N00102.AR.000116
NSY PORTSMOUTH
5090.3a

McLaren Hart

July 6, 1992

Mrs. Linda Resta-Dietz
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
Mail Stop 82
Lester, Pennsylvania 19113-2090

RE: Responses to the Navy's Review Comments of the Final Revised Ambient Air Quality Monitoring Study Report
Portsmouth Naval Shipyard
Kittery, Maine
McLaren/Hart Project No. AL005-09

Dear Linda:

Enclosed as requested are McLaren/Hart's responses to the Navy's specific review comments of the Revised Ambient Air Quality Monitoring Study Report concerning volatile mercury monitoring results of the study.

It is my understanding that the Navy's comments were primarily provided by Ms. Andrea Lunsford of the Navy's Environmental Health Center. Additional comments were also provided by Jim Tayon of the Portsmouth Naval Shipyard.

For the record, a copy of these Navy comments which McLaren/Hart is responding to is attached. The McLaren/Hart responses presented here specifically address these Navy comments. Also attached are supporting material for McLaren/Hart's responses. The material includes 1) the State of New Hampshire's Chapter 1300 Code of Administrative Rules for Toxic Air Pollutants; 2) the Ambient Air Limits for Toxic Air Pollutants list of 108 compounds for the State of New Hampshire; and 3) a copy of the omitted volatile mercury sampling results for November 2, 1992.

28 Madison Avenue Extension, Albany, NY 12203 (518) 869-6192 FAX (518) 869-3971

If additional information and/or clarification are required, please let me know. However, I hope that the enclosed information will suffice in answering the Navy's concerns and needs regarding the mercury monitoring results at the shipyard.

Sincerely,

McLAREN/HART ENVIRONMENTAL
ENGINEERING CORPORATION

Willard J. Smith

Willard J. Smith, P.E.
Principal Engineer
Manager, Engineering

WJS:mw
cc: R. Kane
S. Myers
S. Urschel

McLaren Hart

McLaren/Hart's Responses to the Navy's Specific Review Comments (1-7) Regarding Mercury Monitoring at the Portsmouth Naval Shipyard

Comment No. 1

The State of New Hampshire's Air Resources Division of the Department of Environmental Services has published a list of Ambient Air Limits for Toxic Air Pollutants which currently covers 108 (not 118) different air pollutants. The current list of 108 compounds was released in January 1992; the previous list contained 72 different air toxic pollutants. This prior list was in effect during the Portsmouth Naval Shipyard ambient air monitoring period of October 1991.

The list of 72 air toxic pollutants included six (6) of the twelve (12) pollutants detected by McLaren/Hart during the 1991 monitoring study. The twelve (12) pollutants detected were:

1. Antimony (Federal Cleanup Air Standard was not exceeded)
2. Arsenic (Federal Cleanup Air Standard was exceeded)
3. Cadmium (Federal Cleanup Air Standard was exceeded)
4. Chromium (Federal Cleanup Air Standard was exceeded)
5. Lead (NAAQS was not exceeded)
6. Nickel (NYS AGC was exceeded)
7. N-Nitrosodiphenylamine (NYS AGC was exceeded)
8. Bis(2-ethylhexyl)phthalate (no Federal Cleanup Air or NYS AGC Standard available)
9. Tetrachloroethylene (PCE) (Federal Cleanup Air Standard was exceeded)
10. Benzene (NYS AGC was exceeded)
11. Volatile (Organic) Mercury (NYS AGC was exceeded)
12. Particulate (Inorganic) Mercury (NYS AGC was not exceeded)

NOTE: NAAQS = National Ambient Air Quality Standard
NYS AGC = New York State Annual Guideline Concentration

The following six (6) air pollutants which were included on the 1991 New Hampshire Ambient Air Toxics List are:

1. Arsenic (AAL = 480 ng/m^3)

2. Cadmium (AAL = 24 ng/m^3)

3. Chromium (AAL = 120 ng/m^3)

4. Nickel (AAL = 120 ng/m^3)

5. Benzene (AAL = 71,000 ng/m^3)

6. Tetrachloroethylene (PCE) (AAL = 810,000 ng/m^3)

NOTE: *AAL = Ambient Air Limit = 24-hour average concentration.*

The 1992 New Hampshire list of 108 compounds includes the following additional pollutants which were detected during the monitoring study, but were not regulated by the State of New Hampshire during 1991:

1. Mercury (not specific as to particulate or volatile mercury) (AAL = 167 ng/m^3)

2. Bis(2-ethylhexyl)phthalate (AAL = 11,900 ng/m^3)

Please refer to the attached State of New Hampshire Ambient Air Toxics list and corresponding Chapter 1300 Toxic Air pollutants definitions and toxicity classifications.

A discussion with Mr. Tom Niejadlik of the New Hampshire Air Resources Division (Tel No. 603-271-1370) indicated that New Hampshire's air toxics list is based on New York State's Air Guide-1 (AG-1) list, but is not as comprehensive as New York's. Mr. Niejadlik also said that the current list of 108 compounds will be expanded in 1992 after the regulatory requirements have been met. Also, New Hampshire's ambient air concentration limit values are based on 24-hour averaging periods. Mr. Niejadlik indicated that this averaging period may be changed to an annual averaging period to be consistent with the need to have a long-term (annual) ambient air concentration for the purpose of protecting the environment and the public health from adverse effects which may be associated with long-term exposure to the contaminant(s). This change would be similar to New York's AGC limits. The Air Resources Division is also considering a 1-hour concentration average for each of their listed air pollutants to preclude any significant health or environmental effects which might be associated with acute

exposures to sources of these listed air contaminants. These short-term concentration averages would be similar to New York State's short-term guidance concentrations or SGCs.

