

6.3.1 Mound Erosion

Loss of deposited dredged material (erosion) at the site will be investigated using bathymetry (SAIC, 1985). Typically this methodology applies a minimum area bounded by rectangular dimensions of approximately 800 meters to 1200 meters (0.5 to 0.75 mile) centered around a disposal buoy and aligned with the major axis of the tidal ellipse at the site will be surveyed. Today's survey techniques and equipment have matured to the place that comparative surveys can detect changes in the bathymetry of mounds of approximately 6 inches (15 centimeter) over areas of 50 square meters (538 square feet). Side scan sonar and sediment profile imaging systems (Germano and Rhoads, 1982; 1994) may also be used and are useful for defining broad areas where grain size may have changed or identify thin layers of dredged material, respectively (Rhoades, 1994). Specific survey requirements and application of these measurement tools will be defined for each tier and situation investigated. Evidence of mound erosion will need to be evaluated carefully to distinguish between actual erosion and mound consolidation.

6.3.2 Biological Monitoring

Benthic recovery at disposal mounds will be measured by SPI (Germano and Rhoads, 1982; 1994). Stations will center on the disposal buoy and sampled in a star pattern at 100 meter (328 feet) intervals (if more than one area is used in the year then these additional areas will be surveyed in a similar manner). In addition, stations in a cross pattern at 100 meter (328 feet) intervals at each of the three reference sites will be obtained. At each station three photos will be taken with the sediment profile imaging camera. Image analyses will provide the following information:

- Sediment grain size;
- Relative sediment water content;
- Sediment surface boundary roughness;
- Sea floor disturbance;
- Apparent Redox Potential Discontinuity (RPD);
- Depth of camera penetration;
- Sediment methane;
- Infaunal successional stage;
- OSI.

6.3.3 Water Quality

The National Estuary Program's LISS (<http://www.epa.gov/region01/eco/lis/index.htm>) routinely measures temperature, salinity, and dissolved oxygen using vertical hydrocasts. In addition, water samples will be collected via Niskin bottle and analyzed via Winkler titration at selected stations. Data collected near CLIS will be obtained from the LISS program and evaluated. Should site specific monitoring be required, methodologies comparable to the LISS program data collections will be used (<http://www.epa.gov/region01/eco/lis/index.htm>).

6.3.4 Sediment Quality

Grab samples of the sediments will be collected and analyzed for grain size, total organic carbon, and selected contaminants such as trace metals (e.g., mercury, lead, zinc, arsenic, iron, cadmium, copper), total PCBs, total PAH, and pesticides (see the guidance documents). The number of stations and locations will be defined during survey planning and will be sufficient to enable characterization of within and among station variability. A minimum of two replicate samples should be obtained from each station sampled including each of the three CLIS reference stations.

Toxicity tests will be selected from those used to evaluate dredged material proposed for disposal at CLIS (see the guidance documents). The number of stations and locations will be defined during survey planning and will be sufficient to enable characterization of within and among station variability. A minimum of two replicate samples should be subjected to testing and include each of the three CLIS reference stations.

6.3.5 Living Resources

Data from the CTDEP Trawl Survey (<http://www.dep.state.ct.us/burnatr/fishing/geninfo/fisherie.htm#Coastal%20Programs>) will be obtained and analyzed to determine whether the diversity and abundance of recreational and commercial fish in the vicinity of CLIS area differs from other similar areas (depth, sediment type, etc.) of the Long Island Sound.

A body burden analysis will also be conducted to determine the concentrations of persistent, bioaccumulatable chemicals such as trace metals (mercury, lead, iron, cadmium, copper), PAHs, and total PCBs in benthic invertebrates. The methodologies used will be consistent with those recommended in the guidance documents. The specific species to be evaluated as well as the number of stations and locations will be defined during survey planning and will be sufficient to enable characterization of within and among station variability. A minimum of three replicate samples should be obtained from each station sampled including each of the three CLIS reference stations. Benthic infaunal organisms analyzed may include *Nephtys incisa* or other infaunal species representative of the site and its contiguous areas that have sufficient tissue mass to enable chemical analysis.

Sampling and chemical analysis of higher trophic levels will be at the discretion of the site managers and focus on determining bioaccumulation in species that can clearly document whether bioaccumulations from the deposited sediments may be determined.

6.3.6 Bioaccumulation Measurements

Measurement of bioaccumulation will include collection of representative benthic infaunal species within the site and at reference locations. At least two types of organisms (filter feeders and sediment feeders) will be obtained and genus level species aggregated into field replicates. Sufficient biomass to enable quantifications of bioaccumulatable compounds will be obtained from grab samples (or other appropriate sample collections device). Tissue will be prepared and analyzed using methods consistent with the guidance documents. The

number of stations and locations will be defined during survey planning and will be sufficient to enable characterization of within and among station variability. Between three and five replicate samples should be obtained from each station sampled including each of the three CLIS reference stations.

Laboratory based bioaccumulation testing will follow the requirements outlined in the guidance documents.

7.0 ANTICIPATED SITE USE AND QUANTITY AND QUALITY OF MATERIAL TO BE DISPOSED

MPRSA 102(c)(3)(D) and (E) requires that the SMMP include consideration of the quantity of the material to be placed in the site, and the presence, nature, and bioavailability of the contaminants in the material as well as the anticipated use of the site over the long term. CLIS is designated to receive dredged material only. No other material may be placed in the site.

The capacity of CLIS to receive dredged material is large considering the water depth in the site is at least 18 meters (59 feet) and that creating mounds to depths no greater than 14 meters (46 feet) depth below MLLW provides sufficient clearance for the largest vessels (drafts of less than 40 feet [12 meters]) expected to transit Long Island Sound. For perspective, four meters of sediment placed over a 1 square mile area equals 12.5 million cubic yards (9.6 million cubic meters). Thus, building mounds to no more than the 14 meter (46 feet) depth provides more than 38 million cubic yards (29 million cubic meters) of capacity. Historically, CLIS has received an average of 340,000 cubic yards (260,000 cubic meters) annually. This equates to 6.8 million cubic yards (5.2 million cubic meters) over a twenty year period which is far below the potential site capacity. Site capacity was defined as a mound with a depth of 14 meters (46 feet) below MLW at the mound top, and a mound side slope of 1:10.

The 2000 dredging needs survey of Long Island Sound (USACE, 2001e) identified anticipated dredging volumes for each harbor in the Sound over the next 20-years. Based on the dredging needs study, the projected dredged material volume for the Central and Western regions is 21,601,350 cubic yards (Table 2-1, EPA 2004). These projected dredging volumes include a mix of large and small Federal navigation projects and many small private dredging projects (marinas, boatyards, and harbors), which is consistent with the pattern of dredging in Long Island Sound over the past 20 years. Sediments projected for disposal are expected to come primarily from maintenance dredging projects, although expansion dredging may be required for deeper draft vessels or from increased commerce in Long Island Sound. Of this volume approximately 1 million cubic yards is anticipated to be derived from improvement dredging. Approximately 13.9 million cubic yards (10.6 million cubic meters) of material is expected to be from Federal navigation projects with the rest of the volume coming from other facilities.

Historically one third of the dredged material volume comes from projects >500,000 cubic yards (382,277 cubic meters), one third from projects 200,000 to 500,000 cubic yards

(152,911 to 382,277 cubic meters), and one third from projects <200,000 cubic yards (152,911 cubic meters). The sediment properties are expected to be variable although the predominant sediment type is likely be silty material (silts, organic silts, sandy silts, *etc.*). About 70 percent of the maintenance material volume can be characterized as silty material. Approximately, 10 percent the expansion material are expected to be sands and clays.

