findings were as follows: in the western half of Site E there were accumulations and the Corps made adjustments. The site showed signs of erosion and the Corps anticipates the material to continue to erode. The results are as follows: the six feet accumulations in Site E has reduced and the material is eroding. (Sheets 2-6)

After Eric Braun's presentation, the following conversation occurred.

Kathi Larson asked about the disposal material.

Eric Braun responded that in Site E the dredge ESSAYONS placed 1.9 mcy and the dredge NEWPORT placed 1.2 mcy, totaling 3.1 mcy. In Site F 500 kcy has been placed and there remains 1.77 mcy of material to be removed from the entrance.

Steve Barry inquired if according to the lawsuit, the Corps will not use the western portion of site E.

Eric Braun commented that the contractor is only using the eastern portion of site E.

Edie Beasley asked whether the August 11, 1998 survey was available for distribution.

Eric Braun responded that it was not available. The entrance channel survey was completed on August 18, 1998 and added to the August 11 Site E survey; and after it is signed and printed, copies will be distributed.

Rick Vining inquired if the erosion from Site E was going back to the channel.

Eric Braun answered that it had not thus far. The surveys conducted showed no spillover into the channel.

Rick Vining asked if the elevations were staying the same outside of Site E.

Eric Braun replied that this seemed to be the case. The depths in the channel were based on the July survey as this is the last one already plotted. There had been no evidence of spillover in the channel or buildup outside of Site E up to this point.

Following the above exchanges, **Edie Beasley** noted that she had some information that Dale had given her and was not sure when to discuss it; she held up charts. She said that Dale knew more about the information than she. **The Facilitator** encouraged Edie to present the charts and information to the working group.

Dale & Edie Beasley's Information

Edie Beasley displayed a map to the group comparing surveys from October 1997 and July 26, 1998 illustrating how the 50 and 55 foot contours have shifted. She expressed concern with the material moving and accumulating elsewhere. She inquired about the wave analysis on Peacock Spit conducted by Rod. She requested information from the data buoys. She stated that the current data indicates that the flow of sand would collect in the area they are concerned with.

Eric Braun discussed the difference between surveys from August 11, 1998 and May 1997 displayed on Sheet 6, that he had shown the group. The results displayed on Sheet 6 illustrated that it is two feet deeper in some spots and 2, 4 and 6 feet higher in others.

These questions were addressed:

Steve Barry inquired as to whether the fishermen had noticed any change.

Edie Beasley commented that they had not collected any data.

Rick Vining inquired about why Edie was comparing the July 26, 1998 survey to October 1997 and not to May 1997.

Edie Beasley responded that she was using these surveys as it helps us to understand what has happened between this year and last year

Dick Sheldon observed that this was the time frame that the fishermen were using.

Following these presentations, questions were presented to Eric Braun:

Edie Beasley commented on the area surveyed outside of Area E (further north and west) and suggested that it may be more beneficial to use 500 foot transects rather than 750 foot transects. She inquired as to whether using 750 foot transects was a useful tool and encouraged keeping a watchful eye on this area.

Dave Hlebechuk replied that the dimensions of the transect were agreed upon and if there were technical concerns the Corps will consider them.

Edie Beasley noted that the 750 foot transects were not useful.

Christine Valentine requested that Eric talk about the scour hole proposal.

Eric Braun responded that there was a delay with Pacific County and commented that the federal government does not need a County permit to use the site.

Edie Beasley asked about how the Corps felt about monitoring using time as a factor rather than amount.

Eric Braun replied that the survey was delayed due to electronic equipment problems, but was within the plan to survey monthly. In addition, once there was evidence of accumulation the Corps increased the monitoring frequency. Currently they are monitoring every other week.

Status/Update Dredged Material Management Study

Laura Hicks presented the status of the Dredged Material Management Study. This included the following: (1) no ocean disposal of Columbia River 40-foot Channel sediments would occur until completion of this site designation process; (2) any new ocean disposal site capacity would include the estimated future disposal quantity of 8 mcy from the 40-foot inner channel. (Sheet 7)

Questions and comments were addressed following Laura Hick's presentation.

Rick Vining asked about the distinction between the MCR and the CRC.

Eric Braun responded that the Mouth is a separate project which extends from RM 3 to -2 and the Columbia River Project starts at RM 3 and extends to RM 106.5 in Vancouver.

Rick Vining also asked about the time period for the disposal quantity of 8 mcy from the CRC.

Laura Hicks noted that the 8 mcy represents a 20 year time frame and that this relates only to the existing 40 foot channel.

Dick Sheldon inquired if the 8 mcy disposal quantity was per year.

Laura Hicks responded that this was over a 20 year period.

Steve Barry commented that this figure does not include the MCR.

Laura Hicks explained the Corps' feasibility study with one alternative to deepen the channel three feet and resulting in 17 mcy over 20 year period disposed in the ocean.

Rick Vining asked about the initial construction volumes.

Mark Siipola responded construction volumes would be similar to the annual MCR volumes.

Status/Update of the Columbia River Feasibility Report

Laura Hicks presented the timeline for the Columbia River Feasibility Report Status. The timeline presented was as follows:

August 19-20, 1998: 7th Working Group Meeting (Overlay Process)

October 1998: Public Release of the Draft Feasibility/EIS

February 1999: Division Commander's Public Notice

March 1999: Final EIS Public Review
May 1999: Chief of Engineer's Report
June 1999: Record of Decision
September 1999: EPA Final Rule Making
(Sheet 8)

After Laura Hicks' presentation, the following questions and comments were addressed.

Rick Vining inquired whether the schedule would be delayed if no disposal site was identified within the next two days.

Laura Hicks responded that the Corps will take all available information and propose a site, which will receive public comment in October.

John Malek commented that there will be proposed sites in the DEIS.

Eddie Beasley commented that last November she received overlays by mail and that they were not complete. She further commented that no meeting was held to discuss the changes and that during the February meeting there was no discussion of the overlays.

Laura Hicks responded that the process was not over and that no decision had been made.

Eddie Beasley expressed concern that no criteria were used to assess and select candidate sites being considered by the working group. In addition, she commented that participants drew random sites and that there were problems with the overlays. She expressed frustration about the process moving ahead without having met since October 1997.

The Facilitator observed that as a part of EI's work facilitating the sessions, EI called participants between sessions to discuss issues or concerns that the participants might have; this is part of the "scoping process" for the meeting. Because of concerns raised by Eddie Beasley in the February 1998 meeting about the overlays and candidate sites, the Facilitator had called participants who had attended the February 18 meeting to discuss the level of comfort the participants had with the overlays and also the sites selected for Working Group consideration. The feedback that the Facilitator had received, at that time, was that all of the participants contacted, save one, were comfortable with proceeding on the basis of the overlays and candidate sites.

Eddie Beasley expressed frustration that the participants had not convened to discuss the overlays since they were developed

The Facilitator responded with the suggestion that the participants should refer to the notes from the October 22-23, 1997 as they reflect what occurred concerning the overlays. She directed a question to the Corps regarding the participants comments and inquired as to whether the group had come to agreement about a site.

Laura Hicks responded that there did not need to be consensus amongst the group on a particular site as it is EPA and the Corps' decision.

Christine Valentine inquired about where the candidate sites came from. She agreed with Edie about the need to discuss the sites and what the group's decision was based upon. In addition, she expressed concern that the criteria in the federal process to elect sites was not used in this process.

Laura Hicks responded that criteria are evaluation criteria rather than selection criteria.

The Facilitator noted that in the next day's facilitated session there would be a detailed discussion of the sites and criteria.

Steve Barry expressed the desire to be informed of any problems with the overlays and technical data.

Kim Trimpert suggested that the group discuss the objectives of the candidate sites. She also expressed concern that the candidate sites were arbitrarily drawn.

John Malek reminded the participants that EPA made a presentation regarding the site designation process during the first meeting for this process. He noted that although all groups' input is important and desired, EPA and Corps make the final decision regarding site selection. He added that it is possible to use subsets of candidate sites as well as combine candidate sites. He also stated that the Corps and EPA will have a management and monitoring plan.

Edie Beasley commented that the overlays need revision and expressed concern about the quality of the data and therefore the accuracy of the lines.

The Facilitator observed that it is important that those within the Working Group assess sites selected by the group for consideration on a consistent basis and suggested that overlays be addressed the following day.

Edie Beasley expressed concern with the process to select the candidate sites. She also commented that she had never seen Phase I, Phase II, and Phase III as shown in the process diagram. She stated that the notes detail the Corps' comments but do not state what she says or what other participants say.

The Facilitator explained that EI is very careful with the notes and that EI's goal is to document the proceedings in an accurate and even handed manner. She said that Edie's concerns would be documented.

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Methodology to Evaluate Candidate Sites

Mark Siipola discussed the reason why the participants were evaluating candidate sites. He discussed the MPRSA and the CFR 227 and 228 Regulations requiring the EPA to designate ocean disposal sites for the placement of dredge material. Although the Corps and EPA are working under the jurisdiction of MPRSA, he also discussed the CWA regulations. The CWA

jurisdiction includes the three mile territorial sea. The MPRSA's jurisdiction extends seaward from the baseline of the territorial sea. He further noted that if one is governed by the CWA, you do not need site designation under the MPRSA. (Sheet 9)

Rick Vining inquired as to the current phase of the project.

Mark Siipola responded by describing each phase and its dates and used overheads to assist him in this presentation. The overheads are Sheets 10-16. During his explanation he outlined the tasks that the Corps and the Working Group had completed and the dates for the meetings during which they were completed.

The Phase I activities involved the following (Sheet 10-12):

The July 10, 1997 Working Group meeting involved an explanation and discussion of the laws, ZSF, NEPA, physical characteristics, existing information, and defined resources (sub-groups were established).

On July 23, 1997 the Working Group discussed available data and further defined critical resources.

On October 1-2, 1997 the Corps interviewed fishermen.

The October 8, 1997 Working Group meeting involved the definition of physical process, bathymetry, sediment types, dredge material, further defined resources, an delineated bottom areas.

(Sheet 10-12)

The Phase II activities were addressed in five Working Group meetings (Sheet 13-15):

On July 23, 1997 the Corps and EPA described the overlay process and the groups defined critical overlays.

The August 20, 1997 Working Group continued with the overlay process.

On October 8, 1997 the Working Group identified critical overlays and determined additional data needs for crabs, trawlfish and juvenile flatfish

The October 22-23, 1997 Working Group eliminated sensitive areas through the overlay process and identified candidate sites.

During the February 19, 1998 meeting the Corps presented information on thin-layer disposal.

The Phase III activities include (Sheet 16):

Mark explained that the Corps is still collecting information for this Phase including information from the Crab study. In addition, in current session the Working Group is focusing on Phase III activities.

Mark Siipola noted that in the overlay process those sensitive and incompatible areas are eliminated. He stated that the crab and flatfish studies were determined in phase II as additional data needs. He discussed the process that the participants will go through in the evaluation of each of the candidate sites. He commented that evaluation of the candidate sites is important, as the EPA and Corps will use this to make a decision on proposed sites and write the DEIS. He illustrated the importance of the overlay process for screening out sensitive and incompatible use areas using an example plot of important marine resources. (Sheet 17 and 18) In addition, he

explained the eleven specific factors and the five general criteria for ocean disposal site selection. (Sheet 19 and 20) He also presented the participants an ocean dredged material disposal site conflict matrix for evaluating the potential for conflict with required considerations of the Marine Protection Research and Sanctuaries Act. (Sheet 21-22) The matrix provides the participants with areas of consideration and allows them to comment on each one.

Following Mark Siipola's presentation, comments and questions were addressed:

Christine Valentine inquired as to whether each group should evaluate each candidate site.

Mark Siipola recommended that each group evaluate each candidate site.

The Facilitator asked whether any of the participants had any questions on the evaluation process that Mark had presented.

Dick Sheldon commented that the Corps did not consider the crab issue. He expressed concern and discomfort that the group is now in Phase III of the process with no full assessment conducted.

The Facilitator: commented that there would be an update on the crab study later in the facilitation.

Dick Sheldon commented further on the crab overlay. He stated that crabs are mobile and therefore, it is impossible to determine their location from year to year as well as their populations. He further stated that because it is impossible to determine their locations and population numbers, the impact to them would be different. Provided comments on the following: that all the information discussed today should have been collected years ago, that the crabs should not have been dumped in with other animals, and that the Corps had continued to emphasize the economics of the process.

The Facilitator observed that in the October 22-23, 1997 meeting the group had reached consensus on the crab overlay. The participants had agreed on what was drawn on the map and agreed to add the dotted line. She acknowledged the participants' concerns and reminded the participants that the crab overlay was discussed in previous meetings.

Dick Sheldon stressed the fact that the crabbers have compromised and have taken the least offensive position but not the best. He stated that the corner of the canyon is what was recommended and "this was not even considered." He further stated that he mentioned this site every time and it never even was considered because it was said to be too far out and therefore, too expensive.

The Facilitator encouraged Dick to draw the area to which he was referring.

Kathi Larson inquired if the 350 feet contour was the site that Dick was referring to.

Kim Trimpert commented that the site was on the map but not marked as a candidate site.

The Facilitator asked each participant whether or not they would consider the corner of the canyon as Candidate Site 9. The facilitator received unanimous agreement that the group should consider Candidate Site 9. Following the unanimous consent, Rick Vining drew Candidate Site 9 on the map. One participant, George Priest, inquired as to if the

topography flattened at Candidate Site 9. He commented on the effect of dumping at the top of a canyon and described how there exists the potential for mounding to occur which is a potential source of sand flows. This in turn has the potential to produce tsunamis. He further commented that this has a low probability of occurring but felt that it was worth mentioning.

Mark Siipola inquired about whether there was anything that the participants were not comfortable answering in the evaluation process found on the sheets included in the read ahead materials. He discussed the areas of consideration on the review sheets and commented that the participants need not comment on those considerations that they do not wish to. He encouraged each participant to comment on each consideration as the Corps and EPA would consider their input in their decisions.

Edie Beasley asked whether the soft shell crab study was complete

Kim Larson noted that the study was 75 percent complete.

Edie Beasley inquired why the meeting was scheduled for August and not some time when Dale Beasley could be present. She also commented on the fact that a representative from the Oregon Department of Fish and Wildlife was not present.

Laura Hicks responded describing that there were a number of reasons for the timing of the meeting. First, she said that the Corps had a lawsuit filed against them and the study was involved in the suit and, therefore, they were advised by counsel not to involve the crabbers in designing the research. Second, the Corps had difficulty obtaining a permit from the California Fish and Game to transport Oregon crabs to Scripps in California. As a result of the permit difficulties, the Corps could not begin the study as planned at Scripps and this delayed the study and when this meeting could occur. Third, given the difficulties in beginning the study at Scripps, the Corps contracted with Battelle to perform a study in Washington. There was also the possibility that the crabs in the Battelle study would not molt. Because Battelle was getting good results with molting in the lab and the Corps had felt that they had sufficient information to convene a meeting.

Edie Beasley inquired whether that information was necessary to evaluate candidate sites.

Laura Hicks responded that the group had indicated that the soft and hard shell crab data was important in the evaluation process for several candidate sites.

The Facilitator asked whether Ms. Beasley was representing CRCFA.

Edie Beasley responded that she represented CRCFA for the purpose of collecting information and sharing information with Dale Beasley. She stated that no final comments will be made.

Dick Sheldon noted that he represented the Northern Fish and Oyster Co. and is assisting Edie Beasley on behalf of Dale Beasley. He was asked by Dale to attend.

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Video on Dredging Operations

Eric Braun presented a video taken on the contract dredge NEWPORT, illustrating the placement of a load of material at Site E. This is a split hull dredge and it was estimated to take approximately five minutes to dump the load.

Following the video, questions and comments were addressed:

Steve Barry inquired about the capacity of the dredge

Eric Braun noted that the rated capacity is 4500 yards and typically dredges around 3200 yards. He commented on the turning process of the dredge and the fact that the NEWPORT has no water jets to loosen the sand in comparison to the YAQUINA and the ESSAYONS, which have water jets. Even with the water jets the ESSAYONS takes two or three times longer to dump a load since it has hopper doors rather than a hull that splits open like the NEWPORT. He explained that the water in the hopper matches the ocean water, which indicates how rapid the sand settles.

Kathi Larson asked whether there is a turbidity plume from the dredging.

Eric Braun answered that the material does not remain in suspension very long.

Laura Hicks commented that she had been in a helicopter watching a dredge and commented that the material disappears very quickly.

Eric Braun noted that the material's rate of dispersion depends on the type of the material. In this case, fine sand was dredged. If the material is composed mostly of silt this will result in a plume. However, if the material is composed of coarser material, this will settle very quickly. He further commented on the amount of time it takes to dredge. Coarser material requires less time and finer material requires more time to dredge because coarser sand is less cohesive and settles better in the hopper.

Kathi Larson inquired about the amount of material in a dump.

Eric Braun answered that the amount was approximately 3000 yards.

