

**GFWA COMMENTS
ON GLOUCESTER HARBOR
DREDGING PROPOSAL
July 26, 2009**

These comments by the Gloucester Fishermen's Wives Association (GFWA) are offered in response to the 2009 Gloucester Inner Harbor, North Channel, Proposed Dredging Project Environmental Notification Form.(EOEA # 14447) prepared by CLE Engineering Inc.

The GFWA has been protecting fishing communities, working waterfronts and fisheries habitats of New England for nearly four decades. During this period, we have prevented many inappropriate industrial activities from going forward and we have encouraged and supported projects which benefited fishermen and the region, but didn't cause significant harm to the ocean environment.

The organization has built up an extensive library of resources and references which are not easily available on the internet, but which nevertheless, represent an important part of the historical legacy of Gloucester Harbor. Nowhere is this more evident than in the previous sampling and analysis of sediments in the Gloucester Harbor for dredging purposes. These references were utilized in the preparation of these comments and the relevant sections are herein provided for the official record.

Before we make our recommendations, we would like to state that the purpose of public comment should be to elicit helpful guidance from stakeholders with a different point of view from the applicants. It should not be thought of as an administrative hurdle which has to be quickly leaped over in order to get on with the proponent's business. As such, we urge the MEPA administrators to require considerably more than one week for public comments after a proposal is first received by the Board of Health. This extraordinarily brief comment period places unnecessary constraints on organizations and discourages many from even attempting to provide input. This diminishes the value of stakeholder input and ultimately weakens the final proposal.

The GFWA enthusiastically endorses the proposed Gloucester Inner Harbor Dredging Proposal because it is appropriate in scope, necessary to maintain a vibrant harbor and planned in a way which will have minimum impact on fishermen and fisheries habitats. We commend CLE Engineering Inc. for presenting a concise narrative, along with detailed sample analyses which allow a straightforward assessment of their \$5.2 million dredging plan. We further applaud the decision to dispose of a limited amount of suitable material at the offshore Massachusetts Bay Disposal Site (MBDS) while excluding offshore disposal of unsuitable dredge material near the National Grid-DCR area.

The Site Plan (exhibit J) shows the results of the CLE Engineering Inc. hydrographic survey and includes typical dredge cross-sections of the proposed dredging areas. They show that some of the North Wharf Pier and State Fish Pier areas have shoaled to a water depth of 15 or 16 feet. These indicate that this project is needed and that failure to maintain reasonable depths at these berthing areas “would not allow boaters to safely operate through all tide cycles.” We appreciate having the raw data for water depths, but the map is quite cluttered and perhaps a contoured or color coded map would be easier to interpret.

We also appreciate the stipulation that “to avoid potential impacts to fish habitat and shellfish spawning: No dredging or disposal will occur between February 15 thru July 31st of any year” We urge the authorities to carefully monitor this “no dredge window” to make certain that construction and weather delays do not impinge on the spawning period.

This dredge proposal indicates that proponents have been enlightened by the public comments made by the GFWA and others almost a decade ago to the Dredged Material Management Plan (DMMP) Draft Environmental Impact Report (DEIR) prepared for the Massachusetts Office of Coastal Zone Management (MCZM) in October 2000. That ill-conceived plan was an attempt to discard more than 7 times as much dredge material (as the current proposal) inside Gloucester Harbor. It assumed that more than half of the dredge spoils (about 330,000 cubic yards) would be unsuitable for MBDS disposal. Despite being over 400 pages long, that plan failed to show (on the CD) the location of the 26 samples taken or the sample analyses which could be used to assess the variability of contaminants in the harbor.

In stark contrast, the current Gloucester Inner Harbor Dredging Proposal (in PDF Format) includes both a map of sample locations and the detailed sample analyses of potential contaminants. These indicate that both the sampling scheme for 10 cores and the consolidation program for 4 composite samples (both of which were approved in advance by the U.S. Army Corps of Engineers) make sense for the purposes for which they were intended.

