



DEPARTMENT OF THE NAVY
PORTSMOUTH NAVAL SHIPYARD
PORTSMOUTH, N.H. 03804-5000

IN REPLY REFER TO:

November 12, 1997

MEMORANDUM

FOR THE MEMBERS OF THE RESTORATION ADVISORY BOARD (RAB) CERCLA
REMEDIAL ACTION PROGRAM, PORTSMOUTH NAVAL SHIPYARD, KITTEERY, MAINE

The next RAB meeting will be held on Thursday, November 20, 1997
at 7 p.m. at the Days Inn in Kittery. We will present an update
on schedules, the Mercury Burial Vault removal action and the
draft Phase I/Phase II Offshore Data Comparative Analysis Report.

Your participation is greatly appreciated. If you are unable to
attend the meeting, please call me at (207)438-3830. I look
forward to seeing you again.

Sincerely,

A handwritten signature in cursive script that reads "Ken Plaisted".

Ken Plaisted
Navy Co-Chairman
Restoration Advisory Board

Distribution:

Juanita Bell	Doug Bogen	Jeff Clifford
Michele Dionne	Eileen Foley	Mary Marshall
Phil McCarthy	Jack McKenna	Guy Petty
Onil Roy	Peter Vandermark	Carolyn Lepage

EPA Region I (M. Cassidy)
MEDEP (Iver MacLeod)
NOAA (K. Finkelstein)
MEDMR (D. Card)
NHFG (J. Nelson)
USFWS (K. Munney)
North Div (F. Evans)
COMSUBGRU TWO (R. Jones)
Portsmouth Naval Shipyard (Codes 106, 106.3, 106.3R, 100PAO, 105,
105.5, NRRO)

cc: PNS Meetings

CONTINUOUS IMPROVEMENT THROUGH TEAMWORK



DEPARTMENT OF THE NAVY
PORTSMOUTH NAVAL SHIPYARD
PORTSMOUTH, N.H. 03804-5000

IN REPLY REFER TO:

October 2, 1997

MEMORANDUM

FOR THE MEMBERS OF THE RESTORATION ADVISORY BOARD (RAB) CERCLA
REMEDIAL ACTION PROGRAM, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

The next RAB meeting which was originally scheduled for October 23, 1997 will be postponed until Thursday, November 20, 1997 due to a scheduling conflict of Navy personnel. The November meeting will be still be at 7 p.m. at the Days Inn in Kittery.

I apologize for any inconvenience this may cause. A reminder will be sent out to you approximately one week prior to the next meeting.

Sincerely,

Ken Plaisted
Navy Co-Chairman
Restoration Advisory Board

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cc: File PNS Meetings
CONTINUOUS IMPROVEMENT THROUGH TEAMWORK



DEPARTMENT OF THE NAVY
PORTSMOUTH NAVAL SHIPYARD
PORTSMOUTH, N.H. 03804-5000

IN REPLY REFER TO:

December 17, 1997

MEMORANDUM

FOR THE MEMBERS OF THE RESTORATION ADVISORY BOARD CERCLA REMEDIAL ACTION PROGRAM, PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Enclosed please find the draft minutes from the November 20, 1997, Restoration Advisory Board meeting for your review and comment. Also included are the follow-up responses to questions raised on the Phase I/Phase II Off-Shore Data Comparative Analysis. Comments are requested by January 20, 1997. You may provide your comments to me at 207-438-3830.

Sincerely,

Ken

Ken Plaisted
Navy Co-Chairman
Restoration Advisory Board

Distribution:

Juanita Bell
Doug Bogen
Jeff Clifford
Michele Dionne
Eileen Foley
Carolyn Lepage
Mary Marshall
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EPA New England Region (M. Cassidy)
NOAA (K. Finkelstein)
MEDMR (D. Card)
USFWS (K. Munney)
NHF&G (J. Nelson)
MEDEP (I. McLeod)
NORTHDIV (F. Evans)
COMSUBGRU TWO (R. Jones)
Brown & Root Environmental (B. Horne, L. Klink)
PNS (Codes 106, 106.3, 106.3R, 100PAO, 105, 105.5, NRRO)