All dredged material projects using CLIS are subject to CWA Section 404, although private projects larger than 25,000 cubic yards (19,114 cubic meters) and all Federal projects will also be authorized under MPRSA Section 103. The quality of the material will be determined on a project specific basis under the testing requirements necessary to meet open-water disposal requirements of either CWA 404 or MPRSA 103. The quality of MPRSA material will be consistent with the requirements of the guidance documents.

Estimates of the aggregated volume historically going to the Central Long Island Disposal Site (CLIS) and to WLIS indicate that 61% and 39% of the projected volumes went to CLIS and WLIS, respectively. From these percentages the projected volume of dredged material that may go to CLIS is 13,176,823 cubic yards (10,074,404 cubic meters), which is 24.8 million cubic yards (19 million cubic meters) less than the site's capacity

A specific closure date for CLIS has not been assigned as of the date of this SMMP. The potential capacity at CLIS is far in excess of the potential site use over the next twenty years, thus developing a closure plan at this time is not critical. CLIS has the capacity to meet the regional disposal needs for at least 80 to 100 years. The capacity of the site will be evaluated at least every three years and the prospect of closure will be evaluated. At the time that site closure appears likely in the next decade, plans should be made to (1) manage sediment placement to achieve any preferred bathymetric profile and (2) survey the overall sediment chemical distributions to cover any site areas exhibiting relatively greater contaminant concentrations during the final years of site use.

8.0 REVIEW AND REVISION OF THIS PLAN

MPRSA 102 (c)(3)(F) requires that the SMMP include a schedule for review and revision of the SMMP, which shall not be reviewed and revised less frequently than 10 years after adoption of the plan, and every 10 years thereafter. The EPA, the Corps, and other federal and state agencies have agreed to review this plan yearly as part of the annual agency planning meeting (Section 3.0). A formal review and revision of this SMMP will take place every 5 years beginning from the date of designation unless the frequency is modified during the annual agency planning meeting.

9.0 COORDINATION/OUTREACH

To ensure a disposal program that minimizes impacts to the marine environment, the following management practices will continue to be implemented at the CLIS as a matter of policy. First and foremost, all proposed dredging projects will be reviewed for suitability for ocean disposal by both the Corps and EPA.

An interagency dredged material management review group composed of representatives from EPA, Corps, NMFS, USFWS, and New York and Connecticut state representatives meets approximately every two months to discuss management and monitoring of New England dredged material disposal sites.

To assess compliance with applicable permit conditions and to track overall site usage, permittees will be required to provide written documentation of disposal activities to the Corps during disposal operations and after dredging is complete. Disposal permits and authorizations will include standardized requirements for this reporting to include the source of the dredged material, the amount of the material disposed, the rate of disposal, the date, time and LORAN-C coordinates (or differential GPS, if available) of disposal as well as the due-date for the documentation itself.

The Corps will provide EPA with summary information on each project at two stages of the dredging and disposal process. A Summary Information Sheet will be provided when dredging operations begin, and a Summary Report will be submitted when dredging operations have been completed.

The EPA and the Corps will continue to inform and involve the public regarding the monitoring program and results. For example, the DAMOS Program holds periodic symposia (typically every three years) to report results and seek comment on the program. In addition, DAMOS monitoring results are published in an ongoing series of technical reports that are mailed to interested people and organizations and also distributed at various public meetings. The Corps also has prepared and distributed several Information Bulletins and brochures. To better meet this need, a series of presentations on different aspects of the dredging and disposal process has been prepared. In addition, site related reports can be reviewed at both the Corps Technical Library and the EPA regional library:

U.S. EPA (New England)
Regional Library
One Congress St., 11th Floor
Boston, MA 02114-2023
Hours: Monday-Friday 8:00-5:00

U.S.ACE
NAE Technical Library
696 Virginia Road
Concord, MA 01742
Hours: Monday-Friday 7:30-4:00

Any party interested in being added to the DAMOS mailing list should mail the appropriate information to the Corps at:

U.S. Army Corps of Engineers, New England District
Regulatory Division
Marine Analysis Section
696 Virginia Road
Concord, MA 01742

10.0 FUNDING

The costs involved in site management and monitoring will be shared between EPA New England Region and the Corps NAE and are subject to the availability of funds. This SMMP will be in place until modified or the site is de-designated and closed.

These recommendations do not necessarily reflect program and budgeting priorities of the Federal government in the formulation of EPA's national Water Quality program or the Corps national Civil Works water resources program. Consequently, any recommendations for specific activities or annual programs in support of efforts in Long Island Sound may be modified at higher levels within the Executive Branch before they are used to support funding level recommendations. Requests for funding are also subject to review and modification by Congress in its deliberations on the Federal budget and appropriations for individual programs. Similarly state agency programs (*i.e.*, CTDEP Trawl Survey) will depend solely on funds allocated to the programs by those agencies or other supporting agencies.

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Attachment A
Scow Log Sample

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INSPECTOR'S DAILY REPORT OF DISPOSAL BY SCOW

NOTE: Dredged material volume stated below is approximate and shall not be used for measurement and/or payment.

Permittee _____ Disposal Area _____
 Permit/Contract No. _____ Date _____
 Project _____ Towboat _____
 Dredging Contractor _____ Owner _____

Trip No.	Scow No.	Started From Place	From Time	Disposal Time	Returned To Place	To Time	Round Trip Time	Trip Dist.	Lat/Long Specified	Coordinates* Actual	Dist./Dir. From Buoy

Trip No.	No. of Pockets Loaded	Dumped	Reason Pocket Not Dumped	Disposal Depth	Speed	Weather	Sea Conditions/Visibility	Approx. Volume (CY)	Scow Draft

Comments: _____

*Check the datum used NAD27 NAD83. Also note any factors that may affect reliability of navigation instrument and readouts.

Time On _____	Time Off _____	Hours On Duty _____	Reviewed By: Permittee's Representative or, for Corps Projects, Corps' Resident Engineer or Field Inspector
Total Hours On Duty _____			

To the District Engineer, U.S. Army Engineer District, New England, Concord, Massachusetts:
 I certify that I informed the tug captain of the conditions of the U.S. Army Corps of Engineers permit or contract regarding the distance from the buoy and the speed of the scow during the release of the dredged material. I also informed the captain that failure to comply with these conditions would constitute a violation of the permit and would be reported to the Corps. I certify that this report is correct and that I am not an employee of the dredging or towing firm, or the permittee, nor have I been employed by any of them at any time during the past six months. The approximate volume of dredged material stated on this report is only an estimate. It was made either by me, the dredging or towing contractor, or the Corps of Engineers Resident Engineer or Field Inspector. I do not certify that it correctly states the volume of material dredged.

 Signature of Disposal Inspector (Certification No.)