The chemical analysis of these cores indicates that the levels of metals, polynuclear aromatic hydrocarbons (PAHs) and pesticides were low for marine sediments in three of the four composite samples. The 10-day amphipod bioassay tests on three composite samples resulted in a mean survivorship ranging from 80% to 97%. These analyses clearly show that the dredge material is safe and suitable for offshore disposal.

The CLE study also greatly adds to the inventory of sediments not suitable for offshore disposal. The Army Corps of Engineers (ACOE) New England District office correctly points out that one of the composite samples (Composite A) consisting of sample locations B&C, located North of the U.S. Coast Guard Station, indicates that the sediments are not safe for offshore disposal. Unfortunately, they do not fully explain the

reasons for this determination, although they do refer to the bioassay test with an amphipod survivorship of less than half in 10 days.

So, what killed the amphipods that are used as an indicator for mortality in benthic organisms? The sample analyses provide an abundance of possible causes for bioassay mortality including excessive lead, PAHs and pesticides as detailed below.

Composite sample 1 yielded the highest levels of lead and PAHs known in Gloucester Harbor. Lead was measured at 380 micrograms/gram (about 400 ppm), but the duplicate sample was more than twice that at 780 micrograms/gram (nearly 800 ppm). As the results from the 2000 DMMP DEIR sample analyses (see below) show, this value for lead falls considerably outside the range for lead expected (max 190 ppm) in the earlier planning document.

SECTION 3.0 - PURPOSE AND NEED

Table 3-1 summarizes the mean (average) concentrations of selected substances found in measurable quantities in the sediments from the major dredging projects.

Table 3-1: Summary of concentration of selected contaminants in Gloucester sediments.

Analytes	Annisquam River		Federal Channel		MBDS Reference
	Mean	Range	Mean	Range	
<i>Arsenic</i>	0.965 ppm	0.25 - 3.2	12 ppm	1.9 - 24	28.7 ppm
<i>Cadmium</i>	0.17 ppm	0.05 - 1.1	0.98 ppm	0.15 - 2.4	2.74 ppm
<i>Chromium</i>	0.13 ppm	4 - 70	35 ppm	11 - 41	152 ppm
<i>Copper</i>	9.71 ppm	0.5 - 35	<u>62</u> ppm	10 - 140	31.7 ppm
<i>Mercury</i>	0.053 ppm	0.025 - 0.23	0.24 ppm	0.025 - 0.43	0.277 ppm
<i>Nickel</i>	4 ppm	1 - 10	16.7 ppm	8 - 27	40.5 ppm
<i>Lead</i>	19.3 ppm	1 - 71	<u>86</u> ppm	7 - 190	66.3 ppm
<i>Zinc</i>	55.6 ppm	7 - 350	127.8 ppm	48 - 310	146 ppm
<i>Total PAH</i>	2,670 ppb	15-6,803	<u>12,372</u> ppb	14 - 32,670	2,996 ppb
<i>Total PCBs</i>	38 ppb	6 - 136	113 ppb	0 - 259	ng

Notes:

Underline denotes greater than MBDS Reference

MBDS Reference is mean plus 2 standard deviations

Source: CZM 2000 DMMP DEIR

Also of concern are the levels of pesticide in composite 1. The analysis showed 4,4'-DDD (a DDT metabolite) at 610 ppb. Additionally, the concentration of cis-nonachlor, a

