# Background Document on Retesting Frequency for the Hazardous Waste Identification Rule September, 1999

## Introduction

This document discusses retesting frequency for HWIR exempted waste streams based on the annual volume of these waste streams and their form. Because liquids are generally more homogeneous than non-liquids (semi-solids and solids) and because liquids are produced in much greater volumes than non-liquids, we believe that greater amounts of liquid waste can be managed before retesting must occur. (Recall that liquids are defined to have less than 1 percent total suspended solids. Further discussion of these waste form definitions can be found in the preamble to the proposed regulation and in the background document entitled *Correlation between Liquid, Sludge and Solid Waste Forms and Surface Impoundmnets, Land Application Units, and Landfill Disposal Options* (U.S. EPA, 1999-a)).

To require the same retesting frequencies for liquids and non-liquids would mean relatively small quantities of liquids being retested often or relatively large volumes of solids becoming exempt without retesting. We contend that differentiating the frequency of retesting based on form does not compromise the protectiveness of the continued HWIR exemption and provides more reasonable requirements on the claimant.

Larger amounts of waste have the potential of greater environmental risk than smaller amounts. Therefore, it is reasonable to require larger generators of waste to retest more frequently than smaller generators of waste. This background document explains how the volume categories and retesting frequencies were established for the proposed HWIR regulation.

## What do we know about the distribution of waste streams by volume?

We examined data from both OSW's 1996 National Hazardous Waste Constituent Survey (NHWCS) and OSW's 1995 Biennial Reporting System (BRS) to understand the distribution of waste generation across waste streams. Both the NHWCS and the BRS are national surveys of industrial hazardous waste generation and management practices. Consistent with historic analysis of the hazardous waste universe, a relatively small number of industrial facilities generate a relatively large percentage of all hazardous waste, as evidenced by the following data:

Average for all waste and all generators = 10,257 tons / generator[1]

[1] 1995 BRS: Total Waste reported as 214,092,505 tons; total number of generators = 20,873.

Average for top 50 waste generators = 3,565,395 tons / generator[2]
Average for non-top 50 waste generators = 1,720 tons / generator

Average for top 119 waste generators = 1,562,491 tons / generator (est. of minimum)[3]
Average for non-top 119 waste generators = 1,357 tons / generator (est. of maximum)[4]

Source: U.S. EPA, *The National Biennial RCRA Hazardous Waste Report (Based on 1995 Data) -- National Analysis*, August, 1997, EPA530-R-97-022c.

Most generators therefore generate approximately 1,400 tons per year. These averages do not take into account waste form. Annual generation of wastewater streams tend to be much more sizable than non-wastewater streams and therefore, the average for wastewaters would be expected to be higher (much higher) than 1,400 tons per year and the average for non-wastewaters would be expected to be lower. In addition, for both wastewaters and non-wastewaters a small fraction of waste streams dominate total generation.

These observations are confirmed by looking at wastewater and non-wastewater streams separately and the top 50 streams in each waste form category -- quantities are expressed in tons / generator[5]:

Average wastewater stream = 20,418
Avg. wastewater stream for top 50 wastewater generators = 3,522,270
Avg. wastewater stream for non-top 50 wastewater generators = 2,664
Top 50 wastewater streams represent 87% of total wastewater quantity.

Average non-wastewater stream = 607
Avg. non-wastewater stream for top 50 non-wastewater generators = 112,827
Avg. non-wastewater stream for non-top 50 non-wastewater generators = 315

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[2] 1995 BRS: total waste for top 50 waste generators = 178,269,725 tons

[3] 1995 BRS, Exhibit 1.8 presents a histogram of generator quantity ranges and number of generators. 119 generators were reported to have generated over 111,113.2 tons in 1995. By using the total generation of the top 50 presented in Exhibit 1.7 and assuming that the remaining generators (69) generated 111,113.2 tons in 1995, we come up with our minimum estimate. This estimate is a minimum because any or all of these 69 generators could have generated more than 111,113.2 tons in 1995.

[4] By subtracting the amount of generation calculated in footnote 3 from the total and considering all generators apart from the top 119, we come up with our maximum estimate. If any or all of the top 119 generated more than estimated, then total generation remaining for the non-top 119 would be less, and therefore, what is presented is a maximum.