Print Name Here _____
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Attachment B

CLIS Disposal Site Scow Log Summary by Mound - 1988 to 2002

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PERMITTEE or PROJECT NAME	PERMIT or CONTRACT #	SCOW VOLUME (CUBIC YARDS)	CITY/TOWN	HARBOR	CT/ NY
1988-1989 Disposal Season - CLDS 88 Mound					
ALBERT K HOTCHKISS	198701882	900	Stratford	Housatonic River	CT
B&L ASSOC.	198800001	5,775	Branford	Branford Harbor	CT
BELLE HAVEN YACHT CLUB	198800933	4,025	Greenwich	Belle Haven Cove	CT
BREAKWATER KEY	198701778	400	Stratford	Housatonic River	CT
BROWNS BOATYARD	198701806	2,500	Guilford	West River	CT
CITY OF MILFORD	198700104	2,550	Milford	Milford Harbor	CT
COE-WEST RIVER	1988C0027	104,800	West Haven	West River	CT
DUTCH WHARF BOAT YARD	198700098	12,600	Branford	Branford Harbor	CT
EXXON CO. - USA	198801954	29,050	New Haven	New Haven Harbor	CT
GOODSELL POINT MARINA	198400975	11,150	Branford	Branford Harbor	CT
GUILFORD YACHT CLUB	198700643	107,980	Guilford	West River	CT
INDIAN NECK YACHT CLUB	198800100	11,750	Branford	Branford Harbor	CT
JAMES ALLEN	198700147	900	Norwalk	NA	CT
KAREN CASEY	198700424	2,275	Norwalk	Norwalk River	CT
LEX ATLANTIC CORP	198700058	9,450	Mamaroneck	Mamaroneck Harbor	NY
MAMARONECK BEACH AND YACHT CLUB	NY13445	22,300	Mamaroneck	Mamaroneck Harbor	NY
MAMARONECK BEACH AND YACHT CLUB	NY13455	11,100	Mamaroneck	Mamaroneck Harbor	NY
MANHASSET BAY MARINA	NY88250	11,125	Port Washington	Manhasset Bay	NY
MILFORD WARF CO	198803128	4,010	Milford	Milford Harbor	CT
MOBIL OIL COMPANY	NY14801	1,800	Bronx	Eastchester Creek	NY
NORTHPORT MARINA ASSOC.	NY15027	116,900	Northport	Northport Harbor	CT
NORWALK COVE MARINA	198700293	2,500	Norwalk	Charles Creek	CT
POST ROAD BOAT YARD, INC.	NY14230	3,550	Mamaroneck	Mamaroneck Harbor	NY
ROCCO GENOVESEE	198600296	2,550	Milford	Milford Harbor	CT
ROY PERLER	198700267	1,100	Milford	Milford Harbor	CT
SAUGATUCK YACHT CLUB	198700266	2,700	Westport	Saugatuck River	CT
SOUTH WINDWARD REALTY	NY14736	6,450	New Rochelle	NA	NY
SPENCERS MARINE, INC.	198800086	8,375	Milford	Milford Harbor	CT
ST. ANNS YACHT CLUB	198600054	8,250		Norwalk River	CT
STAMFORD YACHT CLUB	198700131	5,350	Stamford	Stamford Harbor	CT
STEVE BERNI LOCATIONS & CO.	198803047	2,850	Greenwich	Mianus River	CT
TIDE MILL YACHT BASIN	NY14761	8,550	Port Chester	Port Chester Harbor	NY
VENTURA YACHT SALES	NY14545	5,850		Manhasset Bay	NY
WESTCHESTER DEPT OF ENV FACIL	NY14639	5,000	Mamaroneck	NA	NY
	TOTAL	536,415			
1989-1990 Disposal Season - CLDS 89 And CS-90-1 Mounds					
MILFORD HARBOR MARINA	198900787	1,800	Milford	Milford Harbor	CT
BRUCE AND JOHNSONS BRANFORD	199010714	350	Branford	Branford Harbor	CT

PERMITTEE or PROJECT NAME	PERMIT or CONTRACT #	SCOW VOLUME (CUBIC YARDS)	CITY/TOWN	HARBOR	CT/ NY
CORPS NAE - BRANFORD HARBOR	1989B0096	126,430	Branford	Branford Harbor	CT
CORPS NAN - EASTCHESTER CREEK	1989C0010	50,100	Bronx - Eastchester	Eastchester Creek	NY
COOK, SCHNIBLE, DARRETT, KE MPNER	198800130	9,900	Stamford	NA	CT
DRENCKHAHN BOAT BASIN	198700268	450	Greenwich	Mianus River	CT
GOODSELL POINT MARINA	198400975	14,250	Branford	Branford Harbor	CT
GUILFORD YACHT CLUB	198700643	47,300	Guilford	West River	CT
HARBOR VILLAGE LTD PARTNERSHIP	198702174	36,350	Branford	Branford Harbor	CT
HOUSATONIC BOAT CLUB	198601334	1,000	Stratford	Housatonic River	CT
KAREN CASEY	198700424	1,200	Norwalk	Norwalk River	CT
NEPTUNE COVE ASSOC.	NY14726	3,000	New Rochelle	New Rochelle Harbor	NY
NEW HAVEN TERMINAL INC	198903265	2,800	New Haven	New Haven Harbor	CT
NY POWER AUTHORITY	NY15122	30,350	New Rochelle	New Rochelle Harbor	NY
SOUTH WINDWARD REALTY	NY14736	500	New Rochelle	NA	NY
STRATFORD MARINA	198100086	1,350	Stratford	Housatonic River	CT
STRATFORD MARINA	198300015	22,000	Stratford	Housatonic River	CT
THE DOCK, INC.	198701247	11,450	Stratford	Housatonic River	CT
THE DOCK, INC.	198701247	450	Stratford	Housatonic River	CT
WILLIAM AND TAMMY GREEN	198802015	3,050	Guilford	NA	CT
	CS-90-1	140,295			
	CLDS 89	223,785			
	TOTAL	364,080			
1990-1991 Disposal Season - CLDS 90 And CS-90-1 Mounds					
BRUCE AND JOHNSONS BRANFORD	199010714	21,110	Branford	Branford Harbor	CT
GUILFORD YACHT CLUB	198700643	16,168	Guilford	West River	CT
LEX ATLANTIC CORP	198700058	37,480	New Haven	New Haven Harbor	CT
NEPTUNE BOAT CLUB	199000379	4,620	Norwalk	Norwalk Harbor - West Branch	CT
NY POWER AUTHORITY	NY15122	800	New Rochelle	New Rochelle Harbor	NY
PINE ORCHARD YACHT CLUB	199000551	4,450	Branford	Pine Orchard Harbor	CT
	CS-90-1	11,418			
	CLDS 90	73,210			
	TOTAL	84,628			
1991-1992 Disposal Season - CLDS 91 Mound					
BELLE HAVEN YACHT CLUB	198800933	1,700	Greenwich	Byram Harbor	CT
BLOOM BROTHERS MARINE	198400141	3,525	Norwalk	Norwalk Harbor - East Branch	CT
BRUCE AND JOHNSONS BRANFORD	199010714	13,500	Branford	Branford Harbor	CT
CAVANAGH MARINA	198800235	1,600	Norwalk	Rowayton	CT
EXXON CO. - USA	198901382	24,000	New Haven	New Haven Harbor	CT