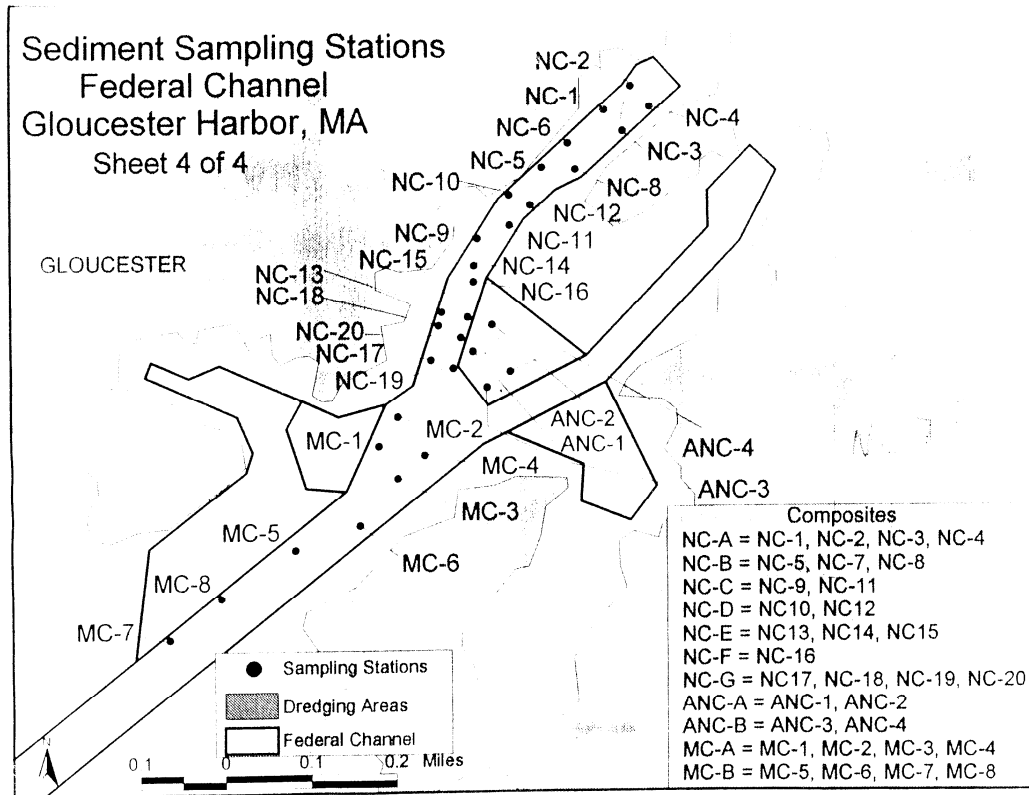
bioaccumulating component of the organochlorine insecticide, chlordane, was 240 ppb. Cis-nonachlor has been shown to be more immunotoxic in rats than the parent chlordane insecticide¹.

While such levels in parts per billion may seem like extremely small amounts, the NOAA Screening Quick Reference Tables (Buchman 2008) for organics in marine sediment show the probable effects level (PEL) of DDD (a remnant of DDT contamination) at under 10 ppb and the PEL for chlordane at about 5 ppb. The composite sample was roughly 50 times the ecotoxic probable effects level on benthic organisms for these pesticides.

In addition, the level of PAHs in composite 1 in the current ENF proposal was more than 140,000 ppb (140 ppm), over 4 times the maximum range of the earlier study. Most alarmingly, the level of Benzo[a]pyrene (BAP), the most toxic of the PAHs and a known carcinogen was 42,000 ppb (42 ppm) in the current proposal. The probable effects level for BAP in marine sediment is 763 ppb. This sample was more than 50 times more toxic than the probable effects level set for the PAH Benzo[a]pyrene. The BAP value exceeded the levels of all the PAHs combined in the 2000 DEIR study.

A map of sample stations in Gloucester Harbor from the 2000 DEIR is shown below.

¹ Tryphonas H; Bondy G; et al **2003**: *Effects of cis-nonachlor, trans-nonachlor and chlordane on the immune system of Sprague-Dawley rats following a 28-day oral (gavage) treatment.* Food and chemical toxicology 2003;41(1):107-18.



In 2001, the GFWA warned that contaminant distributions were highly variable due to multiple pollution sources and differences in total organic carbon content. We cautioned that additional sampling might well find hotspots which were much more toxic than the previously measured range. We further based this conclusion on a report on the North Coastal Water Quality Surveys from the 1980's:²

That report and our warning proved prophetic since it showed high levels of PCB contamination (up to 9 ppm in sample GH 05) just northwest of the area which is now considered unsuitable for offshore disposal.

