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# HAZARDOUS MATERIALS TARGET LIST

## STANDARD PRACTICE

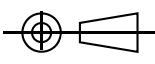


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FORM 12-02

ISSUE DATE: SEPTEMBER 30, 2013 REVISION DATE: OCTOBER 31, 2016

|                              |                                                                                     |                                                     |                      |
|------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------|----------------------|
| THIRD<br>ANGLE<br>PROJECTION |  | CUSTODIAN<br>CIVIL AVIATION ENVIRONMENTAL COMMITTEE | REVISION<br><b>1</b> |
| PROCUREMENT<br>SPECIFICATION | TITLE<br><b>HAZARDOUS MATERIALS TARGET LIST</b>                                     | CLASSIFICATION<br>STANDARD PRACTICE                 | <b>NAS411-1</b>      |
| NONE                         |                                                                                     |                                                     | SHEET 1 OF 40        |



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## 1. SCOPE

This standard establishes the Hazardous Materials Target List (HMTL) that is to be used in defense acquisition programs and other military-contracted programs for Products and Services. The HMTL has been developed to identify HAZMATs targeted for elimination or minimization and to support and enhance the management of risks associated with the use of hazardous materials (HAZMATs) in Products and Services, consistent with requirements contained in National Aerospace Standard 411 (NAS411) *Hazardous Materials Management Program*, Military Standard 882E (MIL-STD-882E), Task 108 *Hazardous Materials Management Plan*, and Tech America Standard 0017 (TA-STD-0017), *Product Support Analysis*.

## 2. PURPOSE

This NAS is intended to provide guidance on identifying and reporting HAZMATs in Products and Services. The HMTL provides a baseline list of HAZMATs that can be tailored to create a program specific list of targeted materials, as required by contract.

This standard also identifies and categorizes targeted HAZMATs for risk management purposes, including reporting. The three (3) categories of targeted HAZMAT include (see below for definitions of these categories in the HMTL):

- Prohibited HAZMAT
- Restricted HAZMAT
- Tracked HAZMAT

This revision added a specified list of tracked and service specific HAZMATs, and Chemical Abstracts Service (CAS) registry numbers (RNs) to make substance identification more convenient and uniform, as HAZMATs often have multiple names.

## 3. APPLICATION

When the version of this NAS is not specified in the contract, the most current version of this NAS should be used, unless otherwise agreed to by the customer and contractor. All references to NAS411-1 (or its affiliated HMTL) should identify a specific version of this standard.

## 4. ACRONYMS AND DEFINITIONS

### 4.1 Acronyms

The acronyms used in this NAS411-1 are defined as follows:

- |           |                                                                               |
|-----------|-------------------------------------------------------------------------------|
| a. AIA    | Aerospace Industries Association                                              |
| b. AFPMB  | Armed Forces Pest Management Board                                            |
| c. CAS    | Chemical Abstracts Service                                                    |
| d. DoD    | Department of Defense                                                         |
| e. ESOH   | Environment, Safety, and Occupational Health                                  |
| f. GEIA   | Government Electronics & Information Technology Association (now TechAmerica) |
| g. HAZMAT | Hazardous Material                                                            |
| h. HMTL   | Hazardous Materials Target List                                               |
| i. HTS    | Hazard Tracking System                                                        |
| j. LPD    | Logistics Product Data                                                        |
| k. MSDS   | Material Safety Data Sheet                                                    |
| l. NAS    | National Aerospace Standard                                                   |
| m. NAVAIR | Naval Air Systems Command                                                     |

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- n. NAVSEA Naval Sea Systems Command
- o. ODS Ozone Depleting Substance
- p. PCB Polychlorinated biphenyl
- q. POP Persistent Organic Pollutant
- r. RN Registry Number
- s. (M)SDS (Material) Safety Data Sheet
- t. TA Tech America

## 4.2 Definitions

The following definitions apply:

### 4.2.1 Chemical Abstract Service (CAS) Registry Numbers (RNs)

CAS RNs are unique numerical identifiers for elements, compounds, polymers, biological sequences, mixtures and alloys. CAS, a division of the American Chemical Society, assigns these identifiers to every chemical that has been described in the literature. CAS Registry Number is a Registered Trademark of the American Chemical Society. CAS recommends the verification of the CAS RNs through CAS Client Services<sup>SM</sup>.

### 4.2.2 Chemical Category

Chemicals with shared chemical and toxicological properties (e.g., Ozone Depleting Substances (ODSs)).

### 4.2.3 Environment, Safety, and Occupational Health (ESOH)

An acronym that refers to the combination of disciplines that encompass the processes and approaches for addressing laws, regulations, Executive Orders (EO), DoD policies, environmental compliance, and hazards associated with environmental impacts, system safety (e.g., platforms, systems, system-of-systems, weapons, explosives, software, ordnance, combat systems), occupational safety and health, hazardous materials management, and pollution prevention. (Reference: MIL-STD-882E)

### 4.2.4 Hazard Tracking System

A system used to document ESOH risks, including risks associated with HAZMATs, and risk mitigation, acceptance and status.