Update on Soft Shell Crab Research

Kim Larson presented an update on the soft shell crab research. He commented that a conference call between Steve Barry, Neil Richardson, Ben Meyers and Kathi Larson was conducted to discuss the design of the soft shell crab study. They concluded to conduct a pilot study at Scripps and see if we could get the crabs to molt in the lab. He explained the contract that the Corps had with Scripps and the study. He said that the Corps had had permit problems in importing crabs from Oregon to California. As a result, he said that Scripps had fisherman collect crabs of different sizes from California near Humboldt. The size of the crabs collected ranged from 4.5 to 6.5 inches and only female crabs were collected. The fishermen were not able to collect any soft shell crabs, only hard shelled crabs. He briefly showed the results of the Scripps burial tests from July 30 and 31, 1998 and from August 5, 1998. (Sheet 23-24) He explained that because the Corps had problems with getting soft-shell crabs to Scripps, they had

contracted with Battelle, a marine science lab in Sequim, to carry out a soft shell crab study. The Battelle study is conducted on smaller sized crabs. The lead researcher for this study is Liam Antrim and his co-researcher is Dave Shreffler. Dave is here today.

Following Kim Larson's presentation, questions and comments were received.

Christine Valentine inquired when study results would be available.

Kim Larson responded that both studies would be completed by the end of September.

Presentation on the Battelle Study

Dave Shreffler presented the methodology and the preliminary results of the soft shell crab study at Battelle. Explained that Battelle was performing dumps with both juvenile flatfish and soft shell crabs both from Sequim Bay. The fish and crabs have been collected using a seine along the shore. He further explained the sizes of the crabs in the study: less than 50 mm, between 50 and 100 mm, and greater than 100 mm. For each size category the same range of depth of sediment is used 2.4, 4.2, 6.6 and 10.2 inches. He explained that the study only included those crabs that have molted. He indicated that there was a 30 to 35 percent gain in size between pre and post molt. The molted crabs are categorized into stages. Stage 3-2 are those crabs that are newly molted; Stage 3-1 are those crabs that have recently molted; and Stage 2-2 are those crabs in the early intermediate phase. He noted that each morning and afternoon the salmon rearing trays (where the crabs are kept) are checked to see if molting has occurred. Only after molting occurs is a dump staged. Therefore, the crabs are determining how fast the study data could be collected. He explained that in each test tank there was a three inch layer of sieved Sequim Bay marine sediment. (The three inches is enough material for the crab to bury without touching the bottom of the tank). He described the dumping apparatus as a plywood box with a circular base that fits inside the test tank. The dumping apparatus is filled with clean fine grained sand that matches the dredge material from the Columbia River. The amount of sand placed in the dumping apparatus depends on the size of the dump. He commented that the researchers were looking at behavioral responses as well as mortality of the crabs. In addition, they are focusing on the location of the crabs after a dump (ie, buried or on the surface). Slides and preliminary results were presented on the study. The tanks are monitored immediately after dumping and every 12 hours subsequently. This is done for 96 hours and after the period of 96 hours the crabs are excavated from the dump material. This has been videotaped throughout the testing procedures

Dave also explained the status on the study of juvenile flatfish (English sole). He indicated that they had collected data on all durations and depths for flatfish and that none had been buried.

Questions and comments followed Dave Shreffler's presentation.

Rick Vining asked why sieved sand was used for the material placed in the test tank.

Dave Shreffler responded that the material was sieved to remove other organisms.

Bob Friedenwald asked about the depth that the crabs are buried.

Dave Shreffler responded that the crabs are generally not completely buried. The crabs normal behavioral pattern is to partially bury rather than remain on the surface.

George Priest inquired about the results that Dave Shreffler presented. There was some confusion as to the manner in which the results were presented regarding the crabs mortality.

Kim Larson answered that none of the crabs died after the initial disposal.

Eddie Beasley asked whether any crabs died at a 10.2 inch depth of sediment.

Dave Shreffler responded that one crab was used and that that crab had died.

Christine Valentine inquired about the mortality data with the crab study.

Dave Shreffler replied that the researchers were not only looking for mortality but for abrasion, missing limbs, eye stocks and anatomical damage. The crabs behavioral response will be conducted by placing food on the surface and observing if they come to the surface.

Eddie Beasley asked whether placing food on the surface would occur in a natural setting.

Dave Shreffler replied that they were trying to replicate natural conditions and social response to disposal.

Kathi Larson noted that there may be food in an area after a dump.

Eddie Beasley inquired as to the type of food used in the study and if it was similar to that found at the MCR.

Dave Shreffler replied that they were adding food on top of sediments (fine grained sand). The food consists of chopped fish, shrimp and algae. It would be similar to that found at the MCR.

Eddie Beasley inquired as to how the range of the dump duration was determined.

Dave Shreffler responded that the range of duration was determined by modeling conducted by the Corps. He presented a table with the target dump duration and the range of duration in seconds.

Eddie Beasley asked about the possibility of receiving a copy of the study.

Kim Larson responded that the study would be presented in the report

Eddie Beasley commented that it would be nice to have the study.

Kim Trimpert asked if the hopper returns to the same location each time.

Eric Braun answered that there are several management options. If the hopper is restricted to a small spot then it returns every few hours. However, if the hopper is using a larger area, it may not return for weeks, months or even years.

Kim Trimpert asked if the crabs were only put through the cycle one time.

Rick Vining questioned why the study did not leave the crabs and conduct additional dumps on them.

Dave Shreffler replied that survival probably depends on a range of variables including depth, duration and shell stage. The preliminary results illustrate that there has been 100 percent survival at shallow depths. In addition those dumps that are performed on crabs at slower rates have resulted in a much higher rate of survival than those dumps performed at faster rates. He also commented that it appears that crabs on the surface at the start of a dump survive better than those that are partly buried.

Christine Valentine asked about the sample size that would be necessary to achieve statistically valid results.

Dave Shreffler answered that the study will test five crabs at each depth and duration. He commented on the tests performed on the juvenile flatfish. These results were as follows: 100 percent survived independent of depth and duration. All the data that has been collected thus far has been on English sole. He noted that before the dump was staged they were resting on the bottom.

Laura Hicks inquired whether the data obtained on flatfish was statistically valid.

Dave Shreffler responded that no statistical evaluation had been performed.

Steve Barry asked whether there had been any behavioral changes noted.

Dave Shreffler answered that no behavioral changes had been observed. The researchers had been looking for a change in the mucous layer. There have no signs of impacts on the juvenile flatfish.

Kathi Larson asked whether any physical abnormalities were observed on both alive and dead crabs.

Dave Shreffler replied that no physical abnormalities were found on either the alive or dead crabs.

George Priest asked whether or not crabs are mobile during tides.

Dave Shreffler replied that this variable depends on the tidal cycle and the time of day. He commented that the crabs feed more readily at night and emerge more at tidal cycles due to the fact that more food is flowing by.

George Priest further inquired as to how to minimize crab mortality.

Dave Shreffler responded that he was reluctant to offer suggestions.

Rick Vining asked if it was appropriate to assume suffocation with those crabs that died.

Dave Shreffler explained that suffocation usually resulted if the crabs are buried for a period of 96 hours.

Eddie Beasley inquired whether or not the crabs are mobile during the molting stage.

Dave Shreffler replied that during the process of molting, some crabs remain on the surface and after molting they may remain on the surface or bury themselves. This depends on how recently the crabs have molted. Those crabs that have recently molted are very vulnerable.

Eddie Beasley further inquired about a difference between the ocean and Sequim Bay.
Dave Shreffler responded that he does not think there is a difference.

Kathi Larson asked whether the data will be presented in a table.
Dave Shreffler answered that the final data would be presented in a table.

Eddie Beasley inquired whether the material presented would be available today.
Kim Larson responded that the study and the final data would be available in the report.

Video on Scripps Crab Study and Discussion of Scripps Study

Kim Larson presented a video on the Scripps hard shell crab work. He described the size of the tank and the methodology of the study; sand was released/dumped on the crabs in the tank. Dumps were conducted on three separate occasions.

The following comments and questions were addressed after the video.

George Priest asked about the sand thickness dumped on the crabs.
Kim Larson replied that in the worst case the sand is eight to ten inches deep.

Eddie Beasley inquired about the amount of time that it takes for the crabs to climatize themselves as well as the water temperature in the tank.
Kim Larson answered that the time for climatization is one hour and the water temperature is 54 degrees Fahrenheit.

Diane Perry asked about whether all the mounds indicate where the crabs dig in.
Kim Larson responded yes, the mounds are where crabs had dug in.

Eddie Beasley inquired whether the sand used in the study had the same clumping nature as that of the sand in the mouth of the Columbia River.
Kim Larson responded that dry sand was used in the study. This presents a worse case scenario as the sand comes out at the same time during a release.
Mark Siipola observed that once the sand hits the water it no longer clumps, and disperses.

Kim Larson showed the portion of the video illustrating the first dump of eight inches of sand with a 20 second duration.

Eddie Beasley asked about how the size of the dump area was determined.
Laura Hicks explained that the entire tank was used.

Eddie Beasley inquired about the technical feasibility of dumping eight inches during actual dredging.

Eric Braun responded that the worst case of dumping in 50 feet of water is a ten and a half inch dump. Therefore, it is technically feasible to dump eight inches during dredging and disposal.

Kim Larson explained the three dumps conducted. The first study consisted of a sample size of 13 crabs. After the dump, ten appeared on the surface after the first hour and three were still buried in the sand mass. The dump occurred at 3 PM and four hours later the three crabs were still present at the sand. The following morning the researcher dug down at the boundary level between the fresh and new sand. One crab died as a result of probing. The results of the three tests conducted are as follows: in the first test, three out of the thirteen died; in the second test, one out of the twelve died and in the third test, zero out of twelve died. The overall results were that most of the crabs appear quickly on the surface after the disposal and the remaining crabs remained buried in the sand. He also commented that Rod had modeled dumps and concluded that the center is the highest part of the mound. Therefore, this study concentrated on trying to create a mound. However, once the dump was conducted no mound was formed because of the dispersion of sand in the water column.

Kathi Larson asked whether the crabs were buried by the dump.

Kim Larson responded that all twelve of the crabs in the third study had been observed on the surface within an hour of the dump.

Edie Beasley asked if the crabs moved out of the area before the dump.

Kim Larson explained that this was probably the crab's behavior in the ocean as well.

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BREAK
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Beneficial Uses and Video Regarding Punaise System

Laura Hicks presented information on the beneficial uses of dredged material. Some beneficial uses are development of county or state park; industrial development; erosion abatement and environmental enhancement. She further presented study cost sharing percentages for different types of beneficial use sites. (Sheet 25-26) She presented information and a video on a submerged dredged system located in the Netherlands called Punaise. (Sheet 27-33) She noted the research the Corps was conducting regarding innovative techniques for dredging. She also explained that the Corps had inquired about the cost of a Punaise.

The following questions and comments were heard following the Punaise video.

Dick Sheldon commented that the impacts on the crabs from dumping sand was only one concern. The mounding and safety issues were also concerns.

Kathi Larson asked about the depth of a submerged dredge system.

Laura Hicks responded that its depth depends on the sand's depth.

George Priest inquired whether it is possible to use the Punaise to dredge material off the spoil piles.

Eric Braun replied that the punaise has a limited pumping range. He thought hoppers are being used in Holland to dredge eight miles off shore.

Ben Meyers asked whether a hopper dredge could place material on top of the Punaise to feed it.

Eric Braun responded that there exists some possibility for using the Punaise in combination with spot dumping, but dumping of top of the punaise probably would be harmful to the dredge. If is plugged or lost power it would be difficult to retrieve.

Dick Sheldon commented that placing deposits on top of the north jetty would be very difficult. He suggested that a hole be dug through the north jetty.

Eric Braun explained that there is more exposure to waves going across the north jetty and that exposure is a factor to consider. Going through the jetty would be very expensive.

Kim Trimpert asked about the costs of such a system.

Laura Hicks replied that both mobilization and average costs must be considered and that the estimates that the Corps receives will be ballpark figures.

George Priest commented that it would not be necessary to pump directly on shore as the drift would take care of it.

Review of Candidate Sites

The Facilitator suggested that the participants refer to the October 22-23, 1997 meetings to review the candidate sites.

The Facilitator also asked Rick Vining to work with Laura Hicks to place the map on which the participants to the October, 1997 meeting had drawn the candidate sites over the maps created by the Corps (hung on the wall) showing candidate sites. Laura Hicks and Rick Vining placed the map with the participant's drawings over the maps drawn by the Corps.

Rick Vining confirmed that all the candidate sites, as drawn by the participants, had been reflected correctly on the maps located on the walls.

John Malek commented on the process for EPA site designation as the rulemaking appears in the Federal Register. From 1983-1984 there were four sites that were designated. In order to de-designate sites requires specific action. There exists sites that were selected by the Corps but not designated but approved by EPA. These sites have a life of five years with one potential extension of another five years. He further

commented that once new, permanent sites (Section 102) are designated, temporary (Section 103) sites cease to exist.

The following comments and questions were raised and made:

Eddie Beasley inquired whether the blue sites or permanent sites were initially designated as Section 103.

John Malek responded that the blue sites or permanent sites may have been interim sites under EPA designation. He further commented on permanent sites. He noted that he must decide to have them cease to exist or to have them stay there forever. If he decides to have them cease to exist, the federal government withdraws the sites and no longer has any management and monitoring responsibility.

Eddie Beasley inquired if the Corps and EPA would be liable.

John Malek replied that there is no liability issue.

Eddie Beasley asked about Site B and if there exists a problem with mounding and wave amplification if the site would be removed.

John Malek responded that this may occur if Congress mandates it.

Laura Hicks commented that if expanded Area F was not designated, it would not exist ten years from now as it was an interim site. She further noted that some candidate sites overlap Area F. The blue, permanent sites would continue to exist unless they are de-designated. The areas outside of the blue, permanent sites will cease to exist when new sites are designated, unless they are part of the designation. Thus, expanded Area F would cease to exist unless it is designated as a permanent site.

Dick Sheldon noted that speaking on behalf of the crabbers, he would like to see Site E cease to exist. The crabbers as a group do not like Site E.

John Malek observed that a candidate site is expanded site E.

Dick Sheldon noted that the Punaise seems like it would solve a lot of problems, as it would keep two dredges running. He noted that there exists a site inside of the jetty near the number 9 buoy in order to pump onto Benson Beach. (Candidate Site 4)

John Malek commented that this was near the area where Eric Braun had posted a public notice. He noted that these are inland waters and not ocean dumping. He further noted that CWA Sec 404 sites will be "looked at" and evaluated, but not as ocean sites.

Dick Sheldon requested that the Corps look inside the number 9 buoy. He observed that the crabbers would like EPA and the Corps to consider disposal inside the number 9 buoy coupled with the Punaise.

Rick Vining inquired about limited capacity.

Edie Beasley asked if the Corps should be looking at a site with a capacity of 20 years.

Dick Sheldon inquired about expanded Site F.

The Facilitator asked that each participant respond to the evaluation of expanded Site F. All participants except for one agreed to evaluate expanded Site F. One participant did not wish to evaluate expanded Site F due to the issue of capacity, mounding as occurred in Sites A, B and F. In addition, the participant expressed concerns that expanded Site F was a non-dispersive site.

Edie Beasley asked whether any additional information is required for the candidate sites.

The Facilitator observed that in the October, 1997 meeting the participants had indicated which candidate sites should involve the consideration of additional information before evaluation. Where the participants made such a note, it was noted on the candidate site map; if there is no note, then there was a consensus that a candidate site could be evaluated without the collection of additional information.

Edie Beasley requested that expanded Site E requires more information and that the soft shell crab populations need to be determined. She commented that the notes from previous meetings had not been received by the participants until one month after the meetings. She further commented that the notes were not accurate.

Dick Sheldon expressed concern that it was not known what the soft shell crabs do from year to year. He requested that if there are any problems with the soft shell crabs that he would like the issue to be addressed.

Steve Barry commented that soft shell crabs may be found just about anywhere and that crabs may be attracted to an area by food. He further commented that crab populations are generally higher at disposal sites and that disposal has an attractive function.

Edie Beasley noted that she would like Site E to be considered. She also commented that Dale Beasley thinks that the shale pile is located differently than shown.

John Malek responded that no one knew the location of the shale pile and Christine Valentine has additional information, provided by ODFW, that will be presented on the location of the shale pile.

Edie Beasley stated that she would like additional information on soft shell crabs.

Dick Sheldon noted that no one would like expanded Site E except for the Corps, although it is better than dumping in Site B.

With the aid of relevant portions of the October, 1997 minutes on overheads, the Facilitator reviewed each candidate site displayed on the wall and the discussion in the notes about each. The Facilitator also identified the maps that corresponded to sites proposed by Dale Beasley in the February, 1998 meeting and the two sites presented in this facilitation.

- Candidate Site 1: Skirt Site/Dick Sheldon's Site
- Candidate Site 2: Expanded Site E
- Candidate Site 3: Shale pile
- Candidate Site 4: Peacock Spit/Benson Beach (Sec 404 Site)
- Candidate Site 5: Rick Vining's Site
- Candidate Site 6: Bob Burkle's Site
- Candidate Site 7: Steve Barry's Site (he redrew site and took out deeper)
- Candidate Site 8: Dale Beasley's Site
- Candidate Site 9: Astoria Canyon Site
- Candidate Site 10: Expanded Site F

Eddie Beasley asked whether there would be a discussion of the overlays and requested a change be made on the soft shell crab and juvenile flatfish overlay. She also suggested that it would be helpful to her if the location of the tow lanes was illustrated on the candidate sites.

The Facilitator noted that the overlays had been adopted by consensus at the October 22-23, 1998 meetings.