CONTINUOUS IMPROVEMENT THROUGH TEAMWORK

cc: File PNS Meetings

**RESTORATION ADVISORY BOARD MEETING
PORTSMOUTH NAVAL SHIPYARD
DAYS INN, KITTERY, MAINE
NOVEMBER 20, 1997**

The meeting began at 7:10 pm and ended at 9:23 pm. Community members attending were: Doug Bogen, Jeff Clifford, Mary Marshall, Jack McKenna, Guy Petty, Onil Roy, and Peter Vandermark; regulatory members Meghan Cassidy, EPA, and Iver McLeod, MEDEP; Natural Resource Trustee Don Card; and Navy members Ken Plaisted and Fred Evans. Others attending were Carolyn Lepage, the Seacoast Anti-Pollution League's technical advisor; and Marty Raymond, Tom Devaney, and Debbie Holton (PAO) from the Shipyard. Larry Favinger from the Portsmouth Herald also attended. Juanita Bell, Michele Dionne, Eileen Foley, and Phil McCarthy were absent.

INTRODUCTION

Ken Plaisted, the Navy Co-Chair, welcomed the RAB and mentioned that Phil McCarthy called to say he could not attend the meeting. He introduced Macy Morse as a guest. Ken announced that Eileen Foley was retiring as Portsmouth's mayor; he read from a newspaper article praising her for more than 50 years of municipal service. Ken will ask if she would like to remain a RAB community member. He also mentioned that a long-time local environmental activist, Conrad Quimby, recently died; Conrad chaired the Kittery Conservation Commission.

Ken reviewed the meeting procedures adopted at the last RAB meeting. Any vacant seats around the table as the meeting begins may be filled by non-RAB members; the status of work presentation format will be amended; EPA and MEDEP will provide their own presentations on the status of IR activities; presentations will be scheduled before regulator comments are incorporated; Carolyn Lepage and community members will be invited to attend IR technical meetings. The next technical meeting is scheduled for the morning of December 9, probably at the Shipyard. Invitations to community members and Carolyn will be mailed next week.

STATUS OF WORK

Fred Evans summarized the status of work:

- Phase I/Phase II Human Health Comparison - The draft report conclusions will be presented this evening.
- The DRMO/Incinerator and Battery Acid Site (Site 10) draft final Work Plan - A Navy response to comments is due the first week in January.
- DRMO Treatability Work Plan - Navy is working on draft final work plan comments, which are due in mid-January.

- Sites 30, 31, and 32 Work Plan - The Navy will issue the draft final work plan in mid-January 1998.
- Ecological Risk Assessment - The Navy is working on the response to comments on the draft final version.
- Site Screening Plan - Comments the draft final version is due December 18.
- Phase 2 Transport Modeling Work Plan - EPA and MEDEP are reviewing the document.
- Interim ROD for the off shore areas.
- Porewater samplers ("peepers") were installed last Thursday.
- A technical meeting is scheduled for December 9 to discuss possible interim actions at the JILF.

Comment: Would it be possible to schedule a technical meeting to discuss the response to comments on the ERA?

Response: Yes.

Iver McLeod summarized MEDEP issues:

- Richard Heath, the geologist assigned to the Shipyard, has been promoted. Various geologists will fill in until another geologist is assigned to the Shipyard.
- Professor Andy Reeve, University of Maine, has been contracted to conduct geotechnical modeling of the JILF. That work should be done soon. MEDEP will extend his contract to assist in modeling report review.
- The state's comments on the Phase I/Phase II Evaluation should be issued next week.
- The RAB should have received a letter about pore water sampling by the Navy. Peepers (pore water sampling devices) were deployed last week.
- The state is awaiting the Navy's response to comments on the ERA.
- The state will be meeting internally on federal facilities agreement (FFA) issues.

