



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION



BUREAU OF WATER MANAGEMENT
PERMITTING, ENFORCEMENT & REMEDIATION DIVISION

APPROVAL

February 27, 1998

Mr. Mark Evans
U.S. Department of the Navy
Northern Division, Naval Facilities Engineering Command, Code 1823
10 Industrial Way, Mail Stop 82
Lester, PA 19113-2090

Re: Request for Approval of Calculated CTDEP Remediation Standards
Lower Subbase Remedial Investigation
Naval Submarine Base New London, Groton, Connecticut

Dear Mr. Evans:

The Federal Remediation Program of the Permitting Enforcement and Remediation Division of the Bureau of Water Management ("Department") has reviewed a letter dated December 23, 1997 requesting approval of calculated soil criteria for additional polluting substances for the planned Lower Base Remedial Investigation at the Naval Submarine Base New London, Groton, Connecticut. Mr. Corey A. Rich, P.E. of Brown & Root Environmental submitted the request on behalf of the Navy.

The Navy's letter requests approval of calculated direct exposure, pollutant mobility, and ground water protection criteria for a number of substances for which criteria are not specified in the Remediation Standard Regulations. Section 22a-133k-2(b)(4) of the Regulations allows the Commissioner to approve direct exposure criteria for additional polluting substances after consultation with the Commissioner of Public Health. Accordingly, the Navy's proposal was forwarded on December 31, 1997 to Dr. Gary Ginsberg of the Department of Public Health for comment on the proposed direct exposure criteria. Dr. Ginsberg's comments are attached for your reference.

The requested criteria listed for the 50 substances in the attached table are hereby approved. The Navy's request for approval of criteria for those substances not specifically listed in this table is still being evaluated. Our comments regarding those criteria not specifically listed in this table are being transmitted to the Navy under separate cover.

Nothing in this approval shall affect the Commissioner's authority to institute any proceeding, or take any action to prevent or abate pollution, to recover costs and natural resource damages, and to impose penalties for violations of law. In addition, nothing in this approval shall relieve any person of his or her obligations under applicable federal, state and local law.

Lower Subbase Request Approval of Additional Soil Criteria
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If you have any questions pertaining to this matter, please contact Mark Lewis of my staff at (860) 424-3768.

Sincerely,



Michael J. Harder
Director
Permitting, Enforcement, and Remediation Division
Bureau of Water Management

Attachments 1) Comment Memo dated 2/4/98
2) Table Listing Approved Criteria

MJH:MRL

cc: Kymberlee Keckler, US EPA New England, Federal Facilities Section
Jeff Sullivan, NSBNL Environmental Department
Jean- Luc Glorieux, P.E., Brown and Root Environmental
Gary Ginsberg, Dept. of Public Health

MEMORANDUM

TO: ELSIE PATTON, CTDEP/WATER BUREAU
THRU: MARY LOU FLEISSNER, DPH/EEOH *mlt*
FROM: GARY GINSBERG, DPH/EEOH *GG*
DATE: 2/4/98

re: NAVY PROPOSAL for ADDITIONAL CLEANUP CRITERIA

In response to your memo dated 12/31/97, we have reviewed the Navy's proposed list of direct exposure criteria (DECs) and groundwater protection criteria for additional polluting substances for the lower subbase area at the Naval Submarine Base in New London/Groton. The list covers cleanup criteria for a large number of analytes present at this particular site but not in the Remediation Standards Regulations. In most cases, we concur that the proposed criteria for these additional substances are appropriate and health protective. However, in the cases discussed below, the proposed criteria require adjustment or further justification. Please note that we have not evaluated the proposed Pollutant Mobility standards since our department was not involved in this area of the Remediation Standards Regulations. Please contact us at 509-7742 if you need additional information.

1. Surrogate chemicals used to supply toxicity values: The use of naphthalene as a surrogate to represent the toxicity of benzo(g,h,i)perylene and phenanthrene is inappropriate given the structural differences (naphthalene 2 cyclic rings, phenanthrene 3 rings, benzo(g,h,i)perylene 6 rings) and the fact that the naphthalene RfD has been withdrawn from the HEAST database. A better surrogate for these PAHs is pyrene (4 rings; RfD of 0.03 mg/kg/d⁻¹). While the pyrene surrogate could be used in a screening level risk assessment, the uncertainties associated with this approach should be discussed if benzo(g,h,i)perylene and/or phenanthrene are among the major PAHs found on-site.