Laura Hicks responded that adjustments would be made on the soft shell crab overlay but that she felt uncomfortable changing the flatfish overlay without ODFW present.

The Facilitator closed the meeting and invited the participants to return the following day at 8:00AM.

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END OF FIRST DAY
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Second Day: August 20, 1998

Kim Larson explained that due to the difficulty in understanding the data presented August 19, 1998, on the soft shell crab and juvenile flatfish study conducted by Battelle, he had restructured the tables as follows: the depth of the sediment; the number of crabs tested; the number that emerged immediately; the number that emerged at 24 hours; the number that emerged at 48 hours; the number that emerged at 72 hours; the number that emerged at 96 hours and the number of crabs that survived. He explained that these test parameters would be used for the

three different sized crab populations (less than 50 mm, between 50 and 100 mm and greater than 100 mm) (Sheet 34-37) He further explained that the objective of the study is to perform a regression analysis of the different factors that affect crab survival.

The Facilitator explained that due to the comments heard on August 19, 1998 regarding the overlays, she encouraged the group to discuss the overlays. She reminded the participants that they had reached unanimous consent during the October 22-23, 1998 meeting.

Christine Valentine presented Arlene Merems' evaluation of the candidate sites on behalf of the Department of Oregon Fish and Wildlife. (Sheet 38-42)

Edie Beasley requested that a change be made on the soft shell crab overlay (17).

Kim Larson responded by changing the line on the soft shell crab overlay (17).

Edie Beasley requested shading on the percent crab fishing income by area overlay (15)

Participants gathered around maps to discuss overlays and candidate sites. Following this discussion that occurred in small groups around the overlays, **The Facilitator** led the participants through a process to rank each overlay as low, medium or high according to its importance in the decision making process. This process and results are explained below.

Relative Importance of Overlays to Participants

In prior meetings, the working group developed 17 overlays for consideration by the group. The working group participants were asked to consider the importance of the individual overlays in their consideration of sites created for group discussion, termed candidate sites. As explained by the facilitator, this helped focus the group's discussion on issues and individual candidate sites and provided information about agency and stakeholder preferences to the Corps of Engineers and EPA for their decision-making process.

During this part of the facilitation individual participants were asked to rank the overlays in terms of how important an individual overlay was to them in their consideration of working group candidate sites. Individual participants were asked to reveal, by placing a colored dot next to each overlay heading, whether an individual overlay was high, medium, or low in importance to them in their consideration of sites. They were free to leave an overlay category without a dot and were instructed not to place more than one dot per overlay category. No effort was made to "police" these ground rules to ensure that each participant placed no more than one dot for each overlay. The results from this ranking process are presented below.

Overlay	Numbers of Dots		
	Low (Green)	Medium (Red)	High (Blue)
1) Groundfish Trawls		1	5

2) Shipwrecks	8		
3) Razor Clams	7		
4) Juvenile Flatfish	3	1	4
5) Sediment Characteristic			10
6) Recreational Fishing	5		3
7) Fishing Navigation Routes		1	8
8) Benthic Sampling 1996	4	1	
9) Benthic Sampling 1993, 1994	5	1	
10) Benthic Sampling 1992	5	1	
11) Benthic Infauna/sq mi			9
12) Commercial Crab Fishing		2	7
13) Towboat Lanes			6
14) Sediment Contours			9
15) Percent Crab Fishing by Income			4
16) Black Cod/Red Rock Fish	4		5
17) Soft-shell Crab		1	7

Pluses and Minuses for Each Candidate Site

Following the activity ranking overlays, **The Facilitator** engaged the group in a discussion of each candidate site that had been identified for discussion by the working group. Individuals were asked to identify “pluses and minuses” of each site; “pluses and minuses” were recorded on the basis of an individual’s perception and group discussion. There was no attempt to achieve unanimity before a plus or a minus was recorded; in fact, a plus or minus was recorded even if it was suggested by only one participant. The results of this process, as recorded on flip charts, are presented below.

Working Grp Site #	Minuses (-)	Pluses (+)
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Site 1	<ul style="list-style-type: none"> • juvenile flatfish rearing • lower productivity by disposal • take sand out of littoral drift • navigational concerns • covers habitat • extends into Site B • sediment grain size (not like on like) 	<ul style="list-style-type: none"> • does not create a navigational hazard for small boat fishing • small disposal area • doesn't cover as much habitat
Site 2 (Expanded Site E)	<ul style="list-style-type: none"> • navigation problems for small boats • interferes with crab fishing • causes soft spots in fishing areas • would require monitoring to avoid wave amplification • redistribution of sediment (?) • soft shell crab fisheries after August 1 • erosion timing may create mounding/navigation issues 	<ul style="list-style-type: none"> • sand stays in littoral drift system • like on like • erosive site • small size
Site 3	<ul style="list-style-type: none"> • not like on like • halibut and rockfish habitat • unique geological features • don't know where shale pile is • sand out of littoral system 	<ul style="list-style-type: none"> • none
Site 4	<ul style="list-style-type: none"> • costs uncertain (costs and feasibility require further investigation) • works in combination with jetty disposal site 	<ul style="list-style-type: none"> • beneficial use/solves Benson Beach problem • negligible impacts to resources and fisheries <p><i>Comment: Good in combination with 404 site</i></p>

Site 5	<ul style="list-style-type: none"> • takes material out of littoral zone • within high benthic productivity in portions • shale pile site • juvenile flatfish and crab habitat 	<ul style="list-style-type: none"> • very large site for “pruning” to minimize impacts
Site 6	<ul style="list-style-type: none"> • potential impacts to crabs • big crab fishing area • conflict with soft shell crab after Aug. 14 • conflicts with crab fishing in OR and WA • threat to crab resources and crab fisheries • concerns about migration to mud hole 	<ul style="list-style-type: none"> • some like on like • near shore transport zone • high energy area • organisms likely to be adapted to moving sand
Site 7	<ul style="list-style-type: none"> • potential impacts to crabs • big crab fishing area • conflict with soft shell crab after Aug. 14 • conflicts with crab fishing in OR and WA • threat to crab resources and crab fisheries • concerns about migration to mud hole 	<ul style="list-style-type: none"> • some like on like • near shore transport zone • high energy area • organisms likely to be adapted to moving sand
Site 8	<ul style="list-style-type: none"> • area of huge benthic productivity • concern with tow boat lanes • some overlap with ground fish area but not big concern to OR • not like on like • close proximity to shale pile (maybe) • outside littoral system 	<ul style="list-style-type: none"> • away from best use resources • small area, therefore less impact to habitat • minimal interference with commercial and recreational fisheries and navigation • minimal impact to local economy • seems to have a 20 year capacity • in tow lanes but bar pilots say ok, no problem if no change in sea conditions

Site 9	<ul style="list-style-type: none"> • do not know what is there • in tow boat lanes • loss of sand from littoral system • risk of sand slides and slope failure • unique areas • never been disposed on before • monitoring would be difficult • may be a productive area with specific resources not adapted to sand movement 	<ul style="list-style-type: none"> • least impact on resources • would not need large area due to depth • could be a target site <p><i>Comment: would not consider unless coupled with Benson Beach</i></p>
Site 10 (Expanded Site F)	<ul style="list-style-type: none"> • limited capacity and mounding problems: wave amplification • ground fishery • soft shell crab concerns • potential conflicts with deep draft navigation • loss of sand to littoral zone • high benthic productivity 	<ul style="list-style-type: none"> • already impacted (previously used site) <p><i>Comment: crabbers would not be impacted if broad disposal; crabbers neutral on site</i></p>

Following the discussion of pluses and minuses the participants were encouraged to fill out their candidate site evaluation sheets for each site being considered by the Working Group. Some handed in sheets to the Corps and EPA; others chose to take their sheets with them. Given that some participants intended to take their sheets with them, **Laura Hicks** established a deadline for the submission of information for consideration by the Corps and EPA prior to the identification of sites to be included in the EIS. **Laura Hicks** required that all participants evaluation of the candidate sites must be received by the Corps at the end of business day on August 26, 1998 to be considered by the Corps and EPA as a part of the process of sites that would be included in the EIS for analysis and discussion. She noted that information not submitted by this deadline would be considered as a part of the comment period for the EIS.

The Facilitator thanked the participants for their attendance and their efforts. She noted that the group had worked hard and produced valuable information for consideration by EPA and the Corps.

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END OF SECOND DAY
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Attendance

Attendance list of the participants present at the first day, **August 19, 1998:**

Participant Name	Organization	Phone/Email
Rick Vining	WDOE	(360) 407-6944 rvin461@ecy.wa.gov
Steve Barry	WDFW	(360) 249-1203 barrystb@dfw.wa.gov
George Priest	DOGAMI	(503) 731-4100 X225 george.priest@state.or.us
Shari Hildreth	For Senator Slade Gorton	(360) 696-7828 shari_hildreth@gorton.senate.gov
Diane Perry	CRCC	(503) 285-6343 crcc@teleport.com
Edith Beasley	CRCFA	(360) 642-3942 crabby@aone.com
Dick Sheldon	CRCFA/Northern Fish & Oyster	(360) 665-4886
Kathi Larson	USFWS, Portland	(503) 231-6179
Mark Siipola	COE	(503) 808-4855 mark.d.siipola@usace.army.mil
Eric Braun	COE	(503) 808-4348 eric.p.braun@usace.army.mil
Dave Hlebechuk	COE	(503) 808-4524
Laura Hicks	COE	(503) 808-4705
Kim Larson	COE	(503) 808-4776
Ben Meyer	NMFS	(503) 230-5425 ben.meyer@noaa.gov
John Malek	EPA	(206) 553-1286 malek.john@epa.gov
Otto Moosburner	EPA	(206) 553-5798 moosburner.otto@epa.gov
Bob Friedenwald	Port of Portland	(503) 731-7310 FRIEDB@PORTDTLO.COM
Christine Valentine	DLCD - Coastal	(503) 373-0093 christine.valentine@state.or.us
Kim Trimpert	CREST	(503) 325-0435 crest@orednet.org
Wendy Barber	Environment International	(206) 525-3362 staff@envintl.com
Valerie Lee	Environment International	(206) 525-3362 staff@envintl.com

Attendance list of the participants present at the second day, **August 20, 1998:**

Participant Name	Organization	Phone/Email
Rick Vining	WDOE	(360) 407-6944 rvin461@ecy.wa.gov
Steve Barry	WDFW	(360) 249-1203 barrystb@dfw.wa.gov
Shari Hildreth	For Senator Slade Gorton	(360) 696-7828 shari_hildreth@gorton.senate.gov
Diane Perry	CRCC	(503) 285-6343 crcc@teleport.com
Edith Beasley	CRCFA	(360) 642-3942 crabby@aone.com
Dick Sheldon	CRCFA/Northern Fish & Oyster	(360) 665-4886
Kathi Larson	USFWS, Portland	(503) 231-6179
Mark Siipola	COE	(503) 808-4855 mark.d.siipola@usace.army.mil
Eric Braun	COE	(503) 808-4348 eric.p.braun@usace.army.mil
Laura Hicks	COE	(503) 808-4705
Kim Larson	COE	(503) 808-4776
Mike Desimone	Pacific County	(360) 642-9382
John Malek	EPA	(206) 553-1286 malek.john@epa.gov
Otto Moosburner	EPA	(206) 553-5798 moosburner.otto@epa.gov
Bob Friedenwald	Port of Portland	(503) 731-7310 FRIEDB@PORTDTLO.COM
Christine Valentine	DLCD - Coastal	(503) 373-0093 christine.valentine@state.or.us
Kim Trimpert	CREST	(503) 325-0435 crest@orednet.org
Wendy Barber	Environment International	(206) 525-3362 staff@envintl.com
Valerie Lee	Environment International	(206) 525-3362 staff@envintl.com

**Columbia River Offshore Disposal Site
Working Group Meeting
Agenda
August 19-20 1998
Robert Duncan Plaza
Room 3H&J**

**August 19, 1998
9:00 am**

Opening Remarks/Introductions	Valerie Lee/ All
Status/Update/What Happens Next	
a. Mouth of the Columbia River	Hlebechuk/Braun
b. Dredged Material Management Study	Laura Hicks
c. Columbia River Feasibility Report	Laura Hicks
Discussion of Methodology to Evaluate Candidate Sites	Mark Siipola
Lunch	
Update on Soft Shell Crab Research	Kim Larson/ Dave Shreffler
Review of Candidate Sites	Valerie Lee

August 20, 1998

Group Discussion of Pros and Cons of Candidate Sites	All
Discussion of the Factors of Consideration	Valerie Lee
Breakout Session for Stakeholder Evaluation of Candidate Sites	All

ERIC

August 17, 1998

Status Report for MCR Dredging/Disposal 1998

13 June: Dredge ESSAYONS ("E") started work at MCR, placing dredged material into the western 5,000 foot portion of expanded Site E.

9 July: Survey of Site E, and larger area to north and west, showed greater than 6 feet accumulation in a portion of site E. "E" had placed approximately 1.4 mcy to date. Directed "E" to restrict placement to 1,000 x 4,000 foot box inside their portion of site E. Limited placement there to 500,000 cy.

11 July: Dredge NEWPORT started at MCR, placing material into eastern 5,000 feet of area E.

25 July: "E" shifted to expanded Site F, placing material into north half of site.

26 July: New survey of Site E. Accumulation still evident in west portion, including effect of last 500,000 cy placed.

4 August: "E" left for Coos Bay. Dredged 2.4 mcy to date.

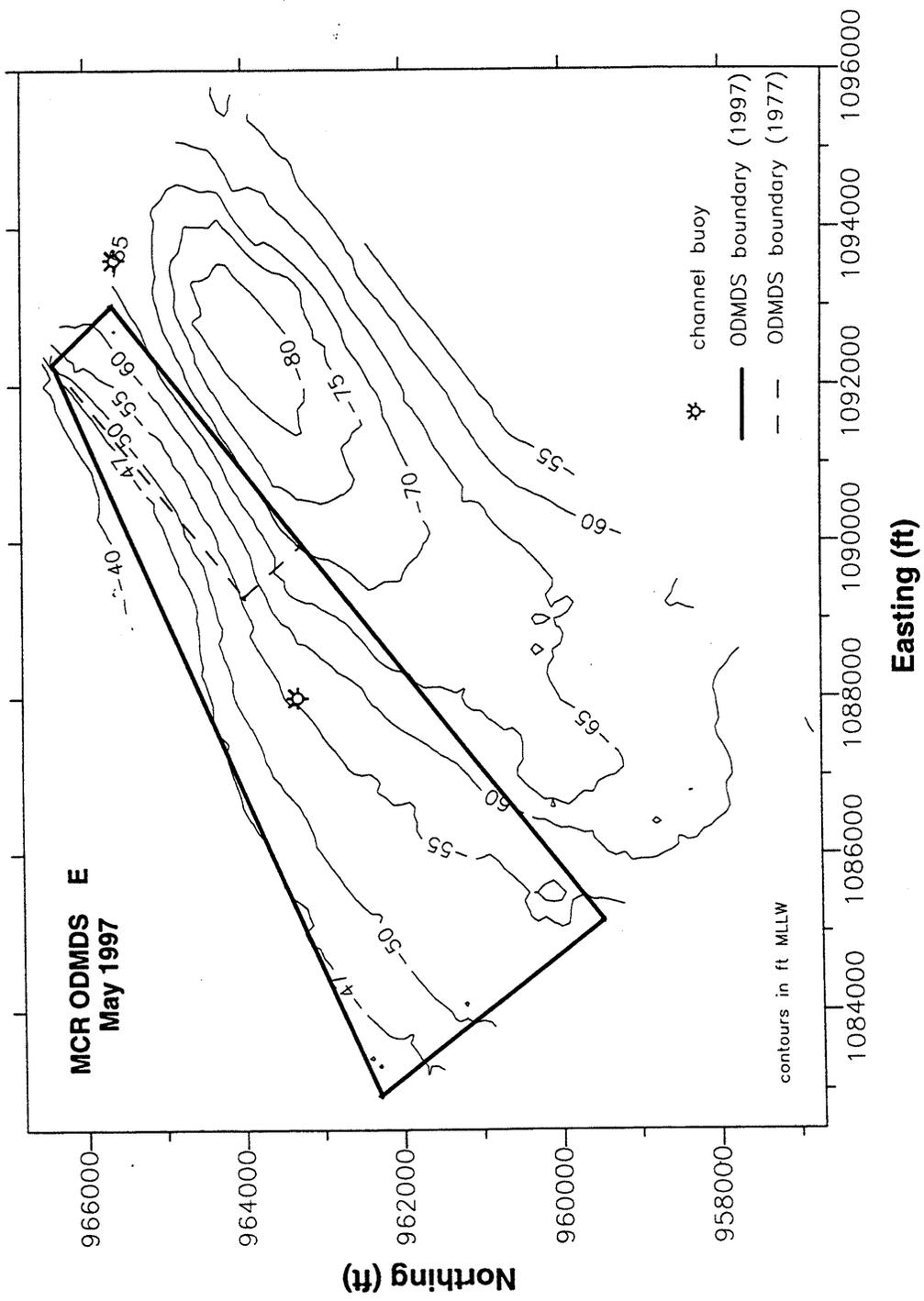
11 August: New survey of Site E. Accumulation in west portion of site appears to be eroding. Most of east portion also appears to be eroding, with only a small area showing more than 4 feet of accumulation.