Meghan Cassidy summarized EPA issues:

- EPA sent its comments on the Historical Radiological Assessment to the Navy last week. The report was reviewed by Region I's radiological technical expert and the staff at the EPA's National Air and Radiation Environmental Laboratory (NAREL) in Alabama. The report raised no new issues or major concerns. One recommendation pertained to screening in freshwater ponds.
- EPA is still reviewing the Phase I/Phase II Evaluation. EPA's risk assessor assigned to the Shipyard is also working on Otis Air Force Base sites so the review will take another couple of weeks. EPA does not anticipate identifying any major issues because EPA itself recommended that the comparison be performed.
- EPA is waiting for the Navy's response to comments on the ERA. EPA and the federal trustees agree with the draft final conclusions and feel the time is ripe for moving on to a feasibility study and interim ROD for the offshore areas.
- FFA negotiations will begin in a few weeks. It is expected that it will take at least 6-9 months for negotiations to conclude.

Comment: What is the life of an FFA?

Response: It coincides with the length of the project.

Comment: Do all facilities have FFAs?

Response: They have either an FFA or a memorandum of agreement among the Navy, the EPA, and the state.

Comment: Is the Shipyard FFA on schedule?

Response: Technically, no. CERCLA requires that an FFA be in place within 6 months of the issuance of an RI/FS. EPA policy, however, is to have the document in place as soon as possible. The stumbling block for this FFA has been the need to wait for a national decision on DOD funding issues. That model language is now available.

- EPA, the state, and the Navy are discussing a possible interim action at the JILF. This activity would need to be consistent with any long-term remedial action planned for the future.

Comment: An interim action at JILF is a new twist. What prompted this as a possible action?

Response: The money is not earmarked for JILF but since the site is of such interest to the RAB, an interim action would nudge the cleanup movement forward without having to conduct a feasibility study. However, other public input mechanisms, such as a proposed plan and public comment period would still be required.

Comment: Is the Navy in jeopardy of losing funds if an interim action is not initiated?
Response: We do not yet know the Navy's actual budget numbers. The targets issued last February showed NORTHDIV receiving \$27,990,000 for all Navy activities under Northern Division's Installation Restoration Program.

Comment: Is the interim action being contemplated because an EPA "bean" is involved?
Response: No "bean counting" is involved because no FFA is in place.

Comment: Is any real time monitoring being conducted at JILF? If contamination is migrating, it would not be identified by the infrequent monitoring events because of daily tidal action.

Response: The Navy has just completed four sampling rounds, the first such activity since the early 1990s. If an interim ROD is signed, it would include a monitoring program to initiate a trends analysis. Although this would not be real time monitoring at three rounds a year, it would provide sufficient data to evaluate trends. In addition, long-term monitoring would be a component of an interim ROD.

Comment: What are the results of EPA's 1997 radiological survey?

Response: An EPA laboratory produces the report. Meghan will get back to the RAB with when the report will be issued.

Fred distributed the draft bar chart schedules for OUs 2 and 3 that would become part of the FFA.

Comment: How can the remedial decision resulting from migration modeling (ID 18) take only 15 days?

Response: We already have that information so it is not a new issue.

Comment: Could that terminology be deceiving? Don't you only need to look at that data to feed it into the FS.

Response: That is correct. This task does not include making a remedial decision; the wording should be amended.

Comment: ID 37 contains a reference to a notice of dispute. What is that?

Response: The FFA process includes a mechanism at the draft final stage (dispute resolution) to ensure that issues do not ping-pong among the parties without resolution and to keep the process moving forward. However, at the draft final stage we prefer not to use it. When it is used, it triggers a progressive elevation in management involvement that can reach to the top levels of both EPA and DOD.

Comment: Is there only one official comment period for proposed cleanup actions?

Response: Yes. However, if a significant change from the proposed plan is decided as a result of public comment, a new public comment period may be needed to

determine how well it meets the nine EPA criteria Meghan briefed the RAB on nearly a year ago. If an alternative other than the preferred alternative is chosen and the chosen alternative was included in the FS and proposed plan, then we don't have to start from scratch.

Comment: How often will these bar chart schedules be updated?

Response: Once or twice a year. They will become part of the FFA. If dates are missed, the Shipyard could be assessed penalties.