Based on this information, McLaren/Hart feels that it would be more prudent to remain with the generally more conservative New York State Air Guide-1 limits and refer to the State of New Hampshire limits for comparative purposes as necessary.

Comment No. 2

The second Navy comment deals with the matter of what form of mercury was actually detected at the shipyard. To clarify this issue, McLaren/Hart sampled for both particulate mercury using total suspended particulate (TSP) high-volume air samplers and sorbent tubes for volatile mercury. The particulate mercury method detected only mercury in particulate form; the sorbent tube method (modified NIOSH Method 6009) detected volatile mercury (elemental vaporous mercury) as well as any particulate (non-volatile) mercury compounds which may have been trapped by the Hopcolite sorbent material. This method did not call for a particulate pre-filter and was, therefore, not used. It should be mentioned that the TSP method for particulate mercury detected very low ambient levels (less than 1 ng/m^3). Therefore, the high levels found with the NIOSH method were attributed primarily to volatile mercury forms.

With respect to the issue regarding the use of the New York State Air Guide-1 AGC for organic mercury for the volatile mercury readings taken by the NIOSH method, it is McLaren/Hart's position that even though the NIOSH Method 6009 covers the entrainment of vaporous elemental mercury, the limited data on this method indicate that there may also be a positive interference for this method from organic and inorganic mercury compounds. No other interferents are known to affect this method. Thus, the very high volatile mercury readings found at the Shipyard may be totally or partially caused by these positive interferents rather than from elemental inorganic vaporous mercury. In either case, the method still shows that mercury or mercury-containing compounds have been detected on-site; we just do not have a quantifiable level or concentration(s) for these mercury compounds.

McLaren/Hart had recommended in its final Ambient Air Quality report and at the TRC presentation for this monitoring study that more information, including possible additional mercury monitoring, is needed at the Shipyard to ascertain the extent of the ambient mercury problem.

At this point, McLaren/Hart recommends that the ambient guideline concentration limits used for mercury not be changed since the State of New Hampshire's current ambient limit for mercury was published in January 1992 and the form of mercury is not specified. On the other hand, the NYS AGC's for mercury are specific for organic and inorganic. For this study it was assumed that particulate mercury would mainly consist of inorganic mercury compounds, such as bonded mercurous and mercuric salts (*i.e.,* mercurous chloride and mercuric chloride);

volatile mercury would mainly consist of organic mercury compounds (such as the alkyl, aryl, and organomercurials of which the alkyl mercurials are the most toxic to humans) as well as vaporous elemental mercury which should be considered to have a very low ambient concentration due to McLaren/Hart's understanding that the Navy does not have elemental mercury sources that could vaporize to the atmosphere at the ambient levels detected by the sorbent tube sampling.

Comment No. 3

The volatile mercury concentration at Site No. 4 on October 13, 1991, is 17,000 ng/m^3 as summarized in Appendix C, Table C-1 for Volatile Mercury Detects.

Comment No. 4

Duplicate and blank sampling tubes were taken during each 24-hour volatile mercury and nitrosodiphenylamine sorbent tube sample. For both of these parameters, a three-point calibration was performed for approximately every twenty (20) samples. A reference standard and a blank were run at the time of the calibration. An additional reference standard and blank were also run every ten (10) samples to confirm calibration.

According to Upstate Laboratories, McLaren/Hart's analytical subcontractor, a review of the QA/QC data for these sampling results showed that all reference standards were within the control limits set. These QA/QC data are presented in Appendix F of the *"RCRA Corrective Action, Portsmouth Naval Shipyard, Ambient Air Quality Monitoring Report"* which was originally dated February 19, 1992.

Comment No. 5

Refer to Comment No. 2 above for McLaren/Hart's response.

Comment No. 6

The sentence which states that the meteorological monitoring data indicate that "most air contaminant releases at the shipyard would be transported away from the populated areas as a result of the prevailing wind direction (from the west-northwest)" was intended to inform the reader that long-term meteorological monitoring data for the Shipyard show that the long-term adverse effects of ambient air contaminant releases on the air quality of the Shipyard and surrounding areas are expected to be somewhat mitigated due to the prevailing wind direction.

On a short-term basis, though, there are definite air contaminant releases (in particular, volatile mercury) which appear to be detrimental to the health and welfare of the Shipyard personnel.

Furthermore, any elevation of the ambient air temperature would only aggravate the situation due to increased volatilization of mercury. Soil temperature increases may or may not contribute to increased atmospheric volatile mercury releases because we do not yet know the source(s) of the mercury.

Because of the high volatile mercury levels found, McLaren/Hart has recommended additional data gathering, including ambient air monitoring and an on-site investigation into the sources of the mercury releases.

Comment No. 7

The typical mercury concentration levels presented in Table 11 of the final report for other parts of the country included both particulate and elemental vaporous mercury (volatile) levels. There was no differentiation between these particulate/volatile mercury levels and organic/inorganic mercury levels because of the fact that no reliable and accurate ambient monitoring method is yet available to quantify ambient organic/inorganic mercury levels.

The volatile mercury levels measured at the Shipyard included particulate, elemental vaporous, and very likely, other forms of mercurial compounds which have a positive but unquantifiable interference on the method used. These are the levels which have been used in comparison with other levels found in the country.

Comment No. 66

Ambient asbestos levels were not measured because it was determined that ambient asbestos would not be a human health risk due to the lack of an air pathway for any asbestos found on site.