14 August: Allowed NEWPORT to use north half of site F during ebb tide (rough seas and current in site E) after coordinated with Columbia River Bar Pilots.

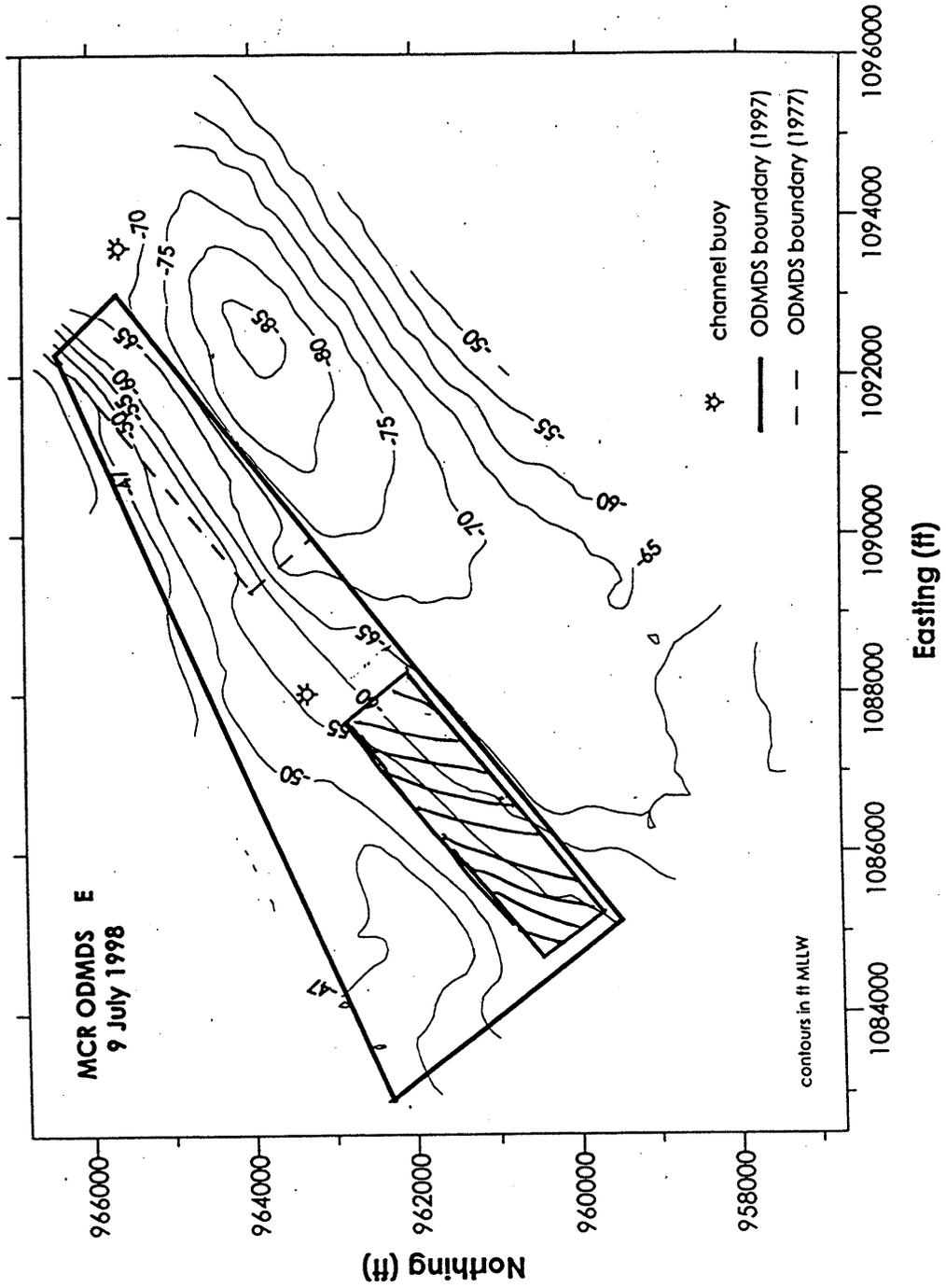
17 August: NEWPORT has dredged 1.2 mcy to date. Scheduled to dredge a total of 1.5 mcy. "E" will return to MCR and dredge any remaining material after completing other work elsewhere.

18 August: New survey of entrance channel completed. Shows 1.77 mcy remaining to be dredged.

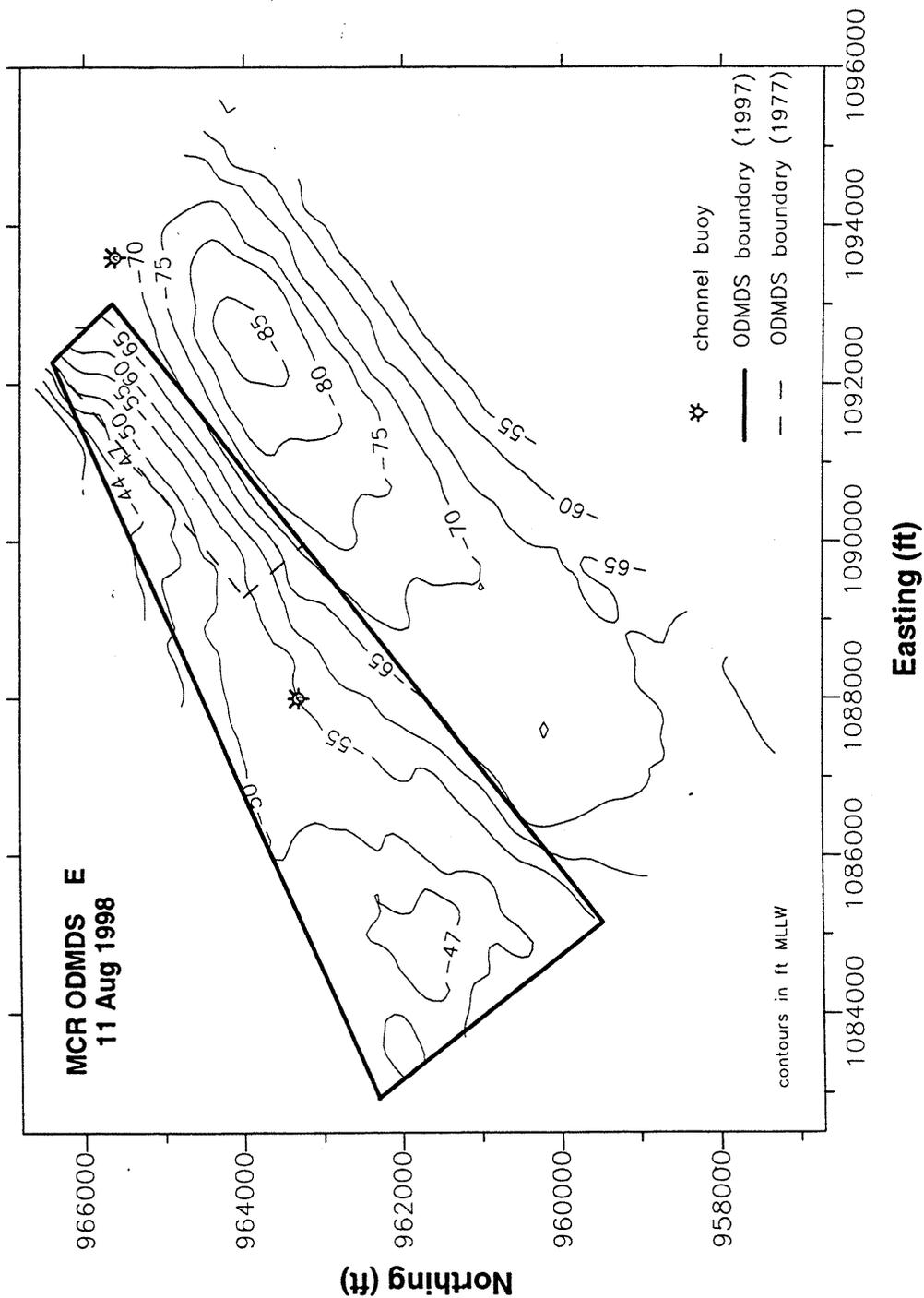
Note: yardages are approximate

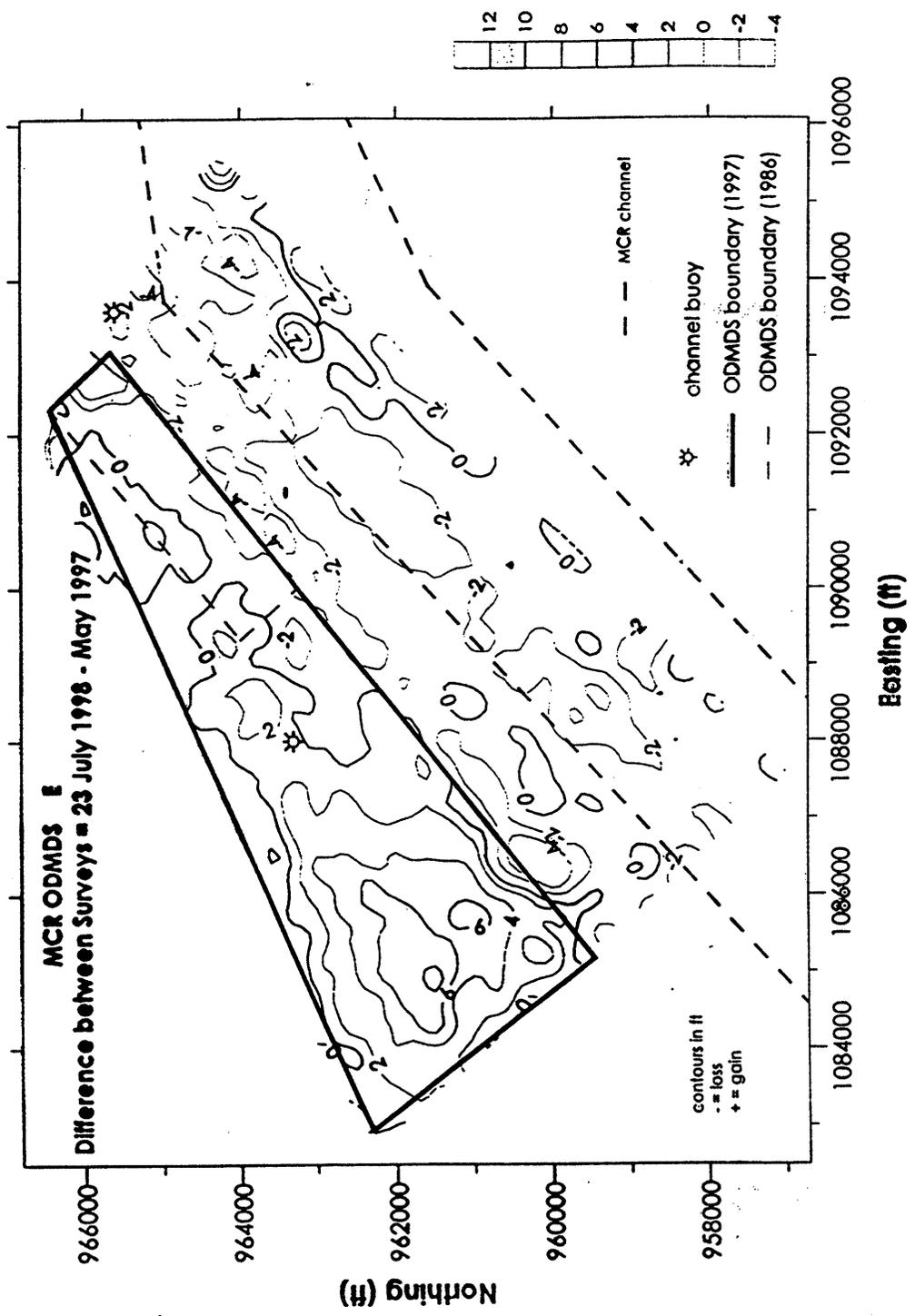


ESSAYONS will be using
cross-hatched area to avoid
increasing height in center

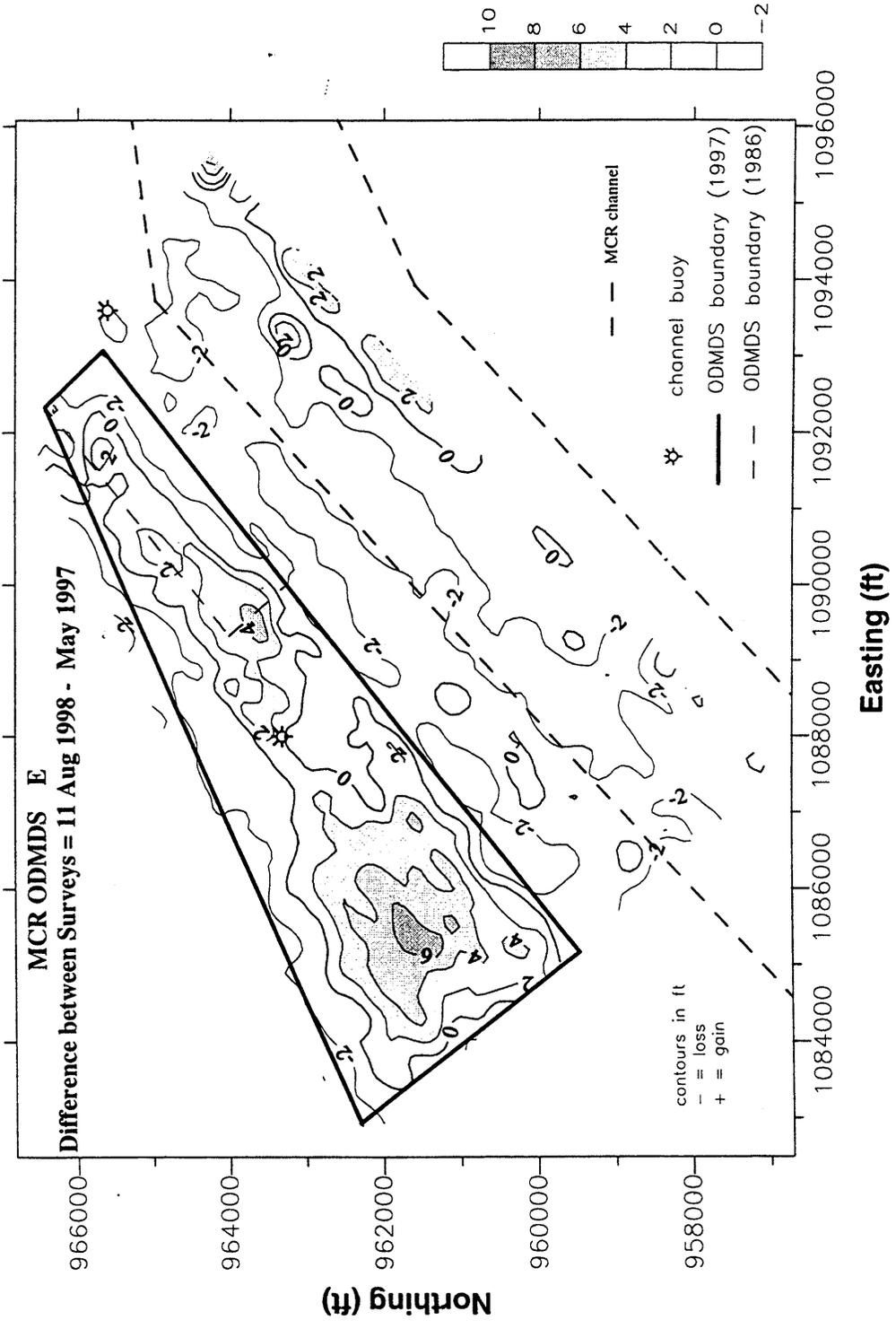


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Dredged Material Management Study Status

- No disposal of Columbia River channel sediments would occur until completion of this site designation process.
- Any new ocean disposal site capacity would include the estimated future disposal quantity of 8mcy from the Columbia River channel.