Comment: What is the next actual on-site action that is scheduled?

Response: Right now it is the JILF remedial action. However, if an interim action is agreed on, that will be added to the schedule. Its insertion should not effect the date of the remedial action.

Fred used overhead graphics to propose two options for better depicting where in the remediation process each site has progressed.

1. The "CERCLA Snake" diagram would indicate that sites 30, 31, and 32 are at the site discovery/evaluation phase. The Navy still needs to determine whether an RI and FS are necessary. The rest of the sites are in the RI/FS phase. Although the diagram indicates they are separate activities, the RI and the FS are part of a circular process: RI field work allows developing FS alternatives. However, it may become evident that more data is needed to proceed, so more RI field work is undertaken. The Navy estimates that three cycles are needed to move fully into the FS phase. The sites closest to this stage are those in OU3, but transport modeling still needs to be completed.

Comment: Why does the RI/FS task for OU2 stretch out for such a long time?

Response: We still need to do additional field work and report preparation. The writing and reviewing among the regulators takes considerable time.

Comment: Are the two schedules driven by funding issues?

Response: Neither schedule is constrained by budget considerations. What is a major consideration is the Island's size. Two major remediation projects could not be underway at the same time. Traffic and site access would be major issues.

Comment: The DRMO now has a study area (the incinerator) associated with it. Will this cause additional delay?

Response: In truth, we cannot remediate one area without also addressing the other. They are too closely linked geographically.

Comment: What operable unit would Sites 30, 31, and 32 fit into?

Response: Until it is determined that they require remediation, these sites will not become part of an operable unit. Sites 30 and 32 are geographically close so they would probably be in the same OU.

Comment: Is site reuse a part of the cleanup process?

Response: As alternatives are being evaluated during the FS, future use is a large component. However, unless the Shipyard was added to the Base Realignment and Closure (BRAC) list, only military future uses would be considered.

In the case where sites have already been remediated and the Shipyard became subject to the BRAC program, the Navy would not have to return to those sites to remediate them to a more stringent cleanup standard. If, however, a site was still under study, the revised potential reuse options would be included in the FS alternatives analysis.

Comment: What level of cleanup are the sites required to attain for Navy use?

Response: The regulators will determine the risk exposure level required for each Shipyard site. The Navy is not required to cleanup beyond the likely future use exposure level. At the same time, the Navy is not interested in a "bad" cleanup; they will want to be able to use those 26 acres. The public will have ample opportunity to comment during the public comment period on the site uses discussed in the proposed plan.

2. A matrix containing the site names on one axis and remediation tasks on the other is another possible vehicle to depict sites' status. A dot at each intersection would denote that that task had been completed.

The RAB agreed that the Navy should use both the bar chart schedules and the matrix configuration for future site status updates.

MERCURY BURIAL VAULT REMOVAL

The Navy's contractor began digging on September 23; within 6 hours, all three vaults, which had been buried about 12 feet below ground, were excavated. One of the two small vaults with pad was excavated in one piece; the other small vault and pad were in two pieces. Each small vault (measuring 5 feet by 4 feet) contained a 55-gallon drum that showed minor surface rust. The drums contained pressure gauges and other mercury-related equipment. Little liquid mercury was seen. The equipment was placed in new drums; the vaults were placed in roll off containers.

The third vault, measuring 8.5 by 7.0 feet, had to be rolled up the side of the excavation. The concrete was in good shape. Inside were three drums, which were in good shape but were punctured during the excavation (everything inside was bagged) and one large metal box. The box contained the same types of equipment but they were larger sized.

Approximately 60,000 pounds of concrete was disposed; 685 pounds of mercury contaminated waste was shipped to the Chicago area for disposal. One bottle was seen that contained approximately .2 teaspoons of mercury. The excavated soil was tested; no

readings were found above the media protection standard for mercury. The excavation was backfilled and seeded. Comment: How is mercury used in present day operations disposed?

Response: Previously we used to encapsulate it, and did a pretty good job, as evidenced by the results of the removal action. Today, we send that material off base to a licensed facility.