Comment No. 67

No response due to lack of specificity of the question.

Comment No. 68

The value of 17,000 ng/m^3 is correct. Please refer to Comment No. 3 above for more detail.

Comment No. 69

Please refer to Appendix C, Table C-1 of the final report for a summary of all detected concentrations at each monitoring site.

Comment No. 70(a)

The lack of a trip blank for the October 13, 1991 volatile mercury sample does not void the sample. According to the analytical subcontractor, Upstate Labs, the analysis for the volatile mercury samples collected on October 13, 1991 passed all in-house quality control requirements. The possibility of sample contamination during handling and/or transportation cannot be verified or excluded due to the fact that a volatile mercury trip blank was not included; however, a review of data for volatile mercury trip blanks from the other sample delivery groups indicates the probability of contamination was minimal, if not nil. Thus, this sample was accepted.

Comment No. 70(b)

Volatile mercury sampling results for Sites 6, 7, 8, and 9 as well as for duplicate and trip blank samples for November 2, 1992, were inadvertently omitted in the final report's Appendix F, dated February 19, 1992. A copy of the data is attached.

Comment No. 70(c)

The McLaren/Hart field sampling team collected both the volatile mercury and N-nitrosodiphenylamine sorbent tubes at the same time and placed them in a Ziplock-type plastic bag. The bag was then tagged by date and location and forwarded to the laboratory for analysis. Each type of sorbent tube was identifiable by its physical uniqueness. Front and back sorbent tubes for each volatile mercury sample collected were additionally marked with unique numbers in order to identify each tube and to prevent samples from being lost. One laboratory number was used for each set of amine and mercury sorbent tube samples collected. This number identified the set of samples with respect to date and location.

Comment No. 70(d)

The modified NIOSH Method 6009 used for measuring volatile mercury did not specify a pre-filter and thus one was not used. The concentration value determined by this method includes the particulate mercury concentrations of the air sample taken. Please also refer to Comment No. 2 above.

Comment No. 70(e)

The calculated study period average of 1879 ng/m^3 for the volatile mercury was based on the arithmetic average of the detectable 24-hour concentrations of mercury as well as one-half of the Limit of Detection (LOD) for each of the non-detects. This calculated value was presented for comparative purposes only in order to provide some basis for indicating the magnitude of the average mercury levels at PNS during the study period versus levels found elsewhere. It should be noted that very limited data are available for ambient air concentrations of mercury. Consequently, comparisons are also limited. Furthermore, any comparison is limited due to the various averaging periods used for the levels presented.

Comment No. 70(f)

The question of "what is the source of volatile mercury" is beyond the scope of this monitoring study. However, it is McLaren/Hart's professional opinion that more than just elemental mercury vapor is being released to the atmosphere to account for these high "hits" of mercury.

Comment No. 70(g)

As mentioned in the prior comments, particulate pre-filters were not used on the sorbent tube sampling trains for volatile mercury.

Comment No. 70(h)

Elemental mercury is considered vaporous even at room temperature because of its relatively high vapor pressure with respect to other metals and elements. Exposed elemental mercury will constantly emit vapors into the air. Since mercury is a liquid at room temperature and because spilled mercury forms small droplets, the amount of vapor produced is increased because of the greatly increased surface area of the mercury. Any source which heats mercury increases its volatility and thus increases its air pollution potential. The atmospheric concentration will approximately double for every 10°C increase.

Comment No. 70(i)

The question as to the size of the mercury source needed to produce such ambient levels detected is beyond the scope of this study.

Comment No. 70(j)

No mercury was used in any of the instrumentation.

Comment No. 70(k)

Again, as noted in Comment No. 70(f), it is beyond the scope of this study to ascertain the source(s) of the mercury/mercury-based emissions. Copy paper, as was suggested as a possible source of mercury contamination, is not considered the source of mercury; however, if it was the source, such an item would have to release a significant amount of mercury to affect the sorbent tube samples in the manner found.

REVISED AMBIENT AIR QUALITY MONITORING
STUDY REPORT REVIEW COMMENTS CONCERNING VOLATILE MERCURY

General Comments

1. Chapter 10.1 (Air Quality Monitoring Program) of the RCRA Facility Investigation, Portsmouth Naval Shipyard, Kittery, Maine was provided to the Navy Environmental Health Center for review. The report was prepared for Northern Division, Naval Facilities Engineering Command, by McLaren/Hart Environmental Engineering Corporation. To date, a limited review of this document was conducted in efforts to determine if mercury presents an immediate health threat. Specific review comments and recommendations are provided below.

2. The technical point of contact for this review is Ms. Andrea Lunsford, Head, Health Risk Assessment Department, Environmental Programs Directorate, Navy Environmental Health Center, who may be contacted at (804) 444-7575 or DSN 564-7575, extension 402.

Specific Review Comments Specific to Mercury Monitoring:

1. Page 4, Executive Summary and Conclusions, paragraph 3:

Comment: The text states that, "Due to the fact that there are no current Federal clean-up action levels or ambient air quality standards for eight (8) of the twelve (12) air contaminants detected, the New York State Air Guide-1 (AG-1) Guidelines for the Control of Toxic Ambient Air Contaminants document were used to provide a basis for the relative toxicity for these air contaminants of concern."

The State of New Hampshire, Department of Environmental Services, Air Resources Division has established air quality standards for 118 various contaminants. The contaminants of concern at Portsmouth Naval Shipyard (PNS) sites may be included in this list. There may be a difference in the standards established in different states (e.g. the ambient air limit for inorganic mercury (particulate) established by New Hampshire is 167 ng/m^3, the ambient air level established by New York is 300 ng/m^3).