[5] 1995 BRS: 9,912 wastewater generators; 19,302 non-wastewater generators. Total wastewater and non-wastewater quantities presented in Exhibit 1.9. Top 50 wastewater generators presented in Exhibit 1.10. Top 50 non-wastewater generators attached as Appendix A.

Top 50 non-wastewater streams represent 48% of total non-wastewater quantity.

For all streams and those within and outside the top 50 streams by volume, the annual generation of wastewater streams is appreciably larger than non-wastewater streams.

**What is the Basis for Establishing Waste Retesting Frequencies?**

Having made the above observations with data from the broader hazardous waste universe, we used OSW's National Hazardous Waste Constituent Survey (NHWCS) to construct specific volume categories to determine retesting frequency for the HWIR proposal. This survey is central to the HWIR regulatory analysis because it provides unique information on chemical constituent identity and concentrations within industrial waste streams from waste generators and waste treatment facilities.

The following information represents the distribution of waste streams by volume and form within the NHWCS:

Wastewaters (Total number of streams in NHWCS = 2,013)

More than half the wastewaters streams were below 150 tons / year
Approximately one quarter of the wastewater streams were above 1,400 tons / year

Of additional importance is how much waste are contained within these waste streams. Considering waste streams weighted by waste volume (# of streams in parentheses):
**Approximately 20% of the waste was in streams (1,940) below 35,000 tons / year**
**More than half the waste was in streams (1,999) below 500,000 tons / year**
Approximately one quarter of the waste was in streams (3) above 1e6 tons /yr

Non-wastewaters (Total number of streams in NHWCS = 6,531)

More than half the non-wastewater streams were below 10 tons / year
Approximately one quarter of the non-wastewater streams were above 60 tons / year

Again, of additional importance is how much waste is contained in these streams. Considering waste streams weighted by waste volume:
**Approximately 20% of the waste was in streams (6,314) below 2,000 tons / year**
**Approximately half the waste was in streams (6,493) below 10,000 tons / year**
Approximately 15% of the waste was in streams (8) above 41,152 tons / year

Source: U.S. EPA, *National Hazardous Waste Constituent Survey: Summary Report*, October, 1998. Also see underlying database.

Again, because larger amounts of waste have the potential for greater environmental risk, we therefore impose the most frequent testing requirements on these larger streams. Two thresholds were selected for more versus less testing and were established for the waste stream size (1) the first threshold set above which approximately half the waste is represented; and (2) the second threshold set below which approximately one-fifth of the waste is represented.

The NHWCS was sent to the largest generators and managers of hazardous waste, because they account for a relatively large percentage of industrial waste generated in the U.S. Consequently, the survey does not necessarily provide representative information on smaller waste streams. Establishing thresholds for more or less testing based on the distribution of waste across waste stream size is therefore slightly skewed, because of this absence of smaller waste streams. The current analysis establishes thresholds higher than they would have been had all waste streams been considered. Waste streams near the threshold will have less frequent testing requirements than those that would have been established using information from the entire waste stream universe.

However, based on historic impact analyses, larger streams are more likely to take advantage of the HWIR exemption[6], and therefore, the use of the NHWCS targeted to those streams is reasonable and appropriate.

In matching the BRS and NHWCS data with the HWIR proposal, we equate the terms "wastewater" as used in the BRS and the NHWCS, with the definition of "liquids" used in the proposed regulation.[7] The HWIR term "liquids" would encompass "wastewaters" because of the possible inclusion of wastes with high organic content. Additional discussion of these waste forms is provided in the HWIR preamble.

In a similar way, we have used information related to non-wastewaters within the BRS and the NHWCS to derive volume categories for "non-liquids" in the HWIR proposal – waste included as "semi-solids" and "solids" and defined to have total suspended solids greater than or equal

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[6] Larger streams are more likely to take advantage of an HWIR exemption because the testing and other HWIR implementation costs necessary to be eligible for the exemption may be cost prohibitive to smaller generators.

[7] Within the BRS, a waste is considered wastewater if the BRS form code is B101, B102, B105, or B110-116, or the BRS system type code is M071-079, M081-085, M089, M091-094, M099, M121-125, M129, or M134-136. (These codes are contained within the documentation for the 1995 BRS).