Comment: Does the Shipyard have any records as to where the mercury itself might have gone?

Response: Back then mercury was quite valuable, so it probably was sold. The equipment that had contained the mercury was not worth anything, so it was buried.

Comment: Do you know where the material in the vault came from?

Response: No. Nothing was tagged. The pressure gauges probably came from the power plant.

Comment: Could the mercury have been used in submarines?

Response: No. Mercury makes metal brittle.

Comment: Was mercury used as a coolant?

Response: It was vaporized at the Shiller plant but it has not been used that way at the Shipyard.

PHASE I/PHASE II COMPARATIVE ANALYSIS REPORT

Fred provided some background about this effort. Off-shore sampling was undertaken in support of the ERA (Phase I) and the human health risk assessment. When more data was needed to conduct the ecological risk assessment, a Phase II effort was initiated. EPA's risk assessor suggested undertaking the comparative evaluation to determine whether another risk assessment was needed.

Debbie Cohen from Brown & Root discussed the draft report, which is dated October 1997. The evaluation's objective was to determine whether the human health risk assessment (HHRA) for offshore media (based on Phase I data, collected in the fall of 1991) should be updated to include Phase II data (collected in the summer of 1993).

The offshore HHRA was finalized in 1994. It determined that seafood ingestion was the pathway of concern. Species analyzed included lobster, flounder, and mussel. The HHRA contaminants of concern include metals (arsenic, lead, mercury, cadmium, and copper) polyaromatic hydrocarbons (PAHs), pesticides, and PCBs.

Chemicals that increased in maximum or average concentrations between Phases I and II were identified; risk levels were calculated for each of these chemicals. Risk is proportional to concentration: a two-fold increase in concentration resulted in a two-fold increase in risk. Those Phase II chemicals found in a different ERA risk category were identified as potential new contaminants of concern. Chemicals included in the Phase II data that were not in Phase I were compared to EPA Region 3 risk-based concentration screening levels. If the

Phase II chemical exceeded the screening levels, its risk was calculated by the same methodology used in the HHRA. Those chemicals with risks greater than EPA-acceptable levels were identified as potential new contaminants of concern.

The evaluation conclusions:

- Most chemical concentrations decreased from Phase I to Phase II.
- Increases in Phase II concentrations resulted in identifying three potential new human health contaminants of concern: manganese (increased in Phase II mussels); methyl mercury (not analyzed for in Phase I); and the PAH dibenzo(a,h)anthracene (not detected in Phase I, found in Phase II mussels).
- Mussels showed the highest increase in concentrations between Phases I and II. Maximum concentration of metals and PAHs showed the greatest increase from Phase I to Phase II. Several Phase II PAH maximum risks are greater than the EPA risk range. However, Phase II average risks were not greater.
- The HHRA does not need to be updated with Phase II data. Except for the three new potential contaminants of concern, Phase II results do not change the Phase I risk assessment conclusions. Preliminary remediation goals development will include the results of both the comparative analysis and the Phase I risk assessment, as well as the ERA.

The Shipyard can now develop offshore remedial objectives and preliminary remediation goals for human and ecological receptors, and prepare an off-shore monitoring plan to support an interim offshore record of decision.

Comment: Initially, was there a plan to conduct two phases?

Response: After Phase I was completed, data gaps became evident, so a second phase study was begun. Phase II also included collection of some information for the state, such as larger lobsters (legal size). Lobster collected in Phase I were gathered without concern for whether they were of legal size.

Comment: Were the two data sets about the same size?

Response: Yes. They contain about the same number of data points.

Comment: Was there any difference in the technology used in each phase?

Response: Comparable detection limits were used; divers were used in Phase II to ensure the lobsters were legal size.

Comment: Were the sampling locations different?

Response: The evaluation did not focus on that issue but the locations were fairly similar.

Comment: Do different EPA regions have different risk-based screening levels?
Response: Only two regions have developed screening levels: Regions 3 and 9. MEDEP also uses Region 3's risk based concentration screening levels. The Shipyard checked with Region 1 and MEDEP staff before selecting the Region 3 numbers.