Because the 1989 report is not readily available, we attach a location map for the samples and analysis sheet below for consideration.

² Duerring, C. L. 1989 *North Coastal Water Quality Surveys 1987 and 1988*. Department of Environmental Quality Engineering, Massachusetts Division of Water Pollution Control, Technical Services Branch, Westborough, MA. 130p.

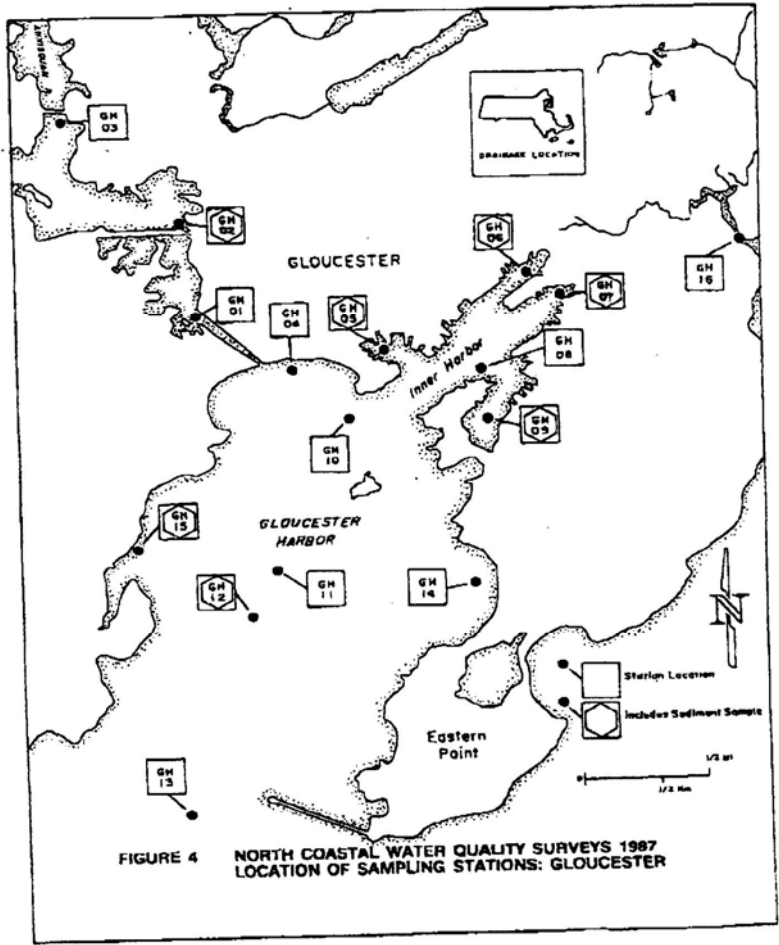


FIGURE 4 NORTH COASTAL WATER QUALITY SURVEYS 1987
LOCATION OF SAMPLING STATIONS: GLOUCESTER

TABLE 30
1987 GLOUCESTER HARBOR SURVEY
SEDIMENT DATA*

POLYCYCLIC AROMATIC HYDROCARBONS AND POLYCHLORINATED BIPHENYLS

(reported as µg/g dry weight) ppm

STATION NUMBER:	GH02	GH05	GH06	GH07	GH09	GH12	GH15
<u>COMPOUNDS</u>							
Acenaphthene	ND	ND	0.16	0.19	ND	ND	ND
Acenaphthylene	ND	0.26	0.23	0.32	ND	ND	ND
Anthracene	ND	ND	1.6	1.3	ND	ND	ND
Benzo(a) anthracene	ND	1.8	3.4	4.0	ND	ND	ND
Benzo(b) fluoranthene	ND	ND	+	+	ND	ND	ND
Benzo(k) fluoranthene	ND	ND	3.5	4.6	ND	ND	ND
Benzo(g,h,i) perylene	ND	ND	ND	ND	ND	ND	ND
Benzo(a) pyrene	ND	ND	2.4	5.9	ND	ND	ND
Chrysene	ND	2.2	2.9	3.9	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND
Dimethyl naphthalene	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	ND	2.9	6.8	6.4	1.1	ND	ND
Fluorene	ND	0.41	0.71	0.77	ND	ND	ND
Methyl anthracene	ND	ND	ND	ND	ND	ND	ND
Methyl fluorene	ND	ND	ND	ND	ND	ND	ND
Methyl phenanthrene	ND	ND	ND	ND	ND	ND	ND
Methyl pyrene	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	1.3	3.0	3.1	ND	ND	ND
Pyrene	ND	2.5	4.7	5.5	1.0	ND	ND
1,1 Biphenyl	ND	ND	ND	ND	ND	ND	ND
PCB A 1242	<0.16	<0.16	<0.16	ND	<0.16	<0.16	ND
PCB A 1254	<0.56	9.0	<0.56	ND	ND	<0.56	<0.56
PCB A 1260	ND	0.49	ND	0.20	0.28	--	ND

It can easily be argued that 20 year old studies utilized less reliable measuring devices and procedures than are currently required for organic compounds. However, these organic contaminants are extremely persistent and have been found decades after oil spills. For example, elevated levels of PAHs were seen 40 years after the Bouchard 67 oil barge spilled its cargo of fuel oil in Buzzards Bay, Massachusetts in 1974³. Geologists know that to ignore a study simply because it is out of date risks being led to the wrong conclusions and scientists do so at their own peril.

With this in mind, we recommend that all future dredge proposals in the region include previous relevant sample locations and analyses as part of their due diligence. While this is not currently a legal requirement, it serves two purposes. First, it guarantees that a comprehensive record of contaminant distribution will be maintained for each area. Second, it encourages each applicant to consider the full range and concentrations of toxic pollutants known to have existed before a project commences.