PERMITTEE or PROJECT NAME	PERMIT or CONTRACT #	SCOW VOLUME (CUBIC YARDS)	CITY/TOWN	HARBOR	CT/ NY
INDIAN HARBOR HOUSE	199100267	925	Greenwich	Indian Harbor	CT
L. SCOTT FRANTZ	199000685	925	Greenwich	NA	CT
LEX ATLANTIC CORP	198700058	11,800	New Haven	New Haven Harbor	CT
ORIENTA YACHT CLUB	NY16253	2,270	Mamaroneck	Mamaroneck Harbor	NY
VILLAGE CREEK HOMEOWNERS ASSOC	199010449	11,428	Norwalk	Village Creek	CT
	TOTAL	71,673			
1992-1993 Disposal Season - CLDS 92 Mound					
BRUCE AND JOHNSONS BRANFORD	199010714	16,350	Branford	Branford Harbor	CT
PIER 66/EST OF ARMAND WILLIAMS	199201214	14,355	Branford	Branford Harbor	CT
PINE ORCHARD YACHT CLUB	199202487	7,300	Branford	Pine Orchard Harbor	CT
POST ROAD BOAT YARD, INC.	NY16288	2,800	Mamaroneck	Mamaroneck Harbor	NY
SHELLEY TRUBOWITZ	198900367	600		Five Mile River	CT
TOWN OF GUILFORD MARINA	199001060	8,025	Guilford	Guilford Harbor	CT
WEST RIVER CORP.	199200541	2,475	NA	West River	CT
	TOTAL	51,905			
1993-1994 Disposal Season - NHAV-93 And MQR Mounds					
BREAKWATER KEY INC	199301158	2,600	Stratford	Housatonic River	CT
COE NEW HAVEN	1993C0062	1,311,975	New Haven	New Haven Harbor	CT
DEEP RIVER MARINA INC	199010208	5,100	Deep River	Connecticut River	CT
GULF OIL	199302697	41,400	New Haven	New Haven Harbor	CT
LEX ATLANTIC CORP	198700058	44,150	New Haven	New Haven Harbor	CT
MOBIL OIL COMPANY	199302696	3,700	New Haven	New Haven Harbor	CT
NEW HAVEN TERMINAL INC	199302694	32,925	New Haven	New Haven Harbor	CT
NORTHEAST PETROLEUM	199302488	79,860	New Haven	New Haven Harbor	CT
PINE ORCHARD YACHT CLUB	199301834	21,500	Branford	Pine Orchard Harbor	CT
POOTATUCK YACHT CLUB	199011161	6,450	Stratford	Housatonic River	CT
STEINIGER MARINE CORP.	199100914	4,450	Bronx	City Island	NY
TOWN OF GUILFORD MARINA	199001060	850	Guilford	Guilford Harbor	CT
US COAST GUARD	199202355	27,685	New Haven	New Haven Harbor	CT
WYATT ENERGY	199302695	31,000	New Haven	New Haven Harbor	CT
	NHAV93	1,489,210			
	MQR	124,435			
	TOTAL	1,613,645			
1994-1995 Disposal Season - CLDS 94 Mound					
ASSOC AT THE GUILFORD YC	199402317	70,050	Guilford	West River	CT
CITY OF NEW HAVEN	199400566	157,100	New Haven	New Haven Harbor	CT
COE-STONY CREEK	1995C0014	53,400	Branford	Stony Creek Harbor	CT
PETER DIPIETRO	199201242	3,100	Milford	Milford Harbor	CT
TILCON CONN.	199401337	134,732	NA	Branford	CT
UNITED ILLUMINATING CO.	199400893	9,300	New Haven	New Haven Harbor	CT
VILLAGE CREEK HOMEOWNERS ASSOC	198500004	3,500	Norwalk	Village Creek	CT

PERMITTEE or PROJECT NAME	PERMIT or CONTRACT #	SCOW VOLUME (CUBIC YARDS)	CITY/TOWN	HARBOR	CT/ NY
	TOTAL	431,182			
1995-1996 Disposal Season - CLDS 95/96 Mound					
ASSOC AT THE GUILFORD YC	199402317	61,800	Guilford	West River	CT
CITY OF MILFORD	199303056	20,125	Milford	Milford Harbor	CT
SHELL OIL CO	199500733	5,575	Bridgeport	Bridgeport Harbor	CT
	TOTAL	87,500			
1996-1997 Disposal Season - CLDS 95/96 Mound					
ASSOC AT THE GUILFORD YC	199402317	1,950	Guilford	West River	CT
BELLE HAVEN YACHT CLUB	199403097	2,400	Greenwich	Byram Harbor	CT
BRUCE AND JOHNSONS BRANFORD	199010714	19,300	Branford	Branford Harbor	CT
DOUGLAS & SANDRA CAMPBELL	199600311	1,700	NA	Five Mile River	CT
PINE ORCHARD YACHT CLUB	199600778	10,000	Branford	Pine Orchard Harbor	CT
POST ROAD BOAT YARD, INC. (BREWER)	199507980	6,600	Mamaroneck	Mamaroneck Harbor	NY
RIVERSIDE YACHT CLUB	199001268	6,500	Greenwich	Cos Cob/Mianus River	CT
SAUGATUCK HARBOR YACHT CLUB	199403098	17,250	Westport	Saugatuck	CT
UNITED ILLUMINATING CO.	199502024	256,300	New Haven	New Haven Harbor	CT
W M NIGHTENGALE	199600523	1,170	Norwalk	NA	CT
WEST COVE MARINA	199200319	17,800	West Haven	West River	CT
	TOTAL	340,970			
1997-1998 Disposal Season - CLDS 97/98 Mound					
ASSOC AT THE GUILFORD YC	199402317	19,250	Guilford	West River	CT
BRANFORD LANDING MARINA	199700080	1,500	Branford	Branford Harbor	CT
BRANFORD YACHT CLUB	199600126	20,250	Branford	Branford Harbor	CT
BRUCE AND JOHNSONS BRANFORD	199010714	13,150	Branford	Branford Harbor	CT
HARBOR WOODS LTD	199501516	6,080	Stratford	Housatonic River	CT
JOSEPH NESTERIAK	199801065	2,625	Milford	NA	CT
PINE ORCHARD YACHT CLUB	199600778	6,700	Branford	Pine Orchard Harbor	CT
SAUGATUCK HARBOR YACHT CLUB	199403098	4,300	Westport	Saugatuck	CT
	TOTAL	73,855			
1998-1999 Disposal Season - CLDS 97/98 Mound					
A C MORGAN	199600793	500	Norwalk	NA	CT
ASSOC AT THE GUILFORD YC	199402317	25,850	Guilford	West River	CT
BREWERS DAUNTLESS SHIPYARD	199801111	2,500	Essex	Connecticut River	CT
BRIDGEPORT ENERGY	199701663	17,050	Bridgeport	Bridgeport Harbor	CT
BRUCE AND JOHNSONS BRANFORD	199010714	27,850	Branford	Branford Harbor	CT
BRUCE KIRBY	199602600	1,600	Norwalk	NA	CT
CITY OF MILFORD	199900798	2,950	Milford	Milford Harbor	CT