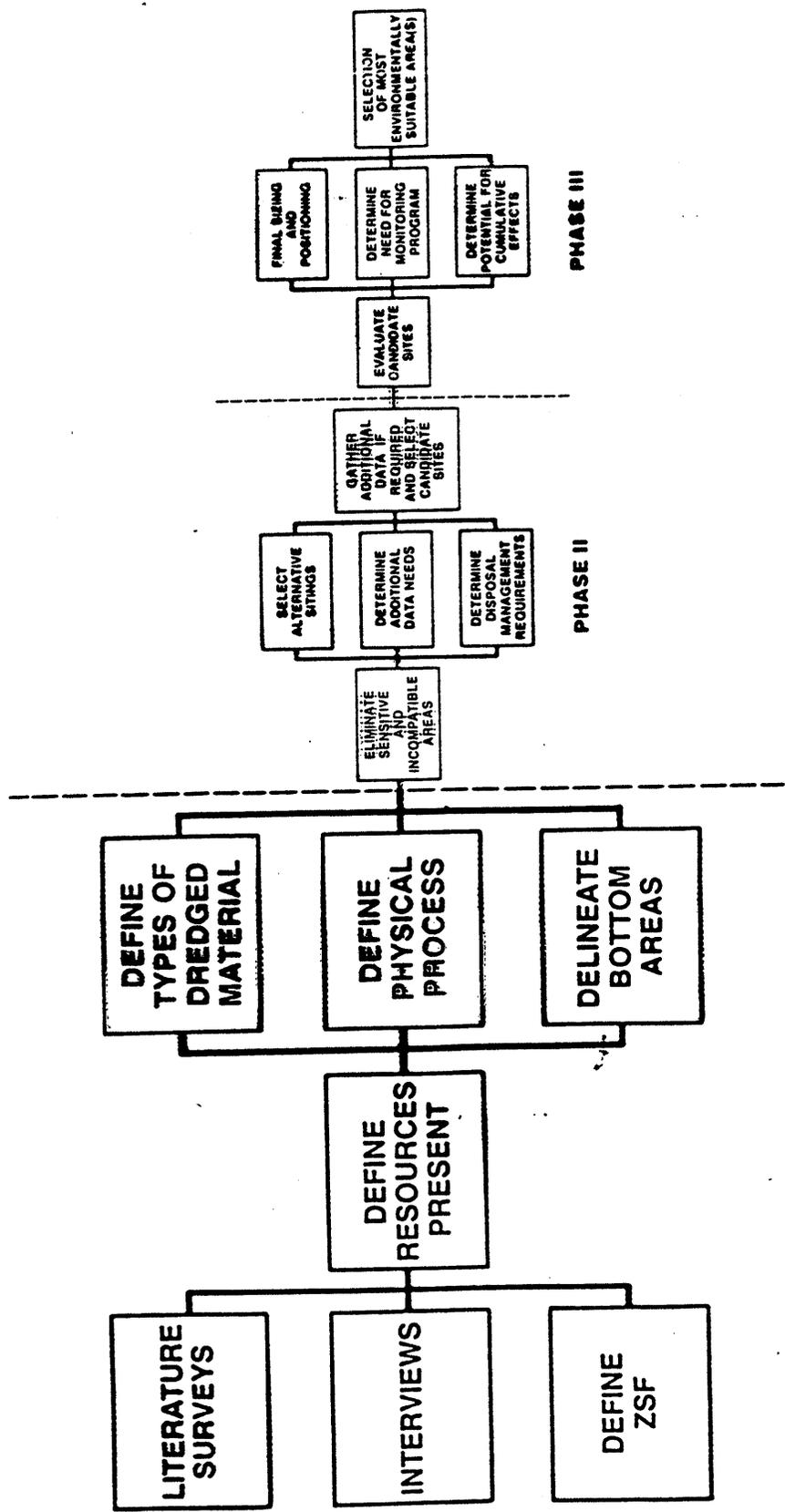
*Reference: Final Iterated Dredge Material Management
plan and Supplemental Environmental Impact Statement,
June 1998*

Columbia River Feasibility Report Status

- 7th Working Group Meeting (Overlay Process) 19-20 Aug
- Public Release of the Draft Feasibility/EIS October
- Division Commander's Public Notice Feb 99
- Final EIS Public Review Mar 99
- Chief of Engineer's Report May 99
- Record of Decision Jun 99
- EPA Final Rule Making Sep 99



Figure 2.1: Geographic Jurisdiction of the Marine Protection, Research and Sanctuaries Act and the Clean Water Act



PHASE I

Figure 4. Phase I of ocean dredged material disposal site designation protocol

Phase I

July 10, 1997

- Laws
- ZSF
- NEPA
- Physical Characteristics
- Existing Information
- Define Resources (Sub-groups established)

July 23, 1997

- Available Data
- Further Define Critical Resources

October 1-2, 1997

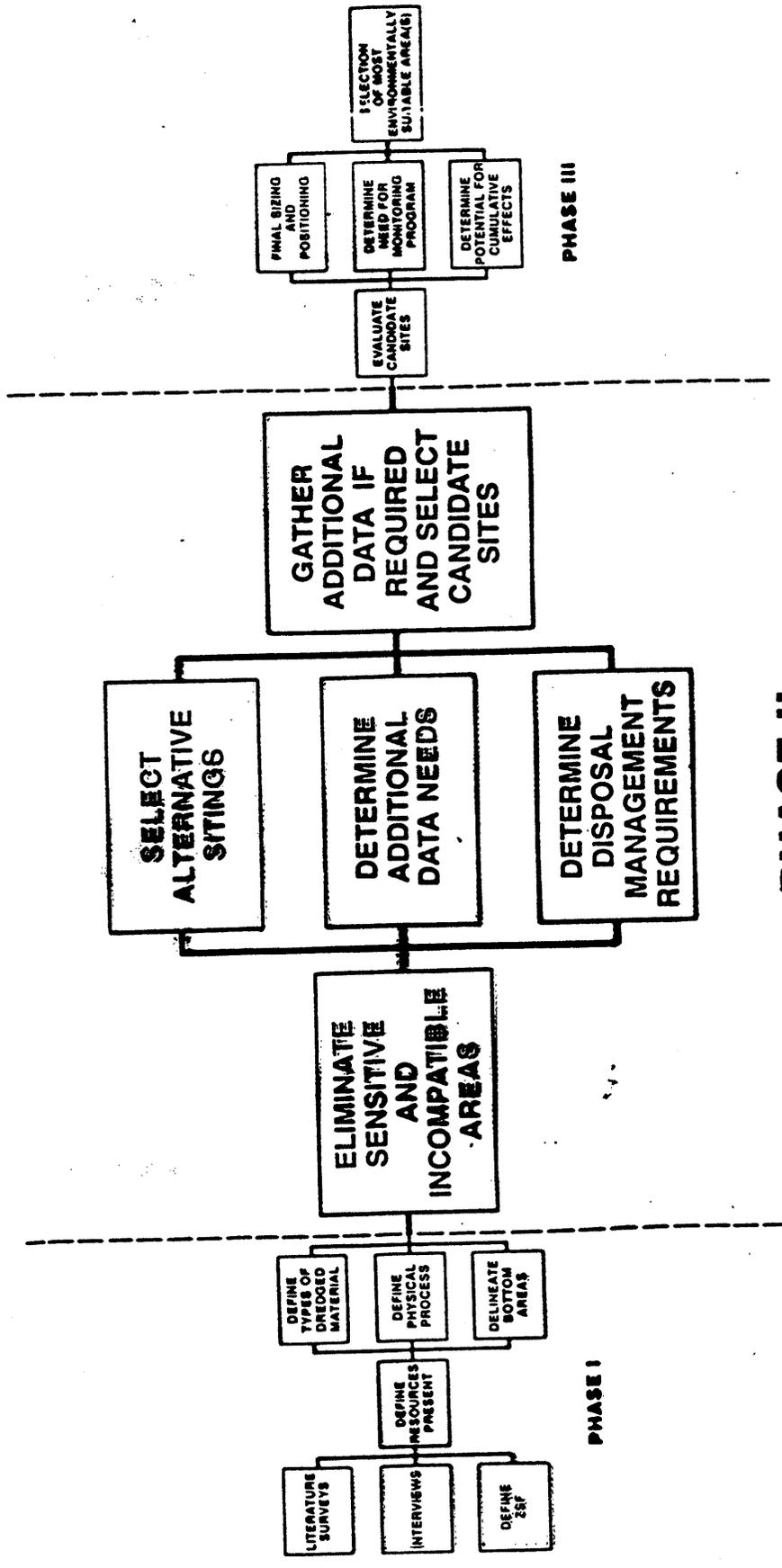
- Interviews with Fishermen

Phase I

October 8, 1997

- Define Physical Process
- Bathymetry
- Sediment Types
- Dredge Material
- Further Define Resources
- Delineate Bottom Areas

m g r k



PHASE II

Figure 5: Phase II of ocean dredged material disposal site designation protocol

Phase II

July 23, 1997

- Describe the Overlay Process
- Define Critical overlays

October 8, 1997

- Identify Critical Overlays
- Determined Additional Data Needs

August 20, 1997

- Continue Overlay Process
 - Crabs
 - Trawlfish
 - Juvenile Flatfish

Phase II

October 22-23, 1997

- Eliminated Sensitive Areas Through Overlay Process
- Identify Candidate Sites

February 19, 1998

- Thin-layer Disposal Presentation

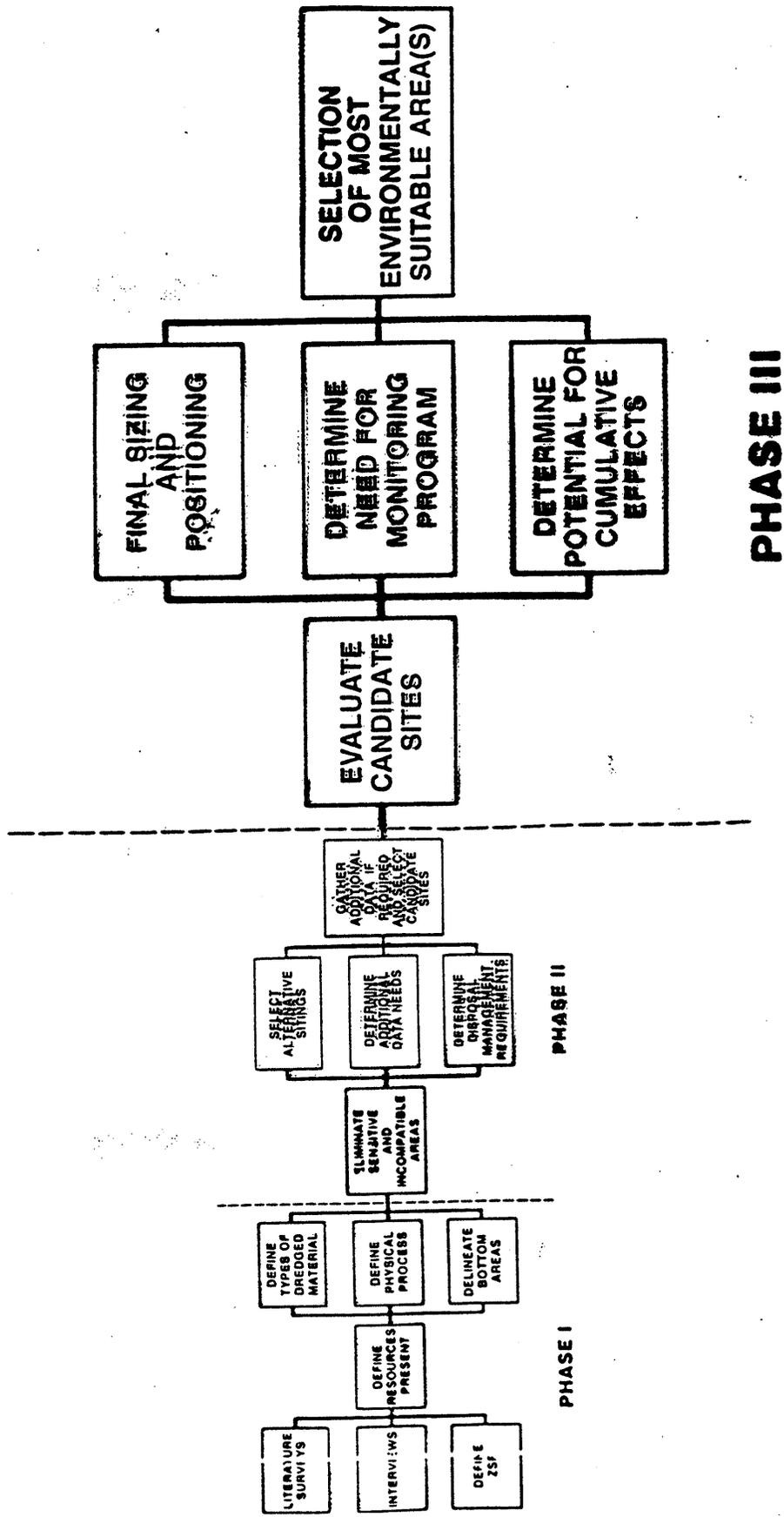


Figure 6. Phase III of ocean dredged material disposal site designation protocol

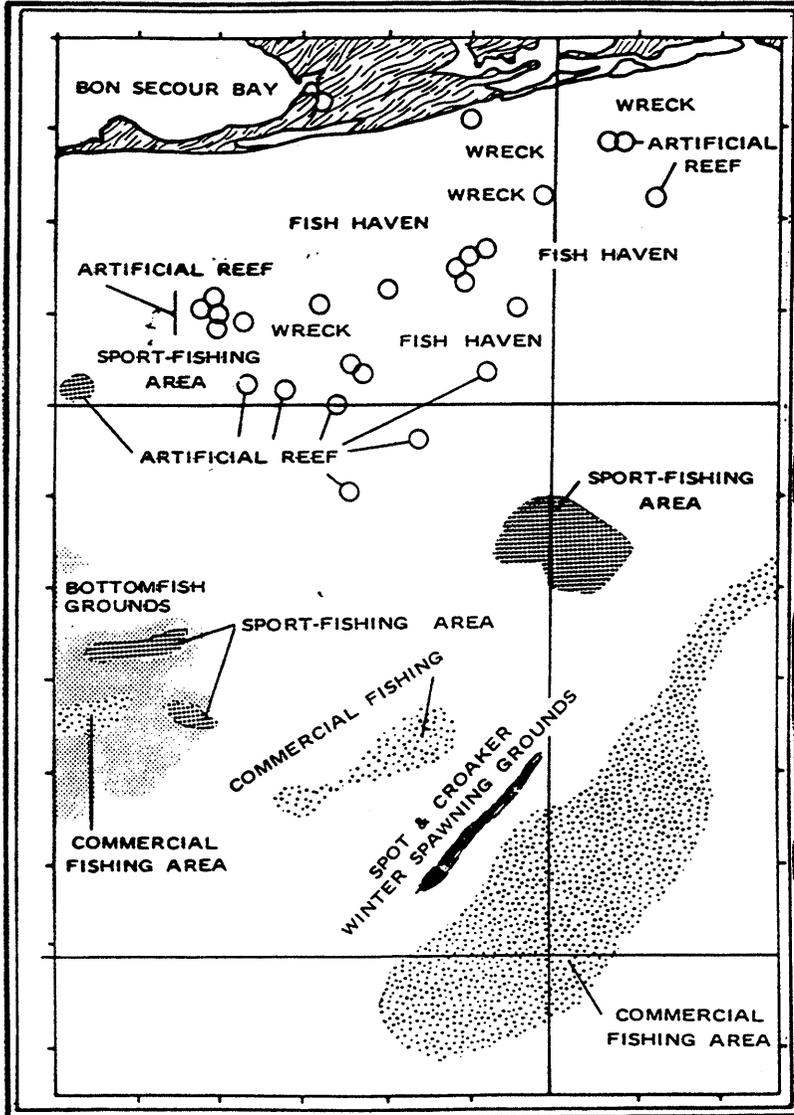


Figure 1. Example plot of important marine resources

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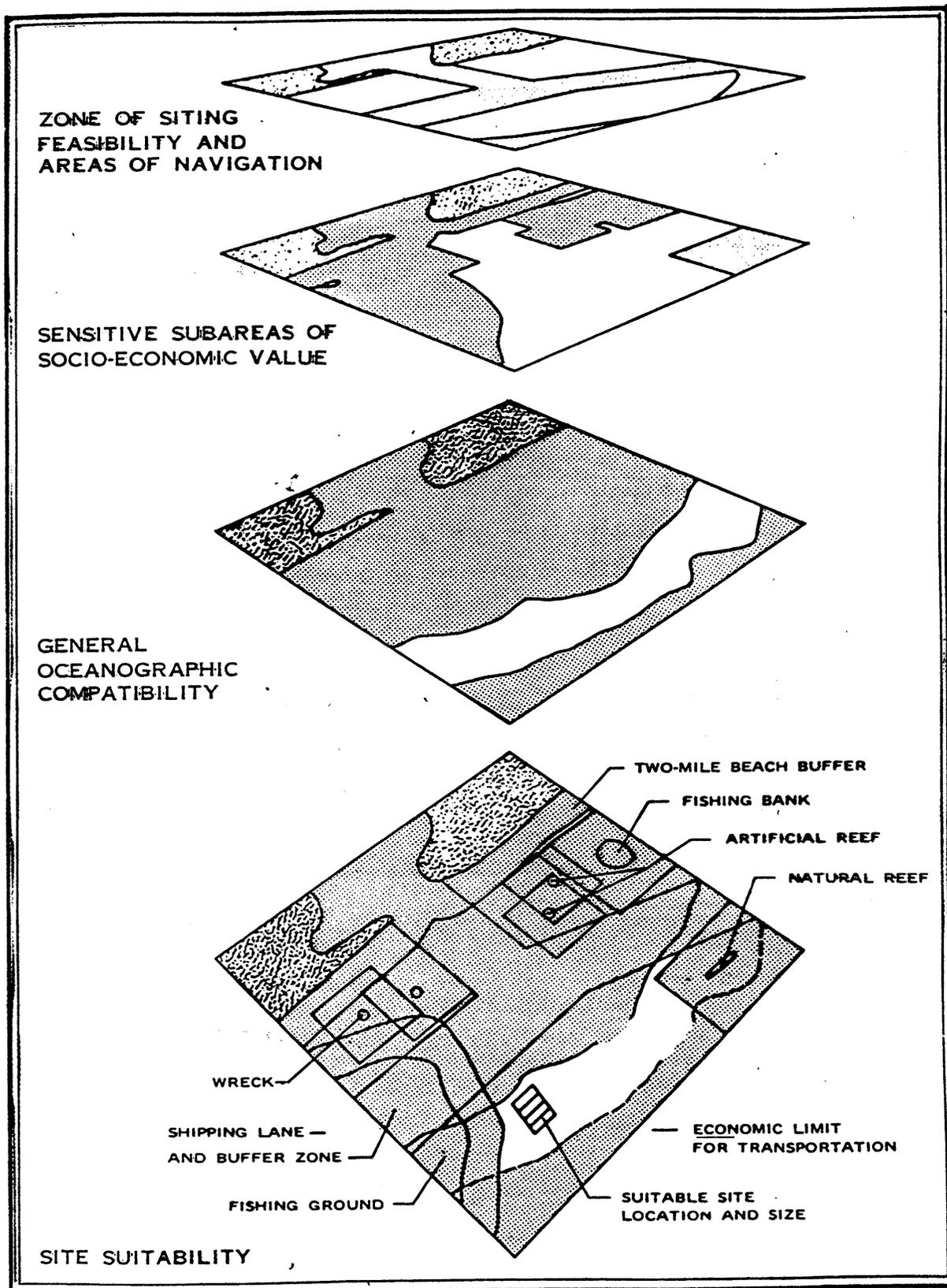


Figure 3. Overlay process for screening out sensitive and incompatible use areas

Table 1

Eleven Specific Factors for Ocean Disposal Site Selection

1. Geographical position, depth of water, bottom topography, and distance from coast.
2. Location in relation to breeding, spawning, nursery, feeding or passage areas of living resources in adult or juvenile phases.
3. Location in relation to beaches or other amenity areas.
3. Types and quantities of waste proposed to be disposed and proposed methods of release, including methods of packaging the waste, if any.
5. Feasibility of surveillance and monitoring.
6. Dispersal, horizontal transport, and vertical mixing characteristics of the area, including prevailing current velocity, if any.
7. Existence and effects of present or previous discharges and dumping in the area (including cumulative effects).
8. Interference with shipping, fishing, recreation, mineral extraction, desalination, shellfish culture, areas of special scientific importance and other legitimate uses of the ocean.
9. Existing water quality and ecology of the site, as determined by available data or by trend assessment or baseline surveys.
10. Potential for the development or recruitment of nuisance species within the disposal site.
11. Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.

