REGULATORY IMPACT ANALYSIS

EPA's 2011 Proposed Revisions to the Industrial Recycling Exclusions of the RCRA Definition of Solid Waste

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PREFACE

This RIA was in large part built upon updated and revised data and analyses borrowed from EPA's September 25, 2008 "*Regulatory Impact Analysis*" (RIA) in support of EPA's October 30, 2008 RCRA "*Definition of Solid Waste*" (DSW) final rule. The 2008 RIA is available to the public in Adobe PDF electronic format (204 pages) as document ID nr. EPA-HQ-RCRA-2002-0031-0602 at http://www.regulations.gov. DPRA Inc. authored Chapters 3, 4, 5, and 7 of this RIA as a sub-contractor to Industrial Economics Inc. under work assignment 3-09 and 4-09 of EPA contract EP-W-07-011. The period of performance for these work assignment were from September 09 to December 31, 2010 and March 21, 2011 to June 30, 2011. Mark Eads, an economist for EPA's Office of Resource Conservation & Recovery (ORCR) was EPA's work assignment manager and author of the Executive Summary and Chapters 1, 2, 6 and 8 (section 8A) of this RIA. Jon Silberman, Attorney-Advisor to EPA's Office of Enforcement & Compliance Assurance (OECA) Planning, Measured & Oversight Division contributed to Chapter 8 (sections 8B & 8C).

The primary data source used in this RIA for identifying potentially affected industrial entities and associated annual waste tonnages for the 2011 proposed revisions to the DSW is EPA's RCRA Hazardous Waste "Biennial Report" (BR). When EPA launched this RIA in September 2010, the most recent BR data year available was 2007, which is applied in this RIA. However, in late November 2010, the 2009 BR data became available on EPA's BR website at http://www.epa.gov/waste/inforesources/data/biennialreport/index.htm. For purpose of comparison before (2005) and after (2009) to the 2007 data year applied in this RIA, the two tables below (Table A & Table B) display the aggregate nationwide BR counts of industrial hazardous waste recycling facilities and their corresponding reported annual tonnages of waste recycled for 2005, 2007 and 2009. Facility counts remained fairly stable although recycling tonnage continued to decline in 2009 compared to 2007.

Table A
Count of Industrial Hazardous Waste Generator Facilities that Recycled Waste as Reported in the BR
(Recycled Onsite by the Generator or Shipped Offsite for Recycling)

Type of Recycling (by BR code)	**2005**	**2007**	**2009**
1. H010 Metals	2,438	2,121	2,066
2. H020 Solvents	2,525	2,146	2,022
3. H039 Others (e.g., acids)	891	907	1,134
Non-duplicative Totals	4,928	4,447	4,502
Percentage Change	N/A	**-9.8%**	**+1.2%**

Table B
Tonnage of Industrial Hazardous Wastes Recycled by Generator Facilities Reported in the BR
(Recycled Onsite by the Generator or Shipped Offsite for Recycling)

Type of Recycling	**2005**	**2007**	**2009**
H010 Metals	904,671	821,536	869,777
H020 Solvents	230,627	255,127	198,148
H039 Others (e.g., acids)	277,484	276,743	201,340
Non-duplicative Totals	1,412,782	1,353,406	1,269,265
Percentage Change	N/A	**-4.2%**	**-6.2%**

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ABSTRACT

Introduction: This RIA evaluates the potential future impacts of seven proposed revisions (i.e., regulatory options) to EPA's RCRA "Definition of Solid Waste" (DSW) regulatory exclusions for industrial recycling. The DSW regulatory exclusions are designed by EPA to provide incentives for increased industrial recycling of "hazardous secondary materials" in lieu of managing and discarding such materials as wastes in compliance with the relatively more costly terms and conditions of RCRA Subtitle C "hazardous waste" regulations.

Affected Entities: Two distinct groups (populations) totaling between 5,983 and 8,992 industrial facilities per year potentially affected:

- 2008 DSW exclusions: 6 of the 7 proposed revisions (Options 1 thru 6) could affect EPA's most recent 2008 DSW recycling exclusions potentially involving between 662 ("*base case*") and 3,671 ("*upper-bound*") average annual future counts of RCRA-regulated facilities.
- Pre-2008 DSW exclusions: 3 of the 7 revisions (Options 4, 5, 7) in part or in whole could affect EPA's pre-2008 DSW recycling exclusions (spanning 1985 and 1998) involving 5,321 industrial facilities operating with pre-2008 DSW exclusions.

Benefits: This RIA presents a qualitative description of three categories of expected future environmental and economic benefits for the proposed revisions: (1) reduction in future environmental damage cases associated with industrial recycling; (2) improved environmental compliance; and (3) reduced liability, less regulatory uncertainty, and lower legal and credit costs for recycling facilities.

Costs: This RIA estimates the future average annualized costs to industry to comply with the 7 proposed revisions at between (2011$ @7% discount rate over 50-years 2015 to 2064):

- Base case scenario: Range of $7.2 million per year (Options 3 to 7 only) to $13.1 million per year (all Options 1 to 7) affecting 662 "base case" average annual facilities expected to implement the 2011 proposed revisions, plus 100% of the current 5,321 pre-2008 DSW exclusion facilities adopting relevant options of the 2011 proposed DSW revisions.
- Upper-bound scenario: $7.4 million per year (Options 3 to 7 only) and $47.5 million per year (Options 1 to 7) affecting 3,671 average annual facilities expected to implement the 2011 proposed DSW revisions, plus 100% of the 5,321 pre-2008 DSW exclusion facilities.

Net Impact: Netting out the $7.3 to $13.1 million average annual future costs for the 7 proposed revisions, from the 2011$-updated DSW regulatory cost savings baseline of **$86.7 million per year** – consisting of $79.3 million per year cost savings associated with pre-2008 DSW exclusions, plus $7.4 million cost saving per year for 13% adoption rate of the 2008 DSW recycling exclusions – yields a future average annual net cost savings for all DSW exclusions of **$73.6 to $79.5 million per year** (@7% "*base case*" discount rate over 50-years 2015 to 2064).

Supplemental Analyses: The 2011 DSW proposal is expected: (1) to have an annual effect less than the $100 million "*economically significant*" threshold under Executive Order 12866: Regulatory Planning and Review; (2) to have a "No SISNOSE" small business impact under EPA's RFA/SBREFA "sales test" threshold; (3) to impose less than $100 million in annual direct costs on state, local, and tribal governments, or on the private sector, under the UMRA threshold; (4) to impose less than EPA's $25 million annual direct cost threshold on state/local governments under Executive Order 13132: Federalism Implications; and (5) to not have an adverse effect on energy supply, distribution, or use under Executive Order 13211: Regulations that Affect Energy Supply, Distribution or Use.

A. Purpose of EPA's 2011 Proposed Revisions to DSW Recycling Exclusions

The Environmental Protection Agency (EPA) is proposing to revise the regulatory exclusions for certain types of industrial recycling from the "*definition of solid waste*" (DSW) under Subtitle C of the 1976 Resource Conservation and Recovery Act (RCRA). The DSW recycling exclusions involve industrial hazardous secondary materials intended for recycling (i.e., reclamation, recovery, regeneration, or reuse) rather than discard (i.e., disposal). Some of the DSW recycling exclusions date back to 1985, whereas other DSW recycling exclusions are relatively new (2008). The exclusions provide eligible industrial facilities with avoided and lower de-regulated costs, compared to more costly compliance with RCRA's full regulatory requirements for hazardous waste management, provided that facilities meet certain eligibility criteria, and comply with certain operating conditions and requirements. Under the DSW exclusions, industrial recyclable materials are not "wastes" because they are recycled, not discarded (i.e., not disposed), and thus are considered "*hazardous secondary materials*" rather than "*hazardous wastes*" if alternatively discarded rather than recycled.

EPA's 2011 proposed revisions to the DSW recycling exclusions are in response to a January 2009 petition submitted to the EPA by the Sierra Club (San Francisco, CA), claiming potential increases in risks to human health and the environment associated with recycling of DSW-excluded industrial hazardous secondary materials. With these proposed revisions EPA intends to ensure that the exclusions, as implemented, encourage recycling in industrial operations under conditions necessary to protect human health and the environment from potential mismanagement of hazardous secondary materials, for example, if such hazardous materials destined for recycling instead become discarded or otherwise mismanaged, resulting in potentially harmful environmental releases of the hazardous materials. Some proposed revisions potentially affect EPA's October 2008 DSW recycling exclusions, while other proposed revisions potentially affect pre-2008 DSW recycling exclusions which date between 1985 and 1998.

B. Proposed Revisions Evaluated in this RIA (8 Sets of Options)

Option 1: Withdraw the 2008 DSW Exclusion for Offsite Transfer Recycling

Withdraw the 2008 DSW exclusion at 40 CFR 261.4(a)(24) and (25) for hazardous secondary materials that are transferred offsite for the purpose of reclamation, and replace it with alternative RCRA Subtitle C regulations for hazardous recyclable materials under Option 2 below.

- Option 2 below is a companion to this option, as it presents a regulatory alternative for offsite reclamation if the 2008 DSW offsite reclamation exclusion is withdrawn.

Option 2: Implement Alternative RCRA Subtitle C Regulation for Offsite Transfer Recycling

As a corollary to Option 1 above, implement an alternative RCRA Subtitle C regulation for hazardous recyclable materials that are transferred offsite for reclamation. Waste generators would need to meet the following requirements:

(2A) Notification: Submit a notification prior to operating under this new RCRA regulation, and thereafter biennially using EPA Form 8700-12.
(2B) Reclamation plan: Make advance arrangements for legitimate reclamation and documents those arrangement in a reclamation plan.
(2C) Accumulation: Allow accumulation of hazardous recyclable materials by the generator for up to one year, but accumulate no more than two shipments of hazardous recyclable materials at any one time.
(2D) Management: Meets labeling, emergency preparedness, contingency planning and management standards similar to those required for hazardous waste generators.
(2E) Transportation: Sends the hazardous recyclable materials under either a hazardous recyclable materials manifest or a hazardous waste manifest to a RCRA permitted reclamation facility and maintain records of shipments for three years..

Option 3: Revise the 2008 DSW Exclusion for Generator Controlled Recycling

Modify the 2008 DSW exclusion for hazardous secondary materials reclaimed under the control of the generator by:

(3A) Add a regulatory definition of "*contained*" to the 2008 DSW generator-controlled recycling exclusion.
(3B) Make notification a condition of the 2008 DSW generator-controlled recycling exclusion.
(3C) Add a recordkeeping requirement for speculative accumulation.
(3D) Add a recordkeeping requirement for reclamation under the 2008 DSW "toll manufacturing" recycling exclusion.
(3E) Eliminate the 2008 DSW "toll manufacturing" recycling exclusion.
(3F) Relocate the non-land based and land-based unit operational requirements in 40 CFR 261 so they both appear in the same section.

Option 4: Revise the 2008 DSW Definition of "*Legitimate*" Recycling

Revise the 2008 DSW definition of legitimate recycling (i.e., legitimacy) by:

(4A) Apply the codified definition to all industrial recycling under the pre-2008 DSW set of regulatory exclusions.
(4B) Make all four legitimacy factors mandatory with a petition process for cases where one factor is not met but the recycling is still legitimate for the 2008 DSW regulatory exclusions and hazardous wastes being recycled under Subtitle C.
(4C) Require documentation of recycling legitimacy for the 2008 DSW regulatory exclusions and hazardous wastes being recycled under Subtitle C.

Option 5: Revise the 1985 Partial Recycling Variance and 2008 DSW Non-Waste Determination Petition Processes

Modify the non-waste determination petition process by:

(5A) Require that applicants re-apply in the event the material no longer meets the relevant criteria under 40 CFR 260.33(c).
(5B) Require biennial notification using EPA Form 8700-12 in compliance with 40 CFR 260.42.
(5C) Modify the 1985 40 CFR 260.31(c) DSW variance for partially recycled materials:
  (1) Require all six of the 1985 criteria for evaluating partial recycling variance applications be met, not "*on any or all of them.*"
  (2) Modify wording of five of the six criteria to make it clear at what point in the recycling process the variance is intended to apply.
(5D) Non-waste determination petitioners must demonstrate why they cannot or should not meet existing DSW exclusions (at 40 CFR 261.2 or 261.4).

(5E) Change the word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34, due to the regional- and case-specific nature of non-waste determinations.

Option 6: Add a new "*Re-Manufacturing*" DSW Exclusion

Add a new DSW recycling exclusion involving inter-company transfer for off-site reclamation of solvents via "re-manufacturing" (i.e., transfer from one manufacturer to another) for the purpose of extending the useful life of the original solvent, by keeping the solvent in commerce to reproduce a commercial grade of the original solvent for continued use as a "processing aid" to manufacturing. This exclusion would operate according to five eligibility criteria and three other sub-options:

(6A) Five eligibility criteria:

(1) 18 types of solvent chemicals only.

(2) Three types of solvent "processing aid" functional uses only (i.e., chemical manufacturing aid, chemical processing aid, or chemical formulation aid) by both generators and re-manufacturers; not involving cleaning or de-greasing solvent uses, plus a chemical intermediate function in which the chemical gets consumed (destroyed) in chemical manufacturing reactions.

(3) Four manufacturing sectors only (NAICS 325199 basic organic chemical manufacturing, NAICS 325211 plastics & resins manufacturing, NAICS 325412 pharmaceutical manufacturing, and NAICS 325510 paints & coatings manufacturing).

(4) Five exclusion conditions for both generators and re-manufacturers (initial and biennial notification, re-manufacturing plan, 3-year recordkeeping of shipments, management in tanks or containers, and no speculative accumulation). (6B) Use of intermediate storage facilities not allowed for this exclusion.

(6C) Add other conditions or restrictions including, but not limited to, additional recordkeeping and reporting requirements, management standards, financial assurance requirements, and public participation requirements. Note: this roughly- and incompletely-defined sub-option is not evaluated in this RIA

(6D) Petition process for requests to add certain chemicals, industries, and/or chemical function uses to the re-manufacturing criteria.

Option 7: Revise pre-2008 DSW Recycling Exclusions & Exemptions

This revision to the pre-2008 DSW exclusions for recyclable materials will require:

(7A) Containment ("contained") standards for excluded hazardous secondary material – applies to 31DSW exclusions

(7B) Biennial notification for facilities operating under the various exclusions and exemptions – applies to 31 DSW exclusions

(7C) Recordkeeping for speculative accumulation in all cases – applies to 40 CFR 261.4 DSW exclusions

Option 8: Other Options for Revising the 2008 DSW Recycling Exclusions Evaluated in this RIA But Not Proposed

Other options evaluated during the initial formulation of this RIA that are not proposed:

(8A) "*Contained*" performance standard for the 2008 DSW offsite transfer recycling exclusion.

(8B) Intermediate facility restriction for the 2008 DSW offsite transfer recycling exclusion.

(8C) Provision for facilities in non-adopting states to qualify for the 2008 DSW offsite transfer recycling exclusion.

C. Potential Industry Costs for Complying With the 2011 Proposed Revisions

C1. *"Base Case"* Adoption Scenario Cost Estimates

This RIA aggregates (i.e., adds-up) the incremental regulatory cost estimates for Options 1 to 7 listed above (not including Option 8)[1] under two alternative future implementation (i.e., future adoption) scenarios: "13% base case scenario" and "74% upper-bound scenario". Each scenario uses a 7% base case discount rate over the future 50-year period of 2015 to 2064, as well as two alternative discount rates (0% and 3%) for purpose of sensitivity analysis. Each scenario consists of two industrial facility sub-populations which the 2011 proposed revisions might affect: (a) facilities which may operate under the 2008 DSW final rule exclusions and (b) facilities which are currently operating under the pre-2008 DSW exclusions (which were promulgated between 1985 and 1998). The two alternative future implementation scenarios are:

- 13% "*base case*" adoption scenario: Based on the actual average annual 2.33-year (December 28, 2008 through April 26, 2011) adoption rate for the 2008 DSW final rule.
  - 2008 DSW final rule exclusions:
    Assumes an average annual count of 13% (i.e., 662) of the 5,007 currently eligible RCRA-regulated industrial facilities (as of 2007) will adopt the 2008 DSW final rule exclusions, as revised according to the 2011 proposed revisions.
  - Pre-2008 DSW exclusions:
    Assumes an average annual count of 100% of the 5,321 industrial facilities (as of 2007) currently operating with pre-2008 DSW exclusions, will adopt the 2011 proposed revisions to the pre-2008 DSW exclusions.
- 74% "*upper-bound*" adoption scenario: Based on the count of currently eligible RCRA-regulated facilities in the 44 states which might adopt the 2008 DSW final rule exclusions:
  - 2008 DSW final rule exclusions:
    Assumes an average annual count of 74% (i.e., 3,671) of the 5,007 currently eligible RCRA-regulated industrial facilities (as of 2007) will adopt the 2008 DSW final rule exclusions, as revised according to the 2011 proposed revisions.
  - Pre-2008 DSW exclusions:
    Assumes an average annual count of 100% of the 5,321 industrial facilities (as of 2007) currently operating with pre-2008 DSW exclusions, will adopt the 2011 proposed revisions to the pre-2008 DSW exclusions.

For purpose of summary, Exhibit A and Exhibit B below present this RIA's estimated industry compliance costs (or net cost savings) under the 13% base case scenario for Options 1 to 7 listed above. Because Option 1, Option 2, and Option 6 are not mutually exclusive, there are two alternative ways to add-up the impacts across all seven options:

Exhibit A (All Options 1 to 7): If Option 1 is selected then the baseline cost savings in Option 2 and 6 are included.
Exhibit B (Only Options 3 to 7): If Option 1 is NOT selected then the baseline cost savings in Options 2 and 6 are excluded to avoid

[1] Costs associated with Option 8 reflect other options evaluated in this RIA but are not presented here because they are not included in EPA's 2011 Federal Register notice of the proposed revisions to the DSW exclusions. The cost (or cost savings) estimates for the set of options included as Option 8 are presented in Chapter 5 of this RIA.

double-counting.

Exhibit A
Potential Future Regulatory Compliance Costs to Industry
for EPA's 2011 Proposed Revisions to the RCRA "*Definition of Solid Waste*" (DSW) Industrial Recycling Exclusions
Note: Costs in this Exhibit are Incremental to the Cost Savings Estimated for the 2008 DSW Final Rule as "Baseline"
13% "*Base Case*" Future Adoption Scenario And All Options 1 to 7 Selected

Proposed Revisions (Regulatory Options)	Average annual future affected industrial facilities	Cost estimates ($millions in 2011$) @alternative discount rates		
		0%	3%	7%
Average Annualized Costs (50-years 2015 to 2064):				
1. Withdraw the 2008 DSW exclusion for offsite transfer recycling	662	$11.991	$8.645	$5.671
2. Implement alternative Subtitle C regulation for offsite transfer recycling	662	($0.834)	($0.315)	$0.099
3. Revise the 2008 DSW exclusion for generator-controlled recycling	37	$0.382	$0.276	$0.181
4. Revise the 2008 DSW definition of recycling "*legitimacy*"	10,254	$7.722	$6.862	$5.891
5. Revise the 1985 Variance and 2008 DSW non-waste determination petition process	379	$0.056	$0.051	$0.044
6. Add a new "re-manufacturing" DSW exclusion*	30	($0.414)	($0.299)	($0.196)
7. Revise pre-2008 DSW recycling exclusions (1985 to 1998)	5,321	$1.883	$1.674	$1.437
Column totals (1 to 7) =		**$20.786**	**$16.894**	**$13.127**
Present Value Costs (50-years 2015 to 2064):				
1. Withdraw the 2008 DSW exclusion for offsite transfer recycling	662	$599.550	$222.408	$78.264
2. Implement alternative Subtitle C regulation for offsite transfer recycling	662	($41.700)	($8.104)	$1.366
3. Revise the 2008 DSW exclusion for generator-controlled recycling	37	$19.100	$7.101	$2.498
4. Revise the 2008 DSW definition of recycling "*legitimacy*"	10,254	$386.100	$176.537	$81.300
5. Revise the 1985 Variance and 2008 DSW non-waste determination petition process	379	$2.800	$1.312	$0.607
6. Add a new "re-manufacturing" DSW exclusion*	30	($20.700)	($7.692)	($2.705)
7. Revise pre-2008 DSW recycling exclusions (1985 to 1998)	5,321	$94.150	$43.067	$19.832
Column totals (1 to 7) =		**$1,039.300**	**$434.628**	**$181.162**

Exhibit B
Potential Future Regulatory Compliance Costs to Industry
for EPA's 2011 Proposed Revisions to the RCRA *"Definition of Solid Waste"* Industrial Recycling Exclusions
Note: Costs in this Exhibit are Incremental to the Cost Savings Estimated for the 2008 DSW Final Rule as "Baseline"
13% "*Base Case*" Future Adoption Scenario and Options 1 and 2 NOT Selected (Only Options 3 to 7)

Proposed Revisions (Regulatory Options)	Average annual future affected industrial facilities	Cost estimates ($millions in 2011$) @alternative discount rates		
		0%	3%	7%
Average Annualized Costs (50-years 2015 to 2064):				
1. Withdraw the 2008 DSW exclusion for offsite transfer recycling	Not Selected = 0	Not Selected = $0	Not Selected = $0	Not Selected = $0
2. Implement alternative Subtitle C regulation for offsite transfer recycling	Not Selected = 0	Not Selected = $0	Not Selected = $0	Not Selected = $0
3. Revise the 2008 DSW exclusion for generator-controlled recycling	37	$0.000	$0.000	$0.000
4. Revise the 2008 DSW definition of recycling "*legitimacy*"	10,254	$7.318	$6.571	$5.691
5. Revise the 1985 Variance and 2008 DSW non-waste determination petition process	379	$0.057	$0.044	$0.044
6. Add a new "re-manufacturing" DSW exclusion*	30	$0.000	$0.000	$0.000
7. Revise pre-2008 DSW recycling exclusions (1985 to 1998)	5,321	$1.883	$1.674	$1.437
	Column totals (3 to 7) =	**$9.258**	**$8.289**	**$7.172**
Present Value Costs (50-years 2015 to 2064):				
1. Withdraw the 2008 DSW exclusion for offsite transfer recycling	Not Selected = 0	Not Selected = $0	Not Selected = $0	Not Selected = $0
2. Implement alternative Subtitle C regulation for offsite transfer recycling	Not Selected = 0	Not Selected = $0	Not Selected = $0	Not Selected = $0
3. Revise the 2008 DSW exclusion for generator-controlled recycling	37	$0.005	$0.003	$0.001
4. Revise the 2008 DSW definition of recycling "*legitimacy*"	10,254	$365.900	$169.051	$78.540
5. Revise the 1985 Variance and 2008 DSW non-waste determination petition process	379	$2.850	$1.132	$0.607
6. Add a new "re-manufacturing" DSW exclusion*	30	$0.000	$0.000	$0.000
7. Revise pre-2008 DSW recycling exclusions (1985 to 1998)	5,321	$94.150	$43.067	$19.832
	Column totals (3 to 7) =	**$462.905**	**$213.252**	**$98.980**

Notes:
* $0 displayed in the Exhibit for Option 6 to indicate that based on the nationwide incremental analysis method presented in this RIA based on the entire RCRA-regulated universe of potentially relevant and eligible facilities, facilities would not be expected to incur incremental costs for Option 6 even though Chapter 5 of this RIA presents potential incremental costs for meeting the conditions (sub-options) of Option 6 without Option 1 (i.e., "without Option 1" = the 2008 DSW final rule exclusions remain in place), because Option 6 would be voluntary, not mandatory. Consequently, facilities engaged in solvent recycling could chose to operate under either the 2008 DSW offsite transfer recycling exclusion, or under the Option 6 solvent re-manufacturing exclusion, depending upon which option provides the greatest net cost savings at the micro-economic (i.e., single facility) level. This RIA did not conduct a micro-economic analysis for Option 6. However, it is conceivable that Option 6 could yield future annual benefits without Option 1 if the additional conditions (cost element 6C of this RIA) are not finalized with Option 6, which would provide added economic incentive for facilities to operate under Option 6 rather than the 2008 DSW recycling exclusions.

C2. Cost Estimate Uncertainty Ranges (Sensitivity Analysis)

Not revealed in the cost estimates in Exhibit A and B above are uncertainties in numerical values applied in this RIA as cost computation factors. As defined and derived in **Chapter 6** of this RIA, there are six cost estimation uncertainty factors which may influence the future annual cost of each option in any given year. Exhibit C below presents how each of the uncertainty factors could affect the actual economic impacts of the DSW final rule in any given future year. These six factors are not necessarily additive (i.e., compounding) in any given year.

Exhibit C
Sensitivity of Estimated Industry Cost for Implementing the 2011 Proposed Revisions to the DSW Recycling Exclusions to Six Cost Estimation Uncertainty Factors
Note: Costs in this Exhibit are Incremental to the Cost Savings Estimated for the 2008 DSW Final Rule as "Baseline"
13% "Base Case" Adoption Scenario for All Options 1 to 7; 50-year period-of-analysis 2015 to 2064; 2011$; 7% discount rate

	Type of cost Uncertainty Factor*	Numerical Uncertainty Range in Factor*		Cost Estimate Range ($millions)	
		Low-end	High-end	Low-end	High-end
	Average Annual Cost Estimate (without uncertainty applied) =			**$13.1/year (source: Exhibit A)**	
1	State government adoption uncertainty	No change (13% "base case" facilities adopt)	+263% (74% upper-bound facilities adopt)	$13.1/year	$47.5/year
2	Future fluctuations in annual tonnages of hazardous secondary materials generated and destined for recycling	-58%	+42%	$5.5/year	$18.6/year
3	Within-year discrepancy between generation & management tonnages	-34%	+39%	$8.6/year	$18.2/year
4	RCRA SQGs in this RIA	+58%	+148%	$20.7/year	$32.5/year
5	Physical & chemical quality of secondary materials available for viable recycling	-10%	-10%	$11.8/year	$11.8/year
6	Expected accuracy of impact estimates	-20%	+30%	$10.5/year	$17.0/year
	Range across all 6 factors =	-58%	+263%	**$5.5/year**	**$47.5/year**

Note:
* A potential 7th cost uncertainty factor is future fluctuations in market prices of recovered commodities from recycled materials. However, the 7th factor is not applied in this RIA because it influences the micro-economic decisions by facilities to switch from disposal to recycling of their hazardous secondary materials, which is only a relatively small fraction of the total industry implementation cost savings estimate for the 2008 DSW recycling exclusions and the 2011 proposed revisions.

D. Potential Benefits of the Proposed Revisions

Chapter 8 of this RIA identifies three categories of potential future benefits of the 2011 proposed revisions to DSW recycling exclusions. However, this RIA does not quantify or monetize these benefit categories:

- Benefit #1: Reduction in future environmental damages associated with industrial recycling of hazardous secondary materials (Options 1, 2, 6).
- Benefit #2: Improved environmental compliance:
  - Clearer and more specific regulatory standards improve environmental compliance (Options 3, 4, 7, 8).
  - More stringent recordkeeping provisions improve environmental compliance (Options 3, 4, 7).
  - Self-reporting requirements (e.g., notification requirements) improve environmental compliance (Options 2, 3, 5, 7).
  - Increased likelihood of detection and potential penalty for non-compliance improves environmental compliance (Options 2, 3, 4, 5, 7).
- Benefit #3: More specific standards result in reduced liability, less uncertainty for the regulated entity, and lower legal and credit costs (Options 3, 4, 7, 8).

E. Findings of Supplemental Analyses

E1. Regulatory Planning and Review (1993 Executive Order 12866)

Executive Order 12866, as amended by Executive Order 13258, requires EPA to determine whether a regulatory action is "*significant*" and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. As defined in Executive Order 12866, a "*significant regulatory action*" is any regulatory action that is likely to result in a rule that may: (1) have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Finding: Based on the cost analyses presented in this RIA, the 2011 DSW proposed revisions are not expected to be "*economically significant*" because in aggregate, the proposed revisions are not expected to have a future annual effect on the economy of $100 million or more, even when non-discounted (i.e., 0% discount rate):

- 7% discount rate: Annual costs for the 2011 proposed revisions to the pre-2008 and 2008 DSW exclusions are estimated between:
  - 13% base case adoption: $7.2 million per year (all Options 1 to 7) and $13.1 million per year (only Options 3 to 7).

- 74% upper-bound adoption: $7.4 million per year (all Options 1 to 7) and $47.5 million per year (only Options 3 to 7).

- 0% discount rate: Annual costs under the 74% upper-bound adoption scenario are between $11.5 million and $67.7 million per year.

E2. Small Business Impact Analysis (1980 RFA/1996 SBREFA)

Because the DSW recycling exclusions are voluntary, as well as deregulatory compared to full regulation of recycling under RCRA Subtitle C regulations, there is no adverse impact to small entities subject to the DSW exclusions. However, the 2011 proposed revisions to the DSW exclusions are expected to incrementally increase future costs to industrial facilities for complying with the 2011 proposed conditions for the DSW recycling exclusions. According to the requirements of the 1980 Regulatory Flexibility Act (RFA) as amended by the 1996 Small Business Regulatory Enforcement Fairness Act (SBREFA), Federal regulatory agencies are required to make initial determinations if proposed regulatory actions may have a "*significant economic impact on a substantial number of small entities*" (SISNOSE). Small entities include small businesses, small organizations, and small governmental jurisdictions. EPA's 2011 proposed DSW revisions could potentially affect the following cumulative counts of facilities by year 2064 over the 50-year period of this RIA (Note: cumulative counts are higher than the average annual facility counts reported elsewhere in this RIA):

- 13% "*base case*" adoption scenario: 6,497 industrial facilities cumulative count to 2064
  - Consisting of 1,176 2008 DSW exclusion facilities+ 5,321 pre-2008 RCRA exclusion facilities
- 74% "*upper-bound*" adoption scenario: 9,102 industrial facilities cumulative count to 2064
  - Consisting of 3,781 2008 DSW exclusion facilities + 5,321 pre-2008 RCRA exclusion facilities

These facilities are located in 622 industries at the 6-digit NAICS code level (as listed in **Appendix A**). This RIA evaluated 27 NAICS industries with the largest number of facilities potentially affected (i.e., in NAICS sub-sectors 32, 33, 54, 56, 61, 62, 92). The percentage of small businesses operating under DSW recycling exclusions is estimated in this RIA as 14% (see Chapter 7), based on analysis of businesses operating under the 2008 DSW exclusions as of October 2010. Thus, this RIA assumes that 14% of industrial facilities which may be affected by the 2011 proposed revisions are owned by small businesses.

This RIA evaluated potential impacts on small businesses, by comparing the total compliance cost in each industry on a per-facility average annual cost basis for compliance with all of the proposed revision options, to the respective per-facility average annual business revenues in each industry.

> Finding: The average annual impact on small businesses is estimated to be significantly less than 1% of annual sales for all small entities. The highest impact as a percentage of sales is estimated at 0.41% of annual sales. The total number of small businesses impacted at this level is estimated at 21 small entities under the 13% base-case adoption scenario, and 30 small entities under the 74% adoption scenario, which represents 2.3% to 2.4%, respectively, of the 910 (13% scenario) to 1,274 (74% scenario) small entities which could be impacted by the proposed revisions to the 2008 and pre-2008 recycling exclusions.

Based on the results of this "*sales test*" method as interpreted relative to the impact thresholds presented in the "SISNOSE decision process" table of EPA's November 2006 final guidance for RFA compliance, this RIA concludes that the 2011 proposed revisions to the DSW recycling exclusions will not have a "*significant economic impact on a substantial number of small entities*" (i.e., "*No SISNOSE*").

E3. Unfunded Mandates Analysis (1995 UMRA)

Potential future annual added costs to state, local, and tribal governments could include the following eleven paperwork activities associated with Option 2, Option 4, Option 5, Option 6, and Option 7 of the 2011 proposed revisions to the DSW recycling exclusions:

1. Receive, review and file biennial notifications (Options 2, 4, 6, & 7)
2. Receive, review and file reclamation plan (Option 2)
3. Receive, Review and approve emergency plans (Option 2)
4. Receive, review and file notification of compliance regarded affected release area (Option 2)
5. Review RCRA permit applications and enter into database (Option 2)
6. Evaluate legitimacy petitions (Option 4)
7. Evaluate legitimacy documentation (Options 4)
8. Receive, review, and file re-application for variance or non-waste determination (Option 5)
9. EPA provides online public access to a list (including documentation) of facilities receiving non-waste determinations (Option 5).
10. Petition process for re-manufacturing exclusion (Option 6)
11. Other State paperwork requirements under existing paperwork requirements covering 2008 revisions to the RCRA definition of solid waste, RCRA hazardous waste manifest system requirements, hazardous waste generator standards, hazardous waste specific unit requirements and special waste processes and types, and air emission standards for tanks, surface impoundment and containers.

As estimated in this RIA (Chapter 7), the maximum state government share of estimated future annual regulatory costs under all options (i.e., Options 1 to 7 combined) is:

- 13% "*base case*" adoption scenario: $8.5 million per year
- 74% "*upper bound*" adoption scenario: $9.1 million per year

No impacts are expected for local or tribal governments. Because the impacts of all the regulatory options are expected to result in expenditures well below the UMRA $100 million threshold for state governments, this RIA concludes that the 2011 DSW rule is not an unfunded mandate according to this UMRA cost threshold.

E4. Federalism Implications (1999 Executive Order 13132)

The 1999 Federalism Executive Order 13132 (Federal Register, Vol.64, No. 153, 10 Aug 1999) furthers the policies of the 1995 Unfunded

Mandates Reform Act (UMRA) by establishing federalism principles, federalism policymaking criteria, and a state/local government consultation process for the development of Federal regulations that have federalism implications. Federalism implications refers to regulations and other Federal policies and actions that have substantial direct effects on states, on the relationship between the Federal government and the states, or on the distribution of power and responsibilities among the various levels of government. For purpose of complying with the Section 6 consultation process of EO 13132, this section of the RIA evaluates whether the 2011 proposed revisions to the DSW recycling exclusions (i.e., Option 1 thru Option 7) may "*impose substantial direct compliance costs*" on state/local governments. EPA's 2008 guidance[2] for compliance with EO 13132 describes two numerical methods (i.e., numerical tests) for evaluating whether an EPA rule may have federalism implications with respect to the "*substantial direct compliance costs*" criterion:

- $25 million test: Annualized direct compliance costs to state/local governments in aggregate of $25 million or more[3]
- 1% test: Annualized direct compliance costs to state/local governments equal or exceed 1% of state/local government annual revenues

As listed above in the prior (UMRA) section, potential future annual added costs to state, local, and tribal governments could include the following 11 paperwork activities associated with Option 2, Option 4, Option 5, Option 6, and Option 7 of the 2011 proposed revisions:

1. Receive, review and file biennial notifications (Option 2, 4, 6, & 7)
2. Receive, review and file reclamation plan (Option 2)
3. Receive, Review and approve emergency plans (Option 2)
4. Receive, review and file notification of compliance regarded affected release area (Option 2)
5. Review RCRA permit applications and enter into database (Option 2)
6. Evaluate legitimacy petitions (Option 4)
7. Evaluate legitimacy documentation (Option 4)
8. Receive, review, and file re-application for variance or non-waste determination (Option 5)
9. EPA provides online public access to a list (including documentation) of facilities receiving non-waste determinations (Option 5).
10. Petition process for re-manufacturing exclusion (Option 6)
11. Other State paperwork requirements covering 2008 revisions to the RCRA definition of solid waste, RCRA hazardous waste manifest system requirements, hazardous waste generator standards, hazardous waste specific unit requirements and special waste processes and types, and air emission standards for tanks, surface impoundment and containers.

As displayed in the prior (UMRA) section above, the state government share of estimated future annual direct costs is estimated in this RIA at $8.5 million per year for the 13% base case adoption scenario, and $9.1 million per year for the 74% upper bound adoption scenario. No added costs are expected for local or tribal governments. Because these direct costs are well below the $25 million test threshold, this RIA concludes

[2] The two methods are from page 6 of "EPA's Action Development Process -- Guidance on Executive Order 13132: Federalism," OPEI Regulatory Development Series, Nov 2008, 62 pages at http://intranet.epa.gov/adplibrary/documents/federalismguide11-00-08.pdf

[3] Although one of the stated purposes of EO 13132 in its first paragraph is "to further the policies of the 1995 Unfunded Mandates Reform Act (UMRA), EPA's $25 million annual direct cost trigger is 75% lower than the $100 million annual direct cost trigger prescribed in Section 202 of UMRA.

that the 2011 DSW rule does not meet the Federalism cost threshold.

E5. Energy Impact Analysis (2001 Executive Order 13211)

White House Executive Order 13211 "*Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*" (66 FR 28355, May 22, 2001) requires Federal agencies to prepare and submit a Statement of Energy Effects to OMB for those matters identified as significant energy actions. As defined in Executive Order 13211, a "*significant energy action*" is any action by an agency that promulgates or is expected to lead to the promulgation of a final rule or regulation, including notices of inquiry, advance notices of proposed rulemaking, and notices of proposed rulemaking that: (1) is a significant regulatory action under Executive Order 12866 or any successor order and is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) is designated by OMB as a significant energy action. EPA's 2011 proposed revisions to the DSW recycling exclusions do not involve the supply, distribution, or use of energy, nor are the proposed revisions over $100 million in expected future annual effect (i.e., "*significant*") under Executive Order 12866. Thus, Executive Order 13211 does not apply to the 2011 proposed rule.

E6. Improving Regulation & Regulatory Review (2011 Executive Order 13563)

The basic framework, scope, and contents of this RIA represent a "benefit-cost analysis" which is the type of analysis required under section 6(a)(2)(B) of the 1993 Executive Order 12866. Furthermore, for rules which are expected to have more than a $100 million per year "economically significant" annual effect on the economy, Section 6(a)(2)(C) of Executive Order 12866 requires Federal regulatory agencies (such as the EPA) to assess the potential effects of the benefits and costs of the proposed regulation on economic and market efficiency, productivity, employment, competitiveness, health, safety, and the natural environment. The January 2011 Executive Order 13563 "Improving Regulation and Regulatory Review" reaffirmed the principles, structures, and definitions established by Executive Order 12866. However, because the 2011 DSW proposed rule is not expected to be an "economically significant" rule according to the quantified and monetized benefits (i.e., cost savings) and costs as estimated elsewhere in the prior chapters of this RIA, this RIA does not attempt to provide quantitative assessments of these other effects, but provides the following qualitative information about some of these other effects.

EPA anticipates the 2011 DSW proposed rule, if promulgated, may increase net employment in the long-term, for the following reason. EPA is proposing revisions to a set of 35 existing exclusions to RCRA industrial waste management regulations which EPA promulgated between 1985 and 2008. EPA promulgated three of the 35 exclusions in 2008, and the 32 other exclusions EPA promulgated between 1985 and 2002. Facilities in industries which are eligible to operate under these exclusions realize annual savings in regulatory costs, compared to operating under full RCRA Subtitle C hazardous waste regulations without these exclusions. However, not all state governments have adopted each of these existing 35 exclusions, particularly with regard to the most recent 2008 set of three RCRA exclusions for operations involving industrial recycling of hazardous secondary materials which are not discarded. As of almost three years after EPA's promulgation of the 2008 exclusions, only four states (ID, IL, NJ, and PA) have voluntarily adopted the exclusions, and only 49 industrial facilities have notified EPA regional offices they are operating under the 2008 exclusions.

One reason why more states have not yet adopted the 2008 exclusions, as well as not yet adopted the pre-2008 exclusions, is some states do not believe some of the exclusions are fully protective of human health and the environment. During EPA's 2008 DSW exclusions rulemaking, 12 state governments commented to EPA on the 2007 DSW exclusions re-proposed rule, they were not likely to adopt the one or more of the three 2008 DSW final rule exclusions. These 12 states account for 23% of foregone RCRA regulatory cost savings to industries compared to nationwide cost savings potential under hypothetical total adoption of the 2008 DSW exclusions by all states.

For the 32 existing pre-2008 RCRA industrial recycling exclusions an average of eight states representing 5.3% of nationwide total RCRA industrial hazardous waste generation have not yet adopted 12 of those 32 exclusions, and 24 states have not adopted at least one of the 32 exclusions. Because it is EPA's intention in the 2011 DSW proposed rule, to remedy the concerns of these non-adopting states about the under-protectiveness of these exclusions, EPA believes that once promulgated, more states may be induced to adopt both the pre-2008 and the 2008 DSW exclusions, thereby making more industrial facilities eligible for regulatory cost savings, which they may pass-thru to their customers in the form of lower prices for goods and services thereby improving market efficiency, stimulating economic growth, and creating jobs in those industries.

CHAPTER 1

Problem Statement
(Justification for Regulatory Action)

Note: This RIA interchangeably uses the words "***recycling***", "***reclamation***", "***recovery***", "***reuse***" and "***regeneration***" as synonyms. However, there are distinct RCRA regulatory differences in the usage of these words (source: July 1, 2010 version of 40 CFR 261.1(c)), as follows:

- A material is ``***reclaimed***'' if it is processed to **recover** a usable product, or if it is regenerated. Examples are recovery of lead values from spent batteries and **regeneration** of spent solvents. In addition, for purposes of Sec. Sec. 261.2(a)(2)(ii), 261.4(a)(23), and 261.4(a)(24) smelting, melting, and refining furnaces are considered to be solely engaged in metals **reclamation** if the metal **recovery** from the hazardous secondary materials meets the same requirements as those specified for metals **recovery** from hazardous waste found in Sec. 266.100(d)(1)-(3), and if the residuals meet the requirements specified in Sec. 266.112.
- A material is ``used or ***reused***'' if it is either: (i) Employed as an ingredient (including use as an intermediate) in an industrial process to make a product (for example, distillation bottoms from one process used as feedstock in another process). However, a material will not satisfy this condition if distinct components of the material are **recovered** as separate end products (as when metals are **recovered** from metal-containing secondary materials); or (ii) Employed in a particular function or application as an effective substitute for a commercial product (for example, spent pickle liquor used as phosphorous precipitant and sludge conditioner in wastewater treatment).
- A material is ``***recycled***'' if it is used, **reused**, or **reclaimed**.

This RIA does not include burning wastes for "***energy recovery***" or otherwise "***using wastes as fuel***" as forms of waste recycling in the scope of EPA's 2011 proposed revisions to the DSW or to this RIA. The word "***re-manufacturing***" has a distinct definition in Option 6 of this RIA.

1A. Purpose of EPA's 2011 Proposed Regulatory Changes

The Environmental Protection Agency (EPA) is proposing to revise the industry regulatory compliance requirements (i.e., conditions) of the recycling exclusions of the "*definition of solid waste*" (DSW) under Subtitle C of the 1976 Resource Conservation and Recovery Act (RCRA). The DSW exclusions involve industrial hazardous secondary materials intended for recycling (i.e., reclamation, recovery, regeneration, or reuse) rather than disposal. Some of the DSW exclusions date back to 1985, whereas other DSW exclusions are relatively new (2008).

EPA's 2011 proposed regulatory revisions are in part, in response to a January 2009 petition submitted to the EPA by the Sierra Club (San Francisco, CA), about potential increases in risks to human health and the environment associated with recycling of industrial hazardous secondary materials excluded under EPA's three 2008 DSW exclusions. These proposed revisions are intended to ensure that the 2008 DSW exclusions encourage recycling in industrial operations under conditions necessary to protect human health and the environment from potential mismanagement of hazardous secondary materials, for example, if such hazardous materials destined for recycling instead become discarded or otherwise mismanaged, resulting in potentially harmful environmental releases of the hazardous materials. In addition, EPA is also proposing revisions to the 32 pre-2008 RCRA exclusions for industrial hazardous secondary material recycling.

The proposed revisions would affect two sets of DSW exclusions and hazardous waste recycling under Subtitle C:

1. Revisions to 2008 DSW exclusions: Revise the 2008 DSW exclusions for certain types of hazardous secondary materials that are conditionally excluded from the DSW. EPA promulgated these exclusions in October 2008 to encourage the recovery and reuse of valuable resources as an alternative to disposal (discard) of such materials as waste, while at the same time maintaining protection of human health and the environment. (73 FR 64688, October 30, 2008).
2. Revisions to pre-2008 DSW exclusions: Add additional regulatory conditions to the pre-2008 DSW exclusions for recyclable materials. The proposed additions include (1) recordkeeping; (2) biennial notification, (3) containment standards, and (d) increasing the number of mandatory eligibility criteria. The pre-2008 DSW recycling exclusions date between 1985 and 1998.
3. Revisions to hazardous waste recycling under Subtitle C: Revise the definition of legitimacy for materials that are regulated under Subtitle C prior to recycling or subject to reduced regulation. The concept of legitimate recycling is used to determine if a unit is a recycling unit exempt from RCRA Subtitle C permitting or is a regulated waste treatment or storage unit subject to full RCRA Subtitle C permitting.

1B. Justification for EPA's Proposed Regulatory Changes

EPA's 2011 proposed revisions to the DSW recycling exclusions are required by law (RCRA). The proposed revisions constitute EPA's notice of action in response to a petition submitted to EPA under section 7004(a) of RCRA:

> *RCRA Section 7004(a) Petition. – Any person may petition the [EPA] Administrator for the promulgation, amendment, or repeal of any regulation under this Act. Within a reasonable time following receipt of such petition, the [EPA] Administrator shall take action with respect to such petition and shall publish notice of such action in the Federal Register, together with the reasons therefor*.

On January 29, 2009, the Sierra Club submitted an administrative petition under RCRA section 7004(a), 42 U.S.C. 6974(a), to the Administrator of EPA requesting that EPA repeal the October 2008 revisions to the DSW and stay the implementation of the rule. The petition argued that the revised regulations are unlawful and that they increase threats to public health and the environment without producing compensatory benefits, and therefore, should be repealed. Among other things, the petition singled out the lack of regulatory definitions in the 2008 DSW exclusions for the words "*contained*" and "*significant release.*" The petition also disagreed with EPA's findings that the 2008 DSW exclusions would have no adverse environmental impacts, including the finding there would be no adverse impact to environmental justice communities (i.e., minority and low-income populations) or children's health. Here is an excerpt from the petition (page 2):

> "*EPA promulgated the DSW Rule on October 30, 2008. The Rule exempted 1.5 million tons (over 3 billion pounds) of hazardous waste from stringent regulation under RCRA, relieving companies handling the most dangerous substances regulated by EPA*

from complying with requirements intended to protect human health and the environment. The Rule is an impermissible abdication of the agency's statutory mandate to prevent spills, midnight dumping, and poor management practices that contaminate air, soil, and water, especially in the minority and low-income neighborhoods disproportionately affected by pollution. By EPA's own analysis the winners are those who wish to "recycle" hazardous waste without the burden of safeguards that have proven effective in reducing harm. The losers are those communities near more than 5,000 chemical companies, pharmaceutical manufacturers, and industrial waste facilities that handle hazardous waste or through which the billions of pounds of deregulated hazardous materials will be transported."

On March 6, 2009, a coalition of industry associations ("industry coalition") submitted a letter to the EPA Administrator in response to the January 2009 Sierra Club petition. The industry coalition consisted of the following organizations (listed below in alphabetical order):

1. Alliance of Automobile Manufacturers
2. American Chemistry Council (ACC)
3. American Coke & Coal Chemicals Institute (ACCCI)
4. American Forest & Paper Association (AF&PA)
5. Metals Industries Recycling Coalition (MIRC) – this organization is a coalition of the following organizations:
    a. American Iron & Steel Institute (AISI)
    b. Copper & Brass Fabricator's Council
    c. Copper Development Association Inc. (CDA)
    d. International Metals Reclamation Company, Inc. (Inmetco)
    e. Specialty Steel Industry of North America (SSINA)
    f. Steel Manufacturers Association (SMA)
6. National Paint & Coatings Association (NPCA)
7. Treated Wood Council (TWC)
8. Synthetic Organic Chemical Manufacturers Association (SOCMA)

This letter requested that EPA deny the Sierra Club's petition on the grounds that the 2008 DSW exclusions comport with prior court cases construing the scope of EPA's jurisdiction to regulate solid waste under RCRA, and that the 2008 DSW exclusions achieve significant economic and conservation benefits, while imposing significant controls on the hazardous secondary material recycling industry that are fully protective of the environment. The letter also responds to each of the specific points raised by the Sierra Club in its petition. Here is an excerpt from the industry coalition letter (page 3):

"*The conditions imposed under the Rule on the generators, reclaimers, intermediate facilities, and transporters seeking to avail themselves of the Rule's exclusions are significant. These conditions, entirely ignored by Sierra Club, are based on the evidence in the record, and are designed to ensure that hazardous secondary materials reclaimed under the Rule's exclusions, are done so legitimately while protecting public health and the environment from potential hazards associated with such hazardous secondary material recycling. Along will the other conditions, the "reasonable efforts" and "financial assurance" requirements*

in particular, will prevent, if not entirely eliminate, the types of mismanagement and abandonment EPA identified during the rulemaking as having contributed to environmental harm at some recycling facilities."

- **June 2009 EPA Public Meeting**

In response to the Sierra Club's administrative petition, EPA issued a May 27, 2009, Federal Register notice (74 FR 25200) describing possible actions and optional paths forward and announcing a public meeting on June 30, 2009, to allow the public and interested stakeholders to provide input to the decision-making process. EPA's May 2009 published notice announcing the planned public meeting, described the scope of possible EPA action. The concept of "*discard*" was the main concept governing the realm of action. As stated in RCRA section 1004(27):

"*[S]olid waste"* is defined as "*any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material ,,, resulting from industrial, commercial, mining and agricultural activities.*"

EPA's May 2009 meeting notice stated EPA did not intend to repeal the 2008 DSW exclusions as requested in Sierra Club's 2009 petition:

"*Because the final revisions to the definition of solid waste are closely tied to EPA's interpretation of ``discard,'' EPA does not expect to completely repeal the rule or stay its implementation, because such an action could result in hazardous secondary materials that are not discarded being regulated as hazardous waste. In particular, EPA said that it does not expect to repeal either the exclusion for hazardous secondary materials reclaimed under the control of the generator or the non-waste determination petition process. However, the Agency stated that there may be opportunities to revise other parts of the definition of solid waste rule, such as the definition of legitimacy and the transfer-based exclusion, in ways that could increase environmental protection, while still appropriately defining when a hazardous secondary material being reclaimed is a solid waste*" (74 FR 25203).

A total of 33 individuals[4] provided verbal comments at EPA's June 30, 2009 public meeting.

- **EPA's Settlement Agreement with the Sierra Club**

On September 7, 2010, EPA signed a settlement agreement with the Sierra Club under which EPA agreed to propose a rule which would address, at minimum, the issues raised in the Sierra Club's administrative petition. As announced in the Federal Register (Vol.74, No.100, May 27, 2009), EPA's June 30, 2009 public meeting addressed four issue areas for potential revision of the 2008 DSW recycling exclusions:

1. Definition of "*contained*"

[4] A list of the names of the 33 individuals and the names of their affiliated organizations is available at http://www.epa.gov/waste/hazard/dsw/speaker-list.pdf

2. Revisions to notification requirements
3. Definition of "*legitimacy*"
4. Revisions to the offsite transfer-based recycling exclusion

The Sierra Club petition also included a request for EPA to immediately stay and revoke the 2008 DSW recycling exclusions. To support this request, the petition asserted that EPA's industrial hazardous secondary materials recycling damage case study demonstrates that hazardous waste recycling has caused substantial harm to health and the environment and that the 2008 DSW final rule increases the likelihood of greater future harm. The petition also asserted that the 2008 DSW final rule does not account for the instability of recycling markets and that current financial conditions increase the risk of hazardous waste abandonment. In addition, the petition asserted that the 2008 DSW final rule will not substantially increase recycling and that the economic benefits are few and will only accrue to deregulated industries. Additionally, the petition claimed that there would be job losses in the hazardous waste treatment industry and increased worker health problems as a result of the rule.

EPA addressed the Sierra Club's request to revoke the 2008 DSW final rule in whole and stay its implementation in the May 27, 2009 public meeting notice, which continues to reflect EPA's current thinking. In that notice, EPA stated at 74 FR 25202:

> *"The scope of possible changes to the definition of solid waste is governed by the concept of "discard." As discussed in the preamble to the DSW final rule, EPA used the concept of discard as the central organizing idea behind the October 2008 revisions to the definition of solid waste. As stated in RCRA section 1004(27), ''solid waste'' is defined as ". . . any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material . . .resulting from industrial, commercial, mining and agricultural activities.'' (emphasis added) Therefore, in the context of the DSW final rule, a key issue relates to the circumstances under which a hazardous secondary material that is recycled by reclamation is or is not discarded (73 FR 64675). In exercising its discretion in the DSW final rule to define what constitutes "discard" for hazardous secondary materials reclamation, EPA included an explanation of how each provision of the final rule relates to discard (73 FR 64676-64679)…..*
>
> *…..Because the final revisions to the definition of solid waste are closely tied to EPA's interpretation of the concept of "discard," EPA does not plan to repeal the rule in whole or stay its implementation. Such an action could result in hazardous secondary materials that are not discarded being regulated as hazardous waste. In particular, EPA does not expect to repeal either the exclusion for hazardous secondary materials reclaimed under the control of the generator or the non-waste determination petition process.*
>
> *However, EPA believes that there may be opportunities to revise or clarify the definition of solid waste rule, particularly with respect to the definition of legitimacy and the transfer-based exclusion, in ways that could improve implementation and enforcement of the provisions, thus increasing environmental protection, while still appropriately defining when a hazardous secondary material being reclaimed is a solid waste and subject to hazardous waste regulation.*"

EPA's Federal Register notice for the 2011 proposed revisions to the DSW includes a discussion of several potential changes to the three 2008 DSW exclusions. In addition, EPA is proposing conforming changes to the 32 pre-2008 DSW and other RCRA industrial recycling exclusions.

- **EPA's New Environmental Justice Analysis for DSW Recycling Exclusions**

The Sierra Club petition asserted that EPA's conclusion that the 2008 DSW final rule would have no adverse environmental impacts, and therefore would have no disproportional adverse impacts to minority and low-income communities, is unsupported by the administrative record. Many commentors (including those at EPA's 2009 public meeting and those who responded with written comments) expressed strong concerns that EPA did not adequately address environmental justice (EJ) in the rulemaking.

In response to these concerns, EPA committed to perform a more rigorous and thorough analysis of the EJ impacts of the 2008 DSW final rule. EPA committed to producing a new EJ analysis to evaluate the potential disproportionate impacts of the 2008 DSW final rule, on both of these two EJ groups (i.e., minority and low-income populations). EPA's shared its January 2009 draft methodology[5] for the EJ analysis with the public in January 2010, and presented the draft methodology to the National Environmental Justice Advisory Committee (NEJAC) and discussed it at three public roundtable meetings (January 28, 2010 New Orleans, LA; February 23, 2010 EPA Potomac Yard Conference Center, Arlington, VA; and February 25, 2010 Web Conference).[6] EPA considered the public comments raised in those meetings and conducted the new EJ analysis. EPA's EJ analysis contractor (ICF Inc.) completed a preliminary draft for EPA internal review in October 2010.

[5] EPA *"Draft Environmental Justice Methodology for the Definition of Solid Waste Final Rule: Proposed Methodology for Assessing Potential Disproportionate Impacts From the Hazardous Secondary Material Recycling Regulations On Minority, Low-Income, and Tribal Population,"* January 13, 2009 at http://www.epa.gov/epawaste/hazard/dsw/ej.htm

[6] Additional information about these three public roundtable meetings is available from EPA's website at http://www.epa.gov/epawaste/hazard/dsw/ej-meet.htm

CHAPTER 2

Regulatory Options Evaluated in This RIA

The scope of revisions to the RCRA DSW exclusion regulations evaluated in this RIA, include the following options and sub-options.

Option 1: Withdraw the 2008 DSW Exclusion for Offsite Transfer Recycling

Withdraw the 2008 DSW exclusion at 40 CFR 261.4(a)(24) and (25) for hazardous secondary materials that are transferred offsite for the purpose of reclamation, and replace it with alternative RCRA Subtitle C regulations for hazardous recyclable materials under Option 2 below.

- Option 2 below is a companion to this option, as it presents a regulatory alternative for offsite reclamation if the 2008 DSW offsite reclamation exclusion is withdrawn.

Option 2: Implement Alternative RCRA Subtitle C Regulation for Offsite Transfer Recycling

As a corollary to Option 1 above, implement an alternative RCRA Subtitle C regulation for hazardous recyclable materials that are transferred offsite for reclamation. Waste generators would need to meet the following requirements:

(2A) Notification: Submit a notification prior to operating under this new RCRA regulation, and thereafter biennially using EPA Form 8700-12.

(2B) Reclamation plan: Make advance arrangements for legitimate reclamation and documents those arrangement in a reclamation plan.

(2C) Accumulation: Allow accumulation of hazardous recyclable materials by the generator for up to one year, but accumulate no more than two shipments of hazardous recyclable materials at any one time.

(2D) Management: Meets labeling, emergency preparedness, contingency planning and management standards similar to those required for hazardous waste generators.

(2E) Transportation: Sends the hazardous recyclable materials under either a hazardous recyclable materials manifest or a hazardous waste manifest to a RCRA permitted reclamation facility and maintain records of shipments for three years.

Option 3: Revise the 2008 DSW Exclusion for Generator Controlled Recycling

Modify the 2008 DSW exclusion for hazardous secondary materials reclaimed under the control of the generator by:

(3A) Add a regulatory definition of "contained".

(3B) Make notification a condition of the exclusion.

(3C) Add a recordkeeping requirement for speculative accumulation.

(3D) Add a recordkeeping requirement for reclamation under toll manufacturing agreements.

(3E) Eliminate the 2008 DSW "toll manufacturing" recycling exclusion.

(3F) Relocate the non-land based and land-based unit operational requirements in 40 CFR 261 so they both appear in the same section.

Option 4: Revise the 2008 DSW Definition of "*Legitimate*" Recycling

Revise the 2008 DSW definition of legitimate recycling (i.e., legitimacy) by:

(4A) Apply the codified definition to all industrial recycling under the pre-2008 set of regulatory exclusions.

(4B) Make all 4 legitimacy factors[7] mandatory, with a petition process where one factor is not met but the recycling is still legitimate for the 2008 DSW regulatory exclusions and hazardous wastes being recycled under Subtitle C.

(4C) Require documentation of recycling legitimacy for the 2008 DSW regulatory exclusions and hazardous wastes being recycled under Subtitle C.

Option 5: Revise the 1985 Partial Recycling Variance and 2008 DSW Non-Waste Determination Petition Processes

Modify the non-waste determination petition process by requiring:

(5A) Require applicants to re-apply in the event the material no longer meets the relevant criteria under 40 CFR 260.33(c).

(5B) Require biennial notification using EPA Form 8700-12 in compliance with 40 CFR 260.42.

(5C) Modify the 1985 40 CFR 260.31(c) DSW variance for partially recycled materials:

EPA's 1985 40 CFR 260.31 RCRA regulation contains three DSW variances for certain types of recyclable industrial materials:

- 40 CFR 260.31(a): Materials accumulated without 75% being recycled within one year.
- 40 CFR 260.31(b): Materials that are reclaimed and then reused within the original primary process in which generated.
- 40 CFR 260.31(c): Materials that have been partially reclaimed but must be reclaimed further before recovery is completed.

The CFR regulatory text for each of these three variances states that EPA's determination of whether to grant requests for these variances "*will be based on the following criteria/factors.*" However, when EPA originally promulgated this variance on January 4, 1985 (Federal Register, Vol.50, No.3, pages 614 to 668), EPA stated in the preamble for two of the three variances (i.e., (b) and (c)), that the Regional Administrator or authorized state under variance (b) "*can rely on any or all of*

[7] The four recycling "legitimacy" factors finalized in EPA's October 2008 DSW recycling exclusions final rule are:

- Factor 1 - Useful Contribution: "Legitimate recycling must involve a hazardous secondary material that provides a useful contribution to the recycling process or to a product of the recycling process…The hazardous secondary material provides a useful contribution if it (i) contributes valuable ingredients to a product or intermediate; or (ii) replaces a catalyst or carrier in the recycling process; or (iii) is the source of a valuable constituent recovered in the recycling process; or (iv) is recovered or regenerated by the recycling process; or (v) is used as an effective substitute for a commercial product" (40 CFR 260.43(b)(1)).
- Factor 2 - Valuable Product or Intermediate: "The recycling process must produce a valuable product or intermediate…The product or intermediate is valuable if it is (i) sold to a third-party or (ii) used by the recycler or the generator as an effective substitute for a commercial product or as an ingredient or intermediate in an industrial process" (40 CFR 260.43(b)(2)).
- Factor 3 - Managed as a Valuable Commodity: "The generator and the recycler should manage the hazardous secondary material as a valuable commodity. Where there is an analogous raw material, the hazardous secondary material should be managed, at a minimum, in a manner consistent with the management of the raw material. Where there is no analogous raw material, the hazardous secondary material should be contained. Hazardous secondary materials that are released to the environment and are not recovered immediately are discarded" (40 CFR 260.43(c)(1)).
- Factor 4 - Comparison of Toxics in the Product: "The product of the recycling process does not (i) contain significant concentrations of any hazardous constituents found in Appendix VIII of 40 CFR 261 that are not found in analogous products; or (ii) contain concentrations of any hazardous constituents found in Appendix VIII of 40 CFR 261 at levels that are significantly elevated from those found in analogous products; or (iii) exhibit a hazardous characteristic (as defined in 40 CFR 261 subpart C) that analogous products do not exhibit" (40 CFR 260.43(c)(2)).

these criteria, and can weigh them as he deems appropriate," and under variance (c) "*may weigh these factors as she sees fit, and may rely on any or all of them to reach a decision.*" Upon EPA's reflection and experience, this approach under variance (c) is too ambiguous and further clarification is required. More specifically, EPA believes the six criteria for variance (c) must be reviewed and evaluated collectively since each criterion reinforces and supports the other criteria. Failure to meet any one criterion is sufficient not to grant a variance. Similarly, EPA believes that modifying the six criteria to make it clear at what point in the reclamation process the variance is intended to apply would foster greater clarity and consistency in application. Therefore, this option consists of two corresponding revisions to 40 CFR 260.31(c):

(1) Require all six of the 1985 criteria for evaluating partial recycling variance applications be met, not "*on any or all of them.*"

(2) Modify wording of five of the six criteria to make it clear at what point in the recycling process the variance is intended to apply would foster greater clarity and consistency in application, as follows (additions shown in *italics*):

1. The degree of processing the material has undergone by the *initial partial reclamation process* and the degree of further processing that is required.
2. The value of the material after it has been *partially* reclaimed.
3. The degree to which the *partially reclaimed* material is like an analogous raw material *entering the final reclamation process*.
4. The extent to which an end market for the *partially reclaimed* material is guaranteed.
5. The extent to which the *partially reclaimed* material is handled to minimize loss.
6. Other relevant factors.

This option would not require RCRA-authorized state government agencies or EPA Regional Offices to re-visit previously granted variances.

(5D) Non-waste determination petitioners to demonstrate why they cannot or should not meet existing DSW exclusions (at 40 CFR 261.2 or 261.4).

(5E) Change the word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34, due to the regional- and case-specific nature of non-waste determinations.

Option 6: Add a "*Re-Manufacturing*" DSW Exclusion

Add a new DSW recycling exclusion involving inter-company transfer for off-site reclamation of solvents via "re-manufacturing" (i.e., transfer from one manufacturer to another) for the purpose of extending the useful life of the original solvent, by keeping the solvent in commerce to reproduce a commercial grade of the original solvent for continued use as a "processing aid" to manufacturing. This exclusion would operate according to the following five eligibility criteria and three other sub-options:

(6A) Eligibility criteria:

(6A.1) 18 types of solvents only:

1. Toluene
2. Xylenes
3. Ethylbenzene
4. 1,2,4-trimethylbenzene

5. Chlorobenzene
6. n-hexane
7. Cyclohexane
8. Methyl tert-butyl ether
9. Acetonitrile
10. Chloroform
11. Chloromethane
12. Dichloromethane
13. Methyl isobutyl ketone
14. N,N-dimethylformamide
15. Tetrahydrofuran
16. Ethanol
17. n-butyl alcohol
18. Methanol

(6A.2) Solvents (a) to be re-manufactured originate from, and (b) after re-manufacturing must be used in, three types of functional uses as manufacturing "processing aids" (i.e., not cleaning or de-greasing operations):

1. Chemical manufacturing aid (reacting, extracting, and/or purifying chemicals) – plus for the re-manufacturer use as a chemical intermediate function in which the chemical gets consumed (destroyed) in chemical manufacturing reactions.
2. Chemical processing aid (extracting and purifying chemicals)
3. Chemical formulation aid (blending chemicals)

(6A.3) Solvents to be re-manufactured originate from four manufacturing sectors only:

1. NAICS 325199 basic organic chemical manufacturing
2. NAICS 325211 plastics & resins manufacturing
3. NAICS 325412 pharmaceutical manufacturing
4. NAICS 325510 paints & coatings manufacturing

(6A.4) Five exclusion conditions for <u>both</u> the generator and the re-manufacturer:

1. Initial notification and update notification every 2-years.
2. Maintain onsite a copy of a re-manufacturing plan.
3. 3-year recordkeeping of shipments and shipment confirmation receipts between generator and re-manufacturer.
4. (a) Prior to re-manufacturing store solvents in labeled tanks or containers meeting 40 CFR 264 subparts I and J RCRA Subtitle C hazardous waste regulations for the design, operation & maintenance, inspection, and end-of-life closure of containers and tanks, respectively; and (b) during re-manufacturing comply with 40 CRF 264 subparts AA, BB, CC RCRA hazardous waste regulations for process vent, equipment leak, and tank/ container air emission controls, respectively.
5. No speculative accumulation according to the RCRA hazardous waste regulation 40 CFR 261.1(c)(8): during a calendar year at least 75% of the material accumulated onsite from the beginning of the year to be recycled (either onsite or offsite) is actually recycled.

(6B) Use of intermediate storage facilities not allowed for this exclusion.
(6C) Addition of other conditions or restrictions including, but not limited to, additional recordkeeping and reporting requirements, management standards, financial assurance requirements, and public participation requirements. Note: this RIA does not evaluate this roughly- and incompletely-defined sub-option.
(6D) Petition process for requests to add certain chemicals, industries, and/or chemical function uses to the re-manufacturing criteria.

Option 7: Revise pre-2008 DSW Recycling Exclusions & Exemptions

Revise the pre-2008 DSW recycling exclusions for recyclable materials by requiring:

(7A) Containment ("contained") standards for excluded hazardous secondary material – applies to 31 DSW exclusions*(7B) Biennial notification for facilities operating under the various exclusions and exemptions – applies to 31 DSW exclusions*
(7C) Recordkeeping for speculative accumulation in all cases – applies to 40 CFR 261.4 DSW exclusions*

* Note: Exhibit 2A below identifies the three different sets of exclusions under each of the three sub-options in Option 7. However, because EPA needed to launch and formulate the analyses for this RIA a few months before EPA defined the three detailed lists of affected RCRA exclusions under Option 7, this RIA evaluated Option 7 --- and all other options affecting pre-2008 DSW regulatory exclusions --- by applying the 16 pre-2008 DSW exclusions listed in Exhibit 2A of EPA's 2008 "*Regulatory Impact Analysis*" (RIA) for the October 2008 DSW final rule. The list of 16 pre-2008 DSW exclusions applied in this RIA, is also presented in the baseline cost analysis chapter of this RIA. Because of the facts that (a) the 16 pre-2008 DSW exclusions listed in Exhibit 2A also cover all manufacturing industries (i.e., NAICS 31, 32, 33), and (b) manufacturing industries constitute 88% of the top-50 US nationwide hazardous waste generation annual tonnage (source: Exhibit 1.9 of EPA's 2009 RCRA Hazardous Waste Biennial Report at http://www.epa.gov/waste/inforesources/data/br09/national09.pdf), using the 16 pre-2008 DSW exclusions to represent all of the 32 exclusions listed in Exhibit 2A, is a reasonable estimation approach. Other industries in the top-50 hazardous waste generators are in economic sub-sectors NAICS 221, 236, 423, 424, 454, 488, 493, 531, 541, 562, 611, 924, 928. However, not all of these other industries have industrial operations or waste types which may be eligible under the other recycling exclusions.

Option 8: Other Options Evaluated in this RIA Not Listed Above

Other options were evaluated during the process of developing this RIA that are not proposed. These options include the following:

(8A) Contained performance standard for transfer-based exclusion,
(8B) Intermediate facility restriction for transfer-based exclusion,
(8C) Provision for facilities in non-adopting states to qualify under the transfer-based exclusion, and

Exhibit 2A
List of Pre-2008 DSW Recycling Exclusions and Exemptions Potentially Affected Under Option 7

Row Item	RCRA Regulatory Exclusion Citation	Exclusion Description (types of eligible industrial processes or industrial secondary materials)	Conditions to Meet RCRA Exclusion	Require Legitimate Recycling 260.43	Require Notification 260.42	Require Contained 260.10	Require Speculative Accumulation 261.1(c)(8)
260 & 261 Definition of Solid Waste							
1	260.30	Procedures for variances and non-waste determinations	Meet eligibility criteria; terms of variance or non-waste determination	Yes	Yes	Yes (In addition to management standards set by variance/determination.)	No - limits determined on a case-by-case basis.
2	261.2 (e)	Use/Reuse	Reclamation prohibited; must be returned to the original process; no land placement; No burning for energy recovery; must meet speculative accumulation limits	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
3	261.2 Table 1	Characteristic sludge being reclaimed	Must meet speculative accumulation limits	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
4	261.2 Table 1	Characteristic by-products being reclaimed	Must meet speculative accumulation limits	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
5	261.2 Table 1	Commercial chemical products being reclaimed	None	Yes	Yes	Yes	No
261.4(a) Exclusions from the Definition of Solid Waste							
6	261.4(a)(6)	Pulping Liquors	Must meet speculative accumulation limits	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
7	261.4(a)(7)	Spent Sulfuric Acid	Must meet speculative accumulation limits	Yes	Yes	Yes	*(Speculative accumulation limits already*

Exhibit 2A List of Pre-2008 DSW Recycling Exclusions and Exemptions Potentially Affected Under Option 7							
Row Item	RCRA Regulatory Exclusion Citation	Exclusion Description (types of eligible industrial processes or industrial secondary materials)	Conditions to Meet RCRA Exclusion	Require Legitimate Recycling 260.43	Require Notification 260.42	Require Contained 260.10	Require Speculative Accumulation 261.1(c)(8)
							required.)
8	261.4(a)(8)	Closed-Loop Recycling	Only tank storage; connected by pipes; no controlled flame combustion; must meet speculative accumulation limits; no burning for energy recovery, no land placement	Yes	Yes	Yes (In addition to management standards in exclusion.)	*(Speculative accumulation limits already required.)*
9	261.4(a)(9)	Spent Wood Preservatives	Reused on-site for intended purpose; managed to prevent releases; meets drip pad standards; one-time notification	Yes	Yes	Yes (In addition to management standards in exclusion.)	Yes
10	261.4(a)(10)	Coke By-Product Wastes	No land disposal	Yes	Yes	Yes	Yes
11	261.4(a)(11)	Splash Condenser Dross Residue	Shipped in drums; no land disposal	Yes	Yes	Yes	Yes
12	261.4(a)(12)	Hazardous Oil-Bearing Secondary Materials and Recovered Oil from Petroleum Refining Operations	No land placement; must meet speculative accumulation limits; coke product also does not exhibit characteristic	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
13	261.4(a)(13)	Processed Scrap Metal	None	Yes	Yes	Yes	Yes
14	261.4(a)(14)	Shredded Circuit Boards	Stored in containers sufficient to prevent release; free of mercury switches,	Yes	Yes	Yes (In addition to management standards in exclusion.)	Yes

Exhibit 2A List of Pre-2008 DSW Recycling Exclusions and Exemptions Potentially Affected Under Option 7							
Row Item	RCRA Regulatory Exclusion Citation	Exclusion Description (types of eligible industrial processes or industrial secondary materials)	Conditions to Meet RCRA Exclusion	Require Legitimate Recycling 260.43	Require Notification 260.42	Require Contained 260.10	Require Speculative Accumulation 261.1(c)(8)
			batteries				
15	261.4(a)(16)	Comparable Fuels	Meet requirements of 261.38	Yes	Yes	Yes (In addition to management standards in exclusion.)	*(Speculative accumulation limits already required.)*
16	261.4(a)(17)	Mineral Processing Spent Materials	Legitimately recycled; Must meet speculative accumulation limits storage standards; notification	Yes	Yes	Yes (In addition to management standards in exclusion.)	*(Speculative accumulation limits already required.)*
17	261.4(a)(18)	Petrochemical Recovered Oil	Oil is characteristic only; No placement on the land; Must meet speculative accumulation limits; meets definition of associated organic chemical manufacturing facility	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
18	261.4(a)(19)	Spent Caustic Solutions from Petroleum Refining	No land placement; must meet speculative accumulation limits	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
19	261.4(a)(20)	Hazardous Secondary Materials Used to Make Zinc Fertilizers	Must meet speculative accumulation limits; one-time notice; storage standards; shipment records; annual reports	Yes	Yes	Yes (In addition to management standards in exclusion.)	*(Speculative accumulation limits already required.)*
20	261.4(a)(21)	Zinc Fertilizers Made from	Contaminant limits; sampling and	Yes	Yes	Yes (In addition to management standards in	No- zinc fertilizers

Exhibit 2A List of Pre-2008 DSW Recycling Exclusions and Exemptions Potentially Affected Under Option 7							
Row Item	RCRA Regulatory Exclusion Citation	Exclusion Description (types of eligible industrial processes or industrial secondary materials)	Conditions to Meet RCRA Exclusion	Require Legitimate Recycling 260.43	Require Notification 260.42	Require Contained 260.10	Require Speculative Accumulation 261.1(c)(8)
		Recycled Hazardous Secondary Materials	analysis; records			exclusion.)	already recycled
21	261.4(a)(22)	Used Cathode Ray Tubes (CRTs)	No disposal; must meet speculative accumulation limits; meet export requirements	Yes	Yes (within US)	Yes (within US)	*(Speculative accumulation limits already required.)*
261.4(b) Solid wastes which are not hazardous wastes (i.e., exclusions from the RCRA Definition of Hazardous Waste)							
22	261.4(b)(12)	Spent Chlorofluorocarbon Refrigerants	Must be reclaimed	Yes	Yes	Yes	No
23	261.4(b)(14)	Used Oil Distillation Bottoms used to manufacture asphalt products	None	Yes	Yes	Yes	No
261.6 Requirements for recyclable materials							
24	261.6(a)(3)(ii)	Scrap metal	None	Yes	Yes	Yes	No
25	261.6(a)(3)(iii)	Waste-derived fuels from refining processes	None	Yes	Yes	Yes	No
26	261.6(a)(3)(iv)	Unrefined waste-derived fuels and oils from petroleum refineries	No distillation; meets used oil specs under 279.11	Yes	Yes	Yes	No
27	261.6(c)(2)	Reclaimers that do not store	Subject to notification, AA/BB, manifest	Yes	Yes	Yes	No
261.7 Residues of hazardous waste in empty containers							
28	261.7	Residues of hazardous waste in empty containers	Quantity limits; handling conditions	No- Does not involve reclamation of hazardous secondary materials	Yes	Yes	No

Exhibit 2A
List of Pre-2008 DSW Recycling Exclusions and Exemptions Potentially Affected Under Option 7

Row Item	RCRA Regulatory Exclusion Citation	Exclusion Description (types of eligible industrial processes or industrial secondary materials)	Conditions to Meet RCRA Exclusion	Require Legitimate Recycling 260.43	Require Notification 260.42	Require Contained 260.10	Require Speculative Accumulation 261.1(c)(8)
Part 266 Standards for the Management of Specific Hazardous Wastes							
29	266 Subpart C	Recyclable Materials Used in a Manner Constituting Disposal	Meet treatment standards	Yes	Yes	Yes (In addition to management standards in exclusion.)	No
30	266 Subpart F	Materials Utilized for Precious Metal Recovery	Notification; export requirements; records; must meet speculative accumulation limits	Yes	Yes	Yes	*(Speculative accumulation limits already required.)*
31	266 Subpart G	Spent Lead-Acid Batteries Being Reclaimed	Multiple conditions.	Yes	Yes	Yes	No
32	266 Subpart H	Hazardous Waste Burned in Boilers and Industrial Furnaces	Multiple conditions.	Yes	Yes	Yes (In addition to management standards in exclusion.)	No
			Column total counts with "Yes" =	30	31	31	18

* Note: Criteria for Selecting Conditions:
Legitimate Recycling - Must involve recycling/recovery
Notification - Must have conditions that need compliance monitoring
Contained- Must not already contain management standards
Changes to Speculative Accumulation

CHAPTER 3

Baseline Industrial Entities & Materials Potentially Affected by the 2011 Proposed Revisions to the DSW Recycling Exclusions

This chapter identifies the types and associated counts/quantities of industrial facilities, hazardous secondary materials, and hazardous wastes potentially affected by the 2011 proposed revisions to the DSW exclusions. These counts/quantities form the physical basis in this RIA for estimating potential industry costs from the 2011 proposed revisions. Because some of the 2011 proposed revisions potentially affect the 2008 DSW final rule recycling exclusions, whereas other 2011 proposed revisions potentially affect the pre-2008 DSW exclusions, this chapter presents two separate populations of potentially affected facilities/materials/wastes, each based on different databases.

3A. 2008 DSW Recycling Exclusions: Baseline Industrial Recycling Potentially Affected

The RCRA Hazardous Waste Biennial Report (http://www.epa.gov/osw/inforesources/data/biennialreport/index.htm) is a census of the company identity, location, industrial sources, waste types, waste quantities, and methods of hazardous waste generation, shipment, receipt, and TSDR management (i.e., treatment, storage, disposal, recycling) at two classes of RCRA-regulated facilities:

- Generators: RCRA hazardous waste large quantity generators (i.e., LQG sites which generate 1,000 kilograms (2,200 pounds) or more of hazardous waste in any single calendar month). LQGs are required to complete a single "**Form GM**" for each hazardous waste generated in each data year. In 2007, **16,387 LQGs** submitted about **210,000 GM forms** to the RCRA Biennial Report The count of GM forms indicates the count of waste streams generated by LQGs in each data year.

- Receivers: RCRA hazardous waste TSDR facilities are required to complete a "**Form WR**" for all hazardous wastes received in the data year. Each Form WR contains separate "waste blocks" (i.e., data fields) for reporting data on separate waste streams received from different generators. In 2007, **541 waste receivers** submitted about **873,000 WR form waste blocks**. The count of WR form waste blocks indicates the count of waste streams received by TSDRFs in each year.

The RCRA Biennial Report (BR) includes both one-time generated industrial wastes (e.g., equipment closure, corrective action site cleanup) as well as annually recurring generated industrial process wastes. This database is the primary source used in this RIA to identify the 2008 DSW final rule current (i.e., baseline) hazardous secondary materials generated that have the potential to become affected by technical provisions under the 2011 DSW proposed rule. These hazardous secondary materials were reported as hazardous wastes in the 2007 BR. Small quantity generators (i.e., SQGs which generate between 100 and 1,000 kilograms per month) and conditionally exempt small quantity generators (i.e., CESQGs which generate less than 100 kilograms per month) are not required to submit hazardous waste data to the BR. However, SQG waste quantities may be reflected in the BR because SQGs typically rely on offsite commercial TSDRFs for management of their hazardous wastes.

The BR is the most complete set of data on industrial hazardous waste generation available given it is a census of LQGs and TSDRFs. It is the best existing database for evaluating changes to RCRA regulations, given the fact that data are reported on the waste stream level by single facilities (some facilities may generate multiple and different waste streams within any given year). As mentioned previously, the Biennial Report does not explicitly include data for SQGs and CESQGs. Consequently, the regulatory cost savings estimates might be expected to increase if the universe of SQGs and CESQGs were explicitly included in this RIA. However, this increase would mostly occur from addition of SQG data because CESQGs are already excluded from most RCRA regulations.[8]

Pre-2008 recycling exclusions under RCRA regulations (i.e., 40 CFR 261.2(3) and 261.4(a)) provided 32 DSW exclusions for recycling of certain types of industrial hazardous secondary materials (Exhibit 2A). The earliest DSW exclusion dates back to 1985. The respective counts of industries, facilities, and waste streams potentially affected by the 2008 DSW final rule did not apply to these pre-2008 excluded industries and hazardous secondary materials. The 2011 DSW proposed rule does affect these excluded hazardous secondary materials. Accurate data on the nationwide annual quantities of pre-2008 excluded hazardous secondary materials are not readily available because they are not subject to biennial reporting to the EPA under the RCRA Subtitle C hazardous waste regulations. Data that EPA has identified for pre-2008 excluded hazardous secondary materials are presented at the end of the chapter.