### 4.2.5 Hazardous Material (HAZMAT)

Any item or substance that, due to its chemical, physical, toxicological, or biological nature, could cause harm to people, equipment, or the environment.

### 4.2.6 Logistics Product Data (LPD)

A portion of the product support analysis documentation consisting of detailed data pertaining to the identification of product support resource requirements of a product.

### 4.2.7 Prohibited HAZMAT

A material that cannot be included or used in Products and Services unless prior customer approval is obtained for each specific application or process. (See Appendix A)

### 4.2.8 Restricted HAZMAT

A material that the contractor is required to target for elimination or minimization. (See Appendix B)

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#### 4.2.9 Targeted Material

A material (prohibited, restricted, and tracked HAZMAT) identified by NAS411-1 or a contractually required list that must be identified and reported to the customer. (See Appendices A, B, and C)

#### 4.2.10 Tracked HAZMAT

A material that does not require specific contractor action other than tracking and reporting to the customer. (See Appendix C)

### 5. HAZARDOUS MATERIAL TARGET LIST (HMTL) DESCRIPTION

The HMTL consists of chemicals (pure substances) categorized as prohibited, restricted, or tracked HAZMAT as described in Table 1. The categories of Prohibited, Restricted, and Tracked HAZMAT are based upon NAS 411 and MIL-STD-882E, Task 108. The AIA, in collaboration with DoD, selected and categorized the chemicals in the HTML based upon regulatory restrictions, chemical hazards, and DoD and industry usage data. Additionally, the HMTL was harmonized with industry declaration lists. Each restricted HAZMAT is identified as either Priority 1, 2, or 3, based on its hazardous properties and regulatory requirements; with Priority 1 potentially having the highest severity.

TABLE 1 – HAZARDOUS MATERIALS TARGET LIST (HMTL) SUMMARY

| HAZMAT CATEGORY | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prohibited      | <p>Appendix A lists the HAZMATs with their CAS RNs for the below prohibited chemical categories:</p> <ul style="list-style-type: none"> <li>- Asbestos (friable)</li> <li>- Hexavalent Chromium Compounds</li> <li>- Mercury and Mercury Compounds</li> <li>- Ozone Depleting Substances (ODSs) Class I and II</li> <li>- Persistent Organic Pollutants (POPs)</li> <li>- Polychlorinated biphenyls (PCBs)</li> </ul> <p><b>Note:</b> Appendix A does not include all possible HAZMATs in a particular chemical category and includes only those identified for reporting under this HMMP process.</p>                                                                                                                                                                                                                          |
| Restricted      | <p>Appendix B lists the restricted HAZMATs with their CAS RNs, many of which fall into the following chemical categories:</p> <ul style="list-style-type: none"> <li>- Antimony Compounds</li> <li>- Arsenic Compounds</li> <li>- Beryllium Compounds</li> <li>- Cadmium Compounds</li> <li>- Cobalt Compounds</li> <li>- Copper Compounds</li> <li>- Cyanide Compounds</li> <li>- Isocyanate Compounds</li> <li>- Lead Compounds</li> <li>- Lithium Compounds</li> <li>- Nickel Compounds</li> <li>- Phthalate Esters</li> <li>- Selenium Compounds</li> <li>- Silver Compounds</li> <li>- Tin Compounds</li> <li>- Zinc Compounds</li> </ul> <p><b>Note:</b> Appendix B does not include all possible HAZMATs in a particular chemical category and includes only those identified for reporting under this HMMP process.</p> |
| Tracked         | <p>Appendix C lists the tracked HAZMATs with their CAS RNs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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The HMTL does not include chemical and biological warfare materials, medical and pharmaceutical materials, medical waste and infectious materials, bulk fuels, radioactive materials, and energetic materials. These materials are hazardous, and exposure to personnel may occur during manufacture, storage, use, and demilitarization of these items. In addition, these materials require special handling, storage and disposal procedures. However, the DoD has other established programs for managing these materials. A program could add these materials to a tailored HAZMAT, see Section 6.

## 6. SERVICE SPECIFIC ADDITIONS TO THE HMTL

Materials in Appendix D shall only be included in the HMTL for the listed service or if specifically required for inclusion by contract. DoD pesticide use is managed by the Armed Forces Pest Management Board (AFPMB) who prohibits the use of pesticides containing Persistent Organic Pollutants (POPs). Any requests for the use of pesticides must be authorized by the AFPMB. POPs that are pesticides, insecticides, or fungicides have a chemical category of "POP (Pesticide)" in Appendix D.