The NHWCS relies on the respondent's designation of whether the waste stream is a wastewater or not. See the *National Hazardous Waste Constituent Survey: Summary Report*, Prepared by Industrial Economics Inc. for the U.S. EPA Office of Solid Waste, July, 1999).

to 1 percent. Again, see the HWIR proposal for definitions of these industrial waste form categories.

**How Many Testing Events Should There Be Each Year?**

We determined the frequency of testing events to balance the burden of frequent testing with the need for accountability. In order to ensure that generators continue to characterize their waste streams and that enforcement officials have confidence that generators remain in compliance with the HWIR exemption levels, periodic testing is important. As a minimum, we believed that testing at least once a year was appropriate. Instances of repeat testing, for example, in the delisting program, range from once a year to daily. (see Table 2, 40 CFR 261 Appendix IX). In an effort to reduce testing burden and with the stated preference of having fewer testing events at which more samples were taken (rather than more events with fewer samples), we chose semi-annual and quarterly time intervals for retesting to be performed. The explicit requirement for more frequent testing was thought unnecessary because the waste generated is assumed to come from a consistent process; any significant process change requires immediate retesting.

We require testing at regular time intervals throughout the year, rather than allowing a generator to independently choose when such tests would be conducted. We did not want to provide a flexibility to generators that they could use to "game the system"; generators might choose most favorable sampling times within a calendar year, when hazardous chemicals present in the waste stream might be at relatively lower concentrations.

**What testing frequencies are being proposed as a result of this analysis?**

The table below presents our proposed retesting frequncies based on the categorization discussed in this document:

| **If your waste is a liquid and it is generated in quantities** | **Then you must test your waste stream** |
|---|---|
| Less than 35,000 tons/year | Every 12 Months |
| Between 35,000 and 500,000 tons/year | Every 6 Months |
| Over 500,000 tons/year | Every 3 Months |

| **If your waste is a non-liquid (that is, a solid or semi-solid) and it is generated in quantities** | **Then you must test your waste stream** |
|---|---|
| Less than 2,000 tons/year | Every 12 Months |
| Between 2,000 and 10,000 tons/year | Every 6 Months |
| Over 10,000 tons/year | Every 3 Months |