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[8] SQGs: The exclusion of SQGs from this analysis reflects the RCRA exclusion of SQGs from reporting to the RCRA Hazardous Waste Biennial Report. Consequently, EPA does not collect regularly updated data on RCRA waste volumes generated by SQGs. Omission of explicit data on SQGs does not necessarily mean that this analysis excludes small and medium size companies for the following reasons:

- Not all SQGs necessarily represent small or medium size companies, and not all LQGs represent large companies, based on either (a) company employee count or (b) company annual sales revenues, two alternative measures used by the Small Business Administration to define "small business" (http://www.sba.gov/contractingopportunities/officials/size/index.html).
- Furthermore, many SQGs are not in the same industries and markets with LQGs; for example, the top-5 largest LQG industries in 2003 based on annual tons waste generated are (1) NAICS 3251 Basic Chemical Mfg, (2) NAICS 3241 Petroleum & Coal Products Mfg, (3) NAICS Waste Treatment & Disposal, (4) NAICS 3252 Resin, Synthetic Rubber, Synthetic Fibers & Filaments Mfg, and (5) NAICS 3311 Iron & Steel Mills & Ferroalloy Mfg, all of which are capital-intensive industries predominantly populated with relatively larger size companies (source: Exhibit 1.9 at: http://www.epa.gov/epaoswer/hazwaste/data/br03/national03.pdf). In contrast, SQGs are predominantly in different industries; for example, the top-5 SQG industries in aggregate constituting 98.3% SQGs and only 1.7% LQGs are (1) NAICS 8111 Automotive Repair & Maintenance, (2) NAICS 3231 Printing & Related Support Activities, (3) NAICS 332 Fabricated Metal Product Mfg , (4) NAICS 4411 Motor Vehicle & Parts Dealers, and (5) NAICS 5111 Print Publishing Industries, based on estimated establishment counts in OSW's July 2003 economic impact analysis for the RCRA spent solvent industrial wipes proposed rule (see page 90 of document ID nr. EPA-HQ-RCRA-2003-0004-0004 at http://www.regulations.gov).
- Although there is not necessarily a high degree of correlation in any single industry between RCRA regulatory status (i.e., LQG, SQG, CESQG) and facility size measured by employee count or annual revenues, comparison of respective RCRA biennial hazardous waste generation volumes (i.e., tons per year) indicate that SQGs are probably much smaller in average size than LQGs. Consequently, most SQGs send their wastes offsite for treatment, disposal or recycling by commercial hazardous waste management facilities because they lack economy-of-scale to manage the wastes themselves, and for other business reasons. Based on 1997 data (source: Steven Brown, Margaret James & Gary Light, ICF Consulting, "SQG Up-Date" 31 July 2000 memorandum to Peggy Vyas, OSW), there are about 114,000 SQGs which generate a total of between 600,000 to 930,000 tons/year of RCRA hazardous waste, which represents an average SQG waste size of 5.3 to 8.2 tons/year. As an example, if this average SQG volume consisted of spent solvents, it would be equivalent to 24 to 37 barrels per year, or 2 to 3 barrels per month (@8 lbs/gallon and @55 gallons/barrel). Compared to the 17,700 LQGs which generate 30,176,000 tons for an average LQG waste size of 1,705 tons/year (as of 2003) --- which represents 7,750 barrels per year or 646 barrels per month of spent solvent as an example waste material --- SQGs are only 0.3% to 0.5% the size of an average LQG. EPA does not expect SQGs will experience an adverse disproportional effect of the 2011 DSW proposed rule if SQGs lack economy-of-scale to justify capital investment in new generator controlled recycling operations, because SQGs are alternatively eligible for DSW offsite transfer recycling exclusion and the associated technical revisions.

Exhibits 3A to 3G below summarize the Biennial Report (BR) dataset for baseline hazardous waste recycling for 2007 for wastes affected by the 2008 DSW final rule. Data year 2007 is used in this RIA to represent the current (i.e., baseline) year because EPA had to launch this RIA before the more recent data year 2009 became available. The BR database only contains the primary NAICS code for each waste generator and waste management facility. However, many industrial facilities have more than one NAICS code corresponding to different types of industrial operations within a single facility, but the entire quantity of hazardous waste undergoing recycling is reported under a single NAICS code for each single facility in the BR dataset.

For each historical data year (i.e., 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007) the BR national total "management" quantity (tons) does not necessarily equal the national total "generation" quantity (tons) because:

1. Some hazardous waste tonnages may be double-counted in "management" because they undergo two or more management steps in a management train.
2. Some wastes may have been generated near year-end but managed (i.e., treated, recycled or disposed) in the next year.
3. Export of generated wastes for management in other countries.
4. Import of wastes generated in other countries for management in the US.

Exhibit 3A below summarizes the three types of recycling included in the RCRA Biennial Report, and their associated 2007 count of facilities and hazardous waste management tonnages, distinguished between onsite and offsite recycling.

Exhibit 3A
Three Categories of RCRA Hazardous Waste Baseline Recycling (2007*)

Hazardous Waste Recycling Category (Biennial Report management code**)	A	B	C	D	E (C+D)	F	G	H (F+G)
	2007 count of facilities generating wastes that are recycled	2007 count of waste streams that are recycled	2007 Count of Facilities Recycling			2007 Quantity Recycled (tons per year)		
			Onsite	Offsite (Received from offsite)	Total facilities	Onsite	Offsite (Received from offsite)	Total (tons/year)
H010: Metals recovery: high temperature metals recovery, retorting, secondary smelting, & other metals recovery (e.g., ion exchange, reverse osmosis, acid leaching).	2,019	4,093	50	104	137	265,626	1,064,888	1,330,514
H020: Solvents recovery: fractionation/ distillation, thin film evaporation, & solvent extraction.	2,101	3,211	392	76	456	106,147	222,784	328,931
H039: Other recovery: acid regeneration, waste oil recovery, non-solvent organic liquids recovery, & other miscellaneous recovery methods except energy recovery or use as fuel.	867	1,334	36	32	65	150,784	184,309	335,093
Non-duplicative totals =	**4,321**	**8,584**	**467 (75%)**	**189 (30%)**	**624 (100%)**	**522,557 (26%)**	**1,471,981 (74%)**	**1.995 million (100%)**

Explanatory Notes:

- * All data represents counts and quantities included in the 2007 National Biennial Report: http://www.epa.gov/osw/inforesources/data/br07/national07.pdf. Some facilities recycled wastes in more than one management method, and some facilities both generated onsite and received from offsite. Thus, the facility counts and percentages will sum to more than 100%.
- ** Beginning with BR data year 2001, EPA changed the BR hazardous waste management codes. For a comparison of the new waste management codes with pre-2001 codes, see p.81 of "2001 Hazardous Waste Report Instructions and Forms": http://www.epa.gov/osw/inforesources/data/brs01/ins-frms01.pdf.

Exhibit 3B below compares the 2007 baseline recycling data (Columns E & F) to data on hazardous waste total generation (Columns A & B) and to total management (Columns C & D), according to 2-digit NAICS code economic sub-sector.

Exhibit 3B
Identity of Industries Generating & Recycling RCRA Hazardous Wastes Which are Currently Recycled (2007)*

			A	B	C	D	E	F	G (F/D)x100	H (100%-G)
			Waste Generation		Waste Management		Waste Recycling			
Item	Economic Sub-Sector (2-digit NAICS Code)		Count of Generators	Tons Per Year Generated	Count of Receivers	Tons Per Year Managed	Count of Recyclers	Tons Per Year Recycled	% Recycled	% Not Recycled
1	11	Ag, Forestry, Fishing, Hunting	27	2,094	1	70	1	70	100.0%	0%
2	21	Mining	123	18,010	4	399	2	4	1.0%	99.0%
3	22	Utilities	593	30,891	9	4,654	1	<0.5	<0.1%	>99.9%
4	23	Construction	309	43,080	4	714	3	669	93.7%	6.3%
5	31	Manufacturing	172	18,531	11	6,627	7	136	2.1%	97.9%
6	32	Manufacturing	4,198	24,167,001	454	25,956,865	202	535,749	2.1%	97.9%
7	33	Manufacturing	6,045	4,706,082	449	3,904,876	213	1,085,944	27.8%	72.2%
8	42	Wholesale Trade	601	94,812	24	537,435	13	16,549	3.1%	96.9%
9	44	Retail Trade	265	1,935	1	6	1	6	100.0%	0.0%
10	45	Retail Trade	61	1,629	1	<0.5	-	-	0%	100%
11	48	Transportation	778	72,403	21	386,489	6	31	<0.1%	>99.9%
12	49	Postal, Couriers, Warehousing	292	33,988	6	97	-	-	0%	100.0%
13	51	Information	53	10,994	16	13,881	2	12,106	87.2%	12.8%
14	52	Finance & Insurance	7	794	-	-	-	-	-	-
15	53	Real Estate, Rental & Leasing	98	43,287	9	3,496	2	<0.5	<0.1%	>99.9%
16	54	Prof, Scientific & Tech Services	543	45,326	36	86,506	12	71	0.1%	99.9%
17	55	Mgt of Companies/Enterprises	10	188	1	132,074	-	-	0%	100.0%
18	56	Admin, Waste Mgt, Remediation	707	2,745,713	216	5,258,957	102	342,901	6.5%	93.5%
19	61	Educational Services	423	16,720	33	99	20	53	53.5%	46.5%
20	62	Health Care, Social Assistance	293	14,609	25	75	22	71	94.7%	5.3%
21	71	Arts, Entertainment, Recreation	32	2,104	-	-	-	-	-	-
22	72	Accommodation & Food Services	9	11,553	-	-	-	-	-	-
23	81	Other Services	274	22,609	5	3,666	3	22	0.6%	99.4%
24	92	Public Administration	473	165,065	56	50,412	12	157	0.3%	99.7%
25	??	NAICS code not provided	1	62	-	-	-	-	-	-
		Column totals =	16,387	32,269,481	1,382	36,347,398	624	**1.995 million**	**5.5%**	**94.5%**

Explanatory Notes:
* Source: EPA 2007 RCRA Hazardous Waste Biennial Report: http://www.epa.gov/osw/inforesources/data/br07/index.htm; 1 ton = 2,000 pounds ("short-ton").
** (-) Indicates no management reported in 2007. Recycling cannot be determined for wastes that have no management information (excluding management by storage).

Exhibit 3C below presents the 2007 data for the three recycling methods (i.e., H010, H020, H039) according to 2-digit NAICS economic sub-sector.

Exhibit 3C
Annual Quantity of RCRA Hazardous Wastes Which are Currently Recycled by Type of Generator Industry (2007)

A	B		C	D	E	F (C+D+E)	
Item	Generator Industry 2-digit NAICS code		Managed by H010 Metals Recovery (tons per year)	Managed by H020 Solvents Recovery (tons per year)	Managed by H039 Other Recovery (tons per year)	Row Totals Managed by Recovery (tons per year)	
1	11	Ag, Forestry, Fishing, Hunting	-	70	-	70	<0.1%
2	21	Mining	1	-	3	4	<0.1%
3	22	Utilities	-	<0.5	-	0	<0.1%
4	23	Construction	-	669	-	669	<0.1%
5	31	Manufacturing	-	136	-	136	<0.1%
6	32	Manufacturing	203,064	144,645	188,039	535,749	26.9%
7	33	Manufacturing	1,041,186	6,380	38,378	1,085,944	54.4%
8	42	Wholesale Trade	126	16,397	25	16,549	0.8%
9	44	Retail Trade	-	6	-	6	<0.1%
10	45	Retail Trade	-	-	-	-	-
11	48	Transportation	19	11	-	31	<0.1%
12	49	Postal, Couriers, Warehousing	-	-	-	-	-
13	51	Information	<0.5	12,106	-	12,106	0.6%
14	52	Finance & Insurance	-	-	-	-	-
15	53	Real Estate, Rental & Leasing	-	<0.5	-	<0.5	<0.1%
16	54	Prof, Scientific & Tech Services	-	71	-	71	<0.1%
17	55	Mgt of Companies/Enterprises	-	-	-	-	-
18	56	Admin, Waste Mgt, Remediation	86,066	148,332	108,503	342,901	17.2%
19	61	Educational Services	24	28	<0.5	53	<0.1%
20	62	Health Care, Social Assistance	7	52	12	71	<0.1%
21	71	Arts, Entertainment, Recreation	-	-	-	-	-
22	72	Accommodation & Food Services	-	-	-	-	-
23	81	Other Services	-	22	-	22	<0.1%
24	92	Public Administration	20	4	133	157	<0.1%
25	??	NAICS code not provided	0	0	0	0	0.0%
		Column totals =	1,330,513	328,929	335,093	**1.995 million**	**100.0%**

Note: (-) Indicates that no management was reported in 2007 (excluding management by storage). Recycling cannot be determined for wastes that have no management information (including storage of wastes).

Exhibit 3D below presents the same 2007 recycling data according to the types of industrial processes (i.e., Biennial Report Gxxx codes) which generated the hazardous wastes being recycled.

Exhibit 3D
Industrial Process/Activity Sources of Recycled RCRA Hazardous Wastes (2007)

A	B		C	D	E	F (C+D+E)	
Item	Industrial Process/ Activity Hazardous Waste Generation Source Code		H010 Metals Recovery (tons/year)	H020 Solvents Recovery (tons/year)	H039 Other Recovery (tons/year)	Total Recovery (tons/year)	
1	G01	Dip, flush or spray rinsing	1,144	7,414	404	8,962	0.4%
2	G02	Stripping and acid or caustic cleaning	77	4	482	563	< 0.1%
3	G03	Plating & phosphating	6,084	18	1	6,103	0.3%
4	G04	Etching	-	-	-	-	-
5	G05	Metal forming & treatment	1,732	-	-	1,732	0.1%
6	G06	Painting & coating	5	6,356	35	6,396	0.3%
7	G07	Product & by-product processing	214,170	45,657	18,670	278,498	14.0%
8	G08	Removal of spent process liquids or catalysts	15	5,072	20,053	25,140	1.3%
9	G09	Other production or service-related processes	763	4,334	29	5,126	0.3%
		Subtotal daily production, service or maintenance processes =	223,990	68,855	39,674	332,519	16.7%
10	G11	Discarding off-spec or out-of-date chemicals or products	612	86	32,195	32,893	1.6%
11	G12	Lagoon or sediment dragout and leachate collection	-	-	-	-	-
12	G13	Cleaning-out process equipment	74	17,330	3,064	20,467	1.0%
13	G14	Removal of tank sludge, sediments or slag	243	220	-	462	< 0.1%
14	G15	Process equipment change-out or discontinuation of use	15	1	116	131	< 0.1%
15	G16	Oil changes and filter or battery replacement	-	-	-	-	-
16	G19	Other one-time or intermittent processes	23	-	62	85	< 0.1%
		Subtotal one-time or intermittent events or processes =	966	17,636	35,436	54,039	2.7%
17	G21	Air pollution control devices	12,624	-	-	12,624	0.6%
18	G22	Lab analytical wastes	13	140	12	165	< 0.1%
19	G23	Wastewater treatment	594	-	-	594	< 0.1%
20	G24	Solvent or product distillation or recovery	-	7,088	15,821	22,909	1.1%
21	G25	Hazardous waste management	26,478	1,963	1,371	29,812	1.5%
22	G26	Leachate collection	-	-	-	-	-
23	G27	Residual from treatment or recovery of universal waste	251	-	-	251	< 0.1%
		Subtotal pollution control & waste management residuals =	39,959	9,191	17,204	66,355	3.3%
24	G31	Accidental contamination of materials, containers	181	1	-	181	< 0.1%
25	G32	Cleanup of spill residues (infrequent, not routine)	-	-	-	-	-
26	G33	Leak collection & floor sweeping ongoing, routine)	36	-	-	36	< 0.1%
27	G39	Other cleanup of current contamination	<0.5	-	-	<0.5	< 0.1%
		Subtotal spills & accidental releases =	217	1	-	218	< 0.1%

Exhibit 3D Industrial Process/Activity Sources of Recycled RCRA Hazardous Wastes (2007)							
A	B		C	D	E	F (C+D+E)	
Item	Industrial Process/ Activity Hazardous Waste Generation Source Code		H010 Metals Recovery (tons/year)	H020 Solvents Recovery (tons/year)	H039 Other Recovery (tons/year)	Total Recovery (tons/year)	
28	G41	Closure of haz waste management unit under RCRA	-	-	-	-	-
29	G42	Correction action at solid waste mgmt unit under RCRA	-	-	43,376	43,376	2.2%
30	G43	Remedial action or emergency response under CERCLA	-	-	-	-	-
31	G44	State program or voluntary cleanup	272	-	4,037	4,308	0.2%
32	G45	Underground storage tank cleanup	-	-	-	-	-
33	G49	Other remediation	-	-	11,057	11,057	0.6%
		Subtotal remediation of past contamination =	272	-	58,469	58,741	2.9%
34	G61	Received from offsite for storage/bulking for transfer	222	10,464	-	10,686	0.5%
35	G63 to G75	Imported from a foreign country	-	-	-	-	-
		Subtotal not physically generated onsite =	222	10,464	-	10,686	0.5%
36	G??	Source code not provided	1,064,888	222,784	184,309	1,471,981	73.8%
		Column totals =	1,330,513	328,929	335,093	**1.995 million**	**100.0%**

Exhibit 3E below presents the same 2007 recycling data according to the types of chemical/physical forms of the wastes (i.e., Biennial Report Wxxx codes) being recycled.

Exhibit 3E
Physical Form of Recycled RCRA Hazardous Wastes (2007)

A	B		C	D	E	F (C+D+E)	
Item	Biennial Report Physical Form Code		H010 Metals Recovery (tons/year)	H020 Solvents Recovery (tons/year)	H039 Other Recovery (tons/year)	Total Recovery (tons/year)	
1	W001	Lab packs w/out acute haz waste	192	49	410	650	<0.1%
2	W002	Contaminated debris	2,062	2,901	9	4,971	0.2%
3	W004	Lab packs w/acute haz waste	<0.5	<0.5	-	1	<0.1%
4	W301	Contaminated soil	533	2	36,965	37,500	1.9%
5	W309	Batteries, battery parts, cores, casings	753,619	<0.5	23,892	777,510	39.0%
6	W310	Filters, adsorbents, ion exchange resins, spent carbon	208	2,238	9,142	11,588	0.6%
7	W320	Electrical devices	1,918	1	753	2,672	0.1%
8	W512	Sediment or lagoon dragout, drilling or other muds	3	-	88	91	<0.1%
9	W801	Compressed gases	601	<0.5	2	603	<0.1%
		Subtotal mixed media/debris/devices =	759,136	5,191	71,259	835,586	41.9%
10	W101	Very dilute aqueous waste >99% water	2,130	2,901	525	5,555	0.3%
11	W103	Spent concentrated acid	19,288	118	2,766	22,172	1.1%
12	W105	Acidic aqueous wastes <5% acid	325	163	8	496	<0.1%
13	W107	Aqueous waste containing cyanides	837	-	1	838	<0.1%
14	W110	Caustic aqueous waste or wastewaters	5,771	3	484	6,259	0.3%
15	W113	Other aqueous waste or wastewaters	81,369	18,735	992	101,096	5.1%
16	W117	Waste liquid mercury	210	<0.5	6	216	<0.1%
17	W119	Other inorganic liquid	9,140	875	53,276	63,290	3.2%
		Subtotal inorganic liquids =	119,070	22,794	58,057	199,922	10.0%
18	W200	Still bottoms liquid form	<0.5	2,828	46	2,874	0.1%
19	W202	Concentrated halogenated solvent	1	20,347	2,882	23,231	1.2%
20	W203	Concentrated non-halogenated solvent	11	133,875	1,038	134,924	6.8%
21	W204	Concentrated halogenated/non-halo solvent mixture	26	20,721	2,620	23,366	1.2%
22	W205	Oil-water emulsion/mixture	75	1,000	2,206	3,281	0.2%
23	W206	Waste oil	<0.5	97	192	289	<0.1%
24	W209	Paint, ink, lacquer or varnish	3	15,741	30	15,774	0.8%
25	W210	Reactive or polymerizable organic liquids/adhesives	-	1,730	1,137	2,866	0.1%
26	W211	Paint thinner or petroleum distillates	-	36,694	8	36,702	1.8%
27	W219	Other organic liquid	63	22,663	91,687	114,413	5.7%
		Subtotal organic liquids =	179	255,696	101,845	357,721	17.9%
28	W303	Ash	9,225	-	-	9,225	0.5%

Exhibit 3E
Physical Form of Recycled RCRA Hazardous Wastes (2007)

A	B		C	D	E	F (C+D+E)	
Item	Biennial Report Physical Form Code		H010 Metals Recovery (tons/year)	H020 Solvents Recovery (tons/year)	H039 Other Recovery (tons/year)	Total Recovery (tons/year)	
29	W304	Slags, drosses, other solid thermal residues	50,564	-	127	50,692	2.5%
30	W307	Metal scale, filings, scrap (including drums)	102	<0.5	12	114	<0.1%
31	W312	Cyanide or metal cyanide bearing solids, salts, chems	104	-	-	104	<0.1%
32	W316	Metals salts or chemicals w/out cyanide	929	<0.5	-	929	<0.1%
33	W319	Other inorganic solids	381,127	663	20,416	402,206	20.2%
		Subtotal inorganic solids =	442,052	663	20,555	463,270	23.2%
34	W401	Pesticide solids	-	<0.5	-	<0.5	<0.1%
35	W403	Solid resins, plastics, polymerized organics	2	74	80	156	<0.1%
36	W405	Explosives or reactive organic solids	-	-	-	-	-
37	W409	Other organic solids	910	12,017	21,729	34,655	1.7%
		Subtotal organic solids =	912	12,091	21,809	34,812	1.7%
38	W501	Lime or metal hydroxide sludges	6,423	-	33,247	39,669	2.0%
39	W503	Gypsum sludges from wastewater or air treatment	-	-	-	-	-
40	W504	Other sludges from wastewater or air treatment	188	-	-	188	<0.1%
41	W505	Metal bearing sludges	178	3	<0.5	182	<0.1%
42	W506	Cyanide-bearing sludges	1,289	-	-	1,289	0.1%
43	W519	Other inorganic sludges	389	12	1,442	1,843	0.1%
		Subtotal inorganic sludges =	8,467	15	34,689	43,171	2.2%
44	W603	Oily sludge	-	629	6,462	7,090	0.4%
45	W604	Paint or ink sludges, still bottoms	<0.5	2,424	-	2,424	0.1%
46	W606	Resins, tars, polymer, tarry sludge	-	21	2,244	2,265	0.1%
47	W609	Other organic sludge	-	298	5,049	5,346	0.3%
		Subtotal organic sludges =	<0.5	3,372	13,754	17,125	0.9%
48	W???	Physical form code not provided	697	29,109	13,125	42,932	2.2%
		Totals =	1,330,513	328,929	335,093	**1.995 million**	**100.0%**

Exhibit 3F below presents the same 2007 recycling data according to the types of RCRA Subtitle C hazardous waste designation regulatory codes (i.e., Dxxx, Fxxx, Kxxx, Pxxx, Uxxx codes) being recycled.

Exhibit 3F
RCRA Subtitle C Regulatory Waste Codes Assigned to Recycled RCRA Hazardous Wastes (2007)

A	B		C	D	E	F (C+D+E)	
Item	RCRA Waste Code		H010 Metals Recovery (tons/year)	H020 Solvents Recovery (tons/year)	H039 Other Recovery (tons/year)	Total Recovery (tons/year)	
1	Dxxx	1 or more toxicity leaching test waste codes only	915,157	134,526	118,142	1,167,826	58.6%
2	Fxxx	1 or more non-specific industrial source waste codes only	2,371	34,156	92,463	128,990	6.5%
3	Kxxx	1 or more specific industrial source waste codes only	384,800	-	21,776	406,575	20.4%
4	Pxxx	1 or more "acutely hazardous" discarded or off-spec commercial chemical products, container residues & spill residues thereof	2	-	23	26	<0.1%
5	Uxxx	1 or more "toxic waste" commercial chemical products, manufacturing intermediates, or off-spec commercial chemical products	2	23,336	970	24,308	1.2%
6	Mixed	Assigned with 2 or more waste code categories above	28,182	136,913	101,718	266,813	13.4%
7	????	Waste code not provided	0	0	0	0	0%
		Column totals =	1,330,513	328,929	335,093	**1.995 million**	**100.0%**

Exhibit 3G below indicates the respective fractions (i.e., associated tonnages and percentages) for each of the three recycling methods which involve recycling "acute" hazardous wastes. Solid wastes shall be listed under RCRA Subtitle C as "*acute hazardous wastes*" if they either:

- Have been found to be fatal to humans in low doses, or
- Have been shown in studies to have an oral LD 50 toxicity (rate) of less than 50 milligrams per kilogram, an inhalation LC 50 toxicity (rat) of less than 2 milligrams per liter, or a dermal LD 50 toxicity (rabbit) of less than 200 milligrams per kilogram, or
- Are otherwise capable of causing or significantly contributing to an increase in serious irreversible, or incapacitating reversible, illness (Source: 40 CFR 261.11(a)(2)).

As codified in the 01 July 2010 version of the Code of Federal Regulations (CFR), RCRA "*acute hazardous wastes*" are designated with the hazard code (H) and include:

- All 239 Pxxx codes in the table at 40 CFR 261.33(e) are designated as "*acute hazardous (H)*" wastes.
- Six of the 28 Fxxx codes in the table at 40 CFR 261.31 are designated as "*acute hazardous (H)*" wastes: F020, F021, F022, F023, F026, and F027.

Exhibit 3G Prevalence of RCRA "*Acute Hazardous*" Waste Recycling (2007)			
Recycling method (Biennial Report management code) Recycling method definition	2007 BR annual total tons recycled (onsite + offsite tons)	2007 Quantity of "*acute hazardous*" waste recycled* (onsite + offsite tons)	% of RCRA hazardous waste recycling involving "*acute hazardous*" wastes (onsite + offsite tons)
H010: Metals recovery	1,330,513*	25	<0.01%
H020: Solvents recovery	328,929	3	<0.01%
H039: Other recovery	335,093	42	<0.01%
Column totals =	**1.995 million**	**69**	**<0.01%**

Notes:
Source: Query of EPA 2007 RCRA Biennial Report (BR) based on selecting recycling data corresponding to (a) all of the Pxxx codes and (b) six of the 28 Fxxx codes which are designated as "acute" hazardous wastes in the Code of Federal Regulations (40 CFR .261.33 and 261.31, respectively).
* Metals Recovery tonnage does not match the 2007 BR volume number in BR exhibits 2.5-2.7 because of updates to the 2007 data since the BR was published.

- **Explanation of Discrepancy Between Waste Generator (GM) and Waste Receiver (WR) Annual Tonnage Data**

The baseline hazardous waste recycling tonnage evaluated in this RIA for potential de-regulatory cost savings is not 1.995 million tons as shown in Exhibits 3A to 3G above. The 1.995 million tons is based on the RCRA Biennial Report (BR) standard data programming logic that totals BR Form GM on-site recycling tonnage data plus BR Form WR waste received tonnage data for offsite recycling. Given the baseline recycling tonnage displayed in Exhibits 3A to 3G are meant to equal the tonnages presented in Exhibits 2.5, 2.6 and 2.7 of the 2007 "National Analysis" RCRA Biennial Report (http://www.epa.gov/wastes/inforesources/data/br07/national07.pdf), the same data query logic were used to complete Exhibits 3A to 3G of this RIA. In comparison, the baseline recycling shown in this RIA uses an alternative BR data programming logic that totals BR Form GM on-site recycling tonnage data plus BR Form GM off-site shipment tonnage data for recycling. Hazardous waste tonnage mass balance does not exist in the BR database for any given year, between what the generator reports shipping offsite for recycling on BR Form GM, and what the TSDR facilities report receiving from generators for recycling on BR Form WR. Also note that the recycling tonnages presented in Exhibits 3A through 3G above will not match the baseline recycling tonnages used in the de-regulatory cost savings analysis. Exhibits 3A through 3G present the national baseline recycling picture based on BR data reporting logic. However, the recycling quantities presented will be higher than those used in the cost analysis. The discrepancy is due to the following:

- The on-site recycling tonnages in Exhibit 3A (column E) are sums of the tonnages reported in Form GM, Section 1F. Quantity Generated in 2007. The on-site recycling tonnages used in the cost savings analysis of this RIA are those reported in Form GM, Section 2, On-site Process System 1 and On-site Process System 2. These numbers sometimes do not match because either:
  - There is a data reporting or data entry error, or
  - Not all of the quantity generated is recovered (i.e., some may be disposed), or
  - Not all of the quantity generated in 2007 was recovered in 2007.
- Source code G61 received from offsite for storage/bulking for transfer offsite waste is excluded in the cost savings analysis given

the waste is not physically generated on site (see Exhibit 3D, Item 34) by the generator.

- The off-site recycling totals in Exhibit 3A (column F) are based on Form WR data for wastes received from off site for management. The off-site recycling tonnages used in the cost savings analysis are based on Form GM reported shipment tonnages to off-site recycling (i.e., Form GM, Section 3, Site 1, Site 2, and Site 3).

3B. Pre-2008 DSW Recycling Exclusions: Baseline Industrial Recycling

Pre-2008 hazardous waste recycling exclusions under RCRA regulations (i.e., 40 CFR 261.2(3) and 261.4(a)) provided 32 DSW exclusions for recycling of certain types of industrial hazardous secondary materials. These pre-2008 DSW recycling exclusions span 1985 and 1998. The respective counts of industries, facilities, and waste streams potentially affected by the 2008 DSW final rule did not apply to these pre-2008 excluded industries and hazardous secondary materials. The 2011 DSW proposed rule does affect these excluded hazardous secondary materials. Comprehensive data on the nationwide annual quantities of pre-2008 excluded hazardous secondary materials are not readily available because they are not subject to biennial reporting to EPA under the RCRA Subtitle C hazardous waste regulations. Limited data on these materials are available from the 2007 BR. The 2007 BR reports on a portion of the material (291,702 tons) managed under the pre-2008 exclusions. The following subsections describe the data from the 2007 BR and outline the methodology this RIA uses to estimate the population of facilities recycling under the pre-2008 DSW recycling exclusions.

2007 Biennial Report Pre-2008 Recycling Exclusion Data

Some pre-2008 DSW recycling exclusion data can be obtained from the 2007 BR. For any given data reporting year, some LQG and TSDRF data records in the BR may be inaccurately or incorrectly (i.e., unnecessarily) included in the BR database for at least three reasons:

1. Misreporting of data
2. State regulatory reporting requirements for hazardous waste data are more stringent than Federal RCRA requirements in some states:
    a. Some states require SQGs and CESQGs to report hazardous waste generation data
    b. Some states require LQGs to report state-regulated waste data, in addition to Federal-regulated waste data
3. The BR may incorrectly contain data from some facilities for wastes that are already excluded.

The 2007 BR includes data for 6 of the 32 pre-2008 DSW exclusions. As summarized in Exhibit 3H below, LQGs or TSDFs in the 2007 BR may have reported these data incorrectly (i.e., unnecessarily). Approximately 292,000 tons of hazardous materials from pre-2008 recycling exclusions were identified in the 2007 BR indicating that the 2008 DSW recycling exclusion baseline cost savings estimate may be overstated by 0.7%. These data are included with the 2008 DSW recycling exclusion data and baseline costs. EPA's 2003 DSW rule RIA (p.3-12) identified three of these six categories (i.e., oil, recovery, by-products, sludges), and the 2007 DSW rule RIA (Exhibit 1A) identified four of these categories, based on QA/QC random visual inspection of waste descriptions supplied by the LQGs (Form GM, Section 1A) and TSDRFs

(Form WR, Section A) reporting to the BR database applied in the prior RIAs. Two additional categories were identified from QA/QC and random visual inspection of the 2005 dataset applied in the 2008 DSW RIA.

Exhibit 3H
Six Industrial Secondary Materials Already-Excluded from the DSW Pre-2008

Type of Excluded Material	Description	Biennial Report Data Code to Identify the Excluded Material	2007 Recycling (tons/year)
1. Oil Recovery	Reported waste quantities in the BR dataset may already be excluded under the existing DSW exclusion for oil recovery in the petroleum refining industry under 40 CFR 261.4(a)(12)(ii). This exclusion requires materials be "*inserted into the petroleum refining process*"; this RIA assumes facilities reporting this to the BR do not meet this condition and are included in the dataset for this RIA.	• SIC code 2911 (petroleum refinery; same as NAICS code 32411) and • W206 waste oil	0
2. Recycled By-products Exhibiting Characteristic of Hazardous Waste	Reported waste quantities in the BR dataset may already be excluded under the existing DSW exclusion for "*by-products*" exhibiting a characteristic of hazardous waste that are not solid wastes when reclaimed under 40 CFR 261.2(c)(3).	• D001 (ignitability characteristic) or • D002 (corrosivity characteristic) or • D003 (reactivity characteristic) or • D004 to D043 (toxicity characteristic), and • G07 source code "Product & by-product processing"	253,355*
3. Recycled Sludge Exhibiting Characteristic of Hazardous Waste	Reported wastes quantities in the BR dataset may already be excluded under the existing DSW exclusion for "*sludges*" exhibiting a characteristic of hazardous waste that are not solid wastes when reclaimed under 40 CFR 261.2(c)(3).	• D001 (ignitability characteristic) or • D002 (corrosivity characteristic) or • D003 (reactivity characteristic) or • D004 to D043 (toxicity characteristic), and • W5xx or W6xx sludges physical form code	17,261
4. Recycled Commercial Chemical Products	Reported waste quantities in the BR dataset may already be excluded under the existing DSW exclusion for "*commercial chemical products*" when reclaimed under 40 CFR 261.2(c)(3).	• G11 source code "Discarding off-spec or out-of-date chemicals or products: unused chemicals or products – corresponds to P and U hazardous waste codes")	32,893
5. Oil refining spent acids	Reported waste quantities in the BR dataset may be already excluded from the DSW if reclaimed under either 40 CFR 261.4(a)(7) or 40 CFR 261.4(a)(12).	• D002 (corrosivity characteristic) and • SIC code 2911 petroleum refinery (same as NAICS code 32411).	0
6. Oil bearing petrochemical wastes	Reported waste quantities in the BR dataset may be already excluded from the DSW if reclaimed under 40 CFR 261.4(a)(18) if "inserted into the petroleum refining process (SIC coded 2911) along with normal petroleum refinery process streams"	• D001 (ignitable characteristic) or • D018 (benzene toxicity characteristic) and • SIC 2865 "Cyclic Organic Crudes, Intermediates & Organic Dyes/Pigments, or SIC 2869 Industrial Organic Chemicals (both SIC codes are same as NAICS 32511 petrochemical mfg)	0
		Column total =	**303,509**
		Percentage of *2007 National Biennial RCRA Hazardous Waste Report* total hazardous waste generation (46.693 million tons, Exhibit 1.3) =	**-0.7%**

* One waste stream accounts for 214,156 tons with the waste description "spent lead/acid batteries and lead bearing scrap dismembered for metals recovery and recycling."

Methodology for Estimating the Baseline Count of Facilities Recycling Under Pre-2008 DSW Recycling Exclusions

Prior to EPA's 2008 DSW final rule, there were already 32 pre-2008 DSW recycling exclusions (Exhibit 2A), of which 16 are listed in Exhibit 3I below as identified in EPA's RIA for the October 2008 DSW final rule. Comprehensive data on the nationwide counts of facilities and associated annual quantities of pre-2008 excluded hazardous secondary materials are not readily available because RCRA-excluded industrial recycling is not subject to reporting under the RCRA hazardous waste "*Biennial Report"* (BR). However, EPA's "*Toxic Release Inventory*" (TRI) requires annual reporting of industrial recycling activities involving +/- 650 toxic chemicals in certain NAICS code industries over certain annual threshold quantities. For purpose of estimating in this RIA the baseline de-regulatory cost savings associated with the pre-2008 DSW recycling exclusions, Exhibit 3I below displays NAICS codes which this RIA assumes is affiliated with each of the 16 pre-2008 DSW exclusions identified in the 2008 RIA, although most of the pre-2008 DSW exclusions do not identify particular eligible NAICS (or SIC) codes in the Code of Federal Regulations (CFR).

Counts of industrial facilities in the affiliated NAICS codes that reported the appropriate onsite and/or offsite recycling activity were obtained for data year 2007 from two EPA databases:

1. TRI: EPA's Toxics Release Inventory database: Facility counts associated with either onsite or offsite (as appropriate to each of the pre-2008 recycling exclusions) are used in this RIA as an estimate of total DSW-excluded plus non-DSW excluded industrial recycling.
2. BR: EPA's RCRA Biennial Report database: Facility counts associated with either onsite or offsite (as appropriate) are used in this RIA as an estimate of non-DSW excluded industrial recycling.

The year 2007 is applied in this analysis because (a) it is common to both the TRI and BR databases, and (b) is the most recent common year relative to 2008, the year of EPA's October 2008 DSW final rule which expanded the exclusions beyond the pre-2008 DSW exclusions.

Exhibit 3J below displays an estimate of **8,492 TRI-reported facilities** involved in industrial recycling of wastes containing toxic chemicals affiliated with the NAICS codes (a mix of 2-digit and 6-digit codes) assigned in this RIA as representative of the pre-2008 DSW exclusions. These facilities are within 622 6-digit NAICS code industries as listed in **Appendix A**. Exhibit 3K displays an estimate of **3,171 BR-reported facilities** involved in non-DSW excluded RCRA-regulated hazardous waste recycling for those same NAICS codes. As displayed in Exhibit 3L, the **5,321** difference between these two facilities counts is applied in this RIA as an estimate of the count of facilities which operate their recycling activities under the pre-2008 DSW exclusions.

In summary, the estimate of 5,321 pre-2008 DSW recycling exclusion facilities is based on two criteria: (1) these generators report recycling wastes in the TRI that contain toxic chemicals and (2) the population of generators is limited to NAICS associated with the pre-2008 exclusions. Because not all TRI recycled wastes containing toxic chemicals will necessarily qualify as RCRA hazardous waste if not recycled, this may be an over-estimate of the pre-2008 DSW recycling exclusion population.

Exhibit 3I
NAICS Codes Assigned in this RIA as Affiliated with 16 of the Pre-2008 RCRA DSW Industrial Recycling Exclusions

A	B	C	D	E	F
Item	Year	Pre-2008 DSW Exclusion 40 CFR citation	Abbreviated Descriptions* of the 16 Pre-2008 DSW Recycling Exclusions	Eligible Recycling Relative to Generator Sites Assumed in this RIA (Onsite or Offsite)	NAICS Codes Assumed in this RIA Affiliated to the Pre-2008 DSW Recycling Exclusions**
1	1985	261.2(e)(i)	Materials used or reused as ingredients in an industrial process to make a product without being reclaimed	Onsite & Offsite	NAICS 31 + 32 + 33 manufacturing***
2	1985	261.2(e)(ii)	Materials used or reused as substitutes for commercial products	Onsite & Offsite	NAICS 31 + 32 + 33 manufacturing***
3	1985	261.2(e)(iii)	Materials returned as a feedstock to the industrial process from which generated without being reclaimed or land disposed	Onsite	NAICS 31 + 32 + 33 manufacturing***
4	1985	261.4(a)(6)	Pulping liquors that are reclaimed in a pulping liquor recovery furnace and then reused in the pulping process	Onsite	NAICS 322110 pulp mills
5	1985	261.4(a)(7)	Spent sulfuric acid used to produce virgin sulfuric acid	Onsite & Offsite	NAICS 325188 other inorganic chem mfg
6	1986	261.4(a)(8)	Materials reclaimed and returned to the original process(es) in which generated for reuse in production if entire process is closed by tanks, pipes or other conveyance, without combustion	Onsite	NAICS 31 + 32 + 33 manufacturing***
7	1990	261.4(a)(9)	Spent wood preserving solutions that have been reclaimed and reused for their original intended purpose	Onsite & Offsite	NAICS 321114 wood preservation
8	1991	261.4(a)(10)	K060, K087, K141, K142, K143, K144, K145, K147, K148 wastes recycled to coke ovens or tar recovery	Onsite	NAICS 324199 coke oven products (coke, gases, tars) made in coke oven establishments
9	1991	261.4(a)(11)	Recovered non-wastewater splash condenser dross residue of K061 treatment in metals recovery units	Onsite & Offsite	NAICS 331111 iron & steel mfg
10	1994	261.4(a)(12)	Petroleum refinery oil-bearing sludges, byproducts or spent materials inserted into the refining process	Onsite	NAICS 324110 petroleum refineries
11	1997	261.4(a)(13)	Scrap metal being recycled	Onsite & Offsite	Recycled onsite at NAICS 562920 materials recovery facilities
12	1997	261.4(a)(14)	Circuit boards being recycled if stored prior to recovery and free of mercury, nickel-cadmium & lithium	Offsite	Recycled onsite at NAICS 562920 materials recovery facilities
13	1998	261.4(a)(17)	Spent materials generated by the primary mineral processing industry for recovery of minerals, acids, etc.	Onsite & Offsite	NAICS 2122 minerals mining (excludes coal, oil, gas; includes 19 6-digit NAICS minerals mining industries)
14	1998	261.4(a)(18)	Petrochemical oil recovered from organic chemical manufacturing if oil is inserted into petro-refining process	Onsite & Offsite	NAICS 32519 organic chemical manufacturing (consists of 325191 + 325192 + 325193 + 325199)
15	1998	261.4(a)(19)	Spent caustic solutions from petroleum refining used as	Offsite	NAICS 325188 all other basic

Exhibit 3I
NAICS Codes Assigned in this RIA as Affiliated with 16 of the Pre-2008 RCRA DSW Industrial Recycling Exclusions

A	B	C	D	E	F
Item	Year	Pre-2008 DSW Exclusion 40 CFR citation	Abbreviated Descriptions* of the 16 Pre-2008 DSW Recycling Exclusions	Eligible Recycling Relative to Generator Sites Assumed in this RIA (Onsite or Offsite)	NAICS Codes Assumed in this RIA Affiliated to the Pre-2008 DSW Recycling Exclusions**
			feedstock to produce cresylic or naphthenic acid		inorganic chemical manufacturing
16	2002	261.4(a)(20,21)	Hazardous secondary materials used to make zinc fertilizers	Offsite	Recycled onsite at NAICS 325314 fertilizer mfg (not nitrogen or phosphate)

Notes:
* See http://www.gpoaccess.gov/cfr for complete descriptions of the 16 DSW exclusions.
** The 16 specific pre-2008 DSW recycling exclusions listed above in this exhibit do not specify eligible NAICS codes; the NAICS codes assigned above are only for analytic and estimation purposes in this RIA.
*** 2007 NAICS 31 consists of 110 6-digit industries, NAICS 32 consists of 126 6-digit industries, and NAICS 33 consists of 236 6-digit industries (i.e., 472 6-digit industries). These 6-digit counts are based on the Census Bureau's 2007 NAICS code list provided at: http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007

Exhibit 3J
2007 TRI Count of Industrial Recycling Facilities
Source: Data extraction conducted 02 Dec 2010 by Carol Bristow, DPRA Inc.

Items	NAICS codes used for TRI data query to represent pre-2008 RCRA-excluded recycling	Count of 6-digit NAICS codes (see **Appendix A** for complete list)	2007 TRI Onsite Recycling Facility Count	2007 TRI Offsite Recycling Facility Count	Non-Duplicative 2007 TRI Total Count Recycling Facilities (Onsite + Offsite)
1	31	44	78	134	205
2	32	106	1,141	1,288	2,116
3	33	222	747	5,856	6,130
	Sub-total 31+32+33 =	372	1,966	7,278	8,451
4	5629	1	7	2	7
5	2122	5	14	31	34
	Total rows 4+5+6 =	**378**	1,987	7,371	**8,492**

Exhibit 3K
2007 RCRA Biennial Report Count of Hazardous Waste Recycling Facilities in pre-2008 Excluded Recycling Industries
Source: Data extraction conducted 02 Dec 2010 by Kevin Weinhold, DPRA Inc.

A	B	C	D	E	F	G	H	I	J	K
Pre-2008 DSW Exclusion	Facility Primary NAICS code	H010 Metals Recycling		H020 Solvents Recycling		H039 Other Materials Recycling (e.g., acids)		Row Total Onsite	Row Total Offsite	Row Total Onsite + Offsite (non-duplicative)
		Onsite	Offsite	Onsite	Offsite	Onsite	Offsite			
1a	31	0	13	7	15	0	11	7	38	43
1b	32	15	411	166	584	23	226	202	1,063	1,215
1c	33	42	1,046	157	733	12	294	210	1,766	1,902
1	Sum (31,32,33)	57	1,470	330	1,332	35	531	419	2,867	3,160
2	Included in item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1
3	Included in item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1
4	32211	0	0	1	0	0	0	1	0	1
5	325188	5	17	3	12	1	6	8	35	38
6	Included in item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1
7	321114	1	0	0	7	1	5	2	12	14
8	324199	0	0	0	1	0	1	0	2	2
9	331111	0	48	0	8	1	5	1	53	53
10	32411	0	0	0	0	2	0	2	0	2
11	56292	1	0	3	0	0	0	4	0	4
12	Incld. in item 11	In item 11	In item 11	In item 11	In item 11	In item 11	In item 11	In item 11	In item 11	In item 11
13	2122	1	6	0	2	0	1	1	7	7
14	32519	0	40	7	35	3	38	10	98	102
15	Included in item 5	In item 5	In item 5	In item 5	In item 5	In item 5	In item 5	In item 5	In item 5	In item 5
16	Included in item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1	In item 1
Column total (non-duplicative) rows 1+11+13 =		59	1,476	333	1,334	35	532	424	2,874	**3,171**

Exhibit 3L
Count of Industrial Facilities Reporting Recycling Activities in 2007* for the Affiliated NAICS Codes Associated with the Pre-2008 DSW Recycling Exclusions

A	B	C			D	E (C – D)
		2007 TRI Count of Industrial Facilities Reporting Recycling (from Exhibit 3J)				
Pre-2008 DSW exclusion (row item)	Affiliated NAICS Codes (from column F of Exhibit 3I)	Onsite	Offsite	Non-duplicative count (on + offsite)	2007 BR Count of Industrial Facilities Reporting Recycling (from Exhibit 3K)	Count of Facilities Assumed to Have Pre-2008 DSW Recycling Exclusions
1	31 +32 + 33 manufacturing	1,966	7,278	8,451	3,160	5,291
2	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1	In item 1
3	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1	In item 1
4	322110 pulp mills	In item 1	In item 1	In item 1	In item 1	In item 1
5	325188 other basic inorganic chem mfg	In item 1	In item 1	In item 1	In item 1	In item 1
6	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1	In item 1
7	321114 wood preservation	In item 1	In item 1	In item 1	In item 1	In item 1
8	324199 coke oven products	In item 1	In item 1	In item 1	In item 1	In item 1
9	331111 iron & steel manufacturing	In item 1	In item 1	In item 1	In item 1	In item 1
10	324110 petroleum refineries	In item 1	In item 1	In item 1	In item 1	In item 1
11	562920 materials recovery facilities	7	2	7	4	3
12	Assume captured in item 11 above	In item 11	In item 11	In item 11	In item 11	In item 11
13	2122 minerals mining	14	31	34	7	27
14	32519 organic chemical mfg	In item 1	In item 1	In item 1	In item 1	In item 1
15	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1	In item 1
16	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1	In item 1
	Non-duplicative column totals =	1,987	7,371	8,492	3,171	**5,321**

Note:
* 2007 is selected for this data analysis because 2007 corresponds to both the Toxics Release Inventory (TRI) and the RCRA Biennial Report (BR) databases.

3C. Annual Rate of Future Adoption of the 2008 DSW Exclusions

3C.1 *"Base Case"* Adoption Scenario (2008 DSW final rule future baseline)

The baseline for this RIA to evaluate the incremental effect of the 2011 proposed revisions to the DSW exclusions, must reflect the regulatory exclusions established under the 2008 DSW final rule, which (all else equal) would reduce the future annual tonnages of hazardous waste to become excluded under the DSW recycling exclusions, relative to the quantities reported in the 2007 BR. To incorporate this effect into the baseline for the 2011 DSW proposed rule, this RIA used exclusion notification data for the 2008 DSW final rule to estimate the number of facilities expected to use the 2008 DSW exclusions during each year in the 50-year period-of-analysis (2015 to 2064) applied in this RIA.

Under EPA's 2008 DSW final rule, facilities are required to notify their regulatory authority prior to managing hazardous secondary materials under the DSW rule and every other year thereafter.[9] Data published by EPA indicate that, as of April 26, 2011, 49 facilities had submitted notifications to EPA claiming either onsite recycling exclusions, same-company transfer exclusions, and/or offsite transfer exclusions.[10] The 49 facilities that claimed one or more of the 2008 DSW exclusions are located in the four states and territories that have adopted the 2008 DSW final rule (i.e., IA, NJ, PA, VI). The count of facilities that have submitted a DSW recycling exclusion notification by state is as follows:

1.	Iowa	16 facilities
2.	New Jersey	12 facilities
3.	Pennsylvania	20 facilities
4.	Virgin Islands	1 facility
	Total=	49 facilities

Based on these data, this RIA assumes that 49 industrial facilities will have submitted DSW exclusion notifications under the 2008 DSW final rule by the end of April 2011. Given that these notifications were submitted to EPA over a two-year, four-month period (i.e., between its December 28, 2008 effective date, and April 26, 2011), this RIA further assumes as a ***"base case"* adoption rate scenario**, that an additional **21 facilities per year** (i.e., 49 facilities divided by 2.3 years = 21 facilities per year) continue to adopt the 2008 DSW exclusion(s) on an annual basis for the 50-year future period of analysis (POA) spanning 2015 to 2064, consisting of the following time interval assumptions:

- Federal Register publication and lagging effective date for the final rule revisions to the DSW exclusions both occur in 2013.
- State government adoption of the final rule is expected to begin two years after its effective date in 2015 (this 2-year lag after the effective date recognizes the fact that state governments need time to change their state regulations and statutes).
- Therefore, the 50-year period of analysis will therefore span from 2015 to 2064.

[9] See 73 FR 64668.
[10] Notification data are available from EPA's webpage at http://www.epa.gov/waste/hazard/dsw/notify-sum.pdf

This "base case" rate of future DSW exclusion adoption is based on recent actual adoption data, rather than the simple 100% immediate adoption assumption applied in EPA's RIA for the 2008 DSW final rule. The future year-by-year facility adoption timeline for this "base case" adoption scenario is as follows:

POA	Year	Cumulative count of adopting facilities
-6.	2009	21 facilities -- adoption of the October 2008 DSW final rule
-5.	2010	42 facilities -- adoption of the October 2008 DSW final rule
-4.	2011	63 facilities -- adoption of the October 2008 DSW final rule
-3.	2012	84 facilities -- adoption of the October 2008 DSW final rule
-2.	2013	105 facilities -- adoption of the October 2008 DSW final rule; 2011 DSW proposed rule is finalized
-1.	2014	126 facilities -- adoption of the October 2008 DSW final rule
1.	2015	147 facilities - State government adoption of 2013 DSW final rule revisions begins.
2.	2016	168 facilities
…		
49.	2063	1,155 facilities
50.	2064	1,176 facilities

3C.2 "*Upper-Bound*" Adoption Scenario (2008 DSW final rule future baseline)

For purpose of comparison to the "base case" adoption scenario of this RIA, Sensitivity Analysis #1 in Chapter 6 of this RIA formulates an alternative ***"upper-bound"* adoption scenario**. This scenario assumes 44 states -- identified as potential adopters in Exhibit 12A of EPA's RIA for the 2008 DSW final rule -- will adopt the 2011 proposed revisions within a 4-year period beginning in 2015 (i.e., 2015, 2016, 2017, 2018), at a rate of 25% of the facilities located in these 44 states per year. This scenario is "Sensitivity Analysis #1" in Chapter 6 of this RIA.

3C.3 Adoption Scenario (pre-2008 DSW exclusions future baseline)

For the population of baseline hazardous secondary material industrial recycling associated with pre-2008 recycling exclusions, a significantly higher rate of 100% adoption is assumed. Many of these facilities have operated under the pre-2008 exclusions for several years, as some DSW exclusions date back to 1985. These facilities may not be equipped to manage these hazardous materials as hazardous wastes. This is in opposition to those materials managed under the 2008 DSW final rule, because facilities did already manage those materials as hazardous wastes. These facilities may; therefore, incur more significant costs for handling and management of these materials as hazardous waste.

For example, under the 1998 listing of crude oil tank sludge and clarified slurry oil sludge, a coking exemption was provided for these sludges if they are recycled back into an on-site coking process unit, off-site coking process unit owned by the same company, or an off-site coking process unit owned by another company. At that time, crude oil tank sludge and clarified slurry oil sludge were typically managed in Subtitle D landfill or land treatment units. In order to comply with the listing in the absence of the coking exemption, the identified facilities managed

these types of sludge in Subtitle C landfill units. In addition, to comply with the land disposal restriction requirements specified simultaneously with the listing, they ultimately would be managed in Subtitle C thermal destruction (i.e., incineration) units. Therefore, if these facilities do not submit a DSW exclusion notification, they will switch from placing sludge in coking units to hazardous waste incineration units. Thus, for both the "base case" and the "upper-bound" adoption scenarios, future adoption of the 2011 proposed revisions to the pre-2008 DSW recycling exclusions will likely be 100% because of the significant increase in materials management costs as RCRA hazardous waste for non-adoption.

3D. Baseline Industrial Waste Disposal Which May Switch to DSW Excluded Recycling

3D.1 2007 Hazardous Waste Disposal

The 2008 DSW final rule may induce more recycling of hazardous wastes which are disposed, because the potential for net cost savings under the new DSW exclusions if wastes are recycled, may provide an economic incentive for some facilities to switchover from disposal to recycling, either by using offsite commercial recyclers, or by investing in and operating onsite recycling operations. The 2011 DSW proposal rule adds technical provisions to the 2008 DSW final rule that will increase costs for regulated entities to improve Agency enforcement capabilities, which will slightly reduce the economic incentives for some facilities to switchover from disposal to recycling. This RIA only evaluates the possibility of disposal switchover to commercial offsite recycling. The entire quantity of each waste potentially switching-over to recycling is used to estimate total cost savings post-rule, not just the valuable portion (i.e., constituent) of the material. The generator sends along all the material to the recycler and then the recovery facility extracts the valuable constituent. Therefore, when calculating cost savings to the generators, it's the entire quantity (i.e., the "waste matrix" mass) that is relevant.

The disposal baseline forms the basis in this RIA, for evaluating the potential for disposed wastes to switch from disposal to recycling, based on (a) the market value of the primary constituent material (e.g., metal or organic solvent) in the disposed waste, in comparison to (b) their current estimated average annual cost for disposal. This RIA estimates the future potential for switchover by applying a "*breakeven test*" which determines on a micro-level waste stream-by-waste stream basis (i.e., not on either a facility-by-facility basis nor industry-by-industry basis), whether the net annual market value of the recovered metal, solvent or other material, would at least offset by a minimum of $0.01, the current average annual cost for disposing the waste stream.

The series of Exhibits 3M to 3Q below provide an overview of the 2007 RCRA hazardous waste disposal baseline. As displayed in rows 1 and 2 of Exhibit 3M below, the two beneficial disposal methods (i.e., H050 onsite burning waste as fuel, and H061 blending waste for use as fuel offsite) are in-eligible methods for the DSW recycling exclusions, although these two methods are displayed in this exhibit only for the purpose of evaluating them for potential switchover to future recycling.[11]

[11] In its comments to the Docket on OSW's 26 March 2007 DSW re-proposal (comment ID nr. 2002-0031-0548), the Cement Kiln Recycling Coalition (CKRC) specifically requested that OSW analyze "the degree to which the [DSW revisions final] rule will adversely affect this desirable practice [of energy recovery from hazardous wastes in cement kilns]" and "would encourage energy-bearing hazardous secondary materials to move away from energy recovery in cement kilns and towards other less-regulated forms of recycling."

Exhibit 3M
Summary of Total Baseline Disposed RCRA Hazardous Wastes by Ultimate* Disposal Method (2007)

A	B	C	D	E	F	G	H	I	J (H+I)
				2007 Count of Facilities Disposing			2007 Tons Disposed (management quantity)		
Item	Disposal method Code	Disposal description	Count of disposed waste streams	Onsite	Offsite (Received)	Total (non-duplicative)	Onsite (tons/year)	Offsite (tons/year)	Total (tons/year)
A. Beneficial Disposal Methods (n=2):									
1	H050	Energy Recovery	7,630	61	48	91	714,900	1,049,793	1,764,693
2	H061	Fuel Blending	28,591	30	99	112	83,810	653,591	737,401
		Subtotal beneficial disposal =	35,654	89	129	184	798,710	1,703,384	2,502,094
B. Non-Beneficial Disposal Methods (n=22):									
1	H040	Incineration	47,713	86	82	140	447,487	583,322	1,030,809
2	H071	Chemical Reduction	1,287	61	23	84	83,588	12,253	95,841
3	H073	Cyanide Destruction	160	23	4	27	12,672	2,262	14,934
4	H075	Chemical Oxidation	301	7	10	15	11,328	78,027	89,355
5	H076	Wet Air Oxidation	7	3	0	3	12	0	12
6	H077	Other Chemical Precipitation	2,955	64	29	92	1,135,328	172,307	1,307,635
7	H081	Biological Treatment	406	29	16	42	1,375,436	24,354	1,399,790
8	H082	Adsorption	117	7	10	17	604,544	2,232	606,776
9	H083	Air Or Steam Stripping	21	6	0	6	487,593	0	487,593
10	H101	Sludge Treatment And/or Dewatering	198	40	9	48	19,381	876	20,258
11	H103	Absorption	29	9	2	11	377,602	4	377,606
12	H111	Stabilization Or Chemical Fixation	9,519	65	47	105	71,766	571,943	643,709
13	H112	Macro-Encapsulation	671	3	12	14	7	8,443	8,450
14	H121	Neutralization Only	2,389	121	36	153	154,854	85,992	240,846
15	H122	Evaporation	139	36	1	36	18,469	819	19,289
16	H123	Settling Or Clarification	25	10	4	14	17,090	16,875	33,964
17	H124	Phase Separation	77	14	9	22	17,785	303	18,088
18	H129	Other Treatment	5,997	125	53	171	828,645	71,047	899,692
19	H131	Land Treatment Or Application	1,021	7	9	16	1,943	38	1,981
20	H132	Landfill Or Surface Impoundment	6,439	44	40	66	363,900	1,575,558	1,939,459
21	H134	Deepwell Or Underground Injection	808	39	8	41	21,159,200	346,669	21,505,869
22	H135	Discharge To Sewer/POTW Or NPDES	851	61	18	78	1,147,380	38,732	1,186,112
		Subtotal non-beneficial disposal =	77,827	669	219	812	28,336,009	3,592,059	31,928,067
		Column totals =	**168,123****	724	285	906	29,134,718 (85%)	5,295,443 (15%)	**34.43 million* (100%)**

Explanatory Notes: * Ultimate disposal = Some hazardous wastes undergo one or more sequential treatment methods prior to ultimate disposal. This exhibit represents ultimate disposal methods from Form GM, Section 2 for onsite disposal, and Form WR for offsite disposal. Tonnages for management method code H141 (wastes stored/bulked, transferred without treatment, recovery or disposal at the transferring site) are not included in this exhibit because transfer does not represent ultimate disposal. ** However, waste stream counts include wastes managed by H141 only, of which there were a total of 58,958 Form GMs. 107,877 Form GMs reported wastes managed exclusively by some disposal method (i.e., were not also managed by a recycle method, ignoring null and storage (H141) codes on form). Thus, 1,288 Form GMs reported wastes managed by a mix of recycle and disposal methods. Waste stream counts are based on Form GM reporting.

Exhibit 3N
Identity of Industries Generating & Disposing Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C	D (B+C)	E	F	G	H (F+G)
			Generation Location of Disposed (Tons Per Year)*				Disposal Location of Disposed (Tons Per Year)*			
Item	Economic Subsector (2-digit NAICS Code)		Count of facilities	Generation disposed Onsite	Generation shipped offsite for disposal	Total generation disposed	Count of facilities	Beneficial disposal**	Non-beneficial disposal***	Total disposal
1	11	Agriculture, Forestry, Fishing, Hunting	21	-	576	576	-	-	-	-
2	21	Mining	105	394	14,150	14,544	3	-	395	395
3	22	Utilities	427	2,578	114,618	117,195	8	1	4,653	4,654
4	23	Construction	274	-	30,273	30,273	1	-	45	45
5	31	Manufacturing	141	6,491	8,959	15,450	4	-	6,491	6,491
6	32	Manufacturing	3,667	24,259,312	1,675,385	25,934,697	280	1,726,278	23,796,832	25,523,110
7	33	Manufacturing	5,100	2,817,623	1,247,439	4,065,061	270	70	2,794,170	2,794,240
8	42	Wholesale Trade	507	514,734	79,735	594,469	15	12,179	508,707	520,886
9	44	Retail Trade	128	-	1,293	1,293	-	-	-	-
10	45	Retail Trade	50	-	1,237	1,237	1	< 0.5	-	< 0.5
11	48	Transportation	626	385,256	51,871	437,127	16	18	386,440	386,459
12	49	Postal, Couriers, Messengers, Storage	235	37	28,480	28,517	6	5	93	97
13	51	Information	36	1,682	7,202	8,884	15		1,775	1,775
14	52	Finance & Insurance	6	-	791	791	-	-	-	-
15	53	Real Estate, Rental & Leasing	84	< 0.5	35,491	35,491	9	< 0.5	3,496	3,496
16	54	Professional, Scientific & Tech Services	471	86,340	26,782	113,122	25		86,435	86,435
17	55	Mgt of Companies/Enterprises	6	132,074	130	132,204	1		132,074	132,074
18	56	Admin, Waste Mgt & Remediation	624	968,471	1,946,933	2,915,404	177	763,511	4,152,545	4,916,056
19	61	Educational Services	350	39	13,725	13,764	19	9	37	47
20	62	Health Care, Social Assistance	232	4	11,637	11,641	5	-	4	4
21	71	Arts, Entertainment, Recreation	28	-	1,924	1,924	-	-	-	-
22	72	Accommodation & Food Services	5	-	11,478	11,478	-	-	-	-
23	81	Other Services	188	3,644	19,837	23,480	2	-	3,644	3,644
24	92	Public Administration	363	45,959	120,488	166,446	49	21	50,233	50,254
		Column totals =	13,674	29,134,718 (84%)	5,450,433 (16%)	**34.675* million (100%)**	906	2,502,094 (7%)	31,928,067 (93%)	**34.43 million* (100%)**

Explanatory Notes:

* Data Source: EPA 2007 RCRA Hazardous Waste Biennial Report (BR): http://www.epa.gov/osw/inforesources/data/br07/index.htm. This exhibit represents generation disposed onsite from Form GM, Section 2, and generation shipped offsite for disposal from Form GM, Section3, compared with ultimate beneficial and non-beneficial disposal from Form GM, Section 2 and Form WR. Columns A through D are calculated using Form GM for onsite and Form GM for offsite shipping. Columns E through F are calculated using Form GM for onsite and Form WR for materials received by the offsite disposal facility.

** Beneficial disposal = H050+H061

*** Non-beneficial = H040+H071+H073+H075+H076+H077+H081+H082+H083+H101+H103+H111+H112+H121+H122+H123+H124+H129+H131+H132+H134+H135.

Exhibit 3O
Industrial Process/Activity Sources of Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C (A+B)
Item	Industrial Process/ Activity Hazardous Waste Generation Source Code		Beneficial disposal** (tons/year)	Non-beneficial disposal*** (tons/year)	Total disposal (tons/year)
1	G01	Dip, flush or spray rinsing	21,127	211,928	233,055
2	G02	Stripping and acid or caustic cleaning	2,732	100,010	102,742
3	G03	Plating & phosphating	652	323,836	324,488
4	G04	Etching	155	730,984	731,139
5	G05	Metal forming & treatment	672	176,742	177,415
6	G06	Painting & coating	62,493	126,379	188,872
7	G07	Product & by-product processing	338,144	9,827,034	10,165,178
8	G08	Removal of spent process liquids or catalysts	163,000	3,780,370	3,943,370
9	G09	Other production or service-related processes	129,148	1,901,204	2,030,352
		Subtotal daily production, service or maintenance processes =	718,123	17,178,487	17,896,611
10	G11	Discarding off-spec or out-of-date chemicals or products	75,564	110,513	186,077
11	G12	Lagoon or sediment dragout and leachate collection	7	7,140	7,147
12	G13	Cleaning-out process equipment	92,385	473,166	565,551
13	G14	Removal of tank sludge, sediments or slag	50,743	85,043	135,786
14	G15	Process equipment change-out or discontinuation of use	7,046	58,968	66,015
15	G16	Oil changes and filter or battery replacement	4,753	2,198	6,951
16	G19	Other one-time or intermittent processes	6,985	158,184	165,169
		Subtotal one-time or intermittent events or processes =	237,484	895,212	1,132,696
17	G21	Air pollution control devices	863	1,996,120	1,996,983
18	G22	Lab analytical wastes	12,280	17,258	29,538
19	G23	Wastewater treatment	30,832	3,865,817	3,896,650
20	G24	Solvent or product distillation or recovery	479,777	2,398,634	2,878,411
21	G25	Hazardous waste management	422,601	1,030,141	1,452,743
22	G26	Leachate collection	10	524,681	524,691
23	G27	Hazardous residual from treatment or recovery of universal waste	34	13,908	13,942
		Subtotal pollution control & waste management residuals =	946,398	9,846,559	10,792,957
24	G31	Accidental contamination of products, materials, containers	919	2,848	3,767
25	G32	Cleanup of spill residues (infrequent, not routine)	1,868	41,543	43,411
26	G33	Leak collection & floor sweeping ongoing, routine)	807	9,109	9,916
27	G39	Other cleanup of current contamination	684	11,588	12,273
		Subtotal spills & accidental releases =	4,278	65,088	69,366
28	G41	Closure of hazardous waste management unit under RCRA	102	5,924	6,025
29	G42	Correction action at solid waste mgmt unit under RCRA	174	3,320,649	3,320,823
30	G43	Remedial action or emergency response under CERCLA	193	159,213	159,407
31	G44	State program or voluntary cleanup	361	633,197	633,559
32	G45	Underground storage tank cleanup	1,819	8,653	10,472

Exhibit 3O
Industrial Process/Activity Sources of Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C (A+B)
Item	Industrial Process/ Activity Hazardous Waste Generation Source Code		Beneficial disposal** (tons/year)	Non-beneficial disposal*** (tons/year)	Total disposal (tons/year)
33	G49	Other remediation	7,038	90,240	97,278
		Subtotal remediation of past contamination =	9,688	4,217,877	4,227,565
34	G61	Received from offsite for storage/bulking for transfer offsite	300,627	246,466	547,093
35	G63 to G75	Imported from a foreign country	8,750	32	8,782
		Subtotal not physically generated onsite =	309,377	246,497	555,875
36	G??	Source code not provided	0	0	0
		Column totals =	2,225,350 (6%)	32,449,721 (94%)	**34.675 million* (100%)**

Notes:
* Data Source: EPA 2007 RCRA Hazardous Waste Biennial Report (BR): http://www.epa.gov/osw/inforesources/data/br07/index.htm. This exhibit represents ultimate disposal methods from Form GM, Section 2 for onsite disposal, and Form GM, Section 3 for offsite disposal.
** Beneficial disposal = H050 + H061
*** Non-beneficial disposal = H040 + H071 + H073 + H075 + H076 + H077 + H081 + H082 + H083 + H101 + H103 + H111 + H112 + H121 + H122 + H123 + H124 + H129 + H131 + H132 + H134 + H135

Exhibit 3P
Physical Form of Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C (A+B)
Item	Biennial Report Physical Form Code		Beneficial disposal** (tons/year)	Non-beneficial disposal*** (tons/year)	Total disposal (tons/year)
1	W001	Lab packs w/out acute haz waste	1,998	9,159	11,156
2	W002	Contaminated debris	15,294	98,864	114,158
3	W004	Lab packs w/acute haz waste	281	8,664	8,945
4	W301	Contaminated soil	1,014	737,724	738,738
5	W309	Batteries, battery parts, cores, casings	6	5,110	5,116
6	W310	Filters, adsorbents, ion exchange resins, spent carbon	7,270	30,721	37,991
7	W320	Electrical devices	165	678	843
8	W512	Sediment or lagoon dragout, drilling or other muds	54	6,120	6,174
9	W801	Compressed gases	2,968	6,507	9,475
		Subtotal mixed media/debris/devices =	29,048	903,547	932,595
10	W101	Very dilute aqueous waste >99% water	4,856	9,386,198	9,391,055
11	W103	Spent concentrated acid	1,108	1,517,271	1,518,379
12	W105	Acidic aqueous wastes <5% acid	803	4,260,407	4,261,210
13	W107	Aqueous waste containing cyanides	7	44,282	44,289
14	W110	Caustic aqueous waste or wastewaters	1,419	1,277,680	1,279,100
15	W113	Other aqueous waste or wastewaters	12,771	5,512,079	5,524,850
16	W117	Waste liquid mercury	2	63	65
17	W119	Other inorganic liquid	30,880	463,728	494,608
		Subtotal inorganic liquids =	51,847	22,461,709	22,513,556
18	W200	Still bottoms liquid form	156,903	35,597	192,501
19	W202	Concentrated halogenated solvent	14,585	38,804	53,388
20	W203	Concentrated non-halogenated solvent	317,076	100,161	417,237
21	W204	Concentrated halogenated/non-halo solvent mixture	286,702	69,556	356,258
22	W205	Oil-water emulsion/mixture	48,863	30,222	79,085
23	W206	Waste oil	28,975	4,895	33,869
24	W209	Paint, ink, lacquer or varnish	68,842	10,939	79,781
25	W210	Reactive or polymerizable organic liquids/adhesives	18,522	31,307	49,829
26	W211	Paint thinner or petroleum distillates	47,654	4,641	52,295
27	W219	Other organic liquid	836,277	6,472,946	7,309,222
		Subtotal organic liquids =	1,824,397	6,799,068	8,623,465
28	W303	Ash	4	113,751	113,754
29	W304	Slags, drosses, other solid thermal residues	31	616,043	616,074
30	W307	Metal scale, filings, scrap (including drums)	238	26,185	26,423
31	W312	Cyanide or metal cyanide bearing solids, salts, chems	4	52,389	52,393
32	W316	Metals salts or chemicals w/out cyanide	175	34,129	34,304
33	W319	Other inorganic solids	12,861	426,324	439,186

Exhibit 3P
Physical Form of Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C (A+B)
Item	Biennial Report Physical Form Code		Beneficial disposal** (tons/year)	Non-beneficial disposal*** (tons/year)	Total disposal (tons/year)
		Subtotal inorganic solids =	13,313	1,268,821	1,282,134
34	W401	Pesticide solids	154	12,067	12,222
35	W403	Solid resins, plastics, polymerized organics	18,261	16,163	34,424
36	W405	Explosives or reactive organic solids	16	26,138	26,154
37	W409	Other organic solids	46,981	171,478	218,458
		Subtotal organic solids =	65,412	225,846	291,258
38	W501	Lime or metal hydroxide sludges	110	57,270	57,380
39	W503	Gypsum sludges from wastewater or air treatment		4,947	4,947
40	W504	Other sludges from wastewater or air treatment	4,556	136,597	141,152
41	W505	Metal bearing sludges	241	21,802	22,043
42	W506	Cyanide-bearing sludges	23	10,991	11,014
43	W519	Other inorganic sludges	314	16,891	17,205
		Subtotal inorganic sludges =	5,243	248,497	253,741
44	W603	Oily sludge	40,397	46,430	86,827
45	W604	Paint or ink sludges, still bottoms	13,575	9,229	22,803
46	W606	Resins, tars, polymer, tarry sludge	41,242	2,747	43,989
47	W609	Other organic sludge	100,003	8,244	108,248
		Subtotal organic sludges =	195,217	66,650	261,867
48	W???	Physical form code not provided	40,871	475,583	516,455 (2.3%)
		Totals =	2,225,350 (6%)	32,449,721 (94%)	**34.675 million* (100%)**

Notes:
* Data Source: EPA 2007 RCRA Hazardous Waste Biennial Report (BR): http://www.epa.gov/osw/inforesources/data/br07/index.htm. This exhibit represents ultimate disposal methods from Form GM, Section 2 for onsite disposal, and Form GM, Section 3 for offsite disposal.
** Beneficial disposal = H050 + H061
*** Non-beneficial disposal = H040 + H071 + H073 + H075 + H076 + H077 + H081 + H082 + H083 + H101 + H103 + H111 + H112 + H121 + H122 + H123 + H124 + H129 + H131 + H132 + H134 + H135

Exhibit 3Q
Waste Codes Assigned to Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C (A+B)	
Item	RCRA Waste Code		Beneficial disposal** (tons/year)	Non-beneficial disposal*** (tons/year)	Total disposal (tons/year)	
1	Dxxx	1 or more toxicity leaching test waste codes only	947,390	19,697,523	20,644,913	60%
2	Fxxx	1 or more non-specific industrial source waste codes only	106,593	1,253,323	1,359,916	4%
3	Kxxx	1 or more specific industrial source waste codes only	99,508	2,457,817	2,557,325	7%
4	Pxxx	1 or more "acutely hazardous" discarded or off-spec commercial chemical products, container residues & spill residues thereof	37	9,355	9,392	< 1%
5	Uxxx	1 or more "toxic waste" commercial chemical products, manufacturing intermediates, or off-spec commercial chemical products	1,866	28,963	30,829	< 1%
6	Mixed	Assigned with multiple waste codes from 2 or more categories above	1,069,956	9,002,468	10,072,424	29%
7	????	Waste code not provided	0	272	272	< 1%
		Column totals =	2,225,350	32,449,721	**34.675 million***	**100%**

Notes:
* Data Source: EPA 2007 RCRA Hazardous Waste Biennial Report (BR): http://www.epa.gov/osw/inforesources/data/br07/index.htm. This exhibit represents ultimate disposal methods from Form GM, Section 2 for onsite disposal, and Form GM, Section 3 for offsite disposal.
** Beneficial disposal = H050 + H061
*** Non-beneficial disposal = H040 + H071 + H073 + H075 + H076 + H077 + H081 + H082 + H083 + H101 + H103 + H111 + H112 + H121 + H122 + H123 + H124 + H129 + H131 + H132 + H134 + H135

3D.2 Methodology for Identifying Potentially Recyclable Wastes Currently Disposed

This section presents the data screening (i.e., data selection) criteria applied in this RIA to the baseline disposal data displayed in Exhibits 3M to 3Q above. As described below, this screening process involves two steps:

- Step1: Primary screening criteria to identify disposed wastes containing constituents of potential commodity value
- Step 2: Secondary screening criteria to identify commodity-containing wastes of sufficient physical quality for recovery

The purpose of these complementary screening steps is to identify the baseline disposal quantities (i.e., 2007 tons per year) that may be physically and chemically sufficient for potential future switchover to recycling under the DSW final rule exclusions. The baseline disposal types and associated annual quantities which remain after applying this two-step data screening process, are applied in this RIA as inputs to the spreadsheet computations for the disposal switchover breakeven test described in Chapter 8 of the 2008 DSW RIA. The breakeven test is executed in this RIA on a micro (i.e., waste stream-by-waste stream) basis, not on a facility-by-facility basis or industry-by-industry basis. The breakeven test represents a micro-economic financial test to determine if facilities may change their management practices for individual waste streams to obtain the potential economic benefits of the DSW final rule.

Before presenting the two-step screening process and results below, there are two possible observations about the baseline disposal data presented in Exhibits 3O, 3P and 3Q above. Taken together these two observations suggest that **76% to 77%** of the baseline disposal hazardous wastes should not be expected, *a priori*, to yield break-even switchover recycling under the 2008 DSW final rule. This percentage range represents a lower-bound and upper-bound range produced by alternatively assuming complete overlap and assuming no overlap between the two observations, respectively.

- Disposal Data Observation 1: Low quality physical form of baseline disposal hazardous wastes:

  Based on the physical form data presented in Exhibit 3N, a relatively large **76%** segment of the 34.675 million tons of baseline disposal appears to be low quality in terms of potential commodity recovery (recycling) efficiency and market value.

Exhibit 3P row 10	Disposal of W101	Very dilute aqueous waste >99% water	9.39 million tons	27.1%
Exhibit 3P row 12	Disposal of W105	Acidic aqueous wastes <5% acid	4.26 million tons	12.3%
Exhibit 3P row 15	Disposal of W113	Other aqueous waste or wastewaters n.e.c.	5.52 million tons	15.9%
Exhibit 3P row 27	Disposal of W219	Other organic liquid n.e.c.	7.31 million tons	21.1%
		Subtotal =	26.5 million tons	**76%**

- Disposal Data Observation 2: Missing codes from baseline disposal hazardous wastes:

  Exhibits 3O, 3P and 3Q reveal that **1%** of baseline disposal tonnage does not have associated Gxx source codes, Wxxx physical form codes, or Dxxx, Fxxx, Kxxx, Pxxx, Uxxx waste codes:

Exhibit 3O row 36	Disposal data without Gxx source codes	0 million tons	0%
Exhibit 3P row 48	Disposal data without Wxxx physical form codes	0.52 million tons	1.4%
Exhibit 3Q row 7	Disposal data without Dxxx, Fxxx, Kxxx, Pxxx, Uxxx	<0.001 million tons	0%
	Subtotal =	0.52 million tons	(**1%**)

Consequently, **1%** of baseline disposal cannot be evaluated in this RIA for break-even switchover, because the switchover methodology is based on using these codes as primary screening selection criteria for assigning to recycling commodity groupings as described below in Exhibit 3R.

- **Step 1: Primary Screening Criteria Applied to Baseline Waste Disposal Data (Commodity Values)**

The first data screening step is structured according to each of the three RCRA baseline recycling methods (i.e., metals recovery, solvent recovery, and other recovery). Each materials recovery method is assigned as a "commodity group" according to the respective types of materials involved in each of these three recovery methods. Exhibit 3R below presents the primary data screening criteria applied in this RIA according to these three commodity groups. The screening criteria consist of three sequentially applied "if then" data selection criteria involving 43 different Biennial Report (BR) and RCRA waste codes:

- Wxxx: 16 BR physical/chemical form codes
- Gxx: 4 BR industrial process/activity source codes
- Dxxx, Fxxx, Kxxx: 23 RCRA regulatory waste codes

EPA identified and assigned the screening codes in each criteria based on determining whether each of these codes pertained to metals, solvents, or to other types of materials contained in the wastes which might be amenable for recovery in the three commodity groups. The disposed quantities (i.e., 2007 tons) presented in Exhibits 3O to 3Q above will not match the disposed quantities presented in Exhibits 3S to 3W below (which are applied in the breakeven test of this RIA). Exhibits 3K to 3O (except for column B of Exhibit 3N as noted previously) present the national baseline disposal picture based on the 2007 BR reporting logic. Given the numbers in Exhibits 3M to 3Q are intended to add-up to the totals presented in the 2007 BR, a compatible BR database query logic was used to complete those exhibits. However, the resultant disposed quantities presented in Exhibits 3M to 3Q are higher than those used in the breakeven test as presented in Exhibits 3S to 3W below. The difference in disposed quantities between these two sets of exhibits is due to the following technical reasons pertaining to (a) how the BR data reporting forms are structured/designed and (b) there are different BR data reporting forms which separately target LQGs (i.e., "Form GM") and TSDFs (i.e., "Form WR"):

1. The onsite quantity disposed totals in Exhibit 3M (column G) from the 2007 BR are sums of the numbers reported in BR Form GM, Sec. 1, F. Quantity Generated in 2007 (see attached 2007 BR Form GM). The on-site quantity disposed totals used in the analysis are those reported in Form GM, Sec. 2, On-site Process System 1 and On-site Process System 2. These numbers sometimes do not match because either there is a reporting/data entry error, not all of the quantity generated is recovered (i.e., some may be disposed), or not all of the quantity generated in 2007 was recovered in 2007.
2. Source code G61 (received from offsite for storage/bulking for transfer offsite) waste is excluded in the breakeven test of this RIA given the waste is not physically generated on site (see Exhibit 3O, Item 34) by the generator.