## 7. TAILORING THE HMTL

The HMTL is intended to be a baseline HAZMAT list, which consists of prohibited, restricted, and tracked HAZMAT categories. The contract may contain a tailored HAZMAT list based on customer requirements by directing the use of the HTML and identifying any additions, deletions, and changes in category on a chemical by chemical basis.

## 8. HAZMAT ANALYSIS

The HAZMAT in Products and Services should be identified using information contained in the SDS (formerly MSDS), technical data, drawings, suppliers' materials declarations, or other available information sources. When feasible, leverage existing frameworks to obtain required data to minimize cost, e.g., using available supplier materials declarations information to identify the HAZMAT content of hardware. Laboratory chemical analysis of materials is not required, unless otherwise indicated by contract requirements.

## 9. EXCEL SPREADSHEET OF PROHIBITED, RESTRICTED, AND TRACKED HAZMAT

An Excel spreadsheet containing the NAS411-1 HMTL is provided with the purchase of NAS411-1. The spreadsheet contains the list of NAS411-1 prohibited, restricted, and tracked HAZMAT with their respective CAS RNs. If any discrepancy is found between the PDF file and the spreadsheet, the HMTL in the NAS411-1 PDF file shall prevail.

## 10. REPORTING

The contract shall specify the process and format for reporting of HAZMAT in Products and Services. For programs with a MIL-STD-882E System Safety program, hazards associated with the use of all HAZMAT should be documented in the hazard tracking system (HTS), including those not on the HMTL. To reduce duplication of effort, contracts specifying activities from TA-STD-0017, *Product Support Analysis*, and utilizing a GEIA-STD-0007, *Logistics Product Data*, compliant database should specify the data elements necessary to identify all HAZMAT in the Logistics Product Data.

## 11. FEEDBACK AND SUGGESTIONS

AIA values your feedback. If you have questions or proposed changes for this standard (including the addition of chemicals as prohibited, restricted, or tracked HAZMAT), please use the standards feedback form available at [www.aia-nas.org](http://www.aia-nas.org).

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APPENDIX A – PROHIBITED HAZMAT (LISTED BY CHEMICAL CATEGORY)

NOTE: Each application or process using a prohibited HAZMAT requires separate specific prior customer approval. Receipt of approval to use a prohibited HAZMAT in a given application **does not** remove the HAZMAT from the prohibited HAZMAT list.

| HMTL Category | Chemical Category  | Chemical Substance                                       | CAS RN       |
|---------------|--------------------|----------------------------------------------------------|--------------|
| Prohibited    | Asbestos (friable) | Actinolite                                               | 77536-66-4   |
| Prohibited    | Asbestos (friable) | Amosite                                                  | 12172-73-5   |
| Prohibited    | Asbestos (friable) | Anthophyllite                                            | 77536-67-5   |
| Prohibited    | Asbestos (friable) | Asbestos                                                 | 1332-21-4    |
| Prohibited    | Asbestos (friable) | Chrysotile                                               | 12001-29-5   |
| Prohibited    | Asbestos (friable) | Chrysotile Asbestos                                      | 132207-32-0  |
| Prohibited    | Asbestos (friable) | Crocidolite                                              | 12001-28-4   |
| Prohibited    | Asbestos (friable) | Ferroactinolite                                          | 12172-67-7   |
| Prohibited    | Asbestos (friable) | Tremolite (Asbestos variation)                           | 77536-68-6   |
| Prohibited    | Asbestos (friable) | Tremolite asbestos                                       | 14567-73-8   |
| Prohibited    | Class I ODS        | 1,1,2,2-Tetrabromo-1-fluoroethane (HBFC-121 B4)          | 306-80-9     |
| Prohibited    | Class I ODS        | 1,1,1,2,2,3,3-Heptachloro-3-fluoropropane (CFC-211aa)    | 422-78-6     |
| Prohibited    | Class I ODS        | 1,1,1,2,2,3,3-Heptachloro-3-fluoropropane (CFC-217aa)    | 135401-87-5  |
| Prohibited    | Class I ODS        | 1,1,1,2-Tetrachloro-2,2-difluoroethane (CFC-112a)        | 76-11-9      |
| Prohibited    | Class I ODS        | 1,1,1,3,3,3-Hexachloro-2,2-difluoropropane (CFC-212)     | 3182-26-1    |
| Prohibited    | Class I ODS        | 1,1,1,3,3-Pentachloro-2,2,3-trifluoropropane (CFC 213)   | 2354-06-5    |
| Prohibited    | Class I ODS        | 1,1,1,3-Tetrabromo-3,3-difluoropropane (HBFC-232 B4)     | 148875-98-3  |
| Prohibited    | Class I ODS        | 1,1,1,3-Tetrabromo-3-fluoropropane (HBFC-241 B4)         | 148875-95-0  |
| Prohibited    | Class I ODS        | 1,1,1,3-Tetrachloro-2,2,3,3-tetrafluoropropane (CFC-214) | 2268-46-4    |
| Prohibited    | Class I ODS        | 1,1,1-Tribromo-3,3,3-trifluoropropane                    | 1393524-84-9 |
| Prohibited    | Class I ODS        | 1,1,1-Trichloro-2,2,2-trifluoroethane (CFC-113a)         | 354-58-5     |
| Prohibited    | Class I ODS        | 1,1,1-Trichloro-2,2,3,3,3-pentafluoropropane (CFC-215cb) | 28109-69-5   |
| Prohibited    | Class I ODS        | 1,1,1-Trichloro-2,2,3,3,3-pentafluoropropane (CFC-215cb) | 4259-43-2    |
| Prohibited    | Class I ODS        | 1,1,1-Trichloroethane (Methylchloroform)                 | 71-55-6      |
| Prohibited    | Class I ODS        | 1,1,1-Trifluoro-2,2,2-trichloroethane (CFC-113a)         | 26523-64-8   |
| Prohibited    | Class I ODS        | 1,1,2,2,3,3-Hexabromo-1-fluoropropane (HBFC-221 B6)      | 958811-66-0  |
| Prohibited    | Class I ODS        | 1,1,2,2,3,3-Hexachloro-1,3-difluoropropane (CFC-212)     | 1599-44-6    |
| Prohibited    | Class I ODS        | 1,1,2,2-Tetrachloro-1,2-difluoroethane (CFC-112)         | 76-12-0      |