.....
.....

Table 2

General Criteria for the Selection of Ocean Disposal Sites

- a. The dumping of material into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.
- b. Locations and boundaries of disposal sites will be chosen so that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations or effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.
- c. If at any time during or after disposal site evaluation studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet criteria for site selection set forth in Sections 228.5 - 228.6, the use of such sites will be terminated as soon as suitable alternative disposal sites can be designated.
- d. The sizes of ocean disposal sites will be limited in order to localize, for identification and control, any immediate adverse impacts and to permit the implementation of effective monitoring and surveillance programs to prevent adverse, long-range impacts. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation study.
- e. EPA will, wherever feasible, designate ocean dumping sites beyond the edge of the continental shelf and other such sites that have been historically used.

TABLE 3

Tillamook Bay Ocean Dredged Material Disposal Site Conflict Matrix
for Evaluating Potential for Conflict with Required Considerations
of the Marine Protection Research and Sanctuaries Act

AREA OF CONSIDERATION	CONFLICT	POTENTIAL CONFLICT	NO CONFLICT	BENEFICIAL USE	COMMENTS	REVELANT SPECIFIC FACTORS	REVELANT GENERAL FACTORS
						(From Table 1 & 40CFR 228.6)	(From Table 2 & 40CFR 228.5)
1. Unusual Topography			X			1, 6, 8, 11	a
2. Physical Sediment Compatibility	X				Possible disposal of fines.	3, 4, 9	b, c, d
3. Chemical Sediment Compatibility	X				Elevation of Possible Contaminates with Finegrained Disposal.	3, 4, 7, 9	a, b, c, d
4. Influence of Past Disposal			X			5, 7, 9, 10	a, b, d
5. Living Resources of Limited Distribution	X				Possible high Benthic Productivity at Site.	2, 3, 6, 8, 11	a, b, d
6. Commercial Fisheries	X				Salmon, Shrimp, Dungeness Crab.	2, 8	a, b
7. Recreational Fisheries	X				Salmon, Bottom Fish.	2, 8	a, b
8. Breeding/Spawning Areas	X				Dungeness Crab, Flatfish.	2, 8	a, b
9. Nursery Areas	X				Dungeness Crab, Flatfish.	2, 8	a, b
10. Feeding Areas	X				Juvenile Salmonids, Marbled Murrelets, Brown Pelicans, Pelagic Birds.	2, 8	a, b
11. Migration Routes	X				Gray Whales, Brown Pelicans, Pelagic Birds, Shore Birds Salmonids.	2, 8	a, b
12. Critical Habitat of Threatened or Endangered Species	X				Gray, Humpback, Blue, Fin, Sei, Right and Sperm Whale Bald Eagles, Peregrine Falcon and Brown Pelicans.	2, 8	a, b
13. Spatial Distribution of Benthos	X				Dissimilar Materials may alter Benthic Habitat.	2, 8, 10	a, b
14. Marine Mammals	X				Gray Whales, Stellar Sea Lions.	2, 8	a, b
15. Mineral Deposits		X				1, 8	a, b, c
16. Navigation Hazard		X				1, 8	a, b, d
17. Other uses of Ocean (cables, pipelines etc.)		X				8	a, b, d
18. Degraded Areas		X				4, 6, 7	a, b, d
19. Water Col. Chem./Phys. Characteristics		X				4, 6, 9	a, b, d
20. Recreational Uses		X				2, 8, 11	a, b, c, d
21. Cultural/Historic Sites		X				11	b
22. Physical Oceanography: Waves/Circulation		X				1, 3, 6, 7	a, b, d
23. Direction of Transport/Potential for Settlement		X				1, 3, 6, 7	a, b, d
24. Monitoring		X				5	c
25. Shape/size of Site (orientation)		X				1, 4, 7	d
26. Size of Buffer Zone		X				2, 3, 4, 7, 11	b, d
27. Potential for Cumulative Effects		X				4, 7	c, d

Organization Name: _____
Date: _____

**Ocean Dredged Material Disposal Site Conflict Matrix
for Evaluating Potential for Conflict with Required Considerations
of the Marine Protection Research and Sanctuaries Act**

AREA OF CONSIDERATION ^{1/}	CONFLICT ^{2/}	POTENTIAL CONFLICT	NO CONFLICT	BENEFICIAL USE	COMMENTS	REVELANT SPECIFIC FACTORS	REVELANT SPECIFIC FACTORS
						Eleven Specific Factors ^{3/} (40CFR 228.6)	5 General Criteria ^{4/} (40CFR 228.5)
1. Unusual Topography/Unique Bottom Features						1, 6, 8, 11	a
2. Physical Sediment Compatibility						3, 4, 9	b, c, d
3. Chemical Sediment Compatibility						3, 4, 7, 9	a, b, c, d
4. Influence of Past Disposal						5, 7, 9, 10	a, b, d
5. Living Resources of Limited Distribution						2, 3, 6, 8, 11	a, b, d
6. Commercial Fisheries						2, 8	a, b
7. Recreational Fisheries						2, 8	a, b
8. Breeding/Spawning Areas						2, 8	a, b
9. Nursery Areas						2, 8	a, b
10. Feeding Areas						2, 8	a, b
11. Migration Routes						2, 8	a, b
12. Critical Habitat of Threatened or Endangered Species						2, 8	a, b
13. Spatial Distribution of Benthos						2, 8, 10	a, b
14. Marine Mammals						2, 8	a, b
15. Mineral Deposits						1, 8	a, b, c
16. Navigation Hazard						1, 8	a, b, d
17. Other uses of Ocean (cables, pipelines etc.)						8	a, b, d
18. Degraded Areas						4, 6, 7	a, b, d
19. Water Column Chem./Phys. Characteristics						4, 6, 9	a, b, d
20. Recreational Uses						2, 8, 11	a, b, c, d
21. Cultural/Historic Sites						11	b
22. Physical Oceanography: Waves/Circulation						1, 3, 6, 7	a, b, d
23. Direction of Transport/Potential for Settlement						1, 3, 6, 7	a, b, d
24. Monitoring						5	c
25. Shape/size of Candidate Site						1, 4, 7	d
26. Size of Buffer Zone						2, 3, 4, 7, 11	b, d
27. Potential for Cumulative Effects						4, 7	c, d

Kim

Dungeness Crab Research

Burial Test July 30, 31 & August 5, 1998

	July 30	July 31	August 5
Sand Type	Dry	Wet	Dry
Water Depth over Sand	38"	38"	70.5"
Depth of Sand Prior to Test	6-8"	11.5"	11.5"
Depth of Sand Placed	8.4"	8.4"	10.2"
Duration of Dump	20 sec	160 sec	23 sec

Dungeness Crab Research

Burial Test July 30, 31 & August 5, 1998

	July 30	July 31	August 5
Number of Crabs	13	12	12
Size Range	4-3/8 - 6-1/4"	4-3/4 - 6-5/8"	4-3/4 - 6-1/2"
Crabs on Surface After 1 Hour	10	8	12
Additional Crab After 2 Hours	1	0	0
Additional Crabs Following Day	0	3	0
Crabs Remaining in Sand	2 1 live	1	0
Long Term Mortality of Emerged Crabs	0	0	0

Beneficial Uses

It is recognized that from time to time beneficial uses of dredged material may become available. Some beneficial uses are: borrow area; development of county or state park; industrial development; erosion abatement and; environmental enhancement.

Corps guidance directs that beneficial use sites be considered when available. If a beneficial use site is determined to not be in the best interest of the Government, the owners would be responsible for obtaining environmental clearances for use as a dredged material disposal site. Where a beneficial use site is part of the recommended alternative for navigation, it would be incorporated into the O&M program.

Where a beneficial use site is not part of the recommended alternative, it would be pursued under relevant authorities and separate funding sources. Study costs for these sites, beyond the reconnaissance level, are either a non-federal or shared federal/non-federal responsibility depending on the type of beneficial use as follows:

1. Restoration and protection of environmental resources;
75/25 cost share
2. Placement of material on beaches for hurricane and storm protection; 50/50 cost share
3. Other beneficial uses; land creation or enhancement, development purposes, placing material on beaches not meeting criteria for Corps participation. In these cases all cost required for the base plan must be paid by non-federal interests.

The Punaise: A Remotely Operated Submerged Dredged System

by Gregory L. Williams¹ and Kris Visser²

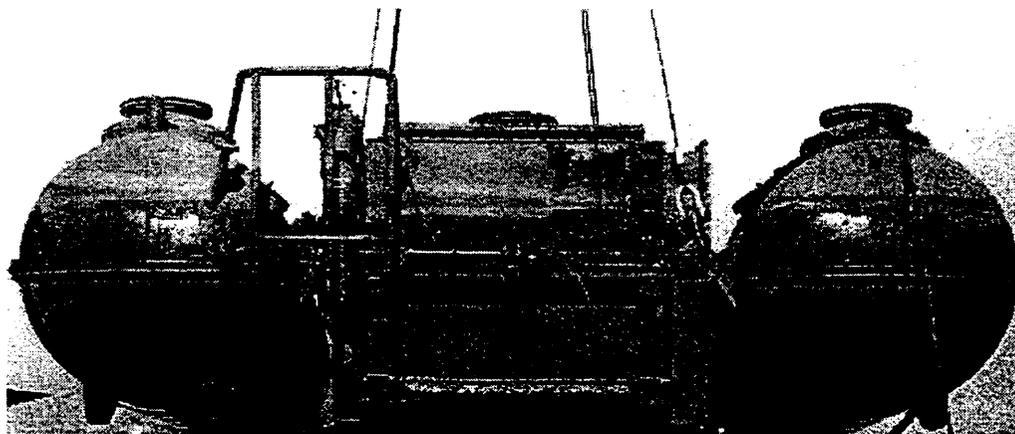
This paper is not an endorsement for any particular technology or dredging company, but is intended to identify a technology with potential application in the United States.

The Innovative Dredging Equipment and Processes Technology focus area of the U.S. Army Corps of Engineers Dredging Operations and Environmental Research program is being conducted at the U.S. Army Engineer Waterways Experiment Station (WES). This focus area will demonstrate and document emerging dredging and disposal technologies available from both domestic and foreign dredging interests for application to Corps dredging projects. Most advances in the dredging industry are modifications to existing equipment. Very infrequently, a new dredging concept is developed. The *Punaise* is new dredging technology which has not yet operated in the United States. The first *Punaise* was designed for silt removal and used in 1991 in The Netherlands. Since then, a second system has been constructed to transport sand for beach nourishment activities. PinPoint Dredging Company, a partnership of J. G. Nelis, Ballast Nedam Dredging, and Boskalis International, operates the *Punaise* and most recently used it at a beach nourishment project on the Dutch coast during 1996.

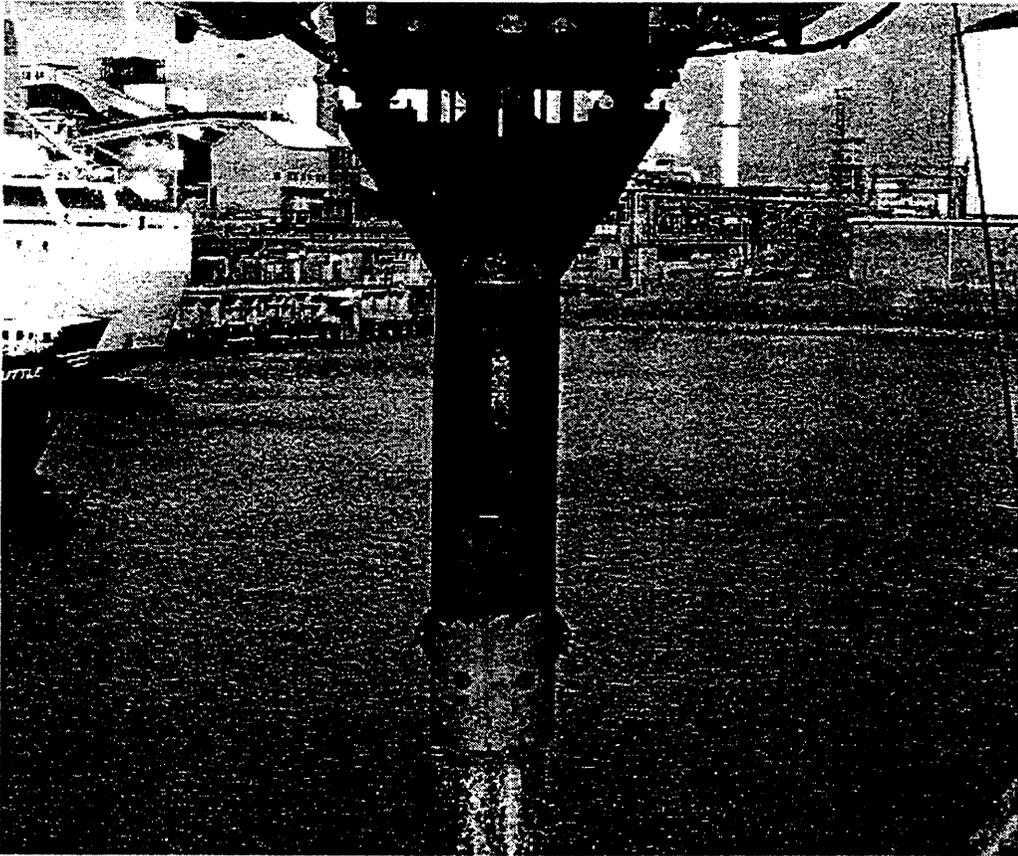
The *Punaise* (Dutch for thumbtack) is a remotely operated, watertight submerged dredge that resides on the seafloor, pumps sediment without impact to navigation, and is not affected by storms. Because it is located on the seafloor, it is very tolerant of adverse surface wave action, which allows it to operate in all types of weather and sea state conditions. The *Punaise* is connected to a shore station by an umbilical, which serves not only as the communication connection but also as the discharge line through which the dredged slurry is pumped. The entire dredging process, including sinking and floating (i.e., filling and emptying ballast tanks), is controlled from the shore station by one person. The *Punaise* can thus operate for long periods with relatively low labor costs. Maximum flexibility in sediment removal is attained through repositioning the *Punaise* at the dredging site from time to time with the help of a tug.

Operational Principle

The *Punaise* operates under the principle of deep dredging (i.e., putting the dredge pump as close to the sediment intake as possible). In so doing, the *Punaise* always requires an embedded support that must extend below the suction intake for vertical stability during dredging. Figures 1 and 2 show the two existing *Punaises* (PN250 and PN400, respectively), which contain a dredge pump, electric motor, instrumentation, suction intake, and vertical support. Specifics for each model are shown in Table 1.



During setup prior to dredging, the shore station is established and the umbilical is floated to the dredging site. The *Punaise* is then connected to the umbilical and positioned at the appropriate location for sinking to the seafloor. Once



positioned, the ballast tanks are filled and the *Punaise* settles to the bottom. Fluidisers are then activated, which allows the vertical support (an extension of the suction pipe) to settle into the sand bottom. When the suction intake reaches the level of the bottom, dredging begins. As material is removed, a crater or pit is formed with the *Punaise* located at the lowest point. Dredging continues and the crater/ pit size grows (*Punaise* settles further into the bottom) until either the desired

dredging depth is reached or resistant bottom features (e.g., bedrock, clay) prevent further settling.