Recommendation: Include the applicable ambient air limits established by the State of New Hampshire, Department of Environmental Services, Air Resources Division in the text for comparison purposes.

Page 3-5, Table 6 (Federal and State Air Quality Standards/Action Levels and Ambient Guideline Concentrations):

Comment: The New York AG-1 cited for volatile mercury is footnoted to be that for organic mercury, not volatile mercury. The differences between organic and volatile mercury are significant. Volatile mercury is elemental mercury (inorganic) in its gas or vapor phase, organic mercury is an organic compound bonded to mercury (e.g., methyl mercury). Organic mercury demonstrates a higher degree of toxicity than volatile mercury.

Section 5.5 (Sorbent Tube Sampling (Amines/Volatile Mercury)) states that the analytical method was based on NIOSH Method 6009 with the collection medium being Hopcolite in a glass sorbent tube (SKC 226-17-1A). The specified method is one used for the determination of mercury vapor.

Efforts to locate a method for the sampling and analysis of organic mercury revealed that OSHA has stayed the standard (FR 54:2922, 01/19/89) until an analytical method can be developed. NIOSH, on the other hand, uses an in-house modified apparatus in conjunction with Method No. P&CAM 175 to evaluate organic mercury. This apparatus is not commercially available. The SKC Guide to NIOSH/OSHA Air Sampling Standards indicates "no verified method" for organic mercury.

As previously discussed, the sampling methodology appears to have been for volatile mercury. The New York State Air Guide-1 Concentration (AGC), presented for volatile mercury in Table 6 is for organic mercury; therefore, these values should not be compared. Instead, a value for volatile mercury should be presented in the table for comparison purposes.

Recommendation: Replace the organic mercury AGC with an AGC for volatile mercury. Additionally, correct all organic mercury citations, in the text, to volatile mercury.

3. Page 3-16, Section 3.0 (Ambient Air Monitoring Results), subsection 3.9 (Volatile Mercury), paragraph 1:

Comment: Editorial: Sentence 3 lists the concentration of volatile mercury at Site 4 to be 12,000 ng/m^3, instead of 17,000 ng/m^3, as listed previously.

Recommendation: Correct as indicated.

4. Page 6-3, Section 6.0 (Quality Assurance/Quality Control Program), subsection 6.1.3 (N-Nitroso-Diphenylamine):

Comment: The text states in paragraph 3 of subsection 5.5 (Sorbent Tube Sampling (Amines/Volatile Mercury)), that duplicate

ampling tubes and blank tubes for each 24-hour sampling run was conducted. Also, on page 6-10, item III, subsection 6.2.2 (Sampling and Analytical Procedures), specific QC procedures described for volatile mercury/amines include 3-Point Calibration, every ten (10) samples, with blank and outside reference samples. However, there is no discussion of the blanks, duplicates, outside reference samples, or quality control parameters, for volatile mercury in section 6.0. This information is crucial to determine the validity of this study, particularly given the relatively high concentrations of volatile mercury detected at the PNS sites.

Recommendation: Include the quality assurance/quality control data for volatile mercury, otherwise, provide a discussion for the data quality with respect to uncertainties as a result of the lack of QA/QC for the data.

5. Page 7-1, Section 7.0 (Conclusions and Recommendations), DRMO Area, bullet 3:

Comment: Again, reference is made to the comparison of New York State AGC for organic mercury to the PNS sites' volatile mercury concentrations. See comment 2.

Recommendation: See comment 2.

6. Page 7-4, Section 7.0 (Conclusions and Recommendations), last paragraph:

Comment: The text states that the meteorological monitoring data indicates that, "Most air contaminant releases at the shipyard would be transported away from the populated areas as a result of the prevailing wind direction (from the west-northwest)." However, the potential for exposure to nearby receptors (individuals at the Child Development Center, residential dwellings and offices), as well as workers on site, exists. The existence of this possibility can be readily ascertained upon examination of the variability of daily wind direction presented in the maps in section 3.0 (Ambient Air Monitoring Results).

In addition, if one were to take into consideration seasonal temperature variations, it is intuitively obvious that the average air and soil temperatures would increase during the summer months. The average ambient air and soil temperatures during the study period, according to Figures 14 and 15, were 13.5°C and 14°C, respectively. Since mercury is slightly volatile at ordinary temperatures, it is logical to assume that an increase in ambient air and soil temperatures would have a net effect of increased volatilization of elemental mercury, thus increasing ambient air concentrations of volatile mercury.

Recommendation: Discuss the potential for exposure to nearby receptors and the potential for increased concentrations of mercury as a result of temperature increases.

7. Page 7-7, Table 11 (Comparison of Certain Air Contaminant Levels Found at PNS with Other Areas of the Country):

Comment: According to the range of concentration levels presented for the contaminant "Mercury," it seems that the range is for volatile mercury versus particulate, and should be listed as such. Also, ensure that the levels found at "other areas of the country," truly represent those for volatile mercury.

Recommendation: Review the table and make necessary corrections as recommended to provide an accurate description of the data.

Section 10.1 Air Quality Monitoring Program

66. 1-3			Why was asbestos not sampled?
67. 2-2	L	2	New Hampshire~~'s~~ Department of Environmental . . .
68. 3-16	2	3,4	Are the data 17,000 and 12,000 ng/m^3 in error?
69. 7-2	1		It should be noted that elevated levels were detected only once at sites 1 and 2.