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APPENDIX A – PROHIBITED HAZMAT (LISTED BY CHEMICAL CATEGORY) (CONTINUED)

| HMTL Category | Chemical Category | Chemical Substance                                       | CAS RN      |
|---------------|-------------------|----------------------------------------------------------|-------------|
| Prohibited    | Class I ODS       | 1,1,2,2-Tetrachloro-1,3,3,3-tetrafluoropropane (CFC-214) | 2268-44-2   |
| Prohibited    | Class I ODS       | 1,1,2,3,3-Pentabromo-1,2-difluoropropane (HBFC-222 B5)   | 958823-07-9 |
| Prohibited    | Class I ODS       | 1,1,2,3-Tetrachloro-1,2,3,3-tetrafluoropropane (CFC-214) | 2268-45-3   |
| Prohibited    | Class I ODS       | 1,1,2-Tribromo-1,2-difluoroethane (HBFC-122 B3)          | 353-97-9    |
| Prohibited    | Class I ODS       | 1,1,2-Tribromo-1-fluoroethane                            | 420-88-2    |
| Prohibited    | Class I ODS       | 1,1,2-Tribromo-2-fluoroethane                            | 598-67-4    |
| Prohibited    | Class I ODS       | 1,1,2-Trichloro-1,2,2-trifluoroethane                    | 76-13-1     |
| Prohibited    | Class I ODS       | 1,1,3,3,3-Pentafluoro-1,2,2-trichloropropane (CFC-215aa) | 1599-41-3   |
| Prohibited    | Class I ODS       | 1,1,3-Tribromo-2,2-difluoropropane                       | 362631-77-4 |
| Prohibited    | Class I ODS       | 1,1,3-Trichloro-1,2,2,3,3-pentafluoropropane (CFC-215ca) | 1652-81-9   |
| Prohibited    | Class I ODS       | 1,1-Dibromotetrafluoroethane (Halon-2402)                | 27336-23-8  |
| Prohibited    | Class I ODS       | 1,1-Dichloro-1,2,2,2-tetrafluoroethane                   | 374-07-2    |
| Prohibited    | Class I ODS       | 1,1-Dichloro-1,2,2,3,3,3-hexafluoropropane               | 2729-28-4   |
| Prohibited    | Class I ODS       | 1,1-Difluoro-1,2,2,3,3,3-hexachloro propane (CFC-212)    | 134452-44-1 |
| Prohibited    | Class I ODS       | 1,1-Difluoro-2,2-dibromoethane                           | 359-19-3    |
| Prohibited    | Class I ODS       | 1,2,2,3-Tetrabromo-1,1,3-trifluoropropane (HBFC-223 B4)  | 958807-65-3 |
| Prohibited    | Class I ODS       | 1,2,2,3-Tetrachloro-1,1,3,3-tetrafluoropropane (CFC-214) | 29255-31-0  |
| Prohibited    | Class I ODS       | 1,2,2,3-Tetrachlorotetrafluoropropane (CFC-214)          | 677-68-9    |
| Prohibited    | Class I ODS       | 1,2,2-Tribromo-1,1-difluoroethane                        | 677-34-9    |
| Prohibited    | Class I ODS       | 1,2,3-Trichloropentafluoropropane (CFC-215ba)            | 76-17-5     |
| Prohibited    | Class I ODS       | 1,2-Dibromo-1,1,3,3,3-pentafluoropropane (HBFC-225 b2)   | 431-78-7    |
| Prohibited    | Class I ODS       | 1,2-Dibromo-1-fluoropropane (R*, R*)                     | 62135-11-9  |
| Prohibited    | Class I ODS       | 1,2-Dibromo-1-fluoropropane (R*, S*)                     | 62135-10-8  |
| Prohibited    | Class I ODS       | 1,2-Dibromo-3-fluoropropane                              | 453-00-9    |
| Prohibited    | Class I ODS       | 1,2-Dibromofluoroethane                                  | 358-97-4    |
| Prohibited    | Class I ODS       | 1,2-Dibromotetrafluoroethane (Halon 2402, R-114B2)       | 124-73-2    |
| Prohibited    | Class I ODS       | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC-114)         | 76-14-2     |
| Prohibited    | Class I ODS       | 1,2-Dichloro-1,1,2,3,3,3-hexafluoropropane               | 661-97-2    |
| Prohibited    | Class I ODS       | 1,3-Dibromo-1,1,3,3-tetrafluoropropane (HBFC-234 b2)     | 460-86-6    |
| Prohibited    | Class I ODS       | 1,3-Dibromo-1,1,3-trifluoropropane                       | 460-60-6    |
| Prohibited    | Class I ODS       | 1,3-Dibromo-1-fluoropropane (HBFC-261 B2)                | 51584-26-0  |
| Prohibited    | Class I ODS       | 1,3-Dibromo-2-fluoropropane                              | 1786-38-5   |