3. The off-site management totals in Exhibit 3K (column H) from the 2007 BR are based on waste receipts (i.e., wastes reported received from off site for management on Form WR). The off-site management totals used in the cost analysis are based on reported shipments on Form GM. The quantities reported shipped for off-site recovery in Form GM, Sec. 3, Site 1, Site 2, and Site 3 are used.
4. Step 2 of this data screening methodology is presented in Exhibit 3S below where screening selection criteria are applied to baseline disposal data that eliminate much of the disposed quantities presented in Exhibits 3I through 3O.

Exhibit 3R
Primary Screening Selection Criteria Applied to Baseline Disposal Data
for Evaluating Potential Future Switchover to Recycling Under the DSW Final Rule Exclusions
(Note: the three criteria in this exhibit represent "IF THEN" criteria*)

Criterion A	Criterion B	Criterion C
BR Physical/Chemical Form Codes**	BR Industrial Process/ Activity Generation Source Codes**	RCRA Regulatory Codes**
Commodity Group #1: For Possible Metal Recovery:		
Include form codes: (n=10) • W107 wastes containing cyanides • W117 waste liquid mercury • W303 ash • W304 slags, drosses, other solid thermal residues • W307 metal scale, filings & scrap (metal drums) • W312 cyanide or metal cyanide solids, chemicals • W316 metal salts or chemicals w/out cyanides • W501 lime and/or metal hydroxide sludges/solids • W505 metal bearing sludges w/out cyanide • W506 cyanide-bearing sludges (non cont. soils)	For wastes with no reported form codes include source codes: (n=2) • G03 plating & phosphating • G04 etching	For wastes with no reported form codes and no reporting source codes G03 or G04 include RCRA waste codes: (n=38) • D005 barium • D006 cadmium • D007 chromium • D008 lead • D009 mercury • D010 selenium • D011 silver • F006, F007, F008 metal electroplating • F019 sludge from conversion coating of aluminum • K061 iron & steel mfg emission dust • K171, K172 petroleum refining spent catalysts

Exhibit 3R (continued)
Primary Screening Selection Criteria Applied to Baseline Disposal Data
for Evaluating Potential Future Switchover to Recycling Under the DSW Final Rule Exclusions
(Note: the three criteria in this exhibit represent "IF THEN" criteria*)

Criterion A	Criterion B	Criterion C
BR Physical/Chemical Form Codes**	BR Industrial Process/ Activity Generation Source Codes**	RCRA Regulatory Codes**
Commodity Group #2: For Possible Solvent Recovery:		
Include form codes: (n=5) • W202 concentrated halogenated organic liquids • W203 concentrated non-halogenated organic liquids • W204 concentrated halo/non-halogenated solvents • W209 paint, ink, lacquer or varnish • W211 paint thinner or petroleum distillates	For wastes with no reported form codes include source codes: (n=2) • G01 dip, flush or spray rinsing (using solvents) • G06 painting & coating	For wastes with no reported form codes and not reporting G01 or G06 include RCRA waste codes: (n=8) • F001, F002, F003, F004, F005 spent solvents • F024, F025 chlorinated aliphatic mfg • K086 solvent washes of ink equipment
Commodity Group #3: For Possible Other Recovery (Carbon Regeneration and Sodium Fluoride)*		
Include form codes: (n=1) • W310 filters, solid adsorbents, ion exchange resins and spent carbon (this RIA evaluates carbon only) • Note: not included are spent acids >5% (W103)***	---	• For wastes with no reported form codes include RCRA waste codes and form code W312 reported with K088 waste code move from Category 1 to Category 3: (n=1) • K088 aluminum production spent potliners (sodium fluoride)
Total codes A =16	Total codes B =4	Total codes C =23

Explanatory Notes:

- * IF THEN = The three criteria in this exhibit represent sequential database query criteria within each waste type row. First the form code data were pulled (criterion A), and for remaining data with missing form codes, the generator source code data were pulled (criterion B), then for remaining data with missing form codes, the regulatory waste code data were pulled (criterion C).
- **There are a total 47 Wxxx codes, 47 Gxxx codes, 40 Dxxx codes, 28 Fxxx codes, 120 Kxxx, codes, 205 Pxxx codes, and , 612 Uxxxx codes defined for data reporting to the RCRA Biennial Report (BR): .for complete lists see pp. 49 to 54 of the 2007 BR instructions book at: http://www.epa.gov/wastes/inforesources/data/br07/07report.pdf
- *** Upon review of W103 spent acids > 5%, G02 stripping and acid or caustic cleaning, and G05 metal forming and treatment waste streams nearly all the waste is not suitable for switchover to off-site other recovery. Much of the waste are dilute acid wastes that are disposed in on-site wastewater treatment systems followed by POTW/sewer or NPDES discharge or disposed by Class I UIC permitted deep-well injection. These disposal methods are cheap compared to offsite recovery. It will not be more economical to ship these wastes offsite for other recovery. It is beyond the time and resource constraints of this RIA to individually carry these records through the analysis. A small quantity (< 1,000 tons) of spent pickle liquor (K062) was identified. The quantity is too small to carry forward through the analysis.

- **Step 2: Secondary Screening Criteria Applied to Baseline Waste Disposal Data (Physical Quality)**

Exhibit 3S below presents the secondary screening criteria applied to baseline disposal wastes The purpose of these secondary screening criteria are to introduce a consideration of the anticipated physical quality of baseline disposed waste streams, prior to evaluating them in the disposal-switchover-to-recycling breakeven test of this RIA. The secondary screening criteria consist of six elements as follows:

(1) Remove disposed waste records that were residuals from hazardous waste management processes. Residuals generated by either (a) current materials recovery operations (H010, H020, H039), (b) energy/fuel recovery operations (H050, H061), or (c) thermal destructive treatment processes (H040), are assumed not to have a high content of recoverable material and are assumed will continue to be disposed. This corresponds to removing baseline disposal data records with source code G25. Disposed wastes with RCRA waste codes F006 and F007 were retained because these potentially recoverable wastes were often reported using this source code because they are derived from wastewater treatment processes.

(2) Remove disposed waste records that were wastes generated from industrial processes that are not continuous (e.g., those generated from remediation or one-time industrial activities). The material values from these wastes are less likely to be recoverable given they are not generated in a controlled process environment (i.e., remediation wastes involve spills and releases to the environment). Given their one-time nature of generation, generators are unlikely to go through the notification process for a DSW exclusion for a one-time waste generation event. This corresponds to removing baseline disposal data records corresponding to three sets of non-continuous source codes: (a) spills and accidental releases G31, G32, G33, G39, (b) remediation of past contamination G41, G42, G43, G44, G45, G49, and (c) non-periodic activities G12, G15, G19.

(3) Remove disposed wastes with waste descriptions containing the word “debris” from the data set. The material values from these wastes are less likely to be recoverable given they are not generated in a controlled process environment. Given their one-time nature of generation, generators are unlikely to go through the notification process for a DSW exclusion for a one-time waste generation event.

(4) Remove wastes with waste descriptions indicating they are “rinsewaters” or “groundwaters” to ensure the physical quality of the waste (i.e., the minimal recoverable material concentration) is technically sufficient for recovery. These dilute aqueous-based wastes typically do not contain recoverable fractions of valuable materials. This screening criterion was only applied to waste streams with no reported form code. Normally wastes like these would have a reported form code of W101 very dilute aqueous waste containing more than 99% water and W105 acidic aqueous wastes less than 5% acid.

(5) Remove some miscellaneous disposed wastes:

   a. Onsite Commodity Group #2 baseline disposal quantities were primarily disposed by non-beneficial incineration (H040), or by beneficial energy recovery (H050), or beneficial fuel blending (H061). For the purposes of this RIA, it is assumed that facilities which both generate and dispose wastes on site via beneficial energy or fuel recovery (i.e., H050 or H061) will not change to a materials recovery process under the DSW final rule exclusions. All these processes require relatively large onsite capital investments and air pollution control permitting costs, which make it less likely that onsite H040, H050 or H061 disposed wastes will switchover to materials recovery under the DSW exclusions. This corresponds to removing baseline disposal data records for onsite waste generation GM Form Section 2 H040, H050 and H061. However, this RIA subjects the disposal data records corresponding to offsite disposal Form GM involving these three waste codes (i.e., H040, H050, H061) to the breakeven

test for switchover to recovery/recycling.

b. All records with form code W310 not containing the word “carbon” or “charcoal” in the waste description were deleted from the list of disposed spent carbon wastes. This is necessary because the definition of the W310 physical/chemical form code allows reporting together in this single code, four different types of materials: (1) filters, (2) solid adsorbents, (3) ion exchange resins, and (4) spent carbons. Because of lack of characterizing data on the other three waste types, only spent carbon from these four waste types is evaluated in this RIA for potential switchover to recovery.

(6) Because of the fact there are tens of thousands of individual waste streams in the Biennial Report database for any given data year, it is beyond the time and resource constraints of this RIA to individually examine each narrative comment for baseline disposed wastes containing these "other" code sub-categories to determine whether they should be included in the breakeven test of this RIA. This corresponds to removing baseline disposal data records for H129 "other treatment". However, this RIA does include the H039 "other recovery or reclamation" catch-all sub-category in the baseline recycling data records analyzed elsewhere in this RIA for potential DSW exclusion de-regulatory cost savings. The “other” form codes already were removed by their exclusion from the “primary” screening selection criteria.

Exhibit 3S
Summary of Outcome of Primary & Secondary Screening Criteria
Applied to Baseline Disposal Wastes to be Evaluated for Switchover to Recycling

Secondary Selection Criteria	Remaining & Removed Disposal Quantities (2007 tons per year)	Total Remaining Baseline Disposal Quantity (2007 tons per year)
A. Primary Selection Criteria:		
Commodity Group 1	1,187,260	
Commodity Group 2	985,788	
Commodity Group 3	225,486	
Total Baseline Disposed Quantity Remaining	2,398,534	2,398,534
B. Secondary Screening Criteria:		
1. Remove Source Code G25	-211,055	2,187,479
2. Remove Wastes Generated by Non-Continuous Processes	-114,756	2,072,723
3. Remove Debris-Wastes	-14,950	2,057,773
4. Remove Rinsewaters and Groundwaters	-15,270	2,042,503
5. Remove Other Waste Specific Quantity	-178,020	1,864,483
6. Remove “Other Treatment” Quantity	-54,401	**1.81 million**

3D.3 Resultant Screening Selection Quantities of Baseline Disposal that May Switchover to Recycling

Exhibits 3T through 3W below present the resultant types and quantities (i.e., tons per year in relation to the baseline data year 2007 applied in this RIA) of the baseline disposed hazardous waste data selected by the 2-step screening process described above, which are applied in the new recycling "breakeven test" (see Chapter 8 of 2008 DSW RIA).

Exhibit 3T
Screening Selection Results of Baseline Disposal for Recycling Breakeven Test by Ultimate* Disposal Method (2007)

A	B	C	D	E	F (D+E)	G	H	I (G+H)
			2007 Count of Facilities Disposing			2007 Tons Disposed (management tons/year)		
Item	Disposal Method Code	Disposal Description	Onsite	Offsite (Shipped)	Total (non-duplicative)	Onsite (tons/year)	Offsite (tons/year)	Total (tons/year)
A. Beneficial Disposal Methods (n=2):								
1	H050	Energy Recovery	1	769	769	0	133,306	133,306
2	H061	Fuel Blending	1	4,782	4,782	0	196,461	196,461
		Subtotal beneficial disposal =	---	---	---	0	329,767	329,767
B. Non-Beneficial Disposal Methods (n=23):								
1	H040	Incineration	1	1,968	1,968	0	124,701	124,701
2	H071	Chemical Reduction	10	55	63	11,939	1,206	13,145
3	H073	Cyanide Destruction	17	60	75	4,698	2,536	7,234
4	H075	Chemical Oxidation	3	14	15	24	1,547	1,571
5	H076	Wet Air Oxidation	1	1	1			0
6	H077	Other Chemical Precipitation	11	142	151	1,086	4,730	5,815
7	H081	Biological Treatment	7	8	13	1,525	1,718	3,242
8	H082	Adsorption	1	6	6	0	1,080	1,080
9	H083	Air Or Steam Stripping	1	3	3	0	9	9
10	H101	Sludge Treatment And/or Dewatering	26	45	69	1,937	977	2,914
11	H103	Absorption	1	1	1	0	14	14
12	H111	Stabilization Or Chemical Fixation	17	755	765	57,998	215,079	273,077
13	H112	Macro-Encapsulation	1	27	27	0	827	827
14	H121	Neutralization Only	5	47	50	49	955	1,004
15	H122	Evaporation	10	10	17	1,151	153	1,303
16	H123	Settling Or Clarification	3	2	3	5	0	5
17	H124	Phase Separation	3	10	11	238	242	480
18	H129	Other Treatment	1	1	1			0
19	H131	Land Treatment Or Application	3	68	69	6	13,405	13,411
20	H132	Landfill Or Surface Impoundment	11	525	533	199,196	327,306	526,502

Exhibit 3T
Screening Selection Results of Baseline Disposal for Recycling Breakeven Test by Ultimate* Disposal Method (2007)

A	B	C	D	E	F (D+E)	G	H	I (G+H)
			2007 Count of Facilities Disposing			2007 Tons Disposed (management tons/year)		
Item	Disposal Method Code	Disposal Description	Onsite	Offsite (Shipped)	Total (non-duplicative)	Onsite (tons/year)	Offsite (tons/year)	Total (tons/year)
21	H134	Deepwell Or Underground Injection	2	36	36	2,090	3,231	5,320
22	H135	Discharge To Sewer/POTW Or NPDES	11	58	66	1,207	684	1,891
23	H141	Site receiving waste stored/bulked & transferred the waste with no treatment or recovery, fuel blending, or disposal at the receiving site.	150	4,607	4,692	106,812	219,960	326,772
24	H???	Disposal method not provided	1	884	884	0	170,144	170,144
		Subtotal non-beneficial disposal =	---	---	---	389,959	1,090,504	1,480,463
		Column totals =	---	---	---	389,959 (22%)	1,420,271 (78%)	**1.81 million (100%)**

Note: * Ultimate disposal = Some hazardous wastes undergo one or more sequential treatment (e.g., chemical neutralization) methods prior to ultimate disposal (i.e., final disposition). Generators report the ultimate disposal of their hazardous wastes on Form GM, Sec. 2 and Sec. 3.

Exhibit 3U
Screening Selection Results of Baseline Disposed Hazardous Wastes for Recycling Breakeven Test
By Identity of Industries Generating & Disposing RCRA Hazardous Wastes Which are Currently Disposed (2007)*

			A	B	C (A+B)	D	E	F (D+E)
			Location of Generation Tons Per Year			Location of Disposal Tons Per Year		
Item	Economic Subsector (2-digit NAICS Code)		Generation disposed onsite	Generation disposed offsite (shipped)	Total generation disposed	Beneficial disposal*	Non-beneficial disposal**	Total disposal
1	11	Ag, Forestry, Fishing & Hunting	0	241	241	0	0	0
2	21	Mining	0	704	704	0	626	626
3	22	Utilities	20	4,059	4,080	0	34	34
4	23	Construction	0	11,830	11,830	0	0	0
5	31	Manufacturing	16	5,104	5,120	0	16	16
6	32	Manufacturing	6,433	412,374	418,807	121,475	176,087	297,562
7	33	Manufacturing	119,096	702,120	821,216	21	140,496	140,517
8	42	Wholesale Trade	10	11,118	11,129	2,301	4,636	6,937
9	44	Retail Trade	0	141	141	0	0	0
10	45	Retail Trade	0	153	153	0	0	0
11	48	Transportation	205	3,939	4,145	23	862	885
12	49	Postal, Couriers, Messengers Storage	1	6,772	6,773	5	120	124
13	51	Information	457	1,972	2,429	2	599	601
14	52	Finance & Insurance	0	2	2	0	0	0
15	53	Real Estate, Rental & Leasing	107	367	474	0	127	127
16	54	Prof, Scientific & Tech Services	20	9,088	9,108	155	102	258
17	55	Mgt of Companies/Enterprises	0	84	84	0	0	0
18	56	Admin, Waste Mgt & Remediation	261,581	208,989	470,570	196,580	1,109,975	1,306,555
19	61	Educational Services	0	3,491	3,492	0	156	156
20	62	Health Care, Social Assistance	2	3,248	3,250	0	4	4
21	71	Arts, Entertainment, Recreation	0	196	196	0	0	0
22	72	Accommodation & Food Services	0	2	2	0	0	0
23	81	Other Services	14	4,375	4,389	10	22	32
24	92	Public Administration	1,995	29,901	31,896	15	2,251	2,266
25	??	NAICS code not reported	0	0	0	9,180	44,351	53,531 (3.0%)
		Column totals =	389,959 (22%)	1,420,271 (78%)	**1.81 million (100%)**	329,767 (18%)	1,480,463 (82%)	**1.81 million (100%)**

Explanatory Notes:

Data Source: EPA 2007 RCRA Hazardous Waste Biennial Report (BR): http://www.epa.gov/wastes/inforesources/data/br07/index.htm

* Beneficial disposal = H050 + H061; ** Non-beneficial disposal = H040 + H071 + H073 + H075 + H076 + H077 + H081 + H082 + H083 + H101 + H103 + H111 + H112 + H121 + H122 + H123 + H124 + H129 + H131 + H132 + H134 + H135 + H141

Exhibit 3V
Screening Selection Results of Baseline Disposal for Recycling Breakeven Test by Industries Generating Disposed Hazardous Wastes (2007)

			A	B	C	D
Item	Economic Subsector (2-digit NAICS Code)		Commodity Group 1 disposal (tons/year)	Commodity Group 2 disposal (tons/year)	Commodity Group 3 disposal (tons/year	Total Disposal (tons/year)
1	11	Agriculture, Forestry, Fishing & Hunting	8	233	0	241
2	21	Mining	264	315	125	704
3	22	Utilities	3,745	328	7	4,080
4	23	Construction	11,193	636	0	11,830
5	31	Manufacturing	1,995	3,124	1	5,120
6	32	Manufacturing	51,210	362,191	5,406	418,807
7	33	Manufacturing	710,045	91,992	19,179	821,216
8	42	Wholesale Trade	1,387	9,712	29	11,129
9	44	Retail Trade	7	134	0	141
10	45	Retail Trade	21	132	0	153
11	48	Transportation	902	3,212	30	4,145
12	49	Postal, Couriers, Messengers, Storage	3,233	3,429	111	6,773
13	51	Information	22	2,384	23	2,429
14	52	Finance & Insurance	2	0	0	2
15	53	Real Estate, Rental & Leasing	175	299	0	474
16	54	Professional, Scientific & Tech Services	379	8,722	7	9,108
17	55	Mgt of Companies/Enterprises	1	84	0	84
18	56	Admin, Waste Mgt & Remediation	216,667	94,507	159,396	470,570
19	61	Educational Services	299	3,189	4	3,492
20	62	Health Care, Social Assistance	228	3,022	0	3,250
21	71	Arts, Entertainment, Recreation	30	167	0	196
22	72	Accommodation & Food Services	0	2	0	2
23	81	Other Services	899	3,491	0	4,389
24	92	Public Administration	27,804	4,042	50	31,896
25	??	NAICS code not provided	0	0	0	0
		Column totals =	1,030,515 (57%)	595,345 (33%)	184,369 (10%)	**1.81 million (100%)**

Exhibit 3W
Screening Selection Results of Baseline Disposal for Recycling Breakeven Test by Physical Form of Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C	D (A+B+C)
Item	Biennial Report Physical Form Code		Commodity Group 1 disposal (tons/year)	Commodity Group 2 disposal (tons/year)	Commodity Group 3 disposal (tons/year)	Total disposal (tons/year)
1	W001	Lab packs w/out acute haz waste	0	0	0	0
2	W002	Contaminated debris	0	0	0	0
3	W004	Lab packs w/acute haz waste	0	0	0	0
4	W301	Contaminated soil	0	0	0	0
5	W309	Batteries, battery parts, cores, casings	0	0	0	0
6	W310	Filters, adsorbents, ion exchange resins, spent carbon	0	0	7,114	7,114
7	W320	Electrical devices	0	0	0	0
8	W512	Sediment or lagoon dragout, drilling or other muds	0	0	0	0
9	W801	Compressed gases	0	0	0	0
		Subtotal mixed media/debris/devices =	0	0	7,114	7,114
10	W101	Very dilute aqueous waste >99% water	0	0	0	0
11	W103	Spent concentrated acid	0	0	0	0
12	W105	Acidic aqueous wastes <5% acid	0	0	0	0
13	W107	Aqueous waste containing cyanides	12,643	0	0	12,643
14	W110	Caustic aqueous waste or wastewaters	0	0	0	0
15	W113	Other aqueous waste or wastewaters	0	0	1	1
16	W117	Waste liquid mercury	110	0	0	110
17	W119	Other inorganic liquid	0	0	0	0
		Subtotal inorganic liquids =	12,753	0	1	12,754
18	W200	Still bottoms liquid form	0	0	0	0
19	W202	Concentrated halogenated solvent	0	20,728	0	20,728
20	W203	Concentrated non-halogenated solvent	0	211,722	0	211,722
21	W204	Concentrated halogenated/non-halo solvent mixture	0	148,274	0	148,274
22	W205	Oil-water emulsion/mixture	0	0	0	0
23	W206	Waste oil	0	0	0	0
24	W209	Paint, ink, lacquer or varnish	0	75,746	0	75,746
25	W210	Reactive or polymerizable organic liquids/adhesives	0	0	0	0
26	W211	Paint thinner or petroleum distillates	0	33,747	0	33,747
27	W219	Other organic liquid	0	0	0	0
		Subtotal organic liquids =	0	490,217	0	490,217
28	W303	Ash	83,629	0	0	83,629

Exhibit 3W
Screening Selection Results of Baseline Disposal for Recycling Breakeven Test by Physical Form of Total Baseline Disposed RCRA Hazardous Wastes (2007)

			A	B	C	D (A+B+C)
Item	Biennial Report Physical Form Code		Commodity Group 1 disposal (tons/year)	Commodity Group 2 disposal (tons/year)	Commodity Group 3 disposal (tons/year)	Total disposal (tons/year)
29	W304	Slags, drosses, other solid thermal residues	398,635	0	158,619	557,254
30	W307	Metal scale, filings, scrap (incl. drums)	21,654	0	0	21,654
31	W312	Cyanide or metal cyanide bearing solids, salts, chems	24,024	0	0	24,024
32	W316	Metals salts or chemicals w/out cyanide	28,938	0	0	28,938
33	W319	Other inorganic solids	4,574	0	0	4,574
		Subtotal inorganic solids =	561,454	0	158,619	720,073
34	W401	Pesticide solids	0	0	0	0
35	W403	Solid resins, plastics, polymerized organics	0	0	0	0
36	W405	Explosives or reactive organic solids	0	0	11,769	11,769
37	W409	Other organic solids	0	0	6,670	6,670
		Subtotal organic solids =	0	0	18,439	18,439
38	W501	Lime or metal hydroxide sludges	59,135	0	0	59,135
39	W503	Gypsum sludges from wastewater or air treatment	0	0	0	0
40	W504	Other sludges from wastewater or air treatment	0	0	196	196
41	W505	Metal bearing sludges	20,449	0	0	20,449
42	W506	Cyanide-bearing sludges	10,112	0	0	10,112
43	W519	Other inorganic sludges	0	0	0	0
		Subtotal inorganic sludges =	89,695	0	196	89,891
44	W603	Oily sludge	0	0	0	0
45	W604	Paint or ink sludges, still bottoms	0	0	0	0
46	W606	Resins, tars, polymer, tarry sludge	0	0	0	0
47	W609	Other organic sludge	0	0	0	0
		Subtotal organic sludges =	0	0	0	0
48	W???	Physical form code not provided	366,613	105,128	0	471,741
		Totals =	1,030,515 (56%)	595,345 (33%)	184,369 (10%)	**1.81 million (100%)**

Notes: Data Source: EPA 2007 RCRA Hazardous Waste Biennial Report:
http://www.epa.gov/wastes/inforesources/data/br07/index.htm
* Beneficial disposal = H050 + H061; ** Non-beneficial disposal = H040 + H071 + H073 + H075 + H076 + H077 + H081 + H082 + H083 + H101 + H103 + H111 + H112 + H121 + H122 + H123 + H124 + H129 + H131 + H132 + H134 + H135 + H141.

3D.4 Baseline Rate of 2008 DSW Exclusions for Hazardous Wastes Diverted from Disposal to Recycling

As described above in Section 3C, the 2007 RCRA Biennial Report (BR) data summarized in this RIA do not reflect the (baseline) diversion of hazardous wastes from disposal to DSW-excluded recycling resulting from the 2008 DSW final rule. To quantify the baseline for analysis of the 2011 DSW proposed rule, this RIA adjusts the 2007 BR data to reflect the exclusions included in the 2008 DSW final rule. The rate of DSW exclusion notifications (i.e., annual count of facilities adopting the exclusions) assumed for baseline industrial recycling as discussed in Section 3D (i.e., 21 facilities per year), will also apply to the baseline disposal which may switch-over to recycling, as presented in this chapter.

CHAPTER 4

Estimate of Baseline Regulatory Cost Savings to Industry for the Existing DSW Recycling Exclusions

4A. Baseline Cost Savings Estimation Methodology

Prior to the 2008 DSW final rule, RCRA facilities engaged in recycling had to comply with 14 elements of RCRA Subtitle C regulatory requirements as listed below in Exhibit 4A. This included facilities that were already recycling (i.e., reported wastes managed by metals, solvent or other recovery in the 2007 BR) and facilities that were not yet recycling but might if costs decreased (i.e., disposed wastes with possible metal, solvent or other material recovery value as defined in Exhibit 3R). In 2008, EPA issued the DSW final rule which provided the opportunity for industries to realize future annual de-regulatory cost savings for current recyclers, and potentially created new recyclers from the population of facilities that were not recycling but might, given decreased costs.

The 2008 DSW final rule created 12 terms/conditions that need to be met to obtain a recycling exclusion. Exhibit 4B below lists the 12 conditions. Costs are incurred by industries to meet these 12 conditions. EPA estimated these cost savings and costs in the "Regulatory Impact Analysis" (RIA) for the October 2008 DSW final rule. For the 2011 DSW proposed rule these costs need to be adjusted for changes in quantity since 2008, changes in the number of affected facilities since 2008, inflation, and the rate at which facilities have submitted exclusion notifications between December 2008 and April 2011. In addition, the population of affected baseline facilities needs to be expanded to include pre-2008 exclusions which must meet technical provisions under the 2011 DSW proposed rule. This chapter updates findings from 2008 adjusting them to conditions in 2011.

This chapter presents estimates for baseline (i.e., current) regulatory cost savings associated with the 2008 DSW final rule exclusions and the pre-2008 DSW exclusions. Baseline cost savings associated with the DSW exclusions, as defined in this RIA include:

1. Avoided industry regulatory costs associated with the 14 elements of RCRA administrative burden.
2. Minus the industry costs associated with meeting the 12 conditions established by the 2008 DSW final rule to obtain a DSW exclusion.
3. Plus additional industry cost savings resulting from longer accumulation times and de-regulated management requirements for residuals under the 2008 DSW final rule.
4. The technical provisions of the 2011 DSW proposed revisions will add regulatory costs reducing the baseline cost savings associated with the 2008 DSW final rule. The costs associated with the 2011 DSW technical provisions are presented in the next chapter.

Baseline RCRA regulatory burden costs --- consisting of administrative paperwork burden plus technical standards burden --- may be eliminated with changes in RCRA regulatory status of the industrial materials and industrial facilities under each 2008 DSW final rule exclusion. As itemized in Exhibit 4A, the 2008 DSW RIA estimated 14 elements of baseline RCRA regulatory burden on the regulated

community (i.e., industrial hazardous waste generators, waste transporters, and waste TSDFs) such as reporting to RCRA-authorized state governments, onsite recordkeeping, RCRA permitting of waste management units, waste transport manifesting, and meeting RCRA Subtitle C technical standards for design, construction, operation and closure of hazardous waste management units. These are the baseline costs eliminated by managing a facility's RCRA hazardous wastes as hazardous materials under the 2008 DSW exclusions.

Also, because of the 2008 DSW final rule the generator status of a facility may change when recycled wastes are no longer counted as hazardous waste under the 2008 DSW final rule, resulting in a reduction or elimination of some RCRA baseline burden. The non-recycled quantity of hazardous waste a facility generates determines its generator status and continued RCRA regulatory burden. For example, if LQGs, SQGs, and CESQGs recycle more waste they may further reduce their generator status (i.e., switch from LQG to SQG, or switch from LQG to CESQG, or switch from SQG to CESQG status, or may no longer be a RCRA hazardous waste generator under any of these three regulatory categories). CESQGs already have exclusions from many RCRA regulatory requirements because of their small annual generation rate (i.e., less than 100 kilograms per month which is equivalent to 1.3 tons per year). SQGs and CESQGs have fewer RCRA regulatory administrative requirements than LQGs under 40 CFR Part 262 of RCRA Subtitle C (i.e., relatively less baseline burden for RCRA personnel training, biennial reporting of hazardous waste generation and management activities, and preparation of contingency plans).

As part of the 2008 DSW final rule industry had to meet 12 conditions associated with the three 2008 DSW final rule exclusions to obtain an exclusion from the definition of solid waste. For example, one condition is the requirement to notify RCRA-authorized state governments (or EPA regional offices) for excluded materials, which represents an implementation cost for compliance with the de-regulatory exclusions under the 2008 DSW final rule. Exhibit 4B presents a summary of the 12 baseline conditions for the three 2008 DSW final rule exclusions. Implementation of these conditions however may affect facility onsite waste accumulation practices, waste shipping, and waste treatment residual management operations creating additional cost savings, for example:

- Example 1: The resulting changes in generator status from LQG to SQG, to CESQG, or to non-generator status, will allow longer accumulation times, resulting in larger truckloads for shipment. With larger truckloads minimum management charges (higher unit costs, $/ton) may be avoided. Longer accumulation times will result in few shipments and reduced total shipping costs.

- Example 2: In addition, the 2008 DSW final rule may cause residuals (e.g., ash, distillation bottoms) generated from the recycling processes to be no longer regulated as "derived-from" RCRA hazardous wastes (RCRA 40 CFR 261.3(c)(2)(I)). Management of previously "listed" hazardous residuals may shift from RCRA Subtitle C regulated hazardous waste management to de-regulated management, although RCRA "characteristic" hazardous waste residuals will continue to require management as hazardous waste (40 CFR 261 Subpart C of the RCRA regulations defines "characteristic" hazardous wastes according to four classifications: 261.21 ignitability, 261.22 corrosivity, 261.23 reactivity, and 261.24 toxicity).

Exhibit 4A
Summary of 14 Baseline RCRA Subtitle C Regulatory Burden Requirements by Industry Facility Classification

A	B	C	D	E	F	G
Item	RCRA Subtitle C Requirement	Facility Regulatory Classification				Potential Change in Baseline Regulatory Burden Costs Under the 2008 DSW Final Rule Exclusions
		LQG	SQG	CESQG	TSDRF	
1	Obtain EPA ID Number	Required	Required	Not required	Required	Assumed no cost savings because generators already have incurred costs for obtaining EPA ID numbers (i.e., assumed "sunk cost")
2	Personnel Training	Required (40 CFR 262.34)	Basic training required (40 CFR 262.34)	Not required	Required	Cost savings incurred if generator becomes a SQG or CESQG with exclusion.
3	Recordkeeping	Required for manifests, exception report, and biennial report.	Required for manifests and exception reports.	Not required	Required for manifests, exception report, and biennial report	Cost savings incurred if recycled waste not defined as a hazardous waste or if generator becomes a SQG or CESQG with exclusion.
4	Exception Report	Required within 45 days of hazardous waste being accepted by initial transporter	Required within 60 days of hazardous waste being accepted by initial transporter	Not Required	See Generator Requirements	Cost savings incurred if generator becomes a SQG or CESQG with exclusion.
5	Biennial Reporting	Required	Not required	Not required	Required	Cost savings incurred if generator becomes a SQG or CESQG with exclusion.
6	Storage Requirements for Accumulated Hazardous Waste	Full compliance with management of containers or tanks	Basic requirements with technical standards for containers or tanks	None	Full compliance with management of containers or tanks	Assumed no cost savings if generator status changes because facilities already have incurred costs (i.e., assumed "sunk cost").
7	Part B Permit Renewal	None	None	None	Required	Cost savings incurred by permitted recycling facilities with exclusion. If they recycle all waste, they will incur facility-wide permit renewal savings. Otherwise, they will only incur savings associated with the permit renewal for the storage area associated with the recycling process.
8	Use Manifests	Required	Required, unless the waste is reclaimed under a contractual agreement	Not required	See Generator Requirements	Cost savings incurred if recycled waste not defined as a hazardous waste or if generator becomes a SQG (with contract agreement) or CESQG with exclusion.
9	Preparedness &	Required	Not Required	Not Required	Required	Cost savings incurred if generator

Exhibit 4A
Summary of 14 Baseline RCRA Subtitle C Regulatory Burden Requirements by Industry Facility Classification

A	B	C	D	E	F	G
Item	RCRA Subtitle C Requirement	Facility Regulatory Classification				Potential Change in Baseline Regulatory Burden Costs Under the 2008 DSW Final Rule Exclusions
		LQG	SQG	CESQG	TSDRF	
	prevention					becomes a SQG or CESQG with exclusion.
10	Contingency Plan	Required	Not required	Not required	Permit Requirement	Cost savings incurred if generator becomes a SQG or CESQG with exclusion.
11	Emergency Plan	Required	Not required	Not required	Permit Requirement	Cost savings incurred if generator becomes a SQG or CESQG with exclusion.
12	Facility closure	Not required	Not required	Not Required	Required	Costs incurred by recycler for obtaining financial assurance for closure/post closure of secondary materials storage containers.
13	Post-closure care	Not required	Not required	Not Required	Required	Costs incurred by recycler for obtaining financial assurance for closure/post closure of secondary materials storage containers.
14	Accumulation Time	90 days "Speculative accumulation" provisions (40 CFR 261.1(c)(8)) require that during a calendar year the amount of material that is recycled, or transferred to a different site for recycling, must equal at least 75% by weight or volume of the material at the beginning of the period.	180 days [or 270 days if transported more than 200 miles] "Speculative accumulation" provisions (40 CFR 261.1(c)(8)) require that during a calendar year the amount of material that is recycled, or transferred to a different site for recycling, must equal at least 75% by weight or volume of that material at the beginning of the period.	None	90 days	Cost savings incurred if generator becomes a SQG or CESQG with exclusion. Cost savings for longer speculative accumulation time limits for recycled materials.
Column total requirements =		**11**	**7**	**0**	**14**	

Exhibit 4B Summary of 12 Baseline Conditions for EPA's 2008 Final Rule Amendments to the DSW Recycling Exclusions					
	Conditions	Exclusion 1: Generator Controlled Recycling	Exclusion 2: Offsite Transfer Recycling	Exclusion 3: Case-by-Case Variance	Potential Baseline Costs Under the 2008 DSW Final Rule Exclusions
1	No speculative accumulation	Yes	Yes	N/A	"Speculative accumulation" provisions (see 40 CFR 261.1(c)(8)) require that during a calendar year (beginning January 1) the amount of material that is recycled, or transferred to a different site for recycling, must equal at least 75% by weight or volume of the amount of that material at the beginning of the period. Impact not estimated in this RIA.
2	Generator notifies EPA initially & every 2-years	Yes	Yes	N/A	Costs were estimated for generators to complete a notification of RCRA exclusion for their recycled wastes every 2-years.
3	Notification signed by corporate official	Yes	Yes	N/A	Additional costs will be incurred in the notification process to brief and obtain the signature of a corporate official.
4	Generator submits petition to EPA to demonstrate that materials are not solid wastes	N/A	N/A	Yes	Costs will be incurred to conduct waste characterization (totals and TCLP) to demonstrate waste has metal, solvent or other material values warranting recovery.
5	Maintain records of all offsite shipments for recycling	No (onsite) Yes (if involving offsite company affiliate, or tolling agreement)	Yes	N/A	Costs will be incurred by generator to maintain records of materials shipments to offsite recycling.
6	Confirmation of shipment receipt	Yes	Yes	N/A	Costs will be incurred by (a) offsite recycler to confirm to generator receipt of shipment, and (b) generator to maintain record of confirmation receipts.
7	Recycler has liability insurance for accidents	No	Yes	N/A	This RIA assumes no additional costs will be incurred because assumes all affected facilities currently have liability insurance for accidents as part of standard industry practice.
8	Recycler has financial assurance for closure	No	Yes	N/A	Costs incurred by recycler for obtaining financial assurance for closure/post closure of secondary materials storage containers.
9	Materials must be contained	Yes	Yes	Yes	No additional costs are assumed because all facilities will ensure containment to avoid CERCLA liability and RCRA corrective action for leaks/spills.
10	Residuals derived from recycling managed in	No	Yes	N/A	Assume all entities are currently treating residuals as listed waste, so cost savings will be incurred because "listed" waste definitions will no

Exhibit 4B
Summary of 12 Baseline Conditions for EPA's 2008 Final Rule Amendments to the DSW Recycling Exclusions

	Conditions	Exclusion 1: Generator Controlled Recycling	Exclusion 2: Offsite Transfer Recycling	Exclusion 3: Case-by-Case Variance	Potential Baseline Costs Under the 2008 DSW Final Rule Exclusions
	environmentally-protective manner				longer be attached to residuals.
11	Generator exercises due diligence reasonable efforts to ensure offsite recycling is legitimate	No	Yes	N/A	Generator incurs cost for conducting due diligence on offsite recycler.
12	Export of materials for recycling requires notice & consent and filing of an annual report documenting the actual number of shipments and quantity of material exported	N/A	Yes	N/A	Costs incurred by generator to notify foreign recycling facility of the requirements of the DSW exclusions and file an annual report on materials exported. This RIA does not estimate the annual fraction (percentage) of affected hazardous secondary materials which may be exported for recycling. However, this is a baseline RCRA Subtitle C requirement (40 CFR 262.53; 40 CFR 262.56), so no additional cost.
Count of total conditions* =		**6**	**11**	**2**	

Explanatory Notes:

- N/A = Not applicable.
- * Total counts of conditions in this Exhibit (a) do not include the four "legitimate recycling" factors (2 mandatory factors, plus 2 non-mandatory factors) which are common to all three recycling exclusions and are substantively the same as the current legitimacy policy, (b) do not distinguish and include the five sub-elements of item 11 due diligence for Exclusion 2, and (c) do not distinguish and include the nine criteria for making a non-waste determination under Exclusion 3.. This more detailed sub-itemization of requirements exceeds the impact estimation level-of-detail of this RIA Addition of these 18 omitted sub-items would increase the total count of conditions to 10 for Exclusion 1, to 20 for Exclusion 2, and to 15 for Exclusion 3.

Excluding metals, solvents, and other industrial "hazardous secondary materials" from RCRA regulation should make it more economical for generators and recycling facilities to recover the market-valued commodities from these materials, if the materials are recycled rather than disposed. For the 2008 DSW final rule, estimates were made of the potential new future industrial recycling that may be induced by the DSW exclusions. The induced new recycling estimates are based on applying a financial "breakeven test" to estimate the portion of baseline hazardous wastes which might switchover from disposal (either onsite or offsite disposal) to offsite recycling. This switchover impact represents a relatively less certain, hypothetical future scenario. It is important to emphasize that this disposal switchover to recycling scenario does not represent a "prediction" or "forecast" in this RIA, but represents a "futures analysis" method often used by EPA:[12]

> "*Scenarios are not predictions. They are stories of how the future might unfold — plausible stories that reflect information about trends and potential future developments. [Scenarios may be] designed to span a range of potential future conditions. The actual future is not likely to match any one of [alternative] depictions, but it will probably fall somewhere within the range of possibilities that [scenarios] explore.*"

The underlying rationale for this disposal switchover scenario is that excluding metal-, solvent-, and other chemical-bearing wastes that are recycled, is expected to make it more economical for waste generators and for waste recycling facilities to recover valuable chemical constituents from these wastes. Therefore, induced new recycling may result in additional savings to generators from at least three sources:

1. Relaxed waste accumulation time limits.
2. De-regulation of waste management residuals (e.g. ash, sludges, leachates) from recycled materials; i.e., if wastes are no longer considered a listed hazardous waste, the residuals generated by the waste recycling processes may no longer be regulated as "hazardous waste" under the RCRA "Derived-from Rule" (40 CFR 261.3(c)(2)(i)). Therefore, the management of these residuals might shift from RCRA Subtitle C (hazardous waste) to Subtitle D (nonhazardous waste) disposal if the residuals do not test characteristically hazardous (40 CFR 261 Subpart C).
3. Reduction and elimination of baseline costs for RCRA regulatory paperwork burden to affected entities (e.g., for manifesting, for maintaining RCRA waste management permits).

However, possibly offsetting some fractions of these potential RCRA regulatory cost savings, are the incremental costs to affected facilities, associated with complying with the conditions of each 2008 DSW final rule exclusion. Induced new recycling costs are a combination of:

- RCRA regulatory paperwork burden costs savings to industry
- New costs to affected industrial facilities to implement (i.e., comply with) the 12 DSW exclusion conditions
- State government hazardous waste fee cost savings to industry
- Waste management costs (i.e., current waste disposal cost compared to new recycling cost) to industry waste generators

[12] Source: EPA Office of Chief Financial Officer, http://www.epa.gov/cfo/futures/env_scen.htm.

- Potential market value to recyclers of the recovered material commodities (if hypothetically recycled rather than disposed)

All of these elements are integrated in the micro-economic (i.e., facility- and waste-specific) financial breakeven test to determine which facilities may be induced to switchover from baseline disposal to recycling under the 2008 DSW final rule exclusions.

Unit cost data and baseline cost estimates are not presented in this RIA for baseline RCRA regulatory requirements which (a) are "sunk costs" or (b) the baseline regulatory requirement is an infrequent event, for example:

- Obtaining an EPA identification number (this is assumed a "sunk cost" for affected industries)
- Preparing a RCRA manifest exception report (this is an unpredictable baseline regulatory event that does not frequently occur and is not estimated in this RIA)
- Complying with storage requirements for accumulated hazardous waste (this is assumed a "sunk cost" for affected industries)

A summary of the unit costs for the 14 elements of RCRA regulatory burden baseline cost to affected industries can be found in the 2008 DSW RIA.[13] Similarly, a summary of average unit costs to meet the 12 conditions associated with the three 2008 DSW final rule exclusions to obtain an exclusion are presented in of the 2008 DSW RIA.[14]

The primary sources of many of these baseline burden unit costs are the labor hour estimates contained in Information Collection Request (ICR) supporting statements for the RCRA hazardous waste program.[15] An ICR describes reporting, record keeping, survey, or other information collection requirements imposed on the public (e.g., households, industry) by a Federal agency such as the EPA. ICR supporting statements provide overviews of the information collection, and provide estimates of the costs and labor hours imposed on the public to respond to ICRs. ICR paperwork burden, referred to as RCRA administrative requirements in this chapter, are evaluated for compliance with 40 CFR 262 generator standards such as manifest, pre-transport, recordkeeping, reporting, and differences in regulatory requirements for facilities that are LQG, SQG, CESQG, and TSDF regulatory status. Industrial disposal and recycling costs are based on RACER 2005 cost estimating software (RACER = Remedial Action Cost Engineering Requirements cost estimating system (http://www.fecpractice.com/Docs/RACER%20Overview.pdf) and other published sources.

[13] See Exhibit 6B of EPA's RIA for the 2008 DSW final rule for a listing of the unit costs. Appendix B to the 2008 RIA provides background data references and computations for these baseline RCRA regulatory unit costs. Potential market values of recoverable commodities contained in the baseline disposed wastes are presented in Appendix A of the 2008 RIA. Baseline industrial disposal costs and commercial recycling prices are presented in Appendix D of the 2008 RIA.

[14] See Exhibit 7B of EPA's RIA for the 2008 DSW final rule for a listing of the unit costs. Additional unit cost details are provided in Appendix C of the 2008 RIA.

[15] The RCRA hazardous waste program ICRs from which unit costs are applied in this RIA are ICR 2106.01, ICR 801, ICR 820, ICR 976, ICR 1189.14, ICR 1572, and ICR 1573. EPA ICRs are available from OMB's Federal agency ICR inventory at: http://www.reginfo.gov/public/do/PRAMain

4B. Baseline Regulatory Cost Savings for the 2008 DSW Recycling Exclusions

4B.1 De-Regulatory Cost Savings Baseline from the 2008 DSW Final Rule RIA

This section contains a series of exhibits which present the outcome of the cost savings estimates for the 2008 DSW final rule exclusions. The average annual, non-discounted, nationwide de-regulatory cost savings estimated in the 2008 DSW RIA was **$95.3 million per year** (source: 2008 RIA Exhibit 1B, page 8). The 2008 RIA cost savings represents one part of the baseline defined in this RIA for purpose of incremental analysis of the potential impact of the 2011 DSW proposed revisions to the 2008 DSW final rule. The other part of the baseline applied in this RIA pertains to the 2011 proposed options which may affect pre-2008 DSW exclusions. The 2008 DSW final rule RIA baseline consists of three components, which are related as follows: ($106.4 million deregulatory savings #1) – ($15.8 million condition costs #2) + (4.7 million net market value #3) = $95.3 million per year net cost savings:

- 2008 baseline component #1 of 3: Cost savings from the deregulation of 14 RCRA Subtitle C regulatory requirements: Annual industry baseline cost savings to LQGs, SQGs, transporters, and TSDRFs for elimination of all 14 regulatory cost elements outlined in Exhibit 4A above are estimated in the 2008 DSW RIA for all three 2008 DSW final rule exclusions. Up to **$106.4 million per year** in cost savings were estimated if 100% of the facilities submitted a notification for exclusion.[16]

- 2008 baseline component #2 of 3: New costs to meet 12 terms/conditions for the 2008 DSW final rule recycling exclusions: Annual industry baseline costs to comply with the paperwork burden conditions under each 2008 DSW recycling exclusion are estimated in EPA's 2008 DSW RIA. Up to **$15.8 million per year** in costs were estimated if 100% of the facilities submitted a notification for exclusion.[17]

- 2008 baseline component #3 of 3: Net market value of recovered hazardous secondary materials facilities would otherwise dispose (discard). Annual industry baseline cost savings for industrial secondary materials recovered from potential switchover of some hazardous waste streams from baseline disposal to new future recycling under the 2008 DSW final rule exclusions are estimated in the 2008 DSW RIA. Up to **$4.7 million per year** in cost savings were estimated if 100% of the facilities switched from baseline disposal to new future recycling and submitted a notification for exclusion.[18]

[16] See Chapter 6 of the 2008 DSW RIA.
[17] See Chapter 7 of the 2008 DSW RIA.
[18] See Chapter 8 of the 2008 DSW RIA.

4B.2 Update Factors Applied to the 2008 DSW De-Regulatory Cost Savings Baseline

The $95.3 million per year average annual cost savings from the 2008 DSW RIA[19] is updated in this RIA to 2011 using four update factors:

1. Update factor #1 of 4: Annual Tonnages: A tonnage adjustment factor to reflect changes in industrial output and coinciding waste recycling between the 2005 and 2007 BR reporting cycles. For the tonnage adjustment factor, the reported 2007 BR recycling quantity was compared to the reported 2005 BR recycling quantity to derive a tonnage adjustment factor of -2.48% representing a decrease in industrial recycling of hazardous wastes (see Exhibit 4C below). Only the reported recycling quantities and not disposal quantities were used because most (81%) of the estimated annual cost savings from the 2008 DSW RIA are associated with RCRA-regulated recycling activities (i.e., $77.3 million per year (81% of $95.3 million/year) in cost savings associated with RCRA-regulated recycling, compared to $16.7 million per year (%18% of $95.3 million/year) in estimated cost savings from disposal quantities shifting to recycling in the 2008 DSW RIA; the residual $1.3 million/year (<2% of $95.3 million/year) is associated with the case-by-case variance exclusion).[20]

Exhibit 4C
Annual Quantities of RCRA Hazardous Wastes Currently Recycled by Generator Industry

A	B		C	D	E ((D-C)/ Cx100%)
Item	Generator Industry 2-digit NAICS code		2005 BR Recycling (tons per year)	2007 BR Recycling (tons per year)	% Change in Recycling Between 2005 & 2007
1	11	Ag, Forestry, Fishing, Hunting	0	70	NA
2	21	Mining	3	4	33.33%
3	22	Utilities	54	0	-100.00%
4	23	Construction	11	669	5981.82%
5	31	Manufacturing	350	136	-61.14%
6	32	Manufacturing	575,988	535,749	-6.99%
7	33	Manufacturing	1,215,208	1,085,944	-10.64%
8	42	Wholesale Trade	19,298	16,549	-14.24%
9	44	Retail Trade	8	6	-25.00%
10	45	Retail Trade	0	0	0.00%
11	48	Transportation	177	31	-82.49%
12	49	Postal, Couriers, Warehousing	0	0	0.00%
13	51	Information	12,781	12,106	-5.28%
14	52	Finance & Insurance	0	0	0.00%
15	53	Real Estate, Rental & Leasing	2	0.5	-75.00%
16	54	Prof, Scientific & Tech Services	9	71	688.89%

[19] See Exhibits 9E and 9F in the 2008 DSW RIA.
[20] See Exhibit 9F in the 2008 DSW RIA.

Exhibit 4C Annual Quantities of RCRA Hazardous Wastes Currently Recycled by Generator Industry					
A	B		C	D	E ((D-C)/ Cx100%)
Item	Generator Industry 2-digit NAICS code		2005 BR Recycling (tons per year)	2007 BR Recycling (tons per year)	% Change in Recycling Between 2005 & 2007
17	55	Mgt of Companies/Enterprises	0	0	0.00%
18	56	Admin, Waste Mgt, Remediation	220,824	342,901	55.28%
19	61	Educational Services	78	53	-32.05%
20	62	Health Care, Social Assistance	153	71	-53.59%
21	71	Arts, Entertainment, Recreation	3	0	-100.00%
22	72	Accommodation & Food Services	0	0	0.00%
23	81	Other Services	13	22	69.23%
24	92	Public Administration	222	157	-29.28%
25	??	NAICS code not provided	0	0	0.00%
		Column totals =	**2,045,182**	1,994,540	**-2.48%**

2. Update factor #2 of 4: Price Level: An annual US nationwide average price inflation factor to reflect changes in labor, equipment, and materials prices between 2007 and 2011 (costs in the 2008 DSW RIA are based on 2007$). For the price level adjustment factor, aggregate costs are all inflated from 2007$ to 2011$ using an implicit price deflator of 1.0505 (based on data from Table 1.1.9 Implicit Price Deflators for Gross Domestic Product, Bureau of Economic Analysis last revised May 26, 2011).[21] The implicit price deflator for 2007 is 106.296. The first quarter 2011 implicit price deflator is 111.668. The ratio of these two implicit price deflator values results in an inflation adjustment multiplier of 1.0505 (111.668/106.296 = 1.0505).

Note: Although not applied in this RIA, it is of macro-economic interest to indicate that an alternative and relevant price level update index – the "Chemical Engineering Plant Cost Index" (CEPCI) -- indicates a 2007:to:2011 update multiplier of 1.0750, whereas in comparison the BEA implicit price deflator is 1.0505. Thus, the dollar values (i.e., costs and cost savings) estimated in this RIA are about 2% lower (i.e., (1.0505 / 1.0750) x 100% = 97.72%) than they would be if this RIA applied the CEPCI rather than the BEA GDP-IPD. The CEPCI is published monthly by Chemical Engineering magazine. The CEPCI ratio for 2011:to:2007 = (564.8 CEPCI January 2011 preliminary) / (525.4 CEPCI 2007 annual) = 1.0750 cost update multiplier. The 2007 and 2011 CEPCI data are from http://www.scribd.com/doc/53184082/M-S-2011. The CEPCI is a relative narrow price index comprised of four major price categories: (a) chemical plant equipment, (b) chemical plant construction labor, (c) chemical plant buildings, and (d) chemical plant engineering and supervision, whereas the BEA GDP IPD is a very broad index comprised of prices for all sectors of the US national economy.

[21] The BEA's Table 1.1.9 "Implicit Price Deflators for Gross Domestic Product" is available online at http://www.bea.gov/national/nipaweb/SelectTable.asp?Selected=Y

3. Update factor #3 of 4: Eligible Facility Count: A facility count adjustment factor to reflect changes in industrial recycling activity between the 2005 and 2007 BR reporting cycles. The 2007 BR counts of facilities recycling were compared to the reported 2005 BR recycling facility count to derive a tonnage adjustment factor of -10.15% representing a decrease in the number of industrial facilities recycling hazardous wastes, as displayed in Exhibit 4D. Only the reported count of facilities recycling hazardous waste and not the count of facilities disposing hazardous waste were used because most (81%) of the estimated cost savings from the 2008 DSW RIA are associated with current recycling activities (i.e., $77.3 million per year (81% of $95.3 million/year) in cost savings associated with RCRA-regulated recycling, compared to $16.7 million per year (%18% of $95.3 million/year) in estimated cost savings from disposal quantities shifting to recycling in the 2008 DSW RIA; the residual $1.3 million/year (<2% of $95.3 million/year) is associated with the case-by-case variance exclusion).[22]

Exhibit 4D
Count of Facilities Currently Recycling Hazardous Waste
by Three Categories of RCRA Hazardous Waste Baseline Recycling*

Hazardous Waste Recycling Category	A 2005 count of facilities generating wastes that are recycled	B 2007 count of facilities generating wastes that are recycled	C ((B-A)/ Ax100%) Percent Change in Generators Recycling
H010: Metals recovery: high temperature metals recovery, retorting, secondary smelting, & other metals recovery (e.g., ion exchange, reverse osmosis, acid leaching).	2,352	2,019	-14.16%
H020: Solvents recovery: fractionation/ distillation, thin film evaporation, & solvent extraction.	2,466	2,101	-14.80%
H039: Other recovery: acid regeneration, waste oil recovery, non-solvent organic liquids recovery, & other miscellaneous recovery methods except energy recovery or use as fuel.	829	867	4.58%
Non-duplicative totals =	**4,809**	**4,321**	**-10.15%**

* The State of Michigan reported a significant decrease in the number of facilities recycling in 2007 compared to 2005.

4. Update Factor #4 of 4: Exclusion Adoption Rate: An adoption rate based on the rate of DSW exclusion notifications for baseline industrial recycling presented later in this RIA.

[22] See Exhibit 9F in the 2008 DSW RIA.

4B.3 Result of Updating the 2008 DSW De-Regulatory Cost Savings Baseline to 2011

Exhibits 4E through 4I below present the updated 2008 RIA baseline facility counts, annual recycling tonnages, and annual net de-regulatory cost savings for the five recycling exclusions of the 2008 DSW final rule.

- Exclusion 1A Generators who recycle on site.
- Exclusion 1B Offsite transfer recycling at a different facility under the control of the generator (i.e., same company).
- Exclusion 1C Offsite transfer recycling under a tolling contract. Tolling arrangement offsite recycling indirectly estimated using baseline offsite recycling for NAICS industry code 32519 Other Organic Chemical Mfg.
- Exclusion 2: Offsite transfer recycling based on all other offsite recycling not covered under Exclusion 1 (i.e., mutually-exclusive non-duplicative impact), plus all baseline disposal estimated to potentially shift to offsite recycling.
- Exclusion 3: Case-by-case "non-waste determination" variance. Note that each exhibit of this chapter does not present Exclusion 3 as a separate exhibit column according to the 2-digit NAICS code itemization, because Exclusion 3 was estimated in EPA's RIA for the 2008 DSW exclusions final rule, based on a simple methodology outside of the baseline recycling and baseline disposal datasets applied in the de-regulatory cost savings and disposal switchover breakeven test analyses used to estimate impacts for Exclusion 1 and Exclusion 2. For this reason, only the aggregate annual impact estimate for Exclusion 3 is presented as a bottom row of each exhibit

- **Update Results Based on 100% Eligible Facilities Adopting Without Future Annual Discounting**

The updated 2008 DSW baseline is based on the same simple scenario applied in the 2008 DSW RIA of 100% adoption (i.e., notification for exclusion under the 2008 DSW final rule) by all affected industrial facilities currently recycling hazardous waste and those projected to switch from baseline disposal of hazardous waste to new future recycling. Results are presented on a 2-digit NAICS code basis for affected industrial facility counts and affected annual tonnages because costs for the 2011 DSW proposed rule are dependent upon these numbers.

- Exhibit 4E: Presents counts of potentially affected 6-digit industries (546) & facilities (5,007) for the three 2008 DSW exclusions.
- Exhibit 4F: Presents estimated annual tonnages of affected hazardous wastes for the three 2008 DSW final rule exclusions (1.499 million tons total).
- Exhibit 4G: Presents the dollar-value of estimated baseline annual net cost savings to industry according to 2-digit NAICS sectors for the three 2008 DSW final rule exclusions ($96.6 million per year).
- Exhibit 4H: Presents the combined impact for all three exclusions.
- Exhibit 4I: Presents the estimated shift in baseline RCRA regulatory generator status of affected industrial facilities for the three 2008 DSW final rule exclusions (i.e., pre-rule and post-rule estimated counts of affected LQGs, SQGs, and CESQGs). This potential change in RCRA status is a driver (i.e., determinant) for five of the 14 RCRA regulatory paperwork burden elements itemized in Exhibit 4A row items 2, 3, 8, 10, 11. To a much lesser extent, RCRA generator status is also a determinant of one of the 12 DSW exclusion conditions itemized in Exhibit 4B (row item 5). The estimate of potential change in generator status in this RIA is in relation to the entire annual tonnage of baseline RCRA hazardous

wastes generated or managed at each potentially affected facility (i.e., the facility-wide total annual tonnage for all hazardous waste streams generated or managed at a single facility), not just in relation to the sub-set of annual hazardous waste stream tonnage which may be affected by the 2008 DSW final rule recovery/recycling exclusions. Thus, as estimated in this RIA, this potential shift in RCRA regulatory status for generators is potentially more beneficial to the relatively large number of small-sized facilities (e.g., small businesses) which generate a relatively small number (i.e., <5) of small tonnage hazardous waste streams annually, and less beneficial to the relatively small number of large-sized facilities (e.g. large companies) which generate a large number (i.e., >5) of hazardous waste streams annually.

Exhibit 4E
Counts of Industries & Facilities Potentially Affected by the 2008 DSW Exclusions (2007 BR Data)
(i.e., Existing Facilities Which May Become Eligible for the Three 2008 DSW Final Rule Exclusions @100% Adoption Rate)

	A. Affected Industries			B. Affected Facilities				
				A	B	C	D	E (A+B+C+D)
Item	Industry 2-digit NAICS code		2007 Count of 6-Digit NAICS Codes Affected (see full list in **Appendix A**)	Exclusion 1A (Generator onsite)	Exclusion 1B (Same co. offsite)	Exclusion 1C (offsite tolling)	Exclusion 2 (Transfer-based)	Combined Exclusions 1+2
1	11	Ag, Forestry, Fishing, Hunting	3	0	0	0	3	3
2	21	Mining	13	0	0	0	21	21
3	22	Utilities	12	0	2	0	94	96
4	23	Construction	9	1	0	0	21	22
5	31	Manufacturing	22	0	0	0	34	34
6	32	Manufacturing	109	49	4	92	1,176	1,322
7	33	Manufacturing	226	36	9	0	2,244	2,289
8	42	Wholesale Trade	25	1	0	0	105	106
9	44	Retail Trade	3	0	0	0	30	30
10	45	Retail Trade	4	0	0	0	4	4
11	48	Transportation*	29	1	0	0	104	105
12	49	Postal, Messengers, Storage	3	0	1	0	28	29
13	51	Information	6	1	0	0	10	11
14	52	Finance & Insurance	0	0	0	0	0	0
15	53	Real Estate, Rental & Leasing	7	0	5	0	8	13
16	54	Prof, Scientific & Tech Services	8	1	1	0	159	161
17	55	Mgt of Companies/Enterprises	1	0	0	0	4	4
18	56	Admin, Waste, & Remediation	17	7	58	0	86	151
19	61	Educational Services	7	2	2	0	167	171
20	62	Health Care, Social Assistance	8	2	1	0	81	84
21	71	Arts, Entertainment, Recreation	5	0	0	0	6	6
22	72	Accommod & Food Services	0	0	0	0	0	0
23	81	Other Services	15	0	1	0	79	80
24	92	Public Administration	13	0	1	0	191	192
Column totals =			**546**	101	84	92	4,656	4,933
Impact for Exclusion 3 (NAICS code industry-by-industry impact for Exclusion 3 not estimated) =								74
Combined impact (Exclusion 1 + Exclusion 2 + Exclusion 3) =								**5,007**

Exhibit 4F
Estimated Tons of Affected Hazardous Wastes in 2007 for the Three 2008 DSW Final Rule Exclusions
(100% Adoption Rate)

Item	Industry 2-digit NAICS code		A Exclusion 1A (Generator onsite)	B Exclusion 1B (Same co. offsite)	C Exclusion 1C (offsite tolling)	D Exclusion 2 (Transfer-based)	E (A+B+C+D) Combined Exclusions 1+2
1	11	Ag, Forestry, Fishing, Hunting	0	0	0	12	12
2	21	Mining	0	0	0	122	122
3	22	Utilities	0	1	0	1,418	1,419
4	23	Construction	4	0	0	789	793
5	31	Manufacturing	0	0	0	299	299
6	32	Manufacturing	136,716	1,234	40,532	164,930	343,412
7	33	Manufacturing	275,289	4,001	0	668,158	947,449
8	42	Wholesale Trade	638	0	0	27,448	28,086
9	44	Retail Trade	0	0	0	229	229
10	45	Retail Trade	0	0	0	52	52
11	48	Transportation	19	0	0	1,559	1,578
12	49	Postal, Messengers, Storage	0	1	0	1,172	1,173
13	51	Information	11	0	0	250	260
14	52	Finance & Information	0	0	0	0	0
15	53	Real Estate, Rental & Leasing	0	3,328	0	83	3,411
16	54	Prof, Scientific & Tech Services	1	13	0	1,011	1,025
17	55	Mgt of Companies/Enterprises	0	0	0	25	25
18	56	Admin, Waste, & Remediation	14,339	16,836	0	16,229	47,403
19	61	Educational Services	7	7	0	786	800
20	62	Health Care, Social Assistance	81	10	0	507	598
21	71	Arts, Entertainment, Recreation	0	0	0	12	12
22	72	Accommodation & Food Srvcs	0	0	0	0	0
23	81	Other Services	0	1	0	992	993
24	92	Public Administration	0	49	0	1,376	1,425
25	??	NAICS code not reported	0	0	0	0	0
		Column totals =	427,104	25,479	40,532	887,457	1,380,571
						Sub-total offsite tonnage excluded (Columns B+C+D) =	953,468 **90,800 shipments***
						Impact for Exclusion 3 (NAICS code industry-by-industry impact for Exclusion 3 not estimated) =	118,476
						Combined impact (Exclusion 1 + Exclusion 2 + Exclusion 3) =	**1.499 million**

Note: * Annual offsite shipments (i.e., RCRA manifests) affected estimated by dividing offsite tonnage by range of 10.5 tons average partial load.

Exhibit 4G
Estimated Baseline Annual Cost Savings to Industry for the Three 2008 DSW Final Rule Exclusions
(Baseline Recycling Plus Baseline Disposal Switchover to Recycling* @100% Adoption Rate & 2011$)

Item	Industry 2-digit NAICS code		A Exclusion 1A (Generator onsite)	B Exclusion 1B (Same co. offsite)	C Exclusion 1C (offsite tolling)	D Exclusion 2 (Transfer-based)	E (A+B+C+D) Combined Exclusions 1+2
1	11	Ag, Forestry, Fishing, Hunting	$0	$0	$0	$7,696	$7,696
2	21	Mining	$0	$0	$0	$400,495	$400,495
3	22	Utilities	$0	$69,428	$0	$1,193,467	$1,261,869
4	23	Construction	$16,557	$0	$0	$232,932	$249,489
5	31	Manufacturing	$0	$0	$0	$577,597	$577,597
6	32	Manufacturing	$613,178	$76,279	$3,230,060	$22,777,272	$26,655,810
7	33	Manufacturing	$1,450,981	$269,383	$0	$44,803,949	$46,524,314
8	42	Wholesale Trade	$235	$0	$0	$1,727,288	$1,727,523
9	44	Retail Trade	$0	$0	$0	$184,892	$184,892
10	45	Retail Trade	$0	$0	$0	$91,209	$91,209
11	48	Transportation*	($1,135)	$0	$0	$1,899,754	$1,898,619
12	49	Postal, Messengers, Storage	$0	$33,342	$0	$545,613	$578,956
13	51	Information	$16,454	$0	$0	$232,226	$248,690
14	53	Real Estate, Rental & Leasing	$0	$28,371	$0	$107,310	$135,681
15	54	Prof, Scientific & Tech Services	$16,627	$51,355	$0	$2,778,298	$2,846,280
16	55	Mgt of Companies/Enterprises	$0	$0	$0	$86,042	$86,042
17	56	Admin, Waste, & Remediation	$150,908	$700,732	$0	$1,713,242	$2,564,882
18	61	Educational Services	$31,431	$67,548	$0	$3,460,750	$3,559,728
19	62	Health Care, Social Assistance	$14,295	$64,925	$0	$1,391,195	$1,470,415
20	71	Arts, Entertainment, Recreation	$0	$0	$0	$65,534	$65,534
21	81	Other Services	$0	$34,201	$0	$1,119,441	$1,153,643
22	92	Public Administration	$0	$33,980	$0	$4,027,347	$4,061,328
		Column totals =	$2,268,550	$1,428,521	$3,230,061	$89,423,563	$96,350,694
		Average per affected facility ($/facility) =	$22,461	$17,006	$35,109	$19,206	$19,532
		Average per affected waste annual ton ($/ton) =	$5	$56	$80	$101	$70
		Impact for Exclusion 3 (NAICS code industry-by-industry impact for Exclusion 3 not estimated) =					$1,311,182
		Combined impact (Exclusion 1 + Exclusion 2 + Exclusion 3) =					**$97.7 million**

* Reductions in state fees may influence generator waste management decisions (e.g., disposal vs. recycling) and are included in the micro-economic breakeven test. Distributive effects on state governments are not treated as social costs in this RIA for estimating the net economic impact. Government fees often represent "transfer payments" not real resource costs. State fees are taken out from the net economic impact. As a result, cost savings may be negative in this table.

Exhibit 4H
Estimated Baseline Annual Cost Savings for Baseline Recycling and Baseline Disposal for the Three 2008 DSW Final Rule Exclusions
(@100% Adoption Rate and 2011$)

			A	B	C	D	E	F
			Impact on Baseline Recycling			Impact on Baseline Disposal (Switchover to Recycling)		
Item	Industry 2-digit NAICS code		Facilities	Tons/year	Net savings	Facilities	Tons/year	Net savings
1	11	Ag, Forestry, Fishing, Hunting	2	9	$6,382	1	3	$1,314
2	21	Mining	15	64	$313,596	7	57	$86,899
3	22	Utilities	82	1,320	$1,116,795	19	98	$145,075
4	23	Construction	13	667	$206,322	10	126	$42,143
5	31	Manufacturing	22	251	$468,541	13	49	$109,058
6	32	Manufacturing	899	337,911	$21,123,039	655	5,500	$5,532,771
7	33	Manufacturing	1,672	933,113	$39,166,879	969	14,337	$7,357,435
8	42	Wholesale Trade	64	27,494	$1,413,702	49	592	$313,821
9	44	Retail Trade	30	229	$184,892	0	0	$0
10	45	Retail Trade	4	48	$80,849	1	4	$10,360
11	48	Transportation	79	1,282	$1,619,366	40	295	$279,253
12	49	Postal, Messengers, Storage	13	1,069	$378,641	16	104	$200,315
13	51	Information	11	239	$233,582	1	20	$15,107
14	53	Real Estate, Rental & Leasing	11	3,403	$113,534	4	9	$22,147
15	54	Prof, Scientific & Tech Services	106	638	$2,311,577	85	386	$534,703
16	55	Mgt of Companies/Enterprises	4	17	$82,605	1	9	$3,436
17	56	Admin, Waste, & Remediation	133	47,207	$2,251,770	38	195	$313,110
18	61	Educational Services	120	532	$2,873,920	92	267	$685,808
19	62	Health Care, Social Assistance	61	409	$1,277,084	35	190	$193,331
20	71	Arts, Entertainment, Recreation	5	12	$58,884	1	0	$6,650
21	81	Other Services	70	935	$1,096,130	11	58	$57,512
22	92	Public Administration	111	887	$2,833,842	146	538	$1,227,486
		Column totals =	3,528	1,357,736	$79,211,931	2,192	22,837	$17,137,733
			74	118,476	$1,311,182	= Impact for Exclusion 3 (NAICS not estimated)		
Baseline recycling + baseline disposal combined impact (Exclusion 1+Exclusion 2+Exclusion 3) =						**5,007**	**1.499 million**	**$97.7 million**

Exhibit 4I
Expected Change in Baseline RCRA Regulatory Generator Status
for the Three 2008 DSW Final Rule Exclusions (100% Adoption Rate)
Note: impacts in this Exhibit based on annual tonnages from both baseline recycling + baseline disposal switchover to recycling

	A	B	C	D	E	F		G	H		I (H-D)	
	Baseline Facility Status Counts				Post-Rule Facility Status Counts							
Generator Status*	Facilities Affected by Exclusion 1	Facilities Affected by Exclusion 2	Facilities Affected by Exclusion 3	Combined Exclusion (1+2+3)	Facilities Affected by Exclusion 1	Facilities Affected by Exclusion 2		Facilities Affected by Exclusion 3	Combined Exclusion (1+2+3)		Incremental Change in Facility Status Counts because of 2008 DSW Final Rule	
						Option 1 Selected	Option 1 NOT Selected		Option 1 Selected	Option 1 NOT Selected	Option 1 Selected	Option 1 NOT Selected
LQG	255	3,752	Not estimated	4,007	201	3,752	2,811	Not estimated	3,953	3,013	-54	-995
SQG	17	829	Not estimated	846	59	829	1,185	Not estimated	888	1,244	42	398
CESQG	4	75	Not estimated	79	16	75	660	Not estimated	91	676	12	597
Column totals	277	4,656	74	**5,007**	277	4,656	4,656	74	**5,007**	**5,007**	0	0

Explanatory Notes:
* RCRA generator status is determined by the monthly hazardous waste generation tonnages reported by each facility in the RCRA Biennial Report:
LQGs = >13.2 tons/year
SQGs = Between 1.3 and 13.2 tons/year
CESQG = <1.3 tons per year (note: this RIA counts facilities post-rule as CESQGs even if they are expected to become non-generators post rule).
"Acute hazardous" wastes determinations of generator status are not taken into consideration in this RIA.

- **Update Results Based on "*Base Case*" 13% Facilities Adopting (662) With Future Annual Discounting**

For a future annual adoption rate scenario for the 2011 proposed DSW recycling exclusion revisions (if promulgated), this scenario is formulated relative to the actual count of 49 industrial facilities which submitted DSW exclusion notifications under the 2008 DSW final rule as of April 26, 2011.[23] These 49 notifications were submitted to EPA over an approximate two-year, four-month period (i.e., between December 28, 2008 and April 26, 2011), which represents an annual average of 21 facilities per-year adopting the 2008 DSW recycling exclusions (i.e., (49 facilities) / (2.33 years) = 21 facilities per year). This actual adoption rate is applied in this RIA as a "base case" adoption scenario over the 50-year future period of analysis (i.e., 2015 to 2064) applied in this RIA.[24]

Using 21 facilities as an average annual adoption rate, over the future 50 year period, the cumulative average annual count of facilities adopting the 2008 DSW final rule under this scenario is 662 or 13% of all facilities potentially eligible for the 2008 DSW exclusions 1,2, and 3 (662/5,007 x 100 = 13%). Previously in EPA's RIA for the 2008 DSW exclusions final rule, industry implementation cost estimates were presented for a scenario in which 100% (i.e., 4,933 for exclusions 1 and 2 or 5,007 including exclusion 3 as of 2007 data year) of eligible industrial facilities submitted notifications for the 2008 DSW exclusions. This 13% "base case" adoption rate is applied in this RIA as a future scenario to estimate the baseline cost savings estimate associated with the 2008 DSW final rule exclusions.

Three alternative discount rates (i.e., 0%, 3%, and 7%) are applied to the baseline costs. Two of these discount rates (3% and 7%) are prescribed in OMB's 2003 "Circular A4" regulatory analysis guidance[25] for Federal regulatory agencies.

> Note: The higher 7% discount rate is used as the "base case" rate for this RIA, because the costs and cost savings associated with the pre-2008 and 2008 DSW recycling exclusions, as well as the 2011 proposed revisions to the DSW exclusions, almost exclusively impact industry rather than government. The higher discount rate (7%) may represent industry opportunity costs relative to investment opportunities by affected industries.

[23] Notification data are available from EPA-ORCR's webpage at http://www.epa.gov/waste/hazard/dsw/notify-sum.pdf

[24] This RIA and 2011 DSW ICR allocate these notifications among the three transfer-based recycling exclusion options differently. The RIA allocates the 21 notifications per year based on the weighted percentage of facilities affected by each exclusion. The remanufacturing exclusion population includes 201 facilities or 4.1% (201/4933 x 100%) of the total population of affected facilities. The Alternative Subtitle C Standards exclusion population includes 4,455 facilities or 90.3% (4,455/4,933 x 100%) of the total population of affected facilities. The generator-controlled population includes 277 facilities or 5.6%% (277/4,933 x 100%) of the total population of affected facilities. These weighted percentages are used to apportion the 21 notifications per year among the three option. The ICR will take into consideration the higher frequency of generator-controlled exclusions documented in the first 2.33 years of the 2008 DSW exclusion and assume this pattern will continue in the near term through their analysis period of 2015 to 2017. The RIA is looking at a 50-year time horizon (2015 to 2064) and assumes the notifications will be distributed proportionally among the three populations of facilities (i.e., transfer-based exclusion options) over the long term.

[25] OMB "Circular A4" is available at http://www.whitehouse.gov/omb/circulars_a004_a-4/

The 13% "base case" baseline cost savings for the 2008 DSW final rule recycling exclusions are:

- 0% discount rate: $15.1 million per year (see Exhibit 4J below).
- 3% discount rate: $10.8 million per year (see Exhibit 4K below).
- 7% discount rate: $7.4 million per year (see Exhibit 4L below).

Exhibit 4J
Estimated Baseline Annual Cost Savings to Industry for the Three 2008 DSW Final Rule Exclusions
(Baseline Recycling Plus Disposal Switchover to Recycling @13% State Adoption Rate, 2011$, 0% Discount Rate)

Item	Industry 2-digit NAICS code		A Exclusion 1A (Generator onsite)	B Exclusion 1B (Same co. offsite)	C Exclusion 1C (offsite tolling)	D Exclusion 2 (Transfer-based)	E (A+B+C+D) Combined Exclusions 1+2
1	11	Ag, Forestry, Fishing, Hunting	$0	$0	$0	$1,032	$1,032
2	21	Mining	$0	$0	$0	$53,705	$53,705
3	22	Utilities	$0	$9,310	$0	$160,040	$169,350
4	23	Construction	$2,220	$0	$0	$31,235	$33,456
5	31	Manufacturing	$0	$0	$0	$77,454	$77,454
6	32	Manufacturing	$82,225	$10,229	$433,141	$3,054,362	$3,579,957
7	33	Manufacturing	$194,572	$36,123	$0	$6,008,071	$6,238,766
8	42	Wholesale Trade	$31	$0	$0	$231,624	$231,655
9	44	Retail Trade	$0	$0	$0	$24,793	$24,793
10	45	Retail Trade	$0	$0	$0	$12,231	$12,231
11	48	Transportation*	($152)	$0	$0	$254,751	$254,599
12	49	Postal, Messengers, Storage	$0	$4,471	$0	$73,165	$77,636
13	51	Information	$2,206	$0	$0	$31,141	$33,347
15	53	Real Estate, Rental & Leasing	$0	$3,804	$0	$14,390	$18,194
16	54	Prof, Scientific & Tech Services	$2,230	$6,887	$0	$372,561	$381,677
17	55	Mgt of Companies/Enterprises	$0	$0	$0	$11,538	$11,538
18	56	Admin, Waste, & Remediation	$20,236	$93,966	$0	$229,740	$343,943
19	61	Educational Services	$4,215	$9,058	$0	$464,076	$477,349
20	62	Health Care, Social Assistance	$1,917	$8,706	$0	$186,555	$197,178
21	71	Arts, Entertainment, Recreation	$0	$0	$0	$8,788	$8,788
23	81	Other Services	$0	$4,586	$0	$150,114	$154,700
24	92	Public Administration	$0	$4,557	$0	$540,055	$544,611
		Column totals =	$309,701	$191,698	$433,141	$11,991,421	$12,925,960
		Average per affected facility ($/facility) =	$23,278	$17,101	$36,249	$19,741	$20,075
		Average per affected waste annual ton ($/ton) =	$6	$56	$82	$104	$72
						Impact for Exclusion 3 (NAICS code industry-by-industry impact for Exclusion 3 not estimated) =	$2,128,086
						Combined impact (Exclusion 1 + Exclusion 2 + Exclusion 3) =	**$15,054,046**

* Reductions in state fees may influence generator waste management decisions (e.g., disposal vs. recycling) and are included in the micro-economic breakeven test. Distributive effects on state governments are not treated as social costs in this RIA for estimating the net economic impact. Government fees often represent "transfer payments" not real resource costs. State fees are taken out from the net economic impact. As a result, cost savings may be negative in this table.

Exhibit 4K
Estimated Baseline Annual Cost Savings to Industry for the Three 2008 DSW Final Rule Exclusions
(Baseline Recycling Plus Disposal Switchover to Recycling @ 13% Adoption Rate, 2011$, 3% Discount Rate)

Item	Industry 2-digit NAICS code		A Exclusion 1A (Generator onsite)	B Exclusion 1B (Same co. offsite)	C Exclusion 1C (offsite tolling)	D Exclusion 2 (Transfer-based)	E (A+B+C+D) Combined Exclusions 1+2
1	11	Ag, Forestry, Fishing, Hunting	$0	$0	$0	$744	$744
2	21	Mining	$0	$0	$0	$38,719	$38,719
3	22	Utilities	$0	$6,712	$0	$115,382	$122,094
4	23	Construction	$1,601	$0	$0	$22,519	$24,120
5	31	Manufacturing	$0	$0	$0	$55,841	$55,841
6	32	Manufacturing	$59,281	$7,375	$312,276	$2,202,064	$2,580,995
7	33	Manufacturing	$140,278	$26,043	$0	$4,331,561	$4,497,883
8	42	Wholesale Trade	$23	$0	$0	$166,991	$167,014
9	44	Retail Trade	$0	$0	$0	$17,875	$17,875
10	45	Retail Trade	$0	$0	$0	$8,818	$8,818
11	48	Transportation*	($110)	$0	$0	$183,665	$183,555
12	49	Postal, Messengers, Storage	$0	$3,223	$0	$52,749	$55,972
13	51	Information	$1,591	$0	$0	$22,451	$24,042
15	53	Real Estate, Rental & Leasing	$0	$2,743	$0	$10,375	$13,117
16	54	Prof, Scientific & Tech Services	$1,607	$4,965	$0	$268,601	$275,173
17	55	Mgt of Companies/Enterprises	$0	$0	$0	$8,318	$8,318
18	56	Admin, Waste, & Remediation	$14,590	$67,745	$0	$165,633	$247,968
19	61	Educational Services	$3,039	$6,530	$0	$334,579	$344,148
20	62	Health Care, Social Assistance	$1,382	$6,277	$0	$134,498	$142,157
21	71	Arts, Entertainment, Recreation	$0	$0	$0	$6,336	$6,336
23	81	Other Services	$0	$3,306	$0	$108,225	$111,532
24	92	Public Administration	$0	$3,285	$0	$389,356	$392,641
		Column totals =	$223,281	$138,206	$312,276	$8,645,300	$9,319,063
		Average per affected facility ($/facility) =	$16,783	$12,329	$26,134	$14,232	$14,473
		Average per affected waste annual ton ($/ton) =	$4	$41	$59	$75	$52
						Impact for Exclusion 3 (NAICS code industry-by-industry impact for Exclusion 3 not estimated) =	$1,453,803
						Combined impact (Exclusion 1 + Exclusion 2 + Exclusion 3) =	**$10,772,866**

* Reductions in state fees may influence generator waste management decisions (e.g., disposal vs. recycling) and are included in the micro-economic breakeven test. Distributive effects on state governments are not treated as social costs in this RIA for estimating the net economic impact. Government fees often represent "transfer payments" not real resource costs. State fees are taken out from the net economic impact. As a result, cost savings may be negative in this table.