70. Code 106 comments:

a. No blank on 13 Oct 91: How does this affect samples this day. Are they voided?

b. Missing Mercury samples on 2 Nov 91 6-9. Is there a missing duplicate, blank or page?

c. Sample numbers for Mercury and N-Nitrosodiphenylamine and their front/back are identical. Lab numbers are the same.

d. Volatile Mercury was not prefiltered. Does this mean total mercury is calculated including particulate in the sample?

e. Mercury average total release is calculated at <1879 ng/m^3. This is barely detectable on a daily average. (Check with 106.31 on this comment and other value before submitting. Note that NEHC has stated that a single excursion constitutes a potential health hazard.)

f. What is postulated as a source of volatile Mercury?

g. Were particulate pre-filters were used on the sorbent tubes while sampling for volatile Mercury?

h. At what temperature would this source be considered to go active; to emit vapors at a level detectable?

i. What size source is needed to produce these types of airborne concentrations? An ounce of Mercury?

j. Was Mercury used in any of instrumentation? For example, Mercury thermometer or mercury relay switches?

k. Could there be a source of emission such as Mercury from copy paper, for example?

CHAPTER Env-A 1300 TOXIC AIR POLLUTANTS

Statutory Authority: RSA 125-I:3

PART Env-A 1301 PURPOSE

Env-A 1301.01 Protection of Public Health. The purpose of this part is to protect the public from pollutants which may occur in the ambient air in such concentrations as to cause adverse health effects including increased cancer risk. The ambient air limits of these pollutants, as specified in this chapter, are intended to provide public health protection.

Source. #4801, eff 4-25-90

PART Env-A 1302 DEFINITIONS

Env-A 1302.01 "Ambient air limit" or "AAL" means a concentration limit of a toxic air pollutant in the ambient air which is intended to provide public health protection.

Source. #4801, eff 4-25-90

Env-A 1302.02 "Area source" means a two-dimensional, horizontal source from which air emissions are being released at a relatively uniform rate from every part of its surface.

Source. #4801, eff 4-25-90

Env-A 1302.03 "LC_{50}" or "lethal concentration fifty" means a calculated concentration of a material in air, exposure to which for a specified length of time is expected to cause the death of 50% of an entire defined experimental animal population.

Source. #4801, eff 4-25-90

Env-A 1302.04 "LD_{50}" or "lethal dose fifty" means a calculated oral or dermal dose of a material which is expected to cause the death of 50% of an entire defined experimental animal population.

Source. #4801, eff 4-25-90

Env-A 1302.05 "Risk assessment" means the scientific activity of evaluating the toxic properties of a chemical and the conditions of human exposure to it in order both to ascertain the likelihood that exposed humans will be adversely affected, and to characterize the nature of the effects they may experience.

Source. #4801, eff 4-25-90

Env-A 1302.06 "Risk management" means the use of the results of environmental health risk assessments or other information in order to develop and evaluate regulatory options, within a statutory framework, to reduce the risk of harm to human health and ecosystems to the greatest possible degree.

Source. #4801, eff 4-25-90

Env-A 1302.07 "Threshold Limit Values (TLV)" means the more stringent of the current occupational standards for workplace exposures to airborne pollutants, established by the American Conference of Governmental Industrial Hygienists (ACGIH), the Occupational Safety and Health Administration (OSHA) or the National Institute for Occupational Safety and Health (NIOSH).

Source. #4801, eff 4-25-90

Env-A 1302.08 "Toxic air pollutant" means any air pollutant which is potentially injurious to human health.

Source. #4801, eff 4-25-90

PART Env-A 1303 POLLUTANTS REGULATED & TOXICITY CLASSIFICATION

Env-A 1303.01 Purpose and Sources of Listed Pollutants.

(a) The purpose of this part is to identify the methodology by which pollutant toxicity is classified and to identify sources of listed pollutants.

(b) There are a significant number of air contaminants meeting the criteria of Part Env-A 1301 which are not regulated by national or state standards. These are contaminants that can be found in the workplace and in the ambient air as a result of industrial venting, process emission, combustion by-products, waste disposal, etc. Listings of these contaminants have been compiled by organizations such as the International Agency for Research on Cancer (IARC), the American Conference of Governmental Industrial Hygienists (ACGIH), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH) and the EPA. The listings provide information regarding the toxicity of these contaminants and present available scientific evidence of their potential for causing cancer in humans.

(c) RSA 125-I:2, III requires the Commissioner of the Department of Environmental Services to designate toxic air pollutants to be regulated under these rules from those listed by the United States EPA in the Code of Federal Regulations, Title 40, Part 261, Subparts C and D, and Table 4 of EPA 450/5-86-011a, NATICH Data Base Report on State and Local Agency Air Toxics Activities, and subsequent updates.

Source. #4801, eff 4-25-90

Env-A 1303.02 Toxicity Classification.

(a) A High Toxicity Classification shall be assigned to the following:

(1) Those substances recognized by IARC or EPA to have carcinogenic or co-carcinogenic potential for humans, or those which are suspect of inducing cancer based on limited epidemiologic evidence or demonstration of carcinogenesis in one or more animal species by appropriate methods; or

(2) Those substances having an acute toxicity in which the:

a. LD_{50} (oral) is equal to or less than 50 mg/kg;

b. LC_{50} (inhalation) is equal to or less than 200 ppm; or

c. LD_{50} (dermal) is equal to or less than 200 mg/kg.