PERMITTEE or PROJECT NAME	PERMIT or CONTRACT #	SCOW VOLUME (CUBIC YARDS)	CITY/TOWN	HARBOR	CT/ NY
CITY OF RYE MUNICIPAL MARINA	199801857	17,750	Rye	Milton Harbor	NY
COE-FIVE MILE RIVER	1999C0004	29,400	Darien & Norwalk	Five Mile River	CT
COE-MAMARONECK	1999C0006	277,030	Mamaroneck	Mamaroneck Harbor	NY
DEREKTOR SHIPYARD	9810110	3,950	Mamaroneck	Mamaroneck Harbor	NY
J DIGIOVANNI	9810120	900	Mamaroneck	Mamaroneck Harbor	NY
JAMES R CRANE	199800287	1,600	Norwalk	Five Mile River	CT
KEVIN CONROY	199900382	500	Norwalk	Five Mile River	CT
M J KATES	9810160	1,600	Mamaroneck	Mamaroneck Harbor	NY
MCMICHAEL YACHT YARD	9810190	1,050	Mamaroneck	Mamaroneck Harbor	NY
N + B RIMAWI	9810240	500	Mamaroneck	Mamaroneck Harbor	NY
NEW HAVEN MARINA/HARBOR POINT	198700070	5,850	New Haven	New Haven Harbor - Morris Cove	CT
NEW HAVEN TERMINAL INC	199702677	14,700	New Haven	New Haven Harbor	CT
NICHOLS YACHT YARD	9810200	7,700	Mamaroneck	Mamaroneck Harbor	NY
NORTHEAST PETROLEUM	199701997	24,000	New Haven	New Haven Harbor	CT
ORIENTA YACHT CLUB	9810220	2,750	Mamaroneck	Mamaroneck Harbor	NY
OSCAR DAVIS	9810100	800	Mamaroneck	Mamaroneck Harbor	NY
POOTATUCK YACHT CLUB	199800511	8,275	Branford	NA	CT
POST ROAD BOAT YARD, INC.	9810230	3,250	Mamaroneck	Mamaroneck Harbor	NY
PRESCOTT BLATTERMAN	9810090	1,600	Mamaroneck	Mamaroneck Harbor	NY
REX MARINE CENTER	199600890	8,950	Norwalk	Norwalk Harbor - West Branch	CT
SHORE ACRES	9810250	11,150	Mamaroneck	Mamaroneck Harbor	NY
THE BAIT SHOP	199900504	600	Norwalk	Five Mile River	CT
VILLAGE OF MAMARONECK	9810270	13,200	Mamaroneck	Mamaroneck Harbor	NY
VILLAGE OF MAMARONECK	9810280	19,725	Mamaroneck	Mamaroneck Harbor	NY
VILLAGE OF MAMARONECK BEACH	9810260	31,800	Mamaroneck	Mamaroneck Harbor	NY
W M NIGHTENGALE	199600523	850	Norwalk	NA	CT
WHITE BRIDGE MARINA	199602552	900	Norwalk	Five Mile River	CT
WILLIAM G COOLING	199700280	1,400	Norwalk	NA	CT
WYATT ENERGY	199702570	15,300	New Haven	New Haven Harbor	CT
WYATT ENERGY	199801211	15,700	New Haven	New Haven Harbor	CT
	TOTAL	601,080			
1999-2000 Disposal Season - CLDS 99 Mound					
BEACH POINT YACHT CLUB	9810080	8,775	Mamaroneck	Mamaroneck Harbor	NY
BELLE HAVEN YACHT CLUB	199803537	13,000	Greenwich	Byram Harbor - Belle Haven Cove	CT
BENNETT GOLUB	199810150	1,100	Mamaroneck	Mamaroneck Harbor	NY
BREAKWATER KEY	199901265	18,650	Stratford	Housatonic River	CT
BROWNS BOATYARD	199900027	1,550	Guilford	West River	CT
CITY POINT YACHT CLUB	199802646	6,000	New Haven	New Haven Harbor	CT
COLDWATER SEAFOOD	199900380	1,200	Norwalk	Norwalk Harbor	CT
GATEWAY TERMINAL	199802942	19,600	New Haven	New Haven Harbor	CT
GUILFORD YACHT CLUB	199902731	4,100	Guilford	West River	CT

PERMITTEE or PROJECT NAME	PERMIT or CONTRACT #	SCOW VOLUME (CUBIC YARDS)	CITY/TOWN	HARBOR	CT/ NY
MAMARONECK BEACH AND YACHT CLUB	9810180	4,125	Mamaroneck	Mamaroneck Harbor	NY
NEW HAVEN MARINA/HARBOR POINT	198700070	6,700	New Haven	New Haven Harbor	CT
NEW HAVEN TERMINAL INC	199702677	2,650	New Haven	New Haven Harbor	CT
NORTHEAST PETROLEUM	199701997	1,800	New Haven	New Haven Harbor	CT
OREINTA CONDO ASSOCIATION	9810210	1,765	Mamaroneck	Mamaroneck Harbor	NY
PINE ORCHARD YACHT CLUB	199600778	11,650	Branford	Pine Orchard Harbor	CT
ROEDIGER FLIK	9810130	2,100	Mamaroneck	Mamaroneck Harbor	NY
WYATT ENERGY	199702570	300	New Haven	New Haven Harbor	CT
WYATT ENERGY	199801211	6,100	New Haven	New Haven Harbor	CT
	TOTAL	111,165			
2000-2001 Disposal Season - CLDS 00/01 Mound					
BENNETT GOLUB	199810150	800	Mamaroneck	Mamaroneck Harbor	NY
BREAKWATER KEY	199901265	2,250	Stratford	Housatonic River	CT
BROWNS BOATYARD	199900027	750	Guilford	Guilford	CT
CITY OF MILFORD	199902639	5,325	Milford	Milford Harbor	CT
CLINTON YACHT HAVEN	199601010	4,200	Clinton	Hammonasset River	CT
ELEANOR MIHALDIS	199900381	1,050	Norwalk	NA	CT
GUILFORD YACHT CLUB	199902731	22,050	Guilford	West River	CT
GUILFORD YACHT CLUB	200100511	400	Guilford	West River	CT
MAMARONECK BEACH AND YACHT CLUB	9810180	1,375	Mamaroneck	Mamaroneck Harbor	NY
MILFORD YACHT CLUB	199901786	8,600	Milford	Milford Harbor	CT
NEW HAVEN MARINA/HARBOR POINT	198700070	800	New Haven	New Haven Harbor	CT
R.G.ELY & SONS	199900505	2,100	Norwalk	NA	CT
RIVERSIDE BASIN MARINA	200000248	10,200	Clinton	Clinton Harbor - Hammonasset	CT
ROEDIGER FLIK	9810130	350	Mamaroneck	Mamaroneck Harbor	NY
ROWAYTON SEAFOOD	199900378	600	Norwalk	NA	CT
TOWN OF FAIRFIELD	199901017	23,750	Fairfield	Ash Creek	CT
TOWN OF FAIRFIELD	200001457	9,350	Fairfield	Ash Creek	CT
	TOTAL	93,950			
2001-2002 Disposal Season - CLDS 00/01 Mound					
AVALON BAY COMMUNITIES	199900082	4,900	Stamford	NA	CT
BIRBARIE MARINA SALES	200003033	5,250	Branford	NA	CT
BRANFORD LANDING MARINA	200001120	2,000	Branford	Branford Harbor	CT
CHARLES CREEK & DORLON MARINA BASIN	199902819	1,800	Norwalk	Charles Creek	CT
CITY OF NORWALK	199901251	8,000	Norwalk	Norwalk Harbor - West Branch	CT
EDWARD LAHEY	199903166	250	Fairfield	Southport Harbor	CT
GUILFORD YACHT CLUB	200100511	13,600	Guilford	West River	CT
HARBOR POINT MARINA	200102331	3,300	New Haven	NA	CT
MARK MASARENHAS	200000769	5,050	Westport	Saugatuck River	CT

PERMITTEE or PROJECT NAME	PERMIT or CONTRACT #	SCOW VOLUME (CUBIC YARDS)	CITY/TOWN	HARBOR	CT/ NY
MILFORD WARF CO	200002086	9,900	Milford	Milford Harbor	CT
SPENCERS MARINA	200101437	4,700	Milford	Milford Harbor	CT
WILSON COVE MARINA	199702342	8,525	Norwalk	Wilson Point Harbor	CT
WISVEST-CT	200002085	1,650	New Haven	New Haven Harbor	CT
	TOTAL	68,925			