The use of 3-methylphenol as a surrogate to represent the toxicity of 4-chloro-3-methylphenol is inappropriate based upon structural differences. Further, a quick literature search found references to chronic/oncogenicity data and developmental data in rats that could form the basis for an interim RfD for this compound. However, de novo RfD development would not be necessary if 4-chloro-3-methylphenol concentrations are uniformly very low (i.e., low ppb range) on-site. In this case, a qualitative assessment could be used to describe the risks, drawing upon what is known about other cresols (2- or 3- or 4-methylphenol and substituted cresols) and from the available 4-chloro-3-methylphenol database.

The use of chloromethane as a surrogate to represent the toxicity of bromochloromethane is one possible approach; however, this surrogate is less highly

halogenated than the analyte of interest, and the chlorine substituent generally confers less molecular reactivity than the bromine constituent. Therefore, the preferred approach would be to use bromodichloromethane as surrogate instead of chloromethane. Since this approach may be somewhat conservative, if bromochloromethane turns out to be a risk driver, a sensitivity analysis could be conducted with the cancer potency allowed to vary between chloromethane's and bromodichloromethane's (a 5 fold spread).

2. Bis(2-chloroethoxy)methane: the proposal is for a purely qualitative assessment. This evaluation should include a literature search and analysis to describe the chemical's toxic potential. If it is present at greater than trace levels (low ppb range) such that it could potentially be a risk driver, then consideration should be given to making the assessment more quantitative (e.g., comparison of daily exposure doses against literature NOAELs/LOAELs), as possible.
3. Incorrect or unsupported potency values: Several of the toxicity potency values listed in the Navy submission appeared to be incorrect or couldn't be verified from an examination of the Region III RBC Table, IRIS, or HEAST. The toxicity values [RfDs in mg/kg/d or cancer slope factors in (mg/kg/d⁻¹)] in question are as follows:

RfD for 1,2-dichloroethene (total) - assume this pertains to the mixture of cis and trans isomers - value should be 9E-03 instead of 2E-02 (RBC Table).

Cancer slope factor for chloroethane listed as 2.9E-03; however, no record of this slope factor in above sources.

RfD for 4,6-dinitro-2-methylphenol listed as 1E-04; however, no record of this RfD in above sources.

RfD for 2-hexanone listed as 4E-02; however, no record of this RfD in above sources.

RfD for 2-methylnaphthalene listed as 4E-02; however, no record of this in above sources and naphthalene RfD withdrawn; ATSDR Toxicological Profile for naphthalene should be consulted for pertinent data on this class of chemicals.

RfD for 4-nitrophenol listed as 8E-03; however, the RBC Table lists a value of 6.2E-02 with no values available on IRIS or HEAST.

cc: Mark Lewis, DEP/Water Bur.

Attachment
Naval Submarine Base New London- Lower Base RI
List of Approved Calculated Cleanup Criteria for Additional Polluting Substances
February 27, 1998

Pollutant	Reference Dose mg/kg/d	Cancer Slope Factor (oral) kg/day/mg	Soil (mg/kg)				Groundwater (µg/l)
			Residential DEC	Industrial/ Commercial DEC	GAA/GA PMC	GB PMC	Groundwater Protection Criteria
acenaphthene	6.00E-2	NA	1000	2500	8.4	84	420
aldrin	3.00E-5	1.70E+1	0.036	0.34	0.000041	0.00041	0.0021
BCH(alpha-)	NA	6.3E 0	0.097	0.91	0.00011	0.0011	0.0056
BCH(beta-)	NA	1.8E 0	0.34	3.2	0.00039	0.0039	0.0194
BCH(delta) (1)	NA	NA	0.097	0.91	0.00011	0.0011	0.0056
bromodichloromethane	2.00E-2	6.20E-2	9.9	92	0.011	0.11	0.56
bromomethane	1.40E-3	NA	95	1000	0.2	2	9.8
4-bromophenyl-phenylether	5.80E-2	NA	500	1000	8.2	82	410
carbazole	NA	2.00E-2	31	290	0.036	0.36	1.8
carbon disulfide	1.00E-1	NA	500	1000	14	140	700
4-chloroaniline	4.00E-3	NA	270	2500	0.56	5.6	28
chloromethane	NA	1.30E-2	47	440	0.054	0.54	2.7
2-chloronaphthalene	8.00E-2	NA	1000	2500	11	110	560
4-chlorophenyl-phenyl ether (2)	NA	NA	500	1000	8.2	82	410