(b) A Moderate Toxicity Classification shall be assigned to the following:

(1) Those substances that are IARC or EPA positive animal carcinogens in at least one species, or have been determined by IARC/EPA to induce mutagenic or teratogenic effects; or

(2) Those substances having an acute toxicity in which the:

a. LD_{50} (oral) is greater than 50 mg/kg but less than 500 mg/kg;

b. LC_{50} (inhalation) is greater than 200 ppm but less than 2000 ppm; or

c. LD_{50} (dermal) is greater than 200 mg/kg but less than 1000 mg/kg.

(c) A Low Toxicity Classification shall be assigned to the following:

(1) Those substances that have not demonstrated carcinogenicity in test animals;

(2) Those substances that might cause mild irritation to sensitive members of the population at concentrations below occupational standards, and have no evidence of adverse effects due to chronic exposure; or

(3) Those substances having an LC_{50} greater than the saturated vapor concentration at standard temperature and pressure.

Source. #4801, eff 4-25-90

PART Env-A 1304 AMBIENT AIR LIMITS (AAL)

Env-A 1304.01 Applicable Limits. For those chemicals for which risk assessments have been provided by the N.H. Department of Health & Human Services (NHDHHS), AALs shall be based on the risk assessments. For those chemicals for which no risk assessments have been requested from or provided by NHDHHS, the AALs shall be based on modified occupational standards.

Source. #4801, eff 4-25-90

Env-A 1304.02 Modified Occupational Standards.

(a) The purpose of this part is to explain how threshold limit values are converted to AALs. Threshold limit values (TLV) refer to airborne concentrations of substances and represent conditions under which it is believed by the scientific community that nearly all healthy workers can be repeatedly exposed day after day, in the workplace, without adverse effect. TLVs provide a comprehensive data base set from which to determine ambient air limit concentrations of hazardous or toxic substances. Since the TLV exposures are those termed to be acceptable for a normal healthy adult for eight hours a day, five days a week, they must be adjusted to provide for continuous exposure of susceptible people such as children, the elderly, the chronically ill, and pregnant women.

(b) Modified Occupational Standards for toxic air pollutants shall be derived by adjusting the occupational standard for continuous exposure by dividing the TLV by 4.2. The safety factors for susceptible people used in practice in conjunction with the occupational standards shall be 100 for high toxicity, 71 for moderate toxicity and 24 for low toxicity pollutants.

(c) The above-noted modifying factors shall be applied to the toxicity classifications as follows:

(1) High toxicity air contaminants are IARC human positive carcinogens or suspected human carcinogens. Applying the adjustment for continuous exposure and the most conservative safety factor, the AAL is determined by dividing the TLV by 420. This AAL is a 24-hour average ambient concentration at any off-site receptor;

(2) Moderate toxicity air contaminants are IARC positive animal carcinogens, or induce mutagenic or teratogenic effects. Applying the adjustment for continuous exposure and the appropriate safety factor, the AAL is determined by dividing the TLV by 300. This AAL is a 24-hour average ambient concentration at any off-site receptor; and

(3) Low toxicity air contaminants are those which are irritants. Applying the adjustment for continuous exposure and the appropriate safety factor, the AAL is determined by dividing the TLV by 100. This AAL is a 24-hour average ambient concentration at any off-site receptor.

(d) Air contaminants that do not have an assigned TLV shall be reviewed by the Air Resources Division. A recommended AAL shall be developed based on available toxicity data, comparison with chemicals of similar structure, and risk assessments performed by federal or other state agencies.

Source. #4801, eff 4-25-90

Env-A 1304.03 Risk Assessment and Management.

(a) The Director shall request the NHDHHS to conduct health risk assessments for selected chemicals known to be emitted by industries in the state. These chemicals shall be selected based on toxicity classification and quantities emitted. For those chemicals for which risk assessments are available, AALs shall be based on risk assessments.

(b) The Director shall request that the NHDHHS provide a health goal, which considers only human health factors, for each chemical for which an assessment has been completed. A range of excess cancer risk levels shall also be provided for carcinogens. The Commissioner, in applying risk management, shall select a concentration as the AAL. The Director shall send the list of current AALs to anyone who so requests.

(c) For those chemicals for which no risk assessment from NHDHHS is available, AALs shall be based on modified occupational standards.

Source. #4801, eff 4-25-90

PART Env-A 1305 IMPACT ANALYSIS & PERMIT REQUIREMENTS

Env-A 1305.01 Applicability.

(a) New or modified devices, new or modified area sources, and existing devices or area sources for which new applications for permits are filed that have the potential to emit, in any amount, substances which meet the criteria of Part Env-A 1301 shall be subject to this Part.

(b) Existing devices and sources operating or having a complete temporary permit application on file as of the effective date of this chapter and that have the potential to emit high toxicity air contaminants shall also be subject to this Part.

(c) Existing devices and sources emitting chemicals that, based on new scientific evidence from a nationally-recognized institution such as the National Cancer Institute, are upgraded to a high toxicity classification, shall be subject to this Part.

(d) This Part shall not apply to all other devices and sources operating or having a complete temporary permit application on file as of the effective date of this Chapter. This Part shall also not apply to any device or source utilizing only coal, refined oil, natural gas and/or wood in the form of whole tree chips by analysis as fuels.

Source. #4801, eff 4-25-90

Env-A 1305.02 Procedures for Air Quality Impact Analysis. Air quality impact analysis of devices and area sources emitting substances meeting the criteria of Part Env-A 1301 shall be performed in accordance with the "NHARD Policy and Procedure for Air Quality Impact Modeling" or other comparable dispersion modeling methods approved by the EPA.