Figure 1. The Punaise PN250

Energy and Data Supply

Electrical power is supplied by two diesel-driven generators located at the shore station on the beach. The total installed electrical power is approximately 1,200 kW, with 800 kW/3,000 V used for the sand pump electric motor and 150 kW/ 660 V used for the auxiliary equipment. The umbilical is composed of 11-mm core diameter electrical cables, which provide a relatively cheap and flexible system so that future changes in working distance and/or electrical power can easily be adapted.

Figure 2. The Punaise PN400

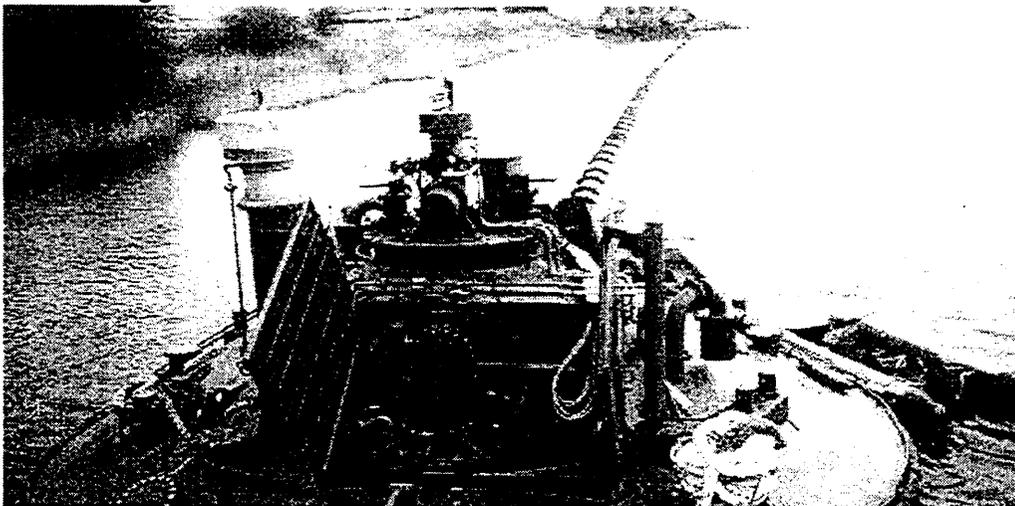




Table 1. Punaise Design Specifics

	PN250	PN400
Width	7.8 m	8.5 m
Height (without suction pipe)	3.1 m	6.0 m
Height (with suction pipe)	8.5 m	8.7 m
Draft	7.5 m	6.5 m
Working depth	30 m	40 m
Required sediment thickness Initial production Maximum production	6 m 8 m	7 m 10 m
Pump capacity	800 cu m/hr @ 87 psi	2,400 cu m/hr @ 116 psi
Discharge pipe diameter	4.0 cm	6.2 cm
Weight	52 tons	105 tons

Remote Control Dredging

The unmanned dredge is controlled by one operator from the shore station using standard personal computers for visualizing and controlling all the processes for signal input and output. All signals (420 digital and 105 analog) are updated and logged every second. All processes (except diving and floating) are fully automated so the operator only tracks operation status, which is visualized on a monitor. Diving and floating remain manually controlled because the various external factors require an experienced operator. The dredging process is displayed on a separate monitor, which includes a window showing the last 10 min of operation to track trends. Additionally, the complete filling of the 1,500-m discharge pipe is shown so the operator can determine the specific critical flow based on the mass of sand in the pipe. The primary variable which the operator can influence is density. Using water jets at the suction mouth and two bypass valves located immediately before the pump entrance, the operator can easily adjust the sand/water mixture with only a few mouse clicks at the computer. Another monitor shows the status of shore-based equipment (generators, air compressors, and fuel supply). Finally, daily reports showing production results, equipment status, fuel consumption, and Punaise movements and location can be produced at the end of each day's operation.

In the event of a fiber-optic failure where communication between the dredge and shore station is lost, the dredge can operate autonomously via a special program in the dredge. If the connection fails, the dredge automatically opens all the bypass valves and pumps clean

the connection fails, the dredge automatically opens all the bypass valves and pumps clean water to shore, thereby removing all of the sand from the discharge pipe. To retrieve the dredge, the operator can supply air at 70 psi to the *Punaise* through one of two air hoses in the umbilical, which allows the dredge to empty its ballast tanks and rise to the surface.

	Bloemendaal	Zandvoort	Heemskerk
Year	1994	1994	1996
Volume	255,000 cu m	350,000 cu m	475,000 cu m
Length of replenishment	2,500 m	2,000 m	1,600 m
Volume per length	103 cu m/m	175 cu m/m	297 cu m/m
Fill elevation	+ 3.5 m mwl	+ 3.5 m mwl	+ 4.0 m mwl
Slope	1:30	1:30	1:30
Maximum pumping distance	2,700 m	2,000 m	1,900 m
Length of submerged pipeline	1,000 m	1,000 m	1,100 m

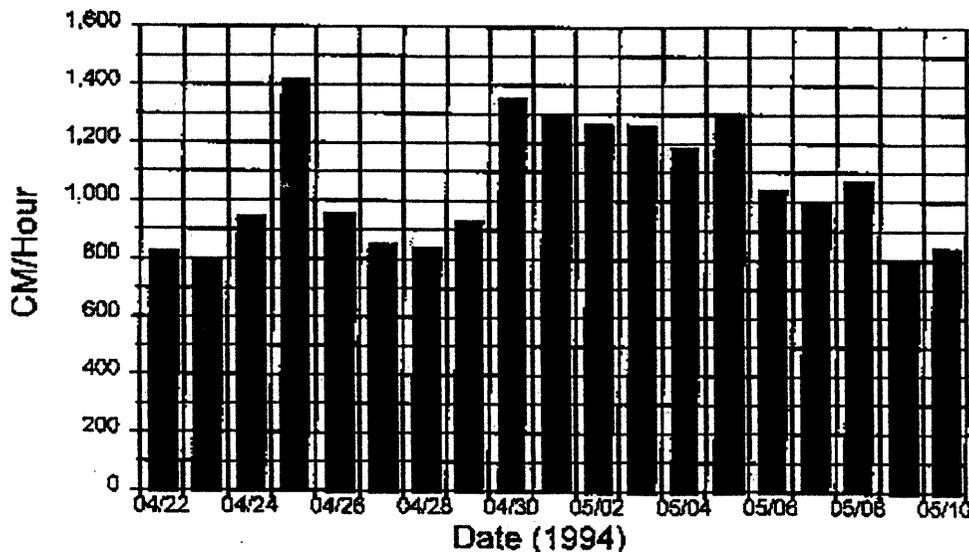
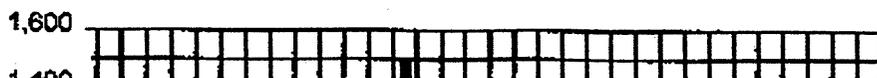


Figure 3. Average Punaise hourly production by day at Bloemendaal



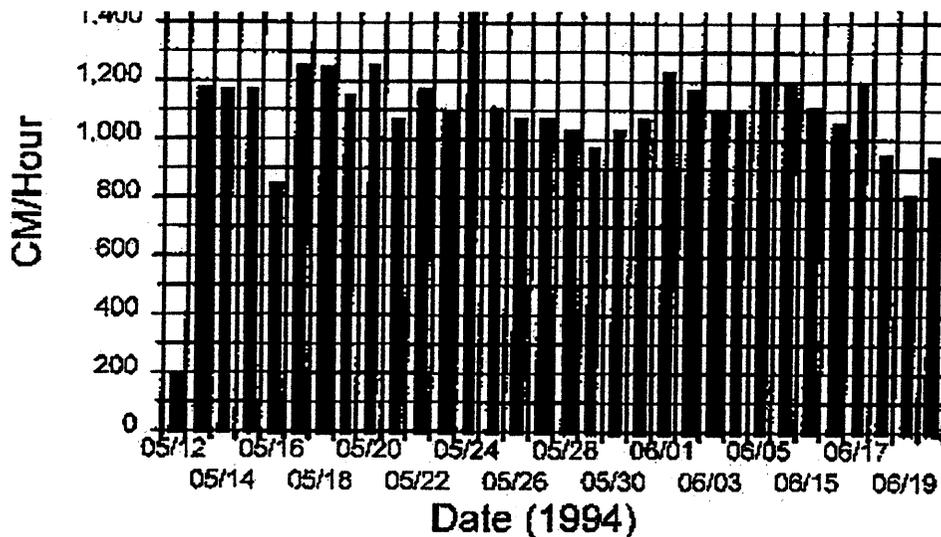


Figure 4. Average Punaise hourly production by day at Zandvoort

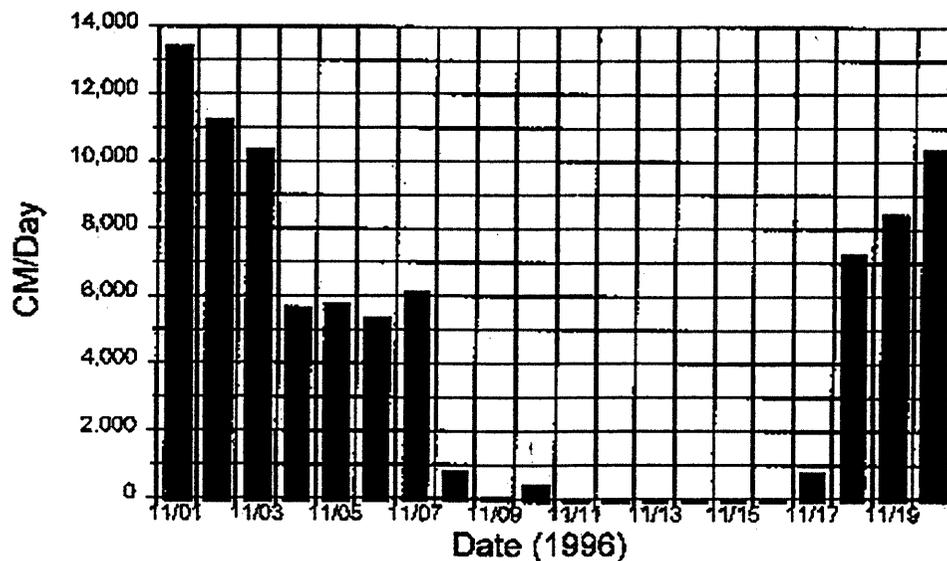


Figure 5. Average Punaise hourly production by day at Heemskerk

Beach Replenishment Projects in The Netherlands

The dredge *Punaise* PN250 was initially used to remove 600,000 cu m of silt per year for 2 years from Flushing Harbour in The Netherlands. The system proved to be so effective that a demonstration contract was signed between the Dutch Ministry of Public Works (DMPW) and the contractor (J. G. Nelis) to conduct beach nourishment projects. The decision was made to construct a bigger and more powerful dredge (*Punaise* PN400) specially suitable for pumping sand from a borrow pit at sea in the coastal zone. *Punaise* PN400 was constructed primarily for three projects, all on the central North Sea coast west or northwest of Amsterdam. Details of these projects are summarized in Table 2.

Production

For the 1994 projects, the DMPW monitored the effects of a temporary sand rehandling pit in front of the coastline at -7.0 m mwl. The monitoring program indicated that negative effects on the coastal morphology and the macrobenthic community on the seabed adjacent to the borrow pit area were either small or immeasurable. Turbidity levels measured in the breaker

zone did not exceed the usual background values and there was no evidence of any movement of the pit in any direction. The *Punaise* was allowed to create its own pit to meet the total quantity to be dredged with no limitation placed on pit size. Total dredging depth was limited to -25.0 m mwl, and the resulting pit was kidney-shaped.

For the project conducted in 1996, the *Punaise* was restricted to work in a 100-m by 60-m area at a depth of -25.0 m mwl. The contours of the rehandling pit at the original depth were 250 m by 150 m. After removing 150,000 cu m from the pit, the *Punaise* received dredged material dumped from a hopper dredge for onshore pumping.

The 1994 projects were conducted in April and May during calm/normal weather conditions. The average hourly productions per day are shown in Figures 3 and 4 for Bloemendaal and Zandvoort, respectively. In October and November 1996, the DMPW initiated the beach nourishment project at Heemskerk to test the performance under heavy weather conditions. During the 2-week period from 1-13 November, the system was tested during a series of storms. A wave rider buoy located offshore recorded storm conditions approaching 10 on the Beaufort Scale, described as: (a) very high waves with long overhanging crests; (b) mean wind speed 52 knots; (c) probable wave height about 9.0 m.

During the first days of the storm, production increased because of an increasing pit production, and the pit slopes changed from 1:3 to 1:5 as a result of breaking waves. After dredging and pumping approximately 150,000 cu m from the pit, additional material was to be supplied by a hopper dredge near the beginning of the storm period. However, owing to the adverse weather conditions, hopper dredge operations did not begin until 13 November. This test thus showed the vulnerability of a continuous production if a hopper dredge and *Punaise* are used together when weather is uncooperative. Figure 5 shows the daily production of the *Punaise* during this time period.

Cost

To minimize cost for mobilization and installation, all of the equipment except the hull of the dredge is stored in containers and transported by ship to a harbor near the dredging location. Assembling of the discharge pipeline and umbilical, and establishing the units for control and power supply normally takes about 4 weeks. The unit cost for dredging the three demonstration projects conducted in The Netherlands was \$4.71/cu m (\$3.60/cu yd).

Punaise Operations in the United States

The State of New York and PinPoint Dredging Company planned to demonstrate the *Punaise* system at Shinnecock and Jones Inlets on the south shore of Long Island during January-February 1997. This demonstration was intended to investigate the feasibility of using the *Punaise* to conduct sand bypassing at structured inlets in the United States. A detailed effort to monitor equipment effectiveness, crater surveys, and beach surveys near the crater and placement sites was planned. Shinnecock and Jones Inlets each have chronic downdrift erosion problems, so the demonstration would have provided an opportunity to evaluate the technology as well as place much needed sand on the downdrift beaches. The demonstration was to have bypassed approximately 153,000 cu m from each inlet to the downdrift beaches. Assuming an equal distribution of mobilization/demobilization costs between inlets, total project costs were estimated at \$810,000 for Shinnecock and \$910,000 for Jones. These costs translate to respective unit costs of \$5.29/cu m (\$4.05/cu yd) and \$5.95/cu m (\$4.55/cu yd) at each inlet. Cores taken at each site indicated that no more than a 6.1-m-thick layer of clean sand was available for dredging at either site. Since this sand thickness was insufficient to support maximum production (see Table 1), the *Punaise* demonstration project was canceled. Although the PN250 (and possibly the PN400) could probably have dredged some sand, the location of a clay layer would have required frequent repositioning, thus reducing dredging efficiency and greatly increasing cost.

No other project has considered using the *Punaise* system for dredging in the United States.

One reason for lack of U.S. work relates to issues associated with the Merchant Marine Act of 1920 (more commonly known as the Jones Act), which might have limited the ability of the *Punaise* to operate in waters of the United States since it is not a U.S. flagged vessel. Before the State of New York could enter into a contract to use the *Punaise* for bypassing at Shinnecock and Jones Inlets, the state had to seek a ruling from the U.S. Customs Service on whether the *Punaise* dredging system was prohibited by the Jones Act. In August 1996, the U.S. Customs Service issued a ruling on the legality of *Punaise* operations in the United States. The U.S. Customs Service decision is based on two requirements from the law, namely that to be prohibited, ...it must be engaged in dredging and must be a vessel. The U.S. Customs Service showed that the *Punaise* was indeed involved in dredging, but since it neither carried a crew nor merchandise, nor was it self-propelled, it could not be considered a vessel. Therefore, the *Punaise* is not prohibited by the Jones Act from working in the United States.

In 1996, the Dutch dredging companies J. G. Nelis, Ballast Nedam Dredging, and Boskalis International entered into an agreement for the exploitation of the Pinpoint technology with the dredges *Punaise* PN250 and PN400. All three partners are working together in this agreement to develop and improve this innovative dredging method. Stuyvesant Dredging Company, New Orleans, Louisiana, fully owned by Boskalis International, is the primary contractor of the *Punaise* in the United States. Currently, there are plans to build a *Punaise* dredge (PN250) to specifically address dredging and bypass problems around the many inlets along the sandy U.S. east coast. PinPoint Dredging expects to execute the first demonstration project in the United States in 1998.

Conclusions

The *Punaise* is a new concept in dredging technology that allows dredging operations in and near navigation channels with minimal impact on ongoing navigation. Some of its advantages are as follows:

- Submerged system.
- Operated via remote control.
- Connected to shore by a communication/discharge umbilical.
- Requires only one operator.
- Automated operation.
- Has mobility for movement within a borrow area or to other locations.

Previous work in The Netherlands has proven the technology to be an effective system to dredge and pump material for traditional beach nourishment projects. The *Punaise* is also especially adept for working in storm conditions at relatively low costs. The *Punaise* is not restricted by the Jones Act for operations in the United States. Pinpoint Dredging is currently considering a design modification to allow better access to thicker sand layers in shallower waters.