³ Peacock, E. E., Hampson, G. R., Nelson, R. K., Xu, L., Frysinger, G. S., Gaines, R. B., et al. (2007). *The 1974 spill of the Bouchard 65 oil barge: Petroleum hydrocarbons persist in Winsor Cove salt marsh sediments*. Mar.Pollut.Bull. 54 (2), 214-225

This brings us to our last and most important recommendation. Given the extent and level of toxic contaminants in the NG-DCR area marked as “unsuitable for open water disposal” on the site map, we highly recommend that the disposition of that cleanup be completely severed from the timetable of the current CLE Engineering Inc proposal. The Order of Conditions issued by the Gloucester Conservation Commission states:

“1. Coordination w/ National Grid/DCR dredge area between STA0+00 and STA 6+00 is required. No dredge will occur near the N-G/DCR site until all testing is complete and a Notice of Intent for that work is also in place. The project dredge in that area will coordinate work under both permits simultaneously.”

We understand that the nature of pollution at the National Grid site is completely different from the current dredge proposal area and could involve migration and even escape of non-aqueous phase liquids. Although, normally, coordination of two dredge projects in the same area would be desirable, in this case, the unsuitable area will require additional sampling to define the problem and either remediation or upland disposal of dredged materials. It could even require alternative dredging technologies such as suction dredge equipment. Furthermore, cleanup of this contaminated site may involve prolonged negotiations between federal agencies and international corporations and could even involve protracted litigation.

Therefore, there is no reason for the current proposal to be held up waiting for a Notice of Intent for that work. The applicants should return to the Gloucester Conservation Commission with the information that the GFWA has brought to light and request a modification of the Order of Conditions so that coordination of the two projects is advised (where practicable), but not required. This should ensure that the current dredging proposal can be implemented without unnecessary delay and that the City of Gloucester and its working waterfront will reap the benefits in the near future.

Thank you for the opportunity to comment on this Gloucester Inner Harbor Dredge Proposal and for making these comments part of the public record.

Sincerely,

Angela Sanfilippo
GFWA, President