Comment: Why do you suspect most of the readings decreased between Phase I and Phase 2?
Response: A trends analysis was not part of the evaluation. However, the difference was less than two times lower overall. We would need to determine what changes occurred in the estuary (such as a sewage treatment plant upgrade) between those two events.

Comment: What levels of methyl mercury were found?
Response: Phase I only analyzed for total mercury. We will have to look through the data to identify the percent methyl mercury. All the data will be reviewed to develop the preliminary remediation goals.

Comment: Was seafood ingestion the only pathway included?
Response: Sediment and surface water were not identified as pathways of concern based on the results of the human health risk assessment.

Comment: Why were mussels, lobster, and flounder selected for evaluation?
Response: Flounder and lobsters are bottom feeders; mussels are filter feeders. They are fairly representative of the commercial catch locally.

Comment: Was a statistical analysis done on whether the samples were representative? What about outliers?
Response: That task was not part of the evaluation. However, both maximum and average concentrations were compared. These events are viewed as individual snapshots.

Comment: How could you even begin the evaluation without knowing whether the data sets were representative?
Response: The Phase II data showed a general decrease from the levels found in Phase I, so it is evident that the Phase I data is more conservative. Outliers will be considered during development of preliminary remediation goals.

Comment: For which species were metals of most concern?
Response: Table 3-1 shows the chemical-specific risk for each species for both the subsistent and recreational scenarios.

Comment: Which contaminants cause cancer?
Response: PAHs are all carcinogens.

Comment: Where are these contaminants coming from?

Response: Manganese is naturally occurring. PAHs are products of combustion, emanating from everything from cars to furnaces to wood fires.

Comment: What about methyl mercury?

Response: Mercury is found everywhere. Forty-eight of the 50 states have issued human health advisories for mercury in freshwater fish.

NEXT RAB MEETING

The next RAB meeting will be held on Thursday, January 22, 1998 at Howard Johnson's at the Portsmouth Rotary. The RAB offered a number of potential agenda items:

- Discussion of a list of RAB accomplishments.
- Update on the progress toward completing FFA negotiations. Because the activity is enforcement-sensitive, the Navy, EPA and the MEDEP can only provide a status of progress; no substantive information can be made available until the document is released for public comment at the completion of negotiations. Progress status will be added to the regular Status of Work updates.
- Answers to questions Deb Cohen could not answer on the Phase I/Phase II Evaluation. Also, the results of the December IR technical meeting.
- Presentation on the OU3 (JILF) history, RI summary, risk assessments, etc.
- Presentation on different remediation techniques.
- Discussion on conducting treatability studies on DRMO closure options. (The Navy is working on comment responses to its DRMO solidification treatability study work plan. Until the fate and transport model is completed, we won't know if the study is necessary but this activity cannot be allowed to compromise the FFA dates.)
- Discussion on Spruce Creek issues (the state will begin sampling for heavy metals since the area is slated to be opened for fishing).
- Discussion on what the RAB can do for the IR process (any potential interim actions the RAB might suggest for other sites would be welcome.)

**FOLLOW-UP RESPONSE ON SEVERAL QUESTIONS RAISED DURING THE NOV. 20, 1997
RAB ON THE PHASE I/PHASE II OFFSHORE DATA COMPARATIVE ANALYSIS**

Comment: Were the two data sets about the same size?

Response: Yes. They contain about the same number of data points.

Follow-up Response: The following table shows the number of samples included in for each data set by species.

Species	No. of Samples Collected in Phase I	No. of Samples Collected in Phase II
Juvenile Lobster Tail ⁽¹⁾	7	12
Sublegal Adult Lobster Tail ⁽¹⁾	7	5
Adult Lobster Tail ⁽¹⁾	7	6
Juvenile Lobster Hepatopancreas ⁽¹⁾	8	13
Sublegal Adult Lobster Hepatopancreas ⁽¹⁾	8	5
Adult Lobster Hepatopancreas ⁽¹⁾	8	6
Mussel	34	73 ⁽²⁾
Flounder	7	5

- (1) Phase I lobster data was not separated into age-classes. All lobster data is included in the Phase I data set.
- (2) For all organic analytes, the number of samples was 28. For metals, the number of samples ranged from 23 to 73.