Source. #4801, eff 4-25-90

Env-A 1305.03 Impact Analysis and Permit Requirements for Devices.

(a) An air quality impact analysis in accordance with Env-A 1305.02 shall be performed to determine if the corresponding AALs are met for each toxic air pollutant present. If no control system is in place and the AALs are met, no permit shall be required.

(b) If, in the absence of a control system, an AAL is not met for a particular pollutant, Best Available Control Technology (BACT) shall be required if the pollutant is in the high toxicity classification, and Reasonably Available Control Technology (RACT) shall be required if the pollutant is in the moderate or low toxicity classification. RACT may include a change of process. A permit shall be required if a control system is necessary to meet an AAL.

(c) If an AAL is not met with BACT or RACT as required by paragraph (b), further corrective action shall be necessary to meet the AAL, and a permit shall be required.

Source. #4801, eff 4-25-90

Env-A 1305.04 Impact Analysis for Area Sources. An air quality impact analysis in accordance with Env-A 1305.02 shall be performed to determine if the AALs are met for each toxic air pollutant present. If all applicable AALs are met, a permit shall not be required. If AALs are not met, corrective action shall be implemented to meet the AAL and a permit shall be required.

Source. #4801, eff 4-25-90

Env-A 1305.05 Odors. For high and moderate toxicity contaminants having an AAL higher than the odor threshold value, the odor threshold value (hourly average concentrations) as determined by the American Society for Testing and Materials' "Compilation of Odor and Taste Threshold Values Data", ASTM Data Series DS 48A, shall be used in Env-A 1305.03 in place of the AAL.

Source. #4801, eff 4-25-90

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
AIR RESOURCES DIVISION

AMBIENT AIR LIMITS FOR TOXIC AIR POLLUTANTS

CAS #	NAME	TOXICITY	AAL (ug/m^3)
50-00-0	Formaldehyde	(H)	0.880
56-23-5	Carbon Tetrachloride	(H)	71.000
64-17-5	Ethyl Alcohol	(L)	19000.000
67-56-1	Methanol	(L)	2600.000
67-63-0	Isopropyl Alcohol	(M)	3267.000
67-64-1	Acetone	(L)	17800.000
67-66-3	Chloroform	(H)	119.000
68-12-2	Dimethyl Formamide	(M)	100.000
71-23-8	Propyl Alcohol	(M)	1667.000
71-36-3	Butyl Alcohol	(M)	500.000
71-43-2	Benzene	(H)	71.000
71-55-6	1,1,1-Trichloroethane	(M)	6333.000
74-90-8	Hydrocyanic Acid	(H)	26.000
75-01-4	Vinyl Chloride	(H)	24.000
75-09-2	Dichloromethane	(H)	417.000
75-21-8	Ethylene Oxide	(H)	5.000
75-71-8	Dichlorodifluoromethane	(L)	49500.000
* 75-50-3	Trimethylamine	(L)	240.000
76-13-1	Freon 113	(L)	76000.000
* 78-59-1	Isoacetophorone	(H)	55.000
78-83-1	Isobutyl Alcohol	(M)	500.000

1/24/92
REV. 1

	CAS #	NAME	TOXICITY	AAL (ug/m^3)
	78-93-3	Methyl Ethyl Ketone	(M)	1967.000
	79-01-6	Trichloroethylene	(H)	643.000
	80-62-6	Methyl Methacrylate	(M)	1367.000
*	84-74-2	Di-n-Butylphalate	(M)	16.700
*	95-49-8	o-Chlorotoluene	(L)	2590.000
*	98-82-8	Cumene	(L)	2400.000
	100-41-4	Ethyl Benzene	(M)	1450.000
	100-42-5	Styrene	(M)	717.000
*	106-87-6	Vinyl Cyclohexene Dioxide	(H)	136.527
*	106-89-8	1-Chloro-2,3-Epoxy Propane	(H)	18.021
	107-06-2	Ethylene Dichloride	(H)	95.000
*	107-21-1	Ethylene Glycol	(H)	302.000
*	107-98-2	Propylene Glycol Monomethyl Ether	(M)	1200.000
	108-05-4	Vinyl Acetate	(M)	100.000
	108-10-1	Methyl Isobutyl Ketone	(L)	2050.000
	108-21-4	Isopropyl Acetate	(L)	9500.000
*	108-46-3	Resorcinol	(M)	150.000
	108-83-8	Diisobutyl Ketone	(L)	1500.000
	108-88-3	Toluene	(M)	1500.000
	108-93-0	Cyclohexanol	(M)	667.000
	108-94-1	Cyclohexanone	(M)	333.000
	108-95-2	Phenol	(M)	63.000

	CAS #	NAME	TOXICITY	AAL (ug/m^3)
	109-60-4	Propyl Acetate	(L)	8400.000
*	109-86-4	Ethylene Glycol Methyl Ether	(M)	53.300
	110-19-0	Isobutyl Acetate	(L)	7000.000
	110-49-6	Ethylene Glycol Mono Methyl Ether Acetate	(M)	73.000
	110-54-3	Hexane	(L)	1800.000
	110-80-5	2-Ethoxyethanol	(M)	60.000
*	110-91-8	Morpholine	(M)	237.600
	111-15-9	2-Ethoxyethyl Acetate	(M)	90.000
	111-76-2	Ethylene Glycol Monobutyl Ether	(M)	400.000
*	117-81-7	Bis (2-Ethylhexyl) Phthalate	(H)	11.900
*	121-44-8	Triethylamine	(M)	133.000
	123-42-2	Diacetone Alcohol	(L)	2400.000
	123-86-4	Butyl Acetate	(M)	2367.000
*	123-91-1	p-Dioxane	(H)	214.500
*	126-73-8	Tributyl Phosphate	(H)	5.188
	127-18-4	Tetrachloroethylene	(H)	810.000
	141-78-6	Ethyl Acetate	(M)	4667.000
	142-82-5	Heptane	(L)	16000.000
*	151-50-8	Potassium Cyanide	(H)	11.900
*	151-56-4	Ethylenimine	(H)	2.100
*	506-64-9	Silver Cyanide	(M)	16.670
*	584-84-9	Toluene Diisocyanate	(H)	0.095
	872-50-4	Methylpyrrolidone	(M)	1333.000