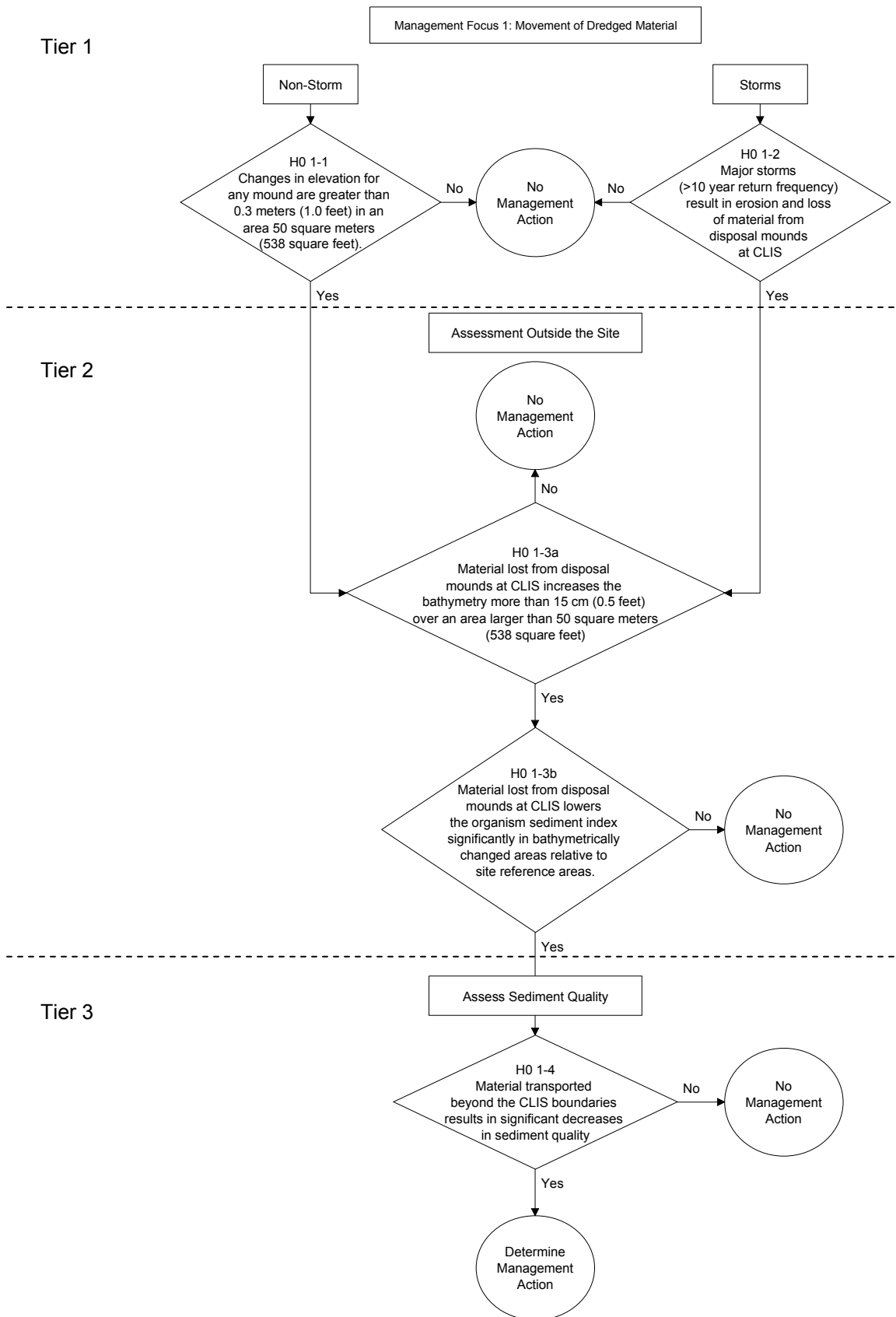
NA – Information not available.

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Attachment C

Hypotheses Flowcharts and Summary Table

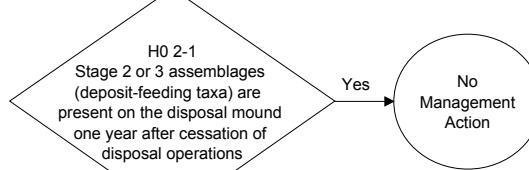
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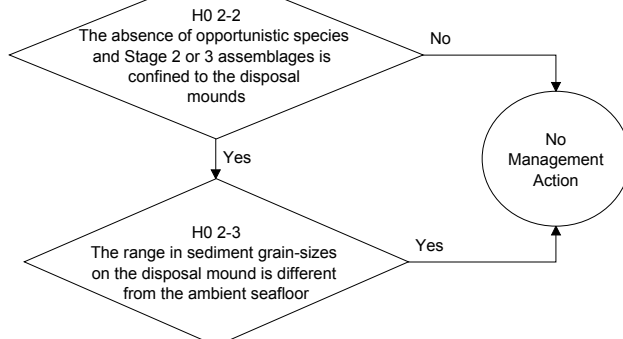
Tier 1

Management Focus 2: Absence from the Disposal Site of
 Pollutant-Sensitive Biota Characteristic of the General Area