Exhibit 4L
Estimated Baseline Annual Cost Savings to Industry for the Three 2008 DSW Final Rule Exclusions
(Baseline Recycling Plus Disposal Switchover to Recycling, 13% Adoption Rate, 2011$, 7% Discount Rate)

Item	Industry 2-digit NAICS code		A Exclusion 1A (Generator onsite)	B Exclusion 1B (Same co. offsite)	C Exclusion 1C (offsite tolling)	D Exclusion 2 (Transfer-based)	E (A+B+C+D) Combined Exclusions 1+2
1	11	Ag, Forestry, Fishing, Hunting	$0	$0	$0	$488	$488
2	21	Mining	$0	$0	$0	$25,401	$25,401
3	22	Utilities	$0	$4,403	$0	$75,693	$80,097
4	23	Construction	$1,050	$0	$0	$14,773	$15,823
5	31	Manufacturing	$0	$0	$0	$36,633	$36,633
6	32	Manufacturing	$38,890	$4,838	$204,860	$1,444,603	$1,693,191
7	33	Manufacturing	$92,026	$17,085	$0	$2,841,601	$2,950,712
8	42	Wholesale Trade	$15	$0	$0	$109,550	$109,565
9	44	Retail Trade	$0	$0	$0	$11,726	$11,726
10	45	Retail Trade	$0	$0	$0	$5,785	$5,785
11	48	Transportation*	($72)	$0	$0	$120,488	$120,416
12	49	Postal, Messengers, Storage	$0	$2,115	$0	$34,604	$36,719
13	51	Information	$1,044	$0	$0	$14,728	$15,772
	53	Real Estate, Rental & Leasing	$0	$1,799	$0	$6,806	$8,605
	54	Prof, Scientific & Tech Services	$1,055	$3,257	$0	$176,208	$180,520
	55	Mgt of Companies/Enterprises	$0	$0	$0	$5,457	$5,457
	56	Admin, Waste, & Remediation	$9,571	$44,443	$0	$108,659	$162,673
	61	Educational Services	$1,993	$4,284	$0	$219,491	$225,769
	62	Health Care, Social Assistance	$907	$4,118	$0	$88,234	$93,258
	71	Arts, Entertainment, Recreation	$0	$0	$0	$4,156	$4,156
	81	Other Services	$0	$2,169	$0	$70,998	$73,167
	92	Public Administration	$0	$2,155	$0	$255,426	$257,582
Column totals =			$146,477	$90,666	$204,860	$5,671,510	$6,113,514
Average per affected facility ($/facility) =			$11,010	$8,088	$17,144	$9,337	$9,495
Average per affected waste annual ton ($/ton) =			$3	$27	$39	$49	$34
Impact for Exclusion 3 (NAICS code industry-by-industry impact for Exclusion 3 not estimated) =							$1,311,182
Combined impact (Exclusion 1 + Exclusion 2 + Exclusion 3) =							**$7,424,696**

* Reductions in state fees may influence generator waste management decisions (e.g., disposal vs. recycling) and are included in the micro-economic breakeven test. Distributive effects on state governments are not treated as social costs in this RIA for estimating the net economic impact. Government fees often represent "transfer payments" not real resource costs. State fees are taken out from the net economic impact. As a result, cost savings may be negative in this table.

4C. Baseline Regulatory Cost Savings for the Pre-2008 DSW Recycling Exclusions

As stated in Section 3C above, comprehensive data on the nationwide annual quantities of pre-2008 DSW excluded hazardous secondary materials are not readily available because they are not subject to biennial reporting to EPA under the RCRA Subtitle C hazardous waste regulations. This RIA assumes that the avoided RCRA regulatory costs for facilities operating under the pre-2008 DSW exclusions, will on a per-facility average annual basis, be the same as the 14 RCRA regulatory requirements avoided as presented in Exhibit 4A above for the 2008 DSW exclusions. Furthermore, net market prices from recovered commodities are assumed to be similar as those estimated for the recovered metals, solvents and acids in the 2008 DSW final rule RIA.

As displayed below in Exhibit 4M, assuming an average annual per-facility RCRA regulatory cost savings of $19,532 per year[26] for the estimated **5,321 facilities** with pre-2008 DSW exclusions (from Exhibit 3L above), produces an estimate of **$103.9 million per year** (2011$ @ 0% discount rate) in average annual RCRA regulatory cost savings (i.e., ($19,532 cost savings per facility per year) x (5,321 facilities)). This cost savings is $95.1 million per year at 3% and $79.3 million per year at 7%.

Exhibit 4M
Estimated Baseline Annual Cost Savings to Industry for the Pre-2008 DSW Industrial Recycling Exclusions (2011$)

A	B	C	D
Pre-2008 DSW exclusion (item)	Affiliated NAICS Codes (from column F of Exhibit 3I)	Count of Facilities Assumed to Have Pre-2008 DSW Recycling Exclusions (from Column E of Exhibit 3L)	Baseline RCRA Regulatory Cost Savings ($ per year)
1	31 +32 + 33 manufacturing	5,291	$78,840,500
2	Assume captured in item 1 above	In item 1	In item 1
3	Assume captured in item 1 above	In item 1	In item 1
4	322110 pulp mills	In item 1	In item 1
5	325188 other basic inorganic chem mfg	In item 1	In item 1
6	Assume captured in item 1 above	In item 1	In item 1
7	321114 wood preservation	In item 1	In item 1
8	324199 coke oven products	In item 1	In item 1
9	331111 iron & steel manufacturing	In item 1	In item 1
10	324110 petroleum refineries	In item 1	In item 1
11	562920 materials recovery facilities	3	$44,703
12	Assume captured in item 11 above	In item 11	In item 11
13	2122 minerals mining	27	$402,323
14	32519 organic chemical mfg	In item 1	In item 1

[26] $19,532 per-facility (2011$) average annual RCRA regulatory cost savings from Exhibit 4G.

Exhibit 4M **Estimated Baseline Annual Cost Savings to Industry for the Pre-2008 DSW Industrial Recycling Exclusions** (2011$)			
A	B	C	D
Pre-2008 DSW exclusion (item)	Affiliated NAICS Codes (from column F of Exhibit 3I)	Count of Facilities Assumed to Have Pre-2008 DSW Recycling Exclusions (from Column E of Exhibit 3L)	Baseline RCRA Regulatory Cost Savings ($ per year)
15	Assume captured in item 1 above	In item 1	In item 1
16	Assume captured in item 1 above	In item 1	In item 1
Non-duplicative column totals (@7% discount rate) =		**5,321**	**$79.3 million**
		@3% discount rate =	**$95.1 million**
		@0% discount rate =	**$103.9 million**

Because of incorrect (unnecessary) data reporting, there are actually some very limited data on the pre-2008 DSW exclusion materials available from the 2007 BR**.** The 2007 BR reports on a portion of the material (303,509 tons per year) managed under the pre-2008 exclusions (see Exhibit 3H above). The 12 conditions and their associated costs from the 2008 DSW final rule are included in the baseline cost savings estimate (presented above in Section 4B) for the excluded materials identified in the 2007 BR. However, the 2011 DSW proposed rule for pre-2008 DSW excluded materials proposes two of these conditions (conduct due diligence to determine legitimacy of recyclers and biennial notification). Thus, the estimate double-counts these costs, but the aggregate compliance costs are small.

For hazardous secondary materials under pre-2008 DSW exclusions, the recovery costs net out to zero due to equivalent pre-and post-2011 DSW proposed rule costs. Therefore, recovery costs are not estimated and included in the baseline. From Exhibit 4G above, average cost savings per facility (including costs associated with the 12 conditions of the 2008 DSW final rule) are estimated to be $19,532/facility or $70/ton. The estimated baseline cost savings is approximately $21.2 million per year (303,509 tons/year x $70/ton).[27] For the 13% "base case" adoption scenario, the estimated baseline cost savings is $2.8 million per year ($21.2 million per year x 13%). These quantities and cost savings are already captured in Section 4C above and are excluded from the totals in Exhibit 4M to avoid double-counting.

[27] One waste stream accounts for 214,156 tons with the waste description "spent lead/acid batteries and lead bearing scrap dismembered for metals recovery and recycling." This waste stream accounts for 71% of the total tonnage and cost savings.

4D. Summary of Baseline De-Regulatory Cost Savings Estimates for DSW Recycling Exclusions

- 7% discount rate: The total baseline de-regulatory costs savings is estimated at **$86.7 million per year** (2011$):
  - 2008 DSW exclusions contribute $7.4 million per year to this total assuming a 13% rate of DSW exclusion notification.
  - Pre-2008 DSW exclusions contribute $79.3 million per year.
- 3% discount rate: The total baseline de-regulatory costs savings is estimated at **$103.1 million per year** (2011$).
  - 2008 DSW exclusions contribute $10.8 million per year to this total assuming a 13% rate of DSW exclusion notification.
  - Pre-2008 DSW exclusions contribute $92.3 million per year.
- 0% discount rate: The total baseline de-regulatory costs savings is estimated at **$119.0 million per year** (2011$).
  - 2008 DSW exclusions contribute $15.1 million per year to this total assuming a 13% rate of DSW exclusion notification.
  - Pre-2008 DSW exclusions contribute $103.9 million per year.

CHAPTER 5

Estimate of Industry Costs to Comply with the 2011 Proposed Revisions to the DSW Recycling Exclusions

This chapter estimates the potential future costs to industry to comply with eight options for revising the DSW recycling exclusions. Seven of the options (i.e., Option 1 thru Option 7) are described in EPA's Federal Register notice for the 2011 proposed revisions to the DSW recycling exclusions. The final option (Option 8) presented in this chapter is not described in EPA's 2011 notice, but represents a preliminary option formulated by EPA at the September 2010 launch of this RIA.

For estimating potential industry costs, this RIA began by updating and revising the relevant unitized (i.e., per-facility) cost savings as estimated in EPA's RIA[28] for the 2008 DSW final rule. The cost analysis basically involved determining the incremental cost (or cost savings) of each proposed revision, relative to the requirements promulgated in the 2008 DSW final rule. In other words, this RIA uses the average annual cost savings estimates from the 2008 RIA, as a "baseline" for the incremental analysis of the 2011 proposed revisions. **Appendix B** to this RIA provides background calculations for factors applied in estimating costs in this chapter.

> Note: To avoid duplication of text in this RIA, descriptions for each DSW revision option are not re-produced in this chapter. Refer to Chapter 2 of this RIA for descriptions and details for each option.

Option 1: Withdraw the 2008 DSW Exclusion for Offsite Transfer Recycling

The estimated baseline cost savings for the 2008 DSW offsite transfer recycling exclusion (i.e., 2008 DSW finale rule "Exclusion 2") is $88.5 million per year (see Exhibit 4G, Column D) if all affected facilities notify. Based on the 13% base case adoption scenario, the annual cost for withdrawing the transfer-based exclusion is estimated to be $5.7 million per year calculated as follows:

[($89.4 million/year) x (6.3423% cost adjustment reflecting a 13% base case adoption rate and 7% discount rate for the 50-year future period of analysis[29])].

[28] EPA's 2008 DSW final rule RIA is titled "Regulatory Impact Analysis: USEPA's 2008 Final Rule Amendments to the Industrial Recycling Exclusions of the RCRA Definition of Solid Waste" 25 Sept 2008, 204 pages, available for free download as document ID nr. EPA-HQ-RCRA-2002-0031-0602 at http://www.regulations.gov.

[29] See **Appendix B, Exhibit B2** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived.

Option 2: Implement Alternative RCRA Subtitle C Regulation for the 2008 DSW Offsite Transfer Recycling Exclusion

Requirement 2A: Extended Accumulation Time Transportation Cost Savings

Potential transportation cost savings for Option 2 were calculated as the savings resulting from extending the accumulation time up to one year which was removed from the baseline cost savings estimate under Option 1 and adjusted for the potential transportation cost savings resulting from the DSW re-manufacturing exclusion under Option 6. One of the 14 burden costs relaxed under the 2008 DSW final rule was the allowance of accumulation up to one year. Under the 2008 DSW final rule "speculative accumulation" provisions (40 CFR 261.1(c)(8)) it required that during a calendar year the amount of material that is recycled, or transferred to a different site for recycling, must equal at least 75% by weight or volume of the material at the beginning of the period. The estimated accumulation baseline transportation cost savings for the speculative accumulation provisions in the 2008 DSW RIA for extending accumulation up to one year and reducing the number of shipments was $40.5 million (2007$) (from Exhibit 6C, Item 14 under Exclusion 2 of the 2008 DSW RIA). Adjusting this number using the tonnage adjustment factor, inflation adjustment factor, and 13% "base case" adoption scenario produces $2,633,406/year (2011 $), calculated as follows:

[($40,530,443 per year) x (1.0505 inflation adjustment factor) x (1 – 0.0248 tonnage adjustment factor) x (6.3423% cost adjustment reflecting a 13% base case rate and 7% discount rate for the 50-year future period of analysis[30])].

Requirement 2B: Notification

Requires submittal of a notification using EPA Form 8700-12 prior to operating, and thereafter biennially, under the 2008 DSW offsite transfer recycling exclusion. Labor hour and O&M cost estimates were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 2310.01 Revisions to the RCRA Definition of Solid Waste (Final Rule)", October 28, 2008.[31] Labor rate estimates were obtained from EPA's ICR for the "Supporting Statement for Revisions to the RCRA Definition of Solid Waste (Proposed Rule) OMB Control No. 2050-0202, EPA ICR No. 2310.02," June 30, 2011. Labor hours include 0.1 hours of managerial time at $101.68/hour, 0.3 hours of technical labor at $69.32/hour, and 0.1 hours of clerical labor at $24.67/hour with $0.44 in postage. The unit costs are estimated to be $33.87 per initial notification/facility and $2.91 for re-notification/facility (2011$). The total cost is $2.91 for re-notification/facility every two years which equals $1.46/facility (2011$) under the baseline transfer-based recycling exclusion will transfer over and cover the cost to re-notify biennially under the alternative RCRA Subtitle C regulation.

In addition, facilities are required to update and submit notification that the hazardous secondary materials are no longer managed in accordance with the alternative Subtitle C standard. This cost is assumed to be captured through the process of notifying biennially.

[30] See **Appendix B, Exhibit B2** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived.
[31] Document can be obtained under ICR Reference No: 200905-2050-001 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200905-2050-001.

The unit cost is applied to transfer-based exclusion facilities minus re-manufacturing exclusion facilities (4,656 – 201 = 4,455). The aggregate annual cost for notification is $413 per year, calculated as follows:

[(4,455 facilities) x ($1.46/facility/year) x (6.3423% cost adjustment reflecting the 13% base case adoption scenario, and 7% discount rate for the 50-year future period of analysis)].[32]

Requirement 2C: Require Advance Arrangements (Reclamation Plan)

Requires advance arrangements (including reclamation plan) for 2008 DSW excluded recycling. The rationale is that it would prevent the problem of generators accumulating potentially unrecyclable hazardous secondary materials. Documenting contractual arrangements will result in incurred costs. As a proxy for this cost, unit cost estimates for the notification of intent to export were used for 40 CFR 262.53 and 262.83(e). Unit cost estimates were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 0820.10 Hazardous Waste Generator Standards (Renewal)," January 2008.[33] Exporters to OECD countries (262.83(e)) are required to provide the following information in their notification to export waste for recycling:

- Fax number
- Serial number/identifier of notification form
- Intended carrier(s) and/or agents
- Countries of export, import, and transit and relevant authorities
- Certification of the existence of written contract, chain of custody, or equivalent arrangement with consignee, between exporter and importer
- Certification that the information is complete and correct
- Certification of financial guarantee if required by any concerned country (importing and transit).

The requirement for advance arrangements is assumed to be a contract similar to the costs for exporting to OECD countries which includes "certification of the existence of written contract, chain of custody, or equivalent arrangement with consignee, between exporter and importer." The cost to collect the specific information under 40 CFR 262.83(e) includes 1.5 hours of technical labor at $69.32/hour and $0.55 for copies for a total of $104.58 per facility (2011$). It is assumed this information is to be kept on file and submitted to EPA only upon request. The cost to prepare and maintain on file for a minimum of three years advance arrangement documents (reclamation plan) includes 0.1 hours of managerial labor at $101.68/hour, 0.3 hours of technical labor at $69.32/hour and 1.5 hours of clerical labor at $24.67/hour for a total of $65.26/facility (2011$). As a proxy, assume that EPA requests documentation of the reclamation plan once every 20 facilities which includes 0.16 hours of clerical labor at $24.67/hour and $0.44 in postage for a total cost of $0.22/facility (2011$). The total cost is $170.02 per facility (2011$).

[32] See **Appendix B, Exhibit B3** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Requirement 2B, this RIA applied an average cost per-facility of $1.46.

[33] Document can be obtained under ICR Reference No: 200801-2050-002 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200801-2050-002.

This cost is applied to transfer-based exclusion facilities only. From Exhibits 4E and 4G (columns D of both), respectively, minus re-manufacturing exclusion counts from Exhibits 5G and 5H (Column C of both), respectively, there are 4,455 affected offsite recycling exclusion facilities and 833,499 affected tons from transfer-based facilities. The aggregate annual cost to prepare advance arrangements is $48,000 per year, calculated as follows:

[(4,455 facilities x $170.02/facility/year x 6.3423% cost adjustment reflecting the 13% base case adoption scenario, and 7% discount rate for the 50-year future period of analysis[34)]].

Requirement 2D: Accumulation Restrictions

Allows accumulation of hazardous recyclable materials by the generator for up to one year, but prohibits accumulation of no more than two shipments of hazardous recyclable materials at any one time. The rational is that limiting the time period to a maximum of 12 months (as opposed to up to two years) reduces the possibility of discard from over-accumulation of materials.

The 2008 DSW final rule "speculative accumulation" provisions (40 CFR 261.1(c)(8)) require that during a calendar year the amount of material that is recycled, or transferred to a different site for recycling, must equal at least 75% by weight or volume of the material at the beginning of the period. Under the new requirement restricting accumulation to up to one year, the remaining 25% by weight or volume of the material can no longer be carried over into a second calendar year. Increased cost from shorter speculative accumulation time limits for recycled materials will occur because of increases in shipping and transportation costs. A 12-month time limit for speculative accumulation (rather than two years) will increase the number of shipments for affected hazardous secondary material. This RIA assumes that 15% of the annual tonnage is speculatively accumulated longer than a year. The number of shipments (or loads) is determined by dividing the tons recycled by 18 tons per truck load (typical truck size). From the 2008 DSW RIA, DPRA used professional judgment and RACER cost estimating software and inflated RACER 2005 unit costs to 2007$ using the GDP implicit price deflator to estimate waste testing and transport unit costs. Waste testing is estimated to cost $346/load (2007$) and an average transport cost for recovery is $2,517/load (2007$).

The average annual cost for reducing the speculative accumulation time period to one year inflated to 2011$ is $2,644/load. There are 4,455 affected transfer-based exclusion facilities generating 833,499 tons per year (from Exhibit 4E and Exhibit 4FColumn D, respectively, minus Exhibit 5G and Exhibit 5H Column C, respectively). The aggregate annual cost to reduce the speculative accumulation time period is $1.2 million per year, calculated as follows:

[(833,499 tons per year) / (18 tons per truck load) x ($2,644/load) x (15% of tonnage speculatively accumulated longer than one year) x (6.3423% cost adjustment reflecting the 13% base case adoption scenario, and 7% discount rate for the 50-year future period of analysis)[35])].

[34] See **Appendix B, Exhibit B3** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Requirement 2C, this RIA applied an average cost per-facility of $170.02.

[35] See **Appendix B, Exhibit B3** of this RIA for an example of how the cost adjustment factor and rate of exclusion notification were derived.

Requirement 2E.1: Speculative Accumulation Labeling

Requires the speculative accumulation start date to be labeled on each container, and allowing other procedures (such as posting of accumulation dates or entering dates in inventory logs) to ensure against speculative accumulation in other types of units not amenable to labeling. The rationale is that without a record of a start date for accumulation, this provision is difficult to enforce. While it is possible to use 40 CFR 261.2(f) to enforce speculative accumulation provisions, making the recordkeeping explicit would render the provision much more enforceable. The net cost impact of this revision is zero because it is likely that facilities already are placing the accumulation start date on containers to ensure compliance with the one year accumulation limit: "Speculative accumulation" provisions (40 CFR 261.1(c)(8)) require that during a calendar year (beginning Jan 1) the amount of material that is recycled, or transferred to a different site for recycling, must equal at least 75% by weight or volume, of material at the beginning of the period.

Requirement 2E.2: Contingency and Emergency Plans

Requires facilities to develop a spill control/contingency plan including personnel training and a chemical analysis plan, and allows facilities to use existing plans developed for other statutes if applicable. The rationale is it helps prevent or limit the potential for discard through spills, accidents or fires. Five percent of damage cases were from accidents. All offsite transfer recyclers will incur costs to develop contingency plans and emergency plans. Unit cost estimates were obtained and estimated from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 0820.10 Hazardous Waste Generator Standards (Renewal)," January 2008.[36] Under contingency planning requirements in 265.37(b), 265.51, 265.52, and 265.53(a) the following costs are incurred by LQGs and SQGs:

- Collecting job-related data uses 0.5 hours of clerical labor at $24.67/hour and equals $12.34/LQG and $12.34/SQG (2011$).
- Maintaining information at facility uses 0.1 hours of clerical labor at $24.67/hour and equals $2.47/LQG and $2.47/SQG (2011$).

Total personnel training costs for LQGs are $14.81/LQG and for SQGs are $14.81/SQG (2011$).

- Collect data required in contingency plan uses 2.0 hours technical labor at $69.32/hour and 1.0 hour of clerical labor at $24.67/hour and equals $163.32/LQG (2011$).
- Document whether authorities decline arrangement includes 0.1 clerical hours at $24.67/hour and equals $2.47/LQG (2011$).
- Write contingency plan includes 6.0 technical labor at $69.32/hour and 2.0 clerical hours at $24.67/hour and equals $466.29/LQG (2011$).
- Maintain contingency plan includes 0.1 clerical hours at $24.67/hour and equals $2.47/LQG (2011$).
- Submit contingency plan to relevant emergency centers includes 0.16 clerical hours at $24.67/hour and equals $3.95/LQG and $4.07/LQG in postage and copying (2011$).
- Amend contingency plan when appropriate includes 1.0 hour technical labor at $69.32/hour and 1.0 hour clerical labor at

[36] Document can be obtained under ICR Reference No: 200801-2050-002 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200801-2050-002.

$24.67/hour and $0.11 in photocopying and equals $94.10/LQG (2011$).

Total contingency plan cost for LQGs is $736.67/LQG (2011$). SQGs and CESQGs are not required to have contingency plans.

Under emergency procedure requirements in 40 CFR 265.56(d) the following costs are incurred by LQGs:

- Collecting information required in emergency report includes 1.0 hour technical labor at $69.32/hour and 1.0 hour clerical labor at $24.67/hour and equals $93.99/LQG (2011$).
- Writing an emergency report includes 0.17 hours of legal at $133.37/hour and 1.0 hour of technical labor at $69.32/hour and equals $91.99/LQG (2011$).
- Calling OSC or notifying NRC and notifying local authorities if advisable includes 0.1 hours managerial labor at $101.68/hour and 0.9 hours technical labor at $69.32/hour and equals $72.56/LQG and $10.38 in O&M costs (2011$).
- The total cost is $268.92/LQG (2011$).

Under emergency procedure requirements in 265.34(d) the following costs are incurred by SQGs:

- Observing scene of hazardous waste discharge includes 0.5 hours of technical labor at $69.32/hour and equals $34.66/SQG (2011$);
- Reporting by phone requested data for NRC includes 0.5 hours of technical labor at $69.32/hour and $5.19 in other charges and equals $39.85/SQG (2011$);
- Documenting that local officials declines to enter into arrangements for coordinating response includes 0.1 hour technical labor at $69.32/hour and equals $6.93/SQG (2011$); and
- Providing post-emergency information by phone includes 0.1 hours clerical labor at $24.67/hour and equals $2.47/SQG (2011$).
- The total cost is $83.91/SQG (2011$).

Under certification of compliance in 265.56(i) the following costs are incurred by LQGs and SQGs:

- Collect information required in emergency notification report includes 0.5 hours technical labor at $69.32/hour and 0.5 hours of clerical labor at $24.67/hour and equals $47.00/LQG (2011$).
- Write emergency notification report includes 0.17 hours of legal labor at $133.37/hour, 0.5 hours of technical labor at $69.32/hour and 0.5 hours of clerical labor at $24.67/hour and equals $69.67/LQG (2011$).
- Submit report to Regional Administrator includes 0.16 hours of clerical labor at $24.67/hour and $0.99 for postage and photocopies and equals $4.94/LQG (2011$).
- Compile information demonstrating compliance includes 0.5 hours of technical labor at $69.32/hour and 0.5 hours of clerical labor at $24.67/hour and equals $47.00/LQG (2011$).
- Total cost is $168.61/LQG (2011$). This RIA assumes the total cost for SQGs is two-thirds of the LQG labor cost at $112.73/SQG plus $0.99/SQG for postage and photocopies (2011$).

Cumulative total cost is $1,201.25/LQG, $194.64/SQG and $0/CESQG (2011$). Because of the withdrawal of the 2008 DSW offsite transfer-

based exclusion under Option 1 the RCRA generator status for these facilities revert to their baseline status. From Column B of Exhibit 4I, the 4,656 transfer-based facilities are comprised of 3,752 LQGs (80.6%), 829 SQGs (17.8%), and 75 CESQGs (1.6%). The weighted-average cumulative cost calculates to $1,002.86/facility (2011$). Assume contingency plans are revised every 10 years. The average annual cost is $100.29/facility/year (2011$). It is applied to transfer-based exclusion facilities only. From Exhibit 4E, there are 4,455 affected transfer-based exclusion facilities (minus 201 re-manufacturing exclusion facilities). The aggregate annual cost to prepare advance arrangements is $28,000 per year calculated as follows:

(4,455 facilities) x ($100.29 per facility per year) x (6.3423% cost adjustment reflecting the 13% base case adoption scenario, and 7% discount rate for the 50-year future period of analysis[37]).

Requirement 2F.1: Recordkeeping of Off-site Shipments

Retains current shipment requirements with no changes (i.e., all parties must retain records of off-site shipments and confirmation of receipts for three years). The rationale is that materials most likely to pose a hazard during transport will still be subject to DOT standards. Creating a new form or adopting the hazardous waste manifest form will be time-consuming and may not be worth the additional level of protection. All generators will incur cost. In the 2008 DSW RIA, costs were assumed to be direct labor costs for a staff engineer to conduct annual record keeping associated with RCRA hazardous waste management. Labor hours and labor costs are estimated based on DPRA professional judgment (2007$): LQGs use 9.0 hours of labor at a cost of $702 per year per facility, SQGs use 6.0 hours of labor at a cost of $468 per year per facility, and CESQGs use 3.0 hours of labor at a cost of $234 per year per facility. Because of the withdrawal of the 2008 DSW offsite transfer-based exclusion under Option 1 the RCRA generator status for these facilities revert to their baseline generator status. From Column B of Exhibit 4I, the 4,656 transfer-based facilities are comprised of 3,752 LQGs (80.6%), 829 SQGs (17.8%), and 75 CESQGs (1.6%). The weighted-average cumulative cost calculates to $649/facility (2007$). The average annual cost for recordkeeping of off-site shipments inflated to 2011$ is $682 per facility. It is applied to transfer-based exclusion facilities only. From Exhibit 4E, there are 4,455 affected transfer-based exclusion facilities minus the 201 re-manufacturing exclusion facilities. The aggregate annual cost to prepare advance arrangements is $193,000 per year, calculated as follows:

[(4,455 facilities x $682/facility/year x 6.3423% cost adjustment reflecting the 13% base case adoption scenario, and 7% discount rate for the 50-year future period of analysis[38])].

Requirement 2F.2: Transport to RCRA Permit Facility

Replaces the 2008 DSW offsite transfer recycling exclusion with an alternative hazardous waste regulation that requires that material be sent to a RCRA-permitted facility for recycling. The rationale is that it would allow EPA to add conditions without linking each one to "discard." TSDRFs will incur costs as a result of maintaining RCRA permits. Before the 2008 DSW final rule, generators were transferring RCRA

[37] See **Appendix B, Exhibit B3** of this RIA for an example of how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Requirement 2E.2, this RIA applied an average cost per-facility of $100.29.

[38] See **Appendix B, Exhibit B3** of this RIA for an example of how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Requirement 2F.1, this RIA applied an average cost per-facility of $682.

hazardous waste to RCRA permitted facilities and this practice would now resume under Requirement 2E.2. The estimated cost savings in the 2008 DSW final rule was $1,620,000 per year (2007$) for not having to renew RCRA permits. The cost of renewing RCRA permits will continue under the 2011 DSW proposed rule at a total cost of $1,620,000 per year (2007$). The total cost in 2011$ is $1,702,000. Discounting these costs from 2015 to 2011 equals $1,298,000 reflecting a 7% discount rate for the 50-year period of analysis ($1,702,000/$(1.07)^4$).

Option 2 (Plus Option 1) Total Cost

Option 2 is implemented in conjunction with Option 1. The total cost for Option 2 equals baseline cost savings plus Option 1 plus Option 2.

- 7% discount rate: The modified baseline cost savings estimate is $7.4 million from the 2008 DSW rule minus $5.7 million from the withdrawal of the off-site transfer exclusion under Option 1 plus $2.6 million under Option 2 for the retention of the one-year accumulation time and its associated transportation cost savings equals $4.3 million per year. Costs associated with meeting the requirements of Option 2 are $2.7 million per year. Baseline cost savings associated with the 2008 DSW final rule are reduced from $7.4 million per year under the 2008 DSW rule to $1.6 million per year post 2011 DSW proposed rule (Exhibit 5A).
- 3% discount rate: The modified baseline cost savings estimate is $10.8 million from the 2008 DSW rule minus $8.6 million from the withdrawal of the off-site transfer exclusion under Option 1 plus $4.0 million under Option 2 for the retention of the one-year accumulation time and its associated transportation cost savings equals $6.2 million per year. Costs associated with meeting the requirements of Option 2 are $3.7 million per year. Baseline cost savings associated with the 2008 DSW final rule are reduced from $10.8 million per year under the 2008 DSW rule to $2.4 million per year post 2011 DSW proposed rule (Exhibit 5B; totals in text due not match exhibit due to rounding).
- 0% discount rate: The modified baseline cost savings estimate is $15.1 million from the 2008 DSW rule minus $12.0 million from the withdrawal of the off-site transfer exclusion under Option 1 plus $5.6 million under Option 2 for the retention of the one-year accumulation time and its associated transportation cost savings equals $8.7 million per year. Costs associated with meeting the requirements of Option 2 are $4.7 million per year. Baseline cost savings associated with the 2008 DSW final rule are reduced from $15.1 million per year under the 2008 DSW rule to $4.0 million per year post 2011 DSW proposed rule (Exhibit 5C; totals in text due not match exhibit due to rounding).

Exhibit 5A
Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Implementing Alternative RCRA Subtitle C Regulation for the 2008 Offsite Transfer Recycling Exclusion (Option 2)
(13% Adoption Rate, 2011$, and 7% Discount Rate)

Item	Industry 2-digit NAICS code		A Count of Affected Transfer-Based Facilities	B Affected Transfer-Based Tonnage	C Baseline Cost Savings under 2008 DSW Rule - Option 1 Withdrawn Savings + Req. 2A Accum.. Transp. Cost Savings	D Requirement 2B Notification Compliance Costs (incremental to 2008 DSW Rule)	E Requirement 2C Advance Arrangements Compliance Costs (incremental to 2008 DSW Rule)	F Requirement 2D Accumulation Restriction Compliance Costs (incremental to 2008 DSW Rule)	G Requirement 2E.2 Contingency Plan Compliance Costs (incremental to 2008 DSW Rule)	H Requirement 2F.1 Record-keeping of Offsite Shipments Compliance Costs (incremental to 2008 DSW Rule)	I Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs (incremental to 2008 DSW Rule)	J (C+…+I) Option 2 Post-Rule Cost Savings (relative to 2008 DSW Rule baseline)
1	11	Ag, For, Fish, Hunt	3	12	$488	($0)	($29)	($17)	($17)	($117)	($17)	$291
2	21	Mining	21	122	$25,401	($2)	($223)	($170)	($131)	($894)	($179)	$23,802
3	22	Utilities	94	1,418	$80,097	($9)	($1,017)	($1,982)	($600)	($4,080)	($2,079)	$70,330
4	23	Construction	21	789	$15,823	($2)	($223)	($1,103)	($131)	($894)	($1,157)	$12,314
5	31	Manufacturing	34	299	$36,633	($3)	($368)	($418)	($217)	($1,476)	($439)	$33,711
6	32	Manufacturing	975	110,970	$1,693,191	($90)	($10,515)	($155,084)	($6,203)	($42,168)	($241,327)	$1,237,803
7	33	Manufacturing	2,244	668,158	$2,950,712	($208)	($24,193)	($933,770)	($14,271)	($97,018)	($979,646)	$901,607
8	42	Wholesale Trade	105	27,448	$109,565	($10)	($1,134)	($38,359)	($669)	($4,546)	($40,244)	$24,603
9	44	Retail Trade	30	229	$11,726	($3)	($320)	($320)	($189)	($1,282)	($336)	$9,277
10	45	Retail Trade	4	52	$5,785	($0)	($48)	($73)	($29)	($194)	($76)	$5,365
11	48	Transportation	104	1,559	$120,416	($10)	($1,124)	($2,179)	($663)	($4,507)	($2,286)	$109,647
12	49	Postal, Msgrs, Stor.	28	1,172	$36,719	($3)	($300)	($1,638)	($177)	($1,204)	($1,719)	$31,678
13	51	Information	10	250	$15,772	($1)	($107)	($349)	($63)	($427)	($366)	$14,459
14	53	Real Estate	8	83	$8,605	($1)	($87)	($116)	($51)	($350)	($13)	$7,987
15	54	Prof Sci &Tech Serv	159	1,011	$180,520	($15)	($1,715)	($1,413)	($1,012)	($6,877)	($1,483)	$168,006
16	55	Management	4	25	$5,457	($0)	($48)	($35)	($29)	($194)	($37)	$5,113
17	56	Ad, Waste & Remed	86	16,229	$162,673	($8)	($930)	($22,680)	($549)	($3,730)	($21,564)	$113,211
18	61	Educational Serv.	167	786	$225,769	($15)	($1,802)	($1,098)	($1,063)	($7,227)	($1,152)	$213,410
19	62	Health Care Soc Ass	81	507	$93,258	($7)	($872)	($709)	($514)	($3,497)	($744)	$86,915
20	71	Arts & Recreation	6	12	$4,156	($1)	($68)	($17)	($40)	($272)	($17)	$3,742
21	81	Other Services	79	992	$73,167	($7)	($853)	($1,386)	($503)	($3,419)	($1,454)	$65,545
22	92	Public Admin.	191	1,376	$257,582	($18)	($2,064)	($1,923)	($1,217)	($8,276)	($2,018)	$242,066
Column totals =			4,455	833,499	$6,113,514	($413)	($48,041)	($1,164,838)	($28,338)	($192,648)	($1,298,353)	$3,380,884
Withdraw 2008 Off-site Transfer Exclusion under Opt. 1					($5,671,409)							($5,671,409)
Accumulation Time Transportation Cost Savings					$2,633,407							$2,633,407
Impact for Exclusion 3 =					$1,311,182	$0	$0	$0	$0	$0	$0	$1,311,182
Combined impact (Excl. 1 + Excl. 2 + Excl. 3) =					**$4,386,694**	**($413)**	**($48,041)**	**($1,164,838)**	**($28,338)**	**($192,648)**	**($1,298,353)**	**$1,654,063**

Exhibit 5B
Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Implementing Alternative RCRA Subtitle C Regulation for the 2008 DSW Offsite Transfer Recycling Exclusion (Option 2)
(13% Adoption Rate, 2011$, and 3% Discount Rate)

Item	Industry 2-digit NAICS code		A Count of Affected Transfer-Based Facilities	B Affected Transfer-Based Tonnage	C Baseline Cost Savings under 2008 DSW Rule - Option 1 Withdrawn Savings + Req. 2A Accum.. Transp. Cost Savings	D Requirement 2B Notification Compliance Costs (incremental to 2008 DSW Rule)	E Requirement 2C Advance Arrangements Compliance Costs (incremental to 2008 DSW Rule)	F Requirement 2D Accumulation Restriction Compliance Costs (incremental to 2008 DSW Rule)	G Requirement 2E.2 Contingency Plan Compliance Costs (incremental to 2008 DSW Rule)	H Requirement 2F.1 Record-keeping of Offsite Shipments Compliance Costs (incremental to 2008 DSW Rule)	I Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs (incremental to 2008 DSW Rule)	J (C+…+I) Option 2 Post-Rule Cost Savings (relative to 2008 DSW Rule baseline)
1	11	Ag, For, Fish, Hunt	3	12	$744	($0)	($44)	($26)	($26)	($178)	($20)	$450
2	21	Mining	21	122	$38,719	($3)	($340)	($260)	($200)	($1,362)	($208)	$36,346
3	22	Utilities	94	1,418	$122,094	($13)	($1,551)	($3,021)	($915)	($6,219)	($2,422)	$107,954
4	23	Construction	21	789	$24,120	($3)	($340)	($1,681)	($200)	($1,362)	($1,347)	$19,187
5	31	Manufacturing	34	299	$55,841	($5)	($561)	($637)	($331)	($2,251)	($511)	$51,545
6	32	Manufacturing	1,176	164,930	$2,580,995	($138)	($16,029)	($236,400)	($9,455)	($64,278)	($281,088)	$1,973,608
7	33	Manufacturing	2,244	668,158	$4,497,883	($317)	($36,879)	($1,423,381)	($21,754)	($147,888)	($1,141,050)	$1,726,615
8	42	Wholesale Trade	105	27,448	$167,014	($15)	($1,728)	($58,473)	($1,019)	($6,929)	($46,875)	$51,975
9	44	Retail Trade	30	229	$17,875	($4)	($487)	($488)	($287)	($1,954)	($391)	$14,262
10	45	Retail Trade	4	52	$8,818	($1)	($74)	($111)	($44)	($296)	($88)	$8,205
11	48	Transportation	104	1,559	$183,555	($15)	($1,713)	($3,321)	($1,011)	($6,870)	($2,663)	$167,962
12	49	Postal, Msgrs, Stor.	28	1,172	$55,972	($4)	($458)	($2,497)	($270)	($1,836)	($2,002)	$48,906
13	51	Information	10	250	$24,042	($1)	($162)	($533)	($96)	($651)	($426)	$22,172
14	53	Real Estate	8	83	$13,117	($1)	($133)	($177)	($78)	($533)	($15)	$12,180
15	54	Prof Sci&Tech Srv	159	1,011	$275,173	($22)	($2,614)	($2,154)	($1,542)	($10,483)	($1,727)	$256,631
16	55	Management	4	25	$8,318	($1)	($74)	($53)	($44)	($296)	($43)	$7,808
17	56	Ad, Waste & Remed	86	16,229	$247,968	($12)	($1,418)	($34,573)	($836)	($5,686)	($25,117)	$180,326
18	61	Educational Serv.	167	786	$344,148	($24)	($2,747)	($1,674)	($1,620)	($11,016)	($1,342)	$325,724
19	62	Health Care Soc Ass	81	507	$142,157	($11)	($1,329)	($1,080)	($784)	($5,330)	($866)	$132,756
20	71	Arts & Recreation	6	12	$6,336	($1)	($103)	($26)	($61)	($415)	($20)	$5,710
21	81	Other Services	79	992	$111,532	($11)	($1,300)	($2,113)	($767)	($5,212)	($1,694)	$100,435
22	92	Public Admin.	191	1,376	$392,641	($27)	($3,146)	($2,931)	($1,856)	($12,615)	($2,350)	$369,716
Column totals =			4,656	887,459	$9,319,063	($629)	($73,230)	($1,775,608)	($43,196)	($293,661)	($1,512,266)	$5,620,472
Withdraw 2008 Off-site Transfer Exclusion under Opt. 1					($8,645,145)							($8,645,145)
Accumulation Time Transportation Cost Savings					$4,014,202							$4,014,202
Impact for Exclusion 3 =					$1,438,692	$0	$0	$0	$0	$0	$0	$1,438,692
Combined impact (Excl. 1 + Excl. 2 + Excl. 3) =					**$6,141,923**	**($629)**	**($73,230)**	**($1,775,608)**	**($43,196)**	**($293,661)**	**($1,512,266)**	**$2,443,332**

Exhibit 5C
Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Implementing Alternative RCRA Subtitle C Regulation for the 2008 DSW Offsite Transfer Recycling Exclusion (Option 2)
(13% Adoption Rate, 2011$, 0% Discount Rate)

Item	Industry 2-digit NAICS code		A Count of Affected Transfer-Based Facilities	B Affected Transfer-Based Tonnage	C Baseline Cost Savings under 2008 DSW Rule - Option 1 Withdrawn Savings + Req. 2A Accum.. Transp. Cost Savings	D Requirement 2B Notification Compliance Costs (incremental to 2008 DSW Rule)	E Requirement 2C Advance Arrangements Compliance Costs (incremental to 2008 DSW Rule)	F Requirement 2D Accumulation Restriction Compliance Costs (incremental to 2008 DSW Rule)	G Requirement 2E.2 Contingency Plan Compliance Costs (incremental to 2008 DSW Rule)	H Requirement 2F.1 Record-keeping of Offsite Shipments Compliance Costs (incremental to 2008 DSW Rule)	I Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs (incremental to 2008 DSW Rule)	J (C+…+I) Option 2 Post-Rule Cost Savings (relative to 2008 DSW Rule baseline)
1	11	Ag, For, Fish, Hunt	3	12	$1,032	($1)	($61)	($35)	($36)	($246)	($22)	$629
2	21	Mining	21	122	$53,705	($4)	($471)	($360)	($278)	($1,889)	($234)	$50,468
3	22	Utilities	94	1,418	$169,350	($18)	($2,151)	($4,190)	($1,269)	($8,626)	($2,725)	$150,371
4	23	Construction	21	789	$33,456	($4)	($471)	($2,331)	($278)	($1,889)	($1,516)	$26,965
5	31	Manufacturing	34	299	$77,454	($7)	($778)	($883)	($459)	($3,122)	($575)	$71,629
6	32	Manufacturing	1,176	164,930	$3,579,957	($191)	($22,233)	($327,897)	($13,115)	($89,157)	($316,330)	$2,811,034
7	33	Manufacturing	2,244	668,158	$6,238,766	($439)	($51,152)	($1,974,293)	($30,173)	($205,127)	($1,284,113)	$2,693,467
8	42	Wholesale Trade	105	27,448	$231,655	($21)	($2,397)	($81,104)	($1,414)	($9,611)	($52,752)	$84,357
9	44	Retail Trade	30	229	$24,793	($6)	($676)	($677)	($399)	($2,711)	($440)	$19,885
10	45	Retail Trade	4	52	$12,231	($1)	($102)	($154)	($60)	($411)	($99)	$11,403
11	48	Transportation	104	1,559	$254,599	($20)	($2,376)	($4,607)	($1,402)	($9,529)	($2,997)	$233,668
12	49	Postal, Msgrs, Stor.	28	1,172	$77,636	($5)	($635)	($3,463)	($375)	($2,547)	($2,253)	$68,358
13	51	Information	10	250	$33,347	($2)	($225)	($739)	($133)	($904)	($480)	$30,865
14	53	Real Estate	8	83	$18,194	($2)	($184)	($245)	($109)	($739)	($17)	$16,898
15	54	Prof Sci&Tech Srv	159	1,011	$381,677	($31)	($3,626)	($2,987)	($2,139)	($14,540)	($1,944)	$356,410
16	55	Management	4	25	$11,538	($1)	($102)	($74)	($60)	($411)	($49)	$10,841
17	56	Ad, Waste & Remed	86	16,229	$343,943	($17)	($1,967)	($47,954)	($1,160)	($7,886)	($28,266)	$256,693
18	61	Educational Serv.	167	786	$477,349	($33)	($3,810)	($2,322)	($2,248)	($15,280)	($1,511)	$452,145
19	62	Health Care Soc Ass	81	507	$197,178	($16)	($1,844)	($1,498)	($1,088)	($7,393)	($975)	$184,365
20	71	Arts & Recreation	6	12	$8,788	($1)	($143)	($35)	($85)	($575)	($22)	$7,926
21	81	Other Services	79	992	$154,700	($15)	($1,803)	($2,931)	($1,063)	($7,229)	($1,906)	$139,752
22	92	Public Admin.	191	1,376	$544,611	($37)	($4,363)	($4,066)	($2,574)	($17,498)	($2,645)	$513,428
Column totals =			4,656	887,459	$12,925,960	($872)	($101,574)	($2,462,848)	($59,915)	($407,322)	($1,701,872)	$8,191,558
Withdraw 2008 Off-site Transfer Excl. under Opt. 1					($11,991,206)							($11,991,206)
Accumulation Time Transportation Cost Savings					$5,567,880							$5,567,880
Impact for Exclusion 3 =					$2,105,967	$0	$0	$0	$0	$0	$0	$2,105,967
Combined impact (Excl. 1 + Excl. 2 + Excl. 3) =					**$8,630,720**	**($872)**	**($101,574)**	**($2,462,848)**	**($59,915)**	**($407,322)**	**($1,701,872)**	**$3,896,317**

Option 3: Revise the 2008 DSW Exclusion for Generator-Controlled Recycling

The six revisions to the generator-controlled exclusion of the 2008 DSW final rule include: (1) add a definition of "*contained*," (2) make notification a condition of the exclusion, (3) speculative accumulation recordkeeping & labeling, (4) recordkeeping requirements under toll manufacturing recycling exclusion, (5) eliminate the 2008 DSW toll manufacturing recycling exclusion, and (6) restructure the regulations. An annual cost savings of $180,000 per year is estimated for this option.

Option 3A: Definition of "Contained"

The net cost impact of this revision is zero because this RIA assumes that affected facilities already meet the un-codified performance-based standard. Codification is intended to benefit enforcement.

Option 3B: Notification (Requirement vs. Condition)

The net cost impact of this revision is zero because notification costs are already included in baseline costs as part of the 2008 DSW final rule conditions. The revision is intended to benefit enforcement.

Option 3C: Speculative Accumulation Recordkeeping & Labeling

The net cost impact of this revision is zero because it is likely that facilities already are placing the accumulation start date on containers to ensure compliance with the one year accumulation limit: "Speculative accumulation" provisions (40 CFR 261.1(c)(8)) require that during a calendar year the amount of material that is recycled, or transferred to a different site for recycling, must equal at least 75% by weight or volume, of material at the beginning of the period. This requirement is intended to improve enforcement.

Option 3D: Recordkeeping Requirement for DSW Excluded Recycling Under Toll Manufacturing Agreements

Recordkeeping costs for the toll manufacturing recycling exclusion in the 2008 DSW rule are already included in the baseline cost savings estimate as one of the 12 conditions of the 2008 DSW final rule.[39] The net impact of this revision is estimated to be zero. These costs should already be incurred as part of their normal RCRA hazardous waste/hazardous materials recordkeeping. For toll contracts they would be kept in their routine business records.

Option 3E: Eliminate the 2008 DSW "*Toll Manufacturing*" Recycling Exclusion

As of April 26, 2011, no facilities have notified under the 2008 DSW toll manufacturing recycling exclusion, confirming that this exclusion

[39] See Exhibit 7A, Item/Row 5 of the 2008 DSW RIA.

appears to benefit only a very small fraction of hazardous waste generators. This RIA assumes that the net cost impact of this revision is zero because generators using toll manufacturing agreements should otherwise be able to use the 2008 DSW offsite transfer recycling exclusion if Option 1 is not selected.

If Option 1 is selected, these facilities can notify under the Option 2 Alternative RCRA Subtitle C recycling exclusion. The cost of withdrawing the toll manufacturing exclusion is $0.2 million per year (Exhibit 4L, Column C). The estimated costs for the Option 2 Alternative RCRA Subtitle C recycling exclusion is $1.2 million per year (see Exhibit 5A, sum totals for Columns D through H and add accumulation time transportation cost savings) based on the 13% base case adoption scenario and 7% discount rate for the 50-year future period of analysis. The annual cost for withdrawing the toll manufacturing exclusion is estimated to be $180,000 per year calculated as follows:

> [(-0.2 million/year for the withdrawal of the toll manufacturing exclusion) + ($1.2 million/year)/597 average annual number of Option 2 Alternative RCRA Subtitle C facilities) x (12 average annual number of toll manufacturing facilities/year)].

Option 3F: Re-structure the location of the non-land based and land-based unit operational requirements in 40 CFR 261

The net cost impact of these revisions to the 40 CFR regulations is minimal. Minimal time/cost savings may be incurred by facilities spending less time reading and understanding the regulations. As an estimate, the time savings could be 0.1 hours of technical labor at $69.32/hour per facility for having to search for and read only one section of the DSW regulations in the CFR, rather than two sections. The estimated hourly rate for technical labor at hazardous waste generator facilities is $69.32/hour from EPA's 2011 DSW ICR, June 30, 2011.[40] Using this rate, the estimated unit cost savings is $6.93/facility (i.e., (0.1 hours saved) x ($69.32/hour)). It is assumed that changeover in staff responsible for compliance and/or refresher with the rule every 3 years on average will result in new familiarization with DSW regulations. Average annual cost is $6.93/facility divided by 3 years equals $2.31/facility/year (2011$). The aggregate annual cost savings is $39 per year calculated as follows:

> [(277 generator-controlled exclusion facilities) x ($2.31 per facility per year) x (6.025% cost adjustment reflecting the 13% base case adoption scenario, and 7% discount rate for the 50-year future period of analysis[41])].

[40] Document can be obtained under ICR Reference No: 200801-2050-002 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200801-2050-002.

[41] See **Appendix B** of this RIA for examples how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Option 3F this RIA applied an average cost savings per-facility of $2.31 and 277 facilities.

Option 4: Revise the Recycling "Legitimacy" Provisions of the 2008 DSW Final Rule

The 2008 DSW final rule codified a self-implementing requirement that recycling must be legitimate (40 CFR 260.43) as a condition of the generator-controlled exclusion, the transfer-based exclusion, and the non-waste determinations. The purpose of defining recycling legitimacy was to distinguish "legitimate" recycling from "sham" recycling (i.e., waste treatment and/or disposal conducted in the guise of recycling). That recycling must be legitimate to be exempt from RCRA regulation is a long-standing part of the definition of solid waste with a history that goes back to preamble statements in EPA's 1980 final rule on the identification and listing of RCRA hazardous waste. Later preambles addressing recycling further explained what legitimacy means for recycling. Up until EPA's 2008 DSW final rule, the most comprehensive guidance on legitimate recycling produced by EPA was a policy document known as the "*Lowrance Memo*" which incorporated concepts from earlier rulemaking notices (i.e., Federal Register preambles), and provided a list of questions that could be posed about an industrial recycling process to determine if the process constituted legitimate recycling (i.e., "true recycling"). EPA's Lowrance Memo was not explicit about whether the answer to each question must be answered in making a determination or whether they should be balanced against each other.

Because the codified legitimacy factors apply only to recycling under the 2008 DSW exclusions, all other industrial recycling is still subject to the Lowrance Memo and other existing legitimacy guidance. The three 2011 proposed revisions to the legitimate recycling provisions include:

4A. Apply the same codified definition of legitimate recycling to all hazardous secondary materials recycled under the pre-2008 DSW exclusions.
4B. Require that all four legitimacy factors be met unless the facility petitions applied to 2008 DSW exclusion facilities and hazardous waste recyclers.
4C. Add a condition requiring documentation of legitimacy for 2008 DSW exclusion facilities and hazardous waste recyclers.

Option 4A: Apply Codified Definition to All Pre-2008 DSW Industrial Recycling Exclusions

Requires all four recycling legitimacy factors be met by each facility. Facilities would need to submit legitimacy documentation to prove their recycling practice meets all four legitimacy factors. If one (or more) of the factors is not met, a facility can submit a legitimacy petition and receive approval from the implementing agency that the recycling is legitimate. In addition, state determinations on legitimacy must be made public and accessible on the Internet. The rationale is it would provide greater enforceability and clarity on legitimacy to have the same codified standard throughout the program. A petition process would give EPA oversight when a factor is not met.

This RIA assumes that a legitimacy petition will include costs equivalent to making a non-waste determination to prove that all four legitimacy factors are met plus the cost for conducting a waste characterization test. Cost estimates for a non-waste determination were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 2310.01 Revisions to the RCRA Definition of Solid Waste (Final Rule)", October 28, 2008.[42] This RIA assumes future legitimacy petitions are a relatively rare frequency applied to 5% of

[42] Document can be obtained under ICR Reference No: 200905-2050-001 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200905-2050-001.

the facilities.[43] To prepare and submit an application for non-waste determination assumes 4 hours of legal labor at $133.37/hour, 4 hours of managerial labor at $101.68/hour, 130 hours of technical labor at $69.32/hour and 5 hours of clerical labor at $24.67/hour and $22.83 in O&M costs which equals $10,173/facility (2011$). From EPA's RIA for the 2008 DSW final rule, characterization of hazardous waste (secondary materials) and recycled materials is estimated to include sampling labor burden and waste characterization analytical costs. The sampling is estimated to require a labor burden of 2 hours of field technician labor at $69.32/hour. The analytical costs were estimated using RACER 2005 cost estimating software at a cost of $284 per sample (2007$).[44] The 2011 DSW ICR inflated this cost to $306/sample (2011$) using the Bureau of Labor Statistics Consumer Price Index. One sample is collected for each waste or recycled materials for a total cost of $445 (2011$). The total cost is estimated to be $10,617/facility (2011$). Assume a petition is submitted every 5 years on average because a facility will either modify its product, production process or recycling operations. Average annual cost is $10,617/facility divided by 5 years equals $2,123/facility/year (2011$). For the total population of pre-2008 DSW recycling exclusion facilities the aggregate annual cost to prepare legitimacy petitions is $431,000 per year calculated as follows:

> [(5,321 facilities) x ($2,123 per facility per year) x (5% of facilities prepare legitimacy petition x cost adjustment factor of 0.7629 to discount costs from the 2015 start date of the rule to 2011$ assuming a 7% discount rate)].

Costs for conducting due diligence and preparing legitimacy documentation were obtained from EPA's DSW ICR, June 30, 2011. The 95% of facilities assumed not to file a legitimacy petition are assumed to prepare and submit legitimacy documentation. Due diligence can be conducted three ways:

1. Generator conduct reasonable efforts for intermediate facilities and reclaimers and prepare certification statement using either in-house employer audits ($1,919/facility),
2. Outside vendor ($3,714/facility), or
3. Readily available information ($481/facility).

The average cost of these three methods is $2,038/facility (2011$). The cost to maintain for a minimum of three years documentation and certification that reasonable efforts were made is $1.23/facility (2011$), while the cost to make documentation and certification available upon request by a regulatory authority within 72 hours, or within a longer period of time as specified by the regulatory authority is $2.91/facility (2011$). The total cost is $2,042/facility (2011$).

Per CFR Section 261.4(a)(24)(v) reasonable efforts must be repeated at a minimum of every three years for the hazardous secondary material generator to claim the exclusion and to send the hazardous secondary materials to each reclaimer and any intermediate facility. Average annual cost is $2,042/facility divided by 3 years equals $681/facility/year (2011$). For the total population of pre-2008 DSW recycling exclusion facilities the aggregate annual cost to prepare legitimacy documentation is $2.6 million per year (5,321 facilities x $681/facility/year x 95% of facilities prepare legitimacy documentation x cost adjustment factor of 0.7629 to discount costs from the 2015 start date of the rule to 2011$ assuming a 7% discount rate).

[43] 5% "rare" future annual frequency assumed in this RIA represents the midpoint of a 0% to 10% range in any given future year.
[44] RACER = Remedial Action Cost Engineering Requirements cost estimating system: http://talpart.earthtech.com/racer_documentation.htm.

For the total population of pre-2008 DSW recycling exclusion facilities, the aggregate average annual cost for codifying that all four legitimacy factors be met under the legitimacy definition assuming 5% of the facilities use legitimacy petitions and the remaining 95% use legitimacy documentations is as follows (as displayed in column D of Exhibit 5K below):

- 7% discount rate: $3.1 million per year ($431,000 per year for legitimacy petitions + $2.6 million per year for legitimacy documentations
- 3% discount rate: $3.6 million per year
- 0% discount rate $4.0 million per year.

Option 4B: Four Legitimacy Factors Petition Applied to 2008 DSW Exclusions and Subtitle C Hazardous Waste Recycling

Requires that all four legitimacy factors be met, unless the facility submits a petition and receives approval from the implementing agency that the recycling is legitimate even if one (or more) of the factors is not met. In addition, state determinations on legitimacy must be made public and accessible on the Internet. The rationale is it would make implementation more straightforward and easier. A petition process would give EPA oversight when a factor is not met. Publishing information on the Internet would reduce state burdens for making determinations and lead to more consistency across state programs. Facilities will incur costs for essentially making a non-waste determination to prove that all four legitimacy factors are met.

All estimated costs apply to generator-controlled facilities (Exclusion 1 of the 2008 DSW Rule),off-site transfer facilities (Exclusion 2 of the 2008 DSW final rule), AND all non-notifying facilities recycling under RCRA. They do not apply to the non-waste determination facilities under Exclusion 3 of the 2008 DSW final rule. Costs for a legitimacy petition are assumed to be equivalent to making a non-waste determination plus conducting a waste characterization test. Hour estimates for a non-waste determination were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 2310.01 Revisions to the RCRA Definition of Solid Waste (Final Rule)", October 28, 2008.[45] Labor rates were obtained from the 2011 DSW ICR. This RIA assumes future legitimacy petitions are a relatively rare frequency applied to 5% of the facilities.[46] To prepare and submit an application for non-waste determination assumes 4 hours of legal labor at $133.37/hour, 4 hours of managerial labor at $101.68/hour, 130 hours of technical labor at $69.32/hour and 5 hours of clerical labor at $24.67/hour and $22.83 in O&M costs which equals $10,173/facility (2011$). From EPA's RIA for the 2008 DSW final rule, characterization of hazardous waste (secondary materials) and recycled materials is estimated to include sampling labor burden and waste characterization analytical costs. The sampling is estimated to require a labor burden of 2 hours of field technician labor at $69.32/hour. The analytical costs were estimated using RACER 2005 cost estimating software at a cost of $284 per sample (2007$).[47] The 2011 DSW ICR inflated this cost to $306/sample (2011$) using the Bureau of Labor Statistics Consumer Price Index. One sample is collected for each waste or recycled materials for a total cost of $445 (2011$). The total cost is estimated to be $10,617/facility (2011$). Assume a petition is submitted

[45] Document can be obtained under ICR Reference No: 200905-2050-001 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200905-2050-001.
[46] 5% "rare" future annual frequency assumed in this RIA represents the midpoint of a 0% to 10% range in any given future year.
[47] RACER = Remedial Action Cost Engineering Requirements cost estimating system: http://talpart.earthtech.com/racer_documentation.htm.

every 5 years on average because a facility will either modify its product, production process or recycling operations. Average annual cost is $10,617/facility divided by 5 years equals $2,123/facility/year (2011$). From Exhibit 4E there are 4,933 affected facilities. The aggregate annual cost to prepare a legitimacy petition is $399,000 per year, calculated as follows:

> [(4,933 facilities x $2,132/facility/year x 3.8145% cost adjustment reflecting the 13% base case adoption scenario, and only 5% of notifying facilities submitting legitimacy petitions and a 7% discount rate for the 50-year future period of analysis)][48].

For the non-waste determination facilities (Exclusion 3 of the 2008 DSW Final rule), it is assumed that these facilities made the argument through the non-waste determination process that the recycling is legitimate. A higher estimated non-waste determination cost estimate was used ($11,451 in 2007$) in the 2008 DSW RIA baseline because higher labor rates than those in the ICR were used. Therefore, no additional waste characterization costs are added to the non-waste determination facilities. The net cost impact of this revision is zero for non-waste determination facilities.

Option 4C: Legitimacy Documentation Applied to 2008 DSW Exclusions and Subtitle C Hazardous Waste Recycling

Adds a condition requiring documentation of recycling "legitimacy" to the 2008 DSW generator-controlled and to the offsite transfer recycling exclusions, the 2008 DSW non-waste determination petition process and hazardous waste recycling facilities. The rationale is that the rule would ensure that facilities will closely examine the recycling taking place for legitimacy in order to also avoid problems with requiring documentation of legitimacy for all existing recycling. Facilities will incur costs for conducting due diligence (legitimacy documentation). If Option 1 is NOT selected costs were not applied to notifying off-site transfer (Exclusion 2) facilities because due diligence costs were already included in the baseline as part of the 2008 DSW RIA. Costs were applied to all non-notifying facilities. If Option 1 is selected costs are applied to all facilities. Cost estimates were obtained from EPA's 2011 DSW ICR. Due diligence can be conducted three ways. The generator can conduct reasonable due diligence efforts on intermediate facilities and reclaimers and prepare certification statement using either of three methods:

1. Generator conduct reasonable efforts for intermediate facilities and reclaimers and prepare certification statement using either in-house employer audits ($1,919/facility),
2. Outside vendor ($3,714/facility), or
3. Readily available information ($481/facility).

The average cost of these three methods is $2,038/facility (2011$). The cost to maintain for a minimum of three years documentation and certification that reasonable efforts were made is $1.23/facility (2011$), while the cost to make documentation and certification available upon request by a regulatory authority within 72 hours, or within a longer period of time as specified by the regulatory authority is $2.91/facility (2011$). The total cost is $2,042/facility (2011$).

To estimate aggregate cost impacts, it is assumed that 5% of the facilities submit a legitimacy petition under Option 5B and 95% of the

[48] See **Appendix B, Exhibit B4** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived.

facilities submit legitimacy documentation under Option 5C. Per CFR Section 261.4(a)(24)(v) reasonable efforts must be repeated at a minimum of every three years for the hazardous secondary material generator to claim the exclusion and to send the hazardous secondary materials to each reclaimer and any intermediate facility. Average annual cost is $2,042/facility divided by 3 years equals $681/facility/year (2011$). If Option 1 is NOT selected a legitimacy documentation cost is applied to generator-controlled facilities under the 2008 DSW exclusions and non-notifying RCRA hazardous waste recyclers. As mentioned previously, legitimacy documentation costs are already included in the baseline cost savings estimate for off-site transfer facilities that have notified. All non-notifying facilities are affected (i.e., RCRA hazardous waste recyclers). The aggregate annual cost to prepare legitimacy provisions is $2,244,000 per year calculated as follows:

> [(4,933 facilities) x ($681 per facility per year) x (66.7883% cost adjustment reflecting the 13% base case adoption scenario, non-notifying facilities, and 95% of notifying facilities submitting legitimacy documentations and 7% discount rate for the 50-year future period of analysis)][49].

If Option 1 is selected there are 4,933 affected facilities. The aggregate annual cost to prepare legitimacy provisions is $2,435,000 per year calculated as follows:

> [(4,993 facilities) x ($681 per facility per year) x (72.4752% cost adjustment reflecting the 13% base case adoption scenario, and 95% of notifying facilities submitting legitimacy documentations and 7% discount rate for the 50-year future period of analysis)][50].

For the non-waste determination facilities (Exclusion 3 of the 2008 DSW Final rule), it is assumed that these facilities made the argument through the non-waste determination process that the recycling is legitimate. Therefore, no additional waste characterization costs are added to the non-waste determination facilities. The net cost impact of this revision is zero for non-waste determination facilities.

Option 4 Total Cost

The total cost for Option 4 is as follows:

- 7% discount rate: The baseline annual cost savings estimate is $7.4 million from the 2008 DSW rule and $79.3 million for the pre-2008 exclusion facilities for a total of $86.7 million. Costs associated with meeting the requirements of Option 5 are $2.8 or $2.6 million per year, respectively, whether Option 1 is or is not selected. Costs associated with the pre-2008 exclusions are estimated at $3.1 million per year. Total costs associated with the revisions to the 2008 DSW rule are either $5.9 or $5.7 million per year, respectively, whether Option 1 is selected or not. Baseline cost savings associated with the 2008 DSW final rule are reduced from $86.7 million per year under the 2008 DSW rule and pre-2008 recycling exclusions to $80.8 or $81.0 million per year post 2011 DSW proposed rule, respectively, whether Option 1 is or is not selected (Exhibit 5D presents the 2008 DSW rule component and Exhibit 5K presents the pre-2008 exclusions component).

[49] See **Appendix B, Exhibit B5** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived. This RIA subtracted out the facilities that notified under the off-site transfer exclusion (covered under baseline already) from the column of notifying facilities.

[50] See **Appendix B, Exhibit B5** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived.

- 3% discount rate: The baseline annual cost savings estimate is $10.7 million from the 2008 DSW rule and $92.4 million for the pre-2008 exclusion facilities for a total of $103.1 million. Costs associated with meeting the requirements of Option 5 are $3.3 or $3.0 million per year, respectively, whether Option 1 is or is not selected. Costs associated with the pre-2008 exclusions are estimated at $3.6 million per year. Total costs associated with the revisions to the 2008 DSW rule are either $6.9 or $6.6 million per year, respectively, whether Option 1 is selected or not. Baseline cost savings associated with the 2008 DSW final rule are reduced from $103.1 million per year under the 2008 DSW rule and pre-2008 recycling exclusions to $96.2 or $96.5 million per year post 2011 DSW proposed rule, respectively, whether Option 1 is or is not selected (Exhibit 5E presents the 2008 DSW rule component and Exhibit 5K presents the pre-2008 exclusions component).

- 0% discount rate: The baseline annual cost savings estimate is $15.1 million from the 2008 DSW rule and $103.9 million for the pre-2008 exclusion facilities for a total of $119.0 million. Costs associated with meeting the requirements of Option 5 are $3.7 or $3.3 million per year, respectively, whether Option 1 is or is not selected. Costs associated with the pre-2008 exclusions are estimated at $4.0 million per year. Total costs associated with the revisions to the 2008 DSW rule are either $7.7 or $7.3 million per year, respectively, whether Option 1 is selected or not. Baseline cost savings associated with the 2008 DSW final rule are reduced from $119.0 million per year under the 2008 DSW rule and pre-2008 recycling exclusions to $111.3 or $111.7 million per year post 2011 DSW proposed rule, respectively, whether Option 1 is or is not selected (Exhibit 5F presents the 2008 DSW rule component and Exhibit 5K presents the pre-2008 exclusions component).

Exhibit 5D
Estimated Baseline Cost Savings, Compliance Costs, and Post Rule Cost Savings for Meeting the 2011 Proposed Revisions to the 2008 DSW "Legitimacy" Requirement (Option 4) (7% Discount Rate)

Item	Industry 2-digit NAICS code		A Count of Affected Facilities	B Baseline Cost Savings (cost savings under 2008 DSW Rule)	C Option 4B Legitimacy Petition Compliance Costs (incremental to 2008 DSW Rule)	D Option 4C OPTION 1 NOT SELECTED Legitimacy Documentation Compliance Costs(incremental to 2008 DSW Rule)	E Option 4C OPTION 1 SELECTED Legitimacy Documentation Compliance Costs(incremental to 2008 DSW Rule)	F (B+C+D) Option 4 OPTION 1 NOT SELECTED Post Rule Cost Savings (relative to pre-2008 DSW Rule baseline)	G (B+C+E) Option 4 OPTION 1 SELECTED Post Rule Cost Savings (relative to pre-2008 DSW Rule baseline)
1	11	Ag, Forestry, Fishing, Hunting	3	$488	($218)	($1,226)	($1,330)	-$956	-$1,061
2	21	Mining	21	$25,401	($1,674)	($9,400)	($10,200)	$14,328	$13,527
3	22	Utilities	96	$80,097	($7,786)	($43,728)	($47,451)	$28,583	$24,859
4	23	Construction	22	$15,823	($1,746)	($9,808)	($10,643)	$4,269	$3,434
5	31	Manufacturing	34	$36,633	($2,765)	($15,530)	($16,852)	$18,338	$17,016
6	32	Manufacturing	1,322	$1,693,191	($107,036)	($601,160)	($652,347)	$984,995	$933,808
7	33	Manufacturing	2,289	$2,950,712	($185,329)	($1,040,893)	($1,129,523)	$1,724,489	$1,635,860
8	42	Wholesale Trade	106	$109,565	($8,586)	($48,224)	($52,330)	$52,755	$48,649
9	44	Retail Trade	30	$11,726	($2,401)	($13,486)	($14,635)	-$4,161	-$5,309
10	45	Retail Trade	4	$5,785	($364)	($2,043)	($2,217)	$3,378	$3,204
11	48	Transportation	105	$120,416	($8,513)	($47,815)	($51,886)	$64,088	$60,017
12	49	Postal, Messengers, Storage	29	$36,719	($2,328)	($13,078)	($14,191)	$21,313	$20,200
13	51	Information	11	$15,772	($873)	($4,904)	($5,322)	$9,995	$9,577
14	53	Real Estate, Rental & Leasing	13	$8,605	($1,091)	($6,130)	($6,652)	$1,384	$862
15	54	Prof, Scientific & Tech Services	161	$180,520	($13,025)	($73,153)	($79,381)	$94,342	$88,114
16	55	Mgt of Companies/Enterprises	4	$5,457	($364)	($2,043)	($2,217)	$3,050	$2,876
17	56	Admin, Waste, & Remediation	151	$162,673	($12,224)	($68,657)	($74,503)	$81,791	$75,945
18	61	Educational Services	171	$225,769	($13,825)	($77,648)	($84,260)	$134,295	$127,684
19	62	Health Care, Social Assistance	84	$93,258	($6,767)	($38,007)	($41,243)	$48,484	$45,248
20	71	Arts, Entertainment, Recreation	6	$4,156	($509)	($2,861)	($3,104)	$786	$543
21	81	Other Services	80	$73,167	($6,476)	($36,372)	($39,469)	$30,319	$27,222
22	92	Public Administration	192	$257,582	($15,571)	($87,456)	($94,903)	$154,554	$147,107
		Column totals =	4,933	$6,113,514	($399,473)	($2,243,621)	($2,434,660)	$3,470,419	$3,279,381
		Impact for Exclusion 3 =	74	$1,311,182	$0	$0	$0	$1,311,182	$1,311,182
		Combined impact (Excl. 1 + Excl. 2 + Excl. 3) =	5,007	**$7,424,696**	**($399,473)**	**($2,243,621)**	**($2,434,660)**	**$4,781,601**	**$4,590,563**

Exhibit 5E
Estimated Baseline Cost Savings, Compliance Costs, and Post Rule Cost Savings for Meeting the 2011 Proposed Revisions to the 2008 DSW "Legitimacy" Requirement (Option 4) (3% Discount Rate)

Item	Industry 2-digit NAICS code		A Count of Affected Facilities	B Baseline Cost Savings (cost savings under 2008 DSW Rule)	C Option 4B Legitimacy Petition Compliance Costs (incremental to 2008 DSW Rule)	D Option 4C OPTION 1 NOT SELECTED Legitimacy Documentation Compliance Costs(incremental to 2008 DSW Rule)	E Option 4C OPTION 1 SELECTED Legitimacy Documentation Compliance Costs(incremental to 2008 DSW Rule)	F (B+C+D) Option 4 OPTION 1 NOT SELECTED Post Rule Cost Savings (relative to pre-2008 DSW Rule baseline)	G (B+C+E) Option 4 OPTION 1 SELECTED Post Rule Cost Savings (relative to pre-2008 DSW Rule baseline)
1	11	Ag, Forestry, Fishing, Hunting	3	$744	($254)	($1,390)	($1,550)	-$901	-$1,060
2	21	Mining	21	$38,719	($1,949)	($10,660)	($11,880)	$26,109	$24,889
3	22	Utilities	96	$122,094	($9,068)	($49,594)	($55,269)	$63,432	$57,756
4	23	Construction	22	$24,120	($2,034)	($11,124)	($12,397)	$10,962	$9,689
5	31	Manufacturing	34	$55,841	($3,221)	($17,613)	($19,628)	$35,008	$32,992
6	32	Manufacturing	1,322	$2,580,995	($124,670)	($681,800)	($759,826)	$1,774,525	$1,696,498
7	33	Manufacturing	2,289	$4,497,883	($215,864)	($1,180,519)	($1,315,620)	$3,101,500	$2,966,398
8	42	Wholesale Trade	106	$167,014	($10,001)	($54,692)	($60,951)	$102,321	$96,062
9	44	Retail Trade	30	$17,875	($2,797)	($15,295)	($17,046)	-$217	-$1,968
10	45	Retail Trade	4	$8,818	($424)	($2,317)	($2,583)	$6,077	$5,812
11	48	Transportation	105	$183,555	($9,916)	($54,229)	($60,435)	$119,410	$113,204
12	49	Postal, Messengers, Storage	29	$55,972	($2,712)	($14,832)	($16,529)	$38,428	$36,731
13	51	Information	11	$24,042	($1,017)	($5,562)	($6,198)	$17,463	$16,826
14	53	Real Estate, Rental & Leasing	13	$13,117	($1,271)	($6,952)	($7,748)	$4,894	$4,098
15	54	Prof, Scientific & Tech Services	161	$275,173	($15,171)	($82,965)	($92,460)	$177,037	$167,542
16	55	Mgt of Companies/Enterprises	4	$8,318	($424)	($2,317)	($2,583)	$5,577	$5,312
17	56	Admin, Waste, & Remediation	151	$247,968	($14,238)	($77,867)	($86,778)	$155,863	$146,951
18	61	Educational Services	171	$344,148	($16,103)	($88,064)	($98,142)	$239,981	$229,903
19	62	Health Care, Social Assistance	84	$142,157	($7,882)	($43,105)	($48,038)	$91,170	$86,237
20	71	Arts, Entertainment, Recreation	6	$6,336	($593)	($3,244)	($3,616)	$2,498	$2,127
21	81	Other Services	80	$111,532	($7,543)	($41,251)	($45,972)	$62,738	$58,017
22	92	Public Administration	192	$392,641	($18,137)	($99,188)	($110,539)	$275,317	$263,965
		Column totals =	4,933	$9,319,063	($465,290)	($2,544,582)	($2,835,790)	$6,309,191	$6,017,984
		Impact for Exclusion 3 =	74	$1,453,803	$0	$0	$0	$1,453,803	$1,453,803
		Combined impact (Excl. 1 + Excl. 2 + Excl. 3) =	5,007	**$10,772,866**	**($465,290)**	**($2,544,582)**	**($2,835,790)**	**$7,762,994**	**$7,471,786**

Exhibit 5F
Estimated Baseline Cost Savings, Compliance Costs, and Post Rule Cost Savings for Meeting the 2011 Proposed Revisions to the 2008 DSW "Legitimacy" Requirement (Option 4) (0% Discount Rate)

Item	Industry 2-digit NAICS code		A Count of Affected Facilities	B Baseline Cost Savings (cost savings under 2008 DSW Rule)	C Option 4B Legitimacy Petition Compliance Costs (incremental to 2008 DSW Rule)	D Option 4C OPTION 1 NOT SELECTED Legitimacy Documentation Compliance Costs(incremental to 2008 DSW Rule)	E Option 4C OPTION 1 SELECTED Legitimacy Documentation Compliance Costs(incremental to 2008 DSW Rule)	F (B+C+D) Option 4 OPTION 1 NOT SELECTED Post Rule Cost Savings (relative to pre-2008 DSW Rule baseline)	G (B+C+E) Option 4 OPTION 1 SELECTED Post Rule Cost Savings (relative to pre-2008 DSW Rule baseline)
1	11	Ag, Forestry, Fishing, Hunting	3	$1,032	($286)	($1,523)	($1,744)	-$777	-$998
2	21	Mining	21	$53,705	($2,194)	($11,678)	($13,370)	$39,834	$38,142
3	22	Utilities	96	$169,350	($10,205)	($54,327)	($62,199)	$104,818	$96,946
4	23	Construction	22	$33,456	($2,289)	($12,185)	($13,951)	$18,981	$17,215
5	31	Manufacturing	34	$77,454	($3,624)	($19,294)	($22,089)	$54,536	$51,740
6	32	Manufacturing	1,322	$3,579,957	($140,301)	($746,866)	($855,092)	$2,692,790	$2,584,563
7	33	Manufacturing	2,289	$6,238,766	($242,928)	($1,293,179)	($1,480,571)	$4,702,658	$4,515,267
8	42	Wholesale Trade	106	$231,655	($11,255)	($59,912)	($68,593)	$160,489	$151,807
9	44	Retail Trade	30	$24,793	($3,147)	($16,755)	($19,183)	$4,891	$2,463
10	45	Retail Trade	4	$12,231	($477)	($2,539)	($2,906)	$9,215	$8,848
11	48	Transportation	105	$254,599	($11,159)	($59,404)	($68,012)	$184,036	$175,428
12	49	Postal, Messengers, Storage	29	$77,636	($3,052)	($16,247)	($18,602)	$58,337	$55,982
13	51	Information	11	$33,347	($1,145)	($6,093)	($6,976)	$26,110	$25,227
14	53	Real Estate, Rental & Leasing	13	$18,194	($1,431)	($7,616)	($8,719)	$9,148	$8,044
15	54	Prof, Scientific & Tech Services	161	$381,677	($17,073)	($90,883)	($104,053)	$273,722	$260,552
16	55	Mgt of Companies/Enterprises	4	$11,538	($477)	($2,539)	($2,906)	$8,522	$8,155
17	56	Admin, Waste, & Remediation	151	$343,943	($16,024)	($85,298)	($97,658)	$242,621	$230,261
18	61	Educational Services	171	$477,349	($18,122)	($96,468)	($110,447)	$362,759	$348,780
19	62	Health Care, Social Assistance	84	$197,178	($8,870)	($47,219)	($54,061)	$141,089	$134,247
20	71	Arts, Entertainment, Recreation	6	$8,788	($668)	($3,554)	($4,069)	$4,566	$4,051
21	81	Other Services	80	$154,700	($8,489)	($45,188)	($51,736)	$101,023	$94,475
22	92	Public Administration	192	$544,611	($20,411)	($108,653)	($124,398)	$415,547	$399,802
		Column totals =	4,933	$12,925,960	($523,627)	($2,787,418)	($3,191,336)	$9,614,915	$9,210,997
		Impact for Exclusion 3 =	74	$2,128,086	$0	$0	$0	$2,128,086	$2,128,086
		Combined impact (Excl. 1 + Excl. 2 + Excl. 3) =	5,007	**$15,054,046**	**($523,627)**	**($2,787,418)**	**($3,191,336)**	**$11,743,001**	**$11,339,083**

Option 5: Revise the 1985 Partial Recycling Variance and 2008 DSW Non-Waste Determination Petition Processes

The Agency is proposing to modify the existing regulation of solid waste variances at 40 CFR 260.31(c), 40 CFR 260.33 and 40 CFR 260.34 to foster greater consistency on the part of implementing agencies and help ensure the protectiveness of the implementation of the solid waste variances and non-waste determinations. Specifically, EPA is proposing to do the following:

1. Revise 40 CFR 260.33(c) to require facilities to re-apply for a variance in the event of a change in circumstances that affects how a material meets the criteria upon which a solid waste variance has been based;
2. Add a provision at 40 CFR 260.33(d) stating that facilities receiving a variance or non-waste determination must provide notification as required by § 260.42 of this chapter;
3. Revise the criteria for the partial reclamation variance in 40 CFR 260.31(c) to more clearly explain when the variance applies and to require, among other things, that the criteria for this variance must be reviewed and evaluated collectively, since each criterion reinforces and supports other criterion;
4. Revise the criteria for the non-waste determination in 40 CFR 260.34 to require that petitioners explain or demonstrate why their hazardous secondary materials cannot meet, or should not have to meet, the existing DSW exclusions under §§ 261.2 or 261.4; and
5. Designate the Regional Administrator as the EPA recipient of petitions for variance and non-waste determinations.