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APPENDIX A – PROHIBITED HAZMAT (LISTED BY CHEMICAL CATEGORY) (CONTINUED)

| HMTL Category | Chemical Category | Chemical Substance                                    | CAS RN       |
|---------------|-------------------|-------------------------------------------------------|--------------|
| Prohibited    | Class I ODS       | 1,3-Dichloro-1,1,2,2,3,3-hexafluoropropane            | 662-01-1     |
| Prohibited    | Class I ODS       | 1-Bromo-1,1,2,2,3,3-hexafluoropropane                 | 63905-11-3   |
| Prohibited    | Class I ODS       | 1-Bromo-1,1,2,2,3-pentafluoropropane                  | 677-53-2     |
| Prohibited    | Class I ODS       | 1-Bromo-1,1,2,2-tetrafluoroethane                     | 354-07-4     |
| Prohibited    | Class I ODS       | 1-Bromo-1,1,3,3,3-pentafluoropropane (HBFC-235B1)     | 460-88-8     |
| Prohibited    | Class I ODS       | 1-Bromo-1,1-difluoroethane                            | 420-47-3     |
| Prohibited    | Class I ODS       | 1-Bromo-1,1-difluoropropane (HBFC-262 B1)             | 420-89-3     |
| Prohibited    | Class I ODS       | 1-Bromo-1,2,2,3,3-pentafluoropropane                  | 679-94-7     |
| Prohibited    | Class I ODS       | 1-Bromo-1,2,2,3-tetrafluoropropane                    | 70192-71-1   |
| Prohibited    | Class I ODS       | 1-Bromo-1-fluoroethane                                | 2311-13-9    |
| Prohibited    | Class I ODS       | 1-Bromo-2,3-difluoropropane                           | 111483-20-6  |
| Prohibited    | Class I ODS       | 1-Bromo-2-fluoropropane                               | 1871-72-3    |
| Prohibited    | Class I ODS       | 1-Bromo-3-fluoropropane                               | 352-91-0     |
| Prohibited    | Class I ODS       | 1-Chloroheptafluoropropane                            | 422-86-6     |
| Prohibited    | Class I ODS       | 1-Chloroheptafluoropropane (CFC-211ba)                | 422-81-1     |
| Prohibited    | Class I ODS       | 1-Chloroheptafluoropropane (CFC-217a)                 | 30143-46-5   |
| Prohibited    | Class I ODS       | 2,2,3-Tribromo-1,1,1-trifluoropropane                 | 421-90-9     |
| Prohibited    | Class I ODS       | 2,2-Dichloro-1,1,1,3,3,3-hexafluoropropane            | 1652-80-8    |
| Prohibited    | Class I ODS       | 2,3-Dibromo-1,1,1,3-tetrafluoropropane                | 501435-65-0  |
| Prohibited    | Class I ODS       | 2,3-Dibromo-1,1,1-trifluoropropane                    | 431-21-0     |
| Prohibited    | Class I ODS       | 2,3-Dibromo-1,1,2-trifluoropropane                    | 1309602-74-1 |
| Prohibited    | Class I ODS       | 2,3-Dibromo-1,1,3,3-tetrafluoropropene                | 666-40-0     |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,1,2,3-pentafluoropropane                  | 677-52-1     |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,1,2-tetrafluoroethane                     | 124-72-1     |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,1,3,3,3-hexafluoropropane                 | 2252-79-1    |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,1,3-pentafluoropropane                    | 22692-16-6   |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,1,3-tetrafluoropropane                    | 29151-25-5   |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,1-trifluoroethane                         | 421-06-7     |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,2,3,3-pentafluoropropane                  | 26391-11-7   |
| Prohibited    | Class I ODS       | 2-Bromo-1,1,3,3-tetrafluoropropane                    | 19041-01-1   |
| Prohibited    | Class I ODS       | 2-Bromo-1,1-difluoropropane                           | 430-87-5     |
| Prohibited    | Class I ODS       | 2-Bromo-1,3-difluoropropane                           | 2195-05-3    |
| Prohibited    | Class I ODS       | 2-Chloro-1,1,1,2,3,3,3-heptafluoropropane (CFC-217ba) | 76-18-6      |