Comment: Was there any difference in the technology used in each phase?

Response: Comparable detection limits were used; divers were used in Phase II to ensure the lobster were legal size.

Follow-up Response: The following table provides a summary of collection method and analytical method used for Phase I and Phase II sampling rounds:

Collection Method	Phase I	Phase II
Lobster	Trawl (nets) used to collect lobster, no age classification	Diver used to collect lobster, classified by three age groups
Flounder	Trawl used to collect flounder, both winter and smooth flounder collected at a time when migratory and nonmigratory flounder present in lower Piscataqua	Purse seine and trawl (both types of nets) used to collect flounder, only winter flounder collected at a time when nonmigratory flounder present in lower Piscataqua
Mussel	Transect (along a 100-meter line) and point (in a 10-meter radius) samples collected, deployed mussels (mussels placed in a cage in the river) also collected	Point samples and deployed mussels collected

Analytical Method	Phase I	Phase II
Laboratory	Ceimic	BMSL and ERLN
Analytes	metals (except methyl mercury), pesticides, PAHs, PCBs	metals (including methyl mercury), pesticides (except 7 pesticides for lobster and flounder), PAHs, PCBs
Detection Limits ⁽¹⁾	Organics - wider range than Phase II Inorganics - several metals ⁽²⁾ had higher detection limits than both labs for Phase II	Organics - smaller range than Phase I, consistently lower than Phase I Inorganics - ERLN detection limits were lower than Phase I, except for several metals ⁽²⁾ BMSL detection limits were higher than Phase I

(1) See Appendix A of the Data Comparative Analysis Report.

(2) Arsenic, chromium, lead, mercury, and nickel.

Comment: What levels of methyl mercury were found?

Response: Phase I only analyzed for total mercury. We will have to look through the data to identify the percent methyl mercury. All the data will be reviewed to develop the preliminary remediation goals.

Follow-up Response: A cursory review of the ratio of methyl mercury to total mercury for Phase II samples showed a variation of the ratio from 0.2 to 1.4. Specifically by species, the ratio for lobster tail ranged from 0.4 to 1.4, the ratio for lobster hepatopancreas ranged from 0.2 to 0.5, and the ratio for flounder ranged from 0.6 to 1.3. Methyl mercury was not analyzed in mussel. Again, the data will be further evaluated for the percent methyl mercury as part of the preliminary remediation goal development.

An article titled "the Methyl Mercury to Total Mercury Ratio in Selected Marine, Freshwater, and Terrestrial Organisms" by B. Lasorsa and S. Allen-Gil concluded that the methyl mercury to total mercury ratio approaches 1 in muscle tissue of higher food chain carnivorous fish residing in waters that are relatively uncontaminated with respect to inorganic mercury species. The ratio in liver tissue of the same fish is generally lower. Low food chain marine organisms, such as mussels, tend to have very low ratios that are apparently influenced by the degree of environmental mercury contamination. Marine animals placed higher on the food chain, such as lobsters, exhibit somewhat higher ratios and can exhibit a large variation in this ratio between organ tissue and muscle tissue of the same animal. The article provided ratios for in-harbor lobster and flounder and offshore (from reference locations) lobster and flounder. In-harbor lobster had ratios of 0.2 to 0.8, with the lowest ratios in juveniles and sublegal adult lobster. The ratios for in-harbor and offshore sublegal adult lobsters were similar. Juvenile lobsters were not captured at the offshore locations. The in-harbor flounder showed a ratio of approximately 1. Offshore flounder ranged from 0.3 to 0.9. Mussels from the east and west coasts of the United States was evaluated and showed ratios ranging from 0.2 to 0.8. Mussels collected from a mercury-contaminated (elemental mercury) shipwreck showed average ratio of 0.03 to 0.06.