Option 5A: Requirement that an Applicant Re-apply in the Event the Material No Longer Meets the Relevant Criteria

Under the current regulatory framework, 40 CFR 260.30 provides the Administrator with the authority to grant a variance from the definition of solid waste or a non-waste determination on a case-by-case basis if materials are recycled in a particular manner. The practical effect of both the solid waste variances and the non-waste determinations is the same; once a petition is granted by EPA or the authorized state, the hazardous secondary material is not regulated as a solid or hazardous waste. The procedures for these variances and non-waste determinations are found in 40 CFR 260.33.

EPA is proposing two changes to 40 CFR 260.33. First, EPA is proposing to make all variances subject to the provision in 40 CFR 260.33(c) requiring an applicant to re-apply for a variance in the event that the material no longer meets the relevant criteria. Second, EPA is proposing to make all variances and non-waste determinations subject to the biennial notification requirements in 40 CFR 260.42 (see Option 4B).

The 2008 DSW rule noted that once a non-waste determination has been granted, the applicant is obligated to ensure the hazardous secondary material continues to meet the criteria of the non-waste determination, including any conditions specified therein by the regulatory authority. If a change occurs that affects how the hazardous secondary materials meet the relevant criteria and (if applicable) any conditions as specified by the regulatory authority and the applicant fails to re-apply to the Administrator for a formal determination, the hazardous secondary materials may be determined to be solid and hazardous waste and subject to the RCRA Subtitle C hazardous waste requirements (73 FR 64712–13, October 30, 2008). This requirement was codified at 40 CFR 260.33(c).

The requirement that the hazardous secondary materials determined to not be a solid waste must continue to meet the relevant criteria of a solid waste variance or non-waste determination is inherent in the regulations. Failure to meet the criteria could indicate that the hazardous secondary materials are discarded and a solid waste and would trigger the need to re-examine the circumstances of the recycling. The 2008 DSW rule codified this requirement in order to enhance clarity and assist in its implementation, but only focused on the non-waste determination provisions because that was the scope of that rule. EPA is now proposing to explicitly apply 40 CFR 260.33(c) to all the solid waste variances, as well as the non-waste determination provisions listed in 40 CFR 260.30 to ensure that if there are changes that may impact how hazardous secondary materials meet the relevant criteria, that such changes be considered by the regulatory authority to ensure that those criteria continue to be met. Codifying this requirement would help ensure clarity and consistency by providing an administrative procedure for reconsidering a variance in the event that the hazardous secondary material no longer meets the relative criteria for the variance.

According to EPA's DSW ICR, June 30, 2011, the cost to re-apply for a non-waste determination petition if the material no longer meets relevant criteria includes 75 hours of technical labor at $69.32/hour and $25.87 in O&M costs for a total of $5,225/application (2011$). This RIA assumes that a non-waste determination application needs to be re-submitted every 10 years due to changes in the process. The aggregate annual cost savings is approximately $28,000 per year , calculated as follows:

> [(73.5 average annual non-waste determination petition facilities/10) x ($5,225/non-waste determination petition facility) x (72.9492% cost adjustment reflecting 7% discount rate for the 20-year future period of analysis selected to be consistent with the 2008 DSW rule baseline analysis)].

According to the latest (December 2007) OMB approved "*Information Collection Requirement*" (ICR) 1189.20 (Exhibit 3, page 66, bottom row), there is a nationwide average annual count of 10 variance applications under 40 CFR 260.31(c) processed by EPA Regional Offices. The 2011 DSW ICR estimated an annual paperwork burden cost of 8,483 per variance application (2011$). The cost for a new variance application is assumed to be the same both pre- and post-rule. The incremental cost is zero. However, the 2011 DSW ICR estimates that the cost for the new requirement to re-apply for a variance if material no longer meets relevant variance criteria includes 75 hours of technical labor at $69.32/hour and $25.87 of O&M costs and equals $5,225/variance re-application (2011$). The 2011 DSW ICR assumes four (4) re-applications for variances per year. The average annual cost is $15,945per year, calculated as follows:

> [($5,225/variance re-application x 4 variance re-applications/year x 0.76290 cost adjustment factor to discount costs from the first year the rule is in effect in 2015 to 2011$ at a 7% discount rate)].

Option 5B: Biennial Notification

Labor hour estimates were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 2310.01 Revisions to the RCRA Definition of Solid Waste (Final Rule)", October 28, 2008.[51] Labor wage rates were obtained from the 2011 DSW ICR, June 30, 2011. The total cost is $2.91 for re-notification/facility every two years which equals $1.46/facility/year (2011$). The aggregate annual cost savings is approximately $78 per year for non-waste determination facilities (73.5 average annual non-waste determination petition

[51] Document can be obtained under ICR Reference No: 200905-2050-001 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200905-2050-001.

facilities x $1.46/facility/year) x (72.9492% cost adjustment reflecting 7% discount rate for the 20-year future period of analysis selected to be consistent with the 2008 DSW rule baseline analysis). The aggregate annual cost savings is approximately $206 per year for variance application facilities, calculated as follows:

[(305 average annual variance facilities) x ($1.46/facility/year) x (46.3457% cost adjustment reflecting 7% discount rate for the 50-year future period of analysis)].

In addition, facilities are required to update and submit notification that the hazardous secondary materials are no longer managed in accordance with the solid waste variances and non-waste determination. This cost is assumed to be captured through the process of notifying biennially.

Finally, EPA intends to provide public online access to a list of facilities which have received variances and non-waste determination. The potential incremental administrative (overhead) cost to EPA for initially posting, and annually updating, the online list is not estimated in this RIA, because this RIA simply assumes that such additional work task may be assigned to existing IT personnel.

Option 5C: Modify the 1985 40 CFR 260.31(c) DSW Variance for Partially Recycled Materials

Lower-Bound Cost Estimate

Despite the 1985 preamble's text "*may rely on any or all of them to reach a decision*" the 40 CFR 260.31(c) regulatory text reads "*This determination will be based on the following factors*". This regulatory language implies that all six factors must be applied, which further implies that Option 4C will not have any impact relative to the average annual success:to:failure ratio according to the baseline decision-making process for these variance applications. This scenario constitutes the "lower-bound" **$0 per-year** cost estimate for Option 4C in this RIA.

Upper-Bound Cost Estimate

On the other hand, some RCRA stakeholders may argue that the phrase "*may rely on any...*" implies that facilities have only had to comply/conform with one of the six factors. Therefore, if all six factors become mandatory, regulators may reject as many as 83% (i.e., 5/6 = 83%) of future annual applicants, resulting in higher incurred cost to recycle as hazardous waste under Subtitle C. Relevant to the ICR's 10 average annual applicants, implies a possible average annual future rejection of 8 variance applications per year (i.e., (10 average annual variance applications) x (83%) = 8). Under this alternative upper-bound impact scenario, this RIA assigns a higher RCRA-regulated recycling cost to those rejected variance applicants (i.e., facilities) in each future year of the 50-year period-of-analysis applied in this RIA, as an "upper-bound" cost estimate for Option 4C. The calculation of this upper-bound cost estimate is displayed in Exhibit 5G below, and is estimated at **$3.706 million** per-year in average annual future cost (0% discount rate). The Exhibit also displays the average annual value of this cost at two alternative discount rates of 3% ($2.452 million per year) and 7% ($1.402 million per year).

According to the background information for Option 4C provided in EPA's Federal Register notice for the 2011 proposed revisions to DSW, in

practical terms, the partial reclamation variance has evolved to include facilities that partially reclaim hazardous wastes into commodity-like materials, and then ship these materials offsite to facilities that complete the reclamation process. Because the baseline activities which operate under this variance apparently involve offsite waste transfer for recycling, this RIA applies the $19,205 (2011$) average annual per-facility cost savings associated with the "Exclusion 2" offsite transfer-based recycling exclusion, as estimated in EPA's RIA for the 2008 DSW final rule and updated in Chapter 4 of this RIA.[52]

Option 5D: Non-Waste Determination Petitioners Must Demonstrate Why They Cannot or Should Not Meet Existing DSW Recycling Exclusions

This RIA assumes that this cost is already included in the preparation of a petition included in the baseline costs. Facilities will have spent the time to make a decision whether they meet existing DSW exclusions as part of determining their need to file a non-waste determination petition. Thus, for purpose of this RIA, this cost is already included in the baseline cost savings estimates. The net cost impact is zero.

Option 5E: Change the Word "Administrator" to "Regional Administrator" to Receive Variance and 2008 DSW Non-Waste Determination Petitions

This RIA assumes that this wording change will not have a cost impact on industrial facilities.

[52] The $19,205 average annual cost (2011$) is calculated in this RIA by dividing the $89.421,946 nationwide annual cost savings for the "Exclusion 2: Transfer-based" from Column D of Exhibit 4G, by the 4,656 nationwide facility count for the "Exclusion 2: Transfer-based" from Column D of Exhibit 4E

Exhibit 5G
Upper-Bound Estimate of Potential Future Cost to Industry for Modifying the 1985 40 CFR 260.31(c) Variance for Partially Recycled Materials for DSW Exclusion (Option 5C)

A	B	C	D	E	F	G	H
50-year period of analysis	Year	Annual new variance applicants	Cumulative applicants	Future baseline cost savings if all variances accepted	Option 5C upper-bound annual rejections (@83% rate)	Option 5C upper-bound cumulative rejections	Reduction in cost savings if 83% future variance applications rejected
-4	2011	10	20	$0	0	0	$0
-3	2012	10	30	$0	0	0	$0
-2	2013	10	40	$0	0	0	$0
-1	2014	10	50	$0	0	0	$0
1	2015	10	60	$1,152,300	8	8	$159,402
2	2016	10	70	$1,344,350	8	17	$318,803
3	2017	10	80	$1,536,400	8	25	$478,205
4	2018	10	90	$1,728,450	8	33	$637,606
5	2019	10	100	$1,920,500	8	42	$797,008
6	2020	10	110	$2,112,550	8	50	$956,409
7	2021	10	120	$2,304,600	8	58	$1,115,811
8	2022	10	130	$2,496,650	8	66	$1,275,212
9	2023	10	140	$2,688,700	8	75	$1,434,614
10	2024	10	150	$2,880,750	8	83	$1,594,015
11	2025	10	160	$3,072,800	8	91	$1,753,417
12	2026	10	170	$3,264,850	8	100	$1,912,818
13	2027	10	180	$3,456,900	8	108	$2,072,220
14	2028	10	190	$3,648,950	8	116	$2,231,621
15	2029	10	200	$3,841,000	8	125	$2,391,023
16	2030	10	210	$4,033,050	8	133	$2,550,424
17	2031	10	220	$4,225,100	8	141	$2,709,826
18	2032	10	230	$4,417,150	8	149	$2,869,227
19	2033	10	240	$4,609,200	8	158	$3,028,629
20	2034	10	250	$4,801,250	8	166	$3,188,030
21	2035	10	260	$4,993,300	8	174	$3,347,432
22	2036	10	270	$5,185,350	8	183	$3,506,833
23	2037	10	280	$5,377,400	8	191	$3,666,235
24	2038	10	290	$5,569,450	8	199	$3,825,636
25	2039	10	300	$5,761,500	8	208	$3,985,038
26	2040	10	310	$5,953,550	8	216	$4,144,439
27	2041	10	320	$6,145,600	8	224	$4,303,841
28	2042	10	330	$6,337,650	8	232	$4,463,242

Exhibit 5G
Upper-Bound Estimate of Potential Future Cost to Industry for Modifying the 1985 40 CFR 260.31(c) Variance for Partially Recycled Materials for DSW Exclusion (Option 5C)

A	B	C	D	E	F	G	H
50-year period of analysis	Year	Annual new variance applicants	Cumulative applicants	Future baseline cost savings if all variances accepted	Option 5C upper-bound annual rejections (@83% rate)	Option 5C upper-bound cumulative rejections	Reduction in cost savings if 83% future variance applications rejected
29	2043	10	340	$6,529,700	8	241	$4,622,644
30	2044	10	350	$6,721,750	8	249	$4,782,045
31	2045	10	360	$6,913,800	8	257	$4,941,447
32	2046	10	370	$7,105,850	8	266	$5,100,848
33	2047	10	380	$7,297,900	8	274	$5,260,250
34	2048	10	390	$7,489,950	8	282	$5,419,651
35	2049	10	400	$7,682,000	8	291	$5,579,053
36	2050	10	410	$7,874,050	8	299	$5,738,454
37	2051	10	420	$8,066,100	8	307	$5,897,856
38	2052	10	430	$8,258,150	8	315	$6,057,257
39	2053	10	440	$8,450,200	8	324	$6,216,659
40	2054	10	450	$8,642,250	8	332	$6,376,060
41	2055	10	460	$8,834,300	8	340	$6,535,462
42	2056	10	470	$9,026,350	8	349	$6,694,863
43	2057	10	480	$9,218,400	8	357	$6,854,265
44	2058	10	490	$9,410,450	8	365	$7,013,666
45	2059	10	500	$9,602,500	8	374	$7,173,068
46	2060	10	510	$9,794,550	8	382	$7,332,469
47	2061	10	520	$9,986,600	8	390	$7,491,871
48	2062	10	530	$10,178,650	8	398	$7,651,272
49	2063	10	540	$10,370,700	8	407	$7,810,674
50	2064	10	550	$10,562,750	8	415	$7,970,075
		Present value @	0%	$292,876,250			**$203,236,913**
		Present value @	3%	$107,816,575			**$71,267,718**
		Present value @	7%	$37,465,042			**$22,704,673**
		Average annual@	0%	$5,857,525			**$4,064,738**
		Average annual@	3%	$4,190,345			**$2,769,855**
		Average annual@	7%	$2,714,711			**$1,645,177**

Option 6: Add a "*Re-Manufacturing*" DSW Recycling Exclusion

This re-manufacturing option as proposed applies to spent solvent "processing aids" which may be sent offsite for "re-manufacturing" (distillation) by another company, for continued use as processing aids. This exclusion could either replace the 2008 DSW offsite transfer exclusion (i.e., in conjunction with Option 1 of this RIA), or be a specific type of offsite transfer exclusion in addition to the more general 2008 DSW offsite recycling exclusion (i.e., without Option 1 of this RIA). The re-manufacturing exclusion has four elements evaluated in this RIA:

6A. Meet the five eligibility criteria of the exclusion:
   1. 18 solvent chemicals
   2. Originate from use as processing aid
   3. Re-manufactured use as processing aid
   4. Originate from four industries (basic organic chemical manufacturing, plastics/resins manufacturing, pharmaceutical manufacturing, paints/coating manufacturing)
   5. Five conditions for both generators & re-manufacturers (notification, re-manufacturing plan, 3-year shipment recordkeeping, store solvents in tanks/containers meeting RCRA Subtitle C, no speculative accumulation).

6B. Restriction against using intermediate storage/consolidation facilities under this exclusion.

6C. Additional possible administrative requirements (e.g., financial assurance, public participation).

6D. Petition process for adding to the eligibility criteria (e.g., adding industries, adding chemicals) of the exclusion.

The impact analysis for Option 6 is organized into two sections for the purpose of distinguishing the potential regulatory impact of (a) complying with the exclusion based on the proposed eligibility criteria (i.e., elements 6A, 6B, 6C), and (b) complying with the exclusion through the petition process (i.e., .elements 6A, 6B, 6C, 6D)

- **Impacts of Re-manufacturing Option 6 Based on Proposed Eligibility Criteria and Conditions (6A + 6B + 6C)**

Element 6A: Potential Future Cost Savings for Eligible Facilities

From the baseline perspective of this RIA defined in relation to the 2008 DSW final rule projected future cost savings, the potential future RCRA de-regulatory annual cost savings to industry for participating under the solvent "re-manufacturing" DSW exclusion are already included, to a lesser or greater extent, in the 2008 DSW final rule cost savings baseline for the 2008 DSW offsite exclusion. The two categories of solvent recycling evaluated for future de-regulatory cost savings in the 2008 RIA, according to the four exclusions of the DSW final rule (i.e., generator onsite recycling, same company offsite recycling, offsite toll recycling, and offsite 2nd party transfer recycling) were:

1. Solvent recycling: 456 facilities currently recycling 328,931 tons per year (2007) RCRA-regulated spent solvents (consisting of 106,147 tons onsite + 222,784 tons offsite), as displayed above in Exhibit 3A based on the Biennial Report (BR) H020 solvent recovery code.

2. Solvent disposal: Upwards of 1,968 facilities (shown in Exhibit 3T, row B1, column F) currently disposing 595,345 tons/year (2007) RCRA-regulated solvents (this tonnage is displayed above in Exhibit 3W for "Commodity Group #2" and identified based on BR data for a combination of (a) five W202, W203, W204, W209, W211 chemical form codes, (b) G01 and G06 industrial process/ activity generation source codes, and (c) eight hazardous waste codes (F001, F002, F003, F004, F005, F024, F025, K086).

The above two spent solvent management categories (i.e., recycling + disposing) total upwards of 2,424 current facilities involving **2.92 million tons spent solvents per year** (i.e., 328,931 tons/year current recycling + 595,345 tons/year current disposal), as updated in this RIA to the 2007 BR data year.

In comparison, based on EPA's 2009 "Toxics Release Inventory" (TRI) database as displayed in **Appendix C** to this RIA, the four eligible NAICS code industries reported generating 507,715 tons/year of waste for 16 of the specific 18 eligible solvents which was either disposed or recycled (2 of the 18 chemicals are not covered by EPA's TRI database).[53] As displayed in the final table of **Appendix C**, based on recent US average market prices for 16 of the 18 chemicals ranging between $0.14 and $0.82 per pound (which is equivalent to $280 to $1,640 per 2,000-pound short-ton), the annual US market value of these 16 chemicals which could potentially be remanufactured is $42.2 million/year under the 13% "base case" adoption scenario.

The cost saving estimate for offsite spent solvent recycling from the 2008 RIA is used as a "***proxy method***" in this RIA for estimating the potential future cost savings for Option 6. Potential cost savings for Option 6 – already included in the baseline of this RIA -- were calculated as the difference in annual off-site solvent recovery costs pre- and post-exclusion. The 2008 RIA baseline (i.e., "pre-rule" without the 2008 DSW exclusions in place) assumed that facilities generating spent solvents would send them offsite for solvent recovery as a RCRA-regulated hazardous waste and incur the associated 14 RCRA Subtitle C burden costs[54] identified in the baseline cost estimates of the 2008 DSW final rule. Under the 2008 DSW "offsite transfer" recycling exclusion (i.e., "post-rule") the spent solvents are treated as "hazardous secondary materials" and facilities no longer need to comply with the 14 RCRA Subtitle C requirements if they meet the 12 conditions[55] specified by the

[53] For purpose of gauging the possible under- or over-estimation of this option, the 2008 RIA's data screening process resulted in a total of 595,345 tons per year (2007) of current RCRA-regulated solvent disposal for potential switchover (i.e., diversion) to offsite recycling (from Exhibit 3W in this RIA). In comparison, as displayed in **Appendix C** to this RIA, a query of EPA's 2009 Toxics Release Inventory (TRI) database indicate that 1,303 facilities in the four NAICS codes eligible for Option 6 disposed 507,715 tons per year (2009) of the 16 chemicals eligible for Option 6, although the TRI database does not explicitly indicate whether the chemicals actually function as "solvents" (or function for other purposes, for example, such as chemical reactants or catalysts) by the TRI-reporting facilities in the processing aid applications for which they are reporting the chemical data.. However, these BR and TRI tonnages are not directly comparable because:

- Different data years (2007 vs. 2009); and
- The BR tonnage is the entire physical mass including all other matter (e.g., water, non-solvent chemicals, debris) which may be contained with spent solvents, whereas the TR tonnage is only the mass of the 16 specific solvent chemicals excluding the weight/volume of any other constituents in the solvents such as water, other chemicals, debris, etc. In order for the lower TRI tonnage to equal the higher BR tonnage, the average concentration of the 16 solvents disposed by the four industrial sectors would have to be 85% pure (i.e., 507,715 / 595,345), with other matter constituting 15% of the disposed spent solvent physical/chemical mass.

[54] The 14 RCRA Subtitle C burden elements are: 1. obtain EPA ID number, 2. personnel training, 3. recordkeeping, 4. manifest exception reporting, 5. biennial reporting, 6. Part B permit renewal, 7. use manifests, 8. Preparedness, 9. prevention, 10. contingency plan, 11. emergency plan, 12. closure, 13. post closure, and 14. accumulation time.

[55] The 12 exclusion conditions of the 2008 DSW final rule are: 1. no speculative accumulation, 2. initial notification and biennial notification, 3. notification signed by a corporate official, 4. non-waste determination petition, 5. maintain records of all shipments to recycling, 6. confirmation of shipment receipt, 7. recycler has liability

2008 DSW final rule. Pre-rule annual facility costs were subtracted from the post-rule annual facility costs to determine the potential incremental annual cost savings for the 2008 DSW final rule exclusions.

The 2008 RIA cost savings estimate for spent solvents consists of the following components according to the three offsite recycling exclusions from the 2008 DSW final rule. The cost savings are alternatively displayed below based on (a) 100% adoption as assumed in the 2008 RIA, and (b) the 13% "base case" adoption assumed in this RIA:

- 2008 RIA 100% Assumption: If 100% of potentially relevant industrial facilities (i.e., 5,007) adopt the 2008 DSW exclusions:
  - As displayed in Exhibit 5H below, the cumulative count of industrial facilities which are estimated to potentially benefit from 2008-excluded offsite spent solvent recycling is estimated to be 386 facilities.
    - 201 (52%) of the 386 facilities are in the four eligible NAICS codes for Option 6.
  - As displayed in Exhibit 5I below, these 386 facilities transfer 71,575 tons of solvent off site for recovery based on 2005 BR data as analyzed in EPA's 2008 RIA for the 2008 DSW final rule.
    - 53,960 (75%) of the 71,575 tons per year sent offsite is associated with the four eligible NAICS codes for Option 6.
  - As displayed in Exhibit 5J below, the estimated average annual industry cost savings for offsite solvent recycling under the 2008 DSW exclusions is $4.64 million per year (2007$), of which $3.03 million/year (65%) is for the four eligible NAICS codes.
    - The 2007$ baseline cost savings estimate of $4,639,037 may be updated to 2011$ by applying the GDP deflator multiplier as follows: ($4,639,037 per year) x (1.0505 year 2011 update multiplier) = $4.87 million per year cost savings.
    - This cost savings estimate represents an average annual de-regulatory cost savings of:
      - Per-facility: $12,600 per-year per-facility sending spent solvents offsite for recycling.
      - Per-ton: $68 per-ton of spent solvent recycled offsite.
    - 65% of the 2011-updated $4.87 million per year cost savings for the four eligible NAICS codes = **$3.17 million/year.**

- 2011 RIA 13% "Base Case" Assumption: 13% of potentially relevant industrial facilities (662 of 5,007) adopt the 2008 DSW exclusions and the 2011 proposed revisions:
  - 7% discount rate: Applying this 2011-updated cost saving estimate to the 13% "base case" adoption scenario produces ($4,873,308 per year) x (0.063423 cost adjustment reflecting a 13% base case rate and 7% discount rate for the 50-year future period of analysis) = $309,080 per year. (Exhibit 5O).
    - 65% for the four eligible NAICS codes = **$200,909/year.**
  - 3% discount rate: $485,294 cost savings per year (Exhibit 5P).
    - 65% for the four eligible NAICS codes = **$306,254/year.**
  - 0% discount rate: $653,520 cost savings per year (Exhibit 5Q).
    - 65% for the four eligible NAICS codes = **$424,788/year.**

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insurance, 8. recycler has financial assurance for closure, 9. materials must be contained, 10. residuals derived from recycling managed in an environmentally-protective manner, 11. due diligence conducted on recycler to ensure legitimacy, and 12. export materials require notice and consent and an annual report).

Exhibit 5H
Count* of Industrial Facilities Projected to Recycle Solvents Offsite Under the 2008 DSW Exclusions Which May be Potentially Eligible for Option 6 ("Re-Manufacturing" Exclusion)

Item	Industry NAICS code		A Exclusion 1B (Same co. offsite)	B Exclusion 1C (offsite tolling)	C Exclusion 2 (Transfer-based)	D Combined 1B+1C+2**
1	32511	Petrochemical Manufacturing	3	3	1	6
2	325132	Synthetic Organic Dye & Pigment Manufacturing	3	0	0	3
3	325181	Alkalies & Chlorine Manufacturing	2	0	0	2
4	325191	Gum & Wood Chemical Manufacturing	0	0	0	0
5	325192	Cyclic Crude & Intermediate Manufacturing	0	3	0	3
6	325193	Ethyl Alcohol Manufacturing	0	36	2	36
7	325199	Basic Organic Chemical Manufacturing	0	0	0	0
8	325211	Plastics Material & Resin Manufacturing	0	0	43	43
9	32532	Pesticide & Other Agricultural Chemical Manufacturing	0	0	6	6
10	3254	Pharmaceutical & Medicine Manufacturing	0	0	66	66
11	3255	Paint, Coating, & Adhesive Manufacturing	0	0	92	92
12	3259	Other Chemical Product & Preparation Manufacturing	1	0	42	42
13	3261	Plastics Product Manufacturing	1	0	87	87
		Column totals =	10	42	339	**386**
		Subtotal items 7+8+10+11 =	0	0	201	**201 (52%)**

Notes:
*Estimate based on 100% full state adoption and the 2005 Biennial Report data according to the 2008 RIA for EPA's 2008 DSW final rule methodology.
** Columns A + B + C may not equal Column D because some facilities are counted in more than one column (e.g., a facility conducts both a same company transfer and an offsite transfer to a non-owned facility for recovery).

Exhibit 5I
Annual Tonnage* of Industrial Solvents Projected to Recycle Offsite Under the 2008 DSW Exclusions Which May be Potentially Eligible for Option 6 ("Re-Manufacturing" Exclusion)

Item	Industry NAICS code		A Exclusion 1B (Same co. offsite)	B Exclusion 1C (offsite tolling)	C Exclusion 2 (Transfer-based)	D (A+B+C) Combined 1B+1C+2
1	32511	Petrochemical Manufacturing	1	1	954	956
2	325132	Synthetic Organic Dye & Pigment Manufacturing	135	0	0	135
3	325181	Alkalies & Chlorine Manufacturing	2	0	0	2
4	325191	Gum & Wood Chemical Manufacturing	0	0	0	0
5	325192	Cyclic Crude & Intermediate Manufacturing	0	7	0	7
6	325193	Ethyl Alcohol Manufacturing	0	5,611	1,316	6,927
7	325199	Basic Organic Chemical Manufacturing	0	0	0	0
8	325211	Plastics Material & Resin Manufacturing	0	0	10,397	10,397
9	32532	Pesticide & Other Agricultural Chemical Manufacturing	0	0	1,182	1,182
10	3254	Pharmaceutical & Medicine Manufacturing	0	0	25,232	25,232
11	3255	Paint, Coating, & Adhesive Manufacturing	0	0	18,331	18,331
12	3259	Other Chemical Product & Preparation Manufacturing	739	0	2,271	3,010
13	3261	Plastics Product Manufacturing	4	0	5,392	5,396
		Column totals =	881	5,619	65,075	**71,575**
		Subtotal items 7+8+10+11 =	0	0	53,960	**53,960 (75%)**

*Note: Estimate based on 100% full state adoption and the 2005 Biennial Report data according to the 2008 RIA for EPA's 2008 DSW final rule methodology.

Exhibit 5J
Annual De-Regulatory Cost Savings* to Industrial Facilities Projected to Recycle Solvents Offsite Under the 2008 DSW Exclusions Which May be Potentially Eligible for Option 6 ("Re-Manufacturing" Exclusion) (2007$)

Item	Industry NAICS code		A Exclusion 1B (Same co. offsite)	B Exclusion 1C (offsite tolling)	C Exclusion 2 (Transfer-based)	D (A+B+C) Combined 1B+1C+2
1	32511	Petrochemical Manufacturing	$0	$0	$0	$0
2	325132	Synthetic Organic Dye & Pigment Manufacturing	$0	$0	$0	$0
3	325181	Alkalies and Chlorine Manufacturing	$0	$0	$0	$0
4	325191	Gum and Wood Chemical Manufacturing	$0	$0	$0	$0
5	325192	Cyclic Crude and Intermediate Manufacturing	$0	$0	$0	$0
6	325193	Ethyl Alcohol Manufacturing	$0	$38,200	$8,960	$47,160
7	325199	Basic Organic Chemical Manufacturing	$0	$0	$0	$0
8	325211	Plastics Material and Resin Manufacturing	$0	$0	$789,380	$789,380
9	32532	Pesticide & Other Agricultural Chemical Mfg	$0	$0	$123,724	$123,724
10	3254	Pharmaceutical and Medicine Manufacturing	$0	$0	$1,086,977	$1,086,977
11	3255	Paint, Coating, and Adhesive Manufacturing	$0	$0	$1,154,960	$1,154,960
12	3259	Other Chemical Product & Preparation Manufacturing	$39,284	$0	$816,249	$855,533
13	3261	Plastics Product Manufacturing	$956	$0	$580,347	$581,303
		Column totals =	$40,240	$38,200	$4,560,597	**$4,639,037**
		Average per affected facility ($/facility) =	$4,024	$910	$13,454	$12,018
		Average per affected waste annual ton ($/ton) =	$46	$7	$70	$65
		Subtotal items 7+8+10+11 =	$0	$0	$3,031,317	**$3,031,317 (65%)**

Note: Estimate based on 100% full state adoption and the 2005 Biennial Report data according to the 2008 RIA for EPA's 2008 DSW final rule methodology.

Note: Although the industrial scope of this option applies only to (a) four specific NAICS codes (i.e., 325199, 325211, 325412, 325510), (b) 18 specific chemical solvents, and (c) "processing aid" solvent uses (i.e., not cleaning or degreasing solvent uses), this RIA evaluates the potential impact of this option by using the results of the solvent portion of the 2008 DSW offsite recycling exclusion cost savings evaluation from the 2008 RIA to the 2008 DSW final rule, as a "proxy analysis" method. This method introduces three sources of impact estimation inaccuracy for Option 6:

1. The count of affected facilities, annual solvent tonnages, and cost savings could be over-estimated below, because the 2008 RIA evaluated (a) more than four NAICS codes, (b) more than 18 specific solvents, and (c) all types of solvent uses.
2. On the other hand, the 2008 RIA's evaluation of potential cost savings associated with future switch-over (i.e., diversion) of spent solvent disposal to recycling, applied two analytic limitations which could under-estimate potential cost savings for this option: (a) it only included one (i.e., G06) of the four potentially relevant BR industrial source codes (i.e., G06, G07, G08, G09)[1], and (b) it excluded solvents used for onsite incineration or energy recovery because of the large capital investments already made in those processes.
3. This proxy method further under-estimates cost savings because the method involves subtraction of "pre-rule" costs from "post-rule" costs which are based on all 12 "post-rule" conditions of the 2008 DSW final rule, rather subtraction of "post-rule" costs based on the smaller set of 5 conditions actually proposed under Option 6 of this RIA (i.e., 1. notification, 2. re-manufacturing plan, 3. shipment recordkeeping, 4.storage standards & air emission controls, and 5. no speculative accumulation). However, addition of the costs associated with element 6C corrects this cost-savings estimation, because sub-option 6C proposes conditions similar to the 12 2008 DSW conditions (e.g., financial assurance).

For purpose of estimating in this RIA the incremental impact of Option 6, the incremental costs estimated below for elements 6B (intermediate facility restriction) and 6C (additional administrative requirements), should theoretically be subtracted from the 6A baseline cost savings if Option 1 is finalized (i.e., withdraw the 2008 DSW "offsite transfer" recycling exclusion). Otherwise, if Option 1 is not finalized (i.e., the 2008 DSW "offsite transfer" exclusion is left in place), then the incremental impact of Option 6 theoretically should exclude the baseline cost savings estimated above (i.e., only consist of the costs estimated below for elements 6B and 6C), to avoid double-counting the spent solvent recycling benefits already included in the baseline of this RIA which is formulated in reference to the 2008 DSW final rule cost savings.

However, given the fact that this re-manufacturing exclusion is voluntary, not mandatory, if the 2008 DSW offsite transfer exclusions remain in place (i.e., Option 1 is not selected), then facilities engaged in solvent recycling could choose to operate under either the 2008 exclusion or under the re-manufacturing exclusion based on which ever provides the most cost savings to the facility. Consequently, the incremental analysis below for Option 6 indicates potential incremental costs for elements 6B and 6C if Option 1 is selected. If Option 1 is not selected, i.e., the 2008 DSW recycling exclusions are retained, these facilities will not incur these added costs, if those costs for any single facility are over and above the costs for meeting the conditions of the 2008 exclusions.

Element 6B: Intermediate Facility Restriction

Regarding proposed element 6B, a question to help assess the regulatory impact of this restriction is whether a facility generating spent solvent according to the terms of the eligibility criteria, would use an intermediate facility to ship spent solvents to a remanufacturer in the absence of this restriction. For facilities in the four specific NAICS codes, there are several reasons why a generator facility has little incentive to use an intermediate facility, even if there was no restriction against it, to ship spent solvents to a re-manufacturer:

1. High annual volume – facilities meeting the criteria of the exclusion are using these 18 chemicals in sufficiently high volumes as processing aides that they could ship full loads directly to the re-manufacturer without difficulty.
2. Proximity – the majority of generators and potential re-manufacturers are co-located within geographical clusters (as illustrated in the example maps provided below in **Appendix C** based on one of the 18 eligible solvent chemicals (toluene) for each of the four eligible industries), so transport to re-manufacturers would usually be accomplished in one direct trip on regional or smaller scale (reference sample mapping of toluene generator/re-manufacturing sector facilities).
3. Economics – if the scale of business opportunity were so small as to be dealing with partial shipments over significant distances, a generator facility would likely forego using this exclusion altogether.
4. Material control – if the generator doesn't need to use an intermediate facility, then it doesn't have to concern itself with tracking and ensuring the load was handled separately from other material under the intermediate facility's control.

Based on the foregoing, this RIA estimates zero incremental cost to facilities in the four eligible NAICS code industries, for restricting intermediate facilities. Thus, the annual cost to restrict generators meeting the proposed re-manufacturing eligibility criteria from using intermediate facilities is estimated to be $0 per year. However, this RIA does estimate a cost for this proposed intermediate facility restriction below in conjunction with the petition element (i.e., element 6D).

Element 6C: Possible Additional Requirements (e.g., Recordkeeping and Reporting Requirements, Management Standards, Financial Assurance Requirements, and Public Participation Requirements)

Future annual costs associated with meeting the five eligibility conditions and possible additional administrative requirements (element 6C) were included in the baseline cost savings estimated as part of the 2008 DSW final rule, and are captured in the baseline cost savings estimate presented in 6A above. Thus, the incremental cost for facilities to meet the proposed eligibility criteria, intermediate facility restriction, and additional requirements (i.e., elements 6A + 6B + 6C) is zero.

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Element 6D. Potential Impact of the Petition Process

Although the proposed petition process could hypothetically in the future involve adding other (a) chemicals, (b) industries, and/or (c) chemical functions to the re-manufacturing exclusion, the "proxy analysis" method applied in this RIA is based on the offsite solvent recycling results of the 2008 DSW final rule RIA, which represents a limited potential expansion of scope along these three dimensions: the proxy method of this RIA only considers (a) all other spent solvent chemicals covered by the RCRA Biennial Report, (b) nine additional spent solvent generator industries as displayed above in Exhibits 5H, 5I, 5J, and (c) all other spent solvent chemical functions covered by the RCRA Biennial Report. This "proxy analysis" method does not consider other chemicals (e.g., spent metals, spent acids) or their associated industries and potential re-manufacturing uses (i.e., chemical functions). To estimate aggregate cost impacts, this RIA assumes that in any given future year a relatively small fraction of between 0% and 10% (midpoint 5%) of all the offsite spent solvent recycling facilities identified in the 2008 RIA, may file a petition to add chemicals, industrial, and/or chemical functions to the re-manufacturing exclusion.

The economic impact of the exclusion on facilities using the petition process is the sum of the costs of complying with elements 6B, 6C, and 6D of the re-manufacturing exclusion as listed above, offset by any de-regulatory cost savings from transactions permissible under the exclusion.

Element 6D.1: Potential Future Cost Savings for Petition Facilities

- 2008 RIA 100% Assumption: If 100% of potentially relevant industrial facilities (i.e., 5,007) adopt the 2008 DSW exclusions:
  - As displayed in Exhibit 5J above the estimated average annual industry cost savings for offsite solvent recycling under the 2008 DSW exclusions is $4.64 million per year (2007$), of which $3.03 million/year (65%) is for the four eligible NAICS codes.
    - The 2007$ baseline cost savings estimate of $4,639,037 may be updated to 2011$ by applying the GDP deflator multiplier as follows: ($4,639,037 per year) x (1.0505 year 2011 update multiplier) = $4.87 million per year cost savings.
      - 65% of the 2011-updated $4.87 million per year cost savings for the 4 eligible NAICS codes = $3.17 million/year
      - **35%** of the 2011-updated $4.87 million per year cost savings for the 9 petition NAICS codes = **$1.70 million/year**

- 2011 RIA 13% "Base Case" Assumption: 13% of potentially relevant industrial facilities (662 of 5,007) adopt the 2008 DSW exclusions and the 2011 proposed revisions:
  - 7% discount rate: Applying this 2011-updated cost saving estimate to the 13% "base case" adoption scenario produces ($4,873,308 per year) x (0.003171 cost adjustment reflecting a 13% base case rate, 5% filing petitions, and 7% discount rate for the 50-year future period of analysis) = $15,453 cost savings per year. (Exhibit 5O).
    - 35% for the 9 petition NAICS codes = **$5,409/year.**
  - 3% discount rate: $23,557 cost savings per year (Exhibit 5P).
    - 35% for the 9 petition NAICS codes = **$8,245/year.**
  - 0% discount rate: $32,677 cost savings per year (Exhibit 5Q).

- 35% for the 9 petition NAICS codes = **$11,437/year.**

Element 6D.2: Potential Future Cost to Submit Petitions

This RIA assumes the cost to file a petition under the re-manufacturing exclusion to add certain chemicals, industries, and/or chemical functions will be similar in cost to filing a legitimacy petition proving that all four legitimacy factors are met. Costs for a legitimacy petition are assumed to be equivalent to making a non-waste determination plus conducting a waste characterization test. Hour estimates for a non-waste determination were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 2310.01 Revisions to the RCRA Definition of Solid Waste (Final Rule)", October 28, 2008.[56] Labor rates were obtained from the 2011 DSW ICR. This RIA assumes future legitimacy petitions are a relatively rare frequency applied to 5% of the facilities.[57] To prepare and submit an application for non-waste determination assumes 4 hours of legal labor at $133.37/hour, 4 hours of managerial labor at $101.68/hour, 130 hours of technical labor at $69.32/hour and 5 hours of clerical labor at $24.67/hour and $22.83 in O&M costs which equals $10,173/facility (2011$). From EPA's RIA for the 2008 DSW final rule, characterization of hazardous waste (secondary materials) and recycled materials is estimated to include sampling labor burden and waste characterization analytical costs. The sampling is estimated to require a labor burden of 2 hours of field technician labor at $69.32/hour which equals $138.64/sample. The analytical costs were estimated using RACER 2005 cost estimating software at a cost of $284 per sample (2007$).[58] The 2011 DSW ICR inflated this cost to $306/sample (2011$) using the Bureau of Labor Statistics Consumer Price Index. One sample is collected for each waste or recycled materials for a total cost of $445 (2011$). The total cost is estimated to be $10,617/facility (2011$). Assume a petition is submitted every 5 years on average because a facility will either modify its product, chemical use, production process or recycling operations. Average annual cost is $10,617/facility divided by 5 years equals $2,123/facility/year (2011$). As displayed in Exhibit 5H above there are 386 facilities estimated to engage in offsite spent solvent recycling in 13 industries, including the four eligible industries. The aggregate annual cost to prepare a petition is $2,753 per year calculated as follows:

[(386 facilities) x ($2,123 per facility per year) x (0.3360% cost adjustment reflecting the 13% base case adoption scenario, and only 5% of notifying facilities submitting petitions and a 7% discount rate for the 50-year future period of analysis)][59].

Element 6D.3: Intermediate Facility Restriction for Petition Facilities

To assess the regulatory impact of this restriction, it is important to have a sense of whether a generator facilities operating under a petition would use an intermediate facility to ship spent chemicals to a re-manufacturer in the absence of this restriction. For some industries, this restriction may not result in a change from current shipment practices, and thus not be an incremental cost impact, for three reasons:

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[56] Document can be obtained under ICR Reference No: 200905-2050-001 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200905-2050-001.

[57] 5% "rare" future annual frequency assumed in this RIA represents the midpoint of a 0% to 10% range in any given future year.

[58] RACER = Remedial Action Cost Engineering Requirements cost estimating system: http://talpart.earthtech.com/racer_documentation.htm.

[59] See **Appendix B** of this RIA for how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Option 3F, this RIA applied (a) an average cost per-facility of $2,123 for 386 affected facilities, (b) the weighted fraction of notifiers which are re-manufacturing facilities (386/4,933), and (c) 5% of facilities submitting a petition.

1. A facility would never choose to incur unnecessary costs. If the transfer-based exclusion of the 2008 DSW final rule is retained (Option 1 is not selected), and if the facility found it more economical to operate under the transfer-based exclusion than the re-manufacturing exclusion (Option 6), it would choose to operate under the transfer-based exclusion. The transfer-based exclusion is already shown in the 2008 DSW RIA to produce cost savings. Operating under the transfer-based exclusion would avoid the intermediate facility restriction of the re-manufacturing exclusion (Option 6).
2. Even if the transfer-based exclusion of the 2008 DSW final rule is not retained (Option 1 is selected), a facility will still choose to not incur unnecessary costs. Implementation costs of the re-manufacturing rule using a rule variance would still be offset by cost savings as cost savings attributed to Option 1 in the 2008 DSW RIA would then shift to Option 6. A facility would take advantage of those cost savings, leaving the net cost of the Option 6 intermediate facility restriction at zero.
3. A facility operating under the re-manufacturing exclusion with a rule variance may have other options for transport other than intermediate facilities. Very often generator facilities and potential re-manufacturing facilities are in geographical clusters (as illustrated in the example maps in **Appendix C** below for the four eligible solvent recycling industries). Frequently the incentive for operating under Option 6 is that there are such annual volumes of spent chemical involved as to make it worthwhile to operate under Option 6, making the shipment of full loads not difficult.

However, based on the national RCRA hazardous waste "Biennial Report" database which formed the data foundation for the 2008 DSW final rule RIA, upwards of 50% of facilities involved in recycling hazardous wastes, currently use intermediate facilities for shipping low-volume partial loads. For those facilities, restricting use of intermediate facilities could result in an incremental cost relative to baseline. However, the incremental cost as estimated below would not, in most if not all cases, offset the overall net cost savings for recycling.

Facilities will make more shipments to reclamation facilities and incur higher shipping costs without intermediate facilities consolidating hazardous secondary materials among different generators. One assumption for the cost estimate in this RIA is that no consolidation of wastes for reclamation is conducted by an intermediate facility to achieve full truck loads. Partial truck loads are assumed. A sample of generators who ship directly to off-site metals recyclers was obtained from Exhibit D12 of EPA's 2008 DSW RIA and used in Exhibit 5N. The weighted-average partial truck load size is 10.5 tons. The unit cost calculation involved the following three steps:

- Step 1: Assume that 50% of all shipments destined for recycling go through an intermediate facility. From Exhibit 3A there were 8,584 waste streams recycled in 2007. From the footnote in Exhibit 3M there were 107,877 waste streams disposed and 58,958 waste streams went to intermediate facilities.[60] Of the total of 175,419 waste streams at least 34% (58,958/175,419 x 100% = 33.61%) went to intermediate facilities. The instructions for the RCRA Biennial Report form are to report the ultimate disposition of the waste. Many of the waste streams reported going to recycling and disposal could have gone through an intermediate facility. Therefore, this RIA assumes 50% of the waste streams go through an intermediate facility.
- Step 2: The calculation for the number of shipments (or loads) for material shipped via *full* truck loads derives from dividing 50% of the

[60] Intermediate facilities were identified using BR management method code H141 (wastes stored/bulked, transferred without treatment, recovery or disposal at the transferring site).

tons shipped to offsite recycling (via intermediate facilities) by 18 tons per truck load (typical truck size). This results in the estimate of the number of shipments shipped to intermediate facilities for consolidation and ultimate shipment for reclamation.

- Step 3: Given the lack of consolidation with like wastes at an intermediary consolidator, smaller loads of secondary materials will ship directly to the reclaimers. The calculation for the number of *partial* truck loads derives from dividing 50% of the tons shipped to offsite recycling (via intermediate facilities) by 10.5 tons per truck load. The increase in the number of shipments (10.5-ton truck loads minus 18-ton truck loads) for the 50% of shipments originally going to intermediate facilities, multiplied by the following unit costs results in an estimate for the increase in shipping costs. From the 2008 DSW RIA, DPRA used professional judgment and RACER cost estimating software[61] and inflated RACER 2005 unit costs to 2011$ using a GDP implicit price deflator to develop these cost estimates.

    - Waste Testing (2011$) = $445/load
    - Transport for Recovery (2011$)

        Acid Recovery: $2,243/load
        Solvent Recovery: $2,279/load
        Metal Recovery: $3,412/load
        Average = $2,644/load

Increases in prices charged by commercial metal, solvent and acid recovery facilities for excepting smaller loads and the increase in handling costs are not estimated. The average annual cost for restricting use of intermediate facilities is $3,089 per shipment (or $11,676 per facility assuming 50% of the tonnage shipments will go from 18-ton loads to 10.5-ton partial loads without the intermediate consolidating facility which results in approximately 3.78 more partial shipments per year per facility). It is applied to transfer-based exclusion facilities only. As displayed in Exhibit 5H above there are 386 affected offsite transfer solvent re-manufacturing exclusion facilities, and as displayed in Exhibit 5I above, 71,575 affected solvent tons from "re-manufacturing facilities". The aggregate annual cost to restrict the use of intermediate facilities is $7,561 per year computed as follows:

[(386 facilities) x ($11,676/facility per year) x (0.1680% cost adjustment reflecting the 13% base case adoption scenario, 50% of tonnage shipped through intermediate facilities, 5% of facilities file petition, and 7% discount rate for the 50-year future period of analysis)][62].

- **Option 6 Total Cost (6A+6B+6C+6D)**

The net cost savings estimates for Option 6 in conjunction with Option 1 (i.e., withdraw the 2008 DSW "offsite transfer" exclusion) are as follows under the 13% "base case" adoption scenario:

- 7% discount rate: Incremental cost for sub-options 6B + 6C+6D estimated at $10,300 per year, which reduces the baseline cost savings

[61] RACER = Remedial Action Cost Engineering Requirements cost estimating system: http://talpart.earthtech.com/racer_documentation.htm

[62] See **Appendix B** of this RIA for an example of how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Option 9B, this RIA applied an average cost per-facility of $11,676..

from $206,300 per year to $196,000 per year (Exhibit 5O).

- 3% discount rate: Incremental cost for sub-options 6B + 6C+6D estimated at $15,700 per year, which reduces the baseline cost savings from $314,500 per year to $298,800 per year (Exhibit 5P).
- 0% discount rate: Incremental costs for sub-options 6B + 6C+6D estimated at $21,800 per year, which reduces the baseline cost savings from $436,200 per year to $414,400 per year (Exhibit 5Q).

Option 7: Revise the Pre-2008 DSW Recycling Exclusions

Option 7A: Recordkeeping for Speculative Accumulation

Facilities will incur costs for labeling and recordkeeping associated with operating a speculative accumulation storage area. Recordkeeping costs are assumed to be similar to LQG accumulation recording keeping requirements under 262.34. Cost estimates were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 0820.10 Hazardous Waste Generator Standards (Renewal)," January 2008.[63] The cost estimate uses documentation of procedure and compliance costs for containment building requirements 264.34(a)(1)(iv) and labeling requirements for 264.34(a)(2) and (3) and 264.34(c).

- The cost for preparing procedures ensuring waste is stored no more than one year includes 1.0 hour technical labor at $69.32/hour and 0.1 hour clerical labor at $24.67/hour and equals $71.79/facility (2011$). Preparation of these procedures is assumed to occur every three years and the annual cost is estimated to be $23.93/facility ($71.79/facility/3 years).
- The cost to document that storage procedures are satisfied includes 0.25 hours technical labor at $69.32/hour and equals $17.33/facility (2011$).
- The cost to prepare a description of waste generation and waste management practices includes 1.5 hours technical labor at $69.32/hour and 0.1 hour clerical labor at $24.67/hour and equals $106.45/facility (2011$).
- Documentation of these storage procedures is assumed to occur every three years and the annual cost is estimated to be $34.48/facility ($106.45/facility/3years).
- The cost to document that the unit is emptied at least once a year includes 1 hour technical labor at $69.32/hour and 0.4 hours clerical labor at $24.67/hour and equals $79.19/facility (2011$).
- The cost to label containers in storage area includes 1 hour technical labor at $69.32/hour and equals $69.32/facility (2011$).
- The cost to label containers in satellite storage areas includes 0.5 hour technical labor at $69.32/hour and equals $34.66/facility (2011$).

The total cost is $259/facility (2011$). For the total population of pre-2008 DSW recycling exclusion facilities the aggregate annual cost for speculative accumulation recordkeeping is $1.05 million per year calculated as follows:

[(5,321 facilities) x ($259 per facility per year) x (0.76290 cost adjustment factor to discount costs from the first year the rule is in effect in 2015 to 2011$ at a 7% discount rate)].

Option 7B: Notification

Requires submittal of a notification using EPA Form 8700-12 prior to operating, and thereafter biennially. Labor hour and O&M cost estimates were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 2310.01 Revisions to the RCRA Definition of Solid Waste (Final Rule)", October 28, 2008.[64] Labor rate estimates were obtained from EPA's ICR for the "Supporting Statement for Revisions to the RCRA Definition of Solid Waste (Proposed Rule) OMB Control No. 2050-0202, EPA ICR No.

[63] Document can be obtained under ICR Reference No: 200801-2050-002 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200801-2050-002.
[64] Document can be obtained under ICR Reference No: 200905-2050-001 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=200905-2050-001.

2310.02," June 30, 2011. Labor hours include 0.1 hours of managerial time at $101.68/hour, 0.3 hours of technical labor at $69.32/hour, and 0.1 hours of clerical labor at $24.67/hour with $0.44 in postage.

- The unit costs are estimated to be $33.87 per initial notification/facility and allocated over 20 years (expected life of facility) equaling $1.69/facility/year (2011$).
- Re-notification includes 0.1 hours of clerical labor at $24.67 and equals $2.91 for re-notification/facility (2011$). Re-notification occurs every two years and equals $1.46/facility (2011$).
- Updating and submitting notification that the hazardous secondary materials are no longer managed in accordance with the exclusion includes 0.1 hours of clerical labor at $24.67 and equals $2.91 for re-notification/facility (2011$). The 2011 DSW ICR assumes this update occurs at 5% of the facilities (or every 20 years). The average annual cost is $0.15/facility/year ($2.91/facility/20 years).

The aggregate annual cost is $3.30/facility/year. For the total population of pre-2008 DSW recycling exclusion facilities the aggregate annual cost for biennial notification is $13,400 per year, calculated as follows:

[(5,321 facilities x $3.30/facility/year x 0.76290 cost adjustment factor to discount costs from the first year the rule is in effect in 2015 to 2011$ at a 7% discount rate)].

Option 7C: Contained Standard

Although not actually required by the rule, affected facilities are expected to incur costs associated with reading the rule in order to understand and comply with the new requirements. Cost estimates were obtained from EPA's ICR for the "Supporting Statement for EPA Information Collection Request Number 2308.02: Revisions to the Requirements for Transboundary Shipments of Wastes between OECD Countries, the Requirements for Export Shipments of Spent Lead Acid Batteries, the Requirements on Submitting Exception Reports for Export Shipments of Hazardous Wastes, and the Requirements for Imports of Hazardous Wastes," December 2009.[65] First year (one-time) cost for reading the regulations is assumed equivalent to the estimate for the SLAB Rule at $260/facility (2007$). Cost includes 1.0 hours of managerial labor at $101.68/hour and 2.5 hours of technical labor at $69.32/hour. It is assumed that changeover in staff responsible for compliance and/or refresher with the rule every 3 years on average will result in new familiarization with regulations. An average annual cost of $274.99/facility divided by 3 years equals $91.66/facility/year (2011$). For the total population of pre-2008 DSW recycling exclusion facilities the aggregate annual cost to meet 2008 legitimacy technical provisions is $372,000 per year calculated as follows:

(5,321 facilities) x ($91.66 per facility per year) x (0.76290 cost adjustment factor to discount costs from the first year the rule is in effect in 2015 to 2011$ using a 7% discount rate).

Option 7 Total Cost (7A+7B+7C)

A total of **5,321 facilities** are estimated to operate their recycling activities under the pre-2008 DSW exclusions. Assuming an average annual per-facility cost to comply with the three proposed revisions to the 2011 DSW proposed rule and the proposed codification of the legitimacy definition under Option 4A, produces an estimate of **$4.5 million** (2011$) ($3.1 million for legitimacy petitions or documents and $1.4 million

[65] Document can be obtained under ICR Reference No: 201002-2050-001 at http://www.reginfo.gov/public/do/PRAViewICR?ref_nbr=201002-2050-001.

for the revisions described under Options 7A, 7B and 7C) in average annual compliance costs to these facilities under the pre-2008 DSW exclusions. The cost savings estimates as displayed in Exhibit 5K (in columns B and I) below are:

- 7% discount rate: Baseline cost savings associated with the pre-2008 DSW industrial recycling exclusions are reduced from **$79.3 million** to **$77.4 million per year** post 2011 DSW proposed rule.
- 3% discount rate: Costs are estimated to be $5.2 million per year with baseline cost savings reduced from $92.4 million per year to $90.2 million per year post 2011 DSW proposed rule
- 0% discount rate: Costs are estimated to be $5.9 million per year with baseline cost savings reduced from $103.9 million to $101.5 million per year post 2011 DSW proposed rule.

Exhibit 5K
Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Meeting Revision Options to the 2011 Proposed Revisions to the pre-2008 DSW Exclusions (Option 7)

Item	Industry NAICS code and Pre-2008 Exclusion		A Count of Affected Facilities	B Baseline Cost Savings (pre-2008 Industrial Recycling Exclusions)	D Option 4A Legitimacy Petition Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	E Option 4A Legitimacy Documentation Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	F Option 7A Record-keeping for Speculative Accumulation Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	G Option 7B Biennial Notification Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	H Option 7C Codified Standard Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	I (B+…+H) Option 4 & 7 Post Rule Cost Savings with Four Factors Legitimacy Definition (relative to pre-2008 DSW Rule baseline)
7% Discount Rate (2011$)										
1	31,32,33	Manufacturing	5,291	$78,840,663	($428,473)	($2,611,405)	($1,045,450)	($13,320)	($369,984)	$76,983,435
2	562920	Materials Recovery Facilities	3	$44,703	($243)	($1,481)	($593)	($8)	($210)	$43,650
3	2122	Minerals Mining	27	$402,324	($2,187)	($13,326)	($5,335)	($68)	($1,888)	$392,847
		Column totals =	**5,321**	**$79,287,690**	**($430,903)**	**($2,626,212)**	**($1,051,378)**	**($13,396)**	**($372,082)**	**$77,419,932**
3% Discount Rate (2011$)										
1	31,32,33	Manufacturing	5,291	$91,830,283	($499,067)	($3,041,655)	($1,217,696)	($15,515)	($430,942)	$89,667,062
2	562920	Materials Recovery Facilities	3	$52,068	($283)	($1,725)	($690)	($9)	($244)	$50,841
3	2122	Minerals Mining	27	$468,610	($2,547)	($15,522)	($6,214)	($79)	($2,199)	$457,571
		Column totals =	**5,321**	**$92,350,961**	**($501,897)**	**($3,058,901)**	**($1,224,601)**	**($15,603)**	**($433,386)**	**$90,175,475**
0% Discount Rate (2011$)										
1	31,32,33	Manufacturing	5,291	$103,343,812	($561,640)	($3,423,012)	($1,370,369)	($17,460)	($484,973)	$100,909,370

Exhibit 5K
Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Meeting Revision Options to the 2011 Proposed Revisions to the pre-2008 DSW Exclusions (Option 7)

Item	Industry NAICS code and Pre-2008 Exclusion		A Count of Affected Facilities	B Baseline Cost Savings (pre-2008 Industrial Recycling Exclusions)	D Option 4A Legitimacy Petition Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	E Option 4A Legitimacy Documentation Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	F Option 7A Record-keeping for Speculative Accumulation Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	G Option 7B Biennial Notification Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	H Option 7C Codified Standard Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	I (B+…+H) Option 4 & 7 Post Rule Cost Savings with Four Factors Legitimacy Definition (relative to pre-2008 DSW Rule baseline)
2	562920	Materials Recovery Facilities	3	$58,596	($318)	($1,941)	($777)	($10)	($275)	$57,216
3	2122	Minerals Mining	27	$527,364	($2,866)	($17,468)	($6,993)	($89)	($2,475)	$514,941
		Column totals =	**5,321**	**$103,929,772**	**($564,824)**	**($3,442,421)**	**($1,378,139)**	**($17,559)**	**($487,723)**	**$101,481,527**

Exhibit 5L
Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Meeting Revision Options to the Pre-2008 DSW Recycling Exclusions (Option 7)
(2011$; 7% discount rate)

A	B	C	D	E	F
Pre-2008 DSW exclusion (row item)	Affiliated NAICS Codes (from column F of Exhibit 3I)	Count of Facilities Assumed to Have Pre-2008 DSW Recycling Exclusions (from Column E of Exhibit 3J)	Baseline RCRA Regulatory Cost Savings (from Column D of Exhibit 4M) (pre-2008 Industrial Recycling Exclusions)	Options 4A & 7 Compliance Costs (incremental to pre-2008 Industrial Recycling Exclusions Baseline)	Option 4A & 7 Post-Rule Cost Savings (relative to pre-2008 Industrial Recycling Exclusions Baseline)
1	31 +32 + 33 manufacturing	5,291	$78,840,500	(4,468,633)	$76,983,435
2	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1
3	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1
4	322110 pulp mills	In item 1	In item 1	In item 1	In item 1
5	325188 other basic inorganic chem mfg	In item 1	In item 1	In item 1	In item 1
6	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1
7	321114 wood preservation	In item 1	In item 1	In item 1	In item 1
8	324199 coke oven products	In item 1	In item 1	In item 1	In item 1
9	331111 iron & steel manufacturing	In item 1	In item 1	In item 1	In item 1
10	324110 petroleum refineries	In item 1	In item 1	In item 1	In item 1
11	562920 materials recovery facilities	3	$44,703	($2,534)	$43,650
12	Assume captured in item 11 above	In item 11	In item 11	In item 11	In item 11
13	2122 minerals mining	27	$402,323	($22,803)	$392,847
14	32519 organic chemical mfg	In item 1	In item 1	In item 1	In item 1
15	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1
16	Assume captured in item 1 above	In item 1	In item 1	In item 1	In item 1
	Non-duplicative column totals =	**5,321**	**$79,287,526**	**($4,493,970)**	**$77,419,932**

Option 8: Other Possible Revisions to the 2008 DSW Recycling Exclusions Evaluated in this RIA Not Listed Above

Upon launching this RIA in September 2010, EPA evaluated other options prior to limiting the 2011 proposed revisions to Options 1 thru Options 7 above. There are three sub-options under Options 8 that relate to possible revisions to the 2008 DSW offsite transfer recycling exclusion. These analyses are retained in this section.

Option 8A: Add a "*Contained*" Performance Standard for 2008 DSW Offsite Transfer Recycling Exclusion

Add a definition of "contained" that specifies performance-based storage standards, but not full Subtitle C tank and container standards. The rationale is that it would make the standard more enforceable and more protective, but still workable. The net cost impact is assumed to be zero because affected facilities are assumed to meet the contained standard already. Performance standard would make standard more enforceable and more protective

Option 8B: Prohibit Intermediate Facilities to Obtain the 2008 DSW Offsite Transfer Recycling Exclusion

Prohibit intermediate facilities to obtain the 2008 DSW offsite transfer recycling exclusion. The rational is that it removes potential confusion over the location of shipments and extended storage times. Facilities will make more shipments to reclamation facilities and incur higher shipping costs without intermediate facilities consolidating hazardous secondary materials among different generators. One assumption for the cost estimate is that no consolidation of wastes for reclamation is conducted by an intermediate facility to achieve full truck loads. Partial truck loads are assumed. A sample of generators who ship directly to off-site metals recyclers was obtained from Exhibit D12 of the 2008 DSW RIA and used in Exhibit 5N below (weighted-average partial truck load size = 10.5 tons). The unit cost calculation involved the following steps:

- Step 1: This RIA assumes that 50% of all shipments destined for recycling go through an intermediate facility. From Exhibit 3A there were 8,584 waste streams recycled in 2007. From the footnote in Exhibit 3M there were 107,877 waste streams disposed and 58,958 waste streams went to intermediate facilities.[66] Of the total of 175,419 waste streams at least 34% (58,958/175,419 x 100% = 33.61%) went to intermediate facilities. The instructions for the RCRA Biennial Report form are to report the ultimate disposition of the waste. Many of the waste streams reported going to recycling and disposal could have gone through an intermediate facility. Therefore, this RIA assumes 50% of the waste streams go through an intermediate facility.
- Step 2: The number of shipments (or loads) for material shipped via *full* truck loads is calculated by dividing 50% of the tons shipped to offsite recycling (via intermediate facilities) by 18 tons per truck load (typical truck size). This provides an estimate of the number of shipments shipped to intermediate facilities for consolidation and ultimate shipment for reclamation.
- Step 3: Given the lack of consolidation with like wastes at an intermediary consolidator, smaller loads of secondary materials will ship directly to the reclaimers. The number of *partial* truck loads is calculated by dividing 50% of the tons shipped to offsite recycling (via

[66] Intermediate facilities were identified using BR management method code H141(wastes stored/bulked, transferred without treatment, recovery or disposal at the transferring site).

intermediate facilities) by 10.5 tons per truck load. The increase in the number of shipments (10.5-ton truck loads minus 18-ton truck loads) for the 50% of shipments originally going to intermediate facilities is multiplied by the following unit costs to estimate the increase in shipping costs. From the 2008 DSW RIA, DPRA used professional judgment and RACER cost estimating software[67] and inflated RACER 2005 unit costs to 2011$ using a GDP implicit price deflator to develop these cost estimates.

- Waste Testing (2011$) = $445/load
- Transport for Recovery (2011$)
  Acid Recovery: $2,243/load
  Solvent Recovery: $2,279/load
  Metal Recovery: $3,412/load
  Average = $2,644/load

Increases in prices charged by commercial metal, solvent and acid recovery facilities for accepting smaller loads and the increase in handling costs are not estimated. The average annual cost for restricting use of intermediate facilities inflated to 2011$ is $3,089 per shipment (or $11,676 per facility assuming 50% of the tonnage shipments will go from 18-ton loads to 10.5-ton partial loads without the intermediate consolidating facility which results in approximately 3.78 more partial shipments per year per facility). It is applied to offsite transfer recycling exclusion facilities only. From Exhibit 4E and Exhibit 4F, respectively, there are 4,656 affected offsite transfer-based exclusion facilities and 887,457 affected tons from offsite transfer recycling facilities. The aggregate annual cost to restrict the use of intermediate facilities is $1.7 million per year calculated as follows:

[4,656 facilities – 201 re-manufacturing exclusion facilities – (386-201) x (5% re-manufacturing exclusion petition facilities)] x ($11,676/facility per year) x (3.3598% cost adjustment reflecting a 13% base case adoption scenario, 50% of tonnage shipped through intermediate facilities, and 7% discount rate for the 50-year future period of analysis[68]).

Option 8C: Non-adopting States Under the 2008 DSW Offsite Transfer Recycling Exclusion

Clarify that generators in states that have not adopted the rule may send hazardous secondary materials to other states for reclamation if they comply with requirements for notification, reasonable efforts (unless sending to a permitted facility), speculative accumulation, containment, recordkeeping for shipments, and legitimacy. The rationale is it allows generators in state that do not adopt the DSW standards for reclaimers to still participate in the rule. Generators in non-adopting states likely will incur higher shipping costs to reclaim hazardous secondary materials out-of-state. In Exhibit 12A of the 2008 DSW RIA, the EPA estimated, based on a review of comments, that 4 states may not adopt the generator-controlled exclusion and 12 states may not adopt the off-site transfer exclusion. The sensitivity analysis presented in that exhibit indicated that estimated cost savings would decrease by 23% if these states did not adopt the rule.

[67] RACER = Remedial Action Cost Engineering Requirements cost estimating system: http://talpart.earthtech.com/racer_documentation.htm

[68] See **Appendix B** of this RIA for an example of how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Option 9B, this RIA applied an average cost per-facility of $11,256..

For this sub-option, this RIA assumes that 23% of the facilities that notify will be located in non-adopting states and they will need to ship waste 50% farther out-of-state. From Exhibit D4 and Exhibit D2 of the 2008 DSW RIA, the distance to metals recovery will increase from 521 miles to 781 miles. The per mile transport cost will decrease from $3.21/mile to $3.03/mile with a $37.89/ton loading/unloading cost ($682/load) for van trailer transport and from $3.40/mile to $3.13/mile with a $50.20/ton loading/unloading cost ($904/load) for tanker truck transport. The transport cost increases approximately 25%. Average transport to recovery costs will change from $2,517/load to $3,146/load (2007$).

Under the base case adoption scenario, 13% of facilities are anticipated to adopt the 2011 DSW proposed revisions. Assuming that 23% of these facilities will be located in "non-adopting" states and 23% of the affected tonnage will come from "non-adopting" states, and further assuming that the affected tonnage shipments will be full truck loads (18 tons per load), the number of shipments (i.e., loads) multiplied by the incremental cost increase per load ($3,146/load - $2,517/load = $629/load in 2007$) may be used as a unit cost to estimate the potential cost impact of this sub-option.

The average annual cost for non-adopting state participation inflated to 2011$ is $661 per shipment (or $1,612 per facility assuming for 23% of the tonnage shipments come from "non-adopting" states which calculates to approximately 2.44 shipments per facility per year). It is applied to offsite transfer recycling exclusion facilities only. From Exhibit 4E and Exhibit 4F, respectively, there are 4,656 affected transfer-based exclusion facilities and 887,457 affected tons from transfer-based facilities. The aggregate annual cost to restrict the use of intermediate facilities is $109,500 per year (4,656 facilities x $1,612/facility/year x 1.4587% cost adjustment reflecting the 13% base case adoption scenario, 23% of tonnage shipped by facilities in non-adopting states, and 7% discount rate for the 50-year future period of analysis[69]).

[69] See **Appendix B** of this RIA for an example of how the cost adjustment factor and rate of exclusion notification were derived. To derive the factors for Option 8C, this RIA applied an average cost per-facility of $1,612..

Exhibit 5M
Estimated Average Truck Load Size for Materials Shipped Directly to Reclamation Facility
(i.e., No Intermediate Facility Used)

Generator Type* & Waste Shipment Weighted-Average Size	No. of data points*	Percent	Average Truck Load Size for Wastes Shipped to Metals Recovery Facilities Pre-2008 DSW Final Rule (tons/load)*	Accumulation Time Pre-2008 DSW Final Rule	Accumulation Time Post-2008 DSW Final Rule	Number of Shipments Post-2008 DSW Final Rule (full truck load of 18 tons)	Average Truck Load Size Pre-2008 DSW Final Rule (tons/load)
Small LQG - small shipment (<13.2 tons/year)	31	35.6%	1	90 days	360 days	1	4
Small LQG - large shipment (13.2 to <60 tons/year)	36	41.4%	3	90 days	360 days	1	12
Large LQG shipment (60 tons/year or greater)	20	23.0%	9	90 days	360 days	2	18
Weighted-Average Truck Load Size			3.7				**10.5**

* Generator Type Categories and data from Exhibit D12 of 2008 DSW RIA

Summary of Estimated Industry Costs to Meet Options 1 to 7 (Excluding Option 8)

- 13% "*base case*" adoption scenario (see Exhibits 5N, 5O, and 5P below at 7%, 3%, and 0% discount rates, respectively):
  - The potential cost to industry to meet the seven primary sets of options to the three 2008 DSW final rule exclusions and the pre-2008 exclusions are estimated to be between:
    - **$7.2 million per year (only Options 3 to 7)**
    - **$13.1 million per year (all Options 1 to 7)**
  - These incremental compliance costs reduce the total estimated baseline cost savings from $86.7 million per year to between $73.6 million per year and $79.5 million per year at a 7% discount rate.[70]
  - The estimates vary depending whether EPA finalizes Options 1 and 2. The inclusion of Options 1 and 2 with the additions of Options 3, through 7 completely negate the $7.4 million per year in baseline cost savings of the 2008 DSW final rule with $8.6 million per year in compliance costs (Exhibit 5N, Column C).
    - Option 1 withdraws the transfer-based exclusion and its associated $5.7 million per year in cost savings under the 2008 DSW final rule.
    - Option 2, the corollary to Option 1, adds back in $2.6 million per year in one-year accumulation time transportation cost savings and $2.7 million per year in compliance costs for a net of $0.1 million per year in post rule costs to meet the requirements of the alternative RCRA Subtitle C regulation of offsite transfers for reclamation.
  - Only including Options 3 through 7 maintains some of the baseline cost savings of the 2008 DSW final rule. The $7.4 million per year in baseline cost savings of the 2008 DSW final rule are reduced to $4.8 million per year (Exhibit 5N, Column D).
  - The application of Options 4, 5, and 7 to the pre-2008 exclusions add $4.5 million per year in compliance costs reducing baseline cost savings from $79.3 million per year to $74.8 million per year (Exhibit 5N, Column E).

- 74% "*upper-bound*" adoption scenario (see Exhibits 5Q, 5R, and 5S below at 7%, 3%, and 0% discount rates, respectively):
  - The potential cost to industry to meet the seven primary sets of options to the three 2008 DSW final rule exclusions and the pre-2008 exclusions are estimated to be between:
    - **$7.4 million per year (only Options 3 to 7)**
    - **$47.5 million per year (all Options 1 to 7)**
  - These incremental compliance costs reduce the total estimated baseline cost savings from $131.7 million per year to between $84.1 million per year and $124.3 million per year at a 7% discount rate.
  - The estimates vary depending whether EPA finalizes Options 1 and 2. The inclusion of Options 1 and 2 with the additions of Options 3, through 7 adds $41.4 million in compliance costs per year and reduces the $52.4 million per year in baseline cost savings of the 2008 DSW final rule to $11.0 million per year (Exhibit 5Q, Column C).
    - Option 1 withdraws the transfer-based exclusion and its associated $47.4 million per year in cost savings under the 2008

[70] Total baseline cost savings includes both the 2008 DSW rule and pre-2008 recycling exclusions populations of affected facilities and is obtained by adding together either Column C + Column E or Column D + Column E in Exhibit 5N.

DSW final rule.

- Option 2, the corollary to Option 1, adds back in $22.0 million per year in one-year accumulation time transportation cost savings and $13.3 million per year in compliance costs for a net of $8.7 million per year in post rule cost savings to meet the requirements of the alternative RCRA Subtitle C regulation of offsite transfers for reclamation.

- Only including Options 3 through 7 maintains most of the baseline cost savings of the 2008 DSW final rule. The $52.4 million per year in baseline cost savings of the 2008 DSW final rule are reduced to $51.1 million per year (Exhibit 5R, Column D).
- The application of Options 4, 5, and 7 to the pre-2008 exclusions add $6.1 million per year in compliance costs reducing baseline cost savings from $79.3 million per year to $73.2 million per year (Exhibit 5S, Column E).