	CAS #	NAME	TOXICITY	AAL (ug/m^3)
*	1309-37-1	Iron Oxide	(H)	11.900
*	1310-73-2	Sodium Hydroxide	(M)	6.670
*	1314-13-2	Zinc Oxide	(M)	16.670
	1314-62-1	Vanadium	(H)	0.120
*	1319-77-3	Cresol	(L)	220.000
	1330-20-7	Xylene	(M)	1450.000
	1338-23-4	Methyl Ethyl Ketone Peroxide	(M)	5.000
*	7429-90-5	Aluminum	(L)	50.000
	7439-96-5	Manganese	(M)	16.700
*	7439-97-6	Mercury	(M)	0.167
	7439-98-7	Molybdenum	(M)	16.700
	7440-02-0	Nickel	(H)	0.120
*	7440-22-4	Silver	(L)	0.100
	7440-38-2	Arsenic	(H)	0.480
	7440-39-3	Barium	(M)	1.700
	7440-41-7	Beryllium	(H)	0.005
	7440-43-9	Cadmium	(H)	0.024
	7440-47-9	Chromium	(H)	0.120
	7440-48-4	Cobalt	(M)	0.167
	7440-50-8	Copper	(M)	0.330
	7440-66-6	Zinc	(L)	50.000
	7647-01-0	Hydrogen Chloride	(M)	23.300
*	7664-38-2	Phosphoric Acid	(L)	10.000

	CAS #	NAME	TOXICITY	AAL (ug/m^3)
*	7664-39-3	Hydrofluoric Acid	(M)	8.180
	7664-41-7	Ammonia	(M)	60.000
*	7664-93-9	Sulfuric Acid	(H)	2.380
	7782-49-2	Selenium	(M)	0.667
	7782-50-5	Chlorine	(H)	3.450
	7783-06-4	Hydrogen Sulfide	(M)	46.700
	7783-07-5	Hydrogen Selenide	(H)	0.480
*	7697-37-2	Nitric Acid	(H)	12.270
*	7786-81-4	Nickel Sulfate	(M)	0.333
	8002-05-9	Petroleum Distillate	(M)	-----
	8006-61-9	Gasoline	(L)	3000.000
	8006-64-2	Turpentine	(L)	5600.000
	8012-95-1	Mineral Spirits	(H)	11.900
	8030-30-6	Naptha	(L)	4000.000
	8052-41-3	Stoddard Solvent	(L)	3500.000
*	10049-04-4	Chlorine Dioxide	(M)	1.000
*	13770-89-3	Nickel (II) Sulfamate	(M)	0.333
*	60676-86-0	Silica, Amorphous Fused	(H)	0.238
*	-	Fiber Glass	(M)	33.333

* - New Additions to List
(H) - High
(M) - Moderate
(L) - Low

1/24/92
REV. 1

TPN:smh
0003p

ATE: 12/07/91

State Laboratories, Inc.
Analysis Results
Report Number: 120791001
Client I.D.: MCLAREN/HART

APPROVAL: JWU
QC: DC
Lab I.D.: 10170
Sampled by: CLIENT/ULI

D:30991024 Mat:Air AL005-09 NAVFAC AQ LOC 6 SOR-06 39521 11/2/91 0001-2400H C

PARAMETERS	RESULTS	DATE ANAL.	KEY
Hg(Volatile)	<3ug/m3	12/05/91	

D:30991025 Mat:Air AL005-09 NAVFAC AQ LOC 7 SOR-07 39520 11/2/91 0001-2400H C

PARAMETERS	RESULTS	DATE ANAL.	KEY
Hg(Volatile)	<3ug/m3	12/05/91	

D:30991026 Mat:Air AL005-09 NAVFAC AQ LOC 8 SOR-08 39519 11/2/91 0001-2400H C

PARAMETERS	RESULTS	DATE ANAL.	KEY
Hg(Volatile)	<3ug/m3	12/05/91	

D:30991027 Mat:Air AL005-09 NAVFAC AQ LOC 9 SOR-09 39524 11/2/91 0001-2400H C

PARAMETERS	RESULTS	DATE ANAL.	KEY
Hg(Volatile)	<3ug/m3	12/05/91	

D:30991028 Mat:Air AL005-09 NAVFAC AQ DUPE LOC 8 SOR-10 39528 11/2/91 0001-2400H C

PARAMETERS	RESULTS	DATE ANAL.	KEY
Hg(Volatile)	<3ug/m3	12/05/91	

D:30991029 Mat:Air AL005-09 NAVFAC AQ ULI TRIP BLANK 40196 11/2/91

PARAMETERS	RESULTS	DATE ANAL.	KEY
Hg(Volatile)	<1ug	12/05/91	

All results are on an as rec.d basis unless otherwise stated.