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APPENDIX A – PROHIBITED HAZMAT (LISTED BY CHEMICAL CATEGORY) (CONTINUED)

| HMTL Category | Chemical Category | Chemical Substance                                                                        | CAS RN      |
|---------------|-------------------|-------------------------------------------------------------------------------------------|-------------|
| Prohibited    | Class I ODS       | 3-Bromo-1,1,1,2,2-pentafluoropropane                                                      | 422-01-5    |
| Prohibited    | Class I ODS       | 3-Bromo-1,1,1,2,3-pentafluoropropane                                                      | 53692-43-6  |
| Prohibited    | Class I ODS       | 3-Bromo-1,1,1,3-tetrafluoropropane                                                        | 460-67-3    |
| Prohibited    | Class I ODS       | 3-Bromo-1,1,1-trifluoropropane                                                            | 460-32-2    |
| Prohibited    | Class I ODS       | 3-Bromo-1,1,2,2-tetrafluoropropane (HBFC-244 b1)                                          | 679-84-5    |
| Prohibited    | Class I ODS       | Bromochlorodifluoromethane (Halon 1211)                                                   | 353-59-3    |
| Prohibited    | Class I ODS       | Bromotrifluoromethane (Halon 1301)                                                        | 75-63-8     |
| Prohibited    | Class I ODS       | Carbon tetrachloride                                                                      | 56-23-5     |
| Prohibited    | Class I ODS       | Chloropentafluoroethane (CFC-115)                                                         | 76-15-3     |
| Prohibited    | Class I ODS       | Chlorotrifluoromethane (CFC-13)                                                           | 75-72-9     |
| Prohibited    | Class I ODS       | Dibromotetrafluoroethane                                                                  | 25497-30-7  |
| Prohibited    | Class I ODS       | Dichlorodifluoromethane (CFC-12)                                                          | 75-71-8     |
| Prohibited    | Class I ODS       | Dichlorohexafluoropropane                                                                 | 42560-98-5  |
| Prohibited    | Class I ODS       | Dichlorotetrafluoroethane (CFC 114)                                                       | 1320-37-2   |
| Prohibited    | Class I ODS       | Methyl bromide                                                                            | 74-83-9     |
| Prohibited    | Class I ODS       | Pentachlorofluoroethane (CFC-111)                                                         | 354-56-3    |
| Prohibited    | Class I ODS       | Pentachlorotrifluoropropane (CFC 213)                                                     | 134237-31-3 |
| Prohibited    | Class I ODS       | Tetrachlorodifluoroethane (CFC-112)                                                       | 28605-74-5  |
| Prohibited    | Class I ODS       | Threo-3-bromo-1,1,1,2,3-pentafluoropropane                                                | 53692-44-7  |
| Prohibited    | Class I ODS       | Tribromodifluoropropane (HBFC-242 B3), systematic name 1,1,1-tribromo-2,2-difluoropropane | 70192-80-2  |
| Prohibited    | Class I ODS       | Tribromofluoropropane (HBFC-251 B1)                                                       | 75372-14-4  |
| Prohibited    | Class I ODS       | Trichloroethane                                                                           | 25323-89-1  |
| Prohibited    | Class I ODS       | Trichlorofluoromethane (CFC-11)                                                           | 75-69-4     |
| Prohibited    | Class II ODS      | 1,1,1,2,3-Pentachloro-2-fluoropropane (HCFC-231bb)                                        | 421-94-3    |
| Prohibited    | Class II ODS      | 1,1,1,2-Tetrachloro-2-fluoroethane (HCFC-121a)                                            | 354-11-0    |
| Prohibited    | Class II ODS      | 1,1,1,3,3-Pentachloro-2,2-difluoropropane (HCFC-222ca)                                    | 422-49-1    |
| Prohibited    | Class II ODS      | 1,1,1,3-Tetrachloro-2,2,3-trifluoropropane (HCFC-223cb)                                   | 422-50-4    |
| Prohibited    | Class II ODS      | 1,1,1,3-Tetrachloro-3,3-difluoropropane (HCFC-232fc)                                      | 460-89-9    |
| Prohibited    | Class II ODS      | 1,1,1-Trichloro-2,2,3,3-tetrafluoropropane                                                | 422-51-5    |
| Prohibited    | Class II ODS      | 1,1,1-Trichloro-2,2-difluoroethane (HCFC-122b)                                            | 354-12-1    |
| Prohibited    | Class II ODS      | 1,1,1-Trichloro-2-fluoroethane (HCFC-131b)                                                | 2366-36-1   |
| Prohibited    | Class II ODS      | 1,1,1-Trichloro-3,3,3-trifluoropropane (HCFC-233fb)                                       | 7125-84-0   |