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²Project Engineer, PinPoint Dredging Company, PO Box 802, 2003 RV Haarlem, Netherlands

Crab Study

Test Dumps with Dungeness Crab <50mm

Depth of Sediment	Number of Crabs Tested	Number Emerged			Number Emerged @ 96 hrs	Number of Crabs Survived
		Immediately @ 24 hrs	@ 48hrs	@ 72 hrs		
2.4	5	3	0	1	0	4 of 5
4.2	14	11	0	0	0	11 of 14
6.6	10	9	0	0	0	9 of 10
10.2	11	10	0	0	0	10 of 11

Crab Study

Test Dumps with Dungeness Crab 50-100mm

Depth of Sediment	Number of Crabs Tested	Number Emerged				Number Emerged @ 96 hrs	Number of Crabs Survived
		Immediately	@ 24 hrs	@ 48hrs	@ 72 hrs		
2.4	5	5	0	0	0	0	5 of 5
4.2	3	3	0	0	0	0	3 of 3
6.6	5	3	0	0	0	0	3 of 5
10.2	8	5	0	0	0	0	5 of 8

Crab Study

Test Dumps with Dungeness Crab >100mm

Depth of Sediment	Number of Crabs Tested	Number Emerged Immediately	Number Emerged @ 24 hrs	Number Emerged @ 48hrs	Number Emerged @ 72 hrs	Number Emerged @ 96 hrs	Number of Crabs Survived
2.4	1	1	0	0	0	0	1 of 1
4.2	1	1	0	0	0	0	1 of 1
6.6	-	-	-	-	-	-	-
10.2	1	0	0	0	0	0	0 of 1

Crab Study

Test Dumps with Juvenile Flatfish

Depth of Sediment	Number of Fish Tested	Number Emerged				Number of Fish Survived
		Immediately	@ 24 hrs	@ 48hrs	@ 72 hrs	
2.4	10	10	0	0	0	10 of 10
4.2	20	20	0	0	0	20 of 20
6.6	10	10	0	0	0	10 of 10
10.2	10	10	0	0	0	10 of 10



INTRA-DEPARTMENT MEMORANDUM
Marine Resources Program, Newport
(541) 867-0300 ext. 246
fax (541) 867-0311
email: arlene.merems@hmsc.orst.edu

Date: August 13, 1998
To: Dredge Material Disposal Working Group
From: Arlene Merems
Subject: COMMENTS FOR AUG. 19 & 20 MEETING

As I will not be able to attend the Dredge Disposal Meeting on August 19 and 20, I forward these comments to you regarding the Site evaluation process and other matters relating to this process as a whole.

Site Evaluation:

Site 1) The "Skirt"- overlaps juvenile flatfish nursery grounds and high density area of groundfish fishing. This site is wedged between and has some overlap with areas known to have important biological resources. Since many of the resource polygons were drawn subjectively, I do not have complete confidence in their boundaries, therefore, my primary recommendation is to not use this area at all until we have more concrete information about the resources in the whole area. If, however, this site is favored by the group, I recommend shrinking this site and moving it to slightly deeper water to minimize overlap with the "mapped" resource areas (see attached map).

Site 2) This site is acceptable as long as the site is monitored for wave amplification and vessel safety, as previously done. I think this is mostly Washington's decision whether or not to continue use of this site. If Washington is comfortable with it, so are we.

Site 3) The shale pile on the Corps map is in the wrong place. Its correct location is actually directly to the north of the Beasley's site (see attached map). One of our longtime fisheries managers brought this to my attention. He has stated that the shale pile may be prime halibut grounds and should not be disposed on until a biological assessment is made to determine otherwise. Any biological assessment would need to occur over a several month time period to determine seasonal use and density of halibut.

Site 4) This site is acceptable to us, but we defer to Washington.

Site 5) We do not approve of this site because of conflicts with many resource and biological uses. This site overlaps much of Oregon's crabbing area, softshell crab area, flatfish nursery area, and Oregon's groundfish area. It encompasses a tremendous amount of marine habitat.

Site 6) Not sure. If the idea here is beach nourishment (littoral system), it may be too deep to accomplish that. I wonder if there is enough wave energy in the deeper sections of this site to ensure sediment transport. We like the idea of utilizing the littoral system to disperse sediment, but I assume it would have to be in shallower than what is depicted here, probably 40 feet or less (I'm guessing). I learned of a potential problem with this site after speaking with our shellfish biologist on the north coast. He says that the area from the south jetty southward for 4 miles and inside of 100 feet deep is full of commercial crab pots from May until Aug. 14. After Aug. 14, the fishery is closed due to softshell conditions. Disposal operations here could create a conflict with the fishery during this time period. After Aug. 14, the pots are removed, but then the crab are soft so now there is that concern. This site may not be as desirable as was originally thought, unless the dredge can work inside of the crab pots. Perhaps a way around it is to just use the WA side if this is not a conflict for WA crabbers, or cut the Oregon side of the polygon by half to minimize conflict. I strongly encourage input from the Oregon crabbers on this one. If they have a problem with the

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dredges inshore here, ODFW would not support use of this site. Neil Richmond will talk to Steve Berry, WDFW, about the situation on the WA side.

Site 7) Same considerations as 6.

Site 8) This site is acceptable. It's away from best known resource use areas, except for some overlap with the groundfish area, but it's not too large to be a concern. I like the idea of a few small areas this size, rather than one big area.

Other Sites

I would like to hear a discussion on using the littoral system. I think the Corps has concerns about operating the dredges in shallow (30 ft) water. What is the deepest they can go and still take advantage of the littoral system? What time of year is best for using this area? George Kaminsky of the Dept. of Nat. Resources (360-407-6797) is a contact I was given for the sediment transport research currently happening in Washington. It would be good if he was at the meeting. Eric Braun should also be able to address this issue. George Priest of DOGAMI will attend the meeting. He may provide some thoughts on beach nourishment.

There is sometimes mention of dumping sediment in the Astoria Canyon. **ODFW does not support this option.** The habitat there is very different from that of the shelf and deepwater species that inhabit this area are not likely able to tolerate enormous amounts of sedimentation. This area is also very important to the commercial groundfish fishery. **ODFW strongly disagrees with using the canyon as a dump site.**

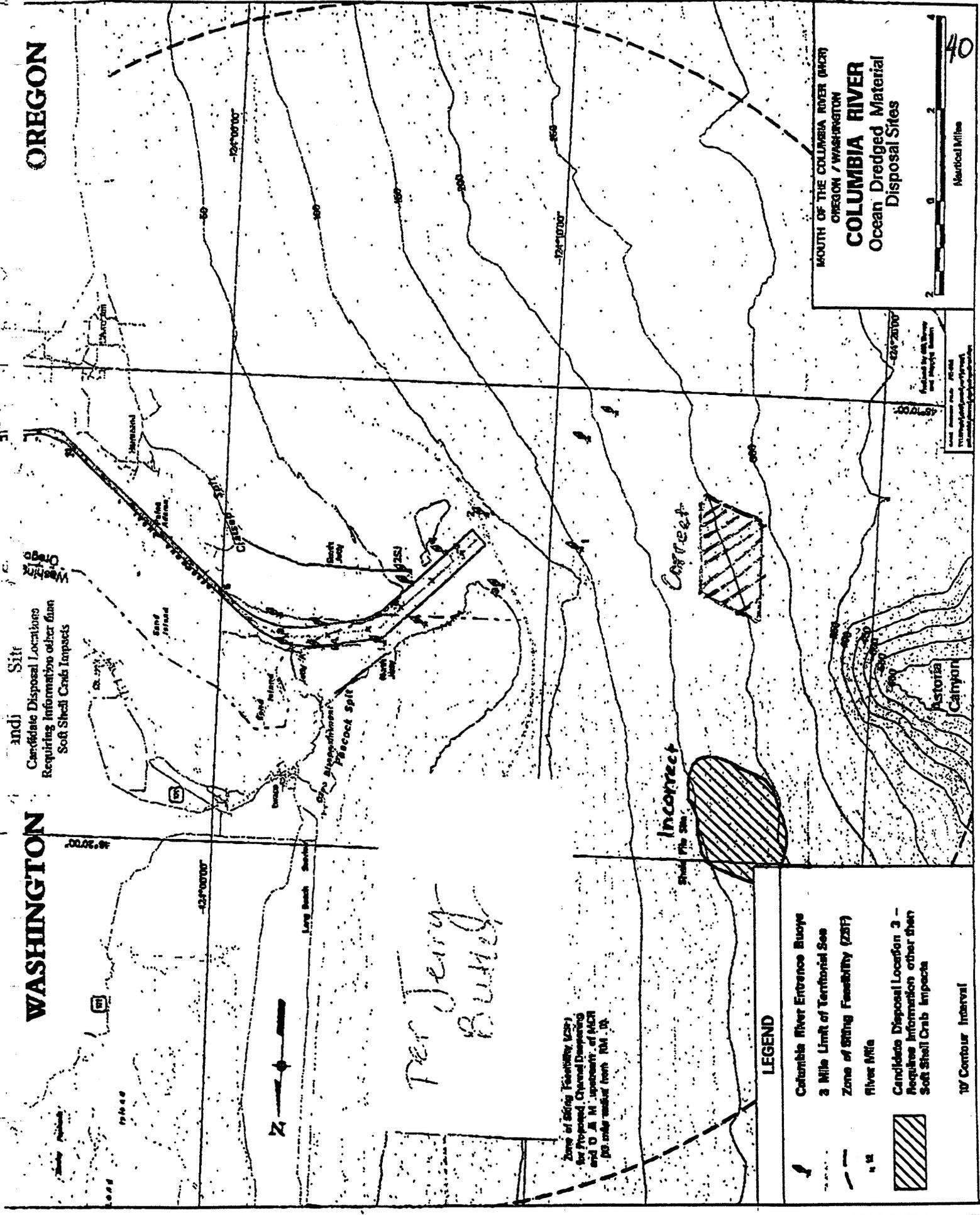
Channel Deepening Disposal Sediments

I would like to hear the Corps comment on the process for disposal of this sediment. We have concerns that there is the assumption that the Channel Deepening sediment will be dumped in the same location as sediment from the mouth, regardless of differences in sediment characteristic. The Group needs to hear more about this in order to make fully informed recommendations for sites.

OREGON

WASHINGTON

and Silt
Candidate Disposal Locations
Requiring Information other than
Soft Shell Crabs Impacts



*Per Jerry
Buller*

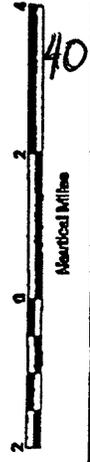
Zone of Siting Feasibility (ZSF)
for Proposed Channel Deepening
and D.M. operations of MCR
for material from RM 10

LEGEND

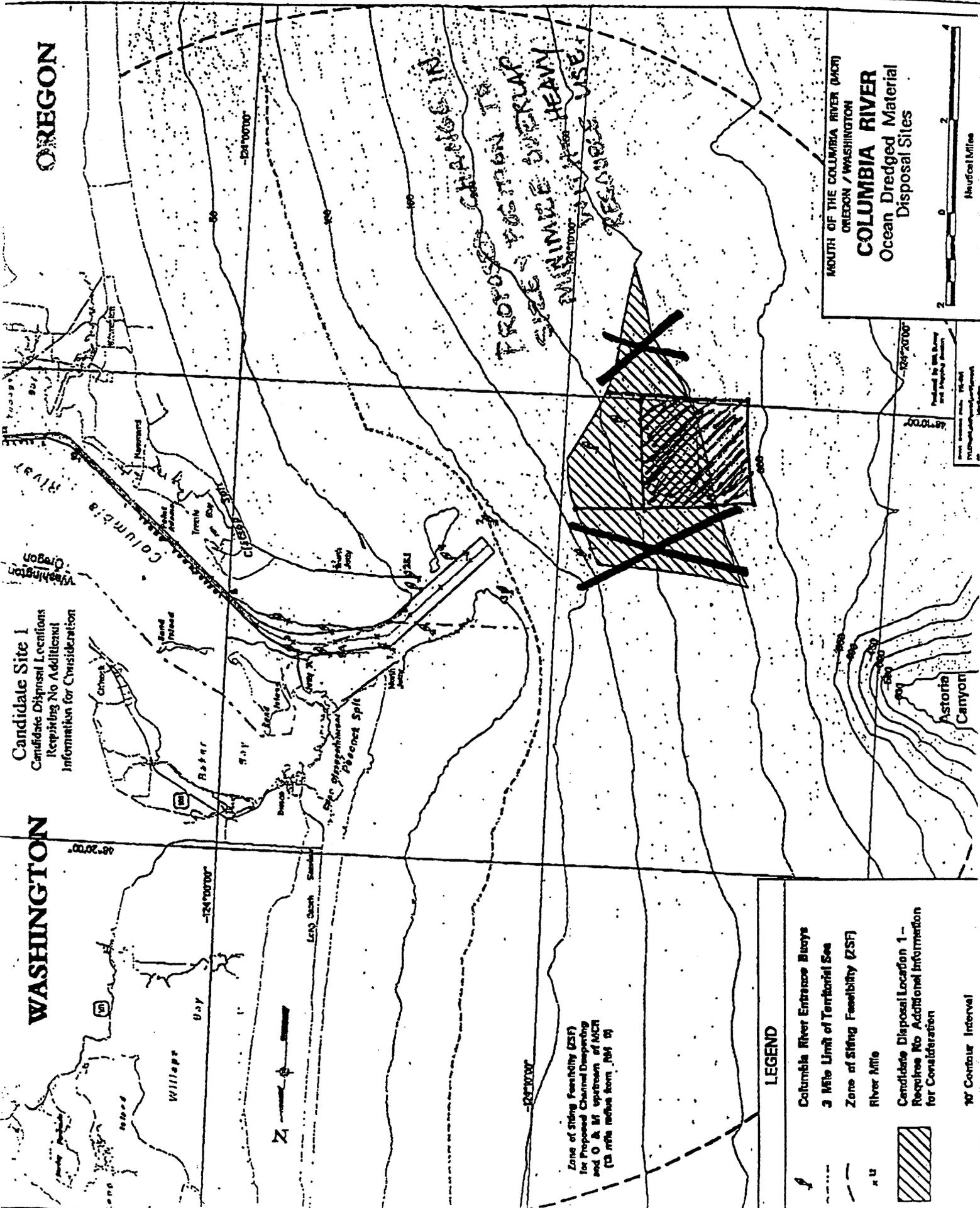
- Columbia River Entrance Buoys
- 3 Mile Limit of Territorial Sea
- Zone of Siting Feasibility (ZSF)
- River Mile
- Candidate Disposal Location 3 -
Requiring Information other than
Soft Shell Crab Impacts
- 10' Contour Interval



MOUTH OF THE COLUMBIA RIVER (MCR)
OREGON / WASHINGTON
COLUMBIA RIVER
Ocean Dredged Material
Disposal Sites



Scale: 1:50,000
Produced by ODFW
Newport, Oregon



Candidate Site 1
 Candidate Disposal Locations
 Requiring No Additional
 Information for Consideration

WASHINGTON

OREGON

MONTH OF THE COLUMBIA RIVER (MCR)
 OREGON / WASHINGTON
COLUMBIA RIVER
 Ocean Dredged Material
 Disposal Sites

LEGEND

- Columbia River Entrance Buoys
- 3 Mile Limit of Territorial Sea
- Zone of Siting Feasibility (ZSF)
- Candidate Disposal Location 1 - Requires No Additional Information for Consideration
- North
- 0 2 Nautical Miles

Zone of Siting Feasibility (ZSF)
 for Proposed Channel Deepening
 and O & M upstream of MCR
 (3 mile radius from 101st St)

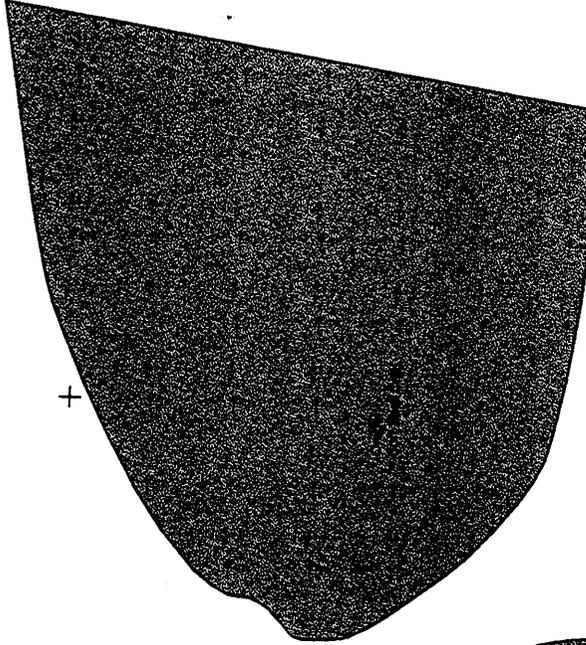
Produced by the Bureau
 of Oceanography
 and Coastal Sciences
 University of North Carolina
 at Chapel Hill

SUPPLEMENT:

STATE OF OR COMMENTS - FOR 8/19-20 DISCUSSION

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Site 3 - Shale pile - We want to stress that we absolutely do not want this site used. It is a very unique rocky habitat in the middle of a bunch of sand. It can be rich with life, just not crab life. That's why crabbers say its a graveyard.



Softshell Crab