Exhibit 5N Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (13% Adoption Rate and 7% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
	Baseline Cost Savings =	**$7,424,696**	**$7,424,696**	**$79,287,690**
1	**Option 1 Withdraw the 2008 DSW Offsite Transfer-Based Exclusion**	**($5,671,409)**		
2	**Option 2: Implement Alternative RCRA Subtitle C Regulation for 2008 DSW Excluded Hazardous Recyclable Materials that Are Transferred Offsite for Reclamation**			
2A	Requirement 2A Transportation Cost Savings from Extension of Accumulation Time to One Year	$2,633,407		
2B	Requirement 2B Notification Compliance Costs	($413)		
2C	Requirement 2C Advance Arrangements Compliance Costs	($48,041)		
2D	Requirement 2D Accumulation Restrictions Compliance Costs	($1,164,838)		
2E.1	Requirement 2E.1 Speculative Accumulation Labeling	$0		
2E.2	Requirement 2E.2 Contingency Plan Compliance Costs	($28,338)		
2F.1	Requirement 2F.1 Recordkeeping of Offsite Shipments Compliance Costs	($192,648)		
2F.2	Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs	($1,298,353)		
	Subtotal Option 2 Compliance Costs =	**($99,224)**		
3	**Option 3 Revisions to Generator-controlled Exclusions**			
3A	Option 3A Definition of "Contained" Compliance Costs	$0	$0	
3B	Option 3B Notification (Requirement vs. Condition) Compliance Costs	$0	$0	
3C	Option 3C Speculative Accumulation Labeling Compliance Costs	$0	$0	
3D	Option 3D Recordkeeping Requirement for Reclamation Under Toll Manufacturing Agreements Compliance Costs	$0	$0	

Exhibit 5N Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (13% Adoption Rate and 7% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
3E	Option 3E Eliminate the 2008 DSW "Toll Manufacturing" Recycling Exclusion	($180,753)	$0	
3F	Option 3F Re-structure the location of the non-land based and land-based unit operational requirements in 40 CFR 261 Compliance Costs	($39)	($39)	
	Subtotal Option 3 Compliance Costs =	**($180,792)**	**($39)**	
4	**Option 4 Revisions to Legitimacy Recycling Provisions**			
4A/4B	Options 4A & 4B Legitimacy Petition Compliance Costs	($399,473)	($399,473)	($430,903)
4A/4C	Options 4A & 4C Legitimacy Documentation Compliance Costs	($2,434,660)	($2,243,621)	($2,626,212)
	Subtotal Option 4 Compliance Costs =	**($2,834,133)**	**($2,643,095)**	**($3,057,114)**
5	**Option 5 Revisions to 1985 Variance and 2008 DSW Non-Waste Determination Petition Process**			
5A	Option 5A Partial Variance and Non-waste determination re-applications	($28,015)	($28,015)	($15,945)
5B	Option 5B Biennial Notification Compliance Costs	($78)	($78)	($206)
5C	Option 5C: Modify the 1985 40 CFR 260.31(c) DSW Variance for Partially Recycled Materials			$0
5D	Option 5D Non-waste Determination Petitioner Must Demonstrate Why They Cannot or Should Not Meet Existing DSW Exclusions Compliance Costs	$0	$0	
5E	Option 5E Change the Word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34.	$0	$0	$0
	Subtotal Option 5 Compliance Costs =	**($28,094)**	**($28,094)**	**($16,151)**
6	**Option 6 DSW Re-Manufacturing Exclusion**			
6A	Element 6A Potential Future Cost Savings for Eligible Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$200,909	Not applicable because Option 6 is voluntary, and facilities would	

Exhibit 5N
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(13% Adoption Rate and 7% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
6B	Element 6B Intermediate Facility Restriction	$0	not incur additional costs to switch from operating under the 2008 DSW exclusions to Option 6.	
6C	Element 6C Possible Additional Requirements (e.g., Recordkeeping and Reporting Requirements, Management Standards, Financial Assurance Requirements, and Public Participation Requirements)	Included in Option 6A Baseline Cost Savings		
6D.1	Element 6D.1 Potential Future Cost Savings for Petition Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$5,409		
6D.2	Element 6D.2 Petition Process	($2,753)		
6D.3	Element 6D.3 Intermediate Facility Restriction for Petition Facilities	($7,571)		
	Subtotal Option 6 Compliance Costs	**$195,994**	**$0**	**$0**
7	**Option 7 Revisions to Pre-2008 Recycling Exclusions**			
7A	Option 7A Recordkeeping for Speculative Accumulation Compliance Costs			($1,051,378)
7B	Option 7B Biennial Notification Compliance Costs			($13,396)
7C	Option 7C Contained Standard Compliance Costs			($372,082)
	Subtotal Option 7 Compliance Costs =			**($1,436,856)**
	Total Compliance Costs =	**($8,617,658)**	**($2,671,227)**	**($4,510,121)**
	Post Rule Cost Savings =	**($1,192,962)**	**$4,753,469**	**$74,777,569**
	Total Compliance Costs if Options 1 and 2 Selected (Columns C+E) =	**($13,127,779)**		
	Total Post Rule Cost Savings if Options 1 and 2 Selected (Columns C+E) =	**$73,584,607**		
	Total Compliance Costs if Options 1 and 2 are NOT Selected (Columns D+E) =	**($7,181,348)**		
	Total Post Rule Cost Savings if Options 1 and 2 are NOT Selected (Columns D+E) =	**$79,531,038**		

Exhibit 5O
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(13% Adoption Rate and 3% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
	Baseline Cost Savings =	**$10,772,866**	**$10,772,866**	**$92,350,961**
1	**Option 1 Withdraw the 2008 DSW Offsite Transfer-Based Exclusion**	**($8,645,145)**		
2	**Option 2: Implement Alternative RCRA Subtitle C Regulation for 2008 DSW Excluded Hazardous Recyclable Materials that Are Transferred Offsite for Reclamation**			
2A	Requirement 2A Transportation Cost Savings from Extension of Accumulation Time to One Year	$4,014,202		
2B	Requirement 2B Notification Compliance Costs	($629)		
2C	Requirement 2C Advance Arrangements Compliance Costs	($73,230)		
2D	Requirement 2D Accumulation Restrictions Compliance Costs	($1,775,608)		
2E.1	Requirement 2E.1 Speculative Accumulation Labeling	$0		
2E.2	Requirement 2E.2 Contingency Plan Compliance Costs	($43,196)		
2F.1	Requirement 2F.1 Recordkeeping of Offsite Shipments Compliance Costs	($293,661)		
2F.2	Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs	($1,512,266)		
	Subtotal Option 2 Compliance Costs =	**$315,611**		
3	**Option 3 Revisions to Generator-controlled Exclusions**			
3A	Option 3A Definition of "Contained" Compliance Costs	$0	$0	
3B	Option 3B Notification (Requirement vs. Condition) Compliance Costs	$0	$0	
3C	Option 3C Speculative Accumulation Labeling Compliance Costs	$0	$0	
3D	Option 3D Recordkeeping Requirement for Reclamation Under Toll Manufacturing Agreements Compliance Costs	$0	$0	
3E	Option 3E Eliminate the 2008 DSW "Toll Manufacturing" Recycling Exclusion	($275,529)	$0	

Exhibit 5O Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (13% Adoption Rate and 3% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
3F	Option 3F Re-structure the location of the non-land based and land-based unit operational requirements in 40 CFR 261 Compliance Costs	($59)	($59)	
	Subtotal Option 3 Compliance Costs =	**($275,588)**	**($59)**	
4	**Option 4 Revisions to Legitimacy Recycling Provisions**			
4A/4B	Options 4A & 4B Legitimacy Petition Compliance Costs	($465,290)	($465,290)	($501,897)
4A/4C	Options 4A & 4C Legitimacy Documentation Compliance Costs	($2,835,790)	($2,544,582)	($3,058,901)
	Subtotal Option 4 Compliance Costs =	**($3,301,079)**	**($3,009,872)**	**($3,560,798)**
5	**Option 5 Revisions to 1985 Variance and 2008 DSW Non-Waste Determination Petition Process**			
5A	Option 5A Partial Variance and Non-waste determination re-applications	($32,247)	($32,247)	($18,569)
5B	Option 5B Biennial Notification Compliance Costs	($90)	($90)	($319)
5C	Option 5C: Modify the 1985 40 CFR 260.31(c) DSW Variance for Partially Recycled Materials			$0
5D	Option 5D Non-waste Determination Petitioner Must Demonstrate Why They Cannot or Should Not Meet Existing DSW Exclusions Compliance Costs	$0	$0	
5E	Option 5E Change the Word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34.	$0	$0	
	Subtotal Option 5 Compliance Costs =	**($32,337)**	**($32,337)**	**($18,888)**
6	**Option 6 DSW Re-Manufacturing Exclusion**			
6A	Element 6A Potential Future Cost Savings for Eligible Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$306,254	Not applicable because Option 6 is voluntary, and facilities would not incur additional	
6B	Element 6B Intermediate Facility Restriction	$0		

Exhibit 5O Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (13% Adoption Rate and 3% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
6C	Element 6C Possible Additional Requirements (e.g., Recordkeeping and Reporting Requirements, Management Standards, Financial Assurance Requirements, and Public Participation Requirements)	Included in Option 6A Baseline Cost Savings	costs to switch from operating under the 2008 DSW exclusions to Option 6.	
6D.1	Element 6D.1 Potential Future Cost Savings for Petition Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$8,245		
6D.2	Element 6D.2 Petition Process	($4,197)		
6D.3	Element 6D.3 Intermediate Facility Restriction for Petition Facilities	($11,541)		
	Subtotal Option 6 Compliance Costs	**$298,761**	**$0**	**$0**
7	**Option 7 Revisions to Pre-2008 Recycling Exclusions**			
7A	Option 7A Recordkeeping for Speculative Accumulation Compliance Costs			($1,224,601)
7B	Option 7B Biennial Notification Compliance Costs			($15,603)
7C	Option 7C Contained Standard Compliance Costs			($433,386)
	Subtotal Option 7 Compliance Costs =			**($1,673,589)**
	Total Compliance Costs =	**($11,639,777)**	**($3,042,267)**	**($5,253,275)**
	Post Rule Cost Savings =	**($866,911)**	**$7,730,598**	**$87,097,686**
	Total Compliance Costs if Options 1 and 2 Selected (Columns C+E) =	**($16,893,052)**		
	Total Post Rule Cost Savings if Options 1 and 2 Selected (Columns C+E) =	**$86,230,774**		
	Total Compliance Costs if Options 1 and 2 are NOT Selected (Columns D+E) =	**($8,295,543)**		
	Total Post Rule Cost Savings if Options 1 and 2 are NOT Selected (Columns D+E) =	**$94,828,284**		

Exhibit 5P
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(13% Adoption Rate and 0% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
	Baseline Cost Savings =	**$15,054,046**	**$15,054,046**	**$103,929,772**
1	**Option 1 Withdraw the 2008 DSW Offsite Transfer-Based Exclusion**	**($11,991,206)**		
2	**Option 2: Implement Alternative RCRA Subtitle C Regulation for 2008 DSW Excluded Hazardous Recyclable Materials that Are Transferred Offsite for Reclamation**			
2A	Requirement 2A Transportation Cost Savings from Extension of Accumulation Time to One Year	$5,567,880		
2B	Requirement 2B Notification Compliance Costs	$0		
2C	Requirement 2C Advance Arrangements Compliance Costs	($101,574)		
2D	Requirement 2D Accumulation Restrictions Compliance Costs	($2,462,848)		
2E.1	Requirement 2E.1 Speculative Accumulation Labeling	$0		
2E.2	Requirement 2E.2 Contingency Plan Compliance Costs	($59,915)		
2F.1	Requirement 2F.1 Recordkeeping of Offsite Shipments Compliance Costs	($407,322)		
2F.2	Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs	($1,701,872)		
	Subtotal Option 2 Compliance Costs =	**$834,349**		
3	**Option 3 Revisions to Generator-controlled Exclusions**			
3A	Option 3A Definition of "Contained" Compliance Costs	$0	$0	
3B	Option 3B Notification (Requirement vs. Condition) Compliance Costs	$0	$0	
3C	Option 3C Speculative Accumulation Labeling Compliance Costs	$0	$0	
3D	Option 3D Recordkeeping Requirement for Reclamation Under Toll Manufacturing Agreements Compliance Costs	$0	$0	
3E	Option 3E Eliminate the 2008 DSW "Toll Manufacturing" Recycling Exclusion	($382,154)	$0	

Exhibit 5P
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(13% Adoption Rate and 0% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
3F	Option 3F Re-structure the location of the non-land based and land-based unit operational requirements in 40 CFR 261 Compliance Costs	($82)	($82)	
	Subtotal Option 3 Compliance Costs =	**($382,236)**	**($82)**	
4	**Option 4 Revisions to Legitimacy Recycling Provisions**			
4A/4B	Options 4A & 4B Legitimacy Petition Compliance Costs	($523,627)	($523,627)	($564,824)
4A/4C	Options 4A & 4C Legitimacy Documentation Compliance Costs	($3,191,336)	($2,787,418)	($3,442,421)
	Subtotal Option 4 Compliance Costs =	**($3,714,963)**	**($3,311,045)**	**($4,007,245)**
5	**Option 5 Revisions to 1985 Variance and 2008 DSW Non-Waste Determination Petition Process**			
5A	Option 5A Partial Variance and Non-waste determination re-applications	($35,420)	($35,420)	($20,900)
5B	Option 5B Biennial Notification Compliance Costs	($99)	($99)	($445)
5C	Option 5C: Modify the 1985 40 CFR 260.31(c) DSW Variance for Partially Recycled Materials			$0
5D	Option 5D Non-waste Determination Petitioner Must Demonstrate Why They Cannot or Should Not Meet Existing DSW Exclusions Compliance Costs	$0	$0	
5E	Option 5E Change the Word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34.	$0	$0	
	Subtotal Option 5 Compliance Costs =	**($35,519)**	**($35,519)**	**($21,345)**
6	**Option 6 DSW Re-Manufacturing Exclusion**			
6A	Element 6A Potential Future Cost Savings for Eligible Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$424,788	Not applicable because Option 6 is voluntary, and facilities would not incur additional costs to switch from	
6B	Element 6B Intermediate Facility Restriction	$0		

Exhibit 5P Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (13% Adoption Rate and 0% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
6C	Element 6C Possible Additional Requirements (e.g., Recordkeeping and Reporting Requirements, Management Standards, Financial Assurance Requirements, and Public Participation Requirements)	Included in Option 6A Baseline Cost Savings	operating under the 2008 DSW exclusions to Option 6.	
6D.1	Element 6D.1 Potential Future Cost Savings for Petition Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$11,437		
6D.2	Element 6D.2 Petition Process	($5,821)		
6D.3	Element 6D.3 Intermediate Facility Restriction for Petition Facilities	($16,008)		
	Subtotal Option 6 Compliance Costs	**$414,395**	**$0**	**$0**
7	**Option 7 Revisions to Pre-2008 Recycling Exclusions**			
7A	Option 7A Recordkeeping for Speculative Accumulation Compliance Costs			($1,378,139)
7B	Option 7B Biennial Notification Compliance Costs			($17,559)
7C	Option 7C Contained Standard Compliance Costs			($487,723)
	Subtotal Option 7 Compliance Costs =			**($1,883,421)**
	Total Compliance Costs =	**($14,875,179)**	**($3,346,645)**	**($5,912,012)**
	Post Rule Cost Savings =	**$178,867**	**$11,707,401**	**$98,017,760**
	Total Compliance Costs if Options 1 and 2 Selected (Columns C+E) =	**($20,787,191)**		
	Total Post Rule Cost Savings if Options 1 and 2 Selected (Columns C+E) =	**$98,196,627**		
	Total Compliance Costs if Options 1 and 2 are NOT Selected (Columns D+E) =	**($9,258,657)**		
	Total Post Rule Cost Savings if Options 1 and 2 are NOT Selected (Columns D+E) =	**$109,725,161**		

Exhibit 5Q
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (74% Adoption Rate and 7% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
	Baseline Cost Savings =	**$52,378,431**	**$52,378,431**	**$79,287,690**
1	**Option 1 Withdraw the 2008 DSW Offsite Transfer-Based Exclusion**	**($47,374,266)**		
2	**Option 2: Implement Alternative RCRA Subtitle C Regulation for 2008 DSW Excluded Hazardous Recyclable Materials that Are Transferred Offsite for Reclamation**			
2A	Requirement 2A Transportation Cost Savings from Extension of Accumulation Time to One Year	$21,997,305		
2B	Requirement 2B Notification Compliance Costs	($3,446)		
2C	Requirement 2C Advance Arrangements Compliance Costs	($401,292)		
2D	Requirement 2D Accumulation Restrictions Compliance Costs	($9,730,099)		
2E.1	Requirement 2E.1 Speculative Accumulation Labeling	$0		
2E.2	Requirement 2E.2 Contingency Plan Compliance Costs	($236,711)		
2F.1	Requirement 2F.1 Recordkeeping of Offsite Shipments Compliance Costs	($1,609,226)		
2F.2	Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs	($1,298,353)		
	Subtotal Option 2 Compliance Costs =	**$8,718,178**		
3	**Option 3 Revisions to Generator-controlled Exclusions**			
3A	Option 3A Definition of "Contained" Compliance Costs	$0	$0	
3B	Option 3B Notification (Requirement vs. Condition) Compliance Costs	$0	$0	
3C	Option 3C Speculative Accumulation Labeling Compliance Costs	$0	$0	
3D	Option 3D Recordkeeping Requirement for Reclamation Under Toll Manufacturing Agreements Compliance Costs	$0	$0	
3E	Option 3E Eliminate the 2008 DSW "Toll Manufacturing" Recycling Exclusion	($1,505,797.06)	$0	

Exhibit 5Q
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(74% Adoption Rate and 7% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
3F	Option 3F Re-structure the location of the non-land based and land-based unit operational requirements in 40 CFR 261 Compliance Costs	($39)	($39)	
	Subtotal Option 3 Compliance Costs =	**($1,505,836)**	**($39)**	
4	**Option 4 Revisions to Legitimacy Recycling Provisions**			
4A/4B	Options 4A & 4B Legitimacy Petition Compliance Costs	($399,473)	($399,473)	($430,903)
4A/4C	Options 4A & 4C Legitimacy Documentation Compliance Costs	($2,434,660)	($838,881)	($2,626,212)
	Subtotal Option 4 Compliance Costs =	**($2,834,133)**	**($1,238,354)**	**($3,057,114)**
5	**Option 5 Revisions to 1985 Variance and 2008 DSW Non-Waste Determination Petition Process**			
5A	Option 5A Partial Variance and Non-waste determination re-applications	($28,015)	($28,015)	($15,945)
5B	Option 5B Biennial Notification Compliance Costs	($78)	($78)	($206)
5C	Option 5C: Modify the 1985 40 CFR 260.31(c) DSW Variance for Partially Recycled Materials			($1,645,177)
5D	Option 5D Non-waste Determination Petitioner Must Demonstrate Why They Cannot or Should Not Meet Existing DSW Exclusions Compliance Costs	$0	$0	
5E	Option 5E Change the Word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34.	$0	$0	$0
	Subtotal Option 5 Compliance Costs =	**($28,094)**	**($28,094)**	**($1,661,328)**
6	**Option 6 DSW Re-Manufacturing Exclusion**			
6A	Element 6A Potential Future Cost Savings for Eligible Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$1,678,230	Not applicable because Option 6 is voluntary, and facilities would not incur additional costs to switch from operating under the 2008 DSW exclusions	
6B	Element 6B Intermediate Facility Restriction	$0		

Exhibit 5Q
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(74% Adoption Rate and 7% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
6C	Element 6C Possible Additional Requirements (e.g., Recordkeeping and Reporting Requirements, Management Standards, Financial Assurance Requirements, and Public Participation Requirements)	Included in Option 6A Baseline Cost Savings	to Option 6.	
6D.1	Element 6D.1 Potential Future Cost Savings for Petition Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$45,183		
6D.2	Element 6D.2 Petition Process	($22,999)		
6D.3	Element 6D.3 Intermediate Facility Restriction for Petition Facilities	($63,244)		
	Subtotal Option 6 Compliance Costs	**$1,637,170**	**$0**	**$0**
7	**Option 7 Revisions to Pre-2008 Recycling Exclusions**			
7A	Option 7A Recordkeeping for Speculative Accumulation Compliance Costs			($1,051,378)
7B	Option 7B Biennial Notification Compliance Costs			($13,396)
7C	Option 7C Contained Standard Compliance Costs			($372,082)
	Subtotal Option 7 Compliance Costs =			**($1,436,856)**
	Total Compliance Costs =	**($41,386,980)**	**($1,266,486)**	**($6,155,298)**
	Post Rule Cost Savings =	**$10,991,451**	**$51,111,945**	**$73,132,392**
	Total Compliance Costs if Options 1 and 2 Selected (Columns C+E) =	**($47,542,278)**		
	Total Post Rule Cost Savings if Options 1 and 2 Selected (Columns C+E) =	**$84,123,843**		
	Total Compliance Costs if Options 1 and 2 are NOT Selected (Columns D+E) =	**($7,421,785)**		
	Total Post Rule Cost Savings if Options 1 and 2 are NOT Selected (Columns D+E) =	**$124,244,337**		

Exhibit 5R Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (74% Adoption Rate and 3% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
	Baseline Cost Savings =	**$63,581,974**	**$63,581,974**	**$92,350,961**
1	**Option 1 Withdraw the 2008 DSW Offsite Transfer-Based Exclusion**	**($57,635,306)**		
2	**Option 2: Implement Alternative RCRA Subtitle C Regulation for 2008 DSW Excluded Hazardous Recyclable Materials that Are Transferred Offsite for Reclamation**			
2A	Requirement 2A Transportation Cost Savings from Extension of Accumulation Time to One Year	$26,761,816		
2B	Requirement 2B Notification Compliance Costs	($4,192)		
2C	Requirement 2C Advance Arrangements Compliance Costs	($488,210)		
2D	Requirement 2D Accumulation Restrictions Compliance Costs	($11,837,592)		
2E.1	Requirement 2E.1 Speculative Accumulation Labeling	$0		
2E.2	Requirement 2E.2 Contingency Plan Compliance Costs	($287,981)		
2F.1	Requirement 2F.1 Recordkeeping of Offsite Shipments Compliance Costs	($1,957,777)		
2F.2	Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs	($1,512,773)		
	Subtotal Option 2 Compliance Costs =	**$10,673,290**		
3	**Option 3 Revisions to Generator-controlled Exclusions**			
3A	Option 3A Definition of "Contained" Compliance Costs	$0	$0	
3B	Option 3B Notification (Requirement vs. Condition) Compliance Costs	$0	$0	
3C	Option 3C Speculative Accumulation Labeling Compliance Costs	$0	$0	
3D	Option 3D Recordkeeping Requirement for Reclamation Under Toll Manufacturing Agreements Compliance Costs	$0	$0	
3E	Option 3E Eliminate the 2008 DSW "Toll Manufacturing" Recycling Exclusion	($1,831,946)	$0	

Exhibit 5R Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (74% Adoption Rate and 3% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
3F	Option 3F Re-structure the location of the non-land based and land-based unit operational requirements in 40 CFR 261 Compliance Costs	($59)	($59)	
	Subtotal Option 3 Compliance Costs =	**($1,832,004)**	**($59)**	
4	**Option 4 Revisions to Legitimacy Recycling Provisions**			
4A/4B	Options 4A & 4B Legitimacy Petition Compliance Costs	($465,290)	($465,290)	($501,897)
4A/4C	Options 4A & 4C Legitimacy Documentation Compliance Costs	($2,835,790)	($894,372)	($3,058,901)
	Subtotal Option 4 Compliance Costs =	**($3,301,079)**	**($1,359,662)**	**($3,560,798)**
5	**Option 5 Revisions to 1985 Variance and 2008 DSW Non-Waste Determination Petition Process**			
5A	Option 5A Partial Variance and Non-waste determination re-applications	($32,247)	($32,247)	($18,569)
5B	Option 5B Biennial Notification Compliance Costs	($90)	($90)	($319)
5C	Option 5C: Modify the 1985 40 CFR 260.31(c) DSW Variance for Partially Recycled Materials			($2,769,855)
5D	Option 5D Non-waste Determination Petitioner Must Demonstrate Why They Cannot or Should Not Meet Existing DSW Exclusions Compliance Costs	$0	$0	
5E	Option 5E Change the Word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34.	$0	$0	$0
	Subtotal Option 5 Compliance Costs =	**($32,337)**	**($32,337)**	**($2,788,743)**
6	**Option 6 DSW Re-Manufacturing Exclusion**			
6A	Element 6A Potential Future Cost Savings for Eligible Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$2,041,726	Not applicable because Option 6 is voluntary, and facilities would not incur additional costs to switch from	
6B	Element 6B Intermediate Facility Restriction	$0		

Exhibit 5R Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (74% Adoption Rate and 3% Discount Rate) (2011 dollars)				
A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
6C	Element 6C Possible Additional Requirements (e.g., Recordkeeping and Reporting Requirements, Management Standards, Financial Assurance Requirements, and Public Participation Requirements)	Included in Option 6A Baseline Cost Savings	operating under the 2008 DSW exclusions to Option 6.	
6D.1	Element 6D.1 Potential Future Cost Savings for Petition Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$54,970		
6D.2	Element 6D.2 Petition Process	($27,980)		
6D.3	Element 6D.3 Intermediate Facility Restriction for Petition Facilities	($76,942)		
	Subtotal Option 6 Compliance Costs	**$1,991,773**	**$0**	**$0**
7	**Option 7 Revisions to Pre-2008 Recycling Exclusions**			
7A	Option 7A Recordkeeping for Speculative Accumulation Compliance Costs			($1,224,601)
7B	Option 7B Biennial Notification Compliance Costs			($15,603)
7C	Option 7C Contained Standard Compliance Costs			($433,386)
	Subtotal Option 7 Compliance Costs =			**($1,673,589)**
	Total Compliance Costs =	**($50,135,663)**	**($1,392,058)**	**($8,023,130)**
	Post Rule Cost Savings =	**$13,446,312**	**$62,189,916**	**$84,327,831**
	Total Compliance Costs if Options 1 and 2 Selected (Columns C+E) =	**($58,158,793)**		
	Total Post Rule Cost Savings if Options 1 and 2 Selected (Columns C+E) =	**$97,774,142**		
	Total Compliance Costs if Options 1 and 2 are NOT Selected (Columns D+E) =	**($9,415,188)**		
	Total Post Rule Cost Savings if Options 1 and 2 are NOT Selected (Columns D+E) =	**$146,517,747**		

Exhibit 5S
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7) (74% Adoption Rate and 0% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
	Baseline Cost Savings =	**$73,867,654**	**$73,867,654**	**$103,929,772**
1	**Option 1 Withdraw the 2008 DSW Offsite Transfer-Based Exclusion**	**($66,551,644)**		
2	**Option 2: Implement Alternative RCRA Subtitle C Regulation for 2008 DSW Excluded Hazardous Recyclable Materials that Are Transferred Offsite for Reclamation**			
2A	Requirement 2A Transportation Cost Savings from Extension of Accumulation Time to One Year	$30,901,942		
2B	Requirement 2B Notification Compliance Costs	$0		
2C	Requirement 2C Advance Arrangements Compliance Costs	($563,738)		
2D	Requirement 2D Accumulation Restrictions Compliance Costs	($13,668,899)		
2E.1	Requirement 2E.1 Speculative Accumulation Labeling	$0		
2E.2	Requirement 2E.2 Contingency Plan Compliance Costs	($332,533)		
2F.1	Requirement 2F.1 Recordkeeping of Offsite Shipments Compliance Costs	($2,260,651)		
2F.2	Requirement 2F.2 Transport to RCRA Permit Facility Compliance Costs	($1,701,872)		
	Subtotal Option 2 Compliance Costs =	**$12,374,250**		
3	**Option 3 Revisions to Generator-controlled Exclusions**			
3A	Option 3A Definition of "Contained" Compliance Costs	$0	$0	
3B	Option 3B Notification (Requirement vs. Condition) Compliance Costs	$0	$0	
3C	Option 3C Speculative Accumulation Labeling Compliance Costs	$0	$0	
3D	Option 3D Recordkeeping Requirement for Reclamation Under Toll Manufacturing Agreements Compliance Costs	$0	$0	
3E	Option 3E Eliminate the 2008 DSW "Toll Manufacturing" Recycling Exclusion	($2,115,253)	$0	

Exhibit 5S
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(74% Adoption Rate and 0% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
3F	Option 3F Re-structure the location of the non-land based and land-based unit operational requirements in 40 CFR 261 Compliance Costs	($82)	($82)	
	Subtotal Option 3 Compliance Costs =	**($2,115,335)**	**($82)**	
4	**Option 4 Revisions to Legitimacy Recycling Provisions**			
4A/4B	Options 4A & 4B Legitimacy Petition Compliance Costs	($523,627)	($523,627)	($564,824)
4A/4C	Options 4A & 4C Legitimacy Documentation Compliance Costs	($3,191,336)	($949,576)	($3,442,421)
	Subtotal Option 4 Compliance Costs =	**($3,714,963)**	**($1,473,203)**	**($4,007,245)**
5	**Option 5 Revisions to 1985 Variance and 2008 DSW Non-Waste Determination Petition Process**			
5A	Option 5A Partial Variance and Non-waste determination re-applications	($35,420)	($35,420)	($20,900)
5B	Option 5B Biennial Notification Compliance Costs	($99)	($99)	($445)
5C	Option 5C: Modify the 1985 40 CFR 260.31(c) DSW Variance for Partially Recycled Materials			($4,064,738)
5D	Option 5D Non-waste Determination Petitioner Must Demonstrate Why They Cannot or Should Not Meet Existing DSW Exclusions Compliance Costs	$0	$0	
5E	Option 5E Change the Word "Administrator" to "Regional Administrator" in 40 CFR 260.30 to 260.34.	$0	$0	
	Subtotal Option 5 Compliance Costs =	**($35,519)**	**($35,519)**	**($4,086,083)**
6	**Option 6 DSW Re-Manufacturing Exclusion**			
6A	Element 6A Potential Future Cost Savings for Eligible Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$2,357,587	Not applicable because Option 6 is voluntary, and facilities would not incur additional	
6B	Element 6B Intermediate Facility Restriction	$0		

Exhibit 5S
Summary of Estimated Baseline Cost Savings, Compliance Costs, and Post-Rule Cost Savings for Industry to Implement the Seven 2011 Proposed Revisions to the DSW Recycling Exclusions (Options 1 thru 7)
(74% Adoption Rate and 0% Discount Rate) (2011 dollars)

A	B	C	D	E
Item	**Revision Options**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 Selected**	**Revisions to 2008 DSW Final Rule Exclusions If Options 1 and 2 NOT Selected**	**Revisions to Pre-2008 Exclusions**
6C	Element 6C Possible Additional Requirements (e.g., Recordkeeping and Reporting Requirements, Management Standards, Financial Assurance Requirements, and Public Participation Requirements)	Included in Option 6A Baseline Cost Savings	costs to switch from operating under the 2008 DSW exclusions to Option 6.	
6D.1	Element 6D.1 Potential Future Cost Savings for Petition Facilities (Baseline cost savings added only if Option 1 selected, otherwise included in baseline cost savings)	$63,473		
6D.2	Element 6D.2 Petition Process	($32,309)		
6D.3	Element 6D.3 Intermediate Facility Restriction for Petition Facilities	($88,845)		
	Subtotal Option 6 Compliance Costs	**$2,299,906**	**$0**	**$0**
7	**Option 7 Revisions to Pre-2008 Recycling Exclusions**			
7A	Option 7A Recordkeeping for Speculative Accumulation Compliance Costs			($1,378,139)
7B	Option 7B Biennial Notification Compliance Costs			($17,559)
7C	Option 7C Contained Standard Compliance Costs			($487,723)
	Subtotal Option 7 Compliance Costs =			**($1,883,421)**
	Total Compliance Costs =	**($57,743,304)**	**($1,508,803)**	**($9,976,750)**
	Post Rule Cost Savings =	**$16,124,350**	**$72,358,851**	**$93,953,022**
	Total Compliance Costs if Options 1 and 2 Selected (Columns C+E) =	**($67,720,054)**		
	Total Post Rule Cost Savings if Options 1 and 2 Selected (Columns C+E) =	**$110,077,372**		
	Total Compliance Costs if Options 1 and 2 are NOT Selected (Columns D+E) =	**($11,485,553)**		
	Total Post Rule Cost Savings if Options 1 and 2 are NOT Selected (Columns D+E) =	**$166,311,873**		

CHAPTER 6

Sensitivity Analyses
(6 Cost Estimation Uncertainty Factors)

This chapter derives six sensitivity analysis factors which are applied in the Executive Summary of this RIA to the average annualized total cost estimate. The purpose of these factors is to illustrate the relative degree by which the industry impact estimates of this RIA --- which are in large part founded on affected industrial facility counts from the **2007** RCRA Biennial Report data year --- may fluctuate in any given future year. These cost estimation uncertainty factors are not necessarily additive; for example, sensitivity analysis factor #3 is a sub-component of sensitivity analysis factor #2. A potential 7th cost estimation uncertainty factor is future fluctuations in market prices of recovered commodities from recycled materials. However, the 7th factor is not applied in this RIA because it influences the micro-economic decisions by facilities to switch from disposal to recycling of their hazardous secondary materials, which is only a relatively small fraction of the total industry implementation cost savings estimate for the 2008 DSW recycling exclusions and the 2011 proposed revisions..

Note: To avoid duplication of text and numerical Exhibits in this RIA, refer to Exhibit C of the "*Executive Summary*" at the front of this RIA to view how each of these six sensitivity factors potentially affects the total industry cost estimate for the 2011 proposed revisions to the DSW recycling exclusions.

Sensitivity Analysis #1: State Government Adoption Uncertainty

Perhaps the largest uncertainty factor in this RIA is the future count and annual rate of state government adoption of the finalized DSW revisions. The future state government adoption rate will affect the discounted present value of both future costs and future benefits associated with the final revisions, as well as the ultimate count of industrial facilities and annual waste volumes (tonnages) that are affected. To illustrate this uncertainty, Exhibit 6A below displays this RIA's "base case" adoption scenario for the 50-year period of analysis (i.e., 2015 to 2064), and the alternative "upper-bound" adoption scenario. The alternative rate is based on the premise that a lower adoption rate occurred after the October 2008 DSW final rule because of the limitations in its implementation conditions (as identified in the Chapter 1 "Problem Statement" of this RIA), and the 2011 DSW proposed rule is designed to remedy these conditions. Therefore, a higher future adoption rate could occur after the 2011 proposed rule is finalized in 2013.

To illustrate an upper-bound adoption potential, Exhibit 6A below displays an upper-bound facility adoption rate associated with the counts of entities in the 44 states identified as potential adopters in Exhibit 6A of EPA's September 2008 RIA for the October 2008 DSW final rule. The upper-bound estimate assumes all facilities in 44 states will adopt the 2008 DSW rule (as revised) within a four-year period beginning in 2015, at a rate of 25% of the 3,655 facilities located in these 44 states per year. This factor results in a cost multiplier equal to **432%.**

Exhibit 6A
Sensitivity Analysis #1
Alternative Implementation Scenarios "*Base Case*" & "*Upper-Bound*" for Future Adoption of 2008 DSW Exclusions

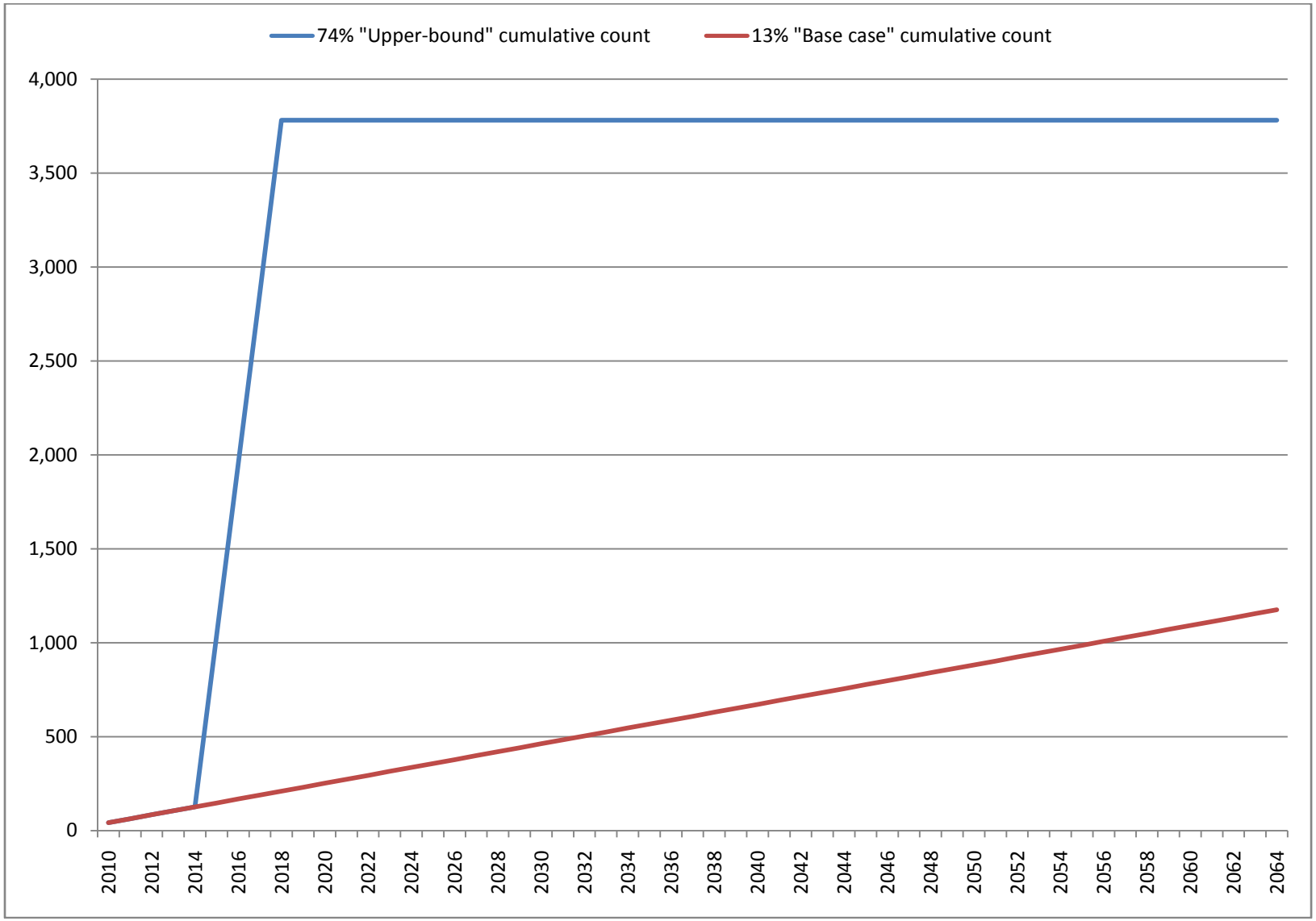
Period of Analysis	Year	13% "*Base Case*" Adoption Scenario Count of Industrial Facilities Adopting		74% "*Upper-Bound*" Adoption Scenario Count of Industrial Facilities Adopting	
		Annual Count	Cumulative Count	Annual Count	Cumulative Count
-4	2011	21	63	21	63
-3	2012	21	84	21	84
-2	2013	21	105 (2011 DSW proposed revisions assumed finalized in the Federal Register)	21	105
-1	2014	21	126	21	126
1	2015	21	147 (state government adoption of the 2013 finalized DSW revisions assumed to begin*)	914 (25% x 3,655 facilities located in estimated 44 adopting states)	1,040
2	2016	21	168	914 (25% x 3,655 facilities located in estimated 44 adopting states)	1,954
3	2017	21	189	914 (25% x 3,655 facilities located in estimated 44 adopting states)	2,867
4	2018	21	210	914 (25% x 3,655 facilities located in estimated 44 adopting states)	3,781
5	2019	21	231	0	3,781
6	2020	21	252	0	3,781
7	2021	21	273	0	3,781
8	2022	21	294	0	3,781
9	2023	21	315	0	3,781
10	2024	21	336	0	3,781
11	2025	21	357	0	3,781
12	2026	21	378	0	3,781
13	2027	21	399	0	3,781
14	2028	21	420	0	3,781
15	2029	21	441	0	3,781
16	2030	21	462	0	3,781
17	2031	21	483	0	3,781
18	2032	21	504	0	3,781
19	2033	21	525	0	3,781
20	2034	21	546	0	3,781

Exhibit 6A
Sensitivity Analysis #1
Alternative Implementation Scenarios "*Base Case*" & "*Upper-Bound*" for Future Adoption of 2008 DSW Exclusions

Period of Analysis	Year	13% "*Base Case*" Adoption Scenario Count of Industrial Facilities Adopting		74% "*Upper-Bound*" Adoption Scenario Count of Industrial Facilities Adopting	
		Annual Count	Cumulative Count	Annual Count	Cumulative Count
21	2035	21	567	0	3,781
22	2036	21	588	0	3,781
23	2037	21	609	0	3,781
24	2038	21	630	0	3,781
25	2039	21	651	0	3,781
26	2040	21	672	0	3,781
27	2041	21	693	0	3,781
28	2042	21	714	0	3,781
29	2043	21	735	0	3,781
30	2044	21	756	0	3,781
31	2045	21	777	0	3,781
32	2046	21	798	0	3,781
33	2047	21	819	0	3,781
34	2048	21	840	0	3,781
35	2049	21	861	0	3,781
36	2050	21	882	0	3,781
37	2051	21	903	0	3,781
38	2052	21	924	0	3,781
39	2053	21	945	0	3,781
40	2054	21	966	0	3,781
41	2055	21	987	0	3,781
42	2056	21	1008	0	3,781
44	2057	21	1,029	0	3,781
43	2058	21	1,050	0	3,781
45	2059	21	1,071	0	3,781
46	2060	21	1,092	0	3,781
47	2061	21	1,113	0	3,781
48	2062	21	1,134	0	3,781
49	2063	21	1,155	0	3,781
50	2064	21	1,176	0	3,781
		Average annual 2015 to 2064 =	**662 (662 / 5,007 = 13%)**	Average annual 2015 to 2064 =	**3,671 (3,671 / 5,007 = 74%)**

* Note: To establish a future period-of-analysis, this RIA assumes that state governments begin adoption of the 2013 finalized DSW revisions two years after, to account for a time lag for state governments to make legislative changes to their RCRA-authorized program hazardous waste statutes and regulations. By=umber may not add due to rounding.

Exhibit 6B
Sensitivity Analysis #1 (continued)
Graph of Two Alternative Implementation Scenarios for the 2008 DSW Exclusions Based on Facility Counts from Exhibit 6A



Sensitivity Analysis #2: Future Annual Fluctuation in Affected Materials Quantities

Because this RIA is based on 2007 RCRA Biennial Report data, it is important to recognize the year-to-year variability (fluctuations) in hazardous waste generation and management tonnage as reported to the Biennial Report in prior data years (i.e., 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2007; prior years are at: http://www.epa.gov/epaoswer/hazwaste/data/biennialreport/index.htm). This variability is an indicator of the extent to which future year tonnages may fluctuate. In particular, year-to-year fluctuations in the tonnages of hazardous waste recycling and hazardous waste disposal affected by the DSW final rule exclusions – which would otherwise be RCRA-regulated in absence of this final rule – implies that the actual impacts of the DSW final rule will fluctuate in future years, compared to the estimates presented in this RIA based on the 2007 single-year data snapshot.

For purpose of illustrating the potential magnitude of future annual fluctuations in recycling and disposal tonnages, Exhibits 6C and 6D present 1997-2007 historical time-trend data for annual facility counts and annual hazardous waste quantities (tons/year) recycled (Exhibit 6C) and disposed (Exhibit 6D). This retrospective is truncated at 1997 rather than extending to 1991 because the RCRA Biennial Report methodology included wastewater data until 1995. As a result, 1995 and prior years include both wastewater and non-wastewater data (i.e., sludge, solids, gases), and are inconsistent with later years. The data in the Exhibits below are from the RCRA Hazardous Waste Biennial Report "National Analysis" report.[71] Exhibits 6C and 6D provide annual percentage deviations for two time-trend metrics (i.e., annual facility counts and annual tonnages), relative to the annual average values for the 1997-2007 historical time period. The 1997-2007 hazardous waste data trends show that:

- Baseline hazardous waste recycling has varied (from Exhibit 6C):
  - -58% to +42% by annual recycler facility count
  - -40% to +40% by annual tonnage recycled
- Baseline hazardous waste disposal has varied (from Exhibit 6D):
  - -22% to +32% by annual disposal facility count
  - -19% to +20% by annual tonnage disposed.

Based on the minimum and maximum annual deviation percentages over these four ranges, the national impacts of the DSW rule could range from **-58% to +42%** on any given future year, compared to the average annualized impact estimates presented in this RIA. This range is not a statistical confidence interval; it represents the overall minimum and maximum range in percentage variation between 1997-2007 annual counts of industrial facilities which reported recycling RCRA hazardous wastes to the RCRA Biennial Report, compared to the average count over that 11-year time period. The purpose of this time-trend deviation computation is to provide an aggregate indicator of how national waste quantities fluctuate year-to-year.

[71] Source: http://www.epa.gov/epaoswer/hazwaste/data/biennialreport/index.htm

There are at least four reasons for annual fluctuations in the quantity of hazardous wastes reported as disposed and recycled:

1. Within-year discrepancies between generation tonnage and management tonnage (addressed as Sensitivity Analysis #3 in this RIA).
2. The economic level of industrial activity in any given year (addressed by Sensitivity Analysis #4 of this RIA).
3. Data over-reporting to the Biennial Report by LQGs and TSDRFs involving reporting of non-required data for state-regulated hazardous wastes.
4. Although not in itself quantified as a separate factor in this chapter, EPA may add or subtract industrial secondary materials to the RCRA hazardous waste regulatory program, such that in any given year, the number and types of wastes covered by the RCRA program may vary:
    a. Adding new waste streams to the program using the 40 CFR 261.11 "listing" procedure.
    b. Removing waste streams from RCRA regulation using the 40 CFR 260.22 "delisting" procedure.

Such changes may influence the types of industries, industrial facilities, and hazardous wastes that may be affected in any future year by the DSW rulemaking. EPA publishes in the Federal Register its Regulatory Agenda twice per year. EPA's Fall 2010 Regulatory Agenda published on December 20, 2010, lists 32 planned future actions for OSWER, of which 12 may affect (i.e., increase or decrease) future annual waste quantities managed under the RCRA hazardous waste regulatory program for certain industries and waste types.[72]

[72] Source: EPA Fall 2010 Regulatory Plan and Semiannual Regulatory Agenda: Part Two - Regulatory Agenda; the 30 OSWER actions are listed on pages 13 & 14 at http://www.epa.gov/lawsregs/documents/regagendabook-fall10.pdf The 15 RCRA-related actions in the Fall 2010 regulatory agenda consist of:

1. RIN: 2050-AE34 Management of Cement Kiln Dust (CKD)
2. RIN: 2050-AE51 Modifications to RCRA Rules Associated With Solvent-Contaminated Industrial Wipes
3. RIN: 2050-AE81 Standards for the Management of Coal Combustion Residuals Generated by Commercial Electric Power Producers
4. RIN: 2050-AG34: Revisions to Land Disposal Restrictions Treatment Standards and Amendments to Recycling Requirements for Spent
5. Petroleum Refining Hydrotreating and Hydrorefining Catalysts
6. RIN: 2050-AG39 Amendment to the Universal Waste Rule: Addition of Pharmaceuticals
7. RIN: 2050-AG44 Identification of Non-Hazardous Secondary Materials That Are Solid Wastes
8. RIN: 2050-AG45 Standards for the Safe and Environmentally Protective Placement of Coal Combustion Residuals as Minefill in Coal Mines Not Regulated Under the Surface Mining Control and Reclamation Act
9. RIN: 2050-AG51 Episodic Generation Rulemaking
10. RIN: 2050-AG54 Identifying the Universe of Government Research in Laboratories and Determining Student Involvement in Generating Laboratory Hazardous Waste
11. RIN: 2050-AG55Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Removing Saccharin and Its Salts From the Lists of Hazardous Constituents, Hazardous Wastes, and Hazardous Substances
12. RIN: 2050-AG57 Withdrawal of Expansion of RCRA Comparable Fuels Exclusion
13. RIN: 2050-AG60 Hazardous Waste Management Systems: Identification and Listing of Hazardous Waste: Carbon Dioxide (CO2) Injectate in Geological Sequestration Activities

Exhibit 6C
Sensitivity Analysis #2:
11-Year Time-Trend (1997-2007) Data for RCRA Hazardous Waste Recycling (Onsite + Offsite)

Data Item	Year	A	B	C	D	E	F	G (A+C+E)	H (B+D+F)
		Metals Recovery* (M011 to M019, or H010)		Solvent Recovery* (M021 to M029, or H020)		Other Recovery** (M031 to M039, or H039)		Row Total Recovery** (%s represent deviations from average)	
		Facilities	Million tons	Facilities	Million tons	Facilities	Million tons	Facilities***	Million tons
1	1997	96	1.078	154	0.617	52	0.443	302 (-48%)	2.138 (+3%)
2	1999	88	0.720	111	0.368	46	0.152	245 (-58%)	1.240 (-40%)
3	2001	191	1.462	534	0.425	97	1.026	822 (+42%)	2.913 (+40%)
4	2003	159	1.152	523	0.263	85	0.729	767 (+33%)	2.144 (+3%)
5	2005	137	1.420	493	0.297	74	0.328	704 (+22%)	2.045 (-2%)
7	2007	137	1.330	456	0.329	65	0.335	624 (+8%)	1.995 (-4%)
							11-year average =	577	2.079
							Deviation range =	**-58% to +42%**	**-40% to +40%**

Explanatory Notes:
(1) Data source: EPA RCRA Hazardous Waste "National Analysis" Biennial Reports: http://www.epa.gov/epawaste/inforesources/data/biennialreport/index.htm
(2) * EPA RCRA Biennial Report waste management "method codes" changed in 2001 from M-codes to H-codes.
(3) ** "Other Recovery" in this exhibit excludes (1) energy recovery and (2) fuel blending because they are not eligible for the DSW final rule exclusions.
(4) *** Facility row total counts overstate actual counts because row totals are duplicative of facilities operating two or more recycling methods.

Exhibit 6D
Sensitivity Analysis #2
11-Year Time-Trend (1997-2007) Data for RCRA Hazardous Waste Disposal (Onsite + Offsite)

Data Item	Year	A	B	C	D	E	F	G (A+C+E)	H (B+D+F)
		Landfill or Surface Impoundment Disposal (M132 & M133, or H132)*		Incineration Disposal (M041 to M049, or H040)		Other Disposal** (M131, or H131, H134, H135)		Row Total Disposal (%s represent deviations from avg)	
		Facilities	Million tons	Facilities	Million tons	Facilities***	Million tons	Facilities***	Million tons
1	1997	72	2.539	166	1.656	104	26.452	342 (-12%)	30.647 (+20%)
2	1999	62	2.115	149	1.454	92	17.473	303 (-22%)	21.042 (-18%)
3	2001	69	1.807	174	1.646	268	24.177	511 (+32%)	27.630 (+8%)
4	2003	72	1.676	162	1.273	184	17.856	418 (+8%)	20.805 (-19%)
5	2005	68	2.038	164	1.564	184	24.225	415 (+7%)	27.827 (+9%)
7	2007	66	1.939	140	1.031	135	22.694	341 (-12%)	25.664 (+0%)
							11-year average =	388	25.603
							Deviation range =	**-22% to +32%**	**-19% to +20%**

Explanatory Notes:
(1) Data source: EPA RCRA Hazardous Waste "National Analysis" Biennial Reports: http://www.epa.gov/epawaste/inforesources/data/biennialreport/index.htm
(2) * EPA RCRA Biennial Report waste management "method codes" changed in 2001 from M-codes to H-codes.
(3) ** "Other Disposal" includes (1) discharge to sewer/POTW or NPDES, (2) deepwell injection, (3) land application.
(4) *** Facility counts for "Other Disposal" overstate actual counts because totals are duplicative of facilities operating two or more disposal methods.

Sensitivity Analysis #3: Within-Year Discrepancy Between Generation Tons & Management Tons

This factor may be a sub-component, in part or in whole, of Sensitivity Analysis #2. For any single data year, the total tons of hazardous wastes reported as "generated" in the RCRA Biennial Report by LQGs does not match the total tons of hazardous wastes reported as "managed" by TSDRFs. This discrepancy may to a large degree result from the fact that typically 15% to 24% of hazardous wastes generated in recent years (1997-2007) are reported as transported (i.e., shipped) either (1) to another industrial unit with a separate EPA ID number within the same LQG facility or (2) offsite for management at a TSDRF, rather than managed onsite by the LQG. Because the economic impacts estimated in this RIA are proportional to the annual tonnage of affected materials, this within-year discrepancy suggests that the estimated net cost savings in this RIA based on 2007 BR data, could vary between **-34% to +39%** for any future year. This range is not a statistical confidence interval; it represents the overall minimum and maximum range in percentage variation between 1997-2007 generation quantities of RCRA hazardous wastes compared to the within-year management quantities reported to the Biennial Report over that 11-year period as displayed in Exhibit 6E below.

Exhibit 6E
Sensitivity Analysis #3
11-Year Time Trend (1997-2007) in Hazardous Waste Generation & Management Tonnages

Indicator	1997	1999	2001	2003	2005	2007
1. Million tons generated	40.7	40.0	40.8	30.2	38.3	46.7
2. Million tons managed	37.7	26.3	45.4	42.1	43.9	50.5
Percent discrepancy indicated by ratio of tons managed:to:generated ((2-1) / 1)	-7.4%	**-34.3%**	+11.3%	**+39.4%**	+14.6%	+7.5
Notes Data source: EPA RCRA Hazardous Waste Biennial Reports at: http://www.epa.gov/osw/inforesources/data/biennialreport/index.htm.						

- **Sensitivity Analysis #4: RCRA SQGs in this RIA**

Small quantity generators generate between 100 and 1,000 kilograms of hazardous waste per month, whereas large quantity generators (LQGs) generate more than 1,000 kilograms per month. Because the impact estimates of this RIA are built upon the RCRA Biennial Report which contains data reported by LQGs and TSDFs but not by SQGs, the complete SQG facility universe count is not included in this RIA, only the small fraction of TSDFs which are also SQGs. The cost estimated in this RIA is likely under-estimated by the following percentage range:

Between 1993 and 2005, there was a low estimate of 84,000 SQGs (1993) to a high estimate of 236,000 SQGs (Source: page 4 of "Work Assignment 7 Task 5 Quick Response Task 1 Memorandum: Study of Impact of Imposing Part 262 Manifest Requirements on Generators of HWIR-Exited Waste," prepared 01 Feb 1999 by Dynamac Corp for EPA Office of Solid Waste).

Step 1: Apply the same 26% ratio of LQGs who recovery waste/all LQGs (source: 4,321 recycling LQGs from Exhibit 3A Column A divided by 16,387 total LQGs from Exhibit 3B Column A), to these SQG counts suggest that 22,150 to 62,230 SQGs generate hazardous wastes which are managed by recovery or recycling.

Step 2: Subtract the 846 SQGs included in this RIA (Exhibit 4I Column D) produces a range of about 21,300 to 61,400 SQGs omitted from this RIA.

Step 3: Cost impacts for SQGs are estimated to be $316/facility/year [(assume half the transportation accumulation time savings in Exhibit 5N, Option 2, Item 4 at $1.32 million/year to reflect SQG accumulation time increasing from 180 days to 360 days instead of LQGs increasing from 90 to 360 days and subtract costs for requirements listed in Items 5 through 11 at $2.73 million/year)/4,455 facilities from Exhibit 5A, Column A = $316/facility/year) assuming the 13% base case adoption scenario, and a 7% discount rate. Multiply the 21,300 to 61,400 SQGs by the $316 per-facility average annual costs to comply with the set of revisions to the 2008 DSW final rule transfer-based exclusion = $6.7 million to $19.4 million per year in additional industry compliance costs.

Step 4: Compare these estimates to the net impact estimate for the 2011 DSW proposed rule (Exhibit 5N, Item 49) to establish percentage range for this sensitivity analysis factor [($6.7 million to $19.4 million per year) / ($13.1 million/year)] results in **+51% to +148%** in additional cost impacts.

Sensitivity Analysis #5: Physical/Chemical Quality of Secondary Materials for Viable Recovery/Recycling

The methodology applied in Chapter 5 of this RIA for identifying baseline disposal wastes for potential switchover to recycling under the DSW final rule, may be overly inclusive in the physical/chemical types and industrial sources identified. Exhibit 6F below identifies nine categories of baseline disposed wastes that may not be suitable for recycling, and their corresponding tonnages in the 2007 Biennial Report, as an indicator of potential industry cost savings over-estimation in this RIA from possible over-estimation of the baseline disposal tonnage that may switch-over to recycling under the DSW final rule.

Exhibit 6F
Sensitivity Analysis #5
Criteria to Identify Baseline Disposal Hazardous Wastes
Unlikely Suitable for Potential Future Switchover to Recovery/Recycling Under the 2008 DSW Final Rule

Types of Disposed Haz Wastes Unlikely Suitable for Recycling	Criterion A	Criterion B	Criterion C	2007 Generation (tons)
	Physical/ Chemical Form Codes	Industrial Source Codes	RCRA Hazardous Waste Codes	
1. Probably better suited for energy recovery or use as fuel (e.g., oily wastes, tarry wastes, PAHs, heavy ends, petroleum refining	For wastes not reporting source code G61 include: • W205 oil-water emulsion • W206 waste oil		For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61, or RCRA waste codes listed in Exhibit 3H or item 8 below include RCRA waste codes: • F024 heavy end, tars reactor clean-out process wastes	470,042

Exhibit 6F
Sensitivity Analysis #5
Criteria to Identify Baseline Disposal Hazardous Wastes
Unlikely Suitable for Potential Future Switchover to Recovery/Recycling Under the 2008 DSW Final Rule

Types of Disposed Haz Wastes Unlikely Suitable for Recycling		Criterion A Physical/ Chemical Form Codes	Criterion B Industrial Source Codes	Criterion C RCRA Hazardous Waste Codes	2007 Generation (tons)
wastes)		• W403 solid resins, plastics or polymerized organics • W409 other organic solids • W603 oily sludge • W604 paint or ink sludges, still bottoms in sludge form • W606 other organic sludge		• F032, F034 chlorophenolic & creosote wood preservative wastewaters • F037, F038 petroleum refinery oil/water separation sludge • K001 wood preserving bottom sediment sludges • K018, K030, K035, K042, K048, K049, K050, K051, K052, K087, K096, K101, K107, K108, K115 heavy ends, overheads • K141, K142, K143, K144, K147, K148 coking operation tars • K169, K170 oil tank sediment	
2. Likely contains acutely toxic (dioxins/furans) or multiple mixed hazardous constituents			For wastes with no reported form codes include source code: • G26 leachate collection	For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61 or RCRA waste codes listed in Exhibit 3H or item 8 below include RCRA waste codes: • F020, F021, F022, F023 listed for dioxins/furans • F026, F027, F028, F032 listed for dioxins/furans • F039 land disposal leachate • K032, K033, K034 listed for carcinogen hexachlorocyclopentadiene • K174 listed for dioxins/furans • P001 to P205 (i.e., all Pxxx) acutely hazardous discarded or off-spec commercial chemical products, container residues	11,968
3. Explosive or reactive material		For wastes not reporting source code G61 include: • W210 reactive or polymerizable organic liquids and adhesives • W405 explosives or reactive organic solids		For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61 or RCRA waste codes listed in Exhibit 3H or item 8 below include RCRA waste codes: • K044, K045, K046, K047 explosives mfg wastewaters, sludge, spent carbon	80,690
4. Already subject to	4a. Distillation residuals (may be better	For wastes not reporting source code G61 include: • W200 still bottoms in liquid form	For wastes with no reported form codes include source code: • G24 solvent or	For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61 or RCRA waste codes listed in Exhibit 3H or item 8 below include RCRA waste codes:	63,172

Exhibit 6F
Sensitivity Analysis #5
Criteria to Identify Baseline Disposal Hazardous Wastes
Unlikely Suitable for Potential Future Switchover to Recovery/Recycling Under the 2008 DSW Final Rule

Types of Disposed Haz Wastes Unlikely Suitable for Recycling		Criterion A	Criterion B	Criterion C	2007 Generation (tons)
		Physical/ Chemical Form Codes	Industrial Source Codes	RCRA Hazardous Waste Codes	
recovery/ recycling	suited for energy recovery)		product distillation or recovery	• K009, K010, K015, K016, K019, K020, K022, K023, K024, K025, K026, K027, K036, K083, K085, K093, K094, K095, K116, K136, K149 chemical mfg product distillation bottoms or solvent recovery residues	
	4b. Acid recovery residuals			For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61 or RCRA waste codes listed in Exhibit 3H or item 8 below include RCRA waste codes: • K150 hydrochloric acid recovery residuals	0
5. Material unlikely to contain recoverable constituents of recycling value		For wastes not reporting source code G61 include: • W301 contaminated soil • W512 sediment or lagoon dragout, drilling or other muds		For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61 or RCRA waste codes listed in Exhibit 3H or item 8 below include RCRA waste codes: • F028 residues from incineration of contaminated soil • K060 ammonia still lime sludge • K102 residue from use of activated carbon for de-colorization	845,749
6. Materials not eligible for DSW final rule exclusions*		For wastes not reporting source code G61 include: • W309 (lead-acid batteries) • W320 electrical devices (lamps, thermostats, CRTs)			276,367
7. Materials not currently widely recovered/ recycled**		• W401 used or discarded pesticide solids • W503 gypsum sludges		For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61 or RCRA waste codes listed in Exhibit 3H or item 8 below include RCRA waste codes: • D004 arsenic	11,472
8. Materials unlikely to be economically recovered off site***		For wastes not reporting source code G61 include: • W103 spent concentrated acid >5% • W110 caustic aqueous waste without cyanides	For wastes with no form code include source codes: • G02 stripping & acid or caustic cleaning • G05 metal forming	For wastes with no form codes and not reporting source codes G01 through G06, G24, G26, or G61 include RCRA waste codes: • K031, K043, K097, K099, K123, K124, K125, K126, K131, K132 pesticide mfg wastewaters, sludges, absorbents, solids • K062 iron & steel spent pickle liquor	2,879,521

Exhibit 6F
Sensitivity Analysis #5
Criteria to Identify Baseline Disposal Hazardous Wastes
Unlikely Suitable for Potential Future Switchover to Recovery/Recycling Under the 2008 DSW Final Rule

Types of Disposed Haz Wastes Unlikely Suitable for Recycling	Criterion A	Criterion B	Criterion C	2007 Generation (tons)
	Physical/ Chemical Form Codes	Industrial Source Codes	RCRA Hazardous Waste Codes	
9. Mixture of RCRA Waste Codes			Wastes that have multiple RCRA waste codes reported and the fall under more than one of the first seven categories.	42
			Column total =	4,639,023
			Percentage of *2007 National Biennial RCRA Hazardous Waste Report* total hazardous waste generation (46.693 million tons, Exhibit 1.3) =	**-10%**

Notes:
Some materials identified in this exhibit may contain potential beneficial re-use market value (e.g., construction fill, soil amendments, cement additives) which is not covered under the DSW final rule exclusions, and therefore not included in this RIA for evaluation of potential switchover from baseline disposal to future recycling.
* Or which may be managed as excluded materials under other RCRA exemptions (e.g., as "universal wastes").
** As determined by comparison with the physical/chemical types or constituents of RCRA hazardous wastes currently being recovered/ recycled according to H010, H020, or H039 management method codes in the 2007 Biennial Report.
*** Note that these data were initially pulled from the 2007 BR under Commodity Group #3 in Exhibit 3R. Upon review of W103 spent concentrated acids > 5%, G02 stripping and acid or caustic cleaning, and G05 metal forming and treatment waste streams nearly all the waste is not suitable for switchover to off-site other recovery. Much of the waste are dilute acid wastes that are disposed in on-site wastewater treatment systems followed by POTW/sewer or NPDES discharge or disposed by Class I UIC permitted deep-well injection. These disposal methods are less expensive compared to offsite recovery, therefore it should be more costly to ship these wastes offsite for other recovery. It is beyond the time and resource constraints of this RIA to individually carry these records through the analysis. A small quantity (< 1,000 tons) of spent pickle liquor (K062) was identified. The quantity is too small to carry forward through the analysis.

Sensitivity Analysis #6: Expected Accuracy of Impact Estimates

This RIA is based on a semi-detailed cost data designed to provide semi-detailed estimates rather than exact engineering cost and benefit estimates for each of the 622 different industries consisting of about 9,100 of facilities which are generating and managing 10,000s of individual waste streams which may be affected by the proposed revisions to the DSW and other RCRA industrial recycling exclusions. For purpose of classifying relative degrees of estimation accuracy, the Association for the Advancement of Cost Engineering (AACE) defines five generic classes of cost estimation accuracy for application in engineering, procurement, and industry.[73] AACE defined these classes in relation to ANSI standards Z94.0 and Z94.2.[74] In the context of this RIA, the purpose of estimation accuracy classification is to indicate the relative degree to which the "ex-post" (i.e., post-rule) actual economic impacts for the DSW rule may vary from the "ex-ante" (i.e., pre-rule) impacts estimated in this RIA. The AACE classification scheme expresses five levels of estimation accuracy according to a +/- percentage range around the point estimate. The five accuracy classes are formulated to reflect varying, relative degrees of:

- Project definition, design, and planning maturity level (e.g., <2% vs. >50% complete),
- End usage purpose of cost estimates (e.g., initial concept screening vs. contract bid),
- Type of estimation methodology (e.g., judgment vs. detailed unit costs), and
- Estimate preparation level-of-effort (e.g., <200 hours vs. >1,000 hours to prepare).

The five accuracy classifications range from -50% :to:+100% for Class 5 "order-of-magnitude" type estimates, to -10% to +15% Class 1 "definitive estimates". Basically, as the level-of-detail and level-of-effort given to a cost (or cost savings) estimate increases, the expected accuracy of the estimate tends to improve, as indicated by a tighter +/- accuracy range assigned to it according to the accuracy classification scheme. The impact estimates of this RIA may be classified as a "Class 3" semi-detailed type of estimate with expected accuracy range of **-20% to +30%**, because this RIA includes semi-detailed unit costs, but which are less than the thousands of highly detailed unit costs and other details that typify a "Class 2" type estimate with -15% to +20% expected accuracy range.

[73] Source: AACE International Recommended Practice No. 17R-97 "Cost Estimate Classification System" , 12 Aug 1997, and Recommended Practice No. 18R-97 "Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries", 15 June 1998; http://www.aacei.org/technical/rp.shtml.

[74] ANSI = American National Standards Institute. ANSI standard Z94.0 was originally published in 1972, then revised as Z94-1983 in 1983, revised as Z94.0-1989 in 1990, and revised again as Z94.2 in 1998. The ANSI Z94.2 standard is one element of the set of 17 standards (i.e., Z94.1 to Z94.17) are for the field of industrial engineering, which is concerned with the design, improvement, and installation of integrated systems of people, materials, information, equipment, and energy. Industrial engineering draws upon specialized knowledge and skill in the mathematical, physical, and social sciences, together with the principles and methods of engineering analysis and design, to specify, predict and evaluate the results obtained from such systems. Additional background information about ANSI Z94 standards is available from the Institute for Industrial Engineers at: http://www.iienet2.org/Details.aspx?id=2644.

CHAPTER 7

Supplemental Analyses

This chapter addresses the special analytic topics, evaluative criteria, supporting data, and analytic results, associated with the Federal regulatory agency evaluations required under four White House Executive Orders and two Congressional laws, spanning 1980 to 2011:

7A.	Regulatory Planning and Review	(1993 Executive Order 12866)
7B.	Impact Analysis	(1980 RFA/1996 SBREFA)
7C.	Unfunded Mandates Analysis	(1995 UMRA)
7D.	Federalism Implications	(1999 Executive Order 13132)
7E.	Energy Impact Analysis	(2001 Executive Order 13211)
7F.	Improving Regulation & Regulatory Review	(2011 Executive Order 13563)

Note: This chapter does not address or present supporting data or analytic results for three other Federal regulatory agency evaluations required by the following White House Executive Orders (EOs):

(1) 1994 EO-12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

(2) 1997 EO-13045: Protection of Children from Environmental Health Risk & Safety Risks.

(3) 1998 EO-13084 Consultation & Coordination with Indian Tribal Governments.

EPA's supporting data and analyses addressing these three Executive Orders are presented in EPA's environmental justice (EJ) analysis document in support of the 2011 DSW proposed revisions. See EPA's 2011 Federal Register notice for the DSW proposed revisions for information about these other analyses and the EJ reference document.

7A. Regulatory Planning and Review (1993 Executive Order 12866)

Executive Order 12866, as amended by Executive Order 13258, requires EPA to determine whether a regulatory action is "significant" and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order. As defined in Executive Order 12866, a "*significant regulatory action*" is any regulatory action that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or Tribal governments or communities;

2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter budgetary impacts of entitlements, grants, user fees, loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, President's priorities, or principles set forth in the Executive Order.

Based on the cost estimates presented in this RIA, this RIA concludes that the 2011 proposed revisions to the DSW recycling exclusions do not constitute an "*economically significant*" regulatory action, as defined under the first factor listed above (i.e., the $100 million annual effect threshold), because the proposed revisions are not expected to have an annual effect on the economy of $100 million or more. The industry compliance costs estimated in this RIA show that the future average annualized costs are expected to total between (2011$ @7% discount rate):

- 13% base case adoption scenario: $7.2 million and $13.1 million per year
- 74% upper-bound adoption scenario: $7.4 million and $47.5 million per year

Even at a 0% discount rate and the 74% upper-bound scenario, annual costs are between $11.5 million and $67.7 million per year.

7B. Small Business Impact Analysis (1980 RFA/1996 SBREFA)

According to the requirements of the 1980 Regulatory Flexibility Act (RFA) as amended by the 1996 Small Business Regulatory Enforcement Fairness Act (SBREFA), Federal regulatory agencies are required to make initial determinations if proposed regulatory actions may have a "significant economic impact on a substantial number of small entities" (SISNOSE). Small entities include small businesses, small organizations, and small governmental jurisdictions. Agencies are required to conduct a Regulatory Flexibility Screening Analysis (RFSA) to make this determination. This section presents the methodology and findings for the RFSA conducted for the proposed rule. Unless Agencies are able to certify that a particular regulatory action is not expected to have a SISNOSE, the RFA/SBREFA requires a formal analysis of the potential adverse economic impacts on small entities, completion of a Small Business Advocacy Review Panel (proposed rule stage), preparation of a Small Entity Compliance Guide (final rule stage), and Agency review of the rule within 10 years of promulgation. The small business impact analysis of this RIA follows the four analytic steps described in EPA's November 2006 RFA/SBREFA compliance final guidance:[75]

Step 1: Determine which small entities are subject to the rule's requirements.
Step 2: Select appropriate measures for determining economic impacts on these small entities and estimate those impacts.
Step 3: Determine whether the rule may be certified as not having a significant impact on small entities (SISNOSE).
Step 4: Document the screening analysis and include the appropriate RFA statements in the preamble.

[75] EPA's RFA/SBREFA guidance: "EPA's Action Development Process: Final Guidance for EPA Rulewriters: Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act", EPA Office of Policy, Economics & Innovation, Nov 2006. http://www.epa.gov/sbrefa/documents/rfaguidance11-00-06.pdf

Step 1: Identification of Small Entities

Based on the baseline and impact analyses presented in EPA's RIA for the 2008 DSW final rule, the 2011 proposed rule revisions to the DSW could potentially affect 5,321 facilities currently (as of 2007) operating under pre-2008 RCRA recycling exclusions plus between 662 and 3,671 facilities currently recycling or disposing hazardous waste regulated which could eventually operate under the 2008 DSW recycling exclusions. This range of 5,983 to 8,992 potentially affected facilities is in a wide range of industries up to 622 industries (as listed in **Appendix A**). For purposes of this RFA/SBREFA analysis only 27 NAICS industries with the largest number of facilities potentially affected were evaluated. This RIA identified the 27 industries by first looking at the count of facilities by 6-digit NAICS for the current population of facilities recovering hazardous secondary materials based on the 2005 Biennial Report data from the 2008 DSW RIA. This data analysis was a further refinement of the facility counts presented in Exhibit 3E by six-digit NAICS. This list of industries was then expanded to capture the largest industries in the list of affected pre-2008 DSW exclusion facilities (from Exhibit 3J) identified in the 2007 TRI database. This data analysis was a further refinement of the facility counts presented by six-digit NAICS. Exhibit 7A presents small business size standards for the 27 major industries expected to be affected by the rule.

Exhibit 7A
Small Business Size Standards for 27 Major Industries Potentially Affected by the 2011 DSW Proposed Revisions

Item	NAICS	Industry Description	2007 Count of Companies in Industry*	2007 Count of Establishments in Industry*	SBA small business size standards in number of employees or annual revenues**
1	323110	Commercial Lithographic Printing	12,614	13,239	500
2	324110	Petroleum Refineries	98	195	1,500
3	325188	All Other Basic Inorganic Chemical Mfg	396	632	1,000
4	325199	All Other Basic Organic Chemical Mfg	540	696	1,000
5	325211	Plastics Material and Resin Manufacturing	803	1,062	750
6	325412	Pharmaceutical Preparation Manufacturing	763	991	750
7	325510	Paint and Coating Manufacturing	1,132	1,370	500
8	325998	All Other Miscellaneous Chemical Product and Preparation Mfg	1,087	1,261	500
9	326199	All Other Plastics Product Manufacturing	6,272	7,311	500
10	331111	Iron and Steel Mills	235	352	1,000
11	331492	Secondary Smelting, Refining & Alloying of Nonferrous Metal (except Copper, Aluminum)	205	233	750
12	332312	Fabricated Structural Metal Manufacturing	<3,698	3,698	500
13	332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	2,370	2,579	500
14	332813	Electroplating, Plating, Polishing, Anodizing and Coloring	2,622	2,731	500
15	332999	All Other Miscellaneous Fabricated Metal Product Mfg	3,567	3,636	500
16	333415	Air Conditioning, Warm Air Heating Equipment, and Commercial & Industrial Refrigerator Equipment Manufacturing	<902	902	750
17	334412	Bare Printed Circuit Board Manufacturing	681	716	500
18	334413	Semiconductor and Related Device Manufacturing	871	972	500
19	334418	Printed Circuit Assembly Manufacturing	<1,021	1,021	500
20	336399	All Other Motor Vehicle Parts Manufacturing	1,315	1,555	750
21	336412	Bare Printed Circuit Board Manufacturing	333	440	500
22	336413	Other Aircraft Part and Auxiliary Equipment Mfg	770	890	1,000
23	541710	Research & Development in Physical, Engineering, Life Sciences	11,382	14,457	750
24	562211	Hazardous Waste Treatment and Disposal	<751	751	$12.5 million
25	611310	Colleges, Universities and Professional Schools	2,419	NA	$7 million
26	622110	General Medical and Surgical Hospitals	<5,159	5,159	$34.5 million
27	928110	National Security	No data	No data	No data

Notes:
* The number of companies and establishments are the totals reported in the 2007 Census of Manufacturers. Only a subset of these companies and establishments should be affected by the 2011 DSW proposed rule if promulgated.
** Source: US Small Business Administration. Table of Small Business Size Standards Matched to North American Industry Classification System Codes. Effective November 5, 2010.

Any business, small or large, has the option of choosing to be subject to the regulation. Any business that chooses to be subject to the proposed rule would have to abide by the requirements of the rule. Accordingly, the business would be required to meet specific requirements of the rule, as described in previous chapters of this RIA.

Two assumptions are used to estimate the number of businesses which may voluntarily choose to be subject to the 2011 DSW revisions, providing a "base case" and an alternative "upper bound" scenario, defined as follows:

- Base case adoption scenario: The number of businesses choosing to be subject to the rule (aka "notifiers") is assumed to be equal to the number of average annual notifiers under the 2008 DSW final rule. This is equivalent to a total of 21 businesses per year, for a total number of businesses of 1,176 adopting the DSW recycling exclusion revisions through year 2064.
- Upper-bound adoption scenario: The upper bound estimate is based on assuming that all of the 44 states will adopt the 2011 DSW proposed rule within a four-year period beginning in 2015, at a rate of 25% of the 44 states adopting in each of the four years following 2014. By the end of those four years all facilities in those 44 states will notify under the DSW recycling exclusions, for an ultimate total of 3,781 businesses adopting the DSW recycling exclusion revisions through year 2064.

The numbers of small businesses that are expected to notify under both the "base case" and "upper bound" adoption scenarios, are estimated based on an analysis of actual notifiers under the 2008 DSW final rule, as presented in **Appendix D** of this RIA. Of the 37 industrial facilities which had notified under the 2008 DSW recycling exclusions final rule during the notification data period analyzed, a total of five of the 31 facilities are owned by small businesses, which is 14% of all notifiers (i.e., 5/37 = 14%). Thus, for those facilities adopting the 2011 proposed revisions to the DSW recycling exclusions, 14% are assumed in this RIA to be small businesses.

Step 2: Select appropriate measures for determining economic impacts on these small entities and estimate those impacts

According to Exhibit 5G of EPA's 2006 RFA/SBREFA small business impact guidance, there are three numerical tests that EPA may use to determine if small entities may be significantly impacted by a proposed rule:

- Sales test: Annualized compliance costs as a percentage of sales
- Cash flow test: Debt-financed capital compliance costs relative to current cash flow
- Profit test: Annualized compliance costs as a percentage of profits

For purposes of this RIA, the sales test method was used to determine if small entities may be significantly impacted by the proposed rule.

Step 3 & Step 4: Determine and document whether the proposed rule may be certified as having "No SISNOSE"

This RIA determined whether each regulatory option may have a "significant impact on a substantial number of small entities" (i.e., SISNOSE) which may choose to be subject to the requirements of the proposed rule. This determination involved comparing the average estimated

regulatory compliance costs for each entity in each industry with the respective annual revenues for each entity. The percentage results calculated for each small entity were compared to the three impact thresholds defined in Table 2 of EPA's November 2006 RFA/SBREFA guidance as reproduced in Exhibit 7B below, regarding the appropriate SISNOSE determination category.

Exhibit 7B
Reproduction of Table 2 "*Example SISNOSE Certification Decision Process*" from EPA's November 2006 RFA/SBREFA Guidance

Impact Threshold	Number of Small Entities Subject to the Rule and Experiencing Given Economic Impact	Percent of All Small Entities Subject to the Rule That are Experiencing Given Economic Impact	SISNOSE Determination Category
Less than 1% for all affected small entities	Any number	Any percent	Presumed No SISNOSE
1% or greater for one or more affected small entities	Fewer than 100	Less than 20%	Presumed No SISNOSE
	Fewer than 100	20% or more	Uncertain -No Presumption
	100-999	Less than 20%	Presumed No SISNOSE
	100-999	20% or more	Uncertain -No Presumption
	1,000 or more	Any percent	Uncertain -No Presumption
3% or greater for one or more affected small entities	Fewer than 100	Less than 20%	Presumed No SISNOSE
	Fewer than 100	20% or more	Uncertain -No Presumption
	100-999	Less than 20%	Uncertain -No Presumption
	100-999	20% or more	Presumed Ineligible for Certification
	1,000 or more	Any percent	Presumed Ineligible for Certification

The estimated impacts on small entities are presented below in Exhibits 7C (13% base case adoption scenario) and 7D (74% upper bound adoption scenario). As shown in the Exhibits, the average annual impact on small businesses is estimated to be significantly less than 1% of annual sales for all small entities. The highest impact as a percentage of sales is estimated at 0.41% of annual sales. The total number of small businesses impacted at this level is estimated at 21 small entities under the 13% base-case adoption scenario, and 30 small entities under the 74% adoption scenario, which represents 2.3% to 2.4%, respectively, of the 910 (13% scenario) to 1,274 (74% scenario) small entities which could be impacted by the proposed revisions to the 2008 and pre-2008 recycling exclusions. Based on this analysis, this RIA concludes that the 2011 proposed revisions to the DSW recycling exclusions are not expected to have a "*significant economic impact on a substantial number of small entities*" (i.e., "*No SISNOSE*" determination).

Limitations of RFA/SBREFA Determination

The assumption of this RIA that 14% of recycling exclusion notifiers will be small businesses was based on data from actual notifiers under the 2008 DSW rule in the 2.3 years of its effective period to date (i.e., December 2008 to April 2011), and may not be representative of future notifiers, nor of facilities operating under pre-2008 RCRA industrial recycling exclusions.

This RIA did not evaluate annual revenue data specific to small businesses. Instead, this RIA developed a proxy for annual revenues based on establishment data from the Census of Manufacturers. For example if the small business size standard was 1,000 employees, the average value of shipments for those facilities with 10-500 employees was used as a proxy for small business revenues. This value may not be an accurate representation of actual notifiers under the rule.

This RIA estimates that under the 13% base-case adoption scenario 910 small entities could be affected by today's proposal (if promulgated) out of a total 6,497 affected small plus non-small entities (i.e., 14.0%; from Exhibit 7C), and 1,274 small entities could be affected out of a total 9,102 potentially affected small plus non-small entities (i.e., 14.0%) under the 74% upper-bound adoption scenario (from Exhibit 7D). These facility counts include facilities currently operating under the pre-2008 DSW recycling exclusions (32 exclusions), plus additional current RCRA hazardous waste recyclers which in the future could potentially operate under the 2008 DSW recycling exclusions (3 exclusions). However, these facility count estimates are based on analyses presented in EPA's RIA involving EPA's Toxic Release Inventory (TRI) database for the pre-2008 exclusions, and EPA's RCRA Hazardous Waste Biennial Report database for potential adoption of the 2008 DSW exclusions, and both databases have limitations which may make these facility count estimates inaccurate. Specifically, some of the facilities identified using the TRI database may be RCRA conditionally-exempt small quantity generators (CESQGs) which will not be affected by today's proposal (and thus may contribute to over-estimating in the RIA both small and total small plus non-small entities affected under the pre-2008 exclusions), and the BR database does not include comprehensive data on RCRA small quantity generators (SQGs) which may contribute to under-estimating in the RIA both small and total small plus non-small entities.

Small business impacts were only estimated for 27 of the industries that will have the largest number of impacted facilities out of 621 6-digit NAICS code industries (as listed in **Appendix A**) that may be affected by the pre-2008 and/or 2008 DSW exclusions. This RIA assumes that these 27 largest impacted industries represent the largest potential impact to small entities for purposes of this RFA/SBREFA impact evaluation. There may be significant impacts to small businesses in some of the industries that were not evaluated.

Exhibit 7C
Estimated Average Annual Impact of the 2011 DSW Proposed Revisions on Small Businesses
(13% base case adoption scenario) 1/

A	B	C	D	E	F	G	H	I	J
Item	NAICS	Industry	Small Company Average Annual Revenue (2011$/yr) 2/	Average Annual Cost Impact Per Facility (2011$/yr)	Annual Cost Impact as Percent of Annual Revenue (%) 3/	Total Count of Businesses Impacted in Year 2015 4/	Count of *Small* Businesses Impacted in Year 2015 5/	Total Count of Businesses Impacted in Year 2064 6/	Count of *Small* Businesses Impacted in Year 2064 7/
1	323110	Commercial Lithographic Printing	$7,655,524	$15,303	0.200%	13	2	24	3
2	324110	Petroleum Refineries	$1,441,928,214	$15,303	0.001%	83	12	105	15
3	325188	All Other Basic Inorganic Chemical Manufacturing	$45,983,586	$15,303	0.033%	61	8	72	10
4	325199	All Other Basic Organic Chemical Manufacturing	$111,235,602	$15,303	0.014%	88	12	111	15
5	325211	Plastics Material and Resin Manufacturing	$88,876,271	$15,303	0.017%	87	12	104	15
6	325412	Pharmaceutical Preparation Manufacturing	$88,315,826	$15,303	0.017%	29	4	49	7
7	325510	Paint and Coating Manufacturing	$29,517,080	$15,303	0.052%	120	17	143	20
8	325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	$26,680,578	$15,303	0.057%	55	8	68	10
9	326199	All Other Plastics Product Manufacturing	$12,424,800	$15,303	0.123%	49	7	58	8
10	331111	Iron and Steel Mills	$136,490,820	$15,303	0.123%	64	9	76	11
11	331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	$52,091,967	$15,303	0.029%	41	6	45	6
12	332312	Fabricated Structural Metal Manufacturing	$12,859,681	$15,303	0.119%	86	12	88	12
13	332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	$11,002,159	$15,303	0.139%	96	13	115	16
14	332813	Electroplating, Plating, Polishing, Anodizing and Coloring	$4,457,248	$15,303	0.343%	178	25	240	34
15	332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	$8,723,677	$15,303	0.175%	101	14	109	15
16	333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	$21,511,990	$15,303	0.071%	72	10	75	10
17	334412	Bare Printed Circuit Board Manufacturing	$3,714,108	$15,303	**0.412%**	121	17	148	**21**
18	334413	Semiconductor and Related Device Manufacturing	$27,339,212	$15,303	0.056%	40	6	55	8

Exhibit 7C
Estimated Average Annual Impact of the 2011 DSW Proposed Revisions on Small Businesses
(13% base case adoption scenario) 1/

A	B	C	D	E	F	G	H	I	J
Item	NAICS	Industry	Small Company Average Annual Revenue (2011$/yr) 2/	Average Annual Cost Impact Per Facility (2011$/yr)	Annual Cost Impact as Percent of Annual Revenue (%) 3/	Total Count of Businesses Impacted in Year 2015 4/	Count of *Small* Businesses Impacted in Year 2015 5/	Total Count of Businesses Impacted in Year 2064 6/	Count of *Small* Businesses Impacted in Year 2064 7/
19	334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	$12,450,771	$15,303	0.123%	143	20	147	21
20	336399	All Other Motor Vehicle Parts Manufacturing	$16,892,517	$15,303	0.091%	102	14	110	15
21	336412	Aircraft Engine and Engine Parts Manufacturing	$27,299,207	$15,303	0.056%	46	6	54	8
22	336413	Other Aircraft Part and Auxiliary Equipment Manufacturing	$23,568,125	$15,303	0.065%	41	6	55	8
23	541710	Research & Development in Physical, Engineering, Life Sciences	$6,249,609	$13,637	0.218%	3	0	25	4
24	562211	Hazardous Waste Treatment and Disposal	$6,534,593	$13,637	0.209%	1	0	10	1
25	611310	Colleges, Universities and Professional Schools	$7,834,683	$13,637	0.174%	4	1	35	5
26	622110	General Medical and Surgical Hospitals	NA	$13,637	NA	2	0	14	2
27	928110	National Security	NA	$13,637	NA	4	1	35	5
		All Other Industries	NA	NA	NA	NA	3,737	523	4325
		Total Number of Facilities Impacted All Options	-	-	-	**5,468**	**766**	**6,497**	**910**

1/ The 13% base case adoption scenario is based on the assumption that 21 facilities adopt the 2011 DSW proposed rule each year. By year 2064 a total of 1,176 facilities will have notified under one of the DSW recycling exclusions. Annual cost impact per facility is discounted by 3% to reflect change in price level from 2015 to 2011.
2/ Small company annual revenue is approximated using the average establishment value of shipments from Census of Manufacturers Data. For example the number is the average establishment value of shipments for small establishments (e.g., for industries with an SBA small business size standard of 1,000 employees, the number is the average value of shipments for facilities with less than 500 employees). This estimate is intended to serve as a conservative value of annual revenue for small businesses. Annual cost impact per facility is discounted by 3% to reflect change in price level from 2015 to 2011.
3/ Column E divided by Column D times 100%.
4/ In the first two years and four months following the 2008 DSW final rule 49 facilities have notified under one of the 2008 DSW recycling exclusions. This rate of 21 facilities notifying per year is continued up through 2015. At this rate, by 2015, 147 facilities will notify under one of the DSW recycling exclusions. See footnote 1 for the years 2015 and later.
5/ Based on industry notifications under the 2008 DSW final rule, approximately 14% of notifiers were small businesses. Calculated as Column G * 0.14.
6/ Total Number of Businesses Impacted in Year 2064 is based on the assumption discussed in footnote 1.
7/ Based on industry notifications under the 2008 DSW final rule where approximately 14% of notifiers were small businesses. Calculated as Column I * 0.14.