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APPENDIX A – PROHIBITED HAZMAT (LISTED BY CHEMICAL CATEGORY) (CONTINUED)

| HMTL Category | Chemical Category | Chemical Substance                                      | CAS RN      |
|---------------|-------------------|---------------------------------------------------------|-------------|
| Prohibited    | Class II ODS      | 1,1,2,2-Tetrachloro-1-fluoroethane (HCFC-121)           | 354-14-3    |
| Prohibited    | Class II ODS      | 1,1,2,3-Tetrachloro-1-fluoropropane (HCFC-241db)        | 666-27-3    |
| Prohibited    | Class II ODS      | 1,1,2-Trichloro-1,2-difluoroethane (HCFC-122a)          | 354-15-4    |
| Prohibited    | Class II ODS      | 1,1,2-Trichloro-1-fluoroethane (HCFC-131a)              | 811-95-0    |
| Prohibited    | Class II ODS      | 1,1,2-Trichloro-1-fluoropropane (HCFC-251)              | 421-41-0    |
| Prohibited    | Class II ODS      | 1,1,2-Trichloro-2,2-difluoroethane (HCFC-122)           | 354-21-2    |
| Prohibited    | Class II ODS      | 1,1,2-Trichloro-2-fluoroethane (HCFC-131)               | 359-28-4    |
| Prohibited    | Class II ODS      | 1,1,3,3-Tetrachloro-1,2,2-trifluoropropane (HCFC-223ca) | 422-52-6    |
| Prohibited    | Class II ODS      | 1,1,3-Trichloro-1,2,2,3-tetrafluoropropane (HCFC-224cb) | 422-53-7    |
| Prohibited    | Class II ODS      | 1,1,3-Trichloro-1-fluoropropane (HCFC-251fb)            | 818-99-5    |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)  | 13474-88-9  |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1,2,2-trifluoroethane (HCFC-123b)          | 812-04-4    |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1,2,2-trifluoropropane (HCFC-243cc)        | 7125-99-7   |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)  | 111512-56-2 |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1,2-difluoroethane (HCFC-132c)             | 1842-05-3   |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1,3,3,3-tetrafluoropropane                 | 64712-27-2  |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1-fluoroethane (HCFC-141b)                 | 1717-00-6   |
| Prohibited    | Class II ODS      | 1,1-Dichloro-1-fluoropropane (HCFC-261fc)               | 7799-56-6   |
| Prohibited    | Class II ODS      | 1,1-Dichloro-2,2-difluoroethane (HCFC-132a)             | 471-43-2    |
| Prohibited    | Class II ODS      | 1,1-Dichloro-2-fluoroethane (HCFC-141a)                 | 430-53-5    |
| Prohibited    | Class II ODS      | 1,2,2,3,3-Pentachloro-1,1-difluoropropane (HCFC-222aa)  | 422-30-0    |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC 225bb)  | 422-44-6    |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)          | 354-23-4    |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225da)  | 431-86-7    |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1,1-difluoroethane (HCFC-132b)             | 1649-08-7   |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1,1-difluoropropane                        | 7126-15-0   |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1,2,3,3-tetrafluoropropane (HCFC-234db)    | 425-94-5    |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1,2-difluoroethane (HCFC-132)              | 431-06-1    |
| Prohibited    | Class II ODS      | 1,2-Dichloro-1-fluoroethane (HCFC-141)                  | 430-57-9    |
| Prohibited    | Class II ODS      | 1,2-Dichloro-2-fluoropropane (HCFC-261ba)               | 420-97-3    |
| Prohibited    | Class II ODS      | 1,3,3-Trichloro-1,1,2,2-tetrafluoropropane (HCFC-224ca) | 422-54-8    |
| Prohibited    | Class II ODS      | 1,3,3-Trichloro-1,1-difluoropropane (HCFC-242fa)        | 460-63-9    |
| Prohibited    | Class II ODS      | 1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)  | 507-55-1    |