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			Residential DEC	Industrial/ Commercial DEC	GAA/GA PMC	GB PMC	Groundwater Protection Criteria
chrysene	NA	7.30E-3	84	780	0.096	0.96	4.8
4,4'-DDD	NA	2.40E-1	2.6	24	0.0029	0.029	0.15
4,4'-DDE	NA	3.40E-1	1.8	17	0.0021	0.021	0.1
4,4'-DDT	5.00E-4	3.40E-1	1.8	17	0.0021	0.021	0.1
dibenzofuran	4.00E-3	NA	270	2500	0.56	5.6	28
dibenz(a,h)anthracene	NA	7.30E 0	0.084	0.78	0.000096	0.00096	0.0048
1,2-dibromo-3-chloropropane	NA	1.40E 0	0.44	4.1	0.0005	0.005	0.025
1,2 dibromoethane	NA	8.50E+1	0.0072	0.067	0.0000082	0.000082	0.00041
3,3'-dichlorobenzidene	NA	4.50E-1	1.4	13	0.0016	0.016	0.078
diethyl phthalate	8.00E-1	NA	1000	2500	110	1100	5600
2,4-dimethylphenol	2.00E-2	NA	1000	2500	2.8	28	140
2,4-dinitrophenol	2.00E-3	NA	140	2500	0.28	2.8	14
2,4-dinitrotoluene	2.00E-3	NA	140	2500	0.28	2.8	14
2,6-dinitrotoluene	1.00E-3	NA	68	2000	0.14	1.4	7

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			Residential DEC	Industrial/ Commercial DEC	GAA/GA PMC	GB PMC	Groundwater Protection Criteria
endosulfan I	6.00E-3	NA	410	1200	0.84	8.4	42
endosulfan II	6.00E-3	NA	410	1200	0.84	8.4	42
endosulfan sulfate (3)	NA	NA	410	1200	0.84	8.4	42
endrin aldehyde (4)	NA	NA	20	610	NE	NE	NE
endrin ketone (5)	NA	NA	20	610	NE	NE	NE
hexachlorobutadiene	2.00E-4	7.80E-2	7.9	73	0.009	0.09	0.45
hexachlorocyclopentadiene	7.00E-3	NA	470	2500	0.98	9.8	49
indeno(1,2,3-cd)pyrene	NA	7.30E-1	0.84	7.8	0.00096	0.0096	0.045
isophorone	2.00E-1	9.50E-4	640	2500	0.74	7.4	37
manganese (6)	2.3E-2		1,600	47,000	50	500	160
2-methylphenol	5.00E-2	NA	1000	2500	7	70	350
4-methylphenol	5.00E-3	NA	340	2500	0.7	7	35
2-nitroaniline	6.00E-5	NA	4.1	1200	0.0084	0.084	0.42
3-nitroaniline	3.00E-3	NA	200	2500	0.42	4.2	21

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			Residential DEC	Industrial/ Commercial DEC	GAA/GA PMC	GB PMC	Groundwater Protection Criteria
4-nitroaniline	3.00E-3	NA	200	2500	0.42	4.2	21
nitrobenzene	5.00E-4	NA	34	1000	0.07	0.7	3.5
2-nitrophenol	NA	NA	540	2500	1.1	11	56
N-nitrosodiphenylamine	NA	4.90E-3	130	1200	0.14	1.4	7.1
N-nitrosodi-n-propylamine	NA	7.00E 0	0.088	0.82	0.0001	0.001	0.005
1,2,4-trichlorobenzene	1.00E-2	NA	680	2500	1.4	14	70
2,4,5-trichlorophenol	1.00E-1	NA	1000	2500	14	140	700
2,4,6-trichlorophenol	NA	1.10E-2	56	520	0.064	0.64	3.2

- Notes: 1) BCH(alpha) used as surrogate for BCH (delta).
2) 4-bromophenyl-phenyl ether used as surrogate for 4-chlorophenyl-phenyl ether.
3) Endosulfan used as surrogate for endosulfan sulfate.
4) Endrin used as surrogate for endrin aldehyde.
5) Endrin used as surrogate for endrin ketone.
6) Pollutant mobility criteria for manganese based on EPA Secondary MCL (50 µg/L). This approach is acceptable. GA/GAA pollutant mobility criteria based on calculated ground water protection criteria would be 160 µg/L, GB pollutant mobility criteria would be 1,600 µg/L.