Exhibit 7D
Estimated Average Annual Impact of the 2011 DSW Proposed Revisions on Small Businesses
(67% upper-bound adoption scenario) 1/

A	B	C	D	E	F	G	H	I	J
Item	NAICS	Industry	Small Company Average Annual Revenue (2011$/yr) 2/	Average Annual Cost Impact Per Facility (2011$/yr)	Annual Cost Impact as Percent of Annual Revenue (%) 3/	Total Count of Businesses Impacted in Year 2015 4/	Count of *Small* Businesses Impacted in Year 2015 5/	Total Count of Businesses Impacted in Years 2018 through 2064 6/	Count of *Small* Businesses Impacted in Years 2018 through 2064 7/
1	323110	Commercial Lithographic Printing	$7,655,524	$15,303	0.200%	23	3	53	7
2	324110	Petroleum Refineries	$1,441,928,214	$15,303	0.001%	102	14	161	22
3	325188	All Other Basic Inorganic Chemical Manufacturing	$45,983,586	$15,303	0.033%	70	10	100	14
4	325199	All Other Basic Organic Chemical Manufacturing	$111,235,602	$15,303	0.014%	108	15	168	23
5	325211	Plastics Material and Resin Manufacturing	$88,876,271	$15,303	0.017%	102	14	146	20
6	325412	Pharmaceutical Preparation Manufacturing	$88,315,826	$15,303	0.017%	47	7	101	14
7	325510	Paint and Coating Manufacturing	$29,517,080	$15,303	0.052%	140	20	200	28
8	325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	$26,680,578	$15,303	0.057%	67	9	103	14
9	326199	All Other Plastics Product Manufacturing	$12,424,800	$15,303	0.123%	57	8	81	11
10	331111	Iron and Steel Mills	$136,490,820	$15,303	0.123%	74	10	107	15
11	331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	$52,091,967	$15,303	0.029%	45	6	57	8
12	332312	Fabricated Structural Metal Manufacturing	$12,859,681	$15,303	0.119%	88	12	94	13
13	332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers	$11,002,159	$15,303	0.139%	113	16	165	23
14	332813	Electroplating, Plating, Polishing, Anodizing and	$4,457,248	$15,303	0.343%	232	32	396	55

Exhibit 7D
Estimated Average Annual Impact of the 2011 DSW Proposed Revisions on Small Businesses
(67% upper-bound adoption scenario) 1/

A	B	C	D	E	F	G	H	I	J
Item	NAICS	Industry	Small Company Average Annual Revenue (2011$/yr) 2/	Average Annual Cost Impact Per Facility (2011$/yr)	Annual Cost Impact as Percent of Annual Revenue (%) 3/	Total Count of Businesses Impacted in Year 2015 4/	Count of *Small* Businesses Impacted in Year 2015 5/	Total Count of Businesses Impacted in Years 2018 through 2064 6/	Count of *Small* Businesses Impacted in Years 2018 through 2064 7/
		Coloring							
15	332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	$8,723,677	$15,303	0.175%	108	15	130	18
16	333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	$21,511,990	$15,303	0.071%	74	10	80	11
17	334412	Bare Printed Circuit Board Manufacturing	$3,714,108	$15,303	**0.412%**	145	20	218	**30**
18	334413	Semiconductor and Related Device Manufacturing	$27,339,212	$15,303	0.056%	53	7	93	13
19	334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	$12,450,771	$15,303	0.123%	147	21	159	22
20	336399	All Other Motor Vehicle Parts Manufacturing	$16,892,517	$15,303	0.091%	109	15	129	18
21	336412	Aircraft Engine and Engine Parts Manufacturing	$27,299,207	$15,303	0.056%	53	7	74	10
22	336413	Other Aircraft Part and Auxiliary Equipment Manufacturing	$23,568,125	$15,303	0.065%	53	7	91	13
23	541710	Research and Development in the Physical, Engineering, and Life Sciences	$6,249,609	$13,637	0.218%	22	3	81	11
24	562211	Hazardous Waste Treatment and Disposal	$6,534,593	$13,637	0.209%	9	1	31	4
25	611310	Colleges, Universities and Professional Schools	$7,834,683	$13,637	0.174%	31	4	112	16
26	622110	General Medical and Surgical	NA	$13,637	NA	13	2	46	6

Exhibit 7D
Estimated Average Annual Impact of the 2011 DSW Proposed Revisions on Small Businesses
(67% upper-bound adoption scenario) 1/

A	B	C	D	E	F	G	H	I	J
Item	NAICS	Industry	Small Company Average Annual Revenue (2011$/yr) 2/	Average Annual Cost Impact Per Facility (2011$/yr)	Annual Cost Impact as Percent of Annual Revenue (%) 3/	Total Count of Businesses Impacted in Year 2015 4/	Count of *Small* Businesses Impacted in Year 2015 5/	Total Count of Businesses Impacted in Years 2018 through 2064 6/	Count of *Small* Businesses Impacted in Years 2018 through 2064 7/
		Hospitals							
27	928110	National Security	NA	$13,637	NA	31	4	112	16
		All Other Industries	NA	NA	NA	4,247	595	5,814	814
Total Number of Facilities Impacted All Options			-	-	-	**6,361**	**891**	**9,102**	**1,274**

Notes:
1/ The upper bound adoption rate is based on the assumption that all of the 44 states will adopt the 2011 DSW proposed rule within a four-year period beginning in 2015, at a rate of 25% of the 44 states adopting in each of the four years following 2014. By the end of those four years all facilities in those 44 states will notify under one of the DSW recycling exclusions. Annual cost impact per facility is discounted by 3% to reflect change in price level from 2015 to 2011.
2/ Small company annual revenue is approximated using the average establishment value of shipments from Census of Manufacturers Data. For example the number is the average establishment value of shipments for small establishments (e.g., for industries with an SBA small business size standard of 1,000 employees, the number is the average value of shipments for facilities with less than 500 employees). This estimate is intended to serve as a conservative value of annual revenue for small businesses. Annual cost impact per facility is discounted by 3% to reflect change in price level from 2015 to 2011.
3/ Column E divided by Column D times 100%.
4/ In the first two years and four months following the 2008 DSW final rule 49 facilities have notified under one of the 2008 DSW recycling exclusions. This rate of 21 facilities notifying per year is continued up through 2014. At this rate, by 2015 147 facilities will notify under one of the DSW recycling exclusions plus those facilities notifying per footnote 1.
5/ Based on industry notifications under the 2008 DSW final rule, approximately 14% of notifiers were small businesses. Calculated as Column G * 0.14.
6/ Total Number of Businesses Impacted in Year 2018 through 2064 is based on the assumption discussed in footnote 1. Though year 2015 it is estimated that 126 facilities will have notified. In the following four years (2015-2018) a total 3,655 additional facilities located in 44 states that adopt the rule are estimated to notify in the upper bound estimate for a total of 3,781 facilities that notified. This total number of notifiers remains constant for the years 2018 through 2064.
7/ Based on industry notifications under the 2008 DSW final rule where approximately 14% of notifiers were small businesses. Calculated as Column I * 0.14.

7C. Unfunded Mandates Analysis (1995 UMRA)

The Unfunded Mandates Reform Act (UMRA) requires that federal agencies assess the effects of federal regulations on state, local, and tribal governments and the private sector. In particular, UMRA requires that agencies prepare a written statement to accompany any rulemaking that "includes any federal mandate that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (annually adjusted for inflation) in any one year" (Section 202(a)). Potential future annual added direct costs to state, local, and tribal governments could include the following eleven paperwork activities associated with Option 2, Option 4, Option 5, Option 6, and Option 7 of the 2011 proposed revisions to the DSW recycling exclusions:

1. Receive, review and file biennial notifications (Options 2, 4, 6, & 7)
2. Receive, review and file reclamation plan (Option 2)
3. Receive, Review and approve emergency plans (Option 2)
4. Receive, review and file notification of compliance regarded affected release area (Option 2)
5. Review RCRA permit applications and enter into database (Option 2)
6. Evaluate legitimacy petitions (Option 4)
7. Evaluate legitimacy documentation (Options 4)
8. Receive, review, and file re-application for variance or non-waste determination (Option 5)
9. EPA provides online public access to a list (including documentation) of facilities receiving non-waste determinations (Option 5).
10. Petition process for re-manufacturing exclusion (Option 6)
11. Other State paperwork requirements under existing paperwork requirements covering 2008 revisions to the RCRA definition of solid waste, RCRA hazardous waste manifest system requirements, hazardous waste generator standards, hazardous waste specific unit requirements and special waste processes and types, and air emission standards for tanks, surface impoundment and containers.

The state government share of estimated future average annualized direct costs under all options is displayed below in Exhibit 7E, which indicates that the maximum annual cost to state governments is $8.5 million for the 13% base case adoption scenario, and $9.1 million for the 74% upper bound adoption scenario. No impacts are expected for local or tribal governments. Because the impacts of all the regulatory options are expected to result in state government expenditures well below the $100 million UMRA threshold, this RIA concludes that the 2011 DSW rule is not an unfunded mandate based on this UMRA cost criterion.

Exhibit 7E
Estimated Maximum Annual State Cost Burden Associated with 2011 DSW Rules (2011$) 1/

Item	Type of Direct Compliance Cost	13% Base Case Adoption Scenario			74% Upper Bound Adoption Scenario			Notes
		Maximum Count of Submissions	State Cost per Submission	Total Annual Cost	Maximum Count of Submissions	State Cost per Submission	Total Annual Cost	
1	Receive, Review and File Biennial Notifications (Option 2A, Option 4B, Option 6, and Option 7B)	3,312	$6	$20,799	4,673	$6	$29,346	2
2	Receive, Review and File Reclamation Plan (Option 2, Requirement 2B)	1,176	$38	$44,735	3,781	$38	$143,829	3
3	Review and Approve Emergency Plans (Option 2, Requirement 2D)	118	$90	$10,589	378	$90	$34,044	4
4	Receive, Review and File Notification of Compliance Regarding Affected Release Area (Option 2, Requirement 2D)	118	$225	$26,488	378	$225	$85,163	5
5	Review RCRA Permit Applications and Enter Into Database (Option 2, Requirement 2E)	19	$1,194	$22,572	19	$1,194	$22,572	6
6	Evaluation of Legitimacy Petitions (Options 4A, 4B)	76	$8,551	$649,846	103	$8,551	$880,712	7
7	Evaluation of Legitimacy Documentation (Options 4A and 4C)	3,247	$2,138	$6,940,950	3,247	$2,138	$6,940,950	8
8	Receive, Review and File Re-application for Variance or Non-waste Determination (Option 5A)	78	$8,550	$666,900	78	$8,550	$666,900	
9	EPA provides online public access to a list (including supporting documentation) of facilities receiving non-waste determinations (Option 5B)	37	$75	$2,787	37	$75	$2,787	9
10	Petition Process for Re-manufacturing Exclusion (Option 6D)	5	$13,640	$68,199	16	$13,640	$218,238	
11	Other State Paperwork Requirements under Existing Paperwork Requirements	NA	NA	$60,605	NA	NA	$60,605	10
12	Total Annual Costs			**$8,514,470**			**$9,085,146**	

Notes:
1/ Data depict the maximum annual costs that will be incurred by states in any one year. For the lower bound adoption rate this is year 2064; for the upper bound adoption rate the maximum impacts occur in years 2018-2064. The maximum number of adoptions under Option 2 is estimated at 1,176 and 3,781 under the lower and upper bound estimates, respectively. The maximum number of adoptions under Option 4 is all 5,321 pre-2008 exclusion facilities and all 4,933 RCRA recycling facilities at 10,254. The maximum number of adoptions under Option 5 is estimated at 74 non-waste determinations and 4 variances. The maximum number under Option 6 is estimated at 53 and 170 for re-manufacturing notifications and 5 and 16 for petitions under the lower and upper bound estimates, respectively. The maximum number of adoptions under Option 7 is estimated at 5,321.
2/ 50% for the total number of facilities opting for coverage under the rule submit notifications every year. State cost estimate obtained from the "Supporting Statement for Revisions to the RCRA Definition of Solid Waste (Proposed Rule), June 30, 2011 (i.e., 2011 DSW ICR).
3/ State cost estimate obtained from 2011 DSW ICR.
4/ Assumes plan is resubmitted every 10 years. State cost estimate obtained from 2011 DSW ICR.
5/ Assumes plan is resubmitted every 10 years. State cost estimate obtained from 2011 DSW ICR.
6/ 189 off-site recyclers accepting hazardous waste identified in Exhibit 3A. Permits are assumed to be renewed every 10 years.

Exhibit 7E
Estimated Maximum Annual State Cost Burden Associated with 2011 DSW Rules (2011$) 1/

7/ 5% of facilities submit petitions every five years. State cost estimate obtained from 2011 DSW ICR.
8/ 95% of facilities submit documentation every three years. State cost estimate obtained from 2011 DSW ICR.
9/ State cost estimate obtained from 2011 DSW ICR.
10/ State cost estimate obtained from 2011 DSW ICR. The 2011 DSW ICR identifies other agency costs under existing paperwork requirements that cover 2008 revisions to the RCRA definition of solid waste, RCRA hazardous waste manifest system requirements, hazardous waste generator standards, hazardous waste specific unit requirements and special waste processes and types, and air emission standards for tanks, surface impoundment and containers.

7D. Federalism Implications (1999 Executive Order 13132)

The 1999 Federalism Executive Order 13132 (Federal Register, Vol.64, No. 153, 10 Aug 1999) furthers the policies of the 1995 Unfunded Mandates Reform Act (UMRA) by establishing federalism principles, federalism policymaking criteria, and a state/local government consultation process for the development of Federal regulations that have federalism implications. Federalism implications refers to regulations and other Federal policies and actions that have substantial direct effects on states, on the relationship between the Federal government and the states, or on the distribution of power and responsibilities among the various levels of government. For purpose of complying with the Section 6 consultation process of EO 13132, this section of the RIA evaluates whether the 2011 proposed revisions to the DSW recycling exclusions (i.e., Option 1 thru Option 7) may "*impose substantial direct compliance costs*" on state/local governments. EPA's 2008 guidance[76] for compliance with EO 13132 describes two numerical methods (i.e., numerical tests) for evaluating whether an EPA rule may have federalism implications with respect to the "*substantial direct compliance costs*" criterion:

- $25 million test: Annualized direct compliance costs to state/local governments in aggregate of $25 million or more[77]
- 1% test: Annualized direct compliance costs to state/local governments equal or exceed 1% of state/local government annual revenues

As listed above in the prior (UMRA) section of this RIA, potential future annual added costs to state, local, and tribal governments could include the following eleven paperwork activities associated with Option 2, Option 4, Option 5, Option 6, and Option 7:

1. Receive, review and file biennial notifications (Options 2, 4, 6, & 7)
2. Receive, review and file reclamation plan (Option 2)
3. Receive, Review and approve emergency plans (Option 2)
4. Receive, review and file notification of compliance regarded affected release area (Option 2)
5. Review RCRA permit applications and enter into database (Option 2)
6. Evaluate legitimacy petitions (Option 4)
7. Evaluate legitimacy documentation (Options 4)
8. Receive, review, and file re-application for variance or non-waste determination (Option 5)
9. EPA provides online public access to a list (including documentation) of facilities receiving non-waste determinations (Option 5).
10. Petition process for re-manufacturing exclusion (Option 6)
11. Other State paperwork requirements under existing paperwork requirements covering 2008 revisions to the RCRA definition of solid waste, RCRA hazardous waste manifest system requirements, hazardous waste generator standards, hazardous waste specific unit requirements and special waste processes and types, and air emission standards for tanks, surface impoundment and containers.

[76] The two methods are from page 6 of "EPA's Action Development Process -- Guidance on Executive Order 13132: Federalism," OPEI Regulatory Development Series, Nov 2008, 62 pages at http://intranet.epa.gov/adplibrary/documents/federalismguide11-00-08.pdf

[77] Although one of the stated purposes of EO 13132 in its first paragraph is "to further the policies of the 1995 Unfunded Mandates Reform Act (UMRA), EPA's $25 million annual direct cost trigger is 75% lower than the $100 million annual direct cost trigger prescribed in Section 202 of UMRA.

As also displayed in the prior (UMRA) section of this RIA in Exhibit 7E, the state government share of estimated future annual direct costs indicates that the maximum annual direct cost to state governments is $8.5 million per year for the 13% base case adoption scenario, and $9.1 million per year for the 74% upper bound adoption scenario. No added costs are expected for local or tribal governments. Because these direct costs are well below the $25 million test threshold, this RIA concludes that the 2011 DSW rule does not meet the Federalism implication "*substantial direct compliance costs"* criterion.

7E. Energy Impact Analysis (2001 Executive Order 13211)

Executive Order 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use" (66 FR 28355 (May 22, 2001)) requires EPA to prepare and submit a Statement of Energy Effects to OMB for those matters identified as significant energy actions. As defined in Executive Order 13211, a "significant energy action" is any action by an agency (normally published in the Federal Register) that promulgates or is expected to lead to the promulgation of a final rule or regulation, including notices of inquiry, advance notices of proposed rulemaking, and notices of proposed rulemaking that:

1. Is a significant regulatory action under Executive Order 12866 or any successor order and is likely to have a significant adverse effect on the supply, distribution, or use of energy; or
2. Is designated by OMB as a significant energy action.

This rule does not involve the supply, distribution, or use of energy and is not a significant regulatory action under Executive Order 12866. Thus, Executive Order 13211 does not apply to this rule.

7F. Improving Regulation & Regulatory Review (2011 Executive Order 13563)

The basic framework, scope, and contents of this RIA represent a "benefit-cost analysis" which is the type of analysis required under section 6(a)(2)(B) of the 1993 Executive Order 12866 for regulatory actions which are "*significant*" according to one or more of four criteria:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive order.

Furthermore, for regulatory actions which are expected to have more than a $100 million per year "*economically significant*" annual effect on the economy according to the first criterion listed above, Section 6(a)(2)(C) of Executive Order 12866 requires Federal regulatory agencies (such as the EPA) to assess the potential effects of the benefits and costs of the proposed regulation on economic and market efficiency, productivity, employment, competitiveness, health, safety, and the natural environment. The January 2011 Executive Order 13563 "*Improving Regulation and Regulatory Review*" reaffirms the principles, structures, and definitions established by Executive Order 12866. However, because the 2011 DSW proposed rule is not expected to be an "*economically significant*" rule according to the quantified and monetized benefits (i.e., cost savings) and costs as estimated in the prior chapters of this RIA, this RIA does not provide quantitative assessments of these other effects, but below provides a brief qualitative assessment of these other economic effects. The following chapter (Chapter 8) provides a qualitative assessment of potential effects (i.e., benefits) on health, safety and the natural environment.

EPA anticipates the 2011 DSW proposed rule, if promulgated, may create jobs in the long-term (i.e., 3 to 5 years beyond its effective date after states adopt it), for the following reason. EPA is proposing revisions to a set of 35 existing exclusions to RCRA industrial waste management regulations which EPA promulgated between 1985 and 2008. EPA promulgated three of the 35 exclusions in 2008, and the 32 other exclusions EPA promulgated between 1985 and 2002. Facilities in industries which are eligible to operate under these exclusions realize annual savings in regulatory costs, compared to operating under full RCRA Subtitle C hazardous waste regulations without these exclusions. However, not all state governments have adopted each of these existing 35 exclusions, particularly with regard to the most recent 2008 set of three RCRA exclusions for operations involving industrial recycling of hazardous secondary materials which are not discarded. As of almost three years after EPA's promulgation of the 2008 exclusions, only four states (ID, IL, NJ, and PA) have voluntarily adopted the exclusions, and only 49 industrial facilities have notified EPA regional offices they are operating under the 2008 exclusions.

One explanation of why more states have not yet adopted the 2008 DSW exclusions, as well as not yet adopted all of the 32 pre-2008 exclusions, is some states may not believe one or more of the exclusions are fully protective of human health and the environment. During EPA's 2008 DSW exclusions rulemaking, 12 state governments commented to EPA on the 2007 re-proposal of the DSW exclusions that they were not likely to adopt one or more of the three 2008 DSW final rule exclusions. These 12 states account for 23% of foregone RCRA regulatory cost savings to industries compared to nationwide cost savings potential under hypothetical total adoption of the 2008 DSW exclusions by all states.

For the 32 existing pre-2008 RCRA industrial recycling exclusions, as displayed in **Exhibit 7F** below an average of eight states representing 5.3% of nationwide total RCRA industrial hazardous waste generation have not yet adopted 12 of the 32 exclusions, and 24 states have not adopted at least one of the 32 exclusions. Because it is EPA's intention in the 2011 DSW proposed rule, to remedy the concerns of non-adopting states about the under-protectiveness of these exclusions, EPA anticipates that once promulgated, more states may be induced to adopt both the pre-2008 and the 2008 DSW exclusions, thereby making more facilities eligible for regulatory cost savings in additional industries (**Appendix A** indicates only a 49% overlap in the types of industries that currently operate under the pre-2008 exclusions, compared to the types of industries which may become eligible in the future to operate under the 2008 DSW exclusions). If those facilities pass-thru their cost savings, in whole or in part, to customers in the form of lower prices for goods and services, the proposed revisions to the recycling exclusions could improve output productivity, improve market competitiveness, stimulate business growth, and create jobs in those industries.

Exhibit 7F
Count of States Which Have Not Adopted the 32 pre-2008 RCRA Regulatory Exclusions for Industrial Recycling

A	B	C	D	E	F	G	H	I
Count of pre-2008 Recycling Exclusions	40 CFR Citation		RCRA Base Program Code	Count of States Adopting (out of 52 w/DC & Guam)	Count of Non-Adopting States	Identity of States Not Adopting Exclusion	2009 Hazardous Waste Generation Tons of Non-Adopting States	% of 2009 US Total Hazardous Waste Generation Tons**
260 & 261 Definition of Solid Waste								
1	260.3	Procedures for variances & non-waste determinations	13	52	0			
2	261.2 (e)	Use/Reuse	13	52	0			
3	261.2 Table 1	Characteristic sludges being reclaimed	13	52	0			
4	261.2 Table 1	Characteristic by-products being reclaimed	13	52	0			
5	261.2 Table 1	Commercial chemical products being reclaimed	13	52	0			
261.4(a) Exclusions from the Definition of Solid Waste								
6	261.4(a)(6)	Pulping Liquors	13	52	0			
7	261.4(a)(7)	Spent Sulfuric Acid	13	52	0			
8	261.4(a)(8)	Closed-Loop Recycling	28N	52	0			
9	261.4(a)(9)	Spent Wood Preservatives	167F	46	6	FL, GU, HI, MA, ME, NH	211,016	0.60%
10	261.4(a)(10)	Coke By-Product Wastes	85	45	7	MA, MD, ME, MN, NH, RI, WA	185,689	0.53%
11	261.4(a)(11)	Splash Condenser Dross Residue	95	47	5	GU, MD, ME, NH, RI	46,835	0.13%
12	261.4(a)(12)	Hazardous Oil-Bearing Secondary Materials and Recovered Oil from Petroleum Refining Operations	135	46	6	GU, MA, MD, ME, MN, NH	181,605	0.51%
13	261.4(a)(13)	Processed Scrap Metal	157	46	6	AL, GU, MD, ME, NH, RI	2,110,444	5.97%
14	261.4(a)(14)	Shredded Circuit Boards	157	46	6	AL, GU, MD, ME, NH, RI	2,110,444	5.97%
15	261.4(a)(16)	Comparable Fuels	168	42	10	CA, CO, CT, GU, HI, MA, ME, NH, RI, VT	810,437	2.29%
16	261.4(a)(17)	Mineral Processing Spent Materials	167D	40	12	AZ, FL, GU, HI, MA, MD, ME, MS, NE, NH, VT, WA	2,315,145	6.55%
17	261.4(a)(18)	Petrochemical Recovered Oil	169	44	8	AZ, CA, GU, HI,	768,493	2.18%

Exhibit 7F
Count of States Which Have Not Adopted the 32 pre-2008 RCRA Regulatory Exclusions for Industrial Recycling

A	B	C	D	E	F	G	H	I
Count of pre-2008 Recycling Exclusions	40 CFR Citation		RCRA Base Program Code	Count of States Adopting (out of 52 w/DC & Guam)	Count of Non-Adopting States	Identity of States Not Adopting Exclusion	2009 Hazardous Waste Generation Tons of Non-Adopting States	% of 2009 US Total Hazardous Waste Generation Tons**
						MD, ME, NH, RI		
18	261.4(a)(19)	Spent Caustic Solutions from Petroleum Refining	169	44	8	AZ, CA, GU, HI, MD, ME, NH, RI	768,493	2.18%
19	261.4(a)(20)	Hazardous Secondary Materials Used to Make Zinc Fertilizers	200	39	13	AZ, CA, CT, GU, HI, KS, MD, ME, MN, NH, NJ, NY, WY	2,706,707	7.66%
20	261.4(a)(21)	Zinc Fertilizers Made from Recycled Hazardous Secondary Materials	200	39	13	AZ, CA, CT, GU, HI, KS, MD, ME, MN, NH, NJ, NY, WY	2,706,707	7.66%
21	261.4(a)(22)	Used Cathode Ray Tubes (CRTs)	ND*	ND*	ND*	ND*	ND*	ND*
261.4(b) Solid wastes which are not hazardous wastes								
22	261.4(b)(12)	Spent Chlorofluorocarbon Refrigerants	84	49	3	MA, ME, TX	13,498,069	38.20%
23	261.4(b)(14)	Used Oil Distillation Bottoms used to manufacture asphalt products	122	43	9	AZ, CA, GU, MA, MD, ME, NE, NH, PA	1,114,499	3.15%
261.6 Requirements for recyclable materials (hazardous wastes)								
24	261.6(a)(3)(ii)	Scrap metal	IA	52	0			
25	261.6(a)(3)(iii)	Waste-derived fuels from refining processes	13	52	0			
26	261.6(a)(3)(iv)	Unrefined waste-derived fuels and oils from petroleum refineries	19	49	3	MD, ME, RI	41,876	0.12%
27	261.6(c)(2)	Reclaimers that do not store	13	52	0			
261.7 Residues of hazardous waste in empty containers								
28	261.7	Residues of hazardous waste in empty containers	IA	52	0			
Part 266 Standards for the Management of Specific Hazardous Wastes								
29	266 Subpart C	Recyclable Materials Used in a Manner Constituting Disposal	13	52	0			
30	266 Subpart F	Materials Utilized for Precious Metal Recovery	13	52	0			
31	266 Subpart G	Spent Lead-Acid Batteries Being Reclaimed	13	52	0			
32	266 Subpart H	Hazardous Waste Burned in Boilers & Industrial Furnaces	85	45	7	MA, MD, ME, MN, NH, RI, WA	502,906	1.42%

Exhibit 7F
Count of States Which Have Not Adopted the 32 pre-2008 RCRA Regulatory Exclusions for Industrial Recycling

A	B	C	D	E	F	G	H	I
Count of pre-2008 Recycling Exclusions	40 CFR Citation		RCRA Base Program Code	Count of States Adopting (out of 52 w/DC & Guam)	Count of Non-Adopting States	Identity of States Not Adopting Exclusion	2009 Hazardous Waste Generation Tons of Non-Adopting States	% of 2009 US Total Hazardous Waste Generation Tons**
Statistical Summary for Exclusions with One or More Non-Adopting States:								
			Minimum =	39	3		41,876	0.1%
			Maximum =	49	13		13,498,069	38.2%
			Average =	44	**8**		1,879,960	**5.3%**
			Non-duplicative identity/totals for states not adopting at least one exclusion =	28	24	**AL, AZ, CA, CO, CT, FL, GU, HI, KS, MA, MD, ME, MN, MS, NE, NH, NJ, NY, PA, RI, TX, VT, WA, WY**	20,819,873	**58.9%**

Footnotes:

- Columns A, B, C data source: Table from section XIII of EPA's 2011 DSW proposed rule Federal Register notice.
- Column D data source 1 of 2: EPA RCRA Rule List StATS database for 52 states (including DC & Guam) as of March 31, 2011 at http://www.epa.gov/waste/laws-regs/state/stats/allrules.pdf
- Column D data source 2 of 2: EPA StATS "Consolidated Checklists C1-C11" for 52 states (including DC & Guam) as of December 31, 2002 at http://www.epa.gov/waste/laws-regs/state/revision/cclists.htm
- Columns E, F, G data source: Authorization Status by Rule from EPA StATS database for 52 states (including DC & Guam) as of March 31, 2011 at http://www.epa.gov/waste/laws-regs/state/stats/authall.pdf
- Columns H & I data source: Exhibit 1.1 of EPA's 2009 "National Biennial RCRA Hazardous Waste Report" at http://www.epa.gov/waste/inforesources/data/br09/national09.pdf
- * ND = No data available in the "Consolidated Checklists C1-C11" because EPA promulgated this particular exclusion after the most current StATS data (Dec 31, 2002).
- ** 2009 US total industrial hazardous waste generated by 56 states (including DC, Guam, Navajo Nation, Puerto Rico, Trust Territories, Virgin Islands) = 35,331,398

CHAPTER 8

Potential Environmental & Economic Benefits For the 2011 Proposed Revisions to the DSW Recycling Exclusions

This chapter provides qualitative descriptions of three categories of potential future environmental and economic benefits, which could be associated with the 2011 DSW proposed revisions.[78] This chapter identifies at least one benefit for each of the seven options presented in the 2011 proposed revisions to the DSW recycling exclusions. Some options have multiple potential benefits associated with multiple revisions proposed under some options (all Options except Option 1 have multiple components, i.e., sub-options).

8A. Reduction in future environmental damages associated with industrial recycling of hazardous secondary materials (Options 1, 2, 6).

8B. Improved environmental compliance:
- B1. Clearer and more specific regulatory standards improve environmental compliance (Options 3, 4, 7, 8).
- B2. More stringent recordkeeping provisions improve environmental compliance (Options 3, 4, 7).
- B3. Self-reporting requirements (e.g., notification requirements) improve environmental compliance (Options 2, 3, 5, 7).
- B4. Increased likelihood of detection and potential penalty for non-compliance improves environmental compliance (Options 2, 3, 4, 5, 7).

8C. More specific standards result in reduced liability, less uncertainty for the regulated entity, and lower legal and credit costs (Options 3, 4, 7, 8).

8A. Reduction in Future Environmental Damage Cases Associated With Hazardous Secondary Materials Industrial Recycling

Option 1 proposes to withdraw the 2008 DSW offsite transfer recycling exclusion, and Option 2 proposes to replace that 2008 exclusion with alternative RCRA Subtitle C hazardous waste regulations for offsite transfer recycling. After analyzing the potential for adverse impact to human health and the environment from discarded material under the 2008 offsite recycling exclusion, including the potential for disproportionate impact to minority and low-income populations, the most appropriate regulatory approach may be to keep most types of third-party transfers of hazardous secondary material regulated under RCRA Subtitle C, rather than excluded from it.

[78] Benefit categories 8B and 8C in this Chapter are from a 2010 unpublished EPA white paper on the potential RCRA regulatory compliance-related benefits which may be associated with EPA's 2011 proposed revisions to the DSW recycling exclusions: "Definition of Solid Waste Rulemaking Compliance Research Background Document" November 17, 2010, 10 pages, Jon Silberman, Attorney-Advisor, Office of Enforcement & Compliance Assurance (OECA) – Office of Compliance – Planning, Measures and Oversight Division.

As noted in the preamble to the 2008 DSW rule (74 FR 64675), generators of hazardous secondary materials who do not reclaim these materials themselves often ship the materials to be reclaimed to a commercial facility or another manufacturer in order to avoid the costs of disposing of the material. Because of low commercial value and high potential liability associated with most types of hazardous secondary materials, the generator typically pays the reclamation facility to accept the materials or receives a salvage fee that only partially offsets the cost of transporting and managing the hazardous secondary materials. In such situations, the generator has relinquished control of the hazardous secondary materials and the entity receiving such materials may not have the same incentives to manage them as a useful product.

This behavior is evidenced by the results of EPA's 2007 "industrial recycling historical damages study.[79]" The study identified a total of 208 historical environmental damage cases from industrial hazardous secondary materials recycling spanning between 1983 and 2005. The study selected year 1983 as the historical cut-off year because EPA published the bulk (i.e., base program) of the RCRA Subtitle C regulations between 1980 and 1982. A sub-total 195 (94%) of the recycling damage cases were associated with off-site third-party recyclers, with clear instances of recyclable materials discard resulting in risks to human health and the environment, including cases of large-scale soil and ground water contamination. The types and prevalence of environmental damages associated with the 208 sites included (source: p.7 of 2007 study):

- Soil & groundwater contamination 41%
- Abandoned hazardous materials 33%
- Soil contamination 30%
- Air pollution 10%
- Surface water contamination 9%
- Sediment contamination 8%
- Groundwater contamination 6%

As displayed in Exhibit 8A below, an average annual rate of nine recycling damage cases have occurred since the RCRA Subtitle C regulations were promulgated. As also displayed in the Exhibit, based on cleanup cost data for 89 of the 208 historical cases for which the study found cleanup cost data, the average annual cleanup cost for an average of nine recycling damage cases is $62.7 million per year, based on an average of $6.9 million cleanup cost per industrial recycling environmental damage case. However, the summary of cleanup costs displayed in Exhibit 8A is based on a mix of price levels during the 1983 to 2005 data collection period in the 2007 EPA study. Based on updating the historical cleanup costs to year 2011 (i.e., 2011$) as displayed in Exhibit 8B below, the 2011-updated average annual cleanup cost is $86 million per year based on the historical average annual nine damage cases per year extrapolated to year 2011.

[79] "An Assessment of Environmental Problems Associated With Recycling of Hazardous Secondary Materials," January 11, 2007 document ID nr. EPA–HQ–RCRA–2002–0031–0355 available at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-RCRA-2002-0031-0355

Exhibit 8A
Estimate of Average Annual Historical Cleanup Costs
Involving 208 Industrial Recycling Environmental Damage Cases Between 1983 and 2005*

A. Estimation of Average Cleanup Cost Per Damage Case Based on Data for a Sample of 89 of the 208 Industrial Recycling Environmental Damage Cases Between 1983 and 2005*

A	B	C	D ((B+C)/2)	E	F (D x E)
Cleanup cost range	Low-end cleanup cost	High-end cleanup cost	Cleanup cost range midpoints	Count of damage cases in cost range	Total cleanup cost for each cost range
1	$10,000	$100,000	$55,000	6	$330,000
2	$100,000	$250,000	$175,000	8	$1,400,000
3	$250,000	$500,000	$375,000	11	$4,125,000
4	$500,000	$1,000,000	$750,000	12	$9,000,000
5	$1,000,000	$2,500,000	$1,750,000	20	$35,000,000
6	$2,500,000	$5,000,000	$3,750,000	14	$52,500,000
7	$5,000,000	$10,000,000	$7,500,000	10	$75,000,000
8	$10,000,000	$100,000,000	$55,000,000	8	$440,000,000
			Sub-total =	89	$617,355,000
			Average cleanup cost per damage case =		**$6.9 million per damage case**

B. Estimation of Average Annual Cleanup Cost Based on Extrapolation of Per-Damage Case Cleanup Cost to All 208 Historical Cases

Total industrial recycling damage cases over 23-year period (1983 to 2005) =	208	
Average count of damage cases per year (1983 to 2005) =	9.0	
Average annual cleanup cost over 23-year period (1983 to 2005) =		**$62.7 million per year**

* Notes:

- Source: Based on data from page 13 of EPA's January 11, 2007 industrial recycling damage case study "An Assessment of Environmental Problems Associated with Recycling of Hazardous Secondary Materials" available as document ID nr. EPA-HQ-RCRA-2002-0031-0355 at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-RCRA-2002-0031-0355
- From page 13 of the source document: "It is entirely possible that these cost data are not a truly accurate representation of actual cleanup costs for the entire sample of 208 cases. For one thing, cost data were much easier to find for CERCLA cleanups than cleanups done under other programs. Since CERCLA cleanups are likely to be skewed toward addressing relatively large, high-priority, expensive contamination sites, the actual cleanup costs for all 208 cases are likely to be somewhat lower than these data suggest."
- Costs in this table are at mixed price levels spanning the 23-year damage cast period (1983 to 2005).

Exhibit 8B
2011$ Update of the 1983-2005 Average Annual Historical Cleanup Costs
Associated with Industrial Hazardous Secondary Materials Recycling Damage Cases

A	B	C	D	E	F ((2011 value in E) / E)	G (D x F)
Item	Year	Reference period	Average annual cleanup cost*	GDP price deflator** (2005 = 100)	Price update multiplier based on deflator	2011$ updated average annual cleanup cost
1	1983	Historical cases	$62,730,747	57.603	1.9392	$121,649,928
2	1984	Historical cases	$62,730,747	59.766	1.8691	$117,247,278
3	1985	Historical cases	$62,730,747	61.576	1.8141	$113,800,845
4	1986	Historical cases	$62,730,747	62.937	1.7749	$111,339,924
5	1987	Historical cases	$62,730,747	64.764	1.7248	$108,199,012
6	1988	Historical cases	$62,730,747	66.988	1.6676	$104,606,808
7	1989	Historical cases	$62,730,747	69.518	1.6069	$100,799,805
8	1990	Historical cases	$62,730,747	72.201	1.5472	$97,054,069
9	1991	Historical cases	$62,730,747	74.76	1.4942	$93,731,953
10	1992	Historical cases	$62,730,747	76.533	1.4596	$91,560,514
11	1993	Historical cases	$62,730,747	78.224	1.4280	$89,581,213
12	1994	Historical cases	$62,730,747	79.872	1.3986	$87,732,883
13	1995	Historical cases	$62,730,747	81.536	1.3700	$85,942,416
14	1996	Historical cases	$62,730,747	83.088	1.3444	$84,337,098
15	1997	Historical cases	$62,730,747	84.555	1.3211	$82,873,879
16	1998	Historical cases	$62,730,747	85.511	1.3063	$81,947,361
17	1999	Historical cases	$62,730,747	86.768	1.2874	$80,760,198
18	2000	Historical cases	$62,730,747	88.647	1.2601	$79,048,370
19	2001	Historical cases	$62,730,747	90.65	1.2323	$77,301,719
20	2002	Historical cases	$62,730,747	92.118	1.2126	$76,069,832
21	2003	Historical cases	$62,730,747	94.1	1.1871	$74,467,596
22	2004	Historical cases	$62,730,747	96.77	1.1543	$72,412,946
23	2005	Historical cases	$62,730,747	100	1.1171	$70,074,008
24	2006	Extrapolated	$62,730,747	103.257	1.0818	$67,863,688
25	2007	Extrapolated	$62,730,747	106.296	1.0509	$65,923,467
26	2008	Extrapolated	$62,730,747	108.619	1.0284	$64,513,583

Exhibit 8B
2011$ Update of the 1983-2005 Average Annual Historical Cleanup Costs
Associated with Industrial Hazardous Secondary Materials Recycling Damage Cases

A	B	C	D	E	F ((2011 value in E) / E)	G (D x F)
Item	Year	Reference period	Average annual cleanup cost*	GDP price deflator** (2005 = 100)	Price update multiplier based on deflator	2011$ updated average annual cleanup cost
27	2009	Extrapolated	$62,730,747	109.615	1.0191	$63,927,390
28	2010	Extrapolated	$62,730,747	110.488	1.0110	$63,422,280
29	2011	Extrapolated	$62,730,747	111.706	1.0000	$62,730,747
					Average annual updated to 2011$=	**$86 million per year**

Notes:
* Source: Column C average annual cost from Exhibit 8A.
** Source: Column D from "Table 1.1.9 Implicit Price Deflators for Gross Domestic Product" from the US Bureau of Economic Analysis National Economic Accounts at http://www.bea.gov/national/nipaweb/SelectTable.asp?Selected=Y; First quarter implicit price deflator used for 2011. All other years are annual implicit price deflators.

In addition, EPA's 2006 "industrial recycling market forces study[80]" in the docket for the 2008 DSW final rule supports the conclusion that the pattern of discard at off-site, third-party recyclers (e.g., commercial recyclers) is a result of inherent differences between commercial recycling and normal manufacturing. As opposed to manufacturing where the cost of raw materials or intermediates (or inputs) is greater than zero, and revenue is generated primarily from the sale of the output, hazardous secondary materials recycling can involve generating revenue primarily from receipt of the hazardous secondary materials. Recyclers of hazardous secondary materials in this situation may thus respond differently than traditional manufacturers to economic forces and incentives, accumulating more inputs (hazardous secondary materials) than can be recycled, which could potentially be lead to environmental contamination (e.g., ground water leaching, container leaks) during protracted storage periods if not sufficiently contained.

The 2008 DSW final rule attempted to address this pattern of adverse impacts to human health and the environment from discarded material transferred to offsite third-party recyclers, by setting conditions for the 2008 DSW offsite transfer recycling exclusion. The intent of those conditions was to define when transfers to offsite third-party recyclers would not result in discard. However, as explained in EPA's 2001 DSW environmental justice analysis (available from the docket for the 2011 DSW proposed revisions), EPA failed to take into account how the

[80] "A Study of Potential Effects of Market Forces on the Management of Hazardous Secondary Materials Intended for Recycling," November 21, 2006, 91 pages, document ID nr. EPA–HQ–RCRA–2002–0031–0358 available at http://www.regulations.gov.

conditions of the 2008 DSW offsite recycling exclusion would work when implemented. EPA's analysis of the 2008 DSW final rule assumed that compliance with the DSW offsite recycling exclusion conditions would be the same as compliance with traditional RCRA Subtitle C hazardous waste recycling regulations.

However, the traditional RCRA Subtitle C recycling regulations have several implementation provisions that are missing from the 2008 DSW offsite recycling exclusion. These provisions ensure a greater level of EPA regional office and state government oversight of the Subtitle C requirements, thereby potentially improving industry compliance:

- Recycling operating permits: Most important of which is the Subtitle C recycling permit requirement which ensures that an EPA regional office or state government agency has reviewed a facility's planned recycling operations before recycling begins, and allows public participation in the permit review and approval/rejection process.
- Recycling inspections: Subtitle C recycling requirements also include a statutory provision that such facilities be inspected every two years by an EPA regional office or state government agency.

When Congress enacted these Subtitle C recycling provisions, it was based on their finding that the placement of inadequate controls on hazardous waste management will result in substantial risks to human health and the environment. Furthermore, the 1976 RCRA statute and its legislative history suggest that Congress expected EPA to regulate as solid and hazardous wastes, certain industrial hazardous materials that are destined for recycling. Based on the evidence of EPA's 2007 industrial recycling historical damage case study and EPA's 2008 recycling market forces study, most transfers of hazardous secondary material for recycling do involve discard, and EPA's attempt to define such material as "not discarded" solely by setting additional management conditions poses the danger of circular reason. In other words, adding conditions, many of which resemble hazardous waste requirements, in order to attempt to prevent the discard of hazardous secondary materials that would otherwise be subject to full hazardous waste requirements, is potentially counter to the original intent of RCRA.

At the same time, some specific types of hazardous secondary materials may be more like valuable commodities than solid wastes, and the act of transferring them to a third-party does not automatically involve discard. Many of the other DSW recycling exclusions in 40 CFR 261.4(a) are for these types of recyclable materials, and the 2008 DSW non-waste determination process under 40 CFR 260.34(c) provides an administrative process for determining that additional hazardous secondary materials are indistinguishable from a product and therefore are not waste. Option 6 proposes a DSW re-manufacturing exclusion for certain high-value hazardous secondary materials (i.e., solvents used as chemical processing aids) whose management is more like manufacturing than waste management. However, the 2008 DSW offsite recycling exclusion applies equally to all hazardous secondary materials intended for recycling, and is not limited to materials that are indistinguishable from products.

Thus, given the evidence of past industrial recycling damage cases posing significant risks to human health and the environment, and the underlying perverse incentives of the recycling market to over-accumulate hazardous secondary materials intended for recycling ultimately resulting in discard of the materials, withdrawing the offsite recycling exclusion (Option 1) and replacing it with alternative Subtitle C recycling regulations (Option 2), as well as adding a re-manufacturing recycling exclusion (Option 6), may serve to reduce the future frequency

and cleanup costs of environmental damage cases associated with industrial hazardous secondary materials recycling. However, this RIA does not estimate the magnitude of this potential reduction.

8B. Improved Environmental Compliance

The potential benefits of improved environmental compliance are not improved compliance rates per se, but the positive environmental and human health protection and risk reduction outcomes resulting from improved compliance. This second potential environmental benefits category consists of four components:

8B.1. Clearer and More Specific Regulatory Standards Improve Environmental Compliance

There is evidence that clearer and less complicated regulations would improve environmental compliance by making it easier for industry to comply with and for regulators to enforce the provisions. David B. Spence, using evidence from behavioral psychology, the courts, and elsewhere, concludes that regulated entities that intend to comply with environmental regulations may often inadvertently violate such regulations because they do not fully understand the regulatory requirements. He cites the case of Rollins Environmental Services Inc. v. US EPA (937 F.2d 649), where the court determined that Rollins' violation of TSCA was based on "EPA's misleading imprecision, not Rollins' lack of acuity".[81]

In the paper "Rational or Confused Polluters? Evidence from Hazardous Waste Compliance" S. Stafford[82] found the following: "In support of the complexity critique, the results show that larger facilities and facilities of multi-plant companies are less likely to violate, while facilities that are subject to more complex regulations are more likely to violate. Also in support of the complexity critique, facilities learn from past inspections and facilities in states with programs directed toward reducing complexity are less likely to violate." One specific case example provided in the Stafford article indicated: "… an analysis by the Colorado Department on Public Health and the Environment found that a number of facilities were frequently violating hazardous waste storage requirements because they were unaware of their regulatory status."[83]

A number of the DSW revision options, including Options 3A, 3E, 4A, 4B, 7A, and 8D, should result in clearer and more specific regulatory requirements, which in turn should improve environmental compliance:

- Option 3A codifying the word "contained," should improve environmental compliance because it reduces the need by the generator and the enforcement staff to interpret the provision. The codification makes the provision more enforceable than the undefined term, while

[81] Spence, David B. 2001. "The Shadow of the Rational Polluter: Rethinking the Role of Rational Actor Models in Environmental Law," California Law Review, Vol.89, pp. 917-998.
[82] Stafford, S. 2006. Rational or Confused Polluters? Evidence from Hazardous Waste Compliance. Contributions to Economic Analysis & Policy: Vol. 5 : Issue. 1, Article 21.
[83] *Ibid.*

still providing the generator with some flexibility, including land-based storage.

- Option 3E, by removing the tolling provision from generator exclusion, would eliminate a somewhat complicated provision that is difficult to explain and, therefore, could be difficult to enforce.
- Option 4A applies the same codified standards of legitimate recycling to all recycled hazardous secondary materials. This should provide greater clarity to recyclers and should make enforcement more straightforward and easier, thereby increasing environmental compliance. Furthermore, Option 4A which codifies the legitimacy provision, should provide greater enforceability and clarity on legitimacy by providing the same legitimacy definition standard throughout the program.
- Option 4B requires all four legitimacy factors be met to be considered a legitimate recycler, unless the facility submits a petition and receives approval from the implementing agency. The state agencies will make these legitimacy determinations public and accessible on the internet. This provision should make easier enforcement ensuring greater compliance. The petition process will give the EPA oversight when any one of the four standards is not met; publishing the information online should increase consistency across state programs, which should also help improve compliance and enforcement.
- Option 7A creates a "*contained*" standard that should be more enforceable than the undefined term, resulting in improved environmental compliance.
- Option 8D makes clearer the status of hazardous secondary material in a unit from which a release to the environment occurred. This revision should make the provision more enforceable and improve compliance because it should avoid the confusion of defining a "significant release" and instead make the regulatory status of the material in the unit based on the likelihood of the release occurring again in the future based on the elements in the definition of "contained".

8B.2. More Stringent Recordkeeping Provisions Improve Environmental Compliance

Although no studies were found indicating that recordkeeping improves environmental compliance, a study of OSHA's recordkeeping rules found that changes to the recordkeeping standard in 1995 and 2001 were responsible for a significant decline in the number of workplace injuries and illnesses observed from 1992-2003.[84] The observed declines corresponded with two major OSHA rule changes requiring recordkeeping. The precipitous declines could not be explained by changes in employment, productivity, OSHA enforcement activity, reporting bias, and other factors which were adjusted for in the study.

Recordkeeping requirements in the 2011 DSW proposed revisions should increase awareness of overall regulatory requirements and also increase the likelihood of detecting noncompliance, both of which serve to promote compliance. Options 3C, 4C, and 7C would use recordkeeping to improve environmental compliance:

- Option 3C would require the speculative accumulation start date to be labeled on each container to ensure against speculative accumulation. Without the labeled start date, the speculative accumulation provision would be difficult to enforce.

[84] Friedman and Forst. 2007. "The Impact of OSHA Recordkeeping Regulation Changes on Occupational Injury and Illness Trends in the Us: a Time-series Analysis". *Occupational and Environmental Medicine*. Volume 64:pgs. 454–460

- Option 4C would require documentation of legitimacy to the generator-controlled and transfer-based exclusions and the non-determination petition process. This should ensure that recycling taking place under the exclusions would be examined closely and would not necessitate required documentation of legitimacy for all recycling.
- Option 7C would also require recordkeeping for speculative accumulation, thereby making the provision more enforceable.

8B.3. Self-Reporting Requirements (e.g., Notification Requirements) Improve Environmental Compliance

A 1998 study by Ruhnka and Boerstler[85] found that government incentives for corporate self-regulation are succeeding based on the number of Fortune 1000 implementing voluntary corporate codes of conduct. An example of the type of government-private program outlined in the report is the EPA's national Environmental Performance Track Program. Performance Track was a voluntary approach to recognize and drive environmental excellence among private and public facilities by encouraging facilities with strong environmental records to go above and beyond their legal requirements. In partnership with EPA, members voluntarily set measurable goals to improve the quality of our nation's air, water, and land. The Performance Track program ended in March 2009. Based on results from 2000-2007 (the most recent year for which data are available), "Performance Track members reported that they collectively reduced their water use by 2.87 billion gallons, conserved more than 24,860 acres of land, and reduced greenhouse gas emissions by nearly 367,000 tons of carbon dioxide equivalent."[86] The members also prevented the generation of 1,261,006 tons of non-hazardous waste and 68,146 tons of hazardous waste.

A 2010 study on the Performance Track program by the RAND Corporation found that the program had mixed success and the study concluded that they "believe that the significant environmental challenges that the United States faces require that EPA continue to seek out new approaches that can complement and enhance traditional regulatory approaches."[87] The problem with the program was the lack of clarity in its purpose and the RAND report indicated "[t]he lack of specificity in the program concept, the deferment and non-implementation of the second component of the originally proposed program, and ambiguous announcements about the program's membership contributed to stakeholders developing different understandings and expectations for the program." RAND Corporation recommended that future programs should strive for program concepts and expectations that are clear for all stakeholder groups, tightly focused on specific environmental programs, and protect the EPA's brand. In defense of the Performance Track program, RAND found that " Performance Track members reported that the program's requirements to have and use EMSs, set continuous improvement goals, and increase community outreach led to beneficial changes in corporate culture, including improved employee engagement, morale, recruiting, and retention. EPA should continue to experiment with providing positive recognition and other strategies that encourage changes in corporate culture."

Options 2B, 3B, 5B and 7B would require biennial notification and would enable RCRA-authorized state government agencies and EPA regional offices to monitor environmental compliance at industrial facilities. However, according to the October 2010 OECA review on industry compliance with EPA regulations, EPA regional office and RCRA-authorized state government agency inspections of industrial facilities for the purpose of enforcing RCRA Subtitle C regulations, only covered 3.14% of the 586,183 nationwide universe of RCRA-

[85] Ruhnka and Boerstler. 1998. "Governmental Incentives for Corporate Self-Regulation." *Journal of Business Ethics* 17: 309–326.
[86] RAND Corporation. 2010. *An Assessment of the U.S. Environmental Protection Agency's National Environmental Performance Track Program.*
[87] *Ibid.*

regulated industrial facilities (as of 2001).[88]

8B.4. Increasing the Likelihood Of Detection and Potential Penalty for Non-Compliance Improves Environmental Compliance

Many studies have found that increasing penalties for non-compliance not only improve compliance of the facilities inspected, but act as a deterrent for all facilities in the area. From the State-of-Science White Paper by Jay Shimshack: "Most recently, Glicksman and Earnhart [2007] analyzed both qualitative and quantitative evidence of specific deterrence for water discharges in the chemical industry. The statistical database analysis examined how plants' composite BOD and TSS discharges responded to EPA/state enforcement actions. The survey component covered 267 of the 1003 originally solicited chemical facilities (a 27% response rate). Glicksman and Earnhart [2007] established that inspections and fines both produced significant deterrence effects. Nearly 75% of survey respondents reported that fines were an effective deterrent and approximately 87% reported that inspections definitely or probably effectively induced water pollution compliance. Similarly, the statistical results indicated that both inspections and enforcement actions resulted in decreased aggregate conventional water pollution emissions."[89]

Stafford[90] studied the response of 8,411 hazardous waste-generating facilities to a rule change that significantly increased financial penalties for violation. The 10 to 20 fold increase in potential fine magnitudes generated an approximately 15% reduction in regulated plants' violation probabilities.

Shimshack and Ward[91] found that levying fines resulted in a significant reduction in the statewide water pollution violation rate in the year following the fines. Nearly all of this was attributable to spillover effects, as the average deterrence impact on each of the other plants in a state was almost as strong as the impact on the sanctioned facility. The authors also showed that general deterrence increased consistently with the amount of the penalty. In other words, larger fines induced fewer subsequent violations by other plants in the state. Other results included the finding that non-monetary enforcement responses like notices of violation alone had little influence on plant-level compliance.

Options 2, 3, 4, 5, and 7 of the 2011 DSW proposed revisions should help enforcement personnel more readily identify violations. For example, the absence of required records and notifications can easily be identified and enforced. Both the magnitude of penalties and the increased likelihood of detection should result in benefits of improved compliance.

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[88] Source: page 14 of the unpublished presentation "Improving Environmental Compliance" by Cynthia Giles, Assistant Administrator, EPA Office of Enforcement & Compliance, October 13, 2010.

[89] Shimshack, Jay. 2007. Monitoring, Enforcement, & Environmental Compliance: Understanding Specific & General Deterrence. State-of-Science White Paper prepared for the EPA ORD and OECA.

[90] Stafford, Susan. 2002. "The Effect of Punishment on Firm Compliance with Hazardous Waste Regulations." *Journal of Environmental Economics and Management*. 44, pgs. 290-308.

[91] Shimshack and Ward. 2005. "Regulator Reputation, Enforcement, & Environmental Compliance." *Journal of Environmental Economics and Management* 3.50: pp. 519-540.

8C. More Specific Standards Result in Reduced Liability, Less Uncertainty for the Regulated Entity, and Lower Legal & Credit Costs

While more specific regulatory requirements are believed to improve environmental compliance, more specific standards are also expected to reduce facilities' liability, resulting in lower legal and other costs. For example, one of the most frequently identified root causes of noncompliance was where the facility was unaware of the applicability of a regulation.[92] In another study of pulp and paper mills in Canada, Laplante, et al., found that the presence of clear and strong standards accompanied with a significant and credible penalty system does send appropriate signals to the regulated community which responds by lowering pollution emissions.[93]

Clearer regulatory requirements should result in higher compliance rates. In turn, higher levels of compliance should likely lower legal costs and potentially more favorable investment and credit markets. For example analysts have examined the reaction of capital markets to the release of information pertaining to environmental performance. Several studies have shown that capital markets react significantly to the release of information: upward when the information reveals a superior performance, and downward when a poor performance is revealed.[94] Moreover, in recent years, the importance of investor interest has increased and suppliers of financing, industrial equipment, and engineering services are increasingly reluctant to do business with firms experiencing problems with environmental regulations.[95]

Options 3A, 3E, 4A, 4B, 7C, 8A and 8D would all reduce uncertainty for regulated entities.

- Option 3A, codifying the word "contained" would create a specific standard with which entities must comply, therefore reducing regulatory uncertainty.
- Option 3E, by removing the tolling provision from generator exclusion, would eliminate a somewhat complicated provision from the regulated entity perspective and, therefore, would make it easier for them to comply with the provisions.
- Option 4A applies the same codified standards of legitimate recycling to all recycled hazardous secondary materials. Both of these measures should make compliance more straight-forward and publishing the legitimacy determinations online should increase transparency and ensure consistency across state programs. Furthermore, Option 4A, which codifies the legitimacy definition, should provide greater clarity and less uncertainty by having the same definition throughout the program.
- Option 4B requires all four legitimacy factors be met to be considered a legitimate recycler, unless the facility submits a petition and receives approval from the implementing agency. The state agencies will make these legitimacy determinations public and accessible on the internet.

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[92] EPA, (1999). "EPA/CMA Root Cause Analysis Pilot Project: An Industry Survey." EPA-305-R-99-001.

[93] Laplante, Lanoie & Foulon. 2000. *Incentives for Pollution Control - Regulation and Public Disclosure*; No 2291, Policy Research Working Paper Series, The World Bank.

[94] *Ibid.*

[95] For a thorough review of these studies see Cohen, M. 1999. *Monitoring and Enforcement of Environmental Policy*. International Yearbook of Environmental and Resource Economics 1999/2000. Tom Tietenberg and Henk Folmer, ed.; Edward Elgar Publishers.

- Option 7A creates a "*contained*" standard that should provide greater clarity than the undefined term.
- Option 8A adds regulatory definition of "contained" that specifies performance-based storage standards, but does not require full Subtitle C tank and container standards. The performance-based standard both reduces uncertainty and maintains a workable standard.
- Option 8D reduces regulatory uncertainty by clearly defining terms.

APPENDICES

APPENDIX A

2007 Count of 6-Digit NAICS Code Industries Potentially Affected

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
1	111120		
2	113110		
3	115114		
4	211111		
5	211112		
6	212210		
7	212220		
8	212221	212221	Overlap
9	212222	212222	Overlap
10		212231	
11	212234	212234	Overlap
12	212299	212299	Overlap
13	212312		
14	212391		
15	213111		
16	213112		
17	213114		
18	221110		
19	221111		
20	221112		
21	221113		
22	221119		
23	221120		
24	221121		
25	221122		
26	221210		
27	221310		
28	221320		
29	221330		
30	233310		
31	234110		
32	235910		

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
33	235990		
34	236118		
35	236220		
36	237310		
37	237990		
38	238320		
39		311111	
40		311119	
41	311221	311221	Overlap
42		311222	
43		311223	
44	311225	311225	Overlap
45		311311	
46	311312		
47		311313	
48		311411	
49		311412	
50	311423		
51		311511	
52		311512	
53		311513	
54	311514	311514	Overlap
55		311520	
56		311611	
57		311612	
58		311613	
59		311615	
60		311712	
61		311812	
62	311822		
63		311919	
64		311920	

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
65	311930	311930	Overlap
66	311942	311942	Overlap
67	311999	311999	Overlap
68	312111		
69		312113	
70	312120	312120	Overlap
71		312140	
72	312221	312221	Overlap
73		312229	
74	313111		
75	313112		
76		313210	
77	313221		
78		313230	
79	313310		
80	313311	313311	Overlap
81	313312	313312	Overlap
82	313320	313320	Overlap
83		314110	
84	314912		
85		314991	
86		314992	
87	314999	314999	Overlap
88		315992	
89	316110	316110	Overlap
90		316211	
91		316213	
92	321110		
93	321113	321113	Overlap
94	321114	321114	Overlap
95	321210		
96		321211	

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
97		321212	
98		321213	
99	321219	321219	Overlap
100	321910		
101	321911	321911	Overlap
102		321912	
103	321918	321918	Overlap
104		321991	
105	321992		
106	321999	321999	Overlap
107	322110	322110	Overlap
108	322120		
109	322121	322121	Overlap
110		322122	
111	322130	322130	Overlap
112	322210		
113	322211	322211	Overlap
114	322212	322212	Overlap
115	322221	322221	Overlap
116	322222	322222	Overlap
117	322223		
118	322224		
119	322225		
120	322226		
121		322231	
122	322232		
123	322291	322291	Overlap
124	322299	322299	Overlap
125	323110	323110	Overlap
126	323111	323111	Overlap
127	323112	323112	Overlap
128	323113	323113	Overlap
129		323115	
130	323119	323119	Overlap
131		323121	
132	323122	323122	Overlap
133	324110	324110	Overlap
134	324121	324121	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
135	324122	324122	Overlap
136	324191	324191	Overlap
137	324199	324199	Overlap
138	325110	325110	Overlap
139	325120	325120	Overlap
140	325131	325131	Overlap
141	325132	325132	Overlap
142	325180		
143	325181	325181	Overlap
144	325188	325188	Overlap
145	325190		
146	325191	325191	Overlap
147	325192	325192	Overlap
148		325193	
149	325199	325199	Overlap
150	325210		
151	325211	325211	Overlap
152	325212	325212	Overlap
153	325220		
154	325221	325221	Overlap
155	325222	325222	Overlap
156	325310		
157	325311	325311	Overlap
158	325312	325312	Overlap
159		325314	
160	325320	325320	Overlap
161	325410		
162	325411	325411	Overlap
163	325412	325412	Overlap
164	325413	325413	Overlap
165	325414	325414	Overlap
166	325510	325510	Overlap
167	325520	325520	Overlap
168	325610		
169	325611	325611	Overlap
170	325612	325612	Overlap
171	325613	325613	Overlap
172	325620	325620	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
173	325910	325910	Overlap
174	325920	325920	Overlap
175	325990		
176	325991	325991	Overlap
177	325992	325992	Overlap
178	325998	325998	Overlap
179	326110		
180	326111		
181	326112	326112	Overlap
182	326113	326113	Overlap
183	326121	326121	Overlap
184	326122	326122	Overlap
185	326130	326130	Overlap
186	326140	326140	Overlap
187	326150	326150	Overlap
188		326160	
189	326190		
190	326191	326191	Overlap
191	326192	326192	Overlap
192	326199	326199	Overlap
193	326211	326211	Overlap
194	326220	326220	Overlap
195	326290		
196	326291	326291	Overlap
197	326299	326299	Overlap
198	327111	327111	Overlap
199	327112	327112	Overlap
200	327113	327113	Overlap
201		327121	
202		327122	
203		327123	
204		327124	
205	327125	327125	Overlap
206	327210		
207	327211	327211	Overlap
208	327212	327212	Overlap
209	327213	327213	Overlap
210	327215	327215	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
211	327310	327310	Overlap
212	327320	327320	Overlap
213		327331	
214		327332	
215		327390	
216	327420	327420	Overlap
217	327910	327910	Overlap
218		327991	
219		327992	
220	327993	327993	Overlap
221	327999	327999	Overlap
222	331110		
223	331111	331111	Overlap
224	331112	331112	Overlap
225	331210	331210	Overlap
226	331220		
227	331221	331221	Overlap
228	331222	331222	Overlap
229		331311	
230	331312	331312	Overlap
231	331314	331314	Overlap
232	331315	331315	Overlap
233	331316	331316	Overlap
234	331319	331319	Overlap
235	331411	331411	Overlap
236	331419	331419	Overlap
237	331421	331421	Overlap
238	331422	331422	Overlap
239	331423	331423	Overlap
240	331491	331491	Overlap
241	331492	331492	Overlap
242	331510		
243	331511	331511	Overlap
244	331512	331512	Overlap
245	331513	331513	Overlap
246	331520		
247	331521	331521	Overlap
248	331522	331522	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
249	331524	331524	Overlap
250	331525	331525	Overlap
251	331528	331528	Overlap
252	332111	332111	Overlap
253	332112	332112	Overlap
254	332114	332114	Overlap
255	332115	332115	Overlap
256	332116	332116	Overlap
257	332117	332117	Overlap
258	332211	332211	Overlap
259	332212	332212	Overlap
260	332213	332213	Overlap
261	332214	332214	Overlap
262		332311	
263	332312	332312	Overlap
264	332313	332313	Overlap
265	332321	332321	Overlap
266	332322	332322	Overlap
267	332323	332323	Overlap
268	332410	332410	Overlap
269	332420	332420	Overlap
270	332430		
271	332431	332431	Overlap
272	332439	332439	Overlap
273	332510	332510	Overlap
274		332611	
275	332612	332612	Overlap
276	332618	332618	Overlap
277	332710	332710	Overlap
278	332721	332721	Overlap
279	332722	332722	Overlap
280	332810		
281	332811	332811	Overlap
282	332812	332812	Overlap
283	332813	332813	Overlap
284	332911	332911	Overlap
285	332912	332912	Overlap
286	332913	332913	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
287	332919	332919	Overlap
288	332990		
289	332991	332991	Overlap
290	332992	332992	Overlap
291	332993	332993	Overlap
292	332994	332994	Overlap
293	332995	332995	Overlap
294	332996	332996	Overlap
295		332997	
296		332998	
297	332999	332999	Overlap
298	333111	333111	Overlap
299	333112	333112	Overlap
300	333120	333120	Overlap
301	333131	333131	Overlap
302	333132	333132	Overlap
303	333210	333210	Overlap
304	333220	333220	Overlap
305	333291	333291	Overlap
306	333292	333292	Overlap
307	333293	333293	Overlap
308	333294	333294	Overlap
309	333295	333295	Overlap
310	333298	333298	Overlap
311	333311		
312	333312	333312	Overlap
313		333313	
314	333314	333314	Overlap
315	333315	333315	Overlap
316	333319	333319	Overlap
317		333411	
318	333412	333412	Overlap
319	333414	333414	Overlap
320	333415	333415	Overlap
321	333511	333511	Overlap
322	333512	333512	Overlap
323	333513	333513	Overlap
324	333514	333514	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
325	333515	333515	Overlap
326	333516	333516	Overlap
327		333518	
328	333610		
329	333611	333611	Overlap
330	333612	333612	Overlap
331	333613	333613	Overlap
332	333618	333618	Overlap
333	333911	333911	Overlap
334	333912	333912	Overlap
335	333913		
336	333921	333921	Overlap
337		333922	
338	333923	333923	Overlap
339	333924	333924	Overlap
340	333991	333991	Overlap
341	333992	333992	Overlap
342		333993	
343		333994	
344	333995	333995	Overlap
345	333996	333996	Overlap
346		333997	
347	333999	333999	Overlap
348	334110		
349	334111	334111	Overlap
350	334112	334112	Overlap
351	334113		
352	334119	334119	Overlap
353		334210	
354	334220	334220	Overlap
355	334290	334290	Overlap
356	334310	334310	Overlap
357	334410		
358	334411	334411	Overlap
359	334412	334412	Overlap
360	334413	334413	Overlap
361	334414	334414	Overlap
362	334415	334415	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
363		334416	
364	334417	334417	Overlap
365	334418	334418	Overlap
366	334419	334419	Overlap
367	334510	334510	Overlap
368	334511	334511	Overlap
369	334512	334512	Overlap
370	334513	334513	Overlap
371	334514	334514	Overlap
372	334515	334515	Overlap
373	334516	334516	Overlap
374	334517	334517	Overlap
375	334519	334519	Overlap
376	334612	334612	Overlap
377	334613	334613	Overlap
378	335110	335110	Overlap
379	335121	335121	Overlap
380	335122	335122	Overlap
381	335129	335129	Overlap
382	335211		
383		335212	
384		335221	
385	335222	335222	Overlap
386	335224	335224	Overlap
387		335228	
388	335311	335311	Overlap
389	335312	335312	Overlap
390	335313	335313	Overlap
391	335314	335314	Overlap
392	335910		
393	335911	335911	Overlap
394	335912	335912	Overlap
395	335921	335921	Overlap
396	335929	335929	Overlap
397	335931	335931	Overlap
398		335932	
399	335991	335991	Overlap
400	335999	335999	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
401	336110		
402	336111	336111	Overlap
403	336112	336112	Overlap
404	336120	336120	Overlap
405	336210		
406	336211	336211	Overlap
407	336212	336212	Overlap
408	336213	336213	Overlap
409	336214	336214	Overlap
410	336310		
411	336311	336311	Overlap
412	336312	336312	Overlap
413	336321	336321	Overlap
414	336322	336322	Overlap
415	336330	336330	Overlap
416	336340	336340	Overlap
417	336350	336350	Overlap
418	336360	336360	Overlap
419	336370	336370	Overlap
420	336390		
421	336391	336391	Overlap
422	336399	336399	Overlap
423	336410		
424	336411	336411	Overlap
425	336412	336412	Overlap
426	336413	336413	Overlap
427	336414	336414	Overlap
428	336415	336415	Overlap
429	336419	336419	Overlap
430	336510	336510	Overlap
431	336610		
432	336611	336611	Overlap
433	336612	336612	Overlap
434	336990		
435	336991	336991	Overlap
436		336992	
437	336999	336999	Overlap
438	337110	337110	Overlap

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
439	337121	337121	Overlap
440	337122	337122	Overlap
441	337124	337124	Overlap
442	337127	337127	Overlap
443	337211	337211	Overlap
444		337212	
445	337214	337214	Overlap
446	337215	337215	Overlap
447		337920	
448	339110		
449	339111	339111	Overlap
450	339112	339112	Overlap
451	339113	339113	Overlap
452	339114	339114	Overlap
453	339115	339115	Overlap
454	339910		
455	339911	339911	Overlap
456	339912	339912	Overlap
457	339913		
458	339914	339914	Overlap
459	339920	339920	Overlap
460	339941	339941	Overlap
461	339942		
462		339943	
463		339944	
464	339950	339950	Overlap
465	339990		
466	339991	339991	Overlap
467	339992	339992	Overlap
468	339993	339993	Overlap
469	339995	339995	Overlap
470	339999	339999	Overlap
471	421120		
472	421490		
473	421620		
474	421830		
475	421930		
476	422690		

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
477	422720		
478	423110		
479	423120		
480	423310		
481	423320		
482	423410		
483	423450		
484	423490		
485	423690		
486	423710		
487	423830		
488	423930		
489	423990		
490	424210		
491	424610		
492	424690		
493	424710		
494	424950		
495	425120		
496	446110		
497	447110		
498	447190		
499	452990		
500	453998		
501	454110		
502	454111		
503	481111		
504	481112		
505	481211		
506	482110		
507	482111		
508	483112		
509	483210		
510	483211		
511	484110		
512	484121		
513	484122		
514	484220		

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
515	484230		
516	485111		
517	485112		
518	485113		
519	485990		
520	486110		
521	486210		
522	486910		
523	488111		
524	488119		
525	488190		
526	488210		
527	488320		
528	488390		
529	488490		
530	488990		
531	488999		
532	492110		
533	493110		
534	493190		
535	511110		
536	511140		
537	512110		
538	512120		
539	512191		
540	512199		
541	531120		
542	531312		
543	531390		
544	532120		
545	532299		
546	532411		
547	532412		
548	541330		
549	541380		
550	541420		
551	541512		
552	541620		

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
553	541710		
554	541720		
555	541940		
556	541990		
557	551114		
558	561210		
559	561439		
560	561499		
561	561790		
562	561990		
563	562110		
564	562111		
565	562112		
566	562119		
567	562210		
568	562211		
569	562212		
570	562213		
571	562219		
572	562910		
573	562920	562920	Overlap
574	562998		
575	611110		
576	611210		
577	611310		
578	611519		

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
579	611610		
580	611699		
581	611710		
582	621111		
583	621112		
584	621491		
585	621511		
586	621512		
587	622110		
588	622210		
589	622310		
590	711212		
591	712190		
592	713110		
593	713930		
594	713990		
595	811111		
596	811120		
597	811121		
598	811191		
599	811211		
600	811219		
601	811310		
602	811490		
603	812310		
604	812320		

2007 Count of Affected Industries			
2007 non-duplicative count	2007 BR NAICS code	2007 TRI NAICS code	Code overlap count
605	812331		
606	812332		
607	812921		
608	812922		
609	814110		
610	921120		
611	921140		
612	921190		
613	922120		
614	922140		
615	922190		
616	923110		
617	924110		
618	926110		
619	926120		
620	926130		
621	927110		
622	928110		
Count =	**546**	**378**	**302 (49% overlap)**

Note: Jointly-shaded NAICS codes indicate those NAICS codes specifically queried in the TRI database to represent the 32 pre-2008 RCRA industrial recycling exclusions.

APPENDIX B

Calculation of Cost Adjustment Factors

The five Exhibits below (i.e., Appendix Exhibits B1 to B7) present five examples of how the cost adjustment factors applied in Chapter 5 of this RIA were calculated. The cost adjustment factors are used to modify the cost estimates assuming a 100% rate of adoption (i.e., rate of 2008 DSW exclusion notification) to reflect the "13% base case" or the "74% upper bound" adoption scenarios applied in this RIA, and applying either a 7%, 3%, or 0% discount rate. The following information is presented in the Exhibits:

- The first column in each exhibit represents the year of the analysis up through 2064.
- The second column in each exhibit is a count of the year included in the analysis.
- The third column indicates the number of facilities operating under a DSW exclusion notification in that year.
    - Exhibit B1: The lower bound assumes that 21 facilities file a DSW exclusion notification per year under Exclusions 1 and 2 of the 2008 DSW rule for the baseline savings adjustment factor beginning in 2009.
    - Exhibit B2: The lower bound assumes that 21 facilities x (4,656 Exclusion 2 facilities/4,933 Exclusion 1&2 facilities) = 19.8 facilities file a DSW exclusion notification per year under Exclusion 2 of the 2008 DSW rule for the baseline savings adjustment factor beginning in 2009.
    - Exhibit B3: The lower-bound count of facilities increases by 18.9 facilities per year because Option 2, Requirement 2C, (reclamation plan) only affects transfer-based exclusions under Exclusion 2 of the 2008 DSW final rule which represent approximately 90% of the affected facilities (4,455 Exclusion 2 facilities minus re-manufacturing facilities/4933 Exclusion 1 and 2 facilities x 21 facilities notifying per year).
    - Exhibit B4: The count of facilities includes 246 (5%) of the total of 4,933 notifying and non-notifying facilities filing a legitimacy petition.
    - Exhibit B5: The count of facilities includes 4,686 (95%) of the total of 4,933 facilities submitting legitimacy documentation.
    - Exhibit B6: The upper bound estimate of facilities that file a DSW exclusion notification per year under Exclusions 1 and 2 of the 2008 DSW rule for the baseline savings adjustment factor. 21 facilities are assumed to adopt per year beginning in 2009 through 2014. Between 2015 and 2018, 25% of the 3,655 facilities in 44 states assumed to adopt the rule notify each of these years.
    - Exhibit B7: The upper-bound count of facilities increases by 18.9 facilities per year in years 2009 through 2014 because Option 2, Requirement 2C, (reclamation plan) only affects transfer-based exclusions under Exclusion 2 of the 2008 DSW final rule which represent approximately 90% of the affected facilities (4,455 Exclusion 2 facilities minus re-manufacturing facilities/4933 Exclusion 1 and 2 facilities x 21 facilities notifying per year). Between 2015 and 2018, 25% of the 3,655 facilities in 44 states assumed to adopt the rule notify each of these years times of which 90% are Exclusion 2 affected facilities.
- The 4^{th} column in each exhibit is either the aggregate savings or costs for each year which is calculated by multiplying the number of notifying facilities by the average savings/facility or average costs/facility.
- The 5^{th}, 6^{th} and 7^{th} columns in each exhibit estimate the aggregate or total present worth savings or costs over the 2011 through 2064

period of analysis using either a 7%, 3%, or 0% discount rate.

- The bottom rows of each exhibit present the following numbers/factors that are used in the cost analysis in Chapter 5 of this RIA:
  - Total present worth savings or costs are annualized to create an annual baseline cost savings estimate or an annual compliance cost estimate over the period of analysis (labeled as "Annualized Savings" or "Annualized Costs").
  - "Average Number of Facilities" affected per year over the 50-year period of analysis (2015-2064) is calculated.
  - "Percent of Facilities Notify" factor is derived by dividing the "Average Number of Facilities" by the total number of "Exclusion 1 and/or 2 Affected Facilities" multiplied by 100%.