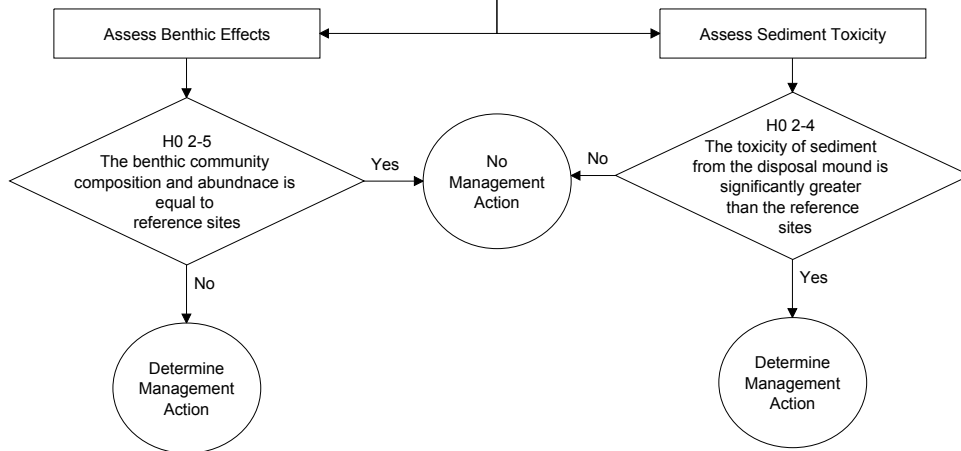
After 12
 months

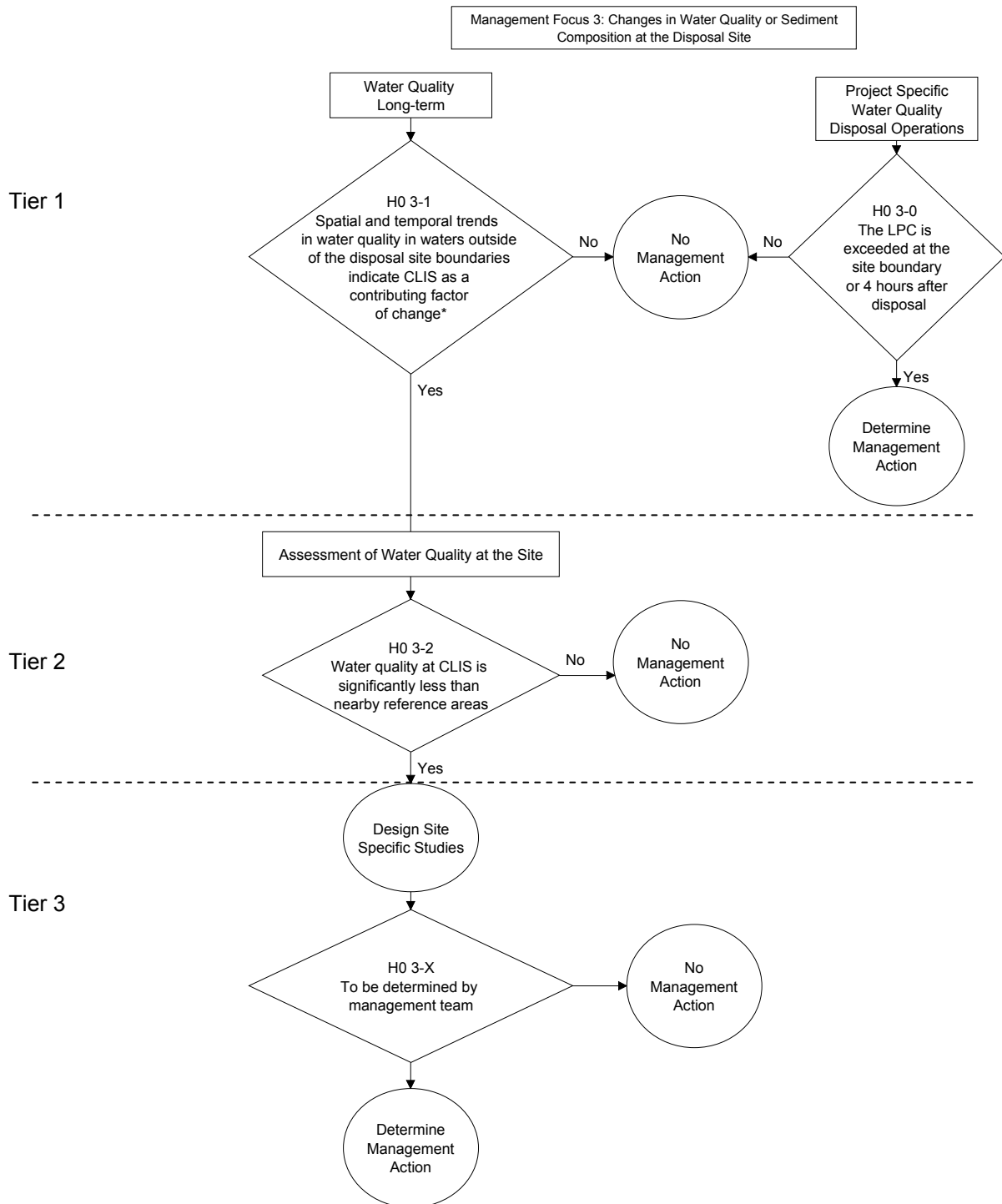


Tier 2

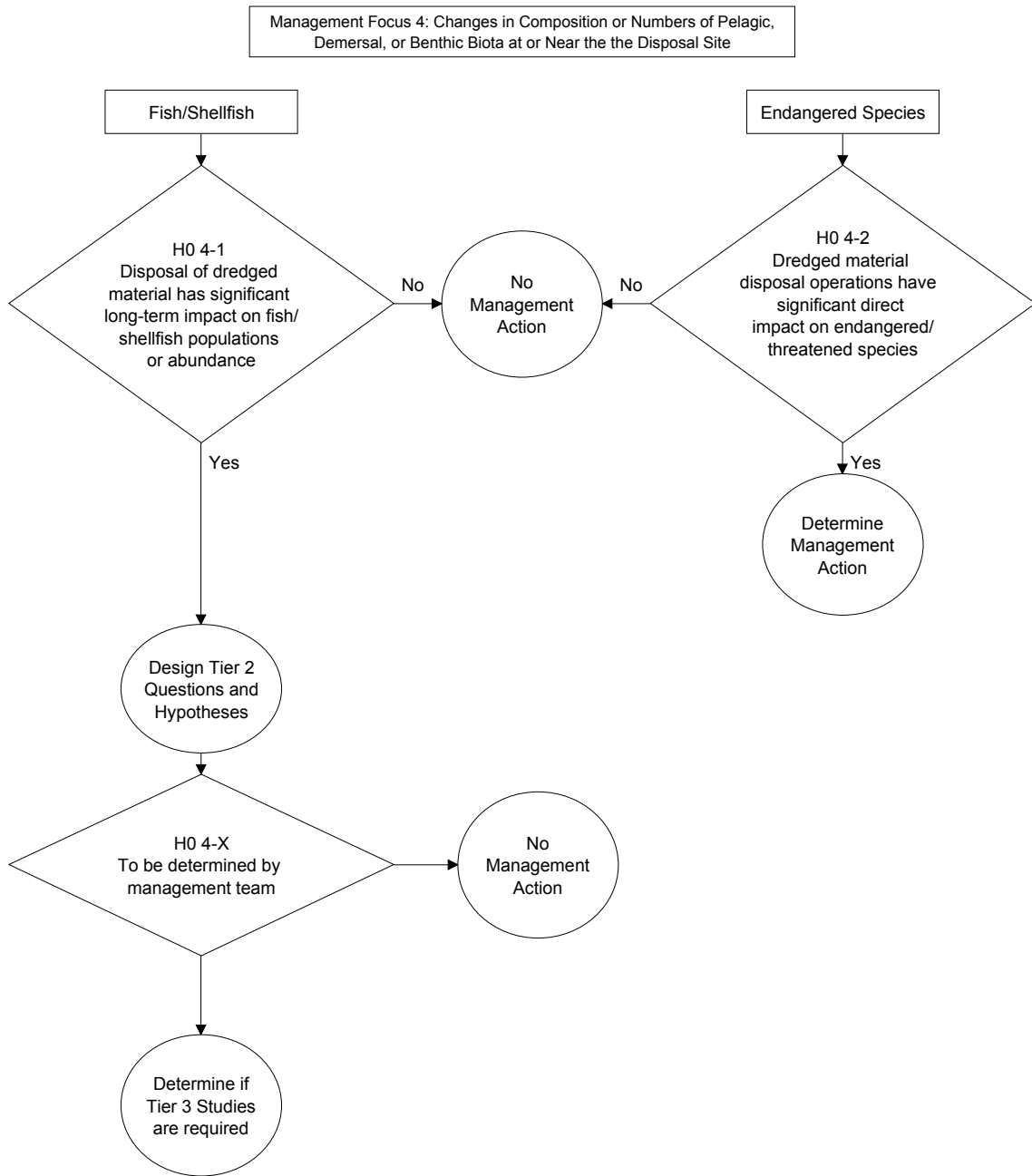


Tier 3





* Long Island Sound Study sites



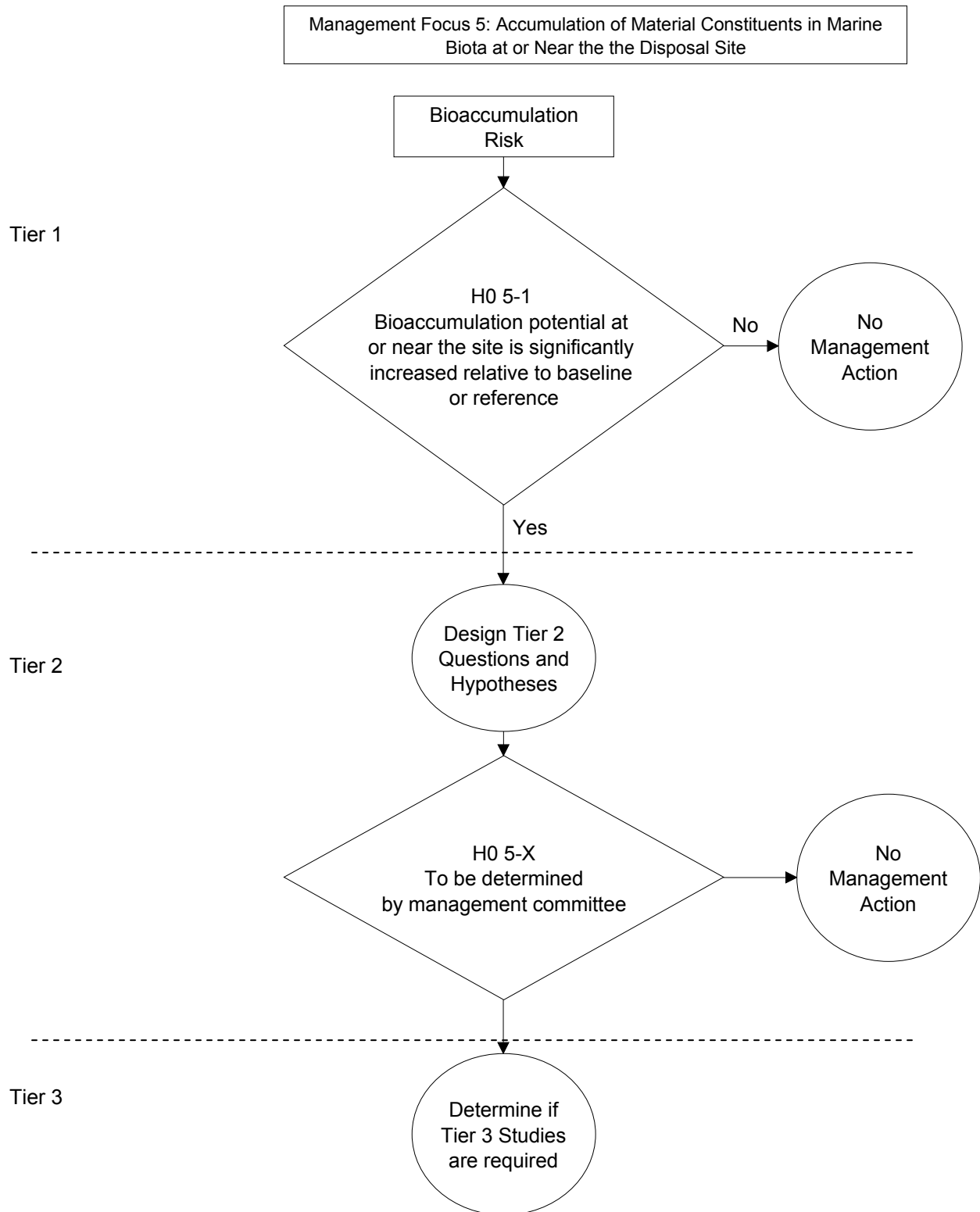


Table C-1. Summary of Hypotheses and Leading Indicators for Each Management Focus

	Management Focus 1: Movement of the Dredged Material	Management Focus 2: Absence of Pollutant- Sensitive Biota	Management Focus 3: Changes in Water Quality	Management Focus 4: Changes in Composition or Numbers of Biota	Management Focus 5: Accumulation of Material Constituents in Biota
TIER 1					
First Hypothesis	Baseline taken after 1 yr of consolidation; entire site bathymetry performed periodically	SPI within 12-16 months of mound completion and survey of historic mounds in a given 5 yrs period.	Annual water quality measured in site vicinity (LISS Monitoring program data)	Annual CTDEP trawl survey data	Bioaccumulation potential estimated of sediments collected within site and ref. areas at least every 5 yrs
Condition(s) triggering Tier 2 monitoring:	Mound changes by > 1.0 ft w/in 5 yr interval	Significant differences between site and ref. areas	Consistent gradients in measures of long-term water quality changes in vicinity	Significant differences in community composition or abundance from baseline or contiguous areas is found	Significant increase in bioaccumulation potential relative to range of bulk chemistry measured during project testing
Second Hypothesis	Bathymetry taken ≤ 2 months after 10-yr storm	N/A.	N/A	TBD	N/A
Condition(s) triggering Tier 2 monitoring:	Mound changes by > 1.0 ft from last survey	N/A	N/A	TBD	N/A
TIER 2					
First Hypothesis	Bathymetry and sediment char. survey w/in 1 km of site boundary	SPI at site and ref. areas at least 1 km away; grain size analysis	Water quality measured at site and ref. Areas during disposal	No hypothesis but studies may include measurement of species distribution at site and ref. areas	No hypothesis but studies will involve the collection of biota from site and ref. areas
Condition(s) triggering Tier 3 monitoring:	Apex or apron bathymetry changes are > 0.5 ft in areas greater than 50 by 50 m	Widespread differences between site and ref. areas are not caused by other factors	Significant short-term WQ gradients are found	A link between reduced biota or diversity and dredged material at the site is found	Significant bioaccumulation is detected