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APPENDIX A – PROHIBITED HAZMAT (LISTED BY CHEMICAL CATEGORY) (CONTINUED)

| HMTL Category | Chemical Category | Chemical Substance                                     | CAS RN      |
|---------------|-------------------|--------------------------------------------------------|-------------|
| Prohibited    | Class II ODS      | 1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225ea) | 136013-79-1 |
| Prohibited    | Class II ODS      | 1,3-Dichloro-1,1-difluoropropane (HCFC-252fb)          | 819-00-1    |
| Prohibited    | Class II ODS      | 1-Chloro-1,1,2,2,3,3-hexafluoropropane                 | 422-55-9    |
| Prohibited    | Class II ODS      | 1-Chloro-1,1,2,2,3-pentafluoropropane                  | 677-55-4    |
| Prohibited    | Class II ODS      | 1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)         | 354-25-6    |
| Prohibited    | Class II ODS      | 1-Chloro-1,1,2,2-tetrafluoropropane (HCFC-244cc)       | 421-75-0    |
| Prohibited    | Class II ODS      | 1-Chloro-1,1,2-trifluoroethane (HCFC-133b)             | 421-04-5    |
| Prohibited    | Class II ODS      | 1-Chloro-1,1,3,3,3-pentafluoropropane (HCFC-235fa)     | 460-92-4    |
| Prohibited    | Class II ODS      | 1-Chloro-1,1-difluoroethane (HCFC-142b)                | 75-68-3     |
| Prohibited    | Class II ODS      | 1-Chloro-1,1-difluoropropane (HCFC-262fc)              | 421-02-3    |
| Prohibited    | Class II ODS      | 1-Chloro-1,2,2,3,3-pentafluoropropane                  | 679-99-2    |
| Prohibited    | Class II ODS      | 1-Chloro-1,2,2-trifluoroethane (HCFC-133)              | 431-07-2    |
| Prohibited    | Class II ODS      | 1-Chloro-1,2-difluoroethane (HCFC-142a)                | 338-64-7    |
| Prohibited    | Class II ODS      | 1-Chloro-1-fluoroethane (HCFC-151a)                    | 1615-75-4   |
| Prohibited    | Class II ODS      | 1-Chloro-1-fluoropropane (HCFC-271fb)                  | 430-55-7    |
| Prohibited    | Class II ODS      | 1-Chloro-2,2,3-trifluoropropane                        | 56758-54-4  |
| Prohibited    | Class II ODS      | 1-Chloro-2,2-difluoropropane (HCFC-262ca)              | 420-99-5    |
| Prohibited    | Class II ODS      | 1-Chloro-2-fluoroethane (HCFC-151)                     | 762-50-5    |
| Prohibited    | Class II ODS      | 2,2,3-Trichloro-1,1,1-trifluoropropane                 | 7125-83-9   |
| Prohibited    | Class II ODS      | 2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa) | 128903-21-9 |
| Prohibited    | Class II ODS      | 2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)          | 306-83-2    |
| Prohibited    | Class II ODS      | 2,2-Dichloro-1,1,3,3-tetrafluoropropane                | 17705-30-5  |
| Prohibited    | Class II ODS      | 2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC 225ba) | 422-48-0    |
| Prohibited    | Class II ODS      | 2,3-Dichloro-1,1,1,2-tetrafluoropropane (HCFC-234)     | 127564-83-4 |
| Prohibited    | Class II ODS      | 2,3-Dichloro-1,1,1-trifluoropropane (HCFC-243db)       | 338-75-0    |
| Prohibited    | Class II ODS      | 2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)          | 2837-89-0   |
| Prohibited    | Class II ODS      | 2-Chloro-1,1,1,3,3,3-hexafluoropropane (HCFC-226da)    | 431-87-8    |
| Prohibited    | Class II ODS      | 2-Chloro-1,1,1-trifluoroethane (HCFC-133a)             | 75-88-7     |
| Prohibited    | Class II ODS      | 2-Chloro-1,1,3,3-tetrafluoropropane                    | 19041-02-2  |
| Prohibited    | Class II ODS      | 2-Chloro-1,1-difluoroethane (HCFC-142)                 | 338-65-8    |
| Prohibited    | Class II ODS      | 2-Chloro-1,1-difluoropropane                           | 430-93-3    |
| Prohibited    | Class II ODS      | 2-Chloro-1,3-difluoropropane (HCFC-262da)              | 102738-79-4 |
| Prohibited    | Class II ODS      | 2-Chloro-2-fluoropropane (HCFC-271ba)                  | 420-44-0    |

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