Appendix Exhibit B1
Lower Bound – Exclusion 1 & 2 Baseline Savings Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying Facilities	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Savings @ 7%	Aggregate PV Savings @ 3%	Aggregate PV Savings @ 0%
2011	-4	63	$0	$0	$0	$0
2012	-3	84	$0	$0	$0	$0
2013	-2	105	$0	$0	$0	$0
2014	-1	126	$0	$0	$0	$0
2015	1	147	$2,871,184	$2,047,115	$2,476,709	$2,871,184
2016	2	168	$3,281,353	$2,186,504	$2,748,082	$3,281,353
2017	3	189	$3,691,523	$2,298,895	$3,001,546	$3,691,523
2018	4	210	$4,101,692	$2,387,222	$3,237,913	$4,101,692
2019	5	231	$4,511,861	$2,454,153	$3,457,966	$4,511,861
2020	6	252	$4,922,030	$2,502,111	$3,662,453	$4,922,030
2021	7	273	$5,332,199	$2,533,290	$3,852,094	$5,332,199
2022	8	294	$5,742,369	$2,549,680	$4,027,582	$5,742,369
2023	9	315	$6,152,538	$2,553,084	$4,189,579	$6,152,538
2024	10	336	$6,562,707	$2,545,131	$4,338,722	$6,562,707
2025	11	357	$6,972,876	$2,527,291	$4,475,624	$6,972,876
2026	12	378	$7,383,045	$2,500,893	$4,600,870	$7,383,045
2027	13	399	$7,793,214	$2,467,132	$4,715,023	$7,793,214
2028	14	420	$8,203,384	$2,427,085	$4,818,623	$8,203,384
2029	15	441	$8,613,553	$2,381,719	$4,912,189	$8,613,553
2030	16	462	$9,023,722	$2,331,901	$4,996,216	$9,023,722
2031	17	483	$9,433,891	$2,278,408	$5,071,181	$9,433,891
2032	18	504	$9,844,060	$2,221,934	$5,137,541	$9,844,060
2033	19	525	$10,254,230	$2,163,098	$5,195,734	$10,254,230
2034	20	546	$10,664,399	$2,102,450	$5,246,178	$10,664,399
2035	21	567	$11,074,568	$2,040,480	$5,289,275	$11,074,568

Appendix Exhibit B1
Lower Bound – Exclusion 1 & 2 Baseline Savings Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying Facilities	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Savings @ 7%	Aggregate PV Savings @ 3%	Aggregate PV Savings @ 0%
2036	22	588	$11,484,737	$1,977,620	$5,325,412	$11,484,737
2037	23	609	$11,894,906	$1,914,252	$5,354,957	$11,894,906
2038	24	630	$12,305,076	$1,850,711	$5,378,262	$12,305,076
2039	25	651	$12,715,245	$1,787,291	$5,395,668	$12,715,245
2040	26	672	$13,125,414	$1,724,248	$5,407,497	$13,125,414
2041	27	693	$13,535,583	$1,661,804	$5,414,059	$13,535,583
2042	28	714	$13,945,752	$1,600,151	$5,415,652	$13,945,752
2043	29	735	$14,355,921	$1,539,453	$5,412,559	$14,355,921
2044	30	756	$14,766,091	$1,479,848	$5,405,052	$14,766,091
2045	31	777	$15,176,260	$1,421,453	$5,393,391	$15,176,260
2046	32	798	$15,586,429	$1,364,365	$5,377,823	$15,586,429
2047	33	819	$15,996,598	$1,308,663	$5,358,587	$15,996,598
2048	34	840	$16,406,767	$1,254,410	$5,335,910	$16,406,767
2049	35	861	$16,816,937	$1,201,654	$5,310,007	$16,816,937
2050	36	882	$17,227,106	$1,150,433	$5,281,087	$17,227,106
2051	37	903	$17,637,275	$1,100,770	$5,249,347	$17,637,275
2052	38	924	$18,047,444	$1,052,682	$5,214,975	$18,047,444
2053	39	945	$18,457,613	$1,006,174	$5,178,153	$18,457,613
2054	40	966	$18,867,782	$961,246	$5,139,052	$18,867,782
2055	41	987	$19,277,952	$917,891	$5,097,835	$19,277,952
2056	42	1,008	$19,688,121	$876,094	$5,054,660	$19,688,121
2057	43	1,029	$20,098,290	$835,837	$5,009,675	$20,098,290
2058	44	1,050	$20,508,459	$797,098	$4,963,023	$20,508,459
2059	45	1,071	$20,918,628	$759,850	$4,914,838	$20,918,628
2060	46	1,092	$21,328,798	$724,065	$4,865,250	$21,328,798
2061	47	1,113	$21,738,967	$689,710	$4,814,381	$21,738,967
2062	48	1,134	$22,149,136	$656,750	$4,762,348	$22,149,136
2063	49	1,155	$22,559,305	$625,152	$4,709,262	$22,559,305
2064	50	1,176	$22,969,474	$594,877	$4,655,228	$22,969,474
Average annual =		662	$19,532			
Total Present Worth Cost Savings				$84,334,127	$239,645,048	$646,016,464
Annualized Savings				$6,110,851	$9,315,003	$12,920,329
Exclusion 1 & 2 Total Annual Cost Savings if 100% Adoption (Average Savings/Facility x Exclusion 1 & 2 Affected Facilities)				$96,350,694	$96,350,694	$96,350,694
Exclusion 1 & 2 Affected Facilities		4,933				

Appendix Exhibit B1 Lower Bound – Exclusion 1 & 2 Baseline Savings Adjustment Factor Calculation						
Year	Analysis Year	Number of Notifying Facilities	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Savings @ 7%	Aggregate PV Savings @ 3%	Aggregate PV Savings @ 0%
Percent of Facilities Notify		13%	Cost Adjustment Factor (Annualized Savings/Total Annual Cost Savings 100% Adoption	**6.3423%**	**9.6678%**	**13.4097%**

Appendix Exhibit B2 Lower Bound – Exclusion 2 Baseline Savings Adjustment Factor Calculation						
Year	Analysis Year	Number of Notifying Facilities	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Savings @ 7%	Aggregate PV Savings @ 3%	Aggregate PV Savings @ 0%
2011	-4	59	$0	$0	$0	$0
2012	-3	79	$0	$0	$0	$0
2013	-2	99	$0	$0	$0	$0
2014	-1	119	$0	$0	$0	$0
2015	1	139	$2,664,712	$1,899,903	$2,298,604	$2,664,712
2016	2	159	$3,045,386	$2,029,269	$2,550,462	$3,045,386
2017	3	178	$3,426,059	$2,133,577	$2,785,699	$3,426,059
2018	4	198	$3,806,732	$2,215,553	$3,005,069	$3,806,732
2019	5	218	$4,187,405	$2,277,671	$3,209,297	$4,187,405
2020	6	238	$4,568,078	$2,322,179	$3,399,079	$4,568,078
2021	7	258	$4,948,752	$2,351,116	$3,575,083	$4,948,752
2022	8	277	$5,329,425	$2,366,328	$3,737,951	$5,329,425
2023	9	297	$5,710,098	$2,369,488	$3,888,299	$5,710,098
2024	10	317	$6,090,771	$2,362,106	$4,026,717	$6,090,771
2025	11	338	$6,471,444	$2,345,549	$4,153,774	$6,471,444
2026	12	358	$6,852,118	$2,321,049	$4,270,013	$6,852,118
2027	13	378	$7,232,791	$2,289,716	$4,375,957	$7,232,791
2028	14	396	$7,613,464	$2,252,549	$4,472,108	$7,613,464
2029	15	416	$7,994,137	$2,210,446	$4,558,945	$7,994,137
2030	16	436	$8,374,810	$2,164,210	$4,636,929	$8,374,810
2031	17	456	$8,755,483	$2,114,564	$4,706,504	$8,755,483
2032	18	476	$9,136,157	$2,062,151	$4,768,092	$9,136,157
2033	19	496	$9,516,830	$2,007,546	$4,822,099	$9,516,830
2034	20	515	$9,897,503	$1,951,259	$4,868,916	$9,897,503
2035	21	535	$10,278,176	$1,893,746	$4,908,914	$10,278,176
2036	22	555	$10,658,849	$1,835,406	$4,942,452	$10,658,849
2037	23	575	$11,039,523	$1,776,594	$4,969,872	$11,039,523
2038	24	595	$11,420,196	$1,717,623	$4,991,502	$11,420,196
2039	25	614	$11,800,869	$1,658,763	$5,007,656	$11,800,869
2040	26	634	$12,181,542	$1,600,254	$5,018,634	$12,181,542
2041	27	654	$12,562,215	$1,542,301	$5,024,725	$12,562,215
2042	28	674	$12,942,889	$1,485,082	$5,026,203	$12,942,889
2043	29	694	$13,323,562	$1,428,748	$5,023,333	$13,323,562
2044	30	714	$13,704,235	$1,373,429	$5,016,365	$13,704,235
2045	31	733	$14,084,908	$1,319,234	$5,005,543	$14,084,908

Appendix Exhibit B2 Lower Bound – Exclusion 2 Baseline Savings Adjustment Factor Calculation						
Year	Analysis Year	Number of Notifying Facilities	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Savings @ 7%	Aggregate PV Savings @ 3%	Aggregate PV Savings @ 0%
2046	32	753	$14,465,581	$1,266,251	$4,991,095	$14,465,581
2047	33	773	$14,846,255	$1,214,555	$4,973,242	$14,846,255
2048	34	793	$15,226,928	$1,164,203	$4,952,195	$15,226,928
2049	35	813	$15,607,601	$1,115,241	$4,928,155	$15,607,601
2050	36	832	$15,988,274	$1,067,703	$4,901,315	$15,988,274
2051	37	852	$16,368,947	$1,021,612	$4,871,857	$16,368,947
2052	38	872	$16,749,621	$976,981	$4,839,957	$16,749,621
2053	39	892	$17,130,294	$933,818	$4,805,783	$17,130,294
2054	40	912	$17,510,967	$892,121	$4,769,493	$17,510,967
2055	41	932	$17,891,640	$851,883	$4,731,241	$17,891,640
2056	42	951	$18,272,313	$813,092	$4,691,170	$18,272,313
2057	43	971	$18,652,987	$775,730	$4,649,420	$18,652,987
2058	44	991	$19,033,660	$739,777	$4,606,123	$19,033,660
2059	45	1,011	$19,414,333	$705,208	$4,561,403	$19,414,333
2060	46	1,031	$19,795,006	$671,996	$4,515,381	$19,795,006
2061	47	1,051	$20,175,679	$640,111	$4,468,170	$20,175,679
2062	48	1,070	$20,556,353	$609,522	$4,419,879	$20,556,353
2063	49	1,090	$20,937,026	$580,196	$4,370,610	$20,937,026
2064	50	1,110	$21,317,699	$552,098	$4,320,462	$21,317,699
Average annual =		624	$19,206			
Total Present Worth Cost Savings				$78,269,511	$222,411,750	$599,560,281
Annualized Savings				$5,671,409	$8,645,145	$11,991,206
Exclusion 2 Total Annual Cost Savings if 100% Adoption (Average Savings/Facility x Exclusion 2 Affected Facilities)				$89,421,946	$89,421,946	$89,421,946
Exclusion 2 Affected Facilities		4,656				
% Facilities Notify		13%	Cost Adjustment Factor (Annualized Savings/Total Annual Cost Savings 100% Adoption	**6.3423%**	**9.6678%**	**13.4097%**

Appendix Exhibit B3 Lower Bound – Option 2 Requirement 2C Compliance Cost Adjustment Factor Calculation						
Year	Analysis Year	Number of Notifying Facilities (Number of Annual Notifiers x (4,656 Exclusion 2 facilities – 201 Re-manufacturing Exclusion facilities)/ 4,933 Excl. 1 & 2 facilities))	Aggregate Annual Costs (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2011	-4	57	$0	$0	$0	$0
2012	-3	76	$0	$0	$0	$0
2013	-2	95	$0	$0	$0	$0
2014	-1	114	$0	$0	$0	$0
2015	1	133	$22,571	$16,093	$19,470	$22,571
2016	2	152	$25,796	$17,189	$21,603	$25,796
2017	3	171	$29,020	$18,072	$23,596	$29,020
2018	4	190	$32,245	$18,767	$25,454	$32,245
2019	5	209	$35,469	$19,293	$27,184	$35,469
2020	6	228	$38,693	$19,670	$28,792	$38,693
2021	7	247	$41,918	$19,915	$30,282	$41,918
2022	8	266	$45,142	$20,044	$31,662	$45,142
2023	9	285	$48,367	$20,070	$32,935	$48,367
2024	10	303	$51,591	$20,008	$34,108	$51,591
2025	11	322	$54,816	$19,868	$35,184	$54,816
2026	12	341	$58,040	$19,660	$36,169	$58,040
2027	13	360	$61,265	$19,395	$37,066	$61,265
2028	14	379	$64,489	$19,080	$37,881	$64,489
2029	15	398	$67,713	$18,723	$38,616	$67,713
2030	16	417	$70,938	$18,332	$39,277	$70,938
2031	17	436	$74,162	$17,911	$39,866	$74,162
2032	18	455	$77,387	$17,467	$40,388	$77,387
2033	19	474	$80,611	$17,005	$40,845	$80,611
2034	20	493	$83,836	$16,528	$41,242	$83,836
2035	21	512	$87,060	$16,041	$41,580	$87,060
2036	22	531	$90,285	$15,547	$41,865	$90,285
2037	23	550	$93,509	$15,048	$42,097	$93,509
2038	24	569	$96,734	$14,549	$42,280	$96,734
2039	25	588	$99,958	$14,050	$42,417	$99,958
2040	26	607	$103,182	$13,555	$42,510	$103,182
2041	27	626	$106,407	$13,064	$42,561	$106,407
2042	28	645	$109,631	$12,579	$42,574	$109,631
2043	29	664	$112,856	$12,102	$42,550	$112,856
2044	30	683	$116,080	$11,633	$42,491	$116,080

Appendix Exhibit B3
Lower Bound – Option 2 Requirement 2C Compliance Cost Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying Facilities (Number of Annual Notifiers x (4,656 Exclusion 2 facilities – 201 Re-manufacturing Exclusion facilities)/ 4,933 Excl. 1 & 2 facilities))	Aggregate Annual Costs (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2045	31	703	$119,305	$11,174	$42,399	$119,305
2046	32	722	$122,529	$10,726	$42,277	$122,529
2047	33	740	$125,754	$10,288	$42,125	$125,754
2048	34	759	$128,978	$9,861	$41,947	$128,978
2049	35	778	$132,203	$9,447	$41,743	$132,203
2050	36	796	$135,427	$9,044	$41,516	$135,427
2051	37	816	$138,651	$8,653	$41,267	$138,651
2052	38	834	$141,876	$8,275	$40,996	$141,876
2053	39	853	$145,100	$7,910	$40,707	$145,100
2054	40	872	$148,325	$7,557	$40,399	$148,325
2055	41	891	$151,549	$7,216	$40,075	$151,549
2056	42	910	$154,774	$6,887	$39,736	$154,774
2057	43	929	$157,998	$6,571	$39,382	$157,998
2058	44	948	$161,223	$6,266	$39,016	$161,223
2059	45	967	$164,447	$5,973	$38,637	$164,447
2060	46	986	$167,671	$5,692	$38,247	$167,671
2061	47	1,005	$170,896	$5,422	$37,847	$170,896
2062	48	1,024	$174,120	$5,163	$37,438	$174,120
2063	49	1,043	$177,345	$4,914	$37,021	$177,345
2064	50	1,062	$180,569	$4,676	$36,596	$180,569
Average annual =		597	$170			
Total Present Worth Costs				$662,974	$1,883,915	$5,078,512
Annualized Costs				$48,039	$73,228	$101,570
Exclusion 2 minus Re-manufacturing Exclusion Total Annual Cost Savings if 100% Adoption (Average Savings/Facility x (Exclusion 2 Affected Facilities – Re-manufacturing exclusion facilities))				$757,439	$757,439	$757,439
Exclusion 2 Affected Facilities minus Re-manufacturing exclusion facilities		4,455				
% Facilities Notify		**13%**	Cost Adj Factor (Annualized Costs/Total Annual Costs is 100% Adoption)	**6.3423%**	**9.6678%**	**13.4097%**

Appendix Exhibit B4 Lower Bound -- Option 4B Compliance Cost Adjustment Factor Calculation						
Year	Analysis Year	Number of Notifying& RCRA Facilities (5% Submit Legitimacy Petition)	Aggregate Annual Costs (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2011	-4	247	$0	$0	$0	$0
2012	-3	247	$0	$0	$0	$0
2013	-2	247	$0	$0	$0	$0
2014	-1	247	$0	$0	$0	$0
2015	1	247	$523,638	$373,347	$451,695	$523,638
2016	2	247	$523,638	$348,922	$438,539	$523,638
2017	3	247	$523,638	$326,095	$425,766	$523,638
2018	4	247	$523,638	$304,762	$413,365	$523,638
2019	5	247	$523,638	$284,824	$401,325	$523,638
2020	6	247	$523,638	$266,191	$389,636	$523,638
2021	7	247	$523,638	$248,777	$378,287	$523,638
2022	8	247	$523,638	$232,502	$367,269	$523,638
2023	9	247	$523,638	$217,291	$356,572	$523,638
2024	10	247	$523,638	$203,076	$346,186	$523,638
2025	11	247	$523,638	$189,790	$336,103	$523,638
2026	12	247	$523,638	$177,374	$326,314	$523,638
2027	13	247	$523,638	$165,770	$316,810	$523,638
2028	14	247	$523,638	$154,926	$307,582	$523,638
2029	15	247	$523,638	$144,790	$298,623	$523,638
2030	16	247	$523,638	$135,318	$289,926	$523,638
2031	17	247	$523,638	$126,465	$281,481	$523,638
2032	18	247	$523,638	$118,192	$273,283	$523,638
2033	19	247	$523,638	$110,460	$265,323	$523,638
2034	20	247	$523,638	$103,233	$257,595	$523,638
2035	21	247	$523,638	$96,480	$250,092	$523,638
2036	22	247	$523,638	$90,168	$242,808	$523,638
2037	23	247	$523,638	$84,269	$235,736	$523,638
2038	24	247	$523,638	$78,756	$228,870	$523,638
2039	25	247	$523,638	$73,604	$222,204	$523,638
2040	26	247	$523,638	$68,789	$215,732	$523,638
2041	27	247	$523,638	$64,289	$209,448	$523,638
2042	28	247	$523,638	$60,083	$203,348	$523,638
2043	29	247	$523,638	$56,152	$197,425	$523,638
2044	30	247	$523,638	$52,479	$191,675	$523,638

Appendix Exhibit B4 Lower Bound -- Option 4B Compliance Cost Adjustment Factor Calculation						
Year	Analysis Year	Number of Notifying& RCRA Facilities (5% Submit Legitimacy Petition)	Aggregate Annual Costs (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2045	31	247	$523,638	$49,045	$186,092	$523,638
2046	32	247	$523,638	$45,837	$180,672	$523,638
2047	33	247	$523,638	$42,838	$175,410	$523,638
2048	34	247	$523,638	$40,036	$170,301	$523,638
2049	35	247	$523,638	$37,417	$165,341	$523,638
2050	36	247	$523,638	$34,969	$160,525	$523,638
2051	37	247	$523,638	$32,681	$155,849	$523,638
2052	38	247	$523,638	$30,543	$151,310	$523,638
2053	39	247	$523,638	$28,545	$146,903	$523,638
2054	40	247	$523,638	$26,677	$142,624	$523,638
2055	41	247	$523,638	$24,932	$138,470	$523,638
2056	42	247	$523,638	$23,301	$134,437	$523,638
2057	43	247	$523,638	$21,777	$130,521	$523,638
2058	44	247	$523,638	$20,352	$126,720	$523,638
2059	45	247	$523,638	$19,021	$123,029	$523,638
2060	46	247	$523,638	$17,776	$119,446	$523,638
2061	47	247	$523,638	$16,613	$115,967	$523,638
2062	48	247	$523,638	$15,527	$112,589	$523,638
2063	49	247	$523,638	$14,511	$109,310	$523,638
2064	50	247	$523,638	$13,561	$106,126	$523,638
Annual average =		247	$2,123			
Total Present Worth Costs				$5,513,134	$11,970,658	$26,181,898
Annualized Costs				$399,482	$465,299	$523,638
Total Annual Costs				$10,472,759		
Exclusion 1 & 2 Affected Facilities		4,933				
Pct Facilities Submit Legitimacy Petition				5.0%		
%Facilities Affected		**5.00%**	Cost Adjustment Factor (Annualized Costs/Total Annual Costs is 100% Adoption)	**3.8145%**	**4.4430%**	**5.0000%**

Appendix Exhibit B5
Lower Bound -- Option 4C Compliance Cost Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying & RCRA Facilities	Aggregate Annual Costs	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2011	-4	4,686	$0	$0	$0	$0
2012	-3	4,686	$0	$0	$0	$0
2013	-2	4,686	$0	$0	$0	$0
2014	-1	4,686	$0	$0	$0	$0
2015	1	4,686	$3,191,404	$2,275,427	$2,752,933	$3,191,404
2016	2	4,686	$3,191,404	$2,126,567	$2,672,751	$3,191,404
2017	3	4,686	$3,191,404	$1,987,446	$2,594,904	$3,191,404
2018	4	4,686	$3,191,404	$1,857,426	$2,519,324	$3,191,404
2019	5	4,686	$3,191,404	$1,735,913	$2,445,946	$3,191,404
2020	6	4,686	$3,191,404	$1,622,348	$2,374,705	$3,191,404
2021	7	4,686	$3,191,404	$1,516,213	$2,305,538	$3,191,404
2022	8	4,686	$3,191,404	$1,417,022	$2,238,387	$3,191,404
2023	9	4,686	$3,191,404	$1,324,319	$2,173,191	$3,191,404
2024	10	4,686	$3,191,404	$1,237,682	$2,109,894	$3,191,404
2025	11	4,686	$3,191,404	$1,156,712	$2,048,441	$3,191,404
2026	12	4,686	$3,191,404	$1,081,039	$1,988,778	$3,191,404
2027	13	4,686	$3,191,404	$1,010,317	$1,930,852	$3,191,404
2028	14	4,686	$3,191,404	$944,221	$1,874,614	$3,191,404
2029	15	4,686	$3,191,404	$882,450	$1,820,013	$3,191,404
2030	16	4,686	$3,191,404	$824,720	$1,767,003	$3,191,404
2031	17	4,686	$3,191,404	$770,766	$1,715,537	$3,191,404
2032	18	4,686	$3,191,404	$720,342	$1,665,570	$3,191,404
2033	19	4,686	$3,191,404	$673,217	$1,617,058	$3,191,404
2034	20	4,686	$3,191,404	$629,175	$1,569,959	$3,191,404
2035	21	4,686	$3,191,404	$588,014	$1,524,232	$3,191,404
2036	22	4,686	$3,191,404	$549,545	$1,479,837	$3,191,404
2037	23	4,686	$3,191,404	$513,594	$1,436,735	$3,191,404
2038	24	4,686	$3,191,404	$479,994	$1,394,889	$3,191,404
2039	25	4,686	$3,191,404	$448,593	$1,354,261	$3,191,404
2040	26	4,686	$3,191,404	$419,246	$1,314,816	$3,191,404
2041	27	4,686	$3,191,404	$391,818	$1,276,521	$3,191,404
2042	28	4,686	$3,191,404	$366,185	$1,239,341	$3,191,404
2043	29	4,686	$3,191,404	$342,229	$1,203,243	$3,191,404

Appendix Exhibit B5
Lower Bound -- Option 4C Compliance Cost Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying & RCRA Facilities	Aggregate Annual Costs	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2044	30	4,686	$3,191,404	$319,840	$1,168,197	$3,191,404
2045	31	4,686	$3,191,404	$298,916	$1,134,172	$3,191,404
2046	32	4,686	$3,191,404	$279,361	$1,101,138	$3,191,404
2047	33	4,686	$3,191,404	$261,085	$1,069,066	$3,191,404
2048	34	4,686	$3,191,404	$244,005	$1,037,928	$3,191,404
2049	35	4,686	$3,191,404	$228,042	$1,007,697	$3,191,404
2050	36	4,686	$3,191,404	$213,123	$978,347	$3,191,404
2051	37	4,686	$3,191,404	$199,181	$949,851	$3,191,404
2052	38	4,686	$3,191,404	$186,150	$922,186	$3,191,404
2053	39	4,686	$3,191,404	$173,972	$895,326	$3,191,404
2054	40	4,686	$3,191,404	$162,591	$869,248	$3,191,404
2055	41	4,686	$3,191,404	$151,954	$843,931	$3,191,404
2056	42	4,686	$3,191,404	$142,013	$819,350	$3,191,404
2057	43	4,686	$3,191,404	$132,722	$795,486	$3,191,404
2058	44	4,686	$3,191,404	$124,040	$772,316	$3,191,404
2059	45	4,686	$3,191,404	$115,925	$749,821	$3,191,404
2060	46	4,686	$3,191,404	$108,341	$727,982	$3,191,404
2061	47	4,686	$3,191,404	$101,253	$706,779	$3,191,404
2062	48	4,686	$3,191,404	$94,629	$686,193	$3,191,404
2063	49	4,686	$3,191,404	$88,439	$666,207	$3,191,404
2064	50	4,686	$3,191,404	$82,653	$646,803	$3,191,404
Avg. nr. Facilities		4,686	Present Worth Costs	$33,600,775	$72,957,297	$159,570,218
Exclusion 1 & 2 and Non-notifying RCRA Hazardous Waste Recycler Annualized Costs				$2,434,712	$2,835,850	$3,191,404
Annualized Costs				$3,359,373	$3,359,373	$3,359,373
Exclusion 1 & 2 and Non-notifying RCRA HW recycler Affected Facilities		4,933				
Pct Facilities Submit Legitimacy Documentation				95.0%		
Percent of Facilities		**95.00%**	Cost Adjustment Factor (Annualized Costs/Total Annual Costs is 100% Adoption)	**72.4752%**	**84.4161%**	**95.0000%**

Appendix Exhibit B6
Upper Bound – Exclusion 1 & 2 Baseline Savings Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying Facilities	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Savings @ 7%	Aggregate PV Savings @ 3%	Aggregate PV Savings @ 0%
2011	-4	63	$0	$0	$0	$0
2012	-3	84	$0	$0	$0	$0
2013	-2	105	$0	$0	$0	$0
2014	-1	126	$0	$0	$0	$0
2015	1	1,040	$20,308,258	$14,479,507	$17,518,081	$20,308,258
2016	2	1,954	$38,155,500	$25,424,621	$31,954,631	$38,155,500
2017	3	2,867	$56,002,742	$34,875,693	$45,535,355	$56,002,742
2018	4	3,781	$73,849,985	$42,981,364	$58,297,860	$73,849,985
2019	5	3,781	$73,849,985	$40,169,499	$56,599,864	$73,849,985
2020	6	3,781	$73,849,985	$37,541,588	$54,951,324	$73,849,985
2021	7	3,781	$73,849,985	$35,085,596	$53,350,800	$73,849,985
2022	8	3,781	$73,849,985	$32,790,277	$51,796,894	$73,849,985
2023	9	3,781	$73,849,985	$30,645,118	$50,288,246	$73,849,985
2024	10	3,781	$73,849,985	$28,640,297	$48,823,540	$73,849,985
2025	11	3,781	$73,849,985	$26,766,633	$47,401,495	$73,849,985
2026	12	3,781	$73,849,985	$25,015,545	$46,020,869	$73,849,985
2027	13	3,781	$73,849,985	$23,379,014	$44,680,455	$73,849,985
2028	14	3,781	$73,849,985	$21,849,546	$43,379,083	$73,849,985
2029	15	3,781	$73,849,985	$20,420,136	$42,115,614	$73,849,985
2030	16	3,781	$73,849,985	$19,084,239	$40,888,946	$73,849,985
2031	17	3,781	$73,849,985	$17,835,738	$39,698,006	$73,849,985
2032	18	3,781	$73,849,985	$16,668,914	$38,541,753	$73,849,985
2033	19	3,781	$73,849,985	$15,578,424	$37,419,178	$73,849,985
2034	20	3,781	$73,849,985	$14,559,275	$36,329,299	$73,849,985
2035	21	3,781	$73,849,985	$13,606,799	$35,271,164	$73,849,985
2036	22	3,781	$73,849,985	$12,716,635	$34,243,849	$73,849,985
2037	23	3,781	$73,849,985	$11,884,705	$33,246,455	$73,849,985
2038	24	3,781	$73,849,985	$11,107,201	$32,278,112	$73,849,985
2039	25	3,781	$73,849,985	$10,380,562	$31,337,972	$73,849,985
2040	26	3,781	$73,849,985	$9,701,460	$30,425,216	$73,849,985
2041	27	3,781	$73,849,985	$9,066,785	$29,539,045	$73,849,985
2042	28	3,781	$73,849,985	$8,473,631	$28,678,684	$73,849,985
2043	29	3,781	$73,849,985	$7,919,281	$27,843,383	$73,849,985

Appendix Exhibit B6
Upper Bound – Exclusion 1 & 2 Baseline Savings Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying Facilities	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Savings @ 7%	Aggregate PV Savings @ 3%	Aggregate PV Savings @ 0%
2044	30	3,781	$73,849,985	$7,401,197	$27,032,410	$73,849,985
2045	31	3,781	$73,849,985	$6,917,007	$26,245,059	$73,849,985
2046	32	3,781	$73,849,985	$6,464,492	$25,480,639	$73,849,985
2047	33	3,781	$73,849,985	$6,041,581	$24,738,485	$73,849,985
2048	34	3,781	$73,849,985	$5,646,338	$24,017,946	$73,849,985
2049	35	3,781	$73,849,985	$5,276,951	$23,318,395	$73,849,985
2050	36	3,781	$73,849,985	$4,931,730	$22,639,218	$73,849,985
2051	37	3,781	$73,849,985	$4,609,094	$21,979,823	$73,849,985
2052	38	3,781	$73,849,985	$4,307,564	$21,339,634	$73,849,985
2053	39	3,781	$73,849,985	$4,025,761	$20,718,092	$73,849,985
2054	40	3,781	$73,849,985	$3,762,393	$20,114,652	$73,849,985
2055	41	3,781	$73,849,985	$3,516,255	$19,528,788	$73,849,985
2056	42	3,781	$73,849,985	$3,286,220	$18,959,989	$73,849,985
2057	43	3,781	$73,849,985	$3,071,234	$18,407,756	$73,849,985
2058	44	3,781	$73,849,985	$2,870,312	$17,871,608	$73,849,985
2059	45	3,781	$73,849,985	$2,682,534	$17,351,076	$73,849,985
2060	46	3,781	$73,849,985	$2,507,042	$16,845,704	$73,849,985
2061	47	3,781	$73,849,985	$2,343,029	$16,355,053	$73,849,985
2062	48	3,781	$73,849,985	$2,189,747	$15,878,692	$73,849,985
2063	49	3,781	$73,849,985	$2,046,493	$15,416,206	$73,849,985
2064	50	3,781	$73,849,985	$1,912,610	$14,967,190	$73,849,985
Avg. No. of Facilities		3,671				
Avg. Savings/Facility			$19,532			
Total Present Worth Cost Savings				$704,457,665	$1,597,661,589	$3,585,415,792
Annualized Savings				$51,045,002	$62,101,106	$71,708,316
Exclusion 1 and 2 Total Annual Cost Savings				$96,350,694	$96,350,694	$96,350,694
Exclusion 1 & 2 Affected Facilities		**4,933**				
Percent of Facilities Notify		**74.42%**	Cost Adjustment Factor (Annualized Cost Savings/Total Annual Cost Savings is 100% Adoption)	**52.9783%**	**64.4532%**	**74.4243%**

Appendix Exhibit B7
Upper Bound Option 2, Requirement 2C Compliance Cost Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying Facilities (Number of Annual Notifiers x 4,455 Exclusion 2 facilities/ 4,933 Excl. 1 and 2 facilities))	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2011	-4	57	$0	$0	$0	$0
2012	-3	76	$0	$0	$0	$0
2013	-2	95	$0	$0	$0	$0
2014	-1	114	$0	$0	$0	$0
2015	1	939	$159,649	$113,827	$137,714	$159,649
2016	2	1,764	$299,951	$199,870	$251,204	$299,951
2017	3	2,589	$440,253	$274,167	$357,966	$440,253
2018	4	3,415	$580,555	$337,888	$458,295	$580,555
2019	5	3,415	$580,555	$315,783	$444,947	$580,555
2020	6	3,415	$580,555	$295,125	$431,987	$580,555
2021	7	3,415	$580,555	$275,817	$419,405	$580,555
2022	8	3,415	$580,555	$257,773	$407,190	$580,555
2023	9	3,415	$580,555	$240,910	$395,330	$580,555
2024	10	3,415	$580,555	$225,149	$383,815	$580,555
2025	11	3,415	$580,555	$210,420	$372,636	$580,555
2026	12	3,415	$580,555	$196,654	$361,783	$580,555
2027	13	3,415	$580,555	$183,789	$351,245	$580,555
2028	14	3,415	$580,555	$171,765	$341,015	$580,555
2029	15	3,415	$580,555	$160,528	$331,082	$580,555
2030	16	3,415	$580,555	$150,026	$321,439	$580,555
2031	17	3,415	$580,555	$140,212	$312,077	$580,555
2032	18	3,415	$580,555	$131,039	$302,987	$580,555
2033	19	3,415	$580,555	$122,466	$294,162	$580,555
2034	20	3,415	$580,555	$114,454	$285,595	$580,555
2035	21	3,415	$580,555	$106,967	$277,276	$580,555
2036	22	3,415	$580,555	$99,969	$269,200	$580,555
2037	23	3,415	$580,555	$93,429	$261,359	$580,555
2038	24	3,415	$580,555	$87,317	$253,747	$580,555
2039	25	3,415	$580,555	$81,604	$246,356	$580,555
2040	26	3,415	$580,555	$76,266	$239,181	$580,555
2041	27	3,415	$580,555	$71,276	$232,214	$580,555
2042	28	3,415	$580,555	$66,614	$225,451	$580,555
2043	29	3,415	$580,555	$62,256	$218,884	$580,555

Appendix Exhibit B7
Upper Bound Option 2, Requirement 2C Compliance Cost Adjustment Factor Calculation

Year	Analysis Year	Number of Notifying Facilities (Number of Annual Notifiers x 4,455 Exclusion 2 facilities/ 4,933 Excl. 1 and 2 facilities))	Aggregate Annual Savings (Number of Facilities x Avg. Savings/facility)	Aggregate Present Value Costs @ 7%	Aggregate PV Costs @ 3%	Aggregate PV Costs @ 0%
2044	30	3,415	$580,555	$58,183	$212,509	$580,555
2045	31	3,415	$580,555	$54,376	$206,320	$580,555
2046	32	3,415	$580,555	$50,819	$200,310	$580,555
2047	33	3,415	$580,555	$47,495	$194,476	$580,555
2048	34	3,415	$580,555	$44,387	$188,812	$580,555
2049	35	3,415	$580,555	$41,484	$183,312	$580,555
2050	36	3,415	$580,555	$38,770	$177,973	$580,555
2051	37	3,415	$580,555	$36,233	$172,789	$580,555
2052	38	3,415	$580,555	$33,863	$167,757	$580,555
2053	39	3,415	$580,555	$31,648	$162,871	$580,555
2054	40	3,415	$580,555	$29,577	$158,127	$580,555
2055	41	3,415	$580,555	$27,642	$153,521	$580,555
2056	42	3,415	$580,555	$25,834	$149,050	$580,555
2057	43	3,415	$580,555	$24,144	$144,708	$580,555
2058	44	3,415	$580,555	$22,564	$140,494	$580,555
2059	45	3,415	$580,555	$21,088	$136,402	$580,555
2060	46	3,415	$580,555	$19,709	$132,429	$580,555
2061	47	3,415	$580,555	$18,419	$128,572	$580,555
2062	48	3,415	$580,555	$17,214	$124,827	$580,555
2063	49	3,415	$580,555	$16,088	$121,191	$580,555
2064	50	3,415	$580,555	$15,036	$117,661	$580,555
Avg. rn. Facilities		3,315				
Avg. Costs/Facility			$170			
Total Present Worth Costs				$5,537,934	$12,559,654	$28,185,932
Annualized Costs				$401,279	$488,194	$563,719
Total Annual Costs if 100% Adoption				$757,439	$757,439	$757,439
Exclusion 2 Affected Facilities		4,455				
$ of Facilities Notify		**74.42%**	Cost Adt Factor (Annualized Costs/Total Annual Costs is 100% Adoption)	**52.9783%**	**64.4532%**	**74.4243%**

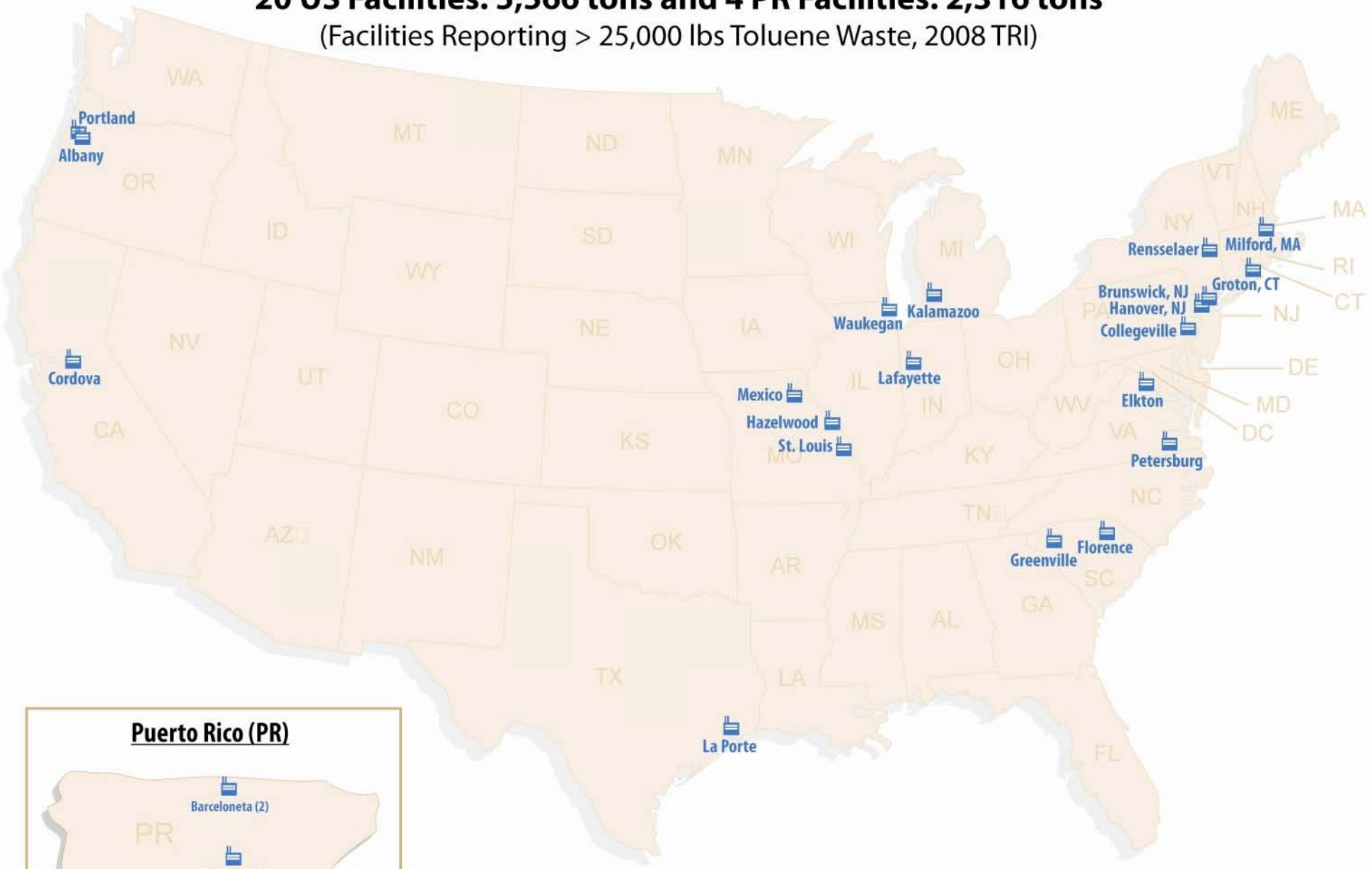
APPENDIX C

2009 EPA "Toxics Release Inventory" (TRI) Chemical Waste Data Reported by the Four Industries Eligible for the "Re-Manufacturing" Option 6

Source: Provided 03 March 2011 to EPA-ORCR by Kathy Davey & Sharon Austin, EPA Office of Pollution Prevention & Toxics

1 of 4: Pharmaceutical Manufacturing - 16 Chemicals			Total Facilities: 114	
	Facilities reporting 16 chemicals: 66 facilities from 53 parent companies		Total Parents: 77	
			Releases (pounds)	Waste (pounds)
179	179 Submissions 16 selected chemicals - Pharmaceutical		1,985,316	107,615,867
	47%	% of total	68%	84%
376	376 Total Submissions - Pharmaceutical		2,927,668	127,941,376
	Chemical Name	# of Submissions		
1	1,2,4-Trimethylbenzene	2	55	2,115
2	Acetonitrile	20	57,947	10,573,683
3	Chlorobenzene	1	48	110,462
4	Chloroform	5	5,231	6,385,920
5	Chloromethane	1	4,130	53,110
6	Cyclohexane	3	7250	3,126,142
7	Dichloromethane	34	287,911	20,301,110
8	Ethylbenzene	1	8	17,908
9	Methanol	46	367,228	43,991,691
10	Methyl isobutyl ketone	1	97	52,867
11	Methyl tert-butyl ether	13	16,998	2,120,018
12	NN-dimethylformamide	13	590143	5,378,248
13	N-butyl alcohol	2	1,477	1,148,099
14	N-hexane	6	6,263	347,367
15	Toluene	27	633,579	13,885,296
16	Xylene (mixed isomers)	5	6951	121811
	179 Submissions 16 selected chemicals - Pharmaceutical	179	1,985,316	107,615,847
		Short ton equivalency =	993	53,808
		Average tons per facility =	9	472

Pharmaceutical Manufacturing Facilities
24 Facilities reporting 7,882 tons Toluene Waste
20 US Facilities: 5,566 tons and 4 PR Facilities: 2,316 tons
(Facilities Reporting > 25,000 lbs Toluene Waste, 2008 TRI)



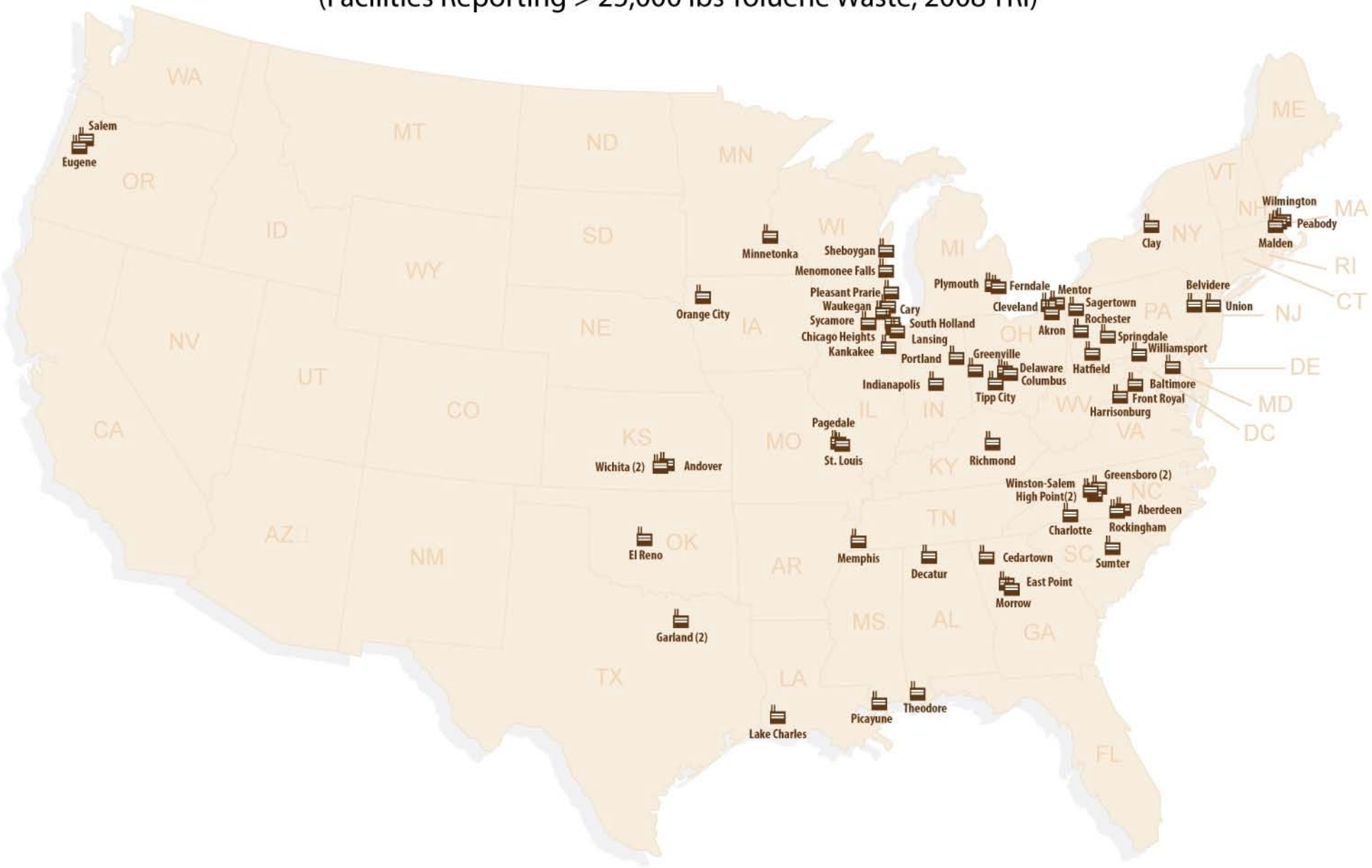
Appendix C (continued)

2 of 4: Paint & Coating Manufacturing - 16 Chemicals			Total Facilities: 430	
	Facilities reporting 16 chemicals: 297 facilities from 200 parent companies		Total Parents: 250	
			Releases (pounds)	Waste (pounds)
960	960 Submissions for 16 selected chemicals – Paint&Coating		1,647,483	76,814,939
	44%	% of total	44%	87%
2187	2187 Total Submissions – All Paint & Coating		3,785,958	88,569,586
	Chemical Name	# of Submissions		
1	1,2,4-Trimethylbenzene	115	106,501	4,269,637
2	Acetonitrile	0		
3	Chlorobenzene	0		
4	Chloroform	0		
5	Chloromethane	0		
6	Cyclohexane	5	2580	23,341
7	Dichloromethane	13	45,383	123,324
8	Ethylbenzene	121	113,961	5,483,886
9	Methanol	69	137,062	11,386,270
10	Methyl isobutyl ketone	95	84,601	8,788,745
11	Methyl tert-butyl ether	1	861	861
12	NN-dimethylformamide	1	5	210
13	N-butyl alcohol	98	127,272	3,312,324
14	N-hexane	12	7,028	114,240
15	Toluene	187	428,524	13,628,661
16	Xylene (mixed isomers)	243	593,704	29,683,620
	960 Submissions for 16 selected chemicals – Paint&Coating	960	1,647,482	76,815,119
		Short ton equivalency =	824	38,408
		Average tons per facility =	2	89

Note: The TRI database does not explicitly indicate whether these chemicals actually function as “solvents” (or function for other purposes, for example, such as chemical reactants or catalysts) by the TRI-reporting facilities in the processing aid applications for which they are reporting the chemical data.

Paint & Coating Manufacturing Facilities
65 Facilities reporting 7,410 tons Toluene Waste

(Facilities Reporting > 25,000 lbs Toluene Waste, 2008 TRI)

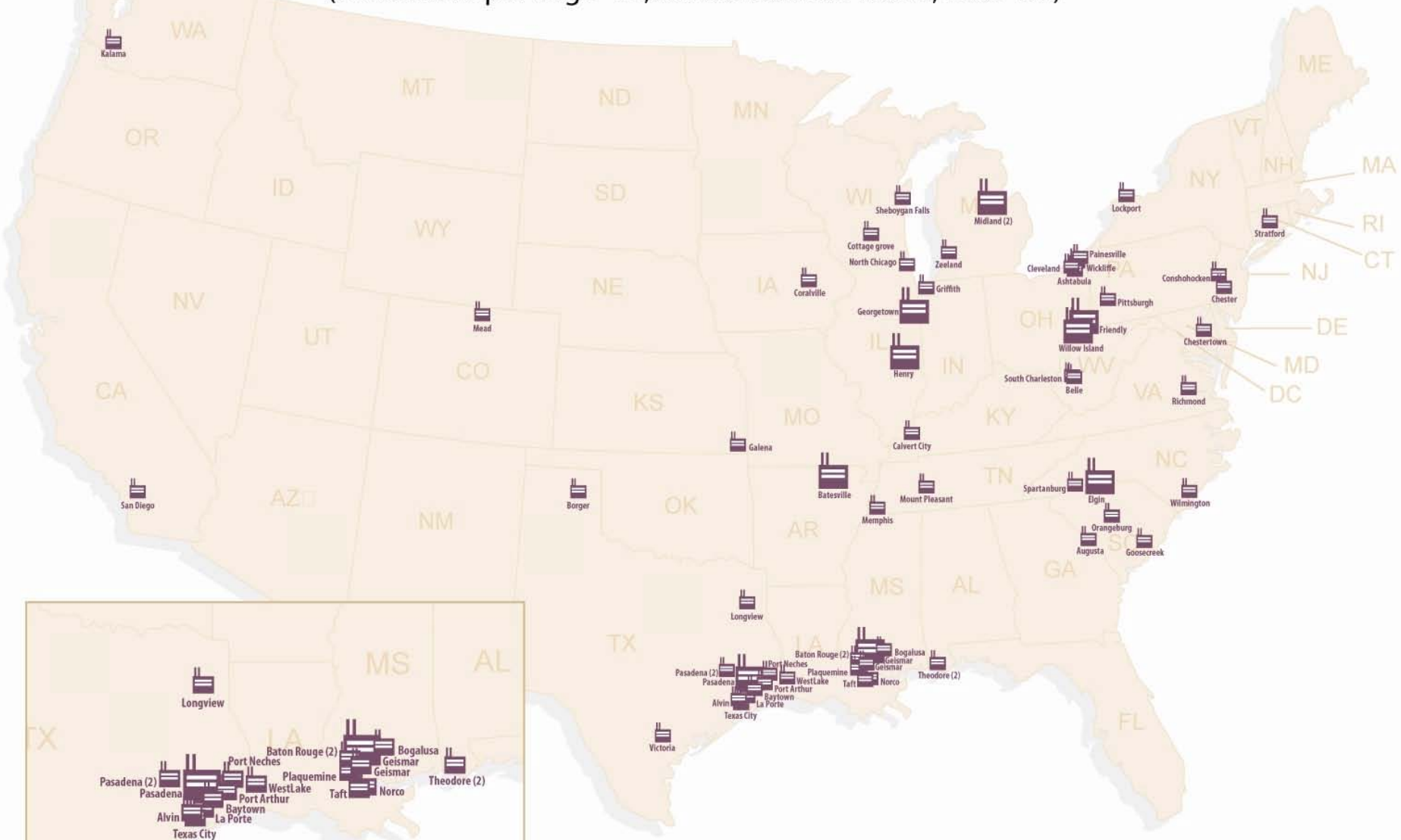


Appendix C (continued)

3 of 4: Basic Organic Chemical Manufacturing - By 16 Chemical			Total Facilities: 390	
	Facilities reporting 16 chemicals: 276 facilities from 200 parent companies		Total Parents: 273	
			Releases (pounds)	Waste (pounds)
801	801 Submissions for 16 selected solvents - Basic Organic Chemical		26,532,002	660,228,736
	25%	% of total	29%	26%
3230	3230 Total Submissions - Basic Organic Chemical		91,222,948	2,507,611,023
	Chemical Name	# of Submissions		
1	1,2,4-Trimethylbenzene	36	15,570	306,747
2	Acetonitrile	27	16,166,337	34,219,998
3	Chlorobenzene	23	54,223	3,330,308
4	Chloroform	19	108,251	10,258,992
5	Chloromethane	24	243,208	9,829,431
6	Cyclohexane	35	1,352,079	26,804,133
7	Dichloromethane	23	221,217	6,084,775
8	Ethylbenzene	50	95,800	8,711,267
9	Methanol	211	6,442,250	376,331,785
10	Methyl isobutyl ketone	30	119,364	5,022,558
11	Methyl tert-butyl ether	13	70,895	1,300,937
12	NN-dimethylformamide	14	17,961	873,917
13	N-butyl alcohol	66	218,524	17,516,584
14	N-hexane	59	400,457	16,683,211
15	Toluene	100	668,119	112,801,779
16	Xylene (mixed isomers)	71	337,668	30,152,314
	801 Submissions for 16 selected chemicals - Basic Organic Chemical	801	26,531,923	660,228,736
		Short ton equivalency =	13,266	330,114
		Average tons per facility =	34	846

Note: The TRI database does not explicitly indicate whether these chemicals actually function as “solvents” (or function for other purposes, for example, such as chemical reactants or catalysts) by the TRI-reporting facilities in the processing aid applications for which they are reporting the chemical data.

Basic Organic Chemicals Manufacturing Facilities
62 Facilities reporting 56,306 tons Toluene Waste
Top 10 Facilities: 50,363 tons Bottom 52 Facilities: 5,947 tons
(Facilities Reporting > 25,000 lbs Toluene Waste, 2009 TRI)



Appendix C (continued)

4 of 4: Plastic Materials and Resin Manufacturing by 16 Chemical			Total Facilities: 369	
	Facilities reporting 16 chemicals: 184 facilities from 89 parent companies		Total Parents: 178	
			Releases (pounds)	Waste (pounds)
447	447 Submissions for 16 selected solvents - Plastic Manufacturing and Resins		6,924,154	170,770,161
	18%	% of total	14%	14%
2473	2473 Total Submissions - Plastic Materials and Resin Manufacturing		47,758,999	1,182,149,902
	Chemical Name	# of Submissions		
1	1,2,4-Trimethylbenzene	31	27,376	389,710
2	Acetonitrile	1	250	250
3	Chlorobenzene	4	71,976	1,574,656
4	Chloroform	8	75,230	4,917,283
5	Chloromethane	5	82,399	1,310,903
6	Cyclohexane	11	242,366	23,150,391
7	Dichloromethane	9	259,074	552,077
8	Ethylbenzene	56	121,117	7,025,598
9	Methanol	103	3,723,361	56,618,397
10	Methyl isobutyl ketone	19	170,165	10,829,032
11	Methyl tert-butyl ether	1	921	921
12	NN-dimethylformamide	7	17,610	3,760,519
13	N-butyl alcohol	36	530,282	5,447,870
14	N-hexane	22	650,738	20,985,783
15	Toluene	74	549,118	15,068,028
16	Xylene (mixed isomers)	60	402,171	19,138,743
	447 Submissions for 16 selected chemicals - Plastic Materials and Resins	447	6,924,154	170,770,161
		Short ton equivalency =	3,462	85,385
		Average tons per facility =	9	231
		Grand total across all 4 industries (short ton equivalency) =		**507,715**
		Average tons per-facility across all 4 industries (1,303 total facilities) =		390

Note: The TRI database does not explicitly indicate whether these chemicals actually function as “solvents” (or function for other purposes, for example, such as chemical reactants or catalysts) by the TRI-reporting facilities in the processing aid applications for which they are reporting the chemical data.

Plastic & Resin Manufacturing Facilities
38 Facilities reporting 7,366 tons Toluene Waste

(Facilities Reporting > 25,000 lbs Toluene Waste, 2009 TRI)

Basic Organic Chemicals, Paint & Coating, Pharmaceutical, Plastic & Resin, and Cement Kiln Facility Locations

(Facilities Reporting > 25,000 lbs Toluene Waste, 2008/9 TRI)

Appendix C (Continued)

Market Value: Pharmaceutical, Paints &Coating, Plastics &Resin, Basic Organic Chemicals						**Total Facilities: 1303**	
Facilities reporting 16 chemicals: 1303 facilities from 650 parent companies						**Total Parents: 650**	
2387	**2387 Submissions 16 selected solvents - All 4 Sectors**		37,088,955	1,015,429,703			
	24%	**% of total**	25%	26%			
10077	**10,077 Total Submissions - Pharmaceutical**		145,695,573	3,906,271,887		DSW RIA	
						Base Case	Upper Bound
	Total lbs	# of Submissions	Release (lbs)	WASTE (lbs)	price /lb	13%	74%
1	**1,2,4-Trimethylbenzene**	**184**	149,502	4,968,209	$0.82	$529,611	$3,014,709
2	**Acetonitrile**	**48**	16,224,534	44,793,931	$0.70	$4,076,248	$23,203,256
3	**Chlorobenzene**	**28**	126,247	5,015,426	$0.68	$443,364	$2,523,762
4	**Chloroform**	**32**	188,712	21,562,195	$0.35	$981,080	$5,584,609
5	**Chloromethane**	**30**	329,737	11,193,444	$0.44	$640,265	$3,644,585
6	**Cyclohexane**	**54**	1,604,275	53,104,007	$0.60	$4,142,113	$23,578,179
7	**Dichloromethane**	**79**	813,585	27,061,286	$0.43	$1,512,726	$8,610,901
8	**Ethylbenzene**	**228**	330,886	21,238,659	$0.53	$1,463,344	$8,329,802
9	**Methanol**	**429**	10,669,901	488,328,143	$0.14	$8,887,572	$50,590,796
10	**Methyl isobutyl ketone**	**145**	374,227	24,693,202	$0.44	$1,412,451	$8,040,107
11	**Methyl tert-butyl ether**	**28**	89,675	3,422,737	$0.43	$191,331	$1,089,115
12	**NN-dimethylformamide**	**34**	625,719	10,012,894	$0.50	$650,838	$3,704,771
13	**N-butyl alcohol**	**202**	877,555	27,424,877	$0.55	$1,960,879	$11,161,925
14	**N-hexane**	**99**	1,064,486	38,130,601	$0.45	$2,230,640	$12,697,490
15	**Toluene**	**388**	2,279,340	155,383,764	$0.43	$8,685,952	$49,443,114
16	**Xylene (mixed isomers)**	**379**	1,340,494	79,096,488	$0.43	$4,421,494	$25,168,502
						$42,229,907	**$240,385,623**
	Total Submissions:	2387					
	2387 Submissions 16 selected solvents - All 4 Sectors		**37,088,875**	**1,015,429,863**			
		Short Tons:	18,544	**507,715**			
		Tons per Facility	14	390			
	Ethanol	***not on TRI***			*$0.47*		
	Tetrahydrofuran	***not on TRI***			*$1.55*		

APPENDIX D

Small Business Count Data to Support the RFA/SBREFA Analysis

Appendix Exhibit D1
Data to Support the RFA/SBREFA Small Business Impact Analysis:
18 Facilities That Submitted Notifications to EPA as of August 4, 2010 for 2008 DSW Final Rule Generator-Controlled Exclusions for Onsite Recycling
23 August 2010 (Mark Eads, Economist, EPA-ORCR)

Item	Business name & EPA ID number	NAICS industry code	SBA small business definition	Small or non-small business?	Business size facts & source
1	Curries 12th St NW facility IA0000362905	332321	<500 employees	Non-small (Assa Abloy parent company is non-small)	Source: #1: US subsidiaries include Ceco Door Products and Curries; in Canada the company operates through Fleming Steel Doors & Frames. ASSA ABLOY Door Group began as a joint venture between Sweden's ASSA ABLOY and SPX Corporation in 2001. In 2003 ASSA ABLOY acquired SPX's interest for $80 million and rebranded the enterprise. Source: http://www.hoovers.com/company/ASSA_ABLOY_Door_Group_LLC/rrhckci-1.html Source #2: Assa Abloy has **32,723 employees** (2008). Source: http://www.hoovers.com/company/ASSA_ABLOY_AB/hjrchi-1.html
2	Curries 9th Street facility IAD043490150	332321	<500 employees	Non-small (Assa Abloy parent company is non-small)	Source #1: US subsidiaries include Ceco Door Products and Curries; in Canada the company operates through Fleming Steel Doors & Frames. ASSA ABLOY Door Group began as a joint venture between Sweden's ASSA ABLOY and SPX Corporation in 2001. In 2003 ASSA ABLOY acquired SPX's interest for $80 million and rebranded the enterprise. Source: http://www.hoovers.com/company/ASSA_ABLOY_Door_Group_LLC/rrhckci-1.html Source #2: Assa Abloy has **32,723 employees** (2008). Source: http://www.hoovers.com/company/ASSA_ABLOY_AB/hjrchi-1.html
3	Fres-co System USA Inc. IAR000007013	323111	<500 employees	Small	Source #1: **201 to 500 employees**. Privately-owned company operates manufacturing facilities in Telford, Pennsylvania; and Red Oak, Iowa. The company was founded in 1978 and is based in Telford, Pennsylvania. Source: http://www.linkedin.com/companies/fres-co-system-usa-inc Source #2: Fresco System is a private company categorized under Wholesale Packaging Machinery and located in Red Oak, IA. Current estimates show this company has annual revenue of $20 to $50 million and employs approximately **50 to 99 staff**. Source: http://www.manta.com/c/mmcs7kw/fresco-system
4	John Deere Davenport Works IAD073489726	333120	<750 employees	Non-small	**51,300 employees**. John Deere is one of the world's largest makers of farm equipment, and a leading producer of construction, forestry, and commercial and residential lawn care equipment. Deere operates three business segments: Agriculture & Turf and Construction & Forestry make up its Equipment Operations; the Credit division is part of Financial Services. Deere operates factories and sales offices around the world. Source: http://www.hoovers.com/company/Deere__Company/rfccci-1.html

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5	John Deere Des Moines Works IAD069624500	333111	<500 employees	Non-small	**51,300 employees**. John Deere is one of the world's largest makers of farm equipment, and a leading producer of construction, forestry, and commercial and residential lawn care equipment. Deere operates three business segments: Agriculture & Turf and Construction & Forestry make up its Equipment Operations; the Credit division is part of Financial Services. Deere operates factories and sales offices around the world. Source: http://www.hoovers.com/company/Deere__Company/rfccci-1.html
6	John Deere Dubuque Works IAD005269527	333120	<750 employees	Non-small	**51,300 employees**. John Deere is one of the world's largest makers of farm equipment, and a leading producer of construction, forestry, and commercial and residential lawn care equipment. Deere operates three business segments: Agriculture & Turf and Construction & Forestry make up its Equipment Operations; the Credit division is part of Financial Services. Deere operates factories and sales offices around the world. Source: http://www.hoovers.com/company/Deere__Company/rfccci-1.html
7	John Deere Engine Works IAD000678094	333618	<1,000 employees	Non-small	**51,300 employees**. John Deere is one of the world's largest makers of farm equipment, and a leading producer of construction, forestry, and commercial and residential lawn care equipment. Deere operates three business segments: Agriculture & Turf and Construction & Forestry make up its Equipment Operations; the Credit division is part of Financial Services. Deere operates factories and sales offices around the world. Source: http://www.hoovers.com/company/Deere__Company/rfccci-1.html
8	John Deere Waterloo Works IAD000805168	333111	<500 employees	Non-small	**51,300 employees**. John Deere is one of the world's largest makers of farm equipment, and a leading producer of construction, forestry, and commercial and residential lawn care equipment. Deere operates three business segments: Agriculture & Turf and Construction & Forestry make up its Equipment Operations; the Credit division is part of Financial Services. Deere operates factories and sales offices around the world. Source: http://www.hoovers.com/company/Deere__Company/rfccci-1.html
9	Siegwerk USA IAD078096732	325910	<500 employees	Non-small (Germany parent company is non-small)	Siegwerk is a world-leading supplier of printing ink for packaging and publications. International family business of **3,900 employees** strives to exceed customers' expectations of quality, reliability and support. In 2009, generated revenues of 774 million Euros. Headquarters is located in Siegburg near Cologne (Germany). Source: http://www.siegwerk.com/en/company.html
10	Vogel Paint & Wax Company Inc IAD007276728	325510	<500 employees	Non-small (Diamond-Vogel parent company is non-small)	**850 employees**. Diamond-Vogel Paint operates seven manufacturing facilities and sells its products through about 80 company-owned stores, primarily in the Midwestern and southwestern US. Diamond-Vogel Paint, which was founded by Dutch immigrant Andrew Vogel in 1926, is owned and managed by the third generation of the Vogel family. Source: http://www.hoovers.com/company/Diamond-Vogel_Paint_Company/rfhtyci-1.html
11	Aluminum	331314	<750	Non-small	One of the largest privately held aluminum extruders in the US, Aluminum Shapes is an operating

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Item	Business name & EPA ID number	NAICS industry code	SBA small business definition	Small or non-small business?	Business size facts & source
	Shapes LLC NJD002338267		employees	(Shapes/Arch parent company is non-small)	subsidiary of Shapes/Arch Holdings LLC. Source: http://www.hoovers.com/company/Aluminum_Shapes_LLC/rfxfkhi-1.html **900 employees**. Source: http://www.hoovers.com/company/Shapes/Arch_Holdings_LLC/shxyktkfx-1.html
12	Siegfried USA NJD064344575	325411	<750 employees	Non-small (Swiss Siegfried Group parent company is non-small)	Siegfried Ltd, and its wholly-owned subsidiary Siegfried USA, form the Swiss-based Siegfried Group. Siegfried has manufacturing facilities in the United States (Pennsville, New Jersey) and Europe (Zofingen, Switzerland). Each of the multi-purpose cGMP facilities - production of APIs and advanced pharmaceutical-related intermediates - are supported by technologically advanced process research and development. In addition, Siegfried also develops and produces finished dosage pharmaceutical products. Siegfried employs **over 800 people** and has annual sales of $258 million. Source: http://www.chembuyersguide.com/partners/siegfried.html
13	Carpenter Technology Corp PAD002344315	331111	<1,000 employees	Non-small	**3,200 employees** (2009). Company makes a variety of corrosion-resistant materials; most of its sales come from stainless steel products and alloys that provide special heat- or wear-resistance or special magnetic or conductive properties. Carpenter also makes titanium products, engineered ceramic products, and tool and other specialty steels. Customers include the aerospace, automotive, medical, and industrial markets. The aerospace sector accounts for more than 40% of its business. Source: http://www.hoovers.com/company/Carpenter_Technology_Corporation/rftski-1.html
14	John Maneely Company Wheatland Tube Division PAD004338091	331210	<1,000 employees	Non-small (Carlyle Group and Novolipetsk parent companies are non-small)	Source #1: The Carlyle Group acquired John Maneely Company in 2006. The deal included Wheatland Tube and John Maneely sister subsidiary Seminole Tubular Products. Source: http://www.hoovers.com/company/Wheatland_Tube_Company/rfxrcki-1.html Source #2: JMC employs **2,100 people** and operates eleven plants in five US states and one Canadian province. Novolipetsk Steel, the leading Russian steel producer, has signed a definitive agreement to acquire JMC from a shareholder group including global private equity firm The Carlyle Group. Headquartered in Lipetsk, Russia, NLMK is a leading steel producer with annual revenues of approximately US$7.7 billion and **70,000 employees** in production facilities across Russia, Europe and the United States. Source: http://www.carlyle.com/media%20room/news%20archive/2008/item10533.html
15	John Maneely Company Wheatland Tube Division PAR000038067	331210	<1,000 employees	Non-small (Carlyle Group and Novolipetsk parent companies are non-small)	Source #1: The Carlyle Group acquired John Maneely Company in 2006. The deal included Wheatland Tube and John Maneely sister subsidiary Seminole Tubular Products. Source: http://www.hoovers.com/company/Wheatland_Tube_Company/rfxrcki-1.html Source #2: JMC employs **2,100 people** and operates eleven plants in five US states and one Canadian province. Novolipetsk Steel, the leading Russian steel producer, has signed a definitive agreement to acquire JMC from a shareholder group including global private equity firm The Carlyle Group. Headquartered in Lipetsk, Russia, NLMK is a leading steel producer with annual revenues of approximately US$7.7 billion and **70,000 employees** in production facilities across

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Item	Business name & EPA ID number	NAICS industry code	SBA small business definition	Small or non-small business?	Business size facts & source
					Russia, Europe and the United States. Source: http://www.carlyle.com/media%20room/news%20archive/2008/item10533.html
16	John Maneely Company Wheatland Tube Division PAD004322863	331210	<1,000 employees	Non-small (Carlyle Group and Novolipetsk parent companies are non-small)	Source #1: The Carlyle Group acquired John Maneely Company in 2006. The deal included Wheatland Tube and John Maneely sister subsidiary Seminole Tubular Products. Source: http://www.hoovers.com/company/Wheatland_Tube_Company/rfxrcki-1.html Source #2: JMC employs **2,100 people** and operates eleven plants in five US states and one Canadian province. Novolipetsk Steel, the leading Russian steel producer, has signed a definitive agreement to acquire JMC from a shareholder group including global private equity firm The Carlyle Group. Headquartered in Lipetsk, Russia, NLMK is a leading steel producer with annual revenues of approximately US$7.7 billion and **70,000 employees** in production facilities across Russia, Europe and the United States. Source: http://www.carlyle.com/media%20room/news%20archive/2008/item10533.html
17	Johnson Matthey Emissions Control Technology PAD980829287	336399	<750 employees	Non-small (Johnson Matthey PLC UK parent company is non-small)	Source #1: Johnson Matthey (1,650 employees in US) serves the precious metals, catalysts, coatings, and pharmaceutical businesses in the US. The company provides contract research and development for the pharmaceutical industry. Its Fine Chemicals and Catalysts unit manufactures active pharmaceutical ingredients and products for chemicals makers. The Precious Metals division sells platinum sheet, tube, and wire to jewelers in addition to refining precious metals. Johnson Matthey Fuel Cells also operates in the US. The company forms the North American unit for the UK chemicals and catalysts maker Johnson Matthey. Source: http://www.hoovers.com/company/Johnson_Matthey_Inc/rtyjcxi-1.html Source #2: **8,588 employees** (2010). Johnson Matthey PLC London UK dates to 1817 as an established world leader in the refining and distribution of gold, silver, and platinum group metals (about 60% of sales). It is the sole marketing arm for Anglo Platinum, the world's largest platinum producer, through its Precious Metal Products division. Johnson Matthey's Environmental Technologies Catalysts division produces emission control products, fuel cells, and process catalysts. Its Fine Chemicals and Catalysts division makes base and precious metals catalysts and chemicals as well as active ingredients sold to pharmaceuticals manufacturers. Johnson Matthey operates in 30 countries on all the major continents. Source: http://www.hoovers.com/company/Johnson_Matthey_Plc/sftyif-1.html
18	Hovensa LLC VID980536080	324110	<1,500 employees & <125,000 barrels-per-day capacity	Non-small (Hess parent company is non-small)	Source #1: HOVENSA is a joint venture of Hess and Venezuelan oil giant PDVSA. The largest private employer in the US Virgin Islands, the company operates a 500,000-barrels-per-day crude oil refinery on St. Croix. Source: http://www.hoovers.com/company/HOVENSA_LLC/rrytxsi-1.html Source #2: Hess Corporation (formerly Amerada Hess) is an integrated oil and gas exploration and production company primarily in Algeria, Australia, Azerbaijan, Brazil, Denmark, Egypt,

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					Equatorial Guinea, Gabon, Ghana, Indonesia, Libya, Malaysia, Norway, Peru, Russia, Thailand, the UK, and the US. It operates a 50%-owned refinery (HOVENSA) in the US Virgin Islands and a smaller one in New Jersey, and it markets gasoline through about 1,360 HESS gas stations in 16 US states. Hess has **13,300 employees** (2009). Source: http://www.hoovers.com/company/Hess_Corporation/rffkyi-1.html
% of facilities owned by small businesses =				1/18 = **5.5%**	

Appendix Exhibit D2
Data to Support the RFA/SBREFA Small Business Impact Analysis:
19 Facilities That Submitted Notifications to EPA as of August 4, 2010 for 2008 DSW Final Rule Exclusions for Offsite Transfer Recycling
(24 August 2010, Mark Eads, Economist, EPA-ORCR)

Item	Business name & EPA ID number	NAICS industry code	SBA small business definition	Small or non-small business?	Business size facts & source
1	Iowa Contract Fabricators Inc IA0000990762	336211	<1,000 employees	Non-small (Oshkosh Corp parent company is non-small)	Source #1: EPA's Federal Registry System (FRS) indicates Oshkosh Corp is the parent company source: http://oaspub.epa.gov/enviro/fii_query_dtl.disp_program_facility?p_registry_id=110007503040 Source #2: The Oshkosh Corporation's Form 10K EX-21 report of 18 Nov 2009 indicates this business is a subsidiary of Oshkosh (source: http://www.faqs.org/sec-filings/091118/OSHKOSH-CORP_10-K/a09-33359_1ex21.htm) Source #3: Founded in 1917, Oshkosh Corporation has manufacturing operations in 11 US states and in Australia, Belgium, Canada, China, France, the Netherlands and Romania. The company currently employs approximately **12,600 employees** worldwide (source: http://www.oshkoshcorporation.com/about/company_profile.cfm).
2	Iowa Mold Tooling Company Inc IAD005286539	333120	<750 employees	Non-small (Oshkosh Corp parent company is non-small)	Source #1: EPA's Federal Registry System (FRS) indicates Oshkosh Corp is the parent company source: http://iaspub.epa.gov/enviro/fii_query_dtl.disp_program_facility?p_registry_id=110000910998 Source #2: The Oshkosh Corporation's Form 10K EX-21 report of 18 Nov 2009 indicates this business is a subsidiary of Oshkosh (source: http://www.faqs.org/sec-filings/091118/OSHKOSH-CORP_10-K/a09-33359_1ex21.htm) Source #3: Founded in 1917, Oshkosh Corporation has manufacturing operations in 11 US states and in Australia, Belgium, Canada, China, France, the Netherlands and Romania. The company currently employs approximately **12,600 employees** worldwide (source: http://www.oshkoshcorporation.com/about/company_profile.cfm).
3	Aleris Rolled Products Inc NJD051415909	331315	<750 employees	Non-small	Aleris is a global leader in the production and sale of aluminum rolled and extruded products, recycled aluminum, and specifications alloy manufacturing. From its headquarters in Beachwood, Ohio, a suburb of Cleveland, Aleris operates more than 40 production facilities throughout the Americas, Europe and Asia. The company employs more than **6,500 people**. Source: http://www.aleris.com/about-aleris
4	Anadigics Inc NJR000036301	334413	<500 employees	Non-small	Source #1: Anadigics, Inc is a public company categorized under Integrated Circuits, Semiconductor Networks, Etc. and located in Warren, NJ. Current estimates show this company has annual revenues of $140,484,000 and employs approximately **657 staff** (source: http://www.manta.com/c/mmldfl2/anadigics-inc) Source #2: **564 employees** (source: http://investing.businessweek.com/research/stocks/snapshot/snapshot.asp?ticker=ANAD:US)
5	Safety-Kleen Systems	562211	<$10.5 million	Non-small	**$1.03 billion** revenues projected for 2010 (source: http://wasteage.com/companies/safety-kleen/)

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Item	Business name & EPA ID number	NAICS industry code	SBA small business definition	Small or non-small business?	Business size facts & source
	Company NJD002182897		revenues/year		
6	Sancoa International NJD986629491	323111	<500 employees	Small	**335 employees** (source: http://www.hoovers.com/company/sancoa_international_company_lp/rkhhtkfjx-1.html and http://www.manta.com/c/mmd32jk/sancoa-international-company-l-p)
7	Siegfried USA NJD064344575	325411	<750 employees	Non-small (Swiss Siegfried Group parent company is non-small)	Siegfried Ltd, and its wholly-owned subsidiary Siegfried USA, form the Swiss-based Siegfried Group. Siegfried has manufacturing facilities in the United States (Pennsville, New Jersey) and Europe (Zofingen, Switzerland). Each of the multi-purpose cGMP facilities - production of APIs and advanced pharmaceutical-related intermediates - are supported by technologically advanced process research and development. In addition, Siegfried also develops and produces finished dosage pharmaceutical products. Siegfried employs **over 800 people** and has annual sales of $258 million. Source: http://www.chembuyersguide.com/partners/siegfried.html
8	Veolia ES Technical Solutions LLC NJD002454544	562211	<$10.5 million revenues/year	Non-small (Veolia Environment parent is non-small)	Veolia Environmental Services in North America, a subsidiary of Veolia Environmental Services (VES), is a division of Veolia Environment (VE-NYSE). VES is the world's largest waste services company, with over 100,000 employees in 42 countries generating **revenues of $13.0 billion** in 2009 (source: http://veoliaes.com/About%20Us)
9	Viking Yacht Company NJD002482545	336612	<500 employees	Non-small	April 10, 2009 -- Viking Yacht Co. concluded its final round of layoffs and furloughs last week, bringing the total to 560 fewer employees since the cost-saving measure began in December, company officials said Thursday. Viking, a high-end boat builder in New Gretna, long has been one of the region's largest private employers, with nearly 1,400 workers at the beginning of 2008. A year later, its payroll has shrunk to **800 employees**, said Andrew Davala, a vice president. The company said no more layoffs or furloughs are planned and that it hopes to bring back as many of those workers as possible by the fall. But "it absolutely hinges on the economy recovering," Davala said (source: http://www.jobbankusa.com/News/Layoffs/latest_layoffs_bring_total_to_560_at_viking_yacht.html and http://www.nj.com/news/index.ssf/2009/04/viking_yacht_one_of_south_jers.html)
10	BAE Systems Land & Armaments PAD003025418	336992	<1,000 employees	Non-small	Source #1: Land & Armaments is o of four business divisions of its parent company BAE Systems (http://www.baesystems.com/AboutUs/CompanyStructure/index.htm). Source #2: BAE Systems is a global defense, security and aerospace company with **107,000 employees** worldwide. The Company delivers a full range of products and services for air, land and naval forces, as well as advanced electronics, security, IT solutions and customer support services. In 2009 BAE Systems reported sales of $36.2 billion. It is the 2nd largest global defense company based on 2009 revenues (source: http://www.baesystems.com/AboutUs/FactSheet/index.htm)
11	Carpenter	331111	<1,000	Non-small	**3,200 employees** (2009). Company makes a variety of corrosion-resistant materials; most of its sales

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Item	Business name & EPA ID number	NAICS industry code	SBA small business definition	Small or non-small business?	Business size facts & source
	Technology Corp PAD002344315		employees		come from stainless steel products and alloys that provide special heat- or wear-resistance or special magnetic or conductive properties. Carpenter also makes titanium products, engineered ceramic products, and tool and other specialty steels. Customers include the aerospace, automotive, medical, and industrial markets. The aerospace sector accounts for more than 40% of its business. Source: http://www.hoovers.com/company/Carpenter_Technology_Corporation/rftski-1.html
12	Cherokee Pharmaceuticals LLC PAD003043353	325411	<750 employees	Non-small (PRWT parent company is non-small)	Acquired in 2008 by PRWT Services Inc, with **1,450 employees** nationwide (source: http://www.prwt.com/images/PRWT%20Corporate%20Overview%202%2016%2010.pdf)
13	Erie Plating Co PAD005031448	332813	<500 employees	Small	Source #1: Erie Plating is a private company categorized under Electroplating/Polishing/Anodizing Manufacturers and located in Erie, PA. Records show it was established in 1925 and incorporated in Pennsylvania. Current estimates show this company has annual revenues of $10 to $20 million and approximately **100 to 249 employees** (source: http://www.manta.com/c/mmcx9xm/erie-plating-co) Source #2: In 2008, Erie Plating Company employs about **125 employees** at its 100,000 square feet (9,300 m2) central plant, which ranks among the top 40% of the cleanest industrial facilities in the United States according to Scorecard's Environmental Release Survey (source: http://en.wikipedia.org/wiki/Erie_Plating_Company?oldid=0).
14	International Metals Reclamation Company Inc PAD087561015	331491	<750 employees	Non-small (Horsehead parent company is non-small)	Source #1: International Metals Reclamation Company is also called "INMETCO" and it is a subsidiary of Horsehead Holding Corp. (source: http://www.inmetco.com/about_inmetco.htm). Source #2: Horsehead Holding Corp. ("Horsehead") (Nasdaq: ZINC) is the parent company of Horsehead Corporation, a leading US producer of specialty zinc and zinc-based products and a leading recycler of electric arc furnace dust, and The International Metals Reclamation Company ("INMETCO"), a leading recycler of metals-bearing wastes and a leading processor of nickel-cadmium batteries in North America. Horsehead, headquartered in Pittsburgh, Pa., employs **1,000 people** and has seven facilities throughout the US (source: http://www.horsehead.net/pressreleases.php?showall=yes&news=&ID=65)
15	Jerr-Dan Corp PAD047518014	336211	<1,000 employees	Non-small (Oshkosh Corp parent company is non-small)	Jerr-Dan is owned by the Oshkosh Corporation. Founded in 1917, Oshkosh Corporation has manufacturing operations in 11 US states and in Australia, Belgium, Canada, China, France, the Netherlands and Romania. The company currently employs approximately **12,600 employees** worldwide (source: http://www.oshkoshcorporation.com/about/company_profile.cfm).
16	Jerr-Dan Corp Wrecker Division	336211	<1,000 employees	Non-small (Oshkosh Corp parent	Jerr-Dan is owned by the Oshkosh Corporation. Founded in 1917, Oshkosh Corporation has manufacturing operations in 11 US states and in Australia, Belgium, Canada, China, France, the Netherlands and Romania. The company currently employs approximately **12,600 employees**

Appendix Exhibit D2
Data to Support the RFA/SBREFA Small Business Impact Analysis:
19 Facilities That Submitted Notifications to EPA as of August 4, 2010 for 2008 DSW Final Rule Exclusions for Offsite Transfer Recycling
(24 August 2010, Mark Eads, Economist, EPA-ORCR)

Item	Business name & EPA ID number	NAICS industry code	SBA small business definition	Small or non-small business?	Business size facts & source
	PAR000029769			company is non-small)	worldwide (source: http://www.oshkoshcorporation.com/about/company_profile.cfm).
17	Spectrum Control Technology Inc PAD043882323	334414	<500 employees	Non-small	Source #1: **1,481 full-time employees** (source: http://finance.yahoo.com/q/pr?s=spec) Source #2: **1,516 employees** (source: http://money.cnn.com/magazines/fsb/fsb100/2009/snapshots/71.html)
18	Triangle Circuits PAD981037377	334412	<500 employees	Small	Source #1: Triangle Circuits is one of three subsidiary companies owned by the Millennia Group, which consists of three subsidiary companies (Millennia Design, Triangle Circuits and Millennia Technology) source: http://www.1tmg.com/TMG-profile.html Source #2: The Millennia Group parent company has **190 employees** (source: http://www.answers.com/topic/the-millennia-group-inc and http://www.manta.com/c/mmlltzn/the-millennia-group-inc)
19	World Resources Company PAD981038227	327999	<500 employees	Small	Source #1: Seventeen Marketing and Sales Support Offices are strategically located in major metropolitan areas worldwide and are designed to provide a broad range of customer support on a global basis. These offices are provided detailed material analytical and recycling support from four state-of-the-art laboratory and processing facilities located in eastern and western United States, Pacific Rim/Asia and Europe (source: http://www.worldresourcescompany.com/about/global.aspx) Source #2: The company is a leading global recycler of metal bearing wastewater treatment sludges and associated recyclable materials, serving over 1,500 companies in more than 40 countries, including 41 states in the USA (source: http://www.worldresourcescompany.com/about/company.aspx) Source #3: **102 employees** (source: http://www.hoovers.com/company/World_Resources_Company/cxycfkcs-1.html)
% of facilities owned by small businesses =				4/19 = **21.0%**	