Second Hypothesis	N/A	SPI at site and ref. areas at least 1 km away; grain size analysis	N/A	No hypothesis but studies may include species distribution at site and ref. areas	Further studies not yet determined

Table C-1. Summary of Hypotheses and Leading Indicators for Each Management Focus (continued)

	Management Focus 1: Movement of the Dredged Material	Management Focus 2: Absence of Pollutant- Sensitive Biota	Management Focus 3: Changes in Water Quality	Management Focus 4: Changes in Composition or Numbers of Biota	Management Focus 5: Accumulation of Material Constituents in Biota
TIER 2 (Cont'd)					
Condition(s) triggering Tier 3 monitoring:	N/A	Differences between in biology between site and ref. areas are not caused by other factors	N/A	N/A	Further studies not yet determined
TIER 3					
First Hypothesis	Sed. chem, toxicity, and benthic community measured where community is depressed and ref. areas	Sediment Chemistry and toxicity measured at site and ref. Areas	No hypothesis but studies may include evaluation of sediment oxygen demand	No hypothesis but studies may include prey evaluation, bioaccumulation, succession, etc.	Further studies not yet determined
Condition triggering Management Action	All three measures are deemed unacceptable	All three measures are deemed unacceptable	Low dissolved oxygen at site and ref. areas is linked to dredged material	A link between reduced biota or diversity and dredged material at the site is found	A cause-effect link between sediment and higher trophic levels is detected
Second Hypothesis	N/A	Benthic community measured at site and ref. areas	No hypothesis but studies may include evaluation of sediment oxygen demand	No hypothesis but studies may include prey evaluation, bioaccumulation, succession, etc.	Further studies not yet determined
Condition triggering Management Action	Significant movement of material outside of the site and significantly impaired benthic community	All three measures are deemed unacceptable	Low dissolved oxygen at site and ref. areas is linked to dredged material	A link between reduced biota or diversity and dredged material at the site is found	A cause-effect link between sediment and higher trophic levels is detected

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