# Appendix A: Top Fifty Generators of Non-Wastewaters

**Source: 1995 Biennial Reporting System (BRS)**

| | EPA ID | HANDLER NAME | | CITY | STATE | TONS GENERATED |
|---|---|---|---|---|---|---|
| 1 | ILD064403199 | MOBIL OIL CORP | | JOLIET | IL | 960,344 |
| 2 | IDD070929518 | FMC CORP PHOSPHORUS CHEMICALS GROUP | | POCATELLO | ID | 505,623 |
| 3 | ILD080012305 | SHELL WOOD RIVER REFINING CO | | ROXANA | IL | 277,680 |
| 4 | TND003376928 | TENN EASTMAN DIVISION OF EASTMAN CHEMICA | | KINGSPORT | TN | 221,105 |
| 5 | TXD008080533 | AMOCO OIL COMPANY | | Texas City | TX | 203,337 |
| 6 | TXD008123317 | DU PONT DE NEMOURS & CO., E.I. | | Victoria | TX | 144,879 |
| 7 | WID066874207 | STRATTEC SECURITY CORP | | GLENDALE | WI | 144,818 |
| 8 | TXD008092793 | THE DOW CHEMICAL COMPANY, TEXAS OPERATIO | | Freeport | TX | 139,231 |
| 9 | MID000724724 | DOW CHEMICAL CO-MIDLAND PLANT SITE | | MIDLAND | MI | 136,639 |
| 10 | NJD002454544 | MARISOL INC | | MIDDLESEX | NJ | 131,626 |
| 11 | ILD006278170 | ALLIED-SIGNAL INC | | METROPOLIS | IL | 122,100 |
| 12 | TXD008079642 | E.I. DUPONT DE NEMOURS & COMPANY | | Orange | TX | 121,572 |
| 13 | MAR000006726 | QUANTUM CORP. | | SHREWBURY | MA | 115,450 |
| 14 | MAD062163191 | POLAROID CORPORATION | | NORWOOD | MA | 112,969 |
| 15 | ALD046481032 | SANDERS LEAD COMPANY, INC. | | TROY | AL | 110,715 |
| 16 | NYD049836679 | CWM CHEMICAL SERVICES, INC. | | MODEL CITY | NY | 108,411 |
| 17 | ILD984832311 | GATTO INDUSTRIAL PLATERS INC | | CHICAGO | IL | 101,187 |
| 18 | LAD000777201 | CHEMICAL WASTE MANAGEMENT | | SULPHUR | LA | 98,659 |
| 19 | TX0000201202 | TEXACO CHEMICAL, INC. | | Port Neches | TX | 84,117 |
| 20 | WID054105218 | MASTER LOCK CO | | MILWAUKEE | WI | 82,792 |
| 21 | TXD990797714 | MOBIL OIL CORPORATION | | Beaumont | TX | 81,690 |
| 22 | WID046536231 | VULCAN MATERIALS CO-VULCAN CHEMICALS DI | | PORT EDWAR | WI | 81,304 |
| 23 | IND000810861 | AMOCO OIL COMPANY WHITING LAKEFRONT | | WHITING | IN | 75,463 |
| 24 | ILD005263157 | NORTHWESTERN | STEEL & WIRE #2 | STERLING | IL | 73,779 |
| 25 | KYD053348108 | SAFETY-KLEEN | CORP. | SMITHFIELD | KY | 70,890 |
| 26 | TXD055141378 | ROLLINS ENVIRONMENTAL SERVICES (TX), INC | | Deer Park | TX | 70,887 |
| 27 | IND093219012 | HERITAGE ENVIRONMENTAL SERVICES INC | | INDIANAPOLIS | IN | 68,235 |
| 28 | MID980615298 | PETRO-CHEM PROC. GRP., NORTRU INC | | DETROIT | MI | 68,102 |
| 29 | TXD102684370 | BAYTANK (HOUSTON) INC. | | Seabrook | TX | 67,642 |
| 30 | ILD005119839 | US FILTER/IWT | | ROCKFORD | IL | 63,889 |
| 31 | ILD005070537 | CATERPILLAR INC | | JOLIET | IL | 61,655 |
| 32 | COD991300484 | HIGHWAY 36 LAND DEVELOPMENT CORP | | DEER TRAIL | CO | 58,545 |
| 33 | IND000717959 | GENERAL BATTERY/EXIDE CORP. | | MUNCIE | IN | 57,959 |
| 34 | CAD067786749 | BKK LANDFILL | | WEST COVINA | CA | 55,411 |
| 35 | TXD058265067 | ARCO CHEMICAL COMPANY | | PASADENA | TX | 54,539 |
| 36 | TXD083472266 | ARCO CHEMICAL COMPANY | | Channelview | TX | 54,249 |
| 37 | NJD002385730 | E I DUPONT DE NEMOURS & CO INC | | DEEPWATER | NJ | 53,931 |
| 38 | TXD007330202 | TEXAS EASTMAN DIVISION | | Longview | TX | 51,383 |
| 39 | ILD000805812 | PEORIA DISPOSAL CO INC | | PEORIA | IL | 51,158 |
| 40 | IND006050967 | ELI LILLY & CO.-TIPPECANOE LABORATORIES | | SHADELAND, | IN | 50,331 |
| 41 | TXD008132268 | COASTAL REFINING & MARKETING, INC. | | Corpus Christi | TX | 48,920 |
| 42 | ILT180014698 | PRECOAT METALS | | GRANITE CITY | IL | 48,175 |
| 43 | ARD981057870 | RINECO | | BENTON | AR | 48,059 |
| 44 | OHD005108477 | ARISTECH CHEMICAL CORPORATION | | HAVERHILL | OH | 46,016 |
| 45 | TXD007376700 | HOECHST | CELANESE CHEMIC | Pampa | TX | 43,981 |
| 46 | ILD049813256 | PRECOAT | METALS | CHICAGO | IL | 43,301 |
| 47 | MID000724831 | MICHIGAN DISPOSAL WASTE TREATMENT PLANT | | BELLEVILLE | MI | 43,259 |
| 48 | PAD980550594 | SUN CO INC MARCUS HOOK REFINERY | | MARCUS HOO | PA | 42,943 |
| 49 | ILD010284248 | CID RECYCLING & DISP FAC | | CALUMET CIT | IL | 41,247 |
| 50 | LAD008086506 | PPG INDUSTRIES, INC. | | WESTLAKE | LA | 41,132 |
| | | | | | | 